3DM™-GX5™-15
Vertical Reference Unit (VRU)

The 3DM-GX5-15 is a high-performance, industrial-grade Inertial Measurement and Vertical Reference Unit (IMU/VRU) that utilizes micro inertial sensors for use in a wide range of industrial-grade applications, such as platform stabilization and vehicle health monitoring.

The 3DM-GX5-15 combines the strengths of an integrated multi-axis gyroscope and accelerometer, in combination with temperature readings to provide highly accurate inertial measurements. The combination of sensors, environmental compensation, and dual on-board processing with an Extended Kalman Filter EKF, allows the 3DM-GX5-15 to perform well in a wide variety of applications that require low noise, drift, gain, and offset errors.

The 3DM-GX5-15 communicates through a serial connection and is monitored by a host computer. Sensor measurements and computed outputs can be viewed and recorded with the LORD Sensing MIP **Monitor** software that is available as a free download from the LORD Sensing website. Alternatively, users can write custom software with the open source data communication protocol. The data is time-aligned and available by either polling or continuous stream.

Figure 1 - 3DM-GX5-15 Sensor

The 3DM-GX5-15 Inertial Sensor can be purchased by itself or with a Connectivity Kit.

Item	Description	Quantity
Included with Sensor Purchase		
A	3DM-GX5-15 Inertial Sensor	1
--	MIP **Monitor** Software Suite download here: http://www.microstrain.com/software	1
--	Calibration Certificate	1
USB Connectivity Kit		
B	USB Communication Cable	1
--	Easy Start card	1
RS232 Connectivity Kit		
C	RS232 Communication Cable	1
	RS232 Power Supply and Plug Adapters	1
--	Easy Start card	1

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The 3DM-GX5-15 sensor interface includes a communications and power input connector. The sensor is installed using the mounting and alignment holes as needed.

The indicators on the 3DM-GX5-15 include a device status indicator and the device information label. Table 1 - Indicator Behaviors describes the basic status indicator behavior. The device information label includes the sensor frame diagram (axis orientation), which will be critical during device installation.
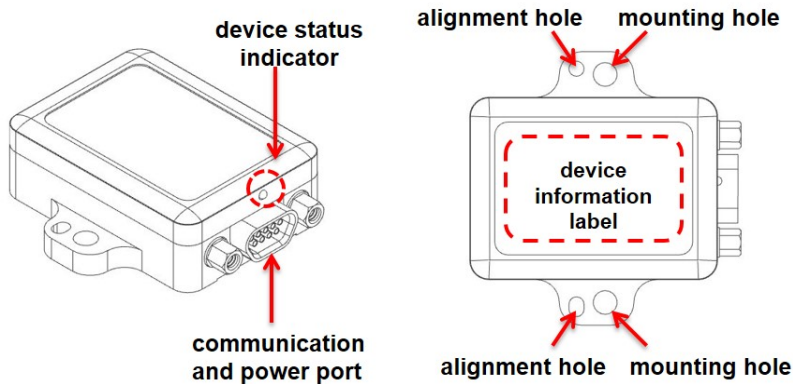

Figure 2 - Interface and Indicators

Indicator	Behavior	Device Status
device status indicator	OFF	no power applied
	rapid flash	streaming data
	slow pulse	idle mode, awaiting commands

Table 1 - Indicator Behaviors

NOTICE Do not put the 3DM-GX5-15 in contact with, or in close proximity to, magnets. Magnets may disrupt operation and cause magnetization of internal components, which can affect magnetometer performance. If magnetization is suspected, use a degaussing tool to demagnetize.

1. Install Software

1. Launch the MIP **Monitor** software installation menu at: https://www.microstrain.com/software.

2. Download and open the MIP **Monitor** zip file.

3. Run the **setup.exe** file, and follow the on-screen prompts to completion.

4. Download and open the Inertial Drivers zip folder to install the hardware drivers required for operating the sensor.

5. Run the **msi** file, and follow the on-screen prompts to completion.

6. If the sensor has internal magnetometers, download and open the Iron Calibration zip file to facilitate magnetometer field calibration.

7. Run the **setup.exe** file, and follow the on-screen prompts to completion. If prompted, reboot the computer when complete.
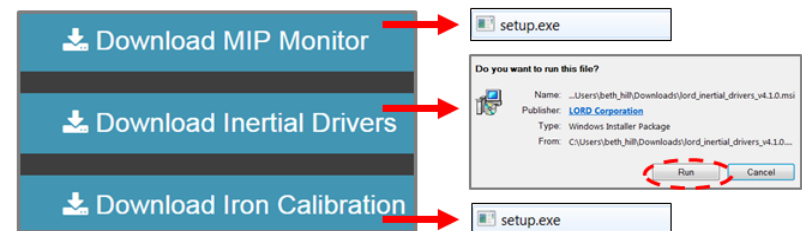

Figure 3 - Software Installation Menu

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2. Make System Connections

To acquire sensor data the following components are needed: 3DM-GX5-15 sensor, communication cable, power cable (as applicable for RS232 communications), and a host computer with LORD Sensing MIP **Monitor** installed.
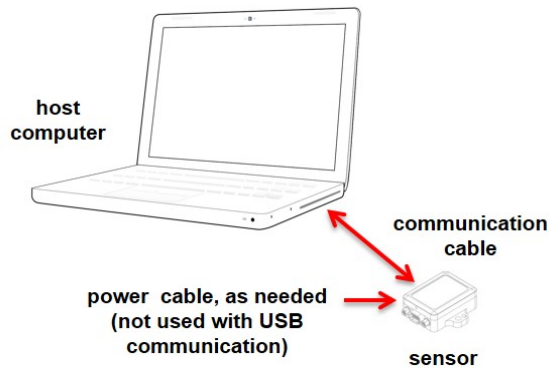

Figure 4 - System Connections

3. Software Interface

The MIP **Monitor** software includes a main window with system information and menus, a device settings window, and several data monitoring windows.
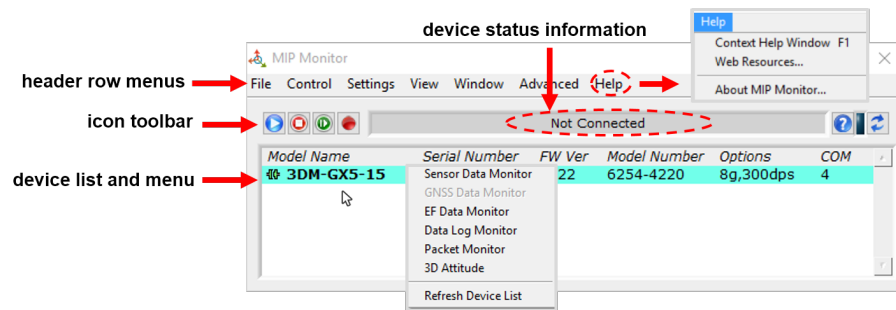

Figure 5 - Main Window Display

4. Establish Sensor Communication

Once power has been applied to the sensor, it is functional. If the hardware drivers have been installed, communication can be established using the MIP **Monitor** software interface.

1. Verify the sensor device status indicator is on.

2. Open the MIP **Monitor** software.

3. The sensor should appear in the device list automatically when the software is running. The list includes the device information and communication port assignment. If the sensor is not automatically discovered, use the refresh button.
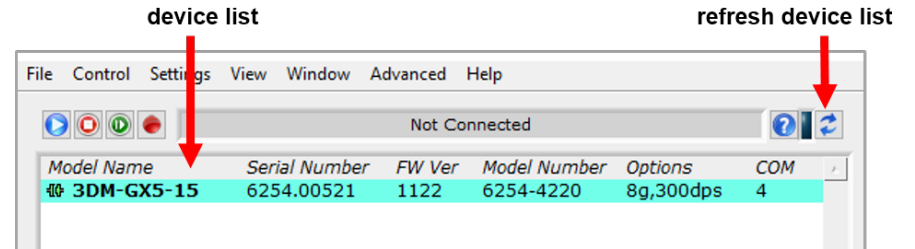

Figure 6 - Sensor Communication

5. Select Sensor Settings

Device settings are stored in the sensor memory. Only the configuration options that are available for the type of sensor being used will be available in the configuration menus.

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To enter the settings menu, right-click on the sensor name, and select Device Settings:

a. **Main menu tabs:** The main tabs break up the setting into broad functional groups for the types of measurement available.

b. **Message Format (first sub-menu tab):** Under each main menu tab there are additional sub-menu tabs, including the Message Format tab. The Message Format tab allows the user to select the measurement type to be displayed and recorded (b1) and the data rate (rate at which data is sent to the host computer) in samples/second (b2).

c. **Measurement parameters (other sub-menu tabs):** Available sub-menu tabs besides the Message Format tab depend on the selected main menu tab. These tabs include the configurable settings for each measurement.

d. **Scrolling:** used to navigate to additional sub-menus

e. **Help button:** Enable the context-sensitive help menu for explanations of specific settings.
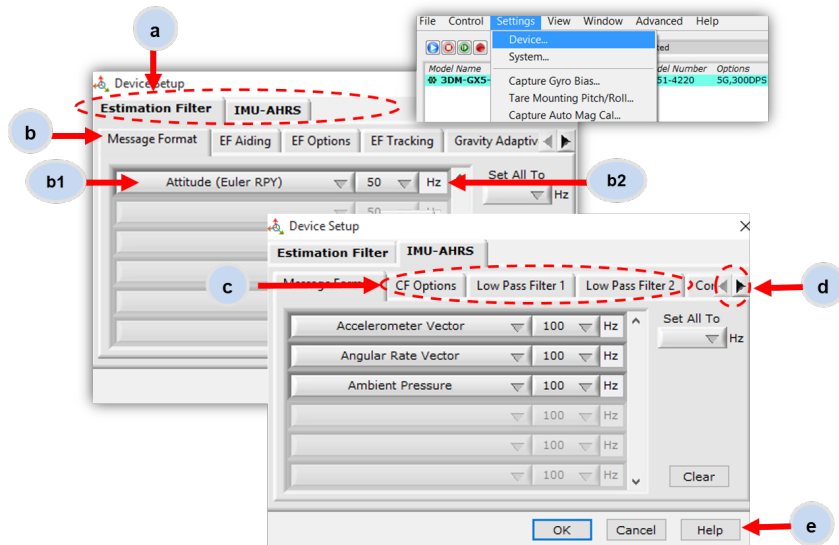

Figure 7 - Device Settings Menu

6. Save Sensor Configuration

Sensor settings are saved temporarily by selecting the OK button in the Device Setup window after configuration, but they are lost when the device is powered off. To save current settings so they are automatically restored the next time the device is powered on, select Settings > Save Current Settings.
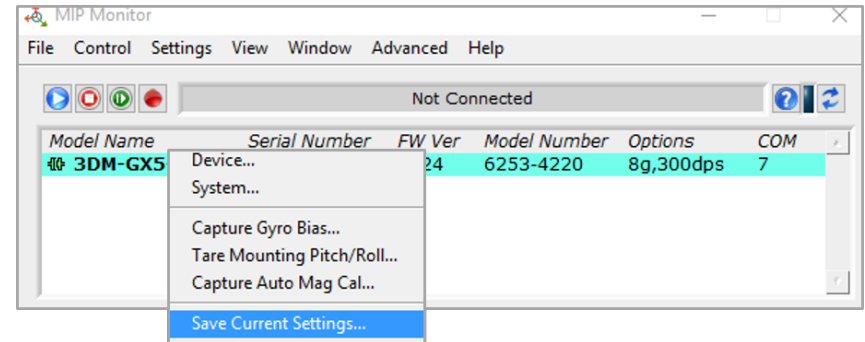

Figure 8 - Save Sensor Settings

7. Start Data Streaming and Recording

Throughout the MIP **Monitor** views the same icons are used to control data streaming (sampling) and recording.
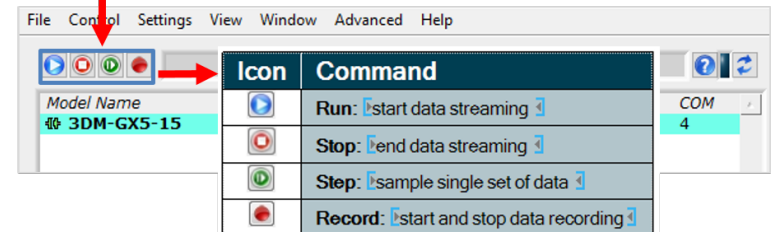

Figure 9 - Sampling and Recording Controls

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1. Right-click on the device in the MIP **Monitor** software main window, and select Sensor Data Monitor.

2. Press the blue Start Streaming icon to start sampling.

Figure 10 - Data Streaming

8. View Recorded Data

Recorded data is stored in either Binary (.bin) or Comma Separated Values (.CSV) format, depending on what was selected at the initiation of data recording. The files can be found in the directory specified at that time or in the default directory on the host computer desktop.

CSV files can be viewed with Microsoft Excel, Quattro Pro, Open Office, or other CSV editors and spreadsheet programs.

Data recorded in Binary format requires a translation program utilizing the LORD Sensing MIP Data Communications Protocol to make it user-readable.
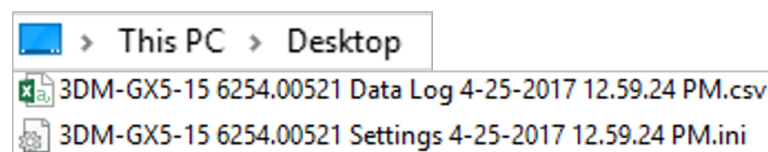
9. Support

Sales Support

Products can be ordered directly from the LORD Sensing website by navigating to the product page and using the Buy feature.

http://www.microstrain.com/inertial

For further assistance, our sales team is available to help with product selection, ordering options, and questions.

Sales Support

sensing_sales@LORD.com

Phone: 802-862-6629

9:00 AM to 5:00 PM (Eastern Time US & Canada)

Technical Support

There are many resources for product support found on the LORD website including technical notes, FAQs, and product manuals.

http://www.microstrain.com/support_overview.aspx

For further assistance our technical support engineers are available to help with technical and applications questions.

Technical Support

sensing_support@LORD.com

Phone: 802-862-6629

SKYPE: microstrain.orientation.support

Live Chat is available from the website during business hours:
9:00 AM to 5:00 PM (Eastern Time US & Canada)

www.microstrain.com

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