

MicroStrain Quick Start Guide: 3DM-GX5-15 Vertical Reference Unit

The 3DM-GX5-15 is a high-performance, industrial-grade, board-level Inertial Measurement and Vertical Reference Unit (IMU/VRU). It combines the strengths of an integrated multi-axis gyroscope and accelerometer, in combination with full temperature compensation, to provide highly accurate inertial measurements.



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 SensorConnect software, available as a free download from the LORD Sensing website. Alternatively, users can write custom software with the open source data communication protocol, also available on the site. Data is time-aligned and available by either polling or continuous stream.



The sensor and connectivity kit are purchased separately. There are two variations of the kit, USB cable (p/n 6212-3004) and RS232 communications and global power (p/n 6212-3001). **This guide assumes that you have a connectivity kit and will download the latest version of SensorConnect™ software.**

Step 1:

Download and install the latest SensorConnect™ software:
http://updates.microstrain.com/SensorConnect_12.3.0_x64.msi



Step 2:

Unpack the sensor and connectivity kit.

Step 3:

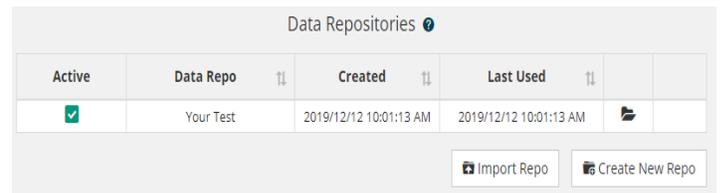
Attach the interface cable to the sensor. If you are using the RS232 version, you must also plug the power supply into the power jack on the RS232 DB9 connector, and then plug it into AC power.

Step 4:

Plug the interface cable into the appropriate computer input. The green LED on the sensor should first blink, then pulse slowly to indicate it is in the idle mode. Sensors are factory-set to idle mode.

Step 5:

Start SensorConnect. The first thing you must do is create a repository file to which you will store settings and data. Click 'home' to bring up this screen:



Step 6:

If you are using a USB interface, the sensor will initiate communications with SensorConnect automatically. This is indicated by a green dot just right of the sensor name. You will also notice that the green LED on the sensor is blinking rapidly, indicating active communications. Click on 'devices' to see this on screen:



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Step 6, continued:

If you are using RS232, click on Devices, and '+ Add Device'.

The 'Add a Device' dialog box shows the 'Connection' dropdown set to 'TCP/IP'. Below it, there is a section for 'Found Network Devices' with a table listing discovered devices. The 'Add Device' button is highlighted in green.

Name	IP Address	Port	Port
W020000000090353	10.6.11.95	5000	5000

Select serial, and identify your serial port. Clicking the port select arrow should identify available comm's ports. Sensors are factory set to 115200 baud. Click Add Device, and Done:

The 'Add a Device' dialog box shows the 'Connection' dropdown set to 'Serial'. Below it, there are dropdown menus for 'Port' (set to COM15) and 'Baud Rate' (set to 115200). The 'Add Device' button is highlighted in green.

Step 7:

Close that window, and click on your device to see settings:

The settings page for device 3DM-GX5-15 97985 is shown. It includes a sidebar with device details (Model, Serial, Firmware, Options, Connection) and a main area with control buttons (Sampling, Set To Idle, Resume), setup options (Configure, Initialize/Reset Estimation Filter, UART Baud Rate, Save/Load Settings), and advanced options (Calibration Report, Monitor Bytes).

Step 8:

Click on sampling, + add channel field, and Attitude (Euler RPY). Set data rate to 10Hz or higher. Then click "apply" and "start"

IMU

Time Field: GPS Correlation Timestamp 10Hz

Channel Field	Data Rate
Attitude (Euler RPY)	10Hz
+ Add Channel Field	

Step 9:

Click on Data, and +Add Widget.

The SensorConnect interface shows the 'Data' tab selected. A '+ Add Widget' button is visible in the top right corner.

Step 10:

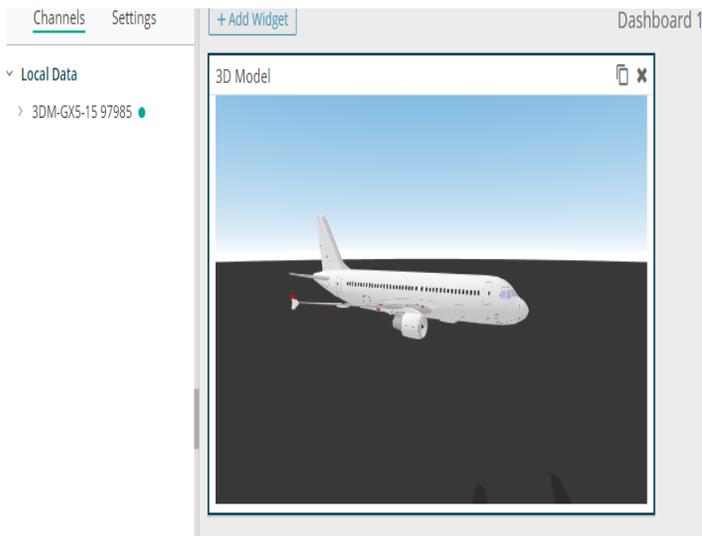
Click on 3D Model.

The SensorConnect interface displays a grid of data visualization widgets. The '3D Model' widget is highlighted. Other widgets include Time Series, Linear Gauge, Radial Gauge, Numeric Display, FFT Gauge, Text Chart, Status Indicator, Thermometer, Histogram, Principal Strain, Notes, and Matrix Display.

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Step 11:

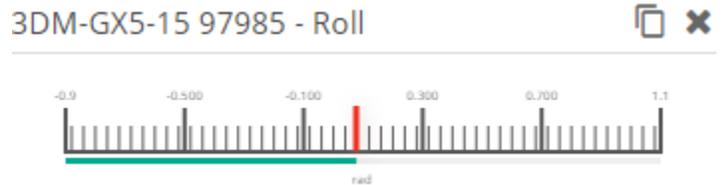
Your screen will look like this:



Step 13:

Test the linkage to the widget aircraft...pick up the sensor, and move it in 3 axes. The plane should respond.

Now you know that your sensor is working, and you're in command. Let's add some other widgets. Click on + Add Widget, and select Linear Gauge. Click on the Gauge icon, and select the Roll data channel, in the local data list:



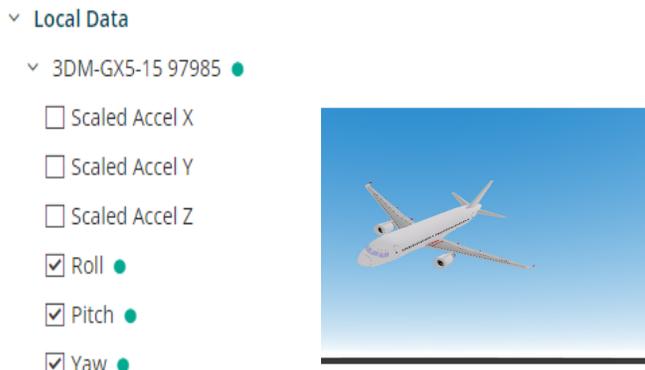
The X icon will close this gauge. The page icon to its left will make duplicates.

Step 12:

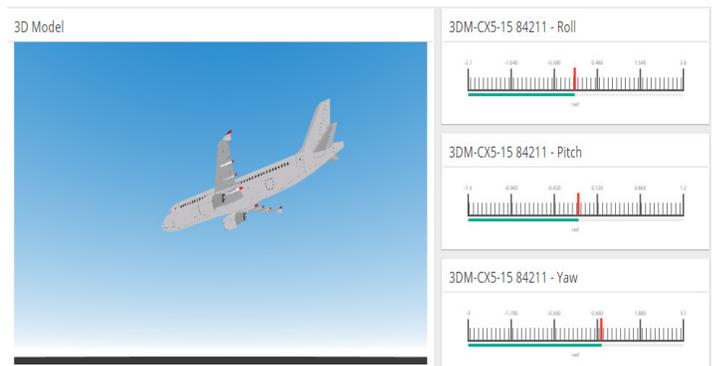
Now let's get data into the model. Under Channels, click on local data, and click on your device. There will be a green dot alongside the sensor name, indicating that it's connected.



Clicking on your sensor will bring up a selection of data channels. Click on Roll, Pitch and Yaw:



Click on the duplicate icon twice, and place two more linear gauges. Click on each of them, and select pitch and yaw data. You'll see the gauge displays move, as you manipulate the sensor.



Step 14:

There is one last step to consider, before exploring SensorConnect further, or incorporating the sensor into your own data handling system.

Click on Devices, and select Monitor Bytes. You can see streaming data:

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Record to file:  
```

```
65 82 0E 0E 11 40 C5 07 99 98 10 62 4E 00 00 00  
01 47 A3  
Read - 2019-11-22 20:03:01.188701952  
75  
Read - 2019-11-22 20:03:01.188865792  
65 80 1C 0E 0C BE 7B 16 F1 BE 09 99 AD 3F 87 5B  
D6 0E 12 40 C5 07 99 DB 22 D0 E5 00 00 00 06 51  
45  
Read - 2019-11-22 20:03:01.278665216  
75  
Read - 2019-11-22 20:03:01.278842880  
65 82 0E 0E 11 40 C5 07 A6 24 DD 2F 1B 00 00 00  
01 87 E2  
Read - 2019-11-22 20:03:01.284687872  
75  
Read - 2019-11-22 20:03:01.284937216  
65 80 1C 0E 0C BE 7B 12 D3 BE 09 95 D6 3F 87 5C  
97 0E 12 40 C5 07 A6 A7 EF 9D B2 00 00 00 06 56  
8C
```

Pin to Bottom Clear

Step 15:

When you're done exploring SensorConnect, click on Home, and select a data repository to save your setup and data.

Active	Data Repo	Created	Last Used	
<input checked="" type="checkbox"/>	cx5-15 test	2019/11/21 03:06:56 PM	2019/11/22 12:07:15 PM	

Now, you're ready to put your sensor to work in your application. For sensor pinout and other details, refer to the user manual, which is found on the MicroStrain website:

<https://www.microstrain.com/inertial/3dm-cx5-45>

Additional information about MicroStrain data communications software and related information will be found by scrolling down to DOCUMENTATION.

Details about other MicroStrain software can be found here: <https://www.microstrain.com/software#web>