MicroStrain 3DM-CX5-45 GNSS/INS: Quick Start Guide

The 3DM-CX5-45 all-in-one navigation solution features a high-performance, integrated multi-constellation GNSS receiver utilizing the GPS, GLONASS, BeiDou, and Galileo satellite constellations. Sensor measurements are fully calibrated, temperature-compensated, and mathematically-aligned to an orthogonal coordinate system for highly accurate outputs.

The 3DM-CX5-45 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 development kit are purchased separately. There are two variations of the kit, USB (p/n 6212-3009) and RS232 (p/n 6212-3010). The C-series Connectivity Board supports both interfaces and is included in both part numbers, along with appropriate cables and mounting screws.

This guide assumes that you have a development kit and will download the latest version of SensorConnect™ software.

Step 1:

Download and install the latest SensorConnect™ software: http://updates.microstrain.com/SensorConnect_12.1.4_x64.msi
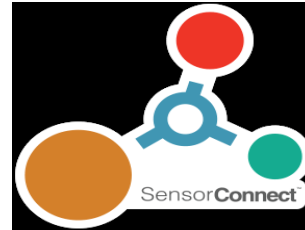
Step 2:

Unpack the development kit, and remove the connectivity board from its anti-stat bag.

Step 3:

Remove the sensor from its packaging, and place it on the mating connector on the connectivity board. Fasten in place with three 2-56 brass screws, provided.

Step 4:

Attach the interface cable to the connectivity board, tighten using a small straight blade screwdriver. 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 5:

Plug the interface cable into the appropriate computer input. The green LED on the connectivity board will illuminate, and the 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 6:

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

Step 7:

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. Click on 'devices' to see this on screen:

Home	Devices	Data

∨ local

3DM-CX5-45 83072 ●
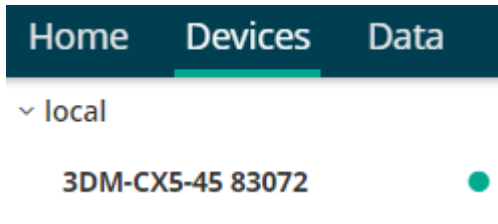
If you are using RS232, click on Devices, and '+ Add Device'. This will bring up the following screen:

Add a Device   ✕

USB devices are automatically discovered when plugged in.
To add a TCP/IP or Serial device, use the form below.

Connection: TCP/IP ▾

Found Network Devices   IP Address: [   ]

Name	IP Address	Port
W020000000090353	10.6.11.95	5000

Port: [5000]

Add Device

Done

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:

USB devices are automatically discovered when plugged in.
To add a TCP/IP or Serial device, use the form below.

Connection: Serial ▾

Port: COM15 ▾

Baud Rate: 115200 ▾

Add Device

Done

Step 8:

Click on your device to see settings and operations:

Options
Settings and operations for your device.

Devices / 3DM-CX5-15 84211

3DM-CX5-15 84211

Model
3DM-CX5-15
6274-4260

Serial
6274.84211

Firmware
1.1.68

Options
8g,300dps

Connection
Serial, COM7, 115200

Last Communication
2 minutes 31 seconds ago

Last Known State
Unknown

Control

▶ Sampling	⏸ Set To Idle	↺ Resume

Setup

⚙ Configure	@ Initialize/Reset Estimation Filter	💾 Save/Load Settings

Advanced

Calibration Report	⌨ Monitor Bytes

Step 9:

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

IMU

Time Field: ☑ GPS Correlation Timestamp   [10Hz ▾]

✕	Channel Field	Data Rate	[10Hz ▾]
✕	Attitude (Euler RPY)	10Hz	▾
+ Add Channel Field			▾

Step 10:

Click on Data, and +Add Widget.

⁂ SensorConnect

Home	Devices	Data

Channels   Settings   [+ Add Widget]

Step 11:

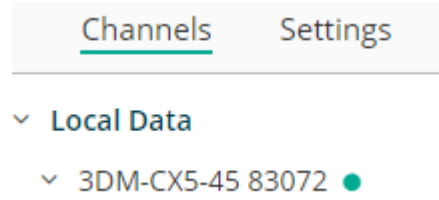**Click on 3D Model.**

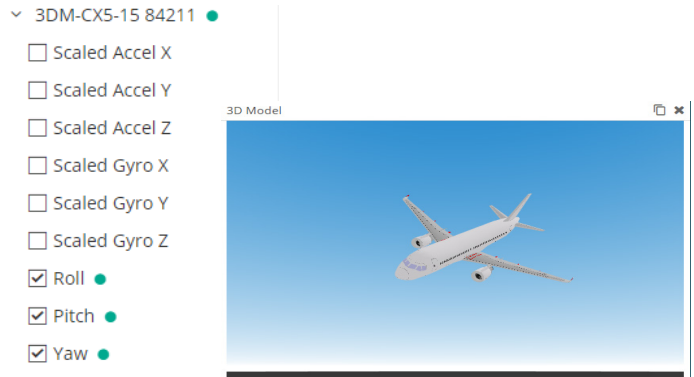## Step 12:

Your screen will look like this:
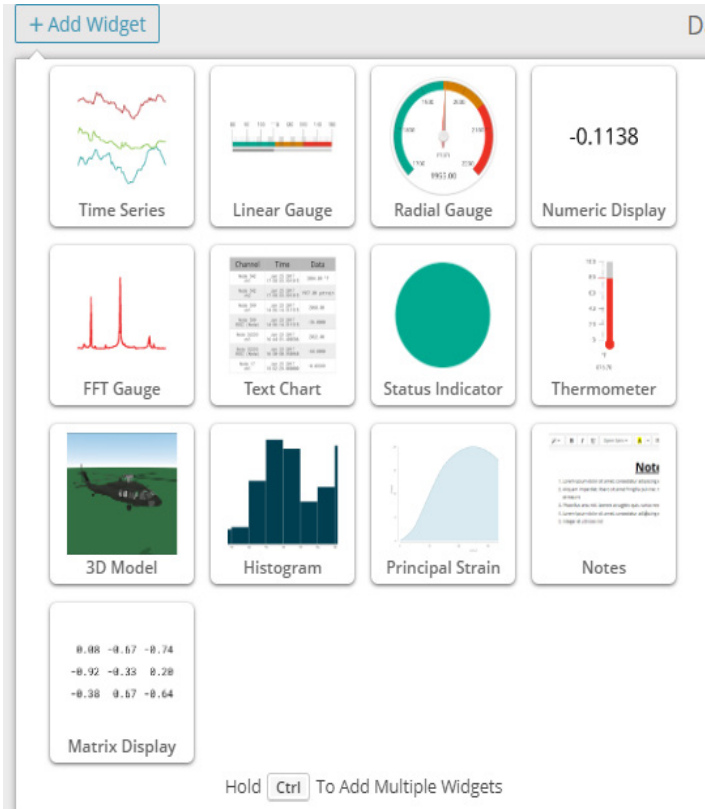
Step 13:

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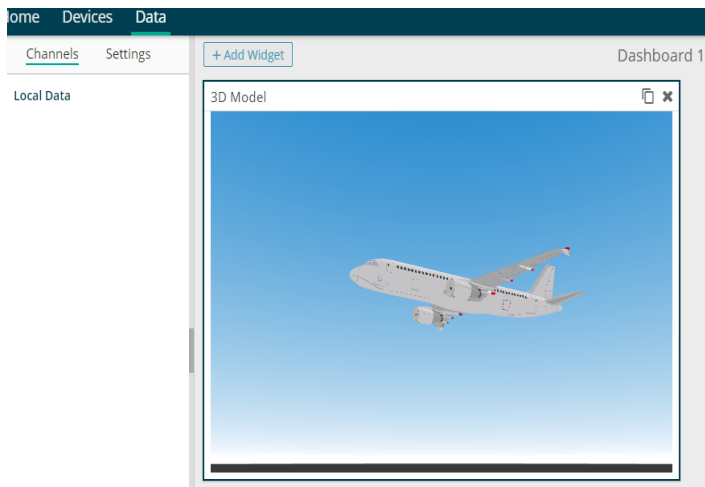

**Clicking on your sensor will bring up a selection of data channels. Click on Roll, Pitch and Yaw:**


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.
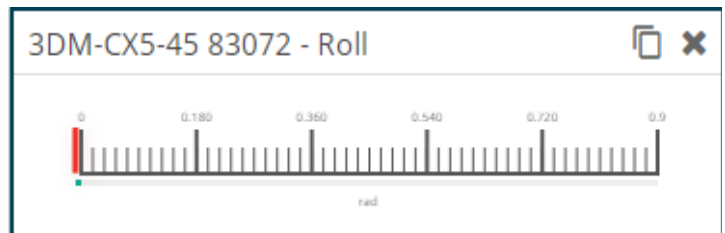
If you click on the duplicate icon in this window, you can place two more linear gauges. To resize a gauge, click on the lower right corner. Then drag and drop it alongside the aircraft image. The X will close the window. The page symbol next to it duplicates the gauge. Click on each of them, and select pitch and yaw data. You'll see the gauge displays move, as you manipulate the sensor.
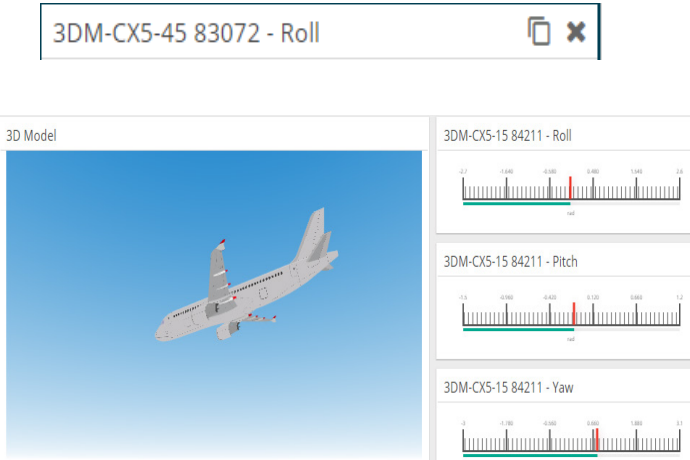
Step 15:
When you're done exploring SensorConnect, click on Home, and select a data repository to save your setup and data.
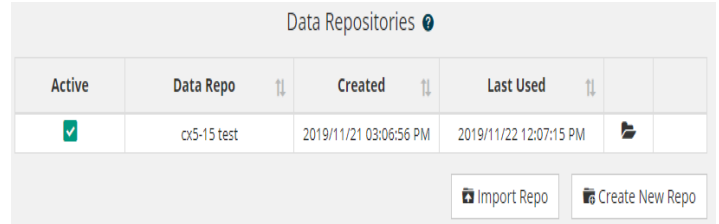
Now, you're ready to put your sensor to work in your application. For sensor pinout and other details, refer to the user manual, which is found on the MicroStrain website:
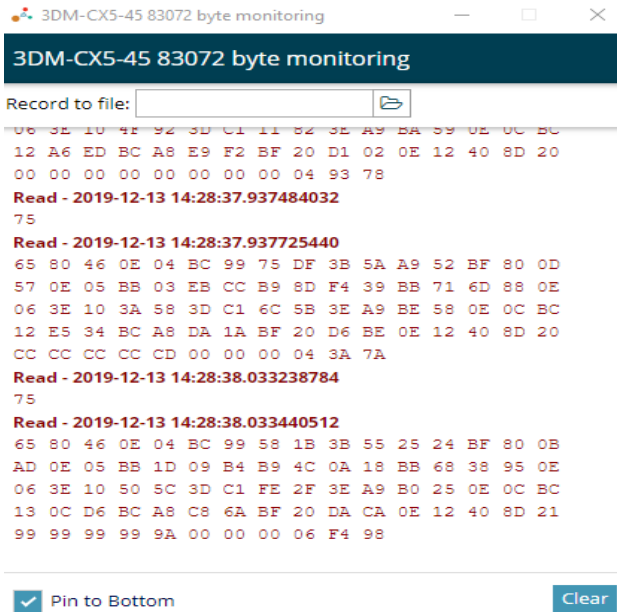
https://www.microstrain.com/inertial/3dm-cx5-45

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

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: