VN-100 DEVELOPMENT KIT

QUICK START GUIDE

INTRODUCTION

This Quick Start Guide provides basic information and instructions to get started using the VN-100 Development board. Please refer to the Development Kit User Guide for additional information regarding the development board features.

WHAT IS IN THE BOX

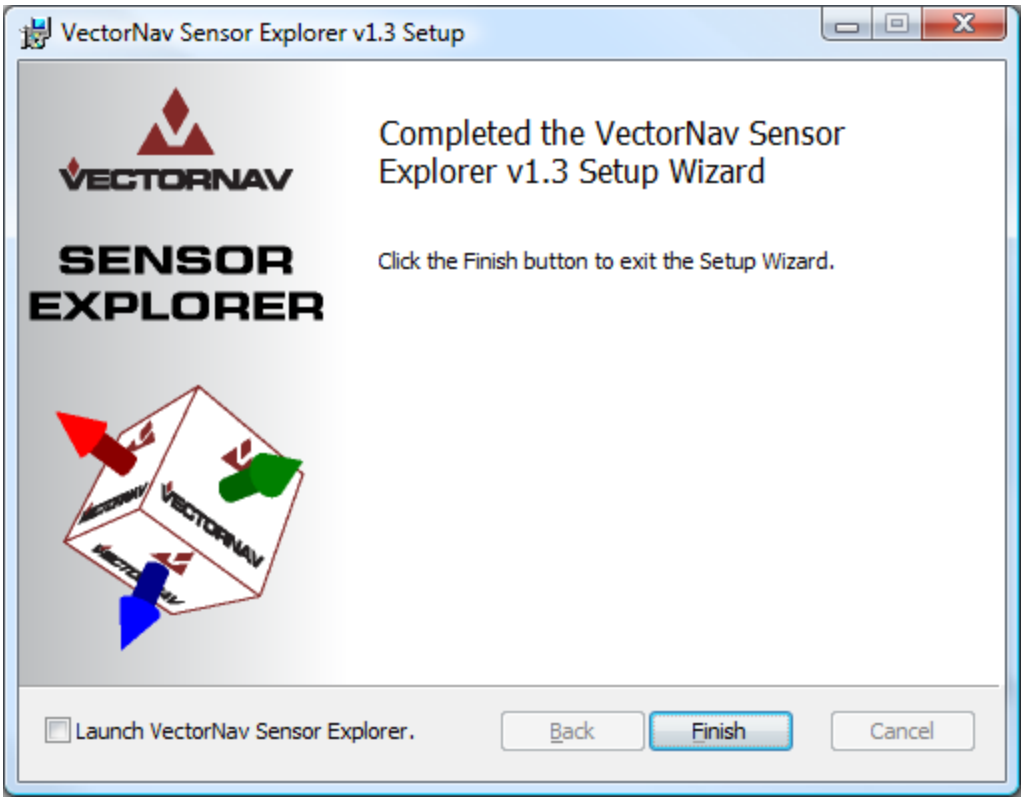
The VN-100 Development Kit is a starter kit for working with the VN-100 orientation sensor. The kit consists of the following items:

1. Development board
2. 5V Regulated power supply
3. One 10-foot USB cable
4. One 6-foot RS-232 serial cable
5. CD-ROM
    a. Documentation (PDF)
    b. USB Device Drivers
    c. Sensor Explorer
    d. Docklight Serial Terminal
6. User Manual
7. Development Kit User Manual
8. Quick Start Guide

SENSOR EXPLORER

STEP 1 – INSTALL SENSOR EXPLORER

Sensor Explorer is a graphical user interface to assist in visualizing the orientation output of the VN-100 sensor. To install the software run **setup.exe** provided in the **/Sensor Explorer** directory on the Development Board CD. After accepting the EULA agreement, continue to click N**ext** until you see the installation complete dialog.

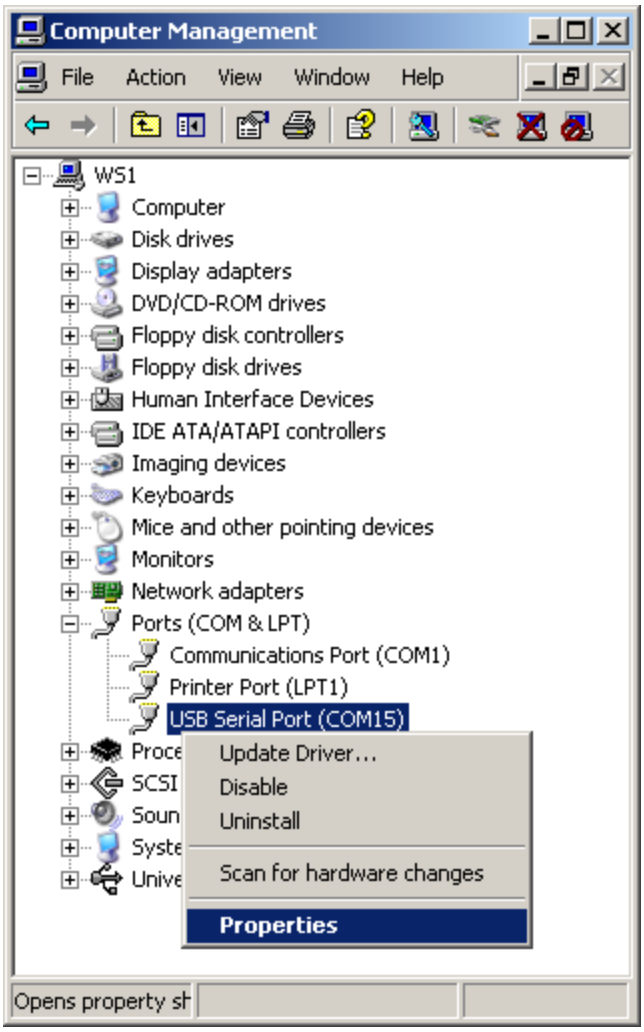


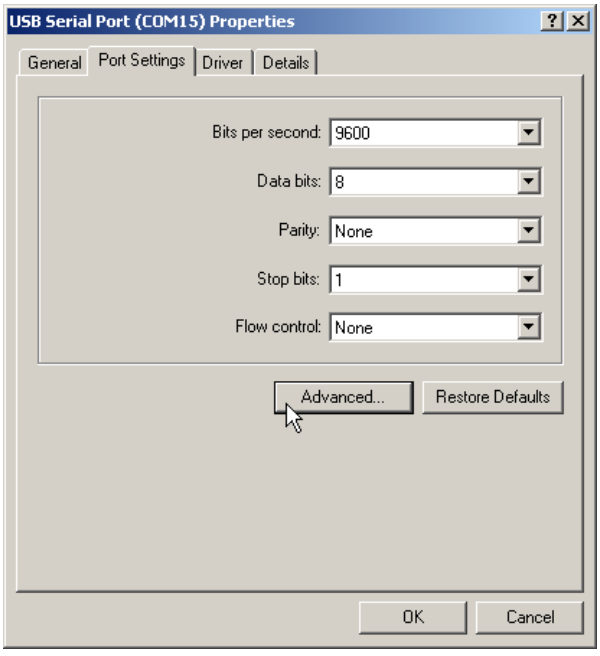
STEP 2 – DECREASE SERIAL PORT LATENCY

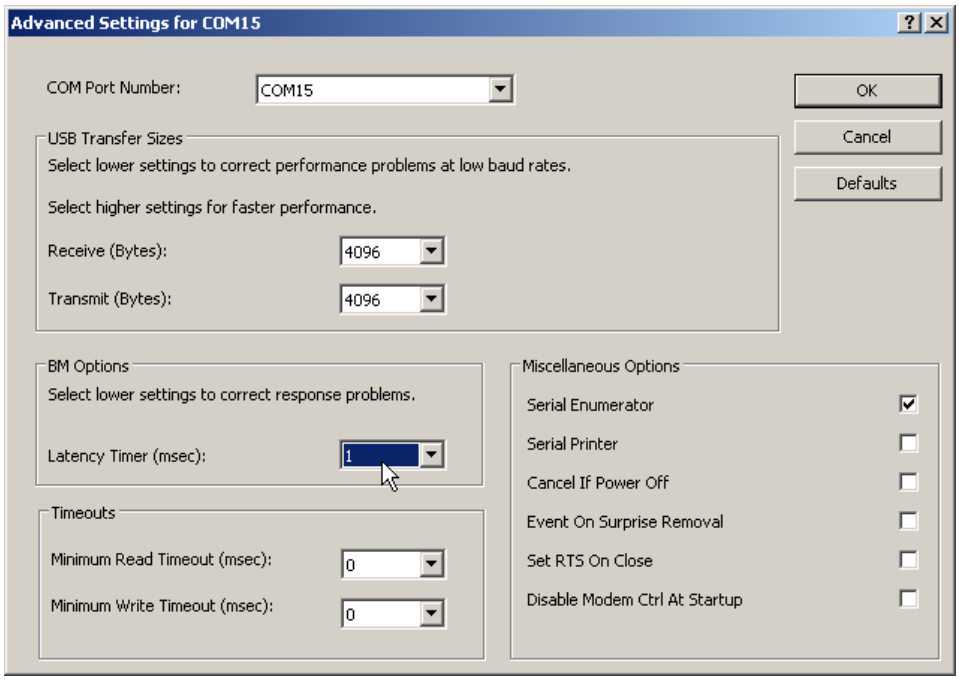
Since the VN-100 is producing real-time data the user experience of Sensor Explorer is influenced by the serial COM port latency settings. Sensor Explorer will attempt to decrease the latency of the COM port. However to ensure that the data is subject to the least amount of latency this step can be performed manually.

To decrease the latency for the COM port:

1. Right click on the USB Serial Port under **Ports (COM & LPT)** section of the Windows Device Manager. (If you forgot which serial port is used by the development board, unplug the development board while watching the device manager window with the **Ports (COM & LPT)** section expanded. Then plug the device back in and take note of the COM port that appears.)
2. Under the **Port Settings** tab click the **Advanced** button.
3. In the **Advanced Settings** dialog box Change the **Latency Timer** to **1ms** under the BM Options.
4. Click **OK** at the top right of the Advanced Settings dialog box.
5. Click **OK** at the bottom right of the USB Serial Port dialog box.

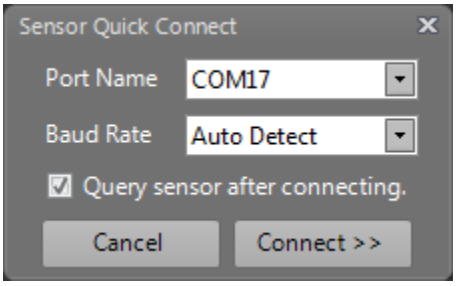






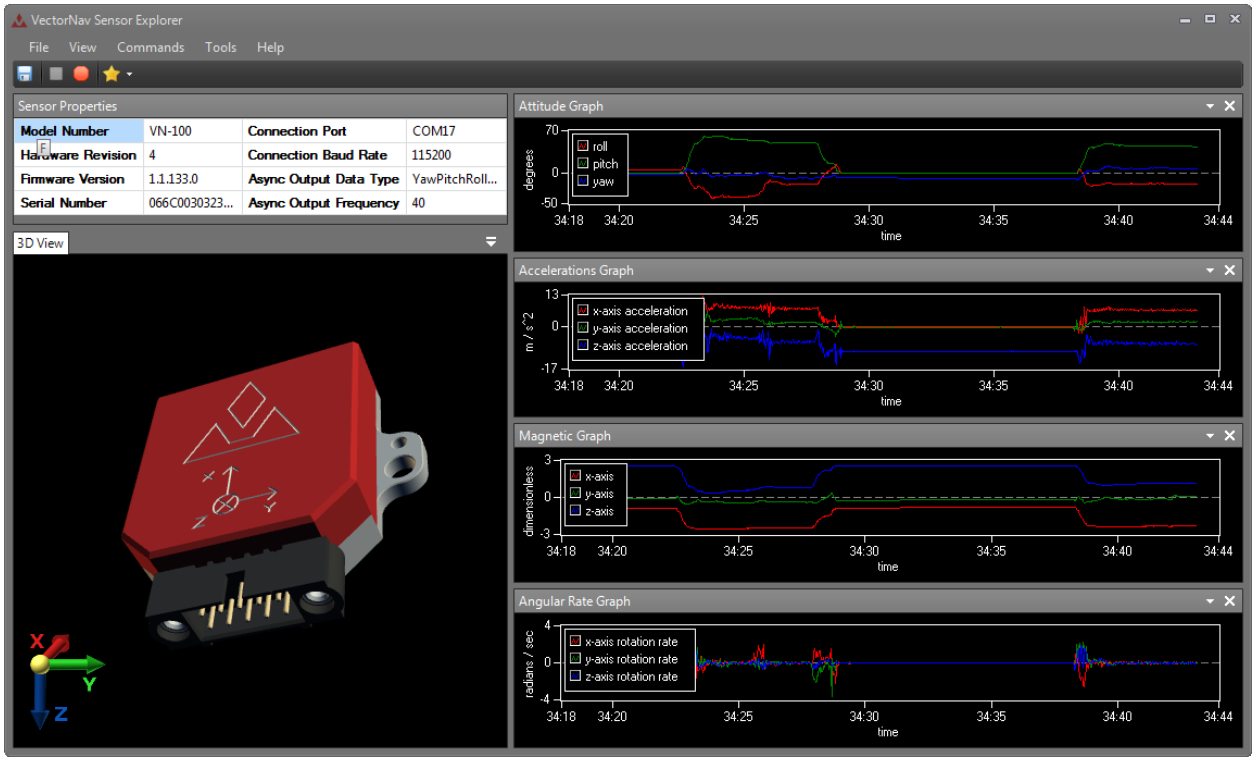
STEP 3 – START SENSOR EXPLORER

To run Sensor Explorer run navigate to **Start** -> **Programs** -> **VectorNav** and click on the Sensor Explorer shortcut. After Sensor Explorer has loaded it will ask you to select a COM port in order to connect to your device. Choose the COM port found previously in Step 2. Sensor Explorer will automatically identify the correct baud rate for your device.



At any time the chip can be returned to its factory default state by resetting the VN-100 while holding the TARE/RESTORE button down. On the VN-100 development board press and hold the TARE/RESTORE button (the one closest to the jumpers), then while holding down the TARE/RESTORE button tap the reset button (middle button). This can easily be done by using your right thumb to press down the TARE/RESTORE button, and then roll your thumb to the left to tap the reset button. After tapping the reset button you can release both buttons. The eraser tip of a pencil also works well to assist in tapping the buttons. This sequence, performed at any time, will restore the chip to its factory default settings.

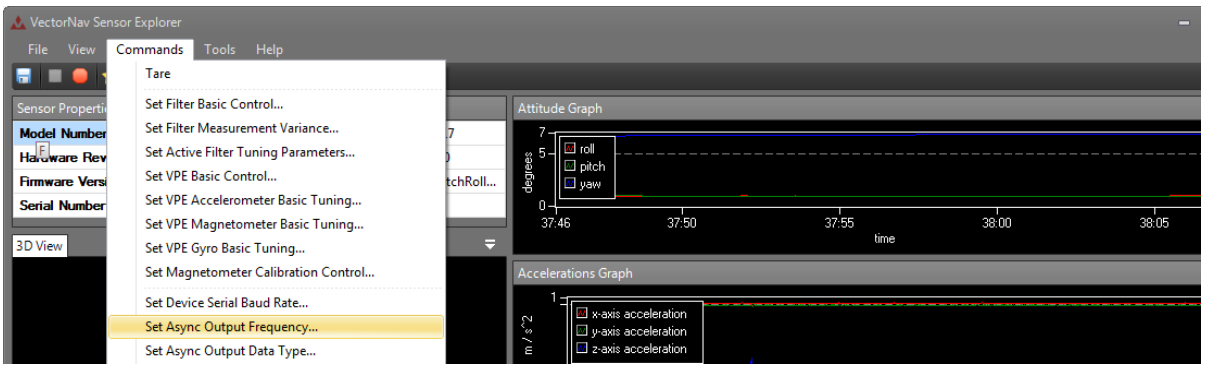
A 3D graphics should now be visible on the screen and its orientation should track the orientation of the VN-100 development board. Move the board around to verify its operation.



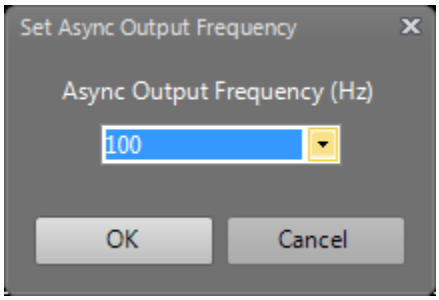
The default parameters for the VN-100 chip are 115200 baud, with Yaw/Pitch/Roll, accelerations, magnetic and angular rates output at 40Hz. As you increase the data output rate or number of output states keep in mind that you will also need to increase the baud rate so that you have sufficient data bandwidth.

STEP 4 – CASE OF INSUFFICIENT BANDWIDTH

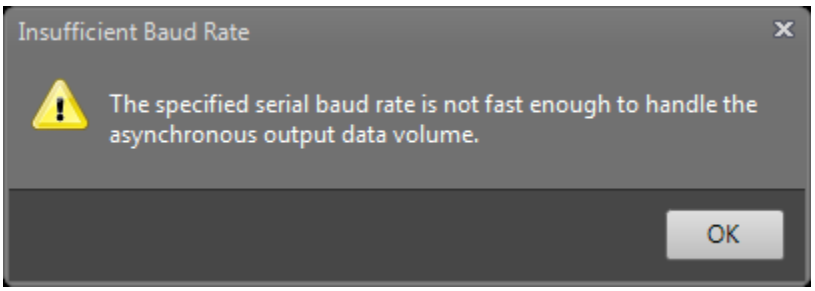
First as an example, try directly increasing the output rate to 100Hz. Go to **Commands** on the Menu bar, and then click **Set Async Output Data Rate**.



In the drop down box select **100Hz**.



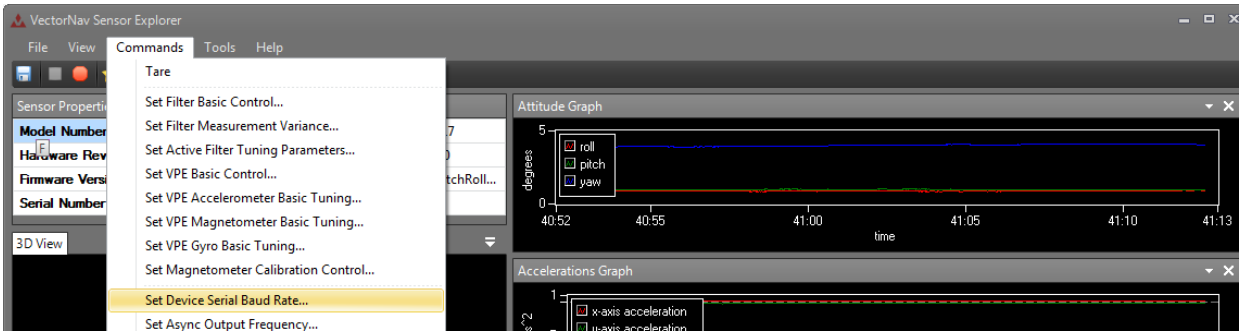
Each time that you change any of the settings from the Commands section from the Menu bar, always check the Sensor Properties section to see if your desired change took effect.



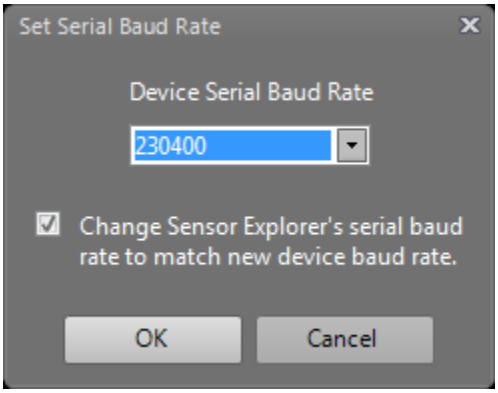
Notice that even though 100Hz was selected from the Command section, the Sensor Properties still reflects 40 Hz in the Async Output Freq (bottom right box). Any time that you increase either the Async Output Freq or change the Async Output Data Type to output more variables than previously displayed always make sure that the baud rate (serial bandwidth) is sufficient to display at your desired settings. In this case since there wasn't sufficient bandwidth, thus the settings did not take effect.

STEP 5 - CHANGE BAUD RATE TO 230400

Go to **Commands** on the Menu bar, and then click **Set Device Serial Rate**.



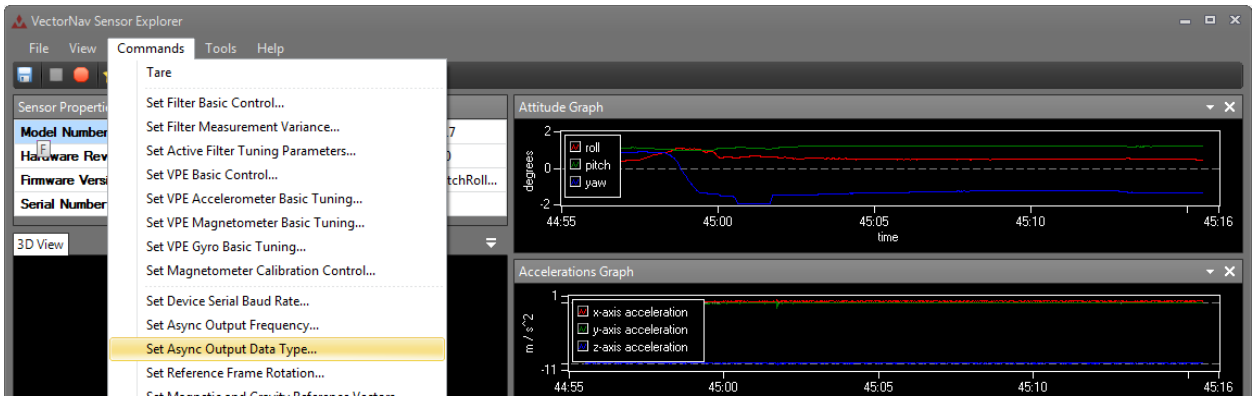
Select baud in the **Set Serial Baud Parameters** dialog box. Make sure that the ***Change Sensor Explorer's serial baud rate to match new device baud rate*** checkbox is selected and click **OK**.



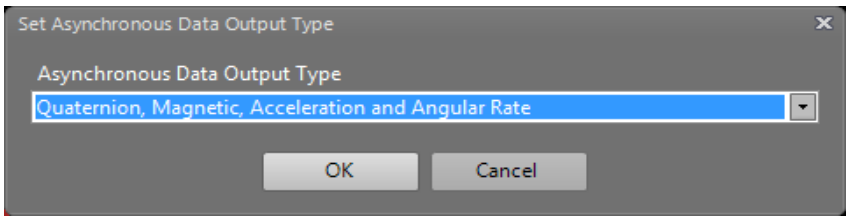
Verify in the Sensor Properties section your changes have taken effect.

STEP 6 - CHANGE DATA OUTPUT TYPE TO QUATERNION

Changing the data output type from Yaw/Pitch/Roll to Quaternion will provide a singularity-free attitude representation. Go to **Commands** then click **Set Async Output Data Type**.

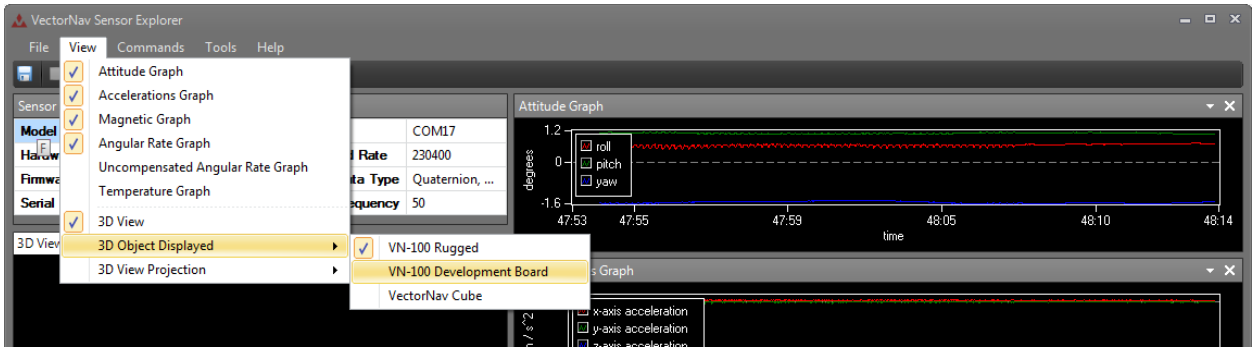


In the **Set Async Output Data Type** dialog box choose **Quaternion, Magnetic, Acceleration, and Angular Rates** and click **OK**.

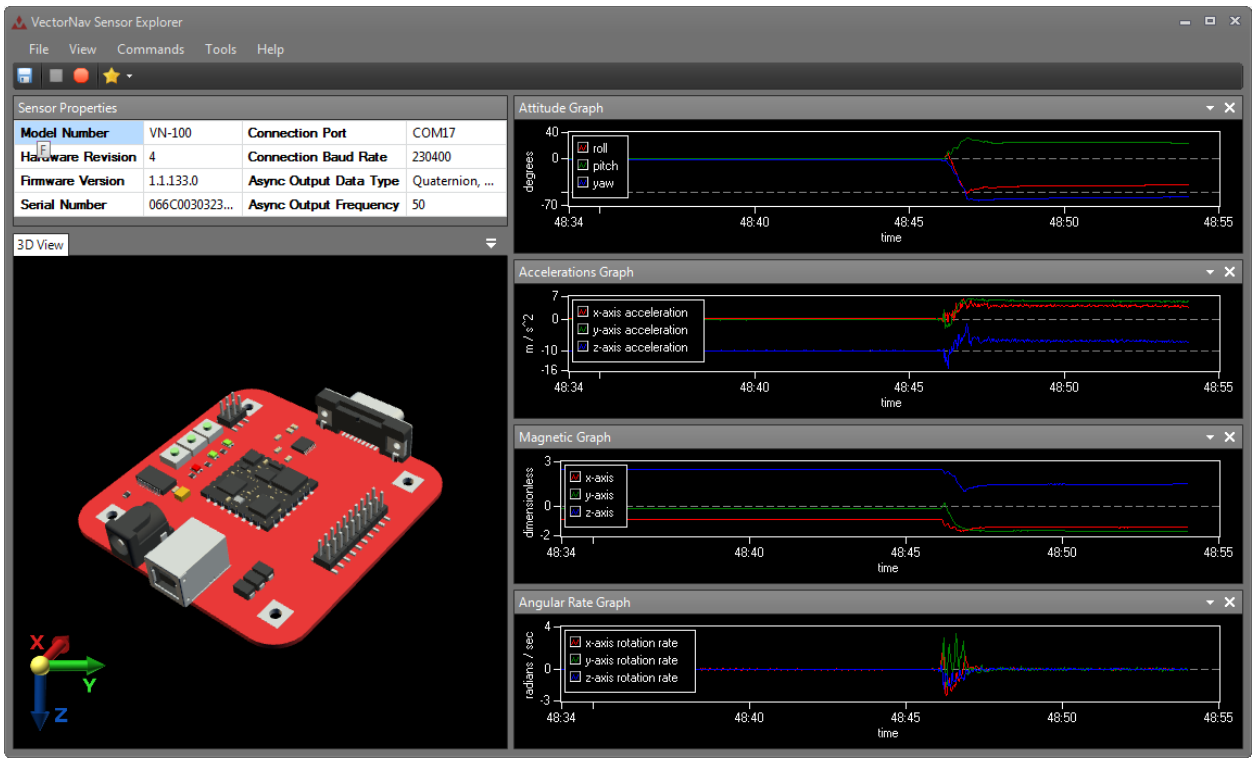


STEP 7 – CHANGE VISUAL REPRESENTATION TO 3D CIRCUIT BOARD

To get a more realistic feel for the development board's attitude, in the menu bar go to **View** -> **3D Object Displayed** then click the **VN-100 Development Board** option.

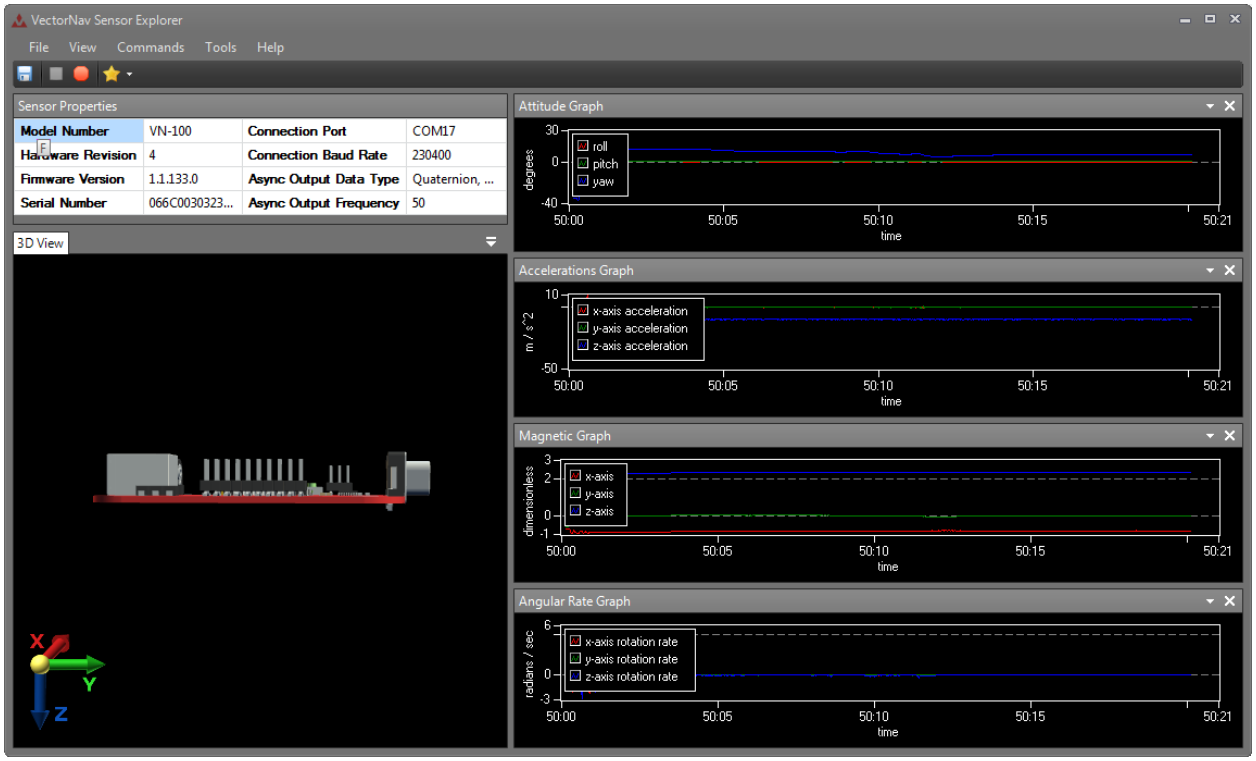


Instead of a cube, a 3D drawing of the VN-100 Development Board should now be displayed.



STEP 8 – TARE YOUR SENSOR TO MATCH SCREEN DISPLAY

To have the orientation of the model on the screen track the orientation of the actual development board you need to tare the sensor in a specific orientation. Place the sensor on the table and tare the sensor by navigating to **Commands** on the menu bar then clicking **Tare**. Note the orientation of the development board now displayed on the screen. It displayed with the circuit board plane perpendicular to the screen with the chip on top and the USB connector to the left.



To get a better feel for perspective, tilt the edge of the development board with the 20-pin header on it down and note the orientation of the development board on the screen. The development board on the 3D display will always go to this orientation whenever a TARE command is sent. To get the 3D board to track the actual board you need to hold the actual development board so that you see it from the same perspective as shown above, that is the VectorNav logo should be facing towards the ceiling and your line of sight should be straight down the circuit board with the USB connector on the left and the serial connector on the right. This may take several attempts to get it just right. Also try to avoid moving the development board any closer than one foot from your PC monitor. Most PC monitors (LCD and CRT) create significant magnetic distortion at a distance closer than approximately 1 foot. After performing a TARE command with the development board in the orientation described above, the 3D board should track the motion of the actual board.

For more information on how to use Sensor Explorer go to **Help** on the menu bar. You can also find video tutorials on our website at the following address. To further explore the rich set of features available to you please reference your VN-100 user manual.

http://www.vectornav.com/support

