

Get Bode Plots of LIGHTNING™ II Scan Head with TuneMaster II Support Module 4.5.2

1 Introduction

This technical bulletin is to provide instructions for users to get Bode Plots of LIGHTNING™ II (LII) scan head with TuneMaster II Support Module 4.5.2.

2 Prerequisite

2.1 Hardware connection

The LII servo board stack must connect to a computer by a USB cable. The other end of the USB cable must be plugged into the USB port on the X-servo board. For this operation, the LII board stack must be connected to the galvos. Power on the LII scan head with +48V.

2.2 Software tool

Users need to have TuneMaster II (TM2) Support Module 4.5.2 installed on the computer that connects to the LII scan head. Please contact Cambridge Technology to get the TM2 software and installation instructions.

3 Get Bode Plot of a Scanning Axis and Measure Its Primary Resonant Frequency

The procedure below uses X axis as an example to describe the steps to get Bode Plot and the resonant frequency on this axis. For Y axis or Z axis (in 3-axis scan head), the steps are similar (see step 7 and step 8).

The TM2 software only allows the user to get Bode Plot after retrieving the tune parameter for that axis, so the procedure starts with retrieving tune:

1. Highlight 'GSB location 0' (X axis), click the 'Tools' menu. In the dropdown list, select 'Retrieve TM2 files from Gsb Location 0' (Figure 1). A pop-up window will ask you to save the tune file to a location of your choice. After that, you can proceed to get BodePlot.

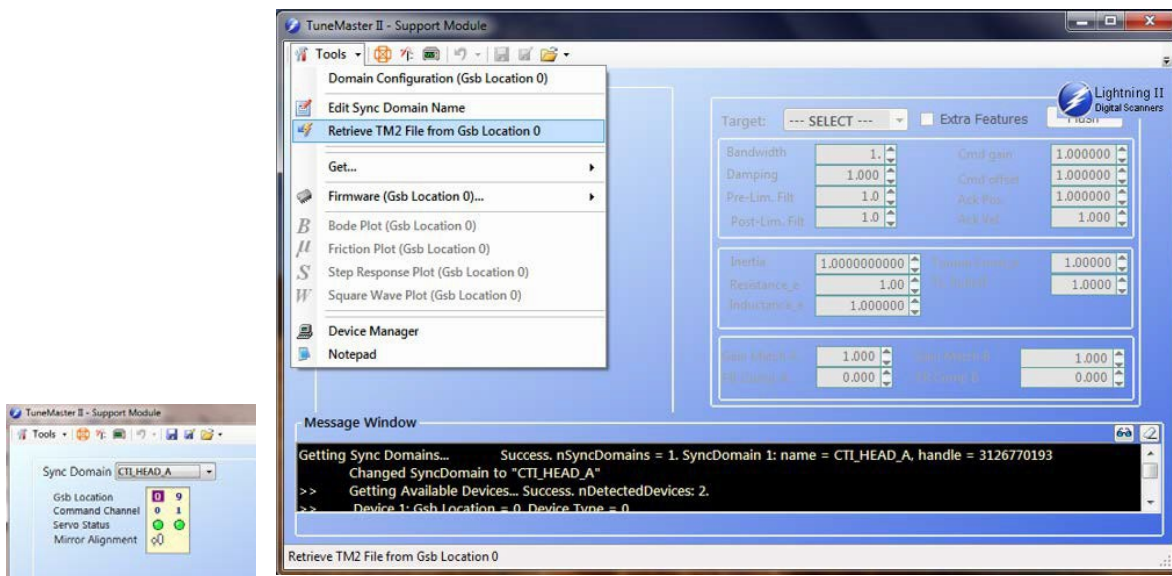


Figure 1 - Highlight Gsb Location 0 (left) and Retrieve Tune (right)

2. Click the 'Tools' menu. In the dropdown list, select 'Bode Plot (Gsb Location 0)'(Figure 2).

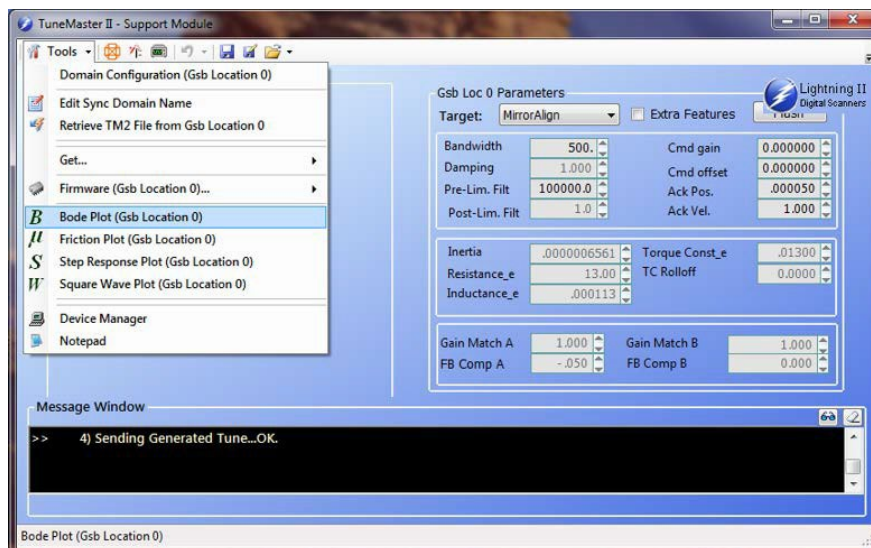


Figure 2 - Get Bode Plot for Gsb Location 0

3. You will see the TM2 software showing the scan head going through 'MirrorAlign' and 'AutoCharacterization' processes. After that, the virtual scope window displaying the Bode Plot of the X axis will pop up (Figure 3). You may need to click on 'Scale Both' to bring both the theoretical (dark green) and measured (light green) frequency response plots inside the scope screen.

- You can use the vertical cursor to measure the primary resonant frequency. In the example shown in Figure 3, the primary resonant frequency of the X axis is measured to be 13.8kHz.

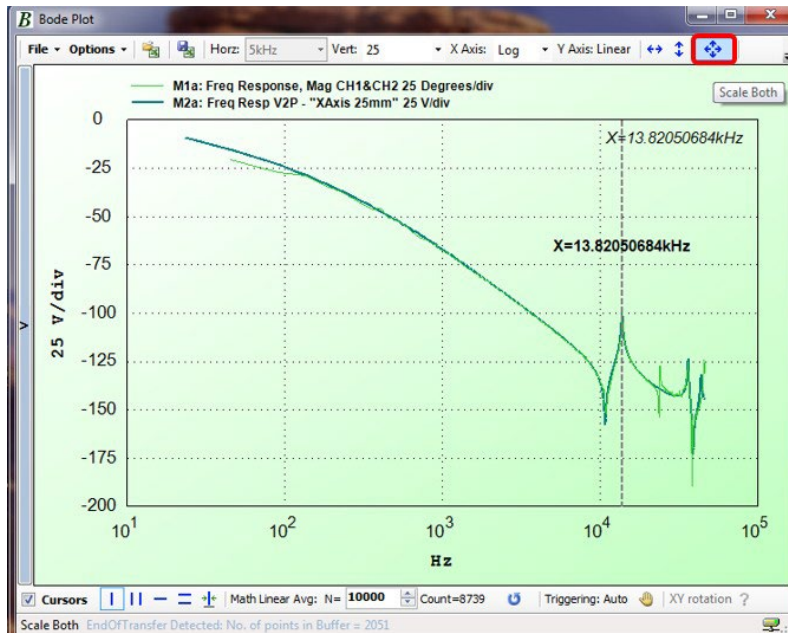


Figure 3 - Bode Plot Displayed in the Virtual Scope

- When you are done with the Bode Plot, you can close the virtual scope window to exit the Bode Plot process.
- You'll find that 'MirrorAlign' tune is now applied to the X axis. To restore the performance tune ('SpeedX' tune) to X axis for normal scanning operation, click on the 'Servo Status' green circle to reset the axis (Figure 4).

Note: NEVER choose the 'SpeedX' from the 'Target' drop down list to restore to SpeedX tune.

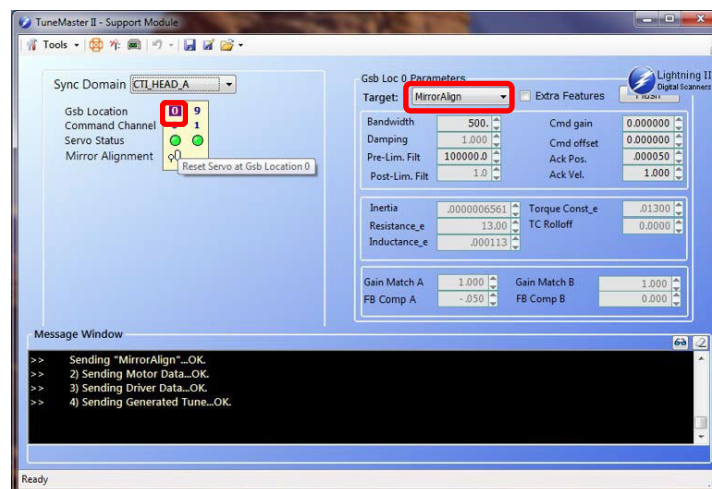


Figure 4 - Reset Servo to Restore SpeedX Tune

7. To get Bode Plot for Y axis in a 2-axis LII scan head and measure its primary resonant frequency, choose 'Gsb Location 9' and repeat step 1 to 6 accordingly.
OR
8. In a 3-axis LII scan head, to get Bode Plot for Y axis or Z axis and measure its primary resonant frequency, choose 'Gsb Location 1' for Y or 'Gsb Location 10' for Z and repeat step 1 to 6 accordingly.