Load Testing Board/App Instructions:

**Background:**

The Load Testing Board is a variable load testing fixture to characterize the power capabilities of other assemblies. The fixture configures a parallel resistor network to vary the load seen by the power source under test. Through the app, the user may manually configure the resistor network using the slider utility, or may run a full test which will test the device through all possible load configurations. During the full test, the app pulls the bus voltage and device current for each load configuration, plotting the I-V curve at the conclusion of the test. The user may save this data to a ‘.csv’ file if desired.

**Instructions:**

1. Plug the Load Tester into an available USB port on your computer. The green ‘5V’ LED and the green ‘3.3V’ LED should immediately turn on.
2. Connect the device you wish to test to connector ‘J2’ using the ribbon cable.
3. On your computer, run ‘LoadTesterApp.exe’. The app should connect to the board and display to your window. If the app fails to load, check the board connections.
4. Check to make sure the ‘Board SN’ field is populated with the correct SN and the ‘Board Rev’ field is populated with the correct board revision. If not, the board may need a FW update.
5. Enter the maximum current you expect to draw from the device under test into the ‘Max Current’ field. This is necessary to set the LSB of the current measurement IC (INA226) on the board. Press the ‘Calculate Calibration’ once entered.
6. Press the ‘Update Device’ button to load the new calibration setting onto the board.
7. Verify the new setting. Move the slider position to the very left and press ‘Set Resistance’ to configure to the lowest load possible.
8. Press ‘Get VBus & Ishunt’ button to pull voltage and current at this low load state. If the ‘Current’ value obtained appears to be maxed to the maximum current you had specified in the ‘Max Current’ field, then you may need to increase the ‘Max Current’ slightly to properly configure the device. Repeat steps 5 & 6 if necessary.
9. Check the ‘Logging’ box if you wish to log the recorded data from the test to a ‘.csv’ file. If yes, enter the name of the file in the ‘Filename’ entry field.
10. Press ‘Run Test’ when ready. The board should begin cycling through all possible load configurations. The app may appear to be frozen during this process. This is normal and the app will respond once the test has concluded.
11. Once the test has concluded, the app will automatically plot the I-V curve of the device under test.
12. To conduct another test, press the ‘Run Test’ button again. The current I-V curve will exit and the test will repeat.

**Manual Settings:**

* The ‘Slider’ at the top of the ‘Manual Settings’ window is an easy drag tool for configuring the load on the Load Tester. The corresponding load to the slider position is displayed immediately below the slider, in Ohms. The ‘+’ and ‘-‘ buttons to the left and right of the load are fine adjustments of the slider. ‘Inf’ load corresponds to a completely open circuit.
* The ‘Bus Conversion’ drop down menu sets the amount of time the INA226 takes to collect one voltage measurement of the main bus. This feature is useful for timing and noise requirements. A faster conversion time allows for more samples to be taken. A longer conversion time is useful for reducing noise transients.
* The ‘Shunt Conversion’ drop down menu sets the amount of time the INA226 takes to collect one measurement voltage measurement across the shunt resistor. Serves a similar purpose to the ‘Bus Conversion’ drop down menu previously discussed.
* The ‘Num Averages’ drop down menu sets the number of samples the INA226 will take and average for one discrete value. This is useful for noise reduction, but will also increase the time needed for data collection.