Sampic Calibration

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Contents

Note: Before the internal trigger calibration disconnect any input cables from the channels of the Sampic

Note: The calibration files are specific to the sampling frequency required. Select the desired frequency for which to create calibration files in the main window under the horizontal tab.
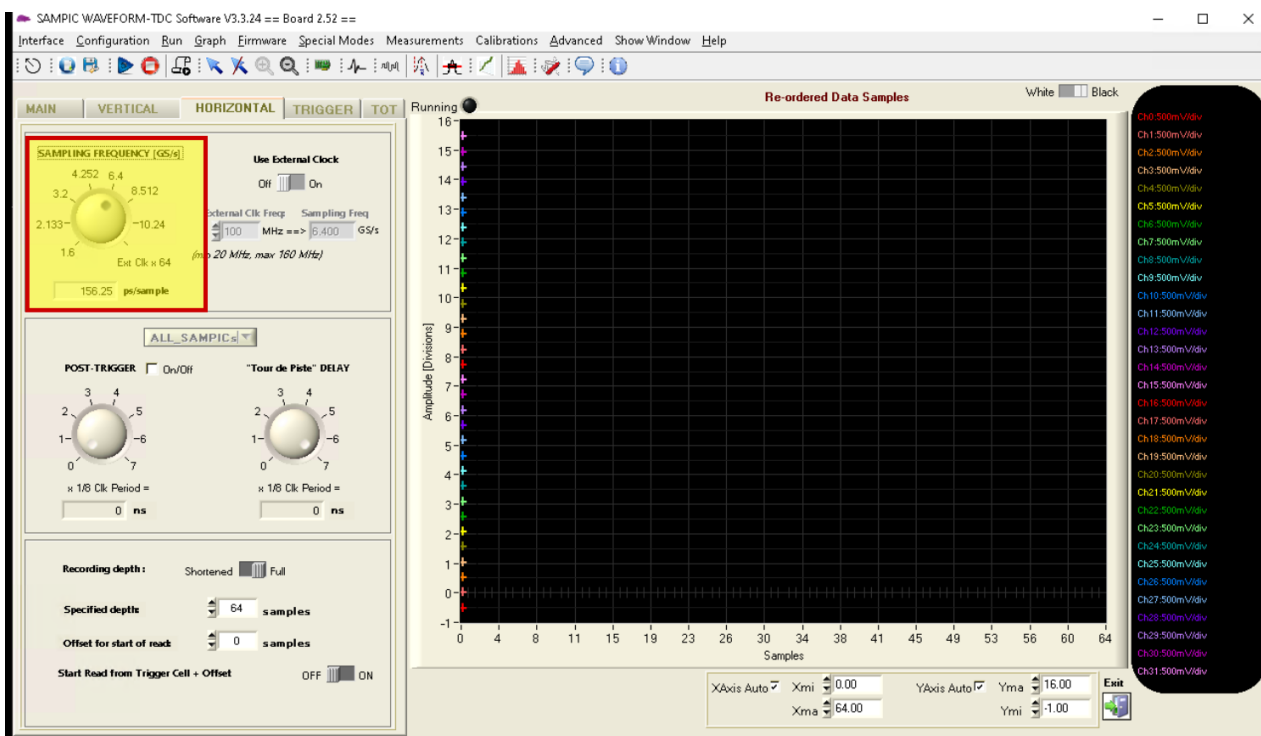

Figure 1: Main window panel with horizontal tab

Note: The calibration files are tied to the device, therefore they can be transferred between computers. They are organised in different folders for every calibration type. Those folders have to be in the same path as the executable file to function properly.

CERN-OPEN-2023-015
09/08/2023

1   ADC Ramp Current calibration

First under the calibrations menu select **'Calibrate ADC Ramp Current'** and wait for the process to finish. After the process has finished save the files by clicking on **'Save ADC Ramp Calib Values to Files'**, which can be found under the calibrations file. The calibration files can be found on the folder that the executable file for the SAMPIC WAVEFORM program is located inside a folder named:`ADC_IRamp_Files`.
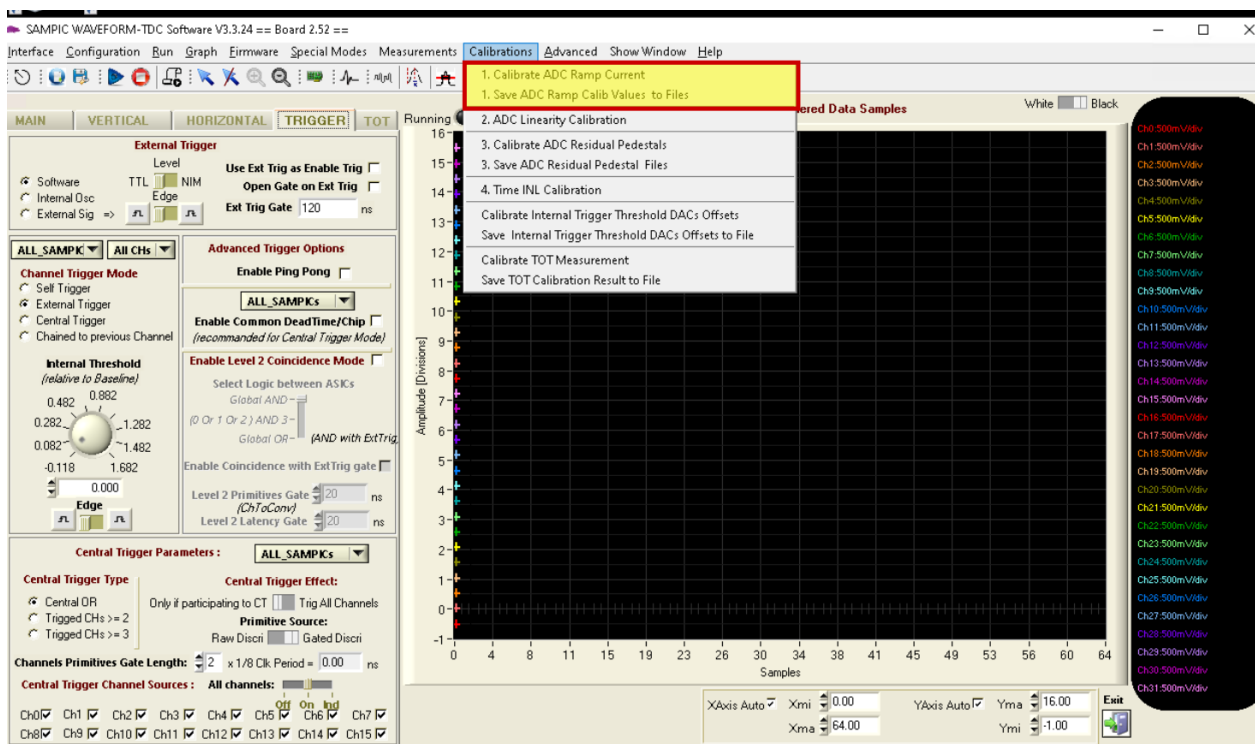

Figure 2: Calibration command for ADC Ramp calibration

2   ADC Linearity Calibration

Under the calibration tab click **'ADC Linearity Calibration'** which will launch the Linearity Plots window.
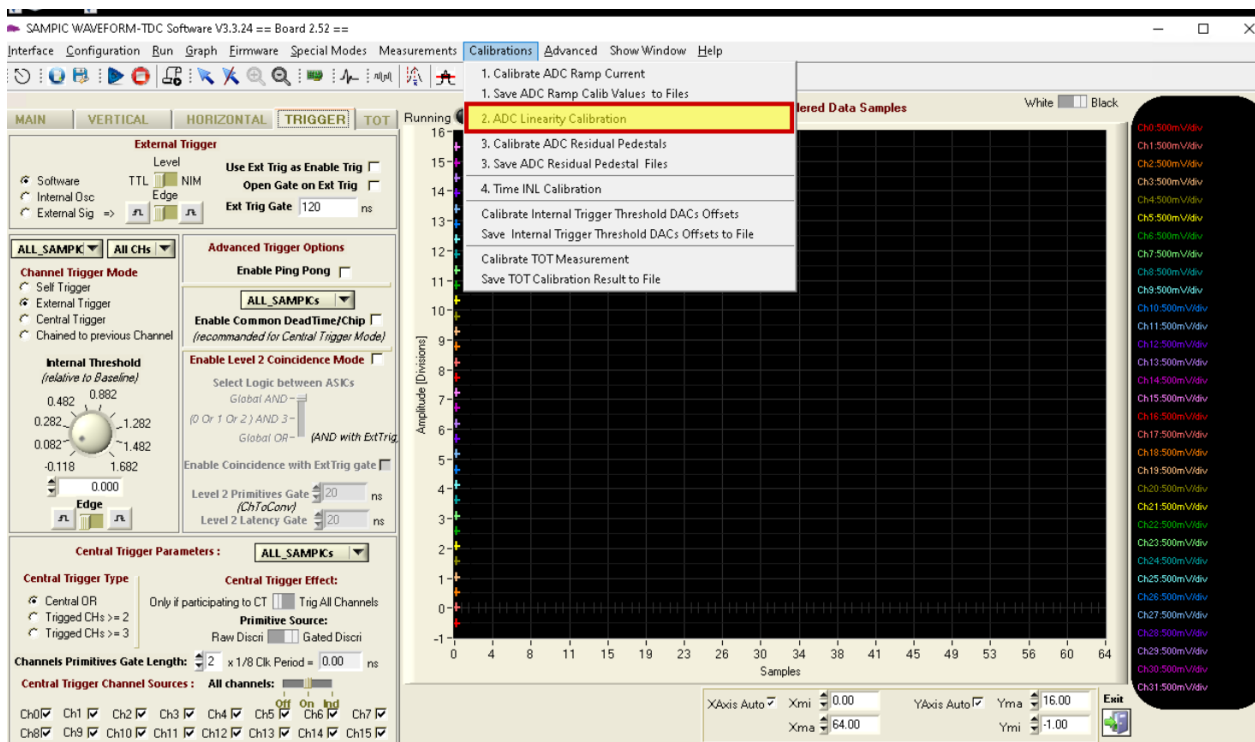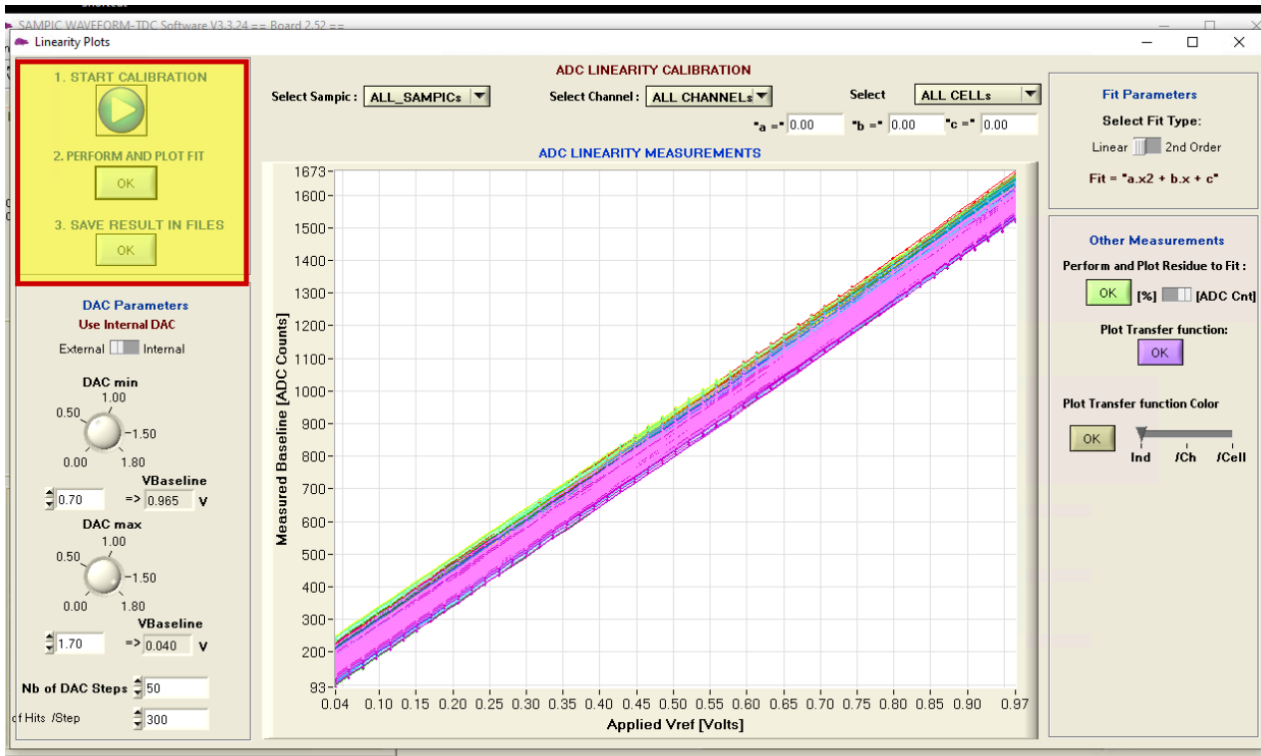

Figure 3: Calibration command for ADC linearity

Figure 4: Correct linearity calibration graph on the linearity plots window

There press **'START CALIBRATION'**. After this has finished click on **'PERFORM AND PLOT FIT'**. At this point a plot will appear and it should be of linear nature. If this is not the case the calibration is incorrect. An example of a correct calibration plot is shown in figure 4. Lastly click on **'SAVE RESULT IN FILES'**. The calibration files can be found on the folder that the executable file for the SAMPIC WAVEFORM program is located inside a folder named:`INL_Files`. To enable the calibration, on the main panel click **'Configuration'** and then **'Enable ADC Linearity Calibration'**.
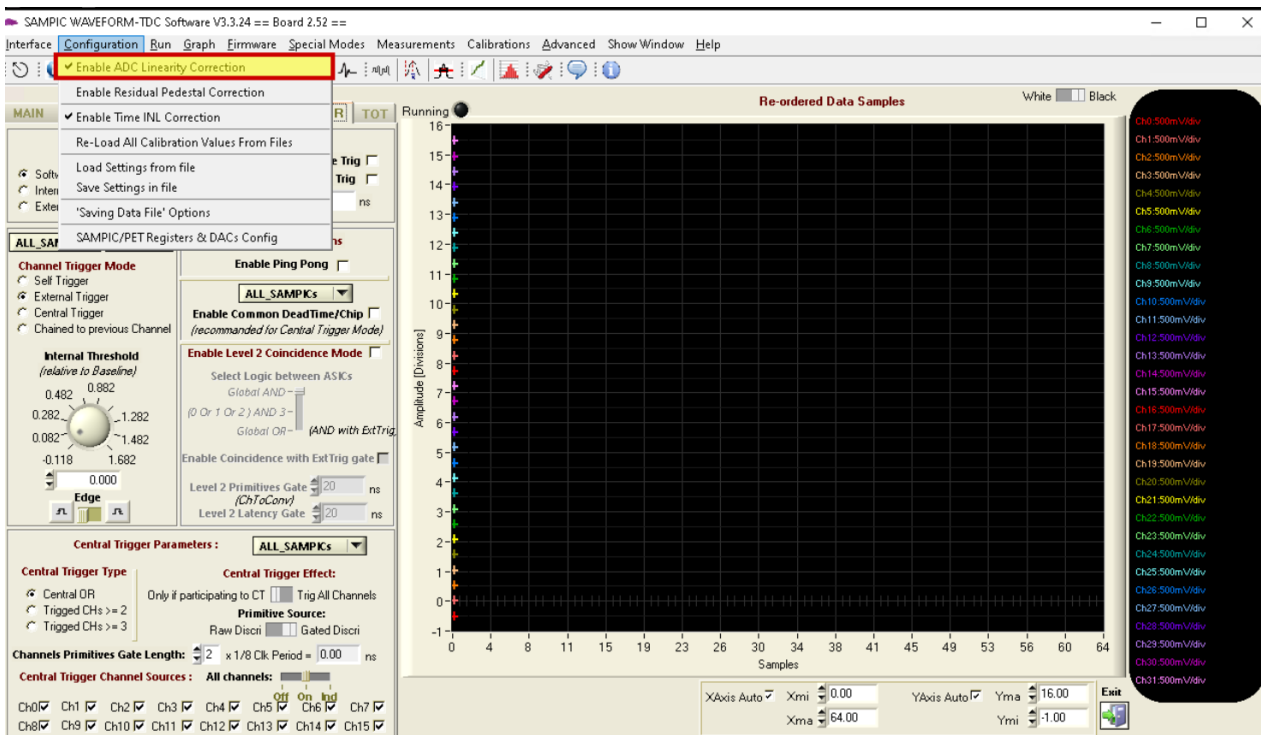

Figure 5: Enabling ADC linearity calibration

3 Time INL calibration

Click on **'Time INL Calibration'** which is located under the Calibrations tab.
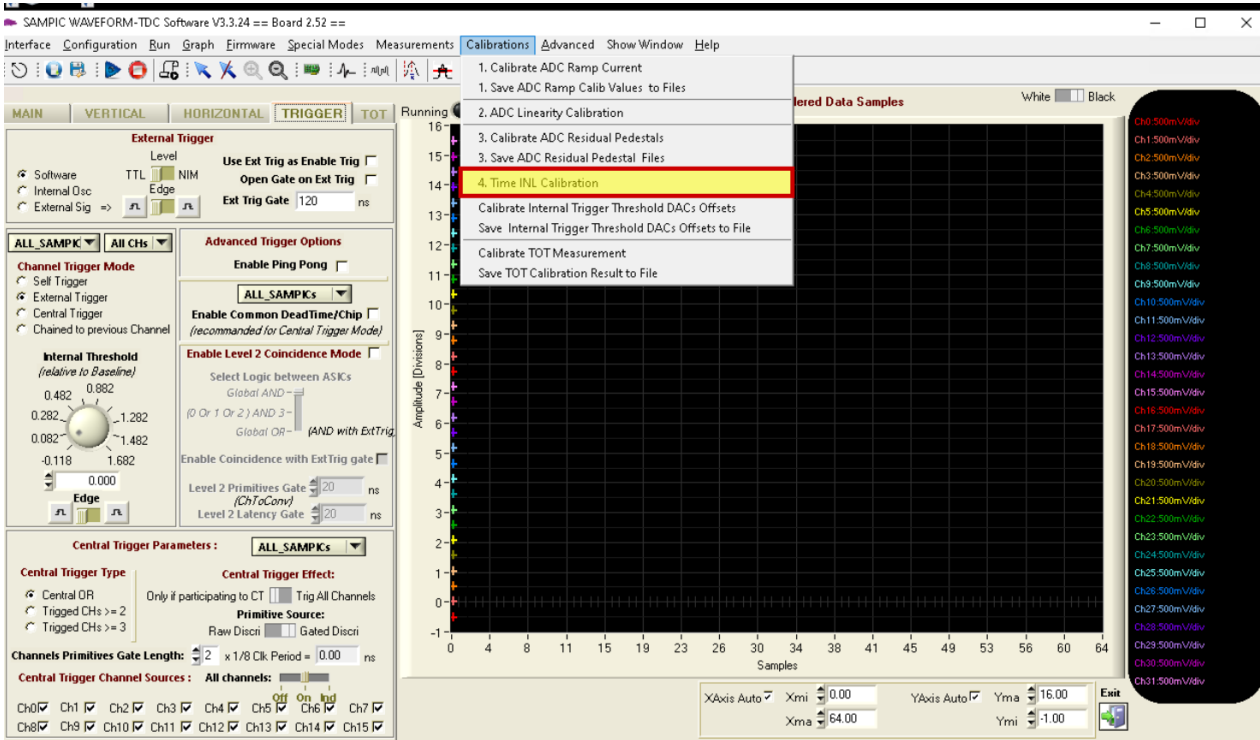

Figure 6: calibration tab for INL
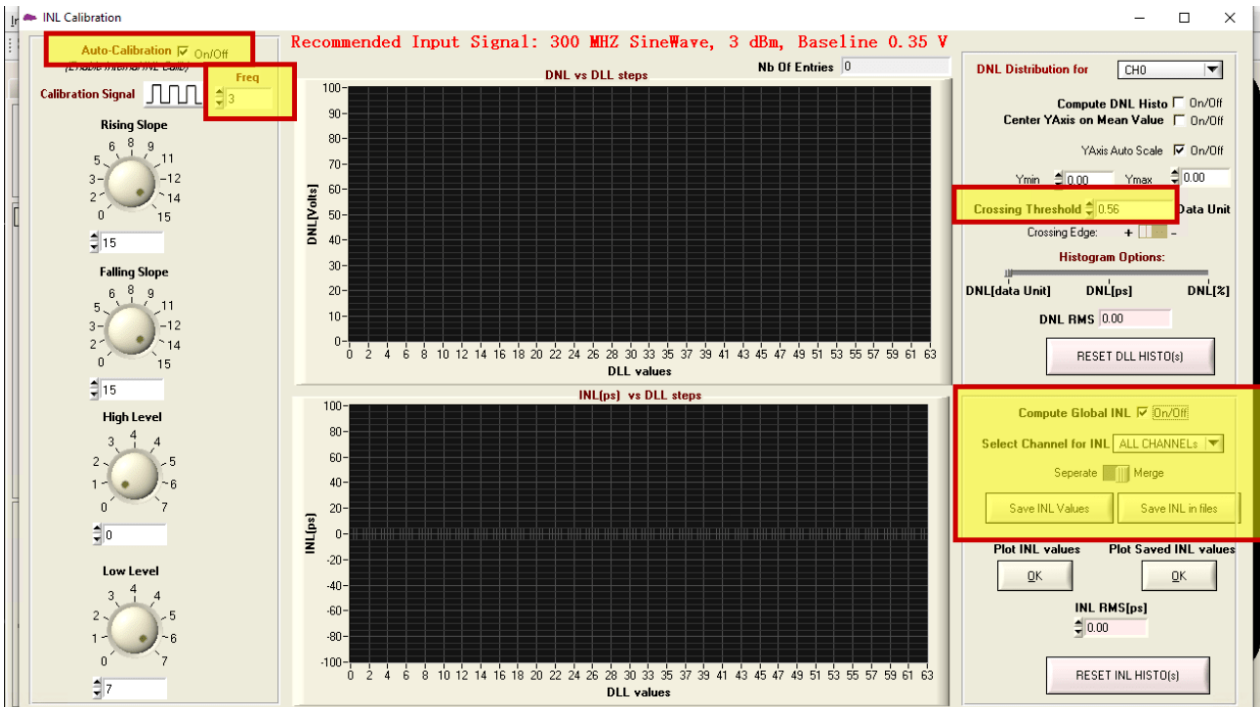
The INL Calibration window will appear.

Figure 7: INL calibration window

There the **'Auto-Calibration'** needs to be set to on and the **'Freq'** at 3. Also make sure that the **'Crossing Threshold'** is set to 0.56. On the **'SAMPIC WAVEFORM'** tab, under vertical set the **'Baseline'** to 0.1V.
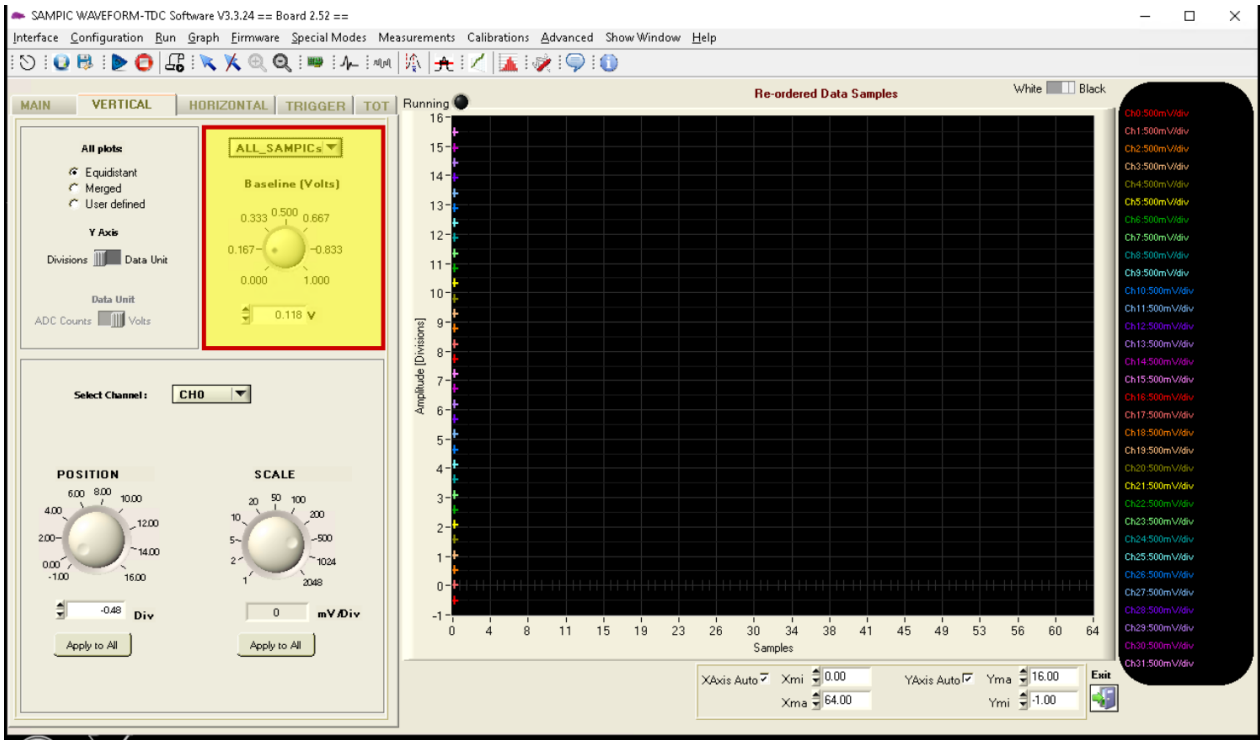
Figure 8: Baseline voltage switch

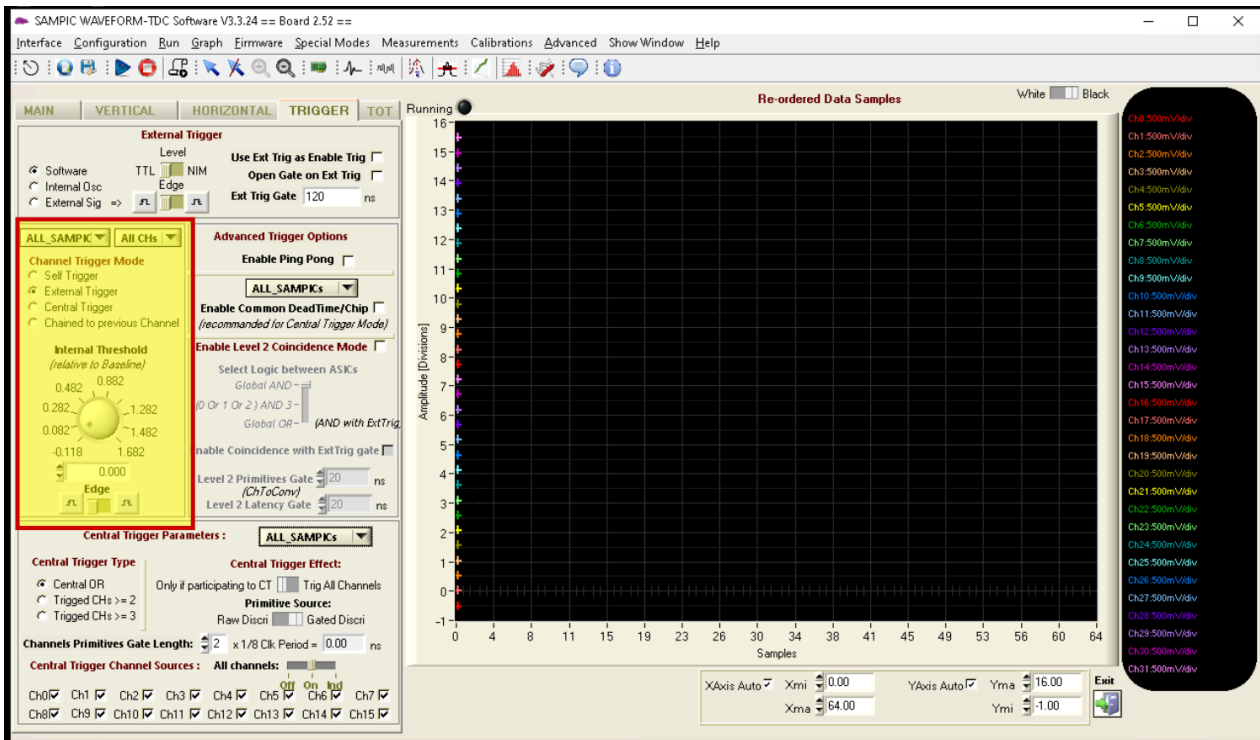Then under the trigger panel set the **'Channel Trigger Mode'** to self trigger and the **'Internal Threshold'** to 0.1.

Figure 9: Internal threshold switch

Then switch to the main panel and set the **'Run Type'** to **'Finite Hit Number'** and the number of hits required to the number of Mezannine boards available x 1000000. So for 2 Mezannine boards(32 channels) we will have 2000000 hits required. On the main panel all the channels must be set to on and then start a run. The software will automatically start doing the calibration for each channel one by one.
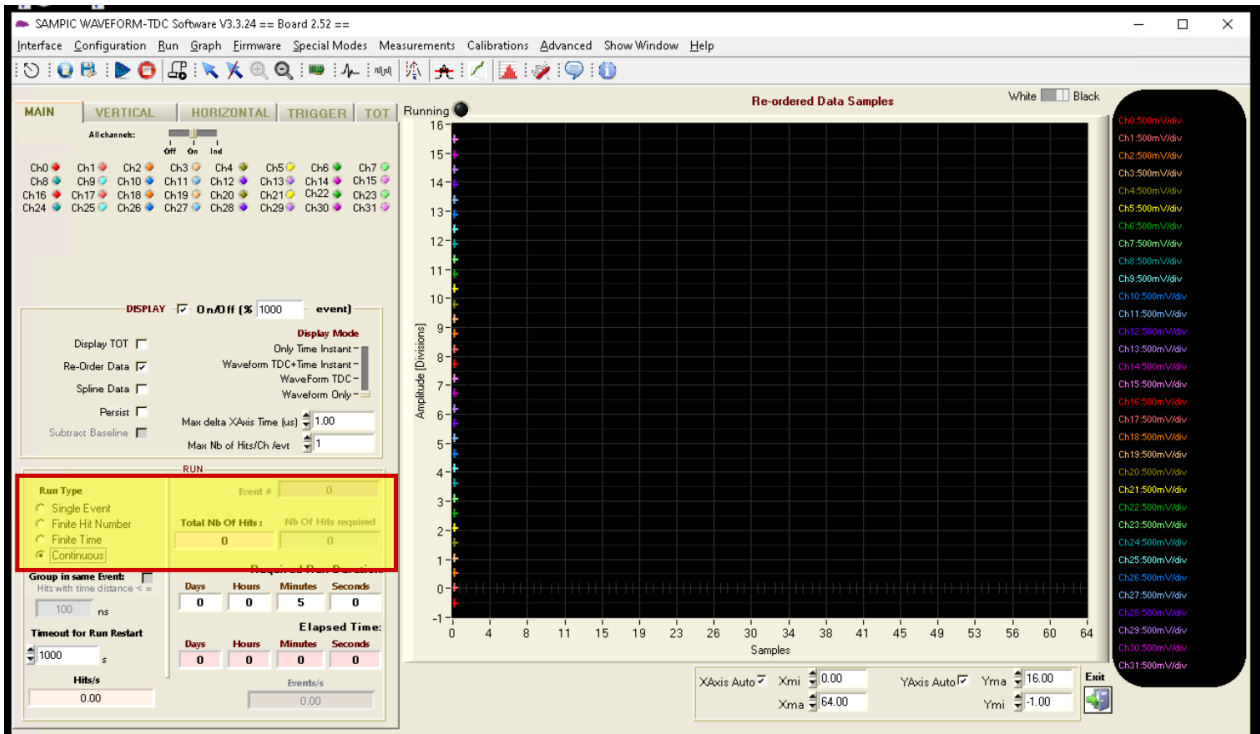
Figure 10: INL calibration window

After all the channels have gone over this process continue by clicking on **'Compute global INL'** which is located on the INL calibration window and setting the **'Select Channel for INL'** to ALL CHANNELS. Then proceed to click **'Save INL values'** and **'Save INL in files'**. Proceed to disable the **'Auto-Calibration'**.

To enable the calibration, on the main panel click **'Configuration'** and then **'Enable INL Correction'**.
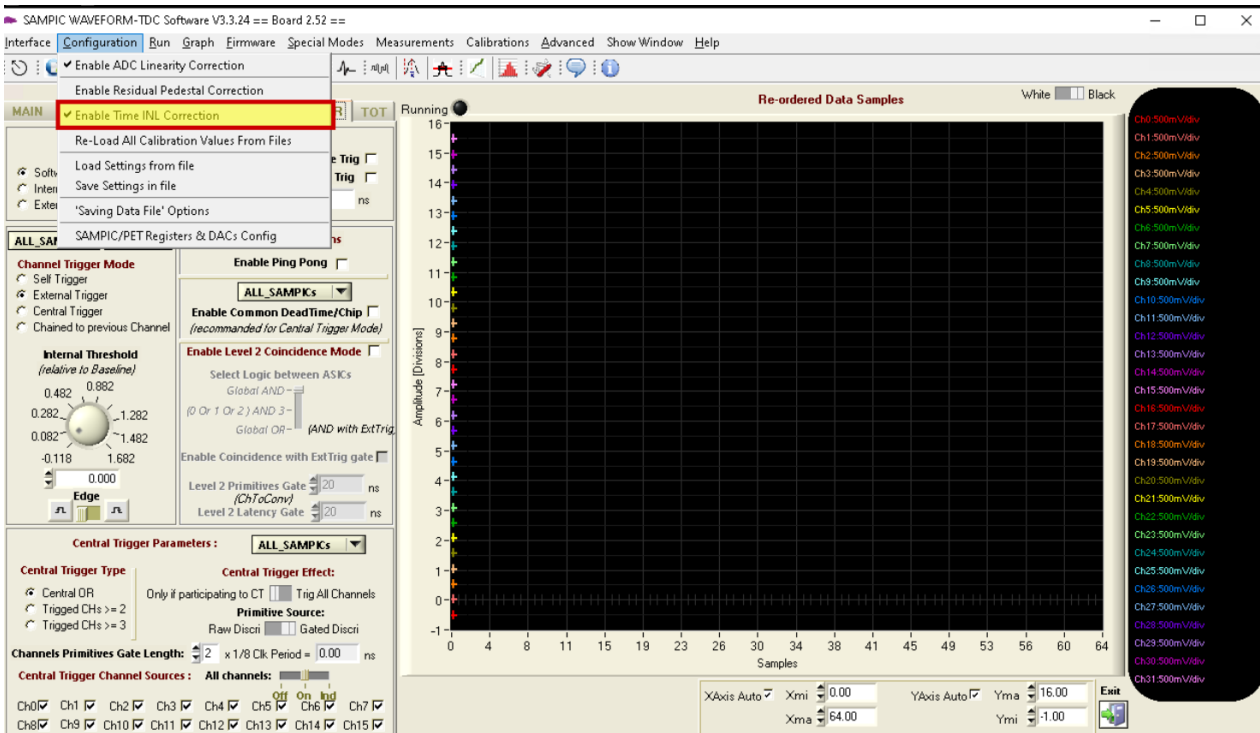

Figure 11: Enabling INL calibration

4 Initial Trigger Threshold DACs Offsets

First under the calibrations menu select **'Calibrate Initial Trigger Threshold DACs Offsets'** and wait for the process to finish. After the process has finished save the files by clicking on **'Initial Trigger Threshold DACs Offsets to Files'**, which can be found under the calibrations file. The calibration files can be

found on the folder that the executable file for the SAMPIC WAVEFORM program is located inside a folder named:`InternalTriggerThresholdOffsets_Files`.
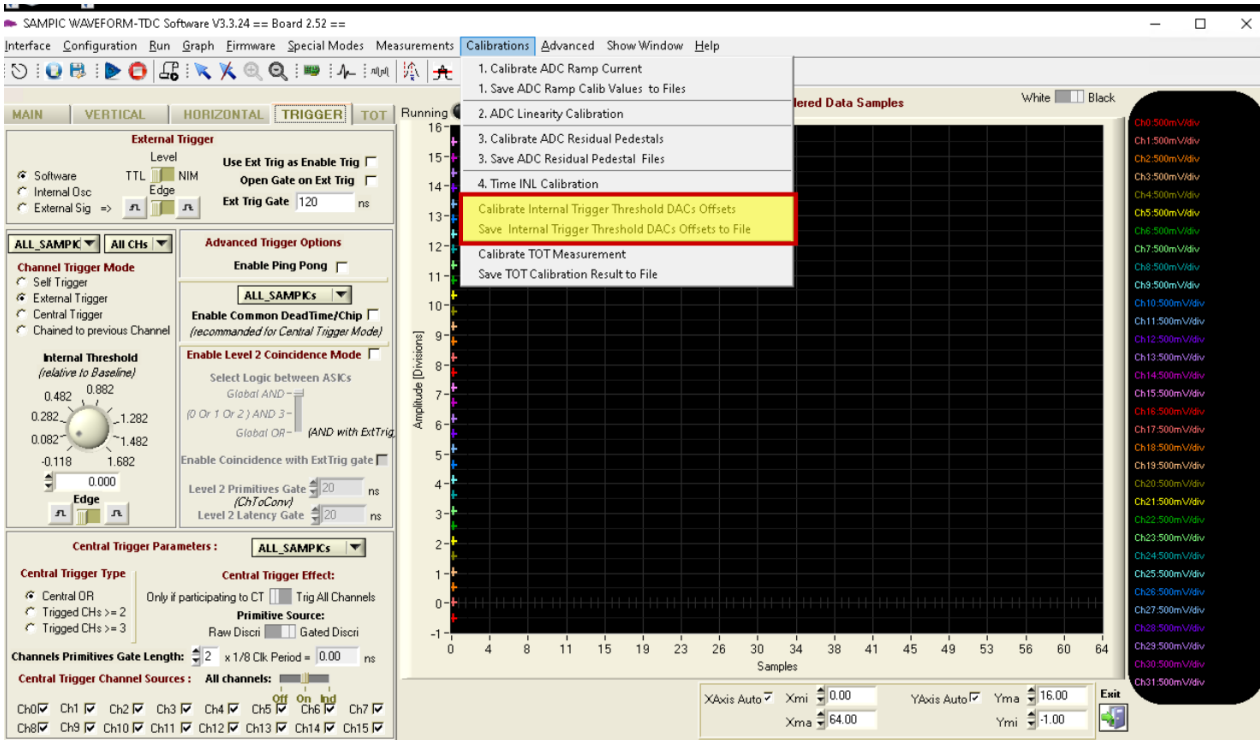

Figure 12: Calibration command for Initial Trigger Threshold DACs Offsets

5 Calibrate TOT Measurement

First under the calibrations menu select **'Calibrate TOT Measurement'** and wait for the process to finish. After the process has finished save the files by clicking on **'Calibrate TOT Measurement to Files'**, which can be found under the calibrations file. The calibration files can be found on the folder that the executable file for the SAMPIC WAVEFORM program is located inside a folder named: `TOT_CalibFiles`.
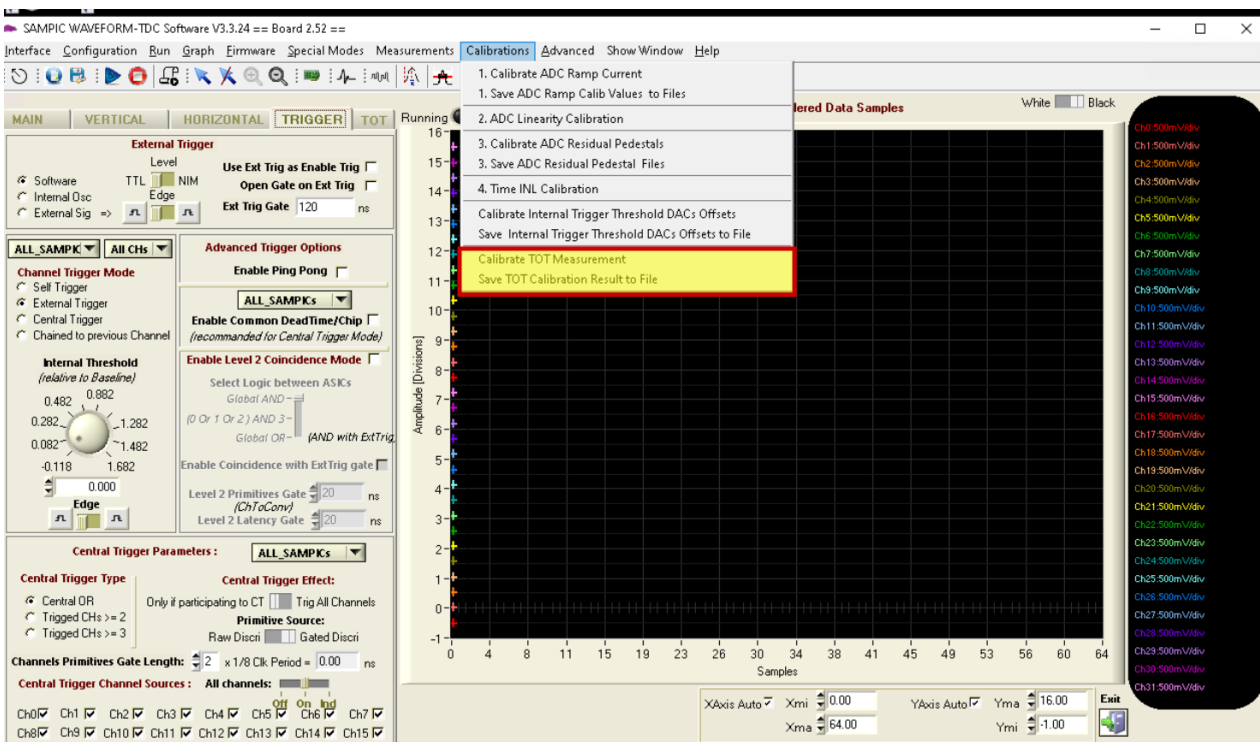

Figure 13: Calibration command for TOT calibration