

RESIDUAL MEASUREMENT

Blue: David from Virtins

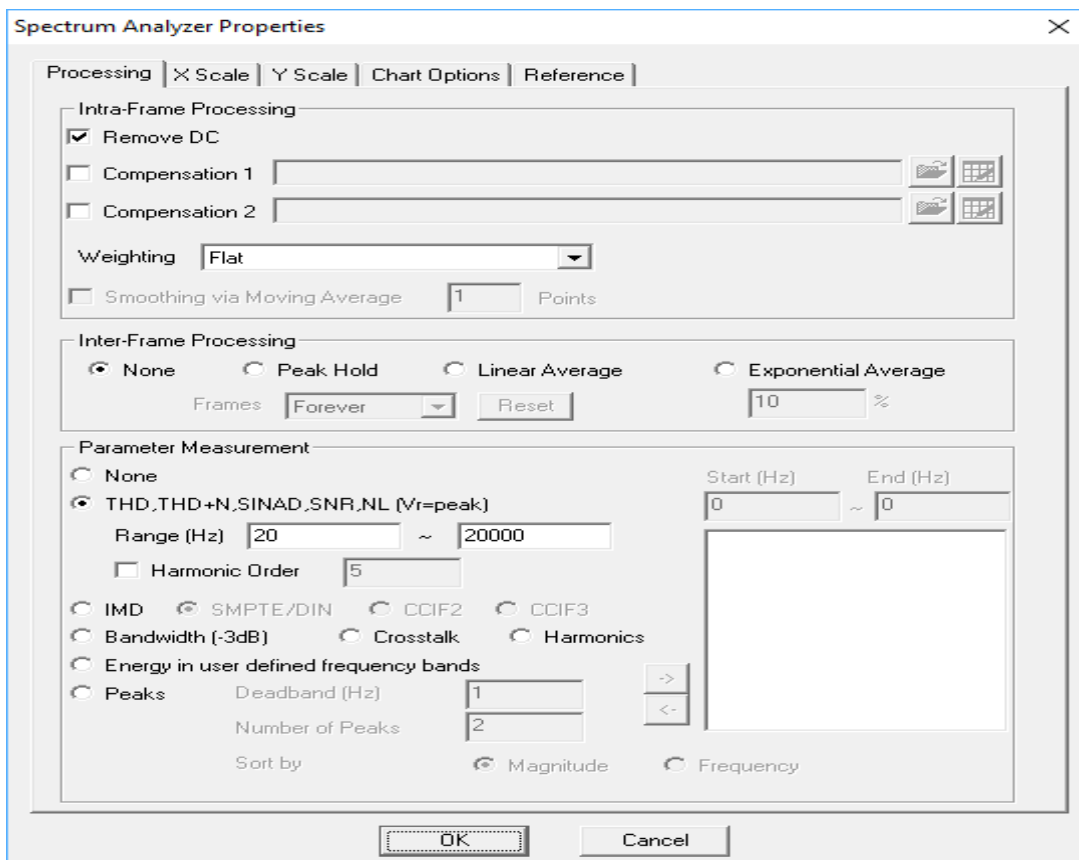
Black: me

Hello Gerd,

It can be done in Multi-Instruments. MI (Standard or above) supports digital filtering which can be used to filter out any unwanted frequency components. For example, if you only want to see the residual waveform of 2nd and 3rd harmonics, you can filter the rest of frequency components out by using a FIR filter. Here is what I have just done to illustrate this capability.

1 THD measurement (Spectrum Analyzer: Kaiser 6 Window, No Interframe, no average)

After activating the oscilloscope, the spectrum analyser and the signal generator adjust two things:
a.)



b.)

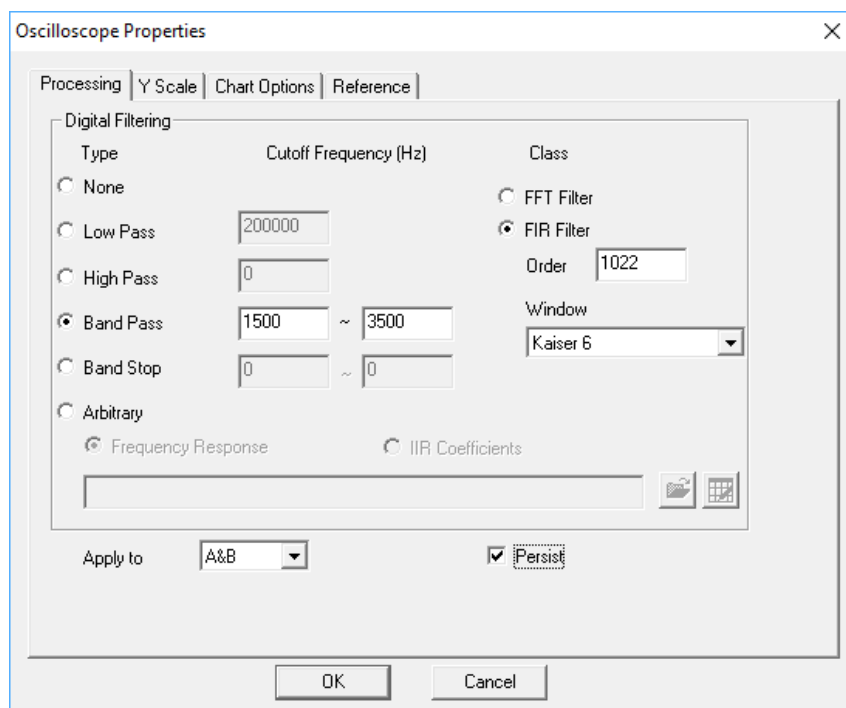
Then click anywhere within the oscilloscope window, and then select the "T" at the bottom left corner of the screen to change the record length (oscilloscope sweep time). Take **1s** length. Thus the waveform is long enough in order to get more usable data.

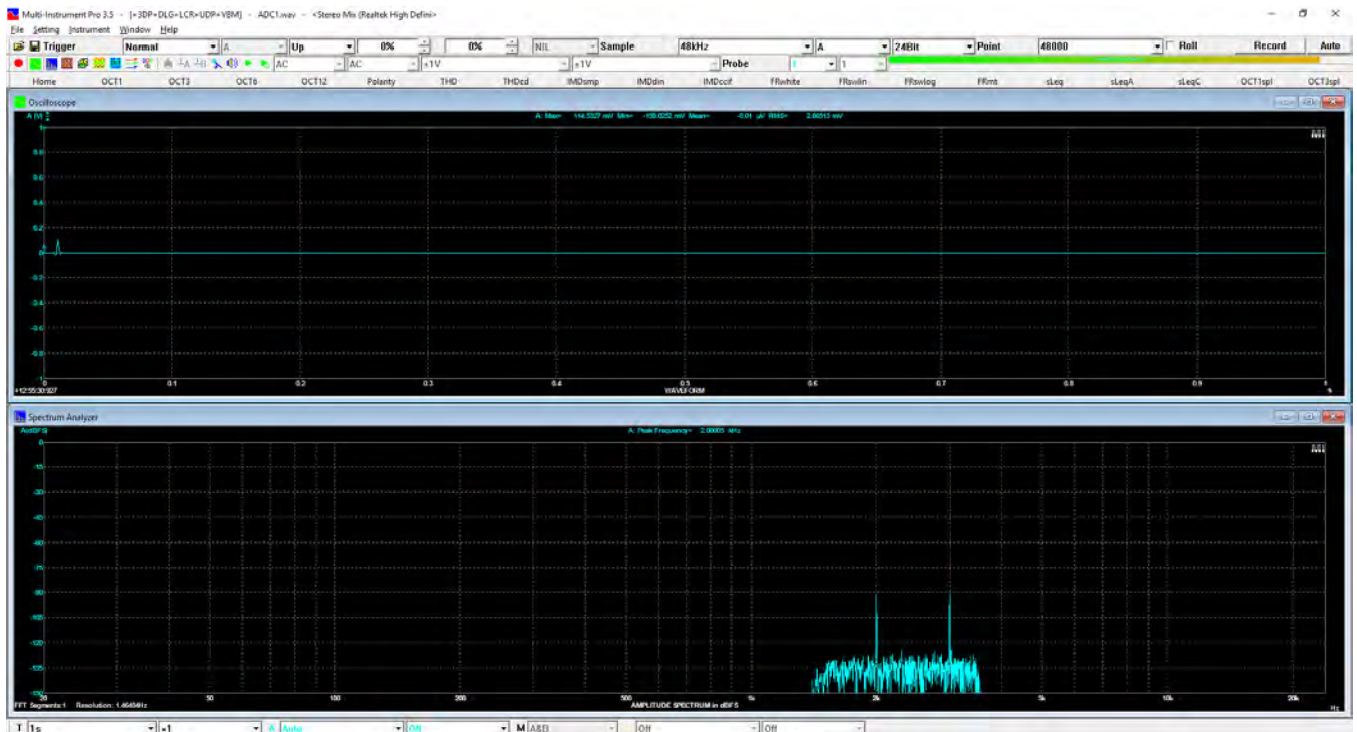
Hit the left red button turning green and chose the THD button and you should see a picture like this



Save the original oscilloscope signal to hard disk using [File]>[Save], name it as “fundamental.wav”. Saving is only possible when you stopped the measurement by clicking on the left green button turning now red.

Then right click anywhere within the oscilloscope window and select [Oscilloscope Processing], apply a FIR filter as follows, to only allow the 2nd and 3rd harmonics of the 1kHz sinewave signal to pass. Then save the filtered data to hard disk using [File]>[Save], name it as “residual.wav”.





Note that there is a small portion of artefact at the leftmost part of the above waveform. That is because the FIR window size is 1022 and at leftmost portion of the waveform, there is no previous data available and thus they are assumed to be zeros. This artefact will disappear after 1022 pints.

Use[File]>[Open] to load the previously saved “fundamentalwav”. Then use [File]>[Combine] to combine “residual.wav” into ADC1.wav. Adjust the oscilloscope scale so that these two signals can be seen clearly in one graph. Mostly residual.wav is seen in channel B so magnify 200x.

Or as David told:If you put the mouse cursor close to an axis (Ch.A, Ch.B, or X), a magnifying glass will appear. Left click to zoom in and right click to zoom out. This is equivalent to adjust the “Multiplier” for each axis in the view toolbar at the bottom of the screen. This method can only do augment, e.g. x1, x2, x5, x10...x200 If you click anywhere within an/a oscilloscope/spectrum analyzer/Multimeter/Spectrum 3D Plot window, the corresponding view toolbar will appear at the bottom of the screen. By default, “Auto” is selected for the Display Range (not ADC full-scale range) of each axis, which is actually based on the full-scale range of the ADC currently being used. In your screenshot, the display range for Ch. A is “+/- 1” (AUTO). If you change it to “+/-2”, then the curve for Channel A will scale down.

Happily you will see the residual..... :-)))

