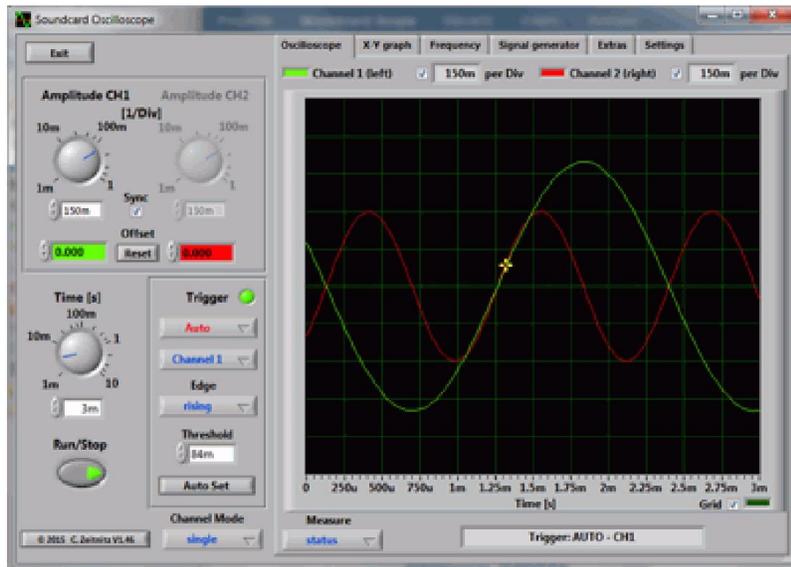# Soundcard Oscilloscope

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Main features:

The PC based Soundcard Oscilloscope receives its data from the Soundcard with 44.1kHz and 16 Bit resolution. The data source can be selected in the Windows mixer (Microphone, Line-In or Wave). The frequency range depends on the sound card, but 20-20000Hz should be possible with all modern cards. The low frequency end is limited by the AC coupling of the line-in signal. Be aware, that most microphone inputs are only mono.

The oscilloscope contains in addition a signal generator for 2 channels for sine, square, triangular, sawtooth wave forms and different noise spectra in the frequency range from 0 to 20kHz. The signal can be defined by a mathematical formula as well. The signals are available at the speaker output of the sound card. These can be fed back to the oscillocope in order to generate Lissajous figures in the x-y mode.

Additional features
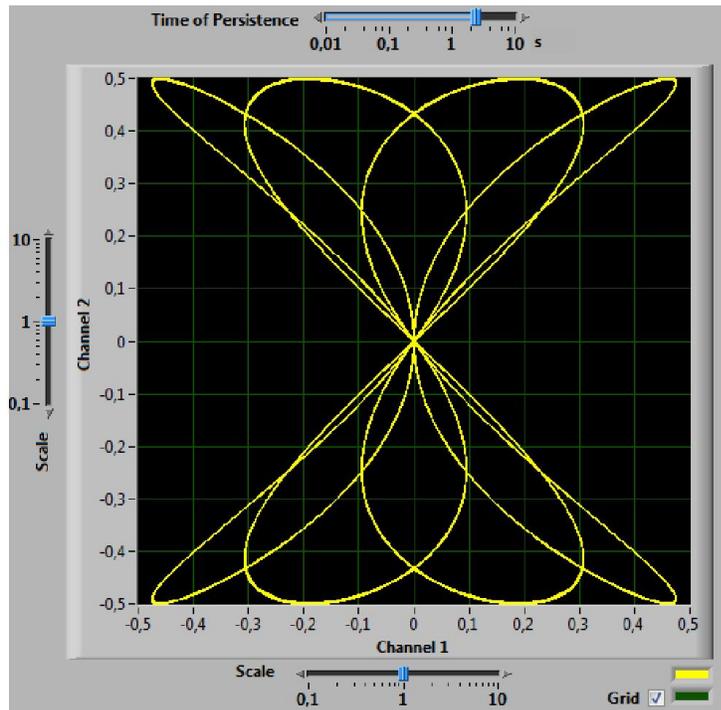
- Trigger modes: off, automatic, normal and single shot
- Triggerlevel can be set with the mouse
- The signals of the two channels can be added, subtracted and multiplied
- x-y mode
- Frequency analysis (Fourier spectrum)
- Waterfall diagram (frequency spectrum as function of time)
- Frequency filter: low-, high-, band-pass and band-stop
- Cursors to measure amplitude, time and frequency in the main window
- Audio Recorder to save data to a wave file
- For multi soundcard system, the used card can be selected in the settings tab

The program has been written in LabView (™ by National Instruments). For the actual Sound I/O part the WaveIO package by the same author has been used.

Signal Sources

The signals for the oscilloscope can be internal to the computer (MP3 player, function generator etc.) or from external sources (line-in, microphone). For external sources care has to be taken, not to exceed the voltage range of the inputs. The range is usually only ±0.7V !! If higher voltage need to be analyzed, a voltage divider has to be used. Additional protection diodes are recommended in order to avoid any damage to the sound card and to the computer.

Requirements

This program will run on Windows 2000/XP/Vista/7/8/10 (32bit and 64bit) computers with a sound card. It will not install on older versions of Windows. The speed requirements are not very hard. A 1GHz machine is suffient. On slower CPUs the load on the system might lead to reduced responsiveness of the system.

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The signal generator is utilizing muParser. Copyright © 2011 Ingo Berg