

Saving oscilloscope data

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Some of the experiments in this course use digital oscilloscopes to collect data. It is useful to be able to save the data from the oscilloscopes to a computer for plotting and further analysis. The software that was supplied by the oscilloscope manufacturers is awkward and inconvenient to use. Therefore, simple Python programs have been written to make it easy and convenient to save scope data to a computer.

There are two programs available. Which program you should use depends on the type of oscilloscope used to collect the data. The Tektronix oscilloscopes in the lab use a serial interface, and the Agilent oscilloscopes use a USB (or parallel) interface. To install the software, do the following:

1. Determine what type of scope you are using.
2. Create a directory where you will save your oscilloscope data.
3. On the desktop of your computer, you will find a directory called "oscilloscope data". Inside this directory you will find the four files:
 - `instruments_serial.py`
 - `save_scope_waveforms_serial.py`
 - `instruments.py`
 - `save_scope_waveforms.py`
4. If you are using a Tektronix scope, copy the first two files (`instruments_serial.py` and `save_scope_waveforms_serial.py`) into the directory you created.
5. If you are using an Agilent scope, copy the last two files (`instruments.py` and `save_scope_waveforms.py`) into the directory you created.

To run the oscilloscope software double-click on either the file `save_scope_waveforms_serial.py` or `save_scope_waveforms.py`, depending on which file you put into your directory. This will open a command window that displays something like the following text:

```
Instrument: Agilent Technologies DS01004A

Read Data from Scope Channels to a File
=====
Channels to save = [1, 2]
Next file to save = "scope_data001.csv"
=====
type 1 to change channels
    2 to change file name
    3 to save data
    4 to quit
```

To change a parameter type the appropriate number.

After saving data, the file number automatically increments, so you don't have to retype the file name (or number) each time you save a file.

The data are saved to a .csv file, in which the first column is the time, and the successive columns correspond to data from each scope channel. The zero of time in the first column corresponds to when the trigger occurred. This type of file is easy to load and plot using python.