

Python Trace Acquisition Tutorial

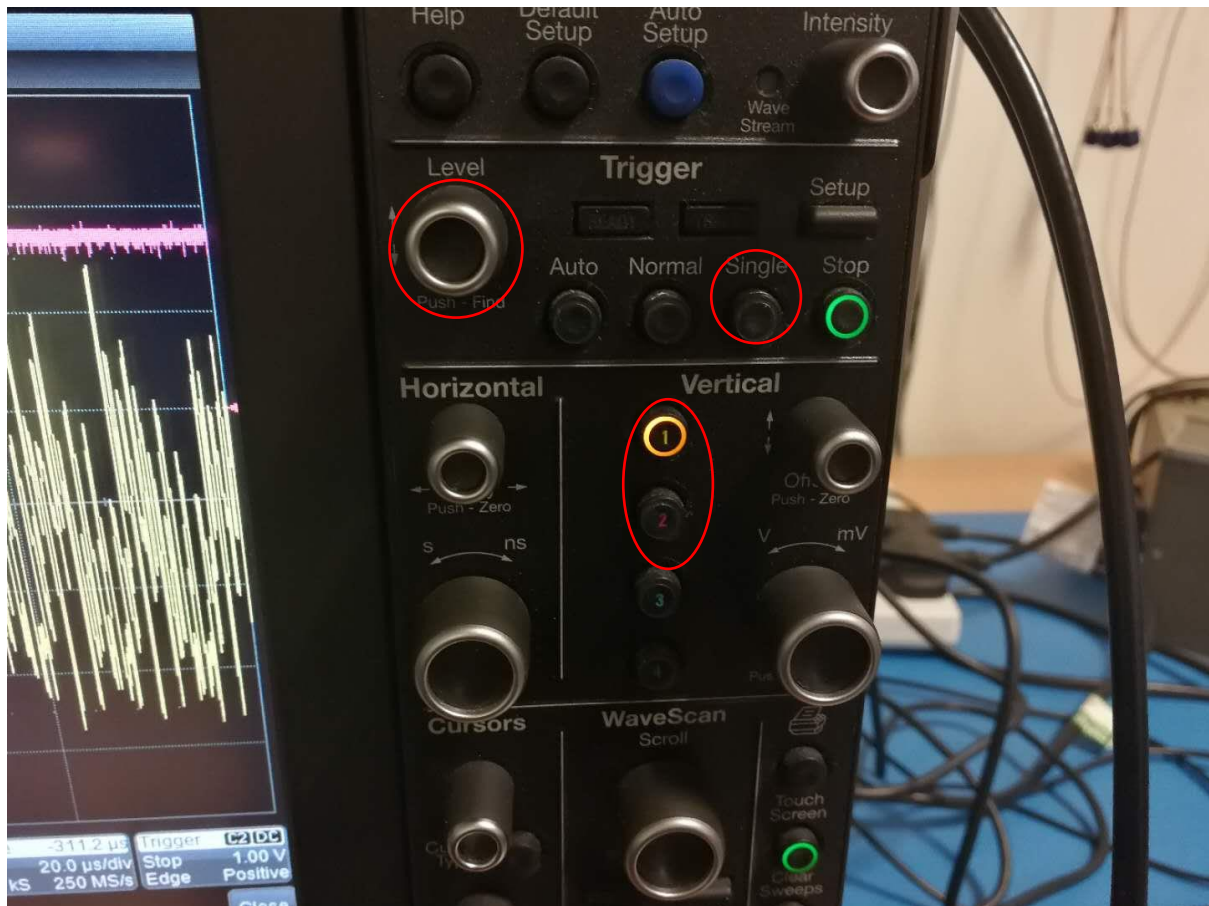
- Code structure:
 - Basic class
 - “scope.py”: provides minimal functions which helps your programme communicate with Lecroy oscilloscope
 - “TRS_TraceSet.py”: store traces into a Riscure TRS trace file.
 - Acquisition script:
 - “Setup.py”: a simplified script which only handles serial port communication; helps to manually determine the setup parameters needed for acquisition
 - “Acquisition.py”: main Python script for trace acquisition

Step 1

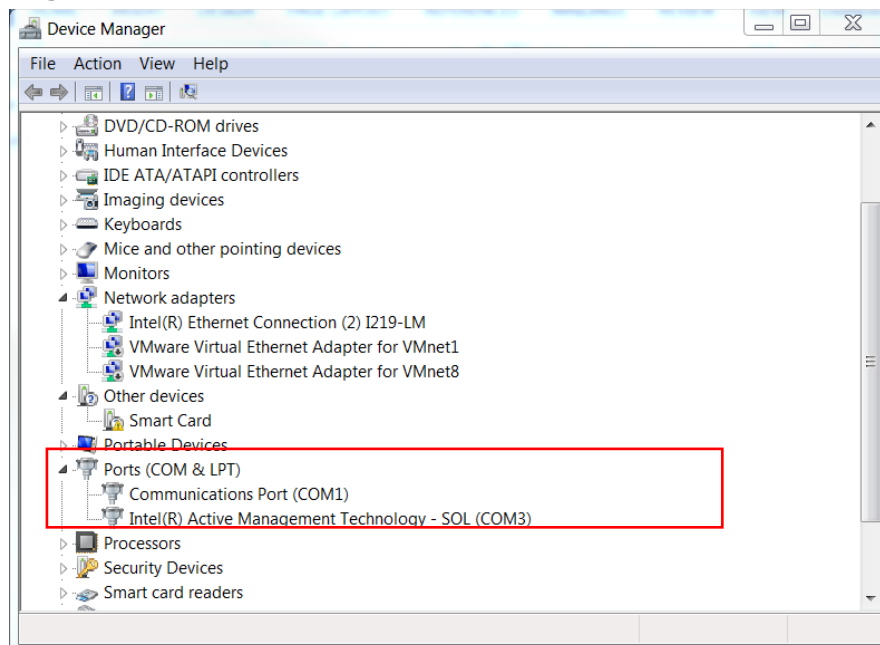
Get the encryption devices ready. Make sure your device can receive the plaintext sent through serial port, correctly encrypt it and sent the ciphertext back. The trigger is pulled high during the encryption process.

Step 2

Connect the signal you wish to measure to C1 and the trigger to C2. On the oscilloscope's screen, show both C1 and C2. Set trigger to 'Single' and trigger level as “1V” (or something else if you know about the high level of trigger)



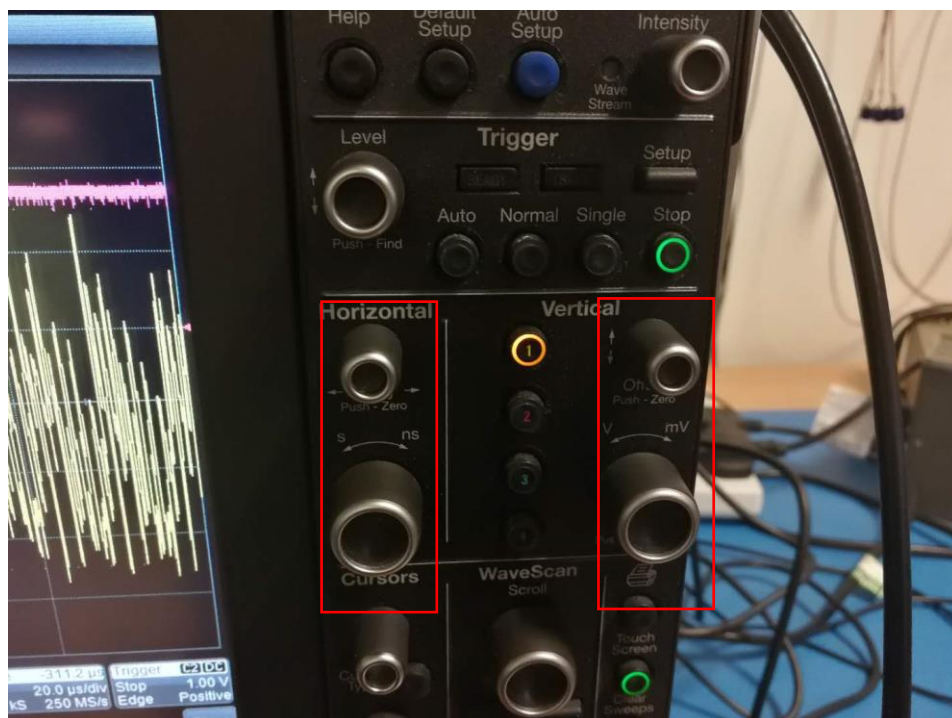
Find out the serial port on the oscilloscope: in the device manager, we have



Change the plaintext/ciphertext length in “Setup.py” according to you encryption, set the correct COM Port then run “Setup.py”. If everything goes well, the oscilloscope should stop after the first encryption occurs (this script keeps running unless you press “Ctrl+C” to stop it)



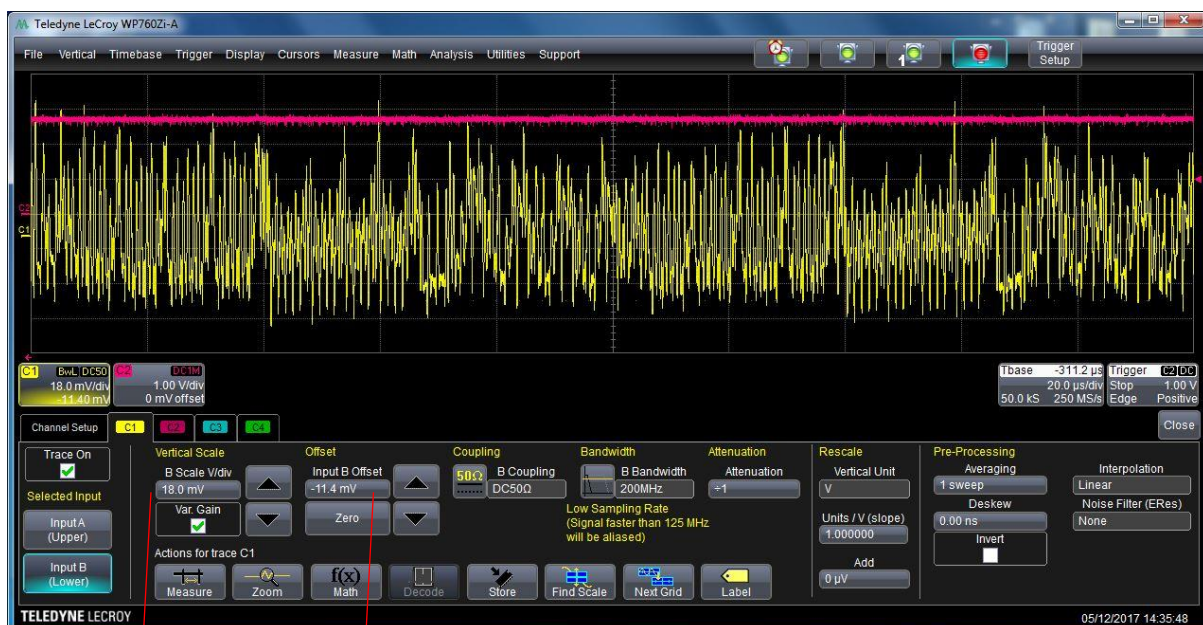
Adjust the horizontal/vertical offsets and scales, make sure the part of trace of interested is located at the centre of your screen



Step 3

Take a note of the following parameters on the oscilloscope's screen:

1. number of samples
2. Sample Rate: Sa/s
3. Vertical resolution: V/div
4. Trigger delay: S
5. Trigger level: V
6. Vertical Offset:V





Fill these parameters into “Acquisition.py”; a few other settings:

- number of traces
- Type of the samples: short or float; short is faster and save some space whereas float MIGHT be more accurate
- isenc = True/False: Whether you are performing encryption or decryption
- Name of the TRS trace set file “xxx.trs”

For convenience, you might want to add some necessary information to the file name, eg.

“SCALE_1000T_50000S_250MHz_AES_Int16.trs”

Run “Acquisition.py” and let the oscilloscope do its job, enjoy some nice coffee and come back later. When it is done, copy your trs file to your USB stick for further power analysis