Loading waveforms on AFG

Manu T S
Saurabh Anmadwar

Department of Electrical Engineering
Indian Institute of Technology Bombay

July 21, 2015

Signal Generation

The following slides provide the steps required for generating the desired base-band signal waveform samples that can be used on the AFG (Arbitrary Waveform Generator). The samples are first generated in Python and then converted to AFG compatible *.tfw format. The signals generated by the AFG will be upconverted using the IQ modulator board.

Step 1. CSV file from Python Code

Run the following command int terminal: python $< filename >$
The python template code is available on Moodle.
It will give out the samples for a standard chirped wave in csv format.
A chirped wave has linearly increasing frequency (i.e. quadratically increasing phase) with time.

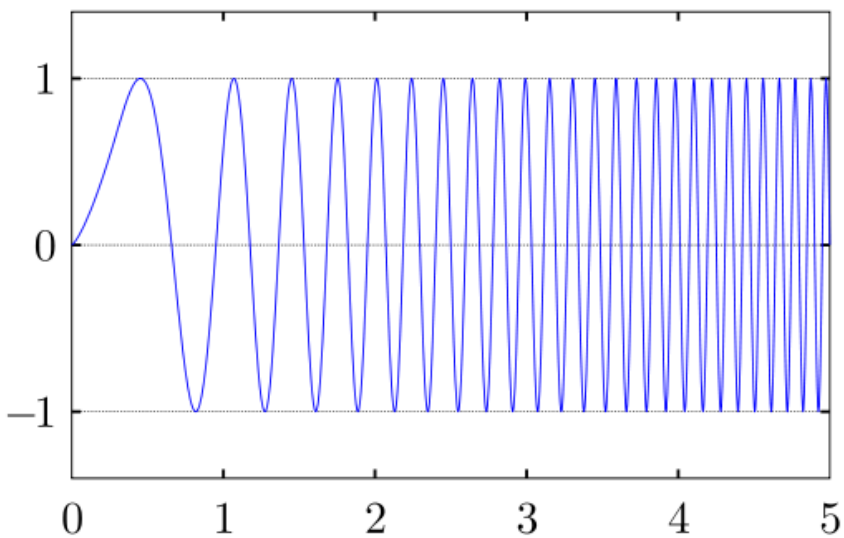
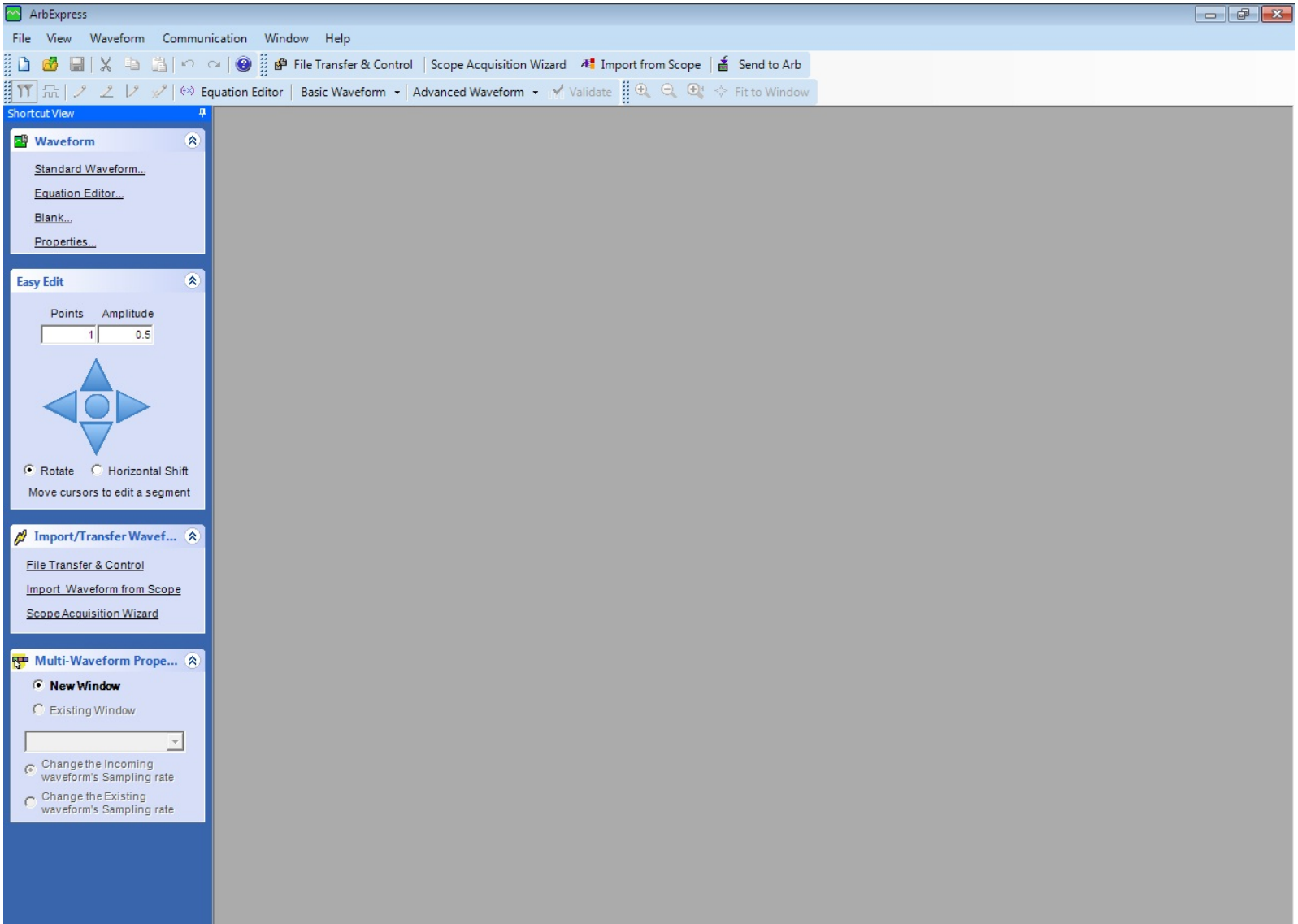


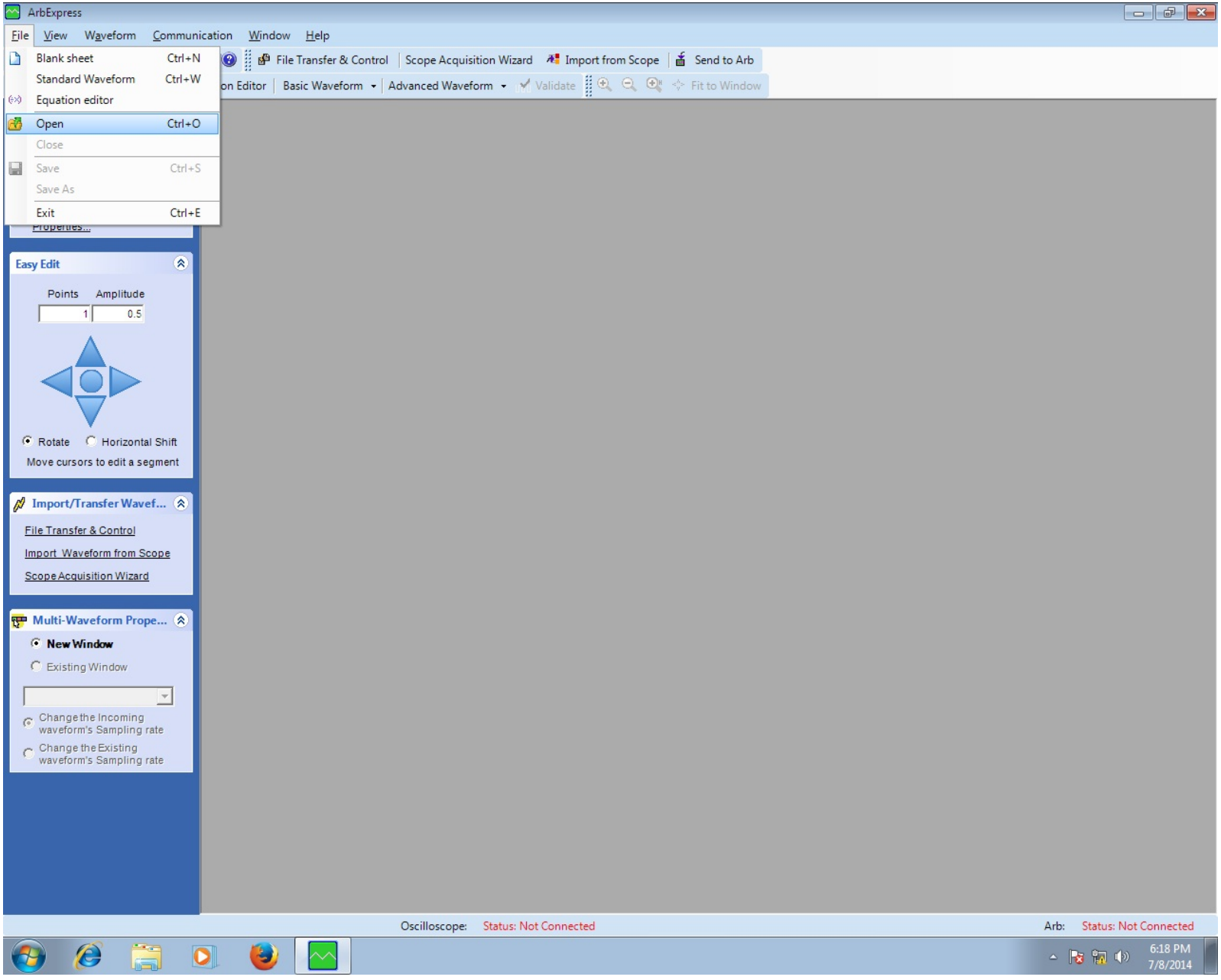
Figure: Chirped Wave: $\cos[(\omega n)n] = \cos(\omega n^2)$

Step 2. csv to tfw

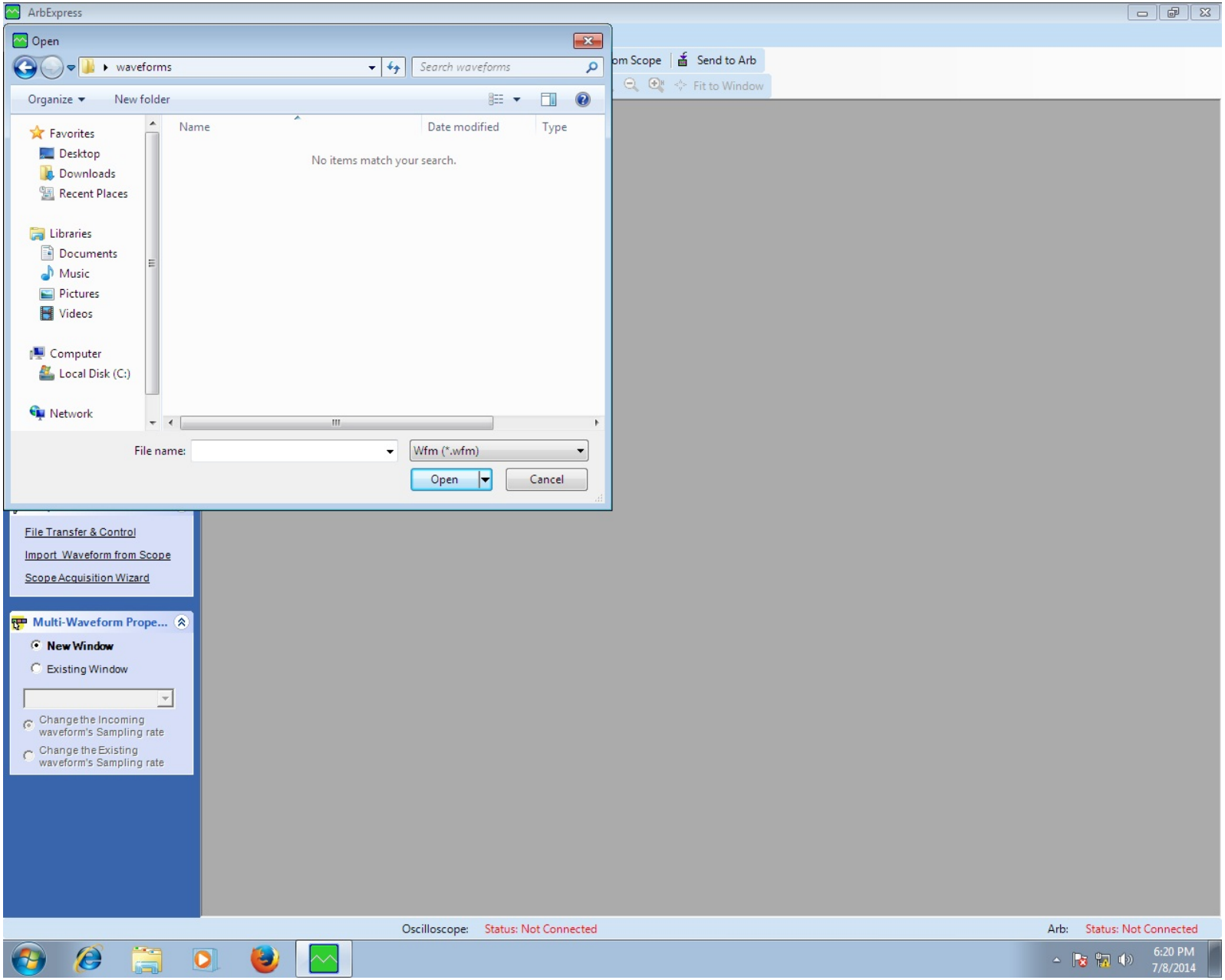
Open software ArbExpress installed on some Windows machine. Following window will be displayed:-



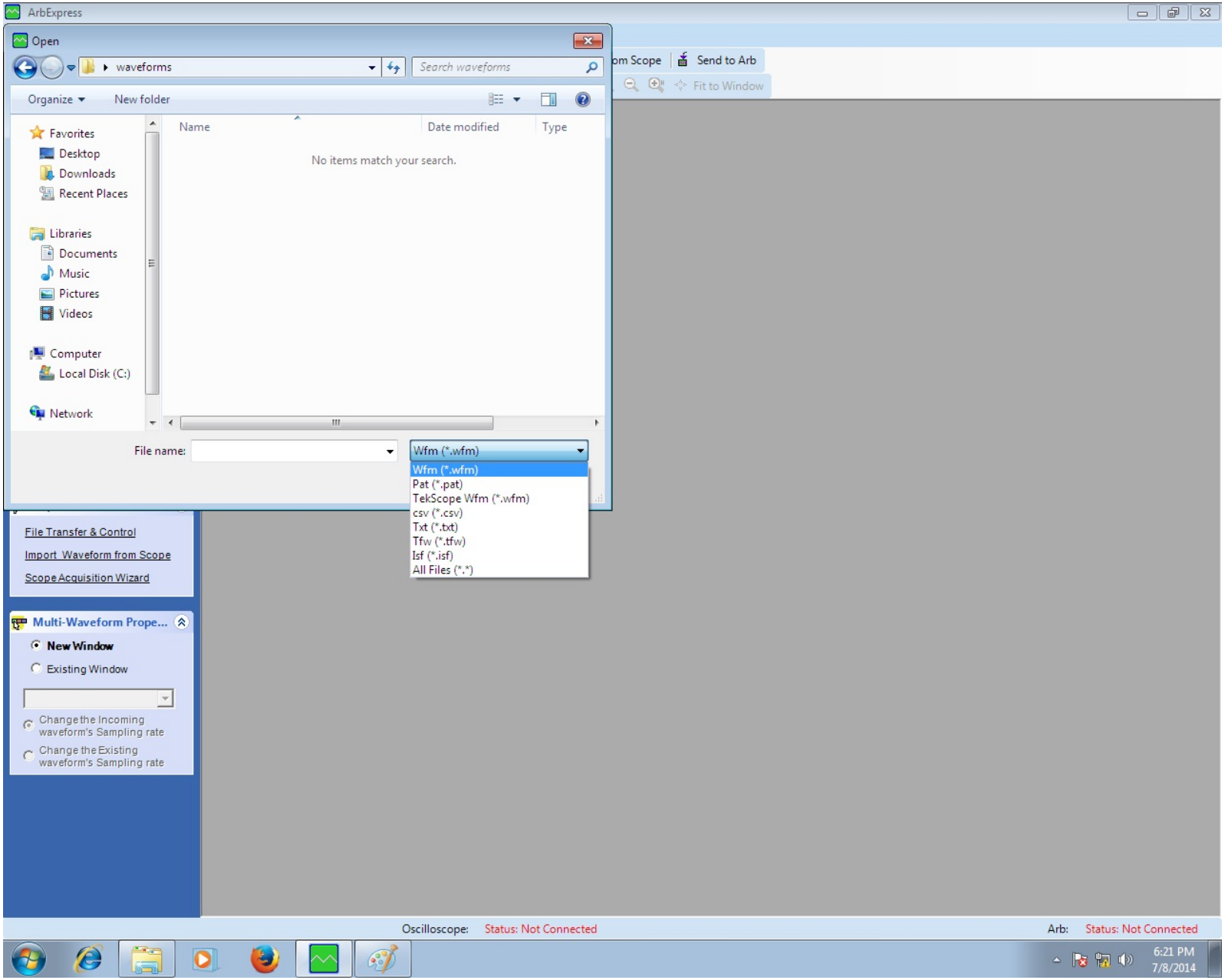
Step 2. csv to tfw



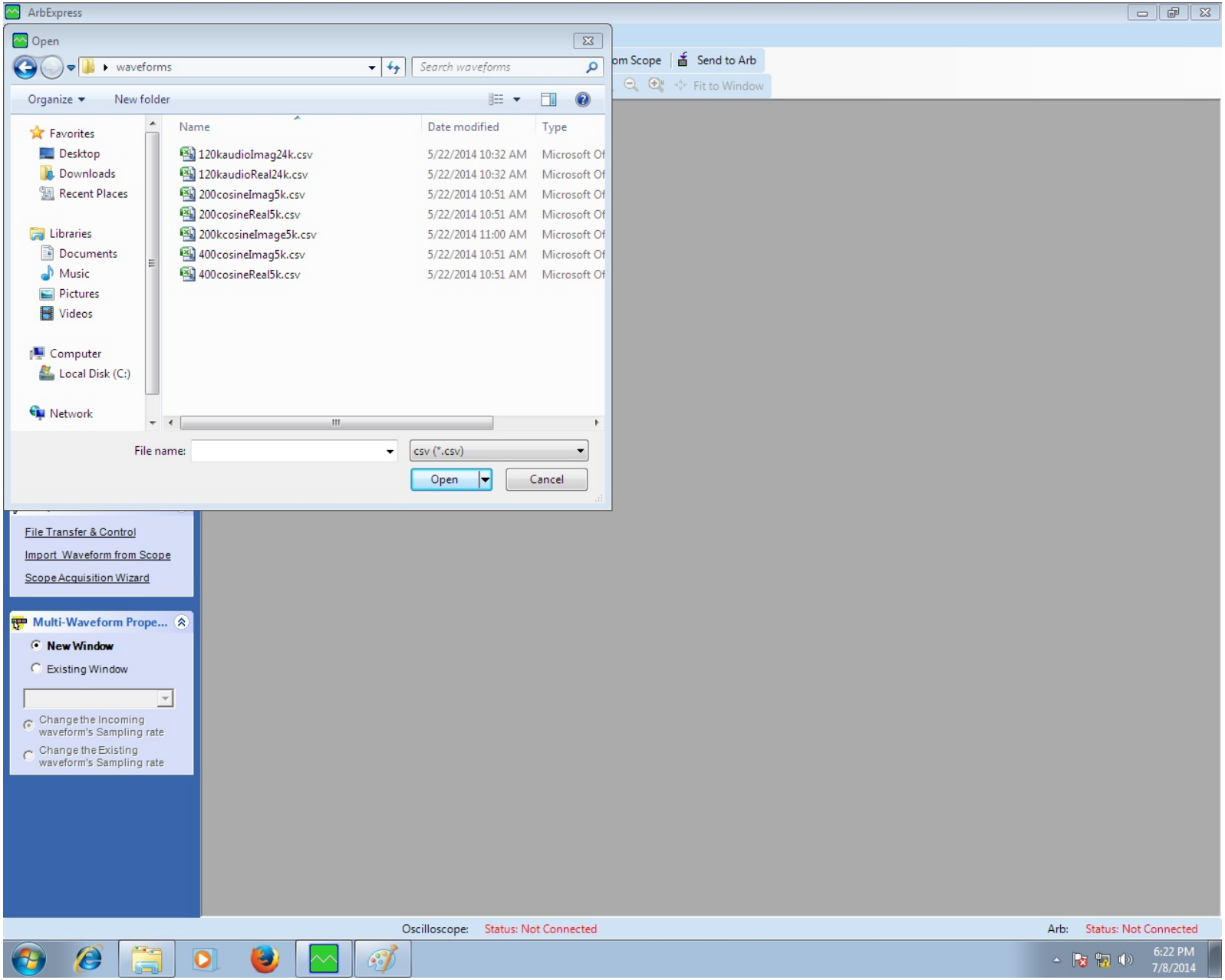
Step 2. csv to tfw



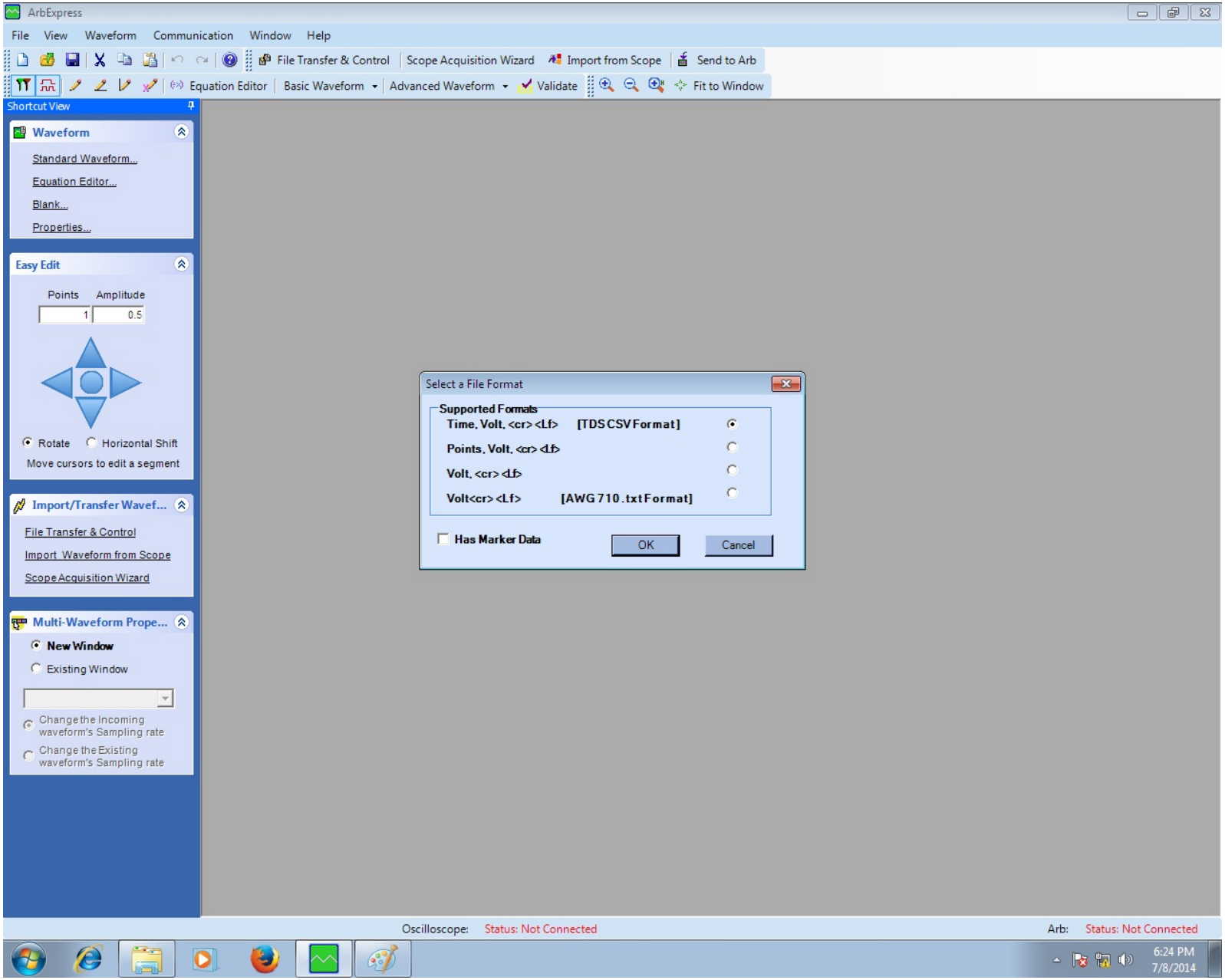
Step 2. csv to tfw



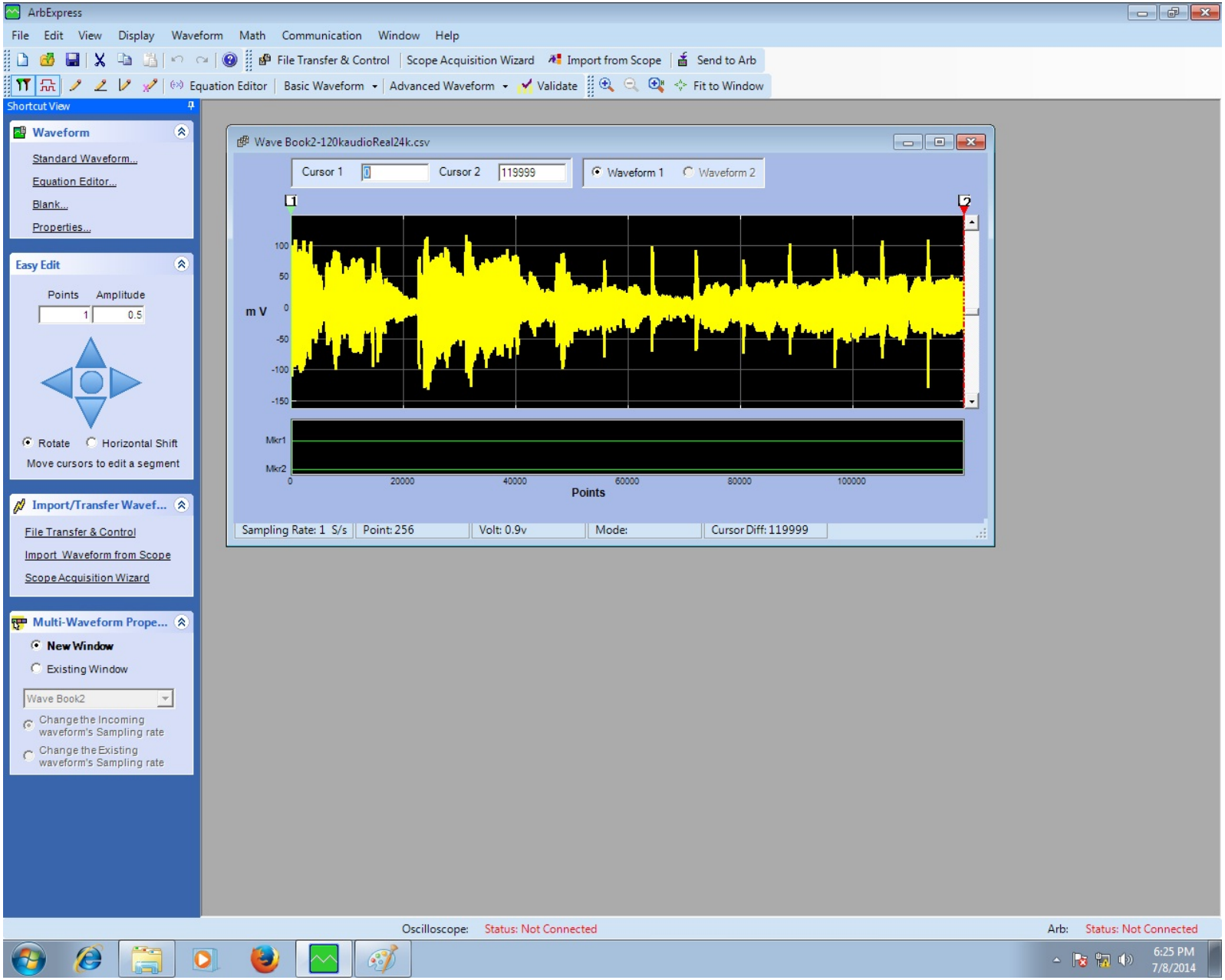
Step 2. csv to tfw



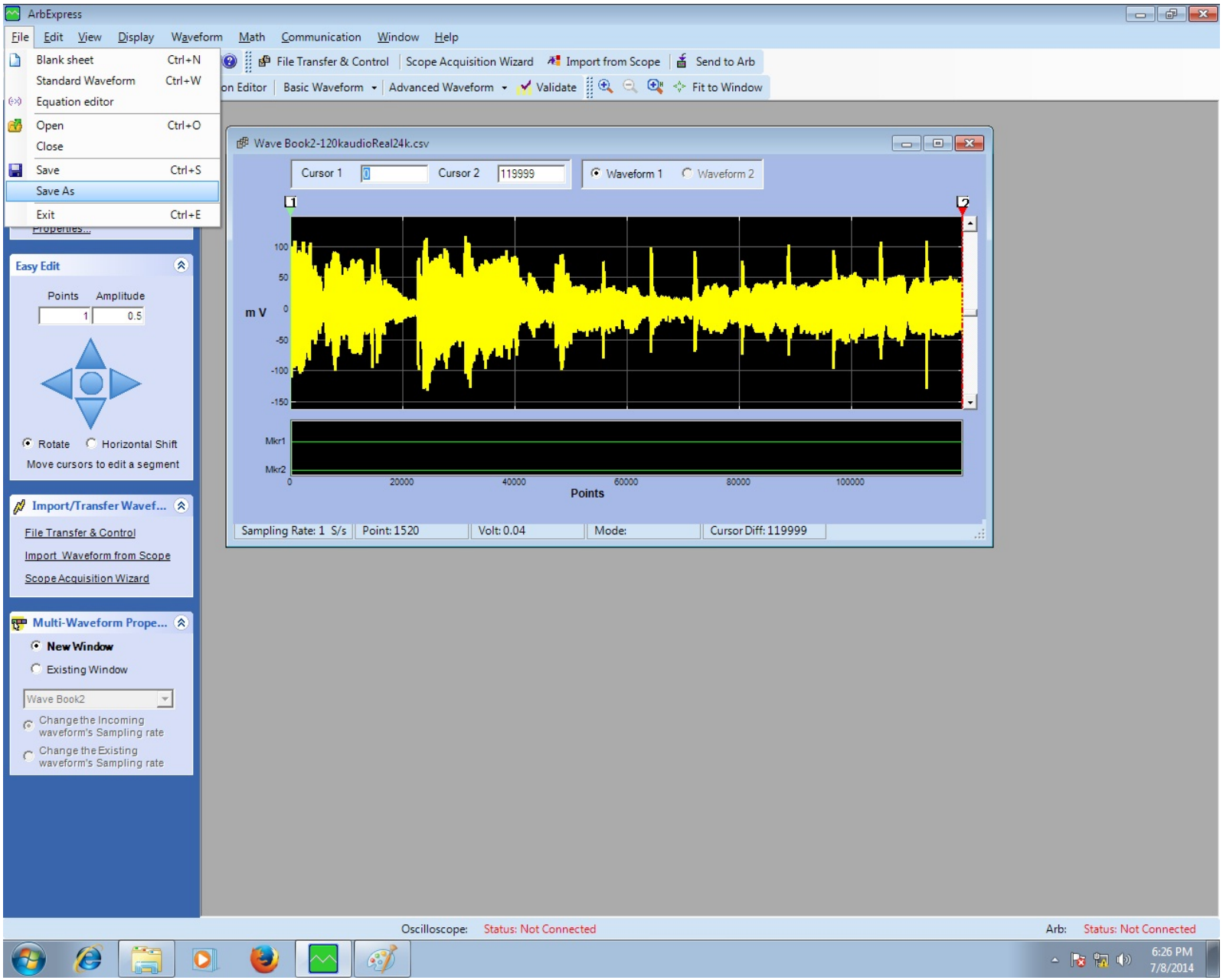
Step 2. csv to tfw



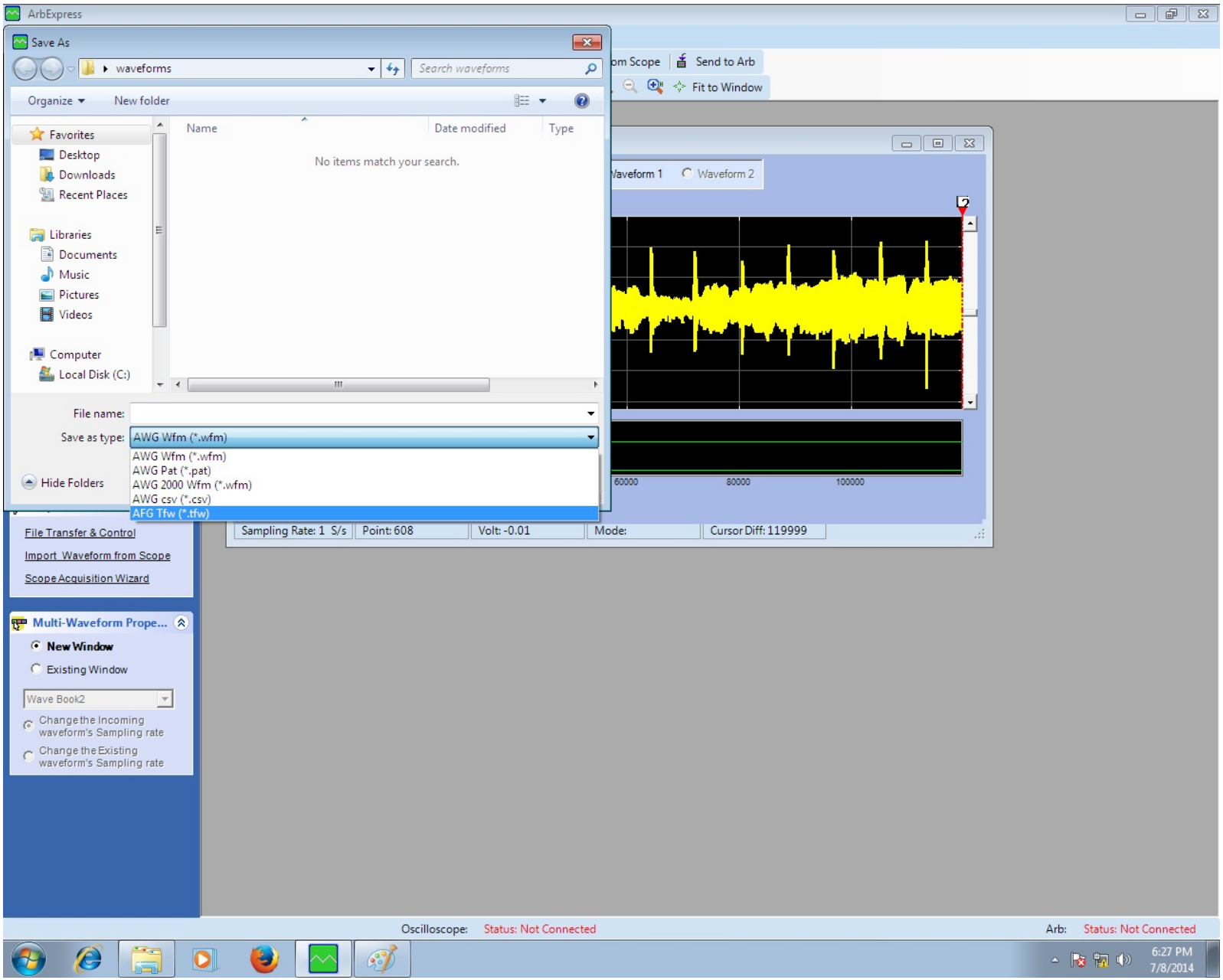
Step 2. csv to tfw



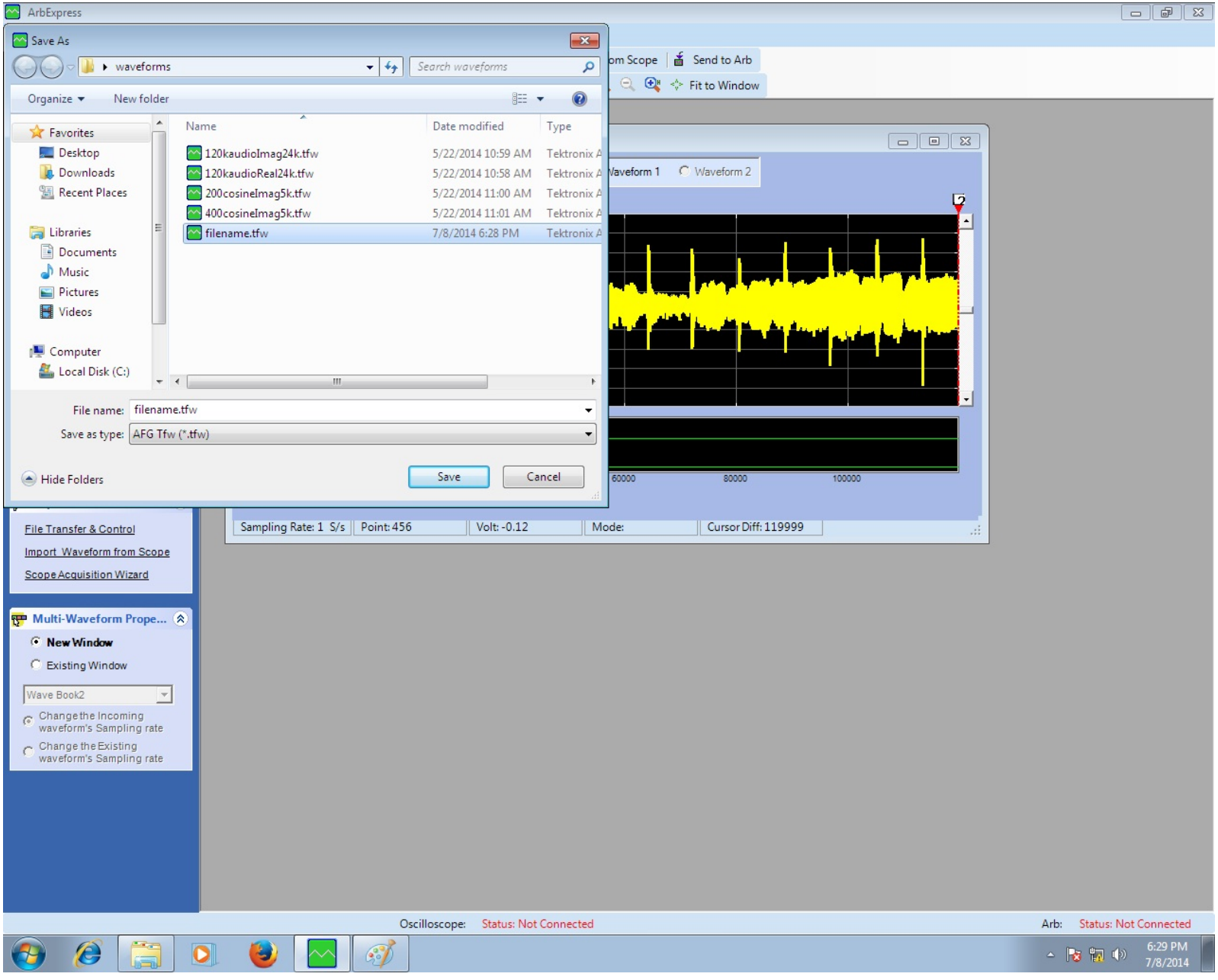
Step 2. csv to tfw



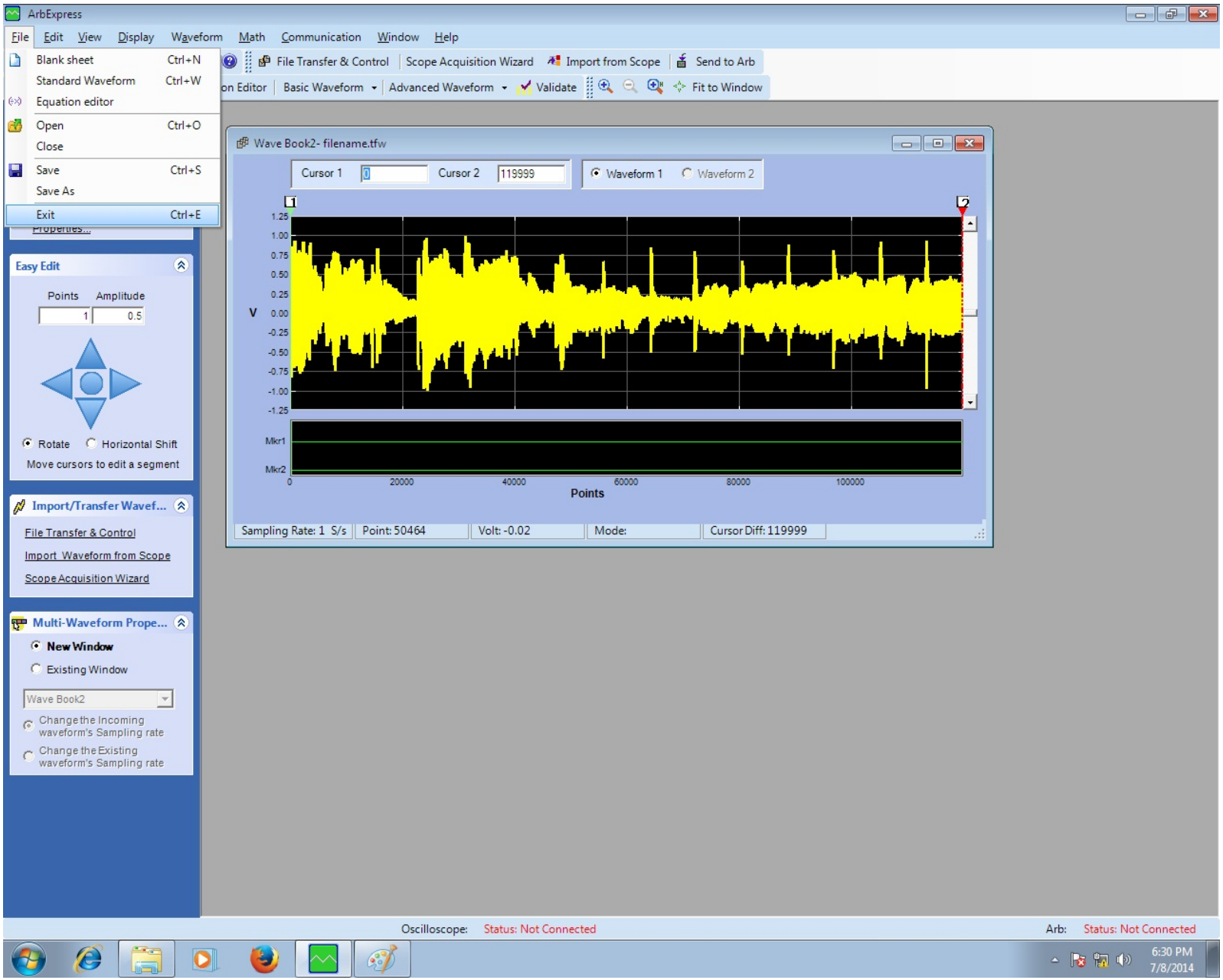
Step 2. csv to tfw



Step 2. csv to tfw



Step 3. csv to tfw



Step 4. Load waveform on AFG

- Keep both channels of AFG in Arb mode.
- Select Arbitrary menu on screen.
- Then select usb as source memory (by default it is internal memory)
- Browse to the desired tfw file and select it.
- Do this for other channel also
- Keep the time period of the loaded waveform such that all instantaneous frequencies generated in chirp should satisfy nyquist criterion when sampled in gnuradio.