

Installation of Digilent Waveforms Board (DWB)

(from Dr. Grigg)

The Digilent Waveforms software enables you to connect the built-in breadboard to your laptop computer through the USB port. This means that you can use your computer as a digital multimeter (DMM), arbitrary waveform generator (AWG), or an oscilloscope.

The concept is simple: Use a computer as the instrument, provide an interface board to connect electrical devices to the computer through the USB port, and manipulate the virtual instruments just as one would use real instruments on a lab bench – but at a much lower cost. But first you have to install the software by going to: www.digilentinc.com/eeboard and scrolling down to WaveForms and press Download.

When the software installation is complete attach your DWB to your laptop using the supplied USB cable and then connect the power. Figure 1 shows a complete set-up with a small circuit attached to it, notice that both the USB and power lights are on.

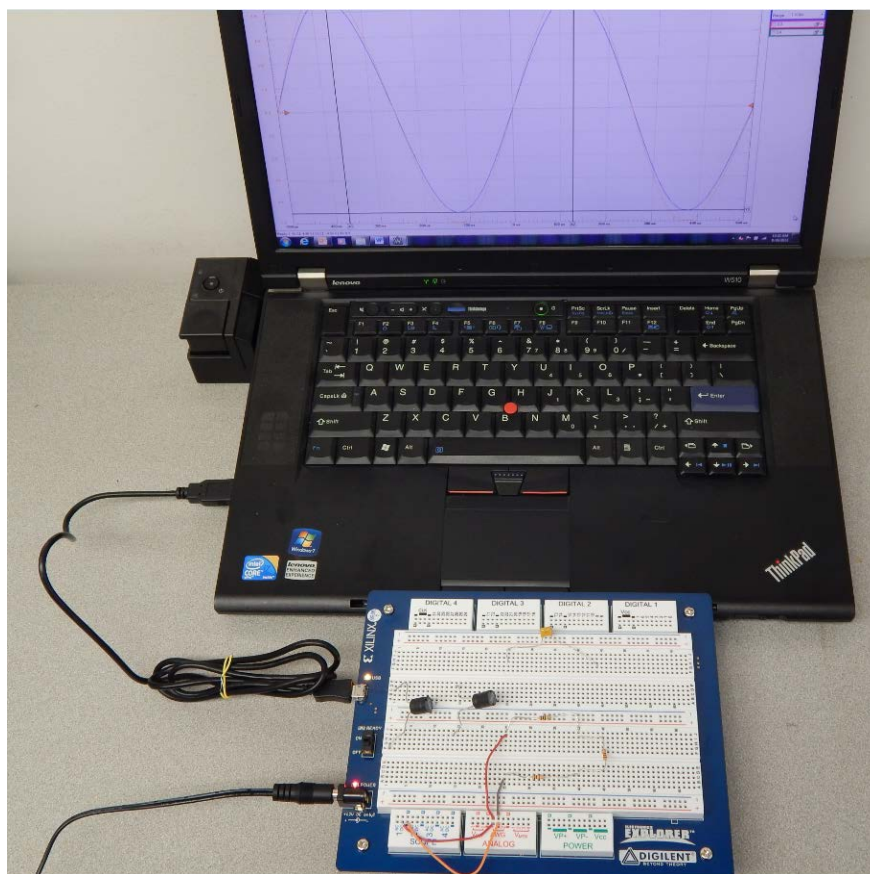



Figure 1 – Complete DWB Setu

Start the WaveForms application from the Start Menu in the bottom left-hand corner of your laptop. Select All Programs > Digilent > WaveForms > WaveForms. The application will start and connect to your board. You may want to create a shortcut for this and place it on your desktop or in the main start menu.

Once the application has started the WaveForms main window will appear as shown in Figure 2. Notice the  Explorer OFF icon, this indicates that the power switch is in the off position – switch it on and this icon will disappear.

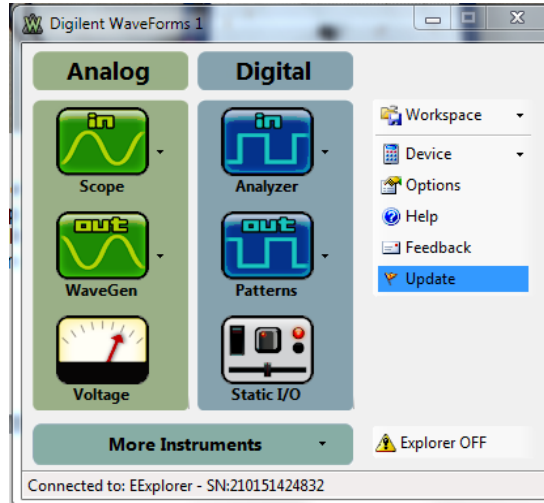


Figure 2 – Main DWB Screen

The board is now ready for use so let's observe a couple of signals from the Arbitrary Waveform Generators (AWGs) by displaying them on the Oscilloscope. We will only be using the Analog components on the left of figure 2. Select the “out WaveGen” icon and the Arbitrary Waveform Generator screen will appear as shown in Figure 3 – you may have to click on the “select channels” icon and check both AWG1 and AWG2.

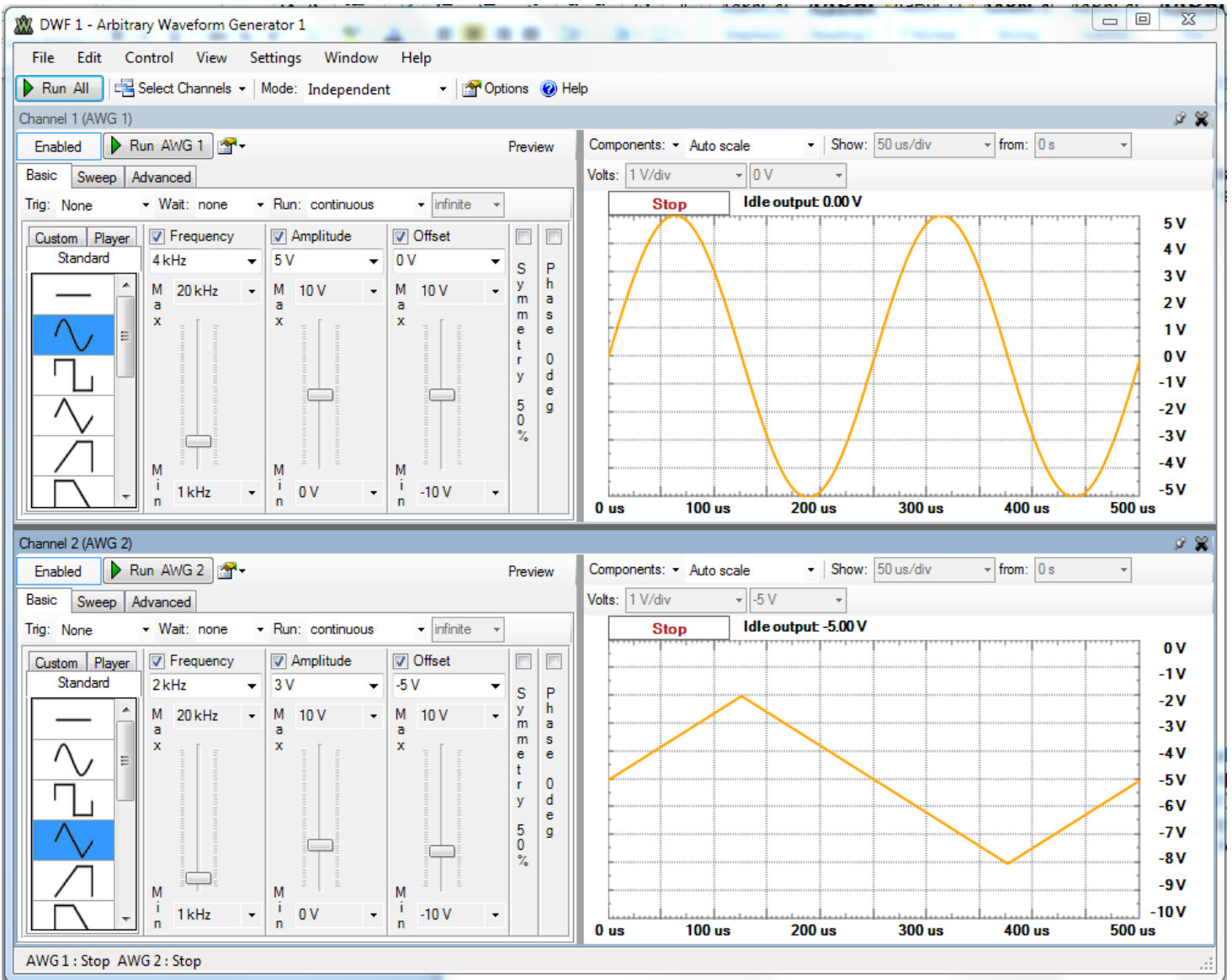


Figure 3 – Arbitrary Waveform Generator Screen

For AWG1 select the sinewave symbol and input 4 kHz Frequency, 5V Amplitude and 0 V Offset. You can do this by either moving the sliders or by typing the values. Then select the triangular symbol for AWG2 and input 2 kHz Frequency, 3 V Amplitude and -5 V Offset. Connect the output of the AWGs to the Oscilloscope using the short links as shown in Figure 4. Notice that there will be no output yet because the “Run AWG” tabs have not been pressed.

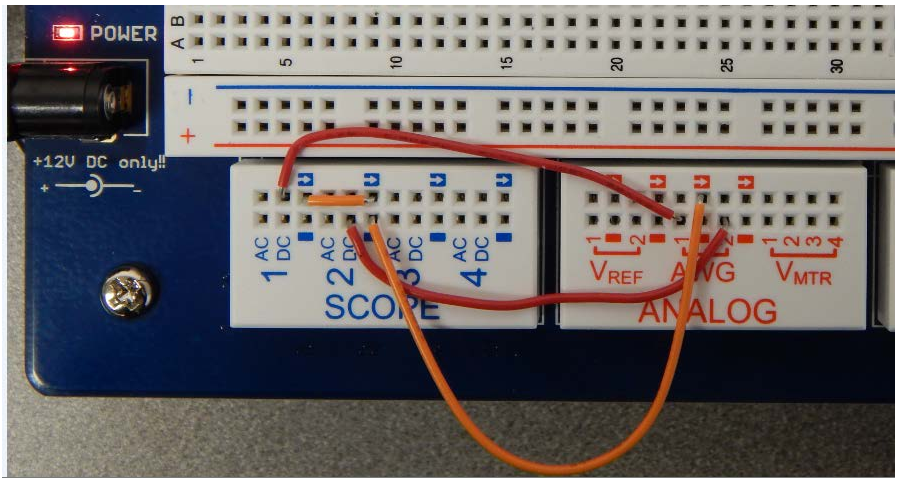


Figure 4 – AWG to Oscilloscope Connections

On the Main DWB Screen Select the “in Scope” icon and the Oscilloscope screen will appear as shown in Figure 5 – deselect C3 & C4 to make it more viewable.

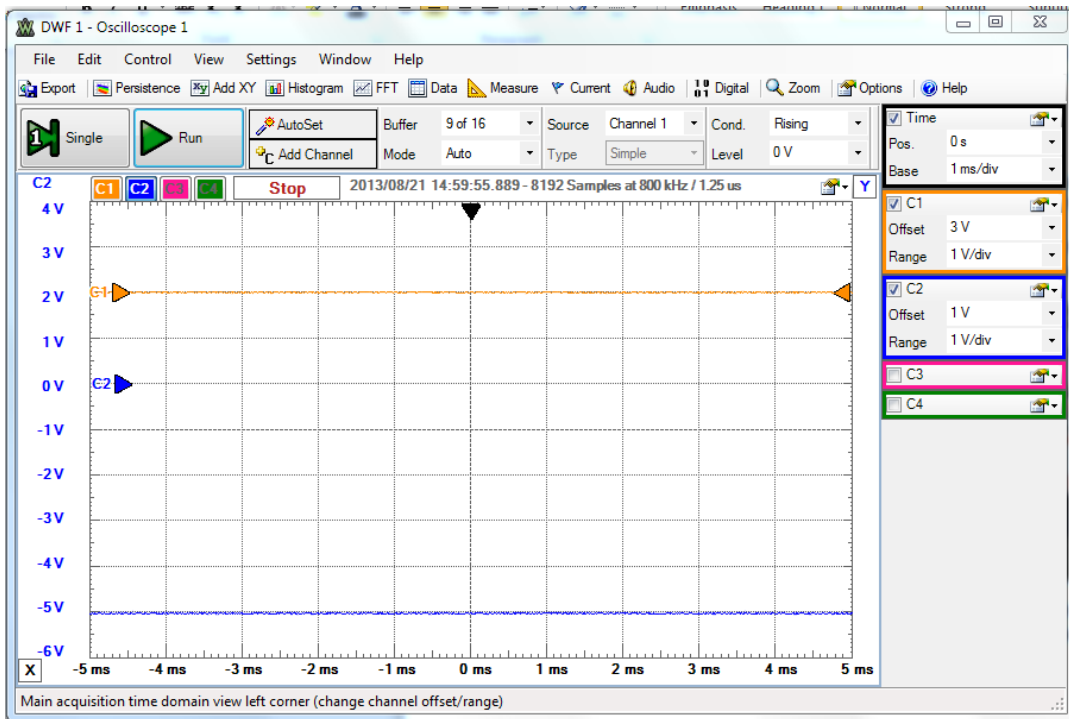


Figure 5 – Basic Oscilloscope Screen

Press the “Run All” tab on the AWGs; this will turn on both AWGs. Then press the “Run” tab on the Oscilloscope to display the images. They will probably look terrible initially, so set the Time Base to $100 \mu\text{s}/\text{div}$ and the Ranges on C1 & C2 to 2 V/div with 0V Offset and your image should look like Figure 6.

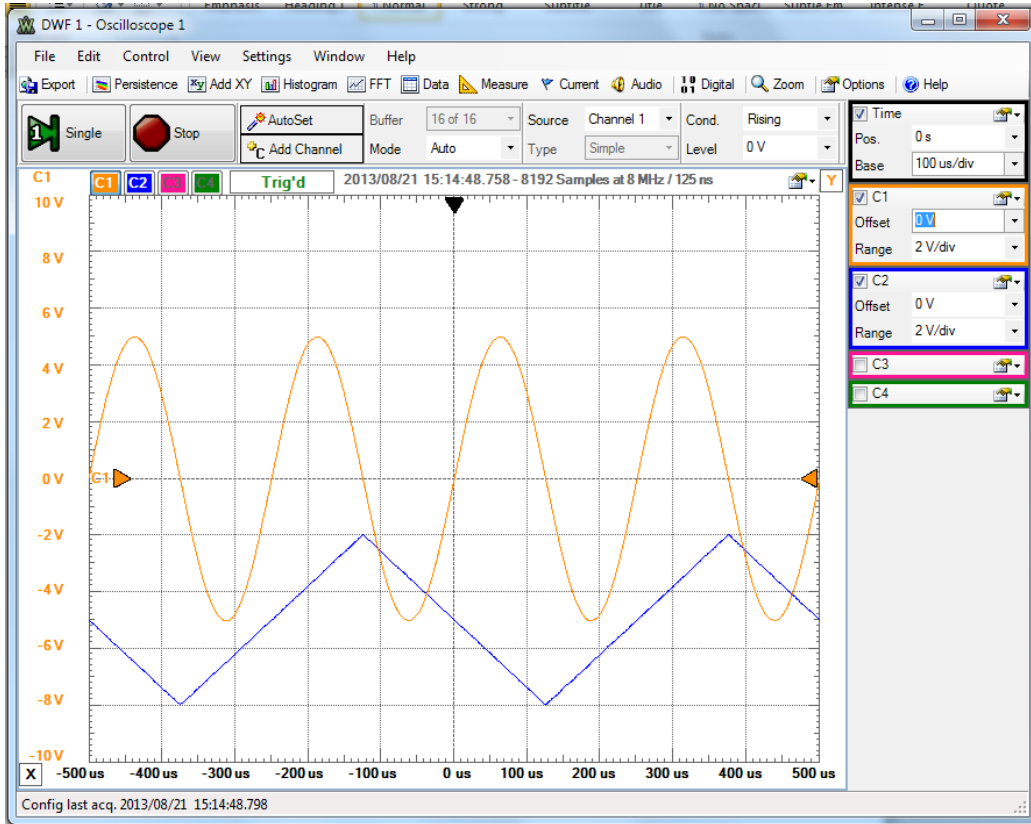


Figure 6 – AWG Waveforms Displayed on the Oscilloscope Screen

Notice that C2 (blue) is constantly moving while C1 (orange) is stationary, this is because the frequencies are different and the “Trigger Source” is Channel 1 – if you change the Source to Channel 2 and the Level to -2 V a more stable image will be obtained.

Press the “Stop All” tab on the AWGs; this will turn off both AWGs. Then press the “Stop” tab on the Oscilloscope. Remove the links between the AWGs and the Oscilloscope and you are ready to start the lab proper.