American University of Beirut

ECE312 Lab

MyDAQ Assignment 3

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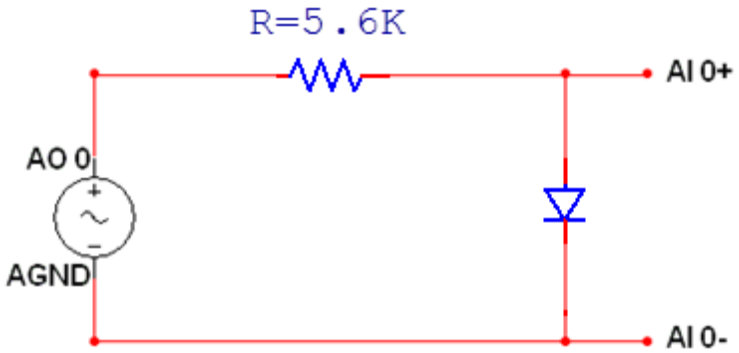
20110****

Due on 23/12/2011

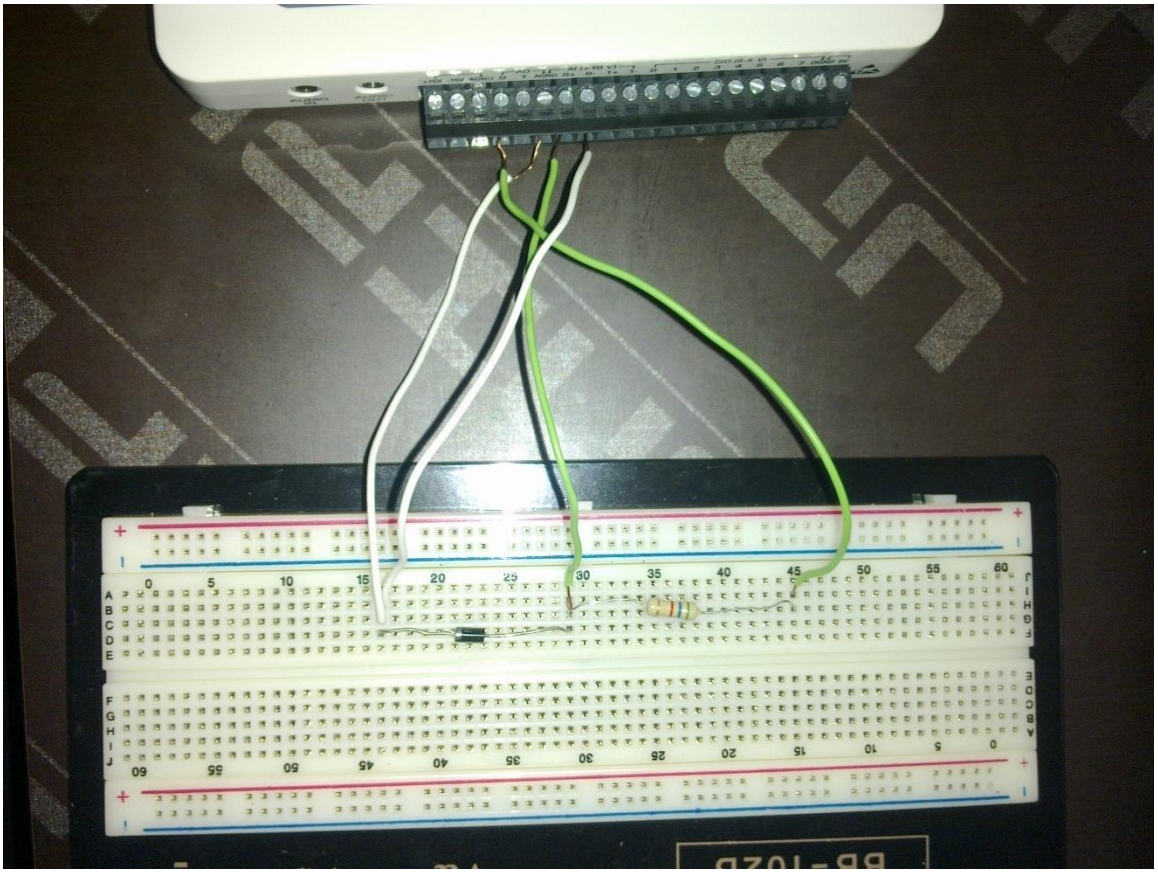
1. Description of the hardware setup:



We use AO0 & AGND of the MyDAQ from which we can get the input voltage signal.

We use AI0+ & AI0- of the MyDAQ in order to plot the output voltage signal on the scope & measure the values needed.

Figure A-1: One diode clipping circuit



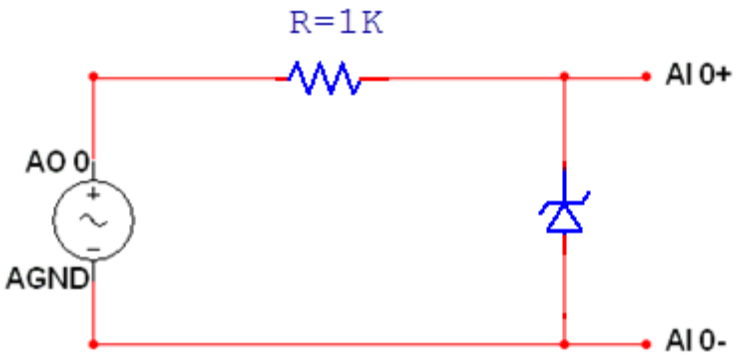
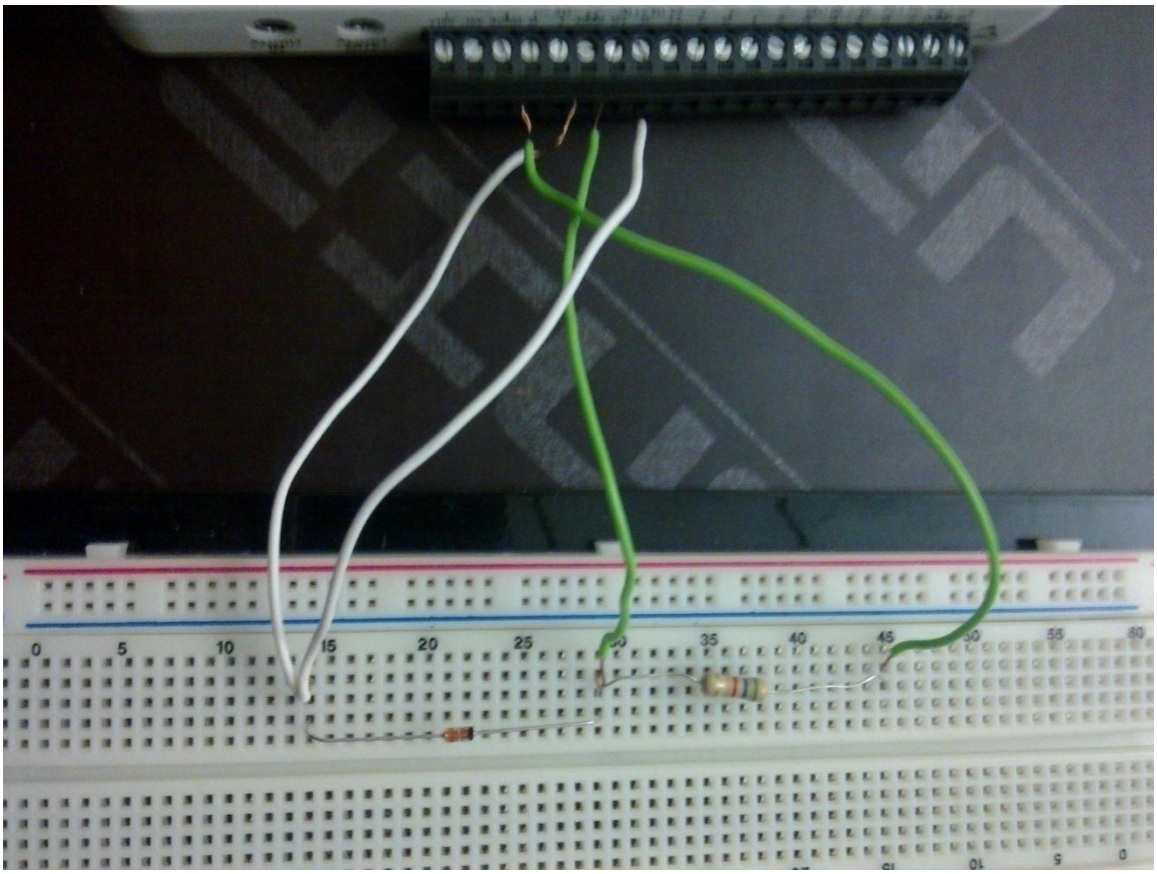


Figure A-2: One Zener clipping circuit



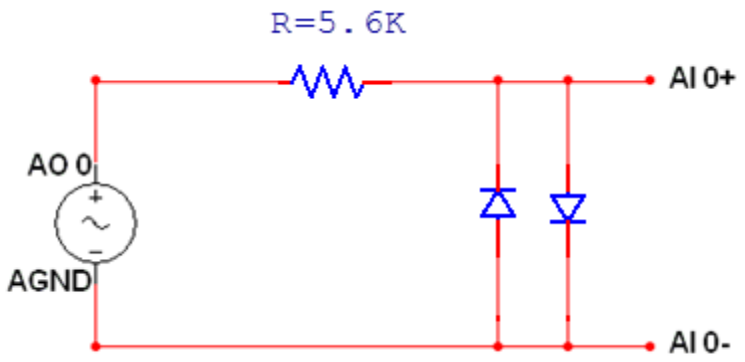
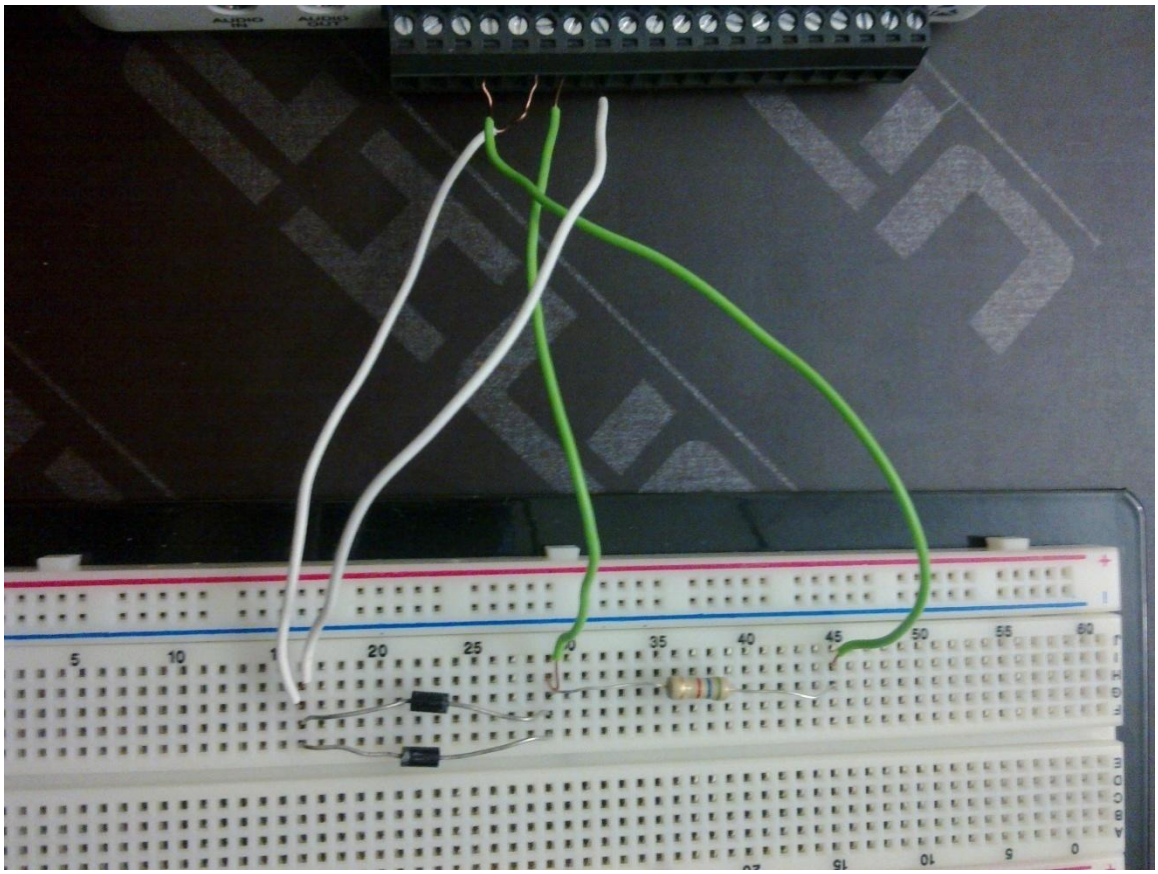


Figure A-3: Two diode clipping circuit



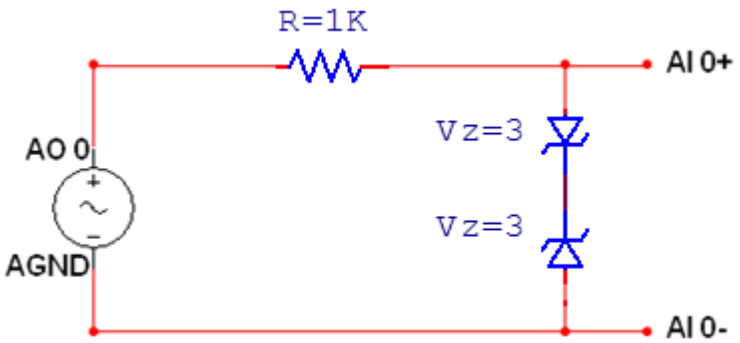
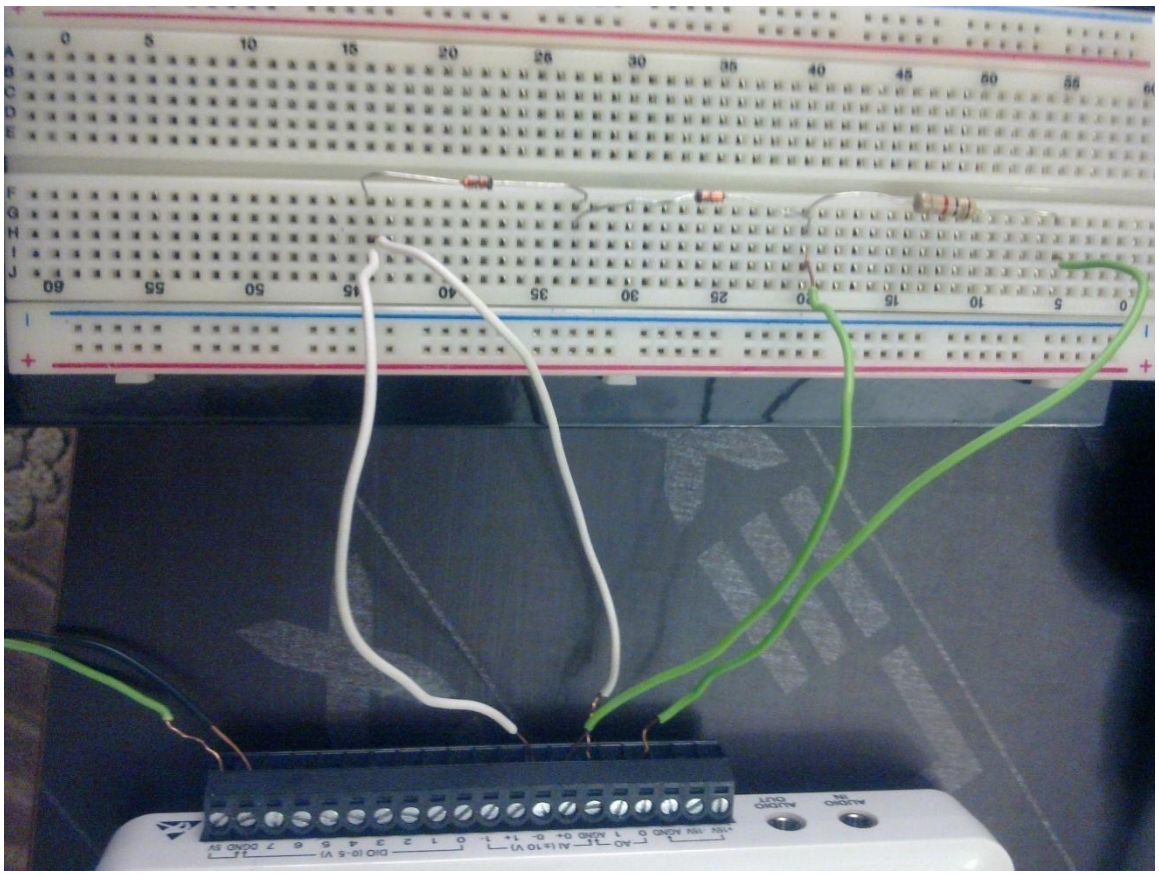


Figure A-4: Two Zener clipping circuit



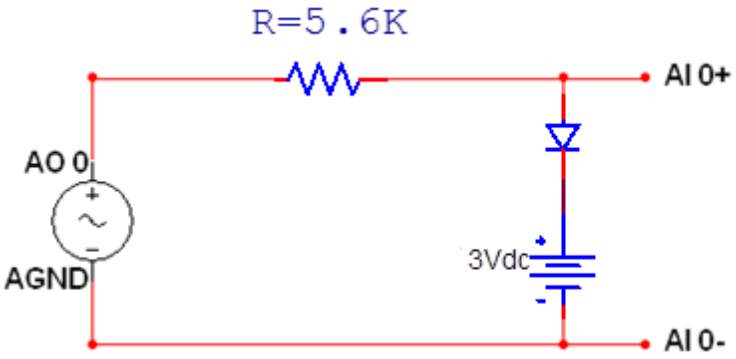
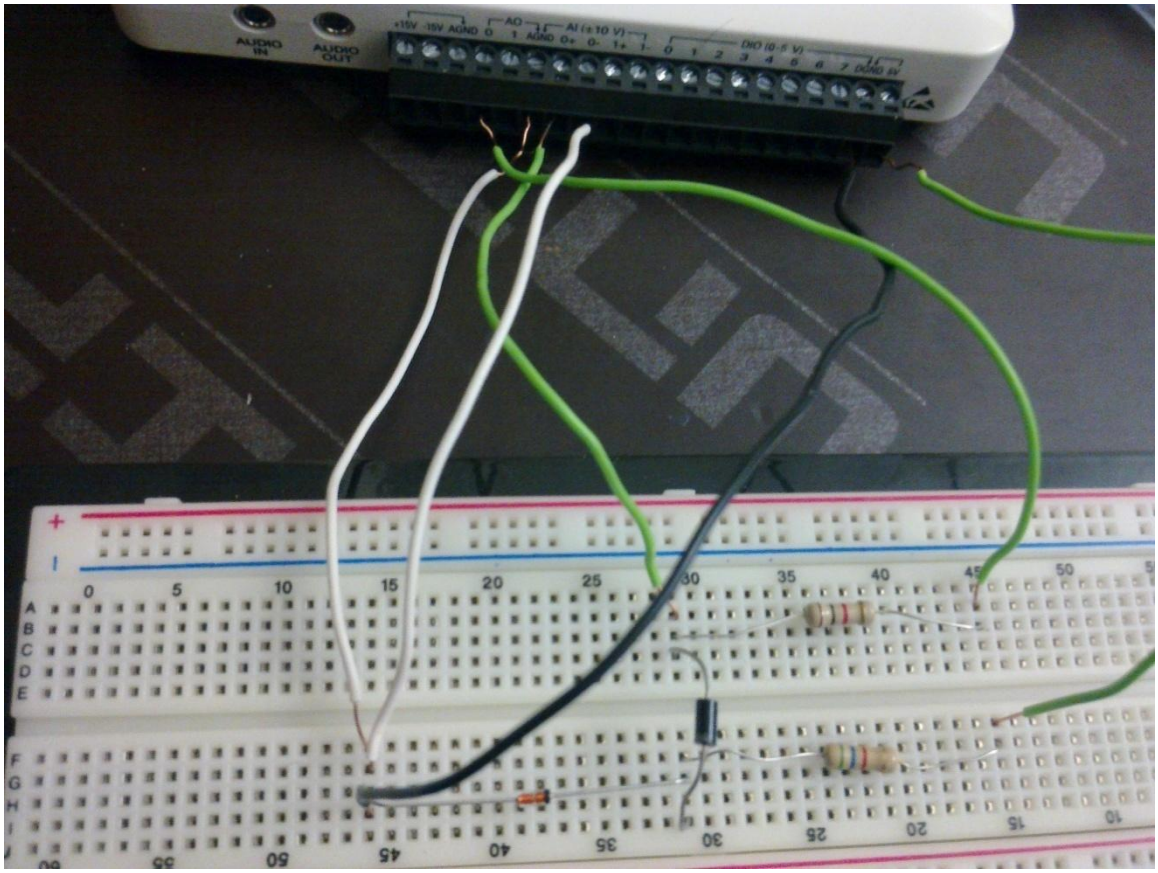


Figure A-5: Diode clipping with DC source



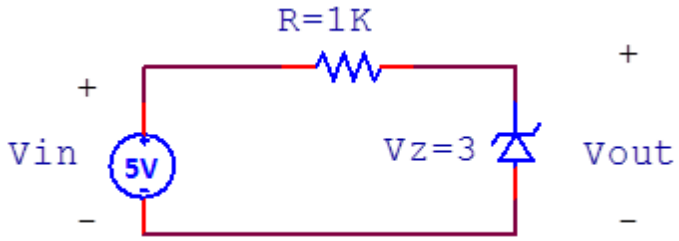
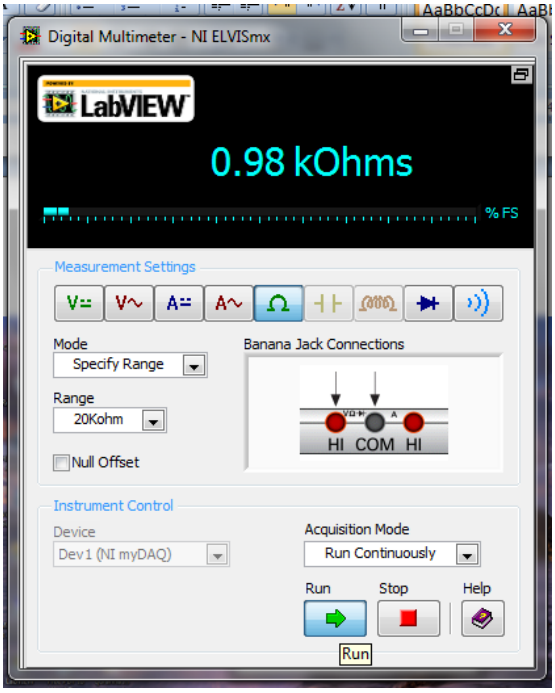


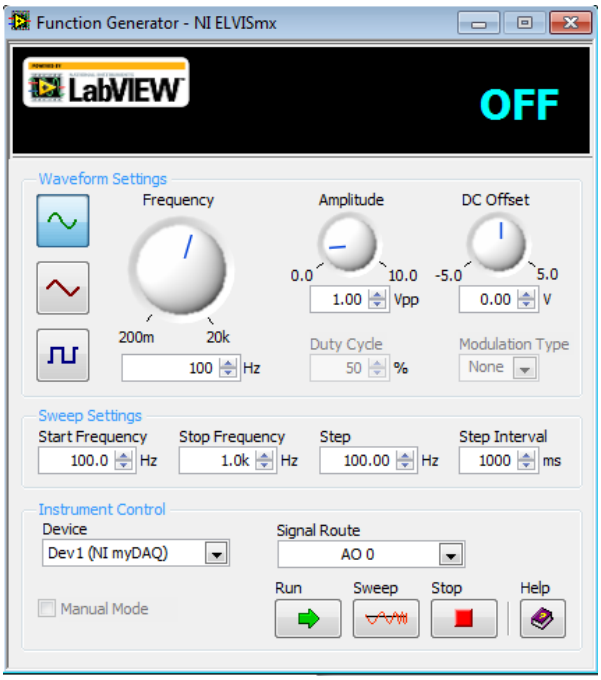
Figure B-1: Voltage regulator used as DC source

2. <u>Description of the software setup</u>:

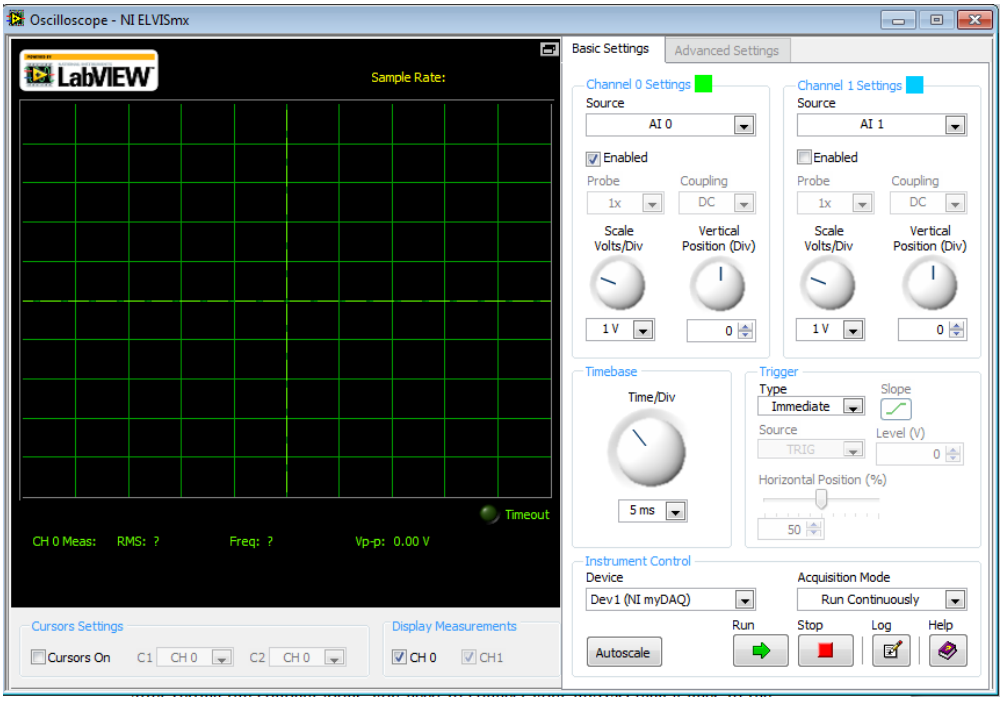
We will use the DMM to measure the resistance of the resistors that we will use in our circuits.



We will also use the Function Generator to apply a sinusoidal input signal of specified frequency and pk-pk voltage (Vpp)

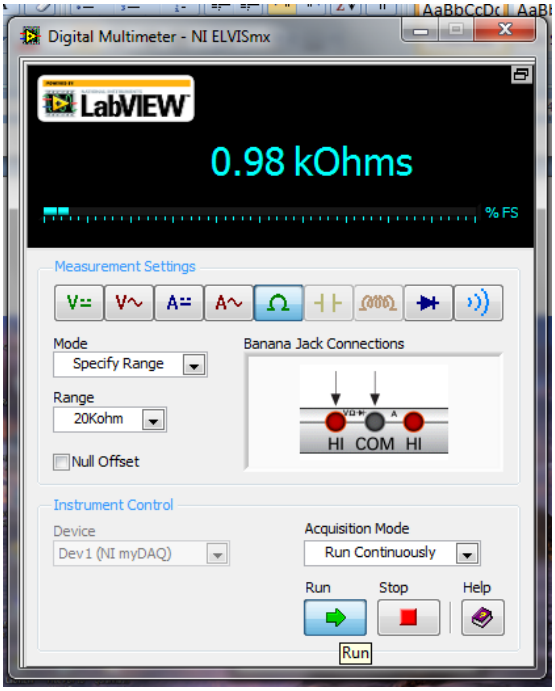


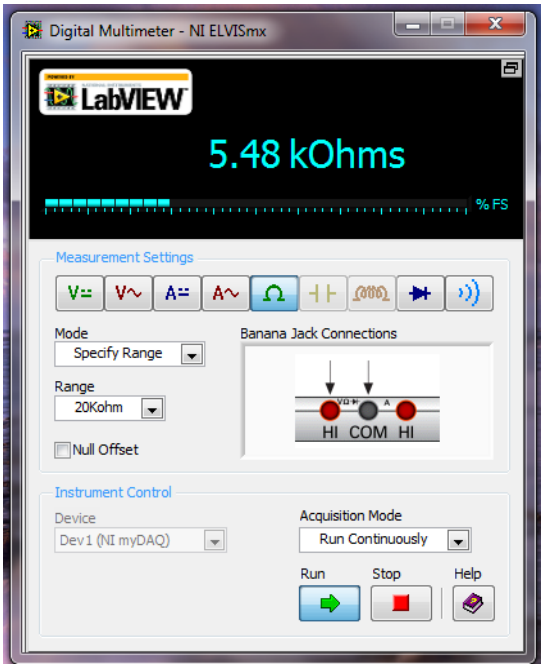
We will also use the scope, where the output signal is plotted, in order to measure the pk-pk output voltage, maximum output voltage, and minimum output voltage.



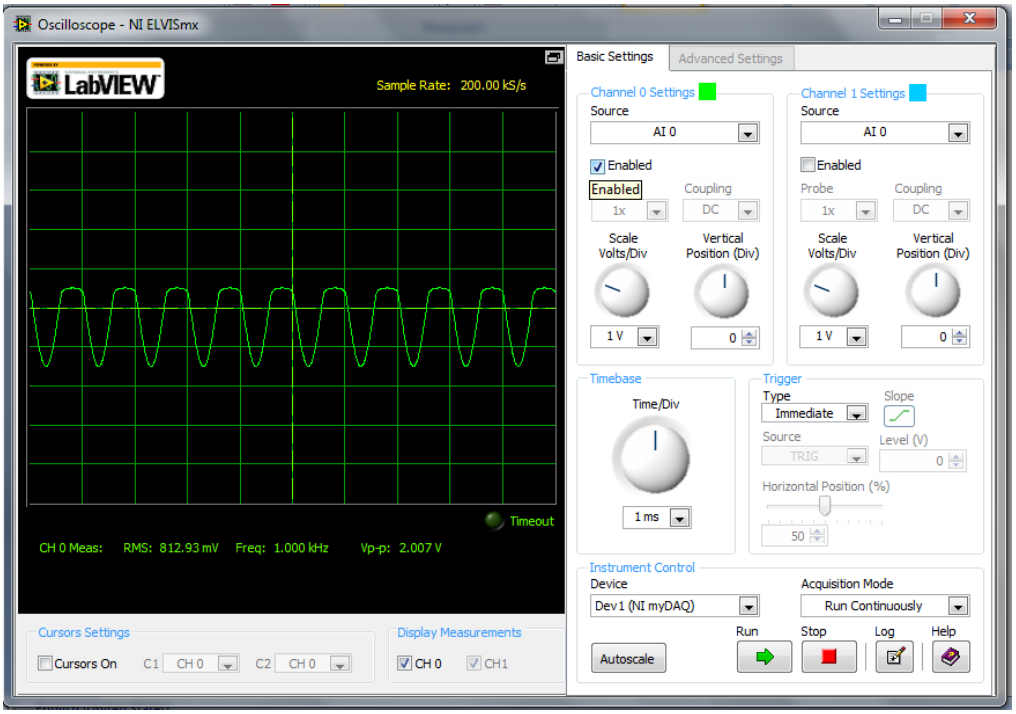
3. Testing:

Resistors Used:





For one diode clipping circuit (Figure A-1), apply a 2 V peak-to-peak, 1 KHz sinusoidal wave as input.

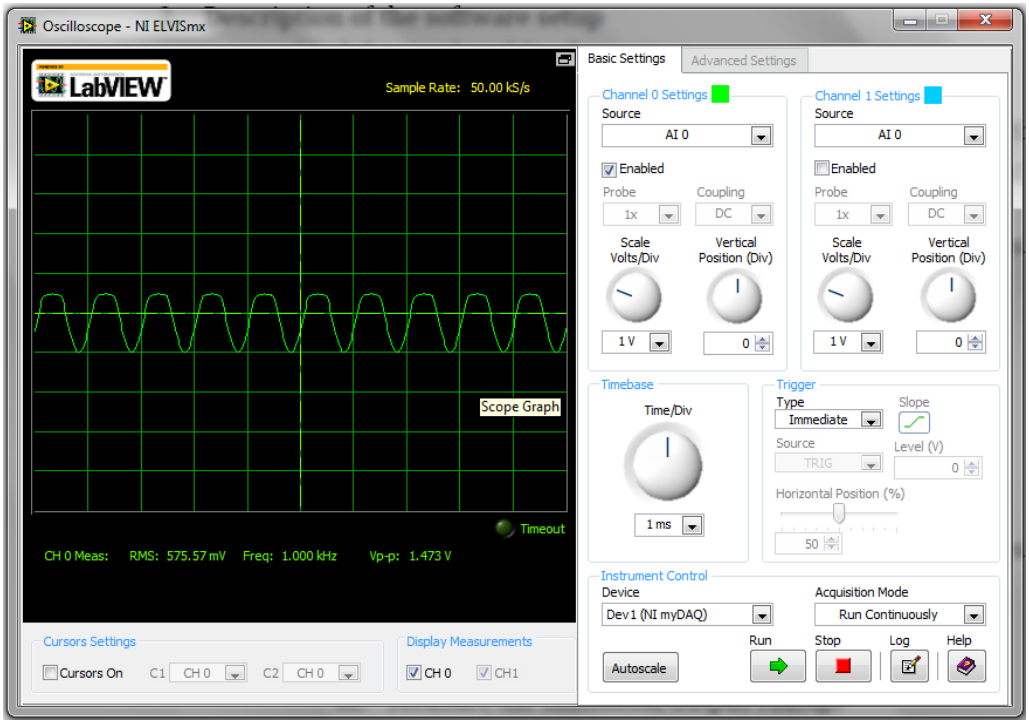


Vpk-pk = 2.0V

Vmax = 0.5V

Vmin = -1.5V

For one diode clipping circuit (Figure A-1), apply a 3 V peak-to-peak, 1 KHz sinusoidal wave as input.

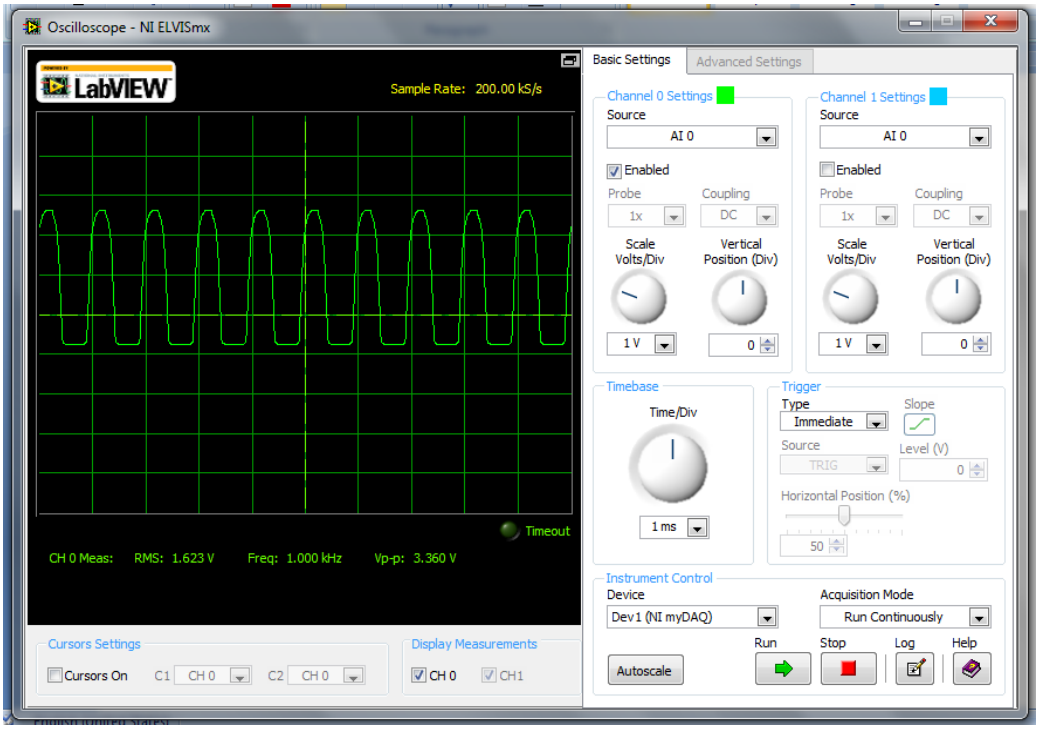


Vpk-pk = 1.473V

Vmax = 0.473V

Vmin = -1.0V

For one Zener clipping circuit (Figure A-2), apply a 3 V peak-to-peak, 1 KHz sinusoidal wave as input.

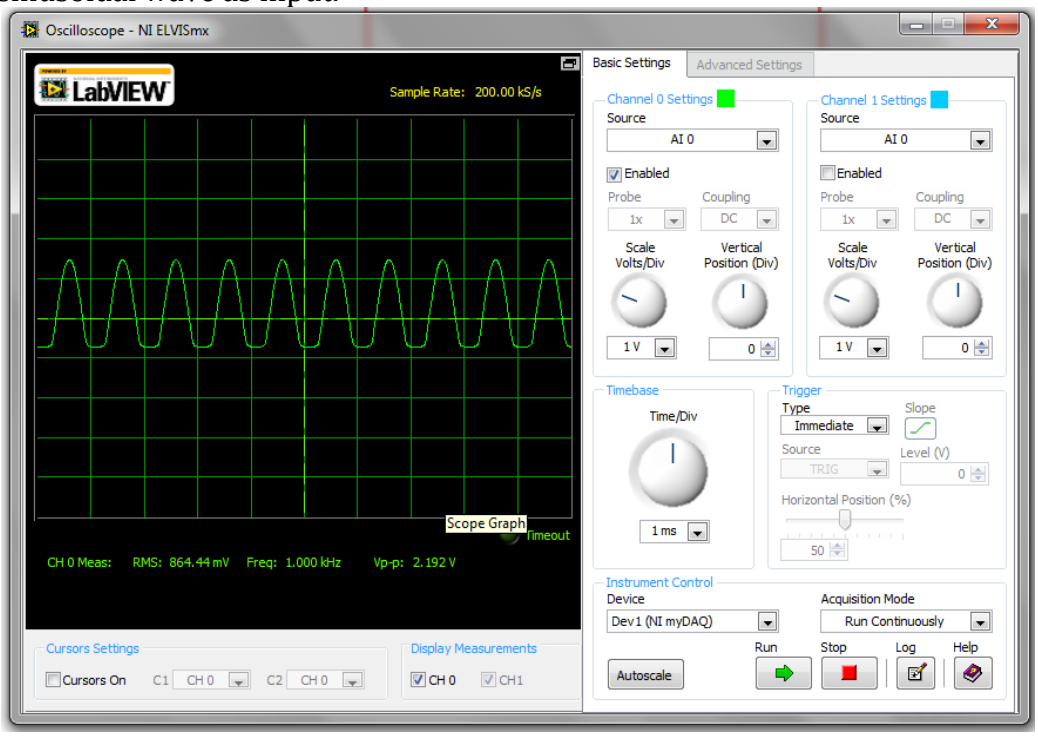


Vpk-pk = 3.36V

Vmax = 2.56V

Vmin = -0.8V

For one Zener clipping circuit (Figure A-2), apply a 10 V peak-to-peak, 1 KHz sinusoidal wave as input.

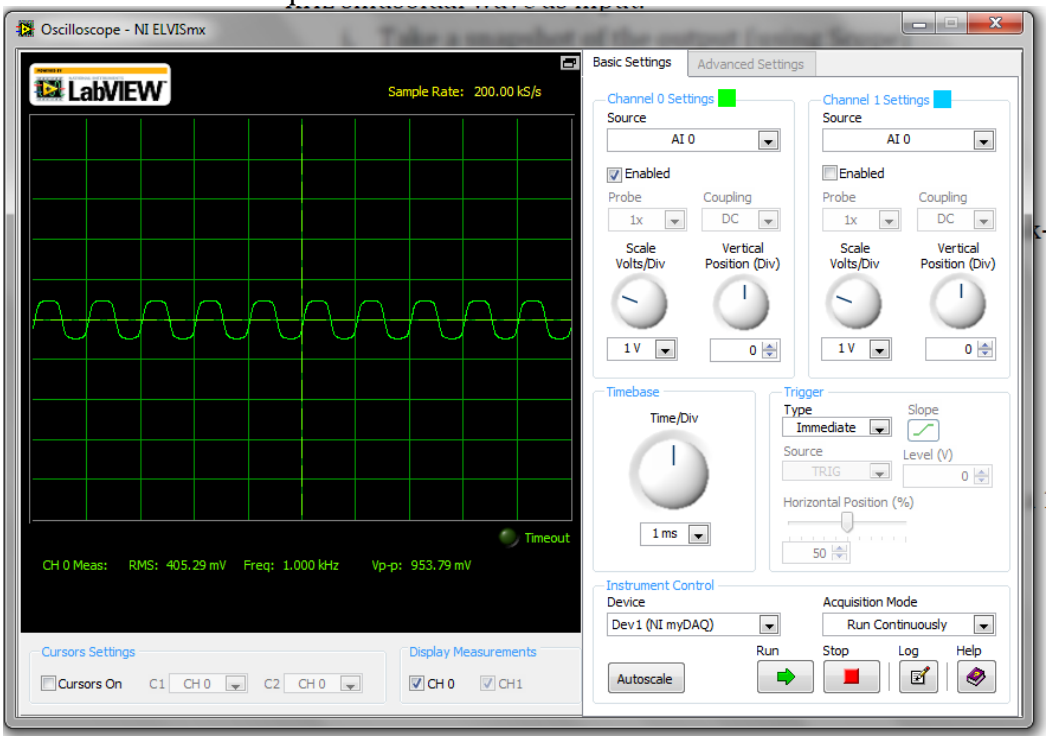


Vpk-pk = 2.192V

Vmax = 1.4V

Vmin = -0.792V

For two diode clipping circuit (Figure A-3), apply a 2 V peak-to-peak, 1 KHz sinusoidal wave as input.

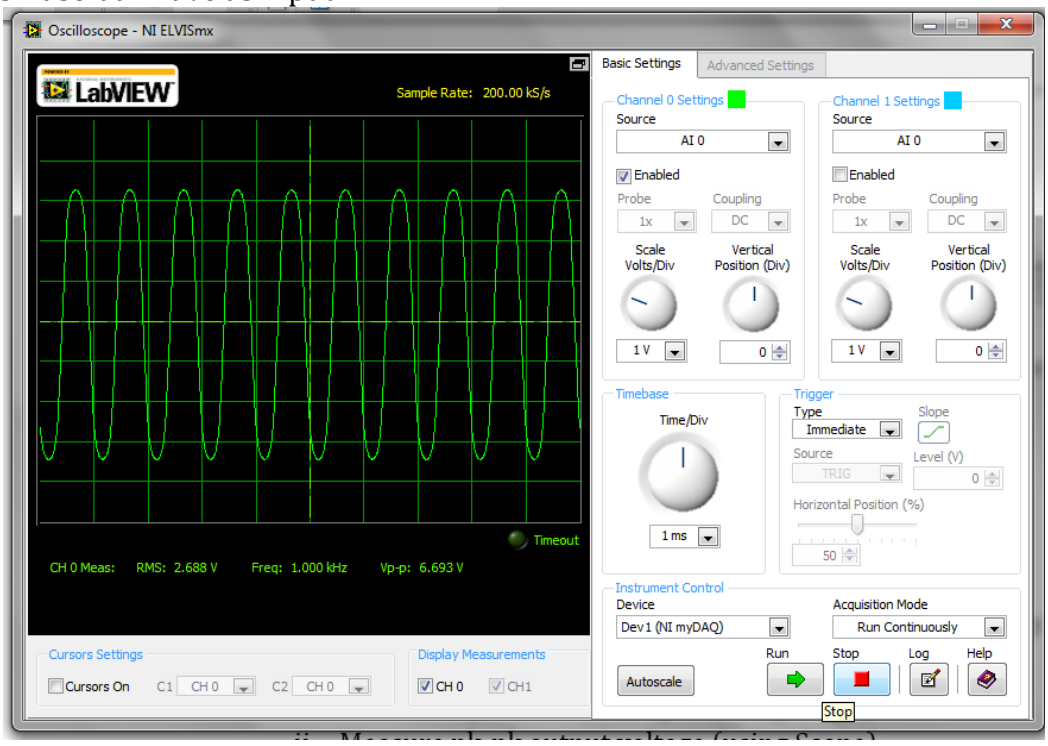


Vpk-pk = 953.8mV

Vmax = 476.9mV

Vmin = -476.9mV

For two Zener clipping circuit (Figure A-4), apply a 10 V peak-to-peak, 1 KHz sinusoidal wave as input.

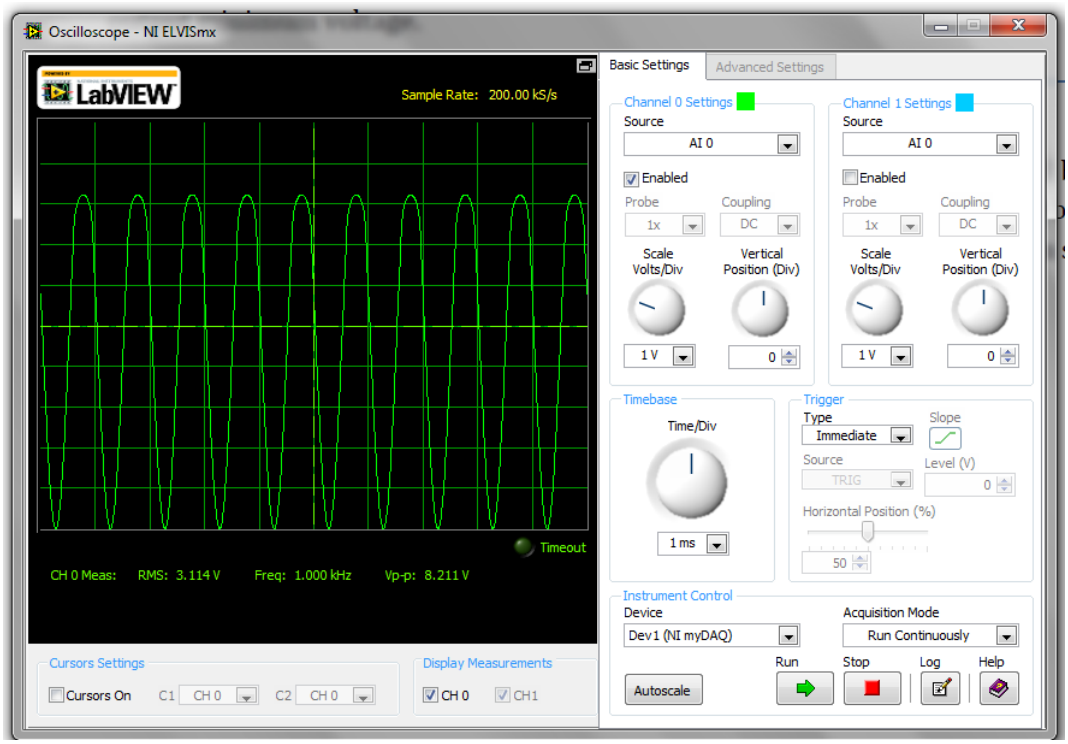


Vpk-pk = 6.693V

Vmax = 3.347V

Vmin = -3.347V

For diode clipping circuit with DC source (Figure A-5), apply a 10 V peak-to-peak, 1 KHz sinusoidal wave as input.



Vpk-pk = 8.211V

Vmax = 3.21V

Vmin = -5.0V