Theory of operation:

The theory of this lab was to get familiar with the lab equipment. In this particular lab, we used an oscilloscope, multimeter, DC power supply, resistors, banana head wires, as well as a coax measurement probe wire.

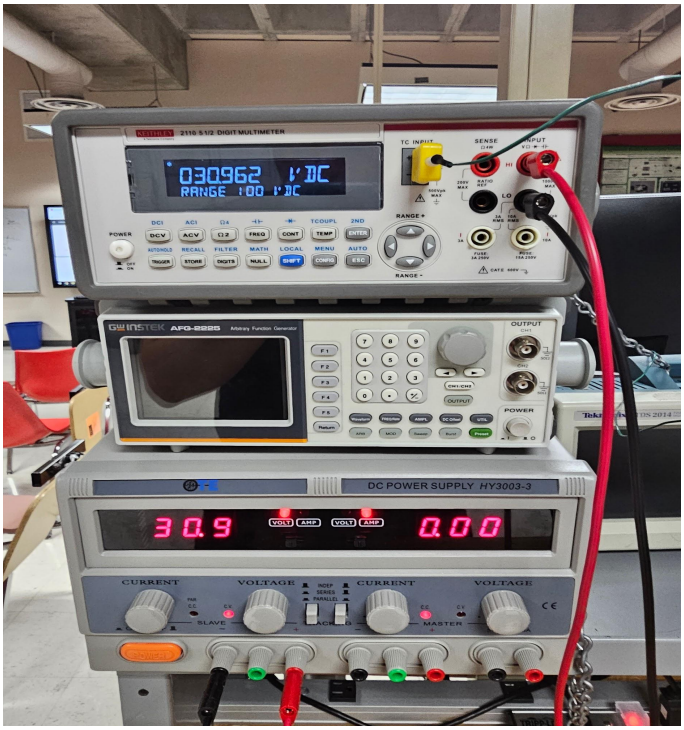
Experiment 1 - Measuring Resistance with Multimeter:

Declared Resistor Value: 750 Ω

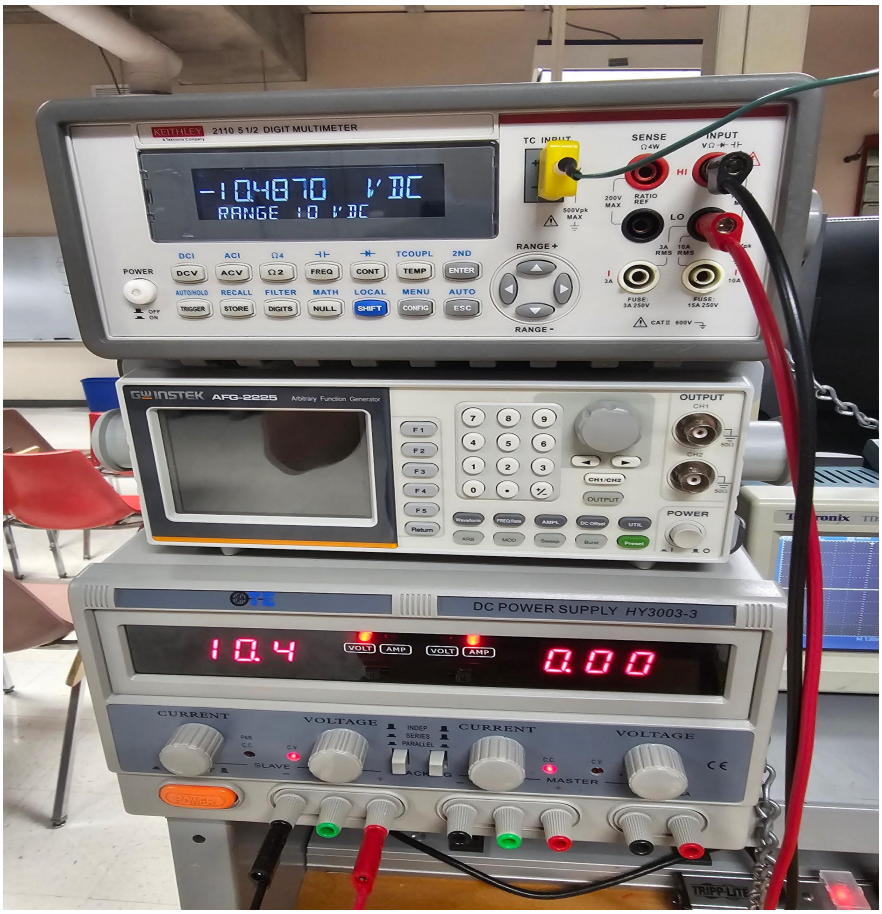
Experiment 2 - DC Power Supply with Multimeter:

0.5 V Reading:

Maximum Voltage Reading (~30.6 V):

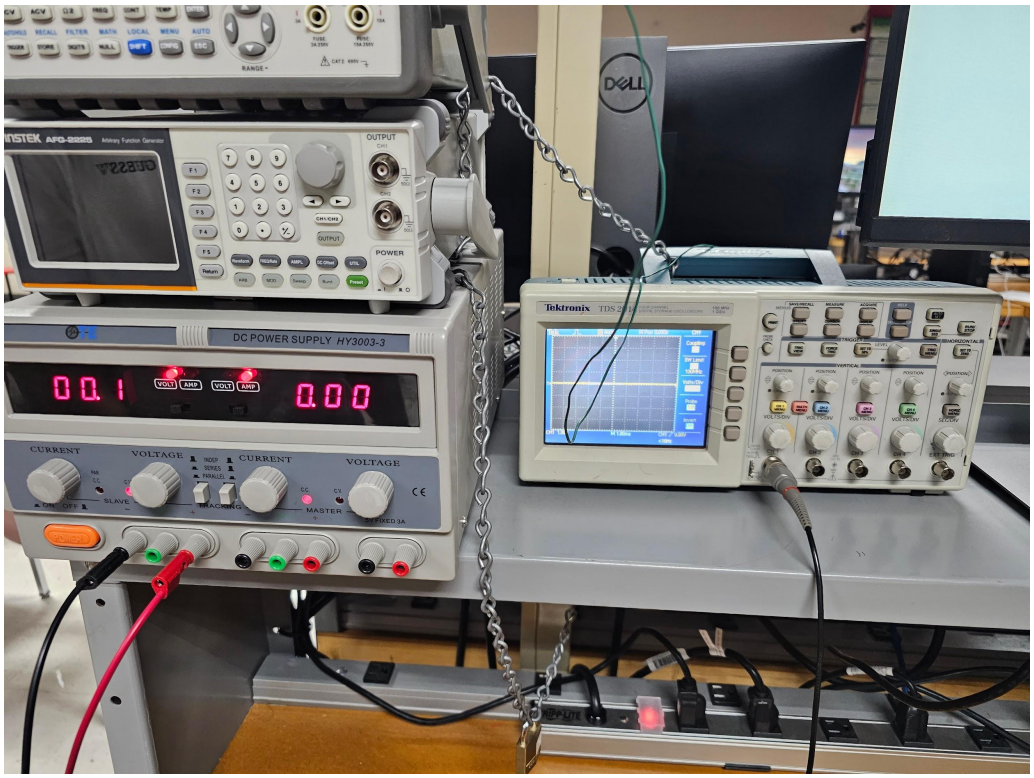


-10 V Reading:



Experiment 3 - DC Power Supply with Oscilloscope:

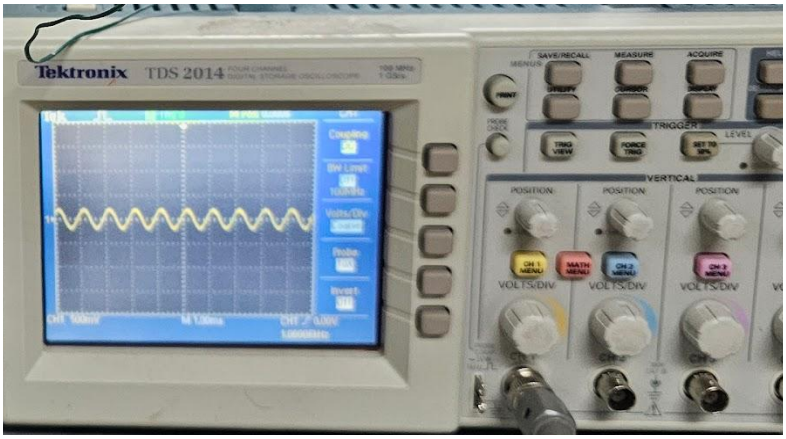
0 V Oscilloscope Reading:



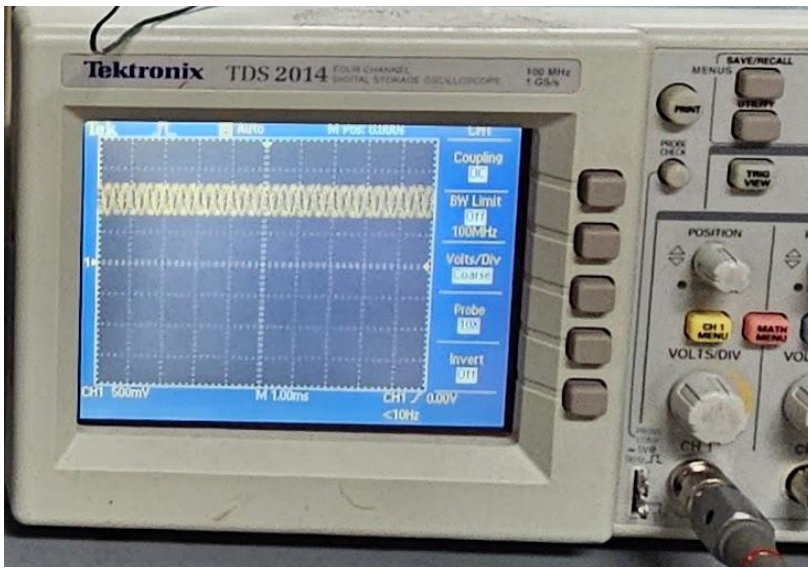
10 V Oscilloscope Reading:

Experiment 4 - Signal Generator with Oscilloscope:

1 kHz Frequency:



2 kHz Frequency:



Question 1: The trace resets back to the middle at zero volts because the DC component has been removed by switching to AC coupling.

Question 2:

- 200 MHz - Max measurable frequency of the coax cable.
- 10 Mohms/<12 pF - Impedance is 10 Megohms while capacitance is less than 12 picofarads.
- 10x - Factor of 10 attenuation for probe. Serves to multiply voltage measurement range using internal resistor.
- 300V CAT II - Safety rating used to indicate that the cable is for use in category II circuits with a maximum voltage of 300 volts.

Question 3: The waveforms are different in the two coupling modes because in DC coupling we see the entire signal, whereas we only see the AC component in AC coupling.

Conclusions: This lab helped introduce me to equipment that will prove useful later on in the semester and I'm sure I will become more familiar within that time. However, this having been my first time using much of this equipment, I learned a lot during the lab. Primarily, I learned how to use a DC power supply, oscilloscope, and function wave generator and how they all work together to be able to make accurate measurements. The only real problem that I encountered was with the waves not behaving properly during the final experiment. This turned out to be a result of faulty equipment so I switched the cables and then got the correct results I was looking for.