Report for Laboratory Two: Voltage Dividers

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ME/EE 316—Mechatronics & Measurements Laboratory

September 22, 2020

Abstract. Applying a 10V DC power supply to a voltage divider circuit with two resistors in series, the voltage across both resistors remains constant while the voltage across a single resistor changes depending on the resistance. Using a myRIO configured with the labVIEW software to change our input voltage and measure the voltage source and the resistor voltage. When connecting a arbitrary function generator to an oscilloscope, a variety of wave functions at 5Vpp had a period of 2.5ms.

1 Introduction

"Introduce what your question is. Explain why someone should find this interesting. Summarize what is currently known about the question. Introduce a little of what you found and how you found it. You should explain any ideas or techniques that are necessary for someone to understand your results section."

Typically, you will be asked to include in your report a theoretical prediction for comparison with your experimental results. Typically, this section is a good place for presenting that. You needn't always include every aspect of your derivation, but you should "sketch out" the process, hitting the "highlight" ideas an equations along the way. Typically there's no need to, say, plot the results here, since you'll be plotting them again alongside the data in the Results section (**??**).

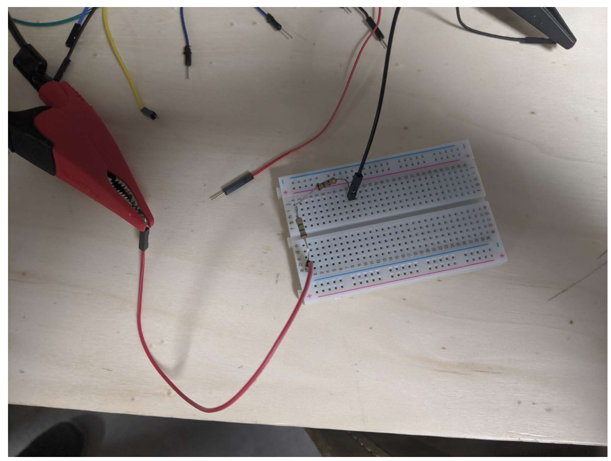

Figure 1: Voltage divider circuit

2 Materials and Methods

This lab has three parts. In the first part of the lab two resistors were placed in series on a bread board connected to a DC power supply set to 10V. Using a multimeter measure the voltage across each resistor and both resistors. Then replacing the second resistor and taking measurements again for all four different resistors.Figure 1

For part two of this lab a myRIO configured with the labVIEW software was be used as the power supply and measurement tool, on the same voltage divider circuit. The myRIO was connected to measure the voltage across both resistors and the voltage across the second resistor. Using labVIEW an analog output and input were made to recieve data from the myRIO, as well as a voltage vs time chart window. Starting at 0V and working up to 10V, in increments of 1V, the voltage source and the resistor voltage is displayed in labVIEW and recorded.Again replacing the second resistor with each of the different resistors and repeating measurements.Figure 2

In part three of this lab an arbitrary function generator was connected to an oscilloscope. While producing a sine wave with the function generator set to 5Vpp, then by adjusting the oscilloscope settings a stable wave was found and the peak to peak amplitude and period were estimated.Figure 3

3 Results

In the first section of the lab the results showed that as the total resistance changed for the circuit the total voltage across the circuit was not changing. The voltage across the second resistor changed when the resistance changed. Table 1

After connecting the myRIO to the circuit and proceeding through the different input voltages we found that again the voltage through the entire circuit was constant no matter the total resistance and the voltage through the resistor depended on the amount of resistance.Table 2

When observing the stable wave made by the function generator in the oscilloscope it was estimated that the peak-peak amplitude was a 5V with a period of 2.5ms. Even when changing the shape of the wave the period and amplitude stayed the same.

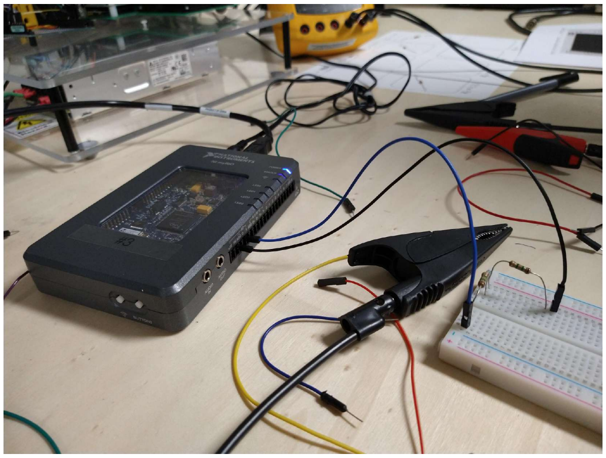

Figure 2: myRIO Ciruit

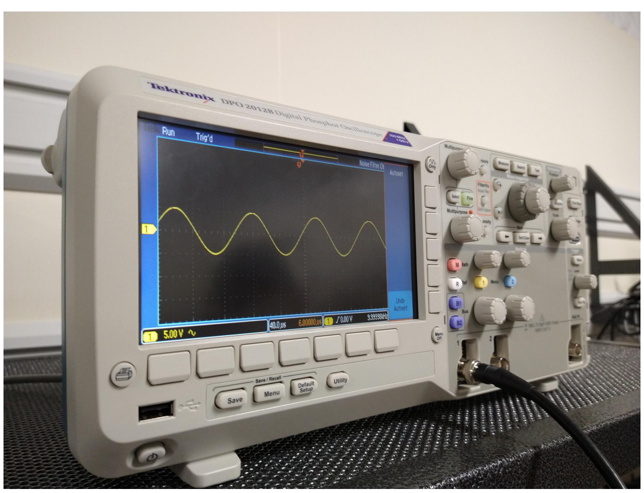

Figure 3: Oscilloscope

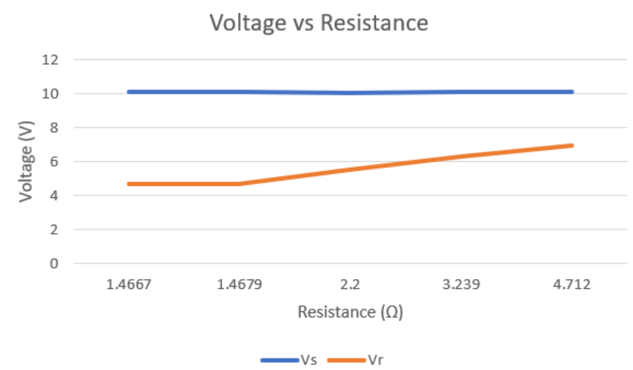

Figure 4

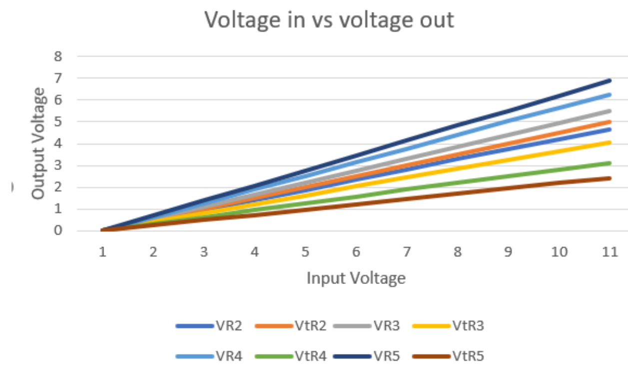

Figure 5: Vin vs Vout(Measured and Theoretical)

4 Equations

$$VR1 = Vs\left(\frac{R1}{R1+R2}\right), \tag{1}$$

5 Discussion

This lab demonstrated

6 Author Contributions

	R1	R2	R3	R4	R5
Ri(MΩ)	1.4667	1.4679	2.2	3.239	4.712
Vs(V)	10.093	10.093	10.091	10.093	10.097
Vr(V)	4.691	4.708	5.547	6.321	6.936

Table 1: Multimeter measurments.

	nom. Vs	**R2**	**R3**	**R4**	**R5**
Vs(V)	0	0.006	0.006	0.006	0.006
Vr(V)	0	0.002	0.003	0.003	0.004
Vs(V)	1	1.0101	1.010	1.010	1.010
Vr(V)	1	0.471	0.555	0.632	0.693
Vs(V)	2	2.015	2.015	2.015	2.015
Vr(V)	2	0.940	1.107	1.241	1.384
Vs(V)	3	3.013	3.013	3.013	3.013
Vr(V)	3	1.406	1.656	1.887	2.070
Vs(V)	4	4.018	4.018	4.018	4.018
Vr(V)	4	1.875	2.209	2.516	2.760
Vs(V)	5	5.023	5.023	5.023	5.023
Vr(V)	5	2.344	2.761	3.145	3.450
Vs(V)	6	6.027	6.027	6.027	6.027
Vr(V)	6	2.813	3.313	3.774	4.140
Vs(V)	7	7.032	7.032	7.032	7.032
Vr(V)	7	3.282	3.866	4.403	4.830
Vs(V)	8	8.030	8.030	8.030	8.030
Vr(V)	8	3.748	4.415	5.028	5.516
Vs(V)	9	9.035	9.035	9.035	9.035
Vr(V)	9	4.218	4.967	5.658	6.207
Vs(V)	10	10.011	10.011	10.011	10.011
Vr(V)	10	4.673	5.504	6.269	6.877

Table 2: myRIO w/ labVIEW read outs.