LabVIEW Module Writeup

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Abstract

Abstract content goes here

I. Purpose:

To build several circuits in which data could be extracted using virtual instruments created on LabVIEW. The data was then to be analyzed.

II. Procedure:

Firstly our objective was to build a circuit with a temp sensor (LM35) and resistor in contact, so that data acquisition would show a change in temperature, voltage, and time, and how they relate. The VI created produced a measure of 10mV/C^{o} directly from the sensor, which was then converted to the proper degree of Celsius, and then to Fahrenheit, based on the formula provided, $F = C\,(1.8) + 32$.

Secondly our objective was to build a circuit with a photodiode, and to use LabVIEW to measure the voltage output from changing luminosity of the area around the sensor. The VI was set to directly send data to a waveform graph, and simultaneously save data to a text file for the preferred number of 10,000 samples at a rate of 10kHz. Next a red LED was hooked up facing the photodiode, then an incandescent bulb.

III. Data: Figures 1-6

IV. Conclusion:

It was observed that the voltage versus time data from the LED produced a square wave on the waveform graph. The results from curve fitting the voltage drop interval from the incandescent bulb were attained by using Python. Optimal half-life parameters were acquired, and after evaluating the voltages at the time interval examined, the voltage of the bulb at half-life was 3.563 volts. Next, the time it took for half of the voltage to drop was calculated by inverting the half-life equation, but only after subtracting the initial time value of the interval being analyzed. The time it took for half of the voltage to drop came to 80 x 10-4 s.

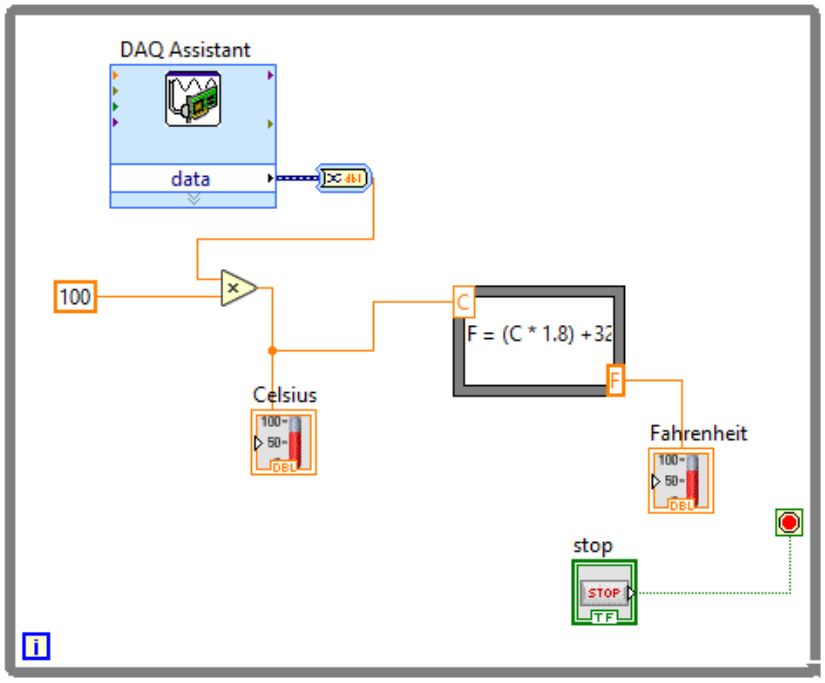

Figure 1: Temp Sensor Grid

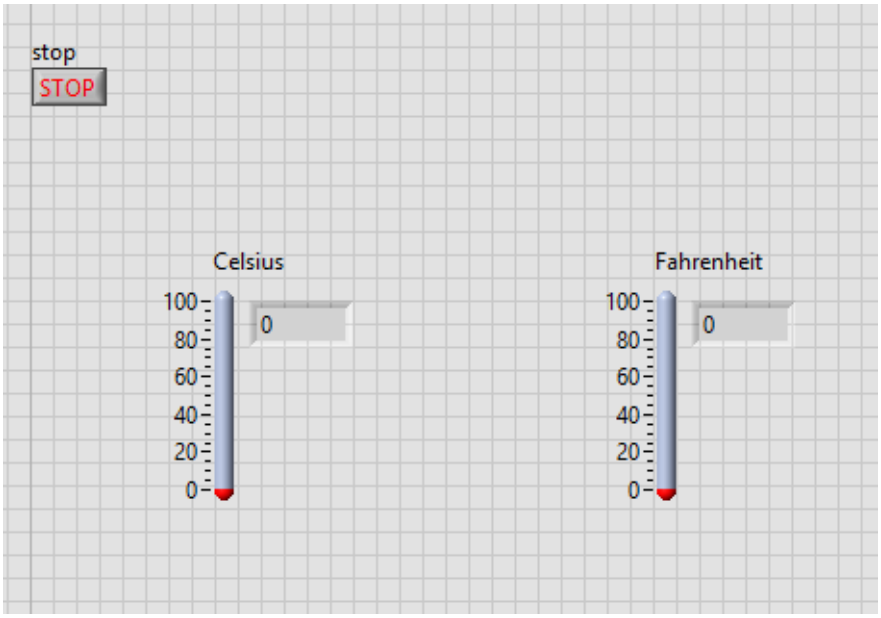

Figure 2: Temp Sensor Front Panel

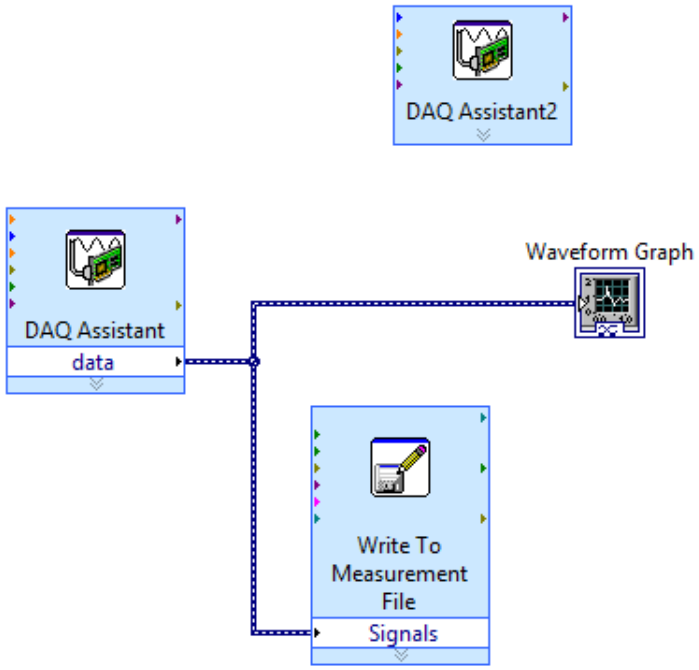

Figure 3: Photodiode Grid

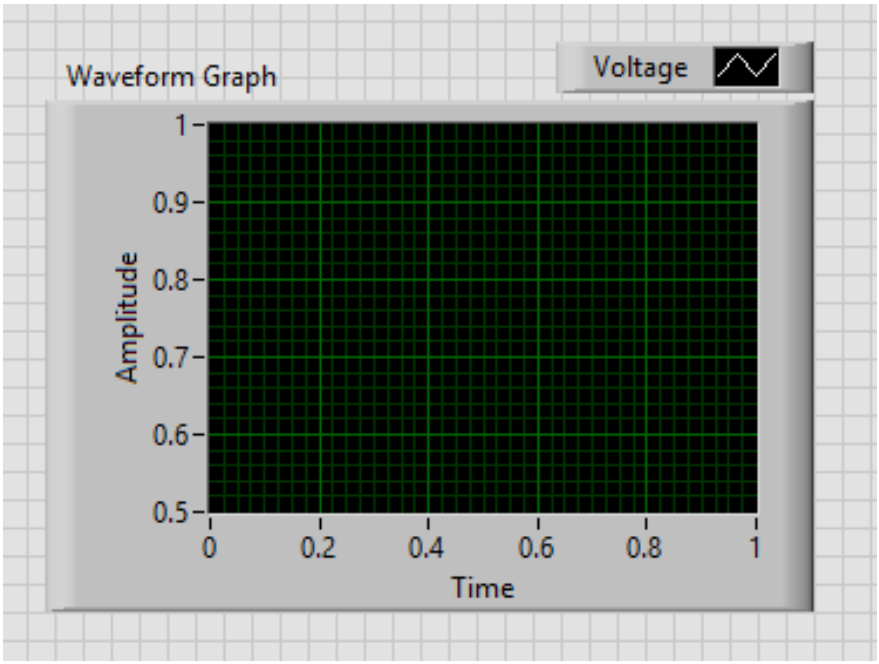

Figure 4: Photodiode Front Panel

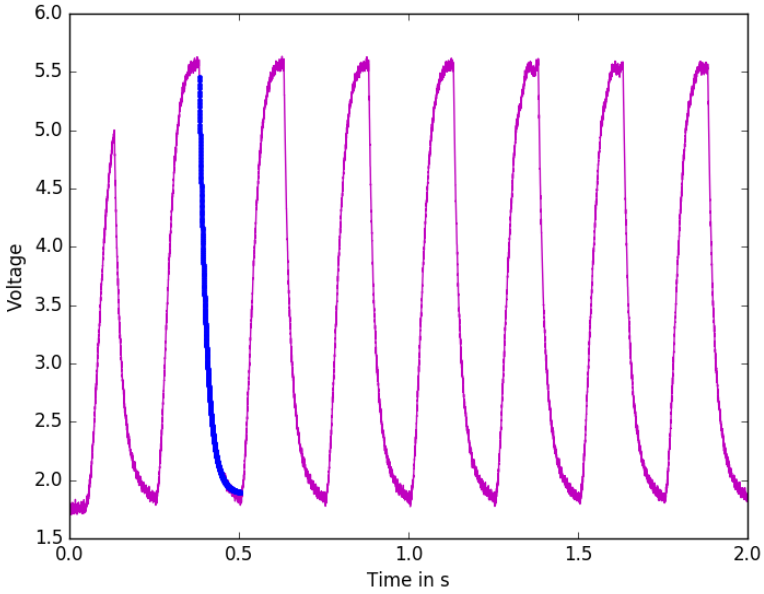

Figure 5: Curve Fit of Incandescent Bulb

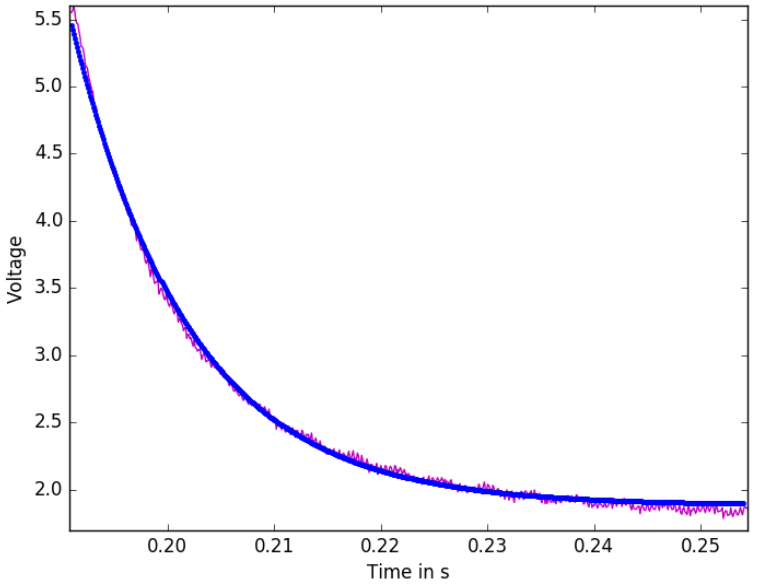

Figure 6: Curve Fit Zoom of Incandescent Bulb