

## Project Identity

Accessible Blood Glucose Monitor Interface

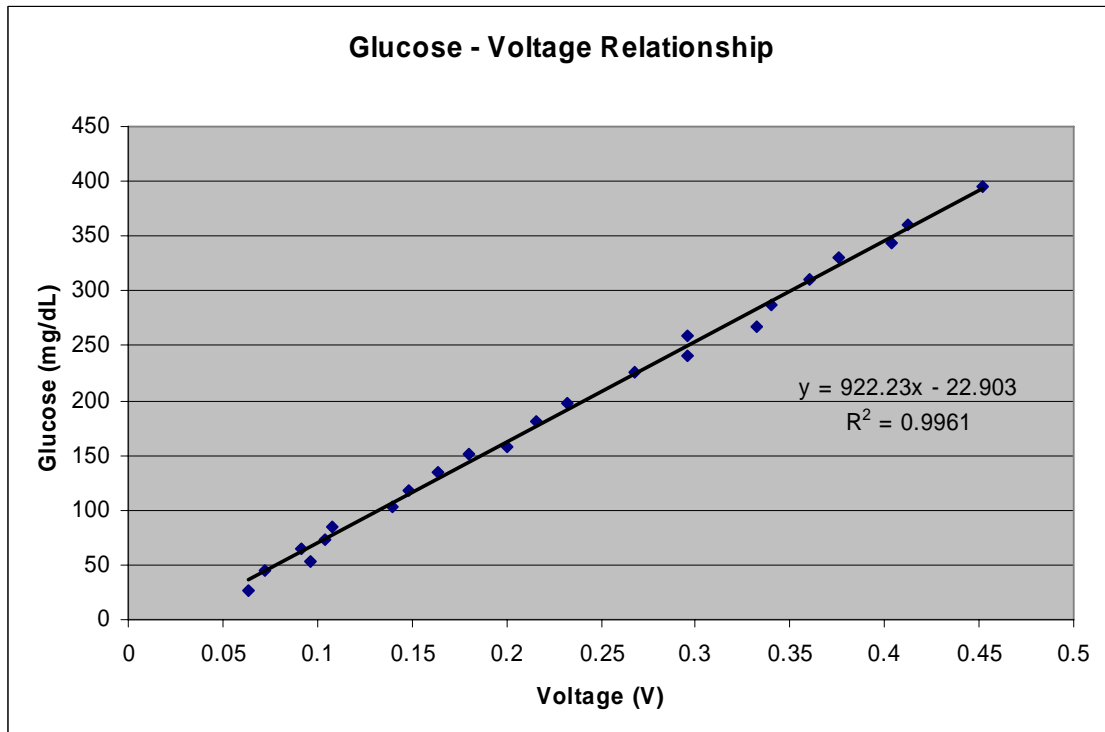
Week # 6 (February 20 – February 26, 2006)

Mike Rivera

## Work Completed

Week 6 was spent creating the overall curve for the glucose-voltage relationship. I did this by first diluting the High glucose solution down to a concentration of about 26 mg/dL. I then would gradually increase the level of glucose by adding back drops of the control. Once another drop was added, I would then test the sample with the working meter to get the new glucose concentration. Next, I would run the sample through our glucose circuit, and save the results for that concentration of glucose. In the end, it came to 26 trials and gave a range of data points from 26 to 395 mg/dL. Figure 1 shows the results of the trials after being analyzed in Excel.

Figure 1: Completed Voltage-Glucose Relationship



The equation to the linear trend line is shown as  $y = 922.23x - 22.903$ , with an  $R^2$  value of .9961. The  $R^2$  value is a measure of how perfectly linear the data points are, with a value of 1 being perfectly linear. This means that the data collect is very close to being exactly linear. The equation of the trend line is what will be used by the microprocessor to calculate the glucose concentration. 'X' is the voltage value at 2 seconds after blood application, 'Y' is then the corresponding concentration.

Another part of my design that I worked on was a circuit that will tell the microprocessor (MP) when to start the 2 second timer to take a measurement. Essentially, once the voltage curve of the blood sample exceeds a certain value, this sub-circuit needs to send 5 volts to the MP, letting it know to start timing. This process is done using a comparator circuit with specific resistors to set a reference voltage. I was not able to get this to work this past week, but I am hopeful that it will be done in the upcoming week.

### **Future Work**

In the upcoming week, I plan to finish the comparator circuit. Once this is complete, the glucose measurement part of the meter will be pretty much completed. With that done, I can begin work on the vial scanner. This part of the design has not been dealt with yet, so work needs to begin there.

### **Project Review**

So far, so good. Things are running smoothly and we seem to be making good progress. Coming soon we should be bringing all our parts of the project together and beginning to develop a working meter.

Hours Worked: 13