

sdmay19-47: NSF Lab furnace control system

Week 4 Report

September 27 - October 10

Team Members

Adam Matthews — *Software/Hardware Engineer, Report Manager*

Kevin Lang — *Electrical Engineer*

Jeremy Hartl — *Hardware Engineer*

Christopher Pohlen — *Software Engineer/Gitlab Moderator*

Nick Brylski — *Systems Engineer*

Summary of Progress this Report

We have also obtained the RS232 shield chips and screen from Dr. Tuttle, we then wired this chip with the help from the data sheet to hook it up to the arduino. We were unsuccessful getting this chip to work with the arduino, more testing is needed.

We also started investigating DACs to use to control the mass flow controllers via a microcontroller. One DAC we investigated allowed it to be set via i2c, a viable option where we would not need to use 12 pins for a 12 bit dac.

We tried to find information on the Mass-flow controller but couldn't find much online. There was manuals for sale on ebay, thats it.

We completed the first draft of our project plan. This involved us creating a timeline of our project. Creating the initial layout of our project plan helped us address important information. We addressed our goals, roles, intended users, project assumptions, objectives, testing plans and much more. Additionally, we participated in a Design Thinking Workshop. During the workshop we created a creative matrix. This helped us transition from our project plan to thinking more about the design requirements and flow of our project.

Additionally, we created a 5 minute lighting talk about our Progress Report and a Design Document. The lighting talk focused on our Gantt chart, which shows our tentative project schedule. Our Design Document

Pending Issues

The rs-232 IC was not working when we tried to send commands to the temperature controller via the arduino. This could be due to bad code or wiring.

We need to keep investigate more into using DAC's to control the MFCs.

Start developing python GUI for RPI.

Plans for Upcoming Reporting Period

Our first goal for this period is to program the Arduino to send commands to the OTC. Simultaneously, we want to watch and affect this interaction with an external device. Once we get a Softwareserial port open, we will use PuTTY to watch the programmed interaction between Arduino and OTC. We will program a set of higher level functions for the Arduino to run, such as setZoneTemp(zone, temp) to set the temperature in a particular zone,

then send commands over PuTTY to run those functions. This is the first step toward enabling a connection between a user interface and the OTC.

Our TA brought up the possibility of using an RPI. This needs to be investigated

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Adam Matthews	<ul style="list-style-type: none"> Started coding GUI Worked with team to create Design Document and Project Plan Investigated screen options 	3	19
Kevin Lang	<ul style="list-style-type: none"> Helped wire circuit for rs 232 Investigated DAC's for MFC 	4	15
Jeremy Hartl	<ul style="list-style-type: none"> investigated and wired max 3223 chip to allow the arduino to communicate with the Omega controller with rs-2323 Tested arduino communication with omega controller looked into display options, designs, and integration 	4	18
Christopher Pohlen	<ul style="list-style-type: none"> Started coding GUI Worked with team to create Design Document and Project Plan Investigated screen options 	4	15
Nick Brylski	<ul style="list-style-type: none"> wired max 3223 circuit for rs-232 comms debugged arduino - circuit prototype investigated use of raspberry pi integration into system for GUI 	4	19

Gitlab Activity Summary

Nothing to report.
