

sdmay19-47: NSF Lab furnace control system

Week 2 Report

September 5 - September 16

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 completed a sketch of a UI that includes all basic functionality, brainstormed what type of devices (touchscreen, keypads, etc.) to use, and mentioned using Python for the UI design. We successfully interfaced the computer running the Arduino IDE with the Arduino and the RS-232 shield, causing the TX led on the shield to light up. We studied the schematics for the shield and the datasheet for the Omega Temperature Controller (OTC). We researched thermostat designs to potentially find inspiration for our design.

We met with Dr. Tuttle to discuss the aforementioned progress. We asked about higher order functionality in the user interface design, such as ramping temperature change. We asked about access to further equipment, such as thermocouples (we found out we already have one), and we talked about the potential need for a more capable microcontroller that can run a display. He gave us an Arduino Due to test out, and said he will look for RS-232 board chips and a screen. We also asked for more information on how the OTC fits into the whole system. All we need to worry about is reading the temperature from the thermocouples and reading and setting the set point.

Pending Issues

USB and the RS-232 shield communicate with Arduino via the same serial port, which makes testing difficult. The *Arduino SoftwareSerial* library may work in combination with jumpers to allow commands to be sent from the computer through the arduino to the OTC.

Plans for Upcoming Reporting Period

We will successfully send commands to read and set temperature to the OTC, and we will further discuss UI hardware and design.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Adam Matthews	<ul style="list-style-type: none">• Drew UI that incorporates all the basic functions• Investigated RS-232 communication with Arduino• Studied Omega controller datasheet• Met with Dr. Tuttle to examine and discuss	7	12

	additions to UI and to discuss microcontrollers and or progress with the Omega Temp Controller <ul style="list-style-type: none"> ● Wrote Status Report 		
Kevin Lang	<ul style="list-style-type: none"> ● Researching how to communicate to the temp controller using an RS-232 ● Attempted to come up with a series of commands to read and set the temp 	3	8
Jeremy Hartl	<ul style="list-style-type: none"> ● Studied RS-232 communication and the serial communication between Arduino and the Omega Controller ● Researched using a microcontroller sans Arduino ● Met with Dr. Tuttle 	5	10
Christopher Pohlen	<ul style="list-style-type: none"> ● Continued research into the RS-232 communications ● Brainstormed ideas for the UI 	4	9
Nick Brylski	<ul style="list-style-type: none"> ● Investigated serial communication with arduino and RS-232 shield ● Figured out how to modify our websites html and upload new files ● Met with Dr. Tuttle to discuss thermocouples and hardware ● Did research into thermostat designs and displays 	6	11

Gitlab Activity Summary

Nothing to report.
