

EE/CprE/SE 491 WEEKLY REPORT 3

2/14/2022 – 2/20/2022

Group number: SDDEC22-01

Project title: Plastic Machine Embedded IOT Controller

Client &/Advisor: Mark Hansen & Dr. Jones

Team Members/Role:

Stone Widder - Technical Lead

Joshua Baringer - Microcontroller Lead

Rachel Teberg - Historian/Reporter

Evan Pasero - Project Manager

Charles Sang - Controls Lead

○ **Weekly Summary**

This week we focused on completing our block diagrams and software descriptions. We also set up our team's gitlab account so individuals can know what needs to be done and have a safe place to store their work. Evan and Rachel continue to work on the trade studies. Charles did more research into different thermocouples and began working on the circuits. Stone and Josh figured out how we are going to connect the display and how we are going to make the UI usable on both the built in display and any connected devices.

○ **Past week accomplishments**

- Thermocouple circuit design/Research - Charles, Evan, Rachel
- Software Description - Josh, and Stone
- Block Diagram - Charles, Evan, Rachel and Stone
 - Drew out a diagram of our hardware system with the interconnects on a whiteboard as a group
 - Transferred said drawing to a PDF version using Visio
- Trade Studies - Rachel and Evan
 - Started working on the trade off analysis that Mark asked for. Created Criteria and weights as well as started filling in potential options.
- Sprint Backlog for git - everybody
 - Went through all the major tasks for the project and put them on a board in git. This way we have an easy and comprehensive list to work off of when creating weekly tasks.

- ### ○ **Pending issues** *(If applicable: Were there any unexpected complications? Please elaborate.)*

Cold Reference Compensate: One of the important properties of the thermocouple is having a good reference junction. The challenge is between designing a cold

reference junction or using one of the many available temperature sensing IC's that have built in reference junction. Building one needs understanding of the seebeck voltage on our thermocouple and application of reference function coefficients in controlling the error measurement of the temperature sensor but challenging compared to using built in cold junction sensing IC's.

○ **Individual contributions**

| <u>NAME</u> | <u>Individual Contributions</u> <i>(Quick list of contributions. This should be short.)</i> | <u>Hours this week</u> | <u>HOURS cumulative</u> |
|--------------------|---|-------------------------------|--------------------------------|
| Stone Widder | Hardware block-digram | 6 | 20 |
| Rachel Teberg | Created and filled in Trade Study document, Assisted with creation/setup of gitlab | 6 | 18 |
| Joshua Baringer | Researched dataflow for microcontroller, researched UI implementation libraries | 6 | 18 |
| Evan Pasero | Project Management, worked on scoring different microcontrollers and LCDs in trade study, helped with controls research | 6 | 12 |
| Charles Sang | Controls research | 6 | 6 |

○ **Plans for the upcoming week**

Joshua: Design UI for display, help Stone set up server config. Update Software description as needed.

Stone: Start looking into programming a server that can take HTTP requests and send back data to our different systems. Look into AWS

Rachel: Finish the trade studies, assist with thermocouple circuit research/design/prototyping

Charles: Working on thermocouple choices while looking at cold junction reference IC chips vs designing one. Also, finished researching different thermocouple designs looking forward to presenting them in our weekly meeting.

Evan: Finish trade studies, begin mapping out high level board design with Charles and Rachel. Continue to work on project management.

- **Summary of weekly advisor meeting**

At this week's advisor meeting we discussed our list of pros and cons for microcontroller options. We also talked about our issues from last week. Specifically about finding out we were doing the trade study wrong. However, we were told that our market research would not go to waste as we will need it for our presentation. We discussed our basic ideas for the thermocouple circuit and some ideas for the interface programming.