

EE / CprE / SE 492 Weekly Report

February 06 - February 13, 2024

sddec25-08

Smart Home Control Unit for Energy Optimization

Faculty Advisor / Client: Md Maruf Ahamed

Team Members:

- Alexander Ryan
- Mitchell Jensen
- Arie Kraayenbrink
- Gamage Binula Karunaratne
- Erik Schmidt

Summary of Work:

During this work period, the team continued development and integration of the dimmer circuit and supporting control systems. Hardware testing and firmware programming were ongoing, with progress made toward stabilizing communication between the dimmer and zone controller. Software efforts focused on finalizing the custom UI infrastructure and ensuring connectivity with the Home Assistant (HA) server. Hardware team members refined the dimmer PCB design and conducted further functional testing to prepare for production prototype validation.

Work Period Accomplishments:

- Continued testing of the dimmer module under varying load conditions.
- Advanced firmware programming for the dimmer and zone controller.
- Designed and built an enclosure for the zone controller.
- Ordered additional components required for testing and integration.
- Finalized infrastructure setup for the custom UI and implemented a test application.
- Reestablished communication between the UI and Home Assistant server.
- Continued work on schematic design for the dimmer PCB.
- Finalized sensor design and discussed ordering of production prototypes.

Plans for Coming Week + Action Items:

- Alexander Ryan- Continue work on UI design
- Mitchell Jensen - continue work on testing the dimmer and begin design of pcb for the dimmer circuit
- Arie Kraayenbrink- continue working on programming the dimmer and zone controller
- Gamage Binula Karunaratne- continue testing the dimmer prototype.
- Erik Schmidt- Discuss with the team ordering, either the final sensor or at least the first production prototype.

Pending Issues:

- Alexander Ryan- No issues
- Mitchell Jensen- No Issues
- Arie Kraayenbrink- No issues
- Gamage Binula Karunaratne- No issues
- Erik Schmidt- No issues

Individual Contributions:

Team Member	Contribution	Weekly Hours	Total Hours
Mitchell Jensen	Continued work on testing dimmer module	4	10.5
Arie Kraayenbrink	Worked on programming the dimmer. Made a box for the zone controller. Ordered additional needed parts.	7	18
Binula Karunaratne	Worked on testing the dimmer prototype.	4	9.5
Erik Schmidt	Continued With Finalized Sensor Design	4	11.5

Alexander Ryan	Updated senior design server. Reestablished connection to HA server. Finalized infrastructure design for custom UI and set up infrastructure, implementing test application. Working on the final design for UI before implementing.	5.5	14.5
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