

EE / CprE / SE 492 Weekly Report

April 3 - April 10, 2025

sddec25-08

Smart Home Control Unit for Energy Optimization

Faculty Advisor / Client: Md Maruf Ahamed

Team Members:

- Seth Proctor - Designer
- Alexander Ryan - Software
- Jacob Carnesi - Project Manager
- Arie Kraayenbrink - Client Relations
- Gamage Binula Karunaratne - Hardware
- Erik Schmidt - Embedded Systems

Work Period Accomplishments:

- Installed Zigbee coordinator radio on hub.
- Performed preliminary battery testing.
- Successfully connected temperature sensor to Home Assistant.

Plans for Coming Week + Action Items:

- Seth Proctor- I plan to work more on finding a dimming solution. Also, work on the next part of the design document.
- Alexander Ryan- Create logic for automation within the home assistant implementation and potentially set up a framework for an automated testing suite
- Jacob Carnesi- Continue working with ETG to get TailScale access for our accounts. Finish configuring the VPN. Work on the design document as needed.
- Arie Kraayenbrink- Planning to continue working on the furnace controller to get it programmed and connected to the hub. Also will work with the team on getting a dimmer.
- Gamage Binula Karunaratne- Work on the light dimmer with the team. Finish up the design document.
- Erik Schmidt- Plan on improving the sensor code. Getting more sensors to be recognized by HA. If all goes well, I will start moving to deep sleep cycles and more battery testing.

Pending Issues:

- Seth Proctor- No issues

- Alexander Ryan- No issues
- Jacob Carnesi- No issues
- Arie Kraayenbrink- No issues
- Gamage Binula Karunaratne- No issues
- Erik Schmidt- No issues

Individual Contributions:

Team Member	Contribution	Weekly Hours	Total Hours
Jacob Carnesi	Worked on the design document. Researched VPN solutions to facilitate remote access to Home Assistant and settled on TailScale. Installed TailScale for Home Assistant and requested access for our ISU emails.	4.5	23
Seth Proctor	I found a viable dimmer, but after talking to the TA he wants us to make our own. Started researching how to make a homemade light dimmer.	4	30.5
Arie Kraayenbrink	Installed zigbee coordinator radio on hub. Worked on learning more about Zigbee and the ESP Zigbee SDK. Configured environment for working with ESP and Zigbee. Started working with the furnace controller. Got an initial example/test program working.	7	36
Binula Karunaratne	Worked on parts 4.4 and 4.5 of the Design section of the Design Document.	4	26.5
Erik Schmidt	Performed preliminary battery testing. Moved sensor from breadboard to protoboard, semi-finalizing the wiring for all the connections. Moved wireless protocol completely over to Zigbee. Successfully connected temperature sensor to Home Assistant. Modified PCB design to work with the new MCU and adjusted its layout.	6.5	33

Alexander Ryan	Created specific detailed design and functionality requirements. Started work with coding in Home assistant workflow.	3	27
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