

EE / CprE / SE 492 Weekly Report

March 13 - March 27, 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

Summary of Work:

Several of us were gone or catching up on schoolwork from being gone, so progress was limited. We completed part 3 of the design document, finalized and obtained sensor hardware, successfully connected the first sensor to the hub, and selected Zigbee as our communications protocol.

Work Period Accomplishments:

- Completed the design document part 3 project plan.
- Got a sensor prototype connected to Home Assistant.
- Determined we will use Zigbee for primary communication between components.

Plans for Coming Week + Action Items:

- Seth Proctor- Work on hardware tasks, play around with Home Assistant, and sensors that are hopefully delivered.
- Alexander Ryan- Finish up design for potential software infrastructure
- Jacob Carnesi- Continue work on the design doc and work on adding a VPN to the NUC.
- Arie Kraayenbrink- Begin working on software for furnace control and other hardware. Also plan to work with the team on bluetooth LE development for our hardware.
- Gamage Binula Karunaratne- Work hardware tasks and the sensors.
- Erik Schmidt- Started working with all the ordered sensor hardware from ETG. Started working on getting Zigbee2MQTT

Pending Issues:

- Seth Proctor- No issues
- Alexander Ryan- No issues
- Jacob Carnesi-None.
- Arie Kraayenbrink- No issues
- Gamage Binula Karunaratne- No issues
- Erik Schmidt- No issues

Individual Contributions:

Team Member	Contribution	Weekly Hours	Total Hours
Jacob Carnesi	Completed sections 3.3 and 3.4 of the design document and edited it. I was still catching up from my absence and did not get to do anything else.	3	18.5
Seth Proctor	Completed 3.1 and 3.2 of the design document 3 and accidentally completed 4.2 of the design document part 4. That is all I was able to complete due to military training.	2.5	23.5
Arie Kraayenbrink	Worked with Erik to finalize sensor hardware. Researched wireless protocol and selected BLE as best option. Ordered hardware for furnace control.	4	22
Binula Karunaratne	Worked on the third part of the design document, specifically parts 3.6 and 3.7.	3	20.5
Erik Schmidt	Worked with Arie to finalize hardware and researched wireless protocols. Made the first official sensor prototype. Connected it to HA with MQTT via wifi.	4	24.5
Alexander Ryan	Finished up design for potential software infrastructure, working on user workflows for design document and finished related diagram	3.5	21