

EE / CprE / SE 492 Weekly Report

September 6 - September 19

sddec24-16

Designing a Smart Plant Nurturing System Enabled by IoT Technology

Faculty Advisor / Client: Md Maruf Ahamed

### **Team Members:**

- Tejal Devshetwar - Frontend
- Holden Brown - Frontend/backend
- Blake Hardy - Backend
- Cameron Jones - Backend
- Cayden Kelley - Hardware
- Chase O'Connell - Hardware

### **Summary of Work:**

Our primary focus these past two weeks has been continuing to discover where we left off this past semester. We have continued working with the NPK and the Modbus to TTL converter to obtain data from the sensor. So far, we have been unable to read any data off of the NPK sensor, and we are continuing to troubleshoot whether the issue resides in the NPK sensor, the Modbus to TTL converter, or our approach of reading the data by the microcontroller. We have also started developing requirements for a PCB to be designed. We began compiling power requirements for each of our devices and are working to get onto Altium Designer to begin the actual PCB design.

### **Work Period Accomplishments:**

- Agreed upon an advisor meeting on Mondays at 4:30PM.
- Continued work on MODBUS functionality.
  - Researched potential alternative implementation: a MODBUS TTL hat for the Pi Pico W.
- Reviewed and organized component datasheets containing information on power consumption.
- Set goals for PCB design this semester.
  - Determine device power requirements.
  - Implement wall power first.
  - Then focus on battery capacity, charging circuits, etc. and ability to switch between wall power and battery power when necessary.
  - Use Altium Designer student license with KiCad as a backup option of the licensing does not work.

### **Plans for Coming Week + Action Items:**

- Holden Brown - Work with Tejal to decide the next steps we need to take with our app.
- Tejal Devshetwar - Work with Holden to plan what next steps are to establish websocket communication. Also based on the development of hardware aspects decide the next steps.
- Blake Hardy - Hopefully get modbus and current hardware to behave. Worst case we get to manually format the dataframes and hope the converter interprets everything correctly
- Cameron Jones - Work further with Blake retrieve a micro USB cable either from ETG or from home. Test first if electricity is flowing through the converter using an oscilloscope then move forward to either using in-built MODBUS resolving packages or doing byte level coding to deconstruct the data frames sent in.
- Cayden Kelley - Work with Chase to further define device power requirements and develop a preliminary PCB design. Test the Modbus to TTL Raspberry Pi hat to see if it will function properly instead of the current converters that we have been struggling with.
- Chase O'Connell - Work with Cayden to further define device power requirements for a preliminary PCB design. Specifically focus on potential battery options and battery life based on power requirements.

### **Pending Issues:**

- Tejal Devshetwar
  - No issues
- Holden Brown
  - No issues
- Blake Hardy
  - No issues
- Cameron Jones
  - The largest current issue is that we are missing a micro USB cable to power the pi pico. After that we are still unaware if the NPK sensor works properly or the MODBUS-TTL translator is working properly. What's more, to resolve these issues we need to be sure we have code that can interpret the data frames sent by the NPK sensor but to verify said code we need to be sure the sensors are working properly.
- Cayden Kelley
  - No issues
- Chase O'Connell
  - Having difficulties with setting up the Altium student license. I had previously received the license to be able to work in Altium on my laptop, but for whatever reason the license is expired or not accessible anymore. I will continue to try getting this license and may contact Altium for support.

**Individual Contributions:**

Team Member	Contribution	Weekly Hours	Total Hours
Tejal Devshetwar	No contributions this week.	0	27
Holden Brown	No contributions this week.	0	50.4
Blake Hardy	Attempt at getting modbus working, no real progress but hopefully soon.	2	30
Cameron Jones	Worked with Blake to research current MODBUS equipment and discussed future plans for how to implement MODBUS setup	2	29.6
Cayden Kelley	Reviewed existing power requirements for the device to prepare for PCB development. Discovered a pi hat for the MODBUS TTL converter and further researched the NPK sensors.	2.5	48.6
Chase O'Connell	Reviewed existing power requirements for the device to prepare for PCB development.	2	31.5