

EE/CPRE/SE 492 - sddec22-10

Low Water Crossing Indicator

Week 4 Report

Reporting date: 9/5/22 - 9/16/22

Client: Lee Harker

Faculty Advisor: Lee Harker

Team Members:

Dylan Blattner: Product Owner/Sensor Lead

Nithin Sebastian: Signage Lead

Brandon Choy: Wireless Communication Lead

Jacob Ross: Power Systems Lead

Tyler Rebischke: Solar Lead/Team Lead

Past Week Accomplishments:

Dylan: Testing of Ultrasonic sensor

- Wrote code for our Arduino to obtain distance readings from our ultrasonic sensor
- Added LCD display to Arduino to view measurements without being tethered to a computer
- Initial testing of sensor indoors with still water
 - High level of accuracy
- Testing of sensor outdoors on a running stream
 - Data obtained was consistent, but was hard to test accuracy
 - Need a way to mount the sensor to something solid to avoid any human error caused by holding the sensor

Nithin: Testing of the LED lights

- Wrote code to light up LED lights, but ran into multiple errors, so have been debugging those

- Figured out that I need to get some more parts in order to get the LED's working with the Arduino
- Created initial design for how the sign would look

Brandon: Testing of the LoRa Module

- Wrote an Arduino code on both the transmitting side and the receiving side for initial testing of the component
- Designed a circuit to test if the LoRa module can transmit data and will light up an LED on the receiving side
- Tested the system at various distances to ensure a functioning system

Jacob:

- Reviewed power system requirements for each component
- Made sure our current storage levels will reach the preferred levels

Tyler:

- Rechecked our power system calculations to ensure that our design changes will not cause too much strain on our power system
- Started exploring waterproof housings to hold our components that can withstand harsh weather conditions
- Explored other ways to display water levels on the roadside sign and researched their power consumption levels
- Reexamined our prior battery technology research to ensure that we were making the right decision on batteries for the project

Pending Issues:

Individual Contributions:

Team Member	Contribution	Weekly Hours	Total Hours
Dylan	Worked on setting up ultrasonic sensor and a testing environment.	6	6

Nithin	Worked on trying to set up LEDs	3	3
Brandon	Worked on the testing of the LoRa module and overall structure of our whole system in relations to the other parts.	5	5
Jacob	Reviewed power system values	1	1
Tyler	Did research about the various modules in our project and double checked our calculations for the power system before ordering the parts	7	7

Plans for Upcoming Week:

Dylan: Continue testing Ultrasonic sensor

- Create a mount for the ultrasonic sensor to obtain more accurate readings
- Take electrical measurements to find the power draw while running, and while idle
- Research ways to conserve power on the Arduino

Nithin: Gather remaining parts for LED's and get lights working

- Get the LED's working
- Work with Brandon to get LoRa transmitters integrated with arduino so that led's can be displayed based on transmitted values

Tyler:

- Work with Nithin to finish our display design and do power requirement calculations
- Order the solar panels and batteries needed for the project
- Continue research on waterproof housings for the electronic components of our system

Brandon:

- Organize how to implement the ultrasonic sensor with the LoRa module
- Continue testing at different distance to figure out the max and limitations

- Continue on adding features to the LoRa module

Jacob:

- Work with Brandon to finish setting up wireless communication system setup and implementation
- Continued research into power systems values and connectivity of components