

Endeavour InvenTeam Invention

Progress & Plans #6

Current Status:

Our test-bed is coming together, although we are currently working on the EEPROM storage and LCD screen so that we can display something other than a weird language. Also we are currently working on completing our power supply and we are beginning to build our first enclosure prototype.

Past Month:

Accomplishments:

During the past month we have been working on getting our test bed ready for the press conference and mainly to have something that we could show to Josh Schuler (you) from MIT. Some of our main criteria for the test bed would be the temperature probe setup (AD592), power supply, enclosure, serial communications, IR Buddies, Nokia M2M Modules, and last getting the LCD screen to display something. Last in our month was our Krispy Kreme Doughnut Fundraiser.

By using the AD592 (the temperature probe setup) on the test-bed we were able to calibrate the temperature probe and made it also work with the other components of the test-bed. Then with the power and enclosure we built a power supply to power the three micro-controllers with a single lead-acid battery. The enclosure for the test-bed was a mounting board with everything neatly laid out on the board for an easier access. We also initially built the board on a piece of wood but we switched it over to a piece of aluminum because it was smaller and matched our test-bed better. Then upon deciding on aluminum we laid out all the micro-controllers, cellular phone (Nokia M2M Module), power supply, battery and the LCD on the board and mounted them with screws. For the actual enclosure, we are still deciding on having it shaped like a donut with a dome. With the stamps we have established serial communication and with this we are able to work with the components of the test bed such as the data logger, serial transmitter, and the LCD screen. Then with the IR Buddies and Nokia M2M Module (cellular phone) we received, we are starting to install and start on them. Like with the IR Buddies, we are working on making them communicate with one another while with the cellular phone we are still working on getting a suitable plan for it.

Another aspect of our month was the Krispy Kreme Doughnut Sales to raise money for the end of the year trip to MIT. Upon ending our pre-sales for the Doughnuts, we began to organize groups to be stationed in local stores such as Wal-Mart and Albertsons to further gain our sales. Then on the morning of sales most of the class began selling at the school's parking lot in front of our activity center. Over all we have met our goal for ending sales. Also, this month we received many donations from individuals and businesses from our community. Two of our team members gave a very

brief presentation to Rotary Club of Paso Robles and within minutes we raised close to a thousand dollars from club members. The Telegram Tribune, which is the local newspaper, ran a story about our team. This greatly helped us to gain recognition around our community and helped us to receive several donations.

Challenges:

Our main challenge for this month was getting our test-bed ready and functional. The low quality temperature probe still needs to be calibrated often although it is only a practice probe, so we will not worry on putting it on the final product. To calibrate it we use an ice bath so that we know the exact temperature. To calculate it we used an Rctime measurement. Then with the LCD we haven't been able to display our data on the screen in a way that is readable to us. All we have been able to do is display unintentional shapes, objects, and geometric shapes. Then with the EEPROM we are still unable to store data, retrieve that data by command and then be able to delete the information stored. With the Nokia M2M wireless communication we are still working on making that function. Whether we choose IR or cellular communication, we need to figure it out. Last remaining and on going problem is the power and enclosure. We still don't have the exact specifications on the size and power although to over come this we are still just making rough estimates and we will later remake our power supply and enclosure to meet our needs.

Next Month:

Next Steps:

In the next month we have big plans, like for the power we are going to integrate solar panels into our power supply and make a switch so that it will recharge the battery and switch over to battery power when there is not enough sunlight. We will therefore make a power-budget to list all of our items that will use power and how much they need, so that we can keep track of how much power will be needed. Then with the sensors we will be integrating our sensor with the other components and to be able to display the temperature measurement on the LCD. With the next month we will also continue on working out the bugs for the LCD screen and we also need to figure out how to store in the EEPROM and be capable of retrieving data on command. We will be working with the timer and counter with sending the data to EEPROM so it will work on command so that it won't be just a constant flow of numbers. Then for our ongoing wireless communication, we are planning on installing a wireless communication.

Team Functioning:

The AWQUARiuS team is becoming more functional. People are finally seeing how big this project is and are working more productively than when we first started. Like how we are mostly spread out from having someone research and working on EEPROM and the LCD screen problem, to having someone work on the power supply and enclosure. So everyone is communicating well and working together to complete our goal to finish.

Needs and Questions:

Some of our needs and questions would be about how to get the LCD to display something other than a weird language and to also decide whether we are going to stick with IR or proceed on to the cellular phone. Then another upcoming question is how big our enclosure needs to be and how much power needs to be supplied to our invention. Another need and question that is coming up is deciding what last supplies we need to order so that it can be put into the next budget request.

Problem Statement:

AWQUARiuS, Autonomous Water Quality Reporting System, will be a system that allows researchers / scientists to set-up personalized, flexible water monitoring studies in freshwater lakes and streams. The sensors will assess acidity, salinity, temperature, flow rate, and conductivity within 1% accuracy. Scientists will be able to monitor and retrieve data from a web interface that updates every hour, with measurements recorded at every minute. The module will weigh 10 pounds, be able to run on battery power for 15 hours with a solar back-up, free-floating or anchored and cost less than \$500.00.