**IoT Connected valves for irrigation of greenhouse**

**Project Name:** Development of a low cost, wireless system for remotely controlling the valves for automating irrigation in greenhouses.
**Suggested By:** Ajit/Vishwanathan
**Mentor Name:** Vishwanathan/ Ajit
**Problem Statement:** To develop system for connecting and controlling valves required for greenhouse automation to the Internet which can be remotely controlled. It should have features to set start time of watering, time for which it should to water, time interval for which it should repeat watering, automatic/ manual mode control etc. First prototype may be powered by rechargeable battery and later the device may be made solar powered.

**Task List:**

| Task No. | Task | Duration |
|---|---|---|
| 1 | Literature survey on solenoid valves, latching solenoid valves, availability in India, cost, size. | 2 days |
| 2 | Literature survey on batteries and power requirement of the system and calculation of power ratings. | 3 days |
| 3 | Design and testing of circuit for controlling the solenoid valves | 5 days |
| 4 | Getting familiar with CC3200 and Interfacing the valves to CC3200, testing and calculating power requirement. | 5 days |
| 5 | Literature survey on M2M communication protocol. | 2 days |
| 6 | Communicating with CC3200 remotely. | 3 days |
| 7 | Development of User interface to control the valves. | 5 days |
| 8 | Adding features to the User Interface. | 3 days |
| 9 | Interfacing solar panel to use it along with rechargible batteries. | 2 days |

**Prerequisite:** Embedded C Or Arduino/Energia programming, Electronic circuit design, PCB design, Designing 3D models using CAD tools, Java for UI.

**Hardware Required:** MOSFET BUZ12, CC3200, latching solenoid valve, small tullu water pump.

**Deliverables:**

1. Demonstration of control of valves remotely.
2. Demonstration of features as mentioned in problem statement.
3. Detailed report on power consumption of the system.
4. Detailed report of the design process with documented code.

**Acceptance Criteria:**

1. Fully functional and working prototype of the system which can remotely control the solenoidal valves.
2. Demonstration of atleast three features mentioned in the problem statement.

**Software Required:** CCS/Energia, Linux(recommended) OR Windows.

**References:**


http://melnor.com/watering-tools/aquatimer-products

https://www.edyn.com/#

http://www.giplindia.com/latching-solenoid-valve.htm

http://energia.nu/pin-maps/guide_cc3200launchpad/

http://www.element14.com/community/servlet/JiveServlet/showImage/38-16954-208960/cc3200+motor+drive.png