Progress Presentation-I

e-Yantra Summer Internship-2015

IoT Connected valves for irrigation of greenhouse

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Overview of Project

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- Project name : IoT Connected valves for irrigation of greenhouse
- Objective : Development of a IOT based low-cost, low-power, standalone module for the automation of Irrigation in a greenhouse.
- Deliverables :
  - Demonstration of control of valves remotely
  - Detailed report on power consumption of the system
  - Detailed report of the design process with documented code

Overview of Task

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sl.no	Task	date of completion
1	Finding appropriate WIFI module and communication protocol	June 2nd
2	Testing Solenoid,H-bridge and ESP8266 control circuit	June 3rd
3	Setting up and running openHAB server	June 6th
4	Controlling valves through MQTT broker	June 12th
5	Designing openHAB UI for controlling valves	June 13th
6	Look into sleep modes and last will testament Of ESP8266	
7	Adding features to the openHAB UI	
8	New device discovery and data persistence	
9	To display the battery status of the connected device	
10	Making a compact and portable design	

Accomplished Tasks I

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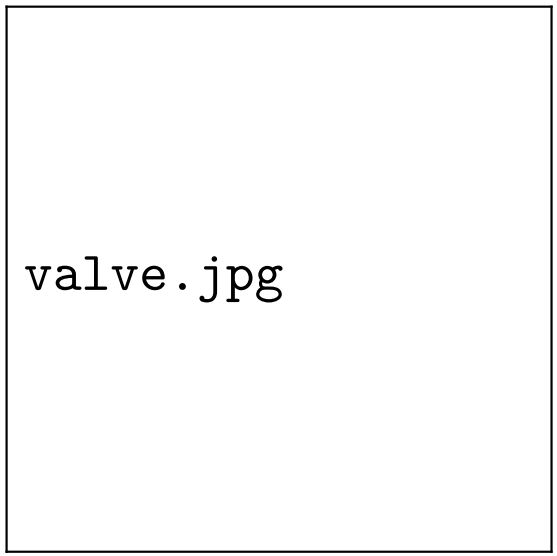
- Survey on Latching solenoid valves and WIFI modules



- Design and testing of circuit for controlling the valve

Accomplished Tasks II

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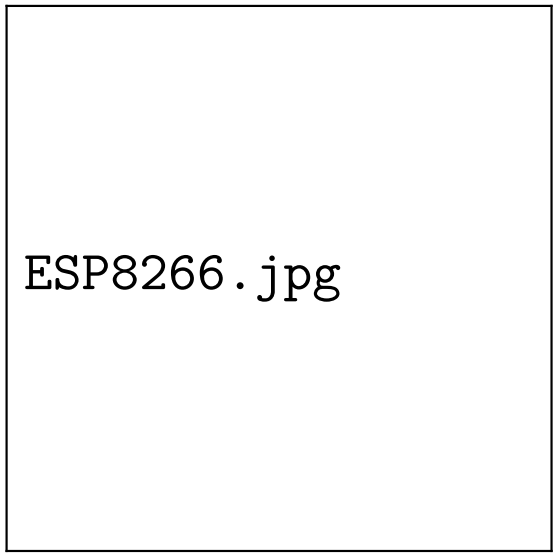

- Survey on M2M communication protocol
- Remotely controlling the valves through ESP8266
- Setting up openHAB and MQTT broker
- User interface to control the valves

Accomplished Tasks III

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openhab.jpg

openhab2.jpg

app1.jpg

app2.jpg

Accomplished Tasks IV

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openHAB UI for android/IOS

Pending Tasks

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- Optimum power consumption design for the setup
- Expanding UI features to timimg based operation and new device discovery
- Looking into 'last will and testament' function of the ESP8266
- Displaying battery status
- Making a compact,portable,plug&play design for the setup

Challenges Faced

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- Getting used to a fairly recent module ESP8266
- Deciding between nodeMCU and Arduino IDE
- Memory management in the ESP8266
- Power management in IOT applications
- Understanding openHAB,data persistence and bindings
- Installation of MOSCA broker on linux system

Current cost and future Plans

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Items	**Est.cost in Rupees**
ESP8266	400
Rechargible Alkaline battery	150
H-bridge	100
Latching Solenoid valve	430
Total cost	1080

Future plans

- Integrating Solar power with the module
- Including a water flow meter sensor
- Including soil moisture sensors and control valves accordingly

Thank You

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Thank you !!!