Weekly Progress Report

Project Name: Energy Management System (EMS)
Date: September 20, 2015
Collaborators:

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Project URL: TBD

Updated Milestone Chart:

Updates from previous revisions are italicized for clarity.

Task Description	Original Scheduled Completion Date	Responsible Team Member	Modified Completion Date	Comments
Critical Component Breakout Boards	8/24/2015	RM, DM	9/28/2015	Critical component breakout boards have been completed for all functions except PLC.
User Interface Implementation	8/24/2015	JL, AC	9/28/2015	Rest of system does not heavily depend on webapp so completion delay is not a large factor.
Web App Database Communication	8/24/2015	AC, JL	9/13/2015	The web application is able to communicate with the database using Hibernate (An Object-Relational Mapping library for Java)
Order Parts	8/24/2015	All	9/20/2015	*Cypress has provided a new PLC evaluation kit which functions correctly.*

Task Description	Original Scheduled Completion Date	Responsible Team Member	Modified Completion Date	Comments
Initial PCB Design	8/31/2015	DM	9/6/2015	Focusing efforts on vero-boarding initial hardware design instead of PCB design. Breadboard has been constructed. PCB may still be constructed if time permits, but based on summer slippage time for spinning PCB my not be available. Completion of breadboard has met the intent of this task.
Obtain and Verify Parts	9/7/2015	All	9/20/2015	All parts except PLC have been received and verified. *Completion date has been pushed back as received evaluation PLC boards are not functioning properly.*
Verification of Power Supply Circuitry	9/14/2015	DM	9/14/2015	Power Supply circuitry has been verified.
Verification of Breadboard Load Switch	9/14/2015	DM	9/14/2015	Load Switch is operational, and a load is able to be switched ON and OFF via an external voltage (provided from FPGA).
Verification of Breadboard Current Sense	9/21/2015	DM		On schedule
Verification of Breadboard Voltage Sense	9/21/2015	DM		On schedule
Outlet Communication with PLC	9/28/2015	RM		Evaluation boards have been acquired.
Interface PLC with Pi	9/28/2015	RM, JL		Team has decided to acquire PLC evaluation boards.

Task Description	Original Scheduled Completion Date	Responsible Team Member	Modified Completion Date	Comments
Verification of Breadboard Processor	10/5/2015	All		On schedule
Final PCB Design	10/19/2015	All		
Finalized Database Structure	10/19/2015	AC, JL	9/28/2015	This will be a result of the webapp completion.
PI PLC API	10/26/2015	RM, AC, JL		Deciding best approach still a subject of team meetings.
System recognizes new outlets automatically	11/2/2015	All		
Send Hardware Measurement over PLC	11/9/2015	RM, JL, DM		
Receive and store measured data	11/9/2015	AC, JL, RM		
View measured data	11/9/2015	JL, AC		
Toggle state of single outlet from web interface	11/16/2015	All		
Toggle state of a group of outlets	11/16/2015	All		
Outlets and groups follow schedule	11/16/2015	All		

Task Description	Original Scheduled Completion Date	Responsible Team Member	Modified Completion Date	Comments
Data Compression Verification	11/16/2015	AC		
Full system test passed	11/25/2015	All		

Current Milestones:

Task Description	Original Scheduled Completion Date	Responsible Team Member	Modified Completion Date	Comments
User Interface Implementation	8/24/2015	JL, AC	9/28/2015	Rest of system does not heavily depend on webapp so completion delay is not a large factor.
Verification of Breadboard Current Sense	9/21/2015	DM		On schedule
Verification of Breadboard Voltage Sense	9/21/2015	DM		On schedule

Next Milestones:

Task Description	Original Scheduled Completion Date	Responsible Team Member	Modified Completion Date	Comments
Outlet Communication with PLC	9/28/2015	RM		Evaluation boards have been acquired.
Interface PLC with Pi	9/28/2015	RM, JL		Team has decided to acquire PLC evaluation boards.
Verification of Breadboard Processor	10/5/2015	All		On schedule
Final PCB Design	10/19/2015	All		
Finalized Database Structure	10/19/2015	AC, JL	9/28/2015	This will be a result of the webapp completion.
PI PLC API	10/26/2015	RM, AC, JL		Deciding best approach still a subject of team meetings.

Status

Difficulties:

Team is attempting to learn how to use PSoC Designer, in order to achieve functionality. Currently concerned that available resources may not be adequate for the analog inputs which are needed, as PLT block takes up a very large portion of the chip. Team has reached out to Cypress application engineer with specific questions regarding PLC PSoC evaluation board.

Surprises

After notifying Cypress of evaluation board which was not functioning correctly, a new replacement board was quickly provided. The amount of resources which PLC block takes up, leaves little room for developing custom applications which was a problem that was not original envisioned by the group.

Successes:

PLC evaluation boards have been configured to send a multi-byte analog signal from one unit to the other.

Remote outlet module hardware is proceeding as planned in the schedule with no issues so far.

Vaadin (the Java framework we are using) has provided us with a free license to their charts library. We plan to use this library for all of the graphing we have to do inside the web app. The charts library is very easy to use and makes professional looking, interactive charts. The home tab and the graphing tab have been mocked up using Vaadin and the functionality of these screens is underway.

Questions/problems for consideration:

We have decided not to make an overall PCB but to develop a working hardware prototype on vero-board which can be used to demonstrate the functionality of the system, and if time/budget permits then complete a PCB design.

Specific questions/problems have been determined regarding the PLC evaluation board. These questions have been sent to a Cypress application engineer familiar with the PLC evaluation board design, and the team is waiting a response.

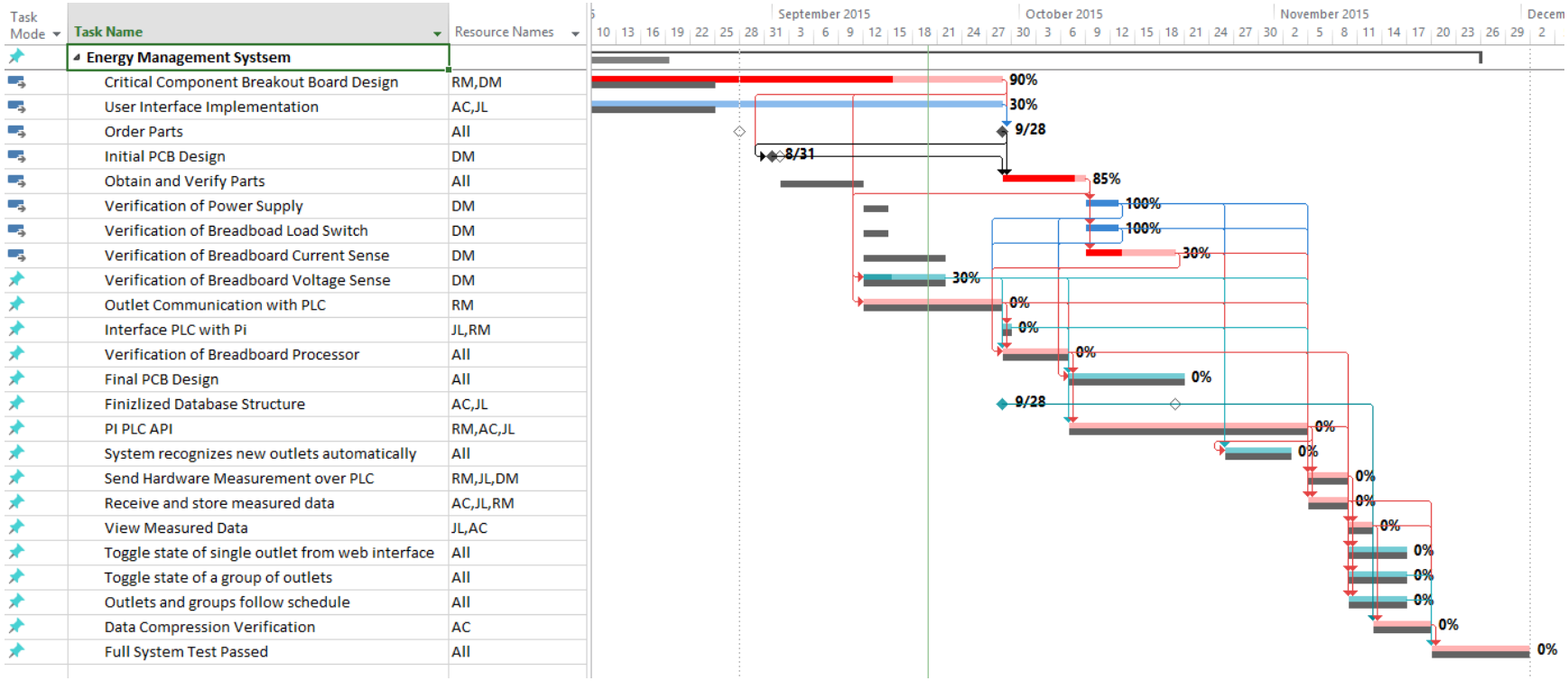
Determine if the Raspberry Pi (main module), will be able to process I2C messages via interrupts or if polling will have to be used.

Team is considering moving proposal document from a word document to a LaTeX document to avoid Figure number issues etc.

We are making a design change within the web application. We are switching from using the Python based Django framework to the Java based Vaadin framework. This is being done because the team is more familiar with Java and the Vaadin framework and also because Java is a more powerful platform for development. This means we will need a way for the Java

app to talk to native Python scripts running on the Raspberry Pi (possibly Jython) and that the web application will use significantly more system memory. Some additional tests will be run in the near future to ensure the memory usage is not too high.

Gantt Chart:



Task Mode	Task Name	Resource Names
	Energy Management Systsem	
	Critical Component Breakout Board Design	RM,DM
	User Interface Implementation	AC,JL
	Order Parts	All
	Initial PCB Design	DM
	Obtain and Verify Parts	All
	Verification of Power Supply	DM
	Verification of Breadboad Load Switch	DM
	Verification of Breadboard Current Sense	DM
	Verification of Breadboard Voltage Sense	DM
	Outlet Communication with PLC	RM
	Interface PLC with Pi	JL,RM
	Verification of Breadboard Processor	All
	Final PCB Design	All
	Finizlized Database Structure	AC,JL
	PI PLC API	RM,AC,JL
	System recognizes new outlets automatically	All
	Send Hardware Measurement over PLC	RM,JL,DM
	Receive and store measured data	AC,JL,RM
	View Measured Data	JL,AC
	Toggle state of single outlet from web interface	All
	Toggle state of a group of outlets	All
	Outlets and groups follow schedule	All
	Data Compression Verification	AC
	Full System Test Passed	All