

Weekly Progress Report

Project Name: Energy Management System (EMS)

Date: August 30, 2015

Collaborators:

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Project URL: None

Updated Milestone Chart:

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	9/28/2015	Rest of system does not heavily depend on webapp so completion delay is not a large factor.
Order Parts	8/24/2015	All	9/28/2015	All parts ordered and received except for PLC parts, best PLC approach still being decided.
Initial PCB Design	8/31/2015	DM	N/A	Focusing efforts on vero-boarding initial hardware design instead of PCB design. Breadboard has been constructed.

Task Description	Original Scheduled Completion Date	Responsible Team Member	Modified Completion Date	Comments
Obtain and Verify Parts	9/7/2015	All	N/A	All parts except PLC have been received and verified.
Verification of Power Supply Circuitry	9/14/2015	DM	N/A	On schedule
Verification of Breadboard Load Switch	9/14/2015	DM	N/A	On schedule
Verification of Breadboard Current Sense	9/21/2015	DM	N/A	On schedule
Verification of Breadboard Voltage Sense	9/21/2015	DM	N/A	On schedule
Outlet Communication with PLC	9/28/2015	RM	N/A	Deciding best approach still a subject of team meetings.
Interface PLC with Pi	9/28/2015	RM, JL	N/A	Deciding best approach still a subject of team meetings.
Verification of Breadboard Processor	10/5/2015	All	N/A	On schedule
Final PCB Design	10/19/2015	All	N/A	
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	N/A	Deciding best approach still a subject of team meetings.

Task Description	Original Scheduled Completion Date	Responsible Team Member	Modified Completion Date	Comments
System recognizes new outlets automatically	11/2/2015	All	N/A	
Send Hardware Measurement over PLC	11/9/2015	RM, JL, DM	N/A	
Receive and store measured data	11/9/2015	AC, JL, RM	N/A	
View measured data	11/9/2015	JL, AC	N/A	
Toggle state of single outlet from web interface	11/16/2015	All	N/A	
Toggle state of a group of outlets	11/16/2015	All	N/A	
Outlets and groups follow schedule	11/16/2015	All	N/A	
Data Compression Verification	11/16/2015	AC	N/A	
Full system test passed	11/25/2015	All	N/A	

Current Milestones:

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Next Milestones:

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	Make decision regarding PLC approach.
User Interface Implementation	8/24/2015	JL, AC	9/28/2015	Begin development

Web App Database Communication	8/24/2015	AC, JL	9/28/2015	Begin development
Order Parts	8/24/2015	All	9/28/2015	Order PLC parts after approach is selected

The current milestones were not all completed due to actual summer progress not meeting expectations. Therefore some current milestones have become the next milestones.

Status

Difficulties:

We were not as productive over the break as we wanted. Given that, we may be crunched for time, and will have to reallocate time or modify the requirements.

We are having difficulty deciding what approach to take regarding the PLC project design. Currently the two options are as follows:

1. Design a custom PCB to implement PLC functionality.
2. Buy PLC evaluation boards and interface these boards into system.

A custom PCB design is seen as very high risk as the PLC board is deemed non-trivial with extensive functionality. Also the amount of time needed to develop and verify the PCB will cut into the amount of time needed to complete other critical tasks required to complete this project. On the other hand the cost of evaluation boards are expensive and multiple evaluation boards would be needed to verify system functionality.

Surprises

Cost of evaluation PLC boards. An attempt will be made to request a free sample.

Successes:

Parts have been obtained and vero-board construction of remote outlet prototype circuits has begun.

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.

We are not sure on our choice yet, but it sounds more feasible to buy a development kit for our target PLC chip, which has many of the systems we need for communication already implemented, including transforming power, and coupling with the power line. This would eliminate the need for us to create PCBs for the PLC chip, which would save us time and work, but comes at great expense (233 dollars apiece), which would limit the number of units we can feasibly afford. This solution is seen to mitigate risk as it frees up team members to work on other project critical tasks and guarantees the PLC design will work as the evaluation board provides a proven design implementation.

Gantt Chart:

