**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. |
| 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. |
| 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-boarding 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:**

