**Weekly Progress Report**

**Project Name**: Energy Management System (EMS)

**Date**: September 13, 2015

**Collaborators:**

Andrew Cope, Computer Engineering major, [ajc4630@rit.edu](mailto:ajc4630@rit.edu)

Jacob Lauzon, Computer Engineering major, [jfl4577@rit.edu](mailto:jfl4577@rit.edu)

Donald MacIntyre, Computer Engineering major, [djm4912@rit.edu](mailto:djm4912@rit.edu)

Ryan McLaughlin, Computer Engineering major, [rpm6651@rit.edu](mailto:rpm6651@rit.edu)

**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 | 9/28/2015 | *Two PLC evaluation boards have been acquired. Unfortunately one of the evaluation boards does not work. Team is working with Becker-Gomez in order to determine next best course of action.* |
| 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 |  | On schedule |
| Verification of Breadboard Load Switch | 9/14/2015 | DM |  | On schedule |
| 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. One of acquired PLC evaluation boards is not functioning correctly.* |
| 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. |
| 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 |  |  |
| Data Compression Verification | 11/16/2015 | AC |  |  |
| Full system test passed | 11/25/2015 | All |  |  |

**Current Milestones:**

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**Next Milestones:**

| **Task Description** | **Original Scheduled Completion Date** | **Responsible Team Member** | **Modified Completion Date** | **Comments** |
| --- | --- | --- | --- | --- |
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| 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. |
| Order Parts | 8/24/2015 | All | 9/28/2015 | *Two PLC evaluation boards have been acquired. Unfortunately one of the evaluation boards does not work. Team is working with Becker-Gomez in order to determine next best course of action.* |
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| Verification of Breadboard Load Switch | 9/14/2015 | DM |  | On schedule |

**Status**

**Difficulties:**

Have obtained a PLC evaluation board but one of the two obtained PLC boards will not power on. Basic debugging has occurred as follows:

1. Perform a continuity test (with no power applied) to verify that the AC line in power is making it onto the board. Continuity test results indicate that there are no loose connections despite loose connector.
2. Perform a continuity test (with no power applied) to verify that the fuse, (F1) located on the evaluation board is not blown. Continuity test results indicate that the fuse is functioning properly.

Team has reached out to Dr. Becker-Gomez regarding best course of action going forward regarding possibly receiving a replacement board or getting current board repaired.

**Surprises**

PLC board request was accepted and processed very quickly. A larger surprise however, was one of the acquired PLC evaluation boards did not work.

**Successes:**

Parts have been obtained and vero-boarding construction of remote outlet prototype circuits is almost complete (except for PLC).

Serious progress has been made on the web app. The Hibernate and Spring configuration is complete and working, meaning that the web app can talk with the database. The User Interface implementation 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, and if time/budget permits then complete a PCB design.

Based on group meetings and discussions it has been determined that attempting to obtain a PLC evaluation kit is the best approach.

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:**

