**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.* |
| 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. |
| 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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| --- | --- | --- | --- | --- |
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| Verification of Breadboard Current Sense | 9/21/2015 | DM |  | On schedule |
| Verification of Breadboard Voltage Sense | 9/21/2015 | DM |  | On schedule |

**Next Milestones:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
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| Finalized Database Structure | 10/19/2015 | AC, JL | 9/28/2015 | This will be a result of the webapp completion. |
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**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:**

