

Group Number: May1725

Project Title: Wireless Energy Measurement System

Advisor: Nathan Neihart

Team Members/Role:

- 1) Joseph Freeland (Co-Lead)
- 2) Milan Patel (Co-Lead)
- 3) Adam Cha (Communications Lead)
- 4) Adam Dau (Webmaster)
- 5) James Tran (Key Concept Holder)
- 6) Wei LinLin (Key Concept Holder)

o **Weekly Summary**

This week we have worked on finalizing the network connectivity and reliability of maintaining a constant connection. We also worked on getting the hardware circuit to match up with the ADC reference voltage so that the microcontroller and amplifiers will have perfect unison between the two so that you can utilize the most of the range of the reference voltage of the microcontroller to increase accuracy. We also worked on getting a database started for the microcontroller to send data from the hardware circuit to over a network.

o **Past week accomplishments (please describe as what was done, by whom, when)**

- Adam Cha - Filled out the weekly report. Also worked on the design document. Looked into database work with Joey and LinLin on what needs to be completed to get that set up to be connected to our microcontroller. We need the database setup soon so we can start testing sending data from the microcontroller to it.
- Adam Dau - Wrote two section in the design document. Researched further on connectivity of the cc3200 board to wifi. Also researched into antenna extensions for the cc3200 board.

- Joseph Freeland - Researched database and wrote section 4 in the design document. Helped solder some components, ordered breakout boards, started UDP server design
- Wei LinLin - Start the database using MySQL
- Milan Patel - Redeveloped methods of current measurement. Looking into PCB design and simulation of analog measurement. Building power supply schematics. Processed technical specifications. Updated design document with updated measurement specifications.
- James Tran - Evaluated capacitive power supply circuit. Researched dual power supply using linear regulator and switch-based power mode.

o **Pending issues (if applicable)**

- Adam Cha - Database needs to be set up and we are still unsure at this point on how the data will be transferred from the microcontroller to the database.
- Adam Dau - Need to figure out how we will connect the the ISU wifi.
- Joseph Freeland - None
- Wei LinLin - None.
- Milan Patel - Power supplies for current way of measurement are not uniform.
- James Tran - Check to see if providing power to the system without using transformer is feasible.

o **Individual contributions**

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| <u>NAME</u> | <u>Individual Contributions</u> | <u>Hours this week</u> | <u>Hours cumulative</u> |
|--------------------|--|-----------------------------------|------------------------------------|
| Adam Cha | Filled out the weekly report. Also worked on the design document (filled out sections 1-3, and software sections for 4.1, 4.2, and references). Looked into database work with Joey and LinLin on what needs to be completed to get that set up to be connected to our microcontroller. We need the database setup soon so we can start testing sending data from the microcontroller to it. | 7 | 30 |

| | | | |
|-------------|--|----|----|
| Adam Dau | Wrote two sections in the design document. Also further researched the cc3200 board. | 3 | 19 |
| Joseph F. | Helped solder some components, ordered breakout boards, started UDP server design. Researched database and wrote section 4 in the design document. | 3 | 21 |
| Wei LinLin | Start the database using MySQL | 3 | 15 |
| Milan Patel | Rewrote & Added Sections of the design document. Ordered components for simulation. Analyzed technical specifications. | 10 | 39 |
| James Tran | Researched about dual power supplies, linear regulator, switched-based power supply. Completed hardware process and result section for design document | 8 | 37 |

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!!! ONLY EDIT BLUE COLUMN !!!

o Comments and extended discussion

There are still a good amount of work that needs to be completed by the software team. As of right now, our microcontroller can connect to the wifi which is a big milestone completed. However, we need a database set up such that we can designate a database URL link for the microcontroller to send the input data to the database URL. From there we can start working on getting data transferred to the microcontroller from the hardware circuit and using an Analog to Digital converter to send the analog input as a digital signal to the database.

o Plan for coming week (please describe as what, who, when)

Adam Cha

| Task | Date | Expected outcome |
|--|----------|---|
| Help Joey and LinLin in setting up database. | 11/10/16 | Have database set up for microcontroller to connect to. |
| | | |

Adam Dau

| Task | Date | Expected outcome |
|---------------------------------------|----------|---|
| Figure out how to connect to ISU wifi | 11/10/16 | Be able to connect to ISU wifi for demo |
| | | |

Joseph Freeland

| Task | Date | Expected outcome |
|-----------------------------|------|----------------------|
| Create database with LinLin | 11/7 | Have database setup. |
| | | |

Wei LinLin

| Task | Date | Expected outcome |
|--|------|--------------------------|
| Completing the database and look into the central hub work | 11/7 | Have a working database. |
| | | |

Milan Patel

| Task | Date | Expected outcome |
|--|----------|--|
| Reselect measurement components to have uniform power supply | 11/11/16 | Able to develop power supply for entire IC |
| Develop PCB | 11/11/16 | Start real-world simulation. |

James Tran

| Task | Date | Expected outcome |
|--|----------|--|
| Define the threshold gains for auto-ranging output | 11/11/16 | Auto-ranging feature will work according to the digital inputs |

| | | |
|--|----------|--------------------------|
| Assembly the current and voltage circuit | 11/11/16 | Be able to compute power |
|--|----------|--------------------------|

o **Summary of weekly advisor meeting**

Tasks (Due 1-2 Weeks):

1. Get hardware circuit to match up with ADC reference voltage.
Answer: Milan and James
2. Create database for microcontroller to connect to
Answer: Joey and LinLin (Adam's can help as well)

Things To Keep In Mind:

- For connectivity of the microcontroller, we might want to check the power of the microcontroller for connecting to the network.
 - Start with using router to see the power of the connected devices to see if the controller is low on power which is causing connectivity issues.
- Try unsecuring the network to see if it makes things easier to connect to the network.
- May be connecting to an occupied channel from the code.
- 3.14 needs to be 3.14f for floating point reasons.
- Change the reference voltages on the microcontroller and the amplifiers to be able to have the perfect unison between the two so you can utilize the most of the range of the reference voltage to increase accuracy.
- Have common ground.
- Keep system's power dissipation in measurements.