EE / CprE / SE 491 - sdmay18-13
Determining voltage and Wire Continuity
Report 2

1/26 - 2/09
Client: Grace Engineering
Faculty Advisor: Nathan Neihart

Team Members:

Mohamed Almansoori - Report Manager
Aaron Eaton - Chief Engineer
Matt Kelly - Meeting Scribe
Sam Kline - Meeting Facilitator
Chris Williams - Test Engineer

Accomplishments

- MSP432P401R Work - Sam
    - Read datasheet and supporting documents for MSP432, we decided it would be better than the arduino because of its variable clock speed and less ambiguity when reading data
    - Installed Energia IDE, configured it to upload code to our specific board, moved code from Arduino IDE to Energia, looked at multitasking examples provided by Energia
    - Changed code to begin calculating amplitudes and phase differences for 3 phases, previous code only calculated amplitude and voltage for 1 phase
    - Read dds synthesizer datasheet provided by wire continuity team, met with wire continuity team and identified next steps to be taken regarding wire continuity software
    - Installed code composer IDE since it appears to have better debugging tools than Energia, which could be useful later. I ran into some problems, so sticking with Energia for now
- Voltage Calculation Work - Chris
    - Calculations are shown to work using a balanced three phase system as an example
    - If we can calculate the phase difference between our measurements, we will only need to take 3
- Difference Amplifier Work - Chris
    - Difference amplifier works as expected when simulated
    - OPA4317ID Amplifier appears to meet our requirements

- Directional coupler analysis - Aaron
    - Calculated the expected output power from the coupler for a system normal case, and a broken wire case to analyse the viability of the coupler.
    - Wrote a program that can take in any value for the directional coupler and for the load impedance and calculate the expected outputs.

Pending Issues

- Make sure that input current won't be an issue with the op amp

Individual Contributions

Team Member	Contribution	Hours Worked	Total Hours
Mohamed Almansoori	Setting up a schedule meeting to make everything correct and up to date. I have been working on the signal generator of the wire continuity circuit, I read through the data sheet, as it summarizes the performance and other technical characteristics of it. This will help in the practical aspect of this project when we setting up our circuit.	7	7
Aaron Eaton	Calcuated values for directional coupler to verify viability of coupler.	5	5
Matt Kelly			
Sam Kline	MSP432 - Voltage measurement code and wire continuity plan	7	11
Chris Williams	Did calculations for voltage derivation with 3 measurements in a three phase system. Simulated difference amplifier circuit	10	16

Plans for Coming Week

- Difference Amp - Chris and Matt
    - Independently check that difference amp will work
    - Check voltage calculations with non balanced system
- MSP432 - Sam
    - Determine what variables need to be modified to what values in order to change clock speed, ideal speed is 16 MHz for wire continuity. Report to wire continuity team with a working example showing what frequencies are possible.
    - Determine if power can be measured as input for wire continuity, otherwise measure voltage
    - Determine how much power can be provided by the board to a signal generator
    - Help wire continuity team find a new signal generator that is compatible with the MSP432
    - Complete setup of Code Composer and migrate code from Energia
    - Update voltage measurement code if design or understanding changes
- Coupler - Aaron
    - Find the best coupler for our project
    - Find out what the optimal frequency for that coupler is
    - Find a way to produce a signal of that frequency and a way to read a signal of that frequency if the MSP432 can not.