

IOWA STATE UNIVERSITY

Senior Design Weekly Report

Weekly Report 3

Group: May-06

Group member: Chongli Cai, Qiaoya Cui, David Hoffman, Andrew Kom, Ailing Mei

Client: Garmin International

Advisor: Dr. Colin Christy

Period: 9/10/2012-9/16/2012

Date: 9/16/2012

Goals to Meet

The goals that we wanted to meet for week 3 of the project included, deciding on some things to start testing, mainly the microprocessor we would like to use for this project. We have requested that the one recommended by Garmin be sent to us, and also have been researching other options to see what would work best for our project. In addition to this, we also determined that another meeting time during the week would be beneficial. We decided to meet on Thursdays at the regular time, and also on Sundays at 1pm. This gives us a good spread between meetings that will allow us to get something to discuss at each.

Weekly Progress

We focused on learning anything we can about the microprocessor we would like to use (the recommended PIC chip from Garmin) and finding other options for processors that will work for us. We learned that the PIC chip we've been looking at has 2 ADCs that have a 10bit resolution each. This means that we can easily use them for the 2 ranges of current measurements we want, 1-500mA and .01-3A. Related to the current measurement, we located a number of possible current sensors that have the required resolution for the project needs. The PIC chip uses standard C coding, and the architecture to communicate with the SD storage units is contained within the SD cards. The interface between the SD card and MCU is standard USART control.

Future Planning

We are currently waiting on getting the development board from Garmin to begin running tests. We would also like to order some current sensors to begin testing the implementation of them with the MCU. We also would like to get the Instruction set for the PIC MCU to begin learning the coding structure for that particular unit. In addition, we would like to analyze other possible MCU options to see if the PIC is really the best option for us to be using, or if there are lower power or cheaper MCUs we could use that would work.

We also would like to get in contact with Garmin again either this week or next and discuss where we are with the project.

Pending Issues

We are currently looking at whether or not the PIC chip is the best option, and since the cost of each unit needs to be relatively low, the cost for the MCU is very important. We also have concerns that the range that the ADCs can read is too high to differentiate mV levels. To fix this, we may need to add in a Voltage amplifier for the current sense portions of the circuit. We also have no designated workspace for our testing, but this may be brought up soon in our 491 class.

Individual Contributions

Andrew:

Wrote the Weekly Progress Report 3

Hosted the group meeting in an organized fashion

Assigned new tasks to be completed by the next group meeting

Chongli:

With Ailing, found a set of possible current sensors that have a resolution high enough for our needs
Researched other possible microprocessors that will serve our purpose to compare with the PIC

Ailing:

With Chongli, found a set of possible current sensors that have a resolution high enough for our needs

Qiaoya:

Determined that LT Spice would not suffice in our circuit simulation
Used Cadence to begin simulation of the circuit

David:

Developed a list of questions that helped in pre-planning for future possible problems
Located and distributed the data sheet for the PIC specified by Garmin
Developed and sent the summary document for the SD MCU interface to all group members
Drew a block diagram of the basic circuit layout