Custom Lab Summary

The idea of my project is a “Secret Agent Watch”. The watch displays the time, temperature, altitude, and messages. The project was done on AtmelStudio 6.0 on an ATMEGA1284. The time is resetted when the power is switched off and on, therefore the time needs to be set. The seconds count up to minutes, which count up to hours. The temperature and altitude is taken from an altimeter sensor (BMP085). The library i2c is used to extract specific information from the sensor. The sensor has different registers that need to be written/read to, in order for the register to know that the user wants to read or write information from it. The temperature and altitude register is read and using a driver provided online, the information is taken and displayed to the LCD. Initially the temperature is calculated in Celsius, therefore some calculations were added to convert the degrees into Fahrenheit. The altitude did not need any extra conversion(s) that were not already provided by the driver. The messages are typed in using a old texting style, using the keypad to scroll through letters to type. The cursor of the LCD is moved once a new letter/number is typed.

The system starts up and requires the user to input the time. From then, the time is displayed in the format of 12 hours:minutes:seconds. The user is free to press any of the three buttons. The first button’s purpose is for the user to be able to go back to displaying the time on the LCD, therefore pressing that button when the time is already displayed does not change the LCD screen. The second button will change the LCD to display the temperature, and a second press will have the LCD display the altitude; pressing it any more times will toggle the temperature and altitude display. The third button clears the LCD display, and allows the user to input messages. This is meant to be a mock message sender, where the user can type messages using the keypad, and enter by pressing ‘C’. Upon pressing ‘C’, the user must press the third button once more, to return to type another message, or any other button to display the previous information.

Project video: http://youtu.be/lySNgZzLW_k

Source Files:

Project Source

https://drive.google.com/file/d/0B3Q4dVN7E0uSVnBMVnJUZDFGR2c/edit?usp=sharing

Header Files

Includes:

- *.h files provided in class for LCD, Scheduler, etc.*
- *driver for Altimeter (BMP085) sensor copyrighted by Davide Gironi and Peter Fleury*

http://davidegironi.blogspot.com/2012/10/avr-atmega-bmp085-pressure-sensor.html

- *i2c and twi files provided by Davide Gironi and Peter Fleury*

https://drive.google.com/folderview?id=0B3Q4dVN7E0uSR1VQcnlPXy12ejg&usp=sharinghttps://drive.google.com/file/d/0B3Q4dVN7E0uSVnBMVnJUZDFGR2c/edit?usp=sharing