

Timothy Kurczewski

Honors Project

Automated Blinds Control System

Individual Contribution

The individual contributions provided to the Automated Blinds Control (A.B.C) System that were completed are mainly coding based, as my role in the team was the Software Lead. Specific duties included, writing the main driver code that ran the microchip controller, as well as many supporting functions that are necessary for complete operation. All code was compiled from online resources, as well as input from teammates and faculty advisors. The code was then properly documented as well as split into header and source files for better code organization. A GitHub repository was utilized to maintain the project and backup copies of the code was kept in a Google Drive account, as well as locally on a PC.

The largest hurdle to overcome in the project was getting the Wi-Fi module to work properly with the PIC24FJ128GA010. This microchip was selected because it supported Analog to digital conversion for sensor values, as well as having UART serial communication capabilities which is needed to communicate with the Wi-Fi module. The ESP8266 was selected for the Wi-Fi module because of its low cost, and relatively detailed documentation available. An ESP8266 C library was found to be very useful in the project but had to be updated to work with an X16 C code compiler, as it was written for an XC8 compiler. A basic HTML page was also written to that had sensor values and blind position posted. From the webpage, blinds were also capable of moving via a mouse click button input. A webserver was also set up for data collection that samples the sensors in the A.B.C system every 30 minutes and posts the new data to a live data graph on thingspeak.com.

As well as heading the software side of the project, contributions were made in other areas of the project. Other responsibilities included troubleshooting custom PCBs that were designed by Matthew Lacek, as well as designing and building the wooden frame that housed our test blind system.

Over the course of the project, a greater understanding of software project organization, and documentation was gained. Experience with reading electrical schematics as well as troubleshooting electrical circuits was gained. A greater understanding of the XC16 MPLAB IDE was gained, including debugging features and capabilities, as well as setting the configuration bits on the PIC24FJ128GA010 properly. Confidence was greatly gained in programming skills from this project.

Included in the process of the project skills increased in teamwork, time management, proper documentation habits and proper code repository maintenance. A Gantt Chart developed by Daniel Nahra was used to keep the team on a passed schedule and on track for project completion.