CHAPTER V

CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

In this work, a wireless touch screen switch panel connected with ZigBee has been developed. This wireless touch screen switch panel could control the lights in a room either a small room or a big room or even some rooms at once. It has been shown reliable and worked in a real-time, while considering mostly lighting controller in the market still need wires and less flexibilities for customers to set up and use the switch panel. From the examinations, it was shown that the device could handle every operations it provides (i.e. turning on/off the lights, lower/higher dimming the lights, user profiles, and flash memory) in a reliable way. Besides, the device also kept updated to the current state of the lights, even if the device was not synchronized with the lights because there was another device controlling the lights at the same time or the connection or electricity down. The device could always catch up the light bulbs current state by sending commands through ZigBee to get current lights' state and update the display right after the information received by the device. From the current consumption examinations, it was shown that the device was also fairly power efficient because the system entered a Sleep Mode if the device is idle for 15 seconds. All the user profiles made still had the preferences made before whenever the battery was changed or even when the device needed to be reset.

5.2. Recommendations

This device was designed as a prototype which runs its basic functions. Yet indeed, there are still some bugs and shortage that need to be fixed. Therefore, there are some open possibilities to do any advanced developments in the future especially in waking up the system after a Sleep Mode, integrating any external memory (i.e. SD Card, External Flash Memory, etc), fixing any minority bugs in the system while the connection is back after being down in a meantime, and

optimizing the features inside the device (i.e. more lights controlled, more user profiles available in accordance with the lights controlled by the device, more dimmer levels, optimizing the buttons' size, and more attractive buttons).

Some recommendations given for this research topic are learning and doing more research how to wake the system with touch sensor after it goes on sleep mode and maintaining the system clock to keep being stable after the Sleep Mode and how to integrate and run the external memory. In this research, the developer had tried to enter sleep mode which is switching microcontroller's system clock from high frequency 48MHz to low frequency, entering suspend mode where microcontroller stop its internal oscillator and idle mode where microcontroller shuts off clock to CPU until any external interrupt is asserted or any reset occurs whenever the device is idle for a minute. At first, the system can wake up after the first time entering sleep mode and do its functions well, but after entering the second time sleep mode and waking up, the system clock becomes slower and does not enter sleep mode anymore. This is caused the system clock becomes unstable after sleep mode and waking up. This is caused by some mistakes in the port initialization, however it has been fixed. But then, after the system runs in a normal clock, the system cannot wake up after the Sleep Mode.

The developer also ever tried to integrate and run an SD-Card Converter with the device. The process was stuck on reading process from SD-Card while the developer could write and make a new file on it. The reading process was bugged by alien symbols and kept repeating the same line in every some data retrievals.

By extending the memory with any external memory, the appearance of device's display can be optimized. The buttons in every page can be optimized as how any common finger could conveniently access the buttons.