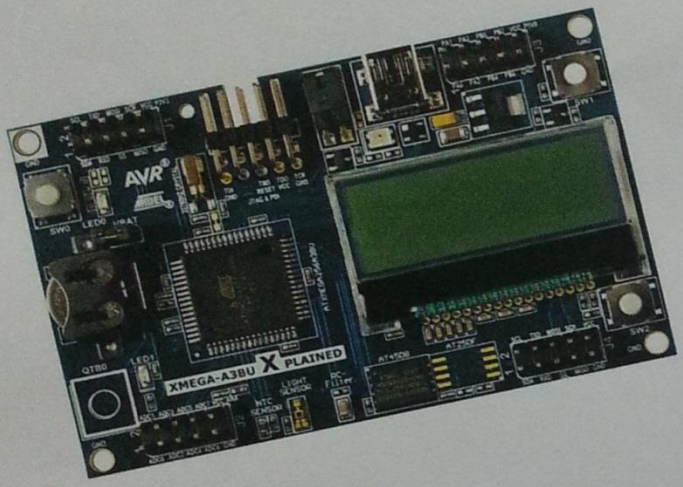
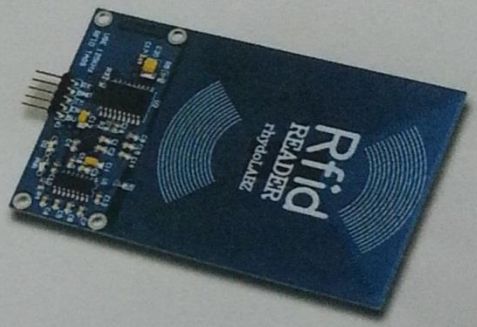
Project report-II

Atmel Embedded Design Contest- 2014

RFID Based Security System

Sardar Vallabhbhai National Institute of Technology, Surat





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MILANKUMAR PATEL	U12co083	UG	Computer	5th
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Project Progress Report – II

- As per the project report submitted on 30th October, we have successfully implemented RFID card detection on ATmega32. We tested our module with simple locking mechanism. Now considering the fact that we have to implement our project on XMEGA-A3BU kit, we started learning different modules of it.

- We successfully implemented the hands-on tutorial provided by Atmel. We have learned how to program the board, How to use AVR-Dragon hardware debugger, how to use Atmel Software Framework and its libraries.

- After getting command over XMEGA-A3BU kit and its programming methods, we started focusing on our first requirement, i.e. Real Time Clock feature.

- Before we thought of interfacing external RTC in our project. But later on we found that the kit itself is contained with inbuilt RTC.

- We went through default examples of RTC, than do some modifications according to our need. Finally we got our RTC module working in about 1 week.

- Next step was to interface RFID reader with XMEGA kit. As RFID reader works with UART serial protocol, we need to successfully implement UART on the kit.

- Firstly we faced the difficulty in configuring UART on XMEGA, as register description and function associated are different from ATmega32. But later on after some debugging we succeed in implementing UART on the kit.

- Next we were facing problems in displaying the output of the card detection algorithm. So we thought of using graphical LCD of the kit for it.

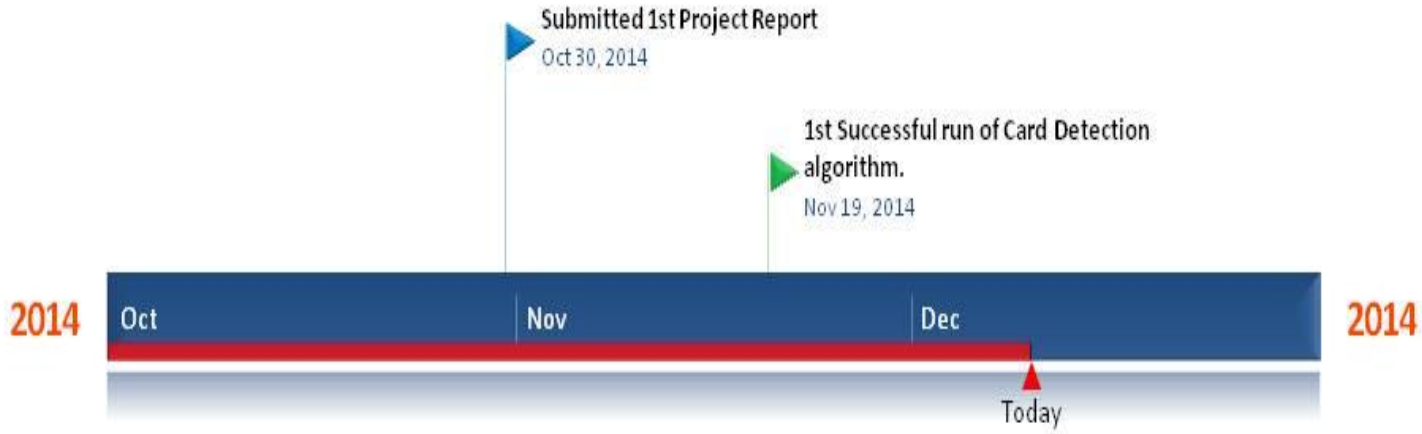
- We have seen the example codes available on Atmel Studio. We used ASF library for display functions. We also written some specific function according to our need. At last we had our display unit as our output.

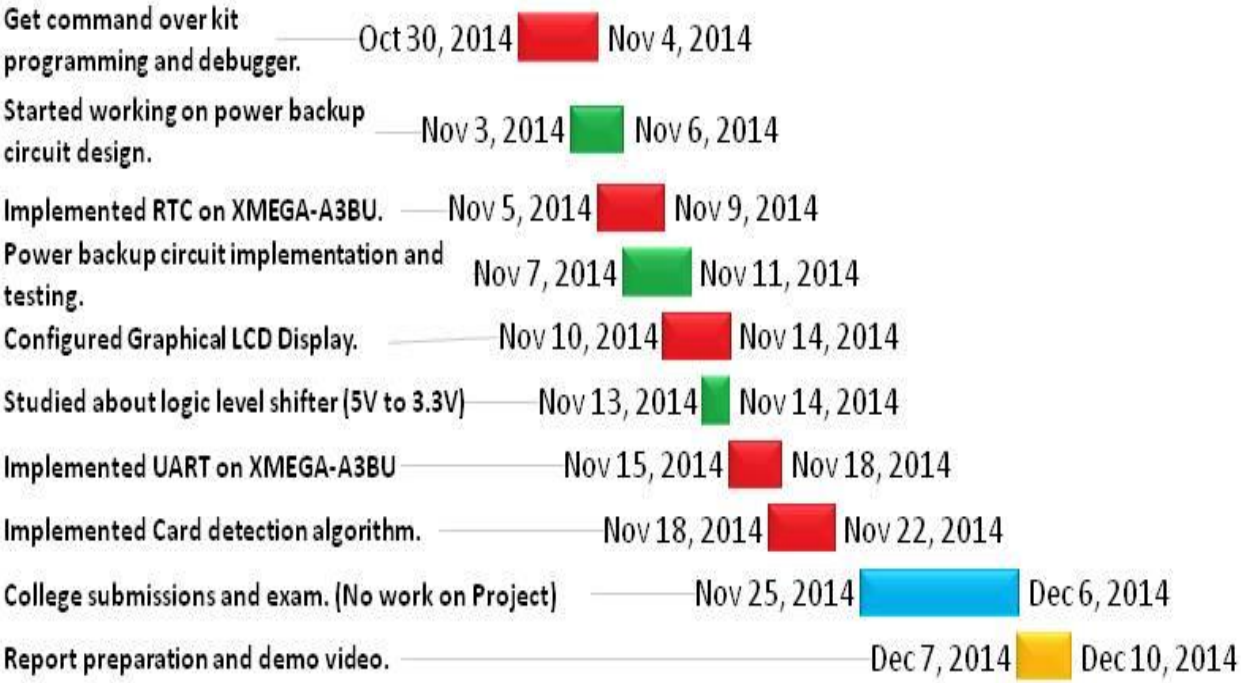
- After that, we needed to implement card detection algorithm for RFID reader. After some trial and correction, we got our first breakthrough in Card detection. We successfully detected the card and were able to distinguish a particular card from many. These can be seen in the demo video submitted along with the report.

- In spite of having work on software side, we also started working on circuit side. We implemented relay circuit for power backup. We used relay to switch between adaptor supply and battery backup supply in case of power failure. This feature is also shown in the video.

- Finally we have prepared a submission report and demo video.

Timeline Chart





Circuit Implemented in video:

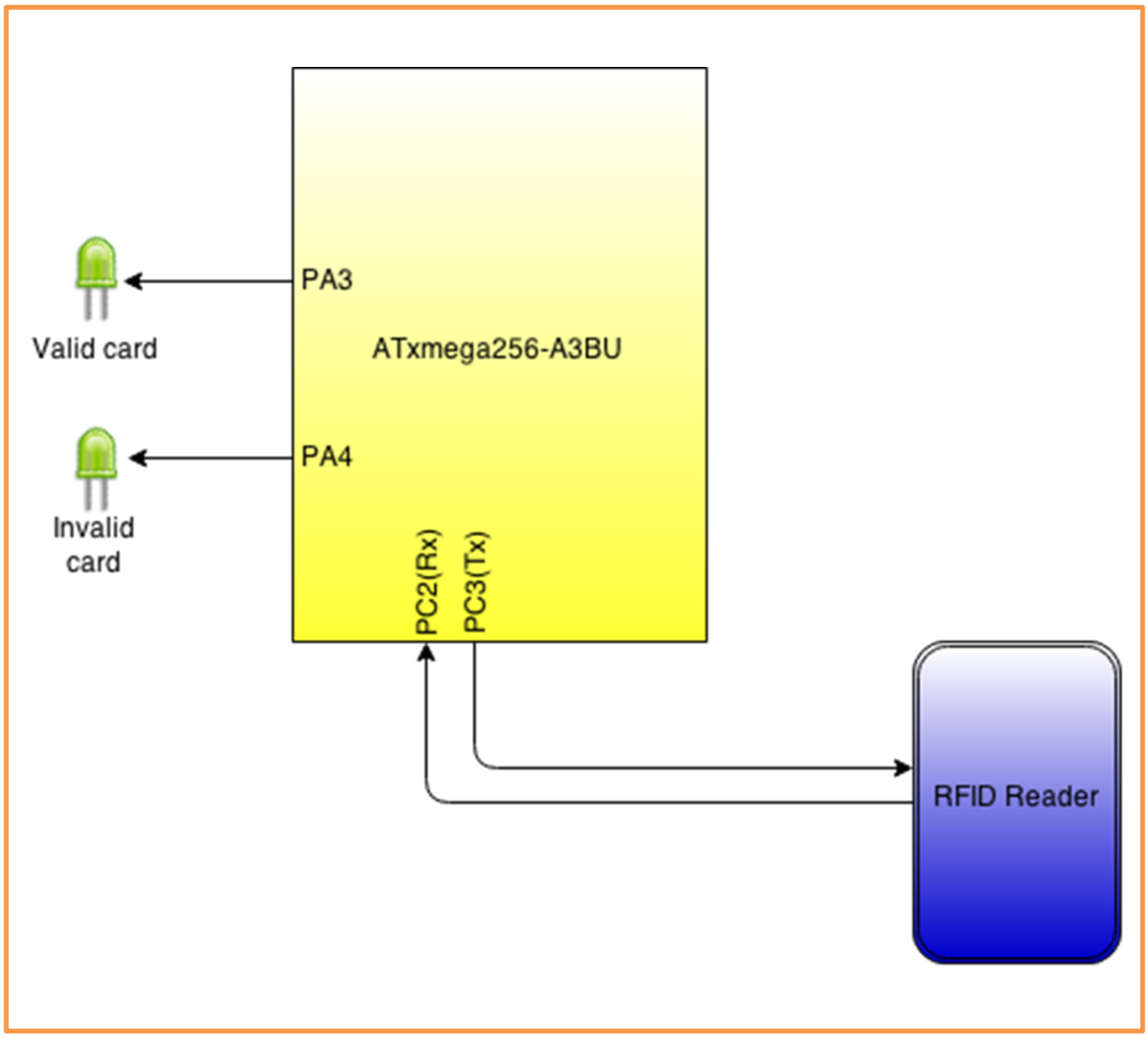


Figure 1: Reader and Indication circuit

Power Backup circuit:

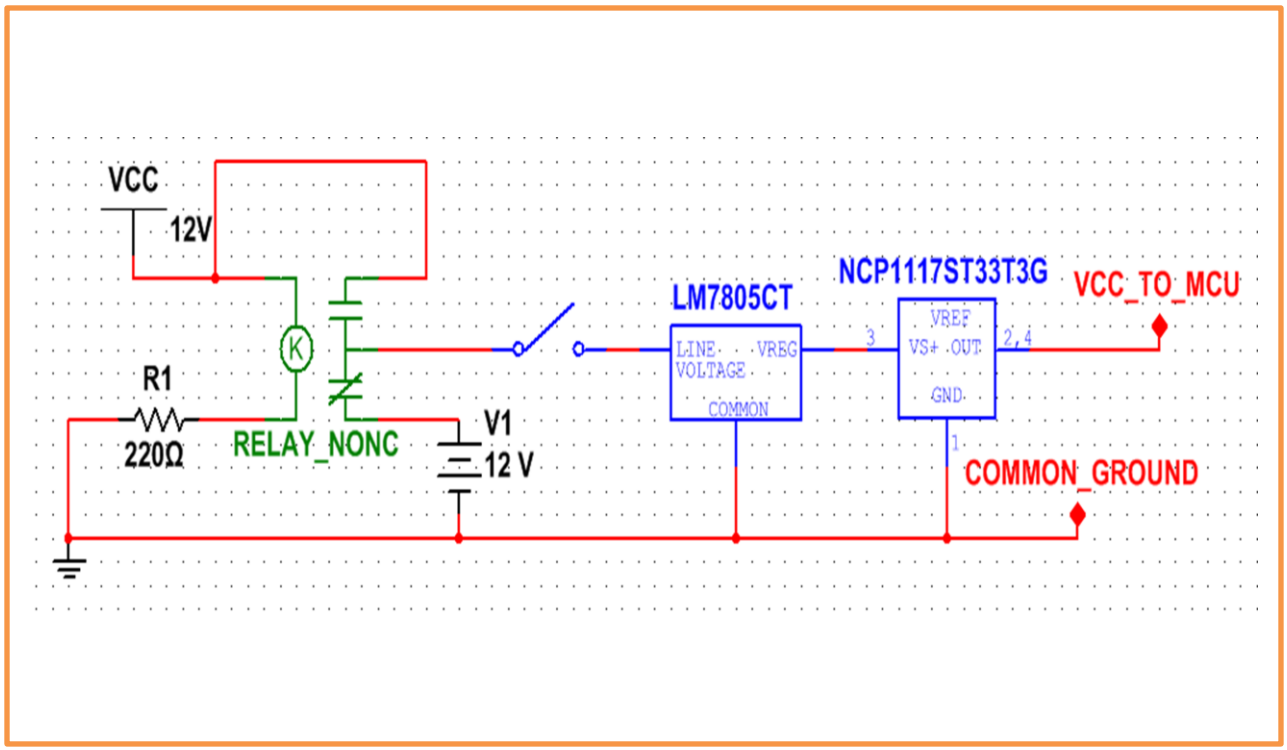


Figure 2: Power backup circuit

Overall circuit diagram:

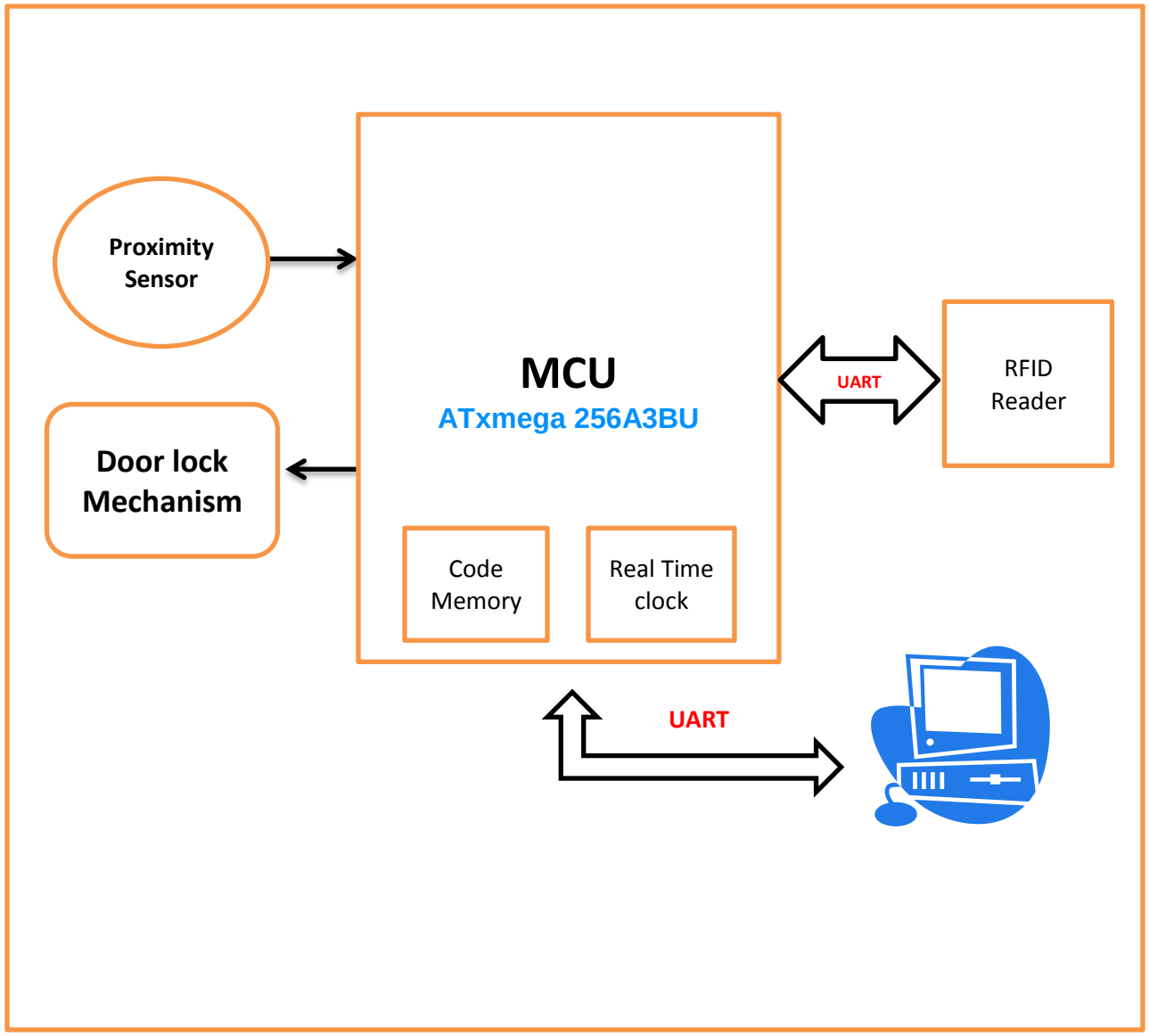
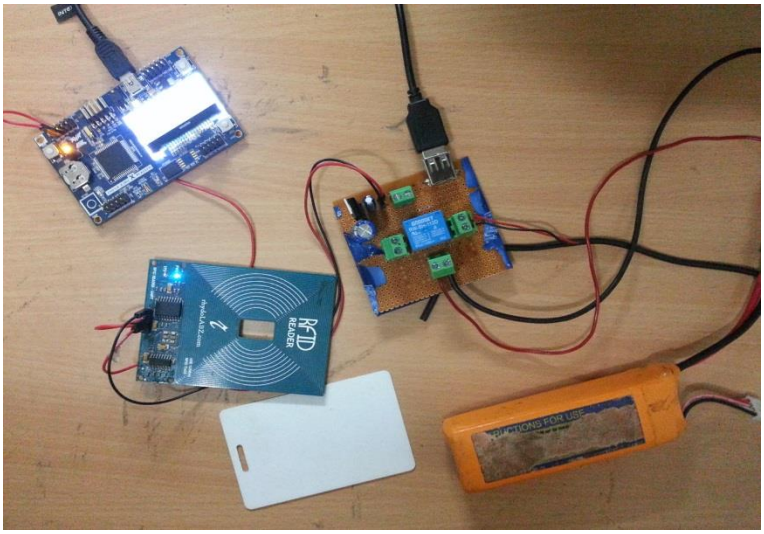
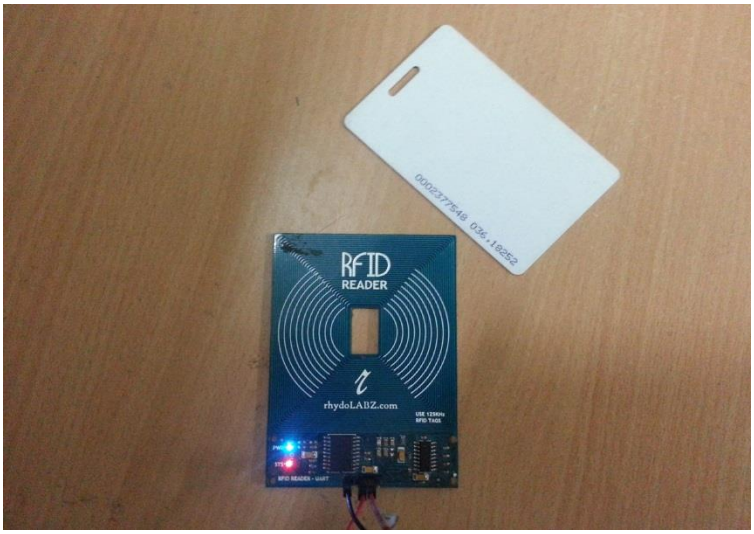
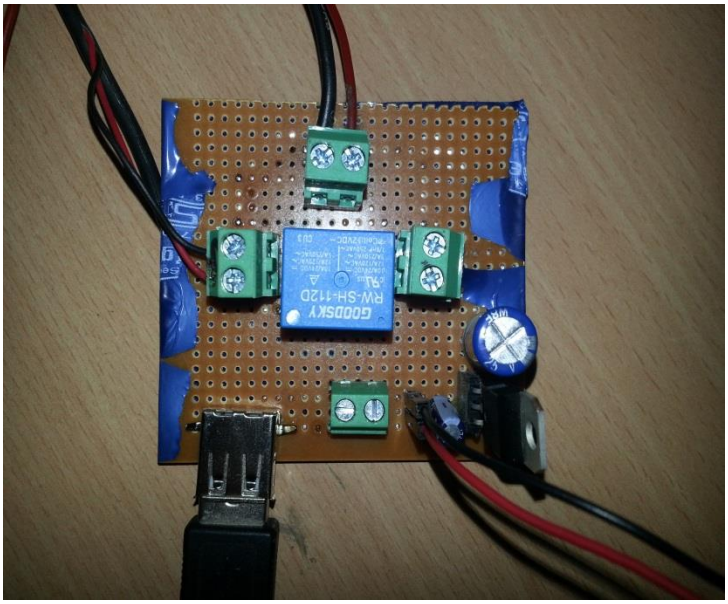


Figure 3: Controller Circuit

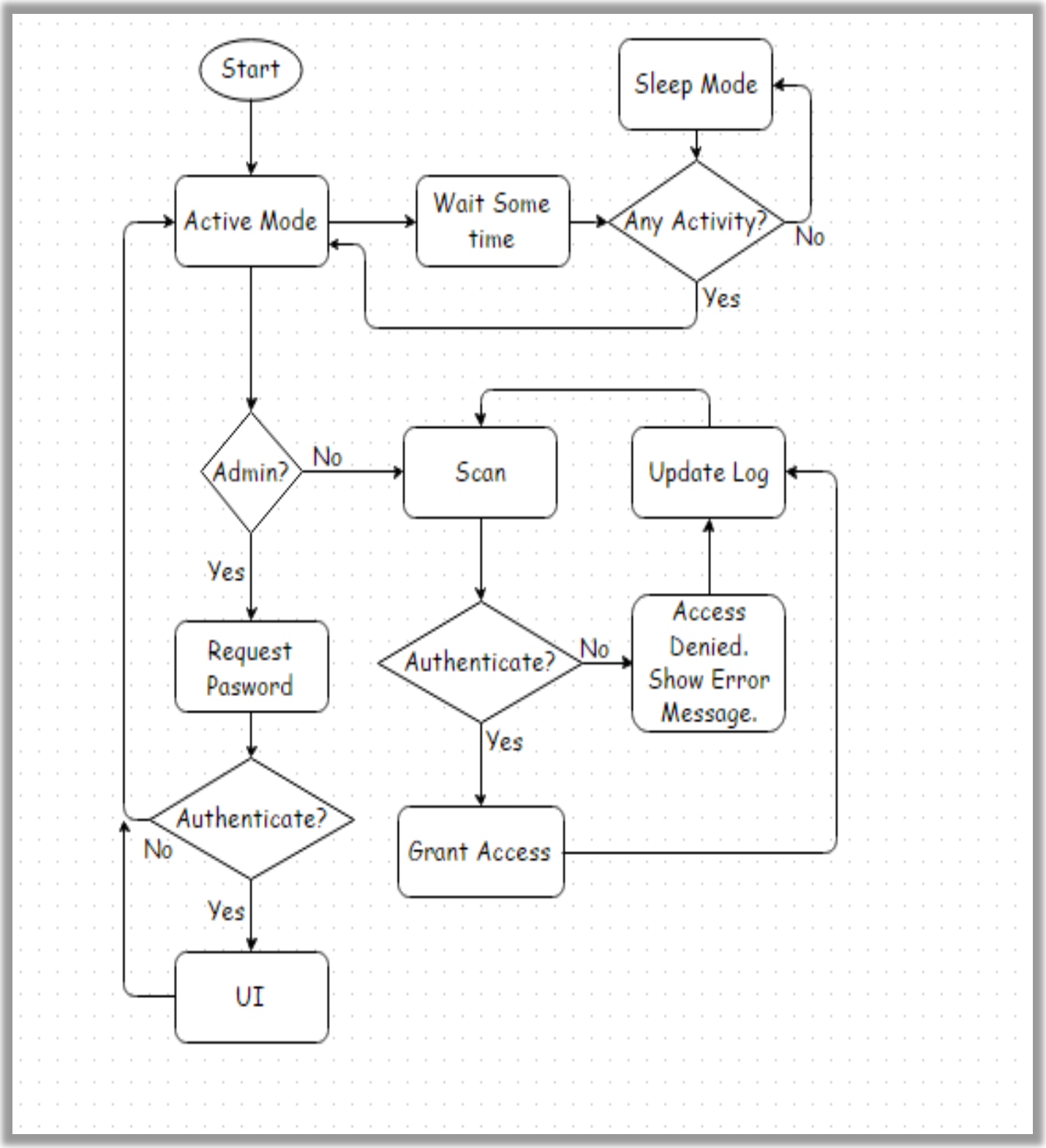
Some hardware pictures







Flow chart of the software:



Conclusion

Finally our card detection is working on XMEGA-A3BU kit. We are now ready to go for final phase of the project. We will be using internal EEPROM or Non Volatile Flash memory of ATxmega256-A3BU for our database. We will be making a compact module for the whole detection system with all the peripherals included in the module itself. Once the module is ready to go, we will be implementing a real time working system in the department laboratory.