

Electronic Protection System For Exam Paper Leakage

Mrs.K.Sai Prasanna¹, K.Venkatesh², G. Manish Reddy³, G. Abhijeet⁴, N.Vineeth⁵
B V Raju Institute of Technology

Abstract- This paper describes Electronic protection for exam paper leakage which is a highly secured system. The examination is mainly the heart of the education system. We have proposed an electronic system to detect and prevent exam paper leakages. In this intended system, the question papers which are in the electronically locked box will be sent to the examination centers. The box will be opened by an authorized user. These boxes are electronically protected by Electro Magnetic Lock. To open the boxes the exam controller will send a message containing secret code. If the Secret code match, only then the box will open through electromagnetic lock. In this system we are using a RFID Reader and Gsm to receive the secret code

Keywords- Examination papers, RFID, GSM, Keypad

I. INTRODUCTION

Education is basically the motivating force of the society. An examination is the assessment planned to measure the skill, knowledge, physical fitness or aptitude and also classification in so many subjects. An exam may be on paper, on the computer, orally, in exam centers, which are conducted to test, calculate or examine the set of skills. Also the main purpose of the examination is to select the capable candidates for different positions.

For the students main issues are question paper leakage, who suffer from the postponed or cancellation of the examination. Each and every year we hear news about postponed/cancelled exam due to paper leakages in the newspaper or on television. Sometimes the university itself doesn't know how there is leakage of any information content related to question papers. Hence, some student gets good rank in minimum time and with less effort and those students who really deserve the rank will not score even after hard work and maximum efforts. This aspect will create negative effect on students and demoralize the growth of society. So we have come up with a compact and portable solution and decided to design and implement an examination paper leakage protection system based Msp430 Controller. Along with the MSP430(FR2311), Arduino, GSM modem, RFID module,

Keypad, LCD and electromagnetic lock are used in this system.

First the question paper comes to the college from university in an electronic sealed box which is called Electronic Control Box. The Electronic Control Box is an embedded system that was designed using MSP430 controller. The authorized person has been given a valid RFID card along with a dummy RFID card from the university. The authorized person swipes the card. The system acknowledges for the secret code if the card is valid. Authorized person needs to type the secret code which is provided by the university using the keyboard. If code is correct, the electromagnetic lock rotates and unlocks the Box. This system has two transceivers. The transceiver 1 is a system related to the Electronic Control Box. The transceiver 2 is the mobile phone with the university authorities. The present module work deals with the hardware and software part

II. PROBLEM DEFINITION

In this system we are using first level security which is an RFID card with a particular or unique number which is provided by university to every college. GSM is used for any unauthorized user tampering. The Keypad is the second level security in this system for secret code matching.

III. HARDWARE COMPONENTS

1. RFID reader module

The "Radio-frequency identification (RFID)" utilizes "the electromagnetic fields" to automatically recognize and track tags connected to objects. The "electronically stored data" is held by the use of tags. An "active tags" have a "local power source (like a battery)" and might work hundreds of meters from "the RFID reader". The "passive tags" gather energy from a close-by "RFID reader's interrogating radio waves". Dissimilar a barcode, the tag does not need within sight line of the reader. Thus it might be embedded in "the tracked object". The "Radio-frequency identification (RFID)" is one strategy for "AIDC (Automatic Identification and Data Capture)". Figure 2 describes the RFID Reader:

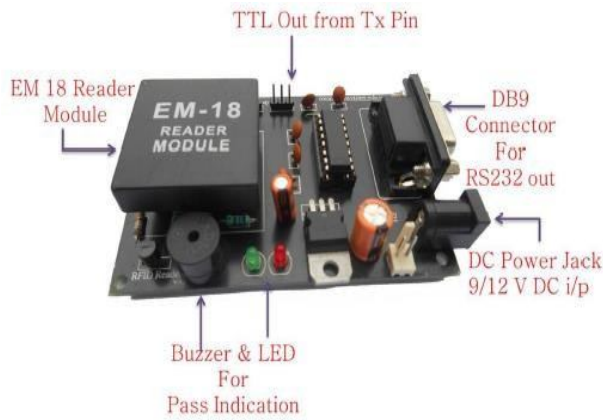


Figure1: RFID reader.

2. GSM module

The “European Telecommunications standards institute (ETSI)” is used to develop the “Global system for mobile communication (GSM)” to define the protocols for “second-generation digital cellular networks” is shown in Figure . 2G networks established for the replacement of "first generation analog cellular networks”, and “the GSM

standard” initially portrayed as a digital, “circuit-switched network” improved for “full duplex voice telephony” This extended time to incorporate information communications initially through “circuit-switched transport”, after that through “packet information transport via GPRS (General Packet Radio Services)” and “EDGE (Enhanced Data Rates for GSM Evolution, or EGPRS)”. Accordingly, the 3GPP recognized as “third-generation (3G) UMTS standards”, followed by “Fourth-generation (4G) LTE advanced standards” that does not portion of “the ETSI-GSM standard”. GSM association is used to possess the trademark of GSM. It might also mention initially to the regular voice codec utilized, “fullrate”



Figure 2:GSM Module.

3. Electromagneti clock

An “electromagnetic lock” is a locking gadget (described in Figure 2.2), which comprises of “an armature plate and an electromagnet”. There are 2 primary kinds of

“electric locking gadgets”. Locking gadgets might be either "fail-safe" or" fail secure". The fail-safe locking gadgets are opened when de- energized. A “fail-secure locking gadget” is remains locked when the power will be lost. The “typical single door electromagnetic locks” are provided in both “dynamic holding force capacities” such as “600 lbs. (272 kg)” and 1200 lbs. (544 kg)”. Nowadays, the quality of "magnetic locks" compares greatly with that of “conventional door locks” and the magnetic locks price is less than “conventional light bulbs” to work.



Figure 3: Electromagnetic Lock

IV. SYSTEMIMPLEMENTATION

We are designing such a highly secured electronics system which prevents the leakages of exam papers. In this system, there are three levels of security. First is a mechanical lock second is RFID card using an RFID reader and the third is keypad security. The system consists of two sections as mentioned. Transceiver 1 and Transceiver 2 .Fig. 6 shows the block diagram of section 1 i.e. The system for question paper leakage protection system based on MSP430 and section 2 is a mobile with the university authorities. Transceiver1 consists of MSP430(FR2311) and Arduino which is interfaced with Keypad, RFID, GSM, LCD, electromagneti clock.

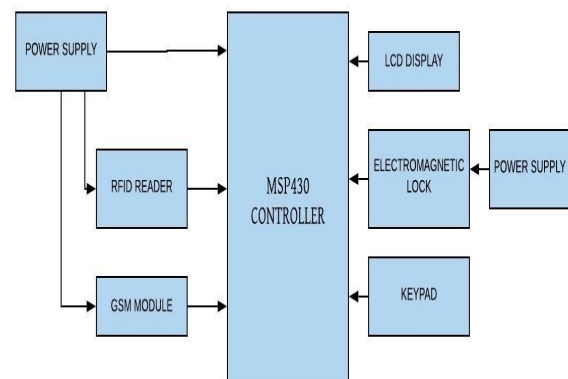


Figure 4:Block Diagram of System

V. WORKING OPERATION

- a) The kit is first switched ON by giving the power supply.
- b) The LCD gives a welcome message. The kit should be reset for proper functioning.
- c) A card is to be shown at the RFID reader which reads the information encoded in the card.
- d) If the card is valid, then it sends an OTP the given mobile number.
- e) If the OTP entered is correct, the lock gets opened.

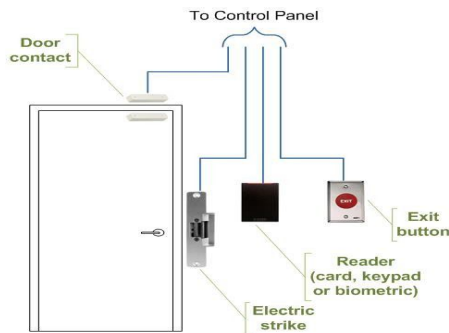


Figure 5: Working condition of electronic magnetic lock

VI. FLOWCHART

Flowchart regarding the software is as shown in the Fig.6

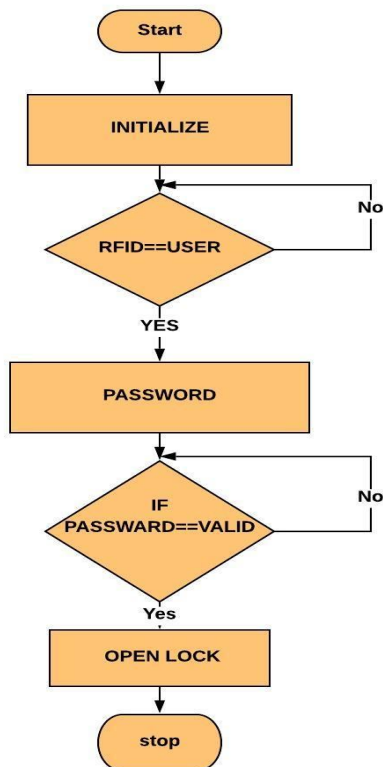


Fig.6. Flow chart

A peculiar GSM password from the university authorities is sent to the chief collage authority. When the system is powered ON, LCD and GSM initializes and displays "EXAM PAPER LEAKAGE PROTECTION"

The GSM Modem is connected to the Electronic Control Box. Mobile of the university authorized person acts as the Base Station. The RFID card is to be swiped to open the Electronic Control Box. Then, Electronic Control Box system sends a message to the pre-stored mobile number of university authorities. The lock is opened, Once the RFID card is swiped, a distinct password is entered in the system through the keypad.

VII. HARDWARE DESCRIPTION

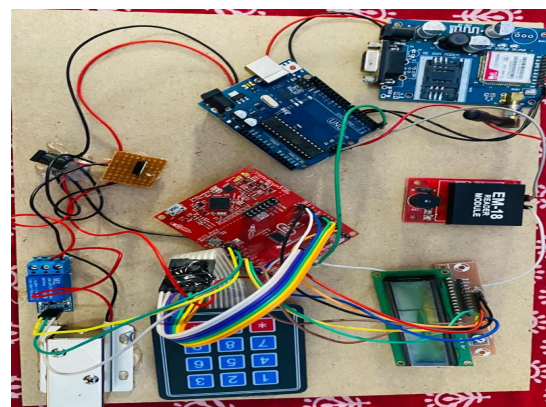


Figure 7: system hardware connections

Figure describes "the exam paper leakage security framework". The "vibration sensor" will be associated to the "microcontroller port pin". The "GSM module" will be linked to the port pin of transmitter pin of the microcontroller and the "receiver pin" is linked to "the RFID reader module". The "matrix keyboard" will be linked to complete 8-bit port, when it gets the vibrations before the time, then it is linked to the ground i.e. "active low". And "the controller programming" is used to examine the information from the inbuilt mobile number and sent the SMS that is at command design.

VIII. APPLICATIONS

- 1. This project can be extended to protect the answer sheets to send it to the university authorities.
- 2. It can also be used in various other applications where protection of documents or any valuables is needed.
- 3. Used in banks for security purposes.

IX. CONCLUSION

The compact and cost effective solution for the examination paper leakage system was achieved with MSP430 controller and RFID. This project can be extended to protect the answer sheets to send it to the university authorities. It can also be used in various other applications where protection of documents or any valuables is needed. The system can be programmed to close the Electronic Control Box after the completion of the exam.

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AUTHORS

1. First Author- **Mrs.K. Sai Prasanna**,Assistant Professor in BVRIT,Narsapur in the Department of Electronics and communication.
Role: Project Mentor.
Email:Saiprasanna.k@bvr.it.ac.in
2. Second Author-**K.Venkatesh**,Pursuing B.Tech final year in BVRIT,Narsapur with specialization in Electronics and communication Engineering.
Role:Team Member.
Email:16211A0492@bvr.it.ac.in
3. Third Author-**G.Manish Reddy**,Pursuing B.Tech final year in BVRIT,Narsapur with specialization in Electronics and communication Engineering.
Role:Team Member.

Email:16211A0475@bvr.it.ac.in

4. Fourth Author- **G.Abhijeet**, Pursuing B.Tech final year in BVRIT,Narsapur with specialization in Electronics and communication Engineering.

Role:Team Member.

Email:16211A0470@bvr.it.ac.in

5. Fifth Author-**N.Vineeth**, Pursuing B.Tech final year in BVRIT, Narsapur with specialization in Electronics and communication Engineering.

Role:Team Member.

Email:16211A04E8@bvr.it.ac.in