

ELECTRONIC PROTECTION FOR EXAM PAPER LEAKAGE

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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 after a predefined date, time and only by an authorized user. Actually the question papers are present in the sub boxes. These boxes are password protected. To open the individual sub boxes the exam controller will send a message along with the password. If the date, time and password match, only then the box will open through electromagnetic lock. In this system we are using a buzzer for any sort of unauthorized interference

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 on ARM processor. Along with the ARM processor (LPC2148), 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 ARM processor, which has inbuilt RTC to monitor the Electronic Control Box. If anyone tries to open that box before and after the RFID swipe time duration, the system communicates to the university authorities by sending an SMS (Short Message Service) through GSM (Global System for Mobile communication) that "some malfunctioning has taken place with the Electronic Control Box".

The university authorities send a unique password to the chief authority of the college before 10 minutes of the exam. The chief authority 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 password if the card is valid. Chief examiner needs to type the password which is provided by the university using the keyboard. If password is correct, the electromagnetic lock rotates and unlocks the Electronic Control Box. This system has two transceivers. The transceiver 1 is an embedded 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

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. If any unauthorized users try to open the box, then immediately a message will go to the university authorities through the GSM. The Keypad is the second level security in this system for date, time and password matching

SYSTEM IMPLEMENTATION AND WORKING

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. Embedded system for question paper leakage protection system based on ARM processor and section 2 is a mobile with the university authorities. Transceiver1 consists of ARM processor LPC2148 which is interfaced with Keypad, RFID, GSM, LCD, electromagnetic lock.

BLOCK DIAGRAM OF ELECTRONIC PROTECTION

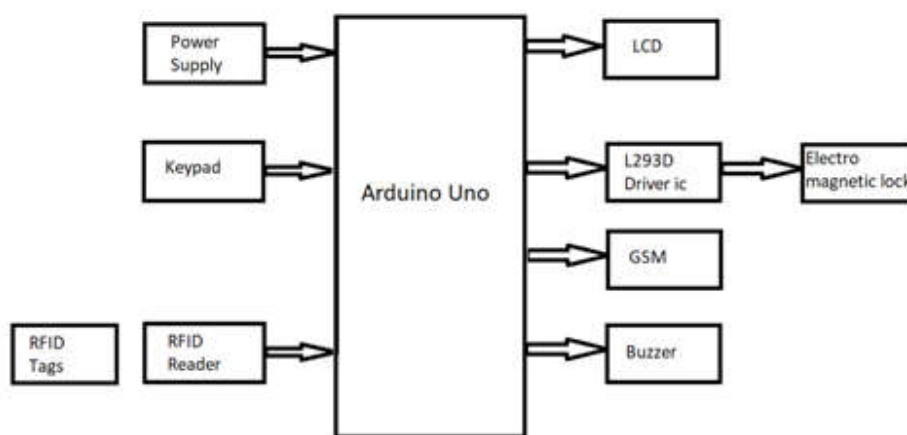


Fig:1 block diagram of electronic protection

CIRCUIT DESCRIPTION

For this system we have used PIC controller for Much Flash memory for transmission, The RISC (Reduced Instructions Set Computer) microcontroller is a powerful tool that provides a highly flexible and cost-effective solutions to many embedded monitoring and diagnostic systems. The central unit has been made around of an PIC microcontroller with proposed architecture which will be used for GSM and Exam paper leakage protection system, also Easy to program it and writing or burning devices are available it also have inbuilt analog to digital convertor of i c module it is directly

connected to controller pin and matrix keyboard and internal timer used for showing time and SMS sending we used LCD 16*2 and we used RFID reader module that is ID of project. Regulated power supply is used and step down transformer for this. The diagram for the Exam paper leakage protection system is shown in fig.1. Vibration sensor is connected to the port pin of Microcontroller. GSM Module is connected to the port pin of transmitter pin of microcontroller and receiver pin is connected to RFID reader module. Matrix key board connected to complete eight bit port. When did it gets vibrations before time then it will be connected to ground i. e. active low. And into controller programming we read the data from inbuilt. mob. No. and sent it to SMS sending i.e. at command format. Circuit of DC motor developed by H-bridge motor driver for forward and reveres direction this circuit made using four power transistors that is shown in dia. As S1,S2,S3 and S4.

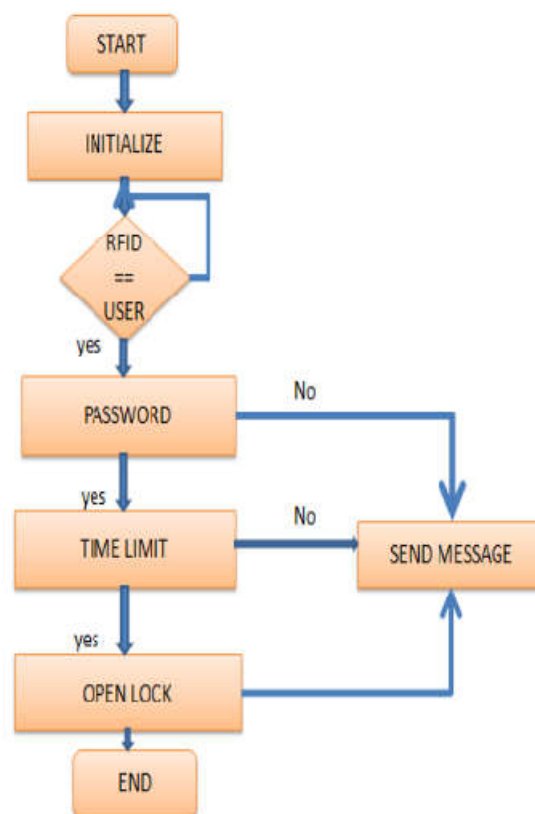


Fig:2 flow chart of electronic protection system

HARDWARE DESCRIPTION

RFID(Radio frequency identification)

Radio Frequency Identification (RFID) technology has been attracting considerable attention with the expectation of improved supply chain visibility for both suppliers and retailers. It will also improve the consumer shopping experience by making it more likely that the products they want to purchase are available.



Fig:3 RFID TAG

gsm

GSM (Global System for Mobile communications) is an open, digital cellular technology used for transmitting mobile voice and data services.

GSM (Global System for Mobile communication) is a digital mobile telephone system that is widely used in Europe and other parts of the world. GSM uses a variation of Time Division Multiple Access (TDMA) and is the most widely used of the three digital wireless telephone technologies (TDMA, GSM, and CDMA). GSM digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot. It operates at either the 900 MHz or 1,800 MHz frequency band. It supports voice calls and data transfer speeds of up to 9.6 k bit/s, together with the transmission of SMS (Short Message Service).

TDMA

In late 1980's, as a search to convert the existing analog network to digital as a means to improve capacity, the cellular telecommunications industry association chose TDMA over FDMA.

Time Division Multiplex Access is a type of multiplexing where two or more channels of information are transmitted over the same link by allocating a different time interval for the transmission of each

channel. The most complex implementation using TDMA principle is of GSM's (Global System for Mobile communication). To reduce the effect of co-channel interference, fading and multipath, the GSM technology can use frequency hopping, where a call jumps from one channel to another channel in a short interval.

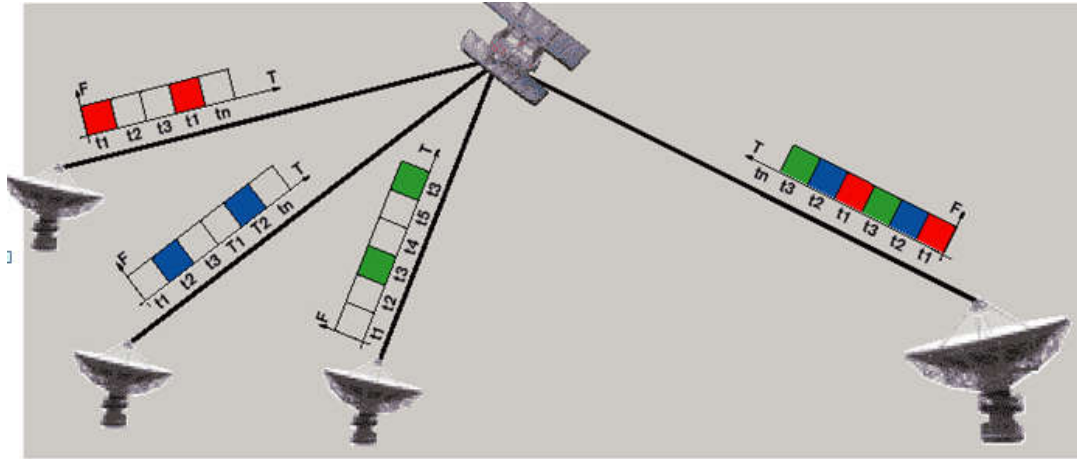


Fig: 4 time division multiple access

TDMA systems still rely on switch to determine when to perform a handoff. Handoff occurs when a call is switched from one cell site to another while travelling. The TDMA handset constantly monitors the signals coming from other sites and reports it to the switch without caller's awareness. The switch then uses this information for making better choices for handoff at appropriate times. TDMA handset performs hard handoff, i.e., whenever the user moves from one site to another, it breaks the connection and then provides a new connection with the new site.

LIQUID CRYSTAL DISPLAY

LCD stands for Liquid Crystal Display. LCD is finding wide spread use replacing LEDs (seven segment LEDs or other multi segment LEDs) because of the following reasons:

1. The declining prices of LCDs.
2. The ability to display numbers, characters and graphics. This is in contrast to LEDs, which are limited to numbers and a few characters.
3. Incorporation of a refreshing controller into the LCD, thereby relieving the CPU of the task of refreshing the LCD. In contrast, the LED must be refreshed by the CPU to keep displaying the data.
4. Ease of programming for characters and graphics.

These components are "specialized" for being used with the microcontrollers, which means that they cannot be activated by standard IC circuits. They are used for writing different messages on a miniature LCD.

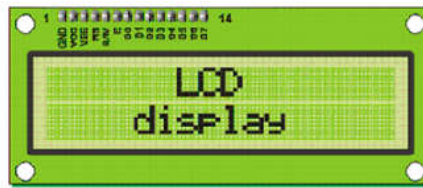


Fig: 5 Liquid crystal display

BUZZER

Digital systems and microcontroller pins lack sufficient current to drive the circuits like relays, buzzer circuits etc. While these circuits require around 10milli amps to be operated, the microcontroller’s pin can provide a maximum of 1-2milli amps current. For this reason, a driver such as a power transistor is placed in between the microcontroller and the buzzer circuit.

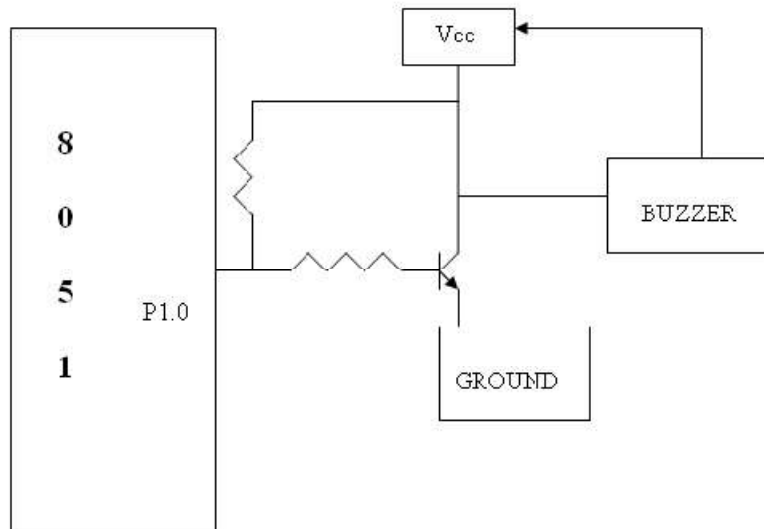


Fig. 6 Buzzer Circuit

The operation of this circuit is as follows:

The input to the base of the transistor is applied from the microcontroller port pin P1.0. The transistor will be switched on when the base to emitter voltage is greater than 0.7V (cut-in voltage). Thus when the voltage applied to the pin P1.0 is high i.e., P1.0=1 (>0.7V), the transistor will be switched on and thus the buzzer will be ON.

Simulation Results

SIMULATION RESULT FOR EXAM PAPER LEAKAGE

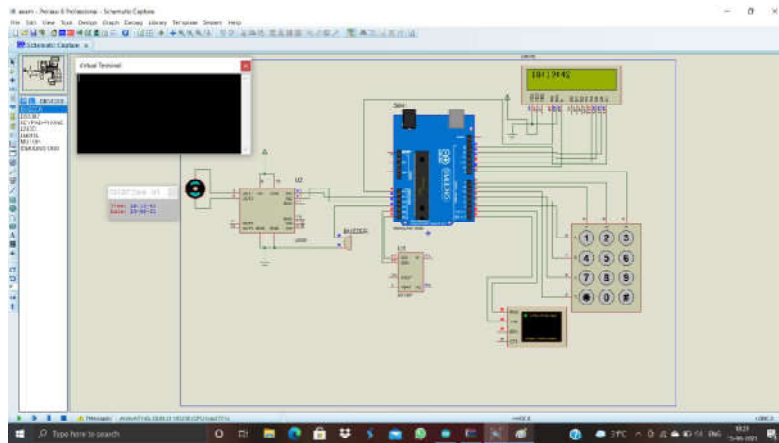


Fig:7 Simulation result for exam paper leakage step 1

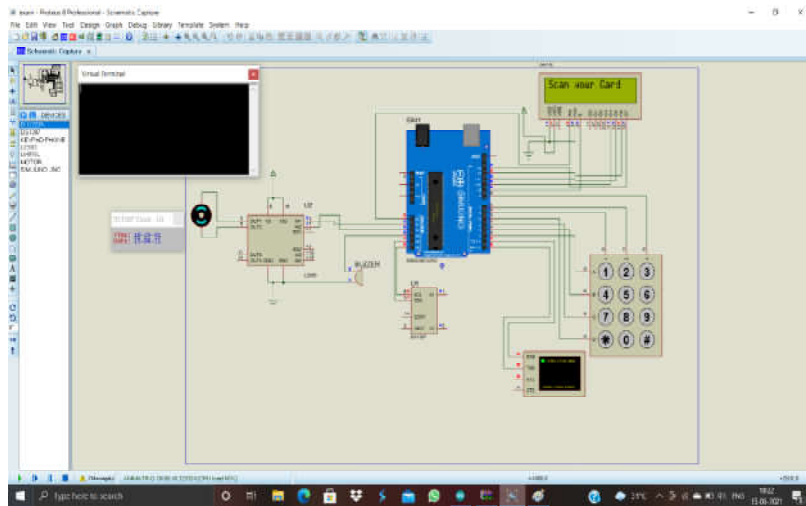


Fig: 8 Simulation result for exam paper leakage step 2

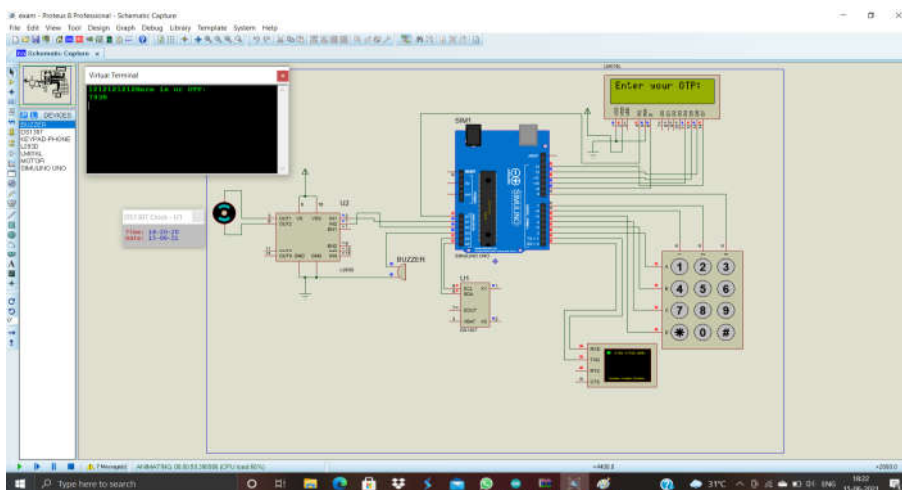


Fig:9 simulation for exam paper leakage step 3

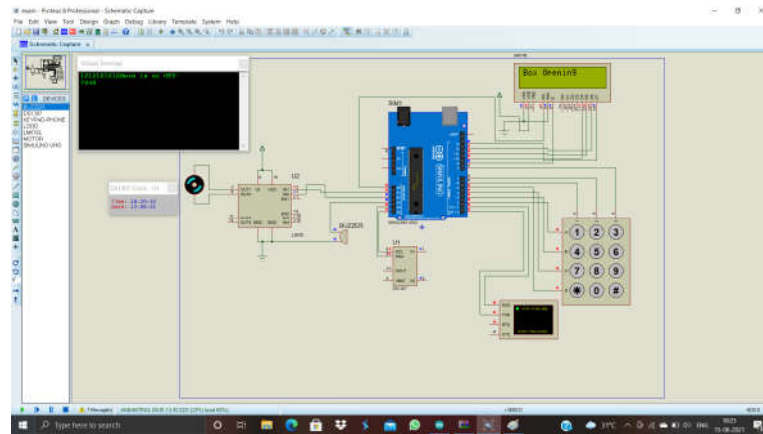


Fig:10 Final output for exam paper leakage

ADVANTAGES

- Simple
- Portable
- No practical limitation
- More availability of components
- Avoid manual errors
- Secured and low cost

7.2 APPLICATIONS

- Colleges
- Offices
- Security systems

CONCLUSION

The compact and cost effective solution for the examination paper leakage system was achieved with ARM processor controller. 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 embedded system can be programmed to close the Electronic Control Box after the completion of the exam.

The Design and its implementation of ARM processor based electronics protection for the exam paper leakage system were effectively carried out with the advantages of minimum peripheral interfaces, low power consumption, low cost, high portability. The system was tested with the help of keypad and RFID card swipe time duration from 10am to 10:10am. The response of the system is successfully tested in all the conditions of the system that is mentioned in the system functionality. Test conditions include:

FUTURE SCOPE

This project can be extended by including biometric of the college authorities. This project can be

extended by placing gas sensor, which is used to detect the gas whenever anybody want to cut the box by using cutter. This project also can be extended by placing vibration sensor in the box, which detects vibrations, whenever, anybody want to break the box with hammer.

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