

Multilevel Security System using Smart Phone

Prof.K.R.Chaudhari¹ Varsha Katariya² Komal Deshmukh³ Sneha Chavan⁴

¹Faculty

^{1,2,3,4}Department of Electronics and Telecommunication Engineering

^{1,2,3,4}Bharati Vidyapeeth College of Engineering for Women, Katraj, Pune, India

Abstract— Multilevel security provided by the combination of three securities which is based on the sequence of (I) Magnetic card reader, (II) password and (III) Smartphone. In this paper we have used a multilevel security system which can be used in Home, Bank Lockers, Government offices, Museum etc. to prevent thefts and hacking of the data. ARM 7 Processor (LPC 2138) is the heart of proposed system. It is a low cost, low in power consumption, compact in size and standalone system. In this system we have used ARM 7 processor which compares the passwords entered by keyboard and received through mobile phone. If these passwords are correct the microcontroller provides necessary control signal to open the bank locker. Buzzer will be turn on whenever entered password is wrong and which will detect the person is unauthorized. Then system will send the same message to Police station using android phone functionality and internet facility.

Key words: ARM 7, Smartphone, Magnetic Card Reader, Buzzer, Relay, Bluetooth

- 3) Random password generation is third level which will be done on Smartphone.
- 4) Keeping the record of the people who access the locker using web page.

III. SPECIFICATIONS

A. Hardware Specifications

- Arm7(LPC2138)
- Magnetic card reader
- Max232
- Relay
- Bluetooth
- Smart phone

B. Software Specifications

- Android
- Embedded c
- Eclipse for web server

I. INTRODUCTION

In recent days security of assets is the main issue for everyone. The purpose of this paper is to provide the reliable security system. In many government offices, banks and home people use lockers to secure valuable documents, money or any valuable thing. So Locker security is becoming an important issue in recent days. Nowadays there is need of more efficient security systems. So that we can avoid the access of unauthorized person. In resent system a unique password is set to open locker, which is only known to authorize person.

In this paper, each authorized person will have his own magnetic card. When he want to access the particular room, they enter in locker room by inserting magnetic card, then magnetic reader will read card number and send it's id to the smart phone by using Bluetooth module. Smart phone will have application which will read the id search for the mobile number in the database then that id will be searched then he will send the random generated password at that moment to that receiver who is owner of the locker. User need to enter that password which was received on his mobile. When this password gets match then the user needs to enter again his own password then only locker or any system will get accessed Data of the user will get store in the database.

II. OBJECTIVES

- 1) In lockers important part of the security of the people to make it highly secure we design multilevel security with help of magnetic card reader which will be available only to the authentic and register user.
- 2) Second level accessing to the pin code which known to the register to the user.

IV. BLOCK DIAGRAM

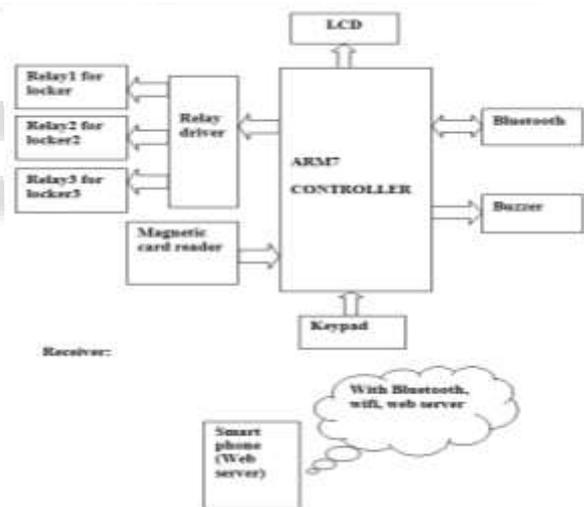


Fig. 1:

V. BLOCK DIAGRAM DESCRIPTION

A. ARM7 (LPC2138)

LPC 2138 is heart of Excavator Monitoring System using Smart phone. It controls all subunits of monitoring system. The LPC2138 microcontrollers are based on a 32 bit ARM7TDMI-S™ CPU with real-time emulation and embedded trace support, that combines the microcontroller with 512kB of embedded high speed Flash memory. Due to their tiny size and low power consumption, these microcontrollers are ideal for applications where miniaturization is a key requirement, such as access control and point-of-sale.

- 32-bit ARM7TDMI-S microcontroller.

- 32 kb of on-chip static RAM and 512 kb of on-chip Flash program memory.
- Two (LPC2138) 8 channel 10-bit A/D converters
- Single 10-bit D/A converter
- Two 32-bit timers/counters
- 3.6V 100mA

B. MAGTEK Magnetic Card Reader

The Mini Magnetic Card Swipe reader family can read ISO and AAMVA card formats. The readers are available in various interface options. These readers provide a small package that is only slightly longer than a credit card. They can be mounted either with the self-mounting adhesive strips or by using the embedded threaded mounting hardware.



Fig. 2:

- Low-cost, high-quality design
- Customization available
- Bi-directional read capability
- ISO, ANSI and AAMVA compatible
- Up to 1,000,000 passes with ISO-conforming cards

C. Bluetooth

Bluetooth Module



HC-05 Host/Slave

Fig. 3:

HC-05 is a class-2 Bluetooth module with Serial Port Profile, which can configure as either Master or slave. You can use it simply for a serial port replacement to establish connection between MCU, PC to your embedded project and etc. The features of IC HC-05 Bluetooth module are as given below

- Bluetooth protocol: Bluetooth Specification v2.0+EDR
- Frequency: 2.4GHz ISM band
- Modulation: GFSK (Gaussian Frequency Shift Keying)
- Emission power: $\leq 4\text{dBm}$, Class 2
- Sensitivity: $\leq -84\text{dBm}$ at 0.1% BER

- Speed: Asynchronous: 2.1Mbps(Max) / 160 kbps, Synchronous: 1Mbps/1Mbps
- Security: Authentication and encryption
- Profiles: Bluetooth serial port
- Power supply: +3.3VDC 50mA

D. MAX232

- MAX232 is a driver IC which converts signals from an RS-232 serial port to signals suitable for use in TTL compatible digital logic circuits. The MAX232 is a dual driver/receiver and typically converts the RX, TX, CTS and RTS signals.
- The MAX232 is a low power dual driver/receiver featuring an onboard DC to DC converter, eliminating the need for $\pm 12\text{V}$ power supplies. The device only requires a +5V power supply

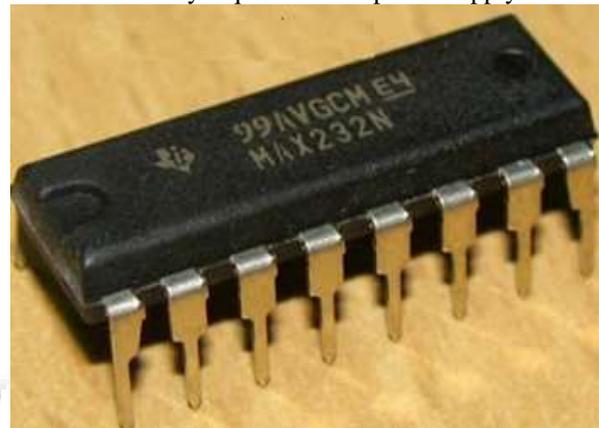


Fig. 4:

E. Relay

A single pole double throw (SPDT) relay is connected to port pin of the microcontroller through a driver transistor. The relay requires 12 volts at a current of around 100mA, which cannot provide by the microcontroller. So the driver transistor is added. The relay is used to operate the external solenoid forming part of a locking device or for operating any other electrical devices. Normally the relay remains off. As soon as pin of the microcontroller goes high, the relay operates. When the relay operates and releases. Diode D2 is the standard diode on a mechanical relay to prevent back EMF from damaging Q3 when the relay releases. LED L2 indicates relay on.

Working:

In this project, each authorized person will have his own magnetic card.

When he want to access the particular room, they enter in locker room by inserting magnetic card, then magnetic reader will read card number and send it's id to the smart phone by using Bluetooth module.

Smart phone will have application which will read the id search for the mobile number in the database then that id will be searched then he will send the random generated password at that moment to that receiver who is owner of the locker.

User need to enter that password which was received on his mobile. When this password get match then the user needs to enter again his own password then only locker or any system will get accessed.

Data of the user will get store in the database.

VI. ADVANTAGES

- Highly secured system.
- Fully automated system.
- To remove human error.
- To store record automatically.
- Less time consuming.

VII. APPLICATIONS

- In museum
- In bank
- Government offices
- Security offices

VIII. CONCLUSION

We have implemented a multilevel security system using Smartphone i.e. Bank locker security system using Magnetic card reader and Android web server. ARM 7 Processor (LPC 2138) is the heart of proposed system. It is a low cost, low in power consumption, compact in size and standalone system. Proposed system is more secure and less time consuming too.

IX. RESULT



Fig. 5:

This is the proposed system. If the authorized person wants to access the locker, then he will have to swipe magnetic card through the magnetic card reader, then magnetic reader will read card number and send its id to the smart phone by using Bluetooth module. Smart phone will have application which will read the id search for the mobile number in the database then that id will be searched then he will send the random generated password at that moment to that receiver who is owner of the locker. Then he will have to enter the password. If the password he has entered is correct, then system will come to know that user is authorized and the locker will get open.



Fig. 6:

If the person enter incorrect password then the system will come to know the user is invalid and the buzzer will be on. And the unauthorized user will be caught easily.

ACKNOWLEDGMENT

We are grateful to the reviewers for their helpful, informative and constructive comments.

REFERENCES

- [1] Shweta S.Joshi¹, Vinayak Ekke², Pankaj Yedurkar³, Ajit Lokhande⁴ "Locker Security System using GSM and Random Password" International Journal of Advanced Research in Electronics and Communication Engineering (IJARECE) Volume 4, Issue 04, April 2015
- [2] Di Ma, Nitesh Saxena, Member, IEEE, Tuo Xiang, and Yan Zhu IEEE "Location-Aware and Safer Cards: Enhancing RFID Security and Privacy via Location Sensing" TRANSACTIONS ON DEPENDABLE AND SECURE COMPUTING, VOL. 10, NO. 2, MARCH/APRIL 2013.
- [3] S.Ramesh¹, Soundarya Hariharan² and Shruti Arora³ 1Asst Prof- Dept of IEEE, 2,3Dept of ECE SRM University, NCR Campus Ghaziabad, India "Monitoring and Controlling of Bank Security System (Based on MICROCONTROLLER)" Volume 2, Issue 10, October 2012 4.
- [4] PRERNA MEDHI Dept .of Electronics & Communication Engineering Amity University, Noida "AN EFFICIENT MULTISTAGE SECURITY SYSTEM FOR USER AUTHENTICATION".
- [5] Verma, A. ; ECE Dept., ASET, Noida, India "A Multi Layer Bank Security System" Green Computing, Communication and Conservation of Energy(ICGCE),2013.
- [6] Sridharan, S. ; Dept. of Comput. Sci., Int. Inst. of Inf. Technol. - Bangalore, Bangalore, India "Authenticated secure bio-metric based access to the bank safety lockers" Information Communication and Embedded Systems (ICICES), 2014.
- [7] Khera, N. ; Deptt. of ECE, Amity Univ., Noida, India ; "Development of an intelligent system for bank security" Confluence The Next Generation Information Technology Summit (Confluence), 2014.