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Bank Locker Security System Using RFID and GSM Technology

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Abstract -The main goal of this paper is to design and implement a bank locker security system based on RFID and GSM technology which can be organized in bank, secured offices and homes. In this system only authentic person can be recovered money from bank locker. We have implemented a bank locker security system based on RFID and GSM technology containing door locking system using RFID and GSM which can activate, authenticate, and validate the user and unlock the door in real time for bank locker secure access. The main advantage of using passive RFID and GSM is more secure than other systems. This system consists of microcontroller AT89C52, RFID reader, GSM modem, keyboard, and LCD, in this system The RFID reader reads the id number from passive tag and send to the microcontroller, if the id number is valid then the person has an access to open the locker.
Keywords: GSM, RFID, locking system, Keyboard, Microcontroller, LCD display

I. INTRODUCTION

In this present age, safety has becomes an essential issue for most of the people especially in the rural and urban areas. Some people will try to cheat or steal the property which may endanger the safety of money in the bank, house, and office. To overcome the security threat, a most of people will install bunch of locks or alarm system. There are many types of alarm systems available in the market which utilizes different types of sensor. The sensor can detect different types of changes occur in the surrounding and the changes will be processed to be given out a alert according to the pre-set value. By the same time this system may not be good for all the time. In this paper we have implemented safety of the money in the bank locker, house, and office (treasury) by using RFID and GSM technology which will be more secure than other systems. Radio-frequency identification (RFID) based access-control system allows only authorized persons to open the bank locker with GSM technology. Basically, an RFID system consists of an antenna or coil, a transceiver (with decoder) and a transponder (RF tag) electronically programmed with unique information. There are many different types of RFID systems in the market. These are categorized on the basis of their frequency ranges. Some of the most commonly used RFID kits are low-frequency (30-500 kHz), mid-frequency (900 kHz-1500MHz) and high-frequency (2.4-2.5GHz)[1]. The passive tags are lighter and less expensive than the active tags [2]. Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication. GSM is a common European mobile telephone standard for a mobile cellular radio system operating at 900 MHz In the current work, SIM300 GSM module is used. The SIM300 module is a Triband GSM/GPRS solution in a compact plug in module featuring an industry-standard interface. It delivers voice, data and fax in a small form factor with low power consumption. [3].in this paper we have designed and implemented a bank locker security system based on RFID and GSM technology. In this system only authentic person can be recovered money from bank locker.

II. EXISTING METHOD

Manual locking system is the one of the existing methods which is widely used by the banking system. It is insecure when the key was lost and manual interference. One more conventional method is digital locking system it is also insecure if any one hacks the password.

III. PROPOSED METHOD

In this proposed work, the RFID reader reads the data from tag and send to the microcontroller, if the card is valid then microcontroller display the account holder name on the LCD display. Then the locker will be opened. If the card is invalid then will start ringing and an SMS is send to the manager using GSM MODEM. When the ID number is invalid then microcontroller sends an SMS that SOMEONE ENTERED IN YOUR BANK LOCKER-SBI. If anyone tries to break the door then magnetic sensor senses,

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buzzer starts ringing and sends an SMS to the manager. This method is simple and more secure than other system.

IV. BLOCK DIAGRAM

The block diagram of Bank locker system based on RFID and GSM technology is shown in the figure5.1. It comprises the power supply section, keyboard, RFID Reader, AT89C51 microcontroller, MAX232driver, relay driver and GSM modem, LCD. The GSM board has a valid SIM card with sufficient recharge amount to make outgoing calls. The circuit is powered by regulated +5v dc.

The RFID cards will be read by using RFID card reader antenna and this information will be given to micro controller by using max 232which is used to convert all RS232 logic levels to TTL logic levels. Messaging will be done by using GSM MODEM and the data will be displayed in LCD. The buzzer and buzzer driver will be connected to micro controller and motor and motor driver are provided to bank locker.

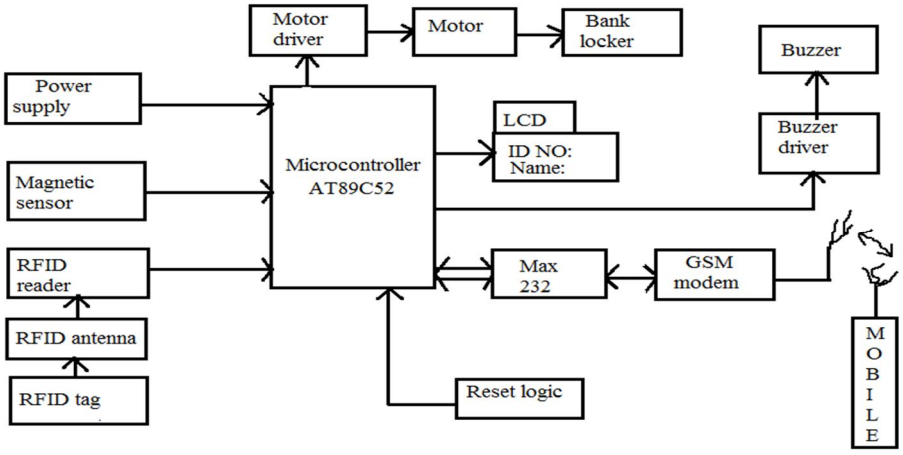


Fig:4.1. Block diagram of bank locker security system

V. CIRCUIT DESCRIPTION.

A. Circuit Diagram

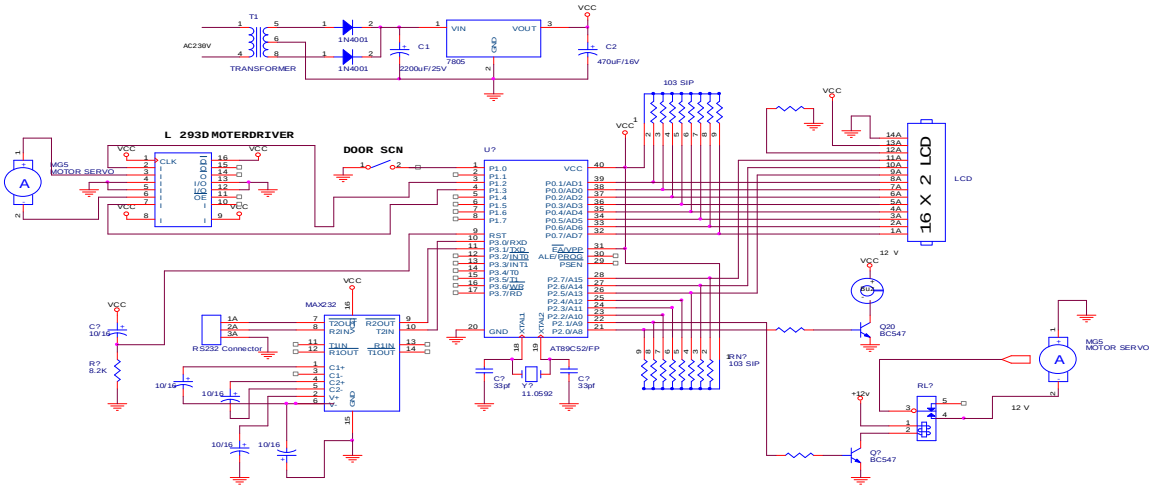


Fig: 5.1.circuit Diagram

1) Working: In this we are using the 230-12v step down transformer it is down converted to 16.8v which is root 2times of the initial voltage. This voltage is applied to the full wave rectifier, it contains two diodes(D1N4007) which forms an AC signal. It is applied to the filter capacitor which converts ac to pulsating dc. Then it is applied to 7805 voltage regulator which maintains 5v constant voltage. If any ripples are present they are cleared by 100pf capacitor. When an RFID card is placed on an RFID antenna using reader the data present in the tag is read. Then data is send to the microcontroller. If it is valid then name of the authorized person is

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displayed on lcd and motor driver drives the motor to open the gate. If the data is invalid the motor driver rotates in the opposite direction, which means closing of gates with in provided time delay. The data is sent to GSM modem through MAX232 interface. RS232 provides serial interface between GSM and MAX232. Crystal oscillator used here is made of quartz material to provide sustained oscillations; it operates at 11.052MHz frequency. The reset logic is used to clear the previous data present in the microcontroller.

VI. HARDWARE ASSEMBLING AND TESTING

First step, we need to make single side PCB layout of the Bank locker system based on RFID and GSM technology for testing the circuit, proceed as follow

After assembling all the components on the PCB ,connect TX and RX pins of the GSM modem to pins 13 and 14 of MAX 232 and RFID Reader, respectively and insert a valid SIM in the card holder of the GSM modem.

Connect ground pins of the GSM modem and RFID to the ground rail of the circuit.

This projects are implemented and tested successfully by us.

This system is very useful for bank locker, office, homes to keep the money safely

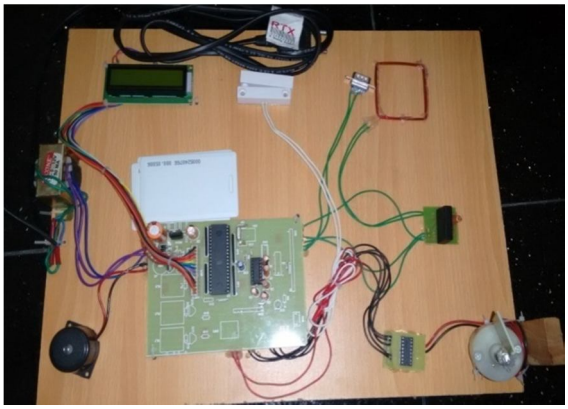


Fig: 6.1. Hardware implementation

VII. RESULTS



Fig :7.1 Reading RFID card by using RFID reader



Fig :7.2 Displaying the authorized person name

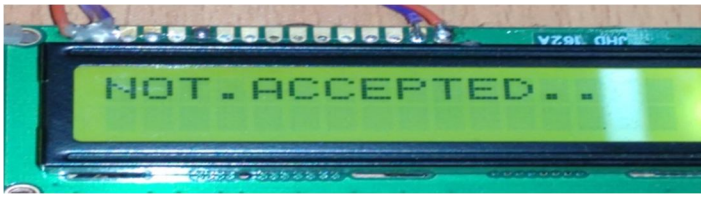


Fig :7.3 Displaying that unauthorized person try to open the door

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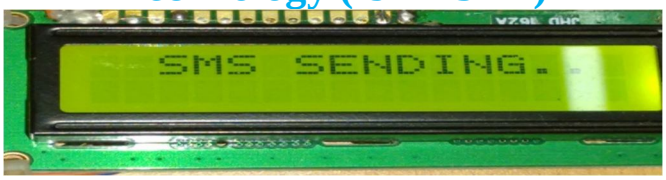


Fig :7.4 Sending SMS to bank manager using GSM modem

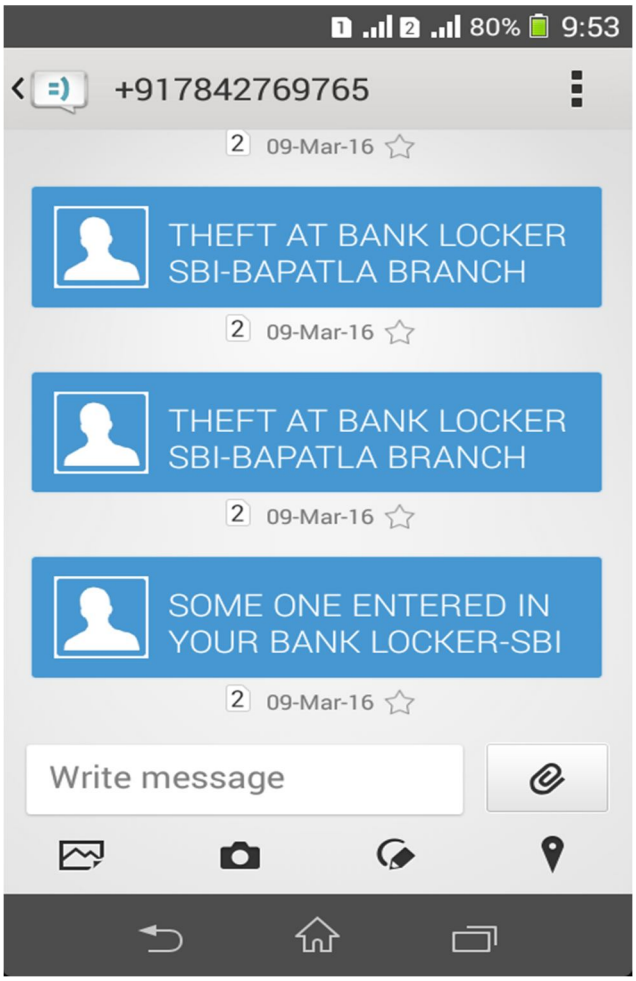


Fig :7.5Messages To Bank Manager When Unauthorized Entered Into Bank

VIII. CONCLUSION

Implemented a Bank locker security system using passive RFID and GSM. It is a low cost, low in power conception, compact in size and standalone system. The microcontroller sends sms to the manager for un-authorized entry and rings if anybody tries to break the based locker. This paper, is planned to a develop security system based on 3G camera for visual identification of the person.

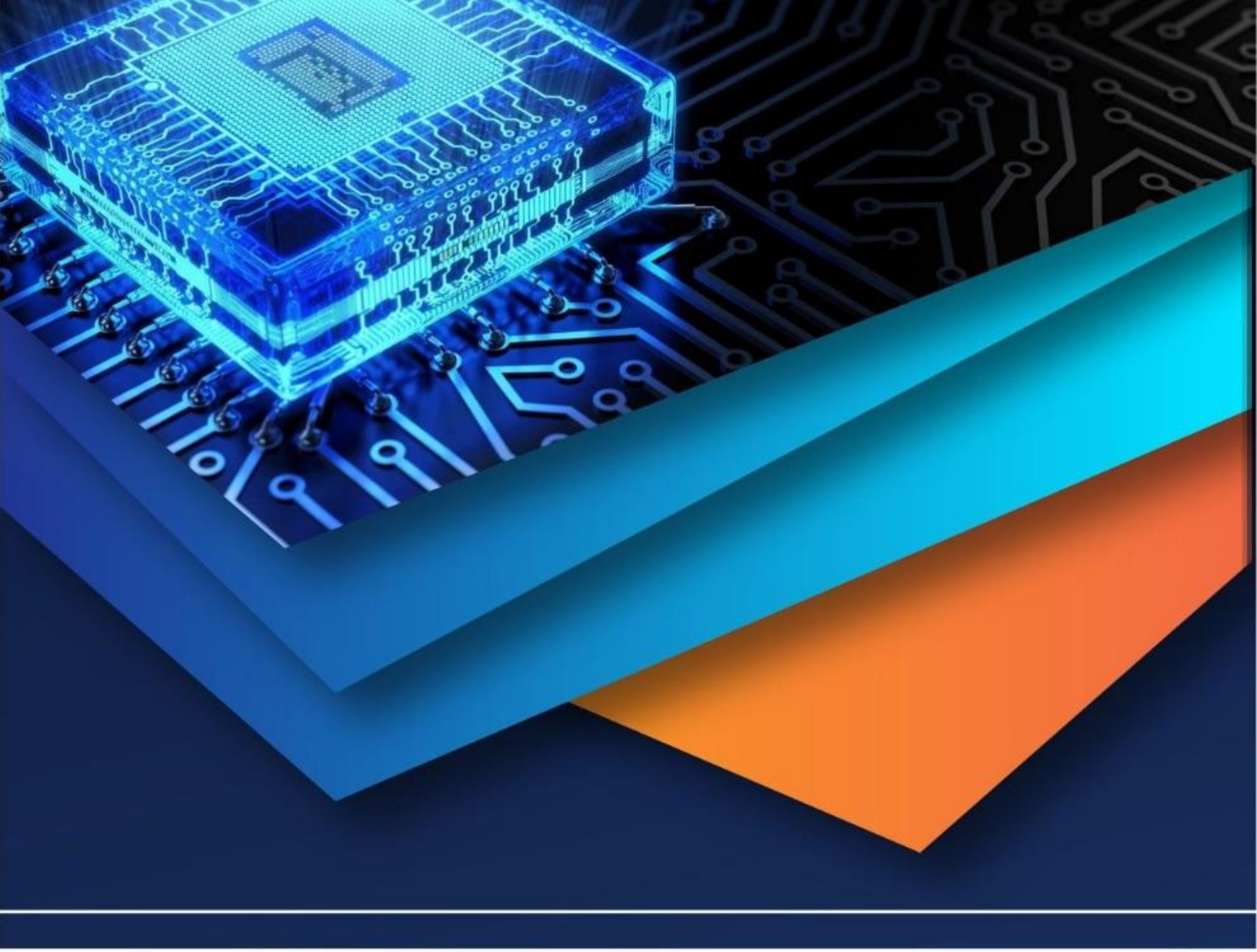
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