Dual Secured Smart Bank Locker Security System

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ABSTRACT: The main objective of this paper is to design and implement a highly dual secured reliable smart bank locker security system based on GSM technology, laser protection and OTP. This can be organized in bank, offices(treasury), schools and homes. In this system only the authentic person can operate the lock and collect the important documents, jeweler or money from the lockers. In our proposed system. ThePIC16F886 microcontroller is used in first panel and PIC16F887microcontroller IC is used in the second panel here because it performs multiple numbers of operations at a time. The main advantages of GSM technology, laser protection and password is highly secure and reliable locker system than any other locker systems. The goal of this paper is to provide dual security so that any user can access the bank locker at any time.

KEYWORDS: Microcontroller, GSM technology, Keypad, LCD Display, Basic laser light, LDR, Vibration sensor, DC Motor, and Buzzer.

I. INTRODUCTION

In the real world, peoples are more concern about their safety for their valuable things like jewelry, money, important documents etc. So, the bank lockers are the safest place to store them. The advent of fast growing technologies makes users to have high security systems with electronic identification options. These identification technologies include Bank Lockers and ATM as well as other intelligent cards, user IDs and password based systems, and so on. But, unfortunately these are unsecure due to hacker attacks, thefts, and forgotten passwords. So, to increase the security of the whole system the laser protection is used for the surface protection other than other security.

We are implementing this bank locker security system using GSM Technology laser protection and password based security system which provide most efficient and reliable security system than the traditional system. Globalsystem for mobile communication (GSM) is mainly used for sending or receiving data such as voice and message. Through the use of GSM call is forward to the police station.ThePIC16F886 microcontroller IC is used in first panel and PIC16F887 microcontroller IC is used in the second panel here because it performs multiple numbers of operations at a time. we are using SIM800L GSM module to send the message or call on nearest police station.

II. EXISTING SCENARIOS

Especially all Indian banks use the old security system as compared to international banks, they are applying a mechanical arrangement to protect the lockers with the aid of two keys all, out of which one is for authorized person and another is with bank authority. When both keys are placed simultaneously the locker can be operated but sudden failure in the gears of the system or loss of keys occurs, then user has to face many difficult situations in this addition this system is time consuming also. Enormously growing banking technology has altered the way banking activities are treated with. Security measures at banks can play a critical, contributory role in preventing attacks on customers. These standards are of paramount importance when considering vulnerabilities &causation in civil litigation and banks must meet certain criteria in order to guarantee a dependable and secure banking environment for their clients.

A. Security using motion sensor: -

One of the key player technologies in security system is motion sensor. The motion sensor is a device used to detect motions or different movements in the area around it. The main function of such sensors is to detect intruder when there is no one in organization or home or any institute. Motion sensors stand guard by alerting the control panel system by sending signals whenever the sensor get tripped by changes in motion. There are various types of motion sensors like passive motion sensor and active motion sensor. Active motion sensor emits various energy signals like sound signals, infrared signal, and microwave signal. Also, few sensors use vibrations, ultrasonic waves to detect motions.
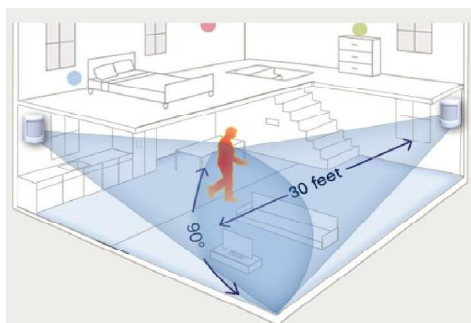

Fig Use of Motion Sensor

B. Security using LDR and GSM: -

In this system, GSM and LDR is used.LDR a light dependent resistor also known as photo resistor works on the principle of photoconductivity. The resistance of LDR decreases with increasing intensity of light when light is incident on it. Lockers in banks are kept in strong room where there is no sufficient light. Also, when locker is closed there is no light inside locker. For security of locker, LDR circuit is designed to detect whether locker is open or close.
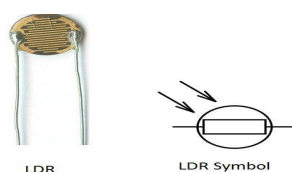

Fig. LDR

IV. PROPOSED METHOD

In this proposed method, there are two panels created in which one is placed at outside the bank locker room and another is placed inside the bank locker room. The first panel consists of microcontroller, keypad, LCD and power supply. The second panel consist of the microcontroller, keypad, LCD, GSM module, Vibration sensor, laser protection.

When the user passes through the first panel than the user has to enter the account number of the particular bank. Then the microcontroller checks the account number, if the account number exist than door opens and it allows the user to enter in the bank locker room. Then after entering into the locker room the user has to pass through the second panel for authentication the second panel the user has to enter the pin code provided by the bank to a particular user. If the pin code or password enter by the user is correct than the locker gets open but if the password or pin code is incorrect than the call is placed to the police station and Alarm system gets activated. In the case of robbery, the laser protection and
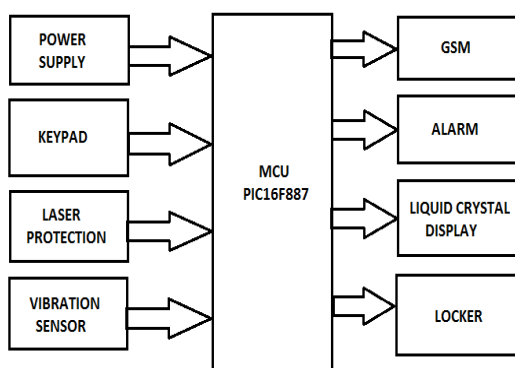
vibration sensor helps in identifying the misshaping done in the locker room. The alarm gets activated and quickly the call is placed through the GSM module.

V. BLOCK DIAGRAM
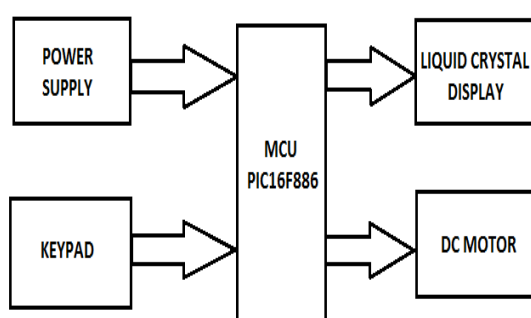
FIRST PANEL

SECOND PANEL

VI. GLOBAL SYSTEM FOR MOBILE COMMUNICATION (GSM)

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. This system is basically a controller based access-control system which allows only authorized person to access the locker with GSM technology.
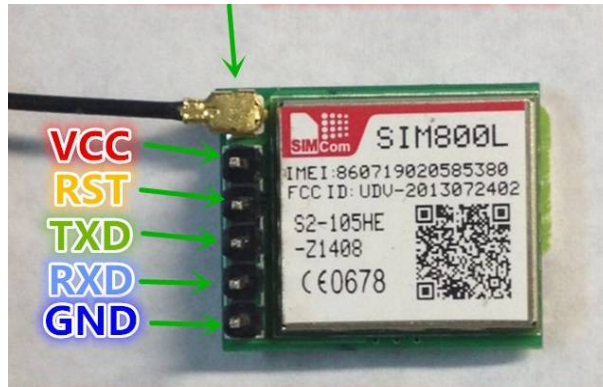
Fig.4 GSM

VII. LCD (LIQUID CRYSTAL DISPLAY)

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs.
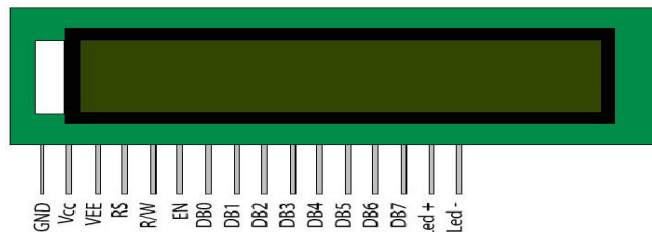
Pin Diagram

Fig.2 4x2 LCD

VIII. KEYPAD 4*4

A keypad is a set of buttons arranged in a block or "pad" which bear digits, symbols or alphabetical letters. Pads mostly containing numbers are called numeric keypad.Numeric keypads are found on alphanumeric keyboards and on other devices which require mainly numeric input such as calculators, push-button telephones, vending machines, ATMs, Point of Sale devices, combination locks, and digital door locks.Many devices follow the E.161standard for their arrangement.

Fig.3 Keypad

IX. VIBRATION SENSOR

Vibration sensor is work to response to hard work to the vibration sensor module vibration switch sw-420 is based on the vibration sensor sw-420 and comparator lm393 to detect if there is any vibration that beyond the threshold.

the threshold can be adjusted by the on-board potentiometer. when this no vibration, this module output logic low the signal indicates led light, and vice versa.
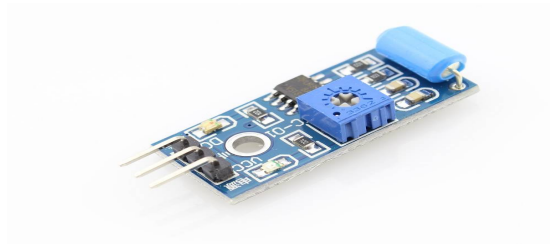

Fig.4 Vibration sensor

X. LASER DIODE MODULES

Laser Diode Modules are used in a variety of applications that require small sizes in addition to low power consumption with long operating lifetimes. Laser Diode Modules are lasers lab or OEM integration. Laser Diode Modules are ideal for applications such as life science, industrial, or scientific instrumentation, in addition to laser line generation or machine vision. Laser Diode Modules are available in a wide variety of wavelengths, output powers, or beam shapes.

Fig.5 Laser diode

XI. FLOW DIAGRAM

To implement the actual algorithm for performing the two-step verification the microcontroller PIC16F886 & PIC16F887 has to follow the step give in the flow chart. The GSM, keypad, laser, vibration sensor & alarm and other devices are interface with microcontroller.
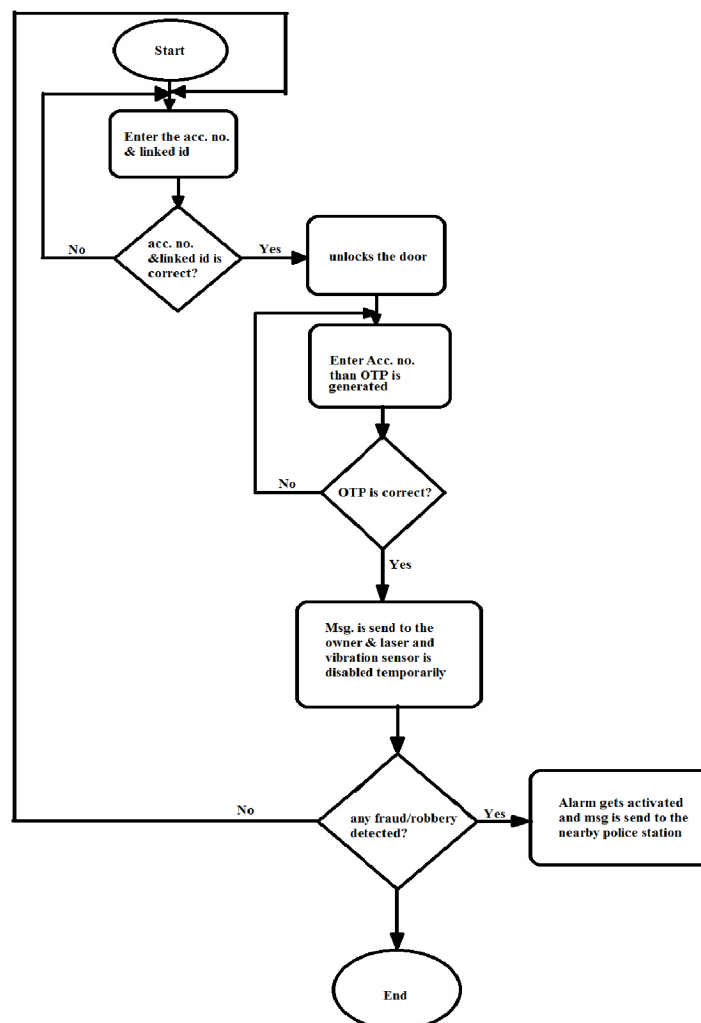
XI. WORKING PROTOTYPE

The working prototype of the dual secured smart bank locker security system is shown below.

Fig.7 first panel and second panel

XII. RESULT & CONCLUSION

Thus, by implementing this Dual Secured Smart Bank LockerSecurity Systemproject using Laser protection, Vibration sensor, OTP and GSM technology money, jewellery and any other important documents of a every citizen we can make at safe custody. Using this smart technology a authorized person can only open the lock and collect the money, jewellery and any other important documents. This is a low cost equipment, low in power consumption, compact in size, wide operating range, highly secured and reliable stand-alone unique system.

XIII. APPLICATIONS

This project is used in following places: In all bank for Lockers, In all bank ATMs, In house, Schools treasury, Colleges treasury and in industries, VIP vehicles, in hospital, offices.Vehicle Security Applications.

XIV. FUTURE SCOPE

In addition to this the future scope of this project is to develop Dual smart bank Locker security system based on "GSM", "laser protection", OTP password & keypad toScanning for visual identification of the person.

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