SECURE PASSWORD PROTECTED BANK LOCKER CONTROLLING USING MOBILE TECHNONOLIES

**K.SHALINI[1], Dr. D.NAGESHWAR RAO[2], B.PARANJAY[3],
B. ANJANEYULU[4],K.KRINSHNADEEPTHI [5]**

[1]ASSISTANT PROFESSOR OF ECE DEPARTMENT,[2]HOD OF ECE,[3,4,5]TKRCOLLEGE OF ENGINEERING AND TECHNOLOGY,ECE DEPARTMENT,HYDERABAD,INDIA

Abstract- The primary goal of this project is to gain access to bank lockers using mobile phone technology and a digital password. The project includes a microcontroller, a GSM modem, and an LCD display.A GSM modem is linked to the microcontroller. This device communicates with both a mobile phone and a microcontroller. The code sent by GSM to the mobile phone is used as the password to open the locker.The system can be accessed quickly and easily by the user. This kit is extremely beneficial to illiterates. It provides high security for bankers, homes, and office workers. The application programme for the microcontroller will be written in embedded 'C' and stored in the microcontroller's flash memory.

I. INTRODUCTION

The main goal of this project is to use a digital password to gain access to bank lockers. Microcontroller, keypad, stepper motor, and LCD are all part of the project. keypad is used to enter the password. The accessing of the door can be controlled using microcontroller interfaced with stepper motor.

The microcontroller can only operate at 5 volts DC. The regulated power source provides this 5v. The system can be accessed without difficulty by the user. Illiterates will benefit greatly from this set. It provides great security for bankers, homeowners, and office workers.

The microcontroller software program will be written in embedded 'C' and saved in the microcontroller's flash memory.

Features:

1. Provides protection for the home.

2. Extremely sensitive

3. Low cost

4. Reliable and simple.

An embedded system is a software and hardware combination that performs a specific task. Microprocessors and microcontrollers are two of the most common embedded devices. Microprocessors are known as general-purpose processors because they simply accept data, process it, and output the results. A microcontroller, on the other hand, does more than accept data as inputs. The project, which uses the PIC16F72 microcontroller, is a unique project that secures bank lockers by allowing access only when the key password is valid. This project can be used in corporate offices, industries, and other places where admission is restricted to a specific number of individuals

II.PROPOSED SYSTEM

A. Block diagram

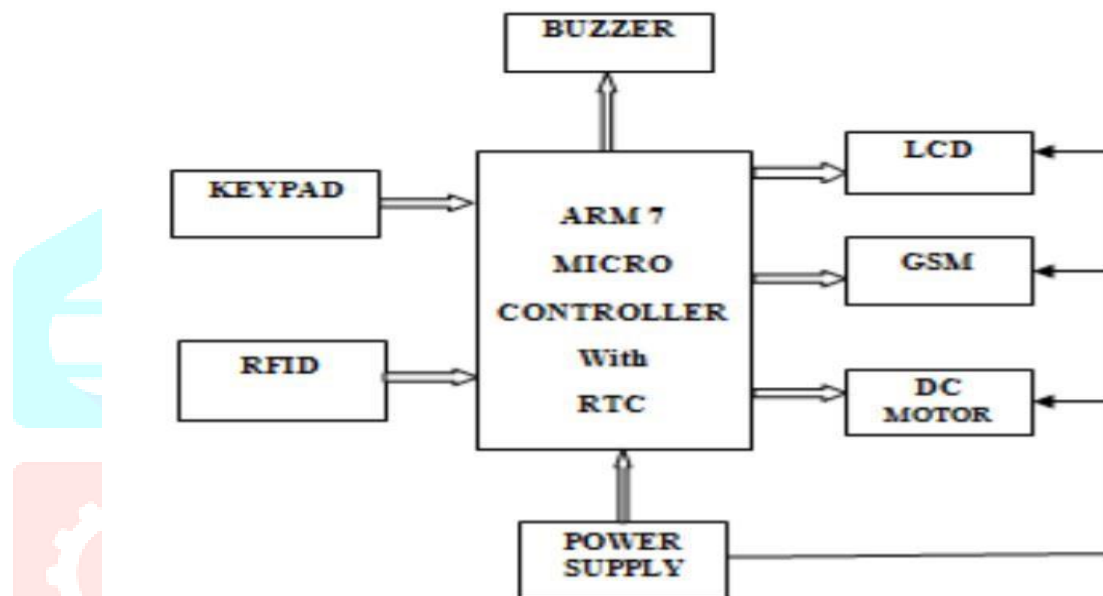The project block diagram and the design concept of independent modules are discussed below.

FIG 3.1: Block diagram of Microcontroller based bank lockers safety system using digital   key password

The following are the essential components of this project:

1. Microcontroller (16F877A)

2 Power supply that is regulated (RPS)

3. LEDs

4. Motorized stepper

5. LCD Monitor 6. Keypad

B. Microcontroller

Pic16f877 is a microcontroller with 40 pins. There are five ports on the device: port A, port B, port C, port D, and port E. The ports' pins are all used to connect input and output devices.

Port A has six pins numbered A0 to A5.

Port B has eight pins numbered B0 to B7.

Port C has eight pins numbered C0 to C7.

Port D has eight pins numbered D0 to D7.

E0 to E2 are the three pins that make up Port E. The remaining pins are required and should not be used for connecting input/output devices.

Pin 1 is the master clear pin (MCLR), often known as the reset pin.

Pins 13, 14, and 15 are used to connect a crystal oscillator to generate a frequency of roughly 20MHz.

Vdd(+) and Vss are supplied by pins 11, 12 and 31 and 32, respectively (-)

PIC 16F877A 368-byte RAM, 256-byte EEPROM

I/O port A,B,C,D,E,F,G,H,I,J,K,L

Microchip's PIC16F877A specification can be found here. A single microcontroller that is both brilliant and simple to assemble and programme, as well as being inexpensive. It was under ten dollars. The good news is that a single unit can be acquired for only ten dollars. Unlike some other integrated circuits, which need a minimum order quantity of 1000 or 2000 units to be purchased, you will be able to buy it.

A PIC16F877A microcontroller can be programmed and wiped an unlimited number of times. Some estimated 10,000 times. If you programme 20 times a day and download your code into the PIC, you can do it for 500 days, or more than a year!

The PIC microcontroller has five input/output ports: port A, port B, port C, port D, and port E. Each port has a distinct purpose. The majority of them can function as I/O ports.

C. Regulated Power Supply
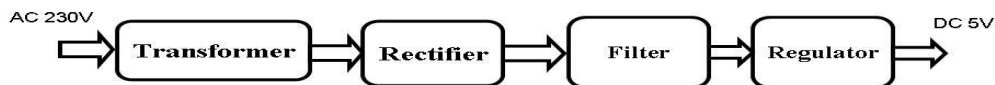
Regulated Power supply

Fig 4.4: Regulated Power Supply

A transformer is a device that uses inductively coupled conductors to transmit electrical energy from one circuit to another without affecting the frequency. A changing current in the primary winding causes a changing magnetic flux in the core of the transformer, and consequently a changing magnetic field in the secondary winding. In the secondary winding, the variable magnetic field causes a varying electromotive force (EMF) or "voltage." Mutual induction is the term for this phenomenon. When a load is connected to the secondary, an electric current flows via the secondary winding, transferring electrical energy from the primary circuit to the load via the transformer. This field is shaped like a bar magnet and is made up of force lines.

In a step down transformer, the primary winding induces greater flux than the secondary winding, and because the secondary winding has fewer turns, it accepts fewer fluxes and releases less voltage.Rectification is the conversion of an alternating current to a pulsing direct current. Rectifiers are used for rectification.

A rectifier is an electrical device that performs rectification, or the conversion of alternating current (AC) to direct current (DC). Rectifiers are used in a variety of applications, including power supplies and radio signal detectors. Solid-state diodes, vacuum tube diodes, mercury arc valves, and other components can be used to make rectifiers. An inverter is a device that can do the reverse function (converting DC to AC).

The difference between the terms diode and rectifier when only one diode is used to rectify AC (by blocking the negative or positive component of the waveform) is solely one of usage, i.e., the term rectifier describes a diode that is used to convert AC to DC. Almost all rectifiers use many diodes in a precise arrangement to convert AC to DC more efficiently than a single diode could. Vacuum tube diodes and copper (I) oxide or selenium rectifier stacks were utilised before the development of silicon semiconductor rectifiers

D. LED

A semiconductor light source is a light-emitting diode (LED). LEDs are rapidly being employed for lighting and as indication lamps in a variety of applications. Early LEDs generated low-intensity red light when they were first introduced as an useful electrical component in 1962, but newer versions are available in visible, ultraviolet, and infrared wavelengths, with extremely high brightness. Figures 3.4.1 and 3.4.2 depict the internal structure and portions of a lead, respectively.
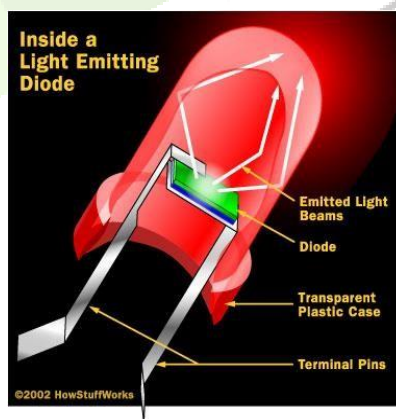

Fig 4.12: Inside a LED

E. LCD Display

LCD display is one of the most frequent devices connected to a microcontroller. 16x2 and 20x2 LCD screens are two of the most frequent LCDs attached to microcontrollers. This translates to 16 characters per line divided by two lines and 20 characters per line divided by three lines.
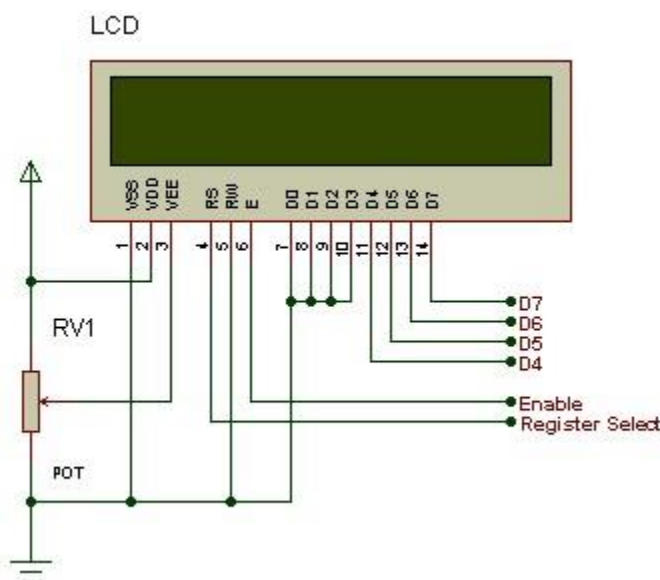

Fig4.17: LCD Pin Diagram Basic 16x2 Characters LCD

The LCD requires three control lines and either four or eight data bus I/O lines. The user can choose whether the LCD should work on a 4-bit or 8-bit data channel. The LCD will require a total of 7 data lines if a 4-bit data bus is employed (3 control lines plus the 4 lines for the data bus). The LCD will require 11 data lines if an 8-bit data bus is employed (3 control lines plus the 8 lines for the data bus).

Enable" is the name of the EN line. This control line is used to inform the LCD that data is being sent to it. To send data to the LCD, our application must first set the other two control lines and/or put data on the data bus. Bring EN high (1) and wait for the least length of time necessary by the LCD datasheet (this varies from

LCD to LCD), then bring it low (0) again when the other lines are ready. The RS line stands for "Register Select." The data should be considered as a command or special instruction when RS is low (0). (such as clear screen, position cursor, etc.). The data sent when RS is high (1) is text data that should be displayed on the screen. To display the letter "T" on the screen, for example, we would set RS high.

The "Get LCD Status" command will return two pieces of information; the information we need right now can be found in DB7. In conclusion, when we execute the "Get LCD Status" command, the LCD will immediately raise DB7 if it is still performing a command, or lower DB7 if it is no longer occupied. As a result, our software can query the LCD until DB7 falls low, signalling that the LCD is no longer in use. We are now free to continue and provide the following command.

F. Keypad

A keypad is a collection of buttons placed in a block or "pad" that commonly display digits and other symbols, as well as a complete alphabetical alphabet. It's also known as a numeric keypad if it largely comprises numbers. Many alphanumeric keyboards and other devices that need mostly numeric input, such as calculators, push-button telephones, combination locks, and digital door locks, have keypads.

Fig4.19: 3 key button membrane keypad

A calculator's keypad holds the numerals 0 through 9, as well as the four arithmetic operations, the decimal point, and other more complex mathematical functions, from bottom to top.

Keypads are changeable parts of mobile phones that sit on the phone's sensor board. A little joystick with a cap that matches the keyboard is found on several multimedia mobile phones. A calculator's keypad holds the numerals 0 through 9, as well as the four arithmetic operations, the decimal point, and other more complex mathematical functions, from bottom to top.

G.   GSM (Global system for mobiles)

The gsm standards for global system for moblie. In December 1991, it was initially deployed in Finland. [2] By the mid-2010s, it had established itself as a global standard for mobile communications, with a market share of over 90% and operations in over 193 nations and territories. 2G networks were created to replace analogue cellular networks of the first generation (1G). GSM was designed to be a digital, circuit-switched network that could handle full duplex voice calls. Data communications, first via circuit-switched transport, then via packet data transmission via General Packet Radio Service (GPRS), and Enhanced Data, were added over time.
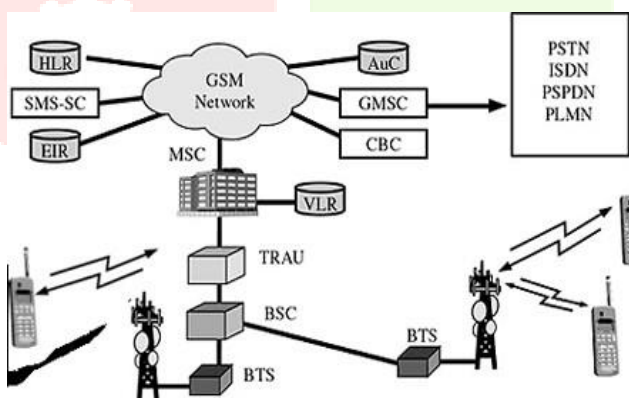
Fig4.20:The   diagram   of   the   GSM Network is shown

III. CONCLUSION

All the features of hardware components has been developed in it. every module should be present and reasoned out and carefully placed with best working of the unit. Secondly, using highly advanced IC's with the help of growing technology, the project has been successfully implemented. Thus the project has been successfully designed and tested.

In the study a security system is proposed by using passive components like locker, gsm etc... low in power conception, compares in standalone system. The microcontroller controls the entire process. The proposed system can be used in other places such as personal places.

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