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Password Based Doorlock System Using Microcontroller

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ABSTRACT: The purpose of this project is to provide security at house, ATM, office etc. in this system the user will have to register a unique password. The information will be stored in data base. Whenever the right password will be received, the controller will accordingly give instruction to dc motor. Dc motor will perform the action on door unlocking. We want to utilize the electronic technology to build an integrated and fully customized home security. Security is a prime concern in our our day today life. Assess control for door form avital link in an assess control system that allows only person to assess a area individual protects his /her valuable belongings and documents and tries to make it as secure as possible. Increase in robbery has resulted in greater demand for secure storage system.

KEYWORDS: Motor, Microcontroller, LCD, Keypad

I.INTRODUCTION

Many times we forgot to carry the key of our home. Or sometimes we come out of our home and door latch closes by mistake. In these cases it is really difficult to get inside the house. This project is designed to solve this purpose. Main concept behind this project is of a door-latch opening using a password entered through keypad. As well as turning on the Buzzer when password is entered wrong. Today people are facing more problems about security in all over world, nowadays security is the most essential issue everywhere in the world so security of everything gains higher and higher importance in recent years. The main component in the circuit is 8051 microcontroller. Here, 4*4 keypad is used to enter the password. The entered password is compared with the predefined password. If it is correct password, the system opens the door by rotating door motor and displays the status of door on LCD. If the password is wrong then door remains closed and displays —password is wrong on LCD. It can be used at organizations to ensure authorized access to highly secured places. With a slight modification by replacing the motor driver with a relay driver, this circuit can be used to control the switching of loads through code. This circuit can be also modified by using EEPROM chip interfaced to the microcontroller and store the entered password in the chip. Such an automatic lock system consists of electronic control assembly which controls the output load through a password. This output load can be a motor or a lamp or any other mechanical/electrical load.

II.LITERATURE SURVEY

LiaKameliaetal [1] this paper gives overall idea of how to control home security for smart homes especially for door key locks. They used android based door lock system for indoor and outdoor key lock system. It also provides a secure system for Android phone users. This project based on Android platform which is Free Open Source i.e. it is easily available. So the implementation rate is inexpensive and it is reasonable for a common person. The wireless Bluetooth connection in microcontroller permits the system installation in more easy way. The system has been designed successfully and aimed to control the door condition using an Android phone which is Bluetooth enabled via Bluetooth HC-05. Smart Home is the term commonly used to define a residence that uses a home controller to integrate the residence's various home automation systems.

ShilpiBanerjeetal[2] this paper gives detail information about system in which we can unlock the door by using pre-decided password. It increases the security level to prevent an unauthorized unlocking done by attacker. In case the user forgets the both passwords, this system gives the flexibility to the user to change or reset the password. This automatic password based lock system will give user more secure way of locking-unlocking system. First the user combination will be compared with prerecorded password which are stored in the system memory.



Arpita Mishra [3] this paper proposed idea that in day to day life security of any object or place password based system plays a major role. This paper has considered about this and created a secure access for a door which needs a password to unlock the door. Using keypad it enters a password to the system and if entered password is correct then door is open by motor which is used to rotate the handle of the door lock. When it is entered incorrectly at the first time it will give three attempts to enter the password. Some extra features like adding new users and changing old password are configured by the keypad as usual. To display messages to the user LCD module is used. Now a day's most of the systems are automated in order to face new challenges to achieve good results. These systems have less manual operations, so the flexibility, reliabilities are high and accurate are there characteristics. Hence every field prefers automated control systems especially in the field of electronics. The goal of the paper is to develop a unique system through mobile technology which can control various units of the houses, industries, and also provides a security system.

R.Piyareetal [4] This paper has proposed design and implementation of a low cost, flexible and wireless solution for home automation, especially on/off the lamp and to on/off the B. LCD: We are going to use 16x2 alphanumeric Liquid Crystal Display (LCD) which means it can display Alphabets along with numbers on 2 lines each are containing 16 characters. Figure 2. LCDtelevision automatically. However, this is a basic system without advanced features like integration of RTOS, and also not has light sensors that are used to intelligently control the home appliances without human intervention. This system is designed to improve the standard living in home. The remote control function by smart phone provides help and assistance especially to disabled **D. Javaleet.aland elderly [5]** this paper gives basic idea of how to control various home appliances and provide a security using microcontroller phone/tab. This project is based on microcontroller and microcontroller the overall implementation cost is very cheap and it is affordable by a common person. Looking at the current scenario they have chosen Android platform so that most of the people can get benefit. The design consists of Android phone with home automation application.

III.METHODOLOGY

Electronic Code Lock System Circuit Design: Password Based Door Locking System design uses five major components – a Microcontroller, an L293D Motor Driver, a DC motor, a 4x4 matrix keypad and an LCD. Here AT89C52 Microcontroller is used and it is an 8-bit controller. This controller requires a supply voltage of +5V DC. In order to provide regulated 5V DC voltage to the controller we need to use 7805 power supply circuit. We can use 9V DC battery or 12V, 1A adaptor as a power source. Reset Circuit Design: The reset pin of the microcontroller is kept active till the power supply is in the specified range and a minimum oscillation level is maintained. In other words to ensure the supply voltage does not falls below the threshold level of 1.2V and the reset pulse width is greater than 100ms (recommended for 89C51), we select the values of resistor and capacitor such that $RC \geq 100ms$. Here we select a 10K resistor and a 10uF electrolyte capacitor. Oscillator Circuit Design: A crystal oscillator is used to provide external clock signal to the microcontroller. To ensure smooth operation, we connect two ceramic capacitors ranges from 20pF to 40pF. This crystal oscillator is connected between pin 18 and 19 of the microcontroller. Compilation of Microcontroller Code: Once the circuit is designed and drawn on a piece of paper, the next step is to write and compile the code. Here we select the Kiel μ Vision software to write the program in C language. Prior to writing the code, general steps needs to be followed like creating a new project

IV. BLOCKDIAGRAM

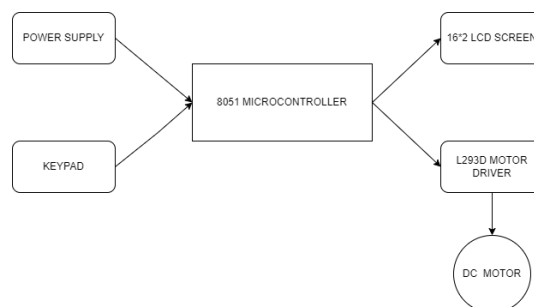


Figure 1 Block Diagram



Microcontroller: This is the CPU (central processing unit) of our project. We are going to use a Microcontroller of 8051 family. The various functions of microcontroller are like:

- Reading the digital input from Keypad
- Sending this data to LCD so that the person operating this this project should read the password.
- Sensing the password using keypad and to check whether it is a correct password or a wrong password and rotate the stepper motor if the password entered is a correct password

KEYPAD: User will enter the password using the keypad. In our project we are using 4*4 matrix to provide the input.

LCD : We are going to use 16x2 alphanumeric Liquid Crystal Display (LCD) which means it can display Alphabets along with numbers on 2 lines each are containing 16 characters

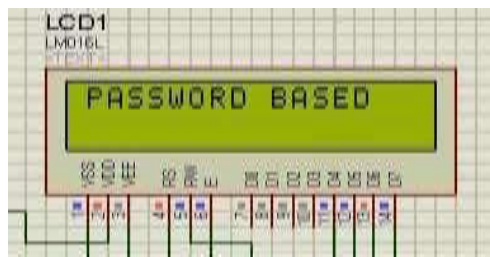


Figure 2. LCD

MOTOR DRIVER IC(L293D): The Actuator's are those devices which actually gives the movement or to do a task like motor's. In the real world there are various types of motors available which works on different voltages. So we need motor driver for running them through the controller. To get interface between motor and microcontroller. We use L293D motor driver IC in our circuit. The Device is a monolithic integrated high volt- age, high current four channel driver designed to accept standard DTL or TTL logic levels and drive inductive loads (such as relays solenoids, DC and stepping motors) and switching power transistors. To simplify use as two bridges each pair of channels is equipped with an enable input. A separate supply input is provided for the logic, allowing operation at a lower voltage and internal clamp di- odes are included. This device is suitable for use in switching applications at frequencies up to 5 kHz. The L293D is assembled in a 16 lead plastic package which has 4 Centre pins connected together and used for heat sinking The L293DD is assembled in a 20 lead surface mount which has 8 center pins connected together and used for heat sinking

V. CIRCUIT DIAGRAM OF PASSWORD BASED DOOR LOCK SYSTEM

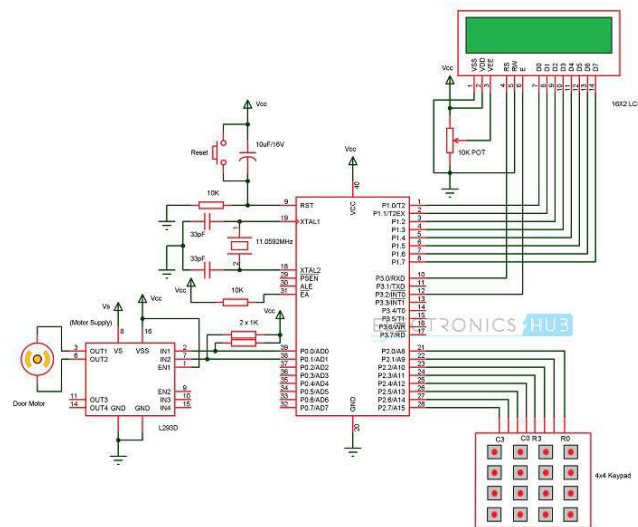


Figure3 Circuit Diagram



Password based door lock system using 8051 microcontroller circuit design uses five major components – a Microcontroller, an L293D Motor Driver, a DC Motor, a 4×4 Matrix Keypad and a 16×2 LCD. Here, an AT89C52 Microcontroller is used and it is an 8-bit controller. This controller requires a supply voltage of +5V DC. In order to provide regulated 5V DC voltage to the controller we need to use 7805 power supply circuit. We can use 9V DC battery or 12V, 1A adaptor as a power source.

Reset Circuit Design: The reset pin of the microcontroller is kept active till the power supply is in the specified range and a minimum oscillation level is maintained. In other words to ensure the supply voltage does not falls below the threshold level of 1.2V and the reset pulse width is greater than 100ms (recommended for 89C52), we need to select the values of resistor and capacitor such that $RC \geq 100\text{ms}$. Hence, we selected a $10\text{K}\Omega$ resistor and a $10\mu\text{F}$ electrolytic.
Oscillator Circuit Design: An 11.0592MHz crystal oscillator is used to provide external clock signal to the microcontroller. To ensure smooth operation, we need to connect two ceramic capacitors in the range of 30pF to 40pF. This crystal oscillator is connected between pin 18 and 19 of the microcontroller. Here, we **interfacing LCD, Keypad and Motor Driver:** First, a $10\text{K}\Omega$ Potentiometer is connected to the LCD Display's Contrast Adjust Pin (Pin 3). RS, RW and E of LCD are connected to P3.0, GND and P3.2 pins respectively. The eight data lines of the LCD are connected to PORT1. The four ROW pins of the Keypad are connected to P2.0 to P2.3 and the four COLUMN pins of the Keypad are connected to P2.4 to P2.7 pins respectively. The IN1 and IN2 of (1A and 2A) of the L293D Motor Driver are connected to PORT0 pins P0.0 and P0.1. Motor is connected between OUT1
Compilation of Microcontroller Code: Once the circuit is designed and drawn on a piece of paper, the next step is to write and compile the code. Here, we used the Keil μ Vision software to write the program in C language prior to writing the code, general steps needs to be followed like creating a new project and selecting the target device or the required microcontroller. Once the code is written, we need to save it with .c extension and then add it to the source file group under the target folder. The code is then compiled by pressing F7 key once the code is compiled, a hex file is created. In the next step, we use Proteus software to draw the circuit. The code is dumped into the microcontroller using an external programmer and Willar Software.

VI. PASSWORD BASED DOOR LOCKING SYSTEM CIRCUIT

Operation

Once the circuit is powered ON, microcontroller sends commands to the LCD to display “enter password” on LCD. Now we need to enter the password using the keypad. Once password is entered, it displays 5 stars on LCD to indicate that controller read password successfully. Now the controller compares the entered password with predefined password the password is matched, then the microcontroller makes P0.0 HIGH and P0.1 LOW, so the motor driver gets the input signals for forward motion of the motor. As a result, the Door Motor rotates in forward direction to open the door. After a delay of 10 seconds, the microcontroller makes P0.0 LOW and P0.1 HIGH, so the motor driver gets the input signals for reverse motion. As a result, the Door motor rotates in reverse direction to close the door. If the password is not matched, then microcontroller maintains both P0.0 and P0.1 LOW. Hence, the door motor is stationary so that door remains closed.

VII. PASSWORD BASED DOOR LOCK SYSTEM ALGORITHM

1. Initially, declare the PORT1 to LCD data pins and control pins (RS and E) to P3.0 and P3.2. Also, declare PORT2 to keypad. Also use P0.0 and P0.1 for motor driver.
2. Then, display the message “enter password” on LCD.
3. Now read the five digit password from the user.
4. Compare the entered password with the stored password.
5. If password is correct, then make P0.0 pin HIGH and P0.1 pin LOW to open the door. During this time, display “Door opening” on LCD.
6. After some time, make P0.0 pin LOW and P0.1 pin HIGH to close the door and after this display “Door closing” on LCD.
7. If the password is wrong, then display “Wrong Password” on LCD.
8. After some delay again ask to enter password.

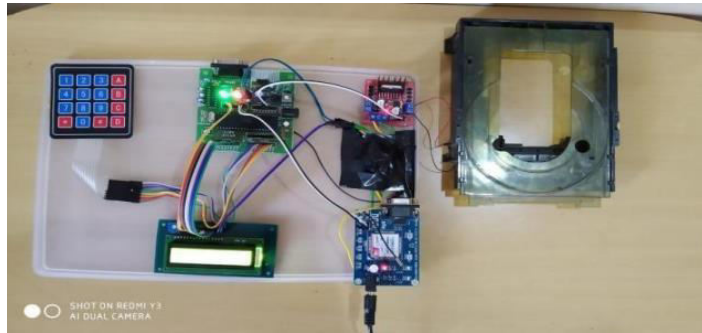


Figure 4 model overview

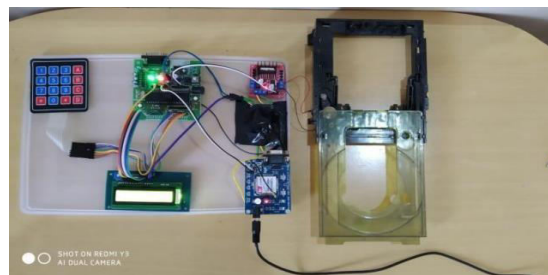


Figure5:Opening Of Digital Locker Door

VIII. CONCLUSION

This paper gives basic idea of how to control home security for smart home, especially for door key locks. It also provides a security and easy for Android phone users. This project based on Android platform which is Free Open Source Software. So the implementation rate is inexpensive and it is reasonable by a common person. With the wireless Wi-Fi connection in microcontroller permits the system installation in easier using an Android Wi-Fi-enabled phone and Wi-Fi modules. Future scope of our project is very high. We have discussed a simple prototype in this paper but in future it can be extended too many other regions.

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FUTURE SCOPE

- We can send this data to a remote location using mobile or internet.
- We can add fingerprint sensor so entry will be allowed for the authorized person using their fingerprints.
- We can add fire, wind and LPG sensors so that, the doors will automatically open.

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