

Password Based Door Lock System

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Abstract: The main component in the circuit is 8051 controller. In this project 4×3 keypad is used to enter the password. The password which is entered is compared with the predefined password. If the entered password is correct then the system opens the door by rotating door motor and displays the status of door on LCD. If the password is wrong then door is remain closed and displays “pwd is wrong” on LCD.

1. INTRODUCTION

This is a simple password based door locking system circuit designed using 8051 microcontroller. It provides control to the actuating the load. It is a simple embedded system with input from the keyboard and the output being actuated accordingly.

This circuit operates on the principle of microcontroller interfacing. A keypad interfaced to the microcontroller is used to enter the password and store it. A LCD is interfaced to the microcontroller to display the status and a motor is interfaced to the microcontroller via the motor driver. The motor is rotated forward or backward, depending on the authenticity of the entered password.

2. LITERATURE REVIEW

Main Components of Password Based Door Lock System Using Micro Controller (a) Micro Controller 8051: Here in this project we are using an 8-bit Micro-Controller which acts as a brain of our circuit or we can say that it is the Central Processing Unit (C.P.U) of our circuit. We are using Micro-Controller 8051 which has a Program Memory of 2Kbytes (EPROM). This memory is used to store the Predetermined password during the time of installation, which is taken into consideration during the operation to compare the input password with the predetermined password.

3. TOOLS REQUIRED:

Hardware Requirements

- 8051 Microcontroller

- 8051 Development Board
- 8051 Programmer
- 4×4 Matrix Keypad
- 16×2 LCD
- L293D Motor Driver Board
- DC Motor
- 10KΩ Potentiometer
- Connecting wires
- Power Supply
- If 8051 Development Board is not used, then the following components are needed.
 - 11.0592 MHz Quartz Crystal
 - 2 x 33pF Ceramic Capacitors
 - 2 x 10 KΩ Resistor (1/4 Watt)
 - 10 μF Capacitor (Polarized)
 - Push Button
 - 2 x 1 KΩ Resistors (for pull up)

Software Requirements

- Keil μVision IDE
- Willar Programmer
- Proteus (for circuit diagram and simulation)

4. BLOCK DIAGRAM



Fig: Password Based Door Lock System Block Diagram

1.4x4 Matrix Keyboard:

This keyboard contains a numbers of switches arranged in a matrix format. Each rows and each column are connected to the pins of micro controller. This keyboard contains numbers from 0 to 9, alphabets from A to D, an Enter button and an Escape buttons. These switches are generally a numbers of push buttons. With the help of this Keyboard an individual can enter the password to unlock the door.

2. Micro Controller 8051:

Here in this project we are using an 8-bit Micro-Controller which acts as a brain of our circuitor we can say that it is the Central Processing Unit (C.P.U) of our circuit. We are using Micro-Controller 8051 which has a Program Memory of 2Kbytes (EPROM).This memory is used to store the Predetermined password during the time of installation, which is taken into

consideration during the operation to compare the input password with the predetermined password.

3. L.C.D:

Here we are using a 16x2 L.C.D which is a dot matrix Liquid Crystal Display. Its function is to display the alphanumeric symbols to indicate the status message of the circuit. This L.C.D can display the two lines and each line contains 16 characters. This L.C.D contains an internal oscillator circuit to work in synchronization with the controller.

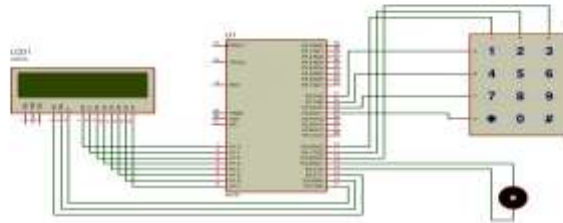
4.D.C Motor Drive:

It is a machine used to convert the electrical energy into mechanical energy. This D.C motor uses a 9V battery as an input through a Switching Relay and rotate to open the door or to lock the door. To interface this D.C motor drive with the Micro Controller we use an L293D.I.C.

5. WORKING PROCEDURE:

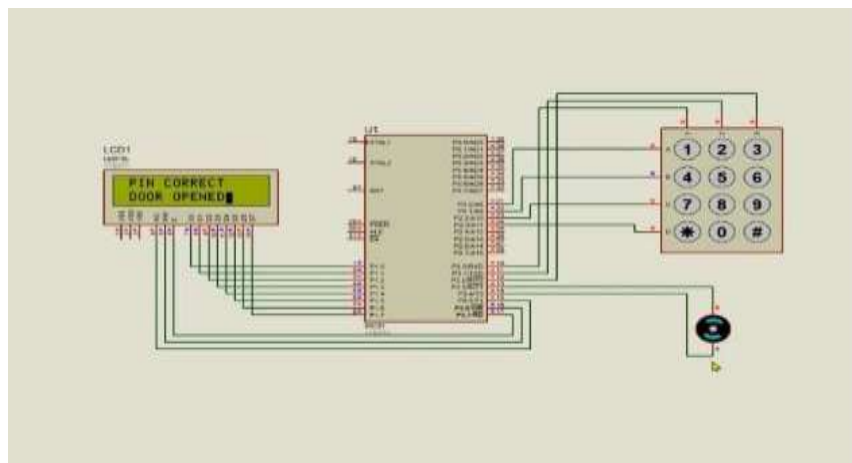
1. The main component in the circuit is 8051 microcontrollers. This control everything in the device.
2. We connect the 4x3 keypad with the microcontroller. In the keypad there is 4 rows which is indicated the letters (A-D) and the 3 columns which is indicated the number (1-3).
3. In the 8051 controller, pin P2.0 to P2.3 are connected to the keypad rows and pin P3.0 to P3.2 are connected to the keypad columns.
4. Then we connect the door lock motor pins in the P3.3 and P3.4. This motor only work when the password is right.
5. LCD's points are connected with P3.5 to P3.7 in 8051. LCD help us to show the inputs and error messages.
6. All devices are connected with each other. In the simulation we use the hex code to run the program. The hex code is generated from the embedded C code. This code only works on any 8051-microcontroller system.
7. To run the simulation, we set the clock frequency at 11.0592 MHZ for 8051. This is allowed us to run the simulation without getting any errors.
8. We pre-define the password 12345 for the program.
9. If user input wrong password it will give another chance to input the password again with an error message. When the password is right it will show the welcome message and lock motor will move to open the door.

6. SCHEMATIC DIAGRAM:



Simulation:

Simulation of project is performed on PROTEUS and the code was written Kiel software. Code for the microcontroller to run DC motors IC (L293D) is written. In the simulation the relevant data to the Microcontroller is send through keypad. The Microcontroller processed the data and sent the information to the Actuator IC (L293D). The Actuator IC upon receiving information showed response by driving the Dmotors.



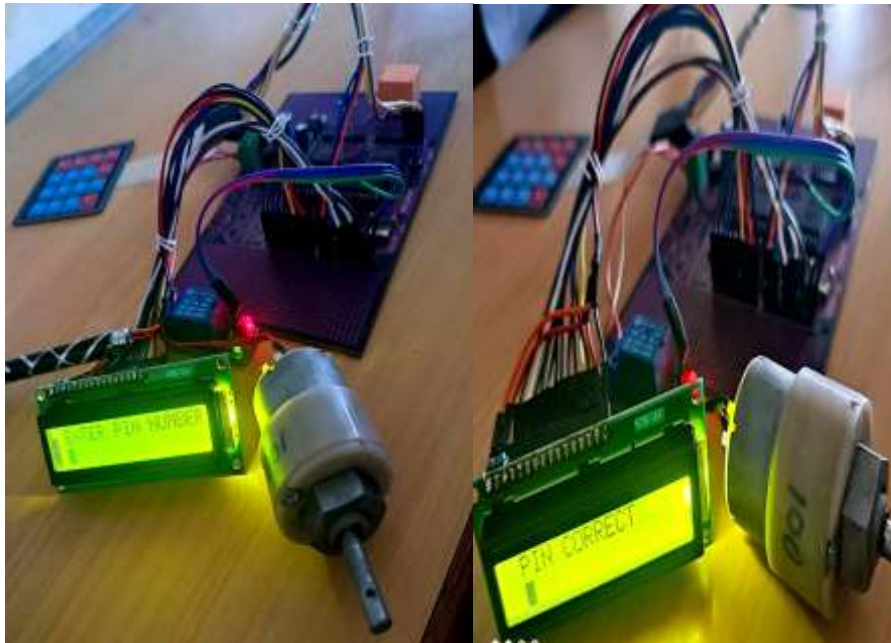
7. APPLICATONS

- This simple circuit can be used at residential places to ensure better safety.
- It can be used at organizations to ensure authorized access to highly secured places.
- With a slight modification this Project can be used to control the switching of loads through password.

8. EXPERIMENTAL SET-UP:

- When it is entered a 4 digit password by the user it will display on LCD as ****.Therefore anyone else can't see what the user enters.

- If it is the correct password, LCD displaying a message —Well come and the door will be opened. After 1minute time door is locked automatically.
- If he is entered password incorrectly LCD displaying —password error.
- After opening the door if user wants to change his password, after pressing —0 key and giving user id user can change his password.
- If user wants to add more people to the system after opening the door pressing —# key, user can add more users. System will give user id to each password.



9. CONCLUSION

The work was done successfully. It is evidence that the use of keypad with the right circuitry can be used to operate a security system. These systems have the ability to accesses a secure place (house, ATM, industries, office etc.).A password based recognition system can easily perform variation. In variation the system compare an input password to the enrolled password of a specific user to determine, if they are form the same password. Now the security of our home,office etc.

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