SHRI RAMDEOBABA COLLEGE OF ENGINEERING AND MANAGEMENT NAGPUR

Teachers Assessment Activity

MICROCONTROLLERS AND INTERFACING

ECT353

Project Report

5th Semester B.Tech. Session-2023-24

Title: Password Based Doorlock System.

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● Components with Specification

Hardware requirements:

Sr. No.	Components	No. of components
1	8051 microcontroller (80C51)	1
2	Phone keypad	1
3	LCD – LM016L	1
4	DC Motor (re-present as a door-lock motor)	1
5	Bread Board	1
6	Battery	1
7	Header pin	1
8	LED	2
9	Crystal (12MHz)	1
10	Potentiometer	1
11	Capacitor	1
12	Pull up Resistor	1

Software requirements:

1.Proteus (for circuit diagram and simulation

2.Keil uVision5 IDE (for c code)

●Literature Review

Safety is the most crucial concern of human. We always try to keep our things between ourselves. For this reason, we still use various methods to lock our precious items like a locked diary. And when it comes to our daily life, we are more serious. In the modern age, there are so many ways to lock the door; one of them is password-based lock system—a system where you are the only one to know how to access it. It saves our daily life from the various malicious problem like a thief. This system will give us the security that we want. To make our life more secure, we are going to build the password-based door lock system. This system is easy to assemble and very easy to use in our daily life. Anyone can use it to secure themselves.

In the program first we import the 8051-family header file which contain all the necessary classes. Then we assign every connected pin to the variables. In keypad we assign variable as keyrow1 to keyrows4 for keypad rows and keycolumn1 to keycolumn3 for keypad columns. Then we connected the motor pins and lcd pins in the variable called motor pins and rs, rw and en.

After assign all the connected pins to the variables. We declare functions for every single task. The main function calls the other functions for execute the program.

Delay function is used for delay the program execution for few seconds. It helps us to execute the program smoothly. We delay the execution for only 1000ms = 1secs.

• Algorithm

```
// password based door lock system in 8051 microprocessor

#include <reg51.h>

// connected pins
// keypad rows
sbit keyrow1 = P2 ^ 0;
sbit keyrow2 = P2 ^ 1;
sbit keyrow3 = P2 ^ 2;
sbit keyrow4 = P2 ^ 3;
//keypad column
sbit keycolumn1 = P3 ^ 0;
sbit keycolumn2 = P3 ^ 1;
sbit keycolumn3 = P3 ^ 2;

// motor pins
sbit motorpin1 = P3 ^ 3;
sbit motorpin2 = P3 ^ 4;

// led pins
sbit rs = P3 ^ 5;
sbit rw = P3 ^ 6;
sbit en = P3 ^ 7;

//functions
void lcdcmd(unsigned char);
void lcddat(unsigned char);
void lcddisplay(unsigned char *q);
char keypad();
void check();
void delay(unsigned int);
unsigned char pin[] = {"12345"};
unsigned char Epin[5];

// main function
void main()
{
   lcdcmd(0x0F); //decimal value: 15
   lcdcmd(0x38); //decimal value: 56
   lcdcmd(0x01); //decimal value: 1

   while (1)
   {
      unsigned int i = 0;
      lcdcmd(0x80); //decimal value: 128
      lcddisplay("ENTER PIN NUMBER");
      delay(1000);
      lcdcmd(0xc0); //decimal value: 192
      while (pin[i] != '\0')
      {
```

```
            Epin[i] = keypad();
            delay(1000);
            i++;
        }
        check();
    }
}

//delay function
void delay(unsigned int j)
{
    int a, b;
    for (a = 0; a < j; a++)
    {
        for (b = 0; b < 10; b++)
            ;
    }
}

// lcd commands functions
void lcdcmd(unsigned char A)
{
    P1 = A;
    rs = 0;
    rw = 0;
    en = 1;
    delay(1000);
    en = 0;
}

//lcd data function

void lcddat(unsigned char i)
{
    P1 = i;
    rs = 1;
    rw = 0;
    en = 1;
    delay(1000);
    en = 0;
}

//lcd display charecters function

void lcddisplay(unsigned char *q)
{
    int k;
    for (k = 0; q[k] != '\0'; k++)
    {
        lcddat(q[k]);
    }
    delay(10000);
```

```
}

// assign keypad character value function

char keypad()
{
   int x = 0;
   while (x == 0)
   {
      // assign values for first row
      keyrow1 = 0;
      keyrow2 = 1;
      keyrow3 = 1;
      keyrow4 = 1;
      if (keycolumn1 == 0)
      {
         lcddat('*');
         delay(1000);
         x = 1;
         return '1';
      }
      if (keycolumn2 == 0)
      {
         lcddat('*');
         delay(1000);
         x = 1;
         return '2';
      }
      if (keycolumn3 == 0)
      {
         lcddat('*');
         delay(1000);
         x = 1;
         return '3';
      }
      // assign values for second row
      keyrow1 = 1;
      keyrow2 = 0;
      keyrow3 = 1;
      keyrow4 = 1;

      if (keycolumn1 == 0)
      {
         lcddat('*');
         delay(1000);
         x = 1;
         return '4';
      }
      if (keycolumn2 == 0)
      {
         lcddat('*');
         delay(1000);
```

```
    x = 1;
    return '5';
}
if (keycolumn3 == 0)
{
    lcddat('*');
    delay(1000);
    x = 1;
    return '6';
}

// assign values for third row
keyrow1 = 1;
keyrow2 = 1;
keyrow3 = 0;
keyrow4 = 1;
if (keycolumn1 == 0)
{
    lcddat('*');
    delay(1000);
    x = 1;
    return '7';
}
if (keycolumn2 == 0)
{
    lcddat('*');
    delay(1000);
    x = 1;
    return '8';
}
if (keycolumn3 == 0)
{
    lcddat('*');
    delay(1000);
    x = 1;
    return '9';
}

// assign values for forth row
keyrow1 = 1;
keyrow2 = 1;
keyrow3 = 1;
keyrow4 = 0;

if (keycolumn1 == 0)
{
    lcddat('*');
    delay(1000);
    x = 1;
    return '*';
}
if (keycolumn2 == 0)
```

```
        {
            lcddat('*');
            delay(1000);
            x = 1;
            return '0';
        }
        if (keycolumn3 == 0)
        {
            lcddat('*');
            delay(1000);
            x = 1;
            return '#';
        }
    }
}

// password check function and run the door motor

void check()
{
    //  compare the input value with the assign password value
    if (pin[0] == Epin[0] && pin[1] == Epin[1] && pin[2] == Epin[2] && pin[3] == Epin[3] && pin[4] == Epin[4])
    {
        delay(1000);
        lcdcmd(0x01); //decimal value: 1
        lcdcmd(0x81); //decimal value: 129
        // show pin is correct
        lcddisplay("PIN CORRECT");
        delay(1000);
        // door motor will run
        motorpin1 = 1;
        motorpin2 = 0;
        lcdcmd(0xc1); //decimal value: 193
        // show the door is unlocked
        lcddisplay("DOOR OPENED");
        delay(10000);
        motorpin1 = 1;
        motorpin2 = 0;
        lcdcmd(0x01); //decimal value: 1
    }
    else
    {
        lcdcmd(0x01); //decimal value: 1
        lcdcmd(0x80); //decimal value: 128
        lcddisplay("WRONG PIN");
        delay(1000);
        lcdcmd(0x01); //decimal value: 1
    }
}

// end
```

- **Advantages**

- The password-based lock system can install any door of any rooms.
- This system also can be integrated with the existing system.
- This electric combination lock system uses a five-digit password.
- The system collects five-digit user input and compares the user input with the preset password inside the program.
- If the password matches, access will be granted, and if not match the entry will be denied.
- The system can be used at residential places to ensure better safety.
- It can be used at organizations to ensure authorized access to highly secured places.
- This system is easy to assemble and very easy to use in our daily life. Anyone can use it to secure themselves.

• Future Scope

1. Biometric Integration:
Integrate biometric authentication such as fingerprint or facial recognition alongside the password-based system for an added layer of security

2. Mobile App Integration:
Develop a mobile application that communicates with the door lock system. Users can control and monitor access through their smartphones, providing convenience and remote management.

3.Cloud Connectivity:
Implement cloud connectivity to store access logs and receive real-time notifications. This allows for better monitoring and management of access control.

4. Voice Recognition:
Enhance security by incorporating voice recognition technology, making it more difficult for unauthorized access

5.Machine Learning for Anomaly Detection:
Use machine learning algorithms to analyze access patterns and detect anomalies. This can help in identifying suspicious activities and improve security.

6. Integration with Smart Home Systems:
Connect the door lock system with other smart home devices, creating a seamless and integrated home automation experience.

• References

- https://github.com/deveshphadke/Password-based-doorlock-system-in-8051-microprocessor

• Block Diagram

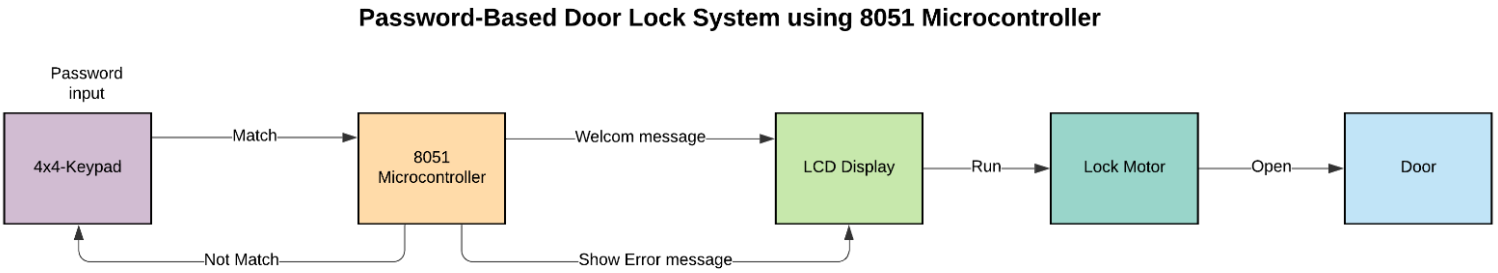

Fig: Password Based Door Lock System Block Diagram

• Circuit Diagram