



IJIRCCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 9, Issue 6, June 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.542



9940 572 462



6381 907 438



ijircce@gmail.com



www.ijircce.com

Bluetooth Based Garage Door Opening Using Android Technology

Megharani Andhare¹, Kirti Lokare², Radha Dhage³, Prof. Satish Mali⁴

B.Tech Students, Department of E&TC Engineering, JSPM's Bhagwant Institute of Technology, Barshi, Dist. Solapur, Maharashtra, India^{1,2,3}

Professor, Department of E&TC Engineering, JSPM's Bhagwant Institute of Technology, Barshi, Dist. Solapur, Maharashtra, India⁴

ABSTRACT: The main objective of this paper is to unlock a garage room door by using an android application using a password entered through the android application device. Opening and closing of garage room door involves using of smart card. The opening and closing of garage room door is achieved by using an android application. The owner can connect android application device to the system through Wi-Fi, which in turn is connected to a microcontroller-controlled door that can open/close the door by entering the password. Remote operation is achieved by any smart phone/Tablet, with Android OS, upon a GUI (Graphical User Interface) based touch screen operation. This paper is based on the android application, android application send data through Bluetooth. Another Bluetooth device connected at the receiving end which is fed to the microcontroller. The sent data (password entered by the user) matches with the password stored in the microcontroller, and then the microcontroller initiates a mechanism to open the door through a motor driver interface. The combination of Bluetooth and android technology will satisfy timeliness, safety and involves elimination of smart card.

KEYWORDS: Automation system; Bluetooth device; Android application; Mobile; Lock; Unlock.

I. INTRODUCTION

Our project aims at remote password-based door opener system through an android application. The system tends to make a secure door opening mechanism such that the door only unlocks when a security personnel opens it by entering the right password through an android application. The authorized personnel need to be present within Bluetooth range of the door but need not open the door manually. He just needs to enter the right password through his android application in order to unlock the door. This is a useful concept in places where the security needs to open gates quite usually or need to operate a door from a vehicle without needing to get down from it. The command sending functionality is achieved through an android application. The application provides an interactive user-friendly GUI for this purpose. The android application can be operated from any device running on android OS and uses Bluetooth as a medium for sending commands. As soon as commands are sent through the android device a Bluetooth receiver is used to receive those commands. These commands are then sent to the 8051 microcontrollers. The microcontroller processes these commands and then tallies the password to check its correctness. If the right password is encountered it sends command to open the door. The main objective of this project is to unlock a garage door by an android application using a unique password entered through the android application device. Opening and closing of garage door involves human labor. In this proposed system, the opening and closing of a garage door is achieved by using an android application. The owner can connect android application device to the system through Bluetooth, which in turn is connected to a microcontroller-controlled garage door that can open/close the door by entering the password. This method is very convenient as one doesn't have to get down of his car to open/close the door physically. Remote operation is achieved by any smart-phone/Tablet etc., with Android OS, upon a GUI (Graphical User Interface) based touch screen operation. This project is based on the android application, android application send data through Bluetooth. Another Bluetooth device connected at the receiving end which is fed to the microcontroller. The sent data (password entered by the user) matches with the password stored in the microcontroller, and then the microcontroller initiates a mechanism to open the door through a motor driver interface. Further this project can be incorporated with an Electrically Erasable Programmable Read Only Memory (EEPROM) i.e., a non-volatile memory so that the password can be changed by the owner.

II. LITERATURE REVIEW

The system tends to make a secure door opening mechanism such that the door only unlocks when a security personnel opens it by entering the right password through an android application. The authorized personnel need to be present within Bluetooth range of the door but need not lock/unlock the door manually. But he needs to be connected to the Bluetooth router which also gives a kind of security by limiting the wireless devices connect to it with the help of MAC address. He just needs to enter the right password through his android application in order to unlock/lock the door. The command sending functionality is achieved through an android application. The application provides an interactive user-friendly GUI for this purpose. The android application can be operated from any device running on android OS and uses Bluetooth as a medium for sending and receiving commands. As soon as commands are sent through the android device a signal receiver (LAN CONTROLLER) is used to receive those commands. These commands are then sent to the ARM 11 PROCESSOR. The processor processes these commands and then tallies the password to check its correctness. If the right password is encountered it sends command to open the door. In case of wrong password, it sounds a small buzzer. This is a useful concept in places where the security needs to open gates quite usually or need to operate a door from a vehicle without needing to get down from it. And also, when the person is inside the bedroom and someone knocks the main door then with the help of video monitoring in mobile for right person it can be unlocked.

III. METHODOLOGY

The basic idea behind the working of door lock lies in the data or ASCII characters sent by the android phone by means of the developed app. To interpret the data sent by the phone, firstly a Bluetooth module (HC-05) which is configured by default at a baud rate of 9600 is connected to the microcontroller which is also configured at the same baud rate. The data which is received by the HC-05 is then given to the microcontroller (ATmega16), which understands in ASCII format, now depending upon the received set of character operations are performed whether to unlock the door or lock it. The app is well protected by means of a password thus neglecting any fraud access to the door and is avoided to be provoked by an anonymous user. This is highly useful when we are trying to automate the home. Although our application also provides a better amount of security for the user, by means of accessing via a password.

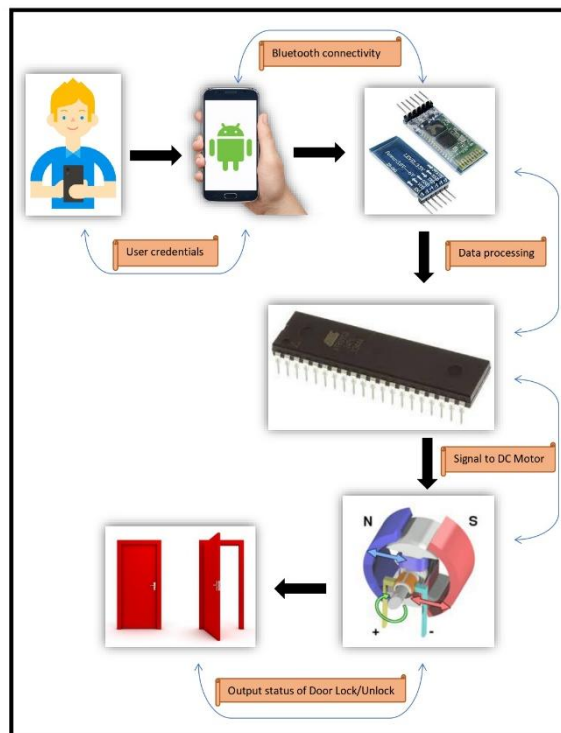


FIG.1: BLOCK DIAGRAM OF DOOR LOCKING SYSTEM

The block diagram in figure 1 describes the system overall. This system has input android smartphone, the overall system is controlled automatically and the output is a stepper motor movement that is connected to the microcontroller.

IV. RELATED TO WORK

BLOCK DIAGRAM:

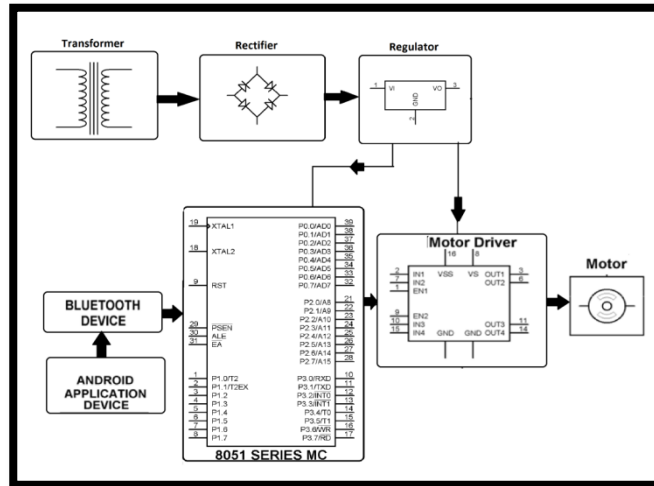


FIG. 2. BLOCK DIAGRAM OF PROJECT SETUP

WORKING OF PROJECT:

Our system intends to lock and open domestic doors, garage doors or in that case any type of door remotely with the help of an android device which is connected through a Bluetooth module. our system basically uses an 8051 microcontroller which is interfaced to the LCD screen. LCD is used to display system uses instructions or commands. we have to then enter a password; the system will check if the password is correct or incorrect.

An Electrically Erasable Programmable Read Only Memory (EEPROM) is used to store the password. the door will open if and only if the password is correct. our system also has the facility to change the password as and when needed. A Bluetooth modem is used to remotely establish a connection with the android device. A motor driver IC is used to operate the door motors & the entire system is powered through a 12-volt transformer.

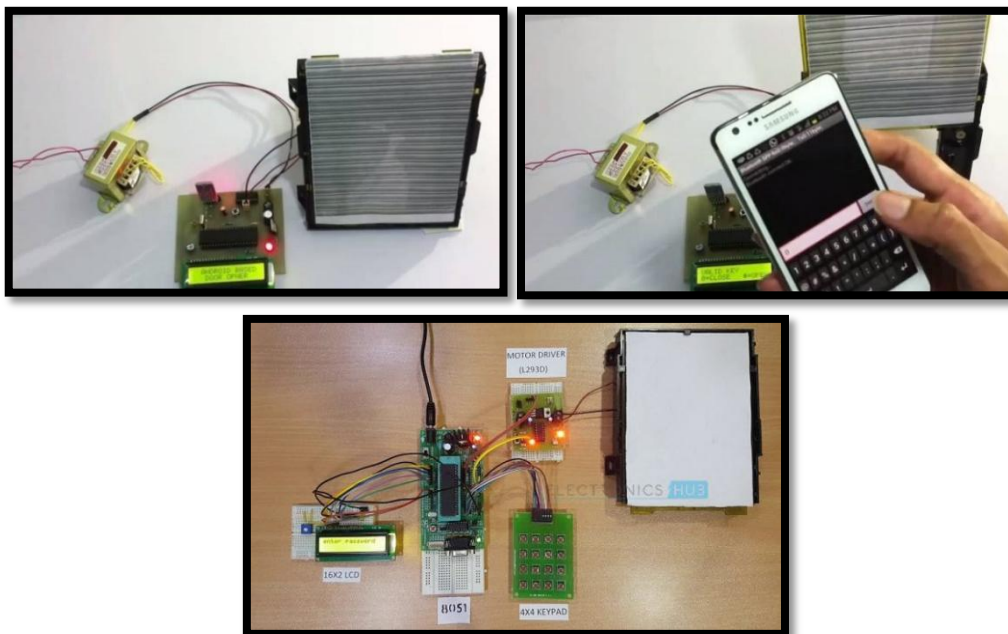


FIG.3. ACTUAL IMAGE OF THE PROTOTYPES

CIRCUIT DIAGRAM:

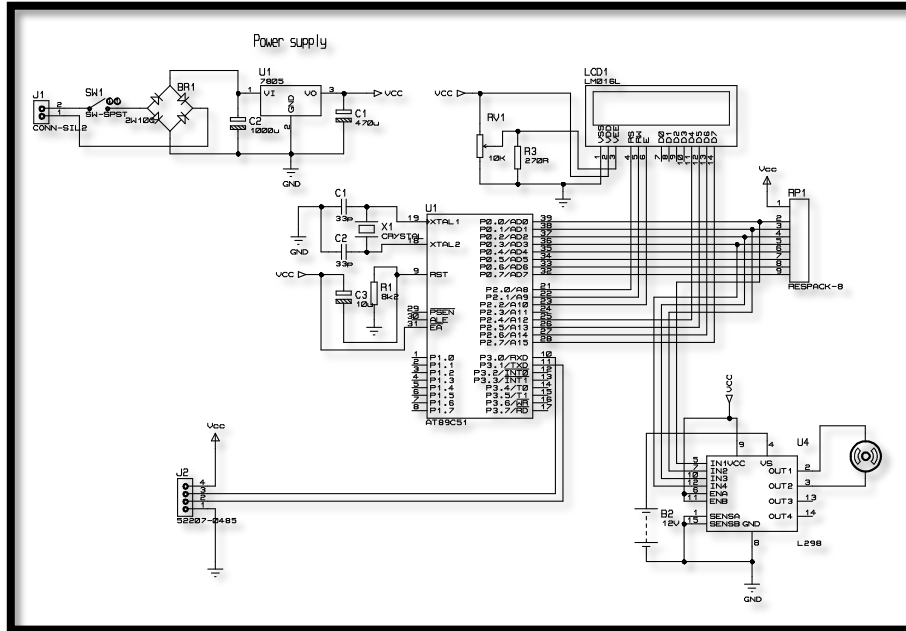


FIG.4. CIRCUIT DIAGRAM OF PROJECT

PCB LAYOUT:

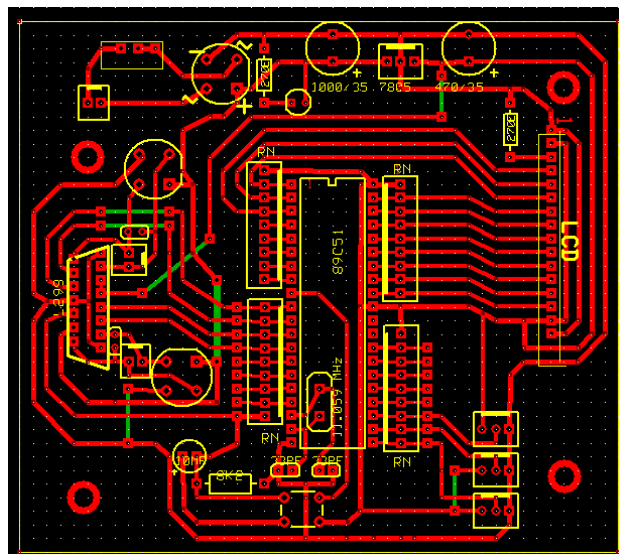


FIG.5. LAYOUT DIAGRAM

V. DESIGN AND IMPLEMENTATION OF APPLICATION

SOFTWARE PROGRAMMING:

```
#include <reg51.h>
#include "UART.h"
#defineLCD_clear
#defineLCD_dat P0
```



```
sbit RS=P1^2;
sbit RW=P1^1;
sbit EN=P1^0;

sbit m21=P3^2;
sbit m22=P3^3;
unsigned char a,value,i,dat;

void _delay_us(unsigned int d)
{
  unsigned int i,j;
  for(i=0;i<d;i++)
  for(j=0;j<10;j++);
}

void _delay_ms(unsigned int d)
{
  unsigned int i,j;
  for(i=0;i<d;i++)
  for(j=0;j<125;j++);
}

void LCD_cmd( unsigned char ch)
{
  LCD_dat=ch;
  RS=0;
  RW=0;
  EN=1;
  _delay_us(100);
  EN=0;
  _delay_us(500);
}

/*void LCD_gotoxy(unsigned char x,unsigned char y)
{
  unsigned char firstCharAdr[]={0x80,0xC0,0x94,0xD4};
  LCD_cmd (firstCharAdr[y-1]+x-1);
  _delay_us(1000);
}
*/

void LCD_data( unsigned char ch)
{
  LCD_dat=ch;
  RS=1;
  RW=0;
  EN=1;
  _delay_us(100);
  EN=0;
  _delay_us(500);
}

void LCD_init()
{
  LCD_cmd(0x38);
  LCD_cmd(0x0E);
  LCD_cmd(0x01);
  // _delay_us(500);
  LCD_cmd(0x06);
  LCD_cmd(0x80);
}
```



```
void LCD_print(char str)
{
  unsigned char i=0;
  while(str[i]!=0)
  {
    LCD_data(str[i]);
    i++;
  }
}

/*void TX_CHAR(unsigned char X)
{
  SBUF=X;
while(TI==0);
  TI=0;
  RI=0;
} */

unsigned char receive()
{
  while(RI == 0) ;
  a=SBUF;
  RI=0;
  TI=0;
  return a;
}

void main()
{
  m21 = 0;
  m22 =0;
  LCD_init();
  LCD_print("BLUETOOTH BASED");
  LCD_cmd(0xc0);
  LCD_print("GARAGE DOOR");
  TMOD=0X20;
  TH1=0XFD;
  SCON=0X50;
  TR1=1;
  _delay_ms(1000);
  _delay_ms(1000);
  while(1)
  {
    dat = receive() ;
    if(dat == '1')
    {
      m21=0;
      m22=1;

      LCD_clear;
      LCD_print("OPEN");
      _delay_ms(1000);
      _delay_ms(1000);
      _delay_ms(1000);
    }
    else if(dat=='2')
    {
      m22=0;

      LCD_clear;
      LCD_print("CLOSE");
      _delay_ms(1000);
    }
  }
}
```

```
        _delay_ms(1000);
        _delay_ms(1000);
    }
    else if(dat == '3')
    {
        m21=0;
        m22=0;
LCD_clear;
LCD_print("STOP ");
    }
    /* else if(dat == '6')
    {
        relay2=0;
LCD_clear;
LCD_print("Device 2 is OFF ");
    }
    else if(dat == '7')
    {
        relay3=0;
LCD_clear;
LCD_print("Device 3 is OFF ");
    }
    else if(dat == '8')
    {
        relay4=0;
LCD_clear;
LCD_print("Device 4 is OFF ");
    } */
}
```

APPLICATION:

1. specially designed for garage door opening system.
2. We can use this project in hotels and restaurants.
3. vehicle service center.
4. Warehouses for door.



FIG. 6. APPLICATION OF PROJECT

VI. ACTUAL SETUP OF BLUETOOTH BASED GARAGE DOOR OPENING USING ANDROID TECHNOLOGY

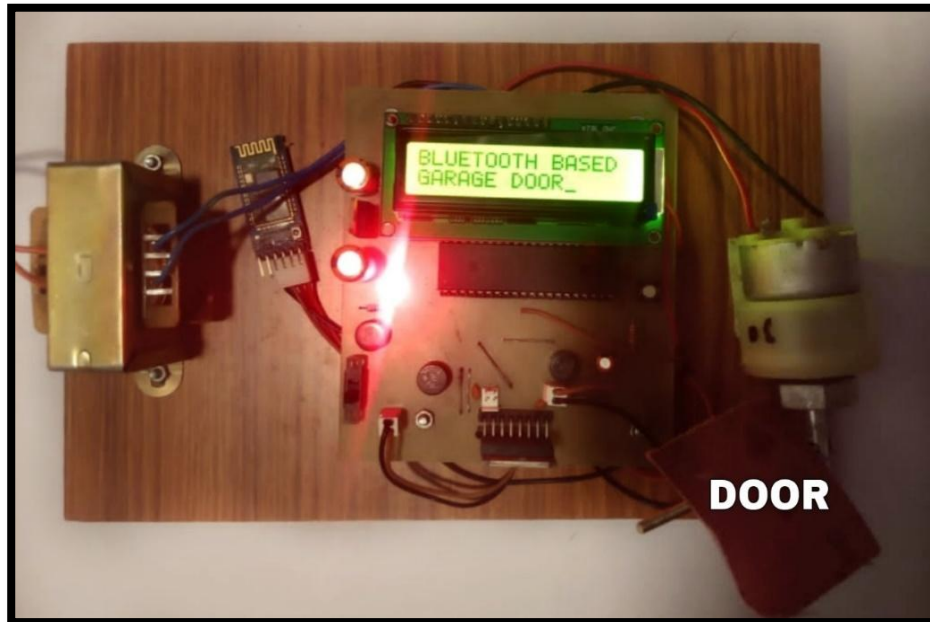


FIG. 7. ACTUAL SETUP OF BLUETOOTH BASED GARAGE DOOR OPENING USING ANDROID TECHNOLOGY

VII. CONCLUSION AND FUTURE WORK

From above discussion it is conclude that this system uses advanced technologies like Bluetooth. Our system intends to lock and open domestic doors, garage doors or in that case any type of door remotely with the help of an android device which is connected through a Bluetooth module. We aim to make not only an affordable but also a durable security mechanism by marking the use of technology. Our system is easy to maintain as well and suppose if we are sitting in a car, we need not have to get down personally open the garage door, then again sit in car and park it. We can directly open the door sitting in the car by being in range of the Bluetooth module that is near the gate & entering the password through the android device. As day in and day out there is vast improvement in the various fields, we decided to do our bit by enhancing the traditional method of locking the doors by provide a system which make use of the modern technological components in providing security. We wanted our system to reach the masses so the cost factor was always in our mind. Keeping the cost thing in mind we did not go for expensive components such as retina scanning or finger print scanning but instead went in for economical components such as a Bluetooth module and an android device which is now found with majority of the people.

One can enhance the project scope by interfacing a GSM module with it. Opening the garage door with a text message. You can also talk with the module. For example, if the user inputs a wrong password, you can send back a warning message of wrong password input. More lights and other extra peripherals can be controlled by increasing the digital output pins and relays.

REFERENCES

1. The 8051 Microcontroller and Embedded Systems using Assembly and Muhammad Mazidi, Janice Mazidi and Rolin McKinley.
2. Embedded Systems by Jack Ganssle.
3. Subrata Ghoshal, „Embedded Systems and Robots- Projects using the 8051 Microcontroller“, Cengage Learning.
4. Microcontroller & Embedded Systems by Ankaj Gupta.
5. Embedded Systems Building Blocks by Jean J. Labrosse.
6. The Digital Locking And Unlocking System Based On Android For Mart Phone International Journal Of Advanced Research In Computer Science And Software Engineering, Volume 6, Issue 2, February 2016.



INNO  **SPACE**
SJIF Scientific Journal Impact Factor
Impact Factor: 7.542



ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

 **9940 572 462**  **6381 907 438**  **ijircce@gmail.com**



www.ijircce.com

Scan to save the contact details