

ANDROID BASED HOME AUTOMATION SYSTEM USING BLUETOOTH ANDROID SMARTPHONE

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ABSTRACT: : *Technology is a never ending process. To be able to design a product using the current technology that will be beneficial to the lives of others is a huge contribution to the community. This paper presents the design and implementation of a low cost but yet flexible and secure cell phone based home automation system. The design is based on a stand alone Arduino BT board and the home appliances are connected to the input/ output ports of this board via relays. The communication between the cell phone and the Arduino BT board is wireless. This system is designed to be low cost and scalable allowing variety of devices to be controlled with minimum changes to its core. Password protection is being used to only allow authorised users from accessing the appliances at home*

Key Words:

INTRODUCTION

The main purpose of any automated system is to reduce the human labor, efforts, time and human negligence. With this system we can control our home appliances very finely. This paper is designed to control the home appliances using an Android Application with the help of a text message sending through the mobile phones. Moving away from the traditional method like keyboard or switches to control the devices here we are using a method of sending a text message with The Automation is a very trending topic in 21st century, and playing a very important role in our daily lives. The automated system is widely used to reduce human labor, efforts, time and errors due to human negligence, and that's why it is used very widely in our society. Today everyone is having their own Android phones, and the people are using many Android Applications in it. And that's why, this paper presents microcontroller based text controlled Home Automation System using smart phones.

. This system enables the user to have a control on every appliance in their homes ,as per the user requirement. The system consists of a smart phone and a control circuit. The control circuit consists of Arduino UNO Microcontroller, which processes the user commands which are in the form of text messages. It compare that commands with the the help of our smart phones towards the home appliances, wirelessly with the help of Bluetooth technology and using an Android Application. T he foremost aim of this technology is to increase efficiency and reduce the efforts. With the advent of 'Internet of Things' in the last decade, we have been pushing for ubiquitous computing in all spheres of the human interfacing with technology. Automation has an aim to achieve the simplicity with the most efficiency.

In this 21st century everyone is well familiar with the use of the smart phones and the Android Applications. By just writing a text message we are controlling our so many home appliances, in this technique. This system provides the simplest way for making our home as an automated home and an Android Application based home. And hence this home automation system is getting much popularity day by day due to their ease of use and wide operations capabilities. Also the system is very flexible and hence we can control number of home appliances with the help of the system as per the requirement of the users The main objective of this project is to control the home appliances without any physical activity i.e. by operating only the mobile phones. This can help the handicapped person very much by reducing their physical activity. Thus it provides the maximum ease and safety to that handicapped peoples. Previously the Same Home Automation System was made with the help of the technology like voice controlled home automation system .But in this system the problems are occurred due to the frequency interfacing of the two or more voice signals interfere with each other if we are going to control the number of home appliances at the same time. Hence this system was not that much accurate.

SYSTEM CONFIGURATION

The home automation, as shown in Fig. 1, is basically an embedded system integrating the following: arduino uno , hc-05bluetooth module, display ,relay to control the home appliances every where in the home with the help of blue tooth module and android applications this system helps us in using the load i.e ON/OFF time The system is powered by a rechargeable battery or 12v adaptor .Since electricity is not a renewable source to use it wisely for future purpose this system is designed in this the application in the android smart phone warns the user in load usage by this the current bill will reduce and we can make necessary changes .

The Block diagram of the system is shown in below fig1. There are total 7 blocks namely Arduino ,Bluetooth Module ,Android phones, LCD, Relays ,Power Supply, Home Appliances (TV, Fan etc.). And Arduino is the main block of the system which is the controller or programmer by using android phone we can control the home appliances by using the Bluetooth technology. LCD is used for displaying the output status. Means whether the particular home appliance in this system is ON or OFF that is indicated on the LCD. After that we are using the relay drives in this system. Relay drivers are used for switching purpose just for making ON and OFF of the home appliances. And a text message is send towards the microcontroller to ON or OFF the home appliances. That text message is the compare with the predefined messages in the controller. The Bluetooth adapter which is present in the Android phone is configured to send this text to the Bluetooth module on ArduinoUno board that would in turn control the electrical appliances through the relay boards.

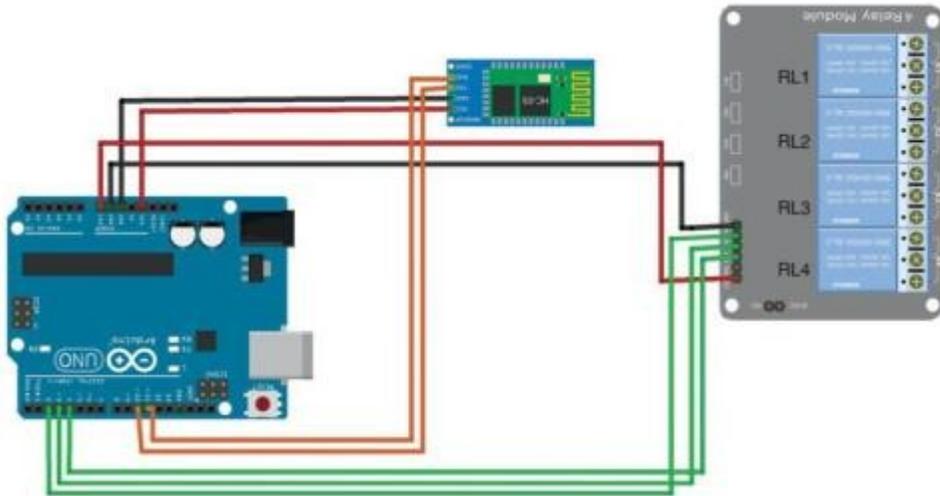


Fig 1 connections for home automation system

BLOCK DIAGRAM FOR HOME AUTOMATIOM SYSTEM

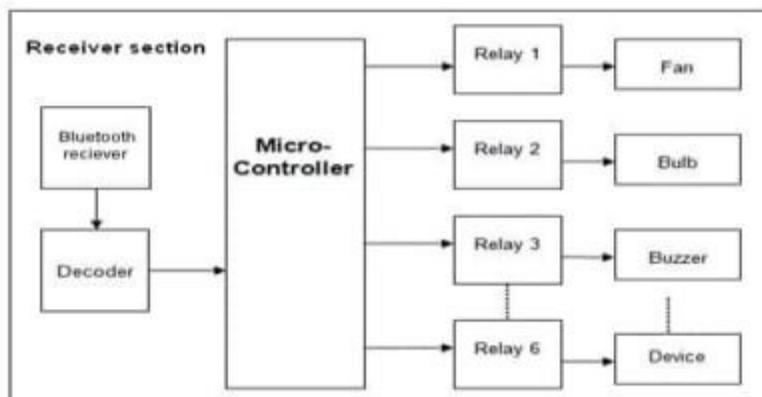


Fig.2 .Block Diagram of home automation system

```
Installing code to Arduino : #include <EEPROM.h>
#include <SoftwareSerial.h>
SoftwareSerial wizbt(11, 10); // RX & TX configured using software serial
int r1=2; // Pin for triggering relay 1
```

```

int r2=4; // Pin for triggering relay 2
int r3=6; // Pin for triggering relay 3
int r4=8; // Pin for triggering relay 4
int ad1=1; //address for storing relay 1 status in the EEPROM
int ad2=2; //address for storing relay 2 status in the EEPROM
int ad3=3; //address for storing relay 3 status in the EEPROM
int ad4=4; //address for storing relay 4 status in the EEPROM
byte h; //
byte i; //
byte j; //
byte k; // Variables to store relay condition
int powerled=12; // connection to power led
int statusled=13; // LED indicating BT connection status
char BluetoothData; // For receiving BT input
void setup()
{
  wizbt.begin(9600);
  pinMode (r1,OUTPUT);
  pinMode (r2,OUTPUT);
  pinMode (r3,OUTPUT);
  pinMode (r4,OUTPUT);
  pinMode (powerled,OUTPUT);
  pinMode (statusled,OUTPUT);
  digitalWrite(powerled,HIGH);
  h = EEPROM.read(ad1);
  i = EEPROM.read(ad2);
  j = EEPROM.read(ad3);
  k = EEPROM.read(ad4);
  // Initialising the Relays according to their last status written in the EEPROM.
  // RELAY - 1
  if(h==1)
  {
    digitalWrite(r1,HIGH);
  }
  else if(h==0)
  {
    digitalWrite(r1,LOW);
  }
  // RELAY - 2
  if(i==1)
  {
    digitalWrite(r2,HIGH);
  }
  else if(i==0)
  {
    digitalWrite(r2,LOW);
  }
  // RELAY - 3
  if(j==1)
  {
    digitalWrite(r3,HIGH);
  }
  else if(j==0)
  {
    digitalWrite(r3,LOW);
  }
  // RELAY - 4

```

```

if(k==1)
{
digitalWrite(r4,HIGH);
}
else if(k==0)
{
digitalWrite(r4,LOW);
}
}
void loop()
{
if (wizbt.available())
{
digitalWrite(statusled,HIGH);
delay(100);
digitalWrite(statusled,LOW);
BluetoothData=wizbt.read();

switch(BluetoothData) {
// RELAY - 1
case 'B' :
digitalWrite(r1,HIGH);
EEPROM.write(ad1,1);
break;
case 'A' :
digitalWrite(r1,LOW);
EEPROM.write(ad1,0);
break;
// RELAY - 2
case 'Y' :
digitalWrite(r2,HIGH);
EEPROM.write(ad2,1);
break;
case 'X' :
digitalWrite(r2,LOW);
EEPROM.write(ad2,0);
break;
// RELAY - 3
case 'Q' :
digitalWrite(r3,HIGH);
EEPROM.write(ad3,1);
break;
case 'P' :
digitalWrite(r3,LOW);
EEPROM.write(ad3,0);
break;
// RELAY - 4
case 'N' :
digitalWrite(r4,HIGH);
EEPROM.write(ad4,1);
break;
case 'M' :
digitalWrite(r4,LOW);
EEPROM.write(ad4,0);
break;
// MASTER SWITCH

```

```

case 'V' :
    digitalWrite(r1,HIGH);
    EEPROM.write(ad1,1);
    digitalWrite(r2,HIGH);
    EEPROM.write(ad2,1);
    digitalWrite(r3,HIGH);
    EEPROM.write(ad3,1);
    digitalWrite(r4,HIGH);
    EEPROM.write(ad4,1);
    break;
case 'U' :
    digitalWrite(r1,LOW);
    EEPROM.write(ad1,0);
    digitalWrite(r2,LOW);
    EEPROM.write(ad2,0);
    digitalWrite(r3,LOW);
    EEPROM.write(ad3,0);
    digitalWrite(r4,LOW);
    EEPROM.write(ad4,0);
    break;
default :
    for(int i=0;i<5;i++)
    {
        digitalWrite(statusled,HIGH);
        delay(100);
        digitalWrite(statusled,LOW);
    }
}
delay(100);
}

```

RESULT :

The home automation system prototype has successfully designed and in analyzed this paper. The newly designed home automation with the human ergonomics because it is developed for adult users. This Home Automation System can controls number of our Home Appliances as per the users requirement. And this particular system is controlling 4 numbers of home appliances. In this system by using Android Phone Application we are sending the text messages towards the controlling unit i.e .Arduino Uno. The format of the text message is to switch on/off the required home appliances. All the components used in this system are very very sensitive and most flexible to use for the user. And finally the Home Appliances are getting switch on/off accurately by using this Home Automation system. Therefore this novel home automation system the user is capable to control home load as per requirement .



Fig 3 Smart home automation system

CONCLUSION

The home automation system has been finally made into prototype which can be used to guide the people in using load . Its aims to solve the problems faced by the people in their daily life. The system also takes the measure to ensure their safety. Smart home automation system will operate to help all the physically disabled people in the world to make them easier to operate the home appliances It was done to help the disabled people to use very well. It is used to help the people with disabilities that are physically challenged to facilitate the movement and increase safety. This paper gives the solution for the need of automation at every basic level that is in our homes. With the help of this paper we come to know that every home appliances which is may be at any corner of our home is in our control. We can control the required number of home appliances by using this system. The system seems much simpler with the use of the text conversion application. Thus this paper gives the most effective and reliable way of home automation system using Android phone Application.

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