VOICE CONTROLLED HOME AUTOMATION SYSTEM USING ARDUINO

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Abstract: *The word automation is automatic control of operating devices with minimal or reduced human efforts. Influence of wireless technology is growing day by day .In today's world, wireless technology doing significant role in the automation. It means automation makes the technology free from human interruption. Home automation is one of the technology emerging these days. To make it more effective and efficient, cost is reduced by low-cost communication technology like Bluetooth, Wi-Fi.Bluetooth which is mainly used for data exchange, add new features to the smartphones.With the help of Android application ,we are able to connect and control house hold appliances and provide security to handicapped ,old people. The idea of paper is to control the home appliances like lights,fan.It also provides home security and emergency alerts to be activated.*
Key Words: Home Automation System, Arduino, Bluetooth, Relay, LCD.

1. INTRODUCTION

The main aim of the project is to control the home appliances through voice using Android OS smartphone with an Arduino board. This is an advanced technology for home automation.So, houses are getting smarter. Usually conventional wall switches are located in different parts of the house and often require persons for their operations and, thus manual pressing turn the ON and OFF. It becomes very difficult for the elderly and the handicapped people to operate them.this system is enhanced to control the home applications through an Android application of smart/tablet phones by entering the selected number for corresponding load.

A Bluetooth is interfaced to the Arduino board using Rx and Tx pins for communication.The electrical loads are controlled by the relay which is connected to the Arduino board.Relay acts as a switch operation.Then the respective devices connected to the circuit will be turned ON/OFF depending on the voice command given.At the output side of home appliances controlling using Android Mobile via Bluetooth.

2. LITERATURE SURVEY

As per review, now a days there are various systems exists but they are hard to handle, maintain and use. Ai-Rousan [1] designed and implemented low cost Java based automation system through World Wide Web. However, they are not too feasible to be carried out as a low cost solution. Because Java based system is very expensive. And it had a standalone embedded system board integrated into a PC based server.So,it is difficult to operate. M.I.Ramli[2] has designed device controlling system with help of web server. They had to face server down problem as well as high cost limitations.so,it failed to operate.

Later on,Hasan and Yavuz [3] designed control system which is telephone and PIC remote controlling communication.Researcher introduced devices pin check algorithm, but it was not wireless communication.It was dedicated cable oriented communication.

N.Sriskanthan,F.Tan,A.Karande[4] presented model for the home automation using Bluetooth via PC.This is the application of Bluetooth technology in home automation and networking environment. They proposes a network ,which controlls a remote ,mobile host controller and several client modules(Home Appliances).The client modules communicate with the host controller through Bluetooth devices.It is expensive and difficult to operate.

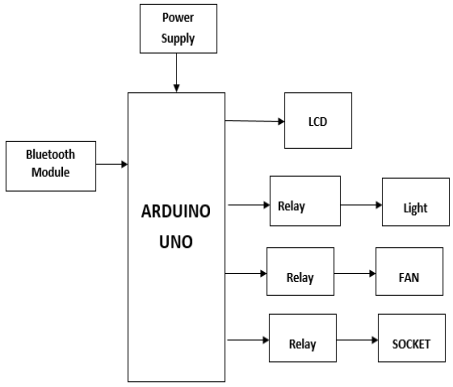
Finally,H.Kanma [5] also proposes a home automation system using Bluetooth that can be accessed remotely through GPRS.The researcher uses a cellphone equipped with Bluetooth connectivity .Home devices are fitted with Bluetooth communication adapters so that they can communicate with the host controller via Bluetooth.

3. PROPOSED SYSTEM

This is a project for a Voice Controlled Home Automation System to control appliances with our voice through an Android app.An Arduino micro controller board is used for controlling the relay through which an appliance is switched On/Off.In this project,a simple Voice Activated Home Automation System is designed.Voice commands are used to control different appliances.All the

connections are made as per the block diagram.

After making the necessary connections,switch on the power supply. Now,we need to pair the Phone's Bluetooth to the HC-05 Bluetooth Module.Before that,we have to install the Android app.



A.Arduino Microcontroller

The controller used for the proposed system as shown in Fig.is Arduino UNO microcontroller. The Arduino platform was provides an inexpensive and easy way to create devices that interact with their environment using sensors and actuators.

Arduino comes with simple integrated development environment (IDE) which runs on a PC and allows user to write programs for Arduino in C or C++ language.It has 14 digital input/output pins (out of these 14 oins 6 can be used as PWM outputs)and 6 analog input pins.Arduino works on 5V DC and has the clock rate of 16MHz.

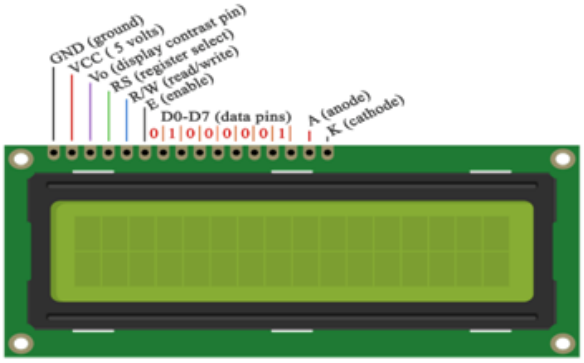
B.HC-05 Bluetooth

HC-05 Bluetooth module which has an operating frequency of 2.4 to 2.485GHz.Initially a password enable method is used to pair the Bluetooth module with a mobile phone. While receiving voice command after which the command can be sent to HC-05 Bluetooth module through a mobile phone . After receiving the voice command as shown the output of Bluetooth module is taken from the receiver terminal which is further given to Arduino controller.The controller checks the output.

C.LCD

A 16x2 LCD implies 16 characters can be shown per line and 2 such lines exist. Each character is shown in a lattice of 5x7 pixels in this LCD. There are two registers in this LCD, in particular Command and Data .

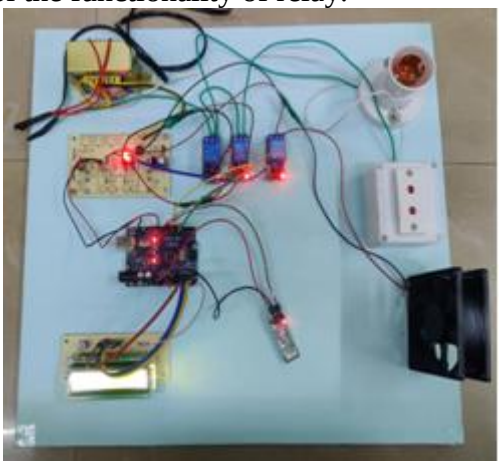
The below figure shows the pin description of LCD :



D.Relay::A Relay is an electromagnetic switch used to turn on and off a circuit by a low power signal,or where several circuits must be controlled by one signal**.**

4. TESTING RESULT

In this paper home appliances are controlled by Android mobile with Bluetooth module. The voice commands are used to control the home appliances. In order to monitor and control the household appliances ,Android application has to start clicking on it's icon in smartphone. Enter username and password ,to enter into application and turn Bluetooth On. Now, user gives the command to the microcontroller by using speech recognition system of smartphone and system software application via Bluetooth module HC-05.The microcontroller acts accordingly to the command gives user and control the functionality of relay.



5. CONCLUSION

The proposed work has developed a Home Automation using Bluetooth, Android and Arduino. This is low maintenance, user friendly and cost effective system to help the elderly and disable

people.By using this system,we can easily operate the home appliances using android .The idea proposed in this article can be extended for the automation of industries, malls, hospitals etc.,

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