Abstract: -Automation is play an important role in our daily life. The main aim of any automated system is saving human labour, effort, time and errors due to human negligence. The main objective of our system is to provide easy means for normal, handicapped and old age persons to control and operate home appliances. We can control any home appliance by using our voice like light, fan, computer etc. The physically disable people does not operate home appliances by using their hand, this voice controlled project is very useful for physically disabled person. They are capable to operate home appliances by using their Voice. In home automation system we are using voice recognition module to recognize our voice. Practical voice recognizer module is utilized in order to store using commands and recognize the user’s voice in digital signal. Our paper presents a micro controller based voice controlled home automation system. Such a system is operated our voice which is recorded in recognition module otherwise it does not operated of other person.[1]

Keywords:- Voice Recogniser, Atmega16, Voice Control, Code Vision AVR, Home Automation, Power Supply.

I. INTRODUCTION

The main aim of voice recognition technology has been to increase efficiency and decrease effort. Automation is one such area that aims achieves simplicity and increasing efficiency. Voice controlled House Automation System aims to further the cause of home automation so as to achieve the goal of simplicity to operate electrical appliances. Inventions and evolution in technology has made this possible. Home automation has an important role in our life for their standard of living. We require the intelligence of a microcontroller to control the home appliances. There are various technologies available for similar purposes like Bluetooth, RF sensor, Smartphone and ZigBee but their cost and complexity is major disadvantage. [1]

In this project, we have designed an affordable and simple to use system that takes the input from the voice recognition module through serial communication port and uses the AT mega 16 microcontroller’s intelligence to operate different devices.

II. SYSTEM DESIGN

The Voice-operated Home automation system uses the ATmega16 as the microcontroller. The key components of this system are:

I. AT mega 16 Microcontroller.
II. Voice Recognition Module V3.1.
III. Relay Board.
IV. 16*2 LCD.

2.1 AT mega 16 Microcontroller:-
It is a part of AVR microcontroller family. AT mega 16 is an 8-bit microcontroller with high performance and less power consumption. Atmega16 comprises of enhanced Advanced RISC Architecture131 Powerful Instructions. Maximum frequency on which it can work is 16MHz. It have 4 port (32pins) input – output ports and 16K Bytes of In-System Self-Programmable Flash and 512 Bytes EEPROM.

2.2 Voice Recognition Module:-
Voice Recognition Module is easy-control our voice signal. Voice Recognition Module can support many voice commands but it disadvantage is some of them could work at the same time. Any sound could be trained as command which is stored in voice recognition module.

Fig. no 1 - Voice Recognition Module V3.1 [4]

In voice recognition module V3.1, voice commands are stored in one large group voice recognition module. Any 7 voice commands could be imported into voice recognizer. It means maximum 7 commands are stored at the same time. Voice
recognition module operated at 4.5-5.5V voltage, current <40 mA and it has some feature like 5V TTL level for USART interface, 3.5 mm microphone connector. Recognition accuracy 99%. The performance of AVR (AT mega 16) microcontroller is best when interfaced with voice recognition technology. Minimum number of components is used for this project like AT mega 16 microcontroller, voice recognition module v3.1, relay board, LCD and power supply unit. First the user has to store the commands in voice recognition module and then speak again so that the voice recognition module can recognize that particular command to operate accordingly. [2]

2.3 Relay Board:
A relay is an electromagnetic switches many relays use an electromagnet to mechanically operate a switch. Relays are used where it is necessary to control a circuit by a low-power signal when a circuit which operate relay is trigger by a clock pulse. In this project the relay circuit is used to turn the appliances on/off on the voice commands. The high/low signal is supplied from the port C of AT mega 16 Microcontroller. When a low voltage is given to the relay transistor to switching of an appliance it is turned off and when a high voltage is given appliance is turned on. The transistor is operated in saturated and cut off mode. The relay circuit to drive four home appliances in the Voice-operated system which is shown in fig. No 2. The number of appliances can be increased according to our requirements. [2]

2.4 16*2 Liquid Phase LCD:
Here we are using a 16 x 2 LCD for display the values and voice command on the screen which is stored in microcontroller. It has 16 pins including 8 data pins, EN, RS, R/W, VCC, VEE, GND, LED +, LED -. It support 16 characters per rows and total no of rows are 2 means it can support up to 32 character at a time, which is sufficient for data display purpose. RS, R/W and Enable pins of LCD are connect with the AT mega 16 microcontroller port B (0-3) pins. Data lines D4-D7 are connected to one of the output port B (4-7 pins) of AT mega 16 microcontroller. [3]

III. WORKING OF THE SYSTEM
Firstly, 230V AC supply is converted into 5V DC using 12V step down transformer, Bridge rectifier (IN4007 diode), smoothening circuit (1000uf capacitor) and LM7805 Voltage regulator. The working principle of speech recognition comprises of the fact that command which is given by any person. These analog waveforms are converted to digital form and decoded the appropriate commands including words and sentences. [1] Initially, train the voice recognition module V3.1 with the suitable commands (AA 06 21 00 6F 6E 31 0A) and say the commands after that the commands will be stored in binary form and fed to Atmega16 microcontroller using serial communication port. The microcontroller operates according to the program burned into it using load commend (AA 06 01 01 02 03 0A). Serial communication port (TXD, RXD) is used to take input from voice recognition module and Port C is used to control output devices. According to the program which fed into microcontroller, it will respond to the instructions and will turn on/off the devices when required. [3]

Fig. no. 2 – Relay Board design on Proteus 7.7
Fig. no. 3 – 16*2 LCD [3]

IV. RESULT
The voice recognition module was first tested in a quiet room with one person. All commands were correctly recognized by the module which stored in...
module but when we tested it with a different person on whom module was not trained.
Although, if the person had spoken command multiple times the recognizer had sufficient examples to properly determine what pronunciation the person spoke. Then we test the project in a noisy room by turning on some music the recognizer found it difficult to recognize the person’s voice.[2]
In the home automation system we are using voice recognition module to recognize their voice. When we speak light on than lights will be on and remaining devices will be off. When we speak fan on than fan will be on and remaining devices off and so on.

Fig. no 5 – Implementation of purposed system [1]

V. SCOPE AND CONCLUSION
The prototype of system which is used in controlling devices through human voice is proposed and implemented and several changes can be done in this for suite different applications and scenarios.
Following learning’s were provided by this project: voice recognition module operation, interfacing voice recognizer module to Microcontroller and Relay working principle.
In our homes, the voice controlled home automation project will enable us to bring every appliance at our home under our control from a single point without having to get up and manually switch on or off the appliance. [5]
The Government of India promoting awareness for switch off household appliances when not in use and save electricity. Such this project initialize most people forget to switch off home appliances and are too lazy to return and switch it off. [2]

ACKNOWLEDGMENT
We would like to extend our sincere gratitude to the Head of Department Electronics & CommunicationEngg. OfPoornima Institute of Engineering and Technology, Jaipur, Mr. Sachin Chauhan, Project guide Mr. Rahul Pandey, who gave us their careful and ardent guidance because of we are able to complete this project.

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