CONTROLLING THE DEVICES THROUGH VOICE COMMANDS

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***Abstract*—The main objective of this project is to develop a home automation system using an Arduino board with Bluetooth being remotely controlled by android smart phone. As technology is advancing houses are also getting smarter. As modern houses are gradually shifting from conventional switches to centralized control system. Presently, conventional wall switches located in different parts of the house makes it difficult for the user to go near them to operate Even more it becomes more difficult to elderly or physically handicapped people to do so. Remote controlled home automation system provides a modern solution with smart phones. In order to achieve this a Bluetooth module is interfaced to the Arduino board at the receiver end and while on the transmitter end, an application on the mobile phone sends voice commands to the receiver where loads are connected. By giving the specified voice command, the loads can be turned ON/OFF remotely through this technology. The loads are operated by Arduino board through relay module.**

Keywords—component

Arduino Uno board, Bluetooth module (HC-05), Active low four channel Relay module, LCD display, AC bulbs, L293D motor driver, D.C. motor, breadboard

Introduction

i. ***Mechanism of removing as much human interaction as***

Technically possible and desirable in various domestic

Processes, and replacing them with programmed electronic systems- essentially the automation of home appliances.

ii. ***The main objective of this project is to develop a load control.***

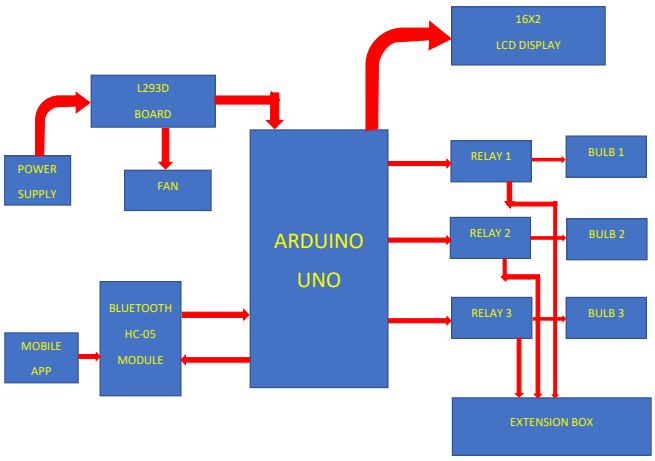
iii. ***The Microcontroller is ATmega328P(Arduino Uno is used.***

iv. ***The Bluetooth module sends commands from any remote location to control the electrical loads.***

MOTIVATION

Our motivation is for the people who are disable and cannot walk to get things done. The blind people are also one of the major motivation for us to work on this project. As they cannot walk to switch ON/OFF their home appliances. Home automation results in a smarter home and is used to provide a higher and healthier standard of living. With the IOT revolution just around the corner, it is high time we move towards widespread adoption of such a system.

BLOCK DIAGRAM AND EXPLANATION



WORKING PRINCIPLE

At first, a mobile app is interfaced with Bluetooth module(HC-05) which is paired by Bluetooth. Here, the Bluetooth module acts as a Master mode, also it makes a serial communication for the transmission of commands to the Arduino uno.

In this project, we have used four devices(3 A.C. bulbs, 1 D.C. motor). For the four devices, by considering the ON cases, we select 16 combination of commands for the activation of corresponding combination of devices, we have given a command for that combination. And that combination is transferred through Bluetooth to the serial monitor of the Arduino.

There we have stored the user given command into a variable and afterwards it checks the condition for equality if it matches to the already existing command that was written in the Arduino code.

If the particular condition is true, then the corresponding signals are generated by the Arduino UNO are sent to the 4-channel Relay module and L293D motor driver to make the status of the device to be ON/OFF.

Finally the status of particular combination will be displayed in the 16x2 LCD display.

DESIGN

COMPONENTS USED

1.Arduino UNO:

It is a microcontroller having 13 digital input or output pins and 5 Analog pins with power supply pins and USB port for dumping of code and a code reset button. Arduino UNO plays a key role for controlling the all other devices connected to it.

2. Bluetooth module(HC-05):

It contains transmission and receiver pins with power supply and ground. It acts as a master mode for the transmission of data to the arduino.

3. 4-channel Relay module:

It contains four input pins with supply and ground.

Each input pin corresponds to each relay module.

It acts as a switch for the circuits whenever the input signal is Active low(switch is closed and the circuit becomes a closed one). It also contains opto-couplers for not to damage the relay module at the time of increase in voltage.

4. L293D Motor driver:

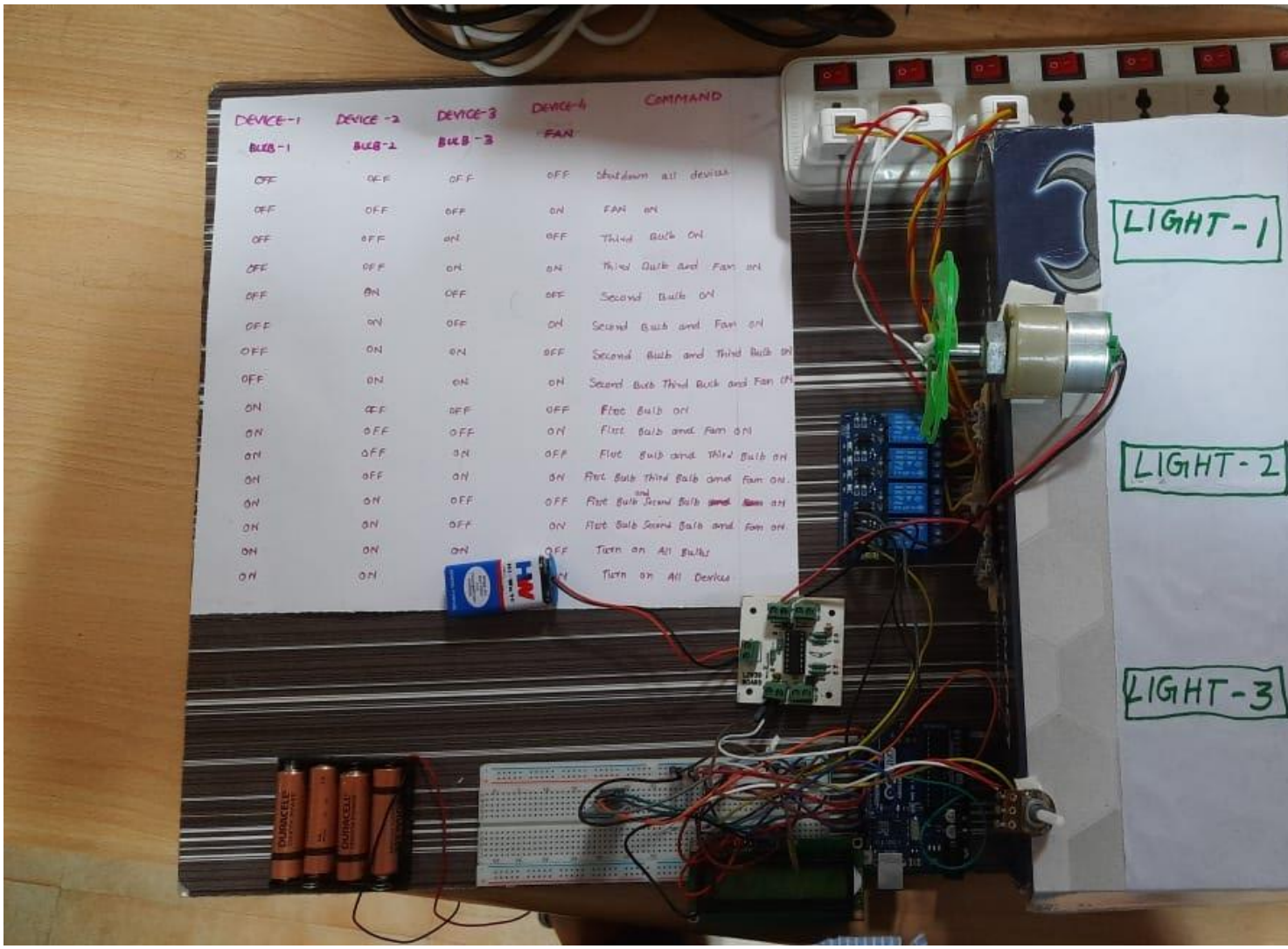
Basically, it is a 14 pin IC used to control two D.C. motors.

- **Enable pin-used to control the speed of a motor.**
- **In1,In2- used to control the direction of the motor(clockwise or anti-cockwise)**
- **Out1,Out2-used to connect to the D.C. Motor**
- **Vcc-power supply and Ground**

5.16x2 Liquid Crystal Display:

It is used to display the output status of the devices.

RESULTS


DEVICE-1
BULB-1
DEVICE -2
BULB-2
DEVICE-3
BULB -3
DEVICE-4
FAN
COMMAND
OFF OFF OFF OFF Shutdown all devices
OFF OFF OFF ON FAN on
OFF OFF ON OFF Third Bulb ON
OFF OFF ON ON Third Bulb and Fan on
OFF ON OFF OFF Second Bulb ON
OFF ON OFF ON Second Bulb and Fan on
OFF ON ON OFF Second Bulb and Third Bulb on
OFF ON ON ON Second Bulb Third Bulb and Fan on
ON OFF OFF OFF First Bulb on
ON OFF OFF ON First Bulb and Fan ON
ON OFF ON OFF First Bulb and Third Bulb on
ON OFF ON ON First Bulb third Bulb and Fan on.
ON ON OFF OFF First Bulb and Second Bulb on
ON ON OFF ON First Bulb Second Bulb and Fan on
ON ON ON OFF Turn on All Bulbs
ON ON Turn on All Devices
LIGHT-1
LIGHT-2
LIGHT-3

FIGURES AND TABLES

S.No.	DEVICE 1 BULB 1	DEVICE 2 BULB 2	DEVICE 3 BULB 3	DEVICE 4 FAN	COMMAND TO BE USED
1	OFF	OFF	OFF	OFF	SHUTDOWN ALL DEVICES
2	OFF	OFF	OFF	ON	FAN ON
3	OFF	OFF	ON	OFF	THIRD BULB ON
4	OFF	OFF	ON	ON	THIRD BUB AND FAN ON
5	OFF	ON	OFF	OFF	SECOND BULB ON
6	OFF	ON	OFF	ON	SECOND BULB AND FAN ON
7	OFF	ON	ON	OFF	SECOND BULB AND THIRD BULB ON
8	OFF	ON	ON	ON	SECOND BULB THIRD BULB AND FAN ON
9	ON	OFF	OFF	OFF	FIRST BULB ON
10	ON	OFF	OFF	ON	FIRST BULB AND FAN ON
11	ON	OFF	ON	OFF	FIRST BULB AND THIRD BULB ON
12	ON	OFF	ON	ON	FIRST BULB THIRD BULB AND FAN ON
13	ON	ON	OFF	OFF	FIRST BULB AND SECOND BULB ON
14	ON	ON	OFF	ON	FIRST BULB SECOND BULB AND FAN ON
15	ON	ON	ON	OFF	TURN ON ALL BULBS
16	ON	ON	ON	ON	TURN ON ALL DEVICES

DISCUSSION AND CONCLUSIONS

Main purpose of home automation system is to provide ease to people to control different home appliances with the help of the android application present in their mobile phones and to save electricity, time and money.

ACKNOWLEDGMENT

We would like to give special thanks to our guides

Mr. Vinod sir and Mr. Balakrishna sir, Department of Electronics and Communication Engineering(ECE), RGUKT, Nuzvid -521202, India

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