Android based Electric Switch

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***Abstract*—**This paper represents design and implementation of Android based electric switch. By using android app, the electrical switches and devices can be controlled and monitor remotely. Data transmission from the microcontroller to the Smartphone Bluetooth module is utilized. This Bluetooth module is on-board radio wave. The world is moving very rapidly towards digital people have less time to handle any device. This project is developed & design by using Arduino with Bluetooth module. The outcome of this project aims as benefit of saving electricity and makes human life easier as we monitored home appliances by android app.

Keywords— Bluetooth technology, microcontroller, bluetooth module, Arduino, Data Transmission

I. INTRODUCTION

Bluetooth technology is a short range wireless communication technology to replace the cables, It has low power consumption. The concept behind bluetooth is to provide a universal short range wireless capability.[1] A bluetooth technology is a high speed radio communication wireless technology link that is designed to connect phones or other portable equipment together.[2] It is achieved by embedded low cost transceivers into the devices. It supports on the frequency band of 2.45 GHz and can support up to 721 kbps.[3] Wireless signals transmitted with bluetooth over short distances, typically up to 30 feet.

Nowadays, there is growing demand of automation and intelligent systems so that it leaves us with less human intervention and smart decision making devices. With growing demand, comes the growing competition which has forced thecompetitors to come out with more intelligent efficient as well as user friendly models. This has made our lives easier from making our intelligent travel arrangements to our personal medical care. With a tap of your finger you can control your lights, fans and many more electrical appliances.[4]

II. METHODOLOGY.

This section discusses about hardware used, software development and the working of the proposed system.

A. Hardware Specifications

1. **Arduino:** Arduino is the versatile device used in project because it provides huge amount of application. The board can work on an external supply of 6v-20. The Atmega328 has 32 kb of flash memory for storing code. All the 14 digital pins on the Arduino board can be used as an input or output using pinMode(), digitalWrite() & digitalRead() functions.

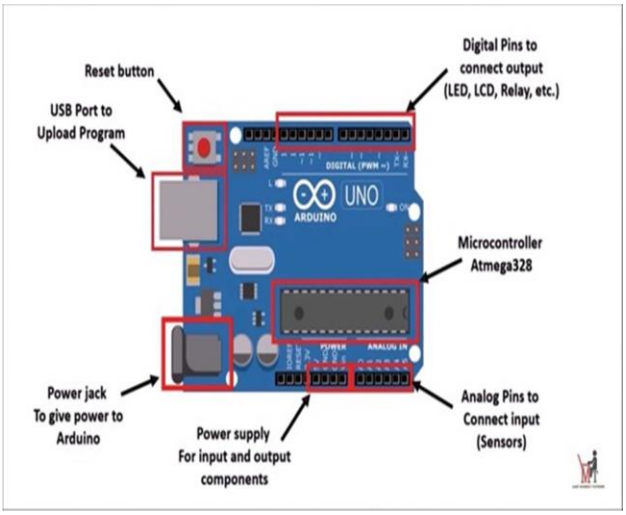


Fig.1 Arduino UNO Development Kit

2. **Bluetooth Module**:The HC 05 Bluetooth module is the most mainstream module in the Indian market and this module is generally utilized in the embedded projects. The HC 05 Bluetooth modules are not difficult to utilize and basic, its cost is low and these sorts of modules are interfaced with the Arduino,

Rasberry Pi, and Microcontroller through thesequential UARTinterface.

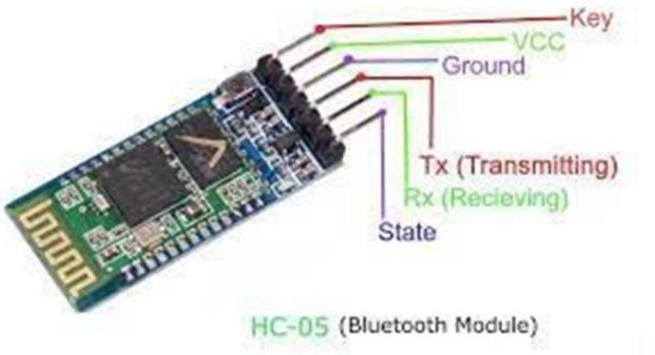


Fig 2. HC05 Bluetooth Module

Relay Module: The 4 Channel Relay Module is used in our project. It is an advantageous board that can be utilized to control high voltage, high current loads like motor, solenoid valves, lights,and AC load. It is intended to interface withmicrocontrollers like Arduino, PIC, and so on. The relay terminal (COM, NO, and NC) is being carried out with a screw terminal. It additionally accompanies a LED to show the situation with the transfer.

Fig 3. 4 Channel Relay Module

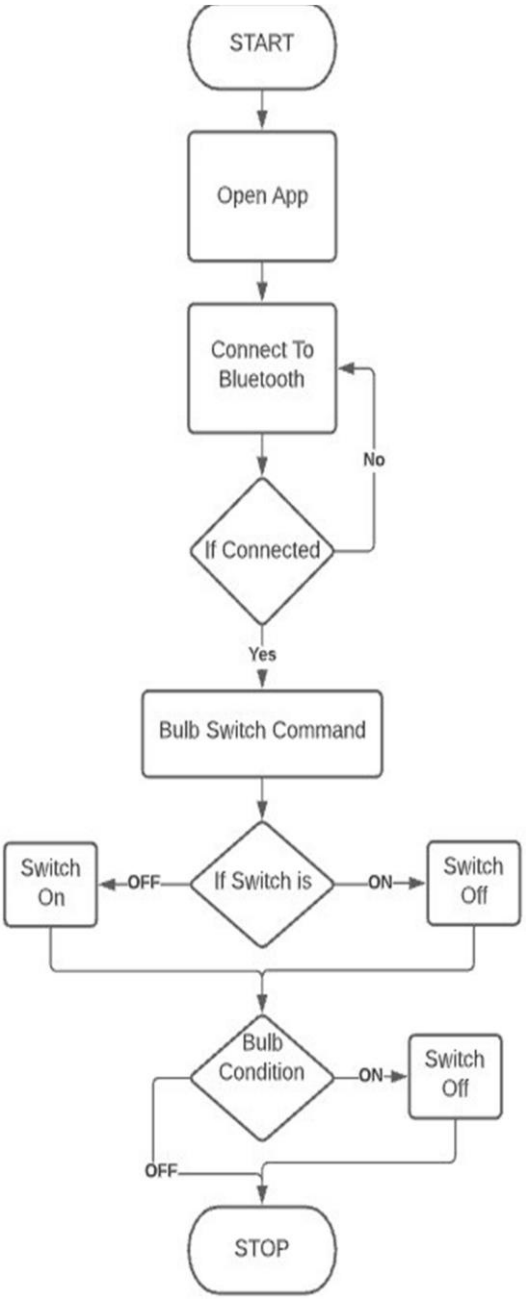
Battery: A 9v Lithium ion battery is used to power up Arduino Uno. It has a rectangular crystal shape with adjusted edges and an enraptured snap connector at the top. This sort is usually utilized in smoke alarms, gas locators, tickers, walkie-talkies, electric guitars and impacts units.

A. Software Implementation

The project mentioned in the paper uses an Arduino which required a program for the execution and operation of the integrated circuit. Since Arduino program is an easy language to implement and is a commonly used program for the development of the microcomputer. The software inserted inside the Arduino helps the Arduino to control the relay to give the 'ON' or 'OFF' command.

The execution of this software design and created with analyzing the comfort level of the human and to give a command to operate by easy way, When operator touches the button in created app in the cell phone the relay gets turn 'ON' and appliance connected to it gets on and when operator again touches the button in cell phone the relay gets turn 'OFF' and the appliance connected to it gets off. This software and app are developed according to the comfort level of the operators so that they can operate their home appliance properly. In this way the system can be programmed with home appliance effectively and efficiently.

B. Flow Chart



III. CIRCUIT DIAGRAM

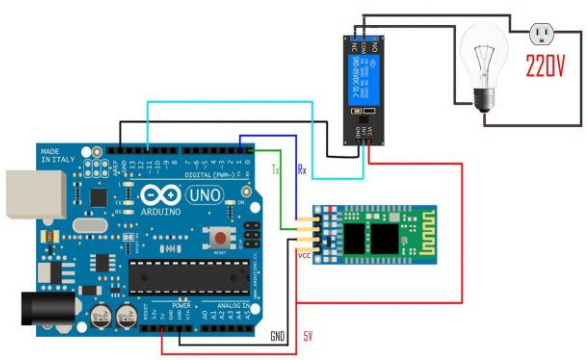


Fig 4. Circuit Diagram of Project

IV. OPERATION

Bluetooth network consist of a personal area network or a piconet which contain a minimum of 2 to a maximum of 8 Bluetooth peer devices. Usually a single master & up to 7 slave. A slave device is the device that response to the master devices. A master device is the device that initiates communication with other device. Slave device are required to synchronies they are receive time with that of masters.

Arduino UNO can detect the surrounding from the input here the input can be detected by variety of sensor, motor, light other actuators etc. Arduino can be Programmed using IDE software which is used for programming of Arduino. USB port is used for programming of Arduino. USB port is connected to Laptop/PC to do the programming part. The reason to use Arduino UNO is because it is more reliable, low cost efficient and can be used as per our requirement. It is easy to use and reliable device. We can modify it as per our requirement to make this project. The help to connect various device and synced them properly.

V. FUTURE SCOPE

Bluetooth has a good future ahead because it meetsa basic need of connectivity. New versions of Bluetooth technology will meet the high speed and large range. Future Scope is considered to be a next generation technology because this technology isaimed at replacing most of the present wireless technologies like Wi-Fi, Bluetooth technologies. This project we can design and implemented byusing IoT based..

VI. RESULTS & DISCUSSION

According to the final plan, the outcome of this project leads to Android Based Electrical Switch. Through this project we learnt that Bluetooth module is an easy to use Bluetooth serial port protocol module. Its communication is via serial communication on which makes a easy way to interface with controller or PC. So, Bluetooth module is far better than any other devices.

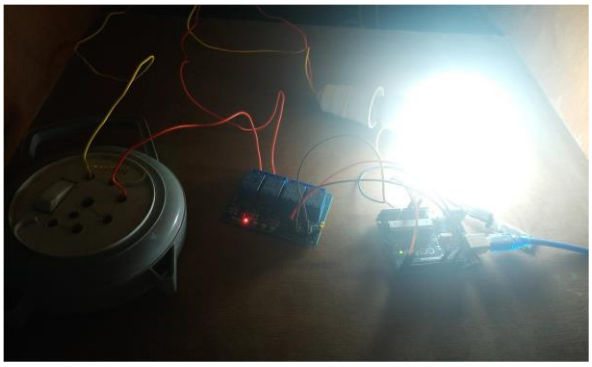


Fig.5 Working Model of ABES

VII. CONCLUSION

Android app is designed through which we can run our working model. This paper presented the design of an efficient, cost effective and reliable android based electric switch. The Bluetooth module and arduino was successfully tested on a multitude of different phones, thus providing its portability and wide compatibility. Thus android based electric switch was successfully designed, implemented and tested.

VIII. REFERENCES

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