

## CONTROL ELECTRIC BULB USING SMART PHONE

Anusha SE\*<sup>1</sup>, Sahan\*<sup>2</sup>, Uthpreksha KP\*<sup>3</sup>

<sup>\*1,2,3</sup>Shree Devi Institute Of Technology, Mangalore, India.

### ABSTRACT

This paper presents an efficient approach to switch on/off and control the intensity of an LED bulb from a remote place using Android Applications installed in a Smartphone. As LED household bulbs and lights are energy efficient, drop-in replacements for the incandescent lighting found in homes and offices. These lights produce a warm brightness while providing a significant cost savings over traditional lighting. Bluetooth & Wi-Fi modules are used simultaneously as an interface that make connection between Android Application and the LPC2148 controller by which the generated output can be viewed with the help of an LED bulb and control various other devices, based on the availability in particular areas.

**Keywords:** Android Bluetooth LED, LPC2148 Controller, Wifi.

### I. INTRODUCTION

This project aims at designing a system which is capable of controlling our Home appliances using Android Smartphone with Multi communication . This project uses both Wi-Fi and Bluetooth communication simultaneously and controls Various devices based on the availability in particular areas. The system controls the LED light Intensity to high and Low using Wi-Fi or Bluetooth technology, Microcontroller and can also control any 230v Home appliances using our smart Phone. This system is very user-friendly ,accurate and future technology. Bluetooth is an open standard specification for a radio frequency (RF)-based, short-range connectivity technology that promises to change the face of computing and wireless communication.

It is designed to be an inexpensive, wireless networking system for all classes of portable devices, such as laptops, PDAs (personal digital assistants), and mobile phones. It also enables wireless connections for desktop computers, making connections between monitors, printers, keyboards, and the CPU cable-free.

The Wi-Fi and Bluetooth work on radio waves technology, as the data to be passed through them is converted into the electromagnetic signal which is then sent using the antenna. This signal is received and decoded by the router at the receiving end. This signal is passed to the controller which is nothing but LPC2148Micro controller. The controller further operates the received information and performs operations on the appliances, which are driven by the driver i.e, (LED Driver that drives the LED lamp to ON/OFF and Intensity control condition), a relay switch is connected to microcontroller through which ac appliances can be connected and controlled.

### II. PROBLEM STATEMENT AND SOLUTION

In today's context of increasing energy efficiency and smart technology integration in homes, there is a need for a system that allows users to remotely control and manage household appliances using a smartphone. Specifically, there is a demand for a solution that enables the following functionalities.

### III. LITERATURE SURVEY

A literature survey on controlling electric bulbs using smartphones typically covers various aspects related to mobile application development, communication protocols, hardware interfaces, and user interaction. Focus on research and developments in LED bulb control methods, including dimming, color control, and scheduling.

Review studies on energy efficiency improvements and cost savings associated with LED lighting compared to traditional bulbs. Examine smart lighting solutions that integrate with smartphone apps for enhanced user experience and environmental benefits.

### IV. METHODOLOGY

To develop a methodology for controlling electric bulbs using a smartphone, you'll need to consider several technical and procedural aspects. Here's a structured approach:

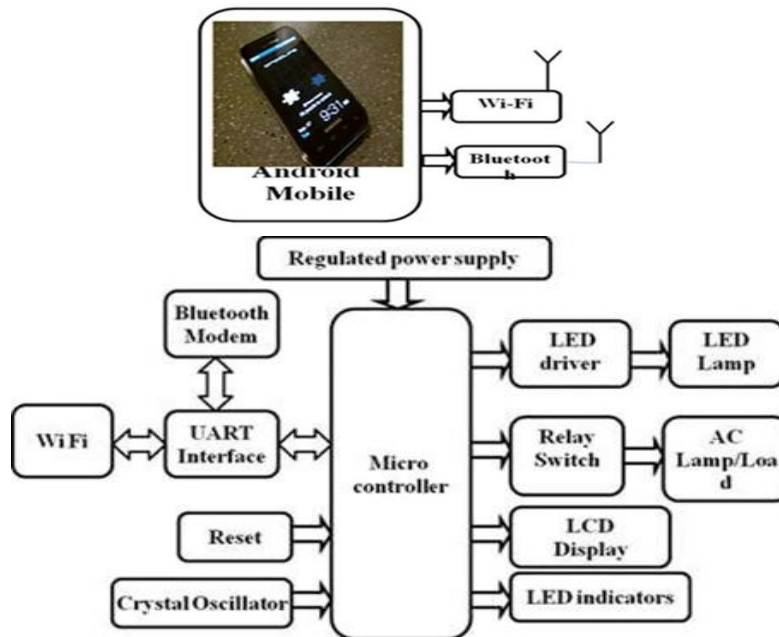


Fig..1 Block diagram.

### SOFTWARE REQUIREMENTS

- KEIL MICROVISION4 (Simulation)
- FLASH MAGIC
- HYPERTERMINAL (Bluetooth Module CI)
- TELNET (Wi-Fi Module App)

### HARDWARE REQUIREMENTS

- LPC2148 Microcontroller
- Regulated Power Supply
- LED Indicators
- Wi-Fi Module
- Bluetooth
- Relay
- LCD Display

#### LPC2148 Microcontroller:

The LPC2141/42/44/46/48 microcontrollers are based on a 16-bit/32-bit ARM7TDMI-S CPU with real-time emulation and embedded trace support, that combine the microcontroller with embedded high-speed flash memory ranging from 32 kB to 512 kB. A 128-bit wide memory interface and a unique accelerator architecture enable 32-bit code execution at the maximum clock rate.

#### Regulated Power Supply:

The power supply section is required to convert AC signal to DC signal and also to reduce the amplitude of the signal. The available voltage signal from the mains is 230V/50Hz which is a AC voltage, but the required is DC voltage (no frequency) with the amplitude of +5V and +12V for various applications.

#### LED Indicator:

A light-emitting diode (LED) is a semiconductor diode that emits light when an electrical current is applied in the forward direction of the device, as in the simple LED circuit. The effect is a form of electroluminescence. Where incoherent and narrow-spectrum light is emitted from the p-n junction. A series of miniature LED's with ultra high output of size 8mm and round dome top shape are used in the project.

#### Wi-Fi Module:

Wi-Fi is a technology that allows an electronic device to exchange data or connects using microwaves in the 2.4 GHz and 5GHz bands. The module is based on the Institute of Electrical and Electronics Engineers 802.11 standards. Wi-Fi is more suitable for sensitive applications. It has power saving mechanisms and extended battery life. Support transparent transmission mode as well as multiple network protocols.

#### Bluetooth Module:

Bluetooth uses a very robust radio technology called frequency hopping spread spectrum. It chops up the data being sent and transmits chunks of it on up to 75 different frequencies. In its basic mode, the modulation is Gaussian frequency shift keying (GFSK). It can achieve a gross data rate of 1 Mb/s. Bluetooth used is Parani-ESD100/110/200/210 which has a working distance ranging from 10 to 100meters and can be extended up to 1000 meters using patch antenna and easy to use Windows configuration tool available.

#### Relay:

A relay is an electrically operated switch which are 25 A or 40 A solid state contactors. They are necessary to control a circuit by a low-power signal, or where several circuits must be controlled by one signal. A solid state relay is used which is a solid state electronic component that provides a similar function to an electromechanical relay but does not have any moving components, increasing long-term reliability.

#### LCD Display:

A liquid crystal display (LCD) is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector. One of the most common devices attached to a controller is an LCD display. A 16x2 smart LCD Display which displays 16 characters per line by 2 lines is used in this project. It displays the status of the device such as a Wi-Fi/Bluetooth module is ON/OFF and also about the LED lamp conditions.

### V. APPLICATIONS OF CONTROL ELECTRIC BULB USING SMART PHONE

- Create the illusion of occupancy when you're not at home.
- This can help you optimize energy usage and reduce electricity bills.
- Control your home lighting without needing to get up or find a physical switch.
- Adjust lighting to suit different activities or moods

### VI. CONCLUSION

The ability to control electric bulbs using a smartphone represents a significant advancement in home automation technology. By seamlessly integrating smart bulbs into our daily lives, we gain unprecedented convenience, flexibility, and efficiency in managing lighting systems. Whether adjusting brightness levels, scheduling operations, or remotely controlling from anywhere, smartphone-controlled lighting enhances comfort, promotes energy conservation, and supports personalized living spaces. As smart home technology continues to evolve, such innovations promise to redefine how we interact with and experience our living environments, making everyday tasks simpler and more enjoyable.

### VII. REFERENCES

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