RGB LED Controller using Android App

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Introduction

In this RGB LED controller we can control a RGB LED from an Android App via a Bluetooth connection. A HC-05 bluetooth module is connected to Arduino UNO. RGB lighting enables you to create millions of different colours of light, all based on these three primary colours (red, green and blue). It can be used in different applications such as outdoor decoration lighting, stage lighting designs, home decoration lighting, LED matrix display, and more

Working

RGB LED controllers works by altering the power on each of the three channels (red, green and blue) to create a specific colour mix. To generate a purple colour, for example, the red and blue channels would be wound up, and the green channel turned off completely. Mixing blue and red light will give you the purple color.

Components

- Arduino UNO
- Bluetooth module HC-05
- RGB LEDs(common anode)
- 3x1KOhm,3x10KOhm resistor
- Battery(9V),Voltage Contoller(L7805cv)
- TIP 122 Transistor

Components Description

1. Arduino UNO:

Arduino is an open-source electronics platform based on easy-to-use hardware and software.You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing.

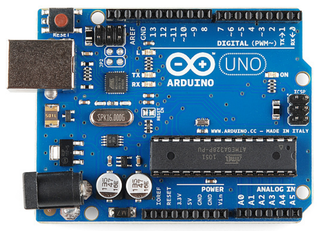


Figure 1: Arduino UNO

2. HC-05 Bluetooth Module:

Bluetooth BLE module is a technology that acts as an interface that aids the wireless Bluetooth Low energy connection of any two devices and establishes a protocol for the communication of data between the devices.

Figure 2: HC-05 Bluetooth Module

3. TIP 122 Transistor:

The TIP122 is a Darlington pair NPN transistor. It functions like a normal NPN transistor, but since it has a Darlington pair inside it has a good collector current rating of about 5A and a gain of about 1000. It can also withstand about 100V across its collector- Emitter hence can be used to drive heavy loads.

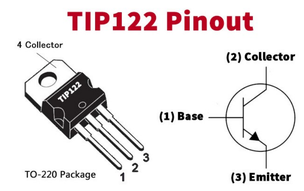
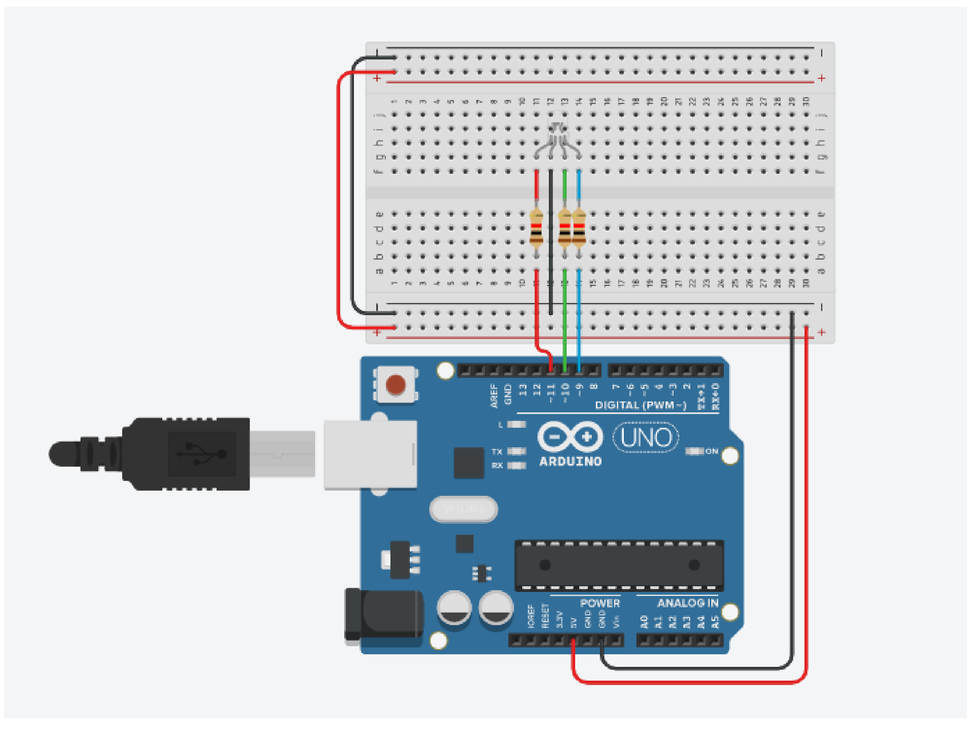


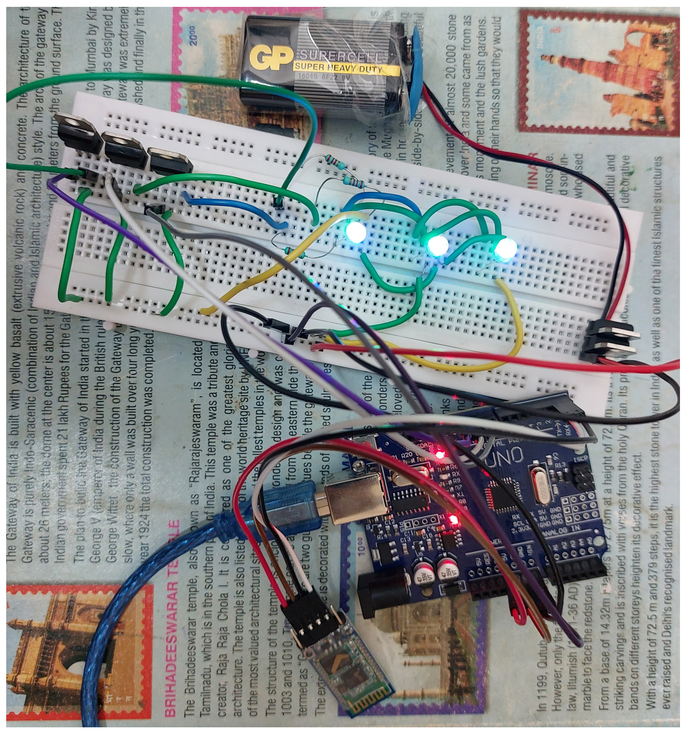
Figure 3: TIP 122 Transistor

4. Android App:

This app acts as RGB LED controller. It allows to change the LED color by using various RGB combinations. The app and the circuit are connected via bluetooth using bluetooth module.

Simulation and Hardware Implementation





Conclusions and References

Conclusion:
We have successfully executed the RGB-LED-Controller.

References:

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QR Code for Recording