

AC Power Controller using Programmable Interface

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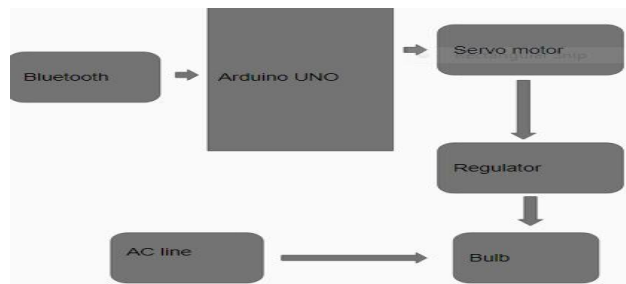
Abstract: The project at controlling the AC power by using the concept regulator angle control of AC line. One can enter the required percentage of power supply through a bluetooth. The input is provided to a microcontroller of a family that initiate the regulator to adjust the load power. For matching the power to the required one, a servo is used in series with the AC load. A display unit is used to display the power and one can go through the preferred percentage to decrease the power to the load. Here, to maintain the load power the regulator would be change automatically. The project employs a bulb such that the entered power equals the necessary one. The above process is carried out with the help of a servo in series with the AC load. It uses AVR family microcontroller. A bluetooth is used to give the input to the microcontroller.

Keywords: Servomotor, Microcontroller, Bluetooth, Regulator

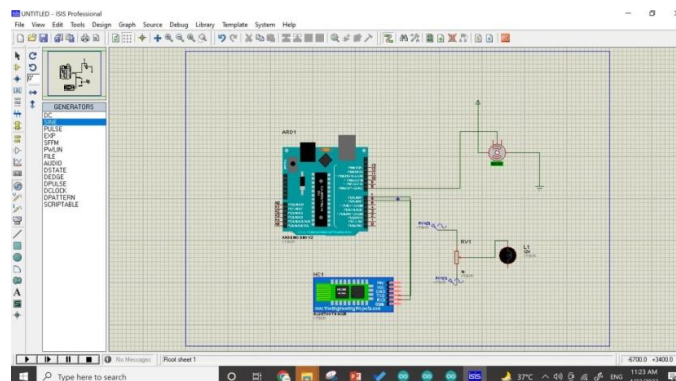
I. INTRODUCTION

The project aims at controlling the AC power by using the concept of regulator control of bluetooth. One can enter the required percentage of power supply through a bluetooth. The input is provided to a microcontroller of AVR family that initiate the regulator to adjust the load power. For matching the power to the required one, a Regulator is used in series with the AC load. A bluetooth app screen is used to display the power percentage that is provided by the user. This system overcomes the faults in the present system and provides a solution for light illumination control mechanism of the lamp.

1.1 Block Diagram



1.2 Circuit Diagram



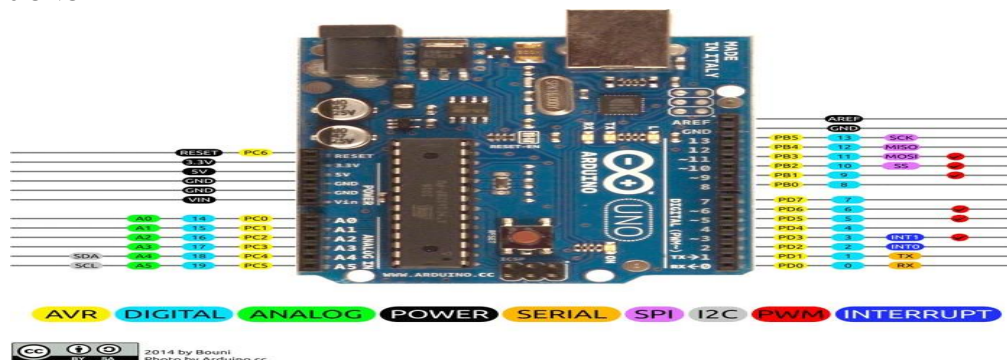
II. PROPOSED METHODOLOGY

We are using Arduino input as a microcontroller with Bluetooth module which give the wireless communication and connect a system with AC power supply using servo motors as a result, according to given input regulator regulate variable resistance to load, servomotor rotates at a particular angle as per give input, and we can control power to the load here we use bulb as load. Like this we can achieve illumination of light.



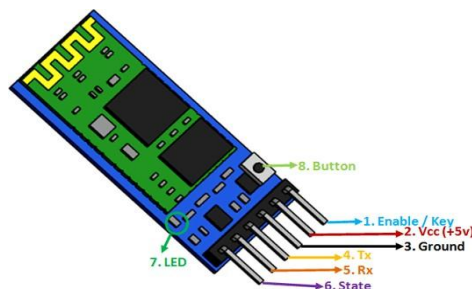
III. COMPONENT DETAILS

3.1 Arduino UNO



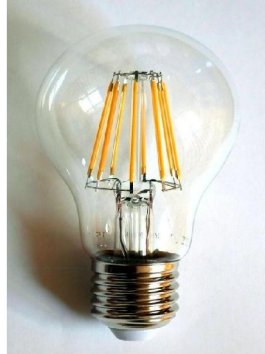
Arduino Uno is a popular microcontroller development board based on 8-bit ATmega328P microcontroller. Along with ATmega328P MCU IC, it consists other components such as crystal oscillator, serial communication, voltage regulator, etc. to support the microcontroller.

3.2 HC-05 Bluetooth Module



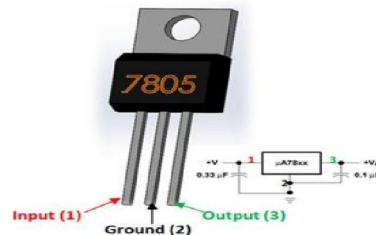
The HC-05 is a popular bluetooth module which can add two-way (full-duplex) wireless functionality to your projects

3.3 Bulb



Tungsten light bulbs are named for the metal tungsten, a gray material that has an extremely high melting point. Because of its high melting point and its strength, it makes for a good filament in light bulbs. A filament is a metal wire that glows when electricity is channeled into it.

3.4 Voltage Regulator



A voltage regulator is a component of the power supply unit that ensures a steady constant voltage supply through all operation conditions. It regulates voltage during power fluctuations and variations in loads. It can't regulate AC as well as DC voltages.

3.5 Servo Motor SG-90

Servo Motor SG90 is a tiny and lightweight servo motor with high output power. Servomotor can rotate approximately 180 degrees (90 in each direction).



IV. RESULT

We are using Arduino input as a microcontroller with a Bluetooth module which gives the wireless communication and connects a system with AC power supply using servo motors as a result. According to the given input, the regulator regulates variable resistance to the load, the servomotor rotates at a particular angle as per the given input, and we can control power to the load here we use a bulb as a load. Like this we can achieve illumination of light.

V. CONCLUSION

This work is used for controlling the AC power by using the concept of regulator control. With this device, one can enter the required percentage of power supply through a Bluetooth. According to the given input, the microcontroller initiates the regulator to adjust to the load power for matching to the power servo motor is employed, and we can decrease or increase the power to the load.

REFERENCES

- [1]. Lee Siang Tat, Yiau Kah Haur "AC Power Controller By Using Microcontroller". ISSN:2180-1843 eISSN:2289-8131. Vol.8 No.12.
- [2]. David Margulies, Clifford E. Felder, Galina Melman and Abraham Shanzer "A Molecular Keypad Lock: A Photochemical Device Capable Of Authorizing Password Entries". Cite This: J. Am. Chem. Soc. 2021, 129, 2 347-354. Publication date: December 19, 2021. <https://doi.org/10.1021/ja065317z>.
- [3]. WebProForumTutorials, "Global System for Mobile Communication (GSM)", The International Engineering Consortium, <http://www.iec.org.comUSA>.
- [4]. Gunnar Heine, "GSM Networks: Protocols, Terminology, and Implementation", British Library, ISBN:0-89006-471-7, London, 2021.
- [5]. Luis Thayer Ojeda, "Arduino Energy Shield User Manual", www.olimex.com, Santiago, Chile, 2021.
- [6]. Arduino UNO, www.arduino.com