

AC POWER CONTROLLER WITH PROGRAMMABLE INTERFACE

Ghotale S.N., Malshetti S.R.,Gajare D.M.,

Prof. Joshi A. A.

Dept. of E&TC Engineering, KEC Shelve, Pandharpur, Maharashtra, India

ABSTRACT

The project at controlling the AC power by using the concept firing angle control of thyristors. One can enter the required percentage of power supply through a keypad. The input is provided to a microcontroller of a family that initiate the firing angle to adjust the load power. For matching the power to the required one, a TRIAC 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 firing angle 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 TRIAC in series with the AC load. It uses 8051family microcontroller. A keypad is used to give the input to the PIC microcontroller. An LCD is used to display the information

KEYWORDS: Microcontroller, TRIAC, Opto Coupler, Zero crossing detector ,LCD Display,etc.

1. INTRODUCTION:-

The project aims at controlling the AC power by using the concept of firing angle control of thyristors. One can enter the required percentage of power supply through a keypad. The input is provided to a microcontroller of 8051 family that initiate the firing angle to adjust the load power. For matching the power to the required one, a TRIAC is used in series with the AC load. A LCD 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.

This system is built by using an 8051 microcontroller and based on the principle of firing angle control of thyristors, which in turn can control the illumination of lamp. An LCD display unit is used, which displays entered percentage of the illumination through a matrix keypad.

The firing angle control of thyristors is done by the microcontroller, according to the desired percentage entered by the user. Based on this input the microcontroller will automatically adjust the power delivered to the lamp through a solid state switching mechanism.

2. BLOCK DIAGRAM:

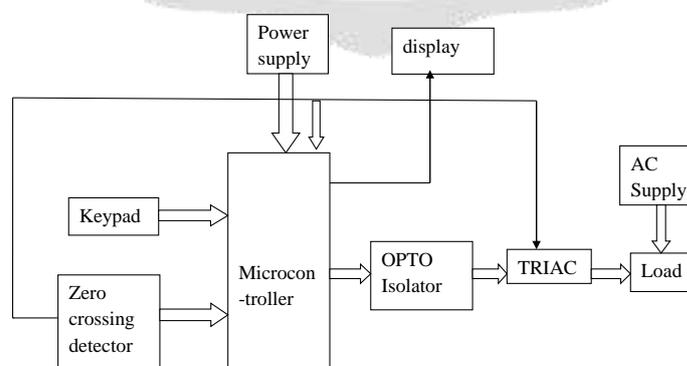


Fig1. AC power controller with programmable interface using microcontroller

Microcontroller:-

- Full duplex UART serial channel.
- 8K bytes of in a system programmable.
- 32 programmable input output lines.
- 256*8 bit internal RAM.

Keypad:-

A keypad is a set of keys placed in a block which frequently bear symbols, digits and a complete set of alphabetical letters.

In order to notice which key is pushed from the matrix, the row lines are to be finished low one by one and read column. A keypad is a set of buttons or keys bearing digits, symbols and/or alphabetical letters placed in order on a pad, which can be used as an efficient input device. A keypad may be purely numeric, as that found on a calculator or a digital door lock, or alphanumeric as those used on cellular phones.

Opto Coupler:

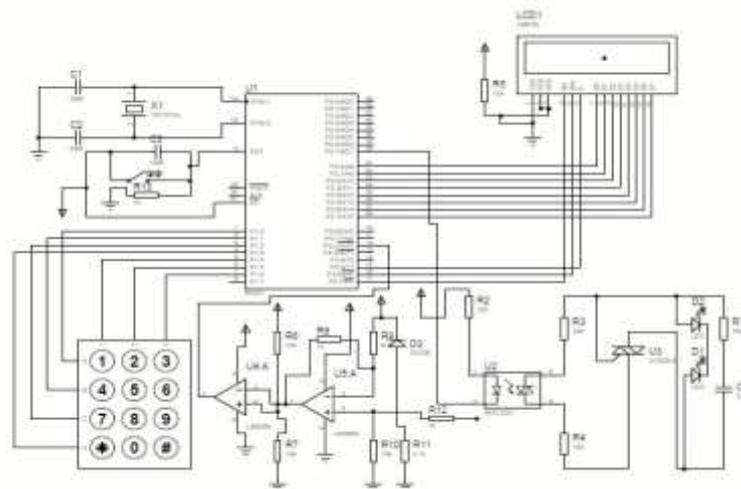
Opto coupler are made up of a light emitting diode, and package. There is no electrical connection between the two devices. Here, the light responsible device may be a phototransistor, photodiode, or devices like thyristors, TRIAC etc.

TRIAC:-

TRIAC, from triode for alternating current, is a generic trademark for a three terminal electronic component that conducts current in either direction when triggered. Its formal name is bidirectional triode thyristor or bilateral triode thyristor.

LCD Display:-

In Ac power controller with programmable interface, the LCD display is used for displaying on the keypad through value. It is 16 pins LCD display, interfaced with microcontroller and is powered up with 5 V dc.

3. CIRCUIT DAIGRAM

The project aims at controlling the AC power by using the concept of firing angle control of thyristors. once can enter the required percentage of power supply through a keypad.

The input is provided to a microcontroller of 8051 family that initiates the firing angle to adjust the load power. For matching the power to the required one, a TRIAC is used in series with the AC load. A LCD screen is used to display the power percentage that is provided by the user.

This system overcomes the faults in the present systems and provides a solution for light illumination control mechanism of the lamp. This system is built by using an 8051 microcontroller and based on the principle of firing angle control of thyristors, which in turn can control the mechanism of the lamp. An LCD display unit is used, which displays entered percentage of the illuminance.

Load is glow at certain intensity depending on power supply. System has turned on that programmable AC power press start to enter user used for keypad enter the percentage is amount of power to be supply to the load if it is 100% supply keep our. System can supply this power is 1% accuracy if the user type enters the 1% power the bulb is glow for 1% intensity.

Press the 1 star use again entire the percentage according to supply 99% & then press # then bulb is 99% intensity glow.

4. FLOW CHART

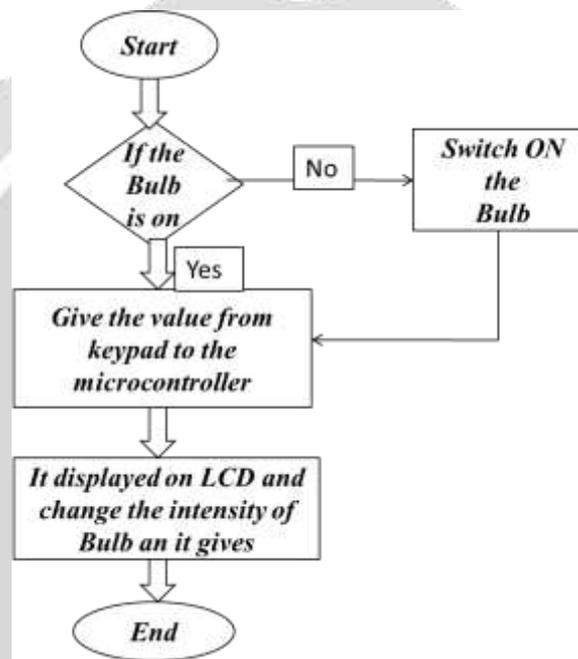


Fig. Flowchart

5. RESULT



6. CONCLUSION:-

This work is used at controlling the AC power by using the concept of firing angle control of thyristors. With this device one can enter the required percentage of power supply through a keypad.

7. REFERENCES:-

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