

# LAB AUTOMATION WITH OVER CURRENT PROTECTION SUPPORTED BY DIGITAL DIMMER

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## ABSTRACT

*In this today's world digital technology is becoming normal part of our life. In each and every field the automation have a essential part. We use so many devices , for that digital electronics is integrated part. We use some measurement device like voltmeter , multimeter , current meter, frequency meter etc. all these now we found have digital electronics. We use function generator.also we use dimmer switch for maintaining the required voltage output as per our next circuit requirement Now its time use some digital electronics for this equipment to make this equipment digital one Also so many mechanical switches are now require to replace with electromechanical switches like relays etc .to make the device on and off. While the devices are used the over current protection and over voltage protection is also a need .*

## I. INTRODUCTION

As we use the dimmer switch for the adjusting the voltage as per out input requirement of the next circuit, we set it manually for example suppose the need is 180 volt A.C. Then we have to move the nob either clockwise or anticlockwise to adjust the voltage in that case for checking the voltage we set we required the multimeter. Also setting time depends upon skill of the person involved in the operation. Second the mechanical switches are used that can not programmed as per our requirement as they have physical contacts and can not be operated by any electronic circuit For protection instant action is required for any hazardous condition that is not available .

## II. LITERATURE REVIEW

Meghana et al. [1] developed the Supervisory Control and Data Acquisition system. According to these system it focuses on the supervisory level and interfaces and implement the hardware component for controlling the DC motor with various speed. The Pulse Width Modulation used as switching to control the speed of DC Pampashree and Ansari [2] gives the introduction, network components, functionality and features of SCADA. In this paper the features, working and automation of PLC has been also discussed. Programming development has also been explained. PLC program development and programming with ladder diagram has been explained with the assignment of SCADA control screen. Also the SCADA screen developed has been shown at the different operation conditions of the processing system in this paper. Experimental setup and performance analysis explains the actual wok which has been adopted for the project. In the website [3] gives an idea about overheating of motor.

The cause of motor overheating are distortion in the supply voltage, impaired cooling capability, unbalanced supply voltages etc. Because of overheating, we can face the problems such as Electrical fire, Decrease in life time of motor etc. Hence, supply is present for single phase and the motor Temperature be within the permitted limit. So for the protection of the motors from mechanical damage and to increase its life time, it is very necessary to protect the phase motor from overheating. Wankhade et al. [4] propose the protection system. In which it protect an induction motor from single phasing and over temperature. The basic idea for the development of this topic is to provide safety to the industrial motor.

### III. OPERATIONAL DIAGRAM

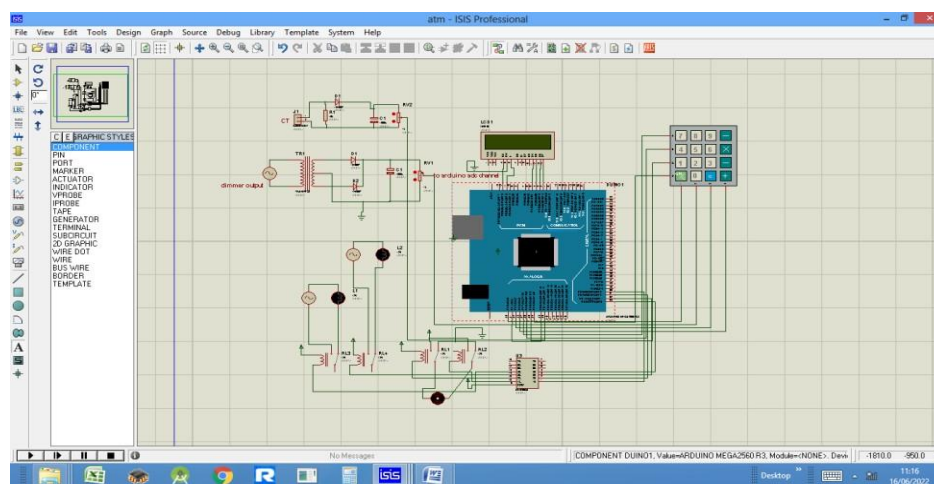


Fig. 1 Operational Diagram

This is the circuit diagram of our project. Her the LCD is interface with atmega arduino board . the 4x4 keypad is interface with the atmega. The current transducer output is ac current . with the help of current sensing circuit the ac current input input is converted into the dc voltage and given to the adc channel mof aduino. Then it is displayed on the LCD. WITH THE HELP OF PROGRAMMING .The keypad is used to enter the desired output from the dimmer.thr relay drive ic2003 is used to drive the relay on or off The devices can be controlled through realy. The motor is connected across two realys to make clockwise or anticlockwise motion to control the dimmer voltage output.

### IV ALGORITHM

- 1) Display welcome on the lcd
- 2) Enter the value from keypad
- 3) Voltage sensing from the dimmer output
- 4) If voltage is greater than the required voltage then move the clockwise

- 5) If voltage is less than the required voltage then move the anti clockwise
- 6) If voltage is equal to the required voltage then stop motor
- 7) Hardware implementation
- 8) Here we have the autotransformer. The required fabrication is done for easy handling the of dimmer. The atmega board have the interfacings of LCD and KEYPAD. The circuit design and implemation ofthe current sensing is done and the output is given to the adc channel.simileraly the voltage sensing circuit is done and out is given ti the adc channel to read the current dimmer output
- 9) The keypad is used to enter the set point
- 10) The clockwise and the anticlokckwise motion is controlled by the realy drive circuit.the arduino programming controls all these operations.

Fig. 2: Flow chart of our project

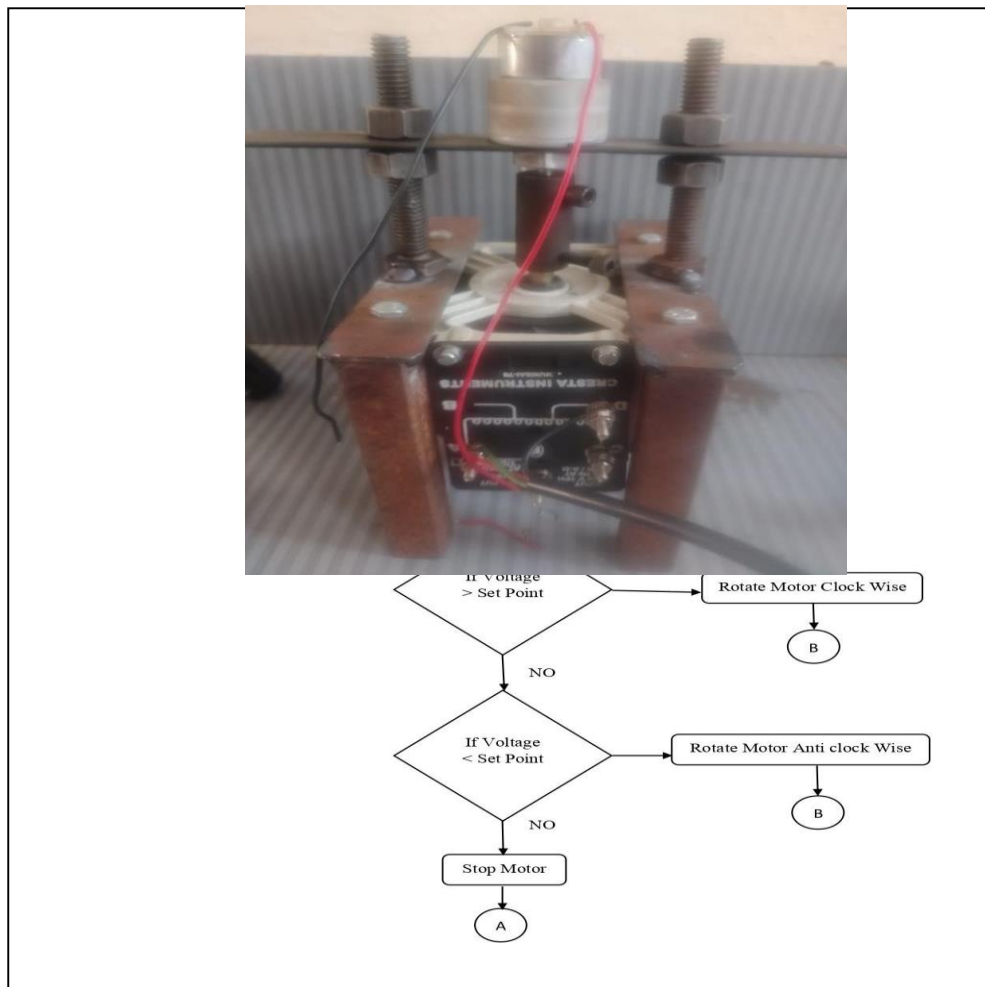


Fig. 3 Hardware implementation

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#### IV. RESULT



#### V. CONCLUSION

This project will be very supportive for the faster opertion to save time and also overcurrent and over protection will avoid the hazards situation. it is cost effective but real time application. the area of application is not limited to lab only we can apply this system to other area also as the system will be reliable, faster and accurate without manual errors.

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