

Industrial Load Controller and its Management with Arduino-uno Single Phase Implementation

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Abstract— At present extra work load on the industry has become a normal situation to meet increasing demand and of production, for this industries are made to run for excess hours which lead to usage of excess power. There is specific limit of power usage under which industry has to work and for this purpose maximum demand controller is installed for controlling the power usage in industry.

Keywords: Load Management, Load Controller, Load Priority Techniques Smart Meter

I. INTRODUCTION

The major problem in the current scenario is power cuts to commercial consumers the conventional solution to this problem is either to increasing generation is not always economical fusible for power plant. Hence industry owner has to install maximum demand controller for controlling power usage. In this device maximum power usage through the months and at end of month generally 24th, 25thday industry exceed its power backup can continue their work and rest has to bear a loss.

II. BLOCK DIAGRAM:

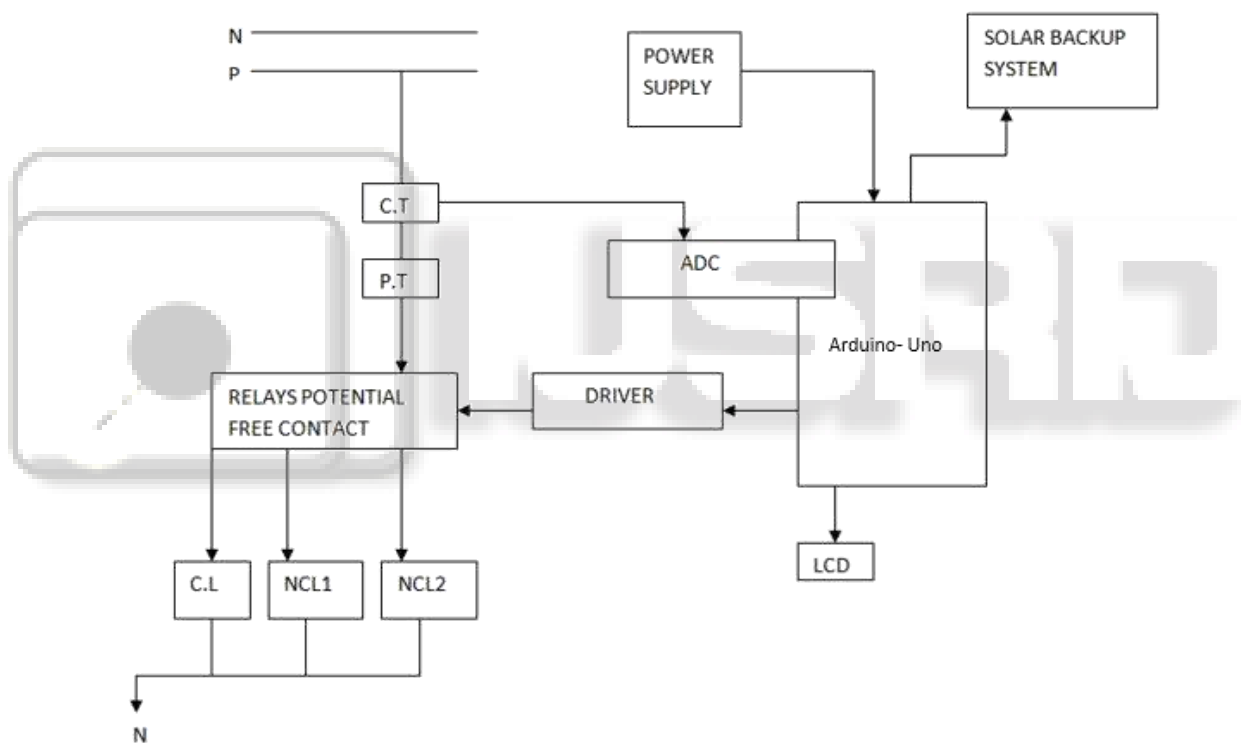


Fig. 1: Block Diagram of Model

III. MODEL DESCRIPTION:

- 1) The idea of the device is designed to control and management power usage of industry and save them from getting penalized
- 2) By using Arduino-Uno the status of the power usage by a industry is monitor and display the same on LCD display.
- 3) A single phase 230V AC supply is given to the current transformer (C.T) and potential transformer (P.T) which is used to measure and sensing the voltage and current in the system.
- 4) The output of CT and PT is given to the Arduino-Uno which shows amount of current and voltage in system of LCD display. Also its product which is known as power is displayed on LCD display.
- 5) A relay driver IC ULN2803 is provided to interface the number of relays directly with the Arduino-Uno Moreover LCD display can be directly interfaced with the Arduino-Uno to display the voltage, the current and power readings in the system.
- 6) The programming fed in an Arduino-Uno will compare the IP signal of current transformer and potential transformer and it will calculate the product of current and voltage which is power and will calculate the product of current and voltage which is power and will compare the same and accordingly turned off the critical and non-critical load.

IV. PROJECT OBJECTIVES:

- 1) Thus by doing so following objectives can be achieved
- 2) To monitor maximum power demand in industrial installation.
- 3) To control power usage in industrial field.
- 4) To maintain and reduce monthly electricity bills.

V. CIRCUIT DIAGRAM

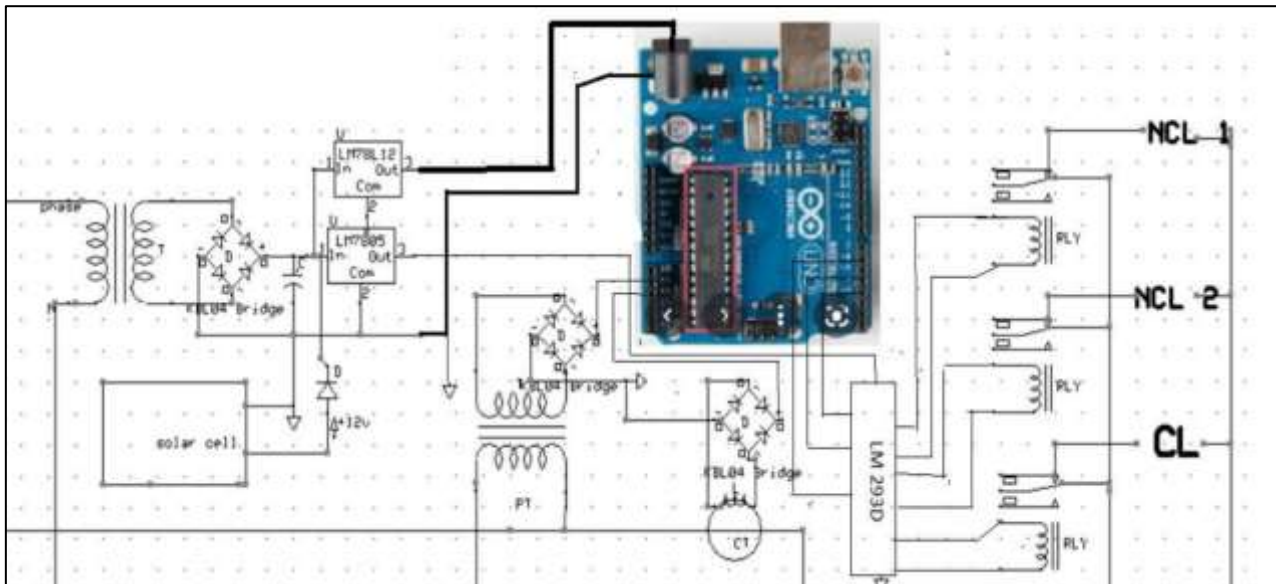


Fig. 2:

VI. WORKING

A single phase 230V AC supply is given to the current transformer (C.T) and potential transformer (P.T) which is used to measure and sensing the voltage and current in the system.

- 1) The o/p of the C.T and P.T is given to the Arduino-uno which shows amount of current and voltage in system on LCD display. Also its product which is known as power is displayed on LCD display.
- 2) Arduino-Uno works on digital signal hence ADC converter is required to convert analog quantities into digital quantities which in build in it.
- 3) A separate 12V DC supply is required to activate the circuit which is given through a step down transformer and a +5 volt supply is required for activating controller which is given through a voltage regulators IC 7805.

- 4) Relay driver IC ULN2803 is provided to interface the no of relays directly with the Arduino-Uno and it also used to increase the voltage level of +5V to +12V so that relay can directly interfere with micro controller which is operated at +12V.
- 5) Moreover LCD display can be directly interfering with the Arduino-Uno to display the voltage current and power reading in the system.

VII. SUMMARY:

This project is about controlling the maximum power in the industry. Every electricity board provides specific amount of energy to industry and if industry exceed this limit then penalty is imposed on industry. This project monitors the power demand for each.

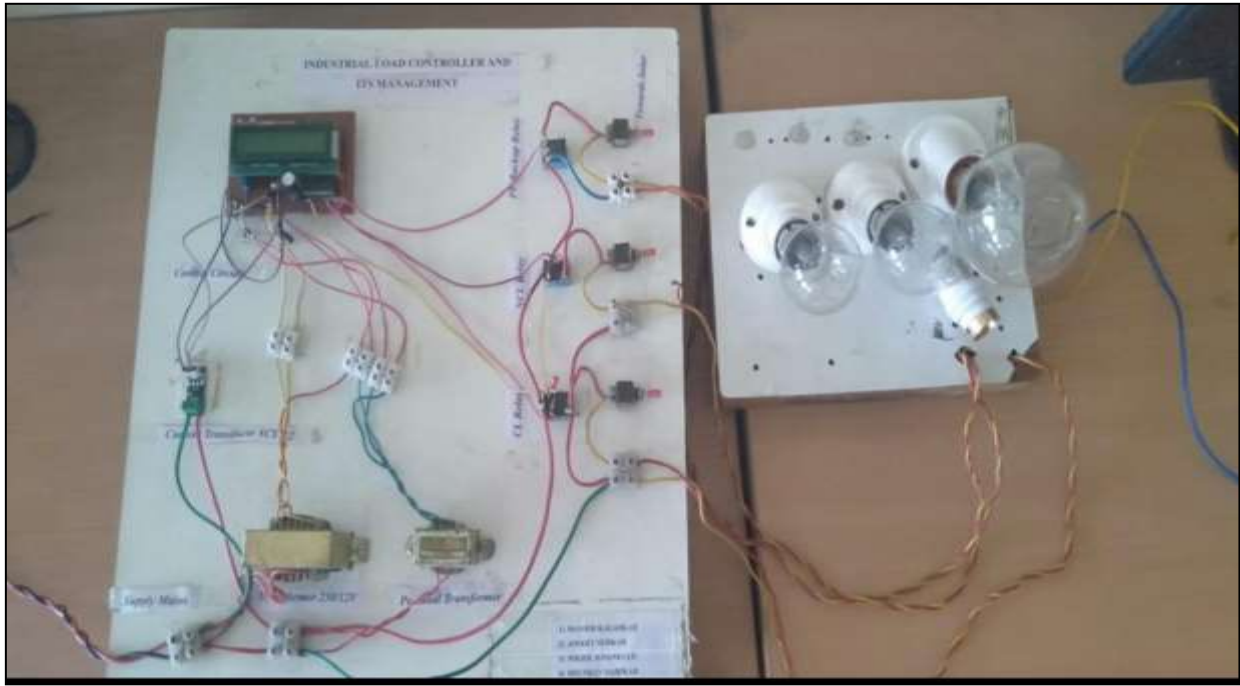


Fig. 3: Final Images of Projects

VIII. CONCLUSION:

In This Project it is analysed that the proposed scheme will control and monitor the load required in industry.

It wills Trip Load Which is categorized as critical load (CL) and non-critical load (NCL) during Peak Period. As per requirement of industries and other sources Arduino-Uno can be programed and desired output results can be obtained which will save the penalties.

Hence this proposed system proves to be optimistic and will operates as per programmed in Arduino-Uno and achieve given objective, also it will save the industries from getting penalty as well as disconnection off supply and hence will cause optimistic use of energy consumption which will help in reduction of monthly energy bill.

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