" DESIGN AND IMPLEMENTATION OF 230V LOAD CONTROL SYSTEM USING RTC"

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Abstract - *The project proposes the microcontroller-based control system for controlling the devices working on 230v load. The main objective of project is focused on the application of RTC in controlling the timing of appliances running on 230v load. The project uses LDR and smoke detector as a sensor. The temperature sensor will sense the temperature and control the speed of fan accordingly. Same will be done by LDR which changes light intensity according to exposure of light on sensor. Additionally we are also installing smoke in case of industrialization of this project. The switching of devices working on 230v load can be controlled using RTC. The embedded C programming language is used for programming the microcontroller.*

Key Words: **LDR , RTC ,Sensor ,Automatio ,smoke.**

1.INTRODUCTION

We need to save or conserve energy because most of the energy sources we depend on , like coal and natural gas can't be replaced. Once we use them up, they are gone forever. saving power is very important, instead of using the power in unnecessary times it should be switched OFF. Most of the times we see unnecessary usage of lights thus wasting lot of energy.

Over here we are avoiding the problem by having an automatic system which turns ON and OFF any device working on 230v load at given times. Whether it is fan or light we can control the switching of these devices accurately at the given time using RTC. We can set the timing of switching of this devices using LCD and input switches, therefore when present time will be equal to the set time then devices will turn on or off.

We are using temperature sensor to sense the temperature of the room and if the temperature meet certain predetermined value , the cooling fan will turn on. In addition to this we are installing a smoke detector to detect smoke which will eventually turn on the exhaust fan.

1.1 Objectives:

1. This paper is intended to manifest the research on 230v load control system.

2. This project is equipped with controlling the switching of any device working on 230v load control system.

3. The objective of the proposed system is an control system which saves the power of devices and provide some automated operations. In this project 89S51 microcontroller is used.

4. Whenever sensors detect operations differing from predetermine settings it will act accordingly.

5. It is equipped with a temperature sensor which will turn on the cooling fan if existing temperature is more than set temperature.

6. Existing temperature is shown on LCD screen and we can vary the set temperature according to our needs.

7. The smoke detector will detect the smoke and get rid of it using exhaust fan.

8. Further the work can be enhanced by making this system more advanced by installing this system in residential buildings for the convenience of the end users.

1.2 Methodology

Here we are using real time clock to control the timing of the project. Power supply of 3.3v is given to RTC. A real time clock provides the system clock to generate the system interrupts. An interrupt service routine executes on each tick (timeout or overflow) of this clock. This timing device once started is generally never reset or never reloaded to another value. RTC is connected to microcontroller bi-directionally and it provides real time operations to the circuit. 5v power supply is given to the microcontroller for inner operations. For input purposes keypad is used which can be used to change settings of this project. Comparator circuit is used to compare existing value and predetermine value of smoke detector and light dependent sensor (LDR). A relay is used for turning on and off operations of exhaust fan and coolant fan. Microcontroller and ac rectifier with TRIAC circuit are isolated from each other, therefore optocoupler is used to transfer electrical signal using light.

Implementation

The role of this project is to conserve electricity in day to day life. It can change light intensity to 5 different intensity level depending on light exposure to the LDR. This can save great amount of electricity. Instead of using light we can also use fan to the intensity level can be change to speed of the fan and thermistor can be used as sensor.

The thought to use this project can be justified by their various benefits: conservation of electricity, more effective way to use electrical appliances ,air filtration, temperature control. It can be used in industries where temperature control is very important for the safety of workers as temperature in industries can vary frequently due to heating of machinery. Also smoke made by there machines can be passed outside using smoke detector and exhaust fan. We are making model of two rooms in which we will display all the circuit operations.
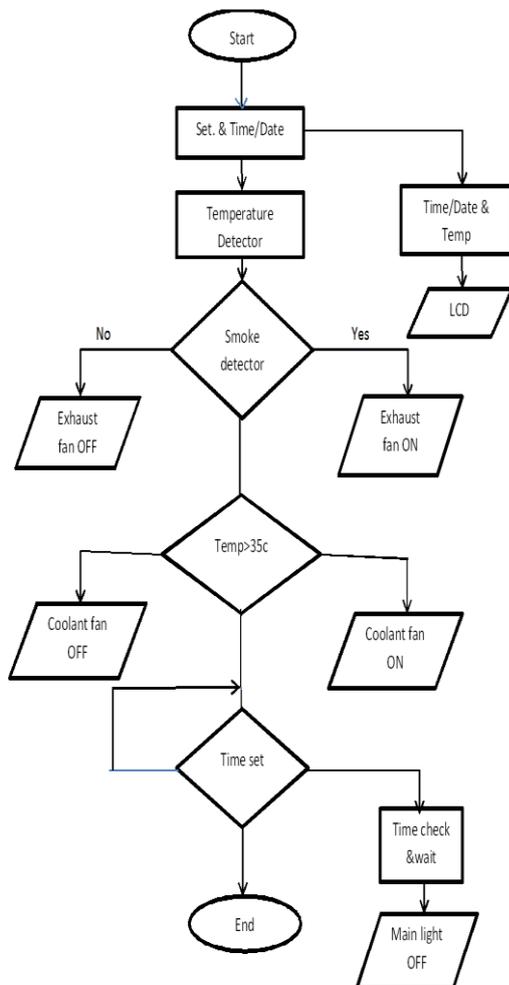
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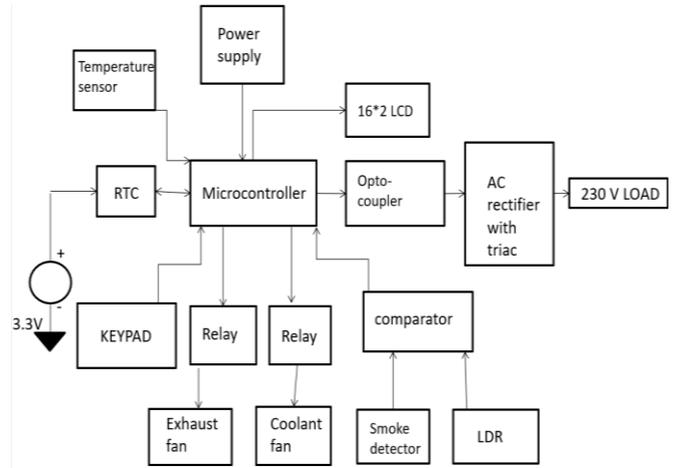

Fig -1

Block Diagram:

Fig -2

3. CONCLUSIONS

The implementation of 230v load control system that is framework presented in this paper is in fact a final year project. A general conclusion that can be said about such engineering projects is that they are presenting students to take few steps even if it is small ones to save the resources of our planet. Such projects contribute to how we can build a technological advance future without destroying our precious resources. This minor saving of energy will eventually save a lot of industrial power if used in industries. We can install this project into residential places and school as well. The intensity level and temperature is displayed on 16*2 LCD display.

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