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Research Article

Smart Temperature Optimization of Devices used in Power Industries

Ajaz Ahmad Bhat[1], Kiranpreet Kaur[2]

[1]M Tech Scholar, [2]Assistant Professor, Department of Electrical Engineering, Desh Bhagat University, Punjab, India.

I N F O

Corresponding Author:
Ajaz Ahmad Bhat, Department of Electrical Engineering, Desh Bhagat University, Punjab, India.
E-mail Id:
bhatajazeee@rediffmail.com
Orcid Id:
https://orcid.org/0000-0002-5399-4067
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A B S T R A C T

Temperature un-stability is the main problem faced in the industries like power and chemical plants that damage the number of devices used in these industries. To address these challenges the requirements is the optimized temperature control approach. Temperature is one of the foremost parameters to manage in most of the manufacturing industries like power stations, chemical, food method, pharmaceutical etc. In these forms of industries, some product would love the required temperature to be maintained at the highest priority the merchandise will fail. Microcontroller programming is a famous approach for making hardware devices instruction based. In this paper the authors deployed embedded programming to make an optimized and intelligent temperature controller system.

Keywords: Internet of Things (IoT), Global System for Mobile Communications (GSM), Liquid Crystal Display (LCD), Direct Current (DC), Alternating Current (AC)

Introduction

Temperature is one of the foremost parameters to manage in most of the manufacturing industries like power stations, chemical, food method, pharmaceutical etc. In these forms of industries, some product would love the required temperature to be maintained at the highest priority the merchandise will fail. That the temperature controller is most typically used within the majority the industries. The goal of this work is to vogue Associate in Nursing shut temperature live and electric circuit. The motivation for the thought is that the incontrovertible fact that temperature live has become Associate in Nursing integral an element of any system operating in an extremely temperature sensitive atmosphere and thus the many learning outcomes associated throughout the implementation of the project. There are many things we've got an inclination to listen to regarding the industrial web of things as a result of it should be a brand new rising technology. We have got an inclination to use sensors to endlessly monitor business appliances that's unimaginable to be managed by a human. Technological developments have enabled to be taken classic systems place by Automatic and advanced systems. To boot, the provision of fast-processing, stable and sensitive product provided specific edges in industrial automation. As results of the developments in communication technologies, systems aren't any more monitored and controlled by personnel victimization classic ways in which, but automatically by computer-controlled or remote-controlled devices. Industrial environmental conditions are upgrading day by day with this freshly introduced automatic technique as a result of getting eliminate the normal procedures of manufacturing increasing massive workloads. The following generation industries are visiting be absolutely plenty of advanced and automatic as compared with existing ones. This brings on an innovative language of "Smart Industries" throughout this new era of observance additionally as dominant of assorted Industrial applications. As an associate in nursing rising technology light-emitting diode to speedy advances in

fashionable wireless telecommunication, the web of Things (IoT) has attracted much attention and is anticipated to bring edges to numerous applications. The freshly introduced plan of "Internet of Things" (IoT) is providing help to realize economic automation through remote access. In IoT, each device or devices constituting a system are visiting be ready to communicate with the alternative devices or system at intervals the identical premises over a typical platform. So this winds up in exchange of relevant data, statistics, logs and diverse different parameters information among various devices to spice up their performance, that is in a position to facilitate industries to possess higher productivity, management and accumulated output.

Problem Formulation

The world is full of industries like power, chemical etc. in the present technological era remote monitoring and controlling is a common concept and in this regard, different projects are developed based on different techniques. My research is based on a temperature control system for devices used in power industries to protect them from damages caused by temperature un-stability. The temperature un-stability badly affects this green world hence need of optimized temperature controller system for devices present in power industry premises that will support in enhancing favourable environmental conditions.

Methodology

The methodology of this work is that which shows how the program is implemented in this work how the work has been done by using different components in it and how these components work together and how they perform various operations and how they behave when some temperature modifications happen. In this work, thread relays are used to drive three loads. The power supply unit is made up of a transformer, bridge rectifier to convert AC voltage to DC voltage after this the voltage regulators and capacitors are used. Three different fans are used which are mounted on a load. If the temperature exceeds a certain limit for a current load, the fan of the specific load will get turn ON instantly and the load will shut down automatically, afterload is shut down the notification or message is delivered to the user using GSM module indicating that some loads have been shut down due to some instability in temperature. Temperature sensors are used in this system to collect temperature from loads every time. The temperature and the status of every load are monitored and are displayed on the LCD screen used in this system.

Results and Discussion

A power station, also known as the power plant is an industrial facility with several types of equipment like generators, rotating machines etc. that converts mechanical power into electrical power. Technological developments have been enabled to be taken classical systems placed by automatic and advanced systems. As we know the development in ICT (Information Communication Technology) systems are automatically controlled by devices instead of manual methods. The next-generation industries will be more and more advanced and equipped with automatic and Hi-Tech machinery. This new concept is commonly known as smart industries, which means fully automation of industries with remote monitoring and controlling. The results obtained during this simulation work in Proteus Software are described below:

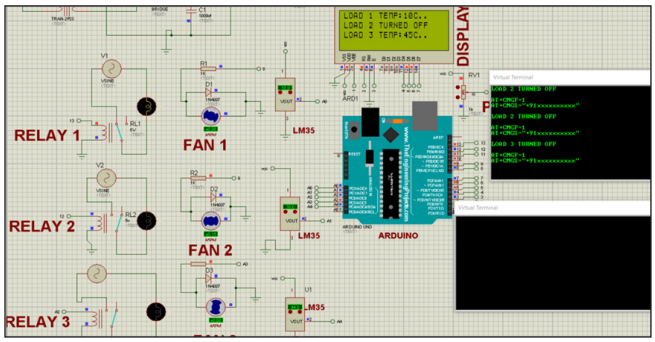

Figure 1.Exceeding Tempruture Limit

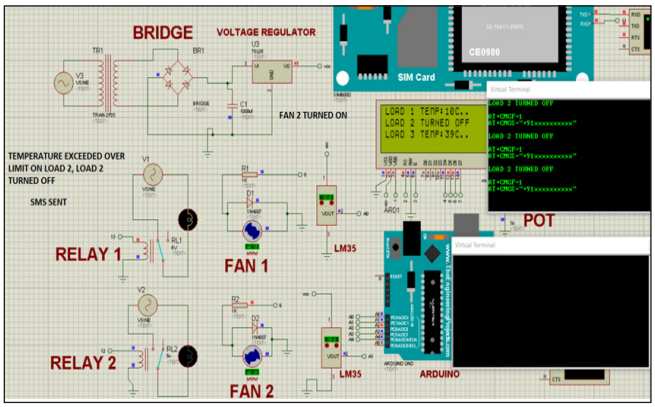

Figure 2.Temperature Exceeded over Limit on Load 2 and Load 2 Turned Off

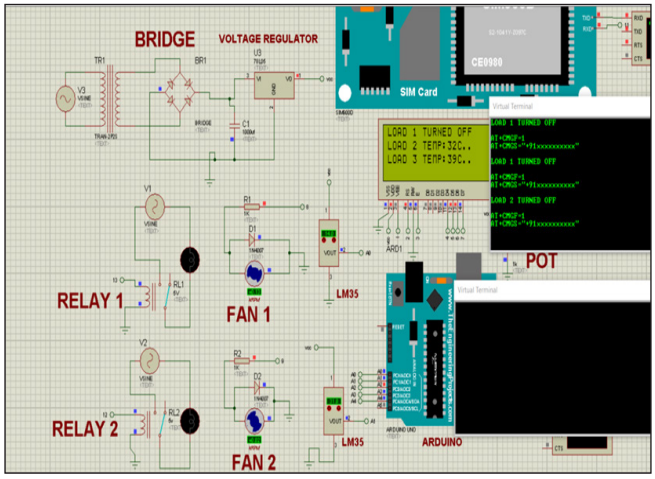

Figure 3.Load 2 Turned Off on Exceeded Temperature

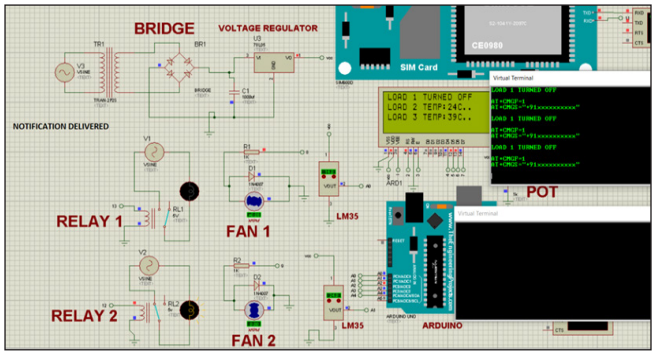

Figure 4.Notification Delivered

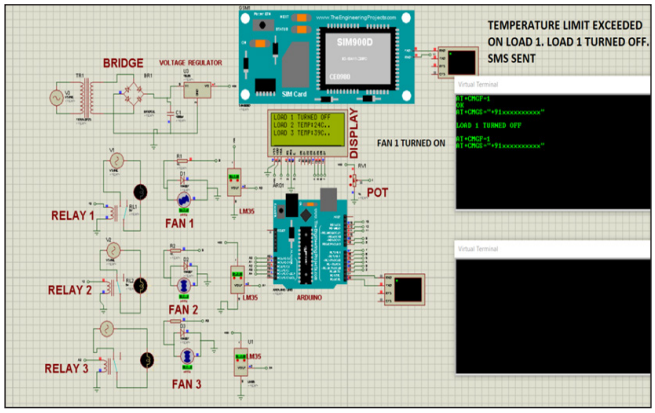

Figure 5.Temperature Limit Exceeded on Load 1, Turned Off and SMS Forwarded

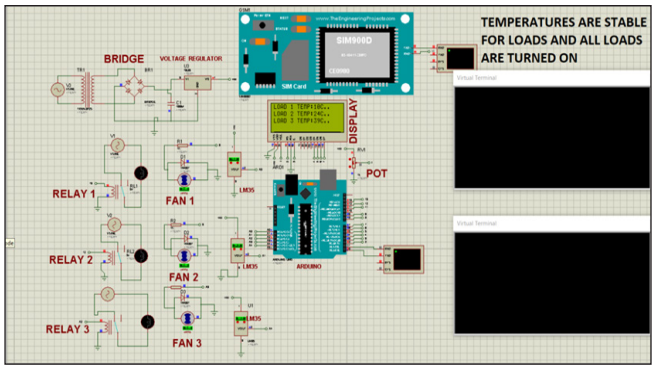

Figure 6.Temperature is Stable for Loads and all Loads are Turned Off

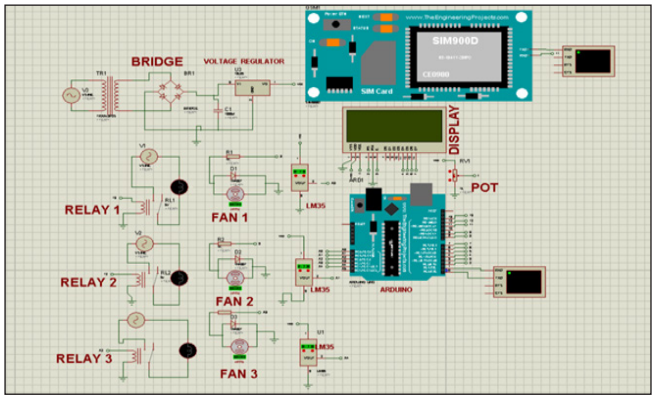

Figure 7.Overview of Temperature Module

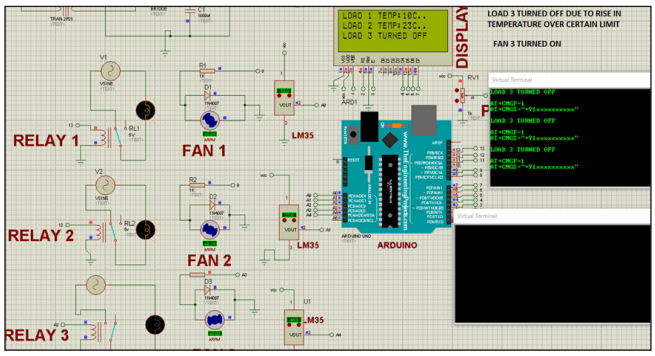

Figure 8.Load 3 Turned Off due to Rise in Temperature over Certain Limit

Conclusion

In industries like power plants chemical and food processing unit's temperature is considered one of the main parameters to control. This research work aims to design an efficient temperature measurement and control system that can optimize the temperature of machinery used in bigger industries like power manufacturing plants. As we know the latest and emerging technologies play a very important role in our daily lives like sensor programming, IoT, Cloud Computing, etc. the whole research is based on emerging micro-controller programming in power industries. The work is based on simulation work developed using Arduino.

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