www.ijecs.in
International Journal Of Engineering And Computer Science ISSN: 2319-7242
Volume 5 Issue 5 May 2016, Page No. 16700-16703

Design of Temperature Control Coolant

Vikash Chandra Sharma[1], Ankit Verma[1], Aditya Kumar Gautam[1], Miss Rangoli Srivastava[2]

[1] Student, [2]Asst. Lecturer

Department of electronics & Communication, Buddha Institute of Technology, GIDA, Gorakhpur.

Dr. APJ Abdul Kalam Technical University, Lucknow,

Uttar Pradesh, India.

vermaankit382@gmail.com

Abstract

In this paper we will discuss about how we can create an artificial environment.

In this Hi tech era Temperature plays an important part in our environment. Changes in temperature can affect the behaviour of human beings, plants and even materials such as semiconductors. This project is to control the temperature of a given environment such as baby incubator, industrial boiler, for automatic room temperature control, for creating artificial weather etc.

A microcontroller is used to control the temperature in a circuit. Where the temperature had to be kept constant at particular value. The system will function as stated in the programming code of Atmega 8 in order to keep the temperature stable. A simple temperature controller which has least complex circuitry has to be designed so that it saves space and be more reliable for an incubator. Present design which uses microprocessor as main controller in digital signal processing combined with complex combinational logic circuit are redundant and needs to be improved in the sense of functionality. Hence, replacement of microprocessor with an microcontroller is prudent action due to its efficiency and reliability especially in an incubator and boiler.

INTRODUCTION

Temperature plays an important part in our environment. Changes in temperature can affect the behaviour of human beings, plants and even materials such as semiconductors. This project is to control the temperature of a given environment such as baby incubator, industrial boiler, for automatic room temperature control for creating artificial weather etc.

A microcontroller is used to control the temperature in a the circuit. Where the temperature had to be kept constant at particular value .The system will function as stated in the programming code of atmega 8 in order to keep the temperature stable. A simple temperature controller which has least complex circuitry has to be designed so that it saves space and be more reliable for an incubator. Present design which uses microprocessor as main controller in digital signal processing combined with complex combinational logic circuit are redundant and needs to be improved in the sense of functionality. Hence, replacement of microprocessor with an microcontroller is prudent action due to its efficiency and reliability especially in an incubator and boiler.

Incubators provide warmth and prevent heat loss to significantly improve survival rates. The use of air-heated incubators has been the standard method of providing a stable, individualized thermal environment for the newborn infant at risk. Where th..e life of an infant relies on. This circuit can cool your heat generating electronic devices by operating a water pump when the temperature in its vicinity increases above the preset level. Its operation is fully automatic and turns off when the temperature returns normal and the pumps goes off. Thermistor is a kind of temperature dependent resistor and its resistance varies depending on the temperature in its vicinity. There are two types of Thermistors- NTC and PTC. Negative temperature coefficient (NTC) Thermistor decreases its resistance when the temperature increases while Positive temperature

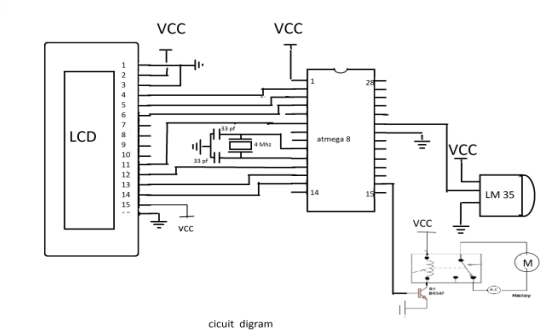
coefficient (PTC) increases its resistance when the temperature increase

Keywords—Embedded system, Temperature Sensor LM35, Liquid Crystal , Display [LCD], etc.

ATMEGA 8 TEMPERATURE CONTROLLER

Basic object of this project is to control one Heater and one Fan to maintain constant temperature is an environment. For this we are using ATMEGA8L microcontroller as the main controller and LM35 for Temperature Sensor. One 16X2 LCD is attached with the microcontroller to display the Set Temperature Value and Present Temperature Value. LCD will also to display the status of Heater and FAN. For Heater we are using one Relay to control 230VAC Heater Element and we have attached on 12VDC Brushless DC FAN directly with the board. The Atmel AVR core combines a rich instruction set with 32 general purpose working registers. All the 32 registers are directly connected to the Arithmetic Logic Unit (ALU), allowing two independent registers to be accessed in one single instruction executed in one clock cycle. The resulting architecture is more code efficient while achieving throughputs up to ten times faster than conventional CISC microcontrollers. The ATmega8 provides the following features: 8 Kbytes of In-System Programmable Flash with Read-While-Write capabilities, 512 bytes of EEPROM, 1 Kbyte of SRAM, 23 general purpose I/O lines, 32 general purpose working registers, three flexible Timer/Counters with compare modes, internal and external interrupts, a serial programmable USART, a byte oriented Two wire Serial Interface, a 6-channel ADC (eight channels in TQFP and QFN/MLF packages) with 10-bit accuracy, a programmable Watchdog Timer with Internal Oscillator, an SPI serial port, and five software selectable power saving modes. The Idle mode stops the CPU while allowing the SRAM, Timer/Counters, SPI port, and interrupt system to continue functioning. The Powerdown mode saves the register contents but freezes the Oscillator, disabling all other chip functions until the next Interrupt or Hardware Reset. In Power-save mode, the asynchronous timer continues to run, allowing the user to maintain a timer base while the rest of the device is sleeping. The ADC Noise Reduction mode stops the CPU and all I/O modules except asynchronous timer and ADC, to minimize switching noise during ADC conversions. In Standby mode, the crystal/resonator Oscillator is running while the rest of the device is sleeping. This allows very fast start-up combined with low-power consumption. The device is manufactured using Atmel's high density non-volatile memory technology. The Flash Program memory can be reprogrammed In-System through an SPI serial interface, by a conventional non-volatile memory programmer, or by an On-chip boot program running on the AVR core. The boot program can use any interface to download the application program in the Application Flash memory. Software in the Boot Flash Section will continue to run while the Application Flash Section is updated, providing true Read-While-Write operation. By combining an 8-bit RISC CPU with In-System Self-Programmable Flash on a monolithic chip, the Atmel ATmega8 is a powerful microcontroller that provides a highly-flexible and cost-effective solution to many embedded control applications. The ATmega8 is supported with a full suite of program and system development tools, including C compilers, macro assemblers, program simulators, and evaluation kits.

CIRCUIT DIAGRAM



cicuit digram

DISCRIPTION OF BLOCK DIGRAM

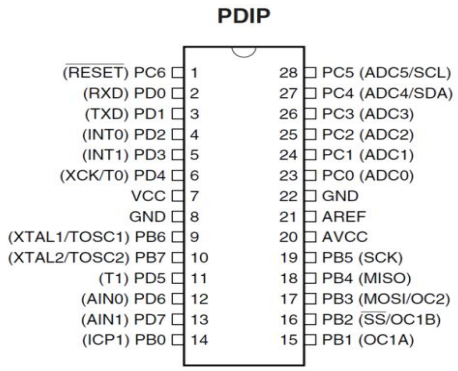
Here we are watching the main component of electronic device which is using the above circuit diagram ,There are mainly seven electronic component are used, that is At mega 8 ,LM 35 sensor, crystal oscillator, microcontroller, LCD , Power system ,Relay & Water pump. With the help of above components we can control our temperature & we can create an artificial environment.

DOI: 10.18535/ijecs/v5i5.61

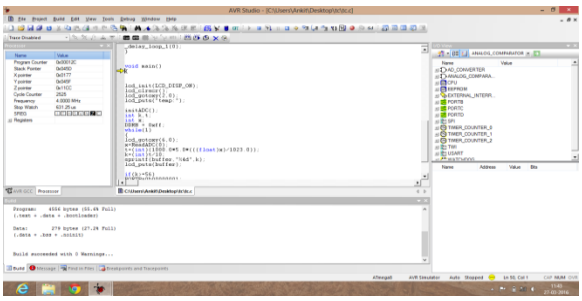
WORKING PRINCIPLE

Whenever the system is switched ON, LCD will display "SV" (for SET Temperature Value) and "PV" (for Present Temperature Value) at the left side of the display. On the right side we will display the
status of FAN (as "FN") and Heater (as "HT"). Transformer converts 220V to 6V. Rectifier converts 12V AC to 12V DC. & IC 7805 converts 12V to 5V, because Atmega 8 works at 5V.This whole process is power supply for this project. Atmega 8, pin 23 works as ADC, we connect sensor(tranducers) that generate 10mv in every 1 C, & this voltage is sampled by uc & This transistor forced to Relay on & this tends to MOTOR on. Problem of ON or OFF: FAN, we set of 56 C temperature, i.e. FAN status will be changed if PV is out of + 56 C. So, if PV is greater than + 56 C of SV then FAN will be on to cool down the environment.If temperature is below the SV, then FAN will Automatically set to off & again environment is set to hot. This process is going continuously. The whole process is Automatice.

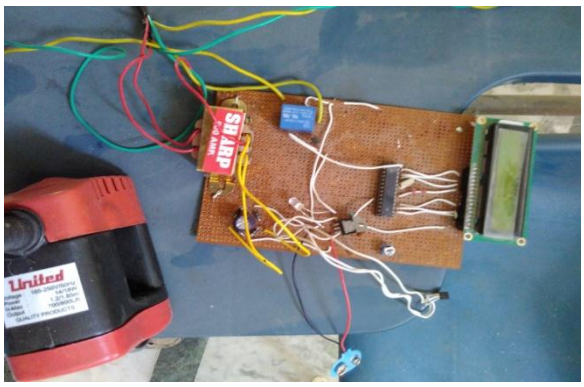
PIN DIAGRAM OF ATMEGA 8



PROGRAMMING SIMULATION



PROPOSED DESIGN



APPLICATIONS

- It is used in different medical application for creating artificial environment like in incubator.
- It is used in metallurgical process for temperature control in the boilers.
- It is used in home appliances for automatic room temperature control.

ADVANTAGES

- It is very economical and easy to handle by the user.
- It is very easy to install in offices, houses, Industries, Hospitals etc.
- Due to its automatic working the control of temperature is very fast.
- It saves energy, because when the temperature comes to its initial value, then water pump will automatically Turn Off.

FUTURE VISION

In the future, there are several improvements can be made in order to upgrade the features-
In place of water pump we use Fire extinguishers Cylinders to control the fire immediately. Using a wireless technology to interface sensor and microcontroller. Monitor and control the temperature via internet and using an USB to link microcontroller and computer.

CONCLUSION

Here by we come to the end of our major project "A TEMPERATURE CONTROL COOLANT". This project has presented a means of controlling the temperature of a system. This system helps to maintain the temperature

within a limit. This system is very marketable because of its simplicity, low cost, low power co nsumption and small size. It can be used in various industrial applications such as to control the temperature in boilers, Computers, Power Industries, and Laboratories.

ACKNOWLEDGEMENT

This research paper would not have been possible without the help of my parents, My project guide & and my friends, so firstly I would like to thank of my parents, My project guide & and my friends for their consistent support, appreciation and motivation.

Last but not the least I would like to thank my all faculty member who provided all the useful contents required for this research paper.

REFERENCE

[1]en.wikipedia.org/wiki/Crystal oscillator

[2]www.electronics-tutorials.ws › Oscillator

[3]http://students.iitk.ac.in/projects/roboticsclub_autobot

[4]www.eiconnect.com/pcbbuild.aspx