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Microcontroller Based All Season Temperature Controller

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ABSTRACT: Temperature management refers to the processes that are geared toward maintaining the temperature in a very given space. several Homes and Industries among different areas maintain sure sections of operation that has to be maintained inside an explicit temperature for method to figure with success. this can be done by victimization temperature sensing element and Microcontroller. it's vital conjointly to watch the extent of temperature varied different places like morgues, hospitals, aircrafts, living rooms, etc, to make sure that thermal comfort is maintained.

KEYWORDS: Microcontroller, Sensor, Fan, Heater, LCD

I.INTRODUCTION

Controlling the temperature could be a major drawback in our apace evolving world and it wants cost-effective solutions. This Temperature system shows how to induce the temperature worth and displaying the worth on a graphical digital display via 89C52 microcontroller. during this Project temperature values are measured in analog type, then it's reborn to digital by the Microcontroller. Digital knowledge is employed for driving the graphical digital display by the microcontroller unit. The user will put together a set-point temperature worth and management an external heating and/or cooling device by victimization the Temperature system. The system may be used because the basis for developing custom solutions for networked and stand alone knowledge assortment and management instrumentality. It may be centrally supercharged because of its low current demand and its tiny size makes it a lot of moveable, permitting it to be placed virtually anyplace.

II.LITERATURE REVIEW

"Online temperature control system" by A. Ikhlef, M. Kihel and others proposed that The physical system is controlled in real time through the Internet network.

"Temperature Control System" by OGU EMMANUEL C proposed that A Temperature Control System is a more like a programmable thermostat that can keep the environment (home or office) at a desired temperature regardless of fluctuating exterior weather conditions.

"Implementation of Home Temperature Sensing Control System Using Microcontroller" by Lwin Mar Aung proposed that Automatic temperature control referred as the best method in any application by controlling the temperature automatically. This method shows significant improvement in temperature control as the process is functioning without needed support from the human to control all the process.

"A Precision Temperature Controller Using Embedded System" by Aakanksha Pimpalgaonkar, Mansi Jha, Nikita Shukla and Kajol Asthana proposed that The circuit maintains the temperature of the system in a particular range. The fan RPM increases with increase in temperature and vice versa

"Automatic Fan Speed Control using Temperature and Humidity Sensor and Arduino" by Suraj Kaushik, Yuvraj Singh Chouhan, Nagendra Sharma, Shreyansh Singh, P Suganya proposed that fan speed has been controlled by using Pulse Width Modulation and Arduino board according to the temperature sensed by the help of Temperature and Humidity Sensor(DHT22).

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III. BLOCK DIAGRAM

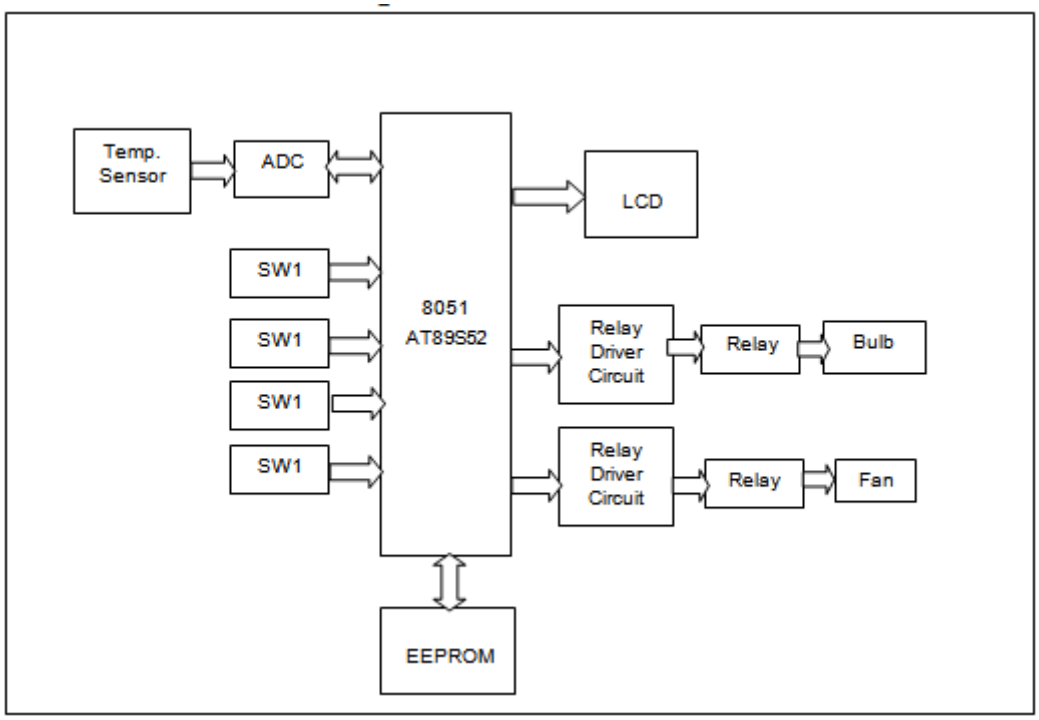

Fig1:Block diagram of temperature control system.

As shown in fig1. the sensor sense the system/Room temperature and the ADC convert it into digital signal for microcontroller use. Microcontroller compare the incoming signal with set point temperature (upper and lower limits saved in EEPROM) and according to the input it gives signal to Fan/Heater relay. If input is below set point, the relay of fan is in off state hence fan will be in off state and the relay of heater is in on state and heater will be in on state and hence temperature will increase and vice-versa .

IV.METHODOLOGY OF SOFTWARE

Step1:- Temperature sense and conversion

The sensor (LM 35) sense the current room/surface temperature, and provide its result to ADC. It converts analog input to the digital which is given input to the microcontroller. The sensed and set values of the temperature are displayed on the 16x2-line LCD.

Step2 :- Processing the input signal

The Microcontroller stores the set point temperature in memory. Set point is set or input by an external operator. The Controller compares the readings received from the sensor with this reference point in order to determine which effector is appropriate. Microcontroller gives instructions to relay driver to drive Fan/heater.

Step 3:- Controlling temperature

Microcontroller gives commands to relay driver circuit to increase the speed of Fan/Heater. proportional to the increase in temperature it increase the speed of fan and decrease heater and vice versa. and the room temperature is maintained.

4. System overview

The temperature sensor senses the room/ system temperature with the help of Sensor it then convert to digital signal using ADC. The set value and sensed temperature are displayed on 16x2 line LCD. These set values and sensed temperature are then compared by microcontroller. It Checks the temperature ranges are within the limits and then drives the relay circuits. Relays operate the Fan or Heater according to the Increase or Decrease in temperature needed.

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V.RESULT AND DISCUSSION

In the fig 2 , it shows the graph of Fan/Heater On-Off position Vs Temperature as result shows the fan will turn ON after exceeding set point temperature (i.e:30^0C) and help to reduce the system/room temperature. the heater also works the same, it will initially turn on before set point temperature it helps to increase the system/room temperature. once it reaches the set point the heater will be turn OFF and fan starts working and it maintain the room/ system temperature.

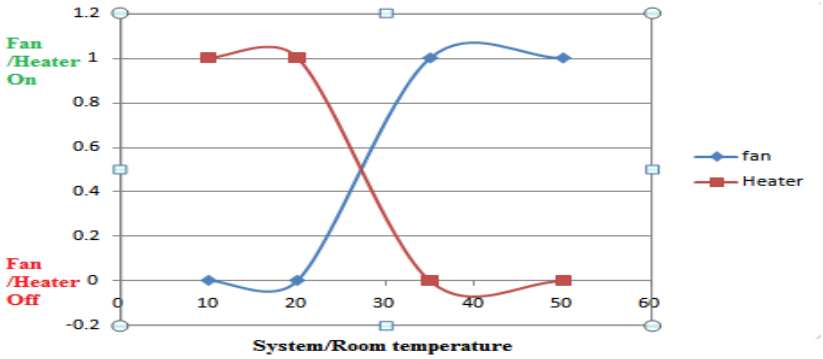

Fig2: Fan/Heater On-Off position Vs Temperature

VI.CONCLUSION

Controlling the temperature is a major problem in our rapidly evolving world and it needs cost-efficient solutions. The proposed project would be able to automatically control the temperature of the environment it is placed in by the timely activation of the effect or devices to influence the temperature in relation to the set-point.It can be centrally powered due to its low current requirement and its small size makes it more portable, allowing it to be placed almost anywhere.

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