

Talking Thermometer

Dhamal Nikhil Ganpat

Electronics & Telecommunication Dept
Shri Chha. Shivajiraje College of Engineering,
Dhangawadi
Bhor, Dist. Pune, Maharashtra, India
E-mail: nikhil.nik004@gmail.com

Dhamal Rakshanda Vijay

Electronics & Telecommunication Dept
Shri Chha. Shivajiraje College of Engineering,
Dhangawadi
Bhor, Dist. Pune, Maharashtra, India
E-mail: rakshandadhamal30@gmail.com

Abstract- This paper presents the design and development of a microcontroller based body temperature monitoring system using temperature sensor. The existing system provides temperature output via only analog or digital display. In proposed system we want take out that drawback with the digital data output for such system. LM35 sensor sense the body temperature and temperature status is transmitted to the Buzzer/APR via microcontroller. Body temperature data transfer between the Human Body & Buzzer/APR that is connected to temperature sensor. The microcontroller which analyzes the temperature data, then inform to human with beeps of buzzer/APR voice. This work aims at monitoring of body temperature.

Keywords-

Microcontroller, Body temperature, Temperature Sensor.

Introduction-

The body temperature changes from one person to another and varies throughout the day. The body temperature is found to be lowest in the early morning while it is highest during the early evening. It is necessary to monitor the changes regularly. An average human adult has normal body temperature of around 37°C. However, it is difficult to define an accurate value of body temperature as it varies according to daytime, age and physical state of a person. So, the normal body temperature of a healthy person can be 36.1°C in the early morning and can rise up to 37.2°C. Hence, normal range of body temperature of a healthy adult varies between 36.1°C and 37.8°C. The temperature sensor used here is LM35. This temperature sensor generates an analog output voltage that is proportional to the temperature. So, this temperature sensor requires an analog to digital converter to convert the analog output voltage to a digital form. For this reason, a

microcontroller of model PIC18F4520 is used to convert the analog value to a digital form in order to send the measured data to a remote end.

Project Description:

The objective of this project is to develop and implement the Temperature Indicator or Talking Thermometer for Human Body. In this we were collect reading of body temperature of Human via LM35 temperature sensor. Using the microcontroller with its ADC analog reading converted into the digital one. With the help of Buzzer/APR we get the temperature variations with beep indications/digital voice readings. It is better results for the blinds also.

Hard ware Features:

- μ C : PIC 18F4520
- Temperature Sensor: LM35
- Buzzer
- LCD: 16*2 , 100 ma , Alphanumeric Display
- Power Supply: 5V, 750 mA current.

Block Diagram:

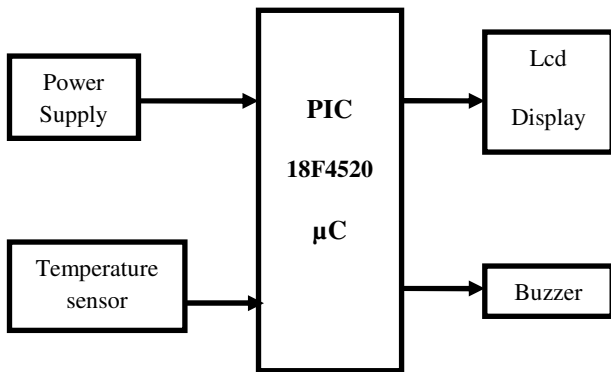
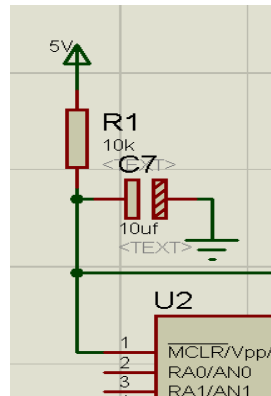


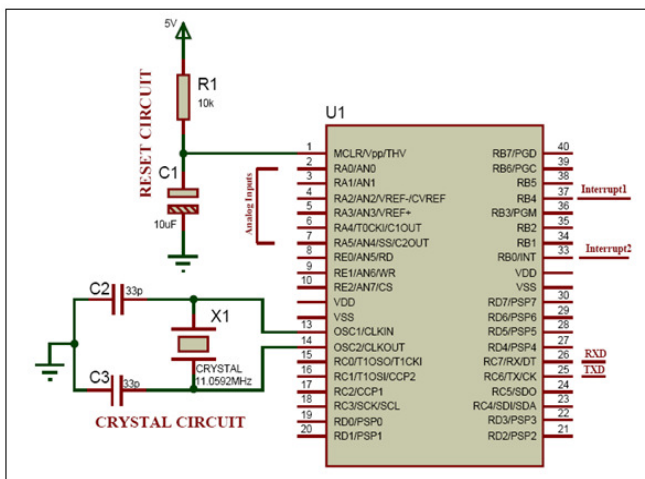
fig.(a) Block Diagram

Reset circuit:

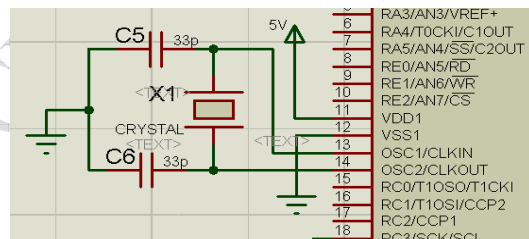


Recommended 1 msec to 100 msec
Project: $10K\Omega * 10\mu f \rightarrow 100\text{ msec}$

μC 18f 4520:



Crystal



The crystal is connected to OSC1 and OSC2
11.0592 Mhz. C5 and C6 are used for noise removal. To get exact square wave.

Temperature Sensor: LM35

Temperature sensor is used to sense the temperature. We have used a Temperature sensor called LM35. This temperature sensor can sense the temperature of the atmosphere around it or the temperature of any machine to which it is connected or even can give the temperature of the human body in case if used. So, irrespective of the application to which it is used, it gives the reading of the temperature. The LM35 series are precision integrated-circuit temperature

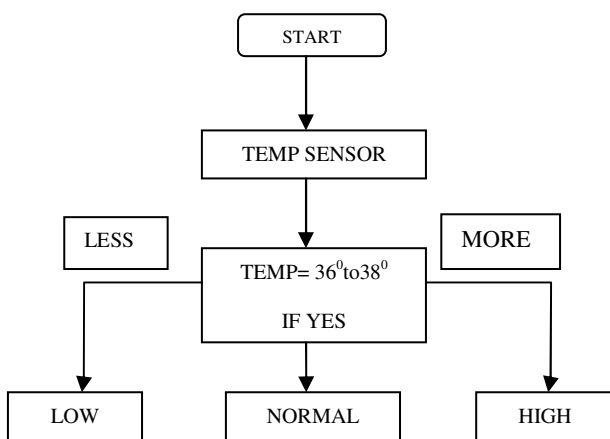
- Clock frequency: 11.0592Mhz
 - Inbuilt ADC 10 bit
 - 33 I/O ports (Including ADC)
 - Memory:
- RAM: 1536 Bytes (1.5 KB)
ROM: 32KB
EEPROM: 256 Bytes
Project: 50 to 100 bytes

sensors, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature. Temperature sensor is an analog sensor and gives the output into form of analog signal. This signal is feed to ADC which will convert it into digital form. Once converted into analog form, the microcontroller can process the digital temperature signal as per the application.

Buzzer:

Buzzer is used in a system to indicate temperature variation observed by LM35. A **buzzer** or **beeper** is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke.

Flowchart:



Advantages:

1. Very high accuracy & fastest response time.
2. Very easy to use with simple displays & buzzer/APR.
3. Highly portable.
4. Variable measurement range, resolution and accuracy.

Future Scope:

1. In Biomedical applications.
2. In Indoor and outdoor temperature measurement.
3. Talking thermometer for blinds.

Proposed Conclusion:

With this project we will implement such system for the temperature measurement system for humans and the detect the body temperature in fever or some other cases of disease. So no need to check body temperature with help of others for the blinds also.

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