NTC Thermistor Interfacing with PIC18F4550

Overview of NTC Thermistor

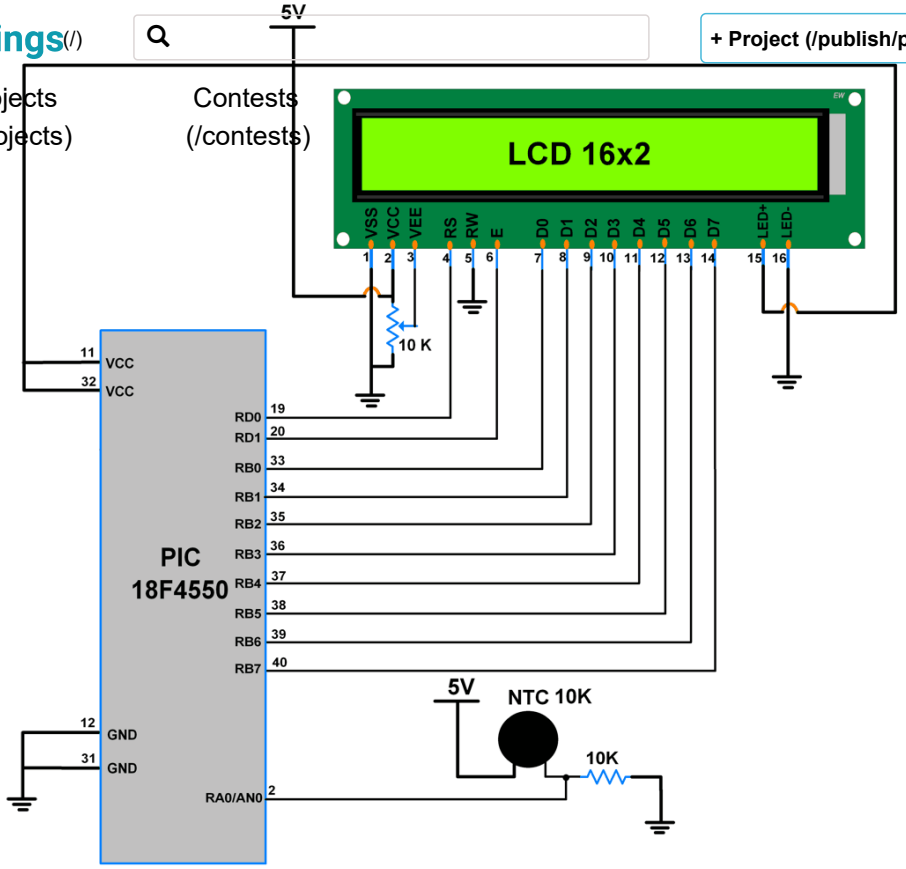
- A thermistor is a variable resistance element, whose resistance changes with the change in temperature.
- The resistance increases with an increase in temperature for PTC (Positive Temperature Coefficient) type thermistors.
- The resistance decreases with an increase in temperature for NTC (Negative Temperature Coefficient) type thermistors.
- They can be used as current limiters, temperature sensors, overcurrent protectors, etc.
- The change in resistance value is a measure of the temperature.
- By using the thermistor in series with a fixed resistance forming a simple voltage divider network, we can find out the temperature by the change in voltage of the voltage divider network due to a change in temperature. (Temperature change leads to change in resistance which leads to change in voltage.)

For more information about the thermistor and how to use it, refer to the topic NTC Thermistor (http://electronicwings.com/sensors-modules/ntc-thermistor) in the sensors and modules section.

For information about ADC in PIC18F4550 and how to use it, refer to the topic ADC in PIC18F4550 (http://electronicwings.com/pic/pic18f4550-adc) in the PIC Inside section.

Connection Diagram of NTC Thermistor with PIC18F4550

Here, we used a 10k NTC thermistor.



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NTC Thermistor Code for PIC18F4550

```
/*
  Thermistor Interfacing with PIC18F4550
  http://www.electronicwings.com
 */

#include <pic18f4550.h>
#include <string.h>
#include <stdio.h>
#include "LCD_16x2_8-bit_Header_File.h"
#include "PIC18F4550_ADC_Header_File.h"
#include <math.h>

#define ohm 0xf4
#define B_coefficient 3950.00      /* B coefficient of NTC Thermistor*/
#define Room_temperature 25.00
#define Series_Resistance 10000.00

float Get_Temperature(int);

long NTC_Resistance;

void main(void)
```

Video of Temperature Measurement using NTC Thermistor and PIC18F4550

Components Used

Powered By MOUSER ELECTRONICS (https://www.mouser.in?utm_source=electronicswings&utm_medium=display&utm_campaign=mouser-componentslisting&utm_content=0x0)

NTC Thermistor NTC Thermistor	X 1	(https://www.mouser.com/ProductDetail/Vishay-BC-Components/NTCLE413E2103F520L?qs=RECgZY%252BK1xlfQ9JFga9iNA%3D%3D&utm_source=electronicswings&utm_medium=display&utm_campaign=mouser-componentslisting&utm_content=0x0) Datasheet (/components/ntc-thermistor/1/datasheet)

Components Used

PIC18f4550 PIC18f4550	X 1	(https://www.mouser.in/ProductDetail/Microchip-Technology/PIC18F4550-I-P?qs=oKK8NaWdAJs8nLDXBGwMXw%3D%3D&utm_source=electronicswings&utm_medium=display&utm_campaign=mouser-componentslisting&utm_content=0x0) Datasheet (/components/pic18f4550/1/datasheet)
LCD16x2 Display LCD16x2 Display	X 1	(https://www.mouser.com/ProductDetail/Adafruit/1447?qs=XAKIUOoRPe6AClmsjw7y7g%3D%3D&utm_source=electronicswings&utm_medium=display&utm_campaign=mouser-componentslisting&utm_content=0x0)

Downloads

Thermistor_Interfacing_PIC18F4550_Project_File	Dow nloa d (/api/download/platform-attachment/239)

Comments

Comment

darshanshrm07
(/users/darshanshrm07/profile)
2020-09-11 21:35:00

I have used this equation for positive and negative temperature value. But when it measures negative value in cold storage it give right value but after some time it increases the temperature and goes to positive value even cold storage doesn't go to positive value of temperature And after that this cyclic things gone continue some negative value some positive value..... and sometime its jump to -28 i dont know why

Reply Like

nadeemsonipat
(/users/nadeemsonipat/profile)
2021-03-07 19:30:55

this stainhart equation used here is working reverse for me. its temperature is increse when i put thermister in cold and temperature decerease when i put thermmister in the heater.

Reply Like 1

dragoumanosapostolos
(/users/dragoumanosapostolos/profile)
2021-04-20 16:12:08

The temperature is working also reverse for me, when i use a lighter the temp decrease instead to increase. Can someone help me with this strange behavior?

Reply Like

OsamahNajjar
(/users/OsamahNajjar/profile)
2021-08-14 21:21:38

seems like you are using a PTC thermistor instead of NTC thermistor ?!

Reply Like

whhuatasay
(/users/whhuatasay/profile)
2022-05-09 06:38:58

Can we have a protues circuit please
Question to everybody

Reply Like

GeorgeCloove
(/users/GeorgeCloove/profile)
2022-11-14 15:52:08

la temperatura funziona al contrario, se faccio aumentare la temperatura il display mostra un valore negativo e procede diminuendo.

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