**TEMPERATURE SENSOR PROGRAM:**

#include <LPC17xx.H>

#include "GLCD.H"

#include "Serial.h"

#define \_\_FI 1

unsigned int Adc;

unsigned long Low\_adc,High\_adc,relay;

read\_adc()

{

unsigned long status,i;

LPC\_GPIO0->FIOPIN |= (1 << 26); /\* (P0.26 = 1) Start conversion of ADC \*/

status = ((LPC\_GPIO1->FIOPIN & 0x00080000) >> 19); /\* P1.19 Read status of ADC \*/

while((status & 0x01) != 0x01)

status = ((LPC\_GPIO1->FIOPIN & 0x00080000) >> 19);

LPC\_GPIO0->FIOPIN &= ~(1 << 26); /\* (P0.26 = 0) Stop conversion of ADC \*/

LPC\_GPIO0->FIOPIN &= ~(1 << 25); /\* (P0.25 = 0) Enable outputs \*/

LPC\_GPIO0->FIOPIN &= ~(1 << 23); /\* (P0.23 = 0) Activate B1 to B8 outputs \*/

for(i=0;i<10000;i++);

Low\_adc = (LPC\_GPIO0->FIOPIN & 0x007F8000); /\* (P0.22 to P0.15) Read lower byte of ADC \*/

Low\_adc = (Low\_adc >> 15) & 0xFF;

LPC\_GPIO0->FIOPIN |= (1 << 23); /\* (P0.23 = 1) Deactivate B1 to B8 outputs \*/

LPC\_GPIO0->FIOPIN &= ~(1 << 24); /\* (P0.24 = 0) Activate B9 to B12 and POL, over range outputs \*/

for(i=0;i<10000;i++);

High\_adc = (LPC\_GPIO0->FIOPIN & 0x00078000); /\* (P0.18 to P0.15) Read higher byte of ADC \*/

High\_adc = (High\_adc >> 15) & 0x0F;

LPC\_GPIO0->FIOPIN |= (1 << 24); /\* (P0.24 = 1) deactivate B9 to B12 and POL, over range outputs \*/

LPC\_GPIO0->FIOPIN |= (1 << 25); /\* (P0.25 = 1) Disable outputs \*/

LPC\_GPIO0->FIOPIN &= ~(1 << 26); /\* (P0.26 = 0) Stop conversion of ADC \*/

}

main()

{

float Temp,Vol,Res;

unsigned char Temp1,Temp2,Temp3;

LPC\_SC->PCONP |= (1<<15);

LPC\_GPIO0->FIODIR |= 0x7F800000; /\* Make portA(P0.15 to P0.22) as input and portC (P0.23 to P0.30) as o/p \*/

LPC\_GPIO1->FIODIR |= (1 << 20); /\* Make P1.20 as o/p \*/

LPC\_PINCON->PINMODE0 |= 0xC0000000; /\* Configure Pull-down for P0.15,P0.16,P0.17,P0.18,P0.19,P0.20,P0.21,P0.22\*/

LPC\_PINCON->PINMODE1 |= 0x00003FFF;

LPC\_GPIO1->FIOPIN &= ~(1 << 20); /\* (P1.20=0) switch OFF relay \*/

LPC\_GPIO0->FIOPIN &= ~(1 << 26); /\* (P0.26 = 0) STOP conversion of ADC \*/

relay = 10;

SER\_Init();

#ifdef \_\_USE\_LCD

GLCD\_Init(); /\* Initialize graphical LCD \*/

GLCD\_Clear(White); /\* Clear graphical LCD display \*/

GLCD\_SetBackColor(Blue);

GLCD\_SetTextColor(White);

GLCD\_DisplayString(0, 0, \_\_FI, " ESA ");

GLCD\_DisplayString(1, 0, \_\_FI, " Bangalore ");

GLCD\_DisplayString(2, 0, \_\_FI, " www.esaindia.com ");

GLCD\_SetBackColor(White);

GLCD\_SetTextColor(Blue);

GLCD\_DisplayString(3, 0, \_\_FI, "TEMP TRANSDUCER TXDR");

#endif

while(1)

{

read\_adc(); /\* Read ADC \*/

Adc = High\_adc;

Adc <<= 8;

Adc = Adc | Low\_adc;

if( (Adc > 0x0656) && (relay != 0)) /\* IF greater than 0x0656 Switch OFF relay \*/

{

GLCD\_DisplayString(5, 0, \_\_FI, "Relay OFF");

SER\_SendString("\n\rRELAY OFF");

LPC\_GPIO1->FIOPIN &= ~(1 << 20); /\* (P1.20=0) switch OFF relay \*/

relay = 0;

}

else if ( (Adc < 0x5B9) && (relay!= 1))

{

SER\_SendString("\n\rRELAY ON");

GLCD\_DisplayString(5, 0, \_\_FI, "Relay ON ");

LPC\_GPIO1->FIOPIN |= (1 << 20);

relay = 1;

}

Vol =-((Adc/10)\*0.000488);

Res =((100\*(1.8-Vol)-100\*Vol)\*100) /(100\*Vol + 100\*(1.8+Vol)); /\* Resistance Value \*/

Res = Res - 100;

Temp = Res/ 0.384;

Temp1 = Temp;

Temp2 = (0x30 + (Temp1 / 0x0A));

Temp3 = (0x30 + (Temp1 % 0x0A));

GLCD\_DisplayString(6, 0, \_\_FI, "Temperature=");

GLCD\_DisplayChar(6, 13, \_\_FI, Temp2);

GLCD\_DisplayChar(6, 14, \_\_FI, Temp3);

SER\_SendString(" Temperature = ");

SER\_PutChar(Temp2);

SER\_PutChar(Temp3);

GLCD\_DisplayString(6, 16, \_\_FI, "'C");

SER\_SendString("'C\n\r");

}

}