

Lecture (11)

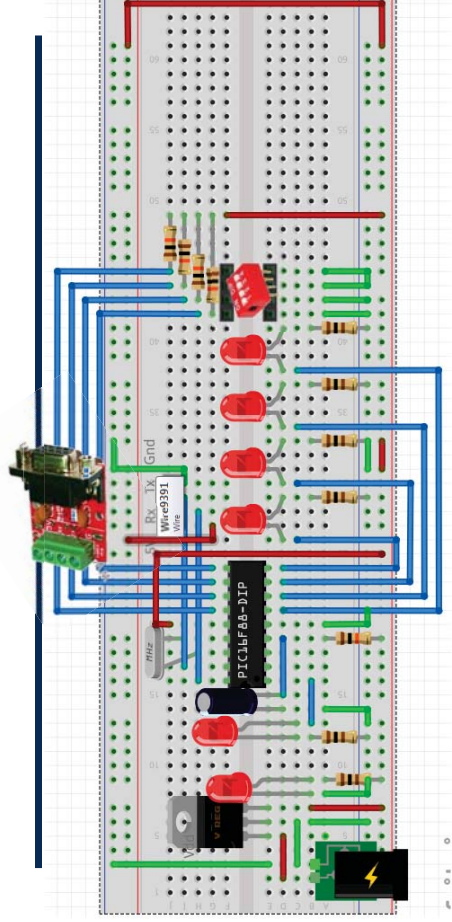
PIC16F84A Serial interface

interfacing light and temperature sensors

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PC controlled and monitor module



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- PIC16F84A serial interface

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Software_UART.h

```
#define _XTAL_FREQ 4000000
#define Baudrate 300
#define OneBitDelay (1000000/Baudrate)
#define DataBitCount 8
#define UART_RX RA1
#define UART_TX RA0
#define UART_RX_DIR TRISA1
#define UART_TX_DIR TRISA0

//Function Declarations
void InitSoftUART(void);
unsigned char UART_Receive(void);
void UART_Transmit(const char);
void UART_Transmit_Str(char str[]);
```

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```

Newfile.c
#include <xc.h>
#include <htc.h>
#include <pic16f84a.h>
#include "Software_UART.h"
#include "config.h"

int main(void) {
    unsigned char ch = 0; //
    Variable to store Rx character
    int act1=0,act2=0,act3=0,act4=0;
    InitSoftUART();
    // Initialize Soft UART
    TRISB=0xf0;
    PORTB=0x00;
    RB0=act1;
    RB1=act2;
    RB2=act3;
    RB3=act4;
    UART_Transmit_Str("\n\/welcome to
    serial control and monitor project");
    while(1)
    {
        ch = UART_Receive();

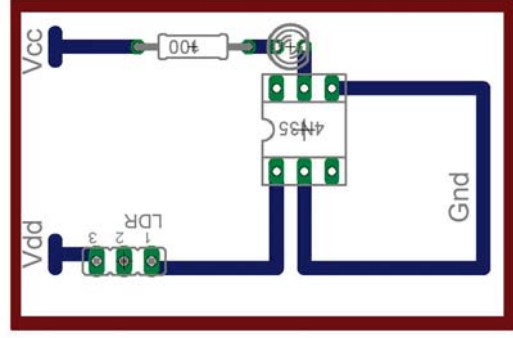
```

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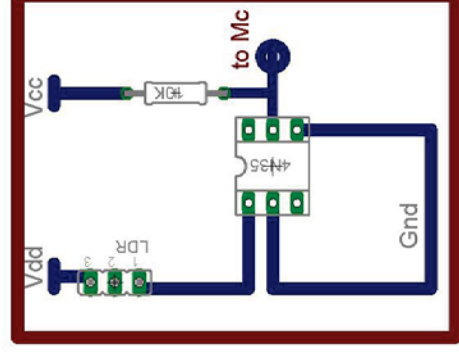
        // Receive a character from UART
        switch(ch)
        {
            case '1':
                act1=~act1;
                RB0=act1;
                UART_Transmit_Str("\n\rActuator 1 : ");
                if(act1==0)
                    UART_Transmit_Str("DeActivated");
                break;
            case '2':
                act2=~act2;
                RB1=act2;
                UART_Transmit_Str("\n\rActuator 2 : ");
                if(act2==0)
                    UART_Transmit_Str("DeActivated");
                break;
            case '3':
                act3=~act3;
                RB2=act3;
                UART_Transmit_Str("\n\rActuator 3 : ");
                if(act3==0)
                    UART_Transmit_Str("DeActivated");
                break;
            case '4':
                act4=~act4;
                RB3=act4;
                UART_Transmit_Str("\n\rActuator 4 : ");
                if(act4==0)
                    UART_Transmit_Str("DeActivated");
                break;
            case '?':
                UART_Transmit_Str("\n\rAlarm 1 : ");
                if(RB4==0)
                    UART_Transmit_Str("Active");
                else
                    UART_Transmit_Str("Clear");
                break;
            default:
                UART_Transmit_Str("\n\rYou
                typed : ");
                UART_Transmit(ch);
                break;
        }
    }
    return (0);}

```

Interfacing generic sensors using opto-coupler isolators I, Light sensor (LDR)

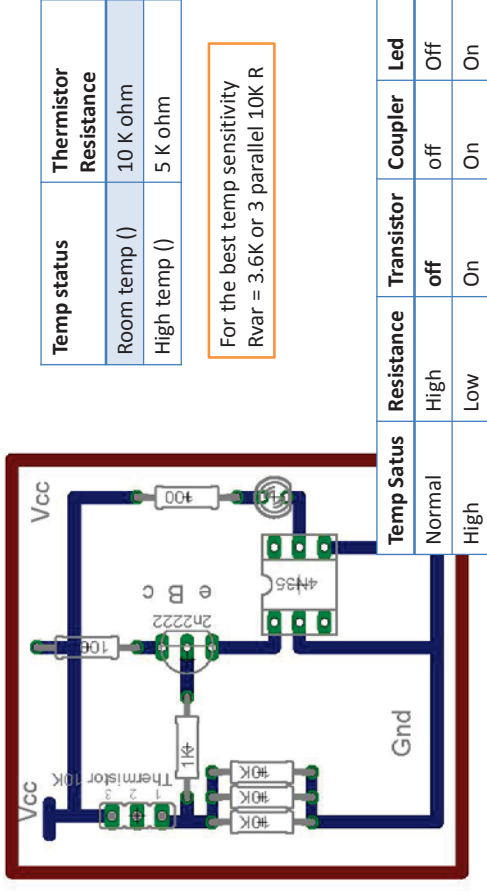
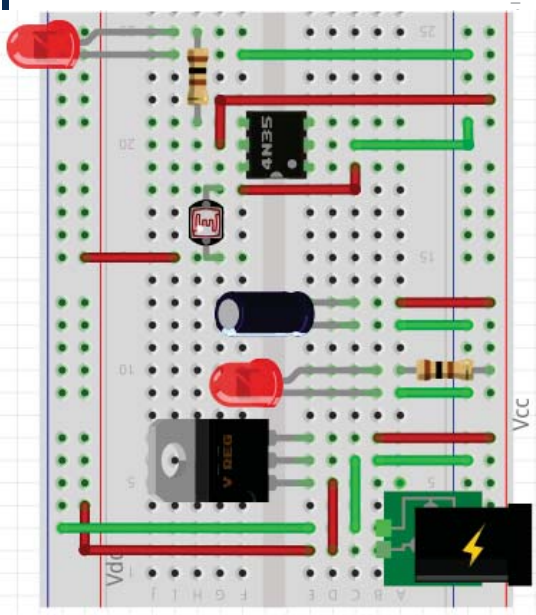


Light status	Resistance	Coupler	Led
dark	1 mega ohm	off	Off
light	36 k ohm	On	on



Light status	Resistance	Coupler	To MC
dark	1 mega ohm	off	1
light	36 k ohm	On	0

Interfacing generic sensors using opto-coupler isolators II, Temp sensor (Thermistor)

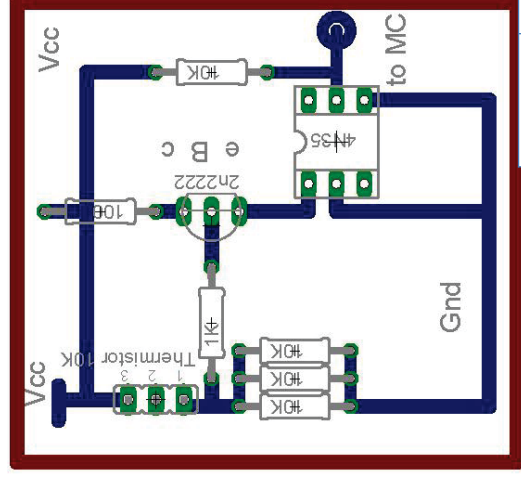


Temp status	Thermistor Resistance
Room temp ()	10 K ohm
High temp ()	5 K ohm

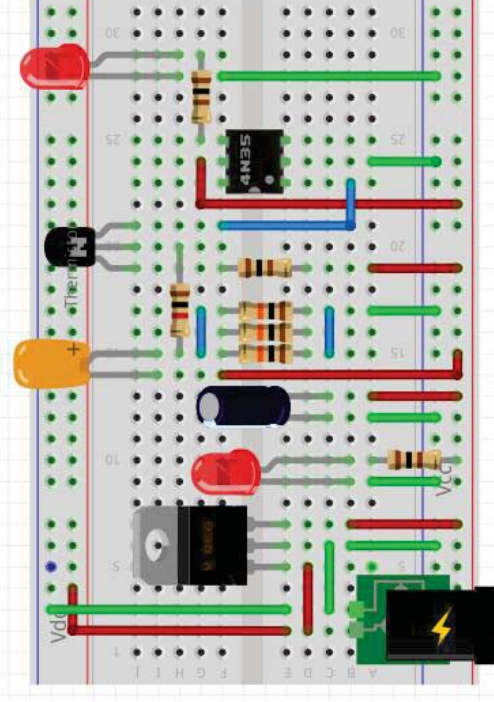
For the best temp sensitivity
 $R_{var} = 3.6K$ or 3 parallel $10K R$

Temp Satus	Resistance	Transistor	Coupler	Led
Normal	High	off	off	Off
High	Low	On	On	On

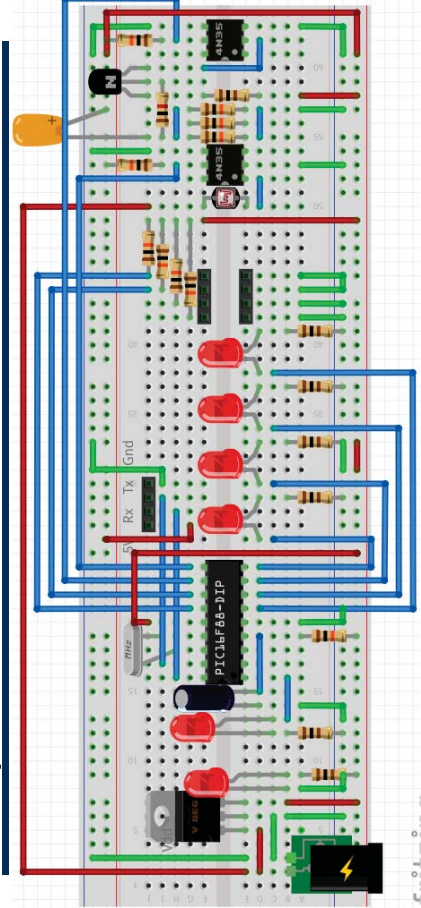
214, Practical Applications CS II



Temp Satus	Resistance	Transistor	Coupler	MC
Normal	High	off	off	1
High	Low	On	On	0



Interfacing MC to light and Temperature sensors



Thanks,..
See you next week (ISA),...