IR Obstacle Sensor

Based on a simple basic Idea, this IR obstacle sensor, is easy to build, easy to calibrate and still, it provides a detection range of 10- 30 cm. This sensor can be used for most indoor applications where no important ambient light is present. It is the same principle in ALL Infra-Red proximity sensors. The basic idea is to send infra red light through IR-LEDs, which is then reflected by any object in front of the sensor.

Features

- IR obstacle based detector.
- Adjustable range with POT.
- Logic output 1 or 0.
- Sensitivity up to 30cm adjustable.

Applications

- Industrial safety devices.
- Wheel encoder.
- Contact less tachometer.

Specification

Parameter	Value
Operating voltage	+5v DC regulated
Obstacle detection	Indicated by active high output

Pin Specification

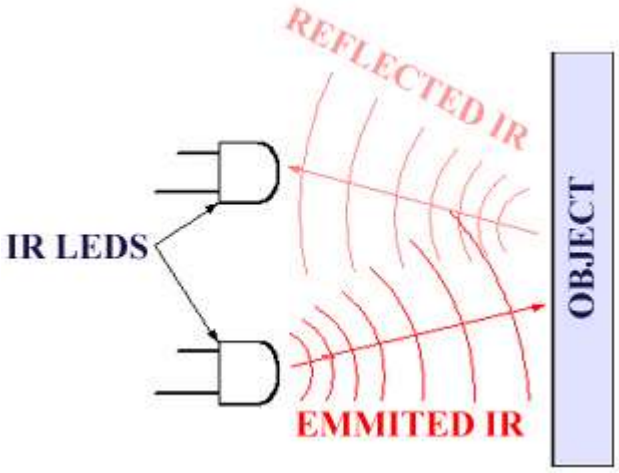
Pin	Name	Details
1	OUT	Active High Output
2	GND	Power Supply ground
3	+5V	Power supply input

Using The Sensor

- Connect regulated DC power supply of 5 Volts to pin 3 and GND to pin2.
- When gas is detected LED is ON or else it is OFF.
- The output from pin1 can be given directly to microcontroller for interfacing applications.

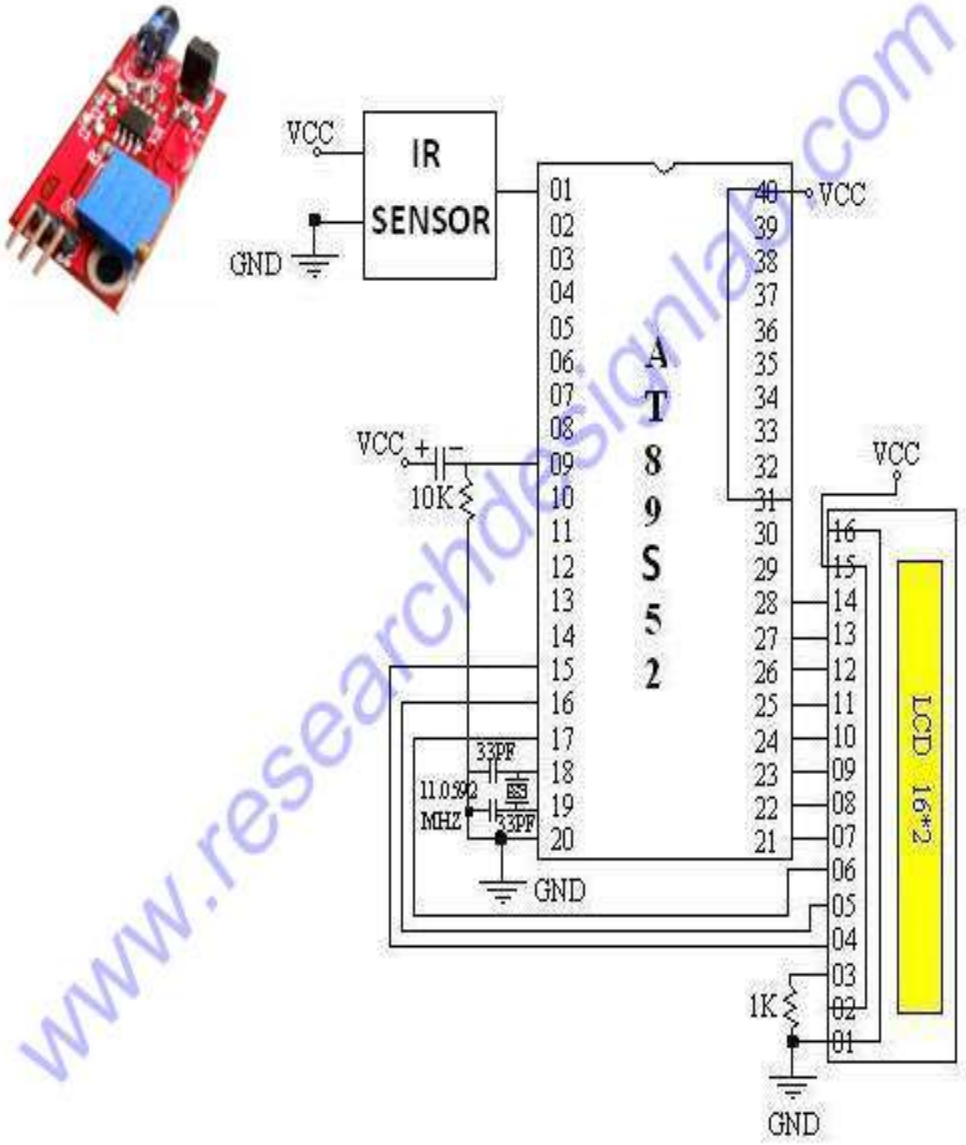
Working

It is the same principle in ALL Infra-Red proximity sensors. The basic idea is to send infra red light through IR-LEDs, which is then reflected by any object in front of the sensor.



Then all you have to do is to pick-up the reflected IR light. For detecting the reflected IR light, we are going to use a very original technique: we are going to use another IR-LED, to detect the IR light that was emitted from another led of the exact same type! This is an electrical property of Light Emitting Diodes (LEDs) which is the fact that a led Produce a voltage difference across its leads when it is subjected to light. As if it was a photo-cell, but with much lower output current. In other words, the voltage generated by the leds can't be - in any way - used to generate electrical power from light, It can barely be detected. that's why as you will notice in the schematic, we are going to use a Op-Amp (operational Amplifier) to accurately detect very small voltage changes.

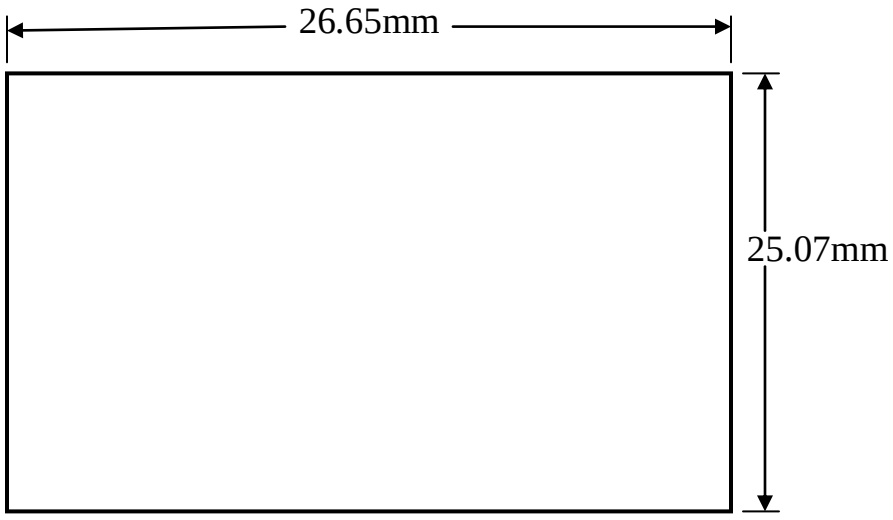
Sample Application: IR sensor is interfaced to 89s52 if any obstacle is detected a message is displayed on LCD.



```
/*
 * Project name:
    IR sensor
 * Copyright
    (c) Researchdesignlab.com
 * Description:
    * Test configuration:
    MCU:           AT89S52
    Dev.Board:      8051
    Oscillator:     11.0592 MHz
    Software:       Keil uVision3
*/
#include<reg51.h>


#define LCD_PORT P2// LCD D0-D7 PINS connected P2
sbit rs=P3^5;     // LCD RS PIN connected P3.5
sbit en=P3^7;
sbit D7=P2^7;
sbit rw=P3^6;
sbit IR=P1^0;     // IR sensor PIN connected P1.0
void busy();                    //LCD busy
void CMD_WRT(unsigned char);
void DATA_WRT(unsigned char);
void LCD_WRT(unsigned char *);
void DELAY();
 void main()
 {
  unsigned char CMD[]={0x38,0x01,0x0f,0x06,0x80},TEMP1,i;
for(i=0;i<5;i++)
        {
        TEMP1=CMD[i]; //write the commands to the LCD
        CMD_WRT(TEMP1);
        }
 while(1)
 {
        if(IR==1)
        {
        CMD_WRT(0X01);
        CMD_WRT(0X80);
        LCD_WRT("IR HIGH");
        DELAY();
   }
        else                    //IR is low enter the loop
        {
        CMD_WRT(0X01);
```

```
            CMD_WRT(0X80);
            LCD_WRT("IR LOW");
            DELAY();

            }

  }

}

void DELAY()

            {                    //delay of 3ms

            unsigned int X=800000;

            while(X--);

            }

void busy()

            {

            D7=1;

            rs=0;
            rw=1;    //read

            while(D7!=0) //wait till LCD is ready

            {

            en=0;

            en=1;
            }

            }

void CMD_WRT(unsigned char val)

            {

            busy();

            LCD_PORT=val;

            rs=0;

            rw=0;

            en=1;

            en=0;    //high to low latch

            }

void DATA_WRT(unsigned char ch)

            {

            busy();

            LCD_PORT = ch;


            rs=1;


            rw=0;


            en=1;

            en=0;


            }


void LCD_WRT(unsigned char *string)

            {

            while(*string)


            DATA_WRT(*string++);

            }
```

Board Dimensions



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