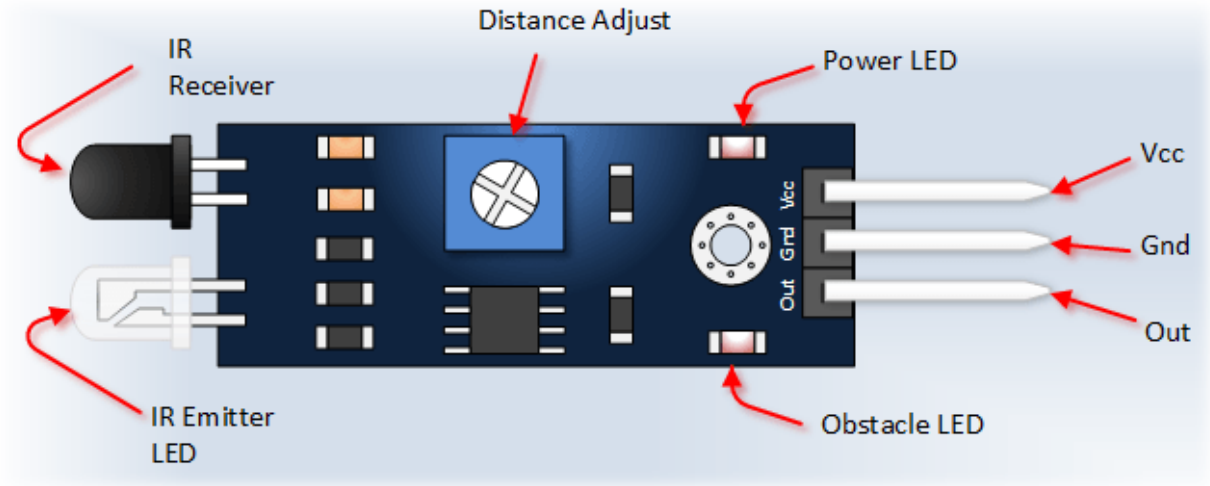
IR Sensor Interfacing With PIC16F877A

The infrared Obstacle Sensor Module has a built-in **IR transmitter** and **IR receiver** that sends out IR energy and looks for reflected IR energy to detect the presence of any obstacle in front of the sensor module.

The PCB of this electronic circuit has a potentiometer. That potentiometer lets users adjust the detection range. The sensor has a very good and stable response even in ambient light or in complete darkness.

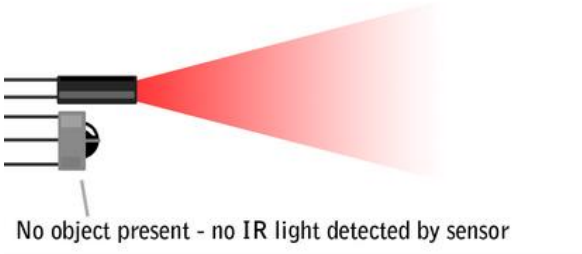
Specifications

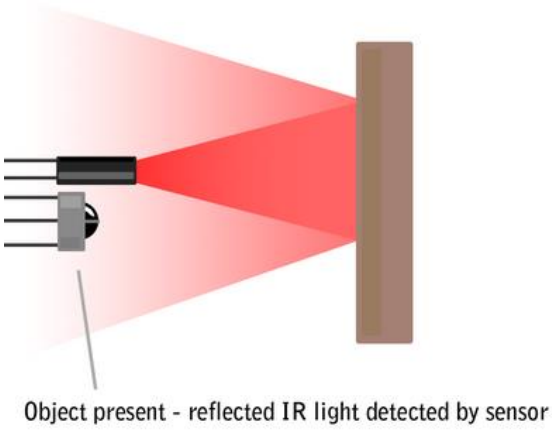
- Operating Voltage: **3.0V – 5.0V**
- Detection range: **2cm – 30cm (Adjustable using potentiometer)**
- Current Consumption:**at 3.3V : ~23 mA**,**at 5.0V: ~43 mA**
- Active output level: **Outputs Low logic level when an obstacle is detected**
- Onboard Obstacle Detection LED indicator



Working Principle of IR Obstacle Sensor

An IR sensor consists of an IR LED and an IR Photodiode; together they are called as Photo–Coupler or Opto–Coupler. As said before, the Infrared Obstacle Sensor has a built-in IR transmitter and IR receiver. **An infrared Transmitter** is a light-emitting diode (LED) that emits infrared radiations. Hence, they are called IR LEDs. Even though an IR LED looks like a normal LED, the radiation emitted by it is invisible to the human eye.





Infrared receivers are also called as infrared sensors as they detect the radiation from an IR transmitter. IR receivers come in the form of photodiodes and phototransistors. Infrared Photodiodes are different from normal photodiodes as they detect only infrared radiation. When the IR transmitter emits radiation, it reaches the object and some of the radiation reflects back to the IR receiver. Based on the intensity of the reception by the IR receiver, the output of the sensor is defined.

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Connection

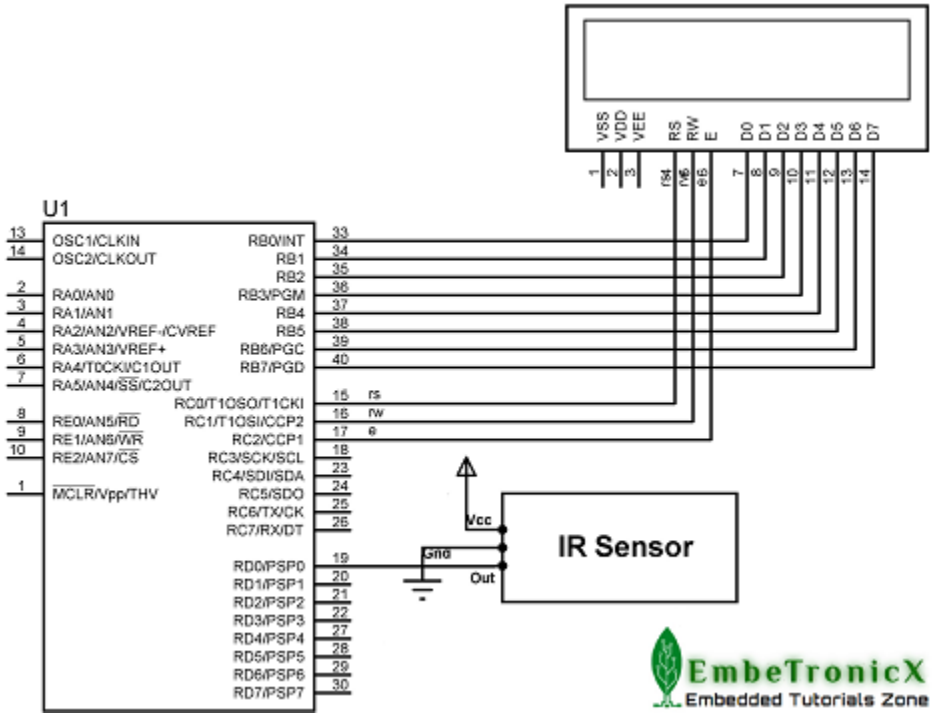
IR Sensor

- Vcc – 5v
- GND – Ground
- Out – RD0 (PORTD.0)

LCD

- RS – RC0
- RW – RC1
- EN –RC2

- Data Lines – PORTB




```
#include<htc.h>
__CONFIG( FOSC_HS & WDTE_OFF & PWRTE_OFF & CP_OFF & BOREN_ON &
LVP_OFF & CPD_OFF & WRT_OFF & DEBUG_OFF);
#define IR RD0 //IR Output is connected at PORTD.0
#define rs RC0
#define rw RC1
#define en RC2
#define delay for(i=0;i<1000;i++)
int i;
void lcd_init();
void cmd(unsigned char a);
void dat(unsigned char b);
void show(unsigned char *s);
void main()
{
TRISB=TRISC0=TRISC1=TRISC2=0;
TRISD=0xff; //Port D act as Input
lcd_init();
```

```
cmd(0x80);
show(" EmbeTronicX ");
while(1) {
if(IR == 0) {
cmd(0xc0);
show("Obstacle Detcted");
delay;delay;
} else {
cmd(0xc0);
show(" ");
}
}
}
void lcd_init()
{
cmd(0x38);
cmd(0x0c);
cmd(0x06);
cmd(0x80);
}
void cmd(unsigned char a)
{
PORTB=a;
rs=0;
rw=0;
en=1;
delay;
en=0;
}
void dat(unsigned char b)
{
PORTB=b;
rs=1;
```

```
rw=0;
en=1;
delay;
en=0;
}
void show(unsigned char *s)
{
while(*s)
{
dat(*s++);
}
}
```

If you want to sense more distance you can use below IR sensor. You can also adjust the distance using this.  This is an Infrared Transmitter and receiver which together make up a photoelectric sensor. The sensor has a long detection distance and has less interference by visible light because it uses modulated Infrared light. This sensor has a screwdriver adjustment to set the detected distance, then gives a digital output when it senses something within that range. This sensor does not return a distance VALUE.