# Interfacing of TSOP IR Sensor

TSOP1738

- **TSOP1738** is a infrared receiver tuned to receive IR of frequency 38 kHz only. It is perfect for making obstacle sensors and to read signals from most IR remotes(TV, AC, Home Theatre Remotes, etc).

- It is used as a receiver in distance sensors, also provides better performance as it allows better reception and protection from ambient light compared to other IR receivers. It can be used to read signals of most IR Remotes.
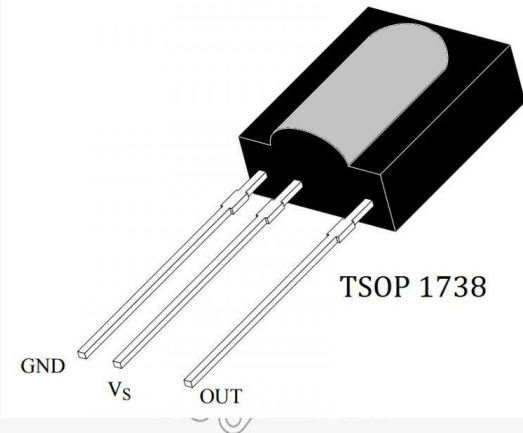
Working principle

- The TSOP1738 IR sensor module consists of a PIN diode and a pre amplifier which are embedded into a single package.
- The output of TSOP is active low and it gives +5V in off state. When IR waves, from a source, with a centre frequency of 38 kHz incident on it, its output goes low.
- Lights coming from sunlight, fluorescent lamps etc. may cause disturbance to it and result in undesirable output even when the source is not transmitting IR signals.
- A bandpass filter, an integrator stage and an automatic gain control are used to suppress such disturbances.
- TSOP module has an inbuilt control circuit for amplifying the coded pulses from the IR transmitter.

Working of TSOP IR Sensor

- When an IR LED is transmitting data onto the TSOP, every time the IR led goes high, the TSOP will go LOW and vice versa. Remote control signals are often bytes of data that is encoded and transmitted by pulsing(switching ON & OFF the IR LED at a specific frequency).

- Most TV remote controls work at 32-40 Khz frequency and most receivers can receive this range.

Components Required

- Arduino Nano
- TSOP1738
- IR LED or Remote
- LED
- Breadboard
- Jumper Wires

Connection Diagram
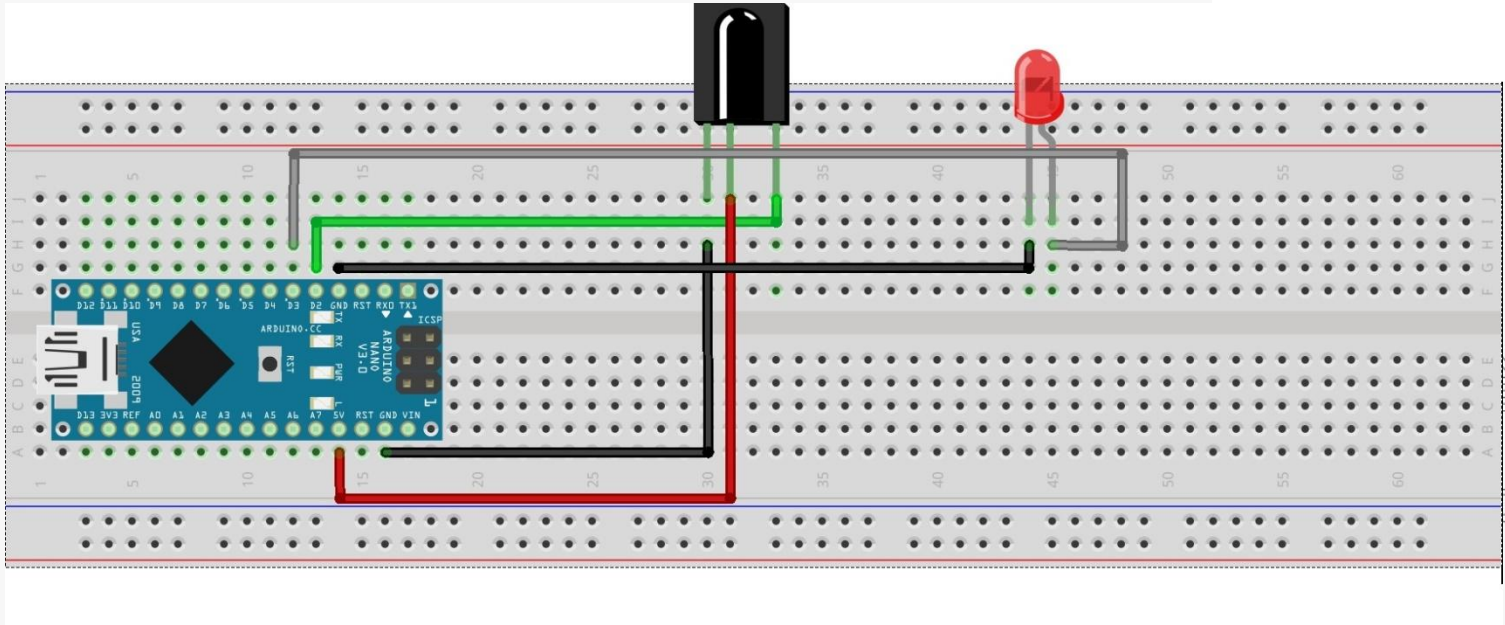
Connections

1. Connect 1st pin(GND) of TSOP1738 with GND pin of Arduino Nano.
2. Connect 2nd pin(Vcc) of TSOP1738 with 5V pin of Arduino Nano.
3. Connect 3rd (OUT) pin of TSOP1738 with D2 pin of Arduino Nano.
4. Connect negative pin of LED with GND pin of Arduino Nano.
5. Connect positive pin of LED with D3 pin of Arduino Nano.
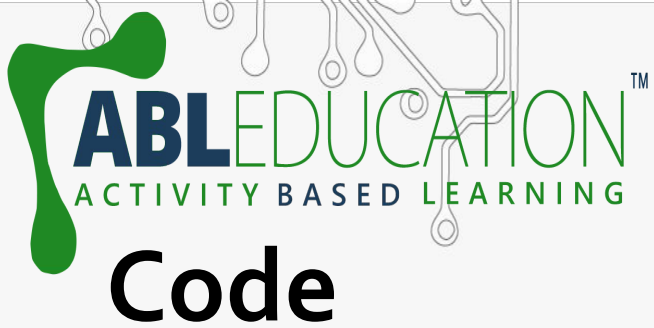
Code

Interfacing_of_TSOP_IR_sensor

```cpp
const int buttonPin = 2;      // the number of the pushbutton pin
const int ledPin =  3;        // the number of the LED pin

// variables will change:
int buttonState = 0;          // variable for reading the pushbutton status

void setup() {
  // initialize the LED pin as an output:
  pinMode(ledPin, OUTPUT);
  // initialize the pushbutton pin as an input:
  pinMode(buttonPin, INPUT);

  // initialize serial communications at 9600 bps:
  Serial.begin(9600);
  Serial.println("TSOP IR Sensor Testing" );
}

void loop(){
  // read the state of the pushbutton value:
  buttonState = digitalRead(buttonPin);
```

```arduino
  // initialize serial communications at 9600 bps:
  Serial.begin(9600);
  Serial.println("TSOP IR Sensor Testing" );
}


void loop(){
  // read the state of the pushbutton value:
  buttonState = digitalRead(buttonPin);

  // check if the pushbutton is pressed.
  // if it is, the buttonState is HIGH:
  if (buttonState == HIGH) {
    // turn LED off:
    digitalWrite(ledPin, LOW);
  }
  else {
    // turn LED on:
    digitalWrite(ledPin, HIGH);
    Serial.println(" sensor Active " );
  }
}
```

Project Link: https://youtu.be/Eyd8NjE5qoQ