

Aim Design a system using Arduino that blinks an LED when you detect a motion in an area on an IDE

Hardware library : ARDUINO UNO

Materials Required : PIR Sensor, Arduino UNO, Jumper wires, LEDs

Theory :

"Passive Infra Red" or PIR sensor is a "pyroelectric IR sensor" which generates energy when exposed to heat. Everything emits some low level of radiation, the hotter the object is, the more radiation is emitted. When a human or an animal approaches the sensors range the sensor detects the heat in the form of infrared radiation.

The sensor only detects the energy emitted by other objects and don't produce any. That's why the sensor is called a PIR or "Passive Infrared" sensor. These sensors are small, cheap, rugged, low power and very easy to use.

Working Principle : The passive infrared sensor does not radiate energy to space. It receives the infrared radiation from the human body to make an alarm.

Any object with temperature is constantly radiating infrared rays to the outside world. The surface temperature of the human body is between 36°C - 37°C and most of its radiant energy concentrated in the wavelength range of 8 μm - 12 μm .

Connections :

with Arduino .

- Connect the VCC of the PIR sensor to the 5V pin of Arduino.
- Then connect the output pin to D13.
- GND to the Ground pin of the Arduino.
- Connect the LED to the D2 pin of the Arduino.
- Now upload the code and test.

Range of PIR Sensor :

Indoor passive infrared : 25 cm to 20 m

Indoor curtain type : 25 cm to 20 m

Outdoor passive infrared : 10 m to 150 m

Outdoor passive infrared curtain detector :

10 m to 150 m

Code :

```
int LED = 13;  
int PIR = 2;  
void setup () {  
    pinMode (LED, OUTPUT);  
    pinMode (PIR, INPUT);  
    Serial.begin (9600);  
}  
  
void loop () {  
    if (digitalRead (PIR) = HIGH)  
    {  
        digitalWrite (LED, HIGH);  
        Serial.println ("Motion Detected");  
        delay (100);  
    }  
    else {  
        digitalWrite (LED, LOW);  
        Serial.println ("Motion Stopped");  
        delay (100);  
    }  
}
```

Expected Output :

Motion detected
Motion detected
Motion detected
Motion detected
Motion stopped
Motion stopped
Motion detected
Motion detected
Motion detected
Motion stopped