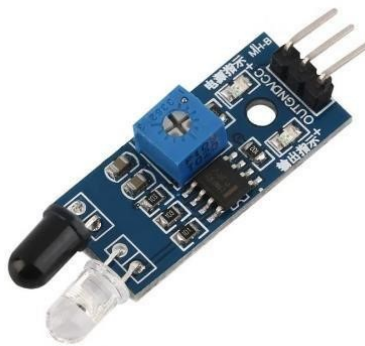


## Practical – 5

**Aim:-**What is IR Sensor? Explain it's Structure, How it works, Applications. Programming & Interfacing of IR Sensor with Arduino Uno.

- **What is an IR Sensor?**

IR sensor is an electronic device, that emits the light in order to sense some object of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. Usually, in the infrared spectrum, all the objects radiate some form of thermal radiation. These types of radiations are invisible to our eyes, but infrared sensor can detect these radiations.



- **Working Principle**

The working principle of an infrared sensor is similar to the object detection sensor. This sensor includes an IR LED & an IR Photodiode, so by combining these two can be formed as a photo-coupler otherwise optocoupler. The physics laws used in this sensor are planks radiation, Stephan Boltzmann & weins displacement.

IR LED is one kind of transmitter that emits IR radiations. This LED looks similar to a standard LED and the radiation which is generated by this is not visible to

the human eye. Infrared receivers mainly detect the radiation using an infrared transmitter. These infrared receivers are available in photodiodes form. IR Photodiodes are dissimilar as compared with usual photodiodes because they detect simply IR radiation. Different kinds of infrared receivers mainly exist depending on the voltage, wavelength, package, etc.

Once it is used as the combination of an IR transmitter & receiver, then the receiver's wavelength must equal the transmitter. Here, the transmitter is IR LED whereas the receiver is IR photodiode. The infrared photodiode is responsive to the infrared light that is generated through an infrared LED. The resistance of photo-diode & the change in output voltage is in proportion to the infrared light obtained. This is the IR sensor's fundamental working principle.

Once the infrared transmitter generates emission, then it arrives at the object & some of the emission will reflect back toward the infrared receiver. The sensor output can be decided by the IR receiver depending on the intensity of the response.

- **Applications of IR Sensor**

1. Night Vision Devices
2. Radiation Thermometers
3. Infrared Tracking
4. IR Imaging Devices

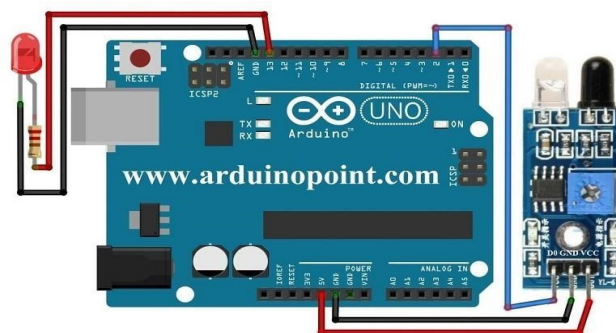
- **Code:-**

```
intIRSensor = 2; // connect IR sensor module to Arduino pin D9  
int LED = 13; // connect LED to Arduino pin 13
```

```
void setup(){
  Serial.begin(115200); // Init Serial at 115200 Baud Rate.
  Serial.println("Serial Working"); // Test to check if serial is working or not
  pinMode(IRSensor, INPUT); // IR Sensor pin INPUT pinMode(LED,
  OUTPUT); // LED Pin Output
}

void loop(){
  intsensorStatus = digitalRead(IRSensor); // Set the GPIO as Input if
  (sensorStatus == 1) // Check if the pin high or not
  {
    // if the pin is high turn off the onboard Led digitalWrite(LED, HIGH);
    // LED LOW
    Serial.println("Motion Detected!"); // print Motion Detected! on the serial
    monitor window
  }
  else {
    //else turn on the onboard LED digitalWrite(LED,
    LOW); // LED High
    Serial.println("Motion Ended!"); // print Motion Ended! on the serial monitor
    window
  }
}
```

**Set up:-**



**Output:-**

