

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 object radiate some form of thermal radiation. These types of radiations are invisible to our eyes, but infrared sensor can detect these radiations.
- The emitter is simply an IR LED (Light Emitting Diode) and the detector is simply an IR Photodiode.
- Photodiode is sensitive to IR light of the same wavelength which is emitted by the IR LED.
- When IR light falls on the photodiode, the resistances and the output voltages will change in proportion to the magnitude of the IR light received.
- IR Working Sensor Principle:

An IR Sensor consists of an IR LED and an IR Photodiode, together they are called as PhotoCoupler or OptoCoupler.

- IR Transmitter or IR LED:
- IR transmitter is a light emitting diode(LED) which emits radiations called as IR LED's.
- Even though an IR LED looks like a normal LED, the radiation emitted by it is invisible to human eye.
- The picture of an Infrared LED is shown below.



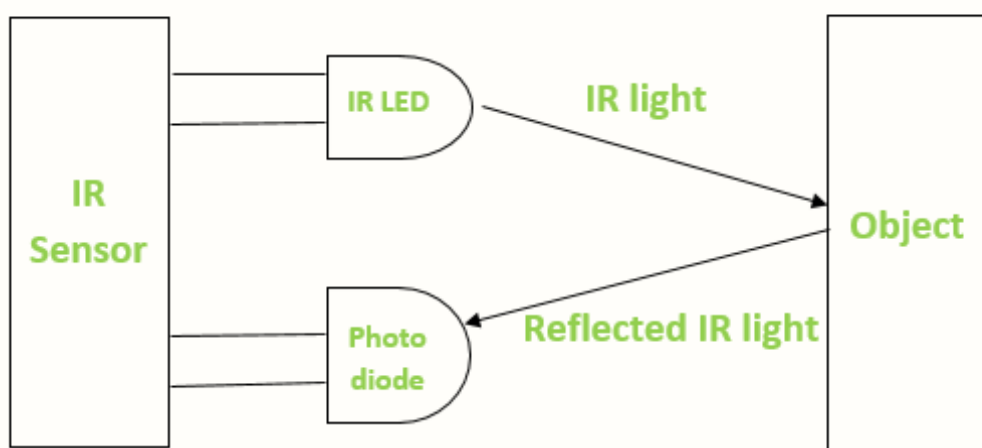
IR Receiver or Photodiode

Infrared receivers or infrared sensors detect the radiation from an IR transmitter. IR receivers come in the form of photodiodes and phototransistors. Infrared Photodiodes

are different from normal photo diodes as they detect only infrared radiation. Below image shows the picture of an IR receiver or a photodiode.



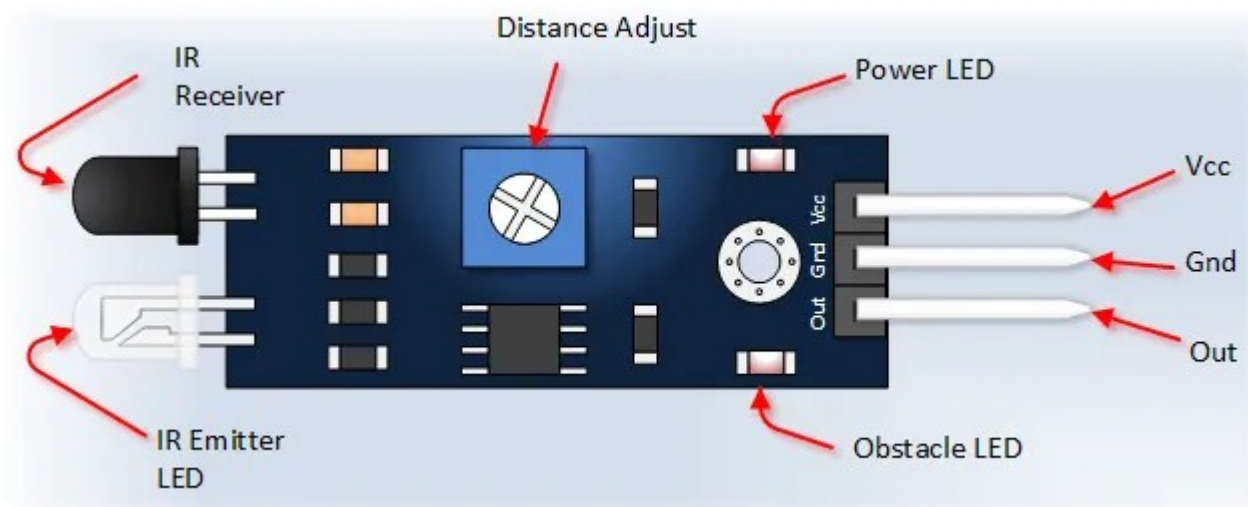
- The emitter is an IR LED and the detector is an IR photodiode. The IR photodiode is sensitive to the IR light emitted by an IR LED. The photo-diode's resistance and output voltage change in proportion to the IR light received.
- This is the underlying working principle of the IR sensor.



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 defines.

- 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



Applications of an IR sensor:

- 1) IR Imaging Devices
- 2) Moisture Analyzers
- 3) Gas Analyzers
- 4) Radiation Thermometers