

PIR (Passive Infrared) Sensor

A PIR sensor detects infrared radiation (heat) emitted by humans or animals. It's commonly used in motion detection systems.

Working Principle:

The PIR sensor has two slots made of a special material that detects IR. When a warm body like a human passes across the sensor's field of view, it causes a differential signal that triggers the output.

Types:

- Standard PIR Sensor (e.g., HC-SR501)
- Digital PIR sensors
- Dual-element sensors for better noise immunity

Applications:

- Motion detectors
- Security alarms
- Automatic lighting systems
- Smart home devices

Advantages:

- Low power consumption
- Inexpensive and easy to use
- Long detection range
- Immune to noise and visible light

Disadvantages:

- Detects only motion, not presence
- Limited detection area
- Prone to false triggering from heat sources

