

In this project, we will interface a PIR (Passive Infrared) Sensor with an Arduino to detect motion. The PIR sensor is commonly used for motion detection because it can sense infrared radiation emitted by human bodies. When motion is detected, the sensor triggers a digital signal that the Arduino can process.

This project can be used for security systems, automatic lighting, and other applications that require motion detection.

Circuit Setup:

1. PIR Sensor Connections:

- VCC of the PIR sensor is connected to the 5V pin on the Arduino.
- GND of the PIR sensor is connected to the GND pin on the Arduino.
- OUT (Signal Pin) of the PIR sensor is connected to a digital input pin on the Arduino (e.g., Pin 2).

2. LED Connections:

- The Anode (positive side) of the LED is connected to Pin 13 on the Arduino through a 220Ω resistor.
- The Cathode (negative side) of the LED is connected to GND.

3. Power Supply:

- The Arduino can be powered via USB or an external power supply (e.g., 9V battery).

Working of the PIR Sensor:

1. PIR Sensor Functionality:

- The PIR sensor detects motion by sensing changes in infrared radiation levels. When a human body (which emits infrared radiation) moves within the sensor's range, the sensor detects the change and sends a HIGH signal to the Arduino. If no motion is detected, the sensor outputs a LOW signal.
- The sensor typically has two adjustable settings: sensitivity (the range of motion detection) and time delay (how long the sensor stays triggered after detecting motion).

2. Arduino Logic:

- The Arduino reads the PIR sensor's OUT pin. When the PIR sensor detects motion, it outputs a HIGH signal, which is detected by the Arduino.
- The Arduino then turns on the LED to indicate motion. When the signal goes LOW (no motion detected), the LED is turned off.