ROBOTiX CLUB
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Project Name - Motion Sensor

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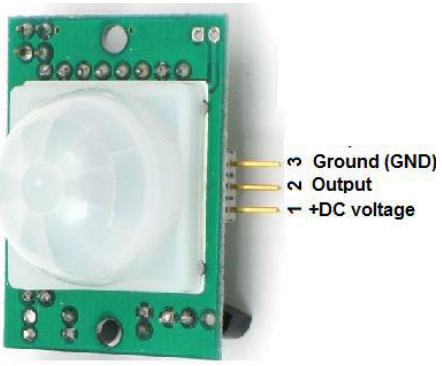
1. Introduction

PIR sensors allow you to sense **motion**, almost always used to detect whether a human has moved in or out of the **sensors** range. They are small, inexpensive, low-power, easy to use and don't wear out.
Here we are using basic ARDUINO USB board so as to enhance the function of PIR MOTION SENSOR and to use it for appropriate tasks, such as to initiate the LED SCREEN DISPLAY, to signal using the BUZZER SOUND, to open the DOOR on detection of any MOTION.
PIRs are basically made of a pyroelectric sensor which can detect levels of infrared radiation. Everything emits some low level radiation. The sensor in a motion detector is actually split in two halves. The reason for that is that we are looking to detect motion and not average IR levels. The two halves are wired up so that they cancel each other out. If one half sees more or less IR radiation than the other, the output will swing high or low.

2. Blueprints



A PIR motion sensor has three terminals as shown above. The terminals are connected to Arduino board.

3. Working

Motion sensor works on the simple principle of receiving the input and evaluating it then giving output. Project is mainly based on the PIR (Passive Infrared)sensor.PIR sensor detects a human being moving around within approximately 10m from the sensor. This is an average value, as the actual detection range is between 5m and 12m.

PIR are fundamentally made of a pyro electric sensor, which can detect levels of infrared radiation.
One pin will be ground, another will be signal and the last pin will be power. Power is usually up to 5V.Once the sensor warms up the output will remain low until there is motion, at which time the output will swing high for a couple of seconds, then return low. If motion continues the output will cycle in this manner until the sensors line of sight of still again.
The PIR sensor needs a warm-up time with a specific end goal to capacity fittingly. This is because of the settling time included in studying nature's domain.
A PIR or a Passive Infrared Sensor can be used to detect presence of human beings in its proximity. The output can be used to control the motion of door.
A PIR sensor detects the infrared light radiated by a warm object. It consists of pyro electric sensors which introduce changes in their temperature (due to incident infrared radiation) into electric signal. When infrared light strikes a crystal, it generates an electrical charge.
Sensor sends message to the Arduino and according to the code done in the Arduino it starts giving output to the buzzer (HIGH), LED (HIGH) and to motor starts moving in clockwise direction after 2 seconds it starts moving anticlockwise using a motor driver. There is also a LCD display which shows that motion is detected By this way the whole system works using Arduino which controls the whole system.

4. Construction

Materials Required

- Different components used are:
- Arduino UNO
- LCD Display
- PIR Motion sensor
- Motor and Motor Driver
- LED
- Rack and Pinion

- Positive terminal of the LED pin is connected to pin 13 of Arduino and negative terminal to GND.

- Input pin of PIR is connected to pin no. 8 of Arduino and +ve of PIR to 5 volt and -ve to GND.

- Positive terminal of the Buzzer pin is connected to pin 10 of Arduino and negative terminal to GND.

- V_{cc} and GND terminal of LCD is connected to 5volt and GND of Arduino respectively SCL and SDA of LCD is connected to A5 and A4 analogue input in Arduino

- M11 and M12 of motor drive are connected to pin 12 and 11 respectively.

- Motor is connected to motor driver. A pinion is attached to shaft of the motor and rack is attached to the door.

- As the motor moves clockwise and anticlockwise the door moves forward and backward