

## PIR SENSOR BASED AUTOMATIC LIGHT CONTROL SYSTEM

(Secure your entire home, office and shop)

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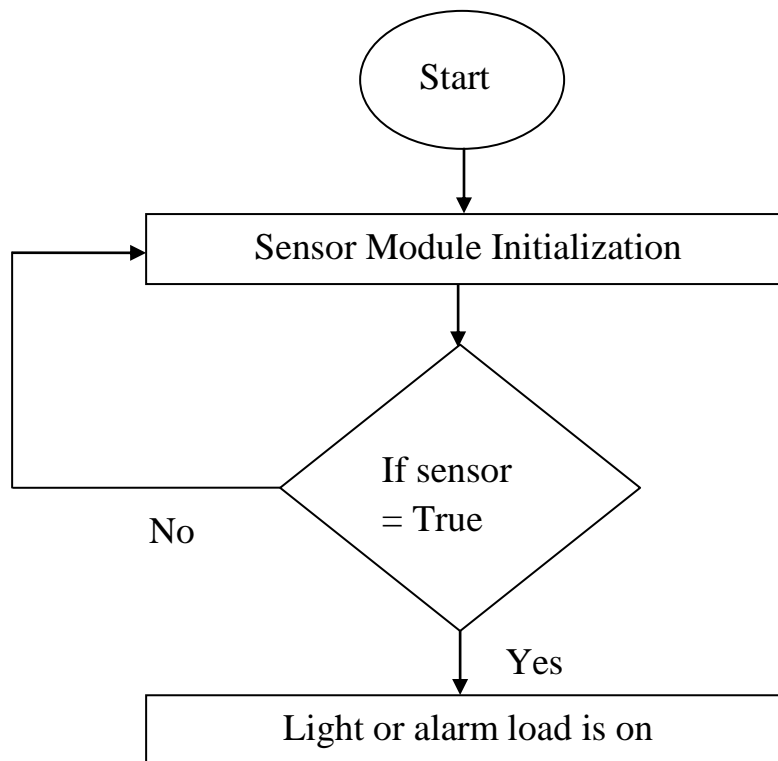
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## Purpose of automatic light control system

The aim of this project is to implement a simple, affordable and cost-efficient system to control a lighting load automatically. The connected lighting load is enable or disable based on the human movement in the targeted area. When a person enters the targeted area then the connected light or alarm will be on automatically in order to draw your attention that someone is moving in the targeted zone.



## Sensor used

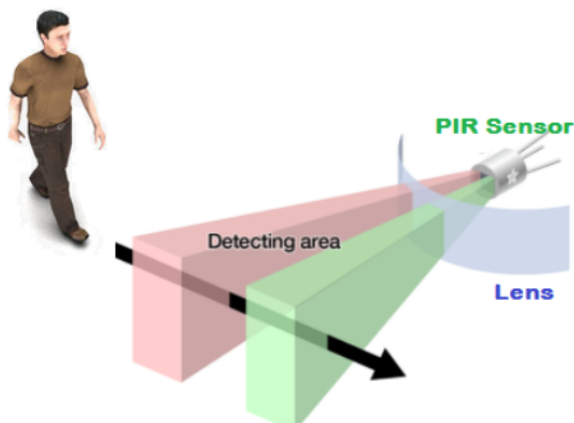


## What is Passive Infrared Sensor (PIR)?

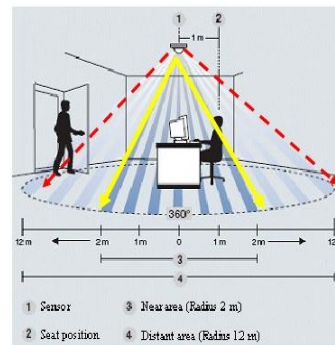
The term PIR is the short form of the Passive Infra Red. The term “passive” indicates that the sensor does not actively take part in the process, which means, it does not emit the referred IR signals itself, rather passively detects the infrared radiations coming from the human body in the surrounding area.

The detected radiations are converted into an electrical charge, which is proportional to the detected level of the radiation. Then this charge is further improved by a built in FET and fed to the output pin of the device which becomes applicable to an external circuit for further triggering and amplification of the alarm stages. The PIR sensor range is up to 6-12 meters at an angle of 180 to 360.

### PIR Sensor Working Principle



### Schematic For Occupancy Sensor



Area in RED – Sensor picks up only walking motion  
Area in Yellow – Sensor picks up motion in seated position

Fig: PIR sensor working principle

## Function of PIR Sensor

The sensor is an energy -saving automatic switch, it adopts integrated circuit and precise detecting components. It can identify day and night automatically. Its performance is very stable. The light will turn on automatically when one enters the detection field; The light will turn off after one leaves the detection field. Ambient-light can be adjusted. So it will work at night and stop in the daytime. The consumer can adjust it freely.

- Detection distance can be adjusted according to the local place.
- The time delay can be adjusted vary to the place.
- The light -time can be added automatically.
- When one moves in the detection field when the lamp is lighting, it can compute time once more and delay the light time automatically after the sensor detects signals.

PIR sensor detects motion by sensing the difference in infrared or radiant heat levels emitted by surrounding objects. The output of the PIR sensor goes high when it detects any motion. The range of a typical PIR sensor is around 6-12 meters or about 20-40 feet.

For proper operation of PIR sensor, it requires a warm up time of 20 to 60 seconds. This is required because, the PIR sensor has a settling time during which it calibrates its sensor according to the environment and stabilizes the infrared detector.

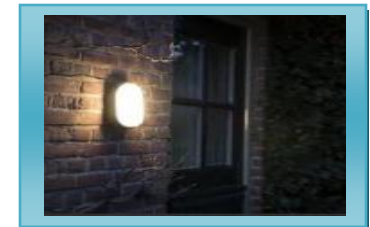
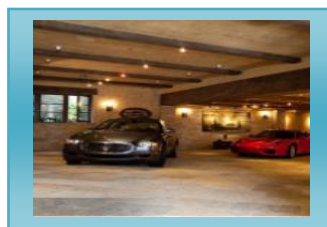
## Motion Detection using PIR Sensor

- ✚ 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 light load, alarm, Air conditioner, Fan, door etc.
- ✚ PIR sensor has two different slot which are sensitive to infrared light/energy.
- ✚ When the sensor is in normal condition, both of the slots measure the same amount of infrared energy radiated by walls etc.
- ✚ When a warm body e.g. animals and human beings crosses its coverage area, they first cross PIR sensors' first slot, which produces positive differential change between two slots.
- ✚ When an animal or human being leave from the sensing area, a corresponding negative differential change is produced.
- ✚ By detecting these types of changes PIR sensor can detect the motion of different objects which radiates infrared energy.

Thus a PIR sensor can be used to detect presence of human beings within a detection area of approximately 6-14 meters (20-45 feet).

## Areas of Applications of PIR Sensors

- All outdoor Lights
- Lift Lobby
- Multi Apartment Complexes
- Common staircases
- For Basement or Covered Parking Area
- Shopping Malls
- Corridor light
- Wash room light
- Balcony light
- For garden lights



## Advantage of the light control system

- ✓ Low cost
- ✓ Easy to implement
- ✓ Low power consumption
- ✓ Long life operation
- ✓ Automated operation

## Project Charge including installation:

| SN | Project Type                       | Project charge in BDT |
|----|------------------------------------|-----------------------|
| 01 | Single light control               | 2,200                 |
| 02 | Double light control               | 4,000                 |
| 03 | Four light control                 | 7,200                 |
| 04 | Wash room light control            | 2200                  |
| 05 | Single balcony light control       | 2,200                 |
| 06 | Common stairs double light control | 4,000                 |
| 07 | Car parking 4-6 light              | 10,000                |
| 08 | Single outdoor light control       | 2,200                 |
| 09 | Single garden light control        | 2,200                 |

The project charge is subject to change without prior notice.

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