Computer Science and Engineering
Jahangirnagar University

PROJECT REPORT

Course Title:

Computer Peripheral & Interfacing Laboratory

Course Code:

CSE-360

Project Title:

Arduino based home security system using PIR motion sensor

Submitted To:

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Objectives:

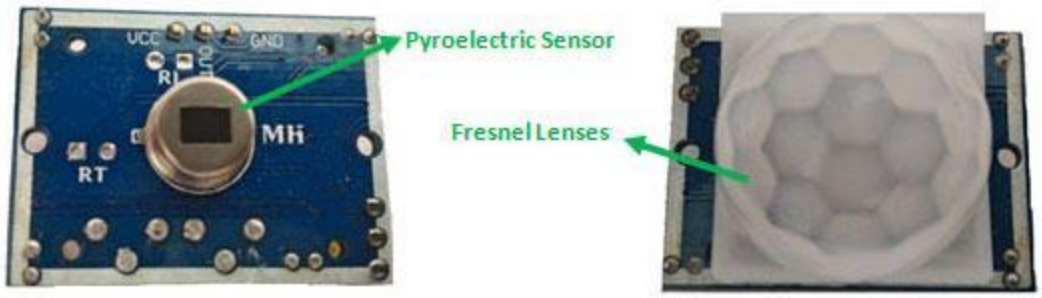
The main objectives of this project are how we use Arduino and PIR motion sensor to detect the presence of human beings and their motion. In this project we also control mains voltage with the Arduino using a relay module.

Instruments:

1. PIR Sensor Module
2. Arduino UNO
3. LED
4. Buzzer
5. Lamp
6. Relay module
7. Breadboard
8. Connecting Wires
9. 220ohm resistor

PIR Sensor Module

The PIR sensor stands for Passive Infrared sensor. It is a low cost sensor which can detect the presence of Human beings or animals. There are two important materials present in the sensor one is the pyroelectric crystal which can detect the heat signatures from a living organism (humans/animals) and the other is a Fresnel lenses which can widen the range of the sensor.

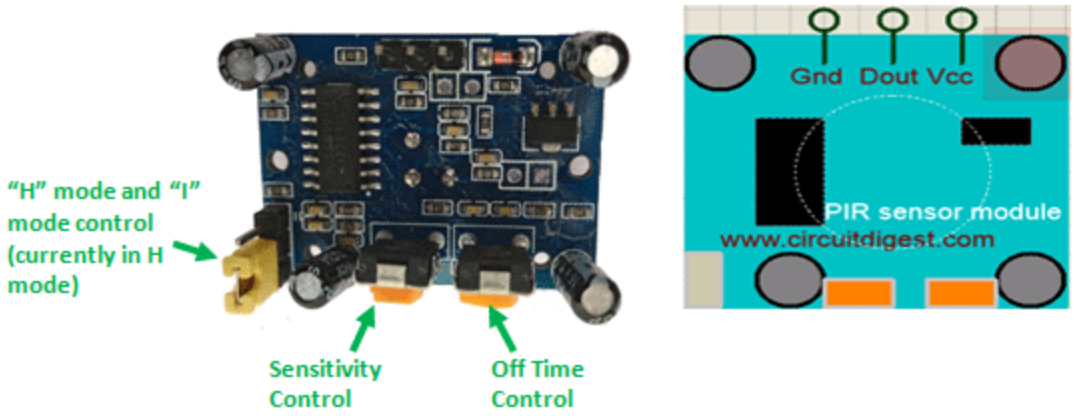


The two potentiometers (orange color) are used to control the sensitivity and trigger on time of the sensor. Basically the Dout pin of the sensor is present in between the Vcc and Gnd pins. The module works on 3.3V but can be powered with 5V as well. On the top left corner it also has a trigger

pin setup which can be used to make the module work in two different modes. One is the “H” mode and the other is the “I” mode.

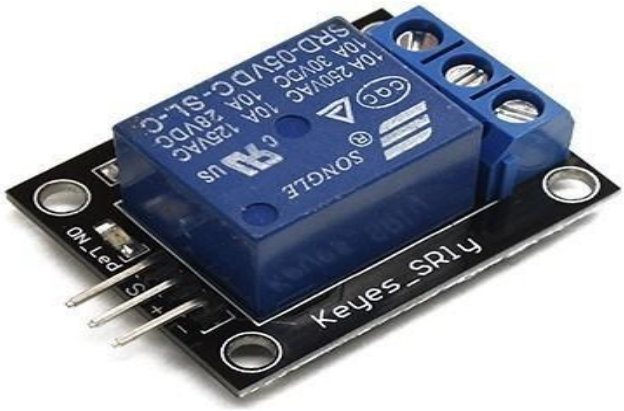
In “H” mode the output pin Dout will go high (3.3V) when a person is detected within range and goes low after a particular time (time is set by potentiometer). In this mode the output pin will go high irrespective of whether the person is still present inside the range or has left the area. We are using our module in “H” mode in our project.

In “I” mode the output pin Dout will go high (3.3V) when a person is detected within range and will stay high as long as he/she stays within the limit of the Sensors range. Once the person has left the area the pin will go low after the particular time which can be set using the potentiometer.



Relay module

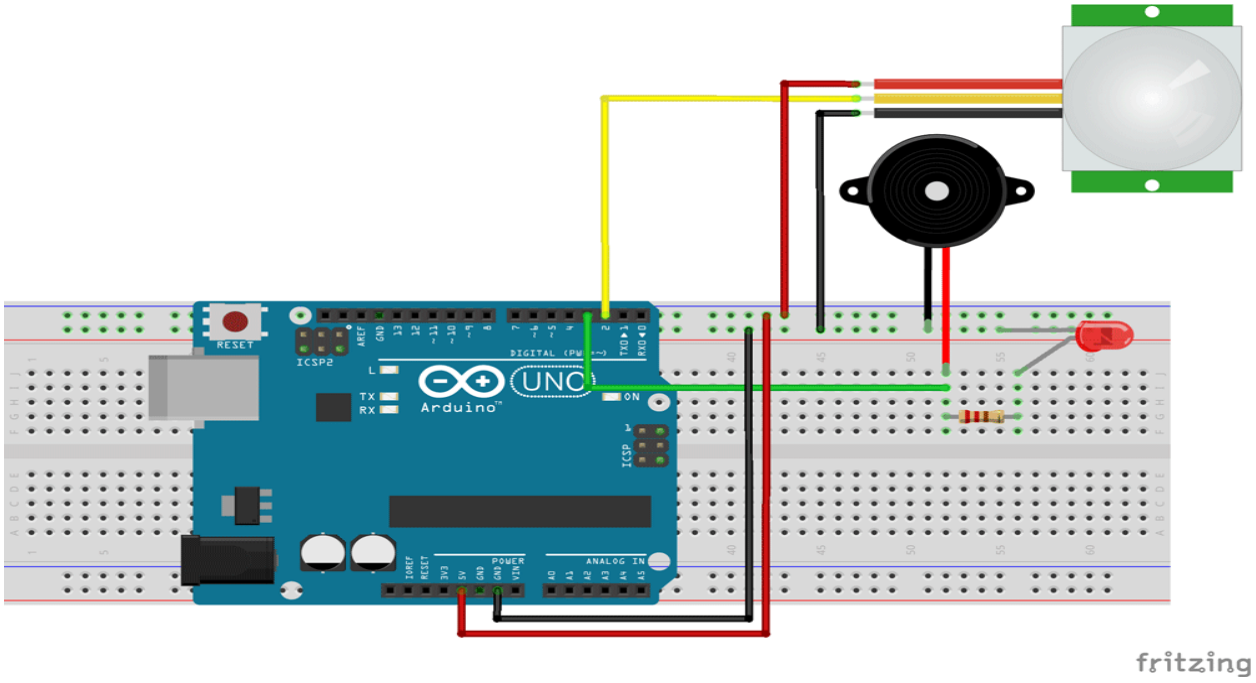
A relay is commonly used to interface a low-current circuit to a higher-current circuit. We can control high voltage electronic devices using relays. A Relay is actually a switch which is electrically operated by an electromagnet. The electromagnet is activated with a low voltage, for example 5 volts from a microcontroller and it pulls a contact to make or break a high voltage circuit.



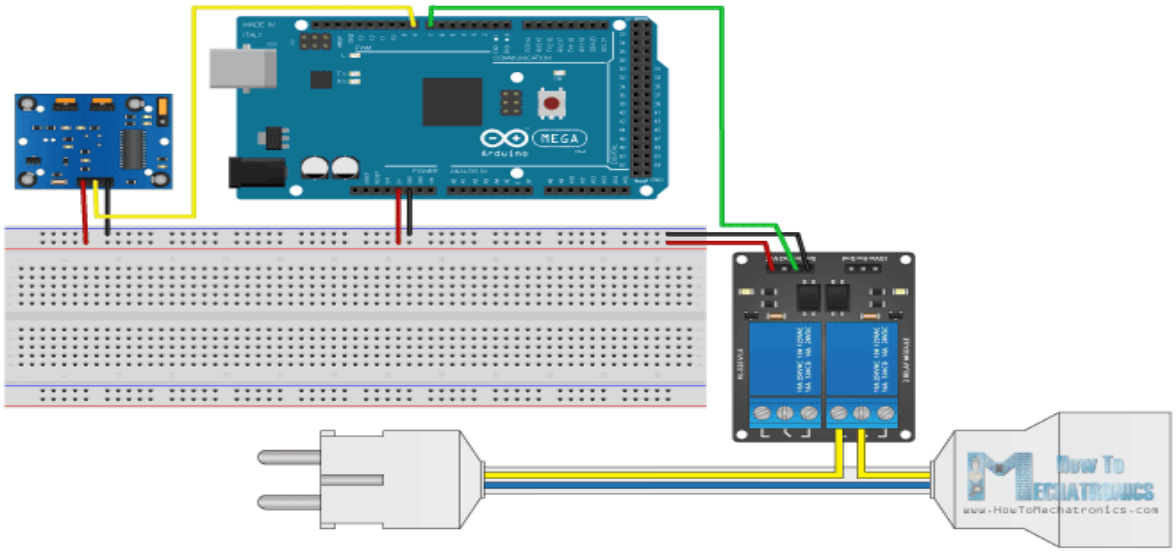
The module's three pins are VCC, IN and GND. All you need is apply power via the VCC and GND and give it a pulse at IN to turn on the relay.

Circuit Schematic

The circuit Diagram for **arduino motion detector project** by interfacing Arduino with PIR module and blinking an LED/Buzzer is shown in the below image.



The circuit Diagram for **arduino motion detector project** by interfacing Arduino with PIR module and blinking an LAMP is shown in the below image.


MEGA
Arduino
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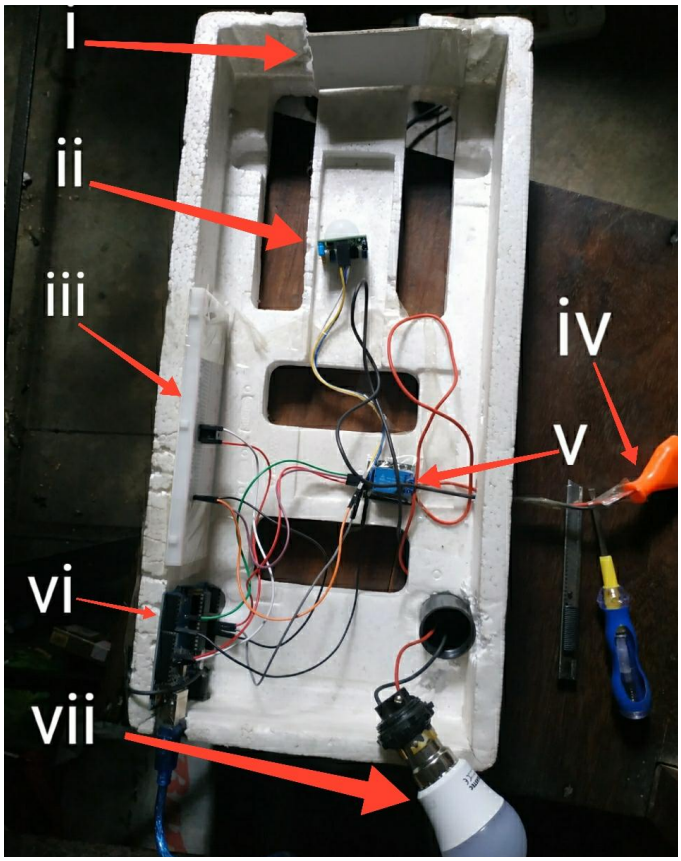
www.HowToMechatronics.com

Connection:


i
ii
iii
iv
v
vi
vii

Inside the picture:

i) Door of a room

ii)PIR sensor

iii)Breadboard

iv)AC connection

v)Relay module

vi)Arduino

vii) Bulb

Code:

```
int lamp = 4; // choose the pin for the RELAY
int inputPin = 8; // choose the input pin (for PIR sensor)

int val = 0; // variable for reading the pin status

void setup() {

pinMode(lamp, OUTPUT); // declare lamp as output

pinMode(inputPin, INPUT); // declare sensor as input

Serial.begin(9600);

}
```

```
void loop(){


val = digitalRead(inputPin); // read input value


Serial.println(val);


if( val== 1) {
digitalWrite(lamp,HIGH); // turn ON the lamp


} else {


digitalWrite(lamp,LOW); // turn OFF the lamp
```

Conclusion:

Our project is appropriately worked in practically. It detects motion of hand to on/off lamp, LED and Buzzer.