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Automatic Control of LED Lamp Using PIR Motion Sensor

Mr. A Sharanbasappa[1], Bharath Kumar S[2], Naveen A[3], Praveen Kumar M[4], Tarun Raj B[5]
[1, 2, 3, 4, 5]*Department of Electrical Engineering, R.Y.M Engineering college Ballari, Karnataka, India*

***Abstract:** This paper represents automatic lighting and security system design using PIR motion sensor Using this PIR sensor we can certainly minimize the consumption of electrical power. Power crisis is one of the most common problems in India. With the help of the sensors we can eliminate this shortage by minimizing the wastage of electrical power or saving our generated power PIR is the type of sensor that gives us signal when anything crosses its rays. It is an electronic sensor that measures infrared (IR) light radiating from objects in its field of view. It is a low-cost device used to detect a change in motion in its surroundings within different range of radius. A PIR-based motion detector is used to sense movement of people, animals, or other objects A PIR-based motion detector is used to sense movement of people, animals, or other objects Automatic Room Light Controller Using PIR Sensor can be used to turn ON and OFF the illumination system of home / office routinely by sensing the existence of human Such Automatic Room Lights systems can be implemented in your Classrooms, faculty cabins, garages, staircases, bathrooms, etc. where we do not need constant light but only when individuals are existing Also, with the assistance of this system, we can save the energy bill as power will be consumed only when hum is present i.e. when required lights will be spontaneously turned ON or OFF.*

I. INTRODUCTION

The PIR Sensor Switch can detect the Infrared Rays released by human body. The light or any other electrical appliance can be activated automatically by the active presence of a human body within the detection range / coverage area & when there is no presence the light will be deactivated Electrical energy has become an crucial part of human life. In recent years the people are looking forward for the automation in their day to day life, and even now the people are excited to save energy consumed to reduce the expenditures. People are becoming lazy to switch off the lights while leaving the room, so the large amount of energy is wasted if the light is remain ON in the absence of human being. Generally, in public and private sector companies, offices, school and colleges most of the people are not interested to switch OFF the electronic machines like fan, light, etc., while going out of the room As more and more consumer electronic and home appliances are used, the size of them is becoming large; power consumption in home area tends to grow.

Moreover, unusable power consumption occurs in the absence of human being in public and private sectors. Using the automation in switching the home or office lighting system, the consumption of electricity can be comprehensively reduce which will in turn save the money of the owner. Now the people are looking forward for automation in their daily life. The people are trying to reduce human efforts. By using suggested system wastage of electricity can be reduced as electrical appliance will be automatically turned ON or OFF based on the presence of the human being with the help of PIR sensor , while departure no need to turn off the appliances or while arriving in your cabin no need to turn on the electrical appliances. This is the main enhancement of the projected PIR Sensor This system can be considered as a major application of PIR sensors

II. OBJECTIVE OF THE PROJECT

The main purpose of designing this project is to prevent loss of current unnecessarily during day time A PIR-based motion detector is used to sense movement of people, animals, or other objects The PIR sensor is mainly used to detect motion by measuring any change in InfraRed levels emitted by objects. Pyroelectric devices have elements which are made of a crystalline material, means they generate an electric current when they are exposed to InfraRed radiation. The aim of the project is to save the energy or power, used in places like libraries where lighting is very important for the people who come to read books. So, the libraries will be well illuminated with many lamps.

At the same time when people are not present at a particular reading place the lighting can be made off by using PIR Sensor and when people come to that area, according to the LDR lighting can be made sufficiently brighter

In our home, school, colleges or industry we see that lights are kept on even

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2.1 Block Diagram:-

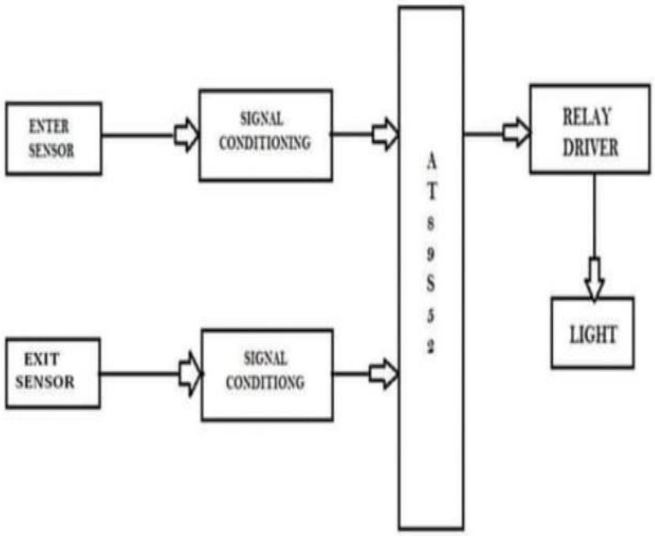


Fig: BLOCK DIAGRAM

The basic block diagram of the bidirectional visitor counter with automatic light controller is shown in the above figure. Mainly this block diagram consists of the following essential blocks.

1) Power supply

Here we used +12V and +15V AC power supply .The main function of this block is to provide the required amount of voltage to essential circuits.

2) Entry and Exit Sensor Circuit

This is one of the main parts of our project. The main intertion of this block is to sense the person.

3) AT 89S52 Microcontroller :

It is a low-power, high performance CMOS 8-bit microcontroller with8KB of Flash Programmable and Erasable Read only Memory (PEROM).

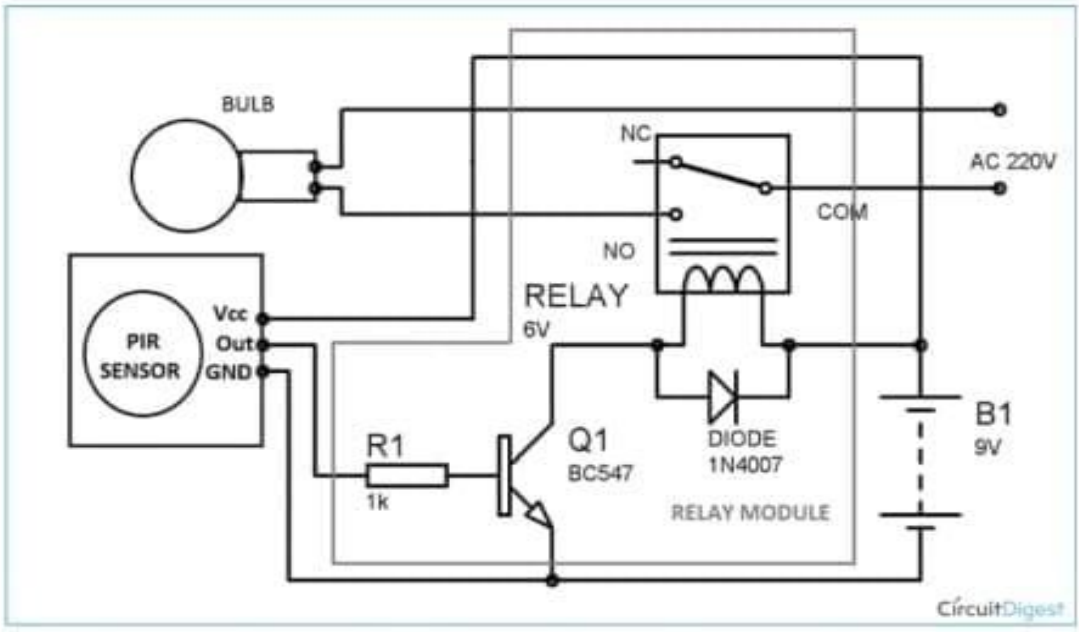
4) Relay Driver Circuit

This block has the potential to drive the various controlled devices In this block mainly we are using the transistor and the relays. One relay driver circuit we are using to control the light

III. HARDWARE COMPONENTS

1) LED PANEL
2) PIR MOTION SENSOR
3) MCB
4) SWITCH
5) CONNECTING WIRES

IV. CIRCUIT DIAGRAM



V. CIRCUIT DIAGRAM EXPLANATION

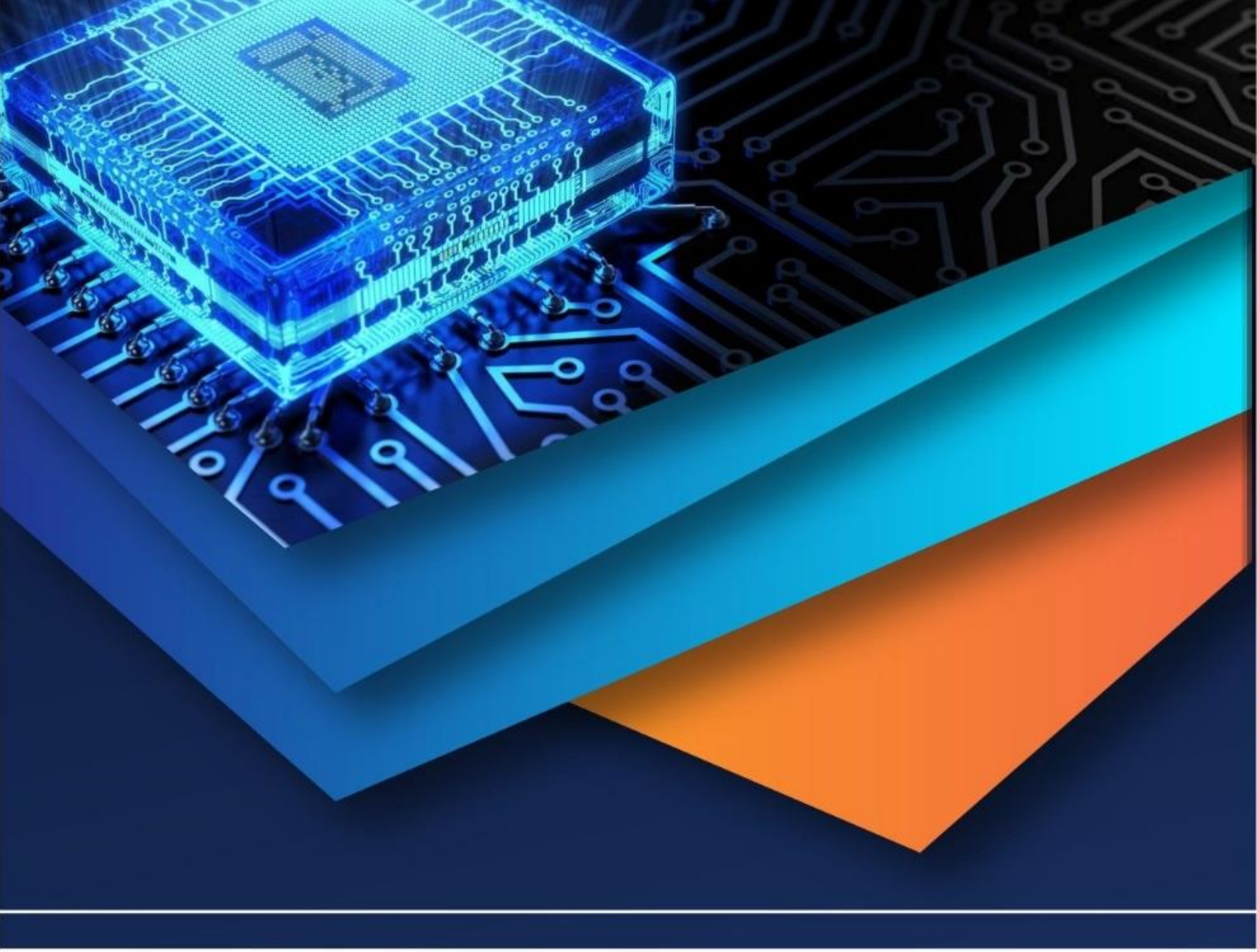
This automatic staircase light circuit can be easily explained. Whenever PIR sensor detects any body movement, its OUTPUT pin becomes HIGH, which applies the triggering voltage to the base of the transistor, transistor get ON, and current started flowing through the coil. Coil in Relay gets energies and create electromagnetic field, which attracts the lever and COM and NO get connected. This allows a much larger current (220v AC) to flow, which turns ON the BULB. You can increase or decrease the Bulb ON duration by setting up PIR sensor A PIR detector is a motion detector that senses the heat emitted by a Living body. These are often fitted to security lights so that they will switch on automatically if approached. They are very effective in enhancing home security systems. The sensor is passive because, instead of emitting a beam of light or microwave energy that must be interrupted by a passing person in order to ―sense‖ that person, the PIR is simply sensitive to the infrared energy emitted by every living thing.

VI. CONCLUSION

The main idea of this project is to reduce the wastage of electricity For this purpose PIR Motion Sensors are used as sensors A PIR-based motion detector is used to sense movement of people, animals, or other objects It is not easy task to design this system using PIR sensors where PIR is generally used for the motion detection. We have done coding in such a way that little movement of the human body is detected by the sensor. We have made some time delay and adjusted the sampling period for the sensor output for the precise detection for this system. In this project, we have designed automatic lighting and security system with the help of the PIR sensor. This system provides a solution to counter the increasing number of house robberies by alerting the user about the breach in the house. The system is also helping in reducing wastage of electricity by switching on the load only when a human entity is present

REFERENCES

[1] Soyoung Hwang et al.[1] proposed are mote monitoring and control system which is based on zigbee network. Real time monitoring is implemented with JMF. It is multimedia extension API of java
[2] Richu Sam Alex et al.[2] proposed system which reduce the power consumption of the street light system about 30% compared to older design. This system is fully automated. It also uses Zigbee so that control station also analyze all the performance of the system
[3] Daeho Kim et al.[3] worked on smart LED light system by using Infrared and Ultrasonic sensor. They proposed a model which continuously track human motion. Output based on human tracking data which is obtained by these sensor are responsible for determining the On-Off control of the LED light.



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