DESIGN OF ELECTRICAL DEVICE SURVELLIANCE AND MANAGEMENT SYSTEM

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ABSTRACT

Every electronic device produces the output by taking some input and processing it. The increase in number of electronic devices also resulted in excess power usage. All electrical appliances consume large amount of power. So, designing an efficient system is a challenging task The main objective of this work is to reduce the consumption of electrical energy.

In this work we focus on controlling the power consumption of a street light system. We focus on on/off functionality of the street light based on availability of human beings in the surroundings and the intensity of light. Thus by switching it off when ever it is not necessary reduces the consumption of power. The system is designed using ESP32 controller which is connected to sensors. The sensors sense the data and send it to the microcontroller, then the data is processed and the on/off functionality of the street light is controlled.

I. INTRODUCTION

Due to increase in usage of electric devices the power needs are also being increased. Meeting the power needs of all devices is becoming a tedious task. So, the only way is to use an electric device wisely and efficiently to reduce the power consumption.

In this system IR sensor and LDR sensor. The IR sensor used in this system is active IR sensor it has two parts: a transmitter and aa receiver. The transmitter emits the infrared radiations and when any object comes close to the sensor infrared light from the transmitter reflects off of the object and is detected by the receiver. In IR sensor LED which emits IR radiations is used as a transmitter and a photodiode is used a receiver. In this system the IR sensor detects the presence of human near the street light. Thus the street light can in ON position when there is a person present and in OFF state otherwise. LDR sensor is light dependent resistor whose resistance changes based the intensity of light falling on it. So, depending on the intensity of the light falling on it the ON/OFF state of the street light can be decided. So, by using these two sensors the intensity of light and the presence of a person is detected and the street light can be ON/OFF accordingly.

II. METHODOLOGY
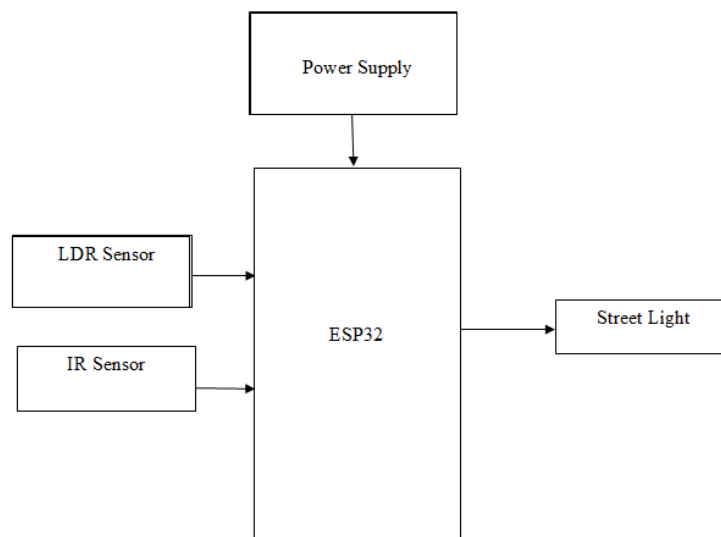
The block diagram of the system is shown in Figure 1.

Figure 1. Block Diagram of the system

The street light will be turned ON only if the intensity of light is less than 400 lux. When there is a bright sunlight the intensity of light is 111,000 lux and at the time of sunset the intensity will be 400 lux. So, we design it in such a way that the street light gets ON according to the intensity of light and presence of human in it's proximity. Thus the sensors collect the data from the surroundings and this data is sent to the controller and here the data is processed and according to the according to the need the street light will be turned ON/OFF. In this way by using the street light whenever necessary we can save a lot of electrical energy.

III.   MODELING AND ANALYSIS

LDR Sensor: LM393 is a readily available LDR sensor. LDR sensor resistance ranges from megaohms to few only a hundred ohms depending on the intensity of light. When light enters the photocell the light takes 8 to 12 milli seconds and few milliseconds to return to its initial stag when intensity of light reduces. Therefore this is referred to as resistance recovery rate.
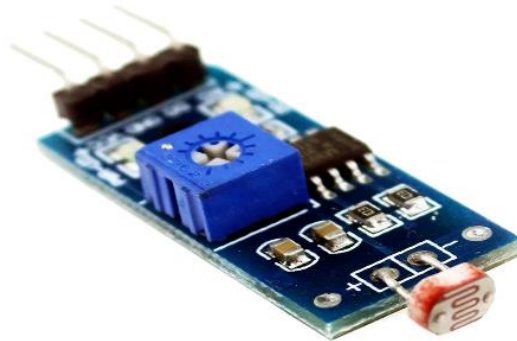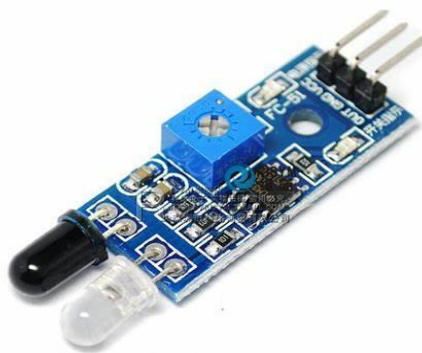

Figure 2. LDR Sensor

IR Sensor: LM358 is an operational amplifier which is used as a voltage comparator in IR sensor.

Applications:

- Obstacle Detection
- Industrial safety devices
- Wheel encoder

Figure 3. IR Sensor

Support Compilers

Arduino IDE: It is an open source in which we can write code and upload it to the board easily
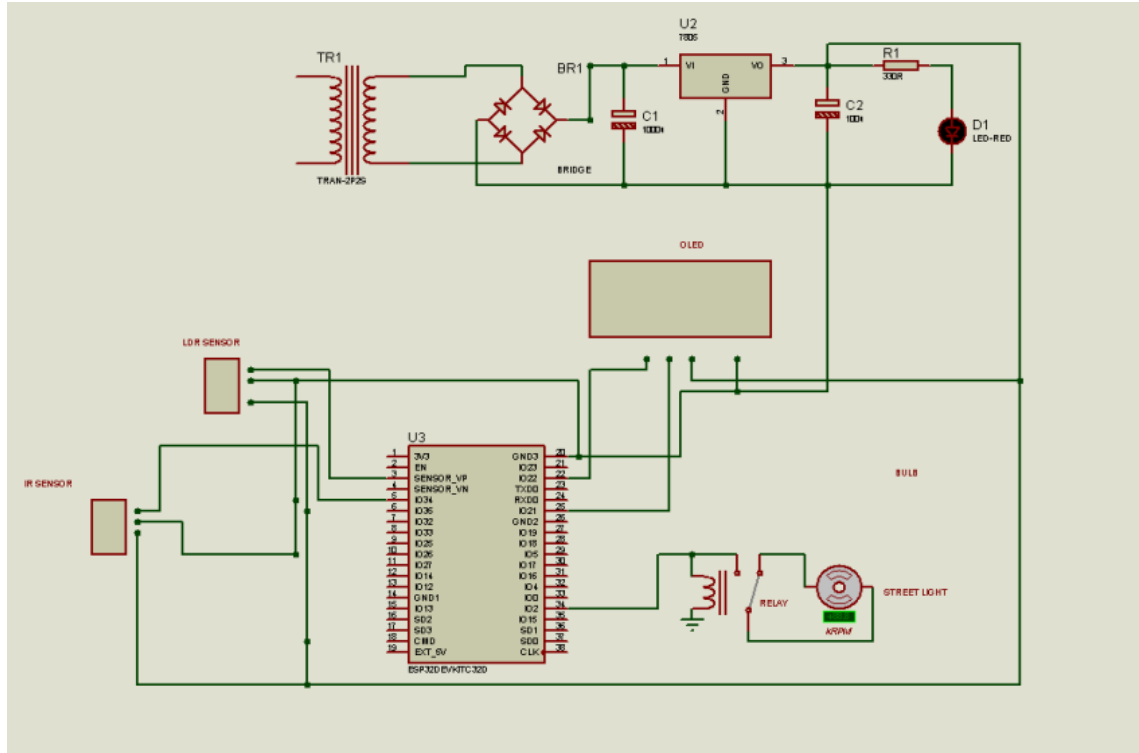
Figure 4. Implementation of proposed

IV.   CONCLUSION

Electrical devices surveillance and management system is the proposed solution for most of the electric power consumption problems. We have focused on appliances Bulb, Fan. And to manage with wireless module. We monitor the electrical devices like street light, bulb, fan. They will be on/off according to the data from different sensors. In this way the power will be consumed and also the efficiency of the electrical device is improved.

V.   REFERENCES

[1]   IOT based Electrical Device Surveillance and Control System Alok Kumar Gupta1 Rahul Johari2 swinger@ipu.ac.in1,2.

[2]   IOT based Electrical Device Surveillance and Control System Ad Gupta, Ra Johari Published 18 April 2019 Computer Science 2019 4th International Conference on Internet of Things: Smart Innovation and Usages (IoT-SIU)

[3]   IOT based Electrical Device Surveillance and Control System Conference: 2019 4th International Conference on Internet of Things: Smart Innovation and Usages (IoT-SIU)

[4]   IOT based Electrical Device Surveillance and Control System A. Gupta, R. Johari ,Published 1 April 2019 Computer Science 2019 4th International Conference on Internet of Things: Smart Innovation and Usages (IoT-SIU)

[5]   IOT Based Surveillance and control system for electrical devices Gagneet Kour, Ashish Sharma , Published 8 September 2022, Computer Science 2022 Second International Conference on Computer Science, Engineering and Applications (ICCSEA)

[6]   A Novel IoT access architecture for vehicle monitoring system Shulong Wang, Yibin Hou, 2016 IEEE 3rd World Forum on Internet of Things (WF-IoT)

[7]   https://robocraze.com/blogs/post/what-is-the-ldr-sensor

[8]   https://www.watelectronics.com/ir-sensor/

[9]   https://en.wikipedia.org/wiki/ESP32