

AUTOMATIC STREET LIGHT

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Abstract Energy can neither be created nor destroyed, it can only be converted from one form to another, due to this energy conservation is required to make the balance, it is necessary to make a system in street lights by which the energy requirement is reduced. The Intelligent Street Light system has following features: Ultrasonic Sensor is used to detect the upcoming object, whenever any object is detected the lights are made to turn on. Range of the Ultrasonic is set so that the lights adjacent to the moving object will only be turned on remaining will be off. Ultrasonic sensor is connected with Arduino microcontroller. The Arduino is connected with LED's of the street lights. The microcontroller is coded such as whenever the input from sensor is detected lights will be ON. This project gives solution for electrical power wastage. As soon as the obstacle goes away the light gets switched OFF as the sensor sense any object at the same time the status (ON/OFF) of the street light can be accessed from anywhere and anytime through internet.

Keywords: Ultrasonic sensor, Arduino, Microcontroller, FRC cable, Transistor BC548, LED's.

1. INTRODUCTION

A large amount of energy expenses for a city comes from street lights. An Intelligent Street Light system can cut municipal street lighting costs as much as 50%-70%. The street light controller should be installed on the pole lights which consist of arduino microcontroller along with ultrasonic sensor. It will control LED street lighting depending on traffic flow, communicate data between each street light. The data from the street light controller can be transferred to base station using wireless technology to monitor the system. According to requirement, the control system will switch ON/OFF the light at required timings and can also vary the intensity of the street lights.

2. PROJECT METHODOLOGY

i. MPLAB IDE: is a free, integrated tool set for the development of embedded applications. It is called an Integrated Development Environment, or IDE, because it provides a single integrated environment to develop code for embedded microcontrollers.

ii. ARDUINO IDE: The Arduino Software (IDE) is an open source software and it makes easy to the code and upload it to the board. It runs on the different platform from Windows, MAC OS, Linux. The environment is written in Java and before running the IDE Java software to be installed on the machine this software can be used with any Arduino board.

iii. OrCAD: OrCAD In general offers a total solution for core design schematic and PCB layout. The Capture program includes a project wizard that provides an easy method for creating a project, complete with library and simulation resources.

3. FEATURES

The intelligent street light control system uses the inputs from the ultrasonic sensor connected to microcontroller. The Arduino microcontroller, controls the street lights through an embedded system. Printed Circuit Board (ZERO PCB) is used to implement entire circuit.

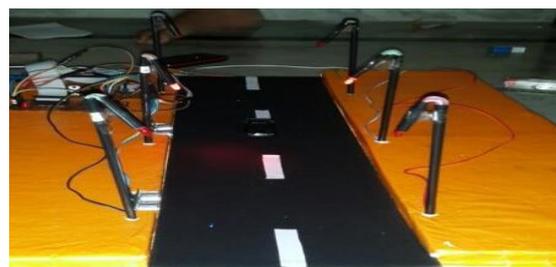


Fig.1. Street Light Control System

3. HARDWARE DESCRIPTION

3.1 ULTRASONIC SENSOR

The ultra sonic sensor can detect movement of obstacles and measure the distance to them sensors can have an ON/OFF digital output for detecting the movement of objects, or an analog output proportional to distance. In our project it is used to detect the upcoming object and provide input to microcontroller.



Fig.2.Ultrasonic Sensor

3.2 FRC CABLE

A Flat Ribbon Cable is also stated as multi-wire planar cable is a cable with many conducting wires running parallel to each other on the same flat plane. In this project cable is used for connections.



Fig.3.FRC Cable

3.3 ZERO PCB

General purpose zero PCBs[9] are widely used to embed circuits randomly for running of hardware. Its layer is coated with copper and allows proper soldering without any short circuit. In this project zero PCBs are used to embed electronic components like, resistors etc.

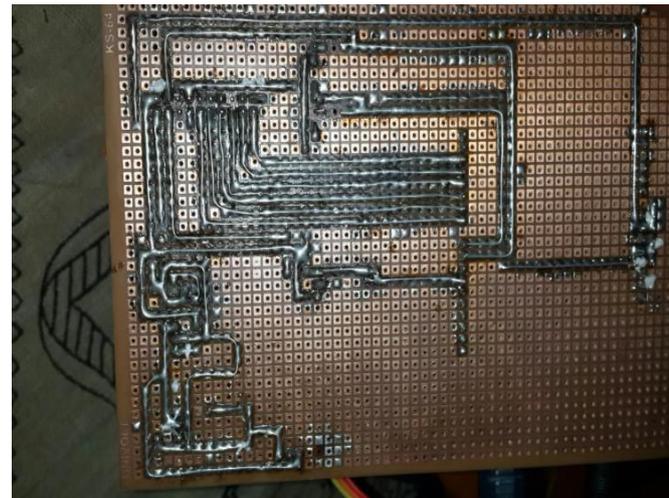


Fig.4. Zero PCB

3.4 Transistor BC548

BC548 is general purpose npn bipolar junction transistor used in electronic equipments. This transistor is used in this project due to circuit requirements.

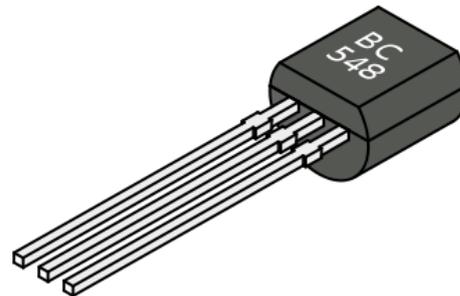


Fig.5.Transistor BC548

4.CONCLUSION

This project has a good real life scope, if it is implemented by the government. By using the intelligent street light system huge amount of energy can be save. This can be achieved by replacing the sodium vapour lamps by LEDs. Energy can be save by controlling the unnecessary wastage of electricity, which is caused by the manual switching of street lights when it is not required. This street light system is cost effective ,eco-friendly and safest way to save the energy.

5.REFERENCES

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