

# Vehicle Movement Based Street Lighting System

<sup>1</sup>Mr. Kamble Santosh Ashok, <sup>2</sup>Ms. Sheetal Deshmukh

<sup>1</sup>R.&D. Engg, <sup>2</sup>Lecturer

<sup>1</sup>R.&D. Dept. SaiTronics <sup>2</sup>Electronics and Telecommunication Dept. BVIT, KHARGHAR

**Abstract**— This paper describes the working of a street light controller which works using an 8051 microcontroller. The circuit consists of components like infrared sensor, light emitting diodes. It detects the vehicle using an infrared sensor within a range and turns the light ON accordingly. This will help in reducing the power consumption and increase the efficiency. If this is implemented all over the country, it can reduce a lot of power consumption and a huge amount of money can be saved which can be used for other purposes.

**Key Words:** Sensor, Movement of Vehicle Detection, Microcontroller.

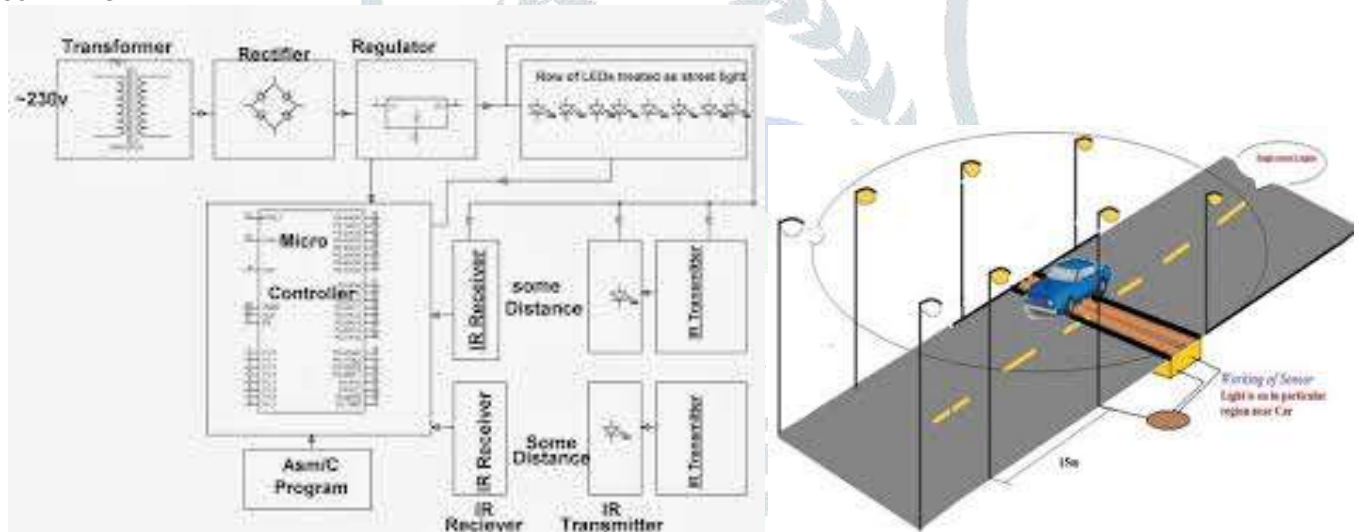
## I. INTRODUCTION (HEADING 1)

The principle behind the working of the project lies in the functioning of IR Sensor. We are going to use a transmission type IR Sensor in this project. In Transmission IR Sensor, the IR transmitter and receiver are placed facing each other so that IR receiver always detects IR Rays emitted by the IR Transmitter. If there is an obstacle between the IR Transmitter and Receiver, the IR Rays are blocked by the obstacle and the IR Receiver stops detecting the IR Rays. This can be configured to turn ON or OFF the LEDs (or street lights) with the help of microcontroller

## II. CHANGES IN THE SYSTEM

The existing system uses a timer which controls the switching ON & OFF of the street light. In the proposed system an Infrared sensor controls the switching of the street light. A proximity will be set and accordingly on detecting the vehicle, the street light will be turned ON or switched OFF. This will add a few components to the existing system but will be more efficient than the existing system.

## III. CIRCUIT DIAGRAM



## IV. CIRCUIT OPERATION

The aim of this project is to design a street light control system using 8051 micro controller, which automatically turns on or off the street lights by detecting the movement of vehicles. The working of the project is explained here.

The IR transmitter is placed directly in the line of sight with IR receiver so that the IR receiver continuously receives infrared rays. Once the IR receiver receives infrared rays, the microcontroller will detect Logic 1. If the infrared rays are blocked by some means, the microcontroller will detect logic 0.

So, the program for the microcontroller must be written in such a way that it will turn ON the LEDs, which means here the street lamp when it detects Logic 0 and it will turn OFF the LEDs when it detects Logic 1.

Consider the two IR sensors i.e. IR Transmitter and IR Receiver are placed on the either side of the road. As per the circuit diagram, the IR receivers are connected to the PORT0 and the LEDs are connected to the PORT2 of the microcontroller.

At the beginning, when there is no obstacle, the IR receiver continuously detects IR light transmitted by the IR Transmitter. When a car or any other vehicle blocks any sensors, the microcontroller will turn ON the immediate three LEDs. If the car blocks the first IR sensor, the first three LEDs are turned ON by the microcontroller. As the car moves forward and blocks the second IR sensor, the corresponding next three LEDs will be turned ON and the first LED of the previous set is turned OFF. The process continues this way for all the IR Sensors and LEDs.

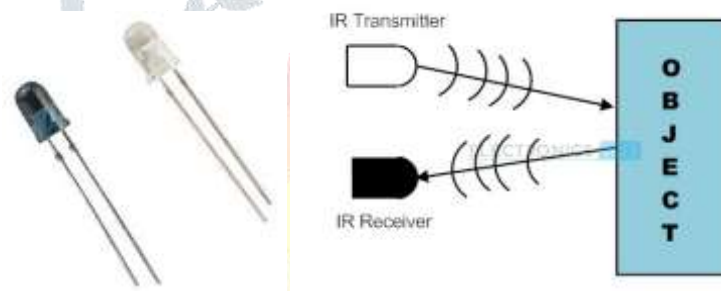
## V. MICROCONTROLLER 89C51

The 8051 is a Harvard architecture, single chip microcontroller ( $\mu$ C) series which was developed by Intel in 1980 for use in embedded systems. Intel's original MCS-51 family was developed using NMOS technology, but later it is modified with CMOS technology which consumes less power.



## VI. INFRARED SENSOR

An infrared sensor is an electronic instrument which is used to sense certain characteristics of its surroundings by either emitting and/or detecting infrared radiation. Infrared sensors are also capable of measuring the heat being emitted by an object and detecting motion. They work entirely by detecting the energy given off by other objects. PIR sensors don't detect or measure "heat"; instead, they detect the infrared radiation emitted or reflected from an object. Infrared Proximity Sensor Long Range - Description: Infrared proximity sensor has an analog output that varies from 2.8V at 15cm to 0.4V at 150cm with a supply voltage between 4.5 and 5.5VDC.



## VII. CONCLUSION

India has a road network of 33 lakh kilometer and is second largest in the world. Hence a lot of energy is consumed by street lights itself. If the proposed system is implemented, a huge amount of electricity can be saved and hence a huge amount of money will be saved as the light will glow on the detection of the vehicle only and the switching ON & OFF will be controlled by the Infrared sensors which will increase the efficiency thereby reducing the wastage of energy. This system can be used for urban as well as rural areas.

## REFERENCES

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