



Automatic Control of Lights Based On Vehicle Movement on Roads by Using Microcontrollers

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Abstract-- In present era, the amount of energy consumed by Lights use a lot of electricity. The vehicles are constantly passing through, and a majority of places will be composed of. In next few places, there are reduced sizes as well as no automobile instances. In common roads, though, all lights will be turned on at night. Appropriate power is necessary to overcome this problem. To be introduced are resource strategies and lighting control. One of the restrictions in the proposed method is to turn off the light. The suggested task involved dual control measures: the first is to automatically turn off the lights since there are no vehicles on the road. When vehicles approach, they turn it on; other methods are there to provide less light for walking and to change to bright mode when a vehicle moves around on the side of the road. Light bulbs are being used for streetlights, while photo diodes and infrared sensors are used to sense vehicle movements in this task. Sensor control signals were fed into the microcontroller 8051. A control model was implemented in the microcontroller to control lights based on pedestrian and vehicle moments, including dark and dull modes of operation, and to turn lights off during bad weather. The suggested method could reduce the energy consumption used for lighting in the present era. Moreover, controllers that are really automatic and intellectual are provided. As cities & people's personal cost of living improve, so does the efficiency of lighting systems to living.

I. INTRODUCTION

This paper describes how and when to sense the movement of vehicles on roads and switch on just a block of road lights in front of it when turning off the following lights to save energy. Gravitates since all of the lighting on the roadway remains on with the vehicles at night, there is still a loss of power if there is no vehicle movement. The developed scheme operates superbly in terms of energy savings. This one is designed to detect a vehicle reaching the road and turning on a series of street lights with in the region. At the front of the vehicle, a series of electric lights is turned on. The following lights turn off with their own as the vehicle moves. A huge amount of energy is saved as a consequence of all this. If there are no vehicles on the road, many of the road lights are turned off. A method for activity is really to turn the lights on it at 10 percent of their high intensity instead of turning lights off totally. As even the vehicle approaches, the set of road lights dims to an ensure high brightness, just as the vehicles pass, the leading lights dim down to

10 percent. In city electric lights, HID lights are being used.

As HID is based on the idea of gas release, no voltage reduction procedure can control its intensity. White LED-based lights may shortly supplant incandescent light bulbs on road lighting, higher flow lights have been used. Pulse width modulation, which itself is provided by the microcontroller, could also be used to control intensity. The photodiode and IR LEDs deliver a logic signal to the microcontroller, which informs it whether to turn on or off the controls based on the activity.

As little more than a result, an incremental turn from ON to OFF saves a lot of energy. The process made use of such a microcontroller from the 8051 family. A suggested method can be improved through effectively integrating sensors are used to detect faulty road lights but instead digging deeper into the problem.

II. PRESENT ANALYSIS

Road lighting structures have already been rapidly changing in recent years as a result of an increasing process of industrialization and urban development. In this the present era, automation of appropriate energy usage & reducing costs is an important component. Various types of roadway light control structures are installed in order to retain control roadway lighting systems. The most effective methods for reducing energy consumption in such a town's open lighting system were manufactured Increased display (HID) lights are used for the present workplace. Actually, HID can be used for road network lighting in which no method of energy monitoring is being used to reduce or turn off the lighting through reduced or uncontrolled regions.

Higher flow light (HIDLs) is still an amount of continuous gas-release light that emits light through an electric circular segment between tungsten terminal. Detailed perspective or basic combination marble terminal (crystal produced with almost silica or mixed alumina curve tube). The that tube is filled with gasoline & metal salt. That spherical segment below it must be activated mostly by gas. When the spherical segment begins, it heats and vaporizes the metal ions, forming gas, which significantly increases the intensity of the first light generated by the curve while reducing its energy usage. Circular segment lights are a type of high intensity discharge lighting.

III. PROCEDURE

The digital road control project provides a creative control method. As per the new system, plenty of the road lights should stay activated for several minutes/instances until turning off. Whenever a vehicle passes through, the series of streetlights turns on, and then as the vehicle moves ahead, the next phase of lights turns on, when the preceding phase of light turns off. HID lights are significantly more expensive than LED lights. Also, as a consequence, higher flow lighting has been forced out in place of light emitting diodes throughout the current field of electronic components and technological advancements, energy consumption and costs could be minimized. The lighting systems are mostly on roads.

Because of the sector's and large cities' increasing growth, energy conservation strategies are becoming increasingly important. Sophisticated technologies were used to control the roadway lighting system, which involves infrared sensors to differentiate the motion of the vehicle, where the light switches on. As when the vehicle passes through all the sensors, the roadway lights which were turned on will turn off (Minimum Light Intensity) and also the lights ahead of it will turn on (Maximum Light Intensity).

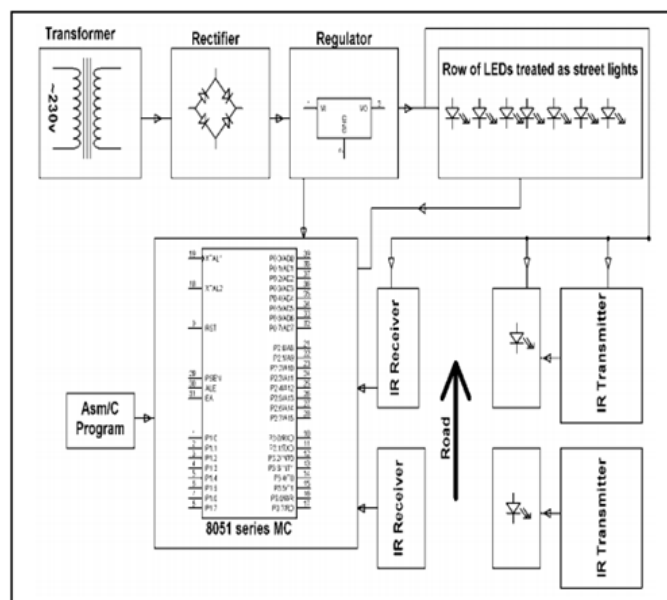


Figure 2: Proposed block diagram for automatic light controller

Inside this suggested case structure, the IR sensors are used to sense distractions and deliver a logic signal to the microcontroller to light the LEDs in advance. Study the possibility that there's not a specific vehicle on the road.

The infrared light from the infrared transistor is incident on the adopted strategies immediately in this situation which would be situated next to the IR sensor. As a consequence, the photo detector performs as present moves through this one. The signal flows through all the photodetector and the voltage regulator on its path to the transistor's base-emitter area. The emitter is connected to the ground in the schematic diagram. The transistor's collector is applied to the input port (port 1), which is attached to the surface, or logical ZERO. Whenever the vehicles aren't present, a module transmits a signal to the microcontroller port1 is zero.

The configuration of equipment design, which comprises of Microcontroller based throughout the series to somewhere on the input side, there seems to be a voltage source as well as a transformer. Trying to approach the Lights and detectors make up the intensity in the method represented.

Study the possibility in which a vehicle prevents the IR. This situation, IR radiation is not allowed to be emitted, and also, as a consequence, it doesn't fall on the adopted strategies, and the sensor also isn't affected. Would be turned off as a consequence, there really is no current movement. Through use of the first transistor. The collector then turns to HIGH. A state The IR path of the Photodiode-IR diode match is blocked.

This is a great example. The lights ahead of the vehicle movement starts, and the two pins are connected. Ports 2 and 3 are set to be HIGH. As the object approaches forward, the brightness of the road lights rises to 90%, as well as the brightness of the following lights reduces to 10%.

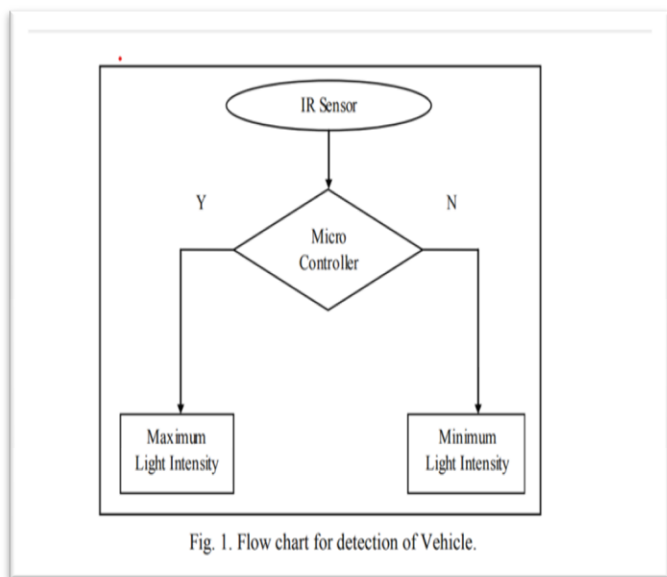


Fig. 1. Flow chart for detection of Vehicle.

IV. STRUCTURAL DESIGN

The device system represents 14 light emitting diodes (LEDs) as streetlights, eight sets of photodiodes (infrared diodes) as sensors, variable resistors, and variable capacitors.

Transistors are transistors that operate as switches. The diodes are located on one side of the road, whereas the photodiodes are located on the opposite side of the road, facing the IR diodes.

V. OUTCOME

The device was already designed, as well as the model's performance has also been checked for two conditions, as well as the location of IR sensors and lighting.

1. For dark places, changing streetlights from darkness to bright.
2. For hilly elevations, Change Street lights from a dark to a bright state.

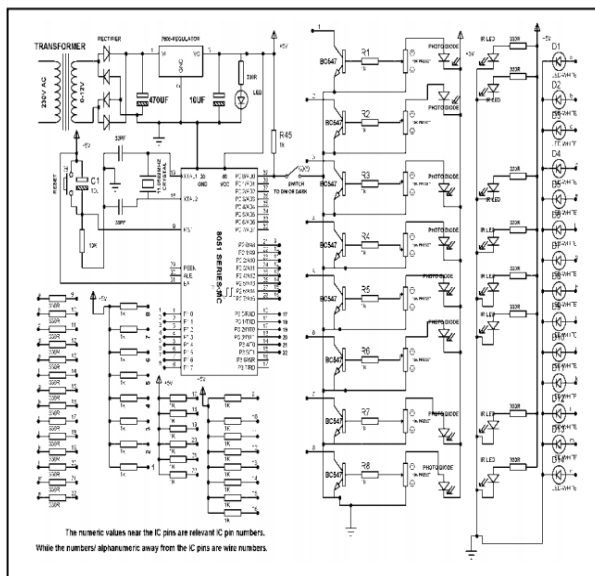


Fig. 3. Circuit Diagram with necessary hardware.

Arrangement of street lights

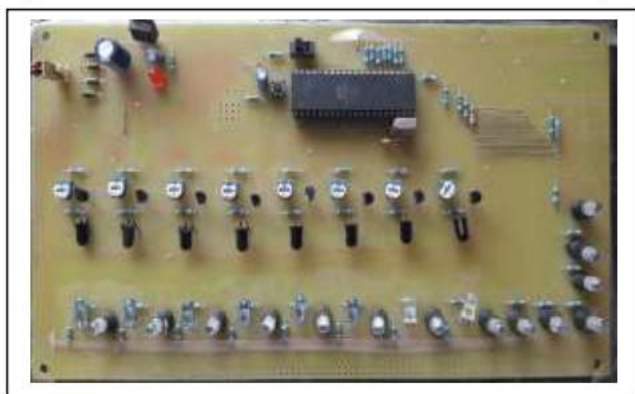


Figure 4

VI. APPROACH1

If there were no vehicles observed, most of the street lights would be turned off. By using a pulse width modulation device and software installed in it.

A microcontroller is used to turn on and off lights. If there is no vehicle on the road, the streetlights are turned on for about one millisecond and afterwards turned off after a hundred milliseconds (first two LEDs). As more than just a consequence, we need streetlights that are less bright. Whenever a vehicle arrives, each street lamp is turned on for 1 millisecond, and the street lamp lights are activated for 100ms. As a consequence, for all those seven LEDs, we have such PWM waves with such a 99 percent requirement duration.

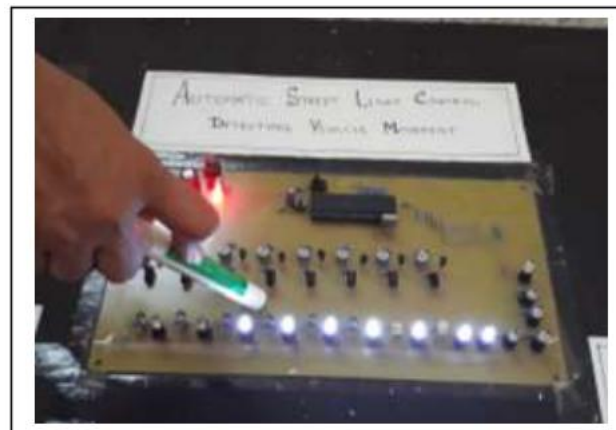


Figure 5: Approach1 setup

VII. APPROACH2:

If there are no vehicles on the road, the lights will be turned down to a low brightness. The set of lights in front of the vehicle might glow till the vehicle was being detected. Skywards If no vehicle was around, the integration event showed the Led lights blinking at 10% brightness. Whenever a vehicle passes in between sensors, the light in front of the vehicle might rise to 100 percent brightness, whereas the following lights might return to 10 percent brightness.

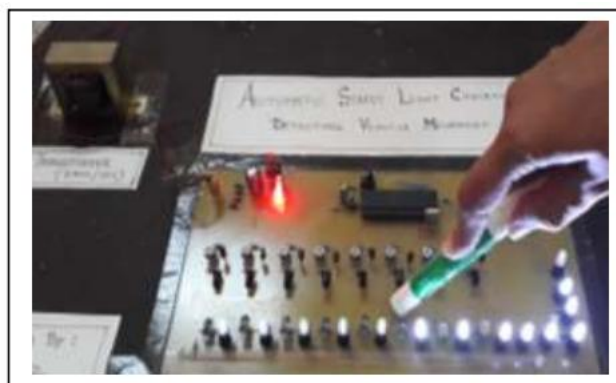


Figure 6: Approach2 setup

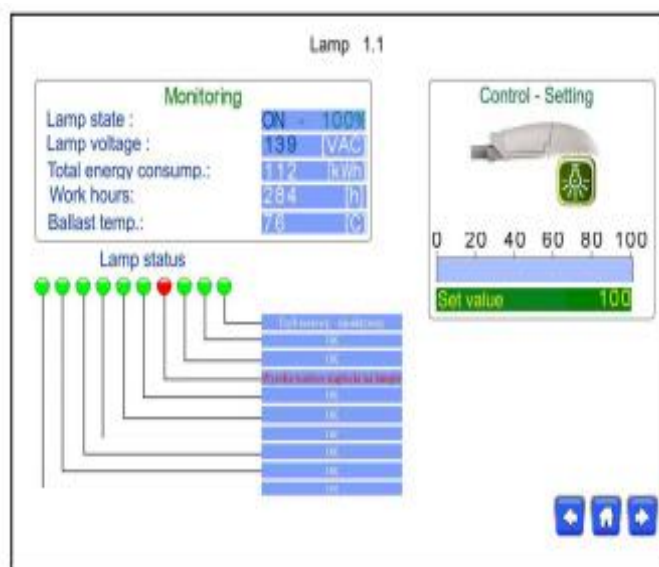


Figure 7: Operation of single lamp in street lighting system



CONCLUSION

Using modern devices to minimize lighting energy consumption in public spaces is reasonable and practical, according to the studies and analysis discussed in the paper.

It is financially efficient. Control systems that meet the European Standard EN 15232 have the most potential in this area. The guidelines and assignments for implementing digital functions to the four efficiency groups provided in this Standard may be used as a reference tool to propose and develop new control scenarios for various advanced and integrated systems.

Street Lighting installations focused on open distributed control systems could be easily adapted to the growing number of Smart City initiatives currently underway, allowing for more flexibility. Integration with other control and monitoring subsystems. Furthermore, individual buildings, campuses, and their environs will be able to be integrated into a network of knowledge sharing with other systems such as Smart Metering – energy and media tracking, and other devices used in buildings – promoting the Internet of Things concept. The value of output has been the most expensive, effective, environmentally friendly, and efficient approach to energy saving. As per data, 35 percent to 40 percent of electric energy is wasted.

The road network, interstate freeways, and local lights are all doing that now. The initial cost and construction may be limitations, but with bulk development of a device, the overall cost of construction may be reduced further due to advances in technology and innovation, and the development cost may be reduced further. The design could be used for a variety of uses, such as lighting.

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