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Review of Various Technology Automatic Dimming Control of LED Street Light

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Abstract: ***In present day, the maintenance of streetlight is one of the major problem for electricity boards in India. Also, there is scope for saving power during off peak time i.e. in from around midnight 12AM to 04AM in the morning. The methods that are currently used to maintain and control the street light is more complex and uneconomical. In this paper a new technique is proposed to control the intensity of LED Street lights using LDR, and to automate street lights using PIR sensors, and LDRs, resulting in power saving. Implementation is done using PIC controller. This paper presents a smart street lighting system which provides a safe night time environment for all road users and pedestrian. The main objectives are to build an automation system of street lighting using a low-cost microcontroller which is PIC and to achieve energy-saving. Light Emitting Diode (LED) is represented as the light module. This system is controlled according to the specific mode. These modes are controlled by two sensors which are Light Dependent Resistor (LDR) and Passive Infrared (PIR) sensor. This system can automatically turn on and off the lights according to traffic flow. This system operates during the night and the focus is only for the one-way road at a junction. Street light will be on when only there is road user otherwise, it will turn off. This design can save a great amount of electricity or energy consumption compared to conventional street lights that keep alight during nights. Moreover, the maintenance cost can be reduced and lifespan of the system will increase. As the result, the system has been successfully designed and implemented as a model system.***

Keywords: PIR, LDR, Streetlights, Power supply, microcontroller

I. INTRODUCTION

In a city street light is one of the major power consuming factor. Even in day time when there is no requirement of street light it is frequently seen that these light remain on violating the energy conservation rule. This continuous lighting pollutes the environment as well as increase the tariff of the electricity. The vital use of street light is in public transportation during night time or when the day light is very feeble. Therefore the design an controlling of street lighting is an important area of work for maintaining safe transformation in or daily life. A number of researches have concentrated on the work to reduce the energy consumption an also to reduce environment pollution. A report was made to present an efficient street lighting system with reduce power consumption in comparison to classical lighting testing system.by study various street lighting lamps, as incandescent, CFL, High-intensity discharge and Light-Emitting diode showing that the LEDs are more efficient than other lighting system.

Nowadays, street lighting is essential for all areas whether urban or rural since people know that street light is an alternative during the day night in order to keep the safety of the road users. Street lights management control is quite simple, yet as the urbanization, the number of streets increased rapidly. The traditional lighting street lamp on-off control is based on chronological time, which may inefficient and inflexible. The existing street lighting control system used timer and photocell. The timer is set up to turn on the street light within 7.00 p.m. until 7.00 a.m. Meanwhile, photocell reacts based on the presence of light or electromagnetic energy. In a rainy day or when the light intensity is low, the photocell will energize the contact and automatically turn on the street lights. This system is quite inefficient since the condition of day and night is uncertain. Sometimes at 7.00 p.m. the day is still bright but the street light is already switched on. In contrast, at 7.00 a.m. the street light is already switched off although the day is still dark. Thus, this system is quite inflexible. The public lighting is designed to meet the needs of local communities, such as the rising number of road and sidewalk traffic safety [2]. In order to surge the efficiency, a modern street lighting control system must be able to adapt the light level intensity to determine the optimum energy consumption level. However, power wastage will happen if there is no user or vehicles use that road especially in rural areas at midnight. Figure-1 shows the power consumption in the urban city, traffic routes and highways from 7.00 p.m. till 7.00 a.m. The graph showing the use of road reduced beginning at 1.00 am until 7.00 am.

This Street Lighting Automation System is an intelligent system which provides the flexible and efficient system in order to control the street lighting autonomously.

This system is controlled by two sensors which are PIR sensor and LDR sensor. LDR sensor is used in order to detect darkness to activate ON/OFF switch. Also new technique to automate their system using both sensors. With the presence of these sensors that detect the intensity of light and used to detect the presence of humans or cars then, it turned on the system automatically. The main controller for this project is using an PIC

The main reason LED was chosen is to reduce the energy consumption as it were very effective in lighting and low light decay in the lifetime. The LEDs have about 110° light emission angle. Meanwhile, the conventional lamps usually have 360° and need a reflector to direct the light beam to the target street lighting.

II. RELATED WORK

In [1] the design of system for yearly Automatic control street lighting. The idea is to increases the energy efficiency by switching ON the lights only in the dark part of the day.

The system provides data on the parameters of the power supply network of street lighting. In [2] the design and idea of adaptive street light application system. Use of light dependent resistor sensor for light operation in day and night according to condition, Light operated in dim mode when any person come on the road then system automatically sense this condition and operate the light in the mode of higher intensity.

In [3] the light emitting diode is most important innovation in the field electronic. The rapid development in the technologies LEDs are driven for different application. This paper prevents the new technology to drive the LED for street light application. The concept is based on digitally controlled TRIAC dimmer which is compatible with LED driver.

In [4] the design has to introduce an intelligent method for optimizing the street light intensity so as to reduce the co_2 emission which in turn reduce pollution of the environment.

The system also detects the movement of vehicle and interrupts the system to increase the intensity the system to increase the intensity of light on the road. In [5] the intelligent monitoring and control rendered to street lighting is a novel idea to Wireless Control Street Lights. Maintenance and patrol costs are also reduced. This system we can save almost 50% of the power consumed by strategically dimming lights

In [6] the design, architecture and monitoring of smart LED Street Lighting Control, investigates the use of a Cloud-Based Multi-agent System (CMAS) as a possible frame work. In [7] the design has two controls likes one is to switch of lights during no vehicle moments is street and automatically switch it on when vehicle. In [8] the system is application for electric lighting of streets, highways, and surrounding areas. The system combines the motion sensors and the lighting fixtures are into single network. In [9] the main purpose of implementing automatic street lights is that lights will switch ON with full intensity only when there are vehicle on the road and remain off otherwise. In [10] the utilization of PIR sensor and microcontroller in intelligent road lights with itemized clarification of sensor.

III. CONCLUSIONS

It can be concluded that a proper designed to optimize the management of street lighting in populated areas. [1] The system provides data on the parameter of the power supply network of street lighting. [2] The experimental result reflect that solar energy is very attractive solution for the lighting system of the roads. [3] Proposed system is best answer to such issues without paying extra cost to design effort ensuring reduced power consumption. [4] The designed can be modified to store the status of the traffic or a certain period of time in a memory module. [5]

This researcher present a technology that can be applied to any control system for enhancing its, efficiency performance an security even in cost an space limited application. [6] The area of intelligent street lighting administration is essential to the controlled operation of these system as they energy in our cities. [7] The project has scope in different application like providing lighting for office, building, grounds, walking paths and parking garages of large shopping centers. This can also be utilized for securing surveillance in corporate buildings, businesses centers, school premises etc. [8] The intelligent lighting control system was described. This system can be applied to stand-alone electric lighting installation, outdoor lighting fixtures mounted on a pole, which are designed for illuminating of highways, roads, street and adjacent territories. [9] Energy management will become easy due to the implementation of the automatic street light system. In rural areas implementing the system of energy generation by faced by residents. Moreover Smart Street light system will also reduce energy consumption. [10] The advanced development in street lights system for energy saving with LDR. PIR sensor will be activated only on the night time if any obstacle crosses the particular light will be on for few seconds.

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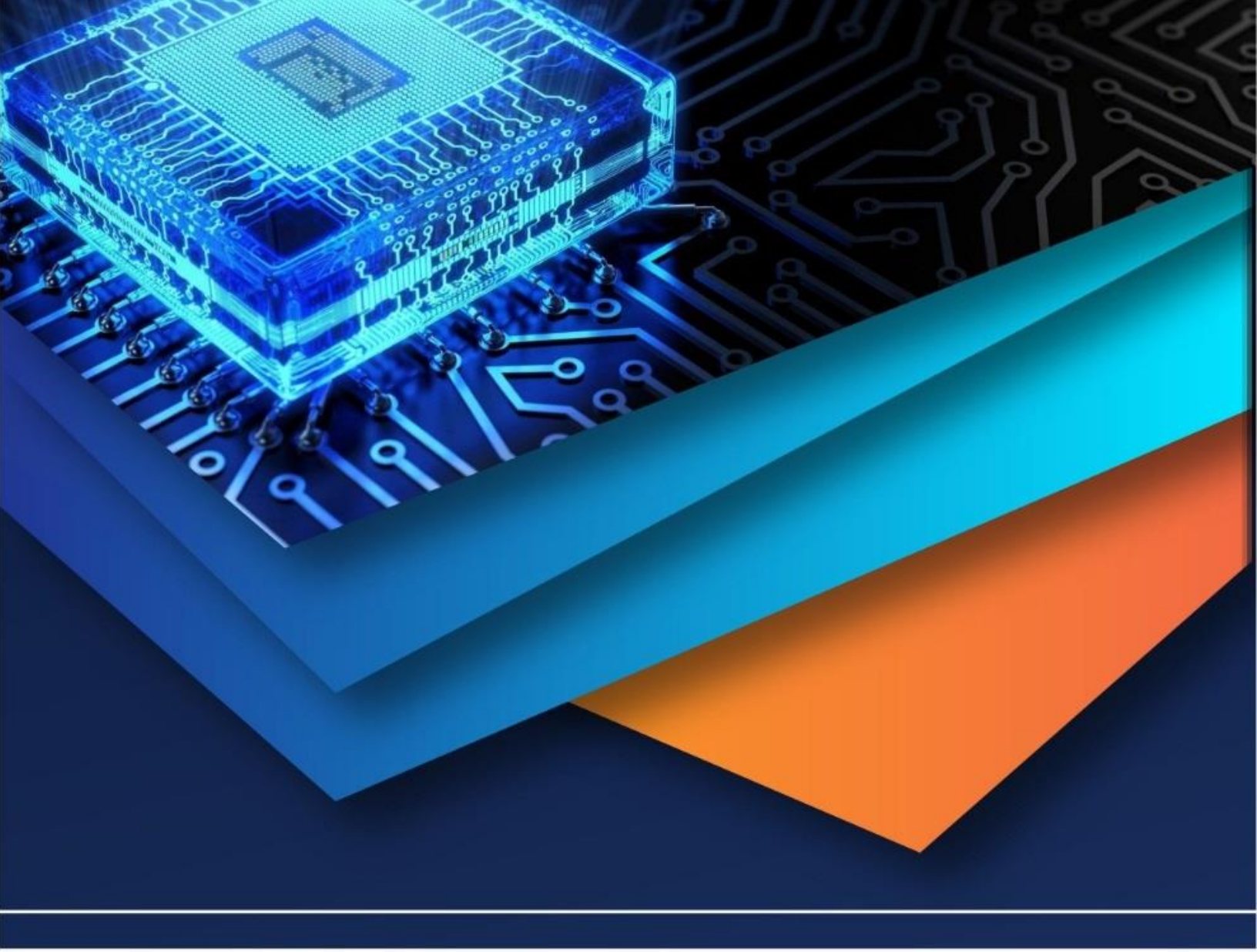

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