

Embedded Solution for Street Light Automation and Security

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Abstract:— In today’s era rampant increase in population has become risk generating factor which has led in indecent utilization of resources for different purposes and applications, which will be ultimately resulting in extinction of resources. This paper proposes and deals with optimum utilization of the resources in the city. The main objective of this paper is to analyze various problems and provide efficient and secure solution resulting in monitoring and controlling the parameters. In current scenario the switching of street light is having fixed routine at fixed time interval irrespective of feedback of darkness & human or vehicle interpretation which instigate street light to glow continuously whose consequence may upshot devastation of electricity & resources . In our proposed work switching of street light is ensued dynamically wherein the switching mechanism is based on different time interval and on the feedback of density of vehicle & human. The another provision developed in the proposed work is detection of violence, threat or safety measure by providing message wirelessly to monitoring or control unit of municipal corporation.

Keywords:-- Street light, Controller, Sensor module, Virtual timer, security, safety, switching, Wireless protocols.

I. INTRODUCTION

Automation, Power conservation and Cost effectiveness are the important aspects in the present field of electronics and electrical related technologies. Industry of street lighting systems are growing rapidly and going to complex with rapid growth of industry and cities [2]. To control and maintain complex street lighting system more economically, various street light control systems are developed. These systems are developed to control and reduce energy consumption of a towns and cities public lighting system using different technologies [1].

1.2 Objectives of Proposed System

Control switching of street light automatically according to Density. [Between the time interval 12.30 am – 4.00 am].

Switching of street lights.

Alternate ON and OFF of the street light lamps.

[Between the time interval 7.30 pm – 11.30 pm].

Turning ON of street light with series fashion 1, 4, 7...so..on

[Between the time interval 11.30 pm -4.30 am].

This proposed system utilizes the latest technology for the sources of light as LED Lamps instead of generally used street lamps such as High Pressure Sodium Lamps, etc. The LED technology is preferred as it offers several advantages over other traditional technologies like energy saving due to high current luminous efficiency, low maintenance cost, rapid start up speed, long working life etc.

This proposed system makes use of infrared sensor for vehicle and human detection. In the proposed work LDR circuit is used to provide actuating signal to the entire system after detection of darkness. The switching of street light happens automatically according to density to develop flow based dynamic control statistics using infrared detection technology. This system also does alternate ON and OFF of the street light lamps by considering different time interval scenarios. This system also proposes assemblage detection. If assemblage is detected the message is transmitted to the monitoring unit using wireless

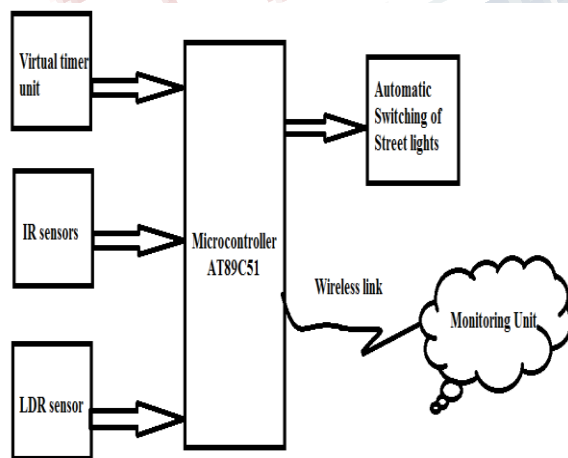


Fig. (a) Block diagram

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communication protocol ZigBee and the further inquisition will verdict the reason of assemblage i. e whether it is a violence or requires a protect and a safety measure.

1.3 Comparative Study Of Existing And Proposed System.

Sr.No	Existing model	Proposed model
1.	More consumption of electricity.	No consumption of electricity due to use solar panel.
2.	Less energy efficient.	More energy efficient due to alternate switching based on timing interval.
3.	No detection of assemblage on road.	Detection of assemblage on road.
4	High pressure sodium vapor are lamps are used	Led lamps are used

Table 1. Comparative study of existing and proposed system.

1.4 Result

1.4.1 Simulation Result

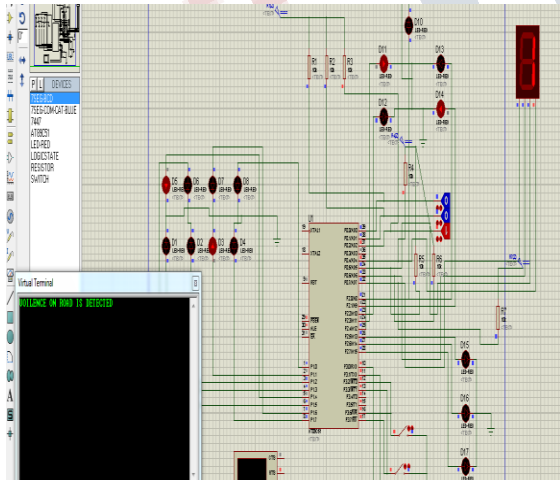


Fig (a) Simulation of Embedded Solution for Street Light Automation and Security

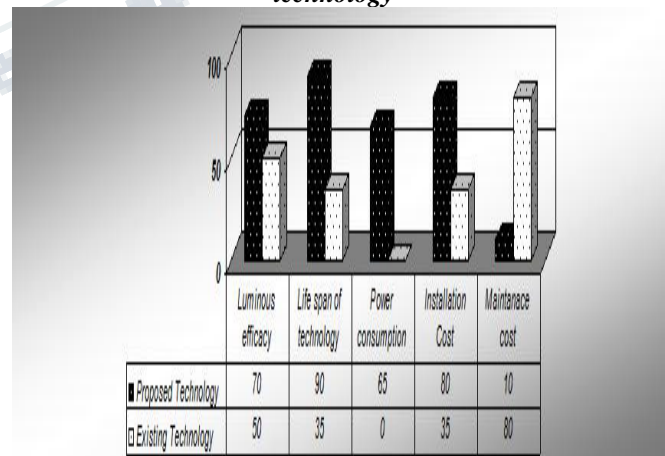
1.4.2 Analytical Results

The design and implementation of the proposed technology will serve a purpose and meet the necessity of today's era more effectively and efficiently by replacing the older technology and resources by improved technology and

will lead in increase in life span of street light lamps, better luminous efficiency, reduced power consumption etc.

Sr.No	Parameters	Existing Technology	Proposed Technology
1	Type of lamp used	High pressure sodium vapor	Led
2	Luminous efficacy lm/W	50-150 lm/W	70-160 lm/W
3	Life span in hours	15,000	50,000
4	Color rendering properties	Fair	Good
5	Installation cost	Less	More
6	Maintenance cost	More	Less
7	Power consumption	More	Less
8	Switching Mechanism	No	yes
9	Security to human life	No	yes

Table 2. Comparative study of existing and proposed technology



Fig(b) :Graphical representation of proposed technology and existing technology

1.5 Conclusion

Embedded Solution for Street Light Automation and Security has been implemented where in issues like

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inefficient utilization of power , threat to human life are been resolved. The implementation results in providing a better solution by efficient use of power and providing a secure and safe environment.



Fig (c) Image of implemented design.

7. Future Scope

The future scope of the proposed system is to implement additional embedded innovations like accident detection, and connecting people and government through IOT.

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