

IoT based Streetlight Monitoring using FPGA

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Abstract - A real-world proven solution for dynamic street light control and management which relies. Automatic street light system is smart and provides a safe night time environment for all road users including pedestrians. The Street light Automation system can reduce energy consumption and maintenance costs and also helps to reduce crime activities up to certain limit. The automatic street light system is mainly decided on the combination of sensors technology. This system would provide a remote access for streetlight maintenance and control. This system dynamically switches ON and OFF light depending upon objects like human body or vehicles etc. and the light intensity will increase or decrease with the vehicles or objects. Therefore, maximum power will be saved. The proposed idea was implemented by FPGA and sensors.

Key Words: FPGA: Field Programmable Gate Arrays

1. INTRODUCTION

One of the substantial parts of a country's infrastructure is the street lighting system. The prominent task is to illuminate the nations streets during the night hours. In the present situation, due to high traffic density the number of street lights are increasing at a rapid rate. In order to have an efficient street lighting system some factors have to be looked after such as power consumption, cost, traffic and mainly accuracy related to time or condition. This paper deals with the intelligent control of illumination of the streets during the off-peak hours in the night based on detection of movement on the road by vehicles (mostly) and pedestrians (if any). The main motto behind this project is obtained from the shortage of power in the ever-increasing power demand scenario in India. And also, this system makes the night life more convenient, safe and environment friendly. Automation of street lights limit the involvement of humans. They are self-sufficient to operate on their own which in turn leads to time saving and reducing the cost as it results in more efficient system than the manual one. As the sunlight decreases slowly from evening to night, the intensity of the LED based LDR which is interfaced with the FPGA board is controlled. This process repeats every day.

2. METHODOLOGY

Firstly, we connect street lights and LDR through FPGA board. Street lights depend on LDR. LDR generate output in the presence of light it may be natural or artificial. LDR sends its output to the FPGA and FPGA sends command to the street lights. If light fall on LDR then its resistance will be high and not output signal generates. FPGA will not response so, the street lights will be in OFF state. When no light falls on LDR then its resistance will be low and output signal generates and FPGA will give response. So, street lights will begin to start glow.

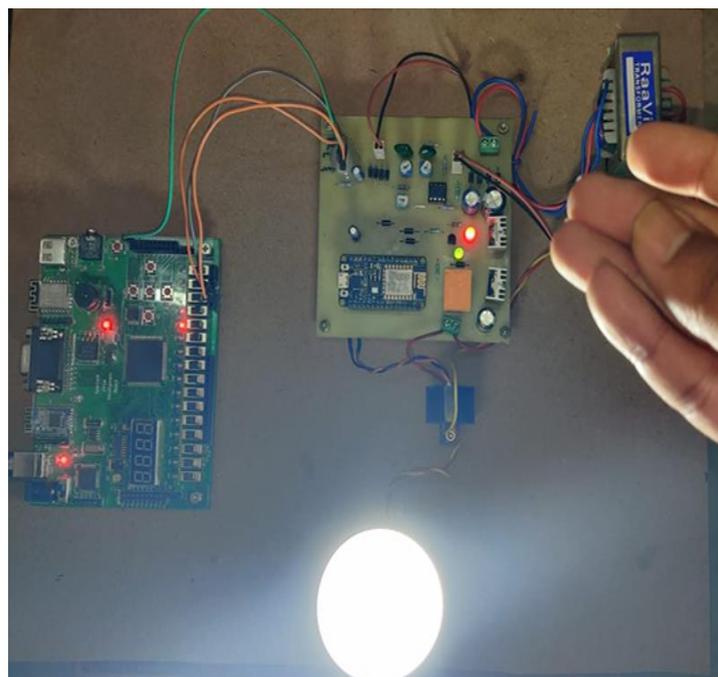


Figure -1: Hardware of IoT based Streetlight Monitoring using FPGA

3. CONCLUSIONS

The important aim of this paper is to save the current. It is mainly used to protect the power efficiently. Using sensors to save the power energy without any waste.

“IoT based Streetlight Monitoring using FPGA” could be a multi-functional element because of their ability to include the software and therefore, the hardware controls of the electrical network. Thus, we are saying that these are the foremost effective means of operating and controlling the intensity of the road lights being installed at the problems that world is facing today, saving of energy and also disposal of incandescent lamps, very efficiently. With the advances in the technology and good resource planning the price the project is often slow down and also with the employment of fine equipment the upkeep may also be reduced in terms of the periodic checks.

The LED’S have the long life, emit cool light, donor have any toxic material and may be used for fast switching. For these reasons our project presents far more advantages which can overshadow the present limitation. Keeping visible the long run benefits and therefore the initial cost would never be an issue because the investment return time is extremely less. The project has scope in various other applications like for providing lightning in industries, campuses and parking plenty of huge shopping malls. This may even be used for surveillance in corporate campuses and industries.

4.RESULT

The project aims were to scale back the side effects of this street lightning system, and find an answer to avoid wasting power. During this project the primary thing to try and do, is to organize the inputs and outputs of the system to regulate the lights of the road. This project could be a cost effective, practical, eco-friendly and also the safest thanks to save energy and this method the sunshine status information is accessed from anytime and anywhere. It clearly tackles the two problems that world is facing today saving of energy and also disposal of incandescent lamps, very efficiently.

The result of the system, as we have discussed in the earlier pages of the report, the LDR detects the light that has been falling on it, they detect or absorbs light they will send a signal to the Controller (FPGA) which there by turns ON the street light, this will be the result of the proposed, IoT based Streetlight Monitoring using FPGA.



Figure -2: Status of Street Light in Night (ON)

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