



International Journal of Advance Engineering and Research Development

Volume 5, Issue 04, April -2018

INTELLIGENT STREET LIGHT SYSTEM

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Abstract — The main purpose of the project is to provide automatic control and fault detection on street lamps. The system which we have proposed has the automatic lights which are economical for the streets and gives immediate response regarding the street light fault information. Moreover, errors due to manual operation can also be eliminated. A Street light is an illumination on any road which turns on at night for the convenience of people. Some major advantages of street lighting includes: prevention of accidents and increase in safety. Our project presents a system for monitoring the proper working of street lights and reports any information regarding the malfunction of streetlights back to the municipal authorities when found fault with any of the street light using IoT.

Keywords-IR sensors ,AT89c52, Wi-Fi module(HLK RM04),GSM module.

I. INTRODUCTION

The project work described here is quite useful for the state electricity departments, generally the line men either he belongs electricity department or municipality, it is the duty of him to energize the street lights in the evening, preferably after Sun set, and he is supposed to be switched off these lights in early in the morning, when the Sun is raised again. But unfortunately due to many reasons the line men may forget to switch off these lights in the morning. Often at many places these lights remains in on condition during the day time also, this is because of the negligence of line men. In this regard lot of energy is wasted, resulting power cuts. There are many reasons for power cuts, in that list this reason also can be added and it can be underlined.

The street light controller should be installed on the pole lights which consist of controller along with various sensor and wireless modules. The street light controller installed on the street light pole will control LED street lighting depending on traffic flow, communicate data between street lights and the monitoring system. The data from the street light controller can be transferred to base station using wireless technology to monitor the system.

The street lighting is one of the largest energy expenses for a city. An intelligent street lighting system can cut municipal street lighting costs as much as 50% - 70%. An intelligent street lighting system is a system that adjusts light output based on usage and occupancy, i.e., automating classification of pedestrian versus cyclist, versus automotive. An intelligent street light management proposes the installation of the wireless based system to remotely track and control the actual energy consumption of the street lights and take appropriate energy consumption reduction measures through power conditioning and control.

Now a days, the energy consumption and energy distribution has become a big subject for discussion because of huge difference in energy production and consumption. The produced energy is not sufficient, it is not able to meet the demand, especially in our country according to surveys conducted by many experts it is stated that the production is only 70% where as the demand is 100%. In such critical condition energy should not be wasted due to the negligence, it is the responsibility of every one to save the energy in all possibilities, otherwise ultimately every one of this country will be a sufferer due to the frequent power failures. There by this project work is taken up, which serves the nation by reducing the power wastage.

II. LITERATURE SURVEY

A significant portion of the national electricity production goes to street lighting. The existing street lighting solution models in different parts of the world are not very efficient and optimised. Due to the same reason, we often find street lights ON during the day time and OFF during the night. Due to this reason there is a wastage thousands of watts. It also reduces the usable life of the lamps. This gives us a substantial scope for improvement in the way street lighting systems operate today. The suggested approach to bringing about improved operational efficiency focuses on two aspects – replacing existing lamps with light-emitting diode (LED) lamps and making the street lights ‘smarter’.

In the proposed model, The street light control and fault detection with cloud storage system is implemented. Nowadays, the street lamps are operated manually. But, the street light control and fault detection with cloud storage system operates the street lamps ON/OFF and find the fault in the street lamps automatically. The system checks the weather condition for the street lamp ON/OFF. The LDR (light dependent resistor) is used to check the weather condition. If weather is bright the system identifies it as the day time. If the weather is dark the system finds it as the night time. So, the system allows switching ON the street lights. The street lights are ON condition. But, some faulty lights are not glowing. At the time the system finds the lights are not glowing.

III.EXISTING SYSTEM

In the existing system, the line men either he belongs to electricity department or municipality, it is the duty of him to energize the street lights in the evening, preferably after sunset. Due to many reasons the line men may forget to switch off these lights in the morning.

Disadvantages

- More Energy Consumption
- More manpower
- Manual switching off/on of street lights
- High expense

IV.PROPOSED SYSTEM

The street light control and fault detection with cloud storage system is implemented. Nowadays, the street lamps are operated manually. But, the street light control and fault detection with cloud storage system operates the street lamps ON/OFF and find the fault in the street lamps automatically. The system checks the weather condition for the street lamp ON/OFF. The LDR (light dependent resistor) is used to check the weather condition. If weather is light/dark check through a LDR. If weather is bright the system identifies it as the day time. If the weather is dark the system finds it as the night time. So, the system allows to switching ON the street lights. The street lights are ON condition. But, some faulty lights are not glowing. At the time the system find the lights are not glow. So, some fault occurs in the light we can knowing through the LDR values. So, the system sends the alert message to the ward member and ward service man mobile numbers through GSM module. At the same time, we can access system status through the cloud storage in anywhere and anytime. Because, the street light system connecting with cloud storage through the Wi-Fi module. The Wi-Fi module is using to store the sensors data in the cloud storage. So, we can access easily the street light system data in the cloud storage.

Advantages of the Proposed System

- Automatic Switching of Street lights.
- Reduction of light pollution.
- Reduction in CO₂ emission.
- Reduced Maintenance Costs.

V.BLOCK DIAGRAM

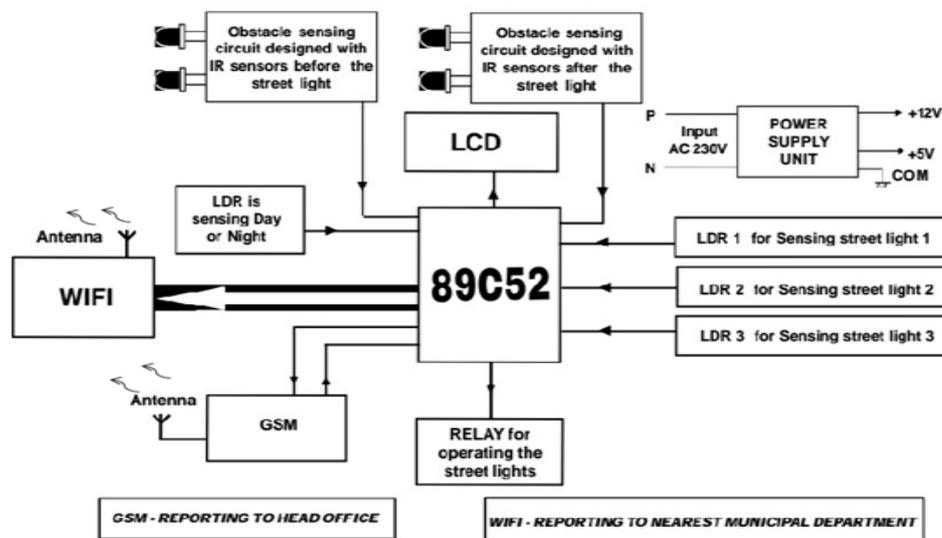


Fig.1 Block diagram

VI.RESULTS



Fig 2:All street lights in ON condition



Fig 3:Conditions of the street lights which is displayed on LCD screen



Fig 4: light 2 in fail condition



Fig 5:light 2 and light 3 as fail conditions on LCD screen

VI.FEATURES

1. This project can be operated automatically.
2. Detection of any vehicle triggers the street lights at night.
3. Based on the time of the day the street lights are switched on/off.
4. Location Based Services can be done by means of enabled devices.
5. Faults in the street lights are detected and instant alert messages are sent through Wi-fi.

VII. CONCLUSION

This project is a cost effective, practical, eco-friendly and the safest way to save energy and this system the light status information can be accessed from anytime and anywhere. It clearly tackles the two problems that world is facing today, saving of energy and also instant faulty light detection, very efficiently. Initial cost and maintenance can be the drawbacks of this project. With the advances in technology and good resource planning the cost of the project can be cut down and also with the use of good equipment the maintenance can also be reduced in terms of periodic checks. LEDs are safe because they do not have any toxic material, emit cool light and are fast switching. For these reasons our project presents far more advantages which can over shadow the present limitations. Keeping in view the long-term benefits and the initial cost would never be a problem as the investment return time is very less. The project has scope in various other applications like for providing lighting in industries, campuses and parking lots of huge shopping malls. In corporate campuses and industries this concept can be used for surveillance.

VIII. FUTURE SCOPE

One can signal to the network management centre by pressing a button at the lamp post and they can make a call to the taxi for service at the appropriate location. Once this intelligent system is implemented, we could directly go for wireless power transmission which would reduce the maintenance costs and power thefts of the system, as cable breaking is one of the problems faced today. In addition to this the traffic signal lights be another feature that we could look of our system. Depending on the amount of traffic in a particular direction, necessary controlling actions could be taken. Also emergency vehicles can be passed efficiently. More attempts can be made to ensure that the complete system is self-sufficient on renewable energy resources like solar power, windmills, piezo-electric crystals etc.

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