

IOT BASED ON AUTOMATIC STREET LIGHT CONTROLLING AND MONITORING USING SMART PHONE

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Abstract— Nowadays Street light have become a vital aspect including road safety. A lot of electricity is consumed by street lights. So it is imperative to save the power as much as we can. The cost of electricity continues to increase as wastage of energy increases. It has become very crucial for saving power. Street light monitoring and control is a system designed used embedded system to improve the efficiency by IOT BASED controlling and monitoring of street light. This project describes a new solution for street light control system. It consists of wireless technology. The street lights are controlled and monitoring by the base server by just sending a notification by using wireless network. It consists of a main-server application. The primary motive behind implementing this project is to save the energy and fault analysis individual pole.

Keywords— atmega328Microcontroller, current sensor voltage sensor, IOT modem (sim800C), max232.

I. Introduction

The largest expenses of a city are mainly because of street light. A smart street light can be used to cut the municipal waste up to 50-70%.

In the current scenario, street lighting is one of the paramount segments of a city or rural infrastructure where the foremost concern is to brighten the city or rural streets during dark hours of the day. A Street light or lamp is preferred as an originator of illumination on the roadside or walkway, which can

be turned on at a definite time periods during dark hours. Lighting is repeatedly substantial

electrical load in workrooms, however cost of illuminating energy utilization is less when collated with personnel costs. Thus its energy frugality prospective is usually forsaken.

Studies have flaunted that concerning 4500MW of power is particularly consumed in India on public illumination. Hitherto, the quantity of street lights in rural and city is comparatively less. Accordingly street lights are comparatively uncomplicated although with the evolution of urbanization operation of street lights escalated speedily.

Street light Monitoring and supervision is an automated system delineated to improve the effectiveness and exactness of an action by automatically controlling the street lights. The system moreover encompasses with client server technique where a user can forthwith his/her reciprocal actions with the web based requisitions to handle the street light of any location from distinct locality. Street light Monitoring system with the help of Microcontroller and GSM/GPRS Technology has been progressed to lessen the utility of power in city public street lighting system. It is incorporated with examined circuits of street lights as well as discrete lights with network employable protocols. For most versions of lights, accordant hardware with definite protocols is utilized.

II. BLOCK DIAGRAM:

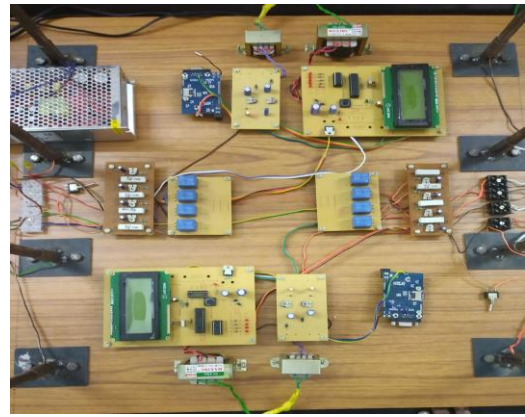
Related work

There are several attempts to control the road lighting for saving the energy and to reduce the pollution. In a road lighting intelligent control system is proposed. The system is based on wireless network control that can implement real-time monitoring for road lighting. The proposed system uses the GPRS standard to monitor the status of the lamps. The goal is to allow a central monitoring of the status of road light terminals that are equipped with wireless controller and electronic and electrical components used to be able to remotely switch on or off the terminals. Furthermore, the system can be programmed to switch all the terminals to half-power state at specific time to save the energy.

There are several limitations of this system. First, its complexity and cost: each node or terminal must have microcontroller atmega328, and wireless interface. This can increase the cost too much and hence hinder the wide-scale deployment of the system. Second, it is using a completely new network rather than using the existing network for the road lighting control and management. Third, the system is not automatic. Thus, it cannot achieve the maximum power- saving. Similar control system that uses GPRS

Another energy saving direction, with no lighting control, is to change the old lighting system. For example: replacing the old system in Thailand by a new high pressure sodium (HPS) road lighting, they saved up to 25% - 30% of the energy. Similar related work to this trend is by using the LEDs (Light Emitting Diodes) lamps that can consume only the quarter of the HPS lamps and give almost the equivalent luminous efficacy.

Hardwae design



i.) GSM/GPRSModule (SIM800C).

SIM800C Module is introduced in the street light monitoring applications which can IOT Based data information with less power utilization. An interface between GSM/GPRS Module and RS232 authorizes an effortless connection with Computer/Laptop with the help of Microcontroller having a baud rate of 9600. The established Serial communication leads to transfer the commands with the help of transmitter and receiver devices established in the monitoring process of street lights.

The GSM/GPRS Module is boasted with intramural TCP/IP pile to authorize us to interact with internet, where it requires microcontroller to drive it.

III. IOT MODEM GSM/GPRS(sim800c):



ii.) ATMEGA328 (Microcontroller)

The main function of Microcontroller (ATMEGA328) is to observe the behavior of street light under variety of environment conditions and verifying the healthy conditions of street light re-percussion and transmitting the data to the GSM/GPRS Module (transmitter/receiver). 8 bit Microcontroller is considered for speed processing which can be operated in the range of 1.8 – 5 V with a frequency of 0 – 4MHz.frequency will be generated used in

crystal

oscillator.

of crystals. LCDs are available to display arbitrary images (as in a general-purpose computer display) or fixed images with low information content, which can displayed or hidden, such as preset words, digits, and seven-segment displays, as in a digital clock. LCD is the output device.

Pin Diagram

PCINT14/RESET) PC6	1*	28	PC5 (ADC5/SCL/PCINT13)
(PCINT16/RXD) PD0	2	27	PC4 (ADC4/SDA/PCINT12)
(PCINT17/TXD) PD1	3	26	PC3 (ADC3/PCINT11)
(PCINT18/INT0) PD2	4	25	PC2 (ADC2/PCINT10)
(PCINT19/OC2B/INT1) PD3	5	24	PC1 (ADC1/PCINT9)
(PCINT20/XCK/TO) PD4	6	23	PC0 (ADC0/PCINT8)
Vcc	7	ATmega22	GND
GND	8	28	PDIP
(PCINT6/XTAL1/TOSC1) PB6	9	20	AVCC
(PCINT7/XTAL2/TOSC2) PB7	10	19	PB5 (SCK/PCINT5)
(PCINT21/OC0B/T1) PD5	11	18	PB4 (MISO/PCINT4)
(PCINT22/OC0A/AIN0) PD6	12	17	PB3 (MOSI/OC2A/PCINT3)
(PCINT23/AIN1) PD7	13	16	PB2 (SS/OC1B/PCINT2)
(PCINT0/CLKO/ICP1) PB0	14	15	PB1 (OC1A/PCINT1)

iii.)RELAY:



Relays are switching devices. Switching devices are the heart of industrial electronic systems. When a relay is energized or activated, contacts are made or broken. They are used to control ac or dc power. They are used to control the sequence of events in the operation of a system such as an electronic. The relay is the electromagnetic switch. The relay coil energized using dc source.

iv)LCD



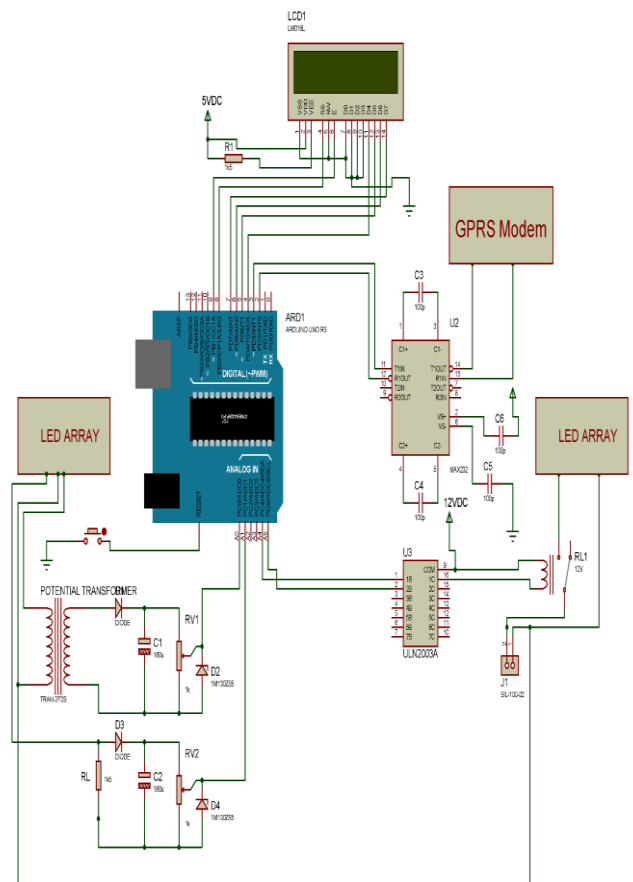
A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties

v)ZENER DIODE:



A Zener diode is a particular type of diode that, unlike a normal one, allows current to flow not only from its anode to its cathode, but also in the reverse direction, when the Zener voltage is reached. Forward bias working in normal PN junction diode, reverse bias working in voltage Regulator.

vi) CIRCUIT DIAGRAM:



Software Requirements

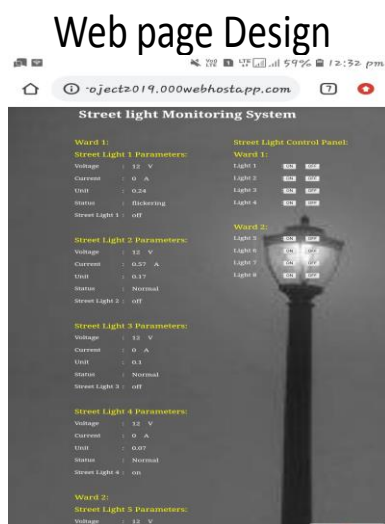
i.) Microcontroller (ATMEGA328):

ATMEGA328 is opted for the process of flash firmware onto the GSM/GPRS module in which it is essential to have all the libraries and board should be perfectly established on it to supervise the condition of street lights.

ii.) Web server :

The GSM module (SIM800A) and its alterations are furnished and underpin PHP, JAVA, HTML, AJAX, etc. Manageable web servers are able to designed and utilized remotely. User can instantly communicated with the help of Client Server based mechanism using web based applications to supervise and monitor the street lights of any place from remote location.

The server will run a PHP web application which is going to maintain the street lights of city or rural area. Whenever street lights are turned on/off server is going to send a message to the controller to recognize the mandatory action. The controller is going receive the data and decode it for every individual street light healthy condition.



To choose a Smartphone that would act as the streetlight of each pole monitoring system, several Android phones were tested. GSM/GPRS signal quality, third generation (3G) The smart phones used first

webpage open web page address:iotproject2019.000webhostapp.com/scadstreetlight/intex.php. After street light monitoring and controlling any fault occur in streetlight status will be see after corresponding signal send.

IV. Future work

There are several ideas for future extensions and it .

In this project future developed using VLSI technology,

Used power line carrier communication or SCADA, PLC

New technique used develop. CDMA technique used easy

1. to achieved An APK can be created to monitor and control street lights.
2. Faults can be reported by customers through the app.
3. Globalization can be achieved.
4. Through globalization, centralized control and monitoring can be done.
5. Decreases cost and manpower.

V. APPLICATION

1. Airport lighting.
2. Highway and Roadway lighting.
3. Park and Playground lighting.
4. Industrial lighting.
5. Smart city lighting

VI. CONCLUSION

This model explained here is a cost effective, practical, eco-friendly and the safest way to save energy and in this system, **the light status information can be accessed from anytime** and any where. It clearly tackles the two problems and the world is facing today, saving of energy and also disposal of incandescent lamps, very efficiently, initial cost and maintenance can be the backs of the model. With the advanced of technology and good resources 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. This work has scope in various other

applications like for providing lighting in industries, campuses and parking lots of huge shopping malls. This can also be used for surveillance in corporate campuses and industries.

VII. References

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