

ENERGY EFFICIENCY LUX MANAGEMENT SYSTEM**A.KIRANBEDI*, N.NAGARAJU****

PG SCHOLAR*, ASSISTANT PROFESSOR**

SCIENT INSTITUTE OF TECHNOLOGY, IBRAHIMPATNAM, RANGA REDDY
DISTRICT**ABSTRACT:**

Nowadays, human has grow to be too busy, and is not able to are looking for out time even to change the lighting had been no longer crucial this device is like, the road street lighting are switched on within the night time in advance than the solar units and they rectangular degree transitioned successive day morning as soon as there may be enough mild at the roads. This undertaking gives the most effective answer for wastage. Conjointly the guide operation of the lights device is truly removed. During this undertaking the sensing elements square degree used that rectangular degree mild-weight Dependent resistance LDR sensor to issue a day/night time time and additionally the small controller is employed it really is able to generate fame of light to the user by way of exploitation. The microcontroller Arduino board is hired as mind to manipulate the road light-weight device, anyplace the programming language used for growing the bundle to the microcontroller is C language. This Arduino board sends road slight on /off time to

raspberry pi the use of x-bee wi-fi module, this raspberry pi ship light on /off time to cloud thru GPRS module

1.INTRODUCTION Providing correct utilization of power for dominant street lights. The concept is to develop a mobile application on automatic street lights on/off. the concept of coming up with a brand new system for the street lamp that don't consume large quantity of electricity and illuminate giant areas with the very best intensity of sunshine is regarding every engineer operating during this field. Providing street lighting is one in every of the foremost vital and high-ticket responsibilities of a town. Lighting will account for 10–38% of the whole energy bill in typical cities worldwide. Street lighting could be a notably crucial concern for public authorities in developing countries attributable to its strategic importance for economic and social stability. Inefficient lighting wastes important monetary resources once a year, and poor lighting

creates unsafe conditions. Energy economical technologies and style mechanism will scale back value of the road lighting drastically. Manual management is liable to errors and ends up in energy wastages and manually dimming throughout time of day is unworkable. Also, dynamically following the sun shine level is manually unworkable. The present trend is that the introduction of automation and remote management solutions to manage street lighting. A Street light, lamppost, street lamp, light standard, or lamp standard is a proposed source of light on the side of a road or walkway, which is turned on or lit at a certain time every night. Significant benefits of street lighting include prevention of accidents and increase in safety. Studies have shown that darkness results in a considerable number of crashes and accidents, especially those involving pedestrians; pedestrian accidents are 3 to 6.75 times more prone in the dark than in day. Street lighting has been found to reduce walker crashes by nearly fifty percent. Street Light Monitoring & control is an automated system designed to increase the efficiency and accuracy of an enterprise by automatically timed controlled switching of street lights. This project describes a new practical solution of street light control

systems. The system also includes the client-server mechanism where a user can directly interact with the web based application to manage the Street lamp of any place from the single position. Some street light control systems have been developed to monitor and reduce the use of power in town's public street lighting system. It includes a monitoring circuit of street lights and individual lights with network operating protocols. For most kinds of lights, compatible hardware with certain protocols are used.

- Today's Streetlight system is not flexible.
- Most of the controlling are manual, whereas some are automated based on environment parameters.
- The biggest problem is to handle remote area locations.
- Manual mistakes results into power wastage. By exploitation this method manual works square measure removed. The street lights square measure mechanically switched ON when the daylight goes below the visible region of our eyes. It mechanically switches OFF the road lights beneath illumination by daylight. It is an easy and powerful thought, to switch ON/OFF the road lightweight system mechanically. It automatically switches ON the street lamp once the sunlight goes below the visible region of our

eyes and switches OFF the street lamp once ample amount of daylight is accessible. The element used for lightweight sensing may be a lightweight Dependent resistance. By using the LDR we will operate the street lamp automatically, once ample quantity of sunshine is available the street lamp are going to be within the OFF state and when it's dark the sunshine are going to be in ON state, it means LDR resistance is reciprocally proportional to light-weight falling on that. Once the sunshine falls on the LDR it sends the commands to the feedback loop that it should be within the OFF state and therefore the street lamp turns OFF. This project exploits the operating of a transistor in saturation region and cut-off region to switch ON and cut the lights at applicable time with the assistance of associate degree electromagnetically operated switch.

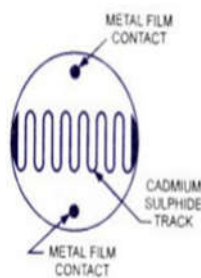


Figure 1 Basic structure of LDR

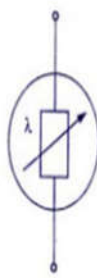


Figure 2 symbol of LDR

Figure 1 & 2 explains about the construction of Light dependent Resistor (LDR)

This system operates in accordance with the varying daylight, whenever there's spare lightweight falling on the LDR, it exhibits high resistance and acts as associate degree material and darkly the LDR behaves as low resistance path and permits the flow of electricity. The shift operation of street lamp is carried out by ATmega8 microcontroller at the side of relay driver circuit. The whole feedback loop requires a regulated 5V DC for its operation. A step-down electrical device is employed to step down the 230V AC from mains into 12V AC, this 12V AC is born-again into 5V DC by employing a bridge rectifier, and the controlled output from the transformer is distributed to the feedback loop.

2. RELATED WORK In [1] the paper describes regarding the circuit that switches the road lightweight ON police investigation the vehicle movement and remains OFF once the fastened time. During this system the road light weight mechanically ON/OFF throughout the night and also the day time. During this system the GSM technology has been utilized in that the manual change OFF/ON of the road lightweight mistreatment GSM. Here the system controls the intensity of the road lightweight by dimming and brightness the intensity on

the detection of any object mistreatment PIR device. In [2] this paper is concentrated on the requirement of the machine-driven street lightweight system and also the peculiar method of implementation with embedded system tools. During this system the piezo electrical device is employed to observe the movement of the thing on the street rather than mistreatment IR device. A microcontroller msp430 as a brain to manage the method concerned. This paper provides a solution to the dominant the intensity of the sunshine considering the movement on the road. In [3] this project is meant to observe the vehicle movement on the highways to change ON solely a block of the road light earlier than it and turn off the trailing lightweight to avoid wasting energy. Throughout the night all the lights on the highways stay ON for the vehicle, however heap of energy is wasted once there's no vehicle movement on the highways. During this paper 2kind of devices has been used that are lightweight sensor, icon electrical device. In [4] Automatic Street lightweight system isn't solely best however additionally the powerful technique. Relay uses as a automatic switch during this system. It releases the manual work at most up to 100% .As presently because the daylight goes below the visible region of our eyes

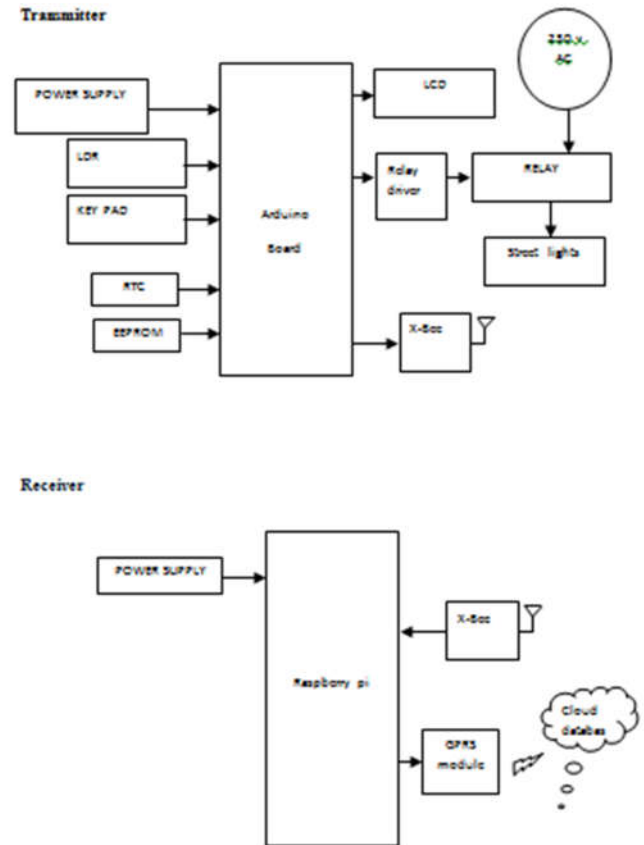
this method mechanically switches ON lights. Lightweight Dependent resistance (LDR) is a kind of sensor that really will this work and senses the sunshine as our eyes will. As presently because the daylight comes, visible to our eyes it mechanically switches OFF lights. Such form of system is additionally helpful for reducing energy consumption.

In [5] this method the system with LDR device, PIR sensor, Zigbee is employed to intimate the standing of humans use, light intensity and street lightweight ON/OFF standing to the EB section to avoid wastage of energy by glowing street lights in unwanted areas. The full system is operated by mistreatment artificial energy supply referred to as star and with battery backup. The PIR and LDR sensors sense the persons and lightweight intensity of a selected place and transmit the info in wireless to the EB section with Zigbee. Relay on the info received the controller can flip ON/OFF the road lightweight in wireless communication. This method is suitable for street lighting in remote urban and rural areas wherever the traffic is low at times. This [6] paper aims at planning and corporal punishment the advanced development of embedded systems for energy saving of street lamps.

Nowadays, the human has become too busy and is unable to seek out time even to modify the lights where not necessary. This paper provides the most effective resolution for electrical power wastage. Also, the manual operation of the lighting system may eliminate. During this article, light-weight Emitting Diode (LED) is employed. During this system, the most disadvantage was switching arrays of street lights weren't potential. Only Single Street may be operated. This [7] paper comprises of a server, interface to show and nodes that are small controlled processed with embedded sensors mensuration completely different parameters. Every node within the network connects to the first server via a protocol. The analogue knowledge perceived by the detector converts it to digital form, processes by microcontroller so sends to the server. The master controls all the slaves. The opposite nodes send the information to master, and also the master collects the information and sends to concentrator and server wherever the information will monitor and on basic alterations method it to modify On/Off the nodes of the devices. This method conjointly senses various parameters like encompassing temperature, fog, carbon emission and noise intensities and suggests corrective measures [7].GSM

electronic equipment needed per street light for in operation that will increase the value mechanically. It also consists of some network problems.

BLOCK DIAGRAM:



Power Supply Block

In-order to paintings with any components basic requirement is power deliver. In this segment there may be a call for of 5V regulated DC strength supply. This block converts 230V AC to 5V regulated DC electricity supply.

Arduino Board

This block is used for control all inter going thru gadgets (LCD, Relay using force, X-Bee, KEY PAD, LDR, RTC, and EEPROM) in step with given code

LCD

This block is used for display time and road light states (ON/OFF)

Relay using force

This block is used for converting microcontroller logical signal to enough power for running relay

RELAY

This block is used for open/close to 230v circuit (switching avenue moderate (ON/OFF))

X-Bee

This block is used for wi-fi commutation using this we are able to ship data of street lighting fixtures on/off time to faraway location

KEY PAD

This block is used for set on/off teeming of street lighting fixtures

LDR

This block is used for sensing weather situation day/night or cloudy/regular

RTC

This block is used for time values (HH:MM:SS) date is deliver to arduino

EEPROM

This block is used for maintain preset on/off timings of road slight

RECEIVER SIDE UNIT**Power Supply Block**

In-order to work with any components basic requirement is power deliver. In this segment there's a demand of 5V regulated DC energy supply. This block converts 230V AC to 5V regulated DC electricity deliver.

Raspberry pi

This block is used for manipulate all inter handling gadgets (X-Bee And GPRS) consistent with given code

X-Bee

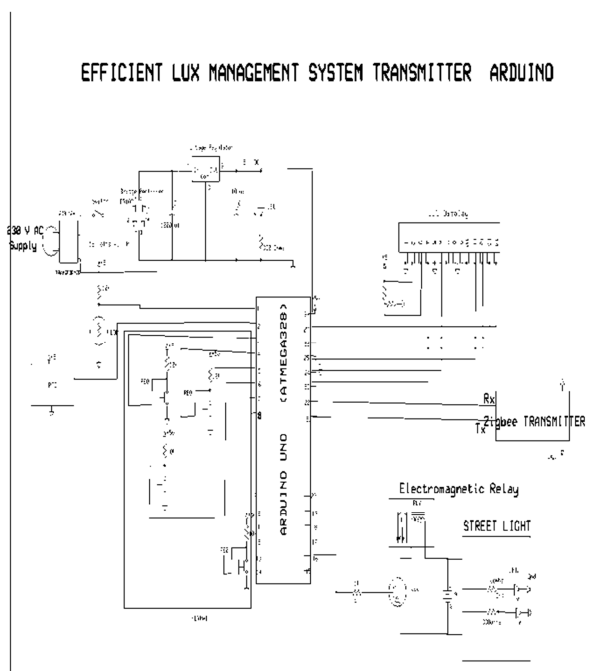
This blocked is used to wireless commutation. This block gets remote facts from transmission section.

GPRS

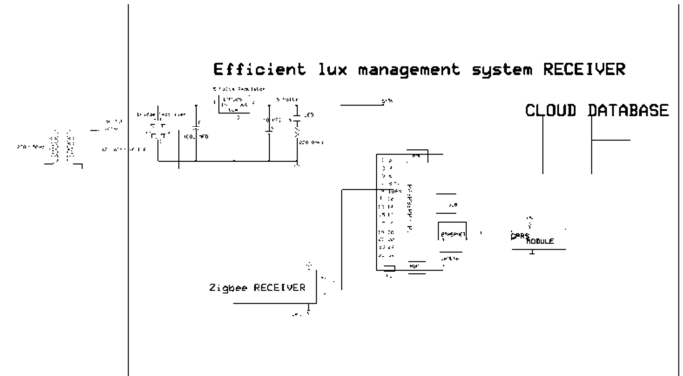
This blocked is used for internet (save data in cloud)

CIRCUIT DIAGRAM

Transmitter circuit



Receiver circuit



CIRCUIT DIAGRAM EXPLANATION

When the deliver is given to the task, AC is converted into DC through RPS gadget. The transformed 5v DC electricity supply is given to all of the additives inside the undertaking. In the task we are the usage of the zig bee module to transmit and receive the information. Sensors like LDR , relay, IOT and avenue mild inside the transmit aspect with Arduino MC .Where as inside the receiving facet raspberry pi MC, Zig bee and IOT module. The led lamp controlling and monitoring wirelessly entails the designing of entire node. The need of such sort of node which should have an capability to ship the commands wirelessly to the precept control center, and controller board that may manipulate the led lamp in terms of on/off and dim awareness part of the design is the electricity intake for the gain of customer and surroundings simultaneously.

The system carries of ZigBee based totally mesh networked streetlamps, gateway node, and manipulate software program that offers actual time monitoring and manipulate of lights device.

LIMITATIONS & FUTURE ENHANCEMENT

The limitations of this project are as follows:

- The commands send to the GSM module other than predefined commands is not recognized by the Arduino.
- Power Fluctuations cannot be handled by the hardware part and it may burn the ICs.
- At present, there is no authentication present for the mobile application.
- If any malfunction occurs in the load fault or LDRs, proper output is not displayed. There are various future enhancements which can be done to this project which are as follows:
 - Pole damage detection with the addition of a suitable sensor.
 - Taxi call buttons on lamp posts to signal to the network management centre to generate a Taxi call to the appropriate location.
 - If the system has traffic speed sensors then this information could be used to manage traffic speed via the dimming of the streetlights. If the average traffic speed is too fast during evening and night hours, this could be used to trigger a slight dimming of the streetlights. The level of dimming would be imperceptible to motorists but they would

slow down, regardless, in response to the slightly diminished lighting. A five percent light reduction slows traffic but is not noticeable to motorists.

- With the added intelligence in the lamp, you can add further features to increase HID lamp life, such as softer start-up and protection against re-igniting an already hot HID lamp, since this shortens the lamp life.
- Information management

CONCLUSION

This project of AUTOMATIC STREET LIGHTS ON/OFF APPLICATION is a cost effective, practical, eco-friendly and the safest way to save energy. It clearly tackles the problem that world is facing today, saving of energy very efficiently. According to statistical data, we can save more than 40 % of electrical energy that is now consumed.

REFERENCES

- [1] Archana. G, Aishwarya N, Anitha J “Intelligent Street Light System” International Journal of Recent Advances in Engineering & Technology, Vol-3, Issue-4, 2015.
- HUSHON, J. M., Expert Systems for Environmental Applications. Washington: American Chemical Society Washington, DC, 1990.
- [2] AkshayBalachandran, Murali Siva, V. Parthasarathi, Surya and Shriram K. Vasudevan “An Innovation in the Field of

Street Lighting System with Cost and Energy Efficiency, Indian Journal of Science and Technology, Vol-8, August 2015

[3] Deepanshu Khandelwal, Bijo M Thomas, Kritika Mehndiratta, Nitin Kumar, Sensor Based Automatic Street Lighting system, International Journal of Education and Science Research Review Volume-2, Issue-2 April- 2015

[4] Isah Abdulazeez Watson, Oshomah Abdulai Braimah, Alexander Omoregie, Design and Implementation of an Automatic Street Light Control System, International Journal of Emerging Technology and Advanced Engineering, 5(3), March 2015

[5] Kapse Sagar Sudhakar¹, Abhale Amol Anil², Kudakechetan Ashok³, Shirsath Shriravan Bhaskar⁴, Automatic Street Light Control System, International Journal of Emerging Technology and Advanced Engineering Volume 3, Issue 5, May 2013

[6] Farah Ramadhani, and Kamalrulnizam Abu Bakar, and Muham-Mad Gary Shafer. Optimisation of standalone street light system with consideration of lighting control, IEEE, 2013.

[7] Chaitanya Amin, Ashutosh Nerkar, Paridhi Holani, Rahul Kaul, GSM Based Autonomous Street Illumination System for Efficient Power Management. IJTE 2013

[8] D. A. Devi and A. Kumar, Design and Implementation of CPLD based Solar Power Saving System for Street Lights and Automatic Traffic Controller, International Journal of Scientific and Research Publications, 2(11), November 2012.

[9] J. Mohelnikova, Electric Energy Savings and Light Guides, Energy & Environment, 3rd IASME/WSEAS International Conference on, Cambridge, UK, February 2008, pp.470- 474. Kang F W C 2007 Automatic Fish Feeder for Cultivation Pond Universiti Teknikal Malaysia Melaka

[10] M. A. Wazed, N. Nafis, M. T. Islam and A. S. M. Sayem, Design and Fabrication of Automatic Street Light Control System, Engineering e-Transaction, 5(1), June 2010, pp 27- 4) R. Priyasree, R. Kauser, E. Vinitha and N. Gangatharan, Automatic Street Light Intensity Control and Road Safety Module Using Embedded System, International Conference on Computing and Control Engineering, April 2012.

[11] K. S. Sudhakar, A. A. Anil, K. C. Ashok and S. S. Bhaskar, Automatic Street Light Control System, International Journal of Emerging Technology and Advanced Engineering, Vol. 3, May 2013, PP. 188-189

[12] K.Y. Rajput, G. Khatav, M. Pujari, P. Yadav, Intelligent Street Lighting System Using Gsm, International Journal of

Engineering Science Invention, Vol2, Issue 3, March 2013, PP.60- 69.

[13] Dr. Kavitha, C. Ramesh Gorrepotu and Narendra Swaroop, Advanced Domestic Alarms with IOT, International Journal of Electronics and Communication Engineering and Technology, 7(5), 2016, pp. 77–85.

[14] Hina ruqsar, ChandanaR, NandiniR and T P Surekha, Internet of Things (IOT) Based Real Time Gas Leakage Monitoring and

Controlling, 5(8), August (2014), pp. 208-214, International Journal of Electronics and communication engineering & Technology.

[15] Viswanath Naik.S, S.Pushpa Bai, Rajesh.P and Mallikarjuna Naik.B, IOT Based Green House Monitoring System, International Journal of Electronics and Communication Engineering & Technology (IJECET), Volume 6, Issue 6, June (2015), pp. 45-47