



e-ISSN: 2319-8753 | p-ISSN: 2320-6710

IJRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 11, Issue 5, May 2022

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.118

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Solar Street Light with Auto Intensity

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ABSTRACT: The main aim of this project is to utilize the applying of the Arduino board to regulate the intensity of street light. Because the traffic decreases slowly during late-night hours, the intensity gets reduced progressively till morning to save lots of energy and then, the road lights turn on at the dusk and so turn off at the dawn, automatically. The method repeats each day.

White Light Emitting Diodes (LED) replaces conventional HID lamps in street lighting system to incorporate dimming feature. The intensity isn't possible to be controlled by the high intensity discharge (HID) lamp which is mostly utilized in urban street lights. LED lights are the long run of lighting, due to their low energy consumption and long life. LED lights are fast replacing conventional lights because intensity control is feasible by the heart beat width modulation. This proposed system uses an Arduino board and a rectified-power supply. String of LED is interfaced to the Arduino board with a MOSFET device. The intensity control of the LED light is feasible by varying duty cycle from a DC source.

I. INTRODUCTION

The most consideration within the field of technologies is Automation, Power consumption and value effectiveness. Automation is meant to cut back man power with the assistance of intelligent systems, Power saving is that the main consideration forever because the source of the facility (Thermal, Hydro etc.,) are becoming diminished because of various reasons. The most objective of the project is to save lots of current automatically employed in street light by the applying of power saving elements like LDR. We would like to save lots of power automatically rather than doing manual, so it's easy to create cost effectiveness. This saved power will be employed in other applications, like in irrigation, villages, towns and plenty of other fields. We are able to design intelligent systems by using Arduino to regulate intensity of street lights. The thought of designing a replacement system for the streetlight by using LED that don't consume huge amount of electricity and illuminate large areas with the best intensity of sunshine whenever required. Providing street lighting is one of the foremost important and expensive expenditure of electricity in a city. Lighting can account for 30-50% of the whole energy bill in typical cities worldwide. Street lighting may be a particularly critical concern for public authorities in developing countries thanks to its strategic importance for economic and social stability.

II. LITERATURE SURVEY

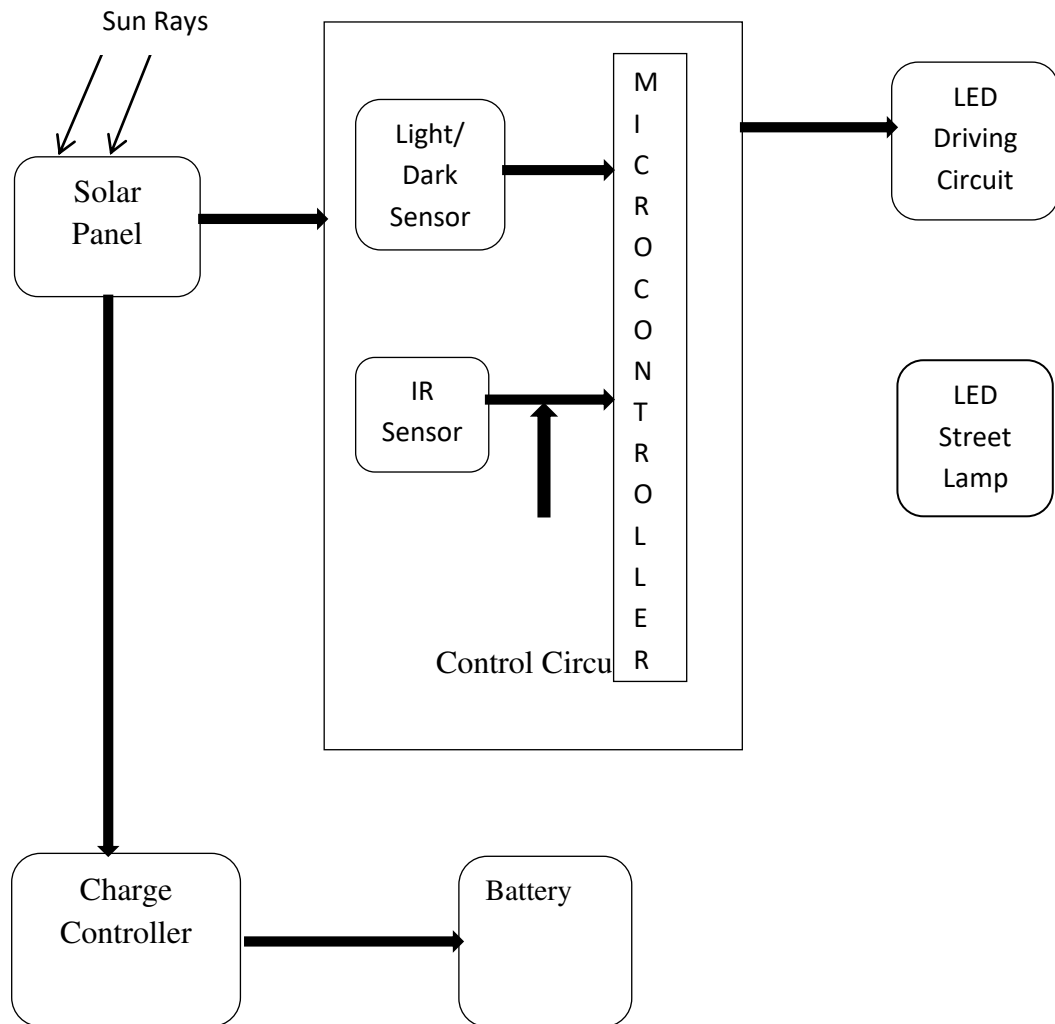
The energy efficient smart street light analyzed the street light with auto intensity tracking system by which one can increase the conversion efficiency of the solar power generation [1]. Here, the sun tracking sensor is the sensing device which senses the position of the sun time to time and gives the output to the amplifier based on light density of the sun [2]. That have proposed about Street Light Glow on detecting vehicle movement using sensor is a system that utilizes the latest technology for sources of light as LED lamps. It is also used to control the switching of street light automatically according to the light intensity [4].

The implemented design of traffic flow based street light control system with effective utilization of solar energy in the year 2015. They used the renewable source of energy i.e. the solar power for street lighting [5]. He is surveyed on

Street Lighting System Based on Vehicle Movements. The system operates in the automatic mode which regulates the street light according to brightness and dimness [6].

III. SYSTEM DEVELOPMENT

3.1 BLOCK DIAGRAM



3.2 WORKING

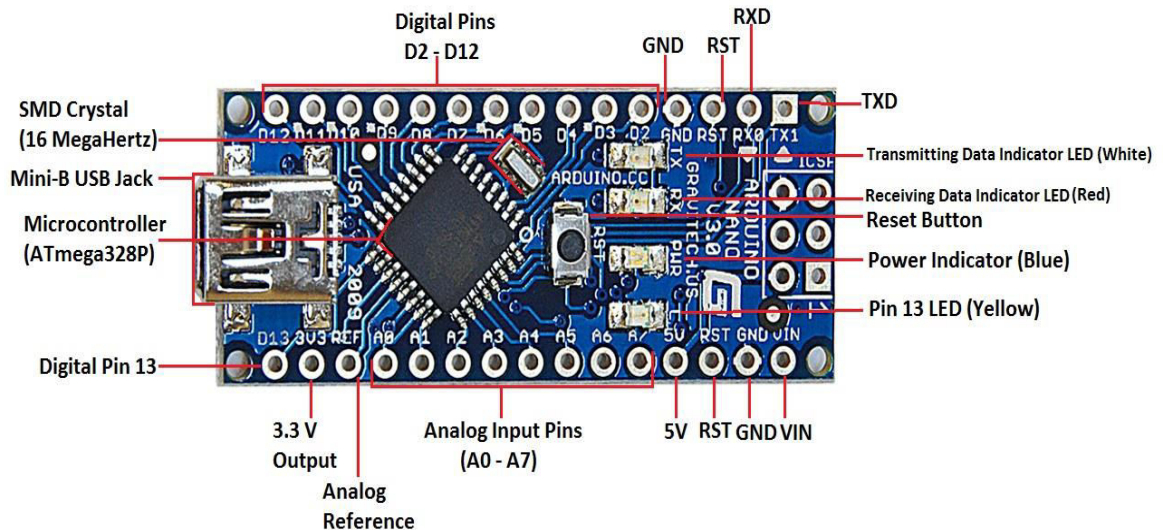
Power project basically work with pwm method and Technology during this system we use IR sensor for detecting cars LED light and LDR for detecting darkness and light-weight difference environment when it's dark time LDR sensor gets activated at low level and arduino put on pwm of LED so whenever any car pass from Led because on and when it distance in day time LDR set at high level and adinos on high mode so whenever pass there's no LED which glows this how we will say a that we will consume solar power and storing battery which is Li continuously utilized on street lights using pwm technique.

IV. SYSTEM COMPONENT

4.1 Arduino NANO

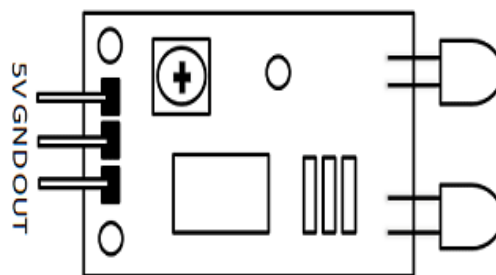
Arduino Nano could be a microcontroller board designed by Arduino. The microcontroller utilized in the Arduino Nano is Atmega328, the identical one as employed in Arduino UNO. It a large range of applications and may be

a major microcontroller board due to its small size and suppleness. The Arduino Nano could be a small, complete, and breadboard-friendly board supported the ATmega328 (Arduino Nano 3.x) or ATmega168 (Arduino Nano 2.x). It's more or less the identical functionality of the Arduino, but in an exceedingly different package. It lacks only a DC power jack, and works with a Mini-B USB cable rather than a typical one.



4.2 IR Sensor Module Features

- 5VDC Operating voltage
- I/O pins are 5V and 3.3V compliant
- Range: 6cm
- Adjustable Sensing range
- Built-in Ambient Light Sensor
- 20mA supply current
- 1 Mounting hole



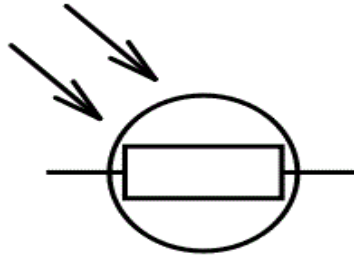
STRUCTURE

An IR sensor is largely a tool which consists of a pair of an IR LED and a photodiode which are collectively called a photo-coupler or an opto-coupler. The IR LED emits IR radiation, reception and/or intensity of reception of which by the photodiode dictates the output of the sensor. Now, there are numerous ways by which the radiation may or might not be ready to reach the photodiode. Let's discuss some.

4.3 LDR

Light Dependent Resistor (LDR) or a photograph resistor may be a device whose resistivity may be a function of the incident radiation. Hence, they're light sensitive devices. They're also called as photo conductors, photo conductive cells or just photocells. They are made from semiconductor materials having high resistance. There are many various

symbols wont to indicate a LDR; one amongst the foremost commonly used symbol is shown within the figure.



Working Principle of LDR

A light dependent resistor works on the principle of photo conductivity. Photo conductivity is a physical phenomenon within which the fabrics conductivity is increased when light is absorbed by the material.

When light falls i.e. when the photons fall on the device, the electrons within the valence band of the semiconductor material are excited to the conduction band. These photons within the incident light should have energy greater than the band gap of the semiconductor material to create the electrons jump from the valence band to the conduction band. Hence when light having enough energy strikes on the device, more and more electrons are excited to the conduction band which ends up in sizable amount of charge carriers. The results of this process is more and more current starts flowing through the device when the circuit is closed and hence it's said that the resistance of the device has been decreased. This can be the foremost common working rule of LDR.

4.4 Solar Panels

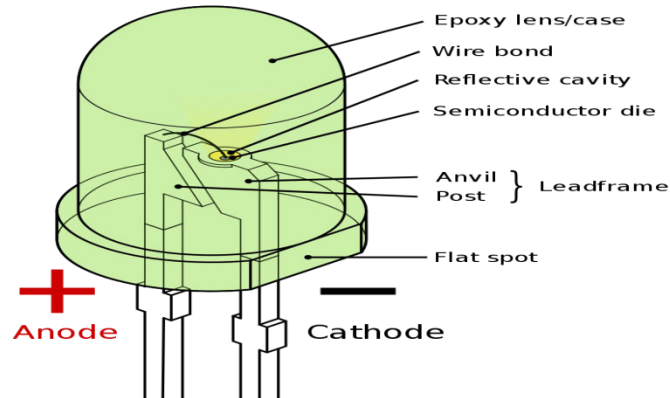


Theory and construction

Photovoltaic modules use light energy (photons) from the Sun to get electricity through the photovoltaic effect. The bulk of modules use wafer-based crystalline silicon cells or thin-film cells. The structural (load carrying) member of a module can either be the highest layer or the rear layer. Cells must even be shielded from mechanical damage and moisture. Most modules are rigid, but semi-flexible ones supported thin-film cells also are available. The cells must be connected electrically nonparallel, one to a different.

4.5 Light-emitting diode (LED)

It's a semiconductor light that emits light when current flows through it. Electrons within the semiconductor recombine with electron holes, releasing energy within the style of photons. This effect is named electroluminescence. The colour of the sunshine (corresponding to the energy of the photons) is decided by the energy required for electrons to cross the band gap of the semiconductor. White light is obtained by using multiple semiconductors or a layer of light-emitting phosphor on the semiconductor.



4.6 APPLICATIONS

1. Employed in street light applications.
2. Employed in Domestic applications.
3. Airport Lighting
4. Highway and roadway lighting
5. Park and Playground lighting
6. Industrial lighting and commercial lighting

V. CONCLUSION

The Streetlight controller using LDR based candlepower & traffic density, within the today's up growing countries are going to be more practical just in case of cost, manpower and security as compare with today's running complicated and complicated light controlling systems. Automatic Street Light Controlling System puts up an awfully user friendly approach and will increase the ability. This paper elaborates the look and construction of automatic street system circuit. Circuit works properly to show lamp ON/OFF. LDR sensor and also the photoelectric sensors are the 2 main conditions in working the circuit. If the 2 conditions are satisfied the circuit will do the required work per specific program. Each sensor controls the turning ON or OFF the lighting column. The road lights have been successfully controlled by microcontroller. With commands from the controller the lights are going to be ON within the places of the movement when it's dark. Furthermore the disadvantage of the road light system using timer controller has been overcome, where the system depends on photoelectric sensor.

REFERENCES

1. Automatic Street Lights by Saakshi Srivastava Electronics and Communication Engineering, Institute Of Technology and Management AL-1, Sector-7, GIDA, Gorakhpur, U.P., INDIA.
2. Design and Implementation of an Automatic Street Light system by Isah Abdulazeez Watson, Oshomah Abdulai Braimah, Alexander Omoregie Department of Electrical/Electronic Engineering, Auchu Polytechnic, Auchu, Nigeria
3. Automatic Street Light system Using Microcontroller by Mustafa Saad, Abdalhalim Farij, Ahamed Salah And Abdalroof Abdaljalil Department of Control Engineering College of Electronic Technology/ Baniwalid Baniwalid-Libya
4. Design and Implementation of Automatic Street Light Control Using Sensors and solar battery Sharath Patil G.S1, Rudresh S.M2, Kallendrachari.K3 ,M Kiran Kumar4, Vani H.V5
5. Autonomous street lighting system supported alternative energy and LEDs" Author(s) : M. A. Dalla Costa ; L. Schuch ; L. Michels ; C. Rech ; J. R. Pinheiro ; G. H. Costa Federal University of Santa Maria - UFSM, GEPOC - GEDRE, Av. Roraima N° 1000, CEP 97105- 900, Santa Maria - RS - Brasil Cited by IEEE Publications
6. Street lighting using solar powered LED light technology: Sultan Qaboos University Case Study by Mahmoud I. Masoud Department of Electrical and Computer Engineering, Sultan Qaboos University, Muscat, Oman Published in: GCC Conference and Exhibition (GCCCE), 2015 IEEE 8th Date of Conference: 1-4 Feb. 2015



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