

## IoT based Intensity Control of Room Lights

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### ABSTRACT

Recent years, Light energy consumption minimization has become the important aspect. In this, it is proposed to develop a system that will help various organizations to play an effective role in saving electrical energy. Energy utilized for lighting purpose sums up to a considerable part in the overall energy consumed. Effective and efficient lighting helps in reducing the unwanted excessive use of energy wasted. Smart illuminance control techniques concentrates on providing effective illuminance at a work place by varying the dimming levels of the networked luminaires. so here we used arduino board and Light Dependent Resister sensor to control the room light.

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### Introduction

“Internet of things” is emerging technology. This provides the user to control the things from anywhere anytime. It is the network of physical objects or “things” embedded with electronics, software, sensors, and network connectivity, which enables these objects to collect and exchange data.

The Internet of Things (IoTs) can be described as connecting everyday objects like smart-phones, Internet TVs, sensors and actuators to the Internet where the devices are intelligently linked together enabling new forms of communication between things and people, and between things themselves.

Now anyone, from anytime and anywhere can have connectivity for anything and it is expected that these connections will extend and create an entirely advanced dynamic network of IoTs. IoTs can also be applied to create a new concept and wide development space for smart homes to provide intelligence, comfort and to improve the quality of life.

IoT works on RFID, sensor and embed with other technology like smart technology, Nano technology. In this paper, we developed the project that controls the light intensity using LDR and potentiometer. Electricity has always remained a prime necessity of life as it is impossible to imagine our life without electricity. There is wastage of electricity while using home appliances and consumption is more.

Due to this, we can control the lights or home appliances using IoT. Here we can control depending on the environment status the light must glow. so that lighting levels maintained. The system that has the ability to tune the light levels focus on avoiding over-illumination to save energy. These systems can also detect under-illuminations that might occur when the daylight intensity decreases during the day, and tune the artificial lights. The system can shut down the lights that are responsible for the illumination of the unoccupied areas.

The combination of these two functionalities (i.e., tuning the light levels and turning the lights ON/OFF) results in the highest energy savings in buildings.

In recent year, there are many implementation is going for the controlling the light intensity to make it more efficient day by day. Many researches are implementing to optimize the efficiency of the automation system; through simulation we can also implement the technique that controls the light. But now a day’s mostly microcontroller is being used. Practically we can implement the controlling of lights that optimize energy consumption for the better result and to improve the technology for the less consumption of electricity and used Illumination Balancing Algorithms [1].

Some of implementation are made on street light that is depending on climatic condition and vehicle movement the light brightness automatically adjusted [2] and also controls the street light intensity from dusk to dawn depending upon the brightness [3].

### Implementation

#### Light Intensity control by LDR and potentiometer

The system mainly developed for controlling the light intensity for saving the energy consumption. The light intensity must be managed during daylight and night. For this, we used LDR and Potentiometer to control the light intensity. The components interfaces shown in fig. 5.1

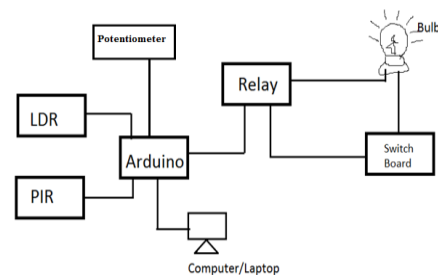


Fig 5.1. Architecture diagram for proposed system.

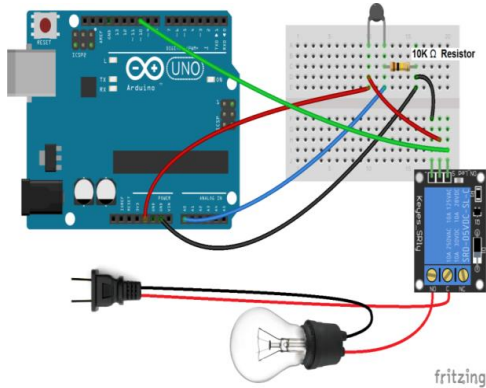


Fig 5.2 b. Circuit Diagram

#### Connection steps

- Connect arduino pin -2 to relay channel
- In relay we have input pin, VCC and Ground that will be connected to arduino and switch board.
- LDR and Resistor are connected to Breadboard.
- LDR and register one end connected to analog input A0.
- Potentiometer has 3 terminal one end is connected to ground, input pin is connected to LED and VCC is connected to 5v power supply

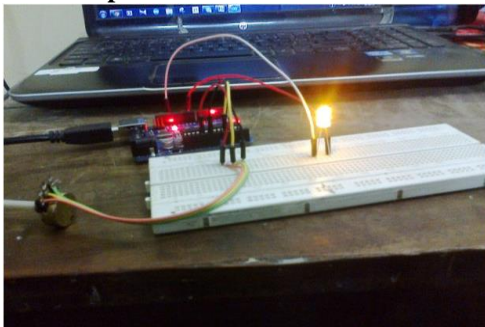
#### Working Procedure

The Light dependent resistor and the 10Kohm resistor are powered by the Arduino's 5V power supply and form a potential divider, which protects the Arduino from short circuits and ensures that at least some resistance is always present on the line.

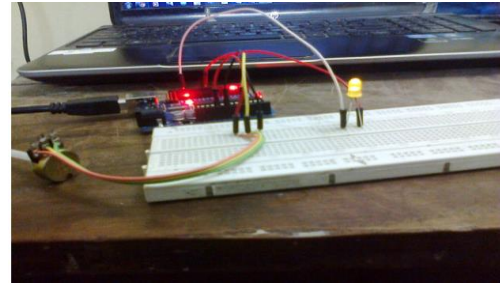
A wire is connected from this circuit to analog input A0 on the Arduino. Resistors lower the voltage passing through them, and so to read changes in light from this circuit, you can use the Arduino's analog to digital converters (ADCs) to measure the voltage level of the input.

When the Light Dependent Resistor is exposed to light, its resistance decreases and so the voltage reading will be higher. When light is blocked, the resistance of the photoresistor increases and so the voltage reading will be lower.

#### Results of the Experiment



The above figure shows the variations in light intensity when there is darkness in the room which is detected by LDR and we can also change the light intensity using potentiometer.



Whenever there is presence of light LDR automatically controls the intensity of light.

#### Conclusion

We can control the light intensity efficiently using the arduino and LDR. This project provides the efficient work when there is wastage of energy in electric. Depends on light intensity the light will glow and manage bulb light intensity levels.

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