

# Light Controller

Prepared By





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## Introduction:

Electrical energy is very essential part of all human being. It is observed that, the demand for power is increasing day by day, but supply is not meeting to that demand. And hence there is a huge gap in supply & demand. It is also observed that to meet the demand of industries, there is power cut in many non-industrial areas especially rural parts. Hence there is need to save the available power by proper usage of it.

## Scope of the problem:

Generally it is observed that, there is less awareness about the usage of electricity. Many street lamps especially street lamps installed by government in urban & rural areas are not get turn **OFF** & turn **ON** at the right time and hence lots of power gets waste. For operating these kinds of lamps or outdoor lamps, one needs to take care of it & hence it includes delay as well as human resources.

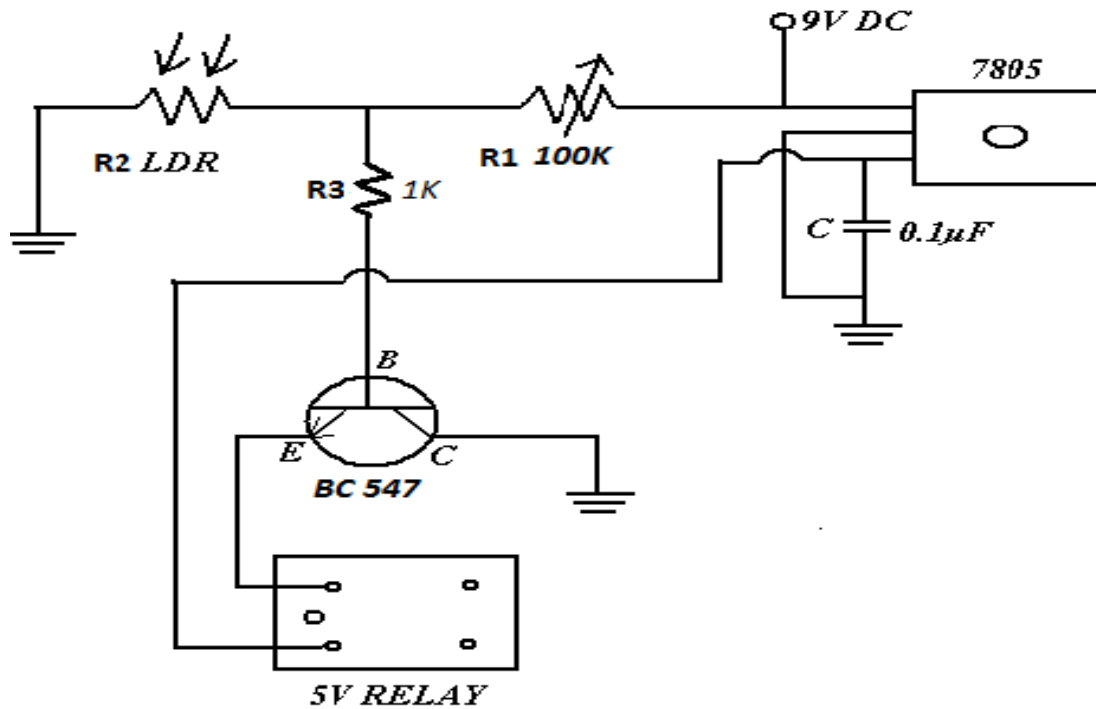
## What we can do..?

To overcome this problem we proposed a system called **LDR based light controller** which turns ON & turn OFF the lamp depending upon the light intensity. When light intensity decreases it turns ON the lamp & when light intensity increases it turns OFF the light. With this we can save the energy as well as human delay for operating the outdoor lamp.

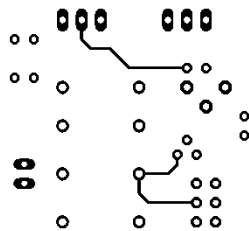
## The Device –Light Controller:



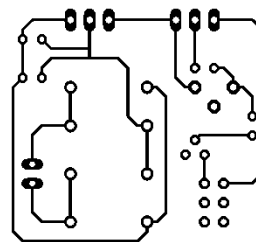
## Circuit Diagram:



## Board Files:



TOP SIDE



BOTTOM SIDE

Please find the above Board files on the following link:

<http://www.scribd.com/doc/160928041/LDR-Board-FILE>

## Circuit Description:

Two resistors R1 & R2 of device actually form a voltage divider circuit. When sun light falls on LDR, its resistance gets decreases and hence current can through it. The output from these two resistors i.e. from voltage divider circuitry get amplified with help of amplifier **BC 547**. This amplified signal is then feed to a 5V relay. Because of this, Relay gets tripped and light gets turn **OFF** (This is because light's phase cable is connected to the NO(Normally Open) contact of the relay).

Similarly when dark forms the resistance of LDR gets increases and current does not reach up to the relay and hence relay's contact lead gets back to its original position i.e at *NO*(Normally Open) contact lead. This lamp gets turn **ON**.

## Technical Details:

### Components Used:-

#### 1. Transistor BC547

**BC547**:-is a plastic package general purpose NPN transistor which is commonly used for switching & amplification purpose.

#### FEATURES:

Low current (max. 100 mA)  
Low voltage (max. 65 V).

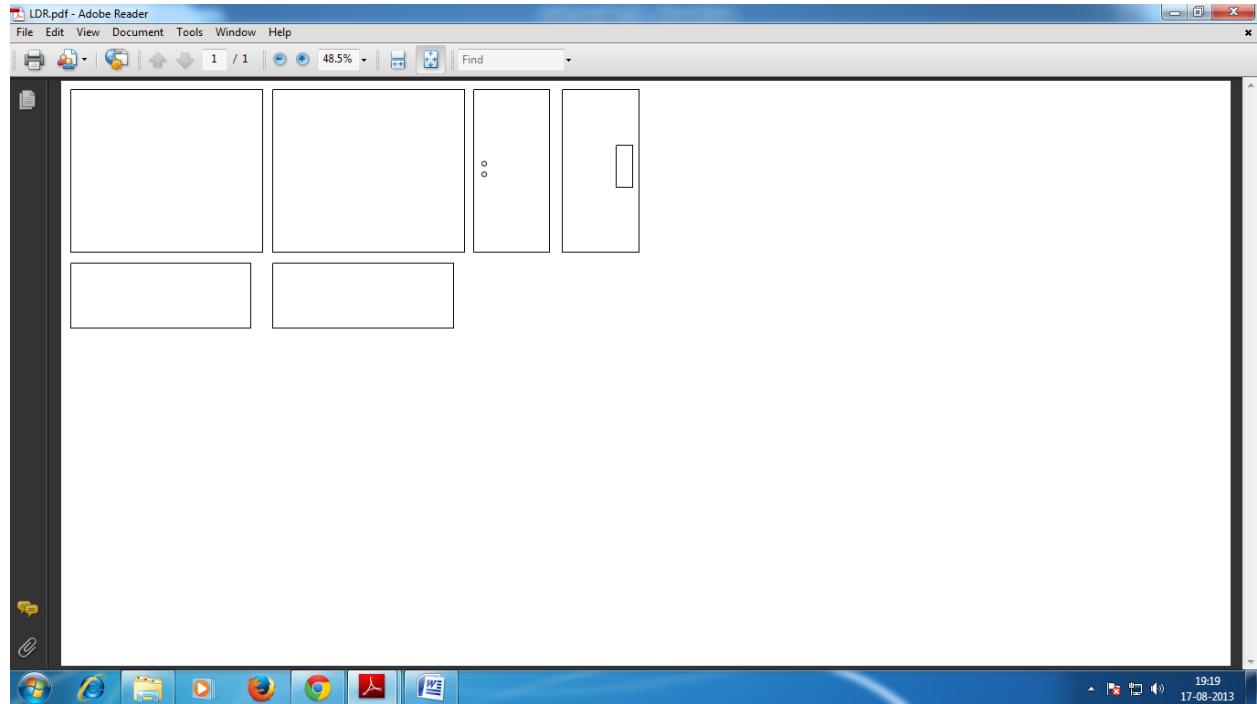
#### 2.7805 Voltage Regulator:

It is used to regulate the output voltage. It gives 5V DC constant voltage to the circuit. It can take input voltage up to 25V DC.

### Material list and tentative price:

Components	Quantity	Rate (Rs)	Price (Rs)
<b>BC547</b>	<b>1</b>	<b>2</b>	<b>2</b>
<b>Voltage Reg. 7805</b>	<b>1</b>	<b>15</b>	<b>15</b>
<b>5V Relay</b>	<b>1</b>	<b>20</b>	<b>20</b>
<b>Transformer 12V</b>	<b>1</b>	<b>60</b>	<b>60</b>
<b>Diode IN4007</b>	<b>4</b>	<b>0.50</b>	<b>2</b>
<b>Resistor (1K)</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>9V DC Battery</b>	<b>1</b>	<b>10</b>	<b>10</b>
<b>100K Variable Res.</b>	<b>1</b>	<b>8</b>	<b>8</b>
<b>LDR</b>	<b>1</b>	<b>5</b>	<b>5</b>
<b>0.1uF Capacitor</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>Wires</b>	<b>1 (M)</b>	<b>7</b>	<b>7</b>
<b>Soldering Metal</b>	<b>60 (cm)</b>	<b>5</b>	<b>5</b>
<b>Enclosure</b>	<b>1 Set(6 Pieces)</b>	<b>150</b>	<b>150</b>
		<b>Total</b>	<b>286</b>

## Enclosure:



**Please find the above enclosure file on the following link:**

<http://www.scribd.com/doc/160925434/LDR-Enclosure>

## Scope ahead:

**A few modifications can be done with the present system like:-**

1. Power can be supplied to circuit from the AC source itself instead of separate power supply.
2. Rechargeable Power supply instead of non-rechargeable batteries.
3. Better Casing or Enclosure for easy handling & tough weather condition.

## Propagation:

We want this system should be adapted by the communities living in rural, urban & city areas to save the electric power.

We also want the awareness about saving electricity should spread among all especially children's as they can save more electricity in their whole life.



## References:

[www.alldatasheet.com](http://www.alldatasheet.com)

<http://inkscape.org/doc/basic/tutorial-basic.html>

<http://www.cadsoftusa.com/training/tutorials/>

## Document History:

Index	Date	Author	Modification made
1	'April 05, 2013	Vigyan Ashram	Document Created
2	'April 11, 2013	Vigyan Ashram	Document Modified
3	'June 08, 2013	Vigyan Ashram	Document Modified
4	'Aug 17, 2013	Vigyan Ashram	Board Files Added