

Sensor Based Energy Conservation (Power efficient LED Bulbs) Using TRIAC and LDR

In this project we have used very simple and low cost components to control the veranda/wall lights automatically. There is no need to write any program, no need to have any micro controller or micro-computer. Simple electronics devices like BT 136 TRIAC, 220K Ω resistor, and light dependent resistor LDR. The main advantage of this project is that it encased all the circuit components inside the bulb holder and hence becomes very compact, easy install and use. The construction picture is shown in figure-1 and in figure-2, a small hole is made on the of bulb holder for the sensor (LDR) to interface with outside-environment and sun-light. Therefore, the set-up/project can be used as power efficient automatic veranda/wall/balcony/street light.

Working:

In the day time due to light from the sun, the resistance of LDR will be too minimal/low. So the voltage fall/drop is maximal/high. This keeps the TRIAC (BT136 or BT139) offstage. BT136 or BT139 is a TRIAC that is used to manage/control the main power 110/220volt AC directly. The light/bulb will remain OFF. As night falls the resistance of LDR rises/increases and it turns on the TRIAC and the light/lamp/bulb turn on. (TRIAC is an electric component that is used to manage the light directly 110/220 volts AC main power)

The additional benefit of LDR switch wall/veranda lights :

Veranda/Balcony/Wall lights use a lot of power in rural as well as urban areas. Mostly even after sunrise, we forget to turn OFF them and remain ON for the whole day. Much quantity/amount of electric energy is wasted in this way. The automatic ON-OFF lights using LDR works according to the light of the sun. During day-time LDR detects the light and its resistance becomes very low hence the bulbs are turned OFF whereas, when it's getting dark its resistance is increased gradually up-to the range of mega ohms (M Ω) and if the sun light intensity is below a particular value, thus the bulbs are spontaneously turned-ON without any external support i.e. automatically. Once the street lights including bulbs, tubes-lights, etc are placed in this managing system there is no need to monitor them anymore. They perform the function on its own without any external assistance. They are very cheap and reliable. This system can manage heavy loads up to 7A if you use BT139 then it can control/manage 18A main current.

As we all know that one unit of energy saving is equal to 100 units of energy generation, it means we should avoid wastage of electric energy. Though some technologies have adopted but are not practical and inefficient due to high cost of installation. Therefore, our project (sensor based LED Bulbs) will be advantageous for low cost, low power balcony/wall/veranda/ street light controller circuit. Each family would be afford (Rs.100 approx. per product) to purchase and use it for energy saving in the house-hold, garden, compound etc. The unit is being used in the college Verandah in the old campus and will be used in the new campus at several points

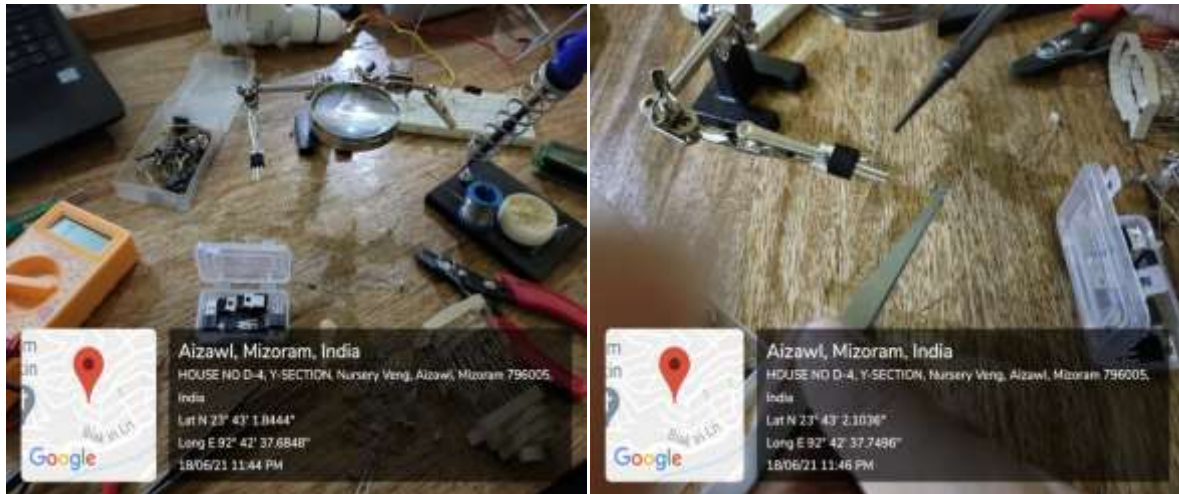


Figure 1: Making of the Circuit



Figure 2: Completed Circuit/product



Precautionary measure:

The Light Sensor Switch operates on 110/220volts AC directly and if you are not familiar to working with mains voltage or do not have awareness/experience in working with 220v AC Mains Voltage, please stay away from this electric project while it is fastened/connected with main high power voltage.



