SOLAR BASED WIRELESS CEILING LIGHT WITH REMOTE

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Abstract: The main theme of this prototype project is to have a knowledge on wireless power transmitter and receiver. In this project we are going to used to know concept such as resonant inductive coupling method, for the transmission of electrical energy between the coil. The source for the electrical energy generated form solar panel in a process like the cell on the solar panel are made of photovoltaic cells which convert the heat energy(ultraviolet energy) from the sun into electrical energy which is totally free of cost, since it's a nature resource(sun).After that electrical energy pumped into the inductive coil and other coil is placed at least minimum of 10cm ,then power coil produced may even passes through the wall because there are high frequency pulses.We are using solar panel with rating of 12v and it can generate 0.6Amp current.

In addition to it, we are using rechargeable battery for the backing up. We are using microcontroller in remote to control light to energized or de-energized like one of its acts like an encoder and other as a decoder. As for the efficiency terms wireless power system is not good because it can generate huge electro-magnetic fields. As we know that how coil things work in practical world it can absorb only 70% energy in the state of closure (gap between them).

1.INTRODUCTION

This project is totally related to wireless energy. So, we are going to know some of wireless power techniques such as near-field techniques, radiative techniques and also radio communication related to electromagnetic waves and the RF communication, through this project we are going to use the above concept to build this project in symmetric way.

In this project we are using two coils in way that one acts as transmitted coil and the other one is receiving coil in terms of power, transmission coil and receiving coil should be placed parallel for some distance, for the sake of power transmission. As, we know already know that range of power transmission increase totally depends on the power source, with this we can use free wireless energy and we are using rechargeable battery, which acts as a backup for the project, when there is no sufficient solar energy present .For designing remote we are using RF modules and also RF communication for transmitter to on and off, in other terms like power up and down.

During the project trail runs, its generating low voltage and low current. We found that around 120 milli amps currents is generated from the source voltage 5. Our project is glow light it can be from any source due the above result we are going for low voltage consume led are using in our prototype project.

APPARATUS:

Solar-panel(12v),Re-chargeablebattery(2AH),Self-oscillatorcircuit,Microcontrollers,433MHz RF modules, Relay, High glow LED's(23).

We all know that our prototype project is about wireless energy, simply the power can't flow itself in air. So, there are so two techniques to transfer power without help of any conductors. One of them is Near-Field techniques, as the name itself imply near means close, in this technique power transfer is shorter in distance like using inductive coupling between two coils as in our project. They are so applications using this technique like charging the train, RFID tags that we are using near the toll gate in the highway.

Second another way to transfer the power, that technique is called Radiative technique.
In this technique we are transferring power for a long-distance usage beam of electromagnetic radiation like microwave beams and it's must target to the receiver all the possibility. Applications under this technique are drone aircraft.

RF communication system, RF transmitter that's remote transmit an 8-bits code with the help of controller opposite side controller which acts like decoder receive the code there will be command of on and off for the decoder to energized or de-energized led light.

Radio communication, in general terms radio communication means sending data form a point to another point. It is a wireless communication it as a different process of communication when it enters into the air it turns into ripple form and also after some distant it hits a distant conductor, after that the second conductor weak current. Radio communication belong to electromagnetic waves due to its sudden change electric currents.

In this project are we are implementing digital communication than analog communication because of is characteristics features like different types of modulation carried out. So, digital communication has some feature which help project in way that information encrypted is proceed. We came across in analog communication subject that a source message required a carried signal to travel long distance if not the message signal is destroyed or loss in the process. So, 433MHz carrier signal is generated so that the command of remote is carried through control key in the RF transmitter.

3.RELATED WORK

Table 1. Similar Works

Authors	Journal Publication	Approach	Advantages	Limitations
Patrizio Primiceri Paolo Visconti	ARPN Journal of Engineering and Applied Sciences.	To obtain energy savings, low maintenance costs employed in solar powered LED-based lighting system	• Open standard protocol with no licensing fees • Available from number of source.	As the required high maintenance But it is not explained
I.Mathews P.J.King F.Stafford R. Frizzell	IEEE Journal of Photovoltaics	Use of solar cells from solar panel for the indoor light energy Harvesters.	• provides good energy efficiency	Computation time is more.
Parkash, Prabu V, Dandu Rajendra	IJIRSET	A manual system where we can turn on the led lights and turn off the light.	• Automatic Switching of led lights. • Reduction in CO_2 emission.	More manpower. High dimensionality.
P.Visconti, A. Lay-Ekuakille, G. Cavalera, P. Primiceri	International Journal on smart sensing and Intelligent Systems.	Design a household Electrical Consumption's control unit.	• Range of remote controller is high upto 8feets.	Its highly non-scalable
Monali Y.Khachane Sherali Zeadally Oswald Jumira	IJERCSE	Desgining and executing the advanced development in embedded system for energy saving.	• Energy Efficiency in wireless Networks	Hardware dependence is more.
Hubert Trazaska, Steven E.Schwarz	International Journal of Advanced Research in Appiled Science	Electric and Magnetic fields relationship producing	• Uni-directional flow current no interruption.	Maximum Output produce depend on size of the solar panel.

	and Technology	current.		
M. Granger Morgan	International Journal of science and technology	Deals with fields from Electric Power.	• Wastage of electricity	Computation time is more.
Prashanth Ken, Shaik Mohammed Wajid, Syed Zuber Ahmad, Rahimunnisa, Shruthi K	IJARIIT	development of technology, where automation system plays a vital role in daily life experience and it is being preferred over the traditional manual system today	• Solving complex problems • Fault diagnosis	Rechargeable batteries have to be replaced from time to time.

4.EXPERIMENT SETUP

This is the prototype project for saving power using solar energy. In this project we are using solar panel of rating 12v and produce an output of 6v,which is connect to rechargeable battery, inductors, special MOSFET's, resistors and finally to the primary coil. Secondary coil is placed exactly parallel to the primary coil certain distance(10cm) to transmit the source power to the secondary coil which as already connected to the LC circuit with led connection help to light the led. For controlling the power supply in terms of on and off we are using remote, which as so software in it.
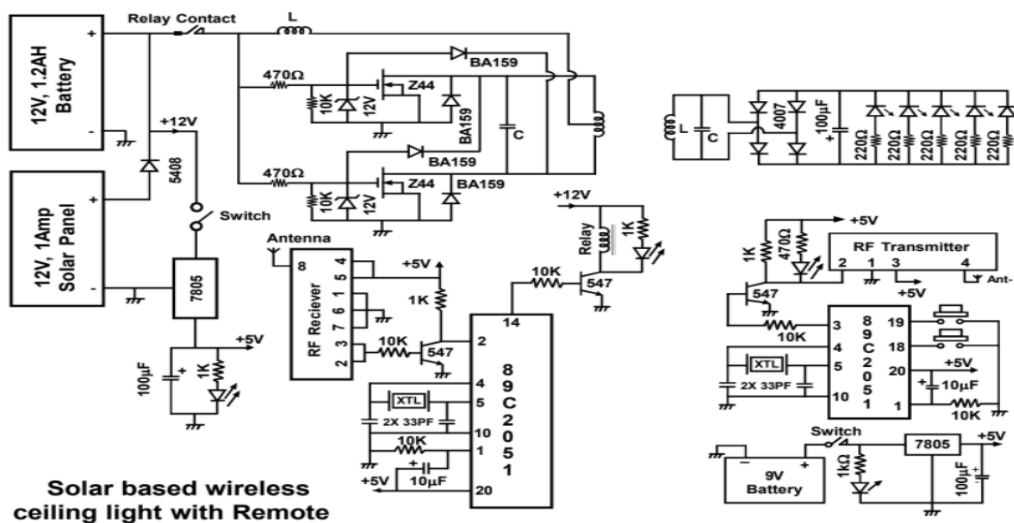

Figure 1. Block diagram of experimental setup

5.WHY WE ARE USING LED

The relevance of street lighting is growing. HID Lamps are used as light sources in most outdoor illumination sources, such as street lights. Global concerns have been expressed about the quantity of electricity required by HID bulbs, and, as a result, the amount of CO_2 released into the atmosphere as a result of this power consumption.The lifecycle of an LED light can be up to three times longer than that of a HID light. LED lighting could cut down on the time it takes to replace broken fixtures, and it's predicted that an LED system will be relatively low-maintenance. As a result, the LED system may be regarded acceptable for usage on remote islands or in high hilly areas [6]. This technique entails making each lamp completely self-contained in terms of lighting management by controlling through the wireless network to the base station for data processing, and in the event of a malfunction, the service engineer is notified via a graphical

interface to take corrective action [2]. In this project usage of no of leds depend on the solar panel because of its producing output range.
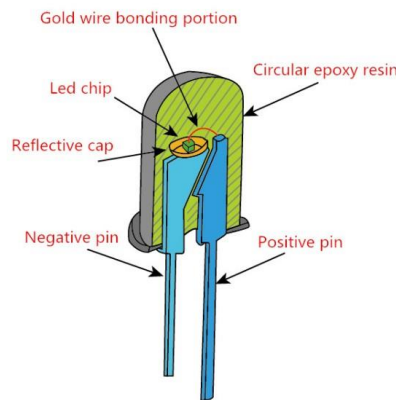
Figure 2. Structure of LED

6.WORKING OF SOLAR BASED WIRELESS CEILING LIGHT WITH REMOTE

We have placed solar panel in way that its absorb the solar light in the photovoltaic cells .Voltage and current produce by the solar panel depends upon the arrangement of photovoltaic cells in solar panel. If there are connected in series voltage will be doubled, in parallel connection means current will be doubled. It as a rechargeable battery for backup upto 30minutes.

Battery backup time = Battery rating/power consumption at the system .

Charging time = Battery rating/ charging current.

We have connected mosfet,resistors,inductors bulid as self oscillator circuit, the circuit itself is designed to generates a continuous chain of pulses. The solar energy is drive into the primary coil and it produce electromagnetic pulses to secondary coil ,here we tune the LC circuit in a way that we can maximum the output current. Additionally we used remote to control the led to turn off/on using microcontroller and some software to handle the on/off modes in remote.

Figure 4. Prototype

As the above figure is totally final setup of the prototype of solar based wireless ceiling light with remote assembling the components as efficient as possible to produce efficient output .And the output of prototype is shown in the figure 5.
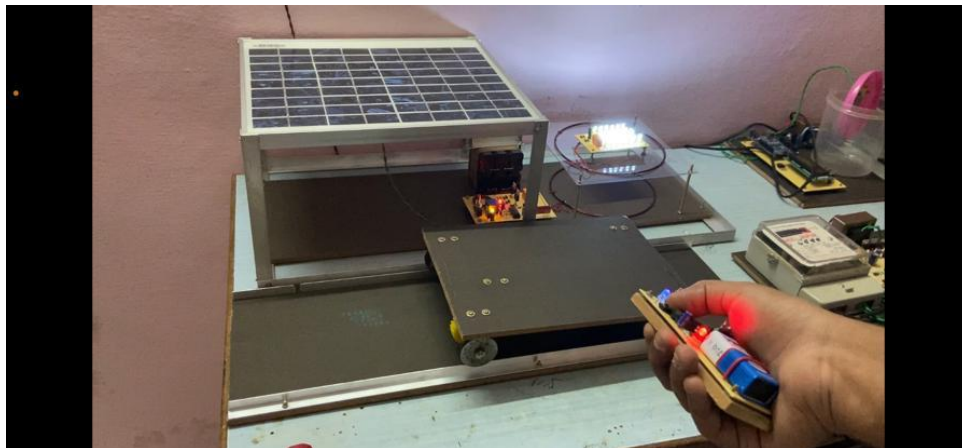
Figure 5. Solar Based Wireless Ceiling Light with Remote

7. CONCLUSION

This project is related to wireless system, we came across variety of concept like wireless transmission methods, wireless power transfer technique like near-field that we used in our prototype project, LC circuit back-forth process, importantly RF communication and related RF modules in it.

Every above concept played an important role in this project, in them synchronizes is the toughest one because we need provide maximum voltage to secondary coil, so distance can be increased. Finally electrical energy generated by the solar panel is induce to primary coil and then primary to secondary coil there as been power transfer been successfully achieved by method of resonant inductive coupling, and power produced by the coil will be transmitted in unidirectional, so power transmitter and power receiver placed parallel. LC circuit correct equipment match as met synchronized is successful is done, led glows, in addition to that controller and RF modules used led light will be energized or de-energized.

8. ACKNOWLEDGEMENT

9. REFERENCES

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