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Solar Street Light Using LDR

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Abstract

The world's need for energy has grown in recent years. Therefore, when fossil fuels are used more and more to meet energy demands, fossil fuels will smother if they are utilized at this pace in the future. To we can employ renewable energy to replace the depletion of fossil fuels. Because they are suitable and easily accessible. Currently, LED (light emitting diode) lights have taken the place of high-intensity lamps with intensity discharge) that were utilized in city streets lights. The way that solar street lights operate is based on sun cell or photovoltaic cell. In summary, this paper is based on the notion of preserving the highest level of usage and minimal energy loss that is possible. This shift is best illustrated by solar street lights, which run on photovoltaic cells that turn sunlight into power. This work essentially promotes energy loss minimization and efficiency maximization. It highlights how crucial it is to switch to renewable energy sources in order to properly address the depletion of fossil resources.

Keywords: Wind Energy, Wind Turbine, Wind Generator, *renewable energy, LED*

INTRODUCTION

The radiant energy that the sun emits is called solar energy. Globally, solar street lights are becoming more and more popular because of their advantages for the environment and energy economy. These lights use solar panels to capture sunlight and turn it into power so they can run off the grid. The Light Dependent Resistor (LDR), which is essential to many solar street light designs, is what makes them operate automatically[1]. There are two methods for converting solar energy into electricity:

1. Making use of solar energy.
2. Making use of concentrated solar electricity indirectly.

SOLAR STREET LIGHT SYSTEM

The solar street light's components:-

1. **Photovoltaic cell (solar panel):-**

This is a necessary component for solar street lights since solar panels will produce electrical energy from sun energy[2-4]. Solar-powered units are divided under two categories:-

- Mono-crystalline and
- Polly crystalline.

2. **Lighting Fixtures:-**Modern solar street lights use LED lighting sources since they produce significantly more lumens with a 50% reduction in energy usage compared to HPS fixtures. High pressure sodium vapor lamps are known as HPS fixtures. It's also referred to as an arc light or high intensity discharge, or HID, and it's a particular kind of gas discharge light.
3. **Rechargeable batteries:-**During the day, the solar panel's electricity is stored in a rechargeable battery, which then powers the fixture at night[5-9]. Rechargeable batteries often come in two varieties:
   - Deep cycle gel cell battery.
   - A battery with lead acid.
4. **Pole:-**Every street light system must have street poles. This is due to the fact that parts like the following are frequently fixed to the top of the pole:
   - Accessory devices (fixtures),
   - Panels, as well as
   - Energy sources.

2. **Solar street light controller:-**

Despite the fact that solar lighting systems are more affordable and environmentally beneficial than conventional lighting systems, some people are still unwilling to switch due to the upfront costs. Now let's see how solar Control system functions, which will enable you to comprehend the Benefits of solar lighting systems use[10-13].

a. Control Center:-The control center, which consists of a PC, server, and solar streetlight, is the primary monitoring platform for the control system. Control software, a web server, and numerous more devices that allow it to receive data from the data center's GPRS/CDMA module.

b. Gateway:-The primary purpose of the gateway is to gather data from the solar lights and send it to the terminal controller. The GPRS/Ethernet signal from the ZIGBEE signal is converted and sent to control center.

c. **Terminal Controller:-**It controls the charging and discharging of solar-powered batteries[14].

LDR (LIGHT DEPENDENT SENSOR)

A light-controlled variable resistor, sometimes referred to as a photo resistor or photocell, is a light-dependent resistor. This is particularly helpful for light- and dark-sensing lamps. The opposition of LDR can reach 10,000 000 ohms at a time. First we want to enter AT mode with a baud rate of 38400 by pressing the linear actuator button on the Bluetooth module or by giving a HIGH to the pin of the linear actuator. All commands should end with \r\n, if we tend to send AT to the module, then the module can reply with ok[15-20].

AT → Check command

at+role= null → select slave mode

at+role= 1→ master mode selection

at + name = xyz → set Bluetooth name

at+pswd = xyz → set word

at+uart=,, →set baud rate

For example

AT+UART=9600.00

Pin Accelerometer Description:

1.State→ Open

2.Rx→ Serial receive pin

3.Tx → Pin for serial transmission

4.Gnd→Ground

5.Vcc→+5 Volt DC

6.En→ to switch to AT

Mode

RESULT AND DISCUSSION

The control system for home electrical appliances using Bluetooth technology and an Android phone is built such that a java code written as a mobile application on the phone is been interfaced with a circuit consisting of several units[21-25]. The mobile application is used to send signals to a Bluetooth module connected to a programmed Atmel 8052 microcontroller which interpret the signals to control electrical loads connected to it via resistor, transistor and relay. The system uses a power supply with a 5volt DC output.
The power supply unit consists of a transformer that was used to step down a 220v AC to 12V AC supply, a bridge rectifier to convert the AC to pulsating DC supply, a filter capacitor to remove the ripples in the supply and then a voltage regulator to hold the DC output voltage constant at 5volt. Three light emitting diodes were used as inductors for power and two electrical loads engagement. All units in the design were tested and with a touch on the phone, the electrical load, in this case electrical bulbs, was engaged or disengaged. Now we have connect our Android phone to Bluetooth module. When Bluetooth module is connected to Android phone, we can send commend to 8051 microcontroller[26-30].
The microcontroller can process and according to given command the supply of relay is turning ON. The relay is operate at 5v DC supply and when microcontroller connect to supply the normally open (NO) switch is connected to main 220v AC supply. This relay is work as switch on load circuit. When microcontroller is turn on the supply of relay the switch is behaves as short circuit, and hence the supply is connected to load. As it is when touch on mobile to turn off the load, the microcontroller cut the supply of relay hence the relay is behaves as an open circuit. It mean we control the electrical appliances wireless through our Android phone. As we can control loads through Android phone this is the simplest form of controlling. It mean we can easily control appliances under a specific range (100m). The electrical appliances controlling through the Android phone is use of these person who have physically disabled[31-32].

CONCLUSION

The work has presented the design of an efficient, cost effective and reliable Android based electrical appliances control system, which has the abili6 to accurately control the power supply fed from the utility to any connected home appliances/device with the aid of an Android phone/pad. This project is so an occasional -cost and economical project for home application, with an easy and straightforward to use interface for the physically disabled folks and decrepit. By victimization this method, home appliances may be controlled to avoid the dangerous of electrical shock and convenience for users. This proof saves resources like time, energy and even lives whereas guaranteeing automatic and economical change ON and OFF electrical masses from the buyer end. This project doesn't have any restriction within the aspects of who to use it and who to not use it its applications vary from domestic homes, domestic outlets and light-weight industries. The Bluetooth module and robot phone application interface was successful tested on a mess of various mobile phones from different manufacturers, so proving its movableness and wide compatibility. so an occasional value home automation system was with success designed, enforced and tested.

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