

Research Article

Solar Tracker with Ups System for Factory and Clinic Emergency Supplies

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Abstract –This paper focuses on factory and clinic emergency supplies UPS system using solar energy with a solar tracking system. Solar energy and UPS system are two rapidly growing technologies due to the demand for electricity and to reduce the carbon footprint in the atmosphere. The main reason for this system to be chosen is UPS system can invert and rectify the electricity that's the solar power can be delivered to DC part of the system instead of an AC grid which may avoid the installation of excessive inverters in the system. The solar tracker is used to improve the energy gained by the panel or payload so that the system produces more power at high efficiency.

Keywords : Arduino Nano ,UPS ,LDR Sensor, Solar Tracker



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1. INTRODUCTION

Solar and wind energy are the two most abundant useful sources of renewable energy that are available on the Earth. The inconsistent availability of solar power, however has a negative impact on the efficiency and reliability of the power system. To eliminate such a problem, a power electronic converter and a solar tracking system is installed and can be used to interface the photovoltaic (PV) module and integrate energy storage with the loads. Although there were various problems encountered throughout the implementation process, what as able to learn was worth it. This project will try my best to make this project chosen success. This project is to design the UPS system for the needs of the clinic or factory to supply electricity if the clinic or factory has a problem with electricity supply. The project aims to supply electricity to clinics or factories in the event of a power outage.

2. METHODOLOGY

Arduino Nano has been used in this project as a main controller. It has controlled the full circuit in various ways. Moreover, there is four inputs and three outputs in this project. Solar Panel, Sensor LDR module, Battery, and inverter are the input in this project and the output is LED lamp, Relay MK3P and servo motor SG90.

3. RESULTS AND DISCUSSION

Table 1 shows how the project works. The sensor can read and detect the light of the lamp to produce energy. The power supply used is 5V. The Solar output power is 2W, the Output voltage is

12V and the output current is 167mA. At the connection of the servomotor, the red wire is connected to VIN/5V while the brown wire is connected to GND, and the orange wire is connected to D9/D7. The LDR sensor is connected to the 5V. The sensor LDR module connects the wire to pin A1 and pin A3. The movement of the solar panel depends on the sensor that detects the light above and below. When the sensor can detect the light, the servomotor starts moving 180 degrees. The solar panel can be charged from 8.00 a.m. to 8.00 p.m. When the battery is fully charged, the UPS system can operate fully.

Table 1: The table shows the time vs percentage battery

Time (Hours)	Lamp	Battery percentage
1 HOURS	Lit up brightly	100%
2 HOURS.	Lit up brightly	90%
3 HOURS	Lit up brightly	80%
4 HOURS	Lit up brightly	70%
5 HOURS	Lit up	60%
6 HOURS	Lit up	50%
7 HOURS.	Lit up	40%
8 HOURS	Dimly lit	30%
9 HOURS	Dimly lit	20%
10 HOURS	Dimly lit	10%
11 HOURS.	Not lit	0%
12 HOURS	Not lit	0%

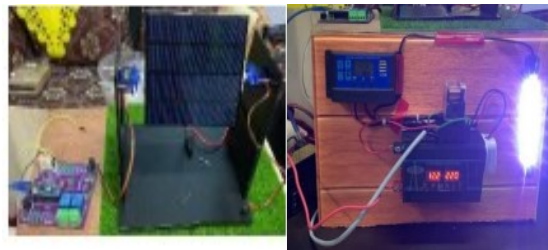


Figure 1: The Solar Tracker System.

4. CONCLUSION

This project is achieved by generating electricity when there is a sudden cut, especially in the middle of the night. In addition, this system can save costs because this system uses solar panels that can turn it into electric current. This system does not use gasoline or diesel oil to produce an electric current.

Acknowledgements: The researchers would like to thank their parents and supervisor for their financial and guidance support. The researchers would also like to thank friends and Polytechnic Lectures for helping in various ways to complete this project.

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