

FINAL YEAR PROJECT REPORT

Solar Power Generation along with Efficiency Improvement of Solar Panels, Automatic Solar Tracking and Remote Monitoring

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Project Abstract

Solar energy is the richest stream of energy that is available directly as solar segregation and has the sources of renewable energy. Its potential is 178 Billion MW, which is about 20,000 times the world's demand. Sun provides energy in the form of electromagnetic energy.

This project esteemed for the generation of electrical energy with the help of photovoltaic arrays known as solar cell / panel. The solar cell works on the photovoltaic effect. It is the type of photovoltaic cell whose electrical characteristics are light dependant. When it is exposed to light, it can generate and support the electric current without being attached to any external voltage source. So this resultant energy produced by the solar cells can be used to switch on the electrical appliances.

The main purpose of this project is to improve the efficiency of the solar cells. i.e. solar to electrical power conversion efficiency. The power generation efficiency of the fixed solar cell / panel is less. A practicable approach to maximize this efficiency is the solar tracking. So in this project a Automatic Solar Tracking System is proposed to track the movement of sun so that the output power is maintained constant. For this purpose we will use LDR sensors and the LM324 comparators. The output of comparator is provided to the H-Bridge and as a result the orientation of the solar panel gets aligned in the direction of sun depending upon the sensitivity and output of comparators. The outputs of comparators are controlled by the variation in the output of LDRs when they are exposed to light.

Other Possible Techniques have also been worked out for the improvement of the Efficiency of Solar Panel. These Techniques includes using Convex Lens with the Panel and MPPT based Charge Controller.

The project also presents a GSM based monitoring system to in order to monitor the status of our whole system and keep us informed through sms. This monitoring system will monitor the battery's charging process and will keep us updated with the current status of the system remotely. We will also able to control the few parameters remotely. e.g. We can Switch On and Switch Off the Appliances working as a Load for this system. For this purpose the GSM Module SIM 900D is used.

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