

Dual Axis Solar Tracking System-A Comprehensive Study

Mr. Nikhil U. Nagose, Mr. Vaibhav B. Dodke, Ms. Shreya A. Thawari, Mr. Rajat C. Patil,
Mr. Adarsh R. Damle, Ms. Bhagyashree D. Rathod, Prof. Ekeshwari A. Rangari
Jagadambha College of Engineering and Technology, Yavatmal, India

Abstract: Energy crisis is one of the prime issues in the third world developing country like Bangladesh. There is an enormous gap between generation and demand of electrical energy. Nearly 50% population of the country is extremely isolated from this blessing. Renewable energy is the only answer to solve this issue. Solar energy is one of the most effective resources of the renewable energy which could play a significant role to solve this crisis. This research presents a performance analysis of the dual axis solar tracking system using Arduino. The main objective of this research is whether a static solar panel is better than solar tracker or not. This work is divided into two parts hardware and software system. In hardware part, four light dependent resistors (LDR) is used to detect the utmost light source from the sun. Two servo motors conjointly used to move the solar panel to maximum light source location perceived by the LDRs. In software part, the code is written by using C programming language and has targeted to the Arduino UNO controller. The outcome of the solar tracker system has analyzed and compared with the fixed or static solar panel found better performance in terms of voltage, current and power. Therefore, the solar tracker is proved more practical for capturing the maximum sunlight supply for star harvesting applications. The result showed dual axis solar tracking system produced extra 10.53-watt power compared with fixed and single axis solar tracking system.

Keywords: solar tracking; single axis; dual axis; light depending resistor (LDR), servo motor, arduino, altitude, azimuth, charge controller

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