ABSTRACT

DEVELOPMENT OF A WEB-BASED APPLICATION FOR REAL-TIME MONITORING DUAL AXIS SOLAR TRACKER ON SOLAR PANELS

Habib Al-Huda Abdullah [1)], Hendi Hermawan, S.T., M.T.I. [2)], Riny Nurhajati, S.T., M.T.I. [3)]

[1)] Student of Informatics Study Program, Pembangunan Jaya University
[2)] Lecturer in Informatics Study Program, Pembangunan Jaya University
[3)] Lecturer in Informatics Study Program, Pembangunan Jaya University

Solar energy is a renewable and abundant energy source that can be utilized by everyone, especially in tropical countries like Indonesia. Solar panels are devices that convert solar energy into electrical energy. Solar panels have two modes: flat and tilted right-left. In the flat mode, solar energy is optimal only when the sun is directly overhead, reducing efficiency in the morning and evening. In the tilted right-left mode, optimal energy is obtained in the morning and evening, but not evenly when the sun is overhead at noon. Consequently, the system is not always at the optimal angle to capture sunlight. Therefore, a system is needed to improve solar panel performance by 30-40% using a dual axis solar tracker. This research develops a dual axis solar tracker system on solar panels that can maximize solar absorption in flat mode by making the solar panels move to follow the direction of the sun. This research utilizes LDR sensors, MG996R servos, INA219, and DHT22. The chosen development method for this system is prototyping. Based on the testing results using white box and black box methods, the dual axis solar tracker system functions optimally, and the LDR, DHT22, and INA219 sensors demonstrate good performance in displaying data on the website in real-time.

***Keywords**: dual axis solar tracker, dashboard monitoring, Solar Panels, real-time*