DESIGN OF SOLAR TRACKER SINGLE AXIS SYSTEM BASED ON ARDUINO MEGA 2560

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Abstract

Indonesia is a tropical country which has two seasons including the rainy and dry season. Meanwhile, Indonesia is also located at the equatorial that makes very rich in biodiversity and natural resources. Indonesia has large potential in the renewable energy development, they are solar, wind, geothermal, biodiesel, etc. Solar energy is abandon renewable energy resources which have not popular in Indonesia due to high cost operation and production when compared with tradisional energy(fossil). One of the effort to support this is creating good innovation in a solar power generation system, consist of solar tracking and material innovation treatment. In this research has been developed solar tracking system based on PID controller. The system includes mechanical part(motor, photovoltaic, gear) and electrical part(sensor, microcontroller, signal conditioning). Photovoltaics will produce maximum power when its surface perpendicular to the solar position. Solar tracking system is invented to make the surface of the photovoltaic is always perpendicular to the sun. According to the experiment shows that the best parameter of PID: Kp, Ki, and Kd are 30, 0.3 and 2, respectively. The results of experiment demonstrate that, the highs photovoltaic performance has been reached above 19.60% of fixed PV.

Keywords: Renewable energy, photovoltaic, solar tracker, PID, Arduino, Power.