

ABSTRACT

Solar energy, as an abundant and environmentally friendly energy source, offers an unlimited, safe alternative, and can be used in places where electricity is not available. The potential of solar energy is predicted to be 207,8 GWp, with the realization of solar power plants (PLTS) in 2020 already reaching 0,15 GWp. As an effort to optimize and improve the efficiency of solar panel systems, this research uses concentrators made from acrylic mirror sheets integrated with solar trackers. This research aims to design a single axis solar concentrator-solar tracker system using BH1750 and LDR on solar panels so that the solar concentrator made from acrylic mirror can follow the direction of the sun's motion. String logic programming, if-else, and constrain are used to set the system mode of "Idle" and "Tracking", LDR difference reading, and constraint and master and slave servo angle motion binding system. The test results show that the system can work at a parameter intensity of 2000 lux based on the BH1750 reading to change the Idle and Tracking modes, the difference in LDR values that moves the master servo angle from the eastern limit of 5° to 175° followed by the slave servo that follows the master with inverse constraints. The average error percentage of the BH1750 sensor is 4,73%, for the ACS712 sensor is 2,23%, and the voltage divider sensor is 2,52%. The highest power generated by the system at 12:00 am was 17,17 Watts.

Keywords : Solar Panel, Solar Concentrator, Solar Tracker, BH1750, LDR Module, ESP32