

Solar Cell Education Trainer Design With Series – Parallel Circuit Using Off-Grid System

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ABSTRACT

PLTS generator is a power plant that utilizes sunlight energy which is converted into electrical energy through solar cells. The process of converting sunlight into electricity where solar cells receive sunlight which causes electrons in solar cells to experience movement from N to P. Solar energy is an energy source that is very abundant and environmentally friendly. The author designed a solar cell education trainer with a series - parallel circuit using an off-grid system. The performance test of all components and the trainer as a whole worked well in accordance with the working principle of the off-grid PV mini-grid system. The program on the PLC runs according to the command. The results of the functional test of this Trainer are suitable for use as a practical learning medium in engineering laboratories. The test results of the solar cell education trainer with an AC load used a 50-watt fan and two 5-watt lamps, while at a DC load a 5-watt lamp was used. The use of a solar cell slope of 13 °. The condition of the solar cells in series is the highest voltage at 11.30 reaching 35.01 V With a current value of 1.0 A. The voltage condition in the solar cells When connected in parallel the highest voltage is at 10.20 Reaching 19.05 V with a current rating of 2.4 A The maximum load that can be supplied by a 144 Watt battery.

Key words : Solar Cell, Trainer, off-grid, Seri, Paralel