عنوان مقاله:

Sensitivity analysis and parameters calculation of PV solar panel based on empirical data and two-diode circuit model

محل انتشار:

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خلاصه مقاله:

In this paper, a simple algorithm based on a two-diode circuit model of the solar cell is proposed for calculating different parameters of PV panels. The input parameters required for this algorithm are available from datasheets of the standard PV modules. The values of series and parallel resistances, as well as the recombination factor of Diode 2, are estimated through an iterative solution process. This method is based on maximum power point matching (MPPM) in which the maximum power of PV panel is calculated by the model reaching a minimum error from maximum power proposed in the datasheet. Unlike the other methods, this method is very straightforward and does not require any additional information apart from that of the datasheet. The objective of this paper is to calculate the recombination factor of both diodes in a two-diode PV model, which then leads to further accuracy of the PV model. This novelty in the calculations further improves the accuracy of the model. The simulation is performed in MATLAB, and the effect of altering the temperature of PV cell and level of radiation on the current, voltage, and output power of the PV panel is investigated. The accuracy of the simulation is validated by data extracted from the datasheets of two different PV modules (polycrystalline and monocrystalline).

کلمات کلیدی:

Solar Energy, Photovoltaic, PV Module, Two-Diode Circuit Model