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Open Circuit MPPT Control Implemented for PV Water Pumping System

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Abstract : Photovoltaic systems use different techniques for tracking the Maximum Power Point (MPPT) to provide the highest possible power to the load regardless of the climatic conditions variation. In this paper, the proposed method is the Open Circuit (OC) method with sudden and random variations of insolation. The simulation results of the water pumping system controlled by OC method are validated by an experimental experience in real-time using a test bench composed by a centrifugal pump powered by a PVG via a boost chopper for the adaptation between the source and the load. The output of the DC/DC converter supplies the motor pump LOWARA type, assembly by means of a DC/AC inverter. The control part is provided by a computer incorporating a card DS1104 running environment Matlab/Simulink for visualization and data acquisition. These results show clearly the effectiveness of our control with a very good performance. The results obtained show the usefulness of the developed algorithm in solving the problem of degradation of PVG performance depending on the variation of climatic factors with a very good yield.

Keywords : PVWPS (PV Water Pumping System), maximum power point tracking (MPPT), open circuit method (OC), boost converter, DC/AC inverter
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