# Dual Active Bridge Converter with Photovoltaic Arrays for DC Microgrids: Design and Analysis

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**Abstract :** In this paper, an enhanced DC microgrid design is proposed using the DAB converter as a conversion unit in order to harvest the maximum power from the PV array. Each connected DAB converter is controlled with an enhanced control strategy. The controller is based on the artificial intelligence (AI) technique to regulate the terminal PV voltage through the phase shift angle of each DAB converter. In this manner, no need for a Maximum Power Point Tracking (MPPT) unit to set the reference of the PV terminal voltage. This strategy overcomes the stability issues of the DC microgrid as the response of converters is superior compared to the conventional strategies. The proposed PV interface system is modelled and simulated using MATLAB/SIMULINK. The simulation results reveal an accurate and fast response of the proposed design in case of irradiance changes.

**Keywords :** DC microgrid, DAB converter, parallel operation, artificial intelligence, fast response
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