



MODERNIZATION SOLAR

# Solar Transformation Dual System





## Overview

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Can Digital Twins transform solar power plant operations?

Digital twin (DT) technology presents a revolutionary approach to overcome these limitations and transform solar power plant operations [3, 4]. The rapid growth of the renewable energy sector, coupled with the adoption of digital twins, is reshaping solar energy generation.

How does a dual-input power converter work?

Dual-input power converter integrates regulated output voltage with global Mppt control Fig. 12 illustrates the flowchart of the proposed control strategy. Initially, the system measures the output voltage ( $V_{pv}$ ) and current ( $I_{pv}$ ) of the solar panels, along with the system output voltage ( $v_o$ ).

What are the simulated waveforms of a dual-input power converter?

Simulated waveforms of the dual-input power converter: (a) solar panel output voltage ( $V_{pv}$ ) and dual-input power converter output voltage ( $v_o$ ); (b) gate-source voltages of Q 1 ( $V_{gs}$ ) and Q 2 ( $V_{gs}$ ). Fig. 14. Simulated waveforms of the 100 W inverter: (a) output voltage ( $v_o$ ) and output current ( $i_o$ ); (b) total harmonic distortion (THD). 5.2.

How do solar panels work?

Initially, the system measures the output voltage ( $V_{pv}$ ) and current ( $I_{pv}$ ) of the solar panels, along with the system output voltage ( $v_o$ ). Subsequently, the micro control unit (MCU) controls the power MOSFETs Q1 and Q 2 within the dual-input power converter to maintain an output voltage of 55 V.



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