

# Mobile energy storage site inverter integration





## Overview

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Can a hybrid energy storage system improve power reliability?

This white paper presents a hybrid energy storage system designed to enhance power reliability and address future energy demands. It proposes a hybrid inverter suitable for both on-grid and off-grid systems, allowing consumers to choose between Intermediate bus and Multiport architectures while minimizing grid impact.

What is a multiport converter & a bidirectional grid inverter?

The multiport structure shown in Fig.4 features a three-port converter and a bidirectional grid inverter. The primary function of the three-port converter is to enable single-stage power conversion, which integrates MPPT for PV systems and manages the charging/discharging of batteries with minimum BOM and improved power conversion efficiency.

How does a grid inverter work?

The grid inverter functions in two modes: as a front-end rectifier when transferring power from the grid to the battery, and as a voltage source inverter when feeding power from the PV/battery back to the grid. It incorporates a full-bridge PWM inverter with an LC output filter to inject synchronized sinusoidal current into the grid.

What architecture does a hybrid inverter use?

The hybrid inverter is configured in two distinct architectures: Intermediate DC Bus Architecture and Multiport Architecture, as shown in Fig. 2 and Fig. 3, respectively. A comparison of the features of each configuration is provided, followed by a detailed description.



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