

# Feedback grid-connected inverter





## Overview

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Can a dual-feedback control be used in a grid-connected inverter?

The dual-feedback control combining inverter current control and capacitor-current active damping is widely applied for LCL -type grid-connected inverters. This paper investigates the operation cases of this dual-feedback control, paving a path for a robust design. Theoretical analysis is presented to provide a design guideline.

How effective is grid voltage full feedforward scheme for grid-connected inverters?

Experimental results from a 6-kW single-phase grid-connected inverter are provided to verify the effectiveness of the proposed method. For the LCL-type grid-connected inverter, grid voltage full feedforward scheme is an effective method to improve the quality of the injected grid current.

Does the dual-feedback inverter current control with capacitor current active damping work?

In terms of the inverter current control with capacitor current active damping, i.e., the dual-feedback inverter current control, its operation cases have not been thoroughly unfolded yet, despite the existing expositions on its stability improvements [18, 19, 20, 21, 22].

Are grid-connected inverters under weak grids unstable?

In summary, this article takes grid-connected inverters under weak grids as the research object, establishes an inverter output impedance model based on full feedforward control of capacitor voltage and takes phase-locked loop into account, and analyzes locks in weak grids. The phase loop causes the system to be unstable.

Why are grid-connected inverters important?

With the large-scale penetration of renewable energy generation, grid-



connected inverters have become an integral part of power generation systems. Due to the access of new energy equipment, the electric resistance at the point of common coupling, (PCC) is disturbed, and the power grid shows the weak grid characteristics , .

How does inverter current control work?

Fortunately, inverter current control has an underlying advantage that the feedback variable, i.e., the inverter current, contains the information of the capacitor current. Naturally, an intuitive idea comes into mind, which is to compute or extract the capacitor current from the sensed inverter current to serve as the damping variable.



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### [A Joint Active Damping Strategy Based on LCL-Type Grid-Connected](#)

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### A Step-by-Step Design Procedure of a Robust Control Design for Grid

The current-controlled grid-connected inverter with LCL filter is widely utilized in the distributed power generation systems at remote places with weak grids. Oscillations in weak ...



### Capacitor Voltage Full Feedback Scheme for LCL-Type Grid ...

For this case, the capacitor voltage full feedback scheme is proposed in this article to suppress the injected grid current distortion due to the grid voltage harmonics, and the full ...



## Controller parameter optimization of LCL-type grid-connected inverters

The conventional passivity-based controller design of LCL -type grid-connected inverters can ensure the stability of the inverter-grid system, but cannot guarantee sufficient ...

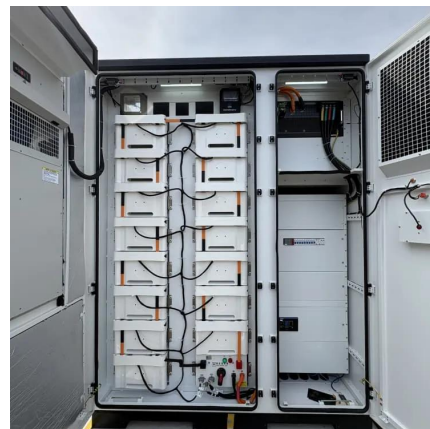


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## A Systematic Controller Design for a Grid-Connected Inverter

Conventionally, an LCL-filtered grid-connected inverter can be effectively controlled by using a full-state feedback control. However, this control approach requires the measurement of all ...



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