DSP-based single-phase grid-connected inverter

Overview

Does a DSP-based digital current controller improve the performance of single-phase bridge inverters?

The improved current controller is a DSP-based digital current controller for grid-connected single-phase bridge inverters, whose performance is optimized by considering the time delay caused by ADC and computations. A comparison has been made to analyze the performance of single-phase grid-connected inverter systems with PCC and ICC.

What is a single phase inverter?

Single-phase inverters are commonly used in distributed generation systems under 10 kilowatts as the connection between the gird and renewable energy sources (RESs). In this application, grid current distortion plays a pivotal role in determining inverter performance.

What is a compensator design for a single-phase grid-connected inverter?

To deal with the control delay and disturbances, an improved current controller with a compensator design is proposed for single-phase grid-connected inverters. The proposed controller optimizes the system performance and decreases the current harmonic distortion due to parameter mismatch and controller time delay.

Do single-phase grid-connected inverter systems perform better with PCC or ICC?

A comparison has been made to analyze the performance of single-phase grid-connected inverter systems with PCC and ICC. Experimental results are provided to verify the effectiveness of the designed current controllers, and the output current of the inverter system with ICC generally has a lower THD than that of the inverter system with PCC.

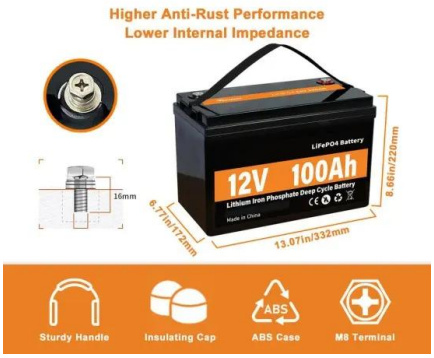
Can a single-phase photovoltaic inverter be controlled by sinusoidal duty cycle modulation?

This paper focuses on a new control strategy for single-phase photovoltaic inverters connected to the electrical power distribution network. The inverter studied is single-phase H bridge, equipped with a robust control strategy by sinusoidal duty cycle modulation. This new control strategy offers the advantage over the control strategy.

What is a DSP-based digital current controller?

The improved current controller is a DSP-based digital current controller for grid-connected single-phase bridge inverters, whose performance is optimized by considering the time delay caused by analog–digital conversion (ADC) and computations.

DSP-based single-phase grid-connected inverter



Design of single phase photovoltaic grid-connected inverter based ...

Feb 9, 2015 · Download Citation , Design of single phase photovoltaic grid-connected inverter based on DSP& ARM , Grid-connected inverter is a key electrical unit for photovoltaic ...

Design and Simulation of Grid-Connected Photovoltaic ...

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Design of single phase photovoltaic grid-connected inverter based ...

Nov 8, 2014 · Abstract: Grid-connected inverter is a key electrical unit for photovoltaic generation system. In this paper, the architecture and its advantages of a single phase photovoltaic grid ...

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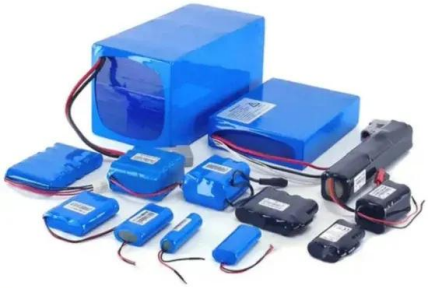
Mentioning: 2 - Development of single-phase photovoltaic grid-connected inverter based on DSP control - Zhou, Hao, Tong, Chaonan, Mao, Meiqin, Gao, Chuan

A review of single-phase grid-connected inverters for photovoltaic

Oct 31, 2005 · This review focuses on inverter technologies for connecting photovoltaic (PV) modules to a single-phase grid. The inverters are categorized into four classifications: 1) the ...

Design of single-phase photovoltaic grid-connected control system based

Jun 24, 2025 · Due to the influence of periodic disturbances such as current discontinuity at zero crossing, switch dead zone, and asymmetric drive signal in the inverter system, the grid ...



Design and Implementation of Digital Control of Photovoltaic Power Inverter

Jan 1, 2011 · Inverter grid-connected PV system as a network interface with the main equipment, the control technology has become a research hotspot. Based on the theoretical analysis, a ...

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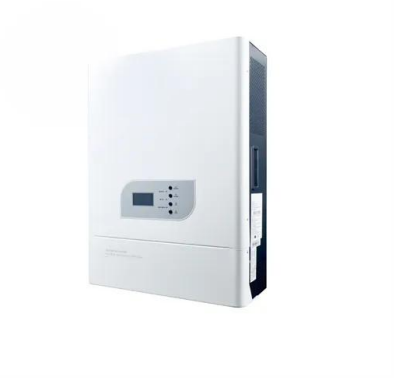
Apr 19, 2019 · The software phase-locked loop proposed in this paper is respectively applied to DSP TMS320F28035 and TMS320F2808 which belong to 500 W dual-channel single-phase ...



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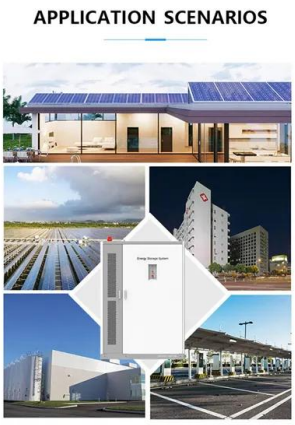

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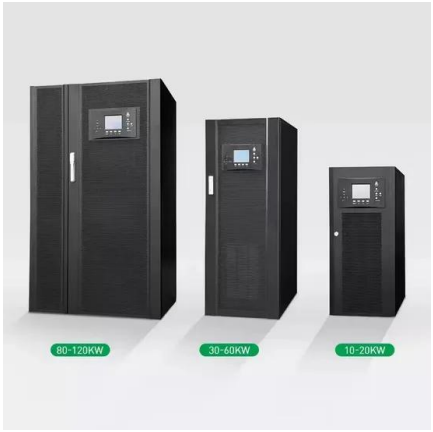
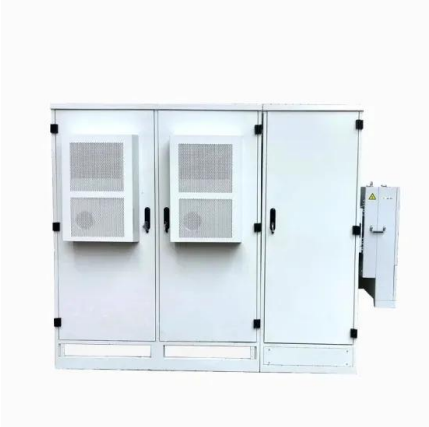


Design of single phase photovoltaic grid-connected inverter based ...

Nov 8, 2014 · In this paper, the architecture and its advantages of a single phase photovoltaic grid-connected inverter based on DSP + ARM dual-core control are studied. The novel ...

Control of single-phase grid connected photovoltaic inverter

Dec 18, 2016 · In this paper, the control of single-phase current source inverter-based grid tie photovoltaic (PV) system is addressed. An intermediate DC/DC buck converter interfaces the ...



DSP Based Control of Grid Interactive Inverter for Small ...

Oct 30, 2022 · DSP Based Control of Grid Interactive Inverter for Small Scale DG

Applications Noufal. P, Sujith. Abstract-- This paper describes a single phase grid interactive inverter ...

Development of single-phase photovoltaic grid-connected inverter based

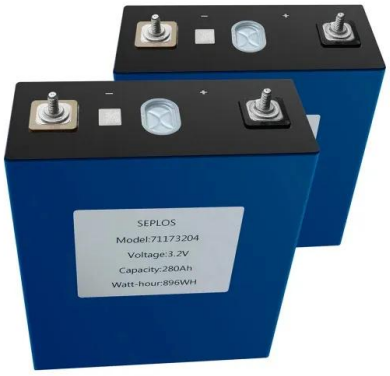
Jun 18, 2010 · PV Grid-connected is the development trend of solar system application, and grid-connected inverter is one of the key components in PV grid-connected systems. Based on ...

Grid connected inverter with harmonic suppression based on DSP ...

Jul 1, 2018 · This device uses DSP to detect harmonic current of power grid, the speed of DSP to ensure that the system has instantaneity, eliminates the influence of detection delay of the ...

DSP Based Control of Grid Interactive Inverter for Small ...

Oct 30, 2022 · Abstract-- This paper describes a single phase grid interactive inverter system especially for small scale DG renewable sources. The hardware part of the system consists of



Design of a single-phase grid-connected photovoltaic inverter based on DSP

Based on the output characteristics of photovoltaic cells,this paper designs a new household single-phase in two levels grid-connected photovoltaic inverter power system. The system ...

Predictive current controller and compensator-based ...

Aug 25, 2022 · The improved current controller is a DSP-based digital current controller for grid-connected single-phase bridge inverters, whose performance is optimized by considering the ...

GRID-CONNECTED PHASE-LOCKED PHOTOVOLTAIC ...

What is a phase-locked loop control strategy for a grid-connected photovoltaic inverter? Based on that,a phase-locked loop control strategy for the grid-connected photovoltaic inverter is ...

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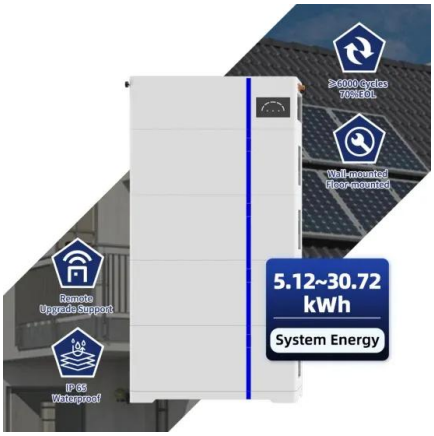

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Design and Analysis of Single Phase Grid Connected ...

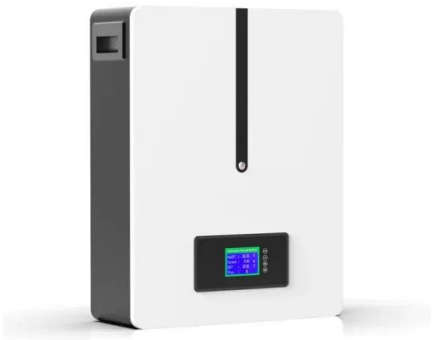
Apr 27, 2024 · Fig.2. shows the equivalent circuit of a single-phase full bridge inverter with connected to grid. When pv array provides small amount DC power and it fed to the step-up ...

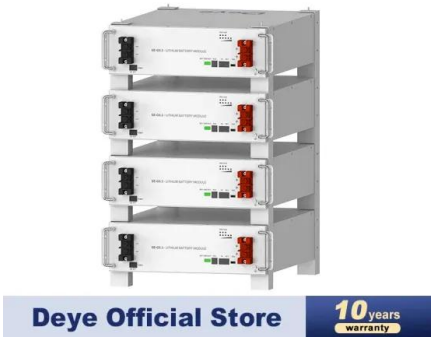
Modeling and Control of a Single-Phase Grid-Connected Inverter with ...

May 27, 2021 · The increasing penetration of renewable energy sources is pushing low-voltage electrical grids to become predominantly power electronic-based. Consequently, the design ...

A Simulation Research on the Grid-Connected Control ...

Abstract: This paper primarily discusses the main circuit of single-phase inverter circuits. It begins by introducing the research context and the significance of the subject, then discusses the ...





A Novel DSP-Based Current-Controlled PWM Strategy ...

A Novel DSP-Based Current-Controlled PWM Strategy for Single Phase Grid Connected Inverters Hossein Madadi Kojabadi, Bin Yu, Idris A. Gadoura, Member, IEEE, Liuchen Chang, Senior ...

Current control strategies for single phase grid integrated ...

Sep 1, 2018 · Solar is the fastest growing form of renewable energy and a single phase voltage source inverter is used to interface photovoltaic based plants with the distribution system. The ...

A Novel DSP-Based Current-Controlled PWM Strategy for Single Phase Grid

Aug 1, 2006 · This paper gives a complete computer simulation program of a single phase grid connected PV system using Matlab/Simulink and SimPower System tool in order to monitor ...

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