

Coordinated control of DC microgrids

What is the energy coordination control strategy for the integrated dc microgrid?

For the integrated DC microgrid, the designed energy coordination control strategy should meet the following conditions: Ensure the power supply of the EV charging unit. Ensure the charging and discharging power of the energy storage device is below the limit. Maximize the use of PV energy as much as possible.

Can coordination control improve the stability of dc microgrid system?

The simulation results show that the proposed coordination control strategy can not only effectively improve the stability of the DC microgrid system but also reduce the capacity redundancy of the energy storage device.

1. Introduction

What is a dc microgrid?

The DC microgrid shown in Fig. 1 contains two different energy storage devices, supercapacitors and batteries. Various control strategies must be adopted for the interface converters of energy storage devices to give full play to the characteristics and advantages of the hybrid energy storage.

What is a microgrid controller?

Practically, microgrid controllers are designed to perform certain operation to serve multiple control objectives as listed down. Bus voltage control and frequency control under both grid-tied and islanded operating mode. Control of real and reactive power realizing better power sharing during both grid-tied and islanded operating mode.

How does a dc microgrid control a bus voltage?

When the system power changes, the bus voltage will also change. An effective control strategy for the energy storage unit in the microgrid is needed to stabilize the bus voltage within a specific range. The DC microgrid shown in Fig. 1 contains two different energy storage devices, supercapacitors and batteries.

Are DC microgrids the future of power system?

But the variable nature of distributed energy resources and variable load profiles (AC/DC loads) leads to voltage deviation in DC microgrid. With bus voltage control, DC microgrid can be operated very efficiently and smoothly than the conventional AC grids. Therefore, DC microgrids are considered to be the future of the power system.

This study presents a distributed prioritised coordinated control topology that has the capability to reduce the total generation cost and maintain the average DC microgrid ...

This paper proposes a consensus-coordinated control strategy to improve the stability and reliability of interconnected direct current (DC) microgrid cluster systems based on ...

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This paper proposes a hierarchical control scheme based on a distributed controller design for a multi-microgrid system. Thus, a proposed control approach of ac and dc ...

This paper is concerned with the voltage tracking problem of DC microgrids subject to communication delays and packet losses, for which existing work commonly adopts passive ...

The key results of the simulation studies reveal that the proposed control scheme has achieved significant improvement in terms of voltage adjustment and power distribution between photovoltaic (PV) and battery technologies accompanied ...

This paper presents a modified approach for the control of DC voltages and State of Charges (SOC) of batteries in an interconnected cluster of DC microgrids. First, the model of a DC ...

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Specifically, the hybrid AC/DC microgrids can directly supply energy to DC electrical devices and AC electrical devices, and easily access different types of energy sources through its DC microgrid and AC microgrid, ...

Designing effective control strategies to achieve coordinated control and power mutual assistance among multiple subsystems is crucial for the stable and reliable operation of ...

3. Direct Current Microgrid System Voltage Control Strategy 3.1 Coordinated Control Strategy for the System
This paper primarily investigates coordinated control methods for photovoltaic ...

