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Title: Distributed collaborative control of microgrids

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What is distributed cooperative control of a dc microgrid cluster?

4. Implementation and validation The proposed distributed cooperative control of a DC microgrid cluster with multiple voltage levels connected by a MAB converter is validated on PLECS RT-Boxes which are hardware-in-the-loop (HiL) simulator and rapid control prototyping (RCP) of Plexim.

What is a dc microgrid cluster?

A DC microgrid cluster with three microgrids and a TAB interconnection converter is implemented in HiL. The real analog signals are sampled by the RCP and the PWM control signals are sent to HiL. With a low I/O latency, this experiment is comparable to a real physical system. Three DESs and a DG are deployed in each DC microgrid.

How does a dc microgrid work?

Within the DC microgrid, the renewable energy distributed generation (DG) generally operates in the maximum power point tracking (MPPT) state. Distributed energy storages (DESs) supply power when the DGs are insufficient to guarantee load power supply. When the DGs are sufficient, the power is stored by DESs to maximize economic benefits.

How do DC microgrids share energy?

The DC microgrids within the cluster are connected by a MAB converter. The proposed method not only realizes the distributed energy storage sharing among the microgrids, but also achieves load/source sharing and voltage recovery within a microgrid.

The contributions of this paper are two-fold: (1) A new configuration of the hybrid series-parallel microgrid is introduced; (2) A distributed decentralized cooperative control method is presented for ...

In this paper, a distributed cooperative control method is proposed for a DC microgrid cluster with multiple voltage levels connected by a multi-port interconnected converter.

This chapter briefly introduces distributed secondary control systems and their functions in islanded AC microgrids. Conventional cooperative distributed secondary controllers are presented.

Distributed collaborative control of microgrids

Microgrids can include distributed energy resources such as generators, storage devices, and controllable loads. Microgrids generally must also include a control strategy to maintain, on an ...

The outcomes revealed that the proposed control effectively achieves its control objectives within a DC microgrid, showcasing rapid responsiveness and minimal oscillation.

Abstract: Collaborative control of microgrid clusters is challenging due to their nested control structures and the integration of heterogeneous microgrids. Besides, the wide coverage also causes some ...

In response to this problem, a distributed cooperative control strategy triggered by an adaptive event is proposed.

In this work, an overview of the state-of-the-art of distributed cooperative control systems for isolated microgrids is presented. Protocols for cooperative control such as linear consensus, ...

This research critically reviews the DCT strategies developed for MGs, presents various MG control strategies, and delves into different approaches to designing distributed controllers.

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