Ship microgrid controller

Overview

According to Nature, researchers have developed an adaptive data-driven controller for shipboard microgrids that achieves remarkable performance improvements, with hardware-in-the-loop testing showing 44. 08% enhancement over fuzzy logic controllers and 36. 85% improvement over model predictive. The growing demand for low-emission maritime transport and efficient onboard energy management has intensified research into advanced control strategies for hybrid shipboard microgrids. Intuitive, intelligent, and integrated real-time monitoring via a state-of-the-art interface. Predict system behavior in response to operator actions and events using. NLR develops and evaluates microgrid controls at multiple time scales. A microgrid is a group of interconnected loads and.

Ship microgrid controller

A Novel Reactive Power Sharing Control Strategy for Shipboard

With the development of artificial intelligence, researchers have begun to apply reinforcement learning to control reactive power distribution of DGs in ship AC microgrids.

Intelligent power control using deep neural networks and

To address the above problem, an adaptive data-driven controller has been proposed for voltage regulation of SHMGs with hybrid energy storage units (HESUs) to preserve robust stability ...

Model predictive control-based energy management strategy for ...

The study uses a cruise ship sailing in the Baltic Sea as a case to verify the potential of the proposed shipboard DC microgrid system and hierarchical EMS for ensuring stable ship operation, ...

Optimization and Control of Electric Ship Microgrids With Short-Term

New design and optimization methodologies, based on new dynamic system model, are presented and discussed. Power system performance has been assessed and validated through real-time hardware ...

Model predictive controller based design for energy optimization of the

We provided the analytical solution for implementing proposed optimal design of hierarchical control for a multi-DG and renewable energy resources (RESs) integration-based ...

Control and operation of a ship AC/DC microgrid under transient

Abstract owards more electric ships with sustainable designs can help in reducing the carbon footprint of the global transportation systems. Ship networks can be based on AC/DC microgrids with resilient ...

Design and Implementation of a Robust Hierarchical Control

for

This study presented a robust hierarchical control architecture for hybrid AC/DC shipboard microgrids, integrating a conventional droop-based PI controller at the primary level with an SMC …

AI-Powered Control System Boosts Ship Microgrid Performance by 44%

The system combines ultra-local model control with regularized actor-critic learning using deep neural networks, along with a non-integer extended state observer to handle unmodeled …

Marine Microgrid Energy Management System

Smart Microgrid - Combines distributed energy technologies with intelligent software to intelligently monitor, proactively predict, actively manage and optimize energy supply & demand for a small-scale …

Microgrid Controls , Grid Modernization , NLR

A microgrid is a group of interconnected loads and distributed energy resources that acts as a single controllable entity with respect to the grid. It can connect and disconnect from the grid to ...

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