PIENAAR ENERGY (PTY) LTD

Smart Microgrid Experimental System

Overview

The Smart Microgrid and Renewable Technology (SMRT) lab is a power converter based microgrid testbed. The facility consists of four types of subsystems, i., two real-time simulators (RTS), two microgrid testbeds, two modular multilevel converters (MMCs), and one multi-agent. Solar photovoltaic microgrids are reliable and efficient systems without the need for energy storage. The RTS. This article proposes an Energy Management System (EMS) for smart microgrids with a decentralized multi-agent system (MAS) based on a bio-inspired T-Cell optimization algorithm. A microgrid is a group of interconnected loads and. An experimental SMG is being deployed that combines photovoltaics and the energy carrier hydrogen through the interconnection of photovoltaic panels, electrolyser, fuel cell, and load around a voltage bus powered by a lithium battery.

Smart Microgrid Experimental System

Smart Microgrid and Renewable Technology (SMRT) Lab

By performing tests with the facilities, we can significantly improve the technology readiness level (TRL) of our research on power and energy systems.

Get Price

Adaptive Energy Management for Smart Microgrids Using a Bio

This article proposes an Energy Management System (EMS) for smart microgrids with a decentralized multi-agent system (MAS) based on a bio-inspired T-Cell optimization algorithm.

Get Price

Advancements and Challenges in Microgrid Technology: A ...

ABSTRACT The concept of microgrids (MGs) as compact power systems, incorporating distributed energy resources, generating units, storage systems, and loads, is widely acknowledged ...

Get Price

PowerLab: a flexible experimental architecture for smart microgrid

Abstract: Interest in microgrids is advancing as they contribute to local energy management while preserving the main grid operation. However, their introduction poses problems of reliability, ...

Get Price

Microgrid Controls , Grid Modernization , NLR

Microgrid Controls NLR develops and evaluates microgrid controls at multiple time scales. Our researchers evaluate in-house-developed controls and partner-developed microgrid ...

Get Price

Experimental investigation of a novel smart energy management system

The study results are of relevance to further develop a smart energy management system for conventional microgrid Industry and to achieve the targets of sustainable development goals.

Get Price

Practical prototype for energy management system in smart microgrid

The conventional electrical grid faces significant issues, which this paper aims to address one of most of them using a proposed prototype of a smart microgrid energy management system.

Get Price

Two-Stage experimental intelligent dynamic energy management of

The experimental setup and results are based on the rapid control prototyping of the micro-grid platform, MATLAB/Simulink and RT-LAB software, and hardware infrastructure such as ...

Get Price

Monitoring System for Tracking a PV Generator in an Experimental Smart

Smart grids and smart microgrids (SMGs) require proper monitoring for their operation. To this end, measuring, data acquisition, and storage, as well as remote online visualization of real-time ...

Get Price

Smart Microgrids

Smart MicroGrids (SMGs) can be seen as a promising option when it comes to addressing the urgent need for sustainable transition in electric systems from the current fossil fuel-based centralised ...

Get Price

Contact Us

For catalog requests, pricing, or partnerships, please visit: https://pienaarshof.co.za