Niue microgrid monitoring system

The design and implementation of a smart monitoring system prototype that can monitor, analyze, and communicate with devices in a tiny micro-grid system are the main topics of this study. In order to create a smart system for monitoring and evaluating renewable energy sources, this research suggests combining a low-cost data acquisition (NI ...

The architectural selection of a given control technique considers the design ability to handle the control strategies of microgrids. The estimation techniques of the microgrid variables and parameters deal with the measurement and monitoring system to accurately reinforce the dynamic performance of control techniques [1].

We designed the microgrid, which comprises hybrid sources such as solar and wind power sources, Li-ion battery storage system, backup electrical grids, and AC/DC loads, considering the functional constraints of a microgrid energy management and stability.

The authors of (Khoa et al., 2021) present a real-time monitoring system using web server technology for the microgrid. The Arduino embedded system was used as a control core, and an Ethernet network ...

This paper focuses on designing and implementing a prototype of smart monitoring system capable of doing multi functions i.e. monitoring, analysing and communicating with devices in a small micro-grid system.

The integration of microgrids (MGs) with existing utility grids presents several challenges, including low inertia, intermittent nature of renewable energy sources (RES), sensor/actuator errors, the presence of imbalanced and nonlinear loads, supply-demand mismatches, uncertainties, and disturbances.

6 · The monitoring system is complex; it ensures the measurement and monitoring of the electric line currents (in the connection boxes, electric stations, and electrical substations), the state of the surge arresters, the existing electrical filters, the outside temperature, the temperatures of the transformer modules, including a complete analysis of the consumption of ...

In this paper a low-cost wireless power quality monitoring system based on Narrowband Internet of Things (NB-IoT) technology is implemented. The system includes the monitoring PCB assembled at Paderborn University, management portal and enables various micro-grid functions via a remote server.

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The active power and voltage responses of the microgrid shows the stable operation of the proposed system by implementing dispatch techniques and voltage Q-droop and input mode P-Q controller. A comparison section is also presented for demonstrating the significance of the research work.

In this paper, a digital twin based scheme is presented for monitoring the power flow of remote microgrid. Digital twin is a real-time, physics based simulation integrated with the real physical system and provides the estimate of different characteristics in real-time.

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