Using PLC to implement microgrid

What is plc based microgrid protection?

This test system is monitored,controlled and protected using a PLC. The PLC is responsible in providing uninterrupted supply to the critical loads in the microgrid network. The purpose of neutral isolating contactor (NIC) and neutral grounding resistor(NGR) in PLC based microgrid protection is also elaborated.

What is the electrical architecture of a microgrid?

Electrical architecture of the studied microgrid (case study). The current and voltage sensors of the distributed generators, the state of charge and the battery temperature are connected to the PLC inputs. Although the PLC outputs control the switches K b a t, K d u m p and K l o a d s.

How to improve power quality and load supply within a microgrid?

Validating the developed framework through a case study in the research field,specifically by applying an advanced Energy Management System (EMS) based on a fuzzy logic controllerto enhance power quality and load supply within a Microgrid (MG). Designing an HMI for monitoring the MG using WinCC-RT. The general paper organization is as follows.

How to simulate a plc with an integrated PI controller?

The simulation of the PLC with an integrated PI controller is conducted using the PLCSim software,while the simulation of the microgrid and the EMS based on fuzzy logic is performed using MATLAB. The developed framework operates according to the following steps: visualization of data using HMI.

Can LV - diesel generator synchronize in a real-time microgrid network?

This paper proposes the implementation of 9 no's 2/2.5 MVA low voltage (LV)- Diesel Generator (DG) sets synchronization in a real-time microgrid network using bus coupler logicto restrict the fault current vide programmable logic controller (PLC) during utility power failure based on load requirement.

How to manage energy flow in a microgrid?

In order to manage the energy flow in the microgrid,a fuzzy logic-based EMSis implemented. Knowing that complex AI algorithms are not supported by PLCs,the framework developed in this paper can be used to process the algorithm under MATLAB and transfer results to the PLC through an OPC server. Fig. 4.

One of the main technical issues in the practical implementation of a Microgrid is the design of the proper protection scheme. The scheme must be capable to meet the basic ...

Artificial Intelligence (AI) is a branch of computer science that has become popular in recent years. In the context of microgrids, AI has significant applications that can ...

Microgrids represent the integration of DERs (Distributed Energy Resources) with utility grids, and they have

become increasingly prominent due to their ability to supplement the main grid"s ...

The economic and environmental challenges by the utilization of fossil fuels have caused restructure in the conventional power system. Hence, future grids, which are called ...

A hardware prototype is developed, tested and validated for a 7-bus microgrid network using Arduino ATmega 1280 for shortest path identification and optimized TMS value ...

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