International Conference of Reliable Information and Communication Technology
IRICT 2017: Recent Trends in Information and Communication Technology pp 496-504 | Cite as

Design and Control of Online Battery Energy Storage System Using Programmable Logic Controller

Authors | Authors and affiliations

Nabil Mohammed [1]
Email author

Kumeresan A. Danapalasingam [1]

1. Department of Control and Mechatronics Engineering, Faculty of Electrical Engineering, Universiti Teknologi Malaysia, Johor Bahru, Malaysia

Conference paper
First Online: 27 May 2017

Part of the Lecture Notes on Data Engineering and Communications Technologies book series (LNDECT, volume 5)

Abstract

The integration of online battery energy storage systems (BESS) with the grid has been used to supply peak demand, improve the stability and power quality of the gird, and work as a backup during source intermittency at a watt-hour scale. To ensure high reliability and safe operation of the online BESS, an efficient control is required. The limitations of the existing controllers include their incapability to handle high-power rating BESS, short life cycle, insufficient electromagnetic immunity, and limited numbers of input and output interfaces. Therefore, in this paper, the programmable logic controller (PLC) is used to control a 200 kWh BESS to operate as an online back-up for the grid. Siemens software, (TIA Portal V13) has been used to simulate the BESS with the proposed control. The PLC programming code is written using SIMATIC STEP 7, while SIMATIC WinCC is used to build the interfaces of the supervisory control and data acquisition (SCADA) system. The results show that the PLC provides an efficient, easy and reliable control of the BESS.