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A LabVIEW-based Real-Time GUI for Switched Controlled Energy Harvesting Circuit for Low Voltage Application

Abstract

This paper develops a universal Real-Time Graphical User Interface for the first time for low-voltage energy Harvesting. The proposed GUI is built in LabVIEW with NIUSB 621 DAQ that synchronized the data to perform real-time analysis through the use of power electronics. A hybrid Vertical Axis Wind Turbine adapted to a 200 W Permanent Magnet Synchronous Generator is used for incorporating the supercapacitor-based battery charging energy harvesting system. The GUI displays the real-time energy harvesting output readings both graphically and digitally along with wind speed and angular velocity of the turbine. The model is built in such a way so that it could be used as a universal GUI for both wind and solar energy harvesting with minimal adjustment.

Keywords

Energy harvesting; Graphical user interface (GUI); LabVIEW; Real-time monitoring; Wind energy