BVRIT HYDERABAD College of Engineering for Women

Department of Electrical & Electronics Engineering

Major Project – Academic year 2022-23

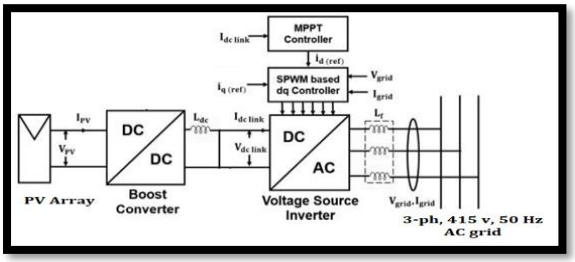
TEAM
2019_7

GRID CONNECTED PV PANEL WITH A dq CONTROLLED INVERTER

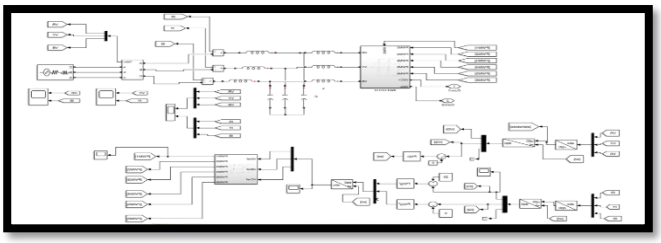
Abstract

Photovoltaic (PV) solar panels absorb energy from the Sun and convert it into electricity. Solar panels produce DC power. The output of the solar panel is less so, boost converter is used to boost up the voltage. Maximum Power Point Tracking (MPPT) is used to extract maximum available power by perturb and observe algorithm. Inverter is used to convert DC to alternating current (AC), which the electrical grid uses. The energy fed to the grid from inverter is to be maintained at constant voltage and constant frequency. To improve the dynamic response of the grid connected inverter the dq control method is used. This transformation is achieved by use of the Clarke and Park transformation methods, which convert the abc to αβ and αβ to dq. This transformation produces DC components of the measured parameters, which are easily processed through filtering and control procedures.

Modules



Architecture



Tools and Technologies

- MATLAB/Simulink Software

Conclusion and Future Scope

The PV panel, a boost converter, an inverter and utility grid are physically modelled in this model. The maximum output of the power is extracted. Boost converter is used to step up the voltage. Solar panels produce DC power. This DC should be converted to AC before injecting it to the grid. Inverter converts DC into AC. dq method is used in inverter. To improve the dynamic response of the grid connected inverter the dq control method is used. Instead of dq method robust method can be used to improve the stability of the grid-connected inverter of PV power generation while connected to a weak power-grid.

Guide

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