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# Voltage and Current Control of Microgrid in Grid Connected and Islanded Modes

**Authors :** Megha Chavda, Parth Thummar, Rahul Ghetia

**Abstract :** This paper presents the voltage and current control of microgrid accompanied by the synchronization of microgrid with the main utility grid in both islanded and grid-connected modes. Distributed Energy Resources (DERs) satisfy the wide-spread power demand of consumer by behaving as a micro source for a low voltage (LV) grid or microgrid. Synchronization of the microgrid with the main utility grid is done using PLL and PWM gate pulse generation technique is used for the Voltage Source Converter. Potential Function method achieves the voltage and current control of this microgrid in both islanded and grid-connected modes. A low voltage grid consisting of three distributed generators (DG) is considered for the study and is simulated in time-domain using PSCAD/EMTDC software. The simulation results depict the appropriateness of voltage and current control of microgrid and synchronization of microgrid with the medium voltage (MV) grid.

**Keywords :** microgrid, distributed energy resources, voltage and current control, voltage source converter, pulse width modulation, phase locked loop
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