

Converter Impedance Characterization for Stability Analysis of Low-Voltage DC-Grids

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Abstract—The paper discusses aspects of modelling and operation of low-voltage DC-grids with aggregated power and load modules in terms of small-signal stability. Multiple power modules connected to the common DC-bus potentially may become a reason of voltage instabilities due to background harmonics interactions. Unfortunately, in a practical grid implementation, usually the internal structure of the converters including control algorithms and parameters is not fully known for the users. A technique of experimental impedance identification, applied to each module and which consequently enables for the relatively simple and effective analysis of the aggregated system, is described.