

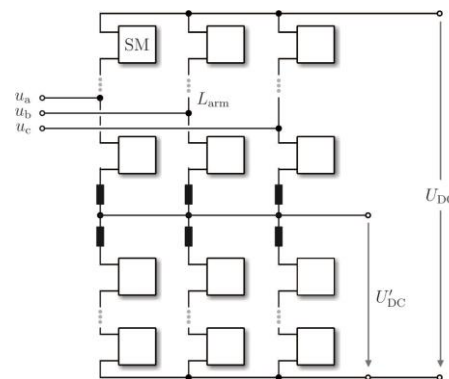
# Multiport Modular Multilevel Converter for AC, DC and Battery Systems Direct Integration

Bachelor's/Master's Thesis

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**Abstract**—Multiport converters can potentially connect different systems with high efficiency. The modular multilevel converter can use this type of connection at a cell or an arm level to connect AC, DC and integrate renewables and/or storage all at once. This work proposes the analyzes of a Multiport Modular Multilevel Converter (M<sup>3</sup>C) as a mean to integrate large Battery Systems into both DC and AC grids with reduced number of conversion stages.



**Background**—This work aims to investigate the possibilities enabled by the utilization of multiport modular multilevel converter topologies into medium voltage connected battery systems. For that, factors such as efficiency and complexity need to be quantified to attest the feasibility and competitiveness of these solutions. It is therefore expected that the student possess a strong background in design and analysis of power electronics converters.

*Objectives:*

- Review of MMC multiport topologies
- Losses evaluation for the different possible power flows
- Control strategy to manage the power flow among the diverse connections

*Type of the Work:*

- Theoretical;
- Simulations

*Language of the Thesis:*

- German/English

*Connected Project:*

BAEW

