Implementation of a PLC Control System for an active rectifier based on the MMC topology [SA1][MA1]

At HPE, a 250kVA/35kV active rectifier realized as a Modular Multilevel Converter is currently built.

The user interface for the control of the rectifier will be implemented using a PLC and the EtherCAT-bus/TwinCAT. The interface should display the main converter parameters such as in- and output voltages and currents, the power and general system states such as temperatures.

In this project, you will connect custom stand-alone voltage sensors to a master controller (FPGA, VHDL) and display the measured values on a HMI-PC (EtherCAT, PLC). Also controlling the converter system with the HMI-PC (e.g. start-up the auxiliary supply, start the cooling system, etc.) should be implemented (VHDL + PLC).

You will validate the functionality of the system by tests and measurements.

**Work Description:**
- 10% Theory
- 60% VHDL/PLC coding
- 30% Testing

**Prerequisites:**
- Interest and knowledge in power electronic systems, interest/knowledge in VHDL and PLC programming

*This work can be done in English or German.*

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