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MASTER OF SCIENCE

Design and Development of a Converter for Field Oriented Control of Asynchronous Machines

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Abstract

Within this thesis, an inverter for the control of asynchronous machines was developed. According to the current state of the art, field-oriented control is implemented. The described development process includes both the development of the modular hardware – which consists of a main control board and three plug-on half-bridge modules – and the associated software, which is implemented on a powerful digital signal processor with two cores. Thereby the separation of an execution logic takes place. The main core implements a real-time operating system, which realizes the external communication via CAN and serves the communication with the second core. On the second core the field-oriented control is implemented. Furthermore, the system design includes a comprehensive interface for control, parameterization and vehicle integration of the inverter. After successful commissioning, the functionality of the drive inverter could be validated and analyzed in a real setup.

15th March 2022