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Concepts and Integration of FPGA based Data Acquisition for novel WEA Sensor.

ABSTRACT - Masterthesis

In Wind turbine, the life of turbine is determined mainly due the electrical faults in Electronic circuits. In order to reduce the faults in Electronic control units which monitor the Wind turbine shaft, we need to improve the components of the Electronic circuits. The Wind turbine shaft consists of a generator, a induction motor and the electronic controlling unit.

The task of controlling unit is to monitor the Speed and Torque of Wind turbine shaft. The process of retrieving the actual values of variables from WEA sensors to the controlling unit is data acquisition. Depending on these actual values and reference values wind turbine shaft is controlled using an inverter.

The aim of the thesis is to develop a data acquisition platform for the Wind turbine control unit. The thesis includes implementing a CAN Bus, with TI F28335 DSP, Bachmann M1, REFU 620 Inverter and PC as nodes on the bus. Later deploying an SPI interface between DE2-115 FPGA Board and F28335 DSP, and integrate an ADC in FPGA board.

By developing the whole platform for controlling unit, we can now test our setup for small test bench available at Fraunhofer IWES, Bremerhaven.