Abstract

This thesis aimes to achieve a wireless data transfer based on the implementation of a simplified communication protocol. The implementation was accomplished on the National Instrument's PXI platform.

The term PXI platform covers both the hardware and the softver development environtment. The main parts of the hardware are the PXI chassis, the two RF modules and the computer which runs the application software. The tasks assigned to the transmitter and receiver parts, are done by the NI PXI-5671vector signal generator and the NI PXI 5661 vector signal analyzer modules respectively. The functionality of the modules is based on the theory of the complex envelope. The software development environment uses the LabVIEW programming language. LabVIEW is a graphical programming language, which is suitable to implement virtual instruments in a dataflow-type approach. The APIs (Application Programming Interface) make the RF modules easy to handle in LabVIEW. The main role of the application software beside the management of the hardware is to perform the necessary signal processing tasks like modulation, demodulation, generation and regeneration of the complex envelopes.

The data transfer has been analyzed based on bit error rate (BER) measurements, eye- and constellation-diagrams. At the end of the MSc thesis a short review sums-up those parts of the evaluation process of the implemented data communication system which could be further developed to achieve a better performance.