Implementasi penerima Ultra Wide Band (UWB) berbasis FPGA = Implementation of Ultra Wide Band (UWB) receiver based on FPGA

Rahmad Sadli, author

Abstrak

This thesis discusses about the implementation of an Ultra Wide Band (UWB) communication system based on the FPGA (Field Programmable Gate Array) using the Orthogonal Amplitude Modulation (OAM) which is the newer modulation technique that can provide a higher speed of data transmission rate. The OAM (Orthogonal Amplitude Modulation) is the combination between the Bi-Phase Modulation (BPM) and Pulse Position Modulation (PPM) using the orthogonal signal. The work is focus on the ADC data captured, performing parallel correlation, synchronization and decoding process. The basic principle of the system is: the transmitted signal is first coded into the symbols by using 4- OAM. Then, this data are transmitted by a UWB antenna. The UWB antenna on the receiver side receives these signals and captured by a high speed ADC and results 16 data samples in parallel on every FPGA clock cycle. These signal are performed the parallel correlation with the reference signal which is stored in the FPGA memory. The results of correlation then can be decoded by firstly finding the peak of correlation result which is refers to the received symbol. By using the PCI express communication, the decoded data is transferred to the host application as a valid data received.