

# OFDM synchronization on USRP system

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## **Abstract:**

Information society is developing, especially radio communications require higher requirements on the number and quality of services. Before these requirements, many studies have been done to increase transmission capacity and improve transmission quality in the system. The aim of this project is introduced model to use Universal Software Radio Peripheral (USRP) as the hardware and GNU Radio as the software to implement some basic transmission of wireless signal. This implementation can be a small part of research on Software Defined Radio. The report introduce OFDM technique model and analyzed the function block model of OFDM, OFDM signal structure and OFDM synchronization. Inside describes the hardware structure of USRP with the function block diagram. There are main components of USRP: Altera Cyclone FPGA, AD9862 chip and Daughterboard's. Each of them is defined generally in term of hardware structure and function. The report also shows how the GNU Radio software toolkit run in Ubuntu Operating System. GNU Radio provides a number of signal processing blocks for the user to build the Flow graph using GNU Radio Companion interface. The method to make user's custom blocks with gr-s4a toolbox is given. The report results gain is installed GNU radio software and through USRP and gnu-radio tool has implemented successfully the model with signal OFDM transceiver can be a vector or text file. Lastly, the report suggests some solutions for some problems of the transmission between USRPs, such as limitation of amplitude, suitable carrier frequency and especially synchronization question.

**Identifier words:** Software Define Radio (SDR), Universal Software Radio Peripheral (USRP), Orthogonal Frequency Division Multiplexing (OFDM)