



Software-Defined Radio with Zynq using Simulink



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Software-Defined Radio with Zynq using Simulink

This one-day course focuses on modeling designs based on software-defined radio in MATLAB and Simulink and configuring and deploying on the ADI RF SOM. Topics discussed include model and simulate RF signal chain and communication algorithms, implementation of Radio I/O and prototype deployment with real-time data via hardware/software codesign.

Prerequisites

Programming Xilinx Zynq SoCs with MATLAB and Simulink. Knowledge of concepts of communications and hardware design.

DURATION	LEVEL
1 day	Advanced
	

TOPICS

Day 1

- Model Communications System using Simulink
- Implement Radio I/O with ADI RF SOM and Simulink
- Prototype Deployment with Real-Time Data via HW/SW Co-Design

Communications System using Simulink

OBJECTIVE: Model and simulate RF signal chain and communications algorithms.

- Overview of software-defined radio concepts and workflows
- Model and understand AD9361 RF Agile Transceiver using Simulink
- Simulate a communications system that includes a transmitter, AD9361 Transceiver, channel and Receiver (RF test environment)

Implement Radio I/O with ADI RF SOM and Simulink

OBJECTIVE: Verify the operation of baseband transceiver algorithm using real data streamed from the AD9361 into MATLAB and Simulink.

- Overview of System object and hardware platform
- Set up ADI RF SOM as RF front-end for over-the-air signal capture or transmission
- Perform baseband processing in MATLAB and Simulink on captured receive signal
- Configure AD9361 registers and filters via System object
- Verify algorithm performance for real data versus simulated data

Prototype Deployment with Real-Time Data via HW/SW Co-Design

OBJECTIVE: Generate HDL and C code targeting the programmable logic (PL) and processing system (PS) on the Zynq SoC to implement TX/RX.

- Overview of Zynq HW/SW co-design workflow
- Implement Transmitter and Receiver on PL/PS using HW/SW co-design workflow
- Configure software interface model
- Download generated code to the ARM processor and tune system parameters in real-time operation via Simulink
- Deploy a stand-alone system



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