

## Summary - E3xx MIMO XCVR AD5662

Names	e3xx_mimo_xcvr_ad5662
Worker Types	Device
Version	v1.5
Release Date	4/2019
Component Library	ocpi.bsp.e310.cards
Workers	e3xx_mimo_xcvr_ad5662.hdl
Tested Platforms	xsim, E310 (Vivado only)

## Worker Implementation Details

The e3xx\_mimo\_xcvr\_ad5662 device worker is used to configure the e3xx\_mimo\_xcvr\_ad5662 MicroDAC hardware block. The hardware takes in a digital word and converts it to an analog voltage value based on the number written. The protocol used to write the DAC value to hardware is compatible with SPI. The e3xx\_mimo\_xcvr\_ad5662 worker will write the DAC value over SPI to the hardware on property write.

## Block Diagrams

### Top level

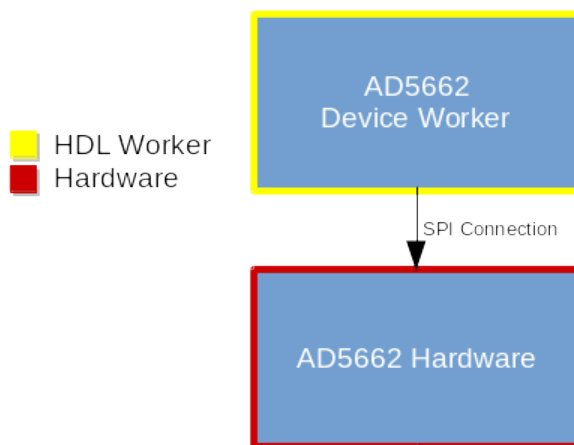


Figure 1: Top level block diagram of the e3xx\_mimo\_xcvr\_ad5662 device worker and hardware

## Source Dependencies

### e3xx\_mimo\_xcvr\_ad5662.hdl

- hdl/cards/e3xx\_mimo\_xcvr\_ad5662.hdl/e3xx\_mimo\_xcvr\_ad5662.vhd
- hdl/cards/e3xx\_mimo\_xcvr\_ad5662.hdl/signals.vhd

# Component Spec Properties

## e3xx\_mimo\_xcvr\_ad5662.hdl

Name	Type	SequenceLength	ArrayDimensions	Accessibility	Valid Range	Default	Usage
-	-	-	-	-	-	-	-

# Worker Interfaces

## e3xx\_mimo\_xcvr\_ad5662.hdl

Scope	Name	Type	SequenceLength	ArrayDimensions	Accessibility	Valid Range	Default	Usage
Property	voltageScale	ulong	-	-	Writable,Readable	0-32767	-	Word to write down to the e3xx_mimo_xcvr_ad5662 hardware block. Bits 15..0 represent D in the following equation $V_{out} = V_{ref}(\frac{D}{65536})$ , bits 18..16 represent the shutdown mode, and bits 31..19 are don't-cares.

# Signals

## e3xx\_mimo\_xcvr\_ad5662.hdl

Name	Type	Width	Description
TUNE_DAC_SYNC	Out	1	SYNC line for SPI connection to e3xx_mimo_xcvr_ad5662 hardware
TUNE_DAC_SCLK	Out	1	SCLK line for SPI connection to e3xx_mimo_xcvr_ad5662 hardware
TUNE_DAC_SDIN	Out	1	SDIN line for SPI connection to e3xx_mimo_xcvr_ad5662 hardware
VCTCXO_TO_MB	In	1	Resultant clock

## Control Timing and Signals

The `e3xx_mimo_xcvr_ad5662` device worker uses the standard Control Plane signals and the raw property interface.

# Worker Configuration Parameters

e3xx\_mimo\_xcvr\_ad5662.hdl

Table 1: Table of Worker Configurations for worker: e3xx\_mimo\_xcvr\_ad5662

Configuration
0

# Performance and Resource Utilization

e3xx\_mimo\_xcvr\_ad5662.hdl

Table 2: Resource Utilization Table for worker "e3xx\_mimo\_xcvr\_ad5662"

Configuration	OCPI Target	Tool	Version	Device	Registers (Typ)	LUTs (Typ)	Fmax (MHz) (Typ)	Memory/Special Functions
0	zynq	Vivado	2017.1	xc7z020clg400-3	38	51	N/A	N/A

## Test and Verification

No unit test for this component exists. However, a simulation-only application (which is NOT a unit test) exists for testing purposes (see `applications/e3xx_mimo_xcvr_ad5662_test`).

## References

- [1] E310 User Manual, [https://files.ettus.com/manual/page\\_usrp\\_e3x0.html](https://files.ettus.com/manual/page_usrp_e3x0.html).
- [2] E310 Hardware Schematics, <https://files.ettus.com/schematics/e310/>.