

OpenCPI
E31x MIMO XCVR AD5662 Component Data Sheet

OpenCPI Release: v2.4.7

Summary - E31x MIMO XCVR AD5662

Name	e31x_mimo_xcvr_ad5662
Worker Type	Device
OpenCPI Release	v2.4.7
Last Update	4/2019
Component Library	ocpi.osp.e31x.cards
Workers	e31x_mimo_xcvr_ad5662.hdl
Tested Platforms	E310 (Vivado only), xsim

Worker Implementation Details

The e31x_mimo_xcvr_ad5662 device worker is used to configure the e31x_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 e31x_mimo_xcvr_ad5662 worker will write the DAC value over SPI to the hardware on property write.

Block Diagrams

Top level

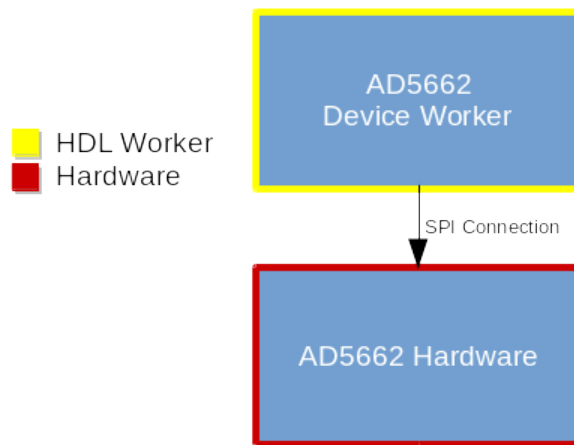


Figure 1: Top level block diagram of the e31x_mimo_xcvr_ad5662 device worker and hardware

Source Dependencies

e31x_mimo_xcvr_ad5662.hdl

- hdl/cards/e31x_mimo_xcvr_ad5662.hdl/e31x_mimo_xcvr_ad5662.vhd
- hdl/cards/e31x_mimo_xcvr_ad5662.hdl/signals.vhd

Component Spec Properties

e31x_mimo_xcvr_ad5662.hdl

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

Worker Interfaces

e31x_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 e31x.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

e31x_mimo_xcvr_ad5662.hdl

Name	Type	Width	Description
TUNE_DAC_SYNC	Out	1	SYNC line for SPI connection to e31x_mimo_xcvr_ad5662 hardware
TUNE_DAC_SCLK	Out	1	SCLK line for SPI connection to e31x_mimo_xcvr_ad5662 hardware
TUNE_DAC_SDIN	Out	1	SDIN line for SPI connection to e31x_mimo_xcvr_ad5662 hardware
VCTCXO_TO_MB	In	1	Resultant clock

Control Timing and Signals

The `e31x_mimo_xcwr_ad5662` device worker uses the standard Control Plane signals and the raw property interface.

Worker Configuration Parameters

e31x_mimo_xcvr_ad5662.hdl

Performance and Resource Utilization

e31x_mimo_xcvr_ad5662.hdl

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/e31x_mimo_xcvr_ad5662_test`).

References

- [1] E310 User Manual, https://files.ettus.com/manual/page_{usrp_}e3x0.html.
- [2] E310 Hardware Schematics, <https://files.ettus.com/schematics/e310/>.