

# axi\_lite\_1553.v

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## AUTHORS

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## DATES

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2024/10/17

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## INFORMATION

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### Brief

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AXI Lite 1553 is a core for interfacing with 1553 devices over the AXI lite bus.

### License MIT

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## axi\_lite\_1553

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```
module axi_lite_1553 #(
  parameter
  ADDRESS_WIDTH
  =
  32,
  parameter
  BUS_WIDTH
  =
  4,
  parameter
  CLOCK_SPEED
  =
  100000000,
  parameter
```

```

SAMPLE_RATE
=
20000000,
parameter
BIT_SLICE_OFFSET
=
0,
parameter
INVERT_DATA
=
0,
parameter
SAMPLE_SELECT
=
0
) ( input aclk, input arstn, input s_axi_awvalid, input [ADDRESS_WIDTH-1:0]

```

AXI Lite based 1553 communications device.

## Parameters

<b>ADDRESS_WIDTH</b> parameter	Width of the axi address bus, max 32 bit.
<b>BUS_WIDTH</b> parameter	Width in bytes of the data bus.
<b>CLOCK_SPEED</b> parameter	This is the aclk frequency in Hz
<b>SAMPLE_RATE</b> parameter	Rate of in which to sample the 1553 bus. Must be 2 MHz or more and less than aclk. This is in Hz. BIT_SLICE_OFFSET- Adjust where the sample is taken from the input.
<b>INVERT_DATA</b> parameter	Invert all 1553 bits coming in and out.
<b>SAMPLE_SELECT</b> parameter	Adjust where in the array of samples to select a bit.

## Ports

<b>aclk</b>	Clock for all devices in the core
<b>arstn</b>	Negative reset
<b>s_axi_awvalid</b>	Axi Lite aw valid
<b>s_axi_awaddr</b>	Axi Lite aw addr
<b>s_axi_awprot</b>	Axi Lite aw prot
<b>s_axi_awready</b>	Axi Lite aw ready
<b>s_axi_wvalid</b>	Axi Lite w valid
<b>s_axi_wdata</b>	Axi Lite w data
<b>s_axi_wstrb</b>	Axi Lite w strb
<b>s_axi_wready</b>	Axi Lite w ready
<b>s_axi_bvalid</b>	Axi Lite b valid
<b>s_axi_bresp</b>	Axi Lite b resp
<b>s_axi_bready</b>	Axi Lite b ready
<b>s_axi_arvalid</b>	Axi Lite ar valid
<b>s_axi_araddr</b>	Axi Lite ar addr
<b>s_axi_arprot</b>	Axi Lite ar prot
<b>s_axi_arready</b>	Axi Lite ar ready
<b>s_axi_rvalid</b>	Axi Lite r valid

<b>s_axi_rdata</b>	Axi Lite r data
<b>s_axi_rresp</b>	Axi Lite r resp
<b>s_axi_rready</b>	Axi Lite r ready
<b>i_diff</b>	Input differential signal for 1553 bus
<b>o_diff</b>	Output differential signal for 1553 bus
<b>en_o_diff</b>	Enable output of differential signal (for signal switching on 1553 module)
<b>irq</b>	Interrupt when data is received

## up\_rreq

---

```
wire up_rreq
```

uP read bus request

## up\_rack

---

```
wire up_rack
```

uP read bus acknowledge

## up\_raddr

---

```
wire [ADDRESS_WIDTH-(  
BUS_WIDTH  
  
2  
)-1:0] up_raddr
```

uP read bus address

## up\_rdata

---

```
wire [31:0] up_rdata
```

uP read bus request

## up\_wreq

---

```
wire up_wreq
```

uP write bus request

## up\_wack

---

```
wire up_wack
```

uP write bus acknowledge

## up\_waddr

---

```
wire [ADDRESS_WIDTH-(  
BUS_WIDTH  
2  
)-1:0] up_waddr
```

uP write bus address

## up\_wdata

---

```
wire [31:0] up_wdata
```

uP write bus data

## INSTANTIATED MODULES

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### inst\_up\_axi

---

```
up_axi #(  
AXI_ADDRESS_WIDTH(ADDRESS_WIDTH)  
) inst_up_axi ( .up_rstn (arstn), .up_clk (aclk), .up_axi_awvalid(s_axi_awv
```

Module instance of up\_axi for the AXI Lite bus to the uP bus.

### inst\_up\_1553

---

```
up_1553 #(  
ADDRESS_WIDTH(ADDRESS_WIDTH),  
BUS_WIDTH(BUS_WIDTH),  
CLOCK_SPEED(CLOCK_SPEED),  
SAMPLE_RATE(SAMPLE_RATE),  
BIT_SLICE_OFFSET(BIT_SLICE_OFFSET),  
INVERT_DATA(INVERT_DATA),  
SAMPLE_SELECT(SAMPLE_SELECT)  
) inst_up_1553 ( .clk(aclk), .rstn(arstn), .up_rreq(up_rreq), .up_rack(up_ra
```

Module instance of up\_1553 creating a Logic wrapper for 1553 bus cores to interface with uP bus.