

Future Design Systems	FDS-TD-2019-04-004

# Xilinx FFT Configuration Controller

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## Abstract

This document describes specifications of controller for Xilinx FFT module.

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## 1 Overview

'xfft\_config' block sets Xilinx FFT module through configuration port with AXI stream protocol and it interacts with system through AMBA APB.

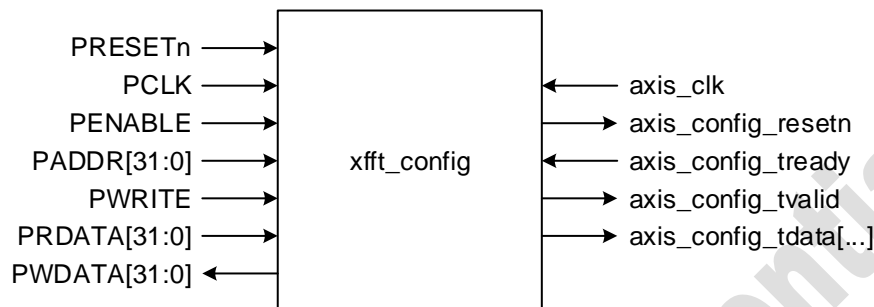


Figure 1: Overview

It uses two clocks and clock-crossing has been considered inside.

## 2 Macros, Parameters, Signals and Control-Status Registers

### 2.1 Parameters

Parameter	Meaning	Default
AXIS_WIDTH	Bit-width of stream data (AXIS_TDATA)	8

### 2.2 Signals

group	Signal	Direction	Remarks
APB	PRESETn	INPUT	
	PCLK	INPUT	
	PENABLE	INPUT	
	PWRITE	INPUT	
	PADDR[31:0]	INPUT	
	PRDATA[31:0]	INPUT	
	PWDATA[31:0]	OUTPUT	
Config	axis_clk	INPUT	
	axis_config_resetsn	OUTPUT	Active low reset to initialize XFFT
	axis_config_tready	INPUT	
	axis_config_tvalid	OUTPUT	
	axis_config_tdata[...]	OUTPUT	Configuration data to be driven with AXIS_WIDTH-bit width

### 2.3 CSR

Name	Address offset	Bit#		description
VERSION	+00h		RO	Version (0x2019_0410)
RESERVED	+04h			Reserved
	+08h			Reserved
	+0Ch			Reserved
RESET	+10h		RW	CONTROL register (default: 0x0000_0000)
			31:1	Reserved
			0	Active-low 'axis_config_resetrn' is driven 0 when it is 1. (Should be written to 0 to get back to normal.)
CONFIG	+10h		RW	
			31:AXIS_WIDTH	Reserved
			AXIW_WIDTH-1:0	Configuration data (Should be valid when 'axis_config_tvalid' is 1)
STATUS	+14h		RO	
			31:4	Reserved
			3	'done'
			2	'axis_config_tvalid'
			1	'axis_config_tready'
			0	'axis_config_resetrn'

### 3 Operation

More details should refer to 'Configuration Channel' in the reference [2].

### 4 API

All API returns '0' when completes successfully. Otherwise, it returns non-zero value.

```
int xfft_config_reset ( void ) ;
```

It drives 'axis\_config\_resetrn' low and then returns to high.

```
int xfft_config ( unsigned int config, int time_out ) ;
```

It set XFFT by driving 'config' data.

- config:
- time\_out:

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## 4.1 Typical usage

Following code shows a typical usage of API to set 'config'.

```
#include "xfft_config_api.h"

int main() {
    ... ..
    xfft_config_reset();
    xfft_config(0x01, 0);
    ... ..
}
```

## References

- [1] AMBA Specification, Rev. 3.0, ARM.
- [2] Xilinx, Fast Fourier Transform, LogiCORE IP product guide, PG109.

## Revision history

- 2019.04.10: Prepared by Ando Ki.

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