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**PKT\_CODEC\_MK2**  
**Reference Manual**

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## 1 REVISION HISTORY

Table 1

Revision	Author	Date	Description
1.00	Lasse Lehtonen	09.11.2011	Initial documentation

## 2 DOCUMENT OVERVIEW

### 2.1 SCOPE

This documentation describes how to interface with NoCs using `pkt_codec_mk2` interface.

### 2.2 AUDIENCE

For hardware integrators wanting to use this component.

### 2.3 RELATED DOCUMENTATION

Table 2

Document	Description

### 2.4 DOCUMENT CONVENTIONS

- Ports: teletype in text
- Generics: teletype in text

## 3 INTRODUCTION

### 3.1 BRIEF DESCRIPTION

PKT\_CODEC\_MK2 is a network interface component placed between the IP and the network. It handles the clock domain crossing and the generation of the network depended packet headers. Supported addressing modes include memory mapped, target id and raw where ip is responsible for using correct network address.

## 4 HARDWARE DESIGN

### 4.1 PKT\_CODEC\_MK2

#### 4.1.1 GENERICS

Table 3

Name	Description
my_id_g	Id number for addressing the agent
cmd_width_g	Width of the command bus
data_width_g	Width of the data bus
agents_g	Total number of agents in the network
cols_g	Columns in mesh like networks
rows_g	Rows in mesh like networks
agent_ports_g	How many agents are connected to a router
addr_flit_en_g	Transfer the original address with the packet
address_mode_g	Select addressing mode to use
clock_mode_g	Select asynchronous clock
rip_addr_g	Remove the network address from the packet
noc_type_g	Select the network model to use

#### 4.1.2 CLOCKING AND RESET

Table 4

Port	Width	Direction	Description
clk_net	1	in	Clock for the network, active on rising edge
clk_ip	1	in	Clock for the IP, active on rising edge
rst_n	1	in	Reset, asynchronous, active low

When `clock_mode_g` is 0 both clock inputs should be connected to the same clock source and when 1 they can be connected to asynchronous clocks.

#### 4.1.3 DATA INTERFACE

Table 5

Port	Width	Direction	Description
cmd_in	2	in	Incoming command
data_in	g	in	Incoming data
stall_out	1	out	Stall the incoming data
cmd_out	2	out	Outgoing command
data_out	g	out	Outgoing data
stall_in	1	in	Stall sending data

Zero on command line means that the line does not contain anything. One means that on the data bus there's a address for the next data. Two means there's data to be sent to the previous address. Value three is undefined. Flow control is simple: at the clock cycle when stall signal is read being high the corresponding command and data lines must remain unmodified.

Format of the address depends on the `address_mode_g` generic. Zero means that the IP should generate the network address directly, one that address should be the id number of the target IP and two that memory mapped addresses are used. Memory map translation table can be defined in `addr_lut.vhd`.