Future Technology Devices International Ltd.

Application Note AN_137

Vinculum-II IO Cell Description

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The purpose of this document is to describe the IO Cell type used in the Vinculum-II devices interface.

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1 Introduction

The Vinculum VNC2 device is FTDI's 2nd generation USB host solution device and expands on the capabilities of the VNC1L. The device is supplied in 6 different packages. There are 32 pin QFN and LQFP packages, 48 pin QFN and LQFP packages and 64 pin QFN and LQFP packages.

The 32 pin packages have 12 IO pins, the 48 pin package has 28 IO pins and the 64 pin package has 44 IO pins.

Each of the IO pins interface to the external logic and may be defined as an input or an output. All IO pins default to an input following a reset.

Following a reset, the IO MUX module within VNC2 can be enabled to set pin function and direction. The actual definition of the pin function and direction is controlled by the firmware.

2   The IO Cell
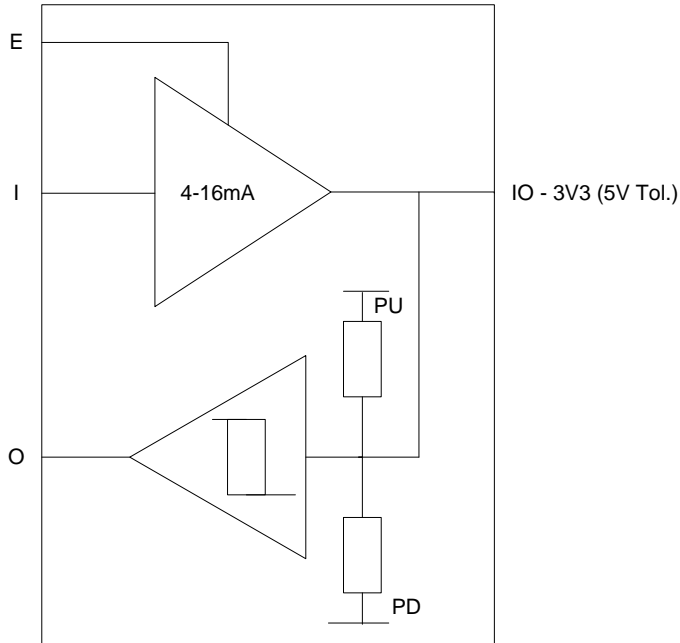
The IO cell is an LVTTL 3V3 (5V tolerant IO Cell).

Figure 1: IO Cell

LVTTL	Low Voltage Transistor Transistor Logic
E	Enable to enable the output stage
I	Input
O	Output
IO	Input/Output
PU	Pull up resistor (75kOhm) option
PD	Pull down resistor (75kOhm) option

Figure 2: Symbol Table

The IO drive strength of the output stage may be configured to be either 4mA, 8mA, 12mA or 16mA. This is controlled by a register setting which is set within the firmware. The default is 4mA.

The input may be configured to use a pull up, pull down resistor or have no termination at all.
The value of the pull up / pull down is 75kOhm. The default is to disable the pull up and pull down resistors.

There is also the capability to control the slew rate – fast or slow. The default is set to fast.

An additional option is the capability of configuring each IO input as a normal input or a Schmitt trigger input. The default is to disable the Schmitt trigger capability.

3   Summary

Although designed for use in a 3V3 system, the IO is tolerant of 5V inputs and can be used to interface to 3V3 or 5V systems. With the configurability of the cell it is not necessary to use external pull up or pull down resistors to realise a design which will result in a smaller bill of materials and less board space on the PCB.

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Please visit the Sales Network page of the FTDI Web site for the contact details of our distributor(s) and sales representative(s) in your country.

Appendix A– Revision History

Version Draft First Draft   01/02/2010
Version 1.0   First release   19/02/2010