ClockMaster

User Guide

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November 6, 2019

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1 Introduction

The Basys2 Figure 1, board is a circuit design and implementation platform that anyone can use to gain experience building real digital circuits. Built around a Xilinx Spartan-3E Field Programmable Gate Array and a Atmel AT90USB2 USB controller, the Basys2 board provides complete, ready-to-use hardware suitable for hosting circuits ranging from basic logic devices to complex controllers.

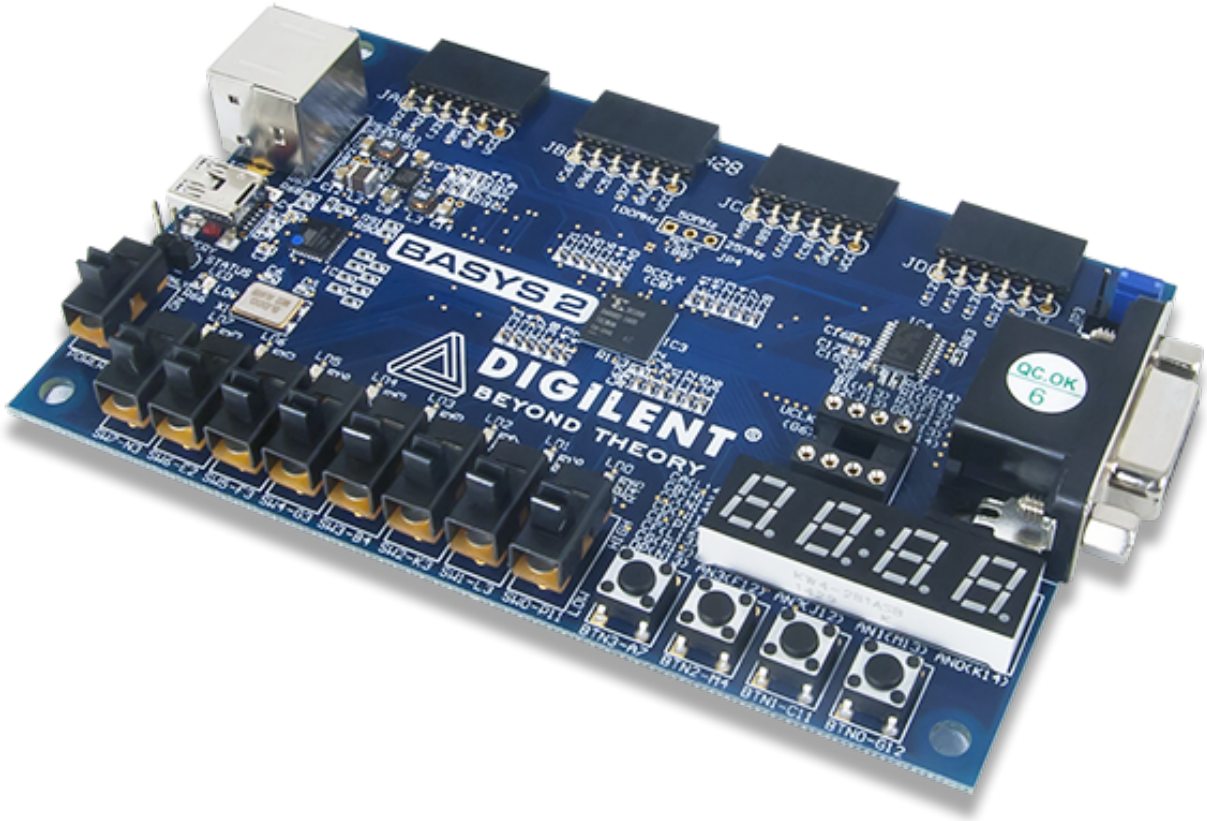

Figure 1: Basys 2 board

Our project uses the Basys2 to make a clock with some features. We propose to use 7 segment dislay as output and the push buttons to set the time and navigate through the menus.

2 Block Diagram

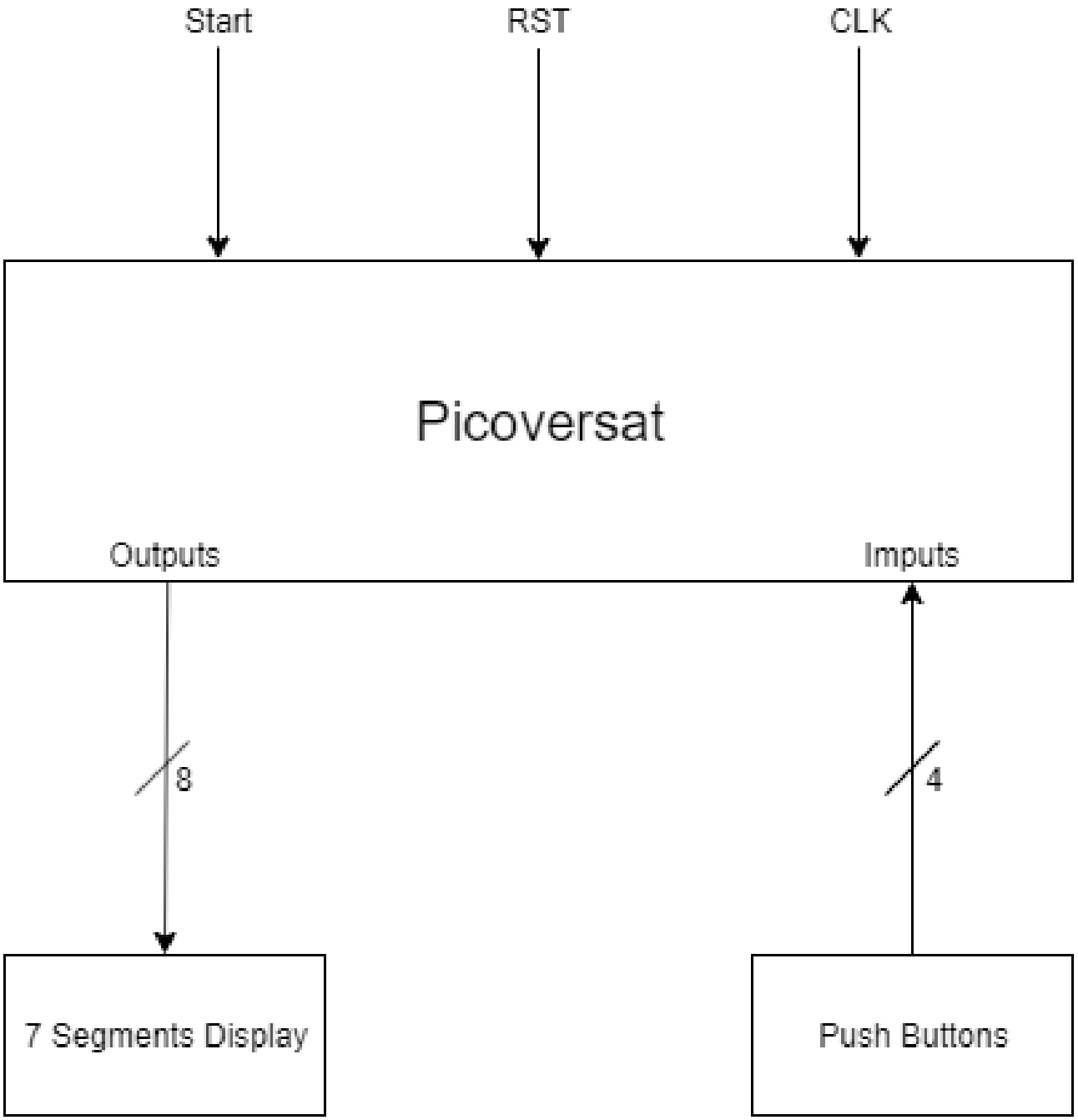

Figure 2: Block diagram

Table 1: Peripheral interface signals.

Name	Direction	Peripheral	Description
clk	IN	FPGA Clock	Clock signal
rst	IN	FPGA push button	Reset signal
mode	IN	FPGA push button	Changes the mode of operation (clock, counter or timer)
seth	IN	FPGA push button	Sets the hours
setm	IN	FPGA push button	Sets the minutes
display	OUT	FPGA 7-LEDs display	Shows the clock, timer or counter (depends on mode)

3 Peripheral Signals

4 Peripherals

The Basys2 has manny peripherals options such as: -7-segments display -on/off switch -push buttons -VGA port -PS/2 port -6-pin headers

4.1 Peripherals Used

The peripherals that we will de using are the 7-segments display and the push buttons.

4.2 7-Segments Display

Table 2: 7-Segments Display.

Name	Address	Bits	Description
DISPLAY_BASE	768	11:0	4 7-segments display with 8 bits[7:0] for each display and 4 bits[11:8] to select the display

4.3 Push Buttons

Table 3: Push Buttons.

Name	Address	Bits	Description
BUTTON_BASE	530	3:0	Reset, mode, set hours and set minutes buttons

5 Instructions

5.1 Clock

The ClockMaster will have the function to show the time in the 7 segment dislay. With the help of the push buttons we will be able to set the time correctly.

5.2 Counter

The Counter is a feature that we can set a desired value and counts until reach that value.

5.3 Timer

This feature use a previously entered value and stop counting when it reaches 0.

6 Implementation Results

7 Conclusions