**Lab 1**

**Counter Tutorial**

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**Programmable ASIC Design**

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# Purpose

The purpose of this lab was to introduce students to Xilinx ISE 13.1 and design flow, learn how to specify pin locations, and to become familiar working with the Atlys FPGA board.

# Background

## Atlys FPGA Board

The Atlys circuit board is a complete, ready-to-use digital circuit development platform based on a Xilinx Spartan-6 LX45 FPGA.

Digilent

Figure . Digilent Atlys FPGA board [1]

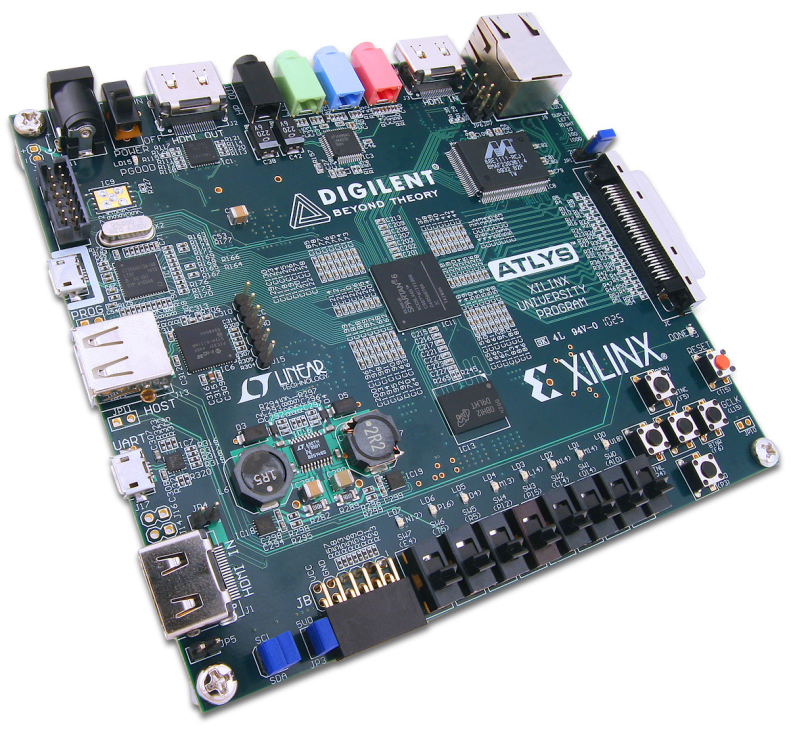


Figure . Atlys FPGA board architecture [1]

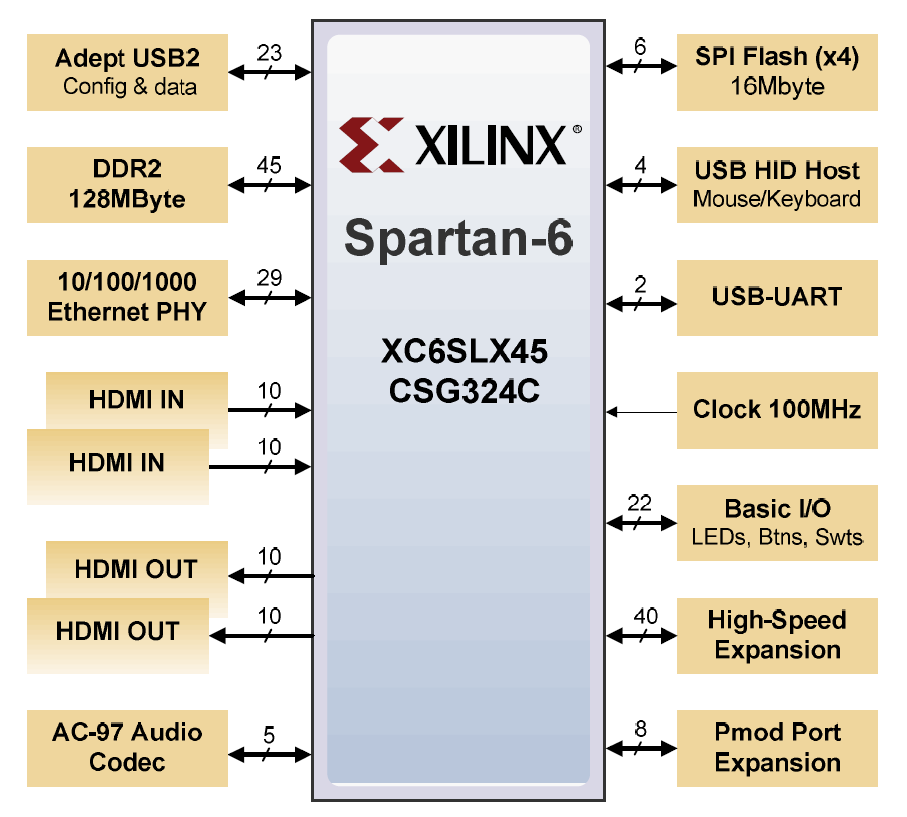
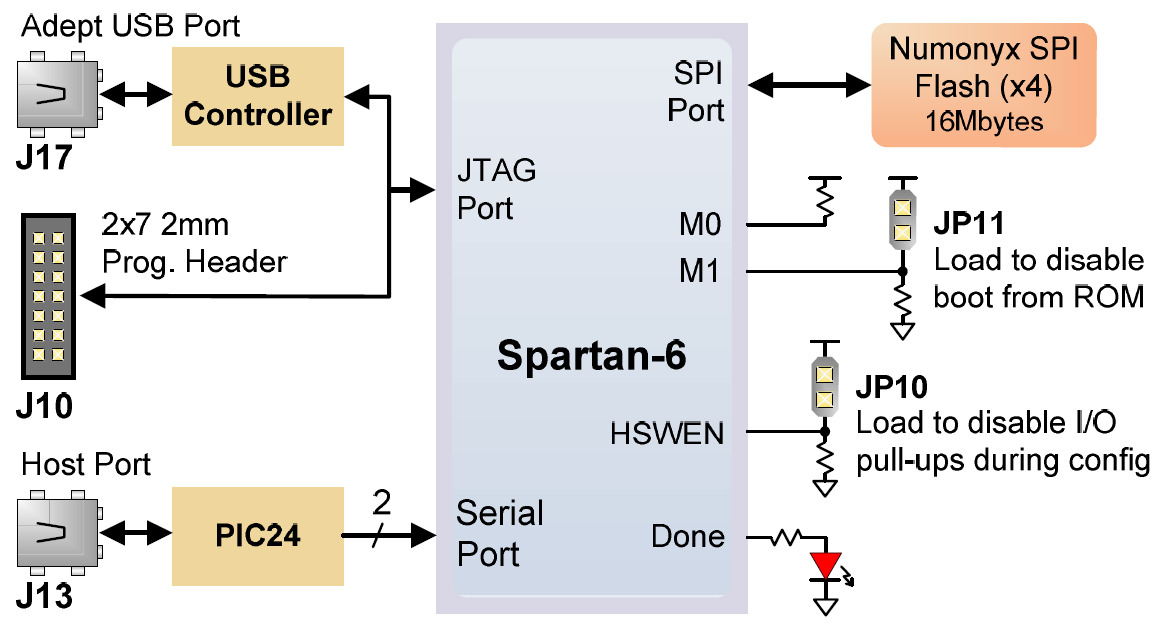


Figure . Atlys FPGA board configuration circuit [1]



# Procedure

## Part 1. Counter Tutorial

1. Follow instructions

## Part 2. Modify Pin Assignments

1. Change to toggle switches
2. Try to debounce with adding clock

# Results

## Schematics:

Figure . RTL Schematic

Figure . Technology Mapping Schematic

Figure . Place and Route

## Simulations:

Figure . Behavioral Simulation

Figure . Post Synthesis Simulation

Figure . Post Place and Route Simulation

# Discussion of Results

## Part 1

# References

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| --- | --- |
| [1] | Digilent, Inc., "Atlys Board Reference Manual," 2 May 2013. [Online]. Available: http://www.digilentinc.com/Data/Products/ATLYS/Atlys\_rm\_V2.pdf. [Accessed 18 February 2015]. |