

# Getting Started with the Spartan-3A DSP S3D1800A Starter Platform User Guide



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## Revision History

The following table shows the revision history for this document.

| Date    | Version | Revision         |
|---------|---------|------------------|
| 1/28/08 | 1.0     | Initial release. |

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## *About This Guide*

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This user guide provides basic information on the Xilinx Spartan™-3A DSP S3D1800A Starter Platform capabilities, functions, and design. It includes general information on how to use the board and verify that it is functional.

### **Guide Contents**

This manual contains the following chapters:

- [Chapter 1, “Introduction and Overview.”](#)
- [Chapter 2, “Quick Start Guide.”](#)

### **Additional Resources**

To find additional resources for the Xilinx Spartan-3A DSP S3D1800A Starter Platform, the Xilinx XtremeDSP development Tools, or the Xilinx Embedded development tools, see the Xilinx website at:

<http://www.xilinx.com/s3adspmb>

[http://www.xilinx.com/products/design\\_resources/proc\\_central/index.htm](http://www.xilinx.com/products/design_resources/proc_central/index.htm)

[http://www.xilinx.com/products/design\\_resources/dsp\\_central/grouping/index.htm](http://www.xilinx.com/products/design_resources/dsp_central/grouping/index.htm)

To find additional documentation, see the Xilinx website at:

<http://www.xilinx.com/literature>

To search the Answer Database of silicon, software, and IP questions and answers, or to create a technical support WebCase, see the Xilinx website at:

<http://www.xilinx.com/support>



## Introduction and Overview

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### Spartan-3A DSP S3D1800A Starter Platform Features and Functions

The Spartan-3A DSP S3D1800A Starter Platform highlights the unique features of the Spartan-3E FPGA family and provides a convenient development board for embedded processing applications.

#### Key Features

The key features of the Spartan-3A DSP S3D1800A Starter Platform are:

- Xilinx Devices: XC3SD1800A-4FGG676C Spartan-3A DSP FPGA
- Clocks 125 MHz LVTTTL SMT Oscillator
  - ◆ LVTTTL Oscillator Socket
  - ◆ 25.175 MHz LVTTTL SMT Oscillator (Video clock)
  - ◆ 25 MHz Ethernet clock (accessible to FPGA)
- Memory
  - ◆ 128 MB (32M x 32) DDR2 SDRAM
  - ◆ 16Mx8 Parallel / BPI Configuration Flash
  - ◆ 64 Mb SPI Configuration / Storage Flash (with 4 extra SPI selects)
- Interfaces
  - ◆ 10/100/1000 PHY
  - ◆ JTAG Programming/Configuration Port
  - ◆ RS232 Port
  - ◆ Low-cost VGA
  - ◆ 4 SPI select lines
- Buttons and switches
  - ◆ 8 User LEDs
  - ◆ 8-position User DIP Switch
  - ◆ 4 User Push Button Switches
  - ◆ Reset Push Button Switch

- User I/O and expansion
  - ◆ Digilent 6-pin header (2)
  - ◆ EXP Expansion Connector (2)
  - ◆ 30 pin GPIO Connector - can be used for System ACE™ Compact Flash daughter card (not included)
- Configuration and Debug
  - ◆ JTAG
  - ◆ System ACE Module Connector
  - ◆ Eridon debug connector (SATA)

# Quick Start Guide

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## Step 1

### Determine if the ISE™ Foundation or ISE WebPACK Software Tools Must be Installed

The Xilinx Embedded Development HW/SW Kit - Spartan™-3A DSP 3SD1800A MicroBlaze™ Processor Edition is provided with the Xilinx ISE™ WebPACK™ FPGA design solution DVD. For more information, or for updates to the ISE(tm) WebPACK FPGA design software, go to

[http://www.xilinx.com/ise/logic\\_design\\_prod/webpack.htm](http://www.xilinx.com/ise/logic_design_prod/webpack.htm).

The Xilinx ISE Foundation or ISE WebPACK will support the Xilinx Embedded Development HW/SW Kit - Spartan-3A DSP 3SD1800A MicroBlaze Processor Edition. If the latest ISE Foundation or WebPACK is installed, skip this step and continue to step 2.

If the Xilinx ISE WebPACK included in this kit is to be installed, the user must to obtain a 16-Digit Registration ID. To obtain this 16-Digit Registration ID, register this software on the Xilinx Software Registration web site. Locate the product ID on the Software assembly DVD holder on the ISE WebPACK Product ID sticker. Enter the ISE WebPACK Product ID on the Xilinx Software registration web site at <http://www.xilinx.com/swreg.htm>.

As part of this registration process the user will be sent a message by email from Xilinx containing the 16-Digit Registration ID that will use during the ISE WebPACK installation steps. After the 16-Digit Registration ID has been received, insert the ISE WebPACK DVD and follow the installation instructions.

If any problems are encountered, contact Xilinx Support at <http://www.xilinx.com/support/mysupport.htm>.

## Step 2

### Determine if the Embedded Development Kit DVD must be Installed

The Xilinx Embedded Development HW/SW Kit - Spartan-3A DSP 3SD1800A MicroBlaze Processor Edition is provided with a fully licensed version of the the Xilinx Embedded Development Kit DVD. For more information, or for updates to the EDK design software, go to <http://www.xilinx.com/edk>.

The Xilinx EDK Platform Studio software tools will support the Xilinx Embedded Development HW/SW Kit - Spartan-3A DSP 3SD1800A MicroBlaze Processor Edition. If the latest EDK Platform Studio installed, skip this step.

If the Xilinx EDK Platform Studio included in this kit is to be installed, the user must obtain a 16-Digit Registration ID. To obtain this 16-Digit Registration, register this software on the Xilinx Software Registration web site. Locate the product ID on the Software assembly DVD holder on the ISE WebPACK Product ID sticker. Enter the ISE WebPACK Product ID on the Xilinx Software registration web site at <http://www.xilinx.com/swreg.htm>.

As part of this registration process the user will be sent a message by email from Xilinx containing the 16-Digit Registration ID that will use during the ISE WebPACK installation steps. After the 16-Digit Registration ID has been received, insert the ISE WebPACK DVD and follow the installation instructions.

If any problems are encountered, contact Xilinx Support at <http://www.xilinx.com/support/mysupport.htm>.

## Step 3

### Verify that the Spartan-3A DSP 1800A Development Board is Functional

Review the Spartan3A DSP 1800A Board User Guide found at <http://www.xilinx.com/s3adspmb>. This user guide will provide more information on the default settings and position of the jumpers.

#### Software Prerequisites

The software used to test this reference design is:

- Windows XP 32-bit
- Xilinx ISE software, version 9.2i with Service Pack 4
- Xilinx EDK software, version 9.2i with Service Pack 2

Note: ISE and EDK latest Service Packs are available at <http://www.xilinx.com/support/download/index.htm>.

#### Hardware Prerequisites

The hardware setup used by this reference design includes:

- Xilinx Spartan-3A DSP 1800A Starter Platform
- Xilinx Parallel Cable IV (PC4) or Platform Cable USB with flyleads
- Serial Cable

### Hardware Setup

1. Install JP9 jumper on M1 and M2 to configure in SPI mode.
2. JP1, JP2, and JP3 jumpers can be installed in either position.
3. Install two jumpers each in the 1:3, 2:4 positions of JP4, JP5, JP6, and JP10.
4. Install a jumper on JP11 in the OFF position.
5. JP8 must NOT have a jumper, as this is the write enable for the serial flash.
6. All other jumpers are NOT installed.

The jumper connections are shown in Figure 2-1.

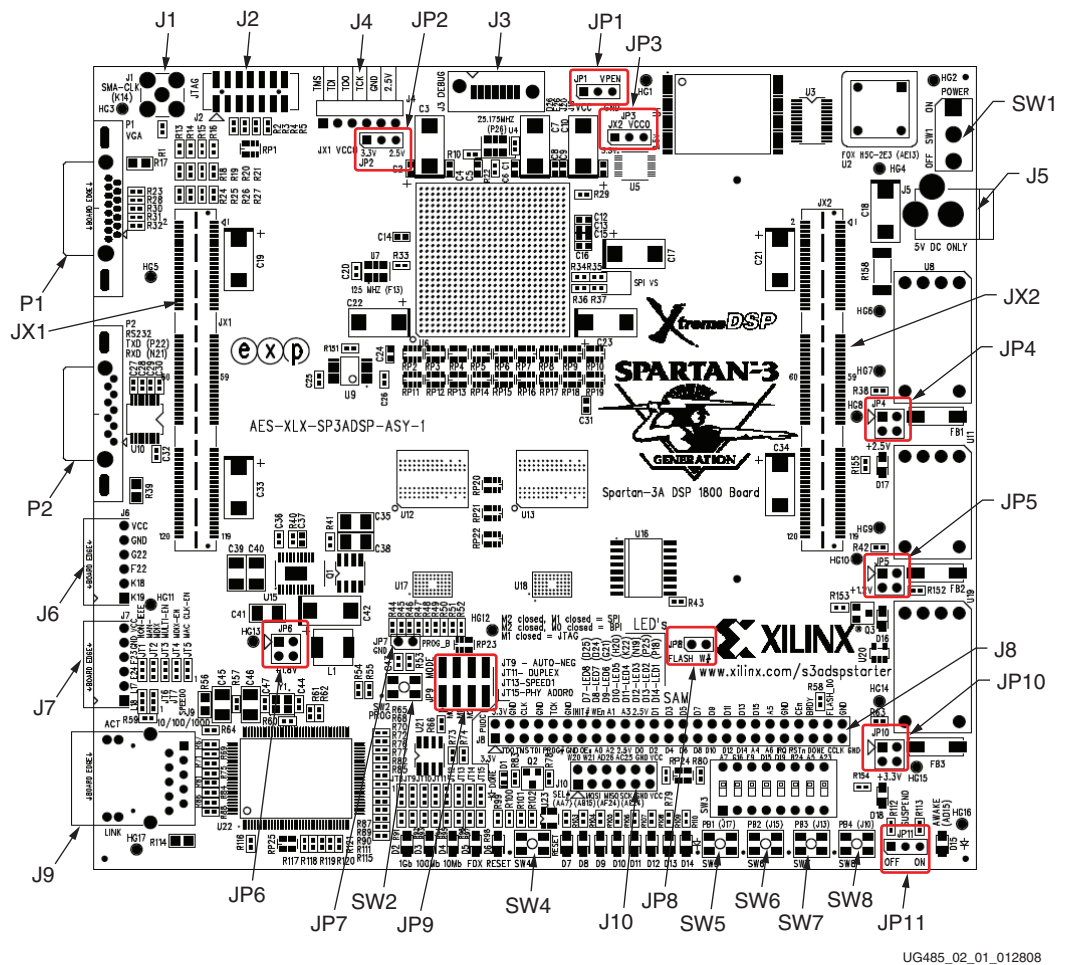


Figure 2-1: Jumper Connections

### Serial Cables

1. Plug in the serial cable between the PC RS232 port and the RS232 connector (P2) on the board.
2. With SW1 Power in the OFF position, plug in the 5V supply at J5.

### PC HyperTerminal Window

Launch a HyperTerminal connected to the RS232 COM port. Set Bits per second to **19200**, Data bits to **8**, Parity to **None**, Stop bits to **1**, and Flow control to **None**.

## Turning on Power for the First Time

1. Turn the SW1 Power to the **ON** position.
  - a. The three red Power Supply LEDs, D16, D17 and D18, will light.
  - a. The red Reset LED, D6, will flash momentarily.
  - a. The blue DONE LED, D1, will turn on, and LEDs D7 through D14 will start to "walk" an LED from right to left and then start to count in binary.
2. In the HyperTerminal, the following text will appear.

```
=====
/ /\
\ \      Xilinx Spartan3A DSP 1800A
/ /      Hello World and Board Bringup Test
\_ \/\
=====
```

Walking the LEDs

Counting on the LEDs

Reading the DIP Switches

SW3 = 0x0

Testing a region of DDR2 SDRAM

Testing : 0x20000000 - 0x20ffffff

Writing pseudo-random data...0x20fd8000

Reading : 0x20fd8000

Total Errors = 0

Mem passed

\*Press any key to continue

3. When this initial test has completed, press any key to continue with additional options. The following text will appear.

```

=====
          / /\
          \ \      Xilinx Spartan3A DSP 1800A
          / /      Hello World and Board Bringup Test
          \_\/\
=====

Type <help> for options
>

```

4. Type **help** to view the additional options listed below.

```

Menu:

cls                clear screen
b                  display banner
fce                Flash Chip Erase
flash              Flash Test
fbe <start> <end>  Flash Block Erase
fac <start> <end>  Flash Address Check
ddr                DDR2 SDRAM Test
mem <start> <end>  Test mem region
mrd <start> <end>  Dump mem region
mwr <addr> <data> Write mem location
gpio              GPIO Test
q                  quit (exit to xmd)
exp                Use Loopback cable. Drive JX1 & read JX2
for connectivity.
test              Perform factory tests
help              View this menu

>

```

If the configuration in the FLASH is inadvertently erased, download the initial bit streams and MEM files from <http://www.xilinx.com/s3adspmb>.

## Related Resources

See the sites listed below for more information on Spartan-3A DSP FPGA, Xilinx design tools, software, and support:

Kit Home Page at <http://www.xilinx.com/s3adspmb>

See this site for additional Reference designs including a additional HelloWorld and a Linux 2.6 reference design (based on LynuxWorks BlueCAT Linux 2.6.

Spartan-3A DSP device home page at <http://www.xilinx.com/spartan3adsp>

Design tool for Embedded Design using Xilinx FPGAs at <http://www.xilinx.com/edk>

Online technical support at <http://www.xilinx.com/support>

Check the development kit home page regularly at <http://www.xilinx.com/s3adspmb> for the latest in documentation, examples, product updates, known issues and links to evaluation and support by Xilinx and our Alliance Partners, etc.