

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.
6/12/08	1.1	Updated to EDK 10.1

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About This Guide

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 developmentTools , or the Xilinx Embedded development tools, see the Xilinx website at:

<http://www.xilinx.com/products/devkits/HW-SD1800A-DSP-SB-UNI-G.htm>

<http://www.xilinx.com/products/devkits/DO-SD1800A-EDK-DK-UNI-G.htm>

<http://www.xilinx.com/products/devkits/DO-SD1800A-DSP-SK-UNI-G.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

Spartan-3A DSP S3D1800A Starter Platform Features and Functions

The Spartan-3A DSP S3D1800A Starter Board is included in the following products:

- Spartan-3A DSP S3D1800A Starter Platform
- Embedded Development HW/SW Kit – Spartan-3A DSP S3D1800A MicroBlaze Processor Edition
- XtremeDSP Starter Kit - Spartan-3A DSP 1800A Edition.

The following list 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

Getting Started

The Spartan-3A DSP S3D1800A Starter Board is included in the following products:

- Spartan-3A DSP S3D1800A Starter Platform
- Embedded Development HW/SW Kit – Spartan-3A DSP S3D1800A MicroBlaze Processor Edition
- XtremeDSP Starter Kit - Spartan-3A DSP 1800A Edition

Each of these Platforms or Kits will include a Xilinx Software Development Suite DVD in the box or the software can be downloaded from the Xilinx software registration site. In either case, the software must be registered as part of the installation process.

To begin using the development kit software resources, the Xilinx Platform Studio (XPS), the Intergrated Software Environment Studio (ISE®), or the System Generator for DSP (SysGen), the user must first obtain the installation keys. To do so, the user can register or download these products immediately from the [Xilinx Registration and Download Site](#).

Determine Which ISE Design Software to Install

If the user is already entitled to a Full seat of the ISE Foundation Design Software or recently purchased a Full ISE Foundation Design Software, select the check box for the ISE Foundation.

If the user has never used the Xilinx ISE Design Software or has not purchased a Full seat of ISE Foundation, then the user should consider installing the free ISE® WebPACK® Design Software. If this is the case, check the box for the ISE WebPACK.

Note: Do not select both ISE WebPACK and ISE Foundation. The user can visit the Xilinx software registration and entitlement site to determine what type of software license is available - a Full license, an Evaluaton license, or a Free license.

Determine if EDK Design Suite Installation is Required:

The *Embedded Development HW/SW Kit – Spartan-3A DSP S3D1800A MicroBlaze Processor Edition* comes with entitlement to a FULL seat of the Embedded Development (EDK) Design Suite product. If this Embedded kit has been purchased, select the check box for the Embedded Development Kit (EDK).

If this Embedded kit has not been purchased, the user may still evaluate the EDK software. In this case select the Evaluation version of the EDK software.

The EDK will allow the user to develop an embedded design and the ISE WebPACK or Foundation will allow the user to place and route the design. A version of both EDK and ISE must be installed.

Determine if SysGen Design Suite Installation is Required

The *XtremeDSP Starter Kit - Spartan-3A DSP 1800A Edition* comes with entitlement to a FULL seat of the System Generator for DSP (SysGen) Design Suite product. If this DSP Starter kit has not been purchase, select the check box for the System Generator for DSP (SysGen).

If the DSP Starter kit has not been purchase, the user may still evaluate the SysGen software. In this case, select the Evaluation version of the SysGen software.

The SysGen will allow the user to develop a DSP design and the ISE WebPACK or Foundation will allow the user to place and route the design. A version of both SysGen and ISE needs to be installed.

Registration and Install Code

Once the registration process has been completed, the user will be presented with an installation code.

Use this code to install the software off the Xilinx Software DVD in the kit or use it with the software that was download from the Xilinx software registration and download site.

Verify that the Spartan-3A DSP 1800A Dev Platform 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 10.1
- Xilinx EDK software, version 10.1 (for Embedded Kit)
- Xilinx EDK software, version 10.1
- Xilinx SysGen software version 10.1 (for DSP Starter Kit)

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

Hardware Prerequisites

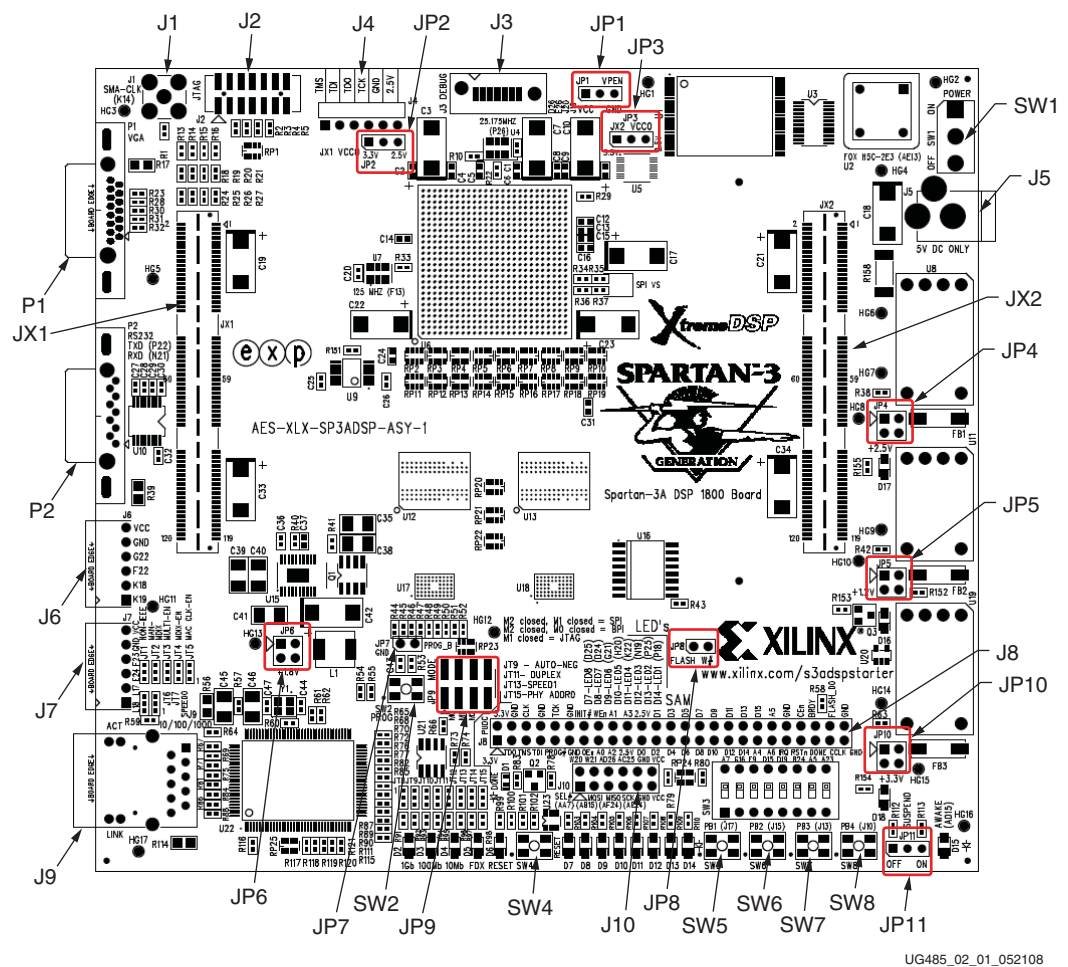
The hardware setup used by this reference design includes:

- 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](#).



Serial Cables

1. Plug in the serial cable from 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

- 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
>

```

- 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 bitstreams 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:

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

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

DSP Starter Kit Home Page at <http://www.xilinx.com/s3adspstarterkit>.

See this site for additional DSP Reference designs including an additional 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>.