

Getting Started with the Xilinx MicroBlaze and PowerPC Development Kit - Virtex-5 FXT70 Edition

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Revision History

The following table shows the revision history for this document.

	Version	Revision
8/7/08	1.0	Initial Xilinx release.

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Getting Started with the Xilinx MicroBlaze and PowerPC Development Kit - Virtex-5 FXT70 Edition

Overview

The Xilinx MicroBlaze™ and PowerPC® Development Kit - Virtex®-5 FXT70 Edition is designed to help you quickly and efficiently develop embedded systems using a fully integrated development platform.

This getting started guide provides a detailed description of what is included in the kit along with instructions on how to use the resources included in this kit.

Development Kit Contents

This development kit contains the following items:

- ML507 Development Platform including the Virtex-5 FXT70 FPGA
- Compact Flash Card - 512 MB
- Xilinx Software Development Suite DVD which includes:
 - ◆ Full seat of the ISE® Foundation™ Software
 - ◆ Full seat of the Embedded Development (EDK) Design Suite
- Power supply
- USB Download / Probe cable
- Serial cable and cross-over Ethernet cable
- DVI adapter and SATA cross-over cable
- Getting Started User Guide, online documentation, and reference designs

Getting Started with the Compact Flash Demonstrations

Before installing the software, you can run some of the demonstration designs provided with the ML507 Development Board. This will let you get an overview of the board features. This development kit comes with a number of pre-installed demonstrations and examples, as well as additional reference designs and application notes on the Xilinx web site. This kit includes a CF card that includes the demonstrations listed below.

- Virtex-5 FPGA Slide Show
- Web Server
- Simon Game
- Board Verification using XROM
- USB
- My Own ACE File
- Ring Tone Player

Some demonstrations interact with a computer, an external device, or require that some of all of the Xilinx Design Suite of software is installed. The following additional equipment is also recommended:

- DVI or VGA monitor
- Computer speaker with audio cable
- Ethernet port and an RJ-45 Ethernet cable
- USB keyboard (without a built-in USB hub)
- Null modem serial cable
- CompactFlash (CF) reader/writer for the computer
- Xilinx download cable (Parallel Cable III/IV or Platform Cable USB) with JTAG flying wire adapter

For detailed instructions of how to access these demonstrations, please read the [Quick Start Presentation](#) and the ML505/ML506/ML507 Getting Started Tutorial at [UG348 ML505/ML506/ML507 Getting Started Tutorial](#)

Installing the Software

The Xilinx MicroBlaze and PowerPC Development Kit – Virtex-5 FXT70 Edition includes a Xilinx Software Development Suite DVD in the box, or you can download the software from the Xilinx software registration site. In both cases, you must register the software as part of the installation process. You cannot install the software until it has been registered.

Step 1: Accessing the Xilinx Electronic Fulfillment Site

This development kit comes with “entitlement” to a FULL seat of the ISE Foundation Design Software (ISE) and a FULL seat of the Embedded Development (EDK) Design Suite product. You should have received an E-mail for the Xilinx electronic fulfillment site, and may have had an opportunity to install the Xilinx software already. If you have not done so, you may register and install your Xilinx software now. To determine what software the you have access to — Full, Evaluation, or Free license—please visit the Xilinx software registration and entitlement site.

To begin using the development kit software resources, the ISE Foundation, and the EDK Design Suite, you must first obtain installation keys. To do this, you may register or download these products immediately on the Xilinx Registration and Download Site at <http://www.xilinx.com/register>.

Step 2: Installing and Updating ISE & EDK Design Software

If you still need to install the ISE software, this embedded development kit comes with “entitlement” to a FULL seat of the ISE Foundation Design Software (ISE). After logging into the <http://www.xilinx.com/register> site, please select the check box for the “ISE Foundation”.

If you still need to install the EDK software, this embedded development kit comes with “entitlement” to a FULL seat of the Embedded Development Kit (EDK) Design Suite products. After logging into the <http://www.xilinx.com/register> site, please select the check box for the “Embedded Development Kit (EDK)”.

Step 3: Register and Install Software

The EDK will let you develop an embedded design and the ISE Foundation will let you place and route the design. A version of both EDK and ISE need to be installed. Any additional software may be selected for evaluation for a period of 60 days.

After making the desired product selections, click **Next**. An installation code will be presented. Use this code to install the software off the Xilinx Software DVD in the Kit or use it with the software that was downloaded from the Xilinx software registration and download site.

Insert the Xilinx Software Development Suite DVD that came with the kit or select and install the Install image that was downloaded from the Xilinx Registration and Download Site. Follow the instruction included in the installation software.

After you have installed the ISE and EDK , software, please make sure you also download the latest software updates. The latest software updates for all Xilinx products can be found on the Xilinx Download site: <http://www.xilinx.com/support/download/index.htm>.

Now What?

Congratulations, you have now successfully run some demonstrations on the ML507 board and installed the Xilinx ISE and EDK software. You now have an opportunity to run some additional Embedded Reference designs, learn how to customize your own hardware design, write your own software application, and explore the OS and RTOS options available to you. In addition to the resources high lighted below, there are additional resources found on the Xilinx website. Using a web browser, please link to <http://www.xilinx.com/products/devkits/DK-V5-EMBD-ML507-G.htm>.

You are encouraged to check the development kit home page regularly at <http://www.xilinx.com/embdevkits> for the latest in documentation, examples, product updates, known issues, and links to evaluation and support by our Alliance Partners and other Xilinx partners.

Reference Designs

The development kit includes two hardware systems that target the ML507 development board. One hardware system targets the PowerPC 440 processor and the other hardware system targets the MicroBlaze processor.

HelloWorld: A HelloWorld software application is included with both systems that exercises various features of the development board. The board memory, switches, LEDs, and other features can interact with a Hyperterminal window. A UART is used as a standard input and output device and a text based menu allows for board interaction.

Linux: Two LynuxWorks BlueCat Linux images are also included. One targets the Virtex-5 440 PPC and the other targets the Xilinx MicroBlaze soft processor. Both systems allow you to boot BlueCat Linux on the ML507 development platform. These images of BlueCat Linux include simple network functions over the Ethernet port, an Apache Web server that can serve up a web page, and other standard Linux file functions

For more information on the reference systems, please see [UG511, Virtex-5 FXT PowerPC 440 and MicroBlaze Edition Kit Reference Systems](#).

Customizing Your Hardware

Now that you have had an opportunity to load the Linux reference design, you will now want to learn how to build your own custom hardware project. The best way to do this is to use the Platform Studio Base System Builder (BSB). The BSB is a wizard that quickly and efficiently establishes a working design, which you can then customize and refine. The BSB may be all you need to create your design, but if more customization is required, BSB saves you a lot of time because it automates basic hardware and software platform configuration tasks common to most processor designs. After running the wizard, you have a working project that contains all the basic elements needed to build a more customized or complex system, should that be necessary.

Using the BSB Wizard, you can create your project file, choose a board, select and configure a processor and I/O interfaces, add internal peripherals, set up software, and generate a system summary report. The BSB recognizes the system components and configurations on the selected board and provides the options appropriate to your selections.

For detailed instructions, refer to the tutorial: “Creating Basic Hardware & Software for the Virtex-5 Embedded kit” available at <http://www.xilinx.com/products/devkits/DK-V5-EMBD-ML507-G.htm>.

Customizing Your Software

After you have created a Hardware system, you will want to start developing your software image. The Xilinx BSB Wizard will automatically create example software code, and you can use this as a starting point or develop your own. The Xilinx Software Development Kit (SDK) is an Eclipse-based IDE, used to compile and debug the embedded software that runs on this system. The SDK includes a GNU C/C++ compiler and debugger, Slinks Microprocessor Debug (XMD) target server, Data2MEM utility for bitstream loading and updating, Base System Builder configuration wizard, and Platform Studio software development software.

For detailed instructions, refer the tutorial: “Creating Basic Hardware & Software for the Virtex-5 Embedded kit” available at <http://www.xilinx.com/products/devotes/DK-V5-EMBD-ML507-G.htm>.

Customizing Your Embedded Software Using Linux

Building on the steps you have used to customize your own Hardware and Software images, you can develop a custom Linux kernel and applications. The SDK provides design support and board support package (BSP) & Libraries generation for numerous third party suppliers in the Xilinx ecosystem, including vendors such as Wind River, MontaVista, Timesys, LynuxWorks and other embedded industry leaders. Using these partner Linux distributions, you will be able to create a custom Linux image and applications

For information on specific Linux distribution refer to <http://www.xilinx.com/products/devkits/DK-V5-EMBD-ML507-G.htm>.

Service and Support

Xilinx provides all of the support and services you need to shrink your development cycle and meet your design goals. From our world-class technical support to Design Services experts, Xilinx has the help you need, when you need it.

Web Support – Knowledge On-Demand

The Xilinx support site provides many ways for you to find the answers you need including tools such as: Forums, Answer Browser, and My Alerts. Get the answers you need at our award-winning web site. For more information go to www.xilinx.com/support.

Technical Support – Highly-Trained Specialists Available to Answer Your Questions

Our highly-trained engineers average 5+ years of industry experience. When you contact us, you will be routed directly to our team which specializes in embedded support. They will provide you the most up to date knowledge in embedded design. For more information go to www.xilinx.com/support.

Recorded Learning Module

Xilinx provides Recorded e-Learning for course accessibility at your convenience. Available at no charge, topics range from high-level software updates and ASIC to FPGA conversion strategies to specifics on device architecture. Check one out today at <http://www.xilinx.com/support/training/free-courses.htm>

Xilinx webcasts are 60 minute live broadcasts featuring interactive technical presentations, product demonstrations, and question-and-answer sessions presented by our expert silicon and software people on Xilinx technology, the industry, or both. All broadcasts are made available for on-demand viewing within 24 hours of the live session. Please register for a webcast live today. <http://www.xilinx.com/events/webcasts.htm> or check out the on-demand training http://www.xilinx.com/events/webcasts_od.htm.

Embedded Education Courses – Training Solutions That Put You On The Fast Track To Success

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QuickStart! – Get Your Design Off To The Right Start With Embedded Processing QuickStart!

Embedded QuickStart! provides you with access to an engineer specializing in embedded development for one week who will deliver the two day Embedded Systems Development course and three days of coaching on your embedded design. Coaching will include focus on: design environment configuration, EDK software customization, design architecture consultation, Hardware/Software partitioning, integration guidance, and MicroBlaze and Power PC processor optimization. For more information go to www.xilinx.com/quickstart.

Titanium Dedicated Engineering – It's All About Efficiency

This robust service provides you with a dedicated Application Engineer on a contract basis, who can be remote, or at your site. The Titanium engineer can help you with optimized hardware design and FPGA implementation, advanced Hardware/Software debugging, and complex IP integration. For more information go to www.xilinx.com/titanium.

Xilinx Design Services - Your Expert Partners in FPGA Embedded Design

Xilinx Design Services (XDS) combines logic, embedded software, and system level skills to help optimize your use of the FPGA embedded infrastructure. XDS provides services to customers in all areas of embedded development, from board bring-up and standalone driver development to BSP and RTOS integration, as well as developing market specific customer applications. XDS has successfully completed several customer engagements in data process, networking and image processing applications. We also augment our technical skills with an ISO accredited project management process. For more information go to <http://www.xilinx.com/xds>.

