

# Getting Started with the PowerPC and MicroBlaze Development Kit - Virtex-4 FX12 Edition

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## Revision History

The following table shows the revision history for this document.

	Version	Revision
7/5/05	1.0	Initial Xilinx release.
8/24/06	1.1	Revised for upgrade to EDK 8.1i
9/29/06	1.2	Revised for upgrade to EDK 8.2.01i
3/2/07	1.3	Revised for upgrade to EDK 8.2.02i
4/24/07	1.4	Revised for upgrade to EDK 9.1
6/18/07	1.5	Revised for upgrade to EDK 9.1.02i
6/2/08	1.6	Revised for upgrade to EDK 10.1i

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# About This Guide

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The PowerPC® and MicroBlaze™ Development Kit - Virtex®-4 FX12 Edition showcases various features of the ML403 Development Platform. This kit includes reference designs and demonstrations. This document describes how to use and run them.

## Guide Contents

This manual contains one chapter:

- [“Getting Started with the PowerPC and MicroBlaze Development Kit - Virtex-4 FX12 Edition.”](#)

## Additional Resources

To search the database of silicon and software questions and answers, or to create a technical support case in WebCase, see the Xilinx website at:

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

## Conventions

This document uses the following conventions. An example illustrates each convention.

### Typographical

The following typographical conventions are used in this document:

Convention	Meaning or Use	Example
Courier font	Messages, prompts, and program files that the system displays	<code>speed grade: - 100</code>
<b>Courier bold</b>	Literal commands that you enter in a syntactical statement	<b><code>ngdbuild design_name</code></b>
<b>Helvetica bold</b>	Commands that you select from a menu	<b>File → Open</b>
	Keyboard shortcuts	<b>Ctrl+C</b>

Convention	Meaning or Use	Example
<i>Italic font</i>	Variables in a syntax statement for which you must supply values	<code>ngdbuild design_name</code>
	References to other manuals	See the <i>Development System Reference Guide</i> for more information.
	Emphasis in text	If a wire is drawn so that it overlaps the pin of a symbol, the two nets are <i>not</i> connected.
Square brackets [ ]	An optional entry or parameter. However, in bus specifications, such as <code>bus [7:0]</code> , they are required.	<code>ngdbuild [option_name] design_name</code>
Braces { }	A list of items from which you must choose one or more	<code>lowpwr = {on off}</code>
Vertical bar	Separates items in a list of choices	<code>lowpwr = {on off}</code>
Vertical ellipsis .	Repetitive material that has been omitted	IOB #1: Name = QOUT' IOB #2: Name = CLKIN' . . .
Horizontal ellipsis ...	Repetitive material that has been omitted	<code>allow block block_name loc1 loc2 ... locn;</code>

## Online Document

The following conventions are used in this document:

Convention	Meaning or Use	Example
<a href="#">Blue text</a>	Cross-reference link to a location in the current document	See the section “ <a href="#">Additional Resources</a> ” for details. Refer to “ <a href="#">Title Formats</a> ” in <a href="#">Chapter 1</a> for details.
<a href="#">Red text</a>	Cross-reference link to a location in another document	See <a href="#">Figure 2-5</a> in the <i>Virtex-4 User Guide</i> .
<a href="#">Blue, underlined text</a>	Hyperlink to a website (URL)	Go to <a href="http://www.xilinx.com">http://www.xilinx.com</a> for the latest speed files.

# *Getting Started with the PowerPC and MicroBlaze Development Kit - Virtex-4 FX12 Edition*

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## Overview

The PowerPC and MicroBlaze Development Kit - Virtex-4 FX12 Edition is designed to help the designer quickly and efficiently develop embedded systems using the ML403 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:

- Virtex-4 FX12 ML403 board
- Compact Flash Card - 512 MB
- Xilinx Software Development Suite DVD which includes:
  - ◆ ISE® WebPack™ Software
  - ◆ Embedded Development (EDK) Design Suite
- Power supply
- USB Download / Probe cable
- Serial cable
- Cross-over Ethernet cable

## Quick Start to Flashing the LEDs

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-4 Slide Show
- Wind River VxWorks Demo
- MontaVista Linux Demo
- WebServer Demo - PowerPC
- WebServer Demo - MicroBlaze
- DCM Phase Shift Demo - MicroBlaze

- Mentor ATI Nucleus WebServ Demo

For detailed instructions of how to install and access these demos please download and read the Xilinx User Guide [UG083 ML40x Getting Started Tutorial](#).

## Board Setup

1. Position the ML403 board so that the Virtex-4 and XILINX logos are oriented near the top edge of the board.
2. Confirm that the power switch, located in the upper right corner of the board, is in the *off* position.
3. Locate the CF card slot (on the back side of the ML403 board), and carefully insert the System ACE CF card with its front label facing away from the board. [Figure 1](#) shows the back side of the board with the CF card properly inserted.

**Note:** The CF card provided in the kit might differ.

**Caution!** Be careful when inserting or removing the CF card from the slot. Do *not* force it.



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**Figure 1: ML403 Prototype Platform with CompactFlash Card**

4. Connect the AC power cord to the power supply. Plug the power supply adapter cable into the ML403 board. Plug in the power supply to AC power.
5. Set the following switches:
  - a. Configuration Address and Mode DIP switch (6-position DIP switch) to 000111
  - b. Set the Configuration Source Selector switch (3-position slide switch) to SYS ACE



6. Connect a null modem serial cable between the host PC and the ML403 board, then open a serial terminal program:
  - a. Select **Start** → **Programs** → **Accessories** → **Communications** → **HyperTerminal**.
  - b. In the Connection Description window, type **9600** in the Name box, then click **OK**.
  - c. In the Connect To window, click **Cancel**.
  - d. In the 9600 Properties window, make the selections shown in [Figure 2](#).
    - Select **File** → **Properties**.
    - Select the Connect To tab.
    - Select **COM1** in the Connect using: field.
    - Click **Configure....**

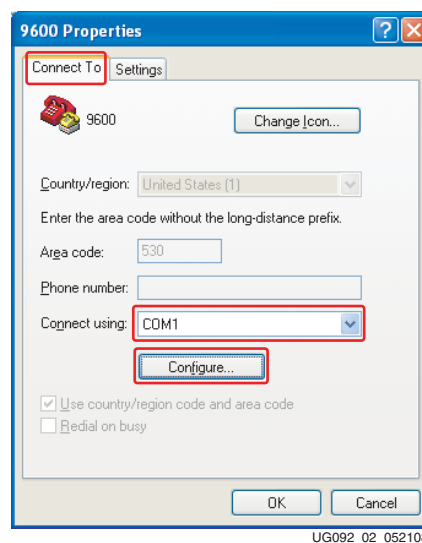
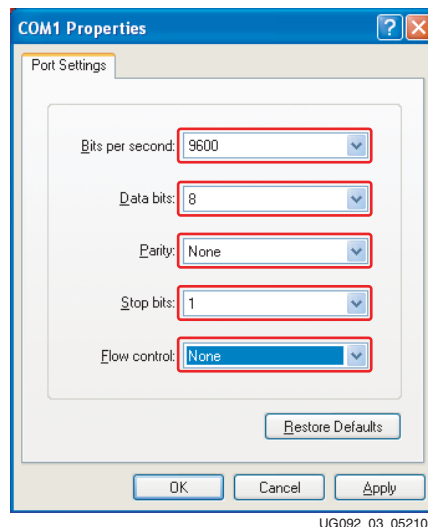


Figure 2: HyperTerminal Setup and Properties

7. In the COM1 Properties window shown in [Figure 3](#), use the pull-down menu to set the COM1 properties to the following values: Bits per second = **9600**, Data bits = **8**, Parity = **None**, Stop bits = **1**, and Flow control = **None**
  - a. Click **OK** two times to accept the settings.



**Figure 3: HyperTerminal Setup and Properties**

8. Connect the VGA monitor to the board, if available.
9. Turn on the main power switch of the ML403 board, then press the System ACE RST button. When the FPGA has been programmed, the LEDs in the lower left corner should display as follows:
  - Bus “Error 1” = off
  - FPGA INIT = green
  - FPGA DONE = green
  - System ACE “Err” = off
  - System ACE “Stat” = green

**Note:** When the CF card is ejected or not installed, the System ACE “Err” LED will blink.

The Bootloader demonstration displays a menu of demonstration designs that can be loaded by using the reconfiguration feature of the System ACE controller. The menu is displayed on the serial terminal, LCD, and VGA.

To choose a demonstration, use the North-East-South-West navigation buttons (GPIO\_SW\_N, GPIO\_SW\_E...) on the board, then press the center button (GPIO\_SW\_C) to start the demonstration. Alternatively, the user can select a demonstration by entering its number into the serial terminal. The demonstrations are:

Virtex-4 Slide Show, pg 14

Web Server (Using Soft Ethernet MAC - ML401/ML402), pg 15

Web Server (Using Hard Embedded Tri-Mode Ethernet MAC - ML403/ML405), pg 18

DSP48 (ML401/ML402), pg 21

Linux (ML403/ML405), pg 22

ChipScope Pro Tools (ML401/ML402), pg 23

QNX (ML403/ML405), pg 24,

USB, pg 25

My Own ACE File, pg 26

Restore CPLD/Flash Images, pg 27

To return to the Bootloader at anytime, press the System ACE RST button. The bootloader runs only if the leftmost configuration address DIP switches are set to 000 and the configuration source selector switch (3-position slide switch) is set to SYS ACE.

## Quick Start to Installing the Software

The PowerPC and MicroBlaze Development Kit – Virtex-4 FX12 Edition includes a Xilinx Software Development Suite DVD in the box, or user can download the software from the Xilinx software registration site. In both cases, the software must be registered as part of the installation process.

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

### 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 not purchased a Full seat of ISE Foundation, install the Free ISE WebPACK Design Software. The ISE WebPACK software is a fully featured front-to-back FPGA design solution that supports a subset of Xilinx FPGAs, including the device found on the ML403 Development Platform. If the user intends to install ISE WebPACK, check the contents of the development kit the ISE WebPACK Software.

Note: Do not select both ISE WebPACK and ISE Foundation. To determine what software the user has – Full, Evaluation, or Free license – visit the Xilinx software registration and entitlement site, contact the purchasing agent, or call the local Xilinx Customer Service.

### Install the Embedded Development (EDK) Design Suite

The PowerPC and MicroBlaze Development Kit – Virtex-4 FX12 Edition comes with entitlement to a FULL seat of the Embedded Development (EDK) Design Suite product. Select the check box for the Embedded Development Kit (EDK).

The user may also select any additional software for evaluation for a period of 60 days.

## Register and Install Kit

After the registration process is completed, 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 in the 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.

## Additional Resources

There are additional Resources and Reference designs found on the PowerPC and MicroBlaze Development Kit – Virtex-4 FX12 Edition product web site. Visit this site for additional documentation, reference designs, and product updates on the [Development Kit Home Page](#) or the [Online Technical Support](#) page.

Check the development kit home page regularly for the latest in documentation, examples, product updates, known issues and links to evaluation and support by Xilinx and our Alliance Partners.