

# Getting Started with the ML300

## *Virtex-II Pro Development System*

UG115 (v1.3) January 7, 2004

# Product Not Recommended for New Designs

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## Getting Started with the ML300 UG115 (v1.3) January 7, 2004

The following table shows the revision history for this document.

	<b>Version</b>	<b>Revision</b>
12/23/02	1.0	Initial Xilinx release.
01/28/03	1.1	Converted document to book format.
01/29/03	1.2	Minor edits to text.
01/07/04	1.3	V2PDK to EDK conversion.

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# About This Manual

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## Manual Contents

This manual contains the following chapter:

- “Getting Started with the ML300,” which provides an overview of the contents of the ML300 Evaluation Platform, directions on how to start using your ML300, and references to more information.

## Additional Resources

For additional information, go to <http://support.xilinx.com>. The following table lists some of the resources you can access from this website. You can also directly access these resources using the provided URLs.

Resource	Description/URL
Tutorials	Tutorials covering Xilinx design flows, from design entry to verification and debugging <a href="http://support.xilinx.com/support/techsup/tutorials/index.htm">http://support.xilinx.com/support/techsup/tutorials/index.htm</a>
Answer Browser	Database of Xilinx solution records <a href="http://support.xilinx.com/xlnx/xil_ans_browser.jsp">http://support.xilinx.com/xlnx/xil_ans_browser.jsp</a>
Application Notes	Descriptions of device-specific design techniques and approaches <a href="http://support.xilinx.com/apps/appsweb.htm">http://support.xilinx.com/apps/appsweb.htm</a>
Data Sheets	Device-specific information on Xilinx device characteristics, including readback, boundary scan, configuration, length count, and debugging <a href="http://support.xilinx.com/xlnx/xweb/xil_publications_index.jsp">http://support.xilinx.com/xlnx/xweb/xil_publications_index.jsp</a>
Problem Solvers	Interactive tools that allow you to troubleshoot your design issues <a href="http://support.xilinx.com/support/troubleshoot/psolvers.htm">http://support.xilinx.com/support/troubleshoot/psolvers.htm</a>
Tech Tips	Latest news, design tips, and patch information for the Xilinx design environment <a href="http://www.support.xilinx.com/xlnx/xil_tt_home.jsp">http://www.support.xilinx.com/xlnx/xil_tt_home.jsp</a>

## 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	speed grade: - 100
<b>Courier bold</b>	Literal commands that you enter in a syntactical statement	<b>ngdbuild</b> <i>design_name</i>
<b>Helvetica bold</b>	Commands that you select from a menu	<b>File → Open</b>
	Keyboard shortcuts	<b>Ctrl+C</b>
<i>Italic font</i>	Variables in a syntax statement for which you must supply values	<b>ngdbuild</b> <i>design_name</i>
	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 <b>bus[7:0]</b> , they are required.	<b>ngdbuild</b> [ <i>option_name</i> ] <i>design_name</i>
Braces { }	A list of items from which you must choose one or more	<b>lowpwr</b> = { <b>on</b>   <b>off</b> }
Vertical bar	Separates items in a list of choices	<b>lowpwr</b> = { <b>on</b>   <b>off</b> }
Vertical ellipsis . . .	Repetitive material that has been omitted	IOB #1: Name = QOUT' IOB #2: Name = CLKIN' . . .
Horizontal ellipsis ...	Repetitive material that has been omitted	<b>allow block</b> <i>block_name</i> <i>loc1 loc2 ... locn</i> ;



## Online Document

The following conventions are used in this document:

Convention	Meaning or Use	Example
Blue text	Cross-reference link to a location in the current file or in another file 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.
Red text	Cross-reference link to a location in another document	See <a href="#">Figure 2-5</a> in the <i>Virtex-II Handbook</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 ML300*

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### Introduction

*Getting Started with the ML300* provides an overview of the contents of the ML300 Evaluation Platform, directions on how to start using your ML300, and references to more information.

### Contents

The ML300 Evaluation Platform comes to you in a jewel box with four drawers and two documentation slots. Each of these drawers and slots contains a different aspect of the ML300 System.

#### ML300 Hardware Platform

The bottom drawer is the ML300 Hardware Platform drawer. This drawer contains the ML300 Hardware Platform with its associated power supply. The ML300 Hardware Platform is a full featured system that allows for demonstrating a wide variety of the capabilities of the Virtex-II Pro™ family of chips, as well as development of custom hardware and applications. More information on the ML300 hardware can be found in the *ML300 User Guide*.

#### ML300 Software and IBM Microdrive

Included in the software drawer is all the software that you will need to get started with the ML300. This includes tools for developing IP, system generation, hardware and software debugging, and cores of system peripherals. The software is included in a CD wallet and consists of the following:

- ISE - Disk 1 of 2, Design Environment and Documentation (PC evaluation)
- ISE - Disk 2 of 2, Device Files (PC evaluation)
- EDK – Xilinx Embedded Development Kit
- Embedded Alliance Partner CDs (trial versions)

On the back of the CD wallet is your product ID that you will need to get started with the installation of the software. For details of how to use the product ID, see the printed Installation Instructions document that is shipped with the kit.

Also included in this drawer is a gigabyte IBM Microdrive™. The Microdrive has been provided to serve two purposes:

- As non-volatile storage for a variety of bitstreams for configuring the Virtex-II Pro using System ACE
- As a file system for the system when one is needed, such as when booting Linux

## ML300 Cables

The ML300 Evaluation Platform is shipped with a wide range of cables to provide for exploring all of the capabilities of the Virtex-II Pro devices, from a standard serial port connection for terminal access, to gigabit Ethernet over Fiber, to 3.125 gb/s over copper. The cables included are:

- 2 Serial port cables
- 2 Gigabit ethernet fiber-optic cables
- 1 HSSDC2/Infiniband cable
- 1 Serial ATA cable
- 1 Parallel port cable
- 1 IEEE-1394 (FireWire) cable
- 1 Set of board-to-board cables
- 1 Ethernet cable and 1 crossover Ethernet cable

## Parallel Cable IV

A Parallel Cable IV cable has been included in the ML300 Evaluation Platform. It serves a variety of purposes, including:

- Downloading hardware configurations to the Virtex-II Pro device
- Software download into the Power PC in the Virtex-II Pro device
- Hardware debug using Chip Scope Pro software tools
- Software debug using GNU Debugger (GDB)

## Documentation

In the two slots provided for documentation in the ML300 jewel box, there is a Virtex-II Pro databook and a ML300 binder.

## Playing with Your ML300 Evaluation Platform

To begin using the tools included within the ML300 Evaluation Platform, go to the Tutorial section of the *ML300 Reference Design User Guide* document.

## Exploring the Software Tools

### Foundation ISE

An evaluation version (Windows only) of Foundation ISE is included. Foundation ISE is required for full functionality of the EDK tools to create bitstreams to configure the Virtex-II Pro.

On Windows, the ISE tools can be accessed from the Start menu at **Start**→**Programs**→**Xilinx ISE**→**Project Navigator**. On Solaris, invoke the Project Navigator by typing “ise” in your shell. More information can be found in the ISE documentation, or online at <http://www.xilinx.com/ise>.

### Embedded Development Kit (EDK)

The Embedded Development Kit (EDK) is an all encompassing solution for designing embedded programmable systems design and supports designs of processor sub-systems using the IBM PowerPC™ hard processor core and the Xilinx MicroBlaze™ soft processor core. Hardware and software development tools, combined with the advanced features of Xilinx FPGAs especially Virtex-II Pro™ the Platform for programmable systems, provides you with a new level of system design, allowing you to optimize your design performance at any time during your design cycle to meet fast-changing design requirements. The EDK also includes the MicroBlaze Soft Processor Core that is very popular in a variety of embedded applications.

On Windows, the EDK tools can be accessed from the Start menu at **Start**→**Programs**→**Xilinx Embedded Development Kit**. On Solaris, invoke the Xilinx Platform Studio by typing “xps” in your shell. More information can be found in the EDK documentation, or online at <http://www.xilinx.com/edk>.

### ChipScope Pro

ChipScope Pro embeds logic analyzer (ILA) and bus analyzer (IBA) low-profile software cores into your design. These cores allow you to view all the internal signals and nodes within your FPGA, including the IBM CoreConnect Processor Local Bus (PLB) or On-Chip Peripheral Bus (OPB) supporting the IBM PowerPC 405 inside the industry-leading Virtex-II Pro™ FPGA.

With the Agilent trace core (ATC) and direct interface to the Agilent FPGA Trace Port Analyzer, ChipScope Pro gives you even deeper trace memory, faster clock speeds, more trigger options, while using fewer pins on the FPGA. This unique partnership from Xilinx and Agilent delivers more real-time debug power where you need it than any other real-time debug solution on the market.

On Windows, ChipScope Pro software tools can be accessed from the Start menu at **Start**→**Programs**→**Chipscope Pro**. More information can be found in ChipScope Pro documentation, or online at <http://www.xilinx.com/chipscope>.

### GNU Tools

GNU software is used to develop software for the Virtex-II Pro family of FPGAs. This includes the GNU C compiler (GCC), the GNU binary utilities (**binutils**), the GNU debugger (GDB), and the GNU **make** program.

From the GNU Project website, <http://www.gnu.org>:

The GNU Project was launched in 1984 to develop a complete Unix-like operating system which is free software: the GNU system. (GNU is a recursive acronym for GNU's Not Unix; it is pronounced 'guh-NEW'.) Variants of the GNU operating system that use the Linux kernel are now widely used; though these systems are often referred to as "Linux," they are more accurately called GNU/Linux systems. As a prerequisite for the development of the GNU system, many different software packages-compilers, assemblers, linkers, debuggers, libraries, and other tools-had to be programmed.

## Getting More Information

### Printed Documentation

The printed documentation, as mentioned previously, takes the form of a Virtex-II Pro data book and an ML300 binder.

### Online Documentation

Online documentation consists of two primary locations, one public and one private. The public access site can be found on the Xilinx web site at <http://www.xilinx.com/ml300>. The private web area is the ML300 Lounge and can be reached from the public site. The lounge provides additional information and updates available only to purchasers of the ML300 Evaluation Platform.

The documentation on these two websites includes all of the printed and electronic documentation provided with the ML300, plus updates and additional information.