Virtex-II Pro™ ML300 Evaluation Platform Quick Start

Thank you for choosing the Virtex-II Pro ML300 Evaluation Platform from Xilinx! This card describes what came in your box, and how to immediately use the ML300 prior to installing the software. When finished with this quick start, follow the included Installation Instructions to complete the product installation.

Exploring the contents

The Virtex-II Pro ML300 Evaluation Platform has a variety of components included with it, including printed materials, a notebook and lab documentation. The four drawers contain various pieces of the ML300 Evaluation Platform. The top left drawer contains the CDs for software installation. The drawer also contains the IBM® Microdrive™ Compact Flash (CF) hard disk, attached to a PCMCIA Adapter card. The Microdrive contains hardware and software demonstration systems for the ML300, including a bootloader, demonstrations of various operating systems, and standalone applications.

The top right drawer contains the Parallel Cable IV hardware. This hardware is used to debug hardware and software on the ML300 Evaluation Platform. It connects to the parallel port of your PC, and hooks to the ML300 via a ribbon cable. The Parallel Cable IV hardware is also used with Xilinx ChipScope Pro software, an integrated logic and bus analyzer.

The middle drawer contains all the cables you will need for using the ML300. These include: two serial cables, parallel cable, Ethernet straight through cable (blue), Ethernet crossover cable (green), 6-pin to 6-pin IEEE-1394 cable, 6-pin to 4-pin IEEE-1394 cable, HSSDC2 cable, Serial ATA cable, two Gigabit Fiber cables, and a pair of headphones.

The ML300 Hardware Platform and power supply are located in the bottom drawer. Please carefully remove both of them from the drawer. Note that the ML300 Hardware Platform consists of two Printed Circuit Boards (PCB): the upper one with the TFT screen is named the ML300_PWR_IO. It contains the power supply, GPIO LEDs and switches. The lower PCB is named the ML300_CPU and contains the Virtex-II Pro FPGA, DDR SDRAM, and various other I/O circuits.

Powering on your new ML300 Hardware Platform!

Step 1: Place the ML300 so that the Gold XILINX logo on the ML300_PWR_IO board is in the upper left corner. Make sure the power switch located on the left-hand side is in the off position. Off is when the switch is flipped upwards, as marked on the Printed Circuit Board.

Step 2: Remove the Microdrive case from the CD / Microdrive drawer, open the case, and remove the PCMCIA 2 CF adapter card. Remove the Microdrive from the adapter card by pulling it away from the adapter. Do not drop the Microdrive! It is a hard disk and can be damaged by dropping it.

Step 3: Find the Compact Flash slot on the ML300, and carefully insert the Microdrive with the red "1 GB" label facing up. The CF slot is located on the ML300_CPU board along the bottom edge of the board and is silver in color. Be careful when inserting the Microdrive into the CF slot – when it is properly engaged, it will slide in easily. This can be tricky the first few times. Do not 'force' it.

Step 4: Connect the AC power cord (located in the middle drawer) to the power supply brick (located in the lower drawer). Plug the power supply adapter cable into the ML300 on the left side. The power supply adapter cable will have its DC logo facing downward to properly insert into the ML300. Plug in the power supply to AC power.

Step 5: Set the System ACE MODE switch to '0'. (The gray knob located on the bottom edge of the ML300_PWR_IO).

Step 6: Turn on the ML300 Main Power, and press the yellow System ACE Reset button (next to gray MODE knob). Various LEDs will blink briefly, leaving the blue "FGPA DONE" LED lit.

Step 7: Using the ML300 Hardware Platform.
When the FPGA has been programmed, the LEDs in the lower left corner should be: PLB & OPB Bus Error = Green, System ACE ERR = off, System ACE STAT = Green, FPGA INIT = Red, FPGA DONE = Blue. Additionally, the TFT screen should also present the Xilinx **ML300 Bootloader** program.

Note: When the Microdrive is ejected or not installed, the System ACE ERR LED will blink.

ML300 Power Monitor

The ML300 Hardware Platform has a built-in visual power monitor. The power monitor is located in the lower right-hand corner of the ML300_PWR_IO board. The monitor consists of seven bi-color LEDs. If any given power supply fails, the corresponding LED will turn RED. When all supplies are healthy, all seven LEDs will be green. The power supply on the ML300 can be put into a sleep mode. When in sleep mode, all seven power monitor LEDs will be RED. Please refer to the ML300 User Guide, Chapter 5 for more information.

ML300 Bootloader

The ML300 Bootloader is a combination of hardware and software that implements a TFT based graphical means for a user to select other System ACE configurations. System ACE permits up to eight configurations natively. A configuration can be a hardware bitstream, a software bitstream, or both. The ML300 Evaluation Platform generally uses the combined approach.

The Microdrive shipped with ML300 uses seven of the eight configurations. Configuration 0 is used for the ML300 Bootloader.   The remaining configurations are used to demonstrate operating systems and a set of standalone applications. You may choose which application you wish to see simply by pressing the button on the TFT screen. The application will then load a new hardware and software bitstream. Note that the FPGA is initiating a new configuration to itself when you press the button on the touch screen. You can return to the ML300 Bootloader by pressing the Yellow System ACE reset button at any time. Note: The Bootloader will only run if the System ACE MODE switch is set to 0 (Grey knob).

Standalone Applications

The Microdrive contains four standalone example applications. The tools provided in the ML300 Evaluation Platform permit you to rebuild the hardware and software for any of these applications. After experimenting with these applications, press the Yellow System ACE RESET button to return to the ML300 Bootloader.

V2PDraw – Standalone application demonstrating a simple touch screen based drawing program.

Tic-Tac-Toe – Standalone application demonstrating a simple touch screen based tic-tac-toe program.

XROM_ML300 – standalone application with a simple set of diagnostics for ML300. This program requires one of the serial cables, and your PC COM port setup as 115200, 8 data bits, no parity, 1 stop bit, no flow control. Plug the serial cable into the DB9 nearest the black PS/2 connectors (UART1). Press the Orange CPU Reset button on the lower right corner of the board and the XROM_ML300 menu will be displayed on the terminal.

My Own ACE File – standalone application explaining how to build an ACE file to put on the Microdrive so that the ML300 Bootloader button "My Own ACE File" will allow your ACE file to be loaded.

Example Operating Systems

The Microdrive has three sample configurations of Operating Systems (OS). Two of these are easily viewable whereas the third requires consultation with the documentation. Select which OS to run from the ML300 Bootloader.

Linux – MontaVista™ Linux 2.1, Preview Kit
You will need a PS/2 Keyboard and Mouse (not provided). Plug the Mouse into the PS/2 port closest to 10/100 ethernet port; plug the keyboard into the other PS/2 port. Run the ML300 Bootloader and select "Linux". When Linux boots, you can log in as "root" with no password. You can access an NFS network using the included blue ethernet cable connected to a 10/100 ethernet network. The Microdrive mounts as the root file system, /.

VxWorks – Wind River® VxWorks®
The VxWorks demo mounts the Microdrive as a file system, and then proceeds to execute tasks that pulls images off the drive and displays them on the screen. The task also shows partial reconfiguration of the FPGA while VxWorks is still running. A serial monitor task runs on UART1, while another task writes various values to the GPIO LEDs Follow the onscreen directions for more details.

VxWorks Bootloader – Please consult online documentation at **www.xilinx.com/ise/embedded/ml300.**