

# Virtex-II Pro™ ML300 Evaluation Platform - Installation Instructions

The following pages will guide you through the software installation for the Virtex-II™ Pro ML300 Evaluation Platform. To skip the complete installation and immediately try out your ML300, refer to the *ML300 Quick Start* card.

## About the CDs

The Virtex-II Pro ML300 Evaluation Platform includes the following CDs:

- ISE 6.2i CD – PC, Disk 1 of 2, Design Environment and Documentation (Windows evaluation version)
- ISE 6.2i CD – PC, Disk 2 of 2, Device Files (Windows evaluation version)
- EDK 6.2i CD – Embedded Development Kit
- Embedded Alliance Partner CDs (evaluation versions)

## System Requirements

The Virtex-II Pro ML300 Evaluation Platform CDs have been tested on the following platforms, with the tools and versions specified.

<b>System Requirements</b>	
<b>Operating System</b>	Windows 2000 SP2 Windows XP Solaris 2.8
<b>Memory</b>	256 MB
<b>Disk Space</b>	3 GB
<b>Tool Requirements</b>	
<b>FPGA</b>	ISE 6.2i *
<b>Embedded &amp; Software</b>	EDK 6.2i **
<b>Simulation</b>	ModelSim SE 5.7x ***
<b>Debug</b>	ChipScope Pro **

\* - PC evaluation version included

\*\* - Full version included

\*\*\* - Not included

Note: Operation under Solaris 2.8 requires a full version of ISE 6.2i, which is not included.

## Installation Outline

Follow these steps in the order given. All steps are required unless noted:

<b>Step 1: Register ML300</b>	<b>3</b>
<b>Step 2: Register CoreConnect (Optional)</b>	<b>4</b>
<b>Step 3: Download ML300 Reference Design, ISE / EDK Service Packs, and ChipScope Pro Software</b>	<b>5</b>
<b>Step 4: Install ISE</b>	<b>6</b>
<b>Step 5: Install EDK</b>	<b>8</b>
<b>Step 6: Install ChipScope Pro Software</b>	<b>10</b>
<b>Step 7: Set Up Simulation Tools</b>	<b>11</b>
Step 7A: Set up SmartModels	11
Step 7B: Set up ModelSim to use SmartModels	12
Step 7C: Compile ISE Simulation Libraries for ModelSim	14
Step 7D: Compile EDK Simulation Library for ModelSim	15
<b>Step 8: Install Reference Design</b>	<b>16</b>
<b>Step 9: Start Running ML300</b>	<b>17</b>

## Step 1: Register ML300

Product registration is required prior to installation of the CDs. Registration provides access to a set of Internet-based *lounges* where various elements of this product can be updated. The ML300 lounge provides access to updated hardware and software for the ML300 Evaluation Platform.

Open the drawer labeled "CDs / Micro Drive" and find the CD pack. Open the URL: <http://www.xilinx.com/swreg.htm> and follow the onscreen directions to log in. Once you are logged in, enter the Product ID (the Product ID label is located on the back of the CD Pack).

Write the Product ID here: \_\_\_\_\_

The next screen is the "Embedded Development Licensing" screen. This is a required part for IP Licensing. Select either "PC" or "Workstation" under License Server Platform, and then enter your Host ID in the next field. You can obtain your PC's Host ID by typing **ipconfig -all** in a DOS shell, and looking for the field "Physical Address". For workstation, enter the command **hostid** in a shell. Enter your Host ID on the web form and then click the Next button.

After successfully registering the ML300 Evaluation Platform product, your Registration ID will be displayed in the 'Thank You' web page.

Write the Registration ID here: \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_

You will receive two e-mails from Xilinx regarding the ML300 product:

**E-mail #1, from [swreg@xilinx.com](mailto:swreg@xilinx.com):**

Contains your Registration ID and a link to the main ML300 lounge where you can obtain updates.

**E-mail #2, from [ip\\_license\\_mgt@xilinx.com](mailto:ip_license_mgt@xilinx.com):**

Contains license files and license installation instructions for the hardware IP cores that are included with the purchase of ML300.

### Go to ML300 Overview Web Page

After obtaining your registration ID, go to <http://www.xilinx.com/ml300> for the latest ML300 information. On the left side of the page, you can:

- Click **ML300 Install** for installation information.
- Click **ML300 Lounge** for news and hardware / software updates.
- Click **ML300 Documentation** for on-line ML300 documentation.
- Click **ML300 Resources** for ML300-related resources.

## Step 2: Register CoreConnect (Optional)

CoreConnect™ is an IBM-developed on-chip bus communications link that enables intellectual property cores from multiple sources to be interconnected to create entire new systems. You can register for CoreConnect to access design files that can enhance your design experience.

### Register:

1. Go to <http://www.xilinx.com/ml300>.
2. Click **ML300 Install** on the left side of the page.
3. Follow the on-screen instructions for registering for CoreConnect.
4. When approved, you will receive an e-mail:  
**E-mail from coreconnect\_lounge\_mngt@xilinx.com:**  
Notifies you that your access to CoreConnect has been approved and contains a link to the CoreConnect Download page.
5. Go to the CoreConnect Download page and follow the instructions to download and install the CoreConnect files.

## Step 3: Download ML300 Reference Design, ISE / EDK Service Packs, and ChipScope Pro Software

Some software packages must be downloaded to perform the ML300 installation. Download these files now.

### Download Files

1. Go to <http://www.xilinx.com/ml300>
2. Click **ML300 Install** on the left side of the page.
3. Follow the on-screen instructions for downloading the following:
  - A. ML300 reference design – the reference design will specify which versions of ISE / EDK it is compatible with.
  - B. ISE Service Pack.
  - C. EDK Service Pack.
  - D. ChipScope Pro software.

## Step 4: Install ISE

Foundation ISE must be installed on your system.

**Tip:** It is recommended that you uninstall older installations of ISE prior to installing these programs unless you require the older versions.

**Tip:** It is usually better to install tools and design files in directory paths that contain only alphanumeric and underscore (\_) characters. Avoid spaces, hyphens, plus signs, and other special characters as not all tools may function properly.

### Windows

If you do not already have Foundation ISE 6.2i on your system, you can install an evaluation version using the CDs shipped with this ML300 Evaluation Platform.

#### Install CDs

1. Insert the ISE Disk 1 into your CD drive.
2. Follow the on-screen directions to complete installation. (**Note:** After installing Disk 1, you will be prompted to insert Disk 2 into your CD Drive)

#### Set Environment

After installation, set the following environment variables if they were not set by the installer:

- **XILINX:** Set to your ISE install directory
- **PATH:** Prefix with %XILINX%\bin\nt

#### Apply Service Pack

1. Run the ISE service pack executable by double clicking on it. (The service pack was downloaded during “Step 3: Download ML300 Reference Design, ISE / EDK Service Packs, and ChipScope Pro Software”.)
2. Follow the on-screen directions to complete installation.

#### Verify Installation

1. Open a Command Prompt / DOS shell by:
  - A. Windows **Start**→**Run...**
  - B. Enter “cmd” in the dialog.
2. Within the shell, invoke PAR on the command line with no arguments:  
`par`
3. Check that the displayed version matches the version you installed. (The first line contains the release version, e.g. “Release 6.2i”.)

## Solaris

**Important Note:** The ML300 Evaluation Platform does NOT contain evaluation CDs for this platform. You must obtain the Solaris version of Foundation ISE separately.

### Install CDs

1. Insert the Solaris ISE Disk 1 (not the Windows evaluation version that comes with ML300) into your CD drive.
2. Change directory to the CD home.
3. Run the **setup** program.
4. Follow the on-screen directions to complete installation.
5. Insert the Solaris ISE Disk 2 into your CD drive.
6. Change directory to the CD home.
7. Run the **setup** program.
8. Follow the on-screen directions to complete installation.

### Set Environment

- Within a shell, source the setup script as follows:  
    `source <ise_install_dir>/settings.csh`  
    OR (for Bourne shell users)  
    `source <ise_install_dir>/settings.sh`  
    (Replace <ise\_install\_dir> with directory where you have installed ISE)

**Note:** The setup file modifies only the current shell's environment to run ISE. It must be re-sourced if you open a new shell.

### Apply Service Pack

1. Run the **setup** executable of the service pack. (The service pack was downloaded during “Step 3: Download ML300 Reference Design, ISE / EDK Service Packs, and ChipScope Pro Software”.)
2. Follow the on-screen directions to complete installation.

### Verify Installation

1. Open a shell and source the ISE environment script as described above.
2. Within the shell, invoke PAR to obtain its usage information:  
    `par`
3. Check that the displayed version matches the version you installed. (The first line contains the release version, e.g. “Release 6.2i”.)

## Step 5: Install EDK

**Tip:** It is recommended that you uninstall older installations of EDK prior to installing these programs unless you need the older versions.

### View EDK Customer Information

- Please view the EDK Customer Information prior to installing EDK. On the installation CD there is a **README\_FIRST.pdf** file that contains a variety of information about the specific EDK release. (Windows users must manually explore the CD as the installer is set to run automatically when the CD is inserted.)
- Under the doc directory of the CD, you can also find “*Getting Started with EDK*” (**edk\_getstarted.pdf**). This document contains EDK installation instructions and is the starting point for learning how to use the Embedded Development Kit tool suite.

## Windows

### Install CD

1. Insert the EDK Installation CD in your PC.
2. The installer should automatically pop up. Otherwise, open Windows Explorer and double click on **setup.exe** on the CD.
3. Click **INSTALL EDK**.
4. Follow the on-screen directions to complete installation.

### Set Environment

The Xilinx EDK installer automatically sets up your environment.

### Apply Service Pack

1. Run the EDK service pack executable by double clicking on it. (The service pack was downloaded during “Step 3: Download ML300 Reference Design, ISE / EDK Service Packs, and ChipScope Pro Software”.)
2. Follow the on-screen directions to complete installation.

### Verify Installation

1. Open a Command Prompt / DOS shell by:
  - A. Windows **Start**→**Run...**
  - B. Enter “cmd” in the dialog.
2. Within the shell, invoke Xilinx Platform Studio (XPS) to obtain its usage information:  
`xps -help`
3. Check that the displayed version matches the version you installed. (One of the first few lines contains the EDK release version, e.g. “Xilinx EDK 6.2”.)

## Solaris

### Install CD

1. Insert the EDK CD into your CD drive.
2. Change directory to the CD home.
3. Run **install\_solaris.csh**.
4. Follow the on-screen directions to complete installation.

### Set Environment

- Source your ISE environment script. The EDK script requires that ISE be setup first.
- Source the environment setup script:  
`source <edk_install_dir>/setup.csh`

*Note:* The setup file modifies only the current shell's environment to run EDK. It must be re-sourced if you open a new shell.

### Apply Service Pack

1. Unzip the service pack into your \$XILINX\_EDK directory. Replace all files when prompted. (The service pack was downloaded during “Step 3: Download ML300 Reference Design, ISE / EDK Service Packs, and ChipScope Pro Software”.)

### Verify Installation

1. Open a shell and source the ISE and EDK environment scripts.
2. Within the shell, invoke Xilinx Platform Studio (XPS) to obtain its usage information:  
`xps -help`
3. Check that the displayed version matches the version you installed. (One of the first few lines contains the EDK release version, e.g. “Xilinx EDK 6.2”.)

## Step 6: Install ChipScope Pro Software

ChipScope Pro software is a powerful on-chip logic and system debug and verification tool. ChipScope Pro includes the tools to enable integrated logic analysis, integrated bus analysis, and deep external sample storage using the Agilent Trace Core (available separately from Agilent).

ChipScope Pro tools have been designed to work with a corresponding version of Xilinx ISE tools. Please verify that the ChipScope Pro version matches that of the ISE tools you are using, e.g. ChipScope Pro 6.2i has been designed to work with ISE version 6.2i.

### Windows

#### Install Download

1. Run the ChipScope Pro installer executable by double clicking on it. (The installer was downloaded during “Step 3: Download ML300 Reference Design, ISE / EDK Service Packs, and ChipScope Pro Software”).

#### Verify Installation

1. Run the ChipScope Pro Analyzer by selecting it under the Windows Start Menu:  
**Start→Programs→ChipScope Pro X.x→ChipScope Pro Analyzer**  
(Where X.x is the version of ChipScope Pro installed)
2. Check that the release version matches the version you installed: **ChipScope Pro Analyzer→Help →About ChipScope Pro Analyzer.**

### Solaris

#### Install Download

1. Extract the ChipScope Pro download by double clicking on it. (It was downloaded during “Step 3: Download ML300 Reference Design, ISE / EDK Service Packs, and ChipScope Pro Software”). This will create a **chipscope** directory in the directory that you extract to.
2. View the **README** files within the extracted **chipscope** directory for information about the ChipScope Pro release.

#### Set Environment

- Source the ISE environment script. The ISE environment is required
- **CHIPSCOPE**: set this to your ChipScope Pro install directory  
`setenv CHIPSCOPE <chipscope_parent_dir>/chipscope`  
(Replace <chipscope\_parent\_dir> with the name of your target directory.)

#### Verify Installation

1. Open a shell and set the environment to run ChipScope Pro as described above.
2. Within the shell, invoke ChipScope Pro Core Generator:  
`‡CHIPSCOPE/bin/sol/gengui.sh`
3. The ChipScope Pro Core Generator GUI should appear. Close the GUI.

## Step 7: Set Up Simulation Tools

To take advantage of simulation capabilities of this kit, you should have Mentor Graphics ModelSim SE and follow the following instructions. **Note:** ModelSim SE is not included.

**Further Reading:** Simulation setup is also covered in the EDK document *Getting Started with EDK: Windows*

- **Start**→**Programs**→**Xilinx Platform Studio X.x**→**EDK X.x Documentation**  
(Where X.x is the version of EDK installed)

Solaris

- found at `$XILINX_EDK/doc/edk_getstarted.pdf`

### Step 7A: Set up SmartModels

SmartModels represent integrated circuits and system buses as black boxes that accept input stimulus and respond with appropriate output behavior. Such behavioral models provide improved performance over gate-level models, while at the same time protect the proprietary designs created by semiconductor vendors.

SmartModels are included in the Xilinx ISE release. The following steps describe how to set up the models.

## Windows

### Set Environment

On Windows, open the "System Properties" dialog box by selecting "System" in the Windows Control Panel. Select the "Advanced" tab and click on "Environment Variables". The "Environment Variables" dialog box will appear.

Set the variables to the following values:

```
LMC_HOME %XILINX%\smartmodel\nt\installed_nt
PATH %LMC_HOME%\bin;%LMC_HOME%\lib\pcnt.lib;%PATH%
```

**Note:** %PATH% represents what your PATH variable had before doing the changes. Make sure you keep that.

## Solaris

### Set Environment

Set the following variables (if not already set):

```
setenv LMC_HOME $XILINX/smartmodel/sol/installed_sol
setenv LD_LIBRARY_PATH $LMC_HOME/lib/sun4Solaris.lib:$LD_LIBRARY_PATH
setenv PATH $LMC_HOME/bin:${PATH}
```

## Step 7B: Set up ModelSim to use SmartModels

Although ModelSim PE/SE supports the SWIFT interface, certain modifications must be made to the default ModelSim setup to enable this feature. The ModelSim installation directory contains an initialization file called **modelsim.ini**. In this initialization file, you may edit GUI and simulator settings so that they default to your preferences. You must edit parts of this **modelsim.ini** file in order for it to work properly with the Virtex-II Pro device simulation models.

The following changes should be made to the **modelsim.ini** file located in the ModelSim installation directory. (An alternative to making these edits to the installation directory is to change the MODELSIM environment variable so that it points to an edited **modelsim.ini** file located in another directory.)

### Edit modelsim.ini

1. Edit the statement "Resolution = ns" and change it to "Resolution = ps".
2. Comment the following statement called "PathSeparator = /" by adding a ";" at the beginning of the line.
3. For Verilog designs enable SmartModels by searching for the variable "Veriuser" and change it to:

On Windows:

```
Veriuser = $MODEL_TECH/libswiftpli.dll
```

On Solaris:

```
Veriuser = $MODEL_TECH/libswiftpli.sl
```

4. Search for the [lmc] section and uncomment the "libsm" and "libswift" definitions according to your operating system. Comment out other "libsm" and "libswift" definitions.

For Example,

On Windows, uncomment these lines:

```
libsm = $MODEL_TECH/libsm.dll  
libswift = $LMC_HOME/lib/pcnt.lib/libswift.dll
```

On Solaris, uncomment these lines:

```
libsm = $MODEL_TECH/libsm.sl  
libswift = $LMC_HOME/lib/sun4Solaris.lib/libswift.so
```

**Note:** It is important to make the changes in the order in which the commands appear in the **modelsim.ini** file. The simulation may not work if the order is changed.

After you finish editing the **modelsim.ini** file, make sure that your environment is set to run ModelSim.

## Windows

### Set Environment

Set the variables to the following values:

```
MODELSIM <path_to_modelsim.ini_script>\modelsim.ini  
PATH <MTI_path>\win32;%PATH%
```

You are responsible for changing the parameters included within <> to match the systems configuration.

**Note:** %PATH% represents what your PATH variable had before doing the changes. Make sure you keep that.

## Solaris

### Set Environment

On Solaris and Linux, add the following environment variables to the MTI ModelSim setup script:

```
setenv MODELSIM <path_to_modelsim_ini_script>/modelsim.ini  
setenv PATH <MTI_path>/bin:${PATH}
```

You are responsible for changing the parameters included within <> to match the systems configuration.

## Step 7C: Compile ISE Simulation Libraries for ModelSim

Most simulators require you to compile the HDL libraries before you can use them for design simulations. The advantages of compiling HDL libraries are speed of execution and economy of memory.

Xilinx provides **compplib** to compile the HDL libraries for all Xilinx-supported simulators. This utility will compile the UNISIM, XilinxCoreLib and SIMPRIM libraries for all supported device architectures.

### Compile Libraries

For ML300, you will need the unisim, simprim, smartmodels, and XilinxCoreLib for Virtex-II Pro to run on ModelSim SE.

1. Open a Command Prompt / DOS shell (Windows) or appropriate Unix shell (Solaris) with its environment set to run ISE, EDK, and ModelSim. On Windows, your environment has already been set up to run the tools. On Solaris, source the necessary environment scripts to be able to run these tools.
2. Choose a directory to install the libraries. As a default, install them under a new “mti\_se” subdirectory under the EDK install directory %XILINX\_EDK% (Windows) or \$XILINX\_EDK (Solaris). This directory will be created automatically by **compplib** if it does not exist.
3. Run **compplib**. If you chose our directory suggestion, your command is:

Windows:

```
compplib -s mti_se -f virtex2p:u:s:c:m -l all -w -o %XILINX_EDK%\mti_se
```

Solaris:

```
compplib -s mti_se -f virtex2p:u:s:c:m -l all -w -o $XILINX_EDK/mti_se
```

This command compiles the unisim, simprim, and XilinxCoreLib verilog / vhdl libraries on ModelSim SE for the Virtex-II Pro family in a new “mti\_se” sub-directory of your EDK install directory. It also compiles the smartmodels. The compiled results are saved in the following directories:

```
unisims_ver  
simprims_ver  
XilinxCoreLib_ver  
unisim  
simprim  
XilinxCoreLib
```

4. Make note of where you installed the libraries. If you chose our directory suggestion, the libraries are installed in %XILINX\_EDK%\mti\_se (Windows) or \$XILINX\_EDK/mti\_se (Solaris).

## Step 7D: Compile EDK Simulation Library for ModelSim

Xilinx provides a tool to compile behavioral model libraries of the EDK IP for ModelSim. The **compedklib** program will compile the libraries into a specified location. For encrypted IP, Xilinx provides precompiled libraries and will be placed by **compedklib** in the same location.

### Compile Library

1. Open a Command Prompt / DOS shell (Windows) or appropriate Unix shell (Solaris) with its environment set to run ISE, EDK, and ModelSim. On Windows, your environment has already been set up to run the tools. On Solaris, source the necessary environment scripts to be able to run these tools.
2. Change directories to where you have installed the libraries generated by **compplib**. If you ran **compplib** with the suggested directory, you will change to either %XILINX\_EDK%\mti\_se or \$XILINX\_EDK/mti\_se.
3. Run **compedklib**. If you choose our directory name suggestion of “edklib”, your command is:  

```
compedklib -X . -o edklib
```

This command will compile the EDK simulation libraries into:

```
./edklib
```

**Note:** ModelSim will overwrite the **modelsim.ini** file when mapping the compiled libraries.

4. Make note of the EDK simulation directory path. If you chose our suggestions, the library is at %XILINX\_EDK%\mti\_se\edklib (Windows) or \$XILINX\_EDK/mti\_se/edklib (Solaris) directory.

## Step 8: Install Reference Design

Reference designs for the ML300 demonstrate various features of the hardware and software on the ML300 Evaluation Platform. They are located in the ML300 Lounge.

### Install

1. Unzip the reference design into a working directory. (The reference design was downloaded during “Step 3: Download ML300 Reference Design, ISE / EDK Service Packs, and ChipScope Pro Software”.)
2. Read the reference design documentation to configure the reference design for your system.

## Step 9: Start Running ML300

Your installation of the ML300 Evaluation Platform is now complete. Please see either the *ML300 Quick Start* card, or open the *Getting Started with ML300* PDF, located on the ML300 Documentation page. You should check the ML300 web pages and ML300 Lounge for the latest in documentation and designs. Both will be updated periodically and can be reached from the ML300 Overview page:

<http://www.xilinx.com/ml300>

- Click **ML300 Lounge** to go the lounge. You must be registered for access.
- Click **ML300 Documentation** to find documentation.