

Quartus® II

Design Software

Installation & Licensing for PCs



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Additional patents are pending.

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Documentation Conventions

The *Quartus II Installation & Licensing for PCs* manual uses the following conventions to make it easy for you to find and interpret information.

Terminology



The following terminology is used throughout the *Quartus II Installation & Licensing for PCs* manual:

Term:	Meaning:
“click”	Indicates a quick press and release of the left mouse button.
“double-click”	Indicates two clicks in rapid succession.
“choose”	Indicates that you need to use a mouse or key combination to start an action.
“select”	Indicates that you need to highlight text and/or objects or an option in a dialog box with a key combination or the mouse. A selection does not start an action. For example: Select Chain Description File , and click OK .
“turn on”/“turn off”	Indicates that you must click a check box to turn a function on or off.

Typographic Conventions

The *Quartus II Installation & Licensing for PCs* manual uses the following typographic conventions:

Visual Cue:	Meaning:
Bold Initial Capitals	Command names, dialog box titles, tab names, page names, and button names are shown in bold, with initial capital letters. For example: Find Text command, Save As dialog box, and Start button.


Visual Cue:	Meaning:
bold	Directory names, project names, disk drive names, file names, file name extensions, software utility names, and options in dialog boxes are shown in bold. Examples: quartus directory, d: drive, license.dat file.
Initial Capitals	Keyboard keys, user-editable application window fields, and menu names are shown with initial capital letters. For example: Delete key, the Options menu.
“Subheading Title”	Subheadings within a manual section are enclosed in quotation marks. In manuals, titles of Help topics are also shown in quotation marks.
<i>Italic Initial Capitals</i>	Help categories, manual titles, section titles in manuals, and application note and brief names are shown in italics with initial capital letters. For example: <i>FLEXlm End Users Guide</i> .
<i>italics</i>	Variables are enclosed in angle brackets (< >) and shown in italics. For example: < <i>file name</i> >, < <i>CD-ROM drive</i> >.
Courier font	Anything that must be typed exactly as it appears is shown in Courier. For example: <code>\quartus\bin\lmutil lmhostid.</code>
■	Bullets are used in a list of items when the sequence of the items is not important.
✓	The checkmark indicates a procedure that consists of one step only.
	The hand points to information that requires special attention.
	The feet show you where to go for more information on a particular topic.
↵	Enter or Return key.

Installing the Quartus II Software

This section describes the requirements and procedures for installing the Altera® Quartus® II software on PCs or compatible computers running Microsoft Windows NT version 4.0, Windows 2000, or Windows XP.

System Requirements

Your system must meet the following minimum requirements:

- Pentium II PC running at 400 MHz or faster with 256-MB system memory
 - 800 MB of available disk space on the drive or partition where you are installing the Quartus II software and an additional 5.2 MB on the drive containing your system directory
 - Microsoft Windows NT version 4.0 (Service Pack 4 or later), Windows 2000, or Windows XP
 - Microsoft Windows-compatible SVGA monitor
 - CD-ROM drive
 - One or more of the following ports:
 - Parallel port for use with the ByteBlaster™ II or ByteBlasterMV™ parallel port download cable
 - Serial port for use with the MasterBlaster™ communications cable
 - USB port for use with the USB-Blaster™ download cable, the MasterBlaster communications cable, and the Altera Programming Unit (APU) (Windows 2000 and Windows XP only)
 - Microsoft Internet Explorer software version 5.0 or later
-  You should have Microsoft Internet Explorer software version 5.0 or later installed, because portions of the Internet Explorer software are required to use the Quartus II online Help system. However, you do not need

to make the Internet Explorer browser your default browser. You may need to configure the Internet Explorer software to work with your company network. For example, you may need to configure for a dial-up connection or for a proxy server. If necessary, you can download the Internet Explorer software from the Microsoft Internet Explorer web site at www.microsoft.com/ie/.



Refer to the **readme.txt** file, which is located in the **quartus** directory on the Quartus II Design Software for PCs CD-ROM, for specific information about disk space and memory requirements in the current version of the Quartus II software. After installation, the **readme.txt** file is available from the Quartus II Help menu and in the Quartus II system directory.

In addition, the most current version of the *Quartus II Installation & Licensing for PCs* manual is available in Adobe Portable Document Format (PDF) from the Literature section of the Altera web site at www.altera.com/literature, and may contain updated information about system requirements.

For the latest information on new features, device support, EDA interface support, and known issues and workarounds for the Quartus II software, refer to the *Quartus II Software Release Notes* document, which is available at www.altera.com/literature/rn/rn_qts.pdf.

For general information about Quartus II software features and how they work with your design flow, refer to the *Introduction to Quartus II* manual, which is included in your Quartus II software package and is also available from the Literature section of the Altera web site at www.altera.com/literature.

Refer to the *Altera Programming Hardware Installation* guide for information about installing programming hardware on a PC. The guide is available from the Literature section of the Altera web site at www.altera.com/literature. Refer to the Quartus II online Help for more information about programming Altera devices.

Uninstalling Previous Versions of the Quartus or Quartus II Software

If you have installed a previous version of the Quartus® or Quartus II software, Altera recommends that you uninstall that software before installing the new version of the software. However, it is not necessary to uninstall it.

To uninstall a previous version of the Quartus or Quartus II software:

- ✓ Choose **Programs > Altera > Quartus <version number> Uninstall, Repair or Modify** (Windows Start menu).

Running the Setup Program

The Quartus II software uses a Setup program for installation. Follow these steps to run the Setup program on your PC:



You must have system administration (Administrator) privileges.

1. Insert the Quartus II Design Software for PCs CD-ROM into your CD-ROM drive. The Quartus II Install CD window appears automatically, offering several options. If the CD-ROM is in the drive, and the Setup program is not already running, start the Setup program manually by performing the following steps:
 - a. Choose **Run** (Windows Start menu).
 - b. In the **Run** dialog box, type `<CD-ROM drive>: \install`.
 - c. Click **OK**.
2. Click the **Install Quartus II Software and Related Software** button to install the Quartus II software. The Setup program starts automatically and guides you through the installation process.



The Setup program also allows you to install the GNU Tools and Excalibur™ Component software and the Model Technology™ ModelSim®-Altera software. The CD-ROMs for this software are included in the Quartus II subscription packages, but may not be included in the Altera development and Altera partner kits. To install these programs, you must turn on the **GNU Tools and Excalibur Component** or the **ModelSim-Altera** options in the Setup program. If you decide to install these software tools at another time, follow the installation instructions located in the *Altera CD Installation Guide*, which is included in your Quartus II software package and is also available in the Literature section of the Altera web site at www.altera.com/literature.

You can select a full installation or a custom installation. If you select a custom installation, you can select which device families you want to install, and you can also select whether you want to install EDA interfaces or tutorial files.



You must install support for the APEX™ 20K EP20K100E device if you want to complete the Basic or LogicLock™ Quartus II tutorial. In addition, you must install support for the MAX® II EP570 and Stratix™ EP1S25 devices if you want to complete the Optional MAX+PLUS II conversion and Stratix tutorial modules.

3. If you will run the Quartus II software using a network (multiuser) license, and not a node-locked (single-user) license, click the **Install FLEXlm Server Control Panel** button to install the FLEXlm License Manager software on the license server only. The Setup program installs the FLEXlm License Manager version 8.2 on the user workstation.

The Quartus II software supports network license servers on PCs running Windows NT 4.0, Windows 2000, and Windows XP; on UNIX workstations running Solaris 7 or 8, or HP-UX 11.0; and on PCs running Linux (Red Hat Linux 7.3 or 8.0). You do not need to install the FLEXlm License Manager software on network client PCs or on PCs running the Quartus II software using a node-locked (single-user) license. Refer to [“Upgrading or Setting Up a License Manager Server” on page 12](#) for more information about setting up the license manager server.

Installing the TCP/IP Protocol

If you do not already have the TCP/IP protocol installed on the PCs in your network, you must add it to your networking configuration. These instructions apply only to PCs running Windows NT.

Follow these steps to install the TCP/IP protocol:

1. Close all other programs.
2. Insert your Windows operating system CD-ROM into your CD-ROM drive.
3. Choose **Settings > Control Panel** (Windows Start menu).
4. Double-click the **Network** icon in the Control Panel window.
5. In the **Network** dialog box, click the **Protocols** tab.
6. Click the **Add** button. The **Select Network Protocol** dialog box appears.
7. In the **Select Network Protocol** dialog box, select **TCP/IP Protocol** from the **Network Protocol** list.
8. Click **OK**.
9. In the **Windows NT Setup** dialog box, make sure the directory path is **<CD-ROM drive>:\i386**.
10. Click **Continue**.
11. In the **Network** dialog box, click **Close** after all files have been copied.
12. When you are asked if it is OK to restart your computer, click **Yes**.



For information about installing the TCP/IP protocol on PCs running Windows 2000 or Windows XP, refer to your Windows 2000 or Windows XP documentation or to the Microsoft web site at www.microsoft.com.

Licensing the Quartus II Software

This section describes how to license the Quartus II software. To set up your license for the Quartus II software, you must perform the following steps, each of which is described in more detail in this section:



If you are using a node-locked (FIXEDPC) license and are upgrading to a new version of the Quartus II software, you can perform an automatic web license retrieval at startup, which allows you to upgrade your license file automatically. For more information on this option, go to [“Starting the Quartus II Software” on page 18](#).

1. If necessary, obtain a license file. The Quartus II software requires a valid, unexpired **license.dat** license file for each server that supports a network (multiuser) license or for each node-locked (single-user) license. This same license file can also enable the additional Altera synthesis and simulation tools included with Altera software subscriptions, as well as the MAX+PLUS® II software.
2. If you are using a network license (FLOATPC, FLOATNET, or FLOATLNX), modify the license file.
3. If you are using a network license, set up and configure the FLEXlm license manager server.

or

If you are using a node-locked (FIXEDPC) license, install a Sentinel Software Guard.

4. Start the Quartus II software.
5. Specify the location of the license file.
6. (Optional) Register for an Altera.com account.

Obtaining a License File

When you start the Quartus II software, if the software cannot detect a valid license file, you are asked whether you want to run in evaluation mode for 30 days, perform an automatic license retrieval from the Altera web site, or specify the correct location of a valid license file.

You can also obtain an ASCII license file, **license.dat**, from the Licensing section of the Altera web site at www.altera.com if you have the following information:

- Your Altera ID, which is a six-digit number that is provided when you purchase the Quartus II development system. This number is listed on the packing list that is shipped with the Quartus II software.
- Your serial number, which can be one of the following numbers:
 - If you have a network (multiuser) license version of the Quartus II software, the serial number is printed on the side of the Quartus II shipping box, and on the *Registration & License File Request Form*, which is also included with the Quartus II software package. This number begins with the letter G, and is followed by five digits (*Gxxxxx*).
 - If you have a node-locked (single-user) version of the Quartus II software, the serial number is the number on your Software Guard. This number begins with the letter T.
- Your Network Interface Card (NIC) number. To find your Windows NT server NIC number by using FLEXlm utilities, type the following command at a command prompt:

```
<disk drive>:\quartus\bin\lmutil lmhostid ←
```



For information about additional methods of finding your NIC number, refer to the Altera Find Answers page, which is available from the Support Center section of the Altera web site at www.altera.com/answers. For complete information about using the FLEXlm utilities, you should refer to the *FLEXlm End Users Guide*, which is available from the Support Services section of the Macrovision web site at www.macrovision.com.

To obtain a license file, follow these steps:



Altera recommends that you save any previous **license.dat** file in a temporary directory, in case you need to refer to it later.

1. Start the Quartus II software as described in the “[Starting the Quartus II Software](#)” on page 18.
2. Select **Perform automatic web license retrieval** to request a valid license file automatically from the Altera web site. If you are using a node-locked (FIXEDPC) license and the Quartus II software is able to retrieve a license file successfully from the web site, you can skip the remaining steps of this procedure. If you are using a network (multiuser) license, or if the Quartus II software is not able to retrieve a license file, you are guided through the licensing procedure.

or

To request a license file at a later time, point your web browser to the Licensing section of the Altera web site at www.altera.com/licensing. The Altera Software Licensing page is displayed.

3. If you are using a node-locked (single-user) license, select the FIXEDPC license option.

or

If you are using a network (multiuser) license, select the FLOATPC, FLOATNET, or FLOATLNX license option.

4. Specify the requested information.
5. You will receive an e-mail from Altera with a **license.dat** file attached, as well as the license file text. Altera recommends using the attached license file if you are using a node-locked (single-user) license. If you are using a network (multiuser) license, you may either use the attached license file, or copy the lines from the attached license file to an existing license file. If you are using the **license.dat** file with both the Quartus II software and the MAX+PLUS II software, Altera recommends that you save the **license.dat** file in a top-level directory named *<disk drive>:\flexlm*.

Figure 1 shows the Quartus II FEATURE line of a sample license file for a node-locked (single-user) license that uses a Software Guard.

Figure 1. Sample Node-Locked (Single-User) License File

<i>Feature name</i>	<i>Daemon name</i>	<i>Version</i>	<i>Expiration date</i>	<i>Number of licenses requested</i>	<i>Authorization code</i>
<pre>FEATURE quartus alterad 2004.01 permanent uncounted 2BC9FE52E0F3 \ HOSTID=GUARD_ID=T000002287 SIGN="1C66 DAC6 1DAB C886 727B 65DF \ FAC2 B479 3E3C 656D 3561 E5D0 BBA3 C45C 4DDC 0F2F 68F5 4DF1 \ 6F63 7785 2F5D 1480 1B0A 70DE 2220 1952 DDCD 9F4D 6D61 A177"</pre>					

Figure 2 on page 9 shows a sample single-server network license file for a PC.

Figure 2. Sample Single-Server Network License File

<i>Server name</i>	<i>Server host ID number</i>	<i>Optional port number</i>	<i>Number of licenses requested</i>	<i>Authorization code</i>
<pre>SERVER alice 00c04f6bead6 1800 VENDOR alterad "<disk drive>:\quartus\bin\alterad.exe" USE_SERVER FEATURE quartus alterad 2004.01 permanent 5 7A496D25A602 SIGN="1C66 \ DAC6 1DAB C886 727B 65DF FAC2 B479 3E3C 656D 3561 E5D0 BBA3 \ C45C 4DDC 0F2F 68F5 4DF1 6F63 7785 2F5D 1480 1B0A 70DE 2220 \ 1952 DDCD 9F4D 6D61 A177"</pre>				
<i>Feature name</i>	<i>Daemon name</i>	<i>Version</i>	<i>Expiration date</i>	

If you are using the Quartus II software with a node-locked (single-user) license, skip to [“Installing a Sentinel Software Guard” on page 15.](#)

The FLEXlm licensing scheme allows you to set up three redundant license servers to serve a network (multiuser) license. You can obtain a license file for redundant servers by performing the steps described earlier in this section for obtaining a license file. [Figure 3](#) shows a sample redundant server license file.

Figure 3. Sample Redundant Server License File

	<i>Server name</i>	<i>Server ID number</i>	<i>Port number</i>		<i>Number of licenses requested</i>	<i>Authorization code</i>
SERVER	alice	00c04f6bead6	1800			
SERVER	king	00c4fbbd170	1800			
SERVER	queen	00c4fbbd320	1800			
VENDOR	alterad "<disk drive>:\quartus\bin\alterad.exe"					
USE_SERVER						
FEATURE	quartus	alterad	2004.01	permanent	5	7A496D25A602 SIGN="1C66 \
	DAC6	1DAB C886	727B	65DF FAC2	B479 3E3C 656D 3561 E5D0 BBA3 \	
	C45C	4DDC 0F2F	68F5	4DF1 6F63	7785 2F5D 1480 1B0A 70DE 2220 \	
	1952	DDCD 9F4D	6D61	A177 "		
	<i>Feature name</i>	<i>Daemon name</i>	<i>Version</i>	<i>Expiration date</i>		



For additional information about setting up and administering license servers, including setting up three redundant license servers, refer to the *FLEXlm End Users Guide*, which is available from the Support Services section of the Macrovision web site at www.macrovision.com.

Modifying the License File

The `license.dat` file must be modified before it can be used by the license server. See *Application Note 340 (Altera Software Licensing)* for a detailed description of the license file.



If you have a node-locked (single-user) license, you can skip this section and go to “Installing a Sentinel Software Guard” on page 15.

The first few lines of the license file are shown in the following example (your license file may not contain all the `VENDOR` entries, depending on which software you have enabled):

```
SERVER <host name> <8- or 12-character host or NIC ID> <port number>
VENDOR alterad "<path to daemon executable>"
VENDOR mgcld "<path to daemon executable>"
```

To modify the license file, follow these steps:

1. In the **license.dat** file, type the variables that are described in [Table 1](#). The host or NIC ID will already be entered in the license file.

Table 1. Variables to Modify in the License File (license.dat)

Variable Name	Description	Directory
<host name>	The host name of the server; for example, my_server.	
<port number> (1)	The port number for the license manager service on the server; for example, 1800. The port number is optional and should be different from the port number for any other service on the machine.	
alterad "<path to daemon executable>" (2)	Path to the Altera vendor daemon executable alterad .	\<Quartus II system directory path>\bin\ alterad.exe
mgcld "<path to daemon executable>" (2)(3)(4)	Path to the Mentor Graphics vendor daemon executable mgcld .	\<ModelSim-Altera system directory>\ win32aolem\mgcld.exe
<p><i>Notes:</i></p> <p>(1) If you do not specify a port number in the license file, the FLEXlm License Manager will automatically choose a free port between 27000 and 27009. However, to prevent port number conflicts, you can specify a port number. If three redundant servers are being used, you must specify a port number. For PC-based license servers, Altera recommends that you specify a port number in the range of 27000-27009. However, you can use any unused port number between 0 and 64000.</p> <p>(2) In some network environments, the license server does not have an installation of the software tool(s) that provides the necessary vendor daemon (alterad or mgcld). In this case, copy the required daemon from another machine that does have an installation of the software. Find the file in the directory location specified. Save the file in a similarly named directory or any other location on the license server. Specify the daemon location on the license server in the license file.</p> <p>(3) If the path to the server has spaces in it, enclose the full path in quotation marks.</p> <p>(4) If you are not using a license file for the ModelSim-Altera software, you may delete this line.</p>		

2. Save the license file with a **.dat** extension. Altera recommends that you name your license file **license.dat**.

3. Make sure the license file meets these guidelines:
 - The license file name must have a **.dat** extension. If your text editor adds **.txt** or another extension to the file name, such as **license.dat.txt**, you must rename the file to have only a **.dat** extension.
 - The license file must have a carriage return at the end of the last `FEATURE` line.
 - Any `FEATURE` line that wraps to a second or third line must contain a backslash (`\`) at the end of each line to indicate that it continues.



For additional information about modifying the license file for the Quartus II and MAX+PLUS II software and other EDA tools, refer to *Application Note 340 (Altera Software Licensing)*, which is available from the Literature section of the Altera web site at www.altera.com/literature.

Upgrading or Setting Up a License Manager Server

This section provides instructions for upgrading or setting up the FLEXlm License Manager server software on a PC running Windows NT 4.0, Windows 2000, or Windows XP. A system administrator should perform these steps to configure license servers after the Quartus II software is installed.



If you have a node-locked (single-user) license, you can skip this section and go to “[Installing a Sentinel Software Guard](#)” on [page 15](#).

Upgrading the FLEXlm License Server Software

To support network licensing, the Quartus II software requires the FLEXlm License Manager software version 8.0 or later. The Quartus II Setup program installs version 8.2 of the FLEXlm License Manager server

software on your user workstation, but you should also verify that the version of the FLEXlm License Manager software or the license server is 8.0 or later. Go to “[Running the Setup Program](#)” on page 3 for more information on installing the FLEXlm License Manager server software. If the FLEXlm License Manager software is version 8.0 or later, skip to “[Setting Up a License Manager Server Under Windows NT, Windows 2000, or Windows XP](#)” on page 14.

To determine which version of the FLEXlm License Manager server software you are using:

- ✓ On the computer running the FLEXlm License Manager server software, type the following commands at a command prompt:

```
<FLEXlm system directory path>\lmgrd -v ↵  
<FLEXlm system directory path>\alterad -v ↵
```

If the **lmgrd** or **alterad** daemons are not from the FLEXlm software version 8.0 or later, you must upgrade both daemons with the versions provided in the installation of the Quartus II software.

To upgrade an older version of the FLEXlm License Manager server software, follow these steps:

1. Make a backup copy of the **lmgrd** and **alterad** daemons you are currently using.
2. Copy the new versions of the files to the computer running the license server over the daemons you are currently using. You may have to shut down the license server software to complete this step.

If you used the Quartus II Setup program to install the FLEXlm License Manager server software, the current version of the **lmgrd** and **alterad** daemons are located in the following location:

```
\<Quartus II system directory path>\bin\alterad  
\<Quartus II system directory path>\bin\lmgrd
```

3. Copy the FLEXlm software **lmutil** utility from the Quartus II system directory to the license server workstation.

- Restart the FLEXlm license server by typing the following commands at a command prompt:

```
<FLEXlm system directory path>\lmutil -c lmdown  
  <license file path> ←  
<FLEXlm system directory path>\lmgrd -c <license file path>  
  [-l <optional log path>] ←
```

Setting Up a License Manager Server Under Windows NT, Windows 2000, or Windows XP

To configure a license server with the FLEXlm Server software, follow these steps:

- If you have not already done so, modify the license file. The FLEXlm licensing scheme also allows you to set up three redundant license servers to serve a network (multiuser) license. You can obtain a license file for redundant servers by performing the steps described in [“Obtaining a License File” on page 7](#). [Figure 3 on page 10](#) shows a sample redundant server license file.
- If you have not already done so, verify that the FLEXlm License Manager server software is version 8.0 or later. Refer to [“Upgrading the FLEXlm License Server Software” on page 12](#) for information on verifying the version of the FLEXlm License Manager software.
- Choose **Settings > Control Panel** (Windows Start menu).
- Double-click the **FLEXlm License Manager** control panel icon.
- To specify information about your license server, click the **Setup** tab.
- Specify the **Service Name**. The default service name is **FLEXlm License Manager**, but because the license manager can administer both the Quartus II software and the Altera MAX+PLUS II software, Altera recommends that you change this name to *Altera License Manager* to avoid conflicts with other software programs that use the FLEXlm License Manager software.

7. Specify additional options on the **Setup** tab, always including the complete path names to the files you specify. The **lmgrd.exe** executable is located in the `<disk drive>:\<Windows directory>\system32` directory. Specifying the debug log file is optional.
8. To set up the Altera License Manager as a service, turn on **Use NT Services**. You can then use the **Services** control panel to adjust the starting and stopping behavior of the Altera License Manager. Setting up the Altera License Manager as a service allows licenses to be issued to other users after you have logged out of a Windows NT session.
9. If you want the Altera License Manager to start automatically when you start your PC, turn on **Start Server at Power-Up**.
10. Click the **Control** tab. This tab allows you to start, stop, and check the status of your license server.
11. In the **Control** tab, click **Start** to turn on your license server and launch the Altera License Manager as a background application.

After the license manager server has been set up in Windows NT, the license file must be specified for each client. Refer to “[Specifying the License File](#)” on page 19 for instructions on how to specify a license file.



For complete information about using the FLEXlm utilities to administer and troubleshoot the FLEXlm License Manager software, refer to the *FLEXlm End Users Guide*, which is available from the Support Services section of the Macrovision web site at www.macrovision.com.

Installing a Sentinel Software Guard

If your Quartus II development system uses a node-locked license and includes a Sentinel Software Guard, you must make sure the Sentinel driver is installed and then install the Software Guard before you can specify a license file.



If you have a network (multiuser) license, you can skip this section and go to “[Starting the Quartus II Software](#)” on page 18.

Installing the Sentinel Driver

The Sentinel driver is required for all Quartus II software systems running on Windows NT, Windows 2000, and Windows XP that use a Software Guard. The Sentinel driver is installed automatically with the Quartus II software.



Installing the Sentinel driver requires that you have system administration (Administrator) privileges.

If the Sentinel driver is not installed, you can install it by following these steps:

1. Choose **Run** (Windows Start menu).
2. In the **Run** dialog box, type the following command:

`<disk drive>:\quartus\drivers\setupx86.exe`
3. Click **OK**.
4. In the **Sentinel Driver Setup Program** window, choose **Install Sentinel Driver** (Functions menu).
5. In the **Sentinel Install** dialog box, specify the directory path to your `\<Quartus II system directory>\drivers` directory.
6. Click **OK**.
7. Restart your computer at the prompt.

or

Open a command prompt window and type the following command:

```
net start sentinel ←
```

Installing the Software Guard

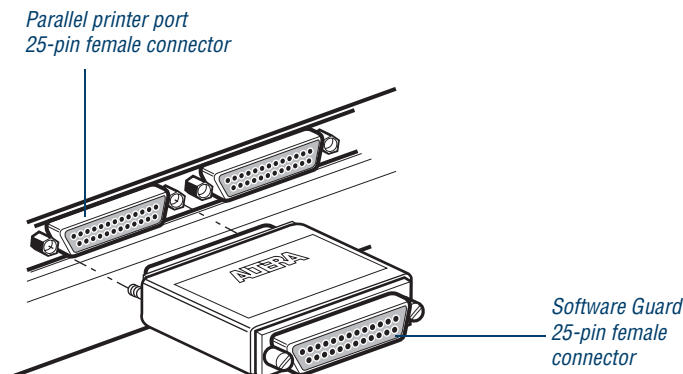
To install the Software Guard on a PC, follow these steps:

1. Locate a parallel printer port (that is, an LPT port) on the computer. If you have a printer connected to this port, you must disconnect it temporarily.
2. Insert the 25-pin male connector end of the Software Guard into the 25-pin female connector of the parallel printer port, as shown in [Figure 4 on page 17](#).



1. Do not connect disk drives that use the parallel port or any device, other than a printer or the ByteBlaster II or ByteBlasterMV download cable, to either end of the Software Guard. Disk drives can destroy a Software Guard by drawing more power than the guard is capable of handling.
2. Disconnect the Software Guard before using the parallel port to transfer data between computers using a data transfer program. Failure to do so can cause damage to the Software Guard.

Figure 4. Attaching the Software Guard to a PC



3. If necessary, reinsert the printer cable connector into the female connector of the Software Guard.

Starting the Quartus II Software

You can start the Quartus II software after installation is complete. In order to enable Quartus II features, however, you must specify the license file, either within the Quartus II software or outside of the Quartus II software. For information about how to specify your license file, refer to the next section, “Specifying the License File.”

To start the Quartus II software:

- ✓ Choose **Programs > Altera > Quartus II <version number>** (Windows Start menu).

or

- ✓ Open a new command prompt window and type the following command:

```
<disk drive>: \<Quartus II system directory>\bin\quartus ↵
```

When you start the Quartus II software, if the software cannot detect a valid license file, you will see a prompt with the following options:

- **Enable 30-day evaluation period with no license file (no programming file support)**—This option allows you to continue to use the Quartus II software for 30 days without programming file support. After 30 days, you must have a valid license file in order to use the software.
- **Perform automatic web license retrieval**—This option displays the Licensing section of the Altera web site, which allows you to request a license file automatically. If you are using a node-locked (FIXEDPC) license, the Quartus II software retrieves the license file automatically from the web site. If you are using a network (multiuser) license, or if the Quartus II software is not able to retrieve a license file, you are guided through the licensing procedure. See [“Obtaining a License File” on page 7](#) for more information.
- **Specify valid license file**—This option displays the License Setup page of the Options dialog box, which allows you to specify the location of your license file. See the next section, [“Specifying the License File,”](#) for more information.

Specifying the License File

Once you have obtained a license file and set up a network license server (for multiuser licenses) or installed a Software Guard (for single-user licenses), you must specify the location of the license file for each user (or “client”). You can specify the license file with one of the following methods, which are described in more detail in this section:

- Specify the license file using the Quartus II software
- Specify the license file using the Windows NT, Windows 2000, or Windows XP **System** control panel



If you are using the Model Technology ModelSim-Altera simulation software, which is included with Altera software subscriptions, and/or you are using the MAX+PLUS II software, you must specify the license file with the **System** control panel.

Specifying the License File Using the Quartus II Software

You can specify the location of your license file from within the Quartus II software.



Specifying the license file from within the Quartus II software does not require system administration (Administrator) privileges.

To specify your license file within the Quartus II software, follow these steps:

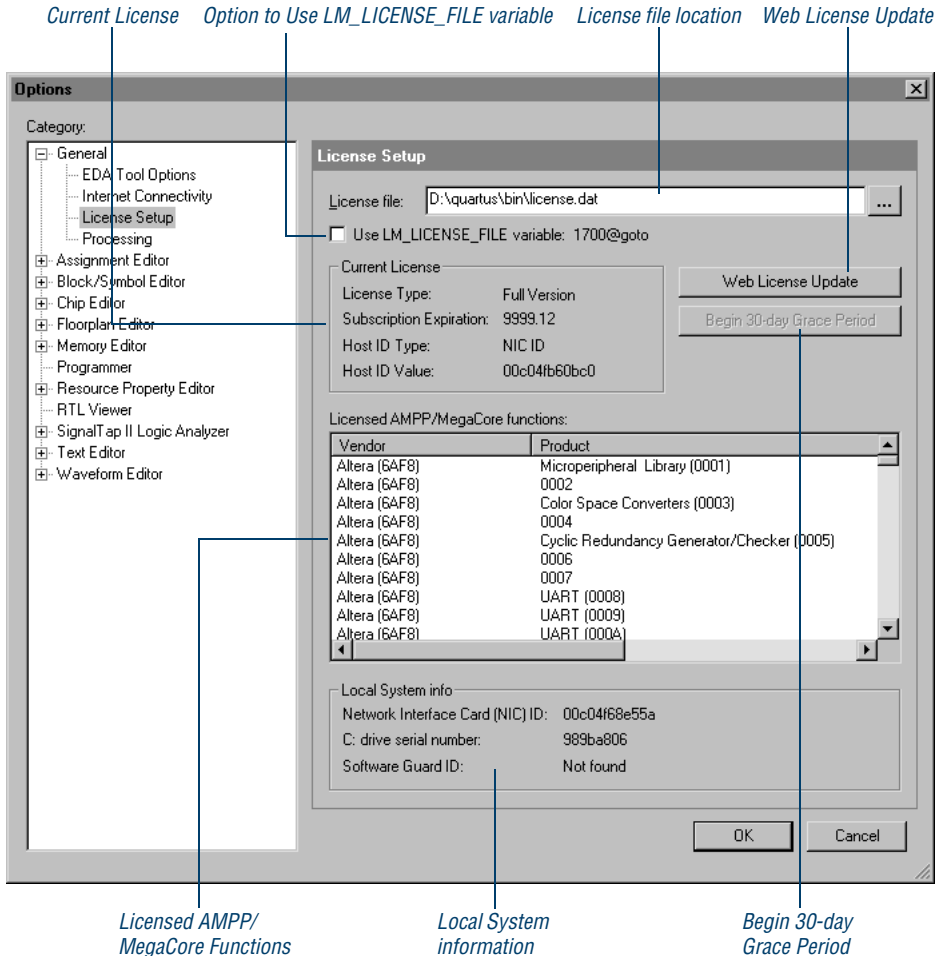
1. Start the Quartus II software as described in the [“Starting the Quartus II Software”](#) on page 18.



When you start the Quartus II software, if the software cannot detect a valid license file, you are asked whether you want to run in evaluation mode for 30 days, request a valid license file automatically from the Altera web site, or specify the correct location of a valid license file.

2. Select **Specify valid license file** to specify the name of the license file. The **License Setup** page of the **Options** dialog box (Tools menu) is displayed. **Figure 5 on page 20** shows the **License Setup** page.

Figure 5. License Setup Page of the Options Dialog Box



3. In the **License file** box, specify the full path name of your **license.dat** file. You can click **Browse (...)** to locate your **license.dat** file. Altera recommends that you store the **license.dat** file in a directory named **<disk drive>\flexlm**.

You can also specify the location of the license file by typing a name of the format `<port>@<host>` instead of a license file path name, where `<host>` is the name of the server on which the license file is stored and `<port>` is the port listed in the **license.dat** file. Refer to [Figure 2 on page 9](#) for a sample network license file to determine your port and server name, and see [Table 1 on page 11](#) for more information about port numbers. If there is no port listed in the **license.dat** file, you can simply specify `@<host>`.



If you have more than one license file or server, separate the port and host specifications with semicolons (;), with no spaces between the names and numbers.

or

If you want to use the current `LM_LICENSE_FILE` value specified in the **System** Control Panel, turn on **Use LM_LICENSE_FILE variable**.

4. If you want the Quartus II software to check the Altera web site automatically for license file updates, click **Web License Update**.
5. If you want to use the Quartus II software in the “Subscription Expiration” grace period and did not already specify that option at startup, click **Begin 30-day Grace Period**. The “Subscription Expiration” grace period allows you to use the Quartus II software with programming file support for 30 days. When the grace period expires, you must obtain an updated license file at the Altera web site to continue using the Quartus II software with programming file support.
6. Click **OK**.

The **Licensed AMPP/MegaCore functions** list of the **License Setup** page lists all of the AMPP and MegaCore functions that are available for the license.

Specifying the License File Using the Windows NT, Windows 2000, or Windows XP System Control Panel

You can specify the location of your license file from outside the Quartus II software by setting system variables in the Windows NT, Windows 2000, or Windows XP **System** Control Panel.



Specifying the license file in the **System** Control Panel requires that you have system administration (Administrator) privileges.

To specify the license file in the Windows NT **System** Control Panel, follow these steps:

1. Choose **Settings > Control Panel** (Windows Start menu).
2. Double-click the **System** icon in the Control Panel window.
3. In the **System Properties** dialog box, click the **Environment** tab.
4. Click the **System Variable** list to highlight it, and then in the **Variable** box, type `LM_LICENSE_FILE`.
5. In the **Value** box, type either `<disk drive>:\flexlm\license.dat` or a name of the format `<port>@<host>`, where `<host>` is the name of the server and `<port>` is the port listed in the `license.dat` file. Refer to [Figure 2 on page 9](#) for a sample network license file to help you determine your port and server name. Refer also to [Table 1 on page 11](#) for more information about port numbers. If there is no port listed in the `license.dat` file, you can simply specify `@<host>`.



If you have more than one license file or server, separate the port and host specifications with semicolons (;), with no spaces between the names and numbers.

6. Click **OK**.

To specify the license file in the Windows 2000 or Windows XP **System** Control Panel, follow these steps:

1. Choose **Settings > Control Panel** (Windows Start menu).
2. Double-click the **System** icon in the Control Panel window.

3. In the **System Properties** dialog box, click the **Advanced** tab.
4. In the **Advanced** tab, click **Environment Variables**.
5. Under **System Variables**, click **New**. The **New System Variable** dialog box is displayed.
6. In the **Variable Name** box, type `LM_LICENSE_FILE`.
7. In the **Variable Value** box, type either `<disk drive>:\flexlm\license.dat` or a name of the format `<port>@<host>`, where `<host>` is the name of the server and `<port>` is the port listed in the **license.dat** file. Refer to [Figure 2 on page 9](#) for a sample network license file to help you determine your port and server name. Refer also to [Table 1 on page 11](#) for more information about port numbers. If there is no port listed in the **license.dat** file, you can simply specify `@<host>`.



If you have more than one license file or server, separate the port and host specifications with semicolons (;), with no spaces between the names and numbers.

8. Click **OK**.

If you want the Quartus II software to use the `LM_LICENSE_FILE` setting from your **System** Control Panel rather than from another license file setting, make sure **Use LM_LICENSE_FILE variable** is turned on in the **License Setup** page of the **Options** dialog box (Tools menu).

Registering for an Altera.com Account

Your copy of the Quartus II software is registered at the time of purchase; however, in order to use the mySupport web site to view and submit service requests, you must also register for an Altera.com account. An Altera.com account is required only for using the mySupport web site; however, having an Altera.com account will also make it easier for you to use many other Altera web site features, such as the Download Center, Licensing Center, Altera Technical Training online class registration, or Buy On-Line-Altera eStore features.

To register for an Altera.com account, follow these steps:

1. Go to the mySupport web site:
 - ✓ To start your web browser and connect to the mySupport web site while running the Quartus II software, choose **Altera on the Web > Quartus II Service Request** (Help menu).

or

 - ✓ Point your web browser to the mySupport web site at **www.altera.com/mysupport**.
2. Follow the instructions on the mySupport web site to register for an Altera.com account.

If you are not a current Altera subscription user, you can still register for an Altera.com account.

Starting the Quartus II Tutorial

The online tutorial introduces you to the features of the Quartus II design software. It shows you how to create and process your own logic designs quickly and easily. The modular design of the Basic and Optional tutorials allows you to choose the areas of the Quartus II software that you want to learn about:

- The Basic tutorial guides you through the steps required to create, compile, perform timing analysis on, simulate, and program a sample finite impulse response (FIR) filter design, called **fir_filter**.
- The Optional tutorial modules focus on topics such as migration from the MAX+PLUS II software, using the LogicLock™ feature, and using Stratix device features. You do not need to complete the Basic tutorial to begin any of the Optional tutorial modules.

To start the Quartus II tutorial after you have successfully installed the Quartus II software:

- ✓ Choose **Tutorial** (Help menu).

After you start the tutorial, the Quartus II window resizes to allow you to view the Tutorial window and the Quartus II software simultaneously.



1. You must have installed support for the APEX 20K EP20K100E device if you want to complete the Basic or LogicLock tutorial. In addition, you must have installed support for the MAX II EPM570 and Stratix EP1S25 devices if you want to complete the Optional MAX+PLUS II Conversion and Stratix tutorial modules. If you did not install support for these devices, refer to [“Running the Setup Program” on page 3](#).
2. The tutorial is designed for display online. However, if you want to print one or more of the tutorial modules, click the **Printing Options** button located at the beginning of each module and then click the link to open the appropriate printable version.

Using Quartus II Help

The Quartus II software includes a platform-independent Help system that provides comprehensive documentation for the Quartus II software and more details about the specific messages generated by the Quartus II software. You can view Help in one of the following ways:

- Press F1 from a highlighted menu command or active dialog box for context-sensitive help.
- Choose **Index** (Help menu) to view the **Index** tab. The Index lets you search for and display all Help topics related to a keyword or phrase.
- Choose **Contents** (Help menu) to view the **Contents** tab. The Contents outlines the design flow and groups related topics into folders, but does not list all the topics in Quartus II Help.
- Choose **Search** (Help menu) to perform a search with the **Search** tab. The Search finds a maximum of 500 topics containing the search keyword.
- Choose **Messages** (Help menu) to view the Messages list. The Messages list provides an alphabetical list of all messages and offers detailed Help on each message.
- Choose **Glossary** (Help menu) to view the Glossary list. The Glossary list provides definitions to key terminology in the Quartus II software.



Refer to “Help Menu Commands” and “Using Quartus II Help Effectively” in Quartus II Help for more information.

Getting Help on a Message

To view Help on an individual message, follow these steps:

1. In the **Processing** or **System** tab of the messages window, select the message on which you want to receive Help.
2. Choose **Help** (right button pop-up menu).

To view the entire alphabetical list of messages:

- ✓ Choose **Messages** (Help menu).

or


- ✓ Choose **Contents** (Help menu), and select **Messages List** from the end of the Contents.

Using Context-Sensitive Help

To view context-sensitive help for a specific item:

- ✓ Press F1 from a highlighted menu command or active dialog box for context-sensitive help.

or

- ✓ Press Shift+F1 or choose the **Context-Sensitive Help** button  on the toolbar. The pointer turns into a Help pointer. You can then point to a menu command or active window and click for context-sensitive help.


Navigating Help

The Help window includes a **Contents** tab, **Index** tab, and **Search** tab that can help you navigate through thousands of Help topics.

Using the Index Tab

To find and display a Help topic using the Index, follow these steps:

1. Choose **Index** (Help menu) or, if the Help window is already open, click the **Index** tab.

2. Type the entry you want to find in the **Type in the keyword to find** box.
3. In the list of keywords, select the entry or sub-entry.
 -  If the entry you are looking for refers to a cross-reference entry in parentheses that is preceded with **See** or **See also**, you can type that entry in the **Type in the keyword to find** box to locate additional topics.
4. To open the topic, click **Display** or double-click the entry.

Using the Search Tab

To search all topics in Quartus II Help for specific keywords, follow these steps:

1. Choose **Search** (Help menu) or, if the Help window is already open, click the **Search** tab.
2. Type the word or words that you want to find:
 - To find topics with adjacent words, type the words in double quotation marks. For example, “this and that” finds topics that contain the exact phrase “this and that.”
 - To find topics that contain the words, type the words without double quotation marks. For example, this and that finds topics that contain any combination of the words “this,” “and,” and “that.”
3. If necessary to narrow your search, select **AND**, **OR**, **NEAR**, or **NOT** from the list.
4. If necessary, turn on **Search previous results**, **Match similar words**, or **Search titles only**.
5. Click **List Topics**.
6. Select the topic you want to display.
7. Click **Display**.

Using the Contents Tab

To view groups of related topics, follow these steps:

1. Choose **Contents** (Help menu) or, if the Help window is already open, click the **Contents** tab.
2. Select the Help folder topic you want to view.
3. Click the + icon to expand the folder and view the names of individual Help topics.
4. Select the topic you want to display.

Printing Help Topics

To print Quartus II Help topics from the **Contents** tab, follow these steps:

1. In the **Contents** tab, select the Help folder or Help topic that you want to print.
2. Choose **Print** (right button pop-up menu).

or

Click the **Print** button  on the toolbar.

3. Select the appropriate print option:
 - To print the selected topic, select **Print the selected topic**.
 - To print the selected folder and all the topics in the folder, select **Print the selected heading and all subtopics**.
4. Click **OK**.



You can also use the **Print** command or **Print** button to print any individual Help topic you are viewing.

Finding a Keyword in a Help Topic

To search for a keyword in an open Quartus II Help topic, follow these steps:

1. To open the **Find** dialog box, press **Ctrl + F**.
2. In the **Find what** box, type the search text.
3. If necessary, turn on one or both of the following options:
 - **Match whole word only**
 - **Match case**
4. In the **Direction** list, select a search direction.
5. Click **Find Next**.
6. If necessary, click **Find Next** again to find the next instance of the search text.
7. To end the search, click **Cancel**.

Viewing a Glossary Definition

To view the alphabetical glossary list:

- ✓ Choose **Glossary** (Help menu).

or

- ✓ Choose **Contents** (Help menu), and select **Glossary List** from the end of the Contents.

Quartus II File Organization

During the Quartus II software installation, two top-level directories are created: **quartus** and **qdesigns**.

- The **quartus** directory contains system software and data files and includes the subdirectories described in Tables 2 through 5.
- The **qdesigns** directory contains tutorial and sample files and includes the subdirectories described in Table 6.

The main **quartus** directory includes the subdirectories described in Table 2.

Table 2. Quartus II System Directory (quartus) Structure (Part 1 of 2)

Directory	Description
.\bin	Contains the executable software program files. Also contains Tcl scripts to perform tasks in the Quartus II software and other EDA software.
.\drivers	Contains drivers, including the following drivers: <ul style="list-style-type: none"> ■ Altera ByteBlaster driver, which is required to use the ByteBlaster II or ByteBlasterMV download cable with Windows NT, Windows 2000, and Windows XP ■ USB-Blaster driver, which is required to use the USB-Blaster download cable with USB for Windows 2000 and Windows XP ■ MasterBlaster USB driver, which is required to use the MasterBlaster communications cable with USB for Windows 2000 and Windows XP ■ APU USB driver, which is required to use the APU with Windows 2000 and Windows XP ■ Sentinel driver, which is required to use the Sentinel Software Guard with node-locked (single-user) licenses for Windows NT
.\drivers\i386	Contains the BBLPT utility, which can be used to install or remove the Altera ByteBlaster driver.
.\eda	Contains libraries for use with other EDA tools. Refer to Table 3 for information on the subdirectories of this directory.
.\libraries	Contains the Quartus II software directory for “self-contained” libraries. Refer to Table 4 for information on the subdirectories of this directory.

Table 2. Quartus II System Directory (quartus) Structure (Part 2 of 2)

Directory	Description
.\lmf	Contains Library Mapping Files (.lmf).
.\sopc_builder	Contains files needed for the SOPC builder software.

The \quartus\eda directory includes the subdirectories described in [Table 3](#).

Table 3. Quartus II EDA Directory (eda) Structure

Directory	Description
.\cadence	Contains technology libraries for Cadence EDA tools.
.\ibis	Contains input files that allow the Quartus II software to generate design-specific IBIS Output Files for EDA tools.
.\mentor	Contains technology libraries for Mentor Graphics EDA tools.
.\sim_lib	Contains VHDL and Verilog HDL simulation libraries that are compatible with EDA tools from other vendors.
.\synopsys	Contains technology libraries for Synopsys EDA tools.
.\innoveda	Contains technology libraries for Mentor Graphics Innoveda EDA tools.
.\fv_lib	Contains formal verification model libraries.

The \quartus\libraries directory includes the subdirectories described in [Table 4](#).

Table 4. Quartus II Library Directory (libraries) Structure (Part 1 of 2)

Directory	Description
.\megafunctions	Contains megafunctions, including Library of Parameterized Modules (LPM) functions, corresponding Include Files (.inc) that contain their AHDL Function Prototypes, and corresponding Block Symbol Files (.bsf).
.\others	Contains libraries of logic functions that provide compatibility between the Quartus II software and the MAX+PLUS II software.

Table 4. Quartus II Library Directory (libraries) Structure (Part 2 of 2)

Directory	Description
.\primitives	Contains Block Symbol Files (.bsf) for Quartus II primitives.
.\software	Contains the bootloader library file that generates flash programming files with the Quartus II software and the ADS Toolset.
.\vhdl87	Contains the library of IEEE std. 1076–1987 VHDL packages.
.\vhdl93	Contains the library of IEEE std. 1076–1993 VHDL packages.

The `\quartus\sopc_builder` directory includes the subdirectories described in [Table 5](#).

Table 5. Quartus II SOPC Builder Directory (sopc_builder) Structure

Directory	Description
.\bin	Contains the executable software program files for the SOPC Builder software.
.\bin\europa	Contains the HDL library generator.
.\components	Contains the SOPC Builder software components.
.\placeholders	Contains the SOPC Builder placeholders for the available components.
.\examples	Contains the SOPC Builder example files.
.\documents	Contains the SOPC Builder documentation.
.\tutorials	Contains the SOPC Builder tutorial files.

The **qdesigns** directory includes the subdirectories described in [Table 6](#).

Table 6. Quartus II Work Directory (qdesigns) Structure

Directory	Description
.\tutorial	Contains the completed project and design files for the Basic tutorial. This directory includes a readme.txt file that contains important information about the tutorial.
.\chiptrip	Contains the chiptrip project for use when completing the MAX+PLUS II Conversion tutorial module.
.\fir_filter	Directory in which you should create the fir_filter project if you are completing the Design Entry tutorial module. Use this directory to prevent accidental changes to the original design files in the \qdesigns\tutorial directory.
.\fir_filter\compile	Contains the compile_fir_filter project for use when completing the Compilation tutorial module independently or nonsequentially.
.\fir_filter\timing	Contains the timing_fir_filter project for use when completing the Timing Analysis tutorial module independently or nonsequentially.
.\fir_filter\simulate	Contains the simulate_fir_filter project for use when completing the Simulation tutorial module independently or nonsequentially.
.\fir_filter\program	Contains the program_fir_filter project for use when completing the Programming tutorial module independently or nonsequentially.
.\logiclock\topmult	Contains the topmult project for use when completing the LogicLock tutorial module.
.\logiclock\lockmult	Contains the lockmult project for use when completing the LogicLock tutorial module.
.\stratix	Contains the stratix_tutorial project for use when completing the Stratix tutorial module.

Contacting Altera

You can contact Altera for technical support and product information.

Technical Support

If you need technical support, you can visit the Altera web site or the mySupport web site, or you can call the Altera Applications Department.

Altera web site:	www.altera.com Includes the Altera Find Answers page, which is available from the Support Center section of the Altera web site at www.altera.com/answers .
mySupport web site:	www.altera.com/mysupport or choose Altera on the Web > Quartus II Service Request (Help menu) in the Quartus II software. This web site allows you to submit, view, and update technical support service requests.
Telephone:	(800) 800-EPLD (7:00 a.m. to 5:00 p.m. Pacific time, M–F) You will need your 6-digit Altera ID to access the hotline. (408) 544-7000 (7:00 a.m. to 5:00 p.m. Pacific time, M–F)



In order to use the mySupport web site to view and submit service requests, you must also register for an Altera.com account. An Altera.com account is required only for using the mySupport web site; however, having an Altera.com account will also make it easier for you to use many other Altera web site features, such as the Download Center, Licensing Center, Altera

Technical Training online class registration, or Buy On-Line-
Altera eStore features. For more information, refer to
“[Registering for an Altera.com Account](#)” on page 23.

Product Information

If you need the latest Altera product information or literature, go to the Literature section of the Altera web site at www.altera.com. You can also purchase printed sets of documentation from the Shop Altera web site at www.shopaltera.com.



Go to “Contacting Altera” in Quartus II Help for complete information on Altera technical support services.

Revision History

The information contained in the *Quartus II Installation & Licensing for PCs* manual version 4.0 revision 1 supersedes information published in previous versions.

Minor typographical changes were made to the previous version.

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