

Quartus™

Programmable Logic Development System

Installation & Licensing for UNIX Workstations



Altera Corporation
101 Innovation Drive
San Jose, CA 95134
(408) 544-7000
<http://www.altera.com>

Note: The HP-UX 10.20 and 11.0 versions of the Quartus software are not yet supported, but will be supported at a later date.

Altera, the Altera logo, and MAX+PLUS are registered trademarks of Altera Corporation in the United States and other countries. APEX, Atlas, ByteBlaster, ByteBlasterMV, MasterBlaster, MAX+PLUS II, NativeLink, Quartus, the Quartus logo, and SignalTap are trademarks and/or service marks of Altera Corporation in the United States and other countries. Product design elements and mnemonics used by Altera Corporation are protected by copyright and/or trademark laws.

Altera Corporation acknowledges the trademarks and/or service marks of other organizations for their respective products or services mentioned in this document.

Altera reserves the right to make changes, without notice, in the devices or the device specifications identified in this document. Altera advises its customers to obtain the latest version of device specifications to verify, before placing orders, that the information being relied upon by the customer is current. Altera warrants performance of its semiconductor products to current specifications in accordance with Altera's standard warranty. Testing and other quality control techniques are used to the extent Altera deems such testing necessary to support this warranty. Unless mandated by government requirements, specific testing of all parameters of each device is not necessarily performed. In the absence of written agreement to the contrary, Altera assumes no liability for Altera applications assistance, customer's product design, or infringement of patents or copyrights of third parties by or arising from use of semiconductor devices described herein. Nor does Altera warrant or represent any patent right, copyright, or other intellectual property right of Altera covering or relating to any combination, machine, or process in which such semiconductor devices might be or are used.

Altera products are not authorized for use as critical components in life support devices or systems without the express written approval of the president of Altera Corporation. As used herein:

1. Life support devices or systems are devices or systems that (a) are intended for surgical implant into the body or (b) support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

Products mentioned in this document are covered by one or more of the following U.S. patents: 6,097,211; 6,094,064; 6,091,258; 6,091,102; 6,085,317; 6,084,427; 6,081,449; 6,080,204; 6,078,521; 6,076,179; 6,075,380; 6,072,358; 6,072,332; 6,069,487; 6,066,960; 6,064,599; 6,060,903; 6,058,452; 6,057,707; 6,052,755; 6,052,309; 6,052,327; 6,049,223; 6,049,225; 6,045,252; 6,043,676; 6,040,712; 6,038,171; 6,037,829; 6,034,857; 6,034,540; 6,034,536; 6,032,159; 6,031,763; 6,031,391; 6,029,236; 6,028,809; 6,028,808; 6,028,787; 6,026,226; 6,025,737; 6,023,439; 6,020,760; 6,020,759; 6,020,758; 6,018,490; 6,018,476; 6,014,334; 6,011,744; 6,011,730; 6,011,406; 6,005,379; 5,999,016; 5,999,015; 5,998,295; 5,996,039; 5,986,470; 5,986,465; 5,983,277; 5,982,195; 5,978,476; 5,977,793; 5,977,791; 5,968,161; 5,970,255; 5,966,597; 5,963,565; 5,969,051; 5,963,069; 5,963,049; 5,959,891; 5,953,537; 5,949,991; 5,949,710; 5,949,250; 5,949,239; 5,954,751; 5,943,267; 5,942,914; 5,940,852; 5,939,790; 5,936,425; 5,926,036; 5,925,904; 5,923,567; 5,915,756; 5,915,017; 5,909,450; 5,909,375; 5,909,126; 5,905,675; 5,904,524; 5,900,743; 5,898,628; 5,898,318; 5,894,228; 5,893,088; 5,892,683; 5,883,526; 5,880,725; 5,880,597; 5,880,596; 5,878,250; 5,875,112; 5,873,113; 5,872,529; 5,872,463; 5,870,410; 5,869,980; 5,869,979; 5,861,760; 5,859,544; 5,859,542; 5,850,365; 5,850,152; 5,850,151; 5,848,005; 5,847,617; 5,845,385; 5,844,854; RE35,977; 5,838,628; 5,838,584; 5,835,998; 5,834,849; 5,828,229; 5,825,197; 5,821,787; 5,821,773; 5,821,771; 5,815,726; 5,815,024; 5,815,003; 5,812,479; 5,812,450; 5,809,281; 5,809,034; 5,805,516; 5,802,540; 5,801,541; 5,796,267; 5,793,246; 5,790,469; 5,787,009; 5,771,264; 5,768,562; 5,768,372; 5,767,734; 5,764,583; 5,764,569; 5,764,080; 5,764,079; 5,761,099; 5,760,624; 5,757,207; 5,757,070; 5,744,991; 5,744,383; 5,740,110; 5,732,020; 5,729,495; 5,717,901; 5,705,939; 5,699,020; 5,699,312; 5,696,455; 5,693,540; 5,694,058; 5,691,653; 5,689,195; 5,668,771; 5,680,061; 5,672,985; 5,670,895; 5,659,717; 5,650,734; 5,649,163; 5,642,262; 5,642,082; 5,633,830; 5,631,576; 5,621,312; 5,614,840; 5,612,642; 5,608,337; 5,606,276; 5,606,266; 5,604,453; 5,598,109; 5,598,108; 5,592,106; 5,592,102; 5,590,305; 5,583,749; 5,581,501; 5,574,893; 5,572,717; 5,572,148; 5,572,067; 5,570,040; 5,567,177; 5,565,793; 5,563,592; 5,561,757; 5,557,217; 5,555,214; 5,550,842; 5,550,782; 5,548,552; 5,548,228; 5,543,732; 5,543,730; 5,541,530; 5,537,295; 5,537,057; 5,525,917; 5,525,827; 5,523,706; 5,523,247; 5,517,186; 5,498,975; 5,495,182; 5,493,526; 5,493,519; 5,490,266; 5,488,586; 5,487,143; 5,486,775; 5,485,103; 5,485,102; 5,483,178; 5,477,474; 5,473,266; 5,463,328; 5,444,394; 5,438,295; 5,436,575; 5,436,574; 5,434,514; 5,432,467; 5,414,312; 5,399,922; 5,384,499; 5,376,844; 5,371,422; 5,369,314; 5,359,243; 5,359,242; 5,353,248; 5,352,940; 5,309,046; 5,350,954; 5,349,255; 5,341,308; 5,341,048; 5,341,044; 5,329,487; 5,317,210; 5,315,172; 5,301,416; 5,294,975; 5,285,153; 5,280,203; 5,274,581; 5,272,368; 5,268,598; 5,266,037; 5,260,611; 5,260,610; 5,258,668; 5,247,478; 5,247,477; 5,243,233; 5,241,224; 5,237,219; 5,220,533; 5,220,214; 5,200,920; 5,187,392; 5,166,604; 5,162,680; 5,144,167; 5,138,576; 5,128,565; 5,121,006; 5,111,423; 5,097,208; 5,091,661; 5,066,873; 5,045,772; 4,969,121; 4,930,107; 4,930,098; 4,930,097; 4,912,342; 4,903,223; 4,899,070; 4,899,067; 4,871,930; 4,864,161; 4,831,573; 4,785,423; 4,774,421; 4,713,792; 4,677,318; 4,617,479; 4,609,986; 4,020,469; and certain foreign patents. Additional patents are pending.

Altera products are protected under numerous U.S. and foreign patents and pending applications, maskwork rights, and copyrights.

Copyright © 2000 Altera Corporation. All rights reserved.



Printed on Recycled Paper.



I.S. EN ISO 9001

Contents

Documentation Conventions	1
Installing the Quartus Software	3
System Requirements	3
Uninstalling Previous Versions of the Quartus & ObjectStore Software	4
The Quartus Installation Script	5
Mounting the CD-ROM & Installing the Quartus Software	5
Unmounting the CD-ROM	7
Setting Up Licensing for the Quartus Software	8
Obtaining a License File	8
Obtaining a Redundant Server License File	10
Specifying an Optional Port Number	11
Setting Up a License Server	12
Configuring an Existing UNIX Workstation License Server	12
Rereading Your License File on a Solaris License Server	13
Rereading Your License File on an HP-UX License Server	13
Configuring a New UNIX Workstation License Server	14
Configuring a New Solaris License Server	14
Configuring a New HP-UX License Server	14
Installing the FLEXlm Software on Another License Server	15
Installing the FLEXlm Software on Another Solaris License Server	15
Installing the FLEXlm Software on Another HP-UX License Server	15
Starting the Quartus Software for the First Time	16
Configuring Each UNIX Workstation (Solaris Only)	16
Configuring Each UNIX Workstation (HP-UX Only)	16
Configuring Each Quartus User's Environment (Solaris & HP-UX)	19
Starting the Quartus Software	20
Specifying the License File	20
Specifying the License File Using the Quartus Software	20
Specifying the License File in the <code>.cshrc</code> File on Client UNIX Workstations	23
Specifying a Web Browser	24
Registering Additional Quartus Users	26
Installing Programming Hardware	27
Installing the MasterBlaster Serial/USB Communications Cable	27

Using Alternate Programming Methods	29
Setting Environment Variables.....	30
Quartus General Environment Variables	30
QUARTUS_ROOTDIR	30
MWFONT_CACHE_DIR.....	30
Quartus NativeLink Environment Variable.....	31
QUARTUS_INIT_PATH.....	31
Starting the Quartus Tutorial.....	32
Quartus File Organization.....	33
Contacting Altera	36
Technical Support.....	36
Product Information.....	36
Index	38

Documentation Conventions

The *Quartus Installation & Licensing for UNIX Workstations* 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 Installation & Licensing for UNIX Workstations* 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 checkbox to turn a function on or off.

Typographic Conventions

Quartus documentation uses the following typographic conventions:

Visual Cue:	Meaning:
Bold Initial Capitals	Command names, dialog box titles, 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, filenames, filename extensions, software utility names, command names, dialog box names, tab 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 User Manual</i> .
<i>italics</i>	Variables are enclosed in angle brackets (< >) and shown in italics. For example: < <i>filename</i> >, < <i>CD-ROM drive</i> >.
Courier font	Anything that must be typed exactly as it appears is shown in Courier. For example: /quartus/qdesigns/fir_filter.
■	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 Software

This section describes the requirements and procedures for installing the Altera® Quartus™ software on Sun Ultra workstations running Solaris version 2.6 or 2.7 or on HP 9000 Series 700/800 workstations running HP-UX version 10.20 or 11.0.

System Requirements

Your system must meet the following minimum requirements:

- One of the following workstations:
 - Sun Ultra workstation running Solaris version 2.6 or 2.7
 - HP 9000 Series 700/800 workstations running HP-UX version 10.20 with Additional Core Enhancements (ACE) dated June, 1999 or later or HP-UX version 11.0
- ISO 9660-compatible CD-ROM drive
- Color monitor
- Serial port for use with the MasterBlaster™ communications cable
- A valid X-Windows display, which is required at all times (both during installation and when running the Quartus software)
- A web browser with an Internet connection, which is required to enable the Quartus software Internet connectivity features



Refer to the **readme.txt** file, which is located in the top-level directory of the Quartus Programmable Logic Development Software for UNIX Workstations CD-ROM, for specific information about disk space, memory, and web browser requirements for the current version of the Quartus software. After installation, the **readme.txt** file is available from the Quartus Help menu and in the **/usr/quartus** directory.

Uninstalling Previous Versions of the Quartus & ObjectStore Software

If you have installed a previous version of the Quartus 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 software:

- ✓ Delete the **quartus** directory.

If you installed a version of the Quartus software prior to version 2000.09, you also installed the ObjectStore database software. This software is no longer required for use with the Quartus software, so you can delete it if you want to make more disk space available. However, if you want to use a version of the Quartus software prior to version 2000.09, do not uninstall the ObjectStore software.

To uninstall the ObjectStore database software from a workstation running Solaris version 2.6 or 2.7, follow these steps:

1. Remove **ostore*** from the **tmp** directory.
2. Remove all symbolic links that match **libos*** from the **/usr/lib** directory.
3. Remove the **S80ostore4** and **K80ostore4** files from the **/etc/rc2.d** directory.

To uninstall the ObjectStore database software from a workstation running HP-UX version 10.20 or 11.0, follow these steps:

1. Remove **ostore*** from the **tmp** directory.
2. Remove all symbolic links that match **libos*** from the **/usr/lib** directory.
3. Remove the **S900ostore** file from the **/sbin/rc2.d** directory.

The Quartus Installation Script

The Quartus software installation script installs the Quartus software.

These installation instructions assume the following conditions:

- Commands that do not fit on a single line in this manual are indicated by indentations of subsequent lines.
- The UNIX environment is case sensitive. You must enter directory names, file names, and file name extensions exactly as shown.
- The default CD-ROM directory is `/cdrom/cdrom0`. If you use a different CD-ROM directory, substitute the appropriate name in the installation steps.
- By default, the Quartus software is installed in the `/usr/quartus` directory. The installation procedure creates this directory, if it does not already exist. If you use a different directory name, substitute the appropriate name in the installation steps.
- Your workstation must have drivers capable of supporting an ISO 9660 CD-ROM drive.
- If necessary, you can rerun the Install script to install additional components of the software.

Mounting the CD-ROM & Installing the Quartus Software

To run the Quartus software, you must first install the appropriate Quartus Programmable Logic Development Software for UNIX Workstations CD-ROM for your operating system:

- Solaris 2.6 or 2.7
- HP-UX 10.20
- HP-UX 11.0

You must then install the Quartus Device Information for UNIX Workstations CD-ROM, which contains support for Altera devices.

To mount the CD-ROMs and install the Quartus software and device information, follow these steps:

1. Insert the appropriate Quartus Programmable Logic Development Software for UNIX Workstations CD-ROM into your CD-ROM drive.
2. Locate your workstation in [Table 1](#) and type the corresponding commands at the command prompt. You are guided through the installation procedure. If necessary, you can rerun the Install script to install additional components of the software.
3. Insert the Quartus Device Information for UNIX Workstations CD-ROM into your CD-ROM drive.
4. Repeat step 2 to install the Quartus device information.



You must install support for the EP20K100 device if you want to run the Quartus tutorial.

Table 1. Commands for Mounting the CD-ROM

Workstation	Commands to Type
Sun Ultra workstations	<p>If you are running Volume Manager, the CD-ROM is mounted automatically as <code>/cdrom/cdrom0</code>, and only the last two commands below are needed. Otherwise, you must be logged in as a superuser and you must type all four of the following commands at the command prompt:</p> <pre>mkdir /cdrom/cdrom0 ↵ mount -f hsfs -o ro /dev/dsk/<device name of CD-ROM> /cdrom/cdrom0 ↵ cd /cdrom/cdrom0 ↵ ./install ↵</pre>
HP 9000 Series 700/800 workstations	<p>Type the following commands at the command prompt (you must be logged in as a superuser):</p> <pre>mkdir /cdrom ↵ /etc/mount -o cdcase /dev/dsk/<device name of CD-ROM> /cdrom ↵ /cdrom/install ↵</pre>

Unmounting the CD-ROM

To unmount the CD-ROM, type the following command at the command prompt:

```
umount /cdrom ↵
```

Setting Up Licensing for the Quartus Software

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

1. If necessary, obtain a license file. The Quartus software requires a **license.dat** license file for each server that supports a multiuser network 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. Set up and configure the FLEXlm license manager server for a UNIX workstation.
3. Start the Quartus software for the first time.
4. Specify the location of the license file.
5. Specify a web browser.
6. If necessary, register additional Quartus users.

Obtaining a License File

You can obtain an ASCII license file, **license.dat**, from the Quartus support web page at <https://websupport.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 development system. This number can be found on the packing list that is shipped with the Quartus software.

- Your serial number, which is printed on the side of the Quartus software shipping box, and on the *Registration & License File Request Form*, which is also included with the Quartus software package. This number begins with the letter G, and is followed by five digits (Gxxxxx).
- The host ID number, for UNIX network license servers. To find your UNIX network license server host ID by using FLEXlm utilities, type the following command at a command prompt (where *<operating system>* represents hp or solaris):

```
/usr/quartus/<operating system>/lmutil lmhostid ↵
```



For information about additional methods of finding your host ID number, refer to the Atlas® online solutions database, which is available at <http://www.altera.com>. For complete information about using the FLEXlm utilities, you should refer to the *FLEXlm End User Manual*, which is available at <http://www.globetrotter.com/manual.htm>.

To obtain a license file, follow these steps:

1. Point your web browser to the Quartus support web site at <https://websupport.altera.com>.
2. Click the **License Request** icon.
3. Enter the requested information on the “License File Request” forms.



If you plan to use both the Quartus software and the Altera MAX+PLUS II software, Altera recommends that you save any previous **license.dat** file in a temporary directory, in case you need to refer to it later.

4. When you receive the license file text, save it with the file name **license.dat** in the **/usr/local/flexlm/licenses** directory.



As an alternative to this procedure, you can point your web browser to the Altera web page at <http://www.altera.com>, click on the **Licensing** icon, and specify the requested information.

Figure 1 on page 10 shows a sample network license file for a UNIX workstation that functions as a single license server.

Figure 1. Sample Network License File for a Single UNIX Workstation Server

```
SERVER alice 807f1034 1800
VENDOR alterad "/usr/quartus/solaris/alterad"
USE_SERVER
FEATURE altera_mainwin alterad 2000.09 permanent 5 4432968595AB
FEATURE quartus alterad 2000.09 permanent 5 7A496D25A602
```

Diagram labels for Figure 1:

- Server name: alice
- Server host ID number: 807f1034
- Optional port number: 1800
- Vendor: alterad
- Path: "/usr/quartus/solaris/alterad"
- Feature name: altera_mainwin
- Daemon name: alterad
- Version: 2000.09
- Expiration date: permanent
- Number of licenses requested: 5
- Authorization code: 4432968595AB
- Feature name: quartus
- Daemon name: alterad
- Version: 2000.09
- Expiration date: permanent
- Number of licenses requested: 5
- Authorization code: 7A496D25A602

If you are using the Quartus software with a node-locked (single-user) license, skip to [“Starting the Quartus Software for the First Time” on page 16](#).

Obtaining a Redundant Server License File

The FLEXlm licensing scheme allows you to set up three redundant license servers to serve a multiuser license. You can obtain a license file to support three redundant license servers by performing the steps described in [“Obtaining a License File” on page 8](#). [Figure 2 on page 11](#) shows a sample redundant server license file.

Figure 2. Sample Redundant Server License File

```

Server name  Server ID  Port
number      number      number
SERVER alice 807f1043 1800
SERVER king 807f1042 1800
SERVER queen 807f1041 1800
VENDOR alterad "/usr/quartus/solaris/alterad"
USE_SERVER
FEATURE altera_mainwin alterad 2000.09 permanent 5 4432968595AB
FEATURE quartus alterad 2000.09 permanent 5 7A496B23A403
Feature name  Daemon name  Version  Expiration date  Number of licenses requested  Authorization code

```



For additional information about setting up and administering license servers, including setting up three redundant license servers, refer to the *FLEXlm End User Manual*, which is available at <http://www.globetrotter.com/manual.htm>.

Specifying an Optional Port Number

System administrators can specify a port number in the `license.dat` file to be used by the license server and client workstations. If a port number is not specified in the `license.dat` file, the FLEXlm utility automatically uses the next available port number in the range 27000 to 27009. However, to prevent port number conflicts, you can specify a port number. If three redundant license servers are being used, you must specify a port number. For more information about redundant license servers, see “[Obtaining a Redundant Server License File](#)” on page 10.

Choose a port number greater than 1024, because port numbers less than 1024 are privileged port numbers on UNIX servers. See “[Setting Up a License Server](#)” on page 12 for more information about setting up a UNIX license server.

Setting Up a License Server

This section provides instructions for configuring network licensing for the Quartus software on Sun Ultra workstations running Solaris 2.6 or 2.7 or on HP 9000 Series 700/800 workstations running HP-UX version 10.20 with ACE dated June, 1999 or later, or HP-UX version 11.0.

Configuring an Existing UNIX Workstation License Server

The Quartus software uses the FLEXlm software to administer licensing for single users or for multiple users in a network installation. If you have an existing FLEXlm license server with an existing license file for the MAX+PLUS II software or software from another vendor, you can add, by copying and pasting, the Quartus `FEATURE` line from your Quartus `license.dat` file into your existing license file. Paste the Quartus `FEATURE` line as shown in the sample license file in [Figure 1 on page 10](#).

If you make these changes to your license file, you must reread the license file or restart the license server before you can run the Quartus software for the first time.

Refer to the `readme.txt` file, which is located in the top-level directory of the Quartus Programmable Logic Development Software for UNIX Workstations CD-ROM, to verify that you are using the latest supported version of the FLEXlm license software.



If you do not have an existing FLEXlm license server, and you need to configure a new license server, skip to [“Configuring a New UNIX Workstation License Server” on page 14](#).

Rereading Your License File on a Solaris License Server

To reread your license file on a Solaris license server:

- ✓ Type the following command at a command prompt:

```
/usr/quartus/solaris/lmutil lmreread ↵
```

or

- ✓ Restart the license server.

Rereading Your License File on an HP-UX License Server

To reread your license file on an HP-UX license server.

- ✓ Type the following command at a command prompt:

```
/usr/quartus/hp/lmutil lmreread ↵
```

or

- ✓ Restart the license server.



For complete information about using the FLEXlm utilities to administer and troubleshoot the FLEXlm License Manager software, refer to the *FLEXlm End User Manual*, which is available at <http://www.globetrotter.com/manual.htm>.

Configuring a New UNIX Workstation License Server

The Quartus software uses the FLEXlm software to administer licensing for single users or for multiple users in a network installation. If you do not have an existing FLEXlm license server, you must configure a new Solaris or HP-UX UNIX license server before starting the Quartus software for the first time.



If you have an existing FLEXlm license server, refer to “Configuring an Existing UNIX Workstation License Server” on page 12.

Configuring a New Solaris License Server

To configure a new Solaris license server:

- ✓ Type the following command at the command prompt:

```
/usr/quartus/solaris/lmgrd -c /usr/local/flexlm/  
licenses/license.dat ↵
```

Configuring a New HP-UX License Server

To configure a new HP-UX license server:

- ✓ Type the following command at the command prompt:

```
/usr/quartus/hp/lmgrd -c /usr/local/flexlm/  
licenses/license.dat ↵
```



For more specific information about configuring a new UNIX workstation license server, refer to the **readme.txt** file, which is located in the top-level directory of the Quartus Programmable Logic Development Software for UNIX Workstations CD-ROM. For additional information about setting up and administering license servers, including setting up three redundant license servers, refer to the *FLEXlm End User Manual*, which is available at <http://www.globetrotter.com/manual.htm>.

Installing the FLEXlm Software on Another License Server

You can install the FLEXlm software on an additional Solaris or HP-UX license server.

Installing the FLEXlm Software on Another Solaris License Server

To install the FLEXlm software on another Solaris license server, perform the following steps:

1. Create a directory named `/usr/quartus/solaris` on the additional license server.
2. Copy the following files from the `/usr/quartus/solaris` directory of your original Quartus software into the new `/usr/quartus/solaris` directory:

lmgrd
lmutil
alterad

Installing the FLEXlm Software on Another HP-UX License Server

To install the FLEXlm software on another HP-UX license server, perform the following steps:

1. Create a directory named `/usr/quartus/hp` on the additional license server.
2. Copy the following files from the `/usr/quartus/hp` directory of your original Quartus software into the new `/usr/quartus/hp` directory:

lmgrd
lmutil
alterad

Starting the Quartus Software for the First Time

After you have installed the Quartus software and set up the license, you can start the Quartus software. You must follow a few preliminary steps for each workstation and each user before starting the Quartus software for the first time.

Configuring Each UNIX Workstation (Solaris Only)

To configure each Solaris UNIX workstation that will run the Quartus software:



You must have superuser or “root” privileges to perform this step. This step does not need to be performed on UNIX workstations running HP-UX.



If you are using a Sun Ultra 60 dual-processor system, install the 105633-26 operating system patch, which is available from the Sun Microsystems support web site at <http://sunsolve.sun.com>. Altera recommends visiting the Atlas solutions page on the Altera web site at <http://www.altera.com> for late-breaking information on required operating system patches.

Configuring Each UNIX Workstation (HP-UX Only)

For each HP-UX UNIX workstation that will run the Quartus software, follow these steps before starting the Quartus software for the first time:



You must have superuser or “root” privileges to perform the following steps. These steps do not need to be performed on UNIX workstations running Solaris.

1. Make sure that each workstation has the three runtime patches that are required to run the Quartus software on an HP-UX UNIX workstation. Each patch may be listed under one of two possible names (for example, PHCO_19434 or PHCO_17187). Refer to [Table 2](#) for a list of required patches and descriptions. To determine which patch is installed on your system, type the following command at the command prompt:

```
swlist -v | grep <patch name and number> ←
```

If one of the patches in each of the three pairs of required patches is not installed on your system, you must download the appropriate replacement patch from the Hewlett Packard support web site at <http://us-support.external.hp.com>. Altera recommends visiting the Atlas solutions page on the Altera web site at <http://www.altera.com> for late-breaking information on required operating system patches.

Table 2. HP-UX Runtime Patches

Runtime Patches	Description	Reason for Patch	Replacement Patch
Either PHCO_19434 or PHCO_17187	HP C++ runtime libraries (ACC A.01.21)	Dependency of compiler A.01.21	If neither patch is available, download PHCO_19434 from the Hewlett Packard support web site.
Either PHSS_17225 or PHSS_15391	dld.sl cumulative patch	Dependency of compiler A.01.18	If neither patch is available, download PHSS_17225 from the Hewlett Packard support web site.
Either PHSS_17872 or PHSS_16585	s700_800 10.20 csh (1) cumulative patch	To fix the problem that when Mainwin crashes from a calling X terminal using csh, the terminal is closed.	If neither patch is available, download PHSS_17872 from the Hewlett Packard support web site. This is only for people using csh.

2. Check to see if the system’s kernel configuration meets the minimum system requirements to run the Quartus software:

- a. Type the following command at the command prompt:

sam ←

- b. In the **SAM Areas** folder, double-click the **Kernel Configuration** icon.
- c. In the **Kernel Configuration** folder, double-click the **Configurable Parameters** icon.
- d. In the **Configurable Parameters** list, scroll to view the **nfile** item.
- e. In the **Current Value** column, check the current value of the **nfile** item, which defines the maximum number of files that can be open at any one time, system-wide:

- ✓ If the value of the **nfile** item is 2,700 or greater, your system meets minimum requirements to run the Quartus software and no additional steps are required. Choose **Exit** (File menu) to close the **Kernel Configuration** dialog box.

or

- ✓ If the value of the **nfile** item is less than 2,700, proceed to step 2f.



After you perform steps 2f through 2k, the system shuts down and restarts.

- f. Choose **Apply Tuned Parameter Set** (Actions menu). The **Tuned Kernel Parameter Sets** dialog box appears.
- g. From the **Select a Tuned Parameter Set** list, select **Enhanced Technical Workstation Parameters**.



If **Enhanced Technical Workstation Parameters** is not available in the dialog box, your system is not running HP-UX 10.20 with ACE dated June, 1999 or HP-UX 11.0. Refer to [“System Requirements” on page 3](#) for minimum system requirements for running the Quartus software.

- h. Click **OK**.

- i. To close the **Kernel Configuration** dialog box, choose **Exit** (File menu). The **Create a New Kernel** dialog box appears.
- j. Click **Create New Kernel Now**.
- k. Click **OK**. The system creates a new kernel, and then restarts.

Configuring Each Quartus User's Environment (Solaris & HP-UX)

Make sure that the following steps have been performed for each Quartus software user before starting the Quartus software for the first time:

1. Update each user's `PATH` environment variable in the `.cshrc` file, which is located in the home directory, to include the `/usr/quartus/bin` directory. To update the `PATH` environment variable, type the following command at a command prompt:

```
setenv PATH $PATH:/usr/quartus/bin ↵
```

2. Save the changes to the `.cshrc` file, and then type the following commands at the command prompt:

```
cd ↵  
source .cshrc ↵
```

3. Type the following command at the command prompt:

```
regq ↵
```

You must type this command once before running the Quartus software. If you install a newer version or run a different copy of the Quartus software, you must type this command again before using the software.

Starting the Quartus Software

After you have followed all the guidelines for each workstation and each user, you can start the Quartus software by typing the following command at the command prompt:

```
quartus ←
```

In order to use the Quartus software, you must follow the guidelines in “[Specifying the License File](#)” on page 20, and “[Specifying a Web Browser](#)” on page 24.

Specifying the License File

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

- Specify the license file using the Quartus software
- Specify the license file using the `.cshrc` file on client workstations



If you are using any of the Altera-provided synthesis and simulation software tools included with Altera software subscriptions, such as the Exemplar Logic LeonardoSpectrum software, the Model Technology ModelSim software, or the Synopsys FPGA *Express* software, and/or you are using the MAX+PLUS II software, you should specify the license file with the `.cshrc` file.

Specifying the License File Using the Quartus Software

To specify the license file within the Quartus software, follow these steps on each workstation that will be running the Quartus software:

1. If you have not already done so, start the Quartus software, as described in “Starting the Quartus Software for the First Time” on page 16.
2. Choose **Options** (Tools menu). In the **Category** list, select **Licensing**. Figure 3 on page 22 shows the **Licensing Options** tab of the **Options** dialog box.
3. In the **License file** box, specify the full path name of the **license.dat** file. You can click **Browse (...)** to locate the **license.dat** file. Altera recommends that you store the **license.dat** file in a directory named **/usr/local/flexlm/licenses**.

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. See Figure 1 on page 10 for a sample network license file to determine your port and server name, and refer to “Specifying an Optional Port Number” 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>`.



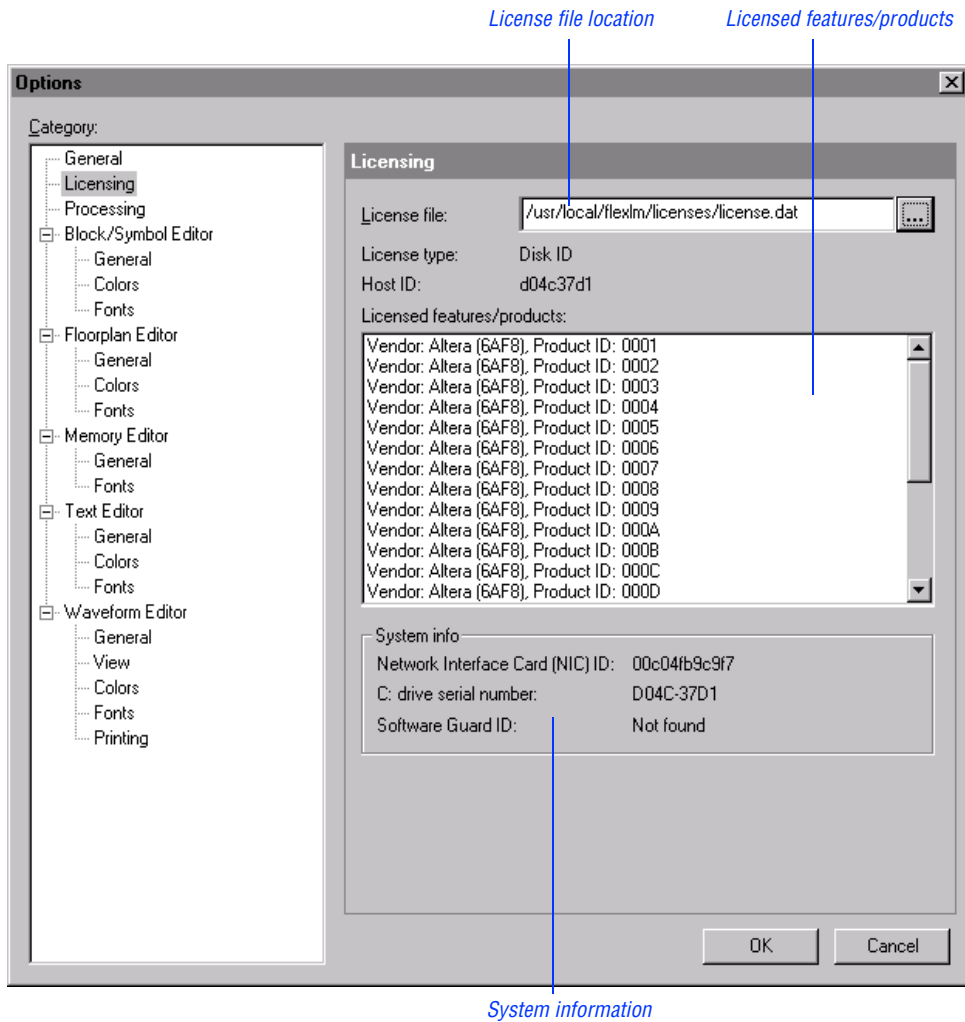
If you have more than one license file or server, separate the port and host specifications with colons (:), with no spaces between the names and numbers. For example:

```
1800@king:/usr/local/lib/license.dat:270000  
@queen
```

4. Click **OK**.

The **Licensed features/products** list of the **Licensing Options** tab lists all of the features and products that are available for the license.

Figure 3. Licensing Options Tab of the Options Dialog Box



Specifying the License File in the .cshrc File on Client UNIX Workstations

To specify the license file in the `.cshrc` file on each client (user) workstation, follow these steps:

1. Update the `LM_LICENSE_FILE` variable that is specified in the `.cshrc` file located in each user's home directory. You must edit this file for each user, or provide clear instructions that describe which lines the user needs to enter or edit:

- ✓ Make sure that each user has an `LM_LICENSE_FILE` variable that is set to the full directory path name of the license file. To update this variable, add the following line to the `.cshrc` file for each user:

```
setenv LM_LICENSE_FILE /usr/local/flexlm/
    licenses/license.dat ↵
```



If more than one application uses this environment variable, separate the different paths with a colon (:) with no spaces between the path names. For example:

```
setenv LM_LICENSE_FILE /usr/local/
    flexlm/licenses/license.dat:/tmp/
    license.xyz ↵
```

or

- ✓ If you want to specify the name of the server on which the license file is stored, add the following line to the `.cshrc` file for each user:

```
setenv LM_LICENSE_FILE=<port>@<host>
```

where *<host>* is the name of the server and *<port>* is the port listed in the `license.dat` file. See [Figure 1 on page 10](#) for a sample network license file to determine your port and server name, and refer to “[Specifying an Optional Port Number](#)” 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 colons (:), with no spaces between the names and numbers. For example:

```
1800@king:/usr/local/lib/  
license.dat:270000@queen
```

2. After saving the changes to each user's `.cshrc` file, type the following commands at the command prompt:

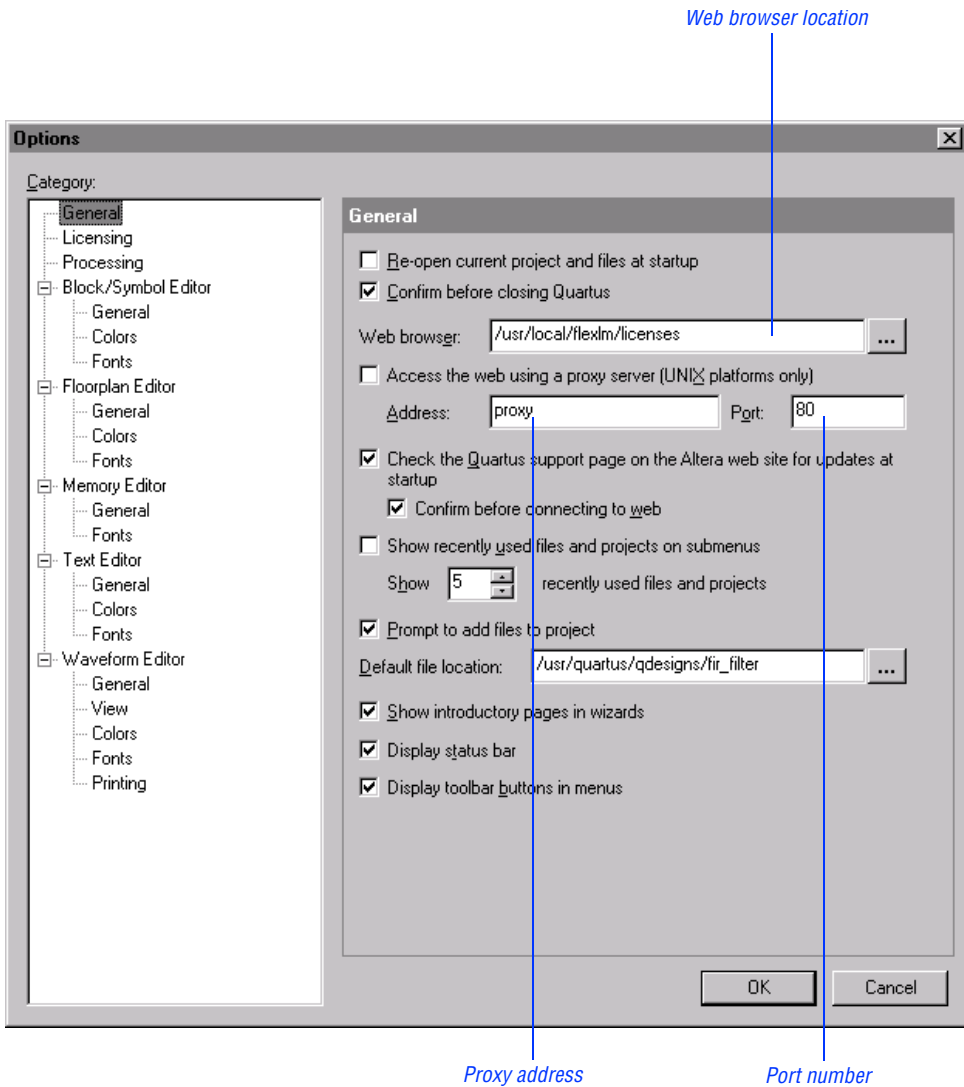
```
cd ←  
source .cshrc ←
```

Specifying a Web Browser

You must specify your web browser location in the **Options** dialog box to enable the Internet connectivity features of the Quartus software. To specify your web browser location, follow these steps:

1. Start the Quartus software.
2. Choose **Options** (Tools menu). The **General Options** tab of the **Options** dialog box appears automatically. [Figure 4 on page 25](#) shows the **General Options** tab of the **Options** dialog box.
3. In the **Web browser** box, specify the full path name of your web browser. You can click **Browse (...)** to locate your web browser.
4. If you are using a proxy server, specify the proxy address and port:
 - a. Turn on **Access the web using a proxy server (UNIX platforms only)**.
 - b. In the **Address** box, type the proxy address.
 - c. In the **Port** box, type the port number.
5. Click **OK**.

Figure 4. General Options Tab of the Options Dialog Box



Registering Additional Quartus Users

Your copy of the Quartus software is registered at the time of purchase. Additional users can also register themselves as Quartus users, which allows them to submit service requests, but does not provide additional licenses.

To register as an additional Quartus user, follow these steps:

1. To start your specified web browser and connect to the Quartus support web site while running the Quartus software, choose **Altera on the Web > Quartus Home Page** (Help menu).

or

Point your web browser to the Quartus support web page at **<https://websupport.altera.com>**.

2. Follow the instructions on the Quartus support web site to register as a new user.



Each user is assigned an Altera ID number. Copy this number and save it; it will be helpful when you are submitting service requests, regenerating license files, and updating your user information.

Installing Programming Hardware

This section describes how to install the MasterBlaster communications cable. This section also describes alternate methods for programming Altera devices. Refer to [“Using Alternate Programming Methods” on page 29](#) for more information.

Installing the MasterBlaster Serial/USB Communications Cable

The UNIX version of the Quartus software currently supports the MasterBlaster communications cable only for the serial port.

You can use the MasterBlaster cable to download configuration data to APEX™ devices, to perform in-system programming of EPC2™ configuration devices, or to perform SignalTap™ logic analysis.

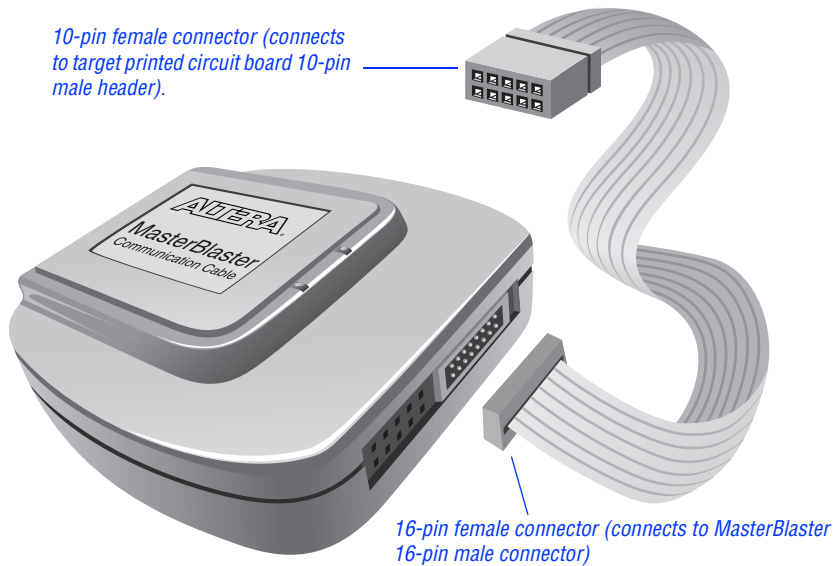
You can connect the MasterBlaster cable to an RS-232 serial port. The MasterBlaster cable can receive power from either of the following sources:

- 5.0-V or 3.3-V circuit boards
- A DC power supply, which is supplied with the MasterBlaster cable

To install and set up the MasterBlaster cable for device configuration or programming, follow these steps:

1. With a standard RS-232 cable, connect one end of the cable to the MasterBlaster cable, and connect the other end of the cable to the appropriate port on the computer.
2. Connect the 16-pin female header end of the cable to the 16-pin male MasterBlaster port, and the 10-pin female end of the cable to the 10-pin male header on the target printed circuit board. [Figure 5 on page 28](#) shows the MasterBlaster communications cable.

Figure 5. MasterBlaster Serial/USB Communications Cable



3. Open the Quartus Programmer:
 - ✓ Choose **Open Programmer** (Processing menu).

or

 - ✓ Choose **New** (File menu). Click the **Other Files** tab, select **Chain Description File**, and click **OK**.
4. In the Programmer window, under **Programming Hardware**, click **Setup**.
5. In the **Hardware Setup** dialog box, select **MasterBlaster** in the **Hardware Type** list.
6. In the **Port** box, type the path and name of the appropriate serial port.
7. In the **Baud rate** list, select a baud rate that is appropriate for your computer.
8. Click **OK**.



For more information about the MasterBlaster cable, refer to the *MasterBlaster Serial/USB Communications Cable Data Sheet*, which is available from the Altera web site at <http://www.altera.com>. For more information about SignalTap logic analysis with the MasterBlaster cable, refer to “Selecting the Communications Cable for the SignalTap Logic Analyzer” in Quartus Help.

Using Alternate Programming Methods

You can also use one of the following software/hardware combinations to download configuration data to APEX devices or to perform in-system programming of EPC2 configuration devices using programming files that are generated with the current UNIX version of the Quartus software:

- The PC version of the Quartus software, with either the MasterBlaster or ByteBlasterMV™ programming hardware.
- The MAX+PLUS II version 10.0 software for PCs, with the MasterBlaster, ByteBlasterMV, or Master Programming Unit (MPU) programming hardware.
- The Altera Stand-Alone Programmer (ASAP2) software for PCs, which is available from the Altera web site at <http://www.altera.com>, with the MasterBlaster, ByteBlasterMV, or Altera MPU programming hardware.



Refer to the *Quartus Installation & Licensing for PCs* manual or the *MAX+PLUS II Getting Started* manual for information about installing programming hardware on a PC. Both manuals are available from the Altera web site at <http://www.altera.com>. Refer to the Quartus and MAX+PLUS II online Help for more information about programming Altera devices and the SignalTap Logic Analyzer.

Setting Environment Variables

This section describes the environment variables that the Quartus software uses to configure various options and locate files.

If you are using the C shell, environment variables are located in your `.cshrc` file, and have the following format:

```
setenv <environment variable> <value>
```

If you are using the Bourne or Korn shell, environment variables are located in your `.profile` file, and have the following format:

```
set <environment variable>=<value>
```

Quartus General Environment Variables

The Quartus software installation process initializes the following variables, but you may wish to change them to optimize your system performance.

QUARTUS_ROOTDIR

The `QUARTUS_ROOTDIR` variable specifies the name of the Quartus home directory. The default directory is `/usr/quartus`. You should change this variable only if the system displays an error message indicating that Quartus files cannot be found when you start the program.

MWFONT_CACHE_DIR

The `MWFONT_CACHE_DIR` variable specifies the name of the Quartus font cache directory. The default directory is `/<user's home directory>/windows`.

Quartus NativeLink Environment Variable

The Quartus software installation process initializes the following variable, but you must set it to use the NativeLink™ features of the Quartus software.

QUARTUS_INIT_PATH

The `QUARTUS_INIT_PATH` variable specifies the path(s) of the EDA tool(s) to be launched from within the Quartus software. You must set this variable to launch other EDA tools from within the Quartus software.

QUARTUS_INIT_LIBPATH

The `QUARTUS_INIT_LIBPATH` specifies the `LD_LIBRARY_PATH` variable needed by some EDA tools. You should set this variable to the EDA tool's `LD_LIBRARY_PATH` if the EDA tool requires an `LD_LIBRARY_PATH` variable.

Starting the Quartus Tutorial

The online tutorial introduces you to the basic features of the Quartus programmable logic development system. It shows you how to create and process your own logic designs quickly and easily. The tutorial guides you through the steps required to create and process a sample finite impulse response (FIR) filter design, called **fir_filter**. The tutorial's modular design allows you to learn as little, or as much, as you need about using the Quartus software.

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

- ✓ Choose **Tutorial** (Help menu).

After you start the tutorial, the Quartus window resizes to allow you to view the Tutorial window and the Quartus software simultaneously. For more information about the Quartus online tutorial, refer to “Starting the Tutorial” in Quartus Help.



You must have installed support for the EP20K100 device if you want to run the tutorial. If you did not install support for this device, refer to [“Mounting the CD-ROM & Installing the Quartus Software”](#) on page 5.

Quartus File Organization

During the Quartus software installation, the following directories are created on your workstation:

- The `/usr/quartus` directory (the main directory where the Quartus software files are installed) contains system software and data files and includes the subdirectories described in [Tables 3 through 6](#).
- The `/usr/quartus/qdesigns` directory contains tutorial and sample files and includes the subdirectories described in [Table 6](#).

The `/usr/quartus` directory includes the subdirectories listed in [Table 3](#).

Table 3. Quartus System Directory (`quartus`) Structure

Directory	Description
<code>./adm</code>	Contains system administration scripts.
<code>./bin</code>	Contains the executable software program files and device files.
<code>./eda</code>	Contains libraries for use with other EDA tools. Refer to Table 4 for information on the subdirectories of this directory.
<code>./hp</code>	Contains platform-specific files for HP-UX UNIX workstation installations.
<code>./libraries</code>	Contains the Quartus software directory for “self-contained” libraries. Refer to Table 5 for information on the subdirectories of this directory.
<code>./lmf</code>	Contains Library Mapping Files (<code>.lmf</code>).
<code>./mw</code>	Contains files needed for the MainWin software.
<code>./objective_studio</code>	Contains files needed for Objective Studio software.
<code>./qdesigns</code>	Contains tutorial and sample files. Refer to Table 6 for information on the subdirectories of this directory.
<code>./solaris</code>	Contains platform-specific files for Solaris UNIX workstation installations.
<code>./tcl</code>	Contains files needed for the Tool Command Language (Tcl) feature of the Quartus software.

The `/usr/quartus/eda` directory includes the subdirectories described in [Table 4](#).

Table 4. Quartus EDA Directory (*eda*) Structure

Directory	Description
<code>./cadence</code>	Contains technology libraries for Cadence EDA tools.
<code>./h</code>	Contains header files for software interfaces to other EDA tools.
<code>./lib</code>	Contains library files for software interfaces to other EDA tools.
<code>./mentor</code>	Contains technology libraries for Mentor Graphics EDA tools.
<code>./sim_lib</code>	Contains VHDL and Verilog HDL simulation libraries that are compatible with EDA tools from other vendors.
<code>./synopsys</code>	Contains technology libraries for Synopsys EDA tools.
<code>./innoveda</code>	Contains technology libraries for Innoveda EDA tools.

The `/usr/quartus/libraries` directory includes the subdirectories described in [Table 5](#).

Table 5. Quartus Library Directory (*libraries*) Structure

Directory	Description
<code>./megafunctions</code>	Contains megafunctions, including Library of Parameterized Modules (LPM) functions, corresponding Include Files (<code>.inc</code>) that contain their AHDL Function Prototypes, and corresponding Block Symbol Files (<code>.bsf</code>).
<code>./others</code>	Contains libraries of logic functions that provide compatibility between the Quartus software and the MAX+PLUS II software.
<code>./primitives</code>	Contains Block Symbol Files (<code>.bsf</code>) for Quartus primitives.
<code>./vhdl87</code>	Contains the library of IEEE Std. 1076–1987 VHDL packages.
<code>./vhdl93</code>	Contains the library of IEEE Std. 1076–1993 VHDL packages.

The `/usr/quartus/qdesigns` work directory includes the subdirectories described in [Table 6](#).

Table 6. Quartus Work Directory (*qdesigns*) Structure

Directory	Description
./tutorial	Contains the completed project and design files for the tutorial. This directory includes a <code>readme.txt</code> file that contains important information about the tutorial.
./fir_filter	Directory in which you should create the <code>fir_filter</code> project if you are completing the Design Entry module. Use this directory to prevent accidental changes to the original design files in the <code>/qdesigns/tutorial</code> directory.
./fir_filter/compile	Contains the <code>compile_fir_filter</code> project for use when completing the Compilation module independently or nonsequentially.
./fir_filter/timing	Contains the <code>timing_fir_filter</code> project for use when completing the Timing Analysis module independently or nonsequentially.
./fir_filter/simulate	Contains the <code>simulate_fir_filter</code> project for use when completing the Simulation module independently or nonsequentially.
./fir_filter/program	Contains the <code>program_fir_filter</code> project for use when completing the Programming module independently or nonsequentially.

Contacting Altera

If you have any additional questions about Altera products, contact Altera for technical support and product information.

Technical Support

If you need technical support, call or fax the Altera Applications Department Monday through Friday.

Tel: (800) 800-EPLD (6:00 a.m. to 6:00 p.m. Pacific Time)
(408) 544-7000 (7:30 a.m. to 5:30 p.m. Pacific Time)
Fax: (408) 544-6401

You can also e-mail the Altera Applications Department at **support@altera.com**.

In addition, you can visit the Atlas online solutions database, which is available from the Altera web site at **<http://www.altera.com>**.

For additional technical support for the Quartus software, refer to the Altera Quartus support web site by choosing **Altera on the Web > Quartus Home Page** (Help menu), or by pointing your browser to **<https://websupport.altera.com>**. This web site provides information on how to register your software and obtain license information, and also provides other support information.

Product Information

If you need the latest Altera product information or literature, use the Altera web site, which is available 24 hours a day, seven days a week.

Altera web site: **<http://www.altera.com>**



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

Revision History

The information contained in *Quartus Installation & Licensing for UNIX Workstations* 2000.09 Revision 2 supersedes information published in previous versions.

Revision 2 Changes

On the cover page, a note was added that the HP-UX version of the Quartus software is not yet supported, but will be supported at a later date.

On the copyright page, updated patent numbers and list of trademarks.

Minor typographical corrections were made to the original version.

Index

Symbols

.cshrc file 23, 30

A

Altera on the Web command 26, 36

Altera, contacting 36

C

CD-ROM, installing Quartus software 5
contacting Altera 36

D

directory structure 33

documentation conventions 1

E

e-mail 36

environment variables 30

environment, configuring 19

F

FLEXlm software

 FLEXlm manual web site 9, 11, 13

 installing a license server 12

 installing an additional license
 server 15

FPGA *Express* software, specifying the
 license file 20

H

Hardware Setup dialog box 28

host ID number 9

I

installation

 MasterBlaster 27

 Quartus software 3

L

LeonardoSpectrum software, specifying
 the license file 20

license file

license.dat file 8

 obtaining 8

 specifying 20

license server configuration

 setting up on UNIX workstations 12

 setting up redundant servers 10

license.dat file 8

lmhostid utility 9

lmutil utility 9, 13, 15

M

MasterBlaster, installing 27

MAX+PLUS II software, using with

 Quartus license file 12, 20

ModelSim software, specifying the license
 file 20

MWFONT_CACHE_DIR variable 30

O

ObjectStore software, uninstalling 4

Open command 28

Open Programmer command 28

Options command 21, 24

P

port number, specifying 11, 21, 23, 24

product information 36

Programmer window 28

proxy address, specifying 24

Q

qdesigns directory 33

quartus directory 33

QUARTUS_INIT_LIBPATH variable 31

QUARTUS_INIT_PATH variable 31

QUARTUS_ROOTDIR variable 30

R

readme.txt file 3, 14

redundant servers 10

registering additional users 26

Registration & License File Request
Form 9

S

serial number 9

serial port 3

T

technical support 36

tutorial, starting 32

U

uninstalling

 ObjectStore software 4

 Quartus software 4

users, registering 8, 26

W

web browser, specifying 24

web support 36