

# Quartus™

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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 version of the Quartus software is not yet supported, but will be supported at a later date.*

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# Contents

Installing the Quartus Software .....	1
System Requirements .....	1
The Quartus Installation Script .....	2
Mounting the CD-ROM & Installing the Quartus Software .....	2
Using ObjectStore Scripts to Run ObjectStore Manually in a Local Installation.....	3
Unmounting the CD-ROM.....	4
Setting Up Licensing for the Quartus Software .....	5
Obtaining a License File.....	5
Obtaining a Redundant Server License File.....	7
Specifying an Optional Port Number .....	8
Setting Up a License Server .....	9
Configuring an Existing UNIX Workstation License Server.....	9
Re-reading Your License File on a Solaris License Server .....	10
Re-reading Your License File on an HP-UX License Server... ..	10
Configuring a New UNIX Workstation License Server.....	11
Configuring a New Solaris License Server .....	11
Configuring a New HP-UX License Server .....	11
Installing the FLEXlm Software on Another License Server .....	12
Installing the FLEXlm Software on Another Solaris License Server.....	12
Installing the FLEXlm Software on Another HP-UX License Server.....	12
Starting the Quartus Software for the First Time .....	13
Configuring Each UNIX Workstation (Solaris Only) .....	13
Configuring Each UNIX Workstation (HP-UX Only).....	13
Configuring Each Quartus User's Environment (Solaris and HP-UX) .....	16
Starting the Quartus Software .....	17
Specifying the License File.....	17
Specifying the License File Using the Quartus Software .....	17
Specifying the License File in the .cshrc File on Client UNIX Workstations .....	20
Specifying a Web Browser.....	21
Registering Additional Quartus Users.....	22
Installing Programming Hardware .....	23
Installing the MasterBlaster Serial/USB Communications Cable (Solaris Only).....	23
Using Alternate Programming Methods.....	25

Setting Environment Variables.....	26
Quartus Environment Variables .....	26
QUARTUS_ROOTDIR .....	26
MWFONT_CACHE_DIR.....	26
MWUNIX_SHARED_MEMORY.....	27
ObjectStore Environment Variables .....	27
OS_CACHE_DIR.....	27
OS_COMMSEG_DIR .....	27
OS_PARAM_FILE.....	28
OS_TXN_LOG .....	28
QUARTUS_OS_ROOTDIR .....	28
Quartus File Organization.....	29
Contacting Altera.....	32
Technical Support.....	32
Product Information.....	32
Revision History.....	33
Index .....	35

# Installing the Quartus Software

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

## System Requirements

Your system must meet the following minimum requirements:

- One of the following workstations:
  - Sun Ultra workstation running Solaris 2.6
  - HP 9000 Series 700/800 workstations running HP-UX version 10.20 with Additional Core Enhancements (ACE) dated June, 1999 or later; HP-UX versions 11.0 and higher are not yet supported
- 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 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.

# The Quartus Installation Script

The Quartus software installation script installs two software programs:

1. The ObjectStore release 5.1 (including Service Pack 2) database management software.
2. 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, and the ObjectStore software is installed in the `/opt/ODI` directory. The installation procedure creates these directories if they do not already exist. If you use different directory names from those listed above, substitute the appropriate names in the installation steps. Do not include spaces in the ObjectStore directory path.

## Mounting the CD-ROM & Installing the Quartus Software

To mount the CD-ROM and install the Quartus and ObjectStore software, follow these steps:

1. Insert the Quartus software CD-ROM into your CD-ROM drive.
2. Locate your workstation in [Table 1 on page 3](#) and type the corresponding commands at the `#` prompt.

**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 /cdrom/cdrom0, and only the last two commands below are needed. Otherwise, type all four of the following commands at the # prompt:</p> <pre># mkdir /cdrom/cdrom0 ↵ # mount -f hsfs -o ro /dev/dsk/&lt;device name of CD-ROM&gt;   /cdrom/cdrom0 ↵ # cd /cdrom/cdrom0 ↵ # ./install ↵</pre>
HP 9000 Series 700/800 workstations	<pre># mkdir /cdrom ↵ # /etc/mount -o cdcase /dev/dsk/&lt;device name of CD-ROM&gt;   /cdrom ↵ # cd /cdrom ↵ # /cdrom/install ↵</pre>

You are guided through the installation procedure. If necessary, you can re-run the Install script to install additional components of the software.

You will be given the choice of Network installation or Local installation.

- Choose Network installation if you are installing the Quartus and ObjectStore software on a shared tools server and are then running the Quartus application from an arbitrary machine on the network.
- Choose Local installation if you are installing the Quartus and ObjectStore software on the same machine you will use to run the Quartus software.

## Using ObjectStore Scripts to Run ObjectStore Manually in a Local Installation

If you choose Local installation, and do not choose to start the ObjectStore server at the time of installation, you must start the ObjectStore server and cache manager manually before running the Quartus software.

Altera recommends that you use the Altera-provided scripts listed in [Table 2](#) to start, stop, and check the status of the ObjectStore server and the ObjectStore cache manager. These scripts are located in the `/quartus/adm` directory.

**Table 2. Altera-provided ObjectStore Scripts**

Script	Description
<code>os_svr_start</code>	Starts the ObjectStore server.
<code>os_svr_stop</code>	Stops the ObjectStore server.
<code>os_svr_check</code>	Checks whether the ObjectStore server is running.
<code>os_cm_start</code>	Starts the ObjectStore cache manager.
<code>os_cm_stop</code>	Stops the ObjectStore cache manager.
<code>os_cm_check</code>	Checks whether the ObjectStore cache manager is running.



Go to [“Quartus File Organization” on page 29](#) for information about the directory structure of the installed Quartus software files.

## Unmounting the CD-ROM

To unmount the CD-ROM, type the following command at the `#` 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.
2. If you are using a network license, 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 workstation network license servers. To find your UNIX network license server host ID by using FLEXlm utilities, type the following command at a # prompt:

```
# /usr/quartus/<solaris or hp>/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, you can point your web browser to the Altera web page at <http://www.altera.com>, click on Quartus & MAX+PLUS II Licenses or Authorization Codes, and enter the requested information.

**Figure 1** 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 1999.10 permanent 5 4432968595AB
FEATURE quartus alterad 1999.10 permanent 5 7A496D25A602

```

Diagram labels for Figure 1:

- Server name: alice
- Server host ID number: 807f1034
- Optional port number: 1800
- Feature name: altera\_mainwin
- Daemon name: alterad
- Version: 1999.10
- Expiration date: permanent
- Number of licenses requested: 5
- Authorization code: 4432968595AB

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 13.

## 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 5. [Figure 2](#) shows a sample redundant server license file.

**Figure 2. Sample Redundant Server License File**

```

Server name  Server ID number  Port 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 1999.10 permanent 5 4432968595AB
FEATURE quartus alterad 1999.10 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 7.

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 9 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 on HP 9000 Series 700/800 workstations running HP-UX version 10.20 with ACE dated June, 1999 or later (but not HP-UX version 11.0 or higher).

## 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 7](#).

If you make these changes to your license file, you must re-read 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 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 11](#).

### ***Re-reading Your License File on a Solaris License Server***

To re-read your license file on a Solaris license server:

- ✓ Type the following command at a # prompt:

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

*or*

- ✓ Restart the license server.

### ***Re-reading Your License File on an HP-UX License Server***

To re-read your license file on an HP-UX license server:

- ✓ Type the following command at a # 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 9.

### **Configuring a New Solaris License Server**

To configure a new Solaris license server:

- ✓ Type the following command at the # 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 # 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 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)

For each Solaris 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 HP-UX workstations.

1. 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<sup>®</sup> solutions page on the Altera web site at <http://www.altera.com> for late-breaking information on required operating system patches.
2. Add the following line to your `/etc/system` file, and then reboot your system:

```
set rlim_fd_cur = 0xFF
```

## 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 Solaris workstations.

1. Make sure that each workstation has the three runtime patches that are required to run the Quartus software on an HP-UX workstation. Each patch may be listed under one of two possible names (for example, PHCO\_19434 or PHCO\_17187). Refer to Table 3 for a list of required patches and descriptions. To determine which patch is installed on your system, type the following command at the # 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 3. HP-UX Runtime Patches**

Runtime Patches	Description	Reason for Patch	Replacement Patch
Either PHCO_19434 or PHCO_17187	HP aC++ 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 minimum system requirements to run the Quartus software:
  - a. Type the following command at the # 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. This value 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.
    - If the value of the **nfile** item is less than 2,700, continue this procedure by performing steps **2f** through **2k**.
  -  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 later. Refer to "**System Requirements**" on page 1 for minimum system requirements to run 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 and 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 `#` prompt:

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

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

```
# cd ↵  
# source .cshrc ↵
```

3. Type the following command at the `#` 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 # prompt:

```
# quartus ←
```

In order to use the Quartus software, you must follow the guidelines in “[Specifying the License File](#)” on page 17, and “[Specifying a Web Browser](#)” on page 21.

## 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](#)

### 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 13.
2. Choose Options (Tools menu). The General Options tab appears automatically. [Figure 3 on page 19](#) shows 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 entering 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 7](#) for a sample network license file to determine your port and server name, and refer to “[Specifying an Optional Port Number](#)” on page 8 for more information about port numbers. If there is no port listed in the license.dat file, you can simply specify `@<host>`.

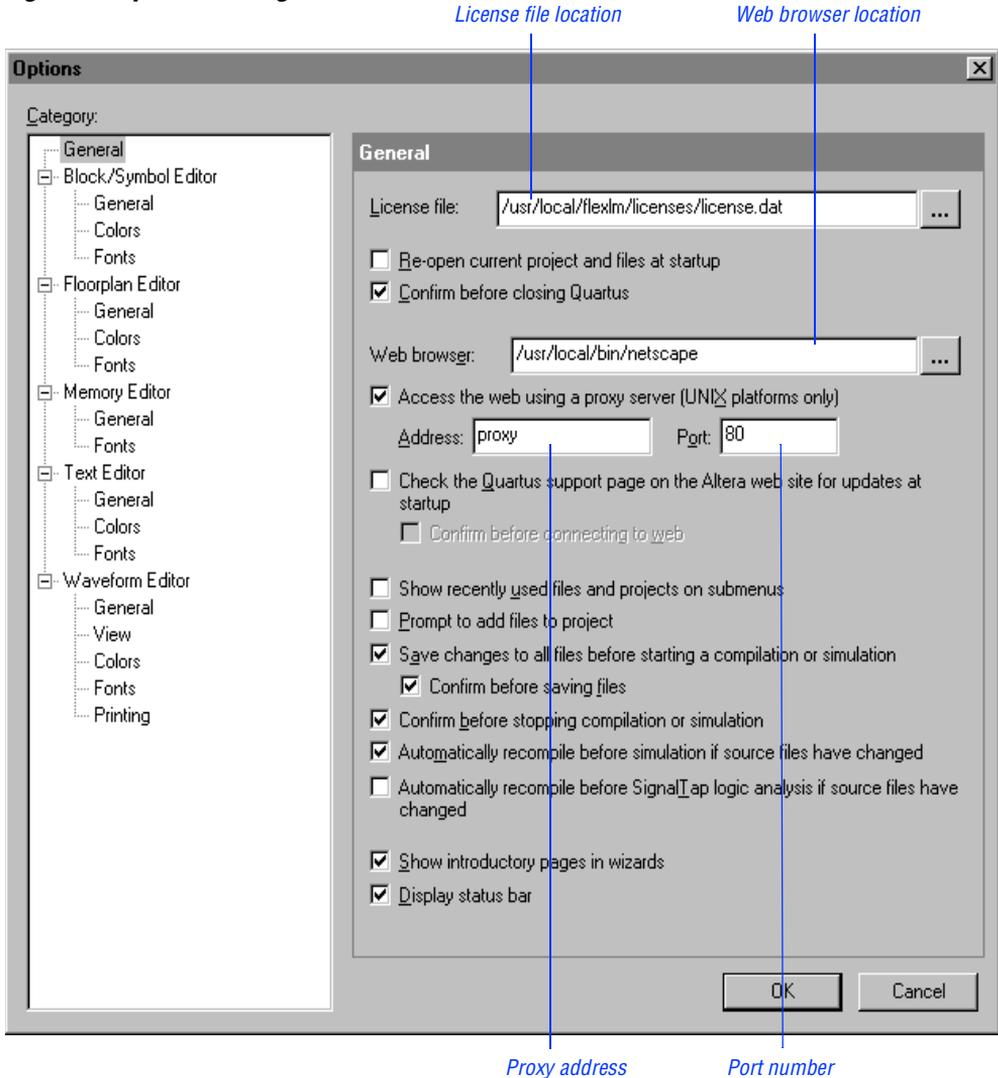


If you have more than one license file or server, separate the port and host specifications with colons (:), with no spaces between the names and numbers. For example:

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

4. Click OK.

**Figure 3. 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 7](#) for a sample network license file to determine your port and server name, and refer to [“Specifying an Optional Port Number” on page 8](#) 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 # 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 appears automatically. [Figure 3 on page 19](#) shows 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.

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

*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. You will need this number to submit service requests, regenerate a license file, or update 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 25](#) for more information.

## Installing the MasterBlaster Serial/USB Communications Cable (Solaris Only)

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.

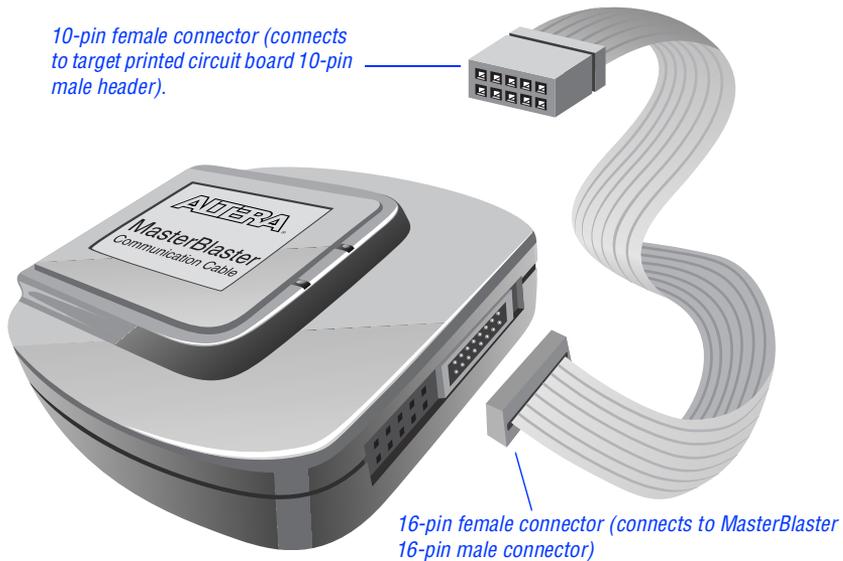
You can connect the MasterBlaster cable to an RS-232 serial port. The MasterBlaster cable can receive power from either of the following sources:

- 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 4](#) shows the MasterBlaster communications cable.

**Figure 4. 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 the *Quartus SignalTap User's Guide*, which is included with your software package.

## 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 9.5 software for PCs, with the MasterBlaster, ByteBlasterMV, or Master Programming Unit (MPU) programming hardware.
- The Altera Stand-Alone Programmer (ASAP2) software, 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 Embedded Logic Analyzer.

# Setting Environment Variables

This section describes the environment variables that the Quartus and ObjectStore software use 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 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`.

## MWUNIX\_SHARED\_MEMORY

The `MWUNIX_SHARED_MEMORY` variable determines whether the Quartus software may use UNIX shared memory when it shares data with another program.

If the `MWUNIX_SHARED_MEMORY` variable is set to `true`, the Quartus software can use UNIX shared memory, which may improve its speed performance. If it is set to `false` (the default value), the Quartus software uses shared memory in the X server when it shares data with another program. This shared memory allows data exchanges between programs that run on different machines, but are displayed on the same X server.

## ObjectStore Environment Variables

The ObjectStore software uses the following environment variables to control the location of its cache, `commseg` (communications segment), parameter, and log files.

### OS\_CACHE\_DIR

The `OS_CACHE_DIR` variable controls the location of the ObjectStore cache files. The default location is the `$TMP/ostore` directory.

### OS\_COMMSEG\_DIR

The `OS_COMMSEG_DIR` variable controls the location of the ObjectStore `commseg` (communications segment) files. The `commseg` is a preallocated region that holds ObjectStore internal data (global data, cache indexing information, and data that describes databases and segments used by the Quartus software.) The default location is the `$TMP/ostore` directory.

## **OS\_PARAM\_FILE**

The `OS_PARAM_FILE` variable controls the path to the ObjectStore server parameter file. The default location is the `$TMP/ostore_server_parameters` directory.

## **OS\_TXN\_LOG**

The `OS_TXN_LOG` variable controls the path to the location of the ObjectStore server transaction log file. The default location of the log file is `$TMP/ostore_svr_txn.log`.

## **QUARTUS\_OS\_ROOTDIR**

The `QUARTUS_OS_ROOTDIR` variable sets the path to the ObjectStore software for each client workstation. You must use this variable if the client's path to the ObjectStore software is different from the value of the `OS_ROOTDIR` line in the server's `set_os_rootdir` file, which is located in the `/usr/quartus/adm` directory.

# 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 4 through 7](#).
- The `/usr/quartus/qdesigns` directory contains tutorial and sample files and includes the subdirectories described in [Table 7](#).
- The `/opt/ODI` directory contains the ObjectStore database management software.

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

**Table 4. Quartus System Directory (`quartus`) Structure**

Directory	Description
<code>./adm</code>	Contains scripts to start, stop, and check the status of the ObjectStore server and the ObjectStore cache manager.
<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 <a href="#">Table 5</a> 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 <a href="#">Table 6</a> for information on the subdirectories of this directory.
<code>./lmf</code>	Contains Library Mapping Files (.lmf).
<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 <a href="#">Table 7</a> 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 5](#).

**Table 5. 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>./viewlogic</code>	Contains technology libraries for Viewlogic EDA tools.

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

**Table 6. Quartus Library Directory (*libraries*) Structure**

Directory	Description
<code>./megafunctions</code>	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).
<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 (.bsf) 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 7](#).

**Table 7. Quartus Work Directory (*qdesigns*) Structure**

Directory	Description
./tutorial	Contains the files for the <code>fir_filter</code> tutorial project.
./fir_filter	A directory in which to create the <code>fir_filter</code> tutorial project.

# 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](mailto: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 version 2000.02 revision 2 supercedes information published in previous versions.

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

On page 23, references to the Quartus software supporting the MasterBlaster communications cable only for Solaris Sun Ultra workstations running Solaris 2.6 were removed, because the MasterBlaster communications cable is now supported for both Solaris and HP-UX workstations.

# Index

## Symbols

.cshrc file 20, 26

## A

Altera on the Web command 22, 32

Altera, contacting 32

## C

CD-ROM, installing Quartus software 2  
contacting Altera 32

## D

directory structure 29

## E

e-mail 32

environment variables, ObjectStore 26

environment, configuring 16

## F

FLEXlm software

    FLEXlm manual web site 6, 8, 10

    installing a license server 9

    installing an additional

    license server 12

## H

Hardware Setup dialog box 24

host ID number 6

## I

installation

    MasterBlaster 23

    Quartus software 1

## L

license file

**license.dat** file 5

    obtaining 5

    specifying 17

license server configuration

    setting up on UNIX workstations 9

    setting up redundant servers 7

**license.dat** file 5

**lmhostid** utility 6

**lmutil** utility 10, 12

## M

MasterBlaster, installing 23

MAX+PLUS II, using with Quartus

    license file 10

MWFONT\_CACHE\_DIR variable 26

MWUNIX\_SHARED\_MEMORY variable 27

## O

ObjectStore software scripts 3

ODI directory 2, 29

**Open** command 24

**Open Programmer** command 24

**Options** command 17, 21

OS\_CACHE\_DIR variable 27

os\_cm\_check ObjectStore script 4

os\_cm\_start ObjectStore script 4

os\_cm\_stop ObjectStore script 4

OS\_COMMSEG\_DIR variable 27

OS\_PARAM\_FILE variable 28

os\_svr\_check ObjectStore script 4, 14

os\_svr\_start ObjectStore script 4, 14

os\_svr\_stop ObjectStore script 4, 14

OS\_TXN\_LOG variable 28

## P

port number, specifying 8, 18, 20, 21

product information [32](#)  
Programmer window [24](#)  
proxy address, specifying [21](#)

## **Q**

qdesigns directory [29](#)  
quartus directory [29](#)  
QUARTUS\_OS\_ROOTDIR variable [28](#)  
QUARTUS\_ROOTDIR variable [26](#)

## **R**

readme.txt file [1](#), [11](#)  
redundant servers [7](#)  
registering additional users [22](#)  
Registration & License File  
Request Form [5](#)

## **S**

scripts for ObjectStore software [3](#)  
serial number [5](#)  
serial port [1](#)

## **T**

technical support [32](#)

## **U**

users, registering [5](#), [22](#)

## **W**

web browser, specifying [21](#)  
web support [32](#)