Section

1

MAX+PLUS II Installation

This section describes how to install MAX+PLUS II software and programming hardware on PCs and workstations.

Installing MAX+PLUS II on a Single-User PC

If you are installing MAX+PLUS II on a single-user PC, read the instructions in the following sections:

Installing MAX+PLUS II on a Multi-User PC Network

If you are installing MAX+PLUS II on a multi-user PC network that uses UNIX servers, read the instructions in the following sections:

Installing MAX+PLUS II on a UNIX Workstation

If you are installing MAX+PLUS II on a UNIX workstation, read the instructions in the following sections:

☞ If you have any questions about MAX+PLUS II installation that you cannot answer after reading this section or the read.me file, contact the Altera Applications Department at:

Altera Corporation
Applications Department
2610 Orchard Parkway
San Jose, CA 95134-2020
Telephone: (800) 800-EPLD *or*
              (408) 894-7000
Fax: (408) 954-0348

Go to *Appendix B:* "Altera Support Services" on page 275 for more information about contacting Altera for technical support, literature, and non-technical customer service.

The read.me File

The MAX+PLUS II read.me file provides up-to-date information on installation and operating requirements, including disk space and memory. You should read the read.me file before installing the software or hardware.

The read.me file is available on the first installation diskette and on the CD-ROM. If you are using the CD-ROM on a PC, the read.me file is in the \pc\maxplus2 directory; on a UNIX workstation, it is in the /cdrom directory. After installation, you can open the read.me file from the MAX+PLUS II Help menu.

Registering MAX+PLUS II Software for a Single-User PC

Before installing the MAX+PLUS II software, you should fill out the Altera Registration Card, which is attached to the "STOP, PLEASE READ THIS FIRST" card.

If you can't find the registration card, you also have an opportunity to register the first time you run MAX+PLUS II software: a dialog box appears automatically to allow you to complete and print a Fax Registration Form. You can register your software by faxing this form to Altera at (408) 428-9220. You can access this form at any time by choosing the Register button in the Authorization Code dialog box (Options menu) in MAX+PLUS II.

You will receive future update information for MAX+PLUS II only if you register your software.

Go to *Appendix B:* "Altera Support Services" on page 275 for more information about contacting Altera technical support services.

Registering MAX+PLUS II Software for a Multi-User Network or a Workstation

Before installing the MAX+PLUS II software, you must fill out and return the Workstation Registration and License File Request Form included with your MAX+PLUS II system to both register your software and obtain the authorization information required to install and run MAX+PLUS II. Once you have completed the form, fax it to Altera at (408) 954-8186.

☞   If you are installing MAX+PLUS II in a multi-user PC network, contact the Altera Marketing Department for information on obtaining network licensing.

The form asks you for the ID of the license server. The license server is the workstation that will run the two Altera license daemons (lmgrd and alterad).

To determine the ID of the license server, type:

License Server Platform:	Command:
Sun SPARCstation running SunOS 4.1.x	# /usr/bin/hostid ↵
Sun SPARCstation running Solaris 2.x	# /usr/ucb/hostid ↵
HP 9000 Series 700 workstation	# /etc/lanscan ↵
IBM RISC System/6000 workstation (you should ignore the last two digits of the ID that is displayed and use the remaining 8 digits as the license server ID)	# /usr/bin/uname -m ↵

The FLEXlm licensing scheme allows either one or three license servers on a network. A single UNIX workstation can function as the file server, license server, and user workstation. The file server, license server, and user workstations (or user PCs) can also be separate computers.

Go to "Configuring Network Licensing" on page 35 for more information about configuring the license server.

Go to *Appendix B:* "Altera Support Services" on page 275 for more information about contacting Altera technical support services.

Installing MAX+PLUS II on a PC

The following instructions describe the requirements and procedures for installing the MAX+PLUS II software on an IBM PC-AT or compatible computer running Microsoft Windows 3.1, Windows for Workgroups 3.11, Windows 95, or Windows NT. This section covers the following topics:

■　　System requirements for PCs
■　　Maximizing available memory under Windows 3.1 and Windows for Workgroups 3.11
■　　Installing MAX+PLUS II software
■　　Additional Windows NT Installation Steps
■　　Additional NEC 9801 Installation Steps
■　　Win32s Additions to Windows 3.1

Go to the *User's Guide* for your version of Microsoft Windows for information on optimizing your system to run MAX+PLUS II.

System Requirements for PCs

Your system must meet the following minimum requirements:

■　　Pentium- (recommended) or 486-based PC
■　　DOS version 5.0 or higher
■　　Microsoft Windows NT version 3.5, Microsoft Windows 95, Microsoft Windows version 3.1 with Win32s support, Windows for Workgroups version 3.11 with Win32s support (if you do not already have Win32s support, the Install program will install it)
■　　Microsoft Windows-compatible graphics card and monitor
■　　CD-ROM drive (recommended) or 1.44-Mbyte, 3 $\frac{1}{2}$-inch floppy disk drive

☞　　Beginning in January 1996, MAX+PLUS II software will be available only on CD-ROM.

■　　Microsoft Windows-compatible 2- or 3-button mouse
■　　Full-length 8-bit slot for the programming card
■　　Parallel port

☞   MAX+PLUS II also requires the Arial TrueType font and the MS Sans Serif (VGA resolution) font, which are present in normal Windows installations. In addition, TrueType fonts must be enabled with the Fonts control in the Windows Control Panel.

Go to the *User's Guide* for your version of Microsoft Windows for more information about fonts.

Go to the read.me file for specific information about disk space and memory requirements in the current version of MAX+PLUS II.

Maximizing Available Memory in Windows 3.1 & Windows for Workgroups 3.11

These steps are necessary only when you are installing MAX+PLUS II under Microsoft Windows 3.1 or Windows for Workgroups 3.11.

To run MAX+PLUS II software, you must have and maintain a minimum amount of available memory, i.e., combined RAM and virtual memory.

☞   Refer to the read.me file for specific memory requirements for the current version of MAX+PLUS II.

Determining Available Memory

To calculate available memory, follow these steps:

1.   Before starting Windows, type mem ↵ at a DOS prompt. Make a note of the available XMS memory, which is listed in the second-to-last line of the command output.

2.   Start Windows and double-click Button 1 on the 386 Enhanced icon in the Windows Control Panel.

3.   Choose the Virtual Memory button in the 386 Enhanced dialog box. The Virtual Memory dialog box is displayed. Make a note of the *Size* shown under *Current Settings.* Choose Cancel twice to close the Virtual Memory and 386 Enhanced dialog boxes.

4. Calculate the total combined RAM and virtual memory available for all Windows programs by using both of the following methods, then comparing the results:

   a. Multiply the size determined in step 1 by 4.

   b. Add the size determined in step 1 to the size determined in step 3.

   The smaller of the two sizes is your total available memory. This size may be smaller than the size indicated by the About Program Manager dialog box (Help menu) in the Windows Program Manager.

5. To increase the amount of available memory, try one or more of the following options:

   ■ Create the largest possible permanent swap file *before* you install MAX+PLUS II, as described in "Creating the Permanent Swap File" below.
   ■ Reduce the size of your disk cache. Refer to the SMARTDrive documentation in the *User's Guide* for your version of Microsoft Windows for details.
   ■ Remove any RAM disks in your system setup. Refer to the RAMDrive documentation in the *User's Guide* for your version of Microsoft Windows for details.

Creating the Permanent Swap File

You should create the largest possible permanent swap file *before* you install MAX+PLUS II. Windows uses the swap file space as virtual memory, which is needed to provide the available memory required for running MAX+PLUS II.

The size of the swap file you create is limited by the amount of available, contiguous, unfragmented disk space. You can use a disk optimization program to make more of the disk space on your disk drive contiguous and unfragmented.

Once you have optimized your hard disk, you can change the size of your swap file:

1. Double-click Button 1 on the 386 Enhanced icon in the Windows Control Panel.

2.   Choose the Virtual Memory button in the 386 Enhanced dialog box. The Virtual Memory dialog box is displayed.

3.   Choose the Change button in the Virtual Memory dialog box. The expanded version of the dialog box is displayed.

4.   Under *New Settings,* select an appropriate drive in the *Drive* box. You should select a drive with as much free, contiguous, unfragmented disk space as possible.

5.   Select *Permanent* in the *Type* box. The default new swap file size is shown in the *New Size* box. You cannot use a size larger than the size shown in *Recommended Maximum Size.*

     Windows limits the size of a swap file to four times the available memory or half of the available disk space. To allow Windows to create a virtual memory file larger than four times the available RAM, you can enter the following variable in the [386Enh] section of your Windows system.ini file:

     ```
     PageOvercommit=n
     ```

     where n is an integer greater than 4. Assuming that you have adequate disk space, this variable allows you to specify the amount of virtual memory available in your computer to be n times RAM (XMS memory) instead of four times RAM.

     Any existing temporary swap file will also reduce the disk space available for the permanent swap file.

6.   Choose OK twice to save the changes in the Virtual Memory and 386 Enhanced dialog boxes. Refer to the swap file documentation in the *User's Guide* for your version of Microsoft Windows for additional information about using swap files.

Installing MAX+PLUS II Software

The following instructions guide you through the installation of
MAX+PLUS II on the PC. The following topics are covered:

Backing Up Your MAX+PLUS II Diskettes

If you are installing MAX+PLUS II software from diskettes, you should
make backups of the diskettes before installation. Use the DOS diskcopy
command, or the appropriate commands for your operating system, to make
a backup copy of each MAX+PLUS II software diskette, then store your
original diskettes in a safe place.

Determining Free Disk Space

The Install program calculates whether you have enough free disk space for
installation. The actual space required depends on the allocation unit size on
your hard disk, which you can determine by typing chkdsk ↵ at a DOS
prompt. Refer to the read.me file for precise information on the amount of
hard disk space required for installation.

Regardless of which drive you select for installing the MAX+PLUS II
software, the Install program requires at least 500 Kbytes of free hard disk
space on your c: drive and 1 Mbyte of free hard disk space on the drive that
contains your Windows directory (which is usually \windows) to perform
installation.

Installing the Software

The following steps describe first-time installation with the Altera Install program. Once you have completed the following installation procedure, you can run MAX+PLUS II programs directly from your hard disk.

☞   Do not install MAX+PLUS II by copying files directly from the diskettes or CD-ROM. The installation files are in compressed format and must be decompressed by the Install program.

These installation instructions assume the following conditions:

- Your hard disk is drive c:.
- If you are installing from diskettes, you are installing from drive a:.
- You have already installed Windows 3.1, Windows for Workgroups 3.11, Windows NT, or Windows 95 in the \windows directory.

If you have another hard disk or floppy drive, substitute the appropriate drive letter in the installation steps.

To install the software, perform the following steps:

1. Boot the computer from the hard disk and start Windows.

2. You can install MAX+PLUS II from CD-ROM or diskettes.

    To install from CD-ROM:

    ✓   Insert the MAX+PLUS II CD-ROM into a caddy if necessary, insert it into your CD-ROM drive, and choose Run from the Windows Program Manager File menu. In the Run dialog box, type the following command in the *Command Line* box:

    <CD-ROM drive>:\pc\maxplus2\install ↵

    or:

    To install from diskettes:

    ✓   Choose Run from the Windows Program Manager File menu. In the Run dialog box, type a:install in the *Command Line* box and choose the OK button.

    The MAX+PLUS II Install program starts. This program prompts you for all information needed to install MAX+PLUS II.

☞ You can abort the installation procedure at any time by choosing the Exit button.

3.   Follow the directions provided on-screen. To get help on any step in the installation process, choose the Help button.

☞ If you are installing from CD-ROM, you can choose to leave the MAX+PLUS II Help files on the CD-ROM and have MAX+PLUS II access them from there. To have MAX+PLUS II access the Help files from the CD-ROM, follow these steps during installation:

a.   Choose Custom Installation in the MAX+PLUS II Installation Options dialog box.

b.   Turn off *MAX+PLUS II Help* under *Optional MAX+PLUS II Features*, and choose Install.

c.   After the Install program has finished, insert the following line in the [system] section of the maxplus2.ini file in your MAX+PLUS II system directory:

HELP_FILE_DIR=*<CD-ROM drive>*\help ↵

4.   Once you have successfully installed MAX+PLUS II, the read.me file appears automatically. You should check the read.me file for important information on the MAX+PLUS II software. After checking the read.me file, exit from Windows.

5.   Edit the setting for the files variable in your config.sys file, which is usually located in the top-level directory of your c: drive, as follows:

files=50 ↵

6.   The Install program may modify your autoexec.bat file, which also is usually in the top-level directory of your c: drive, to make MAX+PLUS II run properly. You should examine this file to check whether it is compatible with other software on your system. The Install program saves the original file as autoexec.bak.

7.   Remove the remaining diskette or CD-ROM from the drive and reboot your computer.

☞ See "MAX+PLUS II File Organization" on page 64 for a description of the directories and subdirectories created during installation.

You can uninstall MAX+PLUS II by following these steps, beginning with step 1 and choosing the Uninstall button instead of the Install button.

Additional Windows NT Installation Steps

On computers running Windows NT, you must install Windows NT drivers to support MAX+PLUS II after you run the Install program. The Sentinel driver is required for all MAX+PLUS II systems; the Altera Programmer driver is required only for systems that include the LP6 Logic Programmer Card.

☞ You do not need to install the Logic Programmer Card before installing the Altera Programmer driver.

To install the Sentinel driver, follow these steps:

1. Click Button 1 on the Drivers icon in the Windows NT Control Panel. The Drivers dialog box is displayed.

2. Choose Add to open the Add dialog box.

3. Select *Unlisted or Updated Driver* from the *List of Drivers* list box and choose OK. The Install Driver dialog box is displayed.

4. Type \\<*MAX+PLUS II system directory*>\drivers in the text box, and choose OK. The Add Unlisted or Updated Driver dialog box is displayed.

5. Select *Sentinel for i386 Systems* from the list box and choose OK. The System Setting Change dialog box is displayed.

6. If you purchased a MAX+PLUS II system that includes programming hardware, choose the Don't Restart Now button in the System Setting Change dialog box and continue with the steps below to install the Altera Programmer driver. Otherwise, choose the Restart Now button in the System Setting Change dialog box to reboot your computer.

To install the Altera Programmer driver, follow these steps:

1. Repeat steps 1 through 4 above.

2. Select *Altera MAX+PLUS II Programmer Driver* from the list box and choose OK.

3. Select the appropriate bus type from the *Bus Type* list box. If you do not know the correct bus type, select *(E)ISA*.

4. Select an unused I/O base address in your PC for your LP6 Logic Programmer Card from the *Physical Address* drop-down list box. The Programmer Card uses 16 contiguous I/O addresses, starting at the selected base address. Altera Programmer Cards are shipped with the default address 280 hex. For more information about changing the I/O address of the Programmer Card, see "Changing the LP6 Card Address Location" on page 55.

5. To install the driver at the current address, choose OK. The System Setting Change dialog box is displayed.

    Your Programmer Card will operate only at the specified address.

    If necessary, you can change the driver's I/O address. To do so, click button 1 on the Drivers icon in the Windows NT Control Panel. In the Drivers dialog box, select *Altera Programmer* from the *Installed Drivers* list box. Then choose the Setup button to open the Altera Programmer Driver Setup dialog box and edit the driver's I/O address.

6. Choose the Restart Now button in the System Setting Change dialog box to reboot your computer.

Additional NEC 9801 Installation Steps

On NEC 9801 computers, you must modify the \windows\system.ini file after you run the Install program for MAX+PLUS II. Add the following lines to the \windows\system.ini file:

```
[sentinel] ↵
MACHINE=NEC9800 ↵
```

Win32s Additions to Windows 3.1 & Windows for Workgroups 3.11

MAX+PLUS II requires Win32s files, and the Install program installs them for you if they are not already present. These Win32s files are installed in your \windows\system\win32s directory.

Other programs installed after MAX+PLUS II may also install Win32s files. If another program installs an earlier version than the version required by MAX+PLUS II, MAX+PLUS II may exhibit erratic behavior such as empty list boxes. If you experience this type of problem, check the version of the Win32s files by running the win32ver utility that is automatically installed in the MAX+PLUS II system directory on your hard disk. (This utility is also available in the \pc directory of the MAX+PLUS II CD-ROM.)

If you determine that you have an older version of Win32s, you should remove it and reinstall your MAX+PLUS II software.

Removing Win32s Files

You can remove the Win32s files from your hard disk by following these steps:

1. Edit the `[386Enh]` section of your system.ini file to remove the following line:

   ```
   DEVICE=C:\WINDOWS\SYSTEM\WIN32S\W32S.386
   ```

2. Delete the following files from your \windows\system directory:

   olecli.dll
   w32sys.dll
   win32s16.dll
   winmm16.dll

3. Delete all the files from the \windows\system\win32s directory, then delete the directory.

Go to to continue the installation process.

Installing MAX+PLUS II on a UNIX Workstation

The following instructions describe the requirements and procedures for installing the MAX+PLUS II software on Sun SPARCstations running SunOS 4.1.x or Solaris 2.4.x, HP 9000 Series 700 workstations, and IBM RISC System/6000 workstations. This section covers the following topics:

System Requirements for Workstations

The hardware and software system requirements listed here and in the read.me file must be met before you can install MAX+PLUS II on a workstation.

Hardware Requirements for Workstations

MAX+PLUS II for workstations requires the following minimum hardware configuration:

■ One of the following workstations:
  – Sun Microsystems SPARCstation or compatible workstation
  – HP 9000 Series 700 workstation
  – IBM RISC System/6000 workstation
■ ISO 9660-compatible CD-ROM drive
■ Color monitor

Software Requirements for Workstations

MAX+PLUS II for workstations requires the following minimum software configuration:

Table 1-1. Workstation Software Requirements

System Type	Software Requirements
Sun SPARCstation	SunOS 4.1.2 or higher OpenWindows 3.0 or higher
	Solaris 2.4 or higher
HP 9000 Series 700	HP-UX 9.03 or higher HP-VUE
IBM RISC System/6000	AIX 3.2.5 or higher AIX/Windows 1.2.5 or higher

Installing the Software & Third-Party Interfaces

MAX+PLUS II installation must be performed by a System Administrator with superuser or "root" privileges. The following steps describe first-time installation with the Altera install.cd program.

The installation procedure consists of two phases:

1. Installing the software on the file server
    a. Installing the software and third-party interface files
    b. Configuring the file server and user environments
2. Setting up the licensing software and server

You can complete phase 2 separately, if necessary. When you install an update to MAX+PLUS II, only the first phase of the installation process is required.

The installation instructions assume the following conditions:

■ The UNIX environment is case-sensitive. You must enter directory names, filenames, and filename extensions exactly as shown.
■ You are logged in as a superuser and you install MAX+PLUS II from a local CD-ROM drive. If not, your System Administrator must provide access to a remote CD-ROM drive.
■ The default CD-ROM directory is /cdrom.
■ MAX+PLUS II will be installed in the /usr/maxplus2 directory. The installation procedure creates the maxplus2 directory if it does not already exist.

If you use a different CD-ROM directory or MAX+PLUS II system directory name, substitute the appropriate name in the installation steps.

☞ Boldface text represents text that appears on screen; Courier font indicates text you must type. The % character indicates the UNIX C-shell prompt; the # character indicates the superuser prompt.

Mounting the CD-ROM

Before installing the software, you must mount the CD-ROM. The commands to do so vary depending on the workstation.

1. Insert the MAX+PLUS II CD-ROM into a caddy if necessary and insert the caddy into your CD-ROM drive.

2. Locate your workstation in Table 1-2 and type the corresponding commands.

Table 1-2. Commands for Mounting the CD-ROM

Workstation	Commands to type
Sun SPARCstation SunOS 4.1.2+	`# mkdir /cdrom` ↵ `# mount -t hsfs -o ro /dev/sr0 /cdrom` ↵
Sun SPARCstation Solaris 2.4+	If you are running Volume Manager, the CD-ROM will be mounted automatically. Otherwise, type the following command: `# mount -F ufs -r /dev/dsk/c0t6d0s2 /cdrom/cdrom0` ↵
HP 9000 Series 700	`# mkdir /cdrom` ↵ `# etc/mount -t cdfs /dev/dsk` *<SCSI ID of the CD-ROM drive>*`s0 /cdrom` ↵
IBM RISC System/6000	`# mkdir /cdrom` ↵ `# crfs -v cdrfs -p ro -dcd0 -m /cdrom -Ano -tn` ↵ `# mount -v cdrfs -r /dev/cd0 /cdrom` ↵

Running the Installation Program

The installation program has several phases, each of which can be completed separately. These phases are:

- Starting the installation program
- Installing the network licensing file
- Installing the third-party interface files

You can run the installation program as many times as necessary to complete your installation.

Starting the Installation Program

To start the MAX+PLUS II installation program, type
`./install.cd` ↵ at the # prompt.

or:

If the CD-ROM was mounted on an HP 9000 Series 700, type
`./INSTALL.CD\;1` ↵ at the # prompt.

☞   You can quit the installation procedure at any time by typing Ctrl+C ↵.

The following text is displayed:

MAX+PLUS II Workstation Installation
Copyright (c) Altera Corporation 1995

Type Ctrl+C <Return> to quit installation at any time.

Type the full pathname of the directory where the MAX+PLUS II CD-ROM is mounted (default: /cdrom):

     Press ↵ if the MAX+PLUS II CD-ROM is mounted in the default directory. Otherwise, type the correct directory name, then press ↵.

Would you like to install the MAX+PLUS II system files (y/n):

     Type n ↵ to skip installation of the system files. Type y ↵ to install the MAX+PLUS II system files. The following prompt is displayed:

Type the full pathname of the system directory where MAX+PLUS II will be installed (default: /usr/maxplus2):

Press ↵ to accept the default directory. Otherwise, type the name of the desired directory and press ↵.

You may install MAX+PLUS II on one or more of the following platforms:

Platform	System Type	Operating System
sunos	Sun SPARCstation	SunOS 4.1.2+ (Solaris 1.x)
solaris	Sun SPARCstation	Solaris 2.4+ (SunOS 5.4+)
hp	HP 9000 Series 700	HP-UX 9.03+
rs6000	IBM RISC System/6000	AIX 3.2.5+

Enter one or more of the platform names listed above
(choices are: sunos, solaris, hp, rs6000)
(default: solaris):

Press ↵ to accept the default platform. Otherwise, type the name(s) of the desired platform(s), then press ↵. To install MAX+PLUS II for multiple platforms simultaneously, type multiple platform names separated by spaces, e.g., `solaris hp` ↵.

Enter license server platform type
(choose one of: solaris sunos)
(default solaris)

Press ↵ to accept the default platform. Otherwise, type the name of the desired license server platform, then press ↵.

The MAX+PLUS II Help files are available on the installation CD-ROM in the /cdrom/help directory, although Altera recommends installing the Help files in your MAX+PLUS II system directory.

Would you like to install the MAX+PLUS II Help files? (y/n):

Type `y` ↵ to install the Help files. If you want to leave the Help files on the CD-ROM and run them from there, type `n` ↵.

☞   If you type n ↵, the installation program inserts the
         following line in the [system] section of your /usr/
         maxplus2/maxplus2.ini file to allow MAX+PLUS II to
         access the Help files from the CD-ROM:

         HELP_FILE_DIR=*<CD-ROM path>*/help ↵

Would you like to install or modify your network license file? (y/n)

   If you type n ↵, the installation program skips the license file
   installation. If you type y ↵, you will be prompted for license file
   information during the installation phase.

Would you like to install the MAX+PLUS II Sample/Tutorial files? (y/n)

   Type n ↵ to skip installation of the MAX+PLUS II Sample/Tutorial
   files.

   Type y ↵ to install the sample files and the files for the chiptrip
   tutorial described in *Section 3: MAX+PLUS II Tutorial.*

   If you type y ↵, the following prompt is displayed:

Type the full pathname of the working directory where the MAX+PLUS II
Sample/Tutorial files will be installed (default: /usr/max2work):

   Press ↵ to accept the default directory. Otherwise, type the name of
   the desired directory and press ↵.

Would you like to install third-party interfaces? (y/n)

   If you type y ↵, the following prompt is displayed:

Enter third-party installation platform type
(choose one of: solaris sunos)
(default solaris)

   Press ↵ to accept the default platform. Otherwise, type the name of the
   desired third-party installation platform, then press ↵.

The following information is displayed:

CD-ROM directory:	*<CD-ROM directory name>*
Install system files:	*<yes or no>*
MAX+PLUS II system directory:	*<system directory name>*
Platforms to install:	*<selected platform(s)>*
License server platform	*<selected platform>*
Install Help:	*<yes or no>*
Install/modify license file	*<yes or no>*
Install third-party interfaces:	*<yes or no>*
Third-party interface platform	*<selected platform>*

Is this information correct? (y/n):

Type y ↵ if the information is correct. Type n ↵ to change any incorrect item(s). You will be given the option to restart the installation program.

If you type y ↵, the installation program installs the items you selected.

If you chose to install the network licensing file, go to "Installing the Network Licensing File," next. If you chose to install the third-party interfaces, go to "Installing the Third-Party Interface Files" on page 25. Otherwise, go to "Unmounting the CD-ROM" on page 25.

Go to "MAX+PLUS II File Organization" on page 64 for information about the directory structure of the files installed for MAX+PLUS II.

Installing the Network Licensing File

If you chose to install the network license file, the installation program displays the following prompt:

Choose one of the following options:

1.   Create a new license
2.   Update an existing license

If you type 1 ↵, the following prompt is displayed (if you type 2 ↵, a shortened version of the same prompt is displayed):

The following information is required to install the network licensing file:

1. The number of license servers at your site
2. The host name and host ID for each license server
3. The MAX+PLUS II product being licensed
4. The maximum number of users that MAX+PLUS II will support concurrently
5. The license expiration date
6. The authorization code from Altera Customer Service

Do you want to continue? (y/n)

If you type y ↵, you are prompted to enter the licensing information provided by Altera, which you can obtain by following the instructions in "Registering MAX+PLUS II Software for a Multi-User Network or a Workstation" on page 5. To quit license installation, type n ↵.

When you register your MAX+PLUS II system, Altera provides you with a "Node Authorization" form with the license file required to run MAX+PLUS II on your workstation. You can read the information from this file to obtain the information needed to respond to the installation program prompts on the features, expiration date, number of licenses, and authorization code. Figure 1-1 shows a sample license file.

Figure 1-1. Sample License File


```
                  Server          Server ID      Optional port
                  name            number         number
                    |               |              |
SERVER alice 08000917ae82 1800
SERVER king 08000926ab6f 1800
SERVER queen 08000913b4c2 1800
DAEMON alterad /usr/maxplus2/adm/alterad
FEATURE maxplus2 alterad 0.000 01-dec-95 1 3B2A134641C57735B618 "ALTERA"
            |            |            |            |              |
         Feature      Daemon      Expiration   Number of      Authorization
         name         name        date         licenses       code
                                               requested
```

Enter the number of license servers: (1/3) *<number of license servers>* ↵

Enter the host name for the license server: *<host name for license server>* ↵

Enter the host ID for the license server: *<host ID number>* ↵

Which feature do you wish to install? Type the desired number (choose one only).

1.   maxplus2   (MAX+PLUS II Base System)
2.   maxplus2tan   (Timing Analyzer)
3.   maxplus2vhdl   (VHDL Synthesis)
4.   maxplus2ext   (Simulator, Graphic Editor, and Waveform Editor)

        <feature number> ↵

Enter the software expiration date in the format 01-jan-1992:

        <expiration date> ↵

Enter the maximum number of users: *<number of users>* ↵

Enter the authorization code: *<authorization code>* ↵

Is the information correct? (y/n/q)

        If you think the information you entered may not be correct, type n ↵.
        The license file installation starts again from the beginning, to allow
        you to accept or change each of your original responses.

        To quit the license installation, type q ↵.

        To accept the information as correct, type y ↵. The following messages
        are displayed:

Your license file has been created. It is located in
/*<pathname>*/adm/license.dat.

The MAX+PLUS II license installation is complete.

If you chose to install the third-party interfaces, go to "Installing the Third-Party Interface Files," next. Otherwise, go to "Unmounting the CD-ROM" on page 25.

Installing the Third-Party Interface Files

If you chose to install the third-party interface files, the installation program displays the following prompt:

Third-Party Interfaces Installation:

1.   Cadence-Composer   x   Mbytes
2.   Cadence-Concept   x   Mbytes
3.   Mentor Graphics   x   Mbytes
4.   Synopsys   x   Mbytes
5.   Viewlogic   x   Mbytes
6.   All
7.   Quit

Enter one or more numbers:

> For example, to install both Synopsys and Viewlogic files, you must type 4 , 5 ↵ or 4 5 ↵. To quit installation, type 7 ↵.

Once the installation of the third-party interface files is complete, the following message is displayed:

Third-party interface installation is complete.

If you have finished installing MAX+PLUS II software, go to "Unmounting the CD-ROM," next.

Go to the Altera-provided Software Interface Guide for your third-party environment for information on the directory structure of the files installed for third-party interfaces to MAX+PLUS II.

Unmounting the CD-ROM

To unmount the CD-ROM, type umount /cdrom ↵ at the # prompt.

Go to "Configuring the File Server & User Environment," next, to continue the installation process.

Configuring the File Server & User Environment

You now must set up the file server and user environment to run MAX+PLUS II. The installation steps vary depending upon the platform.

For each platform you are configuring, follow these steps:

1. Configure the file server environment so that the MAX+PLUS II software installed on the file server is available to other workstations on the network.

2. Configure the user (client) environment so that users can find the MAX+PLUS II software installed on the file server, and the MAX+PLUS II software can find the license server.

Continue to one of the following sections for instructions:

Configuring a SPARCstation Running SunOS 4.1.2+

This section describes the steps necessary to configure a Sun SPARCstation running SunOS 4.1.2 or higher.

Configuring the File Server

If a single workstation functions as the file server, license server, and user workstation, skip this section and go to "Configuring the User Workstation," next.

If the file server, license server, and user workstations are separate workstations, use the Network File System (NFS) to export the directory that contains MAX+PLUS II. To export the directory, follow these steps:

1. If a higher-level directory in the partition is not already exported, add the line /usr/maxplus2 ↵ to the /etc/exports file on the file server.

2. Save the changes.

3. Export the file by typing /etc/exportfs -a ↵ at the # prompt.

Configuring the User Workstation

To configure the user workstation, follow these steps:

1. If the file server and user workstations are separate workstations, mount the /usr/maxplus2 directory on the user workstation with NFS by typing the following commands:

    ```
    # mkdir /usr/maxplus2 ↵
    # /etc/mount <file server name>:/usr/maxplus2 /usr/
       maxplus2 ↵
    ```

2. Update the OPENWINHOME, LD_LIBRARY_PATH, PATH, and LM_LICENSE_FILE variables that are 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 need to be entered or edited.

    a. Update each user's OPENWINHOME and LD_LIBRARY_PATH variables:

    ```
    setenv OPENWINHOME <full directory pathname> ↵
    setenv LD_LIBRARY_PATH $OPENWINHOME/lib ↵
    ```

    ☞   The OPENWINHOME environment variable must be listed before the LD_LIBRARY_PATH variable in the .cshrc file.

    b. Update each user's PATH environment variables to include /usr/maxplus2/bin and $OPENWINHOME/bin:

    ```
    set path = (/usr/local/bin /usr/maxplus2/bin) ↵
    ```

    c. Each user must have an LM_LICENSE_FILE variable that is set to the full directory pathname of the license file. To update this variable, add the following line to the .cshrc file for each user:

    ```
    setenv LM_LICENSE_FILE /usr/maxplus2/adm/
       license.dat ↵
    ```

    If more than one application uses this environment variable, separate the different paths with a colon (:). For example:

    ```
    setenv LM_LICENSE_FILE /usr/maxplus2/adm/
       license.dat:/tmp/license.xyz ↵
    ```

3. After saving the changes to each user's .cshrc file, type the following commands:

    ```
    # cd ↵
    # source .cshrc ↵
    ```

4. Copy the /usr/maxplus2/maxplus2.ini file to each user's home directory. This file must have read and write permission for each user. Refer to "Creating & Using a Local Copy of the maxplus2.ini File" on page 62 for more information.

Go to "Configuring Network Licensing" on page 35 for information about configuring the license server.

Configuring a SPARCstation Running Solaris 2.4+

This section describes the steps necessary to configure a Sun SPARCstation running Solaris 2.4 or higher.

Configuring the File Server

If a single workstation functions as the file server, license server, and user workstation, skip this section and go to "Configuring the User Workstation," next.

If the file server, license server, and user workstations are separate workstations, use the Network File System (NFS) to export the directory that contains MAX+PLUS II.

To export the directory, follow these steps:

1. If a higher-level directory in the partition is not already exported, add the following line to the /etc/dfs/sharetab file on the file server:

    ```
    /usr/maxplus2 "MAX+PLUS II" nfs rw "MAX+PLUS II
        System Directory" ↵
    ```

2. Save the changes.

3. Export the file by typing `shareall` ↵ at the # prompt.

Configuring the User Workstation

To configure the user workstation, follow these steps:

1. If the file server and user workstations are separate workstations, mount the /usr/maxplus2 directory on the user workstation with NFS by typing the following commands:

    ```
    # mkdir /usr/maxplus2 ↵
    # /etc/mount <file server name>:/usr/maxplus2 /usr/
        maxplus2 ↵
    ```

2. Update the `OPENWINHOME`, `LD_LIBRARY_PATH`, `PATH`, and `LM_LICENSE_FILE` variables that are 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 need to be entered or edited.

    a.   Update each user's `OPENWINHOME` and `LD_LIBRARY_PATH` variables:

```
setenv OPENWINHOME <full directory pathname> ↵
setenv LD_LIBRARY_PATH $OPENWINHOME/lib ↵
```

☞   The `OPENWINHOME` environment variable must be listed before the `LD_LIBRARY_PATH` variable in the .cshrc file.

    b.   Update each user's `PATH` environment variables to include /usr/maxplus2/bin and $OPENWINHOME/bin:

```
set path = (/usr/local/bin /usr/maxplus2/bin) ↵
```

    c.   Each user must have an `LM_LICENSE_FILE` variable that is set to the full directory pathname of the license file. To update this variable, add the following line to the .cshrc file for each user:

```
setenv LM_LICENSE_FILE /usr/maxplus2/adm/
    license.dat ↵
```

If more than one application uses this environment variable, separate the different paths with a colon (:). For example:

```
setenv LM_LICENSE_FILE /usr/maxplus2/adm/
    license.dat:/tmp/license.xyz ↵
```

3.   After saving the changes to each user's .cshrc file, type the following commands:

```
# cd ↵
# source .cshrc ↵
```

4.   Copy the /usr/maxplus2/maxplus2.ini file to each user's home directory. This file must have read and write permission for each user. Refer to "Creating & Using a Local Copy of the maxplus2.ini File" on page 62 for more information.

Go to "Configuring Network Licensing" on page 35 for information about configuring the license server.

Configuring an HP 9000 Series 700 Workstation

This section describes the steps necessary to configure an HP 9000 Series 700 workstation.

Configuring the File Server

If a single workstation functions as the file server and user workstation, skip this section and go to "Configuring the User Workstation."

If the file server and user workstations are separate workstations, use the Network File System (NFS) to export the directory that contains MAX+PLUS II. To export the directory, follow these steps:

1.   Type `sam` ↵ at the `#` prompt to bring up the System Administration Manager (SAM).

2.   Choose NFS (Network File Systems) Configuration from the File Systems Management menu.

3.   Set options to allow remote (NFS) file systems access to the local file system's /usr/maxplus2 directory.

Configuring the User Workstation

To configure the user workstation, follow these steps:

1.   If the file server and user workstations are separate workstations, mount the /usr/maxplus2 directory on the user workstation with NFS by typing the following commands:

```
# mkdir /usr/maxplus2 ↵
# /etc/mount <file server name>:/usr/maxplus2 /usr/
   maxplus2 ↵
```

2.   Update the `PATH` and `LM_LICENSE_FILE` variables that are 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 need to be entered or edited.

a. Update each user's `PATH` environment variables to include /usr/maxplus2/bin:

```
set path = (/usr/local/bin /usr/maxplus2/
    bin...) ↵
```

b. Each user must have an `LM_LICENSE_FILE` variable that is set to the full directory pathname of the license file. To update this variable, add the following line to the .cshrc file for each user:

```
setenv LM_LICENSE_FILE /usr/maxplus2/adm/
    license.dat ↵
```

If more than one application uses this environment variable, separate the different paths with a colon (`:`). For example:

```
setenv LM_LICENSE_FILE /usr/maxplus2/adm/
    license.dat:/tmp/license.xyz ↵
```

3. After saving the changes to each user's .cshrc file, type the following commands:

```
# cd ↵
# source .cshrc ↵
```

4. Copy the /usr/maxplus2/maxplus2.ini file to the user's home directory. Refer to "Creating & Using a Local Copy of the maxplus2.ini File" on page 62 for more information.

5. Altera recommends that, for large projects, the server be configured to allow processes to use more than 64 Mbytes of memory. See maxdsize under *System Parameters* in the *HP System Administration Tasks Manual* for more information.

Go to "Configuring Network Licensing" on page 35 for information about configuring the license server.

Configuring an IBM RISC System/6000 Workstation

This section describes the steps necessary to configure an IBM RISC System/6000 workstation.

Configuring the File Server

If a single workstation functions as the file server and user workstation, skip this section and go to "Configuring the User Workstation," next.

If the file server and user workstations are separate workstations, use the Network File System (NFS) to export the directory that contains MAX+PLUS II. To export the directory, follow these steps:

1. If a higher-level directory in the partition is not already exported, add the line `/usr/maxplus2` ↵ to the /etc/exports file on the file server.

2. Save the changes. The directory will be exported automatically.

Configuring the User Workstation

To configure the user workstation, follow these steps:

1. If the file server, license server, and user workstations are separate workstations, mount the /usr/maxplus2 directory on the user workstation with NFS by typing the following commands:

    ```
    # mkdir /usr/maxplus2 ↵
    # /etc/mount <file server name>:/usr/maxplus2 /usr/
        maxplus2 ↵
    ```

2. Update the `PATH` and `LM_LICENSE_FILE` variables that are 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 need to be entered or edited.

    a. Update each user's `PATH` environment variables to include /usr/maxplus2/bin:

    ```
    set path = (/usr/local/bin /usr/maxplus2/
        bin...) ↵
    ```

b.   Each MAX+PLUS II user must have an `LM_LICENSE_FILE` variable that is set to the full directory pathname of the license file. To update this variable, add the following line to the .cshrc file for each user:

```
setenv LM_LICENSE_FILE /usr/maxplus2/adm/
    license.dat ↵
```

If more than one application uses this environment variable, separate the different paths with a colon (:). For example:

```
setenv LM_LICENSE_FILE /usr/maxplus2/adm/
    license.dat:/tmp/license.xyz ↵
```

3. After saving the changes to each user's .cshrc file, type the following commands:

```
# cd ↵
# source .cshrc ↵
```

4. Copy the /usr/maxplus2/maxplus2.ini file to the user's home directory. Refer to "Creating & Using a Local Copy of the maxplus2.ini File" on page 62 for more information.

Go to "Configuring Network Licensing" on page 35 for information about configuring the license server.

Configuring Network Licensing

This section provides instructions for configuring network licensing for MAX+PLUS II. This section discusses the following topics:

Configuring the License Server

The FLEXlm licensing scheme allows either one or three license servers on a network. A single UNIX workstation can function as the file server, license server, and user workstation. The file server, license server, and user workstations (or user PCs) can also be separate computers.

To configure the license server, follow these steps:

1. If a single workstation functions as the file server and license server, skip this step and go to step 2.

    If the file server and license server are separate computers, mount the /usr/maxplus2 directory on the license server with NFS by typing the following commands:

    ```
    # mkdir /usr/maxplus ↵
    # /etc/mount <file server name>:/usr/maxplus2 /usr/
      maxplus2 ↵
    ```

2. Start the license manager daemon on all license servers before starting MAX+PLUS II. Type the following command on each license server:

    ```
    # /usr/maxplus2/adm/max2protd /usr/maxplus2 ↵
    ```

    To invoke the license manager daemon automatically during start-up, add the following lines to the /etc/rc.local file on each license server:

    ```
    if [-f /usr/maxplus2/adm/max2protd]; then /usr/
      maxplus2/adm/max2protd /usr/maxplus2;
      echo -n 'max2protd' ↵
    fi ↵
    ```

3.   Type the following command to make the file executable:

```
# chmod +x /etc/rc.local ↵
```

4.   If you are configuring an IBM RISC System/6000 as the license server, add the following command to the /etc/inittab file after the lines that invoke networking:

```
rclocal:2:wait:/etc/rc.local > /dev/console 2>&1 ↵
```

Troubleshooting License Installation

Most installation errors are caused by improperly installed license daemons (lmgrd and alterad). If you have completed the procedures described for the software and license installation but the daemons have not started, you must verify that the daemons can be located and have the correct permissions. This section lists the most common error messages that can occur during installation, provides information on possible causes, and suggests corrective actions.

For help with error messages not described here and further assistance with troubleshooting license administration, contact the Altera Applications Department. Go to *Appendix B:* Altera Support Services for more information about technical support.

Message: `/usr/maxplus2/max2protd: Command not found`

Cause: The max2protd script or the lmgrd or alterad daemons cannot be located when you try to start them manually or at system start-up. The /usr/maxplus2 directory has not been properly mounted with NFS.

Action: Verify that the /usr/maxplus2 directory, which is exported by the file server with NFS, has been successfully mounted by the license server. This directory should have been mounted when you set up the file server environment, as described in the "Configuring the File Server & User Environment" section for your workstation. To verify that the directory has been mounted correctly, type the following commands on the license server:

```
# cd /usr/maxplus2/adm ↵
# ls -l ↵
```

The ls command output must include the following lines, which list the max2protd, lmgrd, and alterad daemons:

```
-rwxr-xr-x 1 root 278528 jun 01 13:03 alterad
-rwxr-xr-x 1 root  81920 jun 01 13:04 lmgrd
-rwxr-xr-x 1 root    568 jun 01 11:02 max2protd
```

The dates and file sizes may be different, but the three named files must be present. If the named files are not displayed, the directory has not been mounted correctly. Refer to the "Configuring the File Server & User Environment" section for your workstation for instructions on how to mount the /usr/maxplus2 directory.

Message: `license daemon: execl failed`

Cause: The alterad daemon does not exist or cannot be executed.

Action: Verify the existence of the alterad daemon by typing the following commands:

```
# cd /usr/maxplus2/adm ↵
# ls -l ↵
```

The output of the ls command must include the following lines, which list the max2protd, lmgrd, and alterad daemons:

```
-rwxr-xr-x 1 root 278528 Jun 01 13:03 alterad
-rwxr-xr-x 1 root  81920 Jun 01 13:04 lmgrd
-rwxr-xr-x 1 root    568 Jun 01 11:02 max2protd
```

If the MAX+PLUS II software cannot find the alterad daemon in this directory, reinstall the MAX+PLUS II software as described in "Installing the Software & Third-Party Interfaces" on page 17.

If the alterad daemon exists, verify that it can be executed by typing `chmod 755 alterad` ↵.

Message: `Retrying socket bind (address in use)`

Cause: The license daemons are not running because another lmgrd license manager daemon is running and using the same TCP/IP port address.

Action: Terminate the daemon processes:

1. Ask all users who use lmgrd-based applications to log off.

2. If MAX+PLUS II is installed on a Sun SPARCstation (SunOS 4.1.2 or higher) or an IBM RISC System/6000 workstation, type the following command to determine the license daemon process IDs:

```
# ps waux | grep lmgrd | grep -v grep ↵
```

The response includes the entries for active license manager daemons. For example:

```
root   14803 0 0 0 2 60 76 ? S Jun 01 0:03
   /usr/maxplus2/adm/lmgrd -c /usr/maxplus2
   /adm/license.dat
```

or:

If MAX+PLUS II is installed on an HP 9000 Series 700 workstation or a Sun SPARCstation running Solaris 2.4 or higher, type the following command to determine the license daemon process IDs:

```
# ps -e | grep lmgrd | grep -v grep ↵
```

The response includes the entries for active license manager daemons. For example:

```
11478 ttyp2 0:00 lmgrd
```

3. Terminate the license daemons with the following command:

```
kill <pid> ↵
```

The *<pid>* variable is the process ID number that corresponds to the license daemon. In the example shown in step 2, *<pid>* would be `14803`.

☞ Do not use the `-9` option with the `kill` command.

4. Edit the /usr/maxplus2/adm/license.dat file and replace `1800` with a unique four-digit port address that is not used elsewhere on your system and does not conflict with other applications that use lmgrd. To replace the port address, change the third field in the `SERVER` line in the license.dat file.

    In the following example, you would replace `1800` with a unique four-digit number:

    ```
    SERVER artoo 54321234 1800 ↵
    ```

5. Save the changes to /usr/maxplus2/adm/license.dat, then restart the Altera daemon by typing `/usr/maxplus2/adm/max2protd` ↵ at the # prompt.

    You should also restart the daemons for other applications.

Message: `Starting Altera License daemons`
          `Cannot locate the license manager daemon (lmgrd)`

Cause: The max2protd script or the lmgrd or alterad daemons cannot be executed from the UNIX prompt or at start-up with the /etc/rc.local start-up command on a Sun SPARCstation or IBM RISC System/6000 workstation or with the /etc/rc command on an HP 9000 Series 700 workstation.

Action: Verify that the /usr/maxplus2 directory, which is exported by the file server with NFS, has been successfully mounted by the license server. This directory should have been mounted when you set up the file server and the license server environments, as described in the "Configuring the File Server & User Environment" section for your workstation. To verify that the directory has been mounted correctly, type the following commands on the license server:

          ```
          # cd /usr/maxplus2/adm ↵
          # ls -l ↵
          ```

          The ls command output must include the following lines, which list the max2protd, lmgrd, and alterad daemons:

          ```
          -rwxr-xr-x 1 root 278528 Jun 01 13:03 alterad
          -rwxr-xr-x 1 root  81920 Jun 01 13:04 lmgrd
          -rwxr-xr-x 1 root    568 Jun 01 11:02 max2protd
          ```

The dates and file sizes may be different, but the three named files must be present. If the named files are not displayed, the directory has not been mounted correctly. Refer to the "Configuring the File Server & User Environment" section for your workstation for instructions on how to mount the /usr/maxplus2 directory.

If the files exist, you must verify that they have the permissions -rwxr-xr-x. If the executable bit is not set for lmgrd and alterad, type the following commands:

```
# cd /usr/maxplus2/adm ↵
# chmod 755 max2protd lmgrd alterad ↵
```

License Administration Options File

The entries in the options file control the operating parameters of the FLEXlm utility. The System Administrator can use these options to reserve licenses, restrict the use of licenses, and define user groups for use with license reservations. The options file can be edited with any text editor. The following options are available:

Option:	Action:
RESERVE	Reserves licenses for a user, host, display, or group of users.
INCLUDE	Includes a user, host, display, or group of users in a list of users who are allowed to use a software feature.
EXCLUDE	Excludes a user, host, display, or group of users from a list of users who are allowed to use a software feature.
GROUP	Defines a user group for use with the RESERVE, INCLUDE, and EXCLUDE options.
TIMEOUT	Specifies the time after which an inactive license is returned to the free pool, for use by someone else.
NOLOG	Causes messages of the specified type to be filtered out of the log output for lmgrd.

To set any number of options, you must create an options file and list its pathname as the fourth field on the DAEMON line for alterad.

An options file consists of lines in the following format:

```
RESERVE <number> <feature> {USER | HOST | DISPLAY | GROUP}
    <name>
INCLUDE <feature> {USER | HOST | DISPLAY | GROUP} <name>
EXCLUDE <feature> {USER | HOST | DISPLAY | GROUP} <name>
GROUP <name> <list of users>
TIMEOUT <feature> <timeout in seconds>
NOLOG {IN | OUT | DENIED | QUEUED}
```

Lines in an options file that begin with the pound character (#) are ignored and can be used as comments.

In the following example, the options file, called local.options , reserves a copy of the compile feature for user robert, three copies for user dalia, and a copy for anyone on a computer with the hostname mainline. The file also causes QUEUED messages to be omitted from the logfile and prevents user lori from using the compile feature.

```
RESERVE 1 compile USER robert
RESERVE 3 compile USER dalia
RESERVE 1 compile HOST mainline
EXCLUDE compile USER lori
NOLOG QUEUED
```

If these options are included in the file /usr/local/flexlm/options/ local.options, the license file DAEMON line must be specified as follows:

```
DAEMON alterad /usr/maxplus2/adm/alterad /
   usr.local.flexlm/options/local.options ↵
```

License Administration FLEXlm Utilities

The following FLEXlm utilities help the System Administrator manage the licensing activities on the network:

- lmgrd
- lmstat
- lmdown
- lmremove
- lmreread
- lmver
- lmhostid

lmgrd

The lmgrd utility is the main daemon program for FLEXlm. When it is active, it looks for a license file containing all required feature information.

Usage:

```
lmgrd [-2] [-b] [-c <license file>] [-d] [-l <log file>] [-p]
      [-s <interval>] [-t <timeout value>] [-i <feature>]
```

Option:	Action:
-2	Specifies V2 start-up arguments. The -2 option is the opposite of the -b option and is required if you intend to use the -p option.
-b	Specifies backward compatibility mode. The -b option is the default.
-c *<license file>*	Uses the specified license file. If this option is not specified, lmgrd looks for the environment variable LM_LICENSE_FILE. If the environment variable is not set, lmgrd looks for /usr/local/flexlm/licenses/license.dat.
-d	Specifies that hostnames that are read from the license file should have the local domain name appended to them before sending to a client. This option is useful when clients are accessing licenses from another domain.
-l *<log file>*	Specifies the output log file.
-p	Specifies that the lmdown and lmremove utilities can only be run by a "license administrator." A "license administrator" is a member of the lmadmin group, or if the lmadmin group does not exist, "license administrator" is a member of group 0.
-s *<interval>*	Specifies the log file time-stamp interval, in minutes. The default is 360 minutes.

Option: Action:

-t *<timeout value>* Specifies the timeout interval during which
                      daemons must complete their connections to each
                      other. The default is 10 seconds. You can use a
                      larger value if the daemons are running on busy
                      systems or networks.

-i *<feature>*   Displays information about the named feature, or,
                      if no feature name is given, displays information
                      about all features.

☞   Altera recommends that you use the -p option when starting the
        lmgrd utility to provide security.

See also "lmdown" on page 44 and "lmstat" on page 43.

lmstat

The lmstat utility helps monitor the status of all network licensing activities,
including:

■   Active daemons
■   Users of individual features
■   Users of features served by a specific daemon

Usage:

```
lmstat [-a] [-S <daemon>] [-f <feature>] [-s <server>]
    [-t <timeout value>] [-c <license file>] [-A]
    [-l <regular expression>]
```

Option: Action:

-a   Displays information about all features.

-S *<daemon>*   Lists all users of the specified daemon's features.

-f *<feature>*   Lists all users of the specified feature(s).

-s *<server>*   Displays the status of the specified server node(s).

Option:	Action:
`-t` *<timeout value>*	Specifies the timeout interval during which daemons must complete their connections to each other. The default is 10 seconds. You can use a larger value if the daemons are running on busy systems or networks.
`-c` *<license file>*	Uses the specified license file. If this option is not specified, lmstat looks for the environment variable `LM_LICENSE_FILE`. If the environment variable is not set, lmstat looks for /usr/local/flexlm/licenses/license.dat.
`-A`	Lists all active licenses.
`-l` *<reg. expression>*	Lists all users of the features matching the given regular expression.

See also .

lmdown

The lmdown utility instructs lmgrd and alterad to shut down. The license daemons write out their last messages to the log file, close the file, and exit. All licenses that have been given out by those daemons are rescinded, so that the next time a program verifies the license, the license is not valid.

Usage:

```
lmdown [-c <license file>]
```

The correct license file is in /usr/maxplus2/adm/license.dat. The System Administrator should protect the execution of lmdown, since shutting down the servers will cause loss of licenses.

Option:	Action:
`-c` *<license file>*	Uses the specified license file. If this option is not specified, lmdown looks for the environment variable `LM_LICENSE_FILE`. If the environment variable is not set, lmdown looks for /usr/local/flexlm/licenses/license.dat. In addition, lmdown accepts the `-c` *<license file>* argument that specifies the license file location.

See also "lmgrd" on page 42, "lmstat" on page 43, and "lmreread" on page 46.

lmremove

The lmremove utility allows the System Administrator to remove a single user's license for a specified feature. This utility is required if the licensed user was running the software on a node that subsequently crashed, causing the license to become unusable. The lmremove utility allows the license to return to the pool of available licenses.

Usage:

```
lmremove [-c <license file>] <feature> <user> <host> [<display>]
```

Option:	Action:
`-c` *<license file>*	Uses the specified license file. If a license file is not specified, lmremove looks for the environment variable `LM_LICENSE_FILE`. If no `-c` option is specified, lmreread looks for the environment variable `LM_LICENSE_FILE` to find the license file. If the environment variable is not set, lmremove looks for /usr/local/flexlm/licenses/license.dat.

See also "lmstat" on page 43 and "lmremove" on page 45.

lmreread

The lmreread utility allows the System Administrator to tell the license daemon to reread the license file and start any new daemons that have been added. This utility is useful if the data in the license file has changed. The new data can be loaded into the license daemon without shutting it down and restarting it. In addition, all pre-existing daemons will be signaled to reread the license file for changes in licensing information.

The lmreread utility uses the license filename from the command line (or the default filename, if no license filename is specified) to find the alterad daemon. The lmreread utility then gives alterad the command to reread the license file because the data in the file has changed. The alterad daemon always rereads the original file that it loaded. If the path to the license file read by alterad must be changed, the System Administrator must shut down alterad and restart with the new license file path.

The System Administrator cannot use lmreread if the SERVER node names or port numbers have been changed in the license file. In this case, the daemon must be shut down and restarted for the changes to take effect.

The lmreread utility does not change any option information specified in an options file. If the new license file specifies a different options file, the information is ignored. If the options file needs to be reread, the System Administrator must shut down the daemon and restart it.

Usage:

`lmreread [-c` *<license file>*`]`

Option:	Action:
`-c` *<license file>*	Uses the specified license file. If a license file is not specified, lmreread looks for the environment variable, `LM_LICENSE_FILE`. If no `-c` option is specified, lmreread looks for the environment variable `LM_LICENSE_FILE` to find the license file. If the environment variable is not set, lmreread looks for /usr/local/flexlm/licenses/license.dat.

See also "lmdown" on page 44.

lmver

The lmver utility reports the FLEXlm version of a library or binary file.

Usage:

```
lmver <filename>
```

lmhostid

The lmhostid utility reports the host ID of a system.

Usage:

```
lmhostid [ether]
```

The following lines show sample output of lmhostid:

```
lmhostid-Copyright(C)1989,1990 Highland Software, Inc.
The FLEXlm host ID of this machine is "69021c89"
```

Option: Action:

ether   (Available only on HP 9000 Series 700
                     workstations.) Specifies that the Ethernet host ID
                     should be used rather than the external ID module.
                     The dash (–) is not used for this command-line
                     option.

Installing the PC Software Guard

To run MAX+PLUS II software on a PC, you must install the MAX+PLUS II Software Guard and/or the authorization code provided with your development system. If your development system includes a Software Guard, you must install the guard before you can enter the authorization code successfully.

☞   If you are installing MAX+PLUS II software using an ES Site License, you do not need a Software Guard. Go to "Specifying the Authorization Code for a Single-User PC Installation" on page 50 for more information.

To attach the Software Guard to the parallel printer port of an IBM PC-AT or compatible computer:

1.   Locate a parallel printer port on the computer. If you have a printer connected to this port, disconnect it temporarily.

2.   Insert the 25-pin male connector end of the software guard into the 25-pin female connector of the parallel printer port, as shown in Figure 1-2.

Figure 1-2. Attaching the Software Guard to a PC
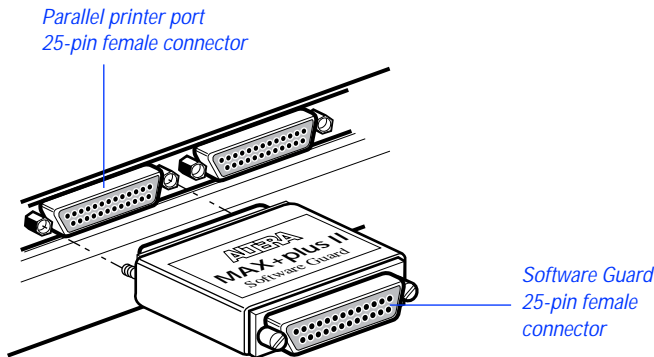
3.   If necessary, re-insert the printer cable connector into the female connector of the Software Guard.

☞ Disconnect the Software Guard before using the parallel port with the Interlink file transfer program. Failure to do so can cause damage to the Software Guard.

If you suspect that your Software Guard is faulty or damaged, contact the Altera Applications Department. Go to *Appendix B: Altera Support Services* for more information about technical support.

Specifying the Authorization Code

Most development system configurations require you to enter an authorization code when you run MAX+PLUS II for the first time. When you start MAX+PLUS II for the first time, the Authorization Code dialog box (Options menu) appears automatically. See Figure 1-3.

Figure 1-3. MAX+PLUS II Authorization Code Dialog Box
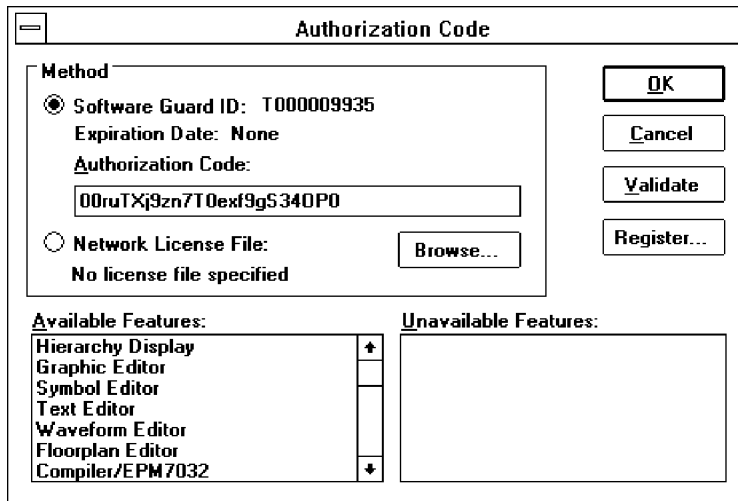
Depending on the type of system you have installed, you must enter an authorization code or specify the license file that contains your authorization code.

Specifying the Authorization Code for a Single-User PC Installation

To specify the authorization code for a single-user PC installation, follow these steps:

1. Select *Software Guard ID* under *Method*, and verify that the ID number displayed matches the number printed on your Software Guard.

2. Type your authorization code, using upper- and lower-case letters exactly as provided by Altera.

3. Choose Validate to confirm your authorization code. Available features will be listed in the *Available Features* box.

4. Choose OK.

Specifying the License File for a Multi-User or Workstation Installation

To specify the license file that contains your authorization code, follow these steps:

✓   Select *Network License File* under *Method*. Available features will be listed in the *Available Features* box.

If the dialog box indicates that MAX+PLUS II cannot locate the license.dat file, choose Browse to open the License File dialog box and locate a suitable license.dat file.

MAX+PLUS II Site License Information

When you purchase a MAX+PLUS II development system for a single-user PC, it includes a site license to install an unlimited number of copies of the PLS-ES feature set. Feel free to pass MAX+PLUS II software along to your colleagues. The additional MAX+PLUS II systems on the site license have only one requirement: after installation, each individual user must contact Altera for an authorization code (at no cost). For details on getting an authorization code, go to "Registering MAX+PLUS II Software for a Single-User PC" on page 4.

Installing the Programming Hardware

Table 1-3 shows the programming hardware configurations that are available for use with MAX+PLUS II.

Table 1-3. MAX+PLUS II Programming Hardware Configurations

Platform	Hardware/Application
PC	The LP6 Programmer Card and the Master Programming Unit (MPU) base unit and its adapters.
PC	The FLEX Download Cable, which is used in conjunction with the LP6 Logic Programmer Card, MPU, and a Configuration EPROM programming adapter to download configuration data to FLEX 10K and FLEX 8000 devices in-system.
PC or workstation	The BitBlaster Serial Download Cable, which is connected to a serial port to download configuration data to FLEX 10K, FLEX 8000, and FLASHlogic devices or to program MAX 9000 and FLASHlogic devices in-system.

This section covers the following topics:

Installing PC-Based Programming Hardware

If you have purchased a system with an LP6 Logic Programmer card, you should follow the installation instructions in the order described here.

1. Install the LP6 card by following the instructions that begin on page 53.

2. Assemble the Master Programming Unit (MPU) and connect it to the Logic Programmer Card by following the instructions that begin on page 53.

3. Optionally connect the FLEX Download Cable by following the instructions that begin on page 58.

## Installing the LP6 Logic Programmer Card

Follow these steps to install the LP6 card in Pentium- and 486-based PCs:

1. Be sure the computer's power is turned off.

2. Remove the cover of your computer. Refer to the documentation accompanying the computer for instructions.

3. Ensure that the all four dipswitches on the LP6 card are turned on, as shown in Figure 1-4.

    ☞   The default I/O address of the LP6 card is 280 hex. If you must change this address because of an addressing conflict, refer to "Changing the LP6 Card Address Location" on page 55 for dipswitch settings for other I/O addresses.

*Figure 1-4. Default Switch Settings on the LP6 Card*
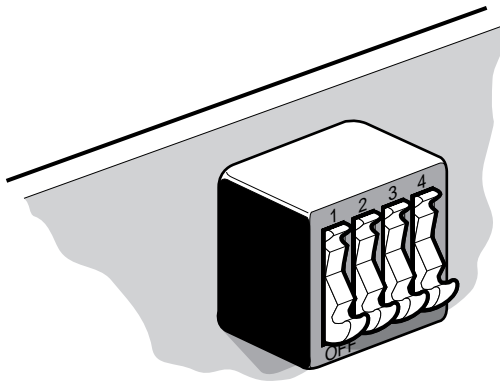
4. Select any convenient empty expansion slot for the LP6 card. If the expansion slot is covered, remove the screw that holds the expansion slot cover and remove the cover. See Figure 1-5.

Figure 1-5. Removing the Expansion Slot Cover
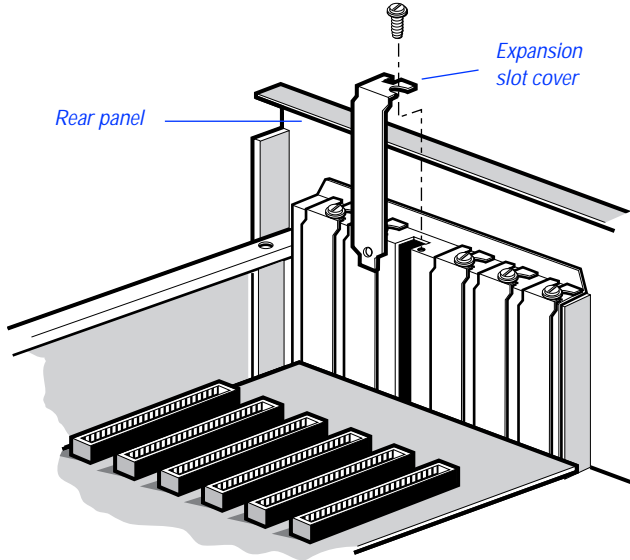
5.   Insert the card into the expansion slot and fasten the retaining bracket with the screw from the slot cover. See Figure 1-6.

Figure 1-6. Locking the Board in Place
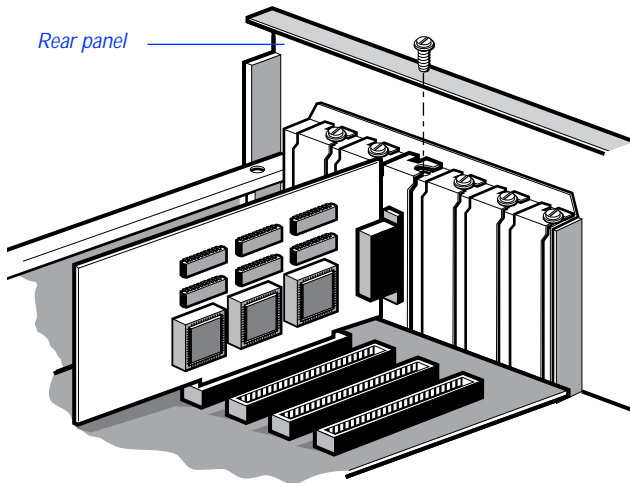
6.   Tighten all the locking screws on all connectors.

Changing the LP6 Card Address Location

You can configure the LP6 card for different I/O addresses. Table 1-4 lists the available I/O addresses and corresponding dipswitch settings.

Table 1-4. LP6 Card I/O Addresses

| Base I/O Address (hex)	Dipswitch Setting			
Required Address Space 16 locations	(1=ON; 0=OFF)			
	1	2	3	4
270	0	0	0	0
260	1	0	0	0
250	0	1	0	0
240	1	1	0	0
230	0	0	1	0
220	1	0	1	0
210	0	1	1	0
200	1	1	1	0
2F0	0	0	0	1
2E0	1	0	0	1
2D0	0	1	0	1
2C0	1	1	0	1
2B0	0	0	1	1
2A0	1	0	1	1
290	0	1	1	1
280 (default)	1	1	1	1

Installing the Master Programming Unit

The Master Programming Unit (MPU) consists of a base unit and one or more adapters that program MAX+PLUS II-supported Altera devices. The PL-MPU programming unit is shipped with all development systems that include programming hardware.

☞ MAX+PLUS II also supports an older programming unit, the PLE3-12A. The PLE3-12A programs many devices from the Classic and MAX 5000 device families.

Figure 1-7 shows an assembled PL-MPU Master Programming Unit.

Figure 1-7. Master Programming Unit
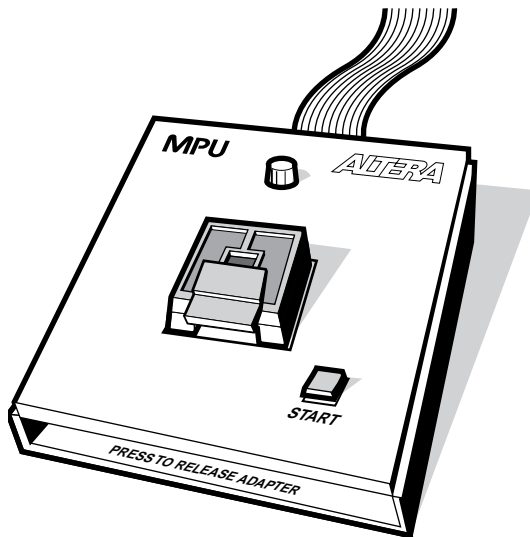

To install the MPU, follow these steps:

1. On the rear panel of your computer, connect the 25-pin flat ribbon cable of the PL-MPU base unit to the Logic Programmer card.

   ☞ Do *not* plug the PL-MPU ribbon cable into the parallel printer port.

2. Install the adapter by sliding the two tabs at the top of the adapter into the slots provided on the base unit. Be sure to use the appropriate adapter for the device you want to program. See Figure 1-8.

3. Carefully lower and align the other end of the adapter, so that the connector in the adapter is inserted into the socket on the base unit. Press down firmly.
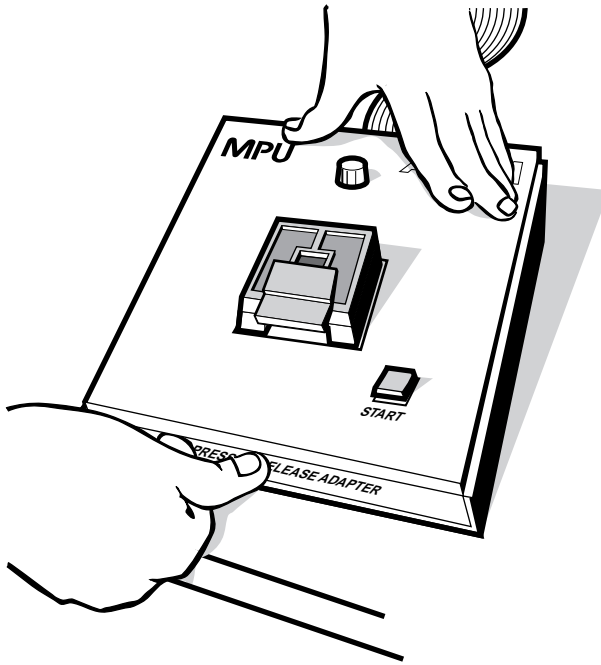
Figure 1-8. Installing the Adapter
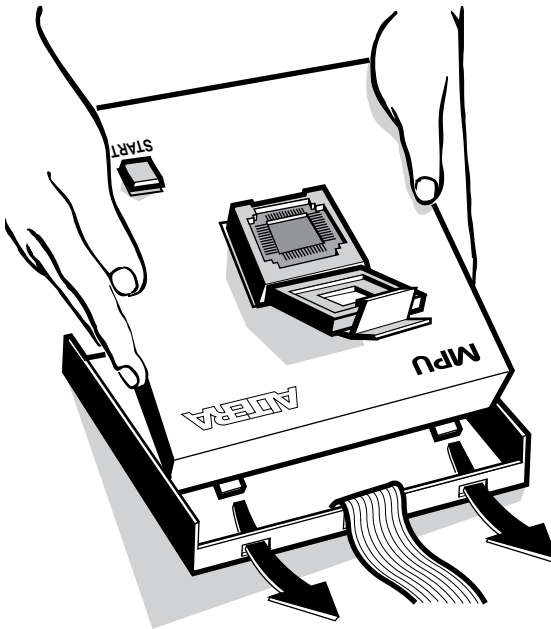
To release an adapter from the base unit:

1. Press down on the front of the unit, while holding down the other end. See Figure 1-9.

2. Lift out the adapter.

Figure 1-9. Releasing the Adapter

Installing the FLEX Download Cable

You can install an optional cable that allows you to download configuration data to configure FLEX 8000 and FLEX 10K devices in-system.

To set up the FLEX Download Cable for configuration:

1. Insert a Configuration EPROM programming adapter (e.g., PLMJ1213 or PLMT1064) into the PL-MPU base unit.

2. Connect the FLEX Download Cable to the 9-pin D-type connector on the Configuration EPROM programming adapter, as shown in Figure 1-10.

Figure 1-10. Connecting the FLEX Download Cable

9-Pin Connector
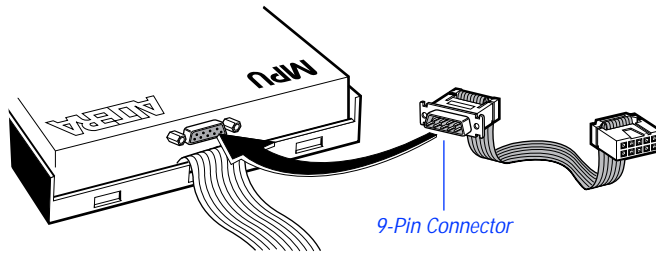
3.   Connect the other end of the FLEX Download Cable to the 10-pin male header on the target printed circuit board.

Go to *Application Note* 33 *(Configuring FLEX 8000 Devices)*, *Application Note* 38 *(Configuring Multiple FLEX 8000 Devices)*, and *Application Note* 59 *(Configuring FLEX 10K Devices)* for instructions on how to configure FLEX 8000 and FLEX 10K devices.

Installing the BitBlaster on a PC or Workstation

The BitBlaster can be used with a PC or workstation RS-232 serial port (called a COM port on a PC). To set up the BitBlaster for device configuration or programming follow these steps:
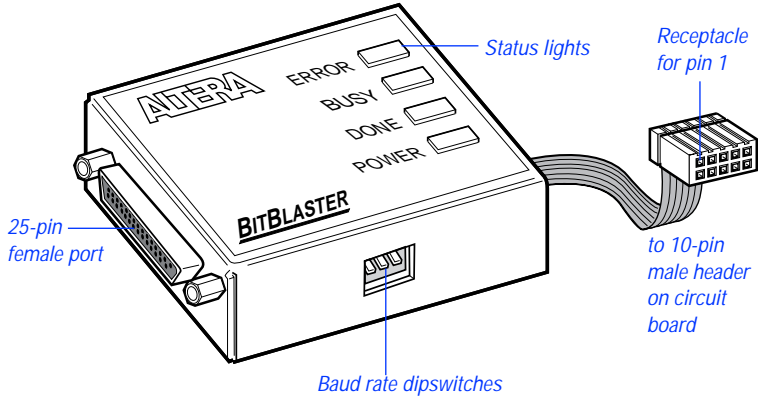
1. Connect the BitBlaster to the serial port on the computer. Figure 1-11 shows a typical serial port on a PC.

Figure 1-11. Connecting the BitBlaster to the Serial Port on the Computer
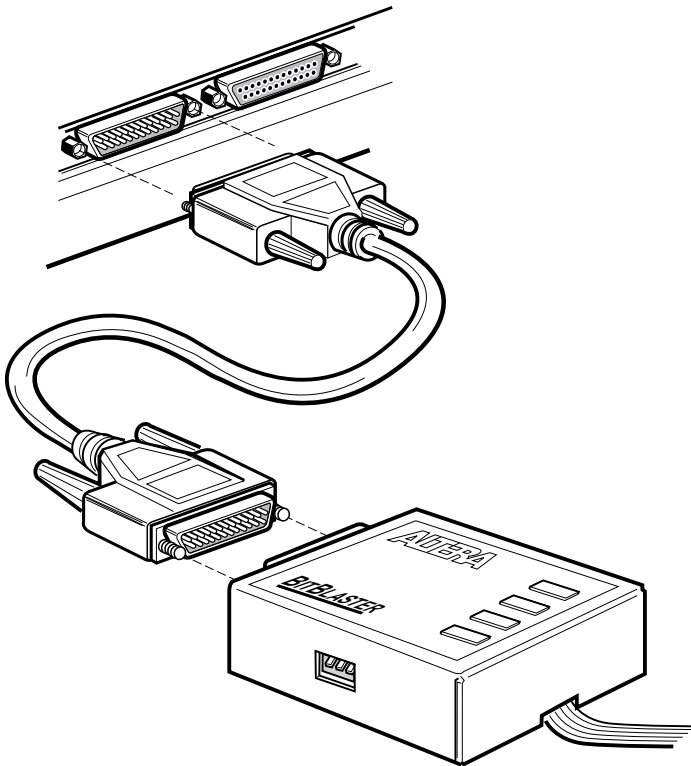
2. Connect the other end of the BitBlaster to the 10-pin male header on the target printed circuit board. See Figure 1-12.

Figure 1-12. BitBlaster and 10-Pin Female Connector

3. Ensure that the baud rate of the BitBlaster, your computer's serial port, and the baud rate set in MAX+PLUS II are the same. You can change the baud rate in MAX+PLUS II to match that of the computer's serial port with Hardware Setup (Options menu) in the MAX+PLUS II Programmer or Simulator. You can change the BitBlaster's baud rate by setting the dipswitches on the side panel. Dipswitch settings are listed in Table 1-5.

☞   You should set the baud rate as high as possible to accelerate configuration time. However, some PC-based systems cannot use baud rates higher than 9600 bps.

Table 1-5. BitBlaster Baud Rate Dipswitch Settings

Baud Rate (bps)	Dipswitches 1 through 3 (1 = ON; 0 = OFF)		
9,600	1	1	1
14,400	0	1	1
19,200	1	0	1
38,400	0	0	1
57,600	1	1	0
76,800	0	1	0
115,200	1	0	0
230,400	0	0	0

Go to "Changing the Hardware Setup" in MAX+PLUS II Help for more information on setting baud rates.

Creating & Using a Local Copy of the maxplus2.ini File

The maxplus2.ini file is a software initialization file created during installation. It contains both Altera- and user-specified parameters that control the way MAX+PLUS II applications operate.

The maxplus2.ini file stores essential information for running MAX+PLUS II. For example, this file stores the pathnames of the Altera-provided primitive, megafunction, and macrofunction libraries and the default colors for your application windows.

☞ If you delete this file, you must reinstall MAX+PLUS II.

The maxplus2.ini file can be stored in one of several locations: for a single-user PC installation, it is stored in the MAX+PLUS II system directory (\maxplus2); on a workstation, it is stored in your home directory. If you use a network copy of MAX+PLUS II, or if a single computer is used by several engineers, you must create a local copy of the maxplus2.ini file. You must then set up an environment variable that specifies the location of the file.

To set up a local copy of the maxplus2.ini file on a PC:

1.   Copy the existing maxplus2.ini file to the desired drive and directory. You can also open the file in MAX+PLUS II with the Open command (File menu) and save it to the desired drive and directory with the Save As command (File menu).

2.   Edit the autoexec.bat file that is used to boot up your computer to include the following line:

     `set MAXPLUS2_INI=`*<drive and directory name>* ↵

3.   Save the changes to autoexec.bat and reboot your computer.

To set up a local copy of the maxplus2.ini file on a workstation:

✓   Copy the existing /usr/maxplus2/maxplus2.ini file to your home directory with workstation commands. If you need to store the maxplus2.ini file in a different location, perform the following additional steps:

     a.   If you are running a C shell, add the line
          `setenv MAXPLUS2_INI` *<directory name>* ↵ to the .cshrc file
          in your /usr/maxplus2 directory:

b.   Type the command `source .cshrc` ⏎ at the C shell prompt.

or:

a.   If you are running a Bourne shell, add the line
       `set MAXPLUS2_INI=`*<directory name>* ⏎ to the .profile file in
       your home directory:

b.   Type the command `source .profile` ⏎ at the Bourne shell
       prompt.

MAX+PLUS II File Organization

During MAX+PLUS II installation, two directories are created: \maxplus2 and \max2work. The \maxplus2 directory contains system software and data files and includes the subdirectories described in Table 1-6:

☞ The pathnames below are shown using the PC pathname convention of backslash (\) characters, but UNIX pathnames use forward slash (/) characters. On a workstation, the max2work and maxplus2 directories are subdirectories of the /usr directory. Otherwise the file and directory organization is identical on PCs and workstations, except where noted.

Table 1-6. MAX+PLUS II System Directory Structure (Part 1 of 2)

Directory	Description
.\adm	Contains FLEXlm license manager daemon, license files, and license manager executable files (workstation and network installations only).
.\bin	Contains the executable software program files (workstation installations only).
.\common	Contains common UNIX files (workstation installations only).
.\drivers	Contains Windows NT device drivers (PC installations for Windows NT only).
.\edc	Contains Altera-provided EDIF Command Files (.edc) that customize EDIF Output Files (.edo) for specific third-party simulation environments.
.\fonts	Contains Altera, Arial, and MS Sans Serif fonts (workstation installations only).
.\hp	Contains platform-specific files for HP 9000 Series 700 workstation installations.
.\lmf	Contains Altera-provided Library Mapping Files (.lmf) that map third-party logic functions to equivalent MAX+PLUS II logic functions.
.\max2inc	Contains Include Files (.inc) with Function Prototypes for Altera-provided macrofunctions. Function Prototypes list the ports (pinstubs) for macrofunctions that can be implemented in Altera Hardware Description Language (AHDL) Text Design Files (.tdf).
.\max2lib\edif	Contains primitives and macrofunctions used for third-party EDIF interfaces.

Table 1-6. MAX+PLUS II System Directory Structure (Part 2 of 2)

Directory	Description
.\max2lib\mega_lpm	Contains megafunctions, including Library of Parameterized Modules (LPM) functions, and the corresponding Include Files that contain their AHDL Function Prototypes.
.\max2lib\mf	Contains old-style 74-series and custom macrofunctions.
.\max2lib\prim	Contains Altera-provided primitives.
.\max2vhdl\altera	Contains the altera library with the `maxplus2` package. This package includes all MAX+PLUS II primitives, megafunctions, and macrofunctions supported by VHDL.
.\max2vhdl\ieee	Contains the ieee library of VHDL packages, including `std_logic_1164`, `std_logic_arith`, `std_logic_signed`, and `std_logic_unsigned`.
.\max2vhdl\std	Contains the std library with the `standard` and `textio` packages defined in the *IEEE Standard VHDL Language Reference Manual*.
.\rs6000	Contains platform-specific files for IBM RISC System/6000 workstation installations.
.\solaris	Contains platform-specific files for Solaris workstation installations.
.\sunos	Contains platform-specific files for SunOS workstation installations.

The \max2work directory contains tutorial and sample files and includes the subdirectories described in Table 1-7:

Table 1-7. MAX+PLUS II Working Directory Structure

Directory	Description
.\ahdl	Contains the sample files used to illustrate "How to Use AHDL" topics in MAX+PLUS II Help and in the *MAX+PLUS II AHDL* manual.
.\chiptrip	Contains all files for the chiptrip tutorial project described in this manual.
.\edif	Contains all sample files used to illustrate EDIF features in MAX+PLUS II Help.
.\tutorial	Contains the read.me file for the chiptrip tutorial. You should create the files for the chiptrip project in this subdirectory.
.\vhdl	Contains the sample files used to illustrate "How to Use VHDL" topics in MAX+PLUS II Help and in the *MAX+PLUS II VHDL* manual.

Go to the Altera-provided Software Interface Guide for your third-party environment for information on the directory structure of the files installed for third-party interfaces to MAX+PLUS II.