SIEMENS

SIMATIC PCS 7 OSx

X Terminal

User Manual

Order Number: 6ES7 6550XX048BD0
Manual Assembly Number: 2806860--0001
Original Edition

⚠ DANGER

DANGER indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.

DANGER is limited to the most extreme situations.

⚠ WARNING

WARNING indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and/or property damage.

⚠ CAUTION

CAUTION used with a safety alert symbol indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.

CAUTION

CAUTION used without the safety alert symbol indicates a potentially hazardous situation that, if not avoided, could result in property damage.

NOTICE

NOTICE indicates a potential situation that, if not avoided, could result in an undesirable result or state.

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Preface

Purpose of This Manual

The *SIMATIC PCS 7 OSx X Terminal User Manual* describes the X terminal support provided by SIMATIC PCS 7 OSx. The X terminal (also called the Network Computer), which is purchased separately, allows you to do the same configuration and runtime operations that you can do from a standard OSx station.

- Sections 1.1 and 1.2 define the capabilities of the X terminal option and describe how to plan your interface with OSx.

- Section 1.3 describes the installation procedures.

- Sections 2.1 through 2.6 explain how to configure the X terminal.

- Section 2.7 shows how to use the operator and engineering keyboards with the X terminal.

- Section 2.8 defines how to use the X terminal with the SIMATIC PCS 7 OSx system.

- Section 2.9 provides troubleshooting guidelines.

If You Need Help

If you have difficulty with your system, contact the Siemens Energy & Automation, Inc., Technical Services Group in the U.S.A. at 423–461–2522. In other countries, call 49–911–895–7000.

Conventions Used in the Manual Set   The procedures in the various manuals give you step-by-step instructions about how to carry out tasks. Typically, the last step of any procedure requires that you select the **OK** or **Save** button, or press **Enter**. To save space and avoid redundancy, this last step does not appear in the procedure. However, you need to finish each procedure with one of these actions.

OK   **OK**   Saves information that you have entered but not saved and closes the window.

Save   **Save**   Saves information that you have entered and does not close the window.

Cancel   **Cancel**   Closes the window without saving any information that you entered and terminates any action that you initiated.

Dismiss   **Dismiss**   Closes the window without undoing any changes that you have entered. However, if you press **Dismiss** before you press **Enter**, the changes that you made are discarded.

The different fonts used in the manual set have the following meanings.

- Entries that you type from the keyboard are indicated with the `courier font.`

- Items that you select on the screen, or keys that you press on the keyboard, are indicated with this **bolded font.**

Items that you select on a cascaded menu are linked in the manual text with arrows. The first term indicates where to click the main menu bar. For example, **Controls->Change System State** tells you to click **Controls** on the main menu bar, then select **Change System State** from the pull-down menu.
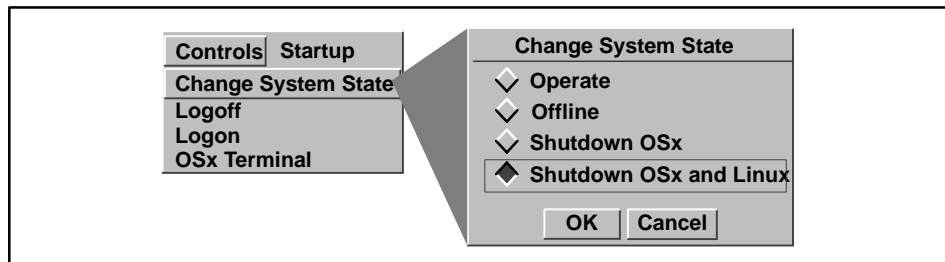
The Other Manuals The OSx manual set consists of several manuals. If you cannot find the information that you need in the *SIMATIC PCS 7 OSx X Terminal User Manual*, check these other books:

- *SIMATIC PCS 7 OSx System Administration Manual*   This manual offers help in configuring network stations, and for procedures that describe how to configure printers, how to archive data, and how to back up files. Other functions normally carried out by the systems administrator are also described here.

- *SIMATIC PCS 7 OSx Process Configuration Manual*   This manual describes the primary tasks required to configure your OSx system for controlling your process.

- *SIMATIC PCS 7 OSx Hardware Manual*   This manual describes the various hardware components of the system and how to install them.

- *SIMATIC PCS 7 OSx Graphical Editor Manual*   This manual describes how to create the graphical displays used with OSx.

- *SIMATIC PCS 7 OSx Reports Manual*   This manual describes how to create reports on your process and your OSx configuration.

- *SIMATIC PCS 7 OSx Recipe Manual*   This manual describes more advanced configuration tasks involving the creation and use of recipes.

- *SIMATIC PCS 7 OSx Batch Programming Manual*   This manual describes more advanced configuration tasks involving the use of BCL, the Batch Control Language, and creating batch programs.

- *SIMATIC PCS 7 OSx Operator Manual*   This manual is written for the configuration engineer, but it describes how to carry out the various tasks that the process operator must do when the system is in the Operate state. You can photocopy all or portions of this manual as a reference for your operators. You may prefer to rewrite sections and perhaps incorporate additional information where necessary.

- *SIMATIC PCS 7 OSx Interface to S5 Controllers Manual*   This manual describes the OSx interface with S5 controllers.

- *SIMATIC PCS 7 OSx Interface to S7 Controllers Manual*   This manual describes the OSx interface with SIMATIC S7 controllers.

- *SIMATIC PCS 7 OSx Library Manual*   This manual describes the function blocks used to program the S7-400 controllers to interface with OSx.

Optional SIMATIC PCS 7 OSx Features

The following manuals are available for optional SIMATIC PCS 7 OSx features.

- *SIMATIC PCS 7 OSx Remote Data Transfer Manual* This manual describes the remote data transfer feature, which allows you to transmit data collected from the process by an OSx station to an Oracle database on the remote computer for historical records and other purposes.

- *SIMATIC PCS 7 OSx @aGlance User Manual* This manual describes how to import OSx data into a Windows application, such as Excel or Lotus 1-2-3, or into another UNIX or VMS application.

Be sure to check the Readme File for information that did not become available until after the publication deadlines for the OSx manuals. The Readme File also points to important copyright, licensing, and warranty information. Select **Help ->About OSx** from the main menu bar, and then click the **Show Readme** button at the bottom of the About OSx dialog box.

Getting Started with X Terminals

1.1　Defining the X Terminal

**What Can an
X Terminal Do for
Me?**

The X terminal option allows you to connect to an OSx station so that you can run OSx on an X terminal. The X terminal (also called the Network Computer) can do all the configuration and runtime operations that an OSx station can do. The X terminal consists of a monitor, logic module, keyboard, and mouse, and runs an X server package. The X terminal can also connect to a host other than an OSx station to run other applications.

With X terminals, you can expand your SIMATIC PCS 7 OSx system beyond the 16-station limit, since additional users can log in. The X terminal option allows additional users to log in to an OSx station and monitor the process or perform configuration tasks. Some examples are listed below.

- Additional operators can monitor and control the factory process.

- More configuration engineers are able to work together on the development of process control. Multiple instances of the graphical editor allow faster development of process graphics.

- Managers, plant engineers, accountants, and other personnel not directly involved on the factory floor can view the process from a traditional desktop format.

Figure 1-1 shows how you can use X terminals to communicate on the OSx network.
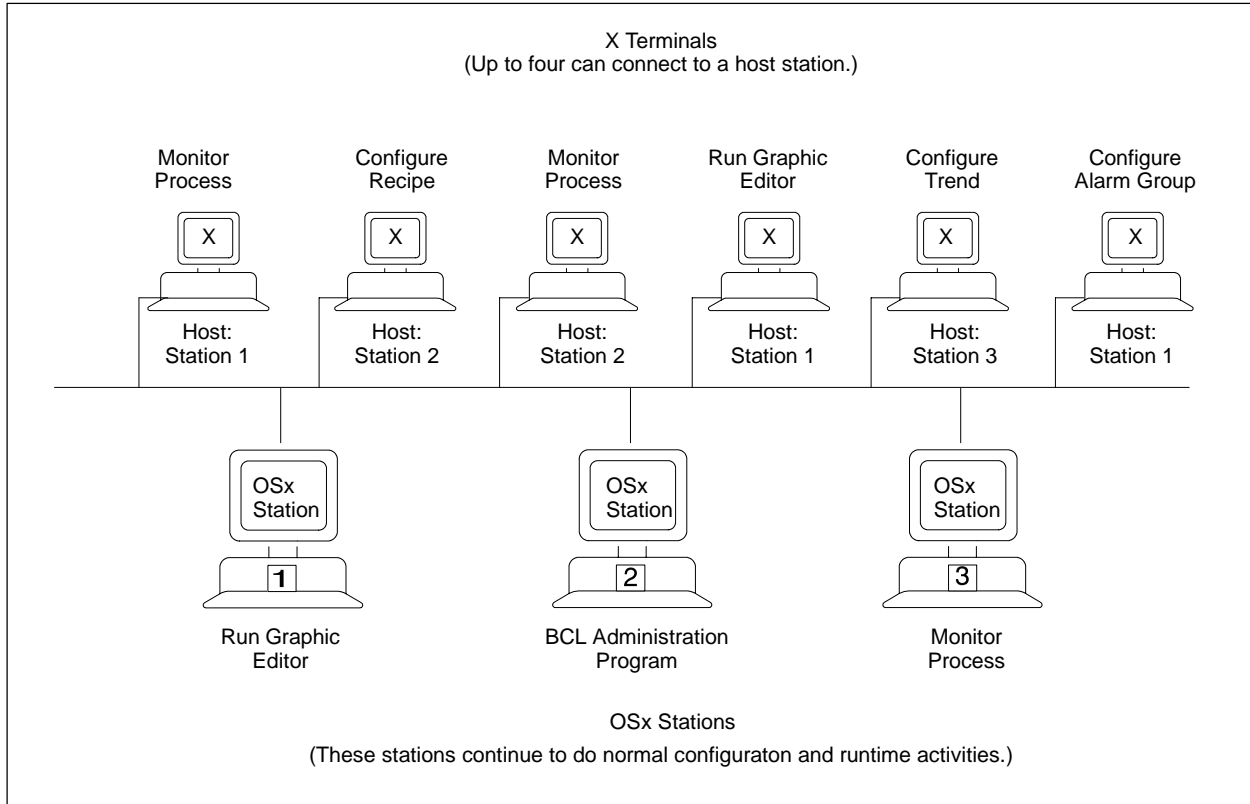
Figure 1-1   SIMATIC PCS 7 OSx System with X Terminals

Defining the X Terminal (continued)

What Components Are Required?

The components that you need to link an X terminal with an OSx station are listed below.

- The X terminal activation license that enables the X terminal option. You receive this activation license when you purchase the SIMATIC PCS 7 OSx X terminal license.

- The X terminal hardware, which consists of a monitor, pointing device, logic module, and an engineering or operator keyboard.

- Connection for the X terminal to the Industrial Ethernet.

- X terminal software installed on one or more OSx stations.

- Extra RAM installed in OSx host stations (16 MB per X terminal). OSx 4.1.1 host stations ship with 128 MB. If you have a 4.1.1 host, you do not need extra RAM.

- Previously installed and operating SIMATIC PCS or SIMATIC PCS 7 OSx system, Release 3.1 or greater.

**What Are the
Licensing
Restrictions?**

There are two kinds of licenses for X terminals. The first license comes from the X terminal vendor and regulates the X terminal software that you load on one or more OSx host stations at a particular site. Hewlett-Packard, Tektronix, and NCD, which provide the three X terminal models tested with OSx, include a site license with their X terminal software. The site license allows you to load the software on as many OSx stations as you want at a particular site. The NCD X terminal software is located on the X terminal itself in ROM, so there is no software to load on the OSx stations that support it. If you purchase a different X terminal, then you need to check with that vendor for any licensing restrictions.

The second license is the SIMATIC PCS 7 OSx X Terminal Activation Key. You can purchase X terminal licenses for up to 4 X terminals per OSx station. These are floating licenses, which means that an X terminal can connect to any OSx station in the system as long as the total number of X terminals connected at any given time does not exceed either the number of licenses purchased for the system or the maximum number of four X terminals per OSx station. If you need to purchase additional licenses, contact your distributor.

NOTE: The SIMATIC PCS 7 system has been tested with 16 X terminals simultaneously connected. The system performs acceptably with this number of X terminals. Configuring more than 16 X terminals is not recommended, even though it is theoretically possible. Network performance may become unacceptably slow when more than 16 X terminals are in operation simultaneously.

When you receive the SIMATIC PCS 7 OSx X Terminal Activation Key from your Siemens representative, you must install it on an OSx station. This station must remain configured in the system for the licenses to remain in effect. You can take the station out of service or shut it down as needed, but it must remain part of the system. For the procedure that you use to install the activation key, see .

1.2   Planning the X Terminal Setup

Choosing the Host Station

An X terminal can connect to any OSx station on the system that has sufficient memory. Since you may have to add RAM to each OSx station that you want to use as a host, you need to decide in advance the stations to use. Take these issues into consideration as you plan your X terminal setup.

- Number per OSx station — Up to four X terminals can connect to an OSx station.

- Memory requirements — You may need to install additional RAM in an OSx host station for each X terminal (or remote terminal) that is to connect to the station. The memory requirement is also affected by the number of graphical editors that you run simultaneously on an OSx station and its X terminals. If you plan to allow an X terminal to log in to several hosts, you may need to install additional RAM in each host. Refer to Table 1-1.

  If you try to connect more X terminals than your memory can support, the system displays a warning, but allows the X terminal to connect. If you try to start more graphical editors than your configuration allows, as indicated in Table 1-1, the system displays an error message, and the graphical editor does not start.

Table 1-1   OSx Host Station Memory Requirements

Memory for OSx	X Terminals/ Remote Terminals	Graphical Editors
64 MB	0	1
	1	2
	2	1
	3+ *	0
96 MB	0	1
	1	2
	2	3
	3	2
	4	1
128 MB	0	1
	1	2
	2	3
	3	4
	4	3
* A warning is displayed when the terminal connects.		

OSx 4.1.1 requires 128 MB of memory. New stations are shipped with 128 MB. Stations that are upgraded to 4.1.1 must have 128 MB installed. Therefore, OSx 4.1.1 stations do not require additional RAM to support X terminals.

Planning the X Terminal Setup (continued)

- OSx station role — In most cases, do not choose the primary, which is the busiest station on the system. Choose a non-primary unless you anticipate extensive work with trending; in this case, the primary can supply trending data most efficiently. Because you can do configuration work on the sysadmin while the process is running, the sysadmin may be a good choice for configuration from an X terminal. Any other role is also appropriate, except for out_of_service.

- Connection type — Either an operator or a supervisory station is an appropriate choice for a host, but an operator station is preferable in most cases, since it is least busy.

- Intended function — Consider whether you want to use the X terminal primarily for configuration, for which the engineering keyboard is recommended, or for monitoring the process, for which the operator keyboard is recommended. You may want to dedicate an X terminal to one major function or the other, since you must reboot the X terminal each time you change keyboards.

You can select a different host for an X terminal at any time. Refer to Section 2.1 for more information. You can also connect additional X terminals to a system by purchasing additional X terminal licenses.

Figure 1-2 shows an example of one possible arrangement of X terminals on an OSx system. Note that a remote terminal can occupy an X terminal slot.
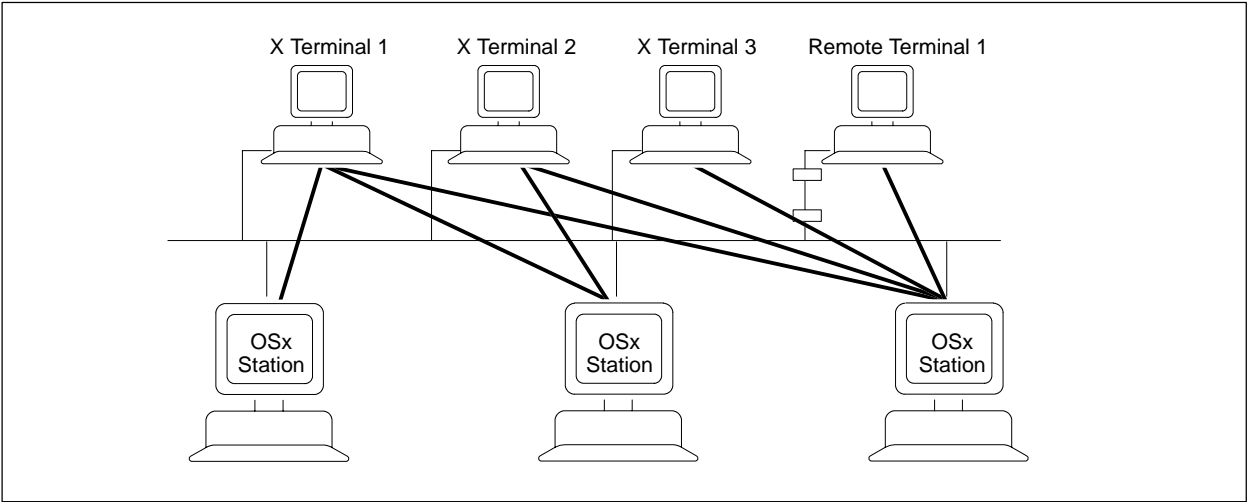
Figure 1-2   X Terminal to Host Station Connections

1.3   Installing the X Terminal Option

Setting Up the Hardware

This section lists the tasks involved in setting up the hardware. Follow the guidelines listed below.

- Refer to the hardware manual that accompanies the X terminal hardware and connect the keyboard, pointing device, monitor, and logic module. For the HP X terminal, be sure the keyboard is plugged in before you power up the logic module. To connect the keyboard to a Tektronix X terminal, see Section 2.7.

  If you purchased the Tektronix or NCD X terminal and the 20-inch industrial monitor, you must connect them using the VGA 15-pin-to-BNC cable, and then set the **Sync** selector switch on the back of the monitor to green.

- Following your ethernet documentation and any plantwide guidelines, connect the X terminal to the ethernet network used by the OSx system.

- Refer to the hardware manual that accompanies your OSx system unit and install RAM on each OSx station that is to serve as a host. For each X terminal that connects to the host, an additional 16 MB are required.

Loading the X Terminal Software

If you ordered the X terminal option with your OSx system, the X terminal software has already been loaded to the OSx host station(s) for you, if required. If you ordered the X terminal option at a later date, follow the steps below to load it. Only the HP and Tektronix X terminals require software to be loaded on the OSx host station; the NCD X terminal does not.

The X terminal software is used to boot the terminal when the X terminal is powered up or reset, and to provide font files when requested. The software can be loaded on one or more hosts. The advantage of loading the software on more than one host is that if one host is shut down, another host is available where the X terminal can boot. You need a separate **SIMATIC PCS 7 OSx Options Activation Key** for each host station on which you want to load the X terminal software.

To load the software on the OSx stations that you have selected as boot stations, follow the steps below.

1. If OSx is running, select **Controls ->Logon** on the menu bar and log in as root.

2. Click **Controls ->Change System State** and select **Shutdown OSx**.

3. Press the left mouse button to bring up a root menu, select **New Xterm**, and log in as root.

4. Insert the Disk 2 CD with the title SIMATIC PCS 7 OSx V4.1.1 in the CD-ROM drive.

5. Type `install.new` and press **Enter**.

6. If this is an operator station with no other options installed, the screen prompts you for the SIMATIC PCS 7 OSx Options Activation Key:

   There is no option license for this station.

   You may:
   1) Enter a valid license to allow installing options
   2) Continue without installing additional options
   Enter operation (1--2):

   Type `1`. The following prompt appears:

   Current license string: None
   Enter new OSx license string:

   Enter the key exactly as it appears on the options license.

   The following prompt appears:

   There is a valid option license string for this station: AbCdEfGh123fg

Number	Installed	Licensed	Description
1	No	No	E4.1.1 Supervisor S/W
2	No	Yes	E4.1.1 HP X Terminal S/W
3	No	Yes	E4.1.1 Tektronix X Terminal S/W
4	No	No	E4.1.1 RDT Oracle S/W
5	No	No	E4.1.1 RDT Sybase S/W
6	No	No	E4.1.1 One User OSx @aGlance Server S/W
7	No	No	E4.1.1 Ten User OSx @aGlance Server S/W

   Enter one of the following options or q to quit:
   1) Enter a valid license string to allow installing options
   2) Continue without installing additional options
   3) Install an option or re-install an installed option
   4) Install all options licensed but not yet installed

   Enter operation (1--4):

Installing the X Terminal Option (continued)

To install all uninstalled options, enter 4. To install only one of the X terminal options, enter 3 to install one option at a time, and then 2 to install the HP X terminal or 3 to install the Tektronix X terminal option. After the option(s) are installed, the list above appears again, with the options shown as installed. Continue with step 8.

7. If this is a supervisory station, or if other options have been previously installed, the screen shows the current license string, followed by a list of currently installed and licensed options:

There is a valid option license for this station: AaBbCcde123fg

Number	Installed	Licensed	Description
1	Yes	Yes	E4.1.1 Supervisor S/W
2	No	No	E4.1.1 HP X Terminal S/W
3	No	No	E4.1.1 Tektronix X Terminal S/W
4	No	No	E4.1.1 RDT Oracle S/W
5	No	No	E4.1.1 RDT Sybase S/W
6	No	No	E4.1.1 One User OSx @aGlance Server S/W
7	No	No	E4.1.1 Ten User OSx @aGlance Server S/W

Enter one of the following options or q to quit:
1) Enter a valid license string to allow installing options
2) Continue without installing additional options
3) Install an option or re-install an installed option
4) Install all options licensed but not yet installed

Enter operation (1–4):

Type 1 to enter your new license string. The following prompt appears:

Current license string: AaBbCcde123fg
Enter new license string:

Enter the key exactly as it appears on the new options license.

The option list appears again, with the new license string and with the additional options shown as licensed:

There is a valid option license for this station: AaBbCcde123fg

Number	Installed	Licensed	Description
1	Yes	Yes	E4.1.1 Supervisor S/W
2	No	Yes	E4.1.1 HP X Terminal S/W
3	No	Yes	E4.1.1 Tektronix X Terminal S/W
4	No	No	E4.1.1 RDT Oracle S/W
5	No	No	E4.1.1 RDT Sybase S/W
6	No	No	E4.1.1 One User OSx @aGlance Server S/W
7	No	No	E4.1.1 Ten User OSx @aGlance Server S/W

Enter one of the following options or q to quit:
1) Enter a valid license string to allow installing options
2) Continue without installing additional options
3) Install an option or re-install an installed option
4) Install all options licensed but not yet installed

Enter operation (1--4):

To install all uninstalled options, enter 4. To install only one of the X terminal options, enter 3 to install one option at a time, and then 2 to install the HP X terminal or 3 to install the Tektronix X terminal option. After the option(s) are installed, the list above appears again, with the options shown as installed. Continue with step 8.

8. When you finish installing options, select 2 to continue. OSx patches are installed. This process could take several minutes, depending on the number of patches installed.

9. Reboot the station. Remove the CD and store it in a safe place.

Installing the X Terminal Option (continued)

**Deinstalling the
X Terminal
Software**

If you want to remove the X terminal software from the OSx station at some later time, follow these steps.

1. Open an XTerm window on the host where you want to remove the software, and log in as `root`.

2. Change directory by entering the following command:

   ```
   cd /usr/tistar/xterm
   ```

3. Remove the software.

   For HP X terminals, enter the following command:

   ```
   rm -fr hp
   ```

   For Tektronix X terminals, enter the following command:

   ```
   rm -fr tektronix
   ```

NOTE: You must reconfigure any X terminal that uses this OSx station as a boot host so that it no longer attempts to boot from this station.

Installing the X Terminal Activation Key

When you purchase the X terminal option, you receive a SIMATIC PCS 7 OSx X Terminal Activation Key that enables the correct number of X terminals to connect to OSx.

When you order the X Terminal Activation Key from your Siemens representative, be prepared to specify the number of licenses you need and the software serial number of one OSx station in your system. To obtain this serial number, select **Help ->About OSx** from the main menu bar. The number appears in the Software Serial Number field.

To install this activation key, follow the steps below.

1. On the OSx station that you used to supply the software serial number for the activation key, open an XTerm window.

2. Log in using the `tistar` User ID.

3. At the prompt, type the following:

    `xt_install`

4. Type in the SIMATIC PCS 7 OSx X Terminal Activation Key at the prompt. This activation key is case sensitive, so be sure to enter the exact characters. The system displays the number of X terminal licenses now available to you.

The OSx station that provided the OSx License String for the X Terminal Activation Key must remain in the OSx system for your X terminals to function. If this station must be removed from the system for repair or replacement, contact the Siemens Energy & Automation, Inc., Technical Services Group in the U.S.A. at 423–461–2522 for assistance. Outside the U.S.A., call 49–911–895–7000.

Configuring and Using X Terminals

2.1   Configuring the X Terminal

Prerequisite Information

Before you can complete the configuration, you need the following information.

- **(For HP and Tektronix only)** Boot station(s) — IP address(es) of the OSx station(s) from which the X terminal can boot and access font information. To obtain the IP address of an OSx station, access **View Node** from **Network Setup** under **Startup** on the menu bar.

NOTE: Do not set a boot station IP address for NCD. It boots from ROM.

- X terminal(s) — Name and IP address of each X terminal.

- Subnet mask — Networks are divided into subnetworks to facilitate network administration. The subnet mask consists of four integers designating the subnetwork. The subnet mask is determined by the network class, which is indicated by the first of the four integers. The IP address structure is AAA.BBB.CCC.DDD, where AAA, BBB, CCC, and DDD are integers in the range of 0 to **255**. The AAA integer is used to determine the network class (Table 2-1).

Table 2-1   Network Class and Subnet Mask

AAA Range	Network Class	Subnet Mask
0–127	A	255.0.0.0
128–191	B	255.255.0.0
192–223	C	255.255.255.0

If, for example, your IP addresses are Host station: 204.109.10.152 X terminal: 204.109.10.100, then the network class is Class C, and the subnet mask is 255.255.255.0.

Additional information may be required for more complicated network setups, such as those involving gateways. Refer to the vendor documentation supplied with the X terminal for more information.

Choosing Ways to Access the Host

X Display Manager Control Protocol (XDMCP) runs both on X terminals and on potential host stations. XDMCP allows the X terminal to connect to a host and begin a session. You can select from two modes for the X terminal connection: direct and broadcast. You make this selection when you configure the X terminal.

Direct   With a direct connection, the X terminal automatically connects to a particular host at power up. This eliminates the necessity of selecting a host, and it is the obvious choice when there is only one OSx station. If you do not want to power down the X terminal, log off OSx. Because the X terminal does not release the license or close the connection, the next user can simply log in to begin working.

When you are ready to end a session, power down the X terminal. To power down the X terminal, first select **Quit OSx Session** from the root menu. As soon as the blank gray screen appears, turn off power to the X terminal. The license then becomes available for another X terminal.

NOTE: If you do not power down the X terminal as soon as the gray screen appears, another session begins. Select **Quit OSx Session** again, wait for the gray screen, then power down the terminal.

Broadcast   With a broadcast connection, the system displays a list of available hosts (those OSx stations running XDMCP). When you select one, the session begins. When you are ready to end the session, click the left mouse button to access the root window menu of the X terminal, and select **Quit OSx Session**. This releases the X terminal activation license and causes the X terminal to redisplay the list of hosts.

Where to Start

To begin configuration, refer to the following sections.

- NCD X terminal, Section 2.2

- Tektronix X terminal, Section 2.3

- HP X terminal, Section 2.4

- Any X terminal other than NCD, Tektronix, or HP, Section 2.5

- PC X Server package, Section 2.6

2.2 Configuring the NCD X Terminal

Address Configuration for the NCD X Terminal

To configure the NCD X terminal (also called the Network Computer), follow the steps below.

1. Power up the X terminal monitor, and then power up the logic module.

2. When the message **Attempting to boot from ROM** appears, press any key to interrupt the boot.

When the boot prompt returns, enter the address information indicated below:

3. For the IP address of the X terminal, enter `iaddr <IP address>`. For example, `iaddr 168.210.122.1`

4. For the subnet mask, enter `imask <subnet mask>`
   In this example, `168` indicates a Class B network. Table 2-1 indicates that the subnet mask (imask) for an integer in the range of 128–191 is 255.255.0.0. Enter `imask 255.255.0.0`

5. For the boot path, enter

   `bpath os.900`

6. For the boot method, type `bmethod ROM` and press **Enter**.

7. Verify what you have typed by checking the entries at the top of the screen. If you have made a mistake, or if you want to change a value, enter the command again.

8. To save your work, type `nvsave` and press **Enter**.

9. To boot the X terminal, type `boot` and press **Enter**.

Accessing the NCD X Terminal Setup Menu

You may need to supply additional configuration information at a later time. For example, you can configure a secondary boot host for an NCD X terminal. After the X terminal has booted, you can access the X terminal Setup menu and modify additional parameters. You can do this at any time, even when the X terminal is displaying OSx. Follow the steps below.

1. Access the X terminal menu by pressing **Shift + Pause**. The client launcher menu appears.

2. Select **Setup** from this menu. The main menu appears (Figure 2-1).

3. Select the appropriate option from this menu. See page 2-6 through page 2-11 for configuration options.
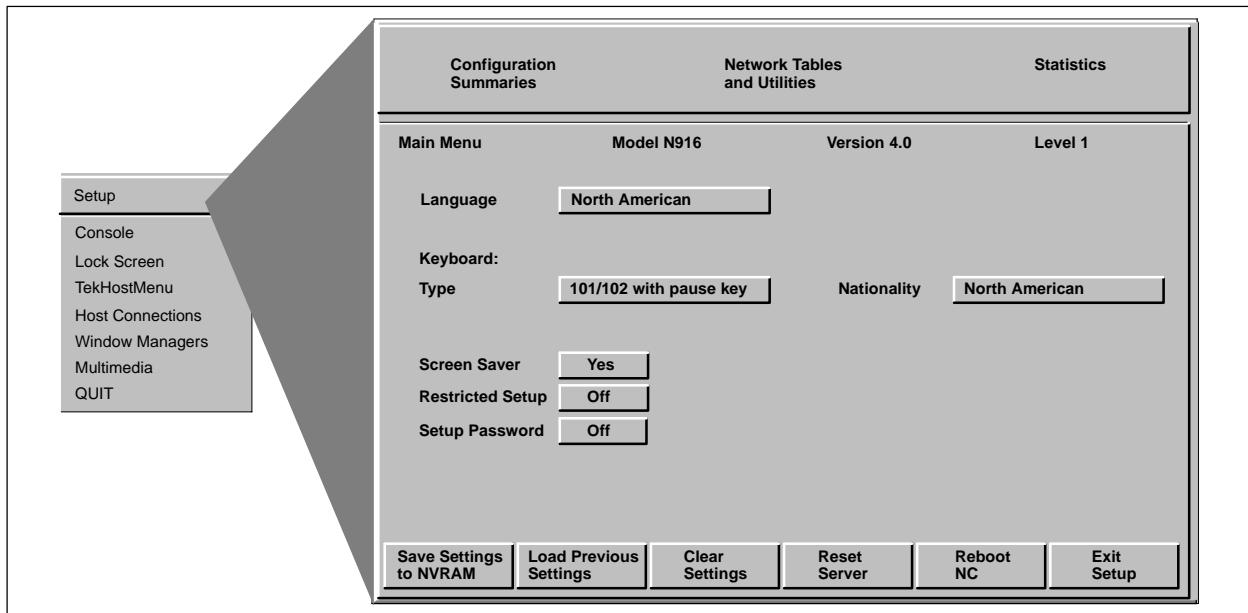
Figure 2-1   NCD Main Menu

Configuring the NCD X Terminal (continued)

Connection Type Configuration for the NCD X Terminal

Since the default connection type for the NCD X terminal is XDMCP Broadcast, the X terminal boots and displays the XDMCP list of host stations. If you prefer to configure the X terminal to connect directly to a host (XDMCP Direct), access the X terminal Setup menu as described on page 2-5. Then follow the steps below.

1. Select **Configuration Summaries ->X Environment** at the top of the main menu (Figure 2-2). The X Environment Configuration menu appears.

2. For the field labeled Host Connect Method, select **XDMCP Direct**.

3. For the field labeled XDMCP Server, enter the IP address of the host to which you want to connect.

4. Select **Return to Main Menu**.

5. When the main menu appears, select **Save Settings to NVRAM**.

6. To exit the main menu, select **Exit Setup**. The next time the X terminal boots, it connects directly to the host with the IP address designated in step 3.

7. To exit the client launcher menu, select **Quit.**
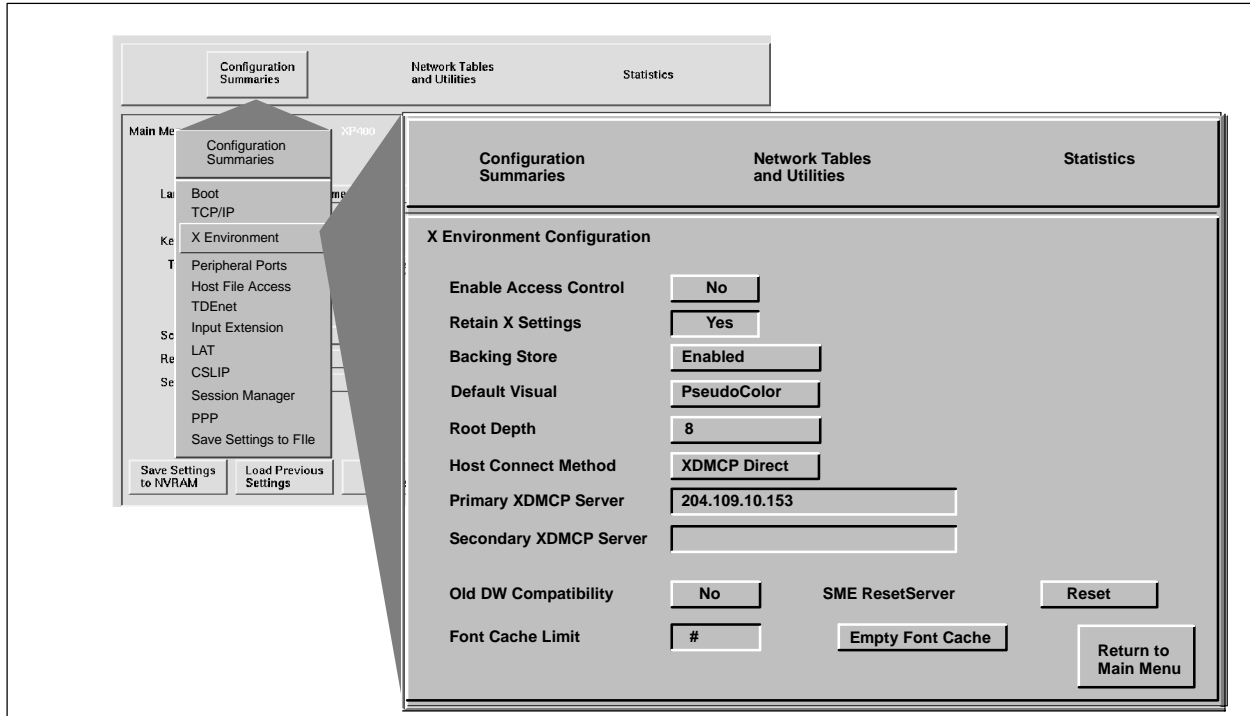
Figure 2-2　NCD Direct Connection Type

Configuring the NCD X Terminal (continued)

To change the connection type from XDMCP Direct back to XDMCP Broadcast, access the X terminal Setup menu as described on . If you are setting up the X terminal for the first time, follow the steps below.

1. Select **Configuration Summaries ->X Environment** at the top of the main menu (Figure 2-3). The X Environment Configuration menu appears.

2. For the field labeled Host Connect Method, select **HostMenu**. The Default Host List field now says **XDMCP**.

3. Select **Return to Main Menu**.

4. When the main menu appears, select **Save Settings to NVRAM**.

5. To exit, select **Exit Setup**. The next time the X terminal boots, it displays the XDMCP list of host stations.

6. To exit the client launcher menu, select **Quit.**
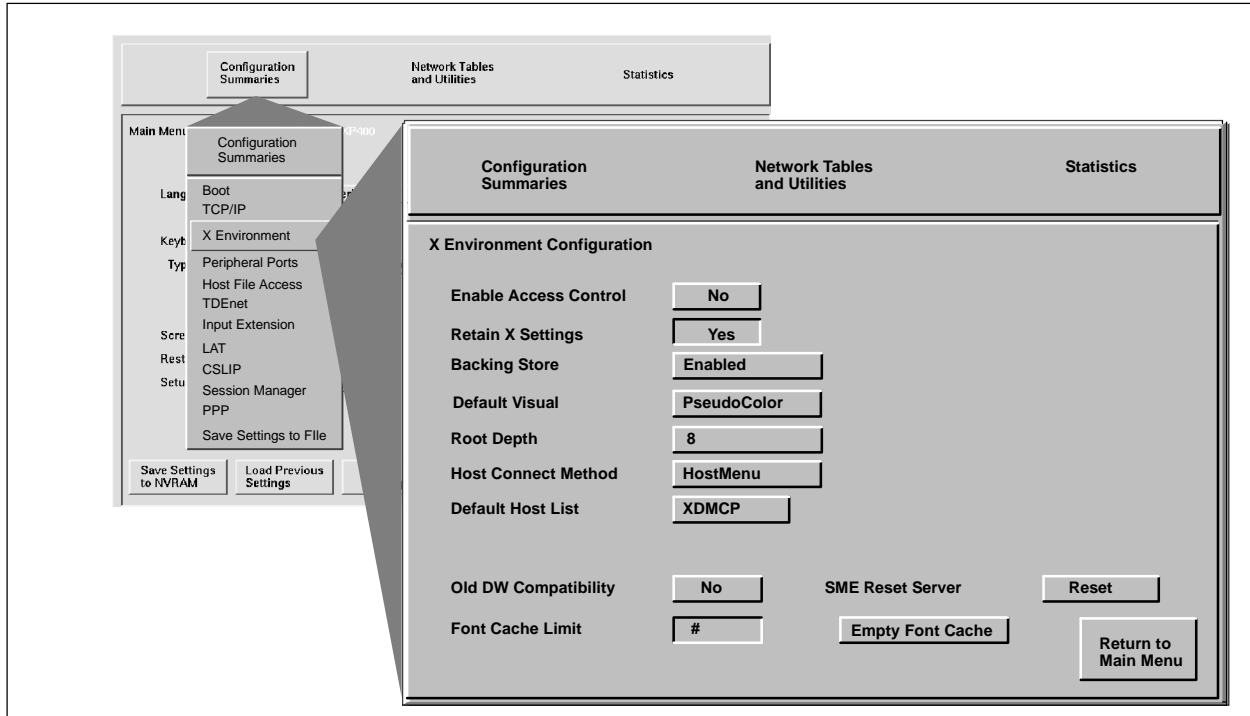
Figure 2-3   NCD Broadcast Connection Type

Configuring the NCD X Terminal (continued)

If you are using a previously set up X terminal, you may need to change the broadcast address and subnet mask. Access the X terminal Setup menu as described on , then follow the steps below to insure that the correct addresses are entered in the TCP/IP dialog box, then continue with the procedure on the previous page.

1. Select **Configuration Summaries ->TCP/IP** at the top of the main menu (Figure 2-4). The TCP/IP dialog box appears.

2. Check the Subnet Mask field. Use Table 2-1 on page 2-2 to be sure that the subnet mask is correct for the IP addresses of your host station and X terminal.

3. Check the Broadcast Address field. Use Table 2-2 to be sure that the broadcast address is correct for the network class.

Table 2-2   Network Class and Broadcast Address

Network Class	Subnet Mask	Broadcast Address
A	255.0.0.0	AAA.255.255.255
B	255.255.0.0	AAA.BBB.255.255
C	255.255.255.0	AAA.BBB.CCC.255
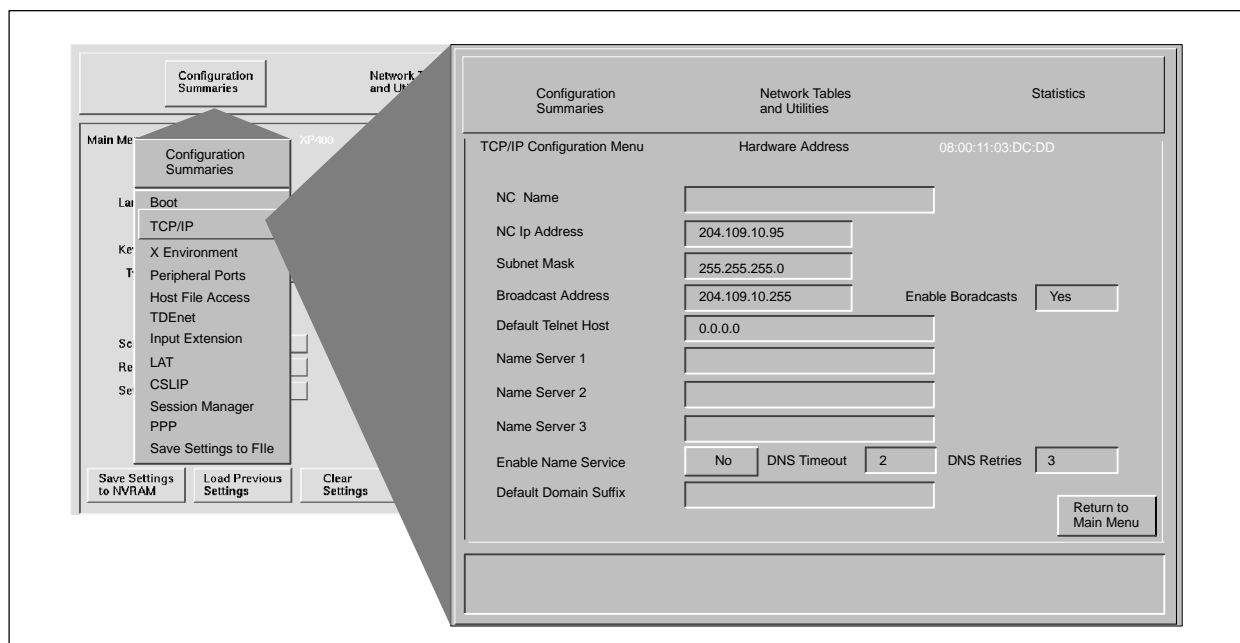
Figure 2-4   TCP/IP Dialog Box

Disabling Screen Saver on NCD X Terminal

The default setting for the screen saver on the NCD X terminal is **Power Save**. The screen saver causes the screen to dim after ten minutes of inactivity. To turn off the screen saver, access the X terminal Setup menu as described on page 2-5. Then follow the steps below.

1. For the field labeled Screen Saver, select **No**.

2. Select **Save Settings to NVRAM**.

3. To exit from the main menu, select **Exit Setup**.

4. To exit the client launcher menu, select **Quit**. The screen saver feature for the X terminal is disabled; you do not need to reboot the X terminal for the change to take effect.

Restoring NCD X Terminal Settings

The following procedure describes how to restore your NCD X terminal settings to the original factory defaults. This may be useful if you are having problems configuring the X terminal, and you want to start over from the beginning.

1. Reboot the X terminal.

2. When the boot screen appears, press **Return**.

3. At the boot prompt, enter the following: `nvf`
    This command clears the X terminal configuration. You can now reconfigure the X terminal, following the procedure on page 2-4.

2.3 Configuring the Tektronix X Terminal

Address Configuration for the Tektronix X Terminal

To configure the Tektronix X terminal (also called the Network Computer), follow the steps below.

1. Power up the X terminal monitor, and then power up the logic module. The boot screen appears and flashes as the monitor and the logic module of the X terminal attempt to synchronize.

2. When the monitor setting **monset 31** appears, press any key. A prompt appears asking you to press the **F1** key to accept this monitor setting, press **F4** to display the previous monitor setting, or press any key to display the next monitor setting.

3. Press **F1** to accept the monitor setting of 31. The following message appears: **Writing NVRAM. Do not disturb.**

When the boot prompt returns, enter the address information indicated below:

4. For the IP address of the X terminal, enter `iaddr <IP address>` For example, `iaddr 204.109.10.94`

5. For the IP address of the host where you loaded the software, enter `ihost <IP address>` For example, `ihost 204.109.10.153`

6. For the subnet mask, enter `imask <subnet mask>` In this example, `204` indicates a Class C network. Table 2-1 on page 2-2 indicates that the subnet mask (imask) for an integer in the range of 192–222 is 255.255.255.0. Enter `imask 255.255.255.0`

7. For the boot path for the new NC200 model, enter

   `bpath /usr/tistar/xterm/tektronix/tekxp/boot/os.500`

   For the older XP400 model, enter `350` instead of `500` at the end of the boot path.

8. For the boot method, type `bmethod NFS` and press **Enter**.

9. Verify what you have typed by checking the entries at the top of the screen. If you have made a mistake, or if you want to change a value, enter the command again.

10. To save your work, type `nvsave` and press **Enter**.

11. To boot the X terminal, type `boot` and press **Enter**.

Accessing the Tektronix X Terminal Setup Menu

You may need to supply additional configuration information at a later time. For example, you can configure a secondary boot host for a Tektronix X terminal. After the X terminal has booted, you can access the X terminal Setup menu and modify additional parameters. You can do this at any time, even when the X terminal is displaying OSx. Follow the steps below.

1. Access the X terminal menu by pressing **Shift + Setup**. The client launcher menu appears.

2. Select **Setup** from this menu. The main menu appears (Figure 2-5).

3. Select the appropriate option from this menu. See page 2-14 through page 2-21 for configuration options.
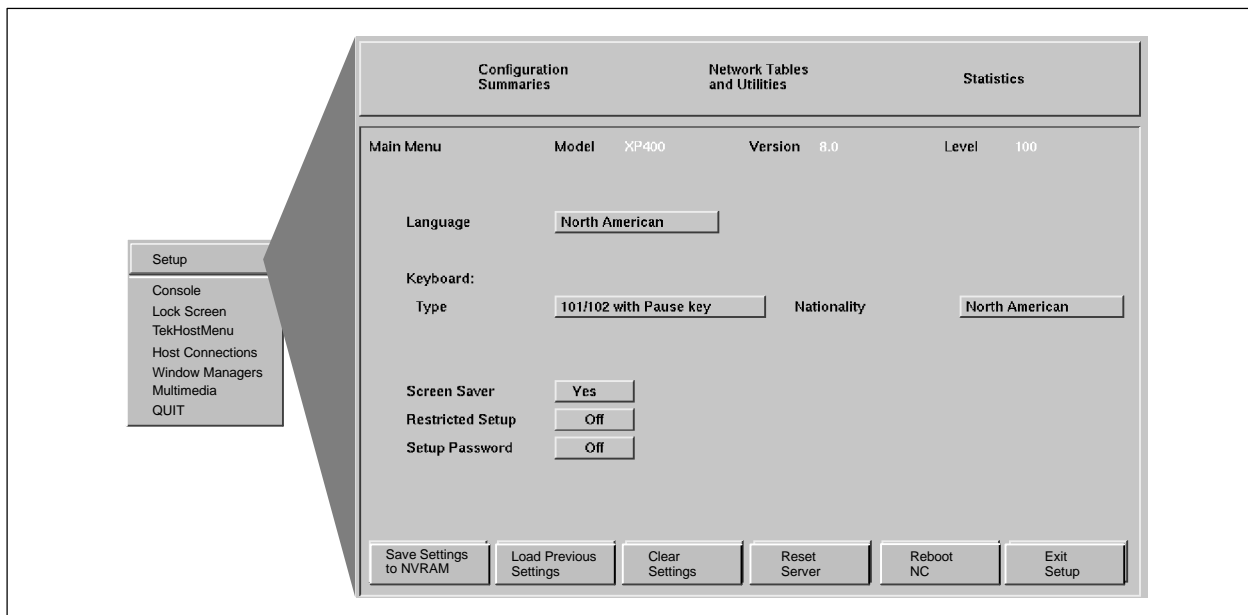
Figure 2-5   Tektronix Main Menu

Configuring the Tektronix X Terminal (continued)

Secondary Boot Host Configuration for the Tektronix X Terminal

If the host that you select when you configure the X terminal is unavailable when you boot an X terminal, the X terminal does not boot successfully. To avoid this situation, you can configure a secondary boot host for the X terminal if you have loaded the X terminal software on it.

To configure a secondary boot host, access the X terminal Setup menu as described on page 2-13. Then follow the steps below.

1. Select **Configuration Summaries ->Boot** at the top of the main menu. The Boot Configuration menu appears (Figure 2-6).

2. For the field labeled Secondary Boot Method, select **NFS**.

3. For the field labeled Secondary Boot Host Name, enter the IP address of the secondary host.

4. For the field labeled Secondary Boot Path for the new NC200 model, enter the following:
   ```
   /usr/tistar/xterm/tektronix/tekxp/boot/os.500
   ```

   For the secondary boot path for the old XP400 model, enter

   ```
   /usr/tistar/xterm/tektronix/tekxp/boot/os.350
   ```

5. Select **Return to Main Menu**.

6. When the main menu appears, select **Save Settings to NVRAM**.

7. To exit the main menu, select **Exit Setup**. The next time the X terminal boots, if the primary boot host is unavailable, the X terminal attempts to boot from the host whose IP address you supplied in step 3.

8. To exit the client launcher menu, select **Quit.**
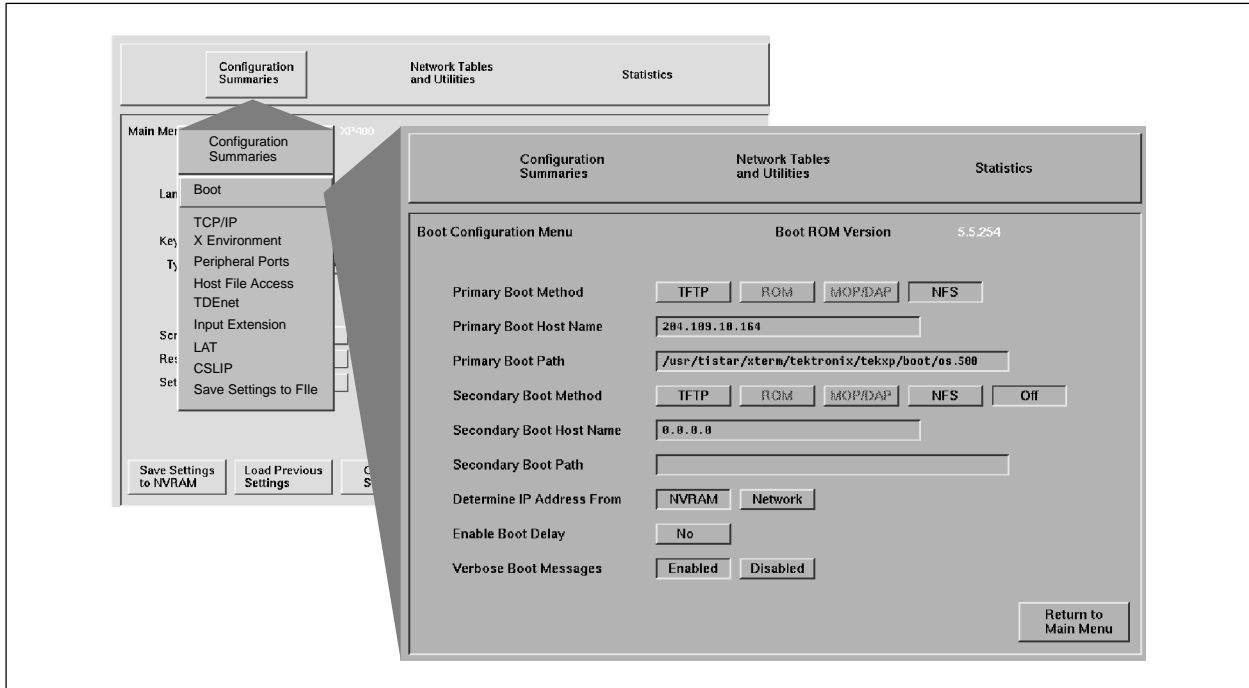
Figure 2-6   Tektronix Boot Configuration Menu

Configuring the Tektronix X Terminal (continued)

Connection Type Configuration for the Tektronix X Terminal

Since the default connection type for the Tektronix X terminal is XDMCP Broadcast, the X terminal boots and displays the XDMCP list of host stations. If you prefer to configure the X terminal to connect directly to a host (XDMCP Direct), access the X terminal Setup menu as described on page 2-13. Then follow the steps below.

1. Select **Configuration Summaries ->X Environment** at the top of the main menu (Figure 2-7). The X Environment Configuration menu appears.

2. For the field labeled Host Connect Method, select **XDMCP Direct**.

3. For the field labeled XDMCP Server, enter the IP address of the host to which you want to connect.

4. Select **Return to Main Menu**.

5. When the main menu appears, select **Save Settings to NVRAM**.

6. To exit the main menu, select **Exit Setup**. The next time the X terminal boots, it connects directly to the host with the IP address designated in step 3.

7. To exit the client launcher menu, select **Quit.**
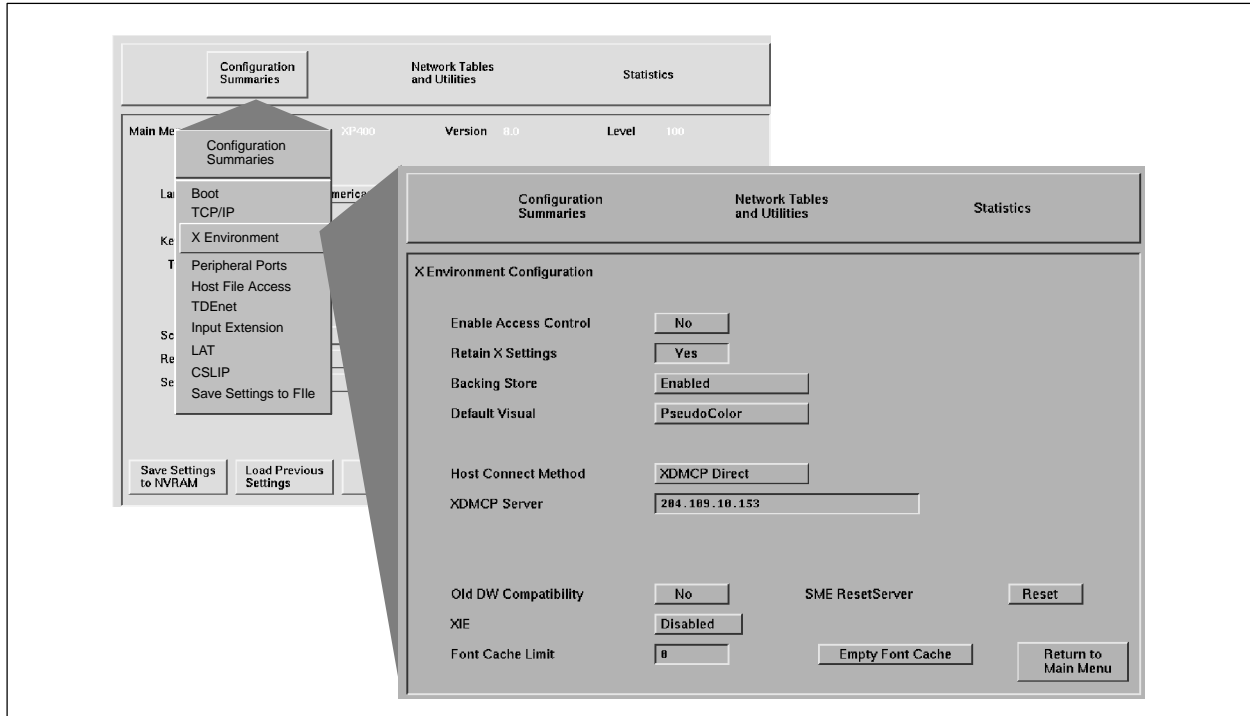
Figure 2-7   Tektronix Direct Connection Type

Configuring the Tektronix X Terminal (continued)

To change the connection type from XDMCP Direct back to XDMCP Broadcast, access the X terminal Setup menu as described on . If you are setting up the X terminal for the first time, follow the steps below.

1. Select **Configuration Summaries ->X Environment** at the top of the main menu (). The X Environment Configuration menu appears.

2. For the field labeled Host Connect Method, select **TekHostMenu**. The Default Host List field now says **XDMCP**.

3. Select **Return to Main Menu**.

4. When the main menu appears, select **Save Settings to NVRAM**.

5. To exit, select **Exit Setup**. The next time the X terminal boots, it displays the XDMCP list of host stations.

6. To exit the client launcher menu, select **Quit.**
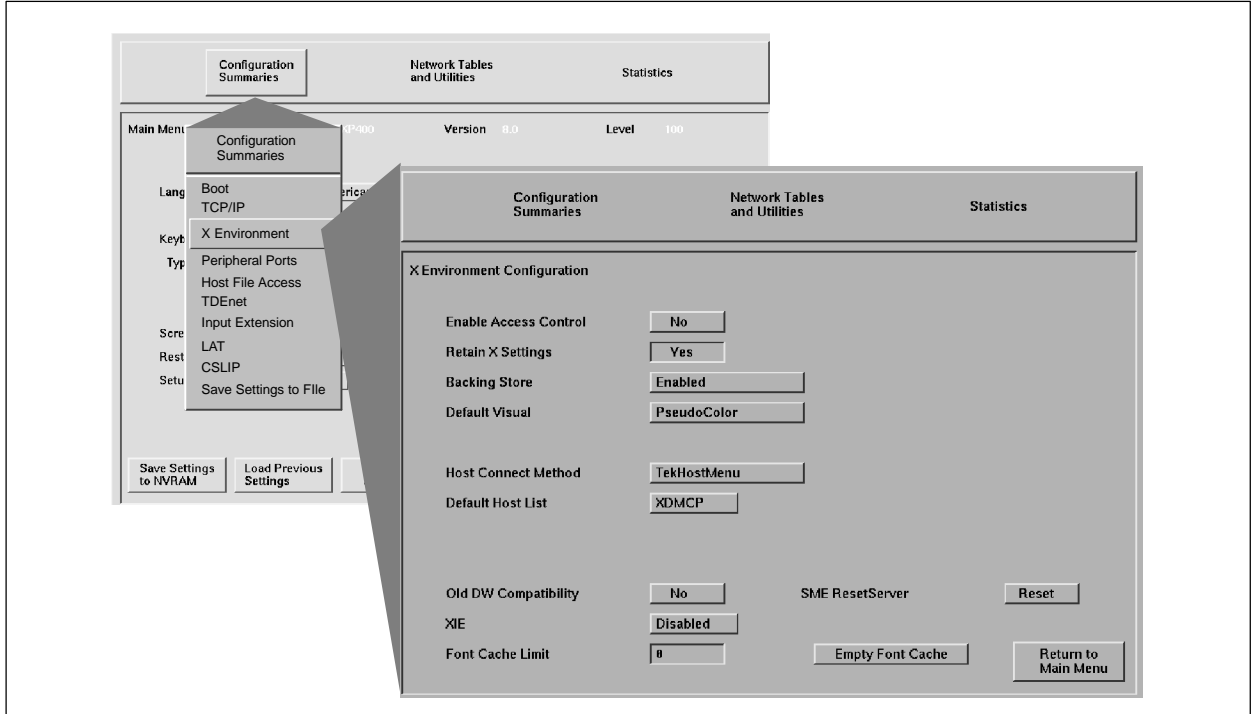
Figure 2-8   Tektronix Broadcast Connection Type

Configuring the Tektronix X Terminal (continued)

If you are using a previously set up X terminal, you may need to change the broadcast address and subnet mask. Access the X terminal Setup menu as described on , then follow the steps below to insure that the correct addresses are entered in the TCP/IP dialog box, then continue with the procedure on the previous page.

1. Select **Configuration Summaries ->TCP/IP** at the top of the main menu (Figure 2-9). The TCP/IP dialog box appears.

2. Check the Subnet Mask field. Use Table 2-1 on page 2-2 to be sure that the subnet mask is correct for the IP addresses of your host station and X terminal.

3. Check the Broadcast Address field. Use Table 2-2 on page 2-10 to be sure that the broadcast address is correct for the network class.
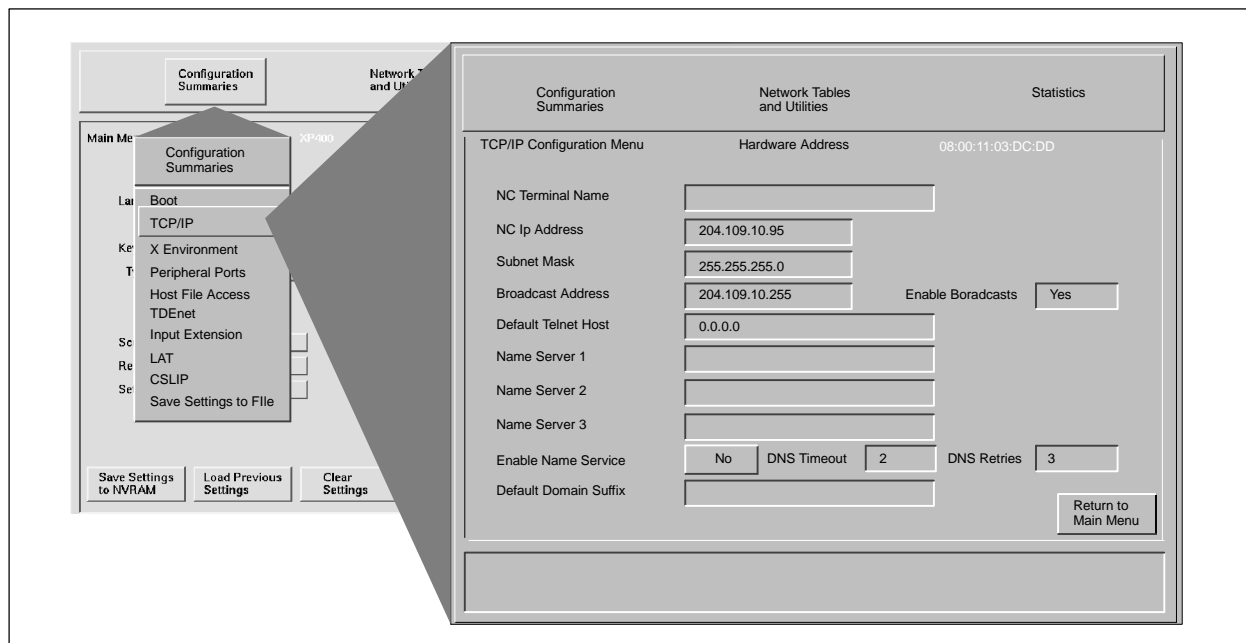
Figure 2-9   TCP/IP Dialog Box

Disabling Screen Saver on Tektronix X Terminal

The default setting for the screen saver on the Tektronix X terminal is **Yes**. The screen saver causes the screen to dim after ten minutes of inactivity. To turn off the screen saver, access the X terminal Setup menu as described on page 2-13. Then follow the steps below.

1. For the field labeled Screen Saver, select **No**.

2. Select **Save Settings to NVRAM**.

3. To exit from the main menu, select **Exit Setup**.

4. To exit the client launcher menu, select **Quit**. The screen saver feature for the X terminal is disabled; you do not need to reboot the X terminal for the change to take effect.

Restoring Tektronix X Terminal Settings

The following procedure describes how to restore your Tektronix X terminal settings to the original factory defaults. This may be useful if you are having problems configuring the X terminal, and you want to start over from the beginning.

1. Reboot the X terminal.

2. When the boot screen appears, press **Return**.

3. At the boot prompt, enter the following: `nvf`
   This command clears the X terminal configuration. You can now reconfigure the X terminal, following the procedure on page 2-12.

Configuring the Tektronix X Terminal (continued)

**Setting up
Tektronix
X Terminal Printer
as Network Printer**

If you have a Tektronix X terminal, you can configure its printer to be a network printer. Complete the series of tasks below.

To set up a print queue for the X terminal, do these steps on the OSx host station:

1. Be sure the X terminal software has been installed on the OSx host station.

2. Select **Controls ->OSx Terminal** on the host station, and log in as `root`.

3. At the command line prompt, enter the following command:

    ```
    cd /usr/tistar/xterm/tektronix/tekxp/boot/config
    ```

4. To set up a print queue for the X terminal, edit the **xp.cnf** file to look as follows. Be sure to uncomment these lines (remove the #):

    ```
    enable_print_spooler      YES
    spooler_size              4096
    spooler_local_queue       xxx PP0
    ```

    where xxx is the Server Printer Name in the Printer Configuration dialog box.

5. To protect data that you may have entered in the **hosts.tbl** file, enter the following command at the prompt:

    ```
    mv hosts.tbl hosts.tbl.off
    ```

6. To enable all OSx stations on the system to access the X terminal printer, enter the following command at the prompt:

    ```
    ln -s /etc/hosts hosts.tbl
    ```

7. Reboot the X terminal.

Perform the remaining tasks on the X terminal itself. To configure the names and addresses of the X terminal and the OSx stations in the Internet Host Table, follow these steps.

1. Press the **SHIFT** and **SETUP** keys simultaneously.

2. Select **Setup** from the Launcher window.

3. Select **Network Tables and Utilities ->Internet Host Table**.

4. Verify that the X terminal's name and IP address are present.

5. Verify that the host station's name and IP address are present.

6. Select **Return to Main Menu**.

To enable communication between the X terminal and the OSx stations, follow these steps.

1. Select **Configuration Summaries ->TCP/IP**.

2. Enter the X terminal name and IP address in the corresponding fields.

3. Enter the X terminal name in the Name Server 1 field.

4. Select **Return to Main Menu**.

5. Select **Save Settings to NVRAM**.

Continue on Page 2-24.
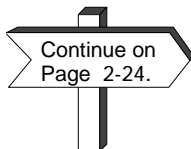
To complete your configuration of the X terminal printer as a network printer, continue with the procedure on .

To enable the parallel port for the printer, follow these steps.

1. Select **Configuration Summaries ->Peripheral Ports**.

2. In the Parallel Port column, select **89** for the Socket Number field, and **TCP/IP** for the Network Protocol field.

3. Select **Return to Main Menu**.

4. Select **Save Settings to NVRAM**.

5. Select **Exit** from Setup.

6. Select **Quit** from the Launcher window.

To configure the X terminal printer as a network printer, follow these steps.

1. From the OSx main menu bar on the X terminal or any OSx station, select **Startup ->Printer ->Printer Setup**.

2. At the bottom of the Printer Configuration dialog box, select **Add** to access the Add Printer dialog box.

3. In the Connection field, select **Network**.

4. In the Server Name field, select the X terminal's name.

5. In the Server Address field, enter the X terminal's IP address.

6. In the Server Printer Name field, enter the spooler_local_queue name.

7. Select **OK** to save your configuration and exit.

You have now completed setting up the Tektronix X terminal printer as a network printer.

NOTE: Each time a new OSx station is added to the system, the X terminal must be rebooted in order for the new station to access the X terminal printer.

2.4   Configuring the HP X Terminal

**Address
Configuration for
the HP X Terminal**

Only the HP Envizex p-series X terminal is supported by OSx. Other HP models are not supported. To configure the HP X terminal, follow the steps below.

1.   Power up the terminal.

2.   Click the **Setup** icon.
      A menu for X terminal configuration appears.

3.   Enter information as described below for these dialog boxes: Terminal, Network/General, Network/Ethernet, and Server.

Terminal Dialog Box   For Terminal information, follow these steps.

1.   Select **Terminal** at the top of the main menu.

2.   For the 17-inch Mag monitor, set the Monitor field to **HP D1193A**.

      For the 20-inch Intecolor monitor, set this field to **HP C2746 (1280)**.

3.   Click **OK** to save your change.

Configuring the HP X Terminal (continued)

Network/General Dialog Box   For general network information, follow these steps.

1. Select **Network ->General** at the top of the main menu.
    The Network/General dialog box appears (Figure 2-10).

2. Change the Network Parameters field to **From Fields Below.**

3. Set the File Server field to the IP address of the host where you loaded the software, for example: `204.109.10.164`

4. Turn off the Alternate NFS and TFTP fields.

5. Click **OK** to save your changes.

Figure 2-10   Network/General Dialog Box

Network/Ethernet Dialog Box   For ethernet information, follow these steps.

1.   Select **Network ->Ethernet** at the top of the main menu.
     The Network/Ethernet dialog box appears (Figure 2-11).

2.   Set the IP Address field to the IP address of the X terminal.

3.   Set the Subnet Mask field as appropriate.

4.   Set the Terminal Name field to the name that you want to use for your X terminal.

5.   Select **OK** to save your changes.
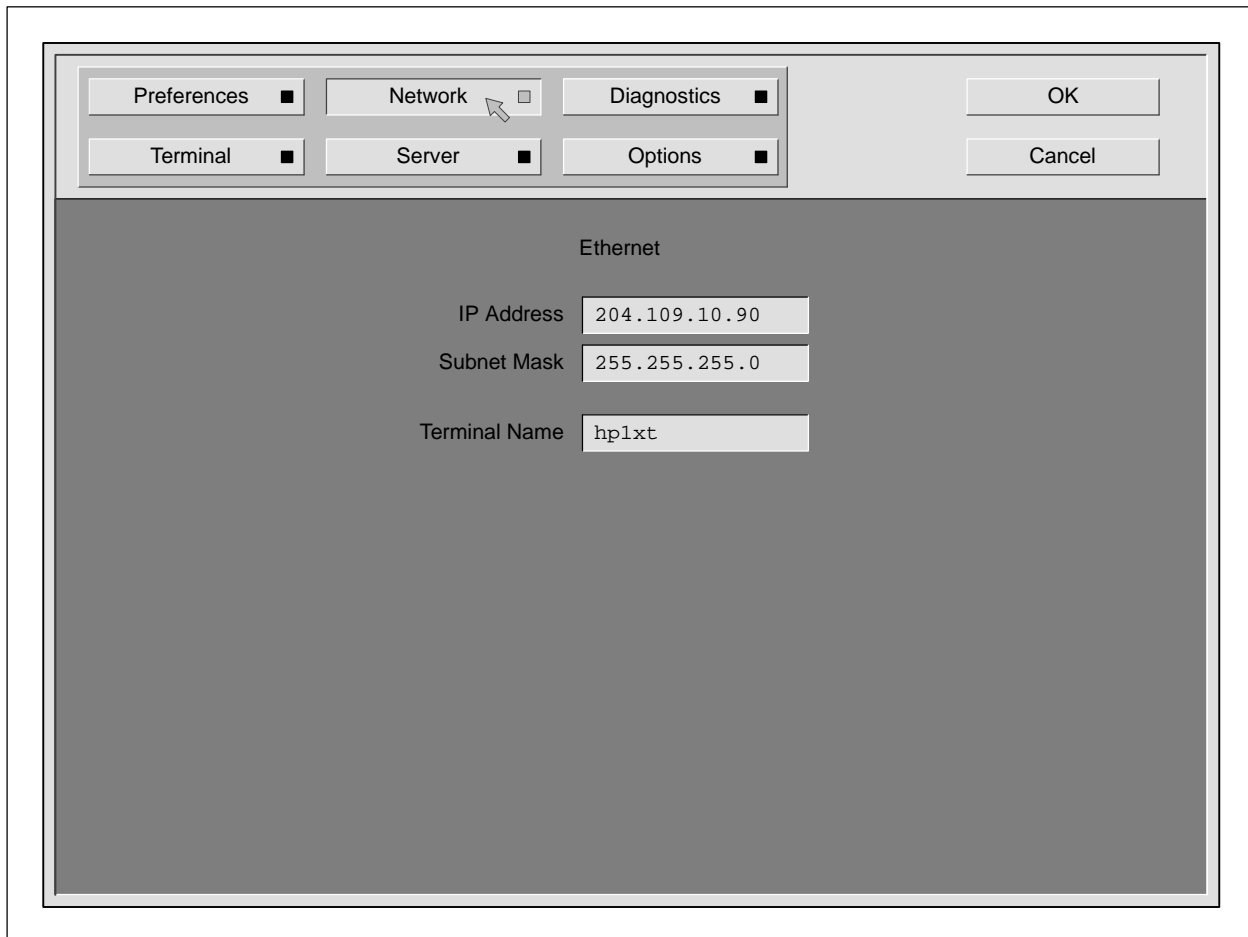
Figure 2-11   Network/Ethernet Dialog Box

Server Dialog Box   For server information, follow these steps.

1.   Select **Server** at the top of the main menu.

2.   Enter the following in the Base Path field:
     `/usr/tistar/xterm/hp/enware/usr/lib/X11/700X/`

3.   Select **OK** to save your changes.

4.   Power off the X terminal.
     When you power up the X terminal, it boots off the host that you
     selected. After it finishes booting, it then attempts to connect to this
     host.

Accessing the HP X Terminal Setup Menu

You may need to supply additional configuration information at a later time.
For example, you can configure a secondary boot host for an HP X terminal.
After the X terminal has booted, you can access the X terminal Setup menu
and modify additional parameters. You can do this at any time, even when
the X terminal is displaying OSx. However, there are different procedures
for accessing the Setup screen in different situations.

- If the X terminal has not completed booting, select the **Setup** icon. In
  this case, however, not all menu items appear. Some items, such as
  certain fields in the Server menu, only become available after the
  X terminal has completed booting.

- If the XDMCP Broadcast list of available hosts is displaying, select the
  To Config button at the top of this list.

- In all other situations, press and hold the **F12** key until the Setup menu
  appears.

Select the appropriate option from the Setup menu. See for configuration options.

Secondary Boot Host Configuration for the HP X Terminal

If the host that you select when you configure the X terminal is unavailable when you boot an X terminal, the X terminal does not boot successfully. To avoid this situation, you can configure a secondary boot host for the X terminal if you have loaded the X terminal software on it.

To configure a secondary boot host, access the X terminal Setup screen as described above. Then follow these steps.

1. Select **Network ->General** at the top of the main menu.

2. In the Alt. File Server field, enter the IP address of the secondary boot host.

3. Select **OK** to save your changes.
    The next time you boot the X terminal, if your main boot host is not available, the secondary boot host will be used.

Configuring the HP X Terminal (continued)

Connection Type Configuration for the HP X Terminal

Since the default connection type for the HP X terminal is XDMCP Direct, the X terminal boots and connects to the OSx station that you configured as the file server. If you prefer to configure the X terminal to display a list of host stations (XDMCP Broadcast), access the X terminal Setup screen as described on . Then follow the steps below.

1. Select **Server** at the top of the main menu.
    The Server dialog box appears (Figure 2-12).

2. Select **Login** and change it to **XDMCP Broadcast**.

3. Select **OK** to save your changes.
    The next time the X terminal boots, it displays the XDMCP list of host stations.

If you want to keep the XDMCP setting as XDMCP Direct, but want to connect to a different host, follow the steps below.

1. Select **Server**.

2. Set the Login Host field to the IP address of the new host.

3. Select **OK** to save your changes.
    The next time the X terminal boots, it connects immediately to the new host.

Preferences ■	Network ■	Diagnostics ■		OK
Terminal ■	Server □	Options ■		Cancel

Login   XDMCP Broadcast   Login Host [   ]

Client authorize ■   Font Caching □

Access control ■   Free Cached Fonts

R3 Compatible ■   Backing Store   By Application

X Server from   Network   X Server file [   ]

RGB file from   Network   Extensions...

Base path   `/usr/tistar/xterm/hp/enware/usr/lib/X11/700X/`

Default
Font path
```
./fonts/hp_roman8/75dpi/
./fonts/iso_8859.1/75dpi/
./fonts/iso_8859.1/100dpi/
./fonts/misc/
```

ROM fonts ■	Reset font path	Copy Current Path

Figure 2-12   Server Dialog Box

Configuring the HP X Terminal (continued)

Disabling Screen Saver on HP X Terminal

According to the default setting, the screen saver on the HP X terminal causes the screen to dim after ten minutes of inactivity. To turn off the screen saver, access the X terminal Setup menu as described on . Then follow the steps below.

1. Select **Preferences** at the top of the main menu.

2. Using the cursor, move the slider next to the Screen Saver field all the way to the left (where the label 0 appears).

3. Select **OK** to save your changes.
   The screen saver is disabled. You do not need to reboot the X terminal for this change to take effect.

Restoring HP X Terminal Settings

The following procedure describes how to restore your HP X terminal settings to the original factory defaults. This may be useful if you are having problems configuring the X terminal and you want to start over from the beginning.

1. Reboot the X terminal.

2. When you hear the double beep, press **Shift F9**.
   This command clears the X terminal configuration. You can now reconfigure the X terminal, following the procedure on .

Using the HP Keyboard Keypad

Whenever the HP X terminal is booted up or a host session has ended, the NUM-LOCK LED on the engineering keyboard is turned on. If you turn off the NUM-LOCK LED by pressing the **Num-Lock** key, you can decrease the time required to connect the X terminal to an OSx station by approximately one minute. To use the numbers on the keypad on both engineering and operator keyboards, you must first press and hold the **Shift** key.

2.5   Configuring Other X Terminals

Tektronix, HP, and NCD X terminals are recommended for use with OSx. If you purchase an X terminal other than Tektronix, HP, or NCD, be aware of these general requirements. The X terminal must provide the following:

• Support for 256 colors and pseudocolor capability

• Support for X11R5 or higher

• XDMCP capability

• Screen resolution of 1280 x 1024

• An internal alarm annunciator (volume, pitch, duration)

The operator keyboard has been tested only with Tektronix, HP, and NCD X terminals.

Install the X terminal software that you received with your X terminal in the **/usr/tistar/xterm** directory. Approximately 60 Mbytes of disk space are reserved in this directory for storage of X terminal software.

In general, you need to provide the following information to configure an X terminal:

• Boot station(s) — IP address(es) of the OSx station(s) from which the X terminal can boot and access font information. To obtain the IP address of an OSx station, access **Startup ->Network Setup** on the menu bar. Click **View Node** in the Network Setup dialog box.

• X terminal(s) — Name and IP address of each X terminal.

• Subnet mask — Networks are divided into subnetworks to facilitate network administration. The subnet mask consists of four integers designating the subnetwork. If, for example, your IP addresses are Host station: 204.109.10.152 X terminal: 204.109.10.100, then your subnet mask is 255.255.255.0, where the "255" integer indicates that the corresponding integers in the two IP addresses are identical, and the "0" integer indicates that the integers are different.

• The full path of the directory where you loaded the X terminal software.

Additional information may be required for more complicated network setups, such as those involving gateways. Consult your X terminal documentation for more specific instructions about configuration.

2.6   Configuring the PC X Server Package

You can also access OSx from a third-party X server package running on a personal computer (PC). The X server package uses one of your SIMATIC PCS 7 OSx X terminal activation licenses exactly as if it were an X terminal.

These X server packages are widely available for MS-DOS, Windows 3.X, Windows 95, and Windows NT environments.

In general, to work properly with OSx, a third-party X server package must provide the following:

- Support for 256 colors and pseudocolor capability

- Support for X11R5 or higher

- XDMCP capability

The PC running the software must have the following:

- Graphics hardware and drivers supporting a screen resolution of 1280x1024

- Ethernet network adapter and software supporting TCP/IP

If you use a third-party X server package to interact with OSx, be aware of the following limitations:

- If your PC is running any of the Microsoft Windows environments with more than 256 colors, the OSx alarm icon does not blink. This situation is caused by the way that Windows allocates colors within its environment. If you want the OSx alarm icon to blink at appropriate times, reconfigure your Windows video driver to use only 256 colors.

- When you run an X server package from a Windows environment, the pitch of the OSx alarm beeper sounds the same for both critical and warning alarms. This is a limitation of the bell capability provided by the Windows environment.

- The operator keyboard has not been tested with computers running third-party X server packages.

- Many PC-based X servers running under Windows allow you to run the X environment either in a single window or in multiple windows. For OSx to operate correctly, you must configure the X server to use its single window mode.

To support a PC-based X server package, you do not need to load any special software on the OSx system, other than your SIMATIC PCS 7 OSx X terminal activation license information.

Consult the user documentation for your X server and network software for specific configuration instructions. In general, however, you need to provide the following information to configure an X server and network software on a PC:

- IP address of the PC

- Network subnet mask

- Color support (specify pseudocolor)

- Start-up method (specify XDMCP)

To select a host from a list of available OSx stations at startup, configure the X server to use the XDMCP Broadcast connection type. To connect to the same station at startup each time, configure the X server to use the XDMCP Direct connection type.

NOTE: If the Windows color palette setting is greater than 256, the OSx terminal session will fail when a **.gif** image is displayed. Be sure that the color palette is set to 256 colors.

2.7   Using Keyboards with the X Terminal

Using Keyboards with a Tektronix or NCD X Terminal

To use the operator keyboard with a Tektronix or NCD X terminal, follow the steps below.

1.   Verify that the X terminal is powered off, and then connect the operator keyboard to it.

2.   Power up the X terminal. The operator keyboard is now ready to use. No reboot of the system is required.

To switch back to the engineering keyboard, follow the steps below:

1.   Verify that the X terminal is powered off, and then connect the engineering keyboard to it.

2.   Power up the X terminal. The engineering keyboard is now ready to use. No reboot of the system is required.

To use an engineering keyboard plugged into an operator keyboard with a Tektronix or NCD X terminal, follow the steps below:

1.   Verify that the X terminal is powered off, and then connect the operator keyboard to it.

2.   Plug the engineering keyboard into the operator keyboard.

3.   Set the switch to select the engineering keyboard.

4.   Power up the X terminal. Both the operator keyboard and the engineering keyboard are now ready to use. Set the switch to the one you want to enable. No reboot of the system is required.

NOTE: Do not disconnect the engineering keyboard during normal operation. Disconnecting the keyboard will cause the keyboard map to be lost. To recover from a situation where the keyboard map has been lost, press **Shift–Pause** to bring up the setup screen, and reselect the keyboard type (**101/102** with **Pause** key). It should not be necessary to reboot the unit.

**Using Keyboards
with the HP
X Terminal**

Keep these points in mind when using the HP X terminal.

For operator keyboards:

- When you enter data in fields of the HP configuration screens (those accessed via **Shift** + **F12**) with the operator keyboard, characters display in the opposite case than you would expect. For example, if you press **Shift** with a letter, the lowercase letter is entered. Without the **Shift** key, the uppercase letter is entered.

- The **Num_Lock** key works with the keypad numbers the way the **Shift** key works with letters. To use it, press and hold it while you press the number. You can also use the **Shift** key with the keypad numbers.

  To use the keypad in data entry fields, you must use the **Num_Lock** key; the **Shift** key does not work. You can also use the number keys located above the letter keys.

For engineering keyboards:

- The Num_Lock LED turns on when you power up the X terminal and when you disconnect from a host.

  If you turn off the Num_Lock LED by pressing the **Num_Lock** key before connecting to a host, then the **Num_Lock** key works like a **Shift** key, as described above. To use the keypad in data entry fields, press the **Num_Lock** key, not the **Shift** key.

  If you do not turn off the Num_Lock LED before connecting to the host, then the **Num_Lock** key does not work at all. You cannot use the keypad to enter data in data entry fields. Use the number keys located above the letter keys instead.

For either operator or engineering keyboards:

- The keypad does not work in the fields of the HP configuration screens. To type numbers in these fields, use the number keys located above the letter keys.

- To clear a data entry field using the asterisk key on the keypad, use the **Shift** key plus the asterisk key on the keypad (*).

2.8   Using the X Terminal

Opening a Session   The way a session opens depends on how you have configured the connection between the X terminal and the OSx host station.

Direct   The X terminal automatically connects to the host after it powers up and boots. After a short delay, the X terminal displays the OSx environment if the host is an OSx station. Simply log into OSx using your OSx User ID and password to begin working.

Broadcast   The X terminal displays a list of hosts after it powers up and boots. Select a host from the list. After a short delay, the X terminal displays the OSx environment if the host is an OSx station. Log into OSx using your OSx User ID and password to begin working.

NOTE: If you open a session from an X terminal after the prompt to designate a new primary has already appeared on the OSx host station, the prompt does not appear on the X terminal. To verify from the X terminal that the host station is communicating with the primary, check Network Status.

Identifying the Terminal Number

The terminal number appears in the information area of the main OSx screen (Figure 2-13). The number 1 always indicates the OSx station; numbers 2–5 indicate X terminals and/or remote terminals, if any are connected. The system assigns these numbers each time an X terminal or remote terminal connects to the system. This means that the numbers can change from session to session.

Figure 2-13   Information Area with X Terminal Number

Working within a Session

After logging into OSx, you can do all the normal configuration and runtime tasks that can be done at any OSx station. Consider these guidelines:

- Only one instance of a specific configuration screen can be displayed at a time on an OSx host station and its X terminals. This means, for example, that if the BCL Program Administration dialog box is displayed on an X terminal, neither the host for that X terminal nor any other X terminal logged into that host can display this dialog box. They can, however, display other configuration dialog boxes. Other OSx stations can display the BCL Program Administration dialog box.

- You can run multiple instances of the graphical editor. This means that users at an OSx station and its X terminals and/or remote terminals can be working on graphics at the same time. Be aware, however, that running multiple instances of the graphical editor without sufficient additional memory can significantly slow down system performance. See .

  The memory check performed to determine if there is enough memory to start an X terminal session does not take the number of graphical editors running into consideration. Please bear this in mind if you start an X terminal and find that performance is degraded.

- On a SIMATIC PCS 7 system with multiple X terminals, if you attempt to change system state before all X terminals are connected and in the same state as the OSx host station, the system goes into alarm, and error messages are recorded in the daily log file. (The messages **Unknown X modifier: num_lock** and **Cannot load transition indication form** appear in the **log.out** file.) If this happens, acknowledge the alarm, and then connect the other X terminals.

  To avoid the system alarm, do not make state changes until all X terminals are connected.

- There is no alarm card in an X terminal. You can see and acknowledge alarms on an X terminal, and you can hear the X terminal bell sound indicating an alarm, but you cannot connect a siren or klaxon to it.

- There is no failover for the X terminal. If the host fails, the X terminal does not fail over automatically to the backup. You must make another connection manually.

- If the network that the X terminal is using fails, the X terminal does not switch media automatically. You must switch networks manually.

- If you select **Controls ->OSx Terminal** from the menu bar on an X terminal to open an OSx XTerm window, the display environment variable is not set appropriately. If you want to run an X application from this window, you must set the display variable yourself. Set it to the name or IP address of the X terminal with the following extension: `:0.0` For example: `export DISPLAY=204.109.10.94:0.0`

- When an OSx station that already has X terminals joins a SIMATIC PCS 7 system, the system verifies that the total number of X terminals that are running an OSx session does not exceed the number of X terminal activation licenses purchased for the system. If the number of licenses is exceeded when the station with the additional X terminals joins, the OSx session on one or more of the X terminals connected to the joining station closes. Users of these X terminals need to select **Quit OSx Session** from the root menu to disconnect from the OSx station.

Using the X Terminal (continued)

Printing from an X Terminal

Any OSx print jobs that you initiate on the X terminal can be printed to the printer connected to the OSx host station or any other station, to any network printer, or to the printer connected to the X terminal (Tektronix only). Any non-OSx applications that you run on the X terminal can use the local printer port.

You must configure the screen print function on an X terminal before you can do a screen print. Select **File ->Screen Print ->Setup** on the menu bar and fill in the appropriate information.

If you disconnect the X terminal from the host, you must reconfigure the screen print function the next time you connect to the host.

When you want to print a screen from an X terminal, the system sends the print job to the printer that is connected to the host station.

Closing a Session

The way you close a session depends on how you have configured the connection type.

Direct   If you do not want to power down the X terminal, log off OSx. Because the X terminal does not release the license or close the connection, the next user can simply log in to begin working. When you are ready to power down the X terminal, first select **Quit OSx Session** from the root menu. As soon as the blank gray screen appears, power down the X terminal. The license then becomes available for another X terminal.

NOTE: If you do not power down the X terminal as soon as the gray screen appears, another session begins. Select **Quit OSx Session** again, wait for the gray screen, then power down the terminal.

Broadcast   Select **Quit OSx Session** from the root menu to end a session. At this point, you can safely power down the X terminal. If you do not power down after ending a session, the X terminal redisplays the list of hosts and releases the license until you begin a new session.

It can take approximately one minute to end a session and release the X terminal activation license. If you try to start a new X terminal session too soon after ending a session, the system sends a message that all X terminal licenses are in use. Wait a minute and then try to start the session again.

NOTE: Close all OSx dialog boxes before selecting **Quit OSx Session**. Otherwise, there may be a delay of up to 30 seconds before the X terminal session ends.

2.9   Troubleshooting

Table 2-3 provides troubleshooting strategies for various problems that you may encounter while using an X terminal. Try the suggested solutions, and if you need further assistance, call the Siemens Energy & Automation, Inc., Technical Services Group in the U.S.A. at 423–461–2522. In other countries, call 49–911–895–7000.

Table 2-3   X Terminal Troubleshooting

Problem	Solution
A gray screen appears, but the OSx screen does not display.	The host is not running OSx. Select a host that is running OSx.
You experience a delay in opening a session.	OSx may be changing state, an OSx station may be synchronizing, or another X terminal may be opening a session. Wait a few minutes; the session should begin automatically upon completion of the current activity.
You receive the warning message: **Not enough memory installed in node. Performance may be degraded.**	Connect to another OSx station that has sufficient memory installed. In order to use the current station, additional RAM must be installed. See Table 1-1 on page 1-7 for host station memory requirements.
You receive an error message indicating that the maximum number of X terminals is already connected to that host station.	Try to connect to another host if the X terminal boots with a query list of hosts.
You receive an error message indicating that all X terminal activation licenses are in use.	Wait for another X terminal to end a session and then try to log in again.
The OSx network fails.	If two networks are installed, switch manually to the other network.
The OSx host station fails.	Reboot the X terminal or select **Quit OSx Session** from the root menu. Then try to connect to another host, if the X terminal boots with a query list of hosts.
An X terminal loses contact with an OSx host station, and that station attempts to go to the Operate state. The OSx station goes to Failed or returns to Offline.	Wait 5 to 15 minutes and then retry the state change. The OSx station will then recognize that the X terminal is no longer connected and the state change will complete. To recover the X terminal, verify that the network connections are properly attached and reboot the X terminal.

Reconfiguring Plug-and-Play Monitors

Determining Whether You Need to Reconfigure

Under the following conditions, you may find while the terminal is booting that the required **HPD1193A** option is not displayed under the terminal icon:

- You have an HP X terminal with a plug-and-play monitor.

- You are using a 15-pin connector plugged into the monitor instead of a video cable with 5 BNC connectors.

Some monitors have a "plug-and-play" feature that OSx does not recognize. You need to disable this feature and replace it with the **HPD1193A** monitor option as described in the following procedures.

Changing the X Terminal Config File

Follow the steps below to change your X terminal's configuration data.

1. Power up the X terminal. As the terminal is booting, press the space bar or click the **Stop** icon to abort the boot process. The **Stop** icon changes to **Start.**

2. While you hold down the left **Alt** key, press the **0** (zero) key on the numeric keypad, followed by the **d** key. This action disables the plug and play feature.

3. Click the **SETUP** icon. A menu for X terminal configuration appears.

4. In the Setup dialog box, click the **Terminal** button.

5. In the File field on the lower right of the Terminal dialog box, enter a file name with its extension. For example, `AAA.cfg`.

6. Click in the Monitor field to display the monitor selection list.

7. Select **HPD1193A** as the monitor type, then click **OK** to exit the Terminal dialog box. Click **OK** to exit the Setup dialog box.

8. Click the **Start** icon, and let the boot process finish. When the boot finishes, a list of host nodes appears. Do not select a host from this list; proceed with the next set of steps.

Creating a New File in the Boot Node Config Directory

Next, you need to create an empty file for the X terminal configuration directory on the boot node. (The boot node is the node that the terminal is the licensed to, and that it boots from.)

On the boot node, do the following steps.

1. Click the left mouse button to bring up the root menu, and select **New XTerm**.

2. In the XTerm window, log in as `root`.

3. Type the following command, then press **Enter**. Note that command line entries are case-sensitive.

   `cd /usr/tistar/xterm/hp/enware/usr/lib/X11/700X/config`

4. Using the filename that you entered in step 5 on page A-2, type `vi <file_name>` and press **Enter**.

5. Type `:wq` to save the empty file and exit the config directory.

Writing X Terminal File to Boot Node File

In the next procedure, you write the X terminal's configuration data into the empty file that you created on the boot node.

On the X terminal, do the following steps.

1. In the Select Session Manager box, click the **To Config** button.

2. In the Config dialog box, click the **Terminal** button.

3. Click the **Write File** button in the Remote Config field.

4. When the **Overwrite File?** message appears, click **OK**.

5. Click **OK** on the Config dialog box.

**Changing Boot
Node Config File**

To modify the plug-and-play option in the X terminal config file on the boot node, do the following steps on the boot node.

1. To edit the config file, type

   ```
   vi <file_name>
   ```

2. To search for **DDC Monitor Support,** type the following at the top of the file.

   ```
   /DDC Monitor
   ```

3. When **DDC Monitor Support=On** is highlighted, arrow over to the **O** in **On**.

4. Type `dw`, then `i`, then `=Off`
   Press **Enter**.

5. Press the **Esc** key.

6. Type `:wq` to save and exit. Press **Enter**.

7. To exit from the XTerm window, type `exit`.

Continue with the instructions for completing the Network Dialog box.

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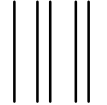
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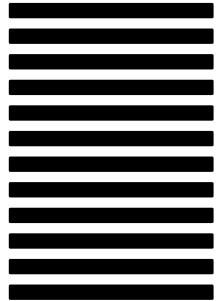3000 BILL GARLAND ROAD
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