Quantum PX500 Series TC2201 Upgrade Instructions

Introduction 3

TC2201 Bridge Operation 3

Preparing for the TC2201 Installation 3

Required Upgrade Kits 3

Required Equipment (Customer Supplied) 3

Required Tools 3

TC2201 Upgrade Procedure 4

Preparing the Quantum PX500 Series Library 4

Removing Tape Drive SCSI Cables 5

Installing the TC2201 Bridge 8

Installing the Ethernet Cables 12

Installing SCSI Cables 16

Configuring the TC2201 Bridge Software 18

Saving the Configuration File 23

Zoning the Ethernet Switch 25

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Introduction

The Quantum PX500 Series automated tape libraries are controlled by a host computer via a SCSI LVD bus using the SCSI-3 medium changer command set.

The Quantum PX500 Series allows for easy conversion from the SCSI host interface to an iSCSI host interface. This document describes upgrading a standard PX500 library equipped with a SCSI host interface to an iSCSI host interface using a TC2201 Upgrade kit.

TC2201 Bridge Operation

Once a TC2201 bridge option is installed and tested, the library operates exactly as a PX500 Series with a SCSI host interface. Operation of the library via the operator control panel (OCP) is unchanged.

Preparing for the TC2201 Installation

Before beginning the installation procedure, make sure that you have the required upgrade kit and tools.

Required Upgrade Kits

The TC2201 installation requires the following upgrade kit for every two tape drives in a PX500 Series library (see table 1):

> **Note:** All part numbers are subject to change without notice.

Table 1 TC2201 Upgrade Kit PN PR-UU9WG-YF

Qty	Description
1	TC2201-LVD PWA
2	SCSI Cables
1	Ethernet cable
1	Quantum PX500 Series TC2201 Upgrade Instructions

Required Equipment (Customer Supplied)

A zonable Ethernet switch is required if multiple TC2201 iSCSI bridges are installed in either a PX506 or PX510 library. If a single TC2201 iSCSI bridge is installed, an Ethernet switch is not required.

Required Tools

The following tools are required to install the TC2201 bridge upgrade:

- #2 PHILLIPS® screwdriver

TC2201 Upgrade Procedure

The upgrade procedure is identical regardless of the number of TC2201s installed except where noted. The upgrade procedure consists of the following major steps:

- Preparing the Quantum PX500 Series Library
- Removing Tape Drive SCSI Cables
- Installing the TC2201 Bridge
- Installing the Ethernet Cables
- Installing SCSI Cables
- Configuring the TC2201 Bridge Software

Preparing the Quantum PX500 Series Library

To prepare the PX500 Series library:

> **Caution:** Use appropriate ESD procedures when assembling and installing the TC2201 option.

1 With the library turned on, press the **Ops** button on the OCP to access the **Operations** screen (see figure 1).

Figure 1 Operations Screen

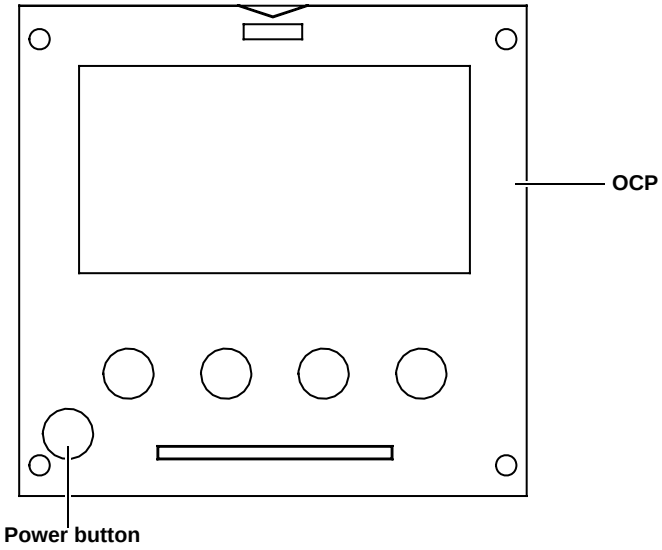
2 Select **Library operations** and press **Enter**.

3 From the library operations menu, select **Library on/offline** and press **Enter** to turn the library offline.

4 Verify that the OCP display indicates "Offline" from the **OCP** screen.

5 Turn off the power button located on the front of the library (see figure 2).

Figure 2 Turning On the Library



Removing Tape Drive SCSI Cables

Each pair of tape drives within the library are connected via a SCSI cable. These cables must be removed prior to cabling the TC2201.

1. Locate the SCSI cables connecting each pair of tape drives in the library and the host systems (see figure 3 for PX502, figure 4 for PX506, and figure 5 for PX510). The tape drives are numbered 1 through 10 (depending on library model) starting in the top-right drive bay. Tape drive 1 is in the upper right-hand drive bay, tape drive 2 is in the upper left-hand drive bay, and so forth. Refer to the following illustrations for exact tape drive numbering.

Figure 3 PX502 Cabling Configuration

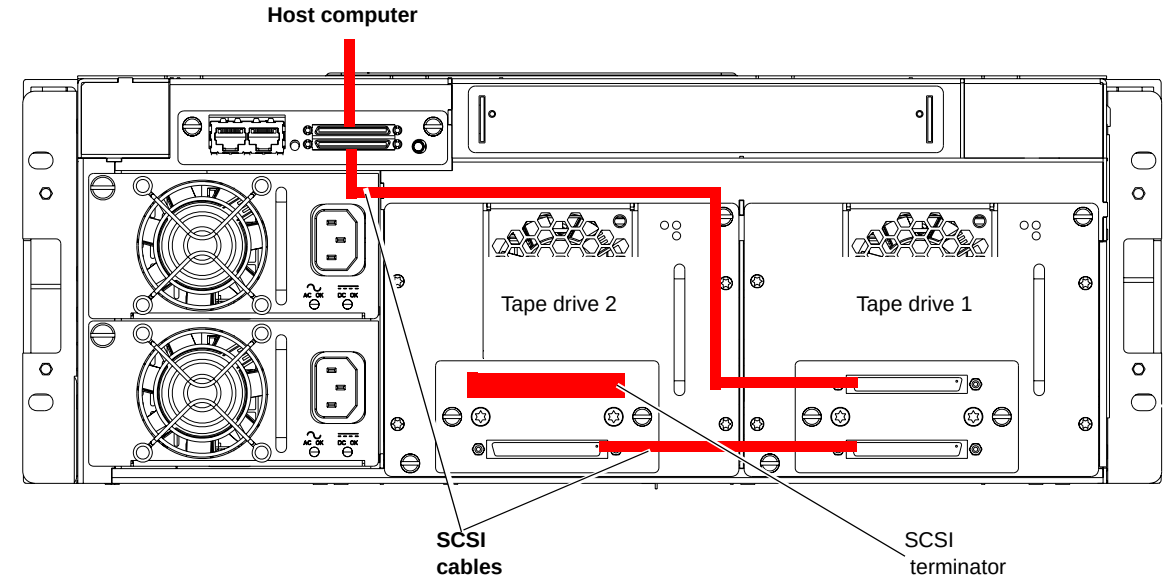


Figure 4 PX506 Cabling Configuration

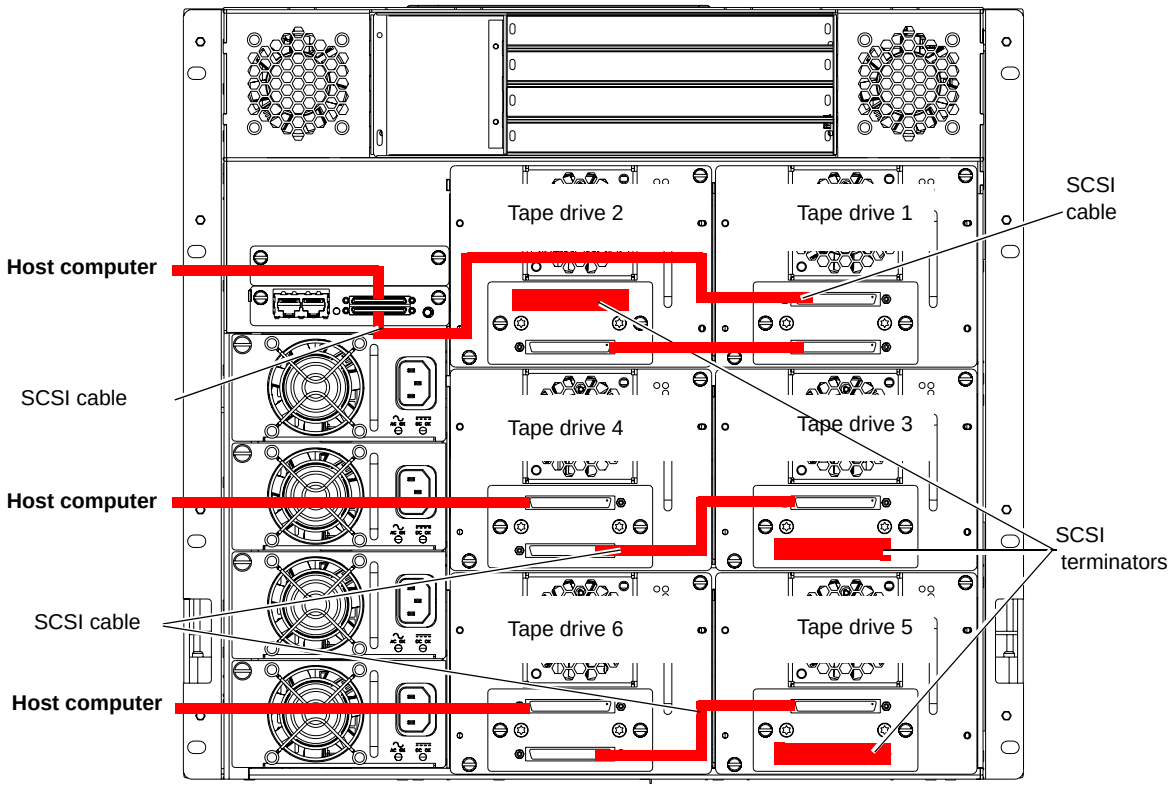
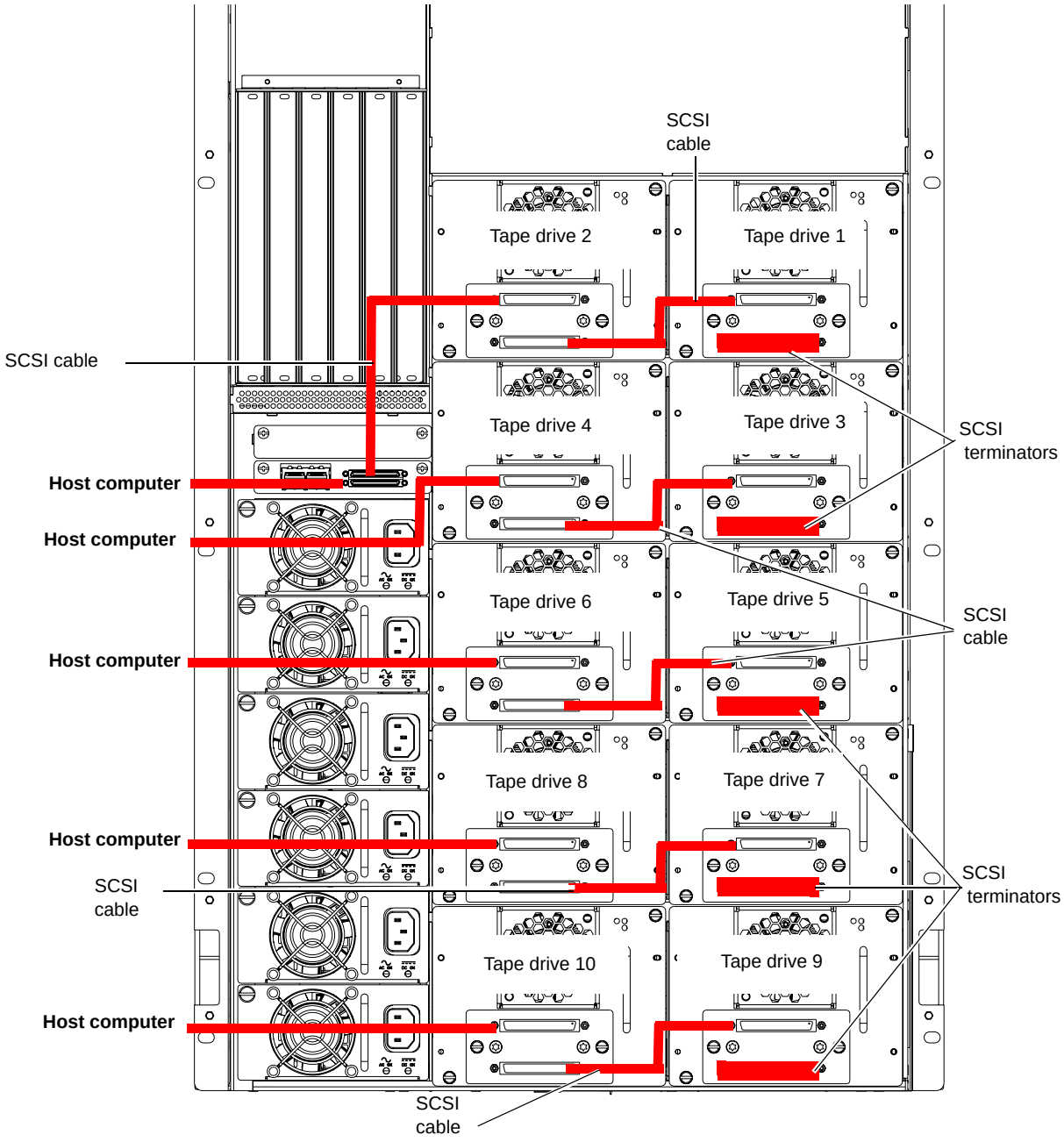


Figure 5 PX510 Cabling Configuration



2 Remove all SCSI cables connecting each pair of tape drives and the host systems and also all terminators.

Installing the TC2201 Bridge

The number of TC2201 bridges required depends on the number of tape drives installed in the library.

- 1 to 2 tape drives requires 1 TC2201
- 3 to 4 tape drives requires 2 TC2201 bridges (PX506 and PX510 only)
- 5 to 6 tape drives requires 3 TC2201 bridges (PX506 and PX510 only)
- 7 to 8 tape drives requires 4 TC2201 bridges (PX510 only)
- 9 to 10 tape drives requires 5 TC2201 bridges (PX510 only)

To install the TC2201 bridge:

1. Loosen the two PHILLIPS screws securing the blank off plate(s) to the CPCI card cage and expose the number of slots needed for the TC2201 installation (one blank off plate per TC2201).

   Note: Start the TC2201 installation in slot 1 of the CPCI card cage (PX506 and PX510 only).

2. With the SCSI ports located to your right as you face the back of the library, slide the first TC2201 into the slot of the card cage (see figure 6 for PX502, figure 7 for PX506, and figure 8 for PX510).

Figure 6 Installing a TC2201 Bridge (PX502)

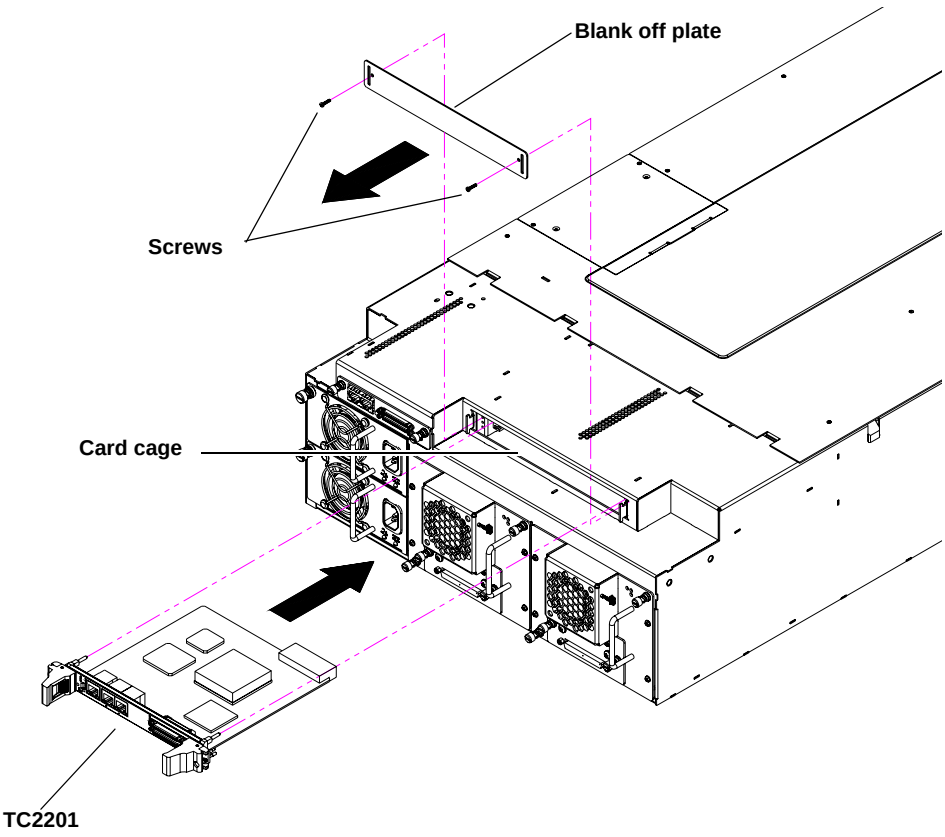


Figure 7 Installing a TC2201 Bridge (PX506)

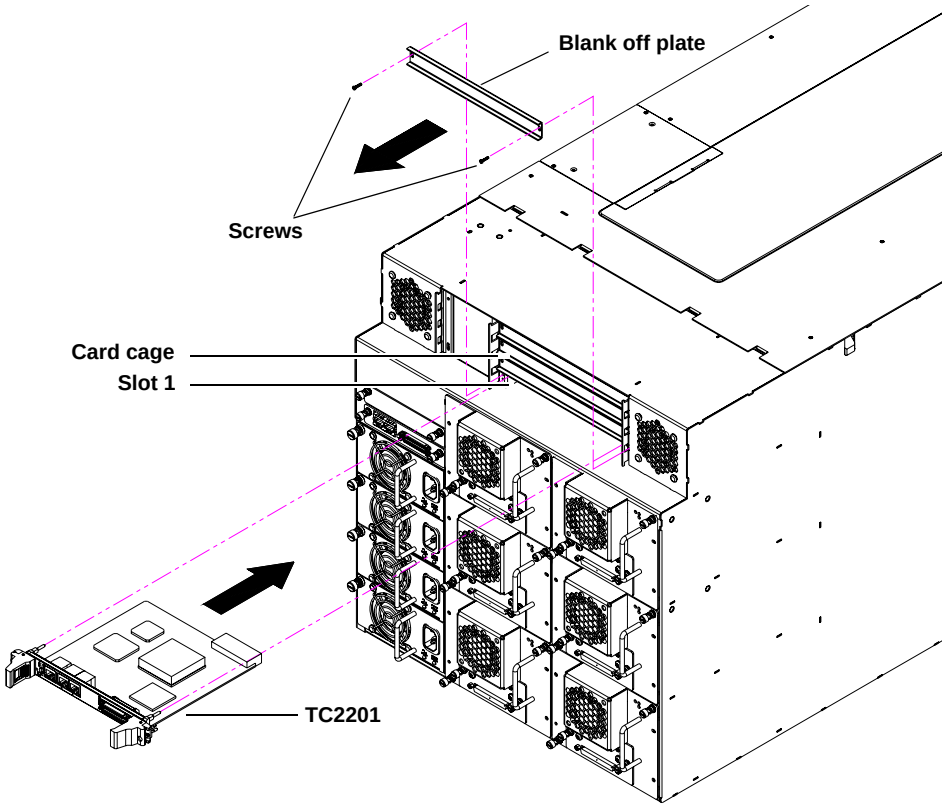
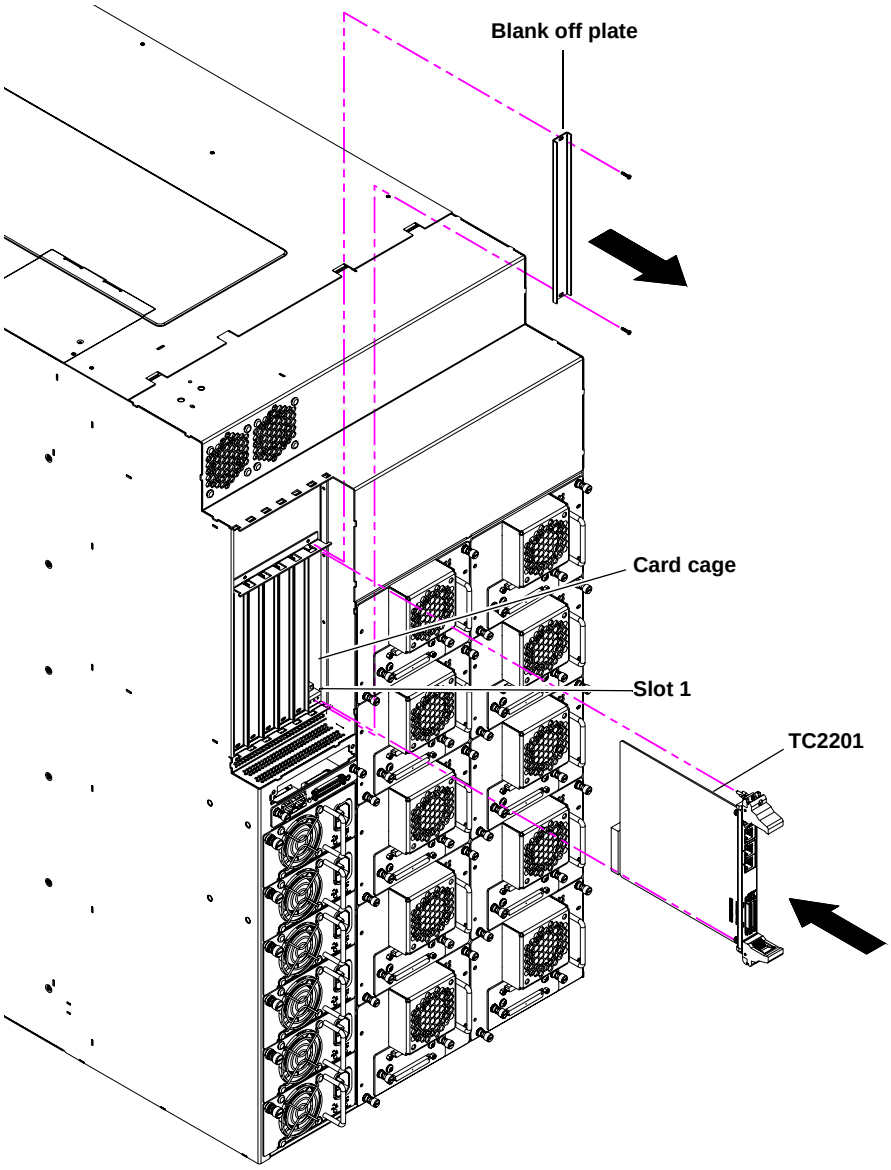
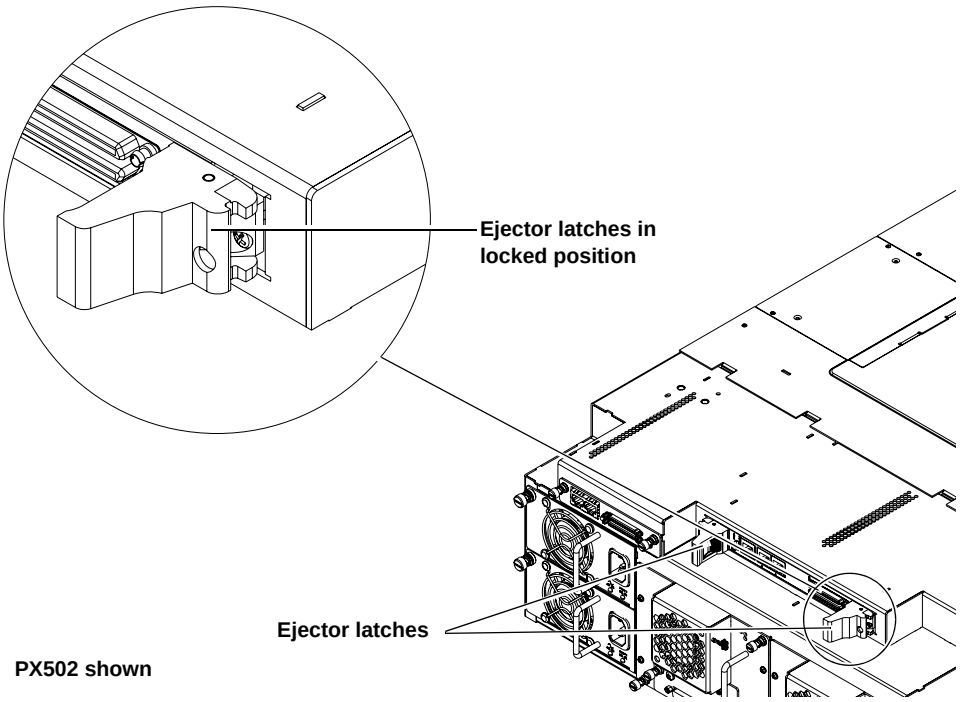


Figure 8 Installing a TC2201 Bridge (PX510)



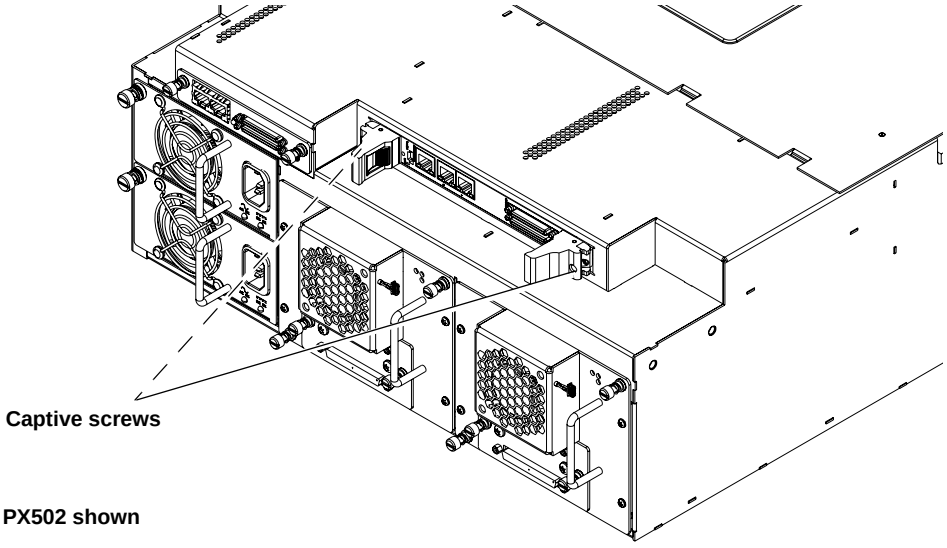
3 Gently press down on the TC2201 until the board is seated in the card cage and the ejector latches lock in place (see figure 9).

Figure 9 Seating the TC2201 Bridge



4 Secure each bridge to the CPCI card cage by tightening the captive screws located in the ejector latches with a PHILLIPS screw driver (see figure 10).

Figure 10 Securing the TC2201 Bridge



5 Repeat step 2 through step 4 for additional TC2201 bridges if necessary, using the next available card cage slot.

Installing the Ethernet Cables

Depending on the library type, one or more Ethernet connections must be made to the TC2201 iSCSI bridge. Refer to the following section for your specific library:

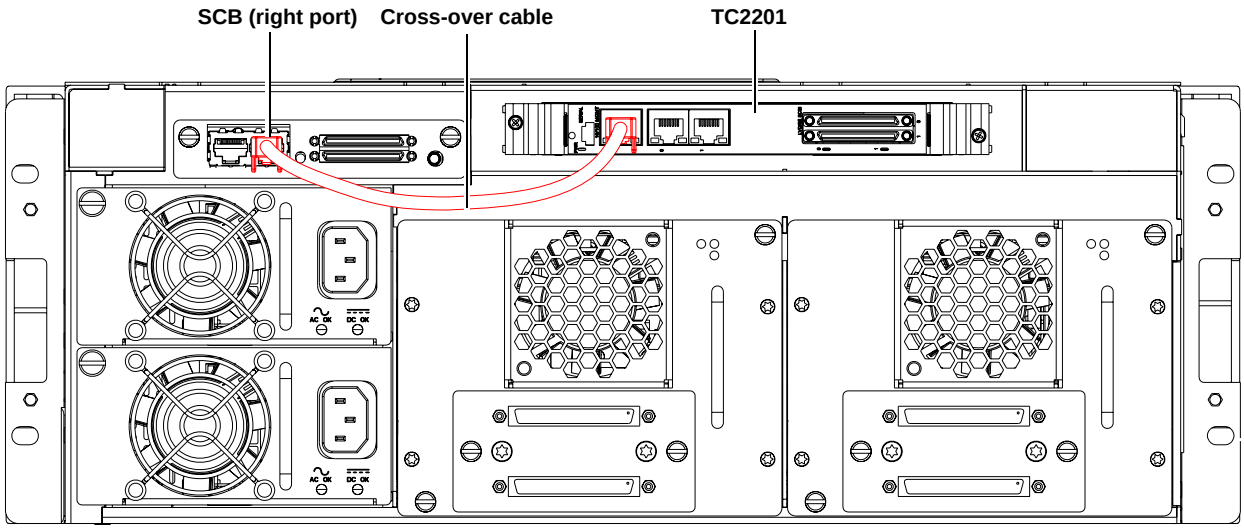
- PX502 Ethernet Connections
- PX506 and PX510 Ethernet Connections

PX502 Ethernet Connections

PX502 libraries with installed TC2201 iSCSI bridges must have the following Ethernet connections:

1 Connect a cross-over cable between the right port of the library system controller board (SCB) and the TC2201 (see figure 11).

Figure 11 PX502 Ethernet Connection



PX506 and PX510 Ethernet Connections

PX506 and PX510 require an Ethernet switch if more than one TC2201 is installed in the library. Use the following procedure to install the Ethernet switch and connect the Ethernet cables.

Note: If your PX506 or PX510 libraries have only a single TC2201 iSCSI bridge, refer the PX502 Ethernet Connections. A single Ethernet cross-over cable is connected between the library SCB and TC2201.

To install and cable the Ethernet switch:.

> **Note:** If the libraries are in a multiple stack configuration, mount the Ethernet switch directly above the top-most library.

1. Refer to the Ethernet switch installation documentation to install the switch into the rack.
2. Connect the following Ethernet cables:
   - One Ethernet cable from the right port on each library SCB to the Ethernet switch.
   - One Ethernet cable from each TC2201 to the Ethernet switch.
3. Secure the Ethernet cables with cable clamps and tie bands as needed (see figure 12 for unstacked configurations and figure 13 for stacked configurations).

> **Note:** The Ethernet switch shown in the following figures (figure 12 and figure 13) is only an example.

Figure 12 Connecting the Ethernet Cables (Single PX506/PX510 Library)

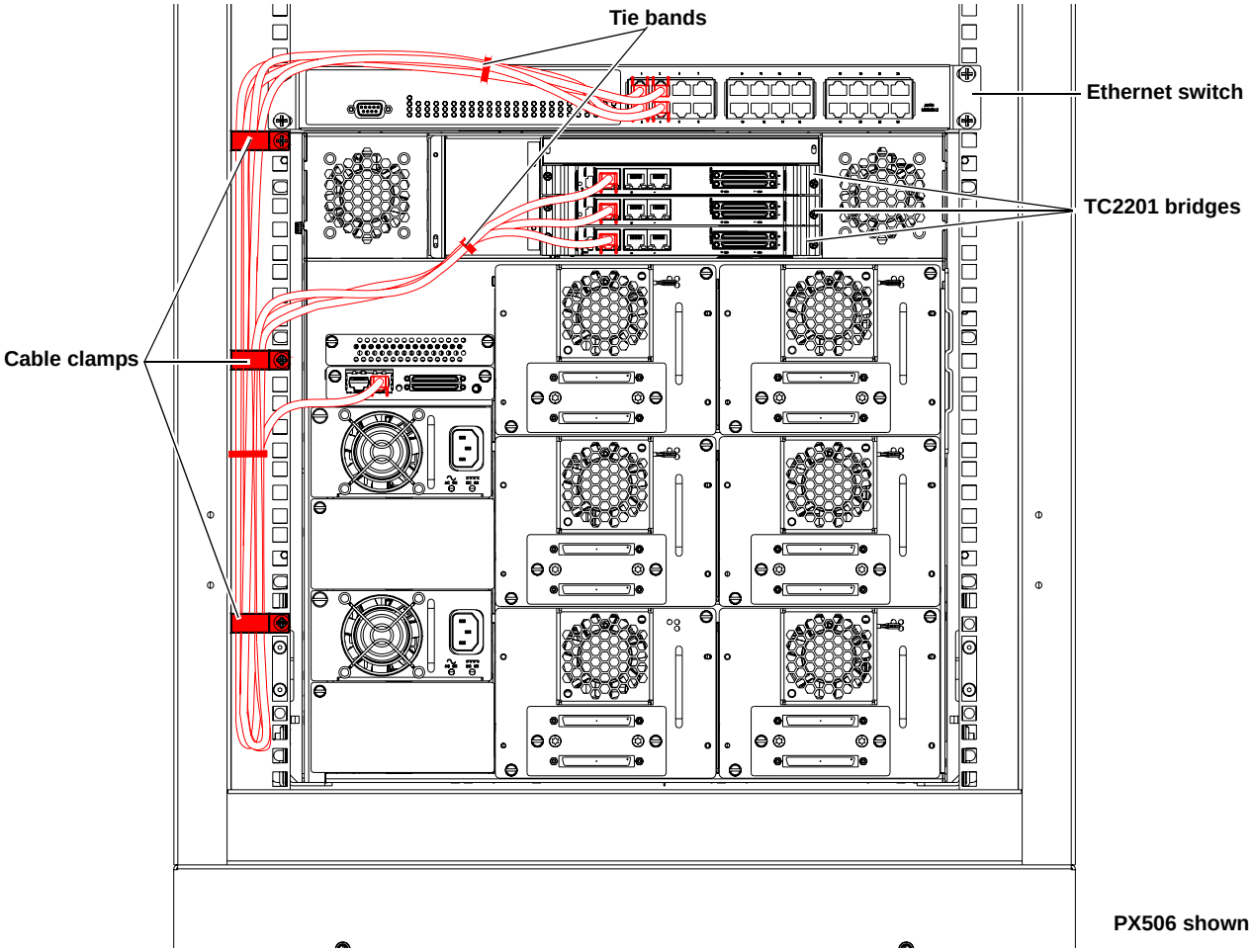
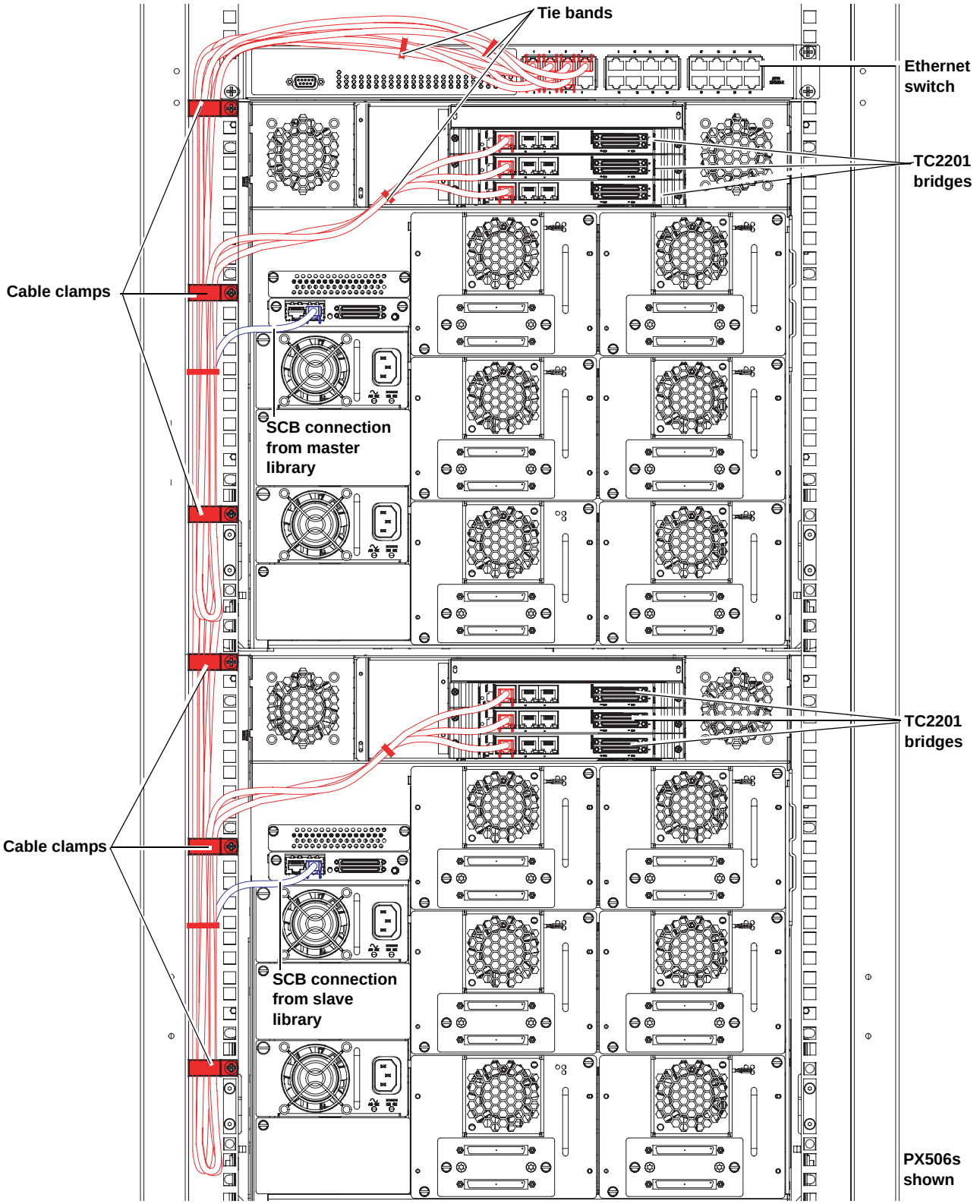


Figure 13 Connecting the Ethernet Cables (Stacked)



Installing SCSI Cables

Use the following procedure to connect the SCSI cables and terminators to the tape drives and TC2201(s).

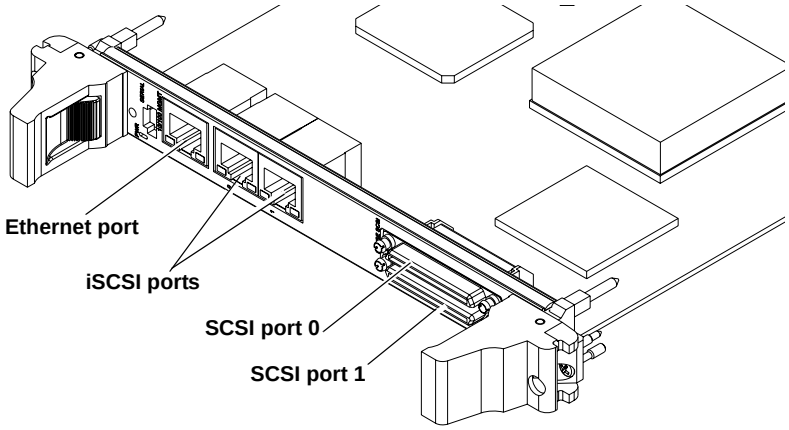
- SCSI connectors 0 through 1 on the first TC2201 are used to connect to tape drives 0 through 1 and the library robotics controller.
- SCSI connectors 0 through 1 on the second TC2201 are used to connect to tape drives 2 through 3, if present.
- SCSI connectors 0 through 1 on the third TC2201 are used to connect tape drives 4 through 5, if present.
- SCSI connectors 0 through 1 on the fourth TC2201 are used to connect tape drives 6 through 7, if present.
- SCSI connectors 0 through 1 on the fifth TC2201 are used to connect tape drives 8 through 9, if present.

To cable a TC2201 bridge to the tape drive(s):

1 To connect the SCSI cables from the TC2201 to the tape drives, see table 2 and figure 14.

> **Caution:** Use care when handling the fibre optic cables. Do not crimp or bend the cables.

Table 2 Cabling a TC2201 Bridge to the Tape Drives

Tape Drive Connection/ System Controller Board	TC2201 Connections/ Tape Drive Termination
	
System controller board (top port)	Port 0 on first TC2201
System controller board (bottom port)	Tape Drive 1, upper port
Tape drive 1, lower port	Terminator
Tape drive 2, upper port	Port 1 on first TC2201

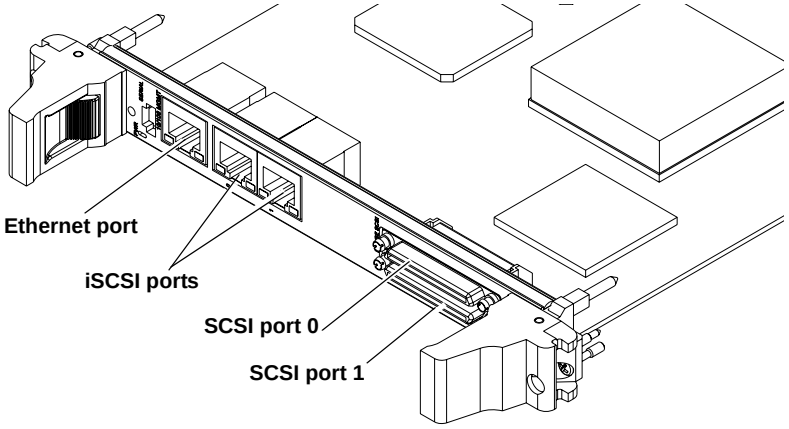
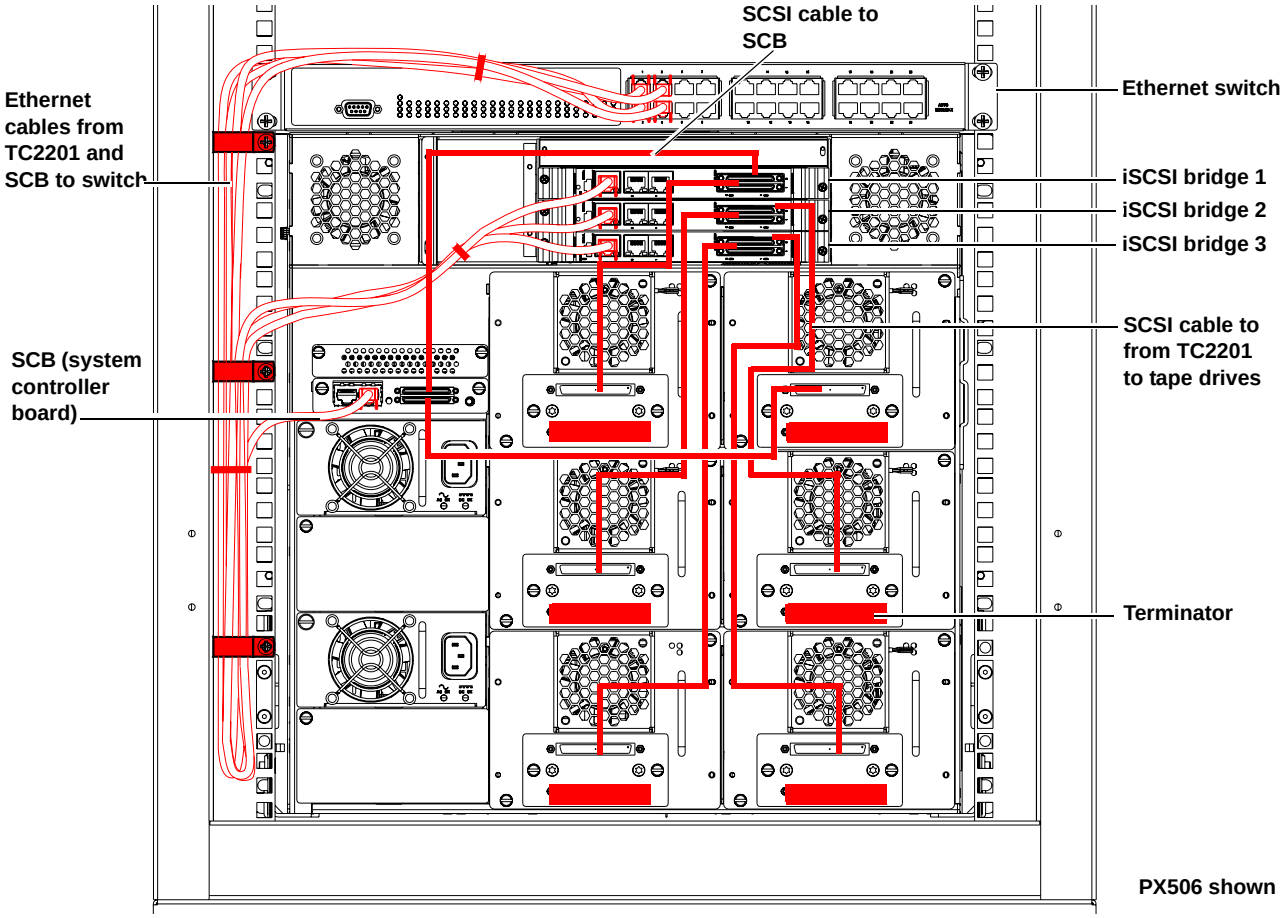
Tape Drive Connection/ System Controller Board	TC2201 Connections/ Tape Drive Termination
	
Tape drive 2, lower port	Terminator
Tape drive 3, upper port	Port 0 on second TC2201
Tape drive 3, lower port	Terminator
Tape drive 4, upper port	Port 1 on second TC2201
Tape drive 4, lower port	Terminator
Tape drive 5, upper port	Port 0 on third TC2201
Tape drive 5, lower port	Terminator
Tape drive 6, upper port	Port 1 on third TC2201
Tape drive 6, lower port	Terminator
Tape drive 7, upper port	Port 0 on fourth TC2201
Tape drive 7, lower port	Terminator
Tape drive 8, upper port	Port 1 on fourth TC2201
Tape drive 8, lower port	Terminator
Tape drive 9, upper port	Port 0 on fifth TC2201
Tape drive 9, lower port	Terminator
Tape drive 10, upper port	Port 1 on fifth TC2201
Tape drive 10, lower port	Terminator

Figure 14 PX506 Series Interconnect (6 drives)



Configuring the TC2201 Bridge Software

After the TC2201 is installed, you must configure the bridge and map the tape drives and library robotics controller to the iSCSI port. Configuring the TC2201 consists of the following steps:

- Accessing the TC2201 Bridge
- Configuring the TC2201 Bridge
- Saving the Configuration File

Accessing the TC2201 Bridge

To configure the TC2201 bridge:

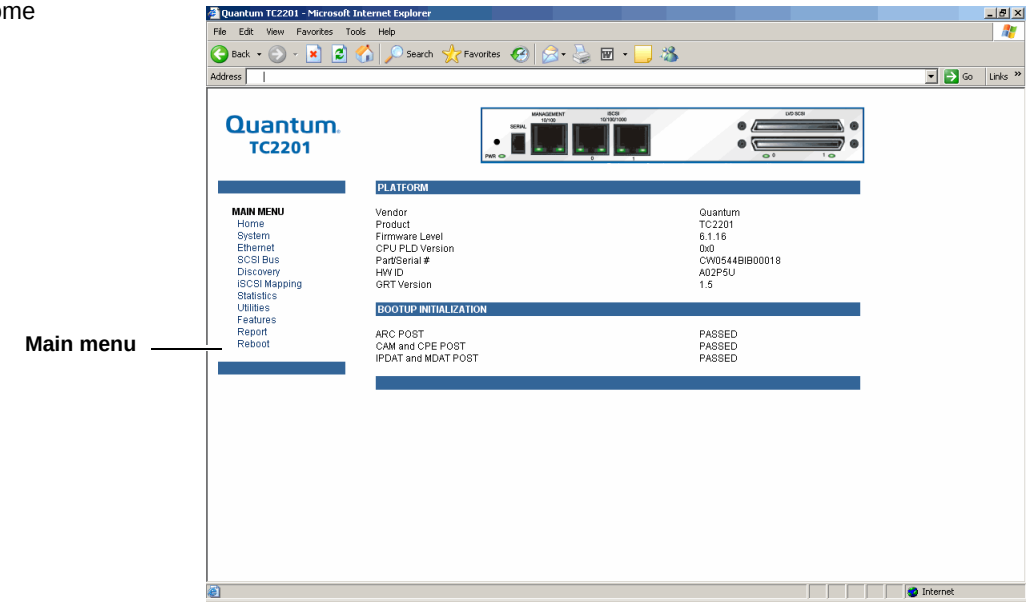
1. Open a web browser on the service PC.
2. In the **Address** field, type http://IPaddress/ where IP address is the IP address for the PX500 Series library (refer to the *Quantum PX500 Series User's Guide* PN 81-81290-01 for information on the PX500 Series remote management web pages).

3 Select the **iSCSI Bridge** tab from the **Setup** page on the PX500 Series remote management web pages.

4 Select the TC2201 bridge you want to configure.

The **TC2201 Home Page** screen displays (see figure 15).

Figure 15 TC2201 Home Screen



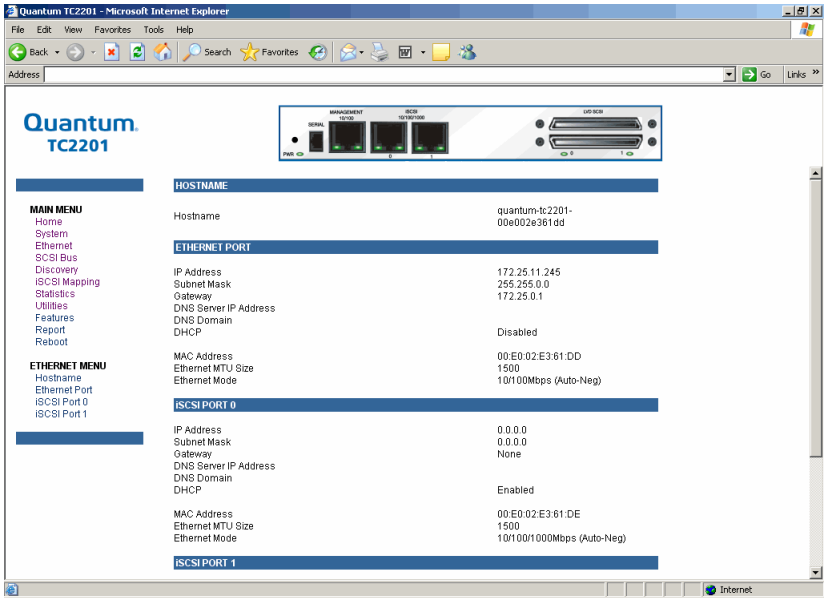
Configuring the TC2201 Bridge

To configure the TC2201 bridge and map the tape drives to the iSCSI ports:

1 From the **Home** screen, click **Ethernet** from the main menu.

The **Ethernet** screen displays (see figure 16).

Figure 16 TC2201 Ethernet Screen

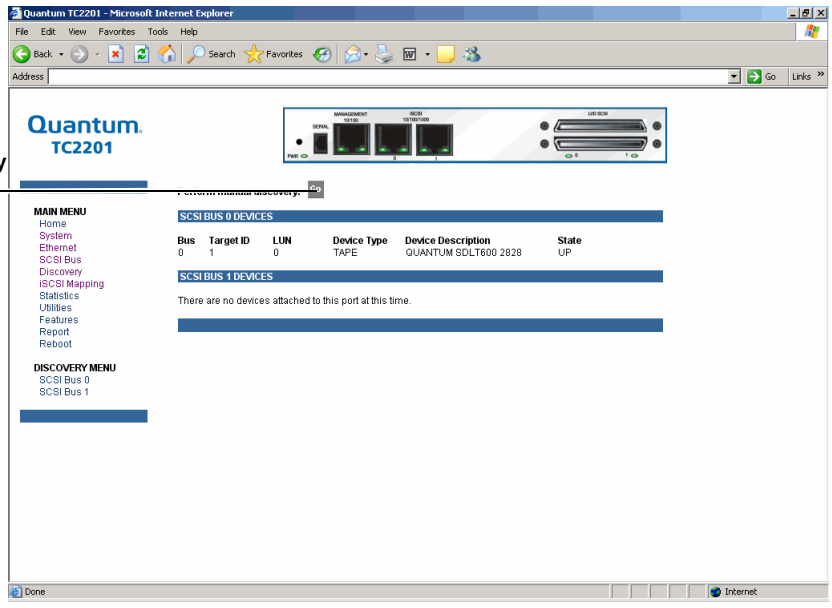


Verify that all the network ports are configured correctly for the network environment.

2 Click **Discovery** from the **Main** menu.

The **Discovery** screen displays (see figure 17).

Figure 17 Discovery Screen

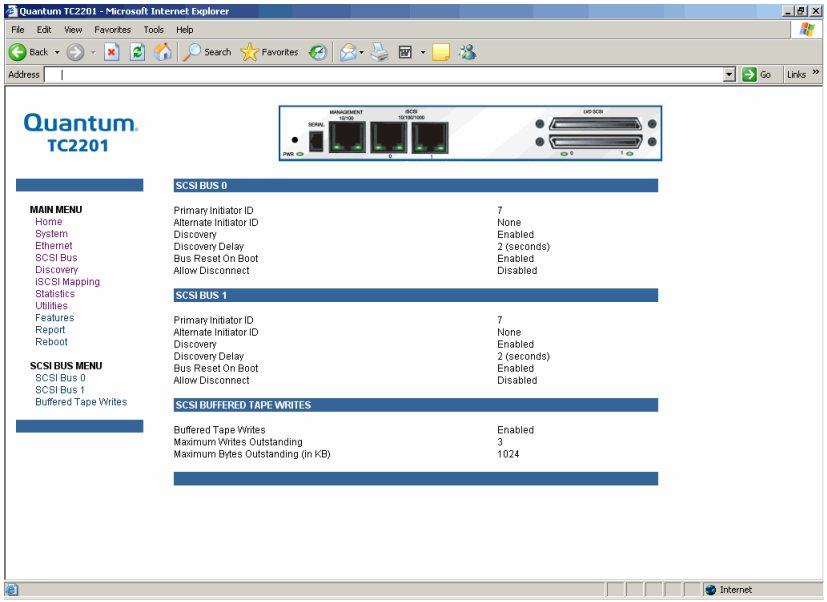


3 Click **Go** to discover all attached devices.

4 Click **SCSI Bus** from the **Main** menu.

The **SCSI Bus** screen displays (see figure 18).

Figure 18 SCSI Bus Screen



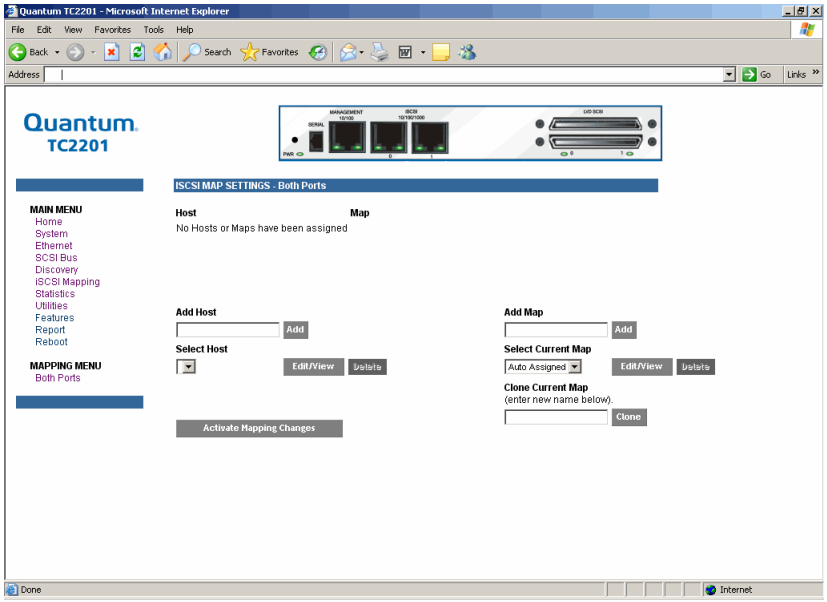
SCSI ID 7 is the default SCSI Initiator ID for each of the TC2201's SCSI buses. If any devices attached to a TC2201 bus are using SCSI ID 7, then that bus's Initiator ID must be changed. To change a bus's Initiator ID: Select the desired bus from the TC2201 GUI or the SCSI Bus submenu. Then use the Initiator ID field drop-down list to select an unused ID number. Click the **Submit** button to record the change.

If the TC2201 does not see all of the devices expected, check that the initiator ID(s) are set to a unique value for each bus attached to devices. For any changes, submit those changes and reboot the TC2201.

5 Click **iSCSI Mapping** from the **Main** menu.

The **iSCSI Mapping** screen displays (see figure 19).

Figure 19 iSCSI Mapping Screen



After the iSCSI port has been selected, mapping information for that port is displayed including the name of the port, the currently selected host and map. The following options are also available:

- Add a new host or map by selecting the respective **Add** button.
- Select an existing host or map from the pull-down lists for **Select Host** and **Select Map**.
- Delete the currently selected host or map by selecting the respective **Delete** button.
- View or Edit the currently selected host or map by selecting the respective **Edit/View** button.
- Clone (via the **Clone Map** button) the currently selected map and set up the name of the new cloned map. This option makes it easier to setup new maps with similar information to previously created maps. Auto Assigned maps cannot be cloned.
- Select the **Activate Mapping Changes** button to dynamically update the current map without rebooting the TC2201. These changes are made effective immediately after being submitted.

Caution: Before activating any port mapping changes, it is strongly recommended that the user verify there are not any command or data operations occurring in conjunction with devices affected by the mapping changes. For example, deleting a LUN or device from a map may disrupt I/O transfers with that device. It is the user's responsibility to ensure that no operations will be negatively impacted due to the activation of mapping changes.

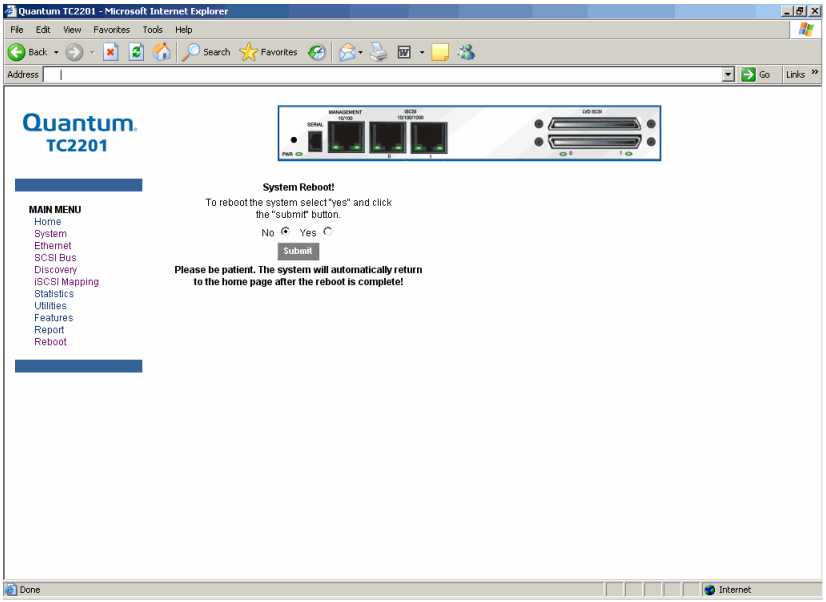
Note: All current Mapping Settings will take effect immediately! If another management interface has made unsaved mapping changes, those changes will be lost.

Note: If the **Activate Mapping Changes** button is not selected, the mapping changes will not take effect unless the TC2201E is rebooted.

6 After activating the mapping options for the Ethernet ports, click **Reboot** from the **Main** menu.

The **System Reboot** screen displays (see figure 20).

Figure 20 System Reboot Screen



7 Select **Yes** and click **Submit**.

The TC2201 reboots.

Saving the Configuration File

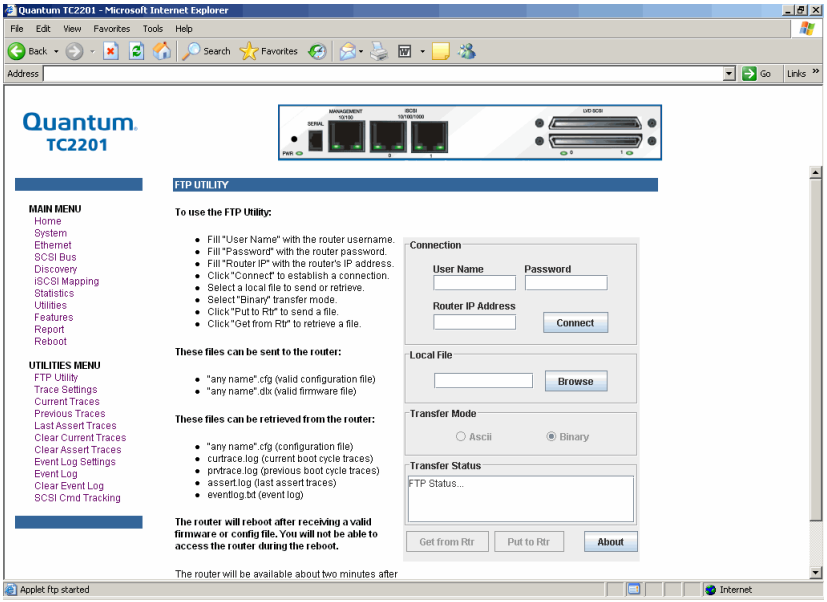
After the TC2201 initial installation and configuration or after any changes are made to the TC2201, you must save the configuration file to a local host. The configuration file contains all configurable parameters such as IP address and mapping information. This configuration file can be uploaded to a replacement TC2201 bridge and eliminate the configuration portion of this instruction.

To save a configuration file using the FTP utility:

1 Click **FTP Utility** from the **Utilities** menu.

The **FTP Utility** screen displays (see figure 21).

Figure 21 FTP Utilities Screen



The FTP utility requires the use of a JAVA applet and prompts for permission to install the applet, if needed. If the prompt is displayed, follow the onscreen instructions to complete the installation. The FTP utility then prompts for permission to run the applet.

> **Note:** Internet access is required to verify the signature for the FTP applet and to download the JAVA applet plug-in for your browser.

2 Enter the User Name, Password, and the IP address of the Interface Controller and click **Connect**.

3 Select the local file to download. If necessary, click **Browse** to scroll through a file list.

> **Note:** The configuration file should be named <myconfigfile.cfg> when typing it into the FTP window.

The following file types can be downloaded from the Interface Controller:

- Configuration *(.cfg)*
- Traces for the current boot cycle (*curtrace.txt*)
- Traces from the previous boot cycle (*prvtrace.txt*)

4 Click **Binary Transfer** mode.

5 To download a file, click **Get from Rtr**.

The configuration file is saved to the local host.

Zoning the Ethernet Switch

The Ethernet switch used for connecting multiple TC2201 iSCSI bridges is capable of being zoned so specific ports can be grouped together as a virtual independent switch. This capability is used ONLY when multiple libraries are together in a rack. This allows each library SCB to assign IP addresses to only the TC2201s within the library and not TC2201s in other libraries For example, if stacked libraries are in a rack, three independent zones must be created. 1 zone = library SCB + number of TC2201s installed in the library.

Refer to the installation documentation included with the Ethernet switch for information on zoning the switch. The following table provides a recommended zoning example.

Table 3 Recommended Zoning Example

Library Type	Number of FC Bridges	Switch Zones
PX506	3	First zone - ports 1 through 4 for connections from library SCB and three TC2201 bridges.
PX506	3	Second zone - ports 5 through 8 for connections from library SCB and three TC2201 bridges.
PX506	3	Third zone - ports 9 through 12 for connections from library SCB and three TC2201 bridges.