adic **Intelligent Storage**™

SNC® 450x User's Guide

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1

Introduction

This manual provides information and instructions that support the installation and operation of two ADIC Storage Networking Controllers, the SNC® 4500 and the SNC® 4501. The SNC 4500 is an external, rack-mounted SCSI over IP (iSCSI) connectivity unit used with the Scalar 100. The SNC 4501 is an iSCSI unit mounted internally in the Scalar 24. Both units support Gigabyte Ethernet speeds. This document uses SNC 450x to refer collectively to the SNC 4500 and the SNC 4501.

Intended Audience

This guide is intended for operators, administrators, and maintenance personnel who interact with the SNC 4500 and SNC 4501 hardware.

Associated Documents

The following documents are associated with this guide:

- *Scalar 24 Installation and Operation Guide (62-2301-xx)*
- *Scalar 100 User's Guide (6-00667-xx)*

Explanation of Symbols

These symbols appear throughout this document to highlight important information:

Note   Indicates important information that helps you make better use of your system.

CAUTION   **Indicates a situation that may cause possible damage to equipment, loss of data, or interference with other equipment.**

WARNING   **INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR BODILY INJURY.**

Environmental Notices and Statements

Environmental notices and statements that relate to the SNC 450x include the following:

Product Recycling

This unit contains recyclable materials that must be recycled according to local regulations wherever processing sites are available.

Electrostatic Discharge (ESD)

ESD is a sudden flow of electric current through a material that is normally an insulator.

⚠️ **CAUTION**   **Never open the cover of the SNC as this exposes ESD-sensitive parts and voids the warranty.**

Getting More Information

If you want more information about your product, visit the ADIC website or contact the ADIC Technical Assistance Center (ATAC).

ADIC Technical Assistance Center

If problems cannot be solved with the aid of this document or if training is desired, contact the ADIC Technical Assistance Center (ATAC).

In the USA:	800-827-3822
In Europe and Japan:	00-800-9999-3822
For other contact numbers:	www.adic.com/contact
To open a Service Request online:	www.adic.com/techsup

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SNC Description

The SNC 4500 and SNC 4501 are Gigabit Ethernet (GbE) to SCSI Storage Networking Controllers that enable iSCSI protocol support for your Scalar 100 and Scalar 24. Visit www.adic.com to see a list of drive types currently supported by the SNC 4500 and SNC 4501.

The SNC 450x[1] includes two Ethernet data ports, an Ethernet management port that may be used as a data port, a serial management port, and two SCSI ports. The SNC 4500 has a 100-240V 50-60Hz auto sensing power supply. A US and European power cable are provided. The SNC 4501 receives power directly from the Scalar 24.

The SNC 4500 is installed externally to the Scalar 100 in standard 19" racks or free standing near the library. The SNC 4501 is integrated into the Scalar 24.

SCSI Ports

The two SCSI ports use independent buses and connect storage devices into the iSCSI SAN. The ports are Ultra 3 LVD/SE SCSI buses with a "P" interface and VHDCI connector. These ports are terminated internally. They provide 160 MB/sec maximum throughput, and are downwardly compatible with all forms of single-ended SCSI. For the position of the SCSI ports on the SNC 4500, see Figure 1. For the position of these ports on an SNC 4501, see Figure 2.

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1. This document uses the term SNC 450x to refer collectively to the SNC 4500 and the SNC 4501.

Figure 1   SCSI Ports and Ethernet Ports on the SNC 4500
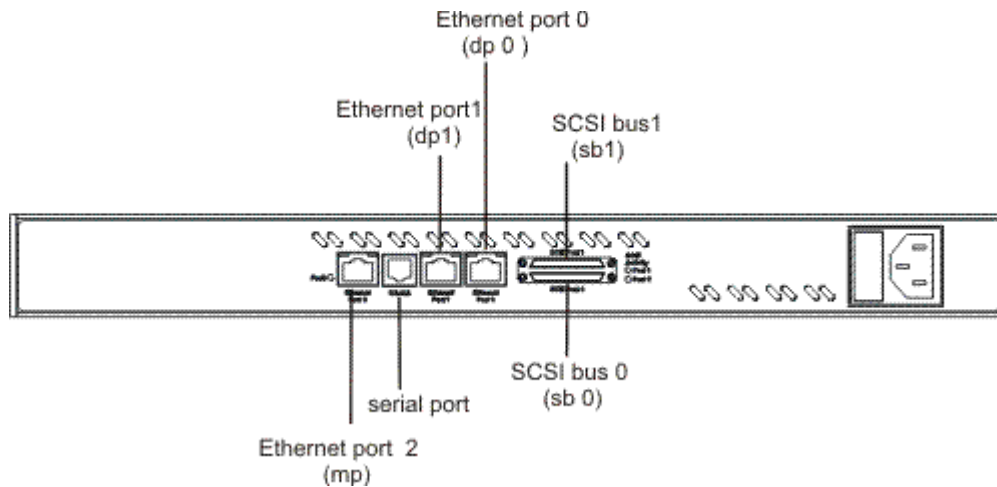
Figure 2   SCSI Ports and Ethernet Ports on the SNC 4501
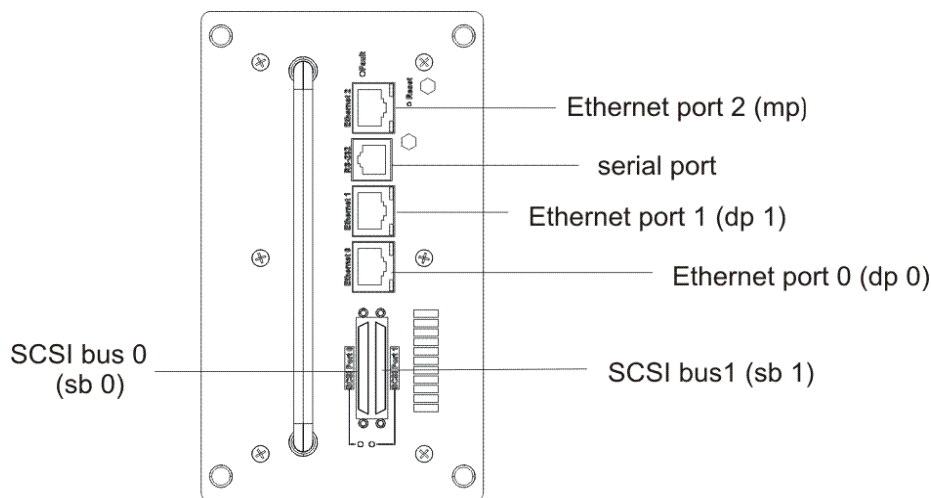
Ethernet Ports

> ⚠️ **CAUTION**   **For best performance, all cabling, network interface cards (NICs), host bus adapters (HBAs), and network switches must be Gigabit Ethernet (GbE), and at least Cat 5e certified. Most standard offices use 2-pair wiring which is not compatible. GbE requires 4-pair wiring. For best performance, support for 9014 byte jumbo frames should be available for all switches and host iSCSI equipment.**

The two independent 10/100/1000 Ethernet RJ45 data ports support TCP/IP-based data transfer. These two ports are also referred to as "dp0" and "dp1." They are labeled Ethernet ports 0 and 1 on the SNC 4500 in Figure 1 and on the SNC 4501 in Figure 2.

A separate 10/100/1000 Ethernet standard RJ45 management port provides monitoring and management through the SNC Manager, the management GUI. This port is labeled Ethernet port 2 on the SNC 4500 in Figure 1 and on the SNC 4501 in Figure 2. It may also be used as a data port.

In the command line interface, data ports are referred to as "dp0" and "dp1" and the management port is referred to as the "mp0."

Serial Port

The RS-232 serial port is an RJ-11 connection used to connect this port to the serial port on a service computer. The position of the RS-232 serial port on an SNC 4500 can be seen in Figure 8 on page 19. The position of the RS-232 serial port on an SNC 4501 is shown in Figure 9 on page 19.

> **Note** To configure the management port IP address, you must use either the serial port or the library operator panel.

The serial port provides support for remote monitoring and management when you use a terminal session to access the command line interface (CLI).

The serial port is configured at:

- Baud rate: 115,200 bits per second
- Data Bits: 8
- Parity: None
- Stop Bits: 1
- Flow Control: None
- Terminal type: ASCII
- Echo: off

Operating Specifications

This section contains the physical, electrical, and environmental specifications for the SNC 4500 and SNC 4501.

SNC 4500 Dimensions

- Depth: 33.02 cm (13 in.)
- Height: 4.37 cm (1.72 in.)
- Width: 48.26 cm (19 in.)
- Weight: 4.53 kg (10 lbs.)

SNC 4501 Dimensions

- Depth: 17.78 cm (7 in.)
- Height: 7.62 cm (3 in.)
- Width: 15.24 cm (6 in.)
- Weight: 1.13 kg (2.5 lbs)

Operating Environment

The operating environment is as follows:

- Operating temperature: 10° to 40°C (50° to 104°F) external
- Blower and airflow: Be sure there is sufficient airflow to the rack or library.

For the SNC 4500, air enters through the slots in the rear panel and exits through the blower on the far end of the rear panel.

- Humidity: 10 to 90% non-condensing

Power

The SNC 4501 is powered by the Scalar 24.

The power for the SNC 4500 is as follows:

- Input voltage: 120–240 VAC, 50–60 Hz, fused on the power supply.

- Power draw: 15 Watts

- Battery-backed event log SRAM: Typically the rechargeable Lithium ion battery cell holds memory for more than 30 days during power off. Recharging begins automatically when power is restored to the system. The battery is shipped fully charged from the factory. The SNC should be left on to keep the battery charged. If the SNC is left unpowered for long periods of time, you may need to reset the time and date. For instructions, refer to Setting the Date and Time on page 26.

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3

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<div style="text-align: right">

Getting Started

</div>

This chapter describes how to install the SNC 450x and how to configure the serial port and the Ethernet management port. It also contains information about SCSI device cabling and Ethernet data port cabling.

Before Installing the SNC

Before you begin installing the SNC 450x, be sure to check or complete the following:

- If you are managing your iSCSI system across a WAN and your system uses a firewall, be sure that the following ports are open and available:

    If you are using the TCP protocol

    - telnet (port 23)

    - http (port 80)

    - ftp (ports 20 and 21)

    - iscsi (port 3260)

    - iSNS (port 3705)

    If you are using the UDP protocol

    - ntp (port 123)

    - SNMP (port 161)

- Be sure your host system is set up and configured.

    - Your host system can use any of three different types of cards: a network interface card (NIC), a TCP/IP offload engine card (TOE), or a storage network interface card (SNIC).

    - Obtain the SNC driver file, "SNC Null Driver for Windows 200X", from *www.adic.com*. Unpack the ZIP file to a temporary directory on your host. Follow the directions to install the driver in the `Readme.txt` file or, after you have installed the SNC and the host posts a message saying it has located an unknown system device, point the host at the SNC device driver.

> ⚠️ **CAUTION**   **It is recommended that you configure host access through a switch.**

For more information about preparing your system, refer to [iSCSI Performance Tuning](#) on page 107.

Installing the SNC

The SNC 4500 is installed on a desktop or in a rack near the Scalar 100. The SNC 4501 is installed directly into the rear of the Scalar 24.

Installing the SNC 4500 on a Desktop

1   Place the SNC 4500 on a desktop near the Scalar 100.

2   Connect the SNC AC power cord from the SNC to a proper AC source outlet.

> Note   The SNC should be left on to keep the battery charged. If the SNC is left unpowered for long periods of time, you may need to reset the time and date. For instructions, refer to Setting the Date and Time on page 26.

3   Proceed to the section Connecting the SCSI Ports on page 11.

Installing the SNC 4500 in a Rack

1   Using the screws provided, screw the bracket's flat side to one side of the SNC, matching the holes in the bracket with the holes in the SNC as shown below.
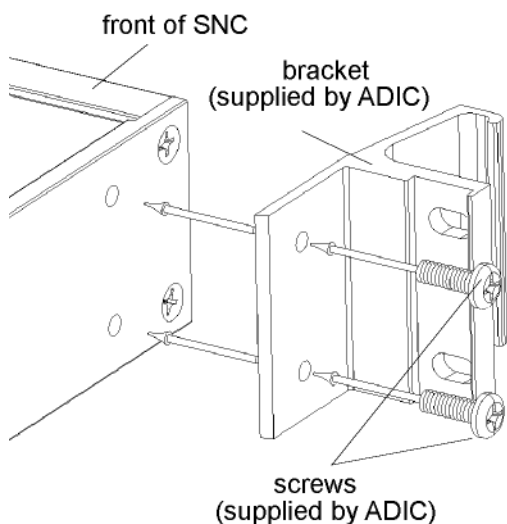
2   Repeat on the other side.

3 Fasten the SNC with the brackets to one side of the rack's rail pairs using 10/32 pan head screws with lock and flat washers (not provided).

flat washers
(supplied by customer)

lock washers
(supplied by customer)

10/32 pan head screws
(supplied by customer)
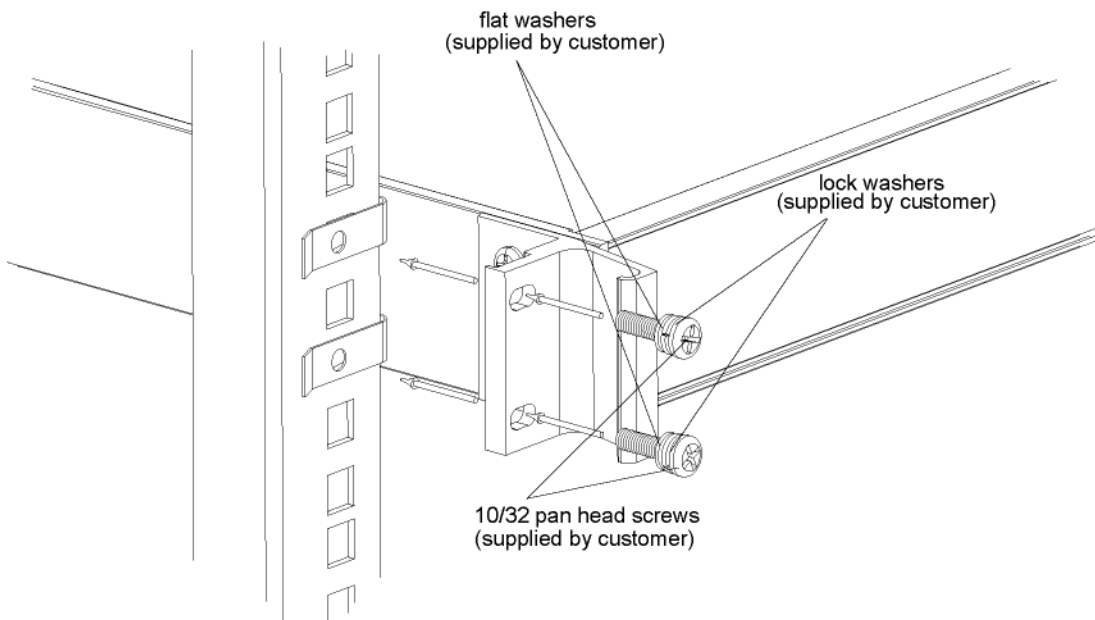
4 Repeat on the other side.

5 Connect the SNC AC power cord from the SNC to the proper AC source outlet.

> **Note**   The SNC should be left on to keep the battery charged. If the SNC is left unpowered for long periods of time, you may need to reset the time and date. For instructions, refer to Setting the Date and Time on page 26.

6 Proceed to the section Connecting the SCSI Ports on page 11.

Installing the SNC 4501

1 If the Scalar 24 is on, turn the power off.

2 Locate the SNC slot on the rear of the Scalar 24.

3 Loosen the four thumbscrews on the cover plate and remove the cover plate.
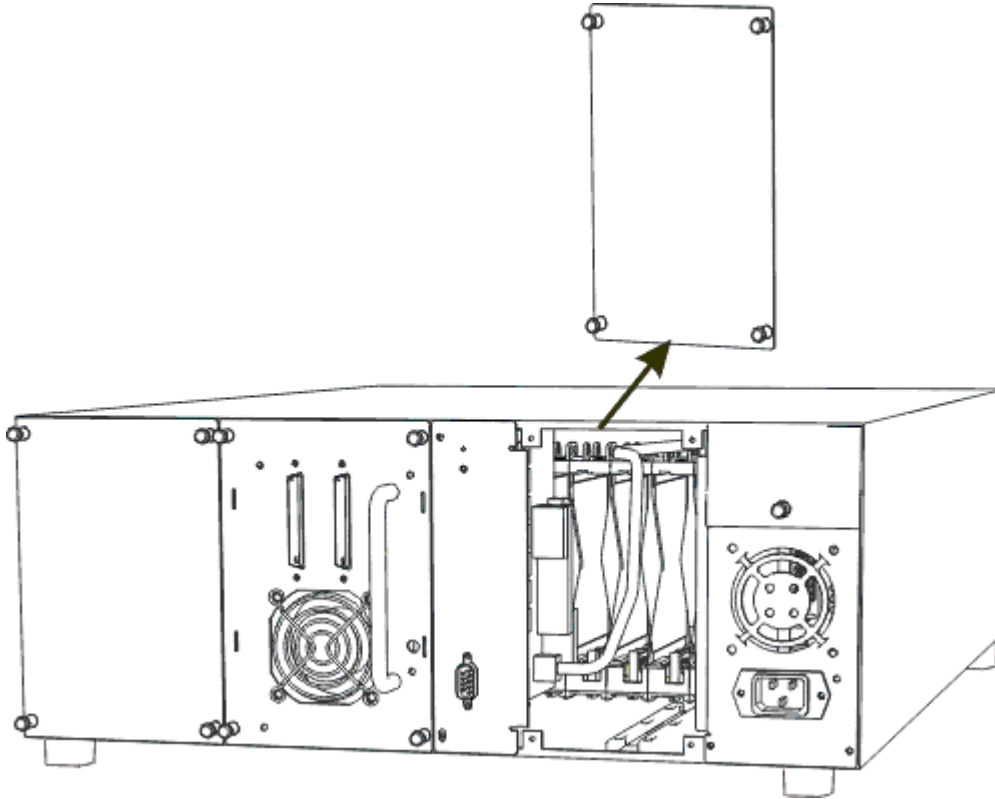
Note   Store the cover plate in a convenient place. You must replace it later for proper operation and cooling of the library if the SNC is removed.

4 Orient the SNC so that the SCSI ports are on the bottom and the handle is on the left.
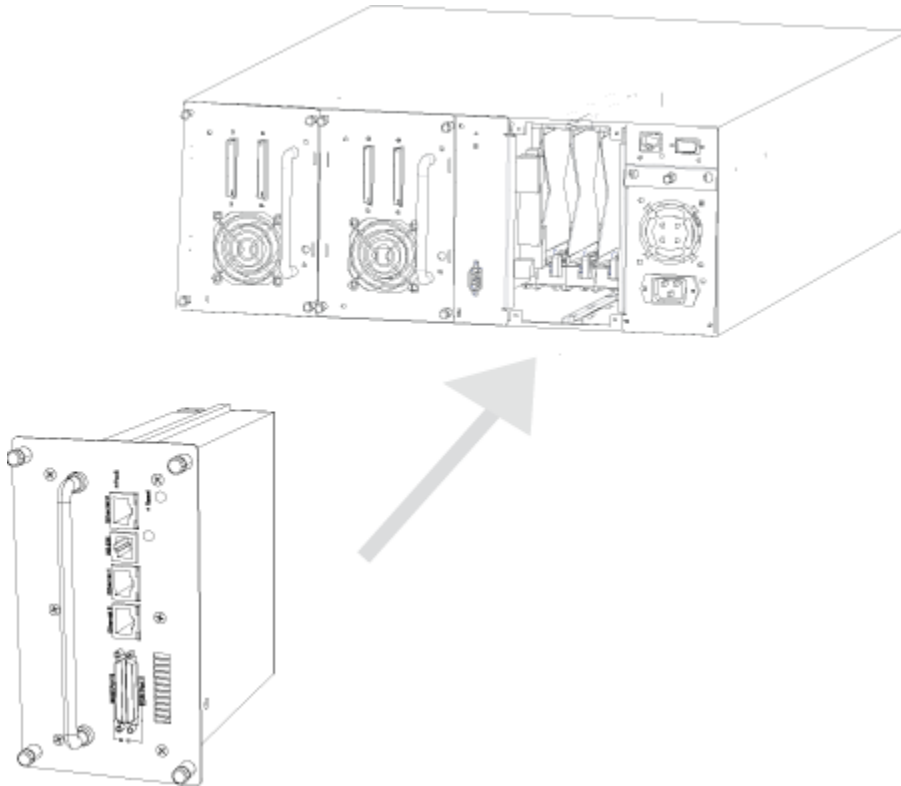
5 Slide the SNC into the bay until it matches with the connector and power receptacle. Then tighten the thumbscrews.

6 Ensure that the AC power cord is plugged into the proper AC source outlet.

> 🗒 Note   The SNC should be left on to keep the battery charged. If the SNC is left unpowered for long periods of time, you may need to reset the time and date. For instructions, refer to Setting the Date and Time on page 26.

Connecting the SCSI Ports

SNC SCSI ports are used to connect SCSI storage devices (drives) and media changers. Each SCSI port is independent from the other SCSI port.

Because each bus is independent, each bus is capable of supporting 15 devices and transfer rates of 40, 80, or 160 MB/sec. (Ultra, Ultra2, or Ultra3). When using a SNC 4500 or SNC 4501, one tape drive per SCSI bus is recommended for the Scalar 24 and two tape drives per bus is recommended for the Scalar 100.

Each SCSI bus auto-negotiates the appropriate sync rates with connected drives. If slower single-ended (SE) drives are mixed with faster low voltage differential (LVD) drives, the bus communicates at the rate of the slowest drive, thus wasting the performance capabilities of the faster drives. Connect slower SE drives to one SCSI port and connect faster LVD drives to the other port.

Cables and drives must be chosen to maximize performance and minimize the electrical noise from the high-speed data transfers available with the SCSI protocol. Cabling and termination methods become important considerations for proper performance. SCSI cables and drives are subject to specific length and number limitations to deal with electrical problems that arise at increased operating speeds.

Use high-quality cables rated for the type of SCSI transfers required. Well-insulated SCSI cables significantly reduce the occurrence of errors in communications. Try to keep cable lengths as short as possible to ensure higher signal quality and performance.

Cabling the SNC 4501 to the Scalar 24

1 Turn off the library and SNC, if they are on.

> ⚠ **CAUTION**   **Use a maximum cable length of 6m (20 ft) for LVD devices.**

2 Check the type of cable, cable length limit and number of devices recommended for each port. For general guidelines, refer to Connecting the SCSI Ports.

3 Connect sb0 on the SNC to drive 1.

4 Terminate drive 1.

See Figure 3. Stop here if you have only one LTO-1 or SDLT drive. If you have two LTO-1 or SDLT drives, proceed to Step 5.

5 Connect sb1 on the SNC to drive 2.

6 Terminate drive 2.

See Figure 3.

Figure 3   Scalar 24 with Two LTO-1/LTO-2 or SDLT Drives
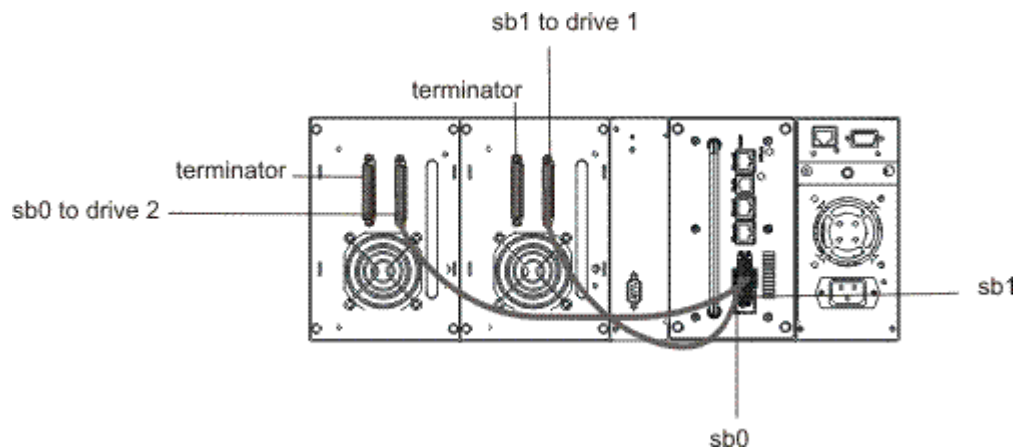
Cabling the SNC 4500 to the Scalar 100: Four or Six LTO-1 or SDLT Drives

1 Turn off the library and SNC, if they are on.

> ⚠ **CAUTION**   **Use a maximum cable length of 6m (20 ft) for LVD devices.**

2 Check the type of cable, cable length limit and number of devices recommended for each port. For general guidelines, refer to Connecting the SCSI Ports.

3 Connect sb0 on SNC 1 to the library controller.

4 Connect the library controller to drive 3.

5   Use a jumper cable to connect drive 3 to drive 4.

6   Terminate drive 4.

7   Connect sb1 on SNC 1 to drive 1.

8   Use a jumper cable to connect drive 1 to drive 2.

9   Terminate drive 2.

See Figure 4 on page 14. Stop here if you have only four LTO-1 or SDLT drives. If you have six LTO-1 or SDLT drives, proceed to Step 12. See Figure 5 on page 15.

10 Connect sb0 on SNC 2 to drive 5.

11 Terminate drive 5.

12 Connect sb1 on SNC 2 to drive 6.

13 Terminate drive 6.

See Figure 5 on page 15.

Figure 4   Scalar 100 with Four LTO-1 or SDLT Drives

SCSI port 1
(sb1)   SCSI port 0
(sb0)

SNC 4500
SCSI port 1 to
library drive 1

SNC 4500
SCSI port 0 to
library controller

library
controller
to library drive 3

terminator
drive 4

drive 3

terminator
drive 2
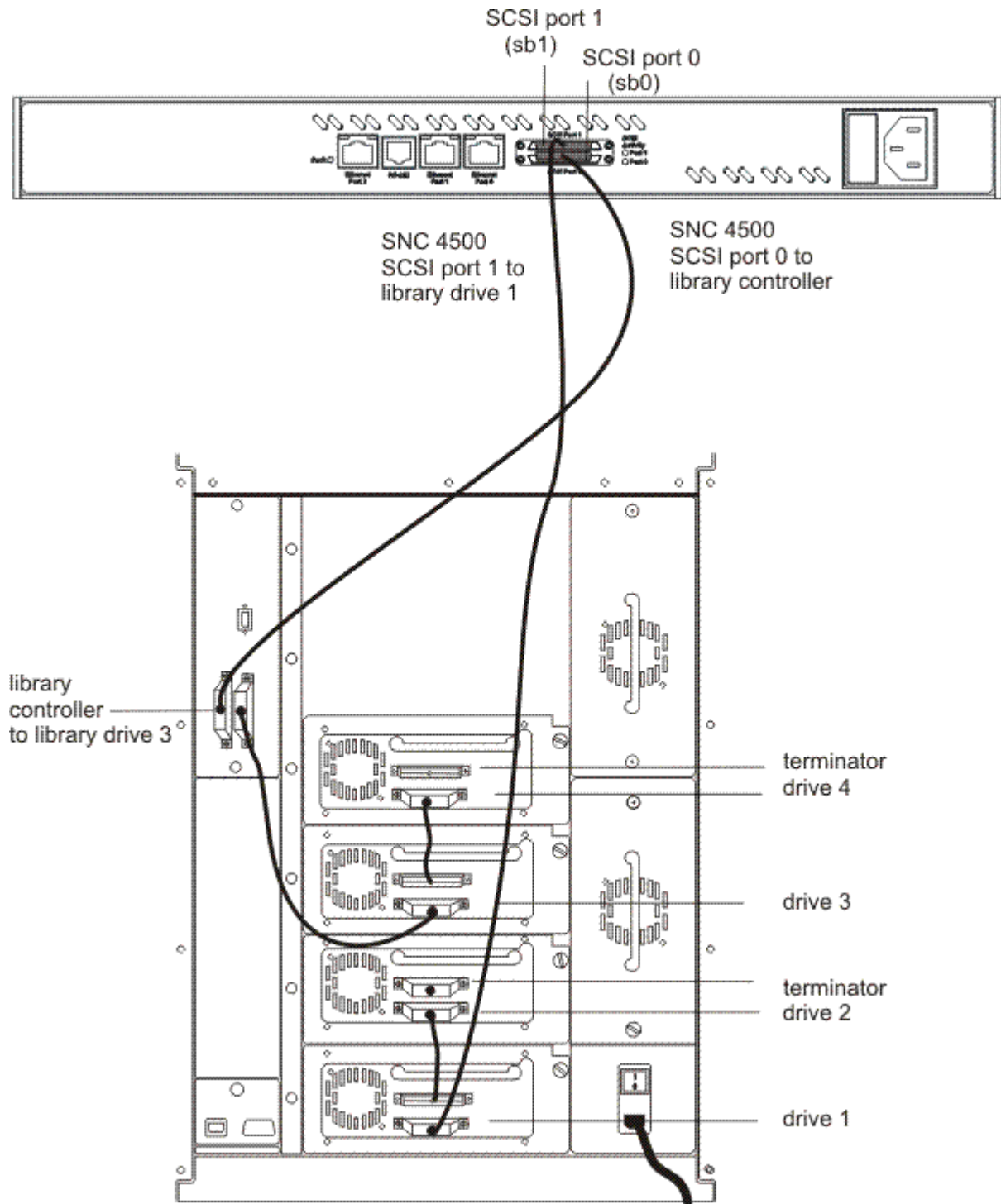
drive 1

Figure 5   Scalar 100 with Six LTO-1 or SDLT Drives
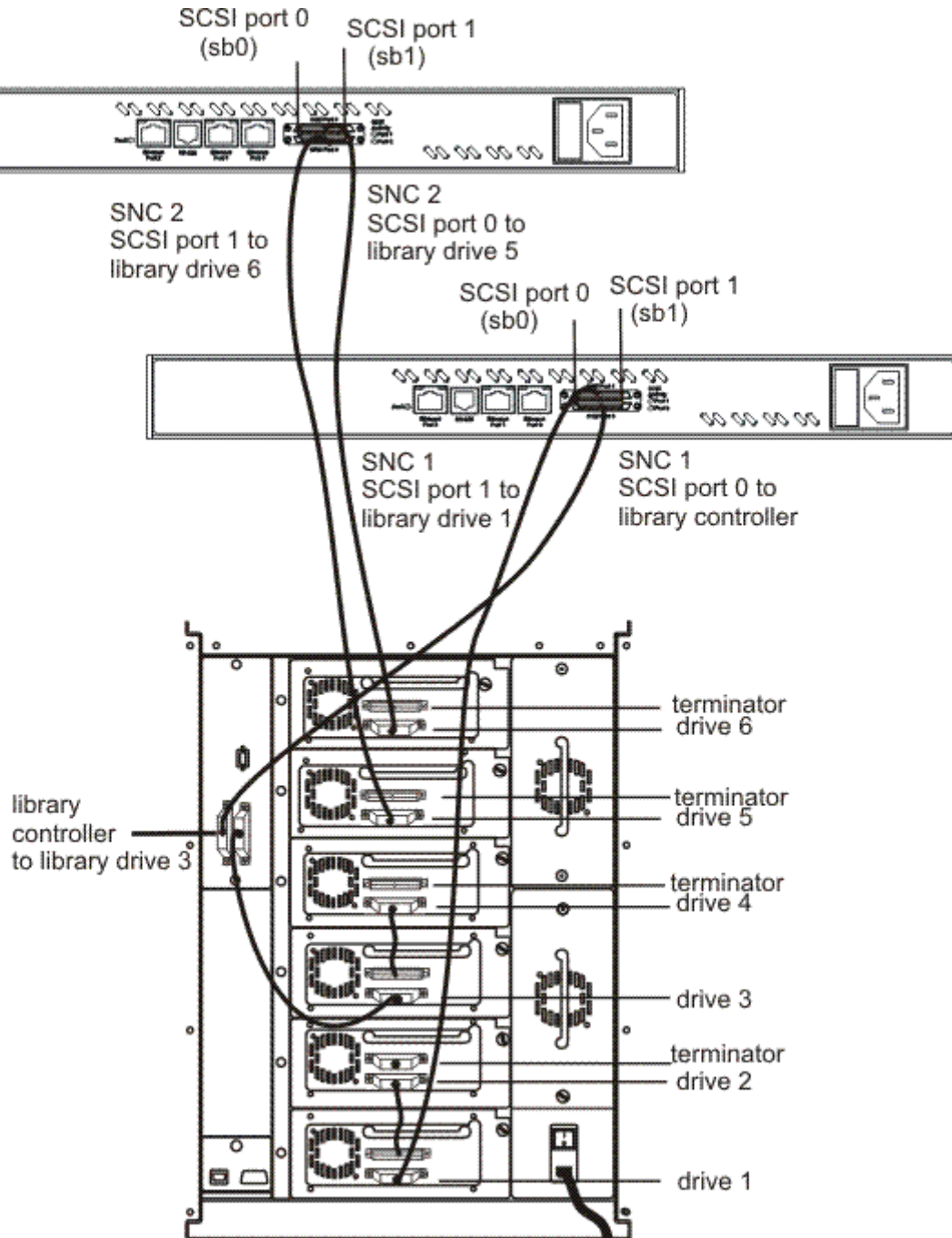
Cabling the SNC 4500 to the Scalar 100: Four or Six LTO-2 Drives

1   Turn off the library and SNC, if they are on.

⚠️ **CAUTION**   **Use a maximum cable length of 6m (20 ft) for LVD devices.**

2   Check the type of cable, cable length limit and number of devices recommended for each port. For general guidelines, refer to Connecting the SCSI Ports.

3   Connect sb0 on SNC 1 to the library controller.

4   Connect the library controller to drive 1.

5   Terminate drive 1.

6   Connect sb1 on SNC 1 to drive 2.

7   Terminate drive 2.

8   Connect sb0 on SNC 2 to drive 3.

9   Terminate drive 3.

10   Connect sb1 on SNC 2 to drive 4.

11   Terminate drive 4.

See Figure 6 on page 17. Stop here if you have only four LTO-2 drives. If you have six LTO-2 drives, proceed to Step 12. See Figure 7 on page 18.

12   Connect sb0 on SNC 3 to drive 5.

13   Terminate drive 5.

14   Connect sb1 on SNC 3 to drive 6.

15   Terminate drive 6.

See Figure 7 on page 18.

Figure 6   Scalar 100 with Four LTO-2 Drives
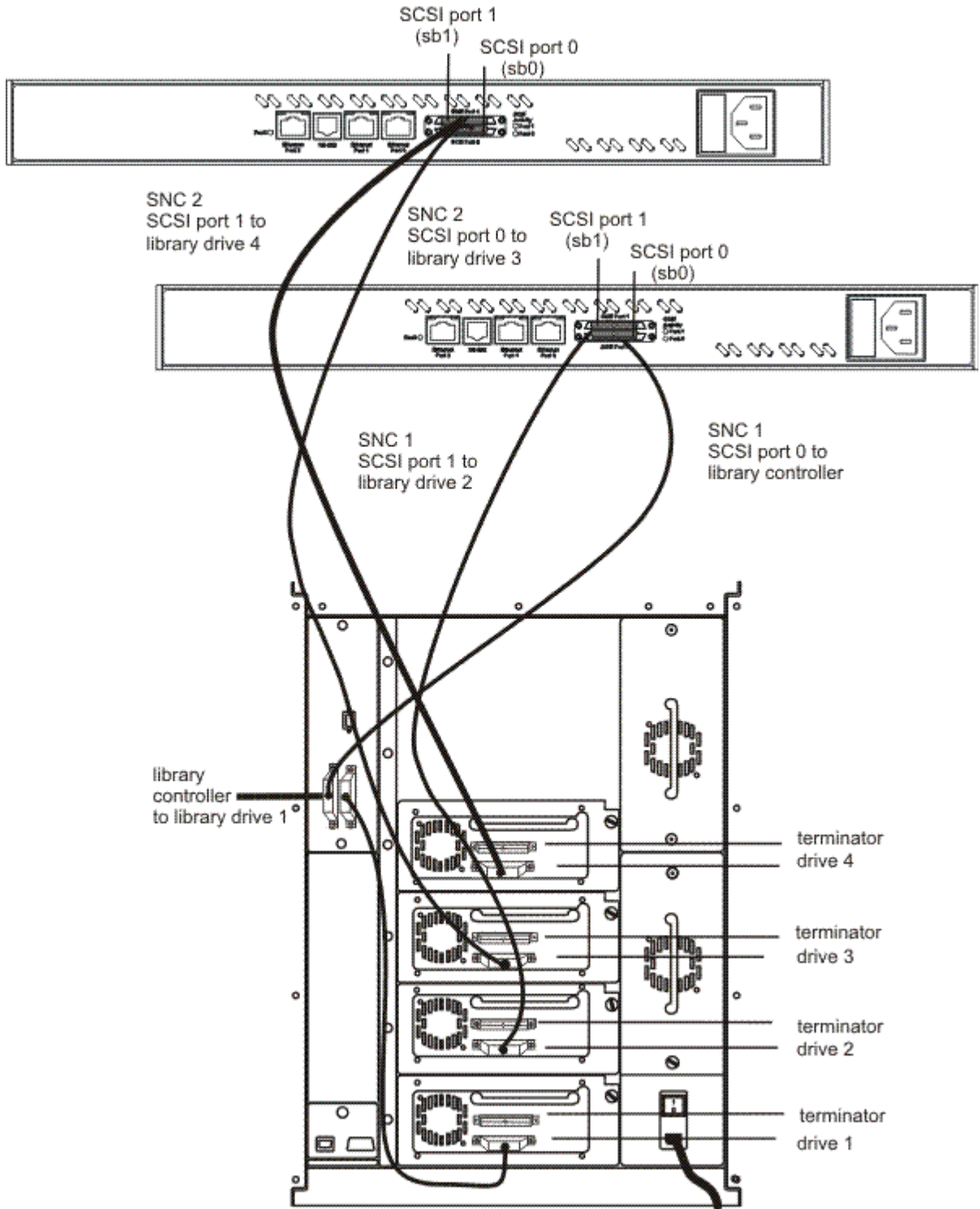
Figure 7   Scalar 100 with Six LTO-2 Drives
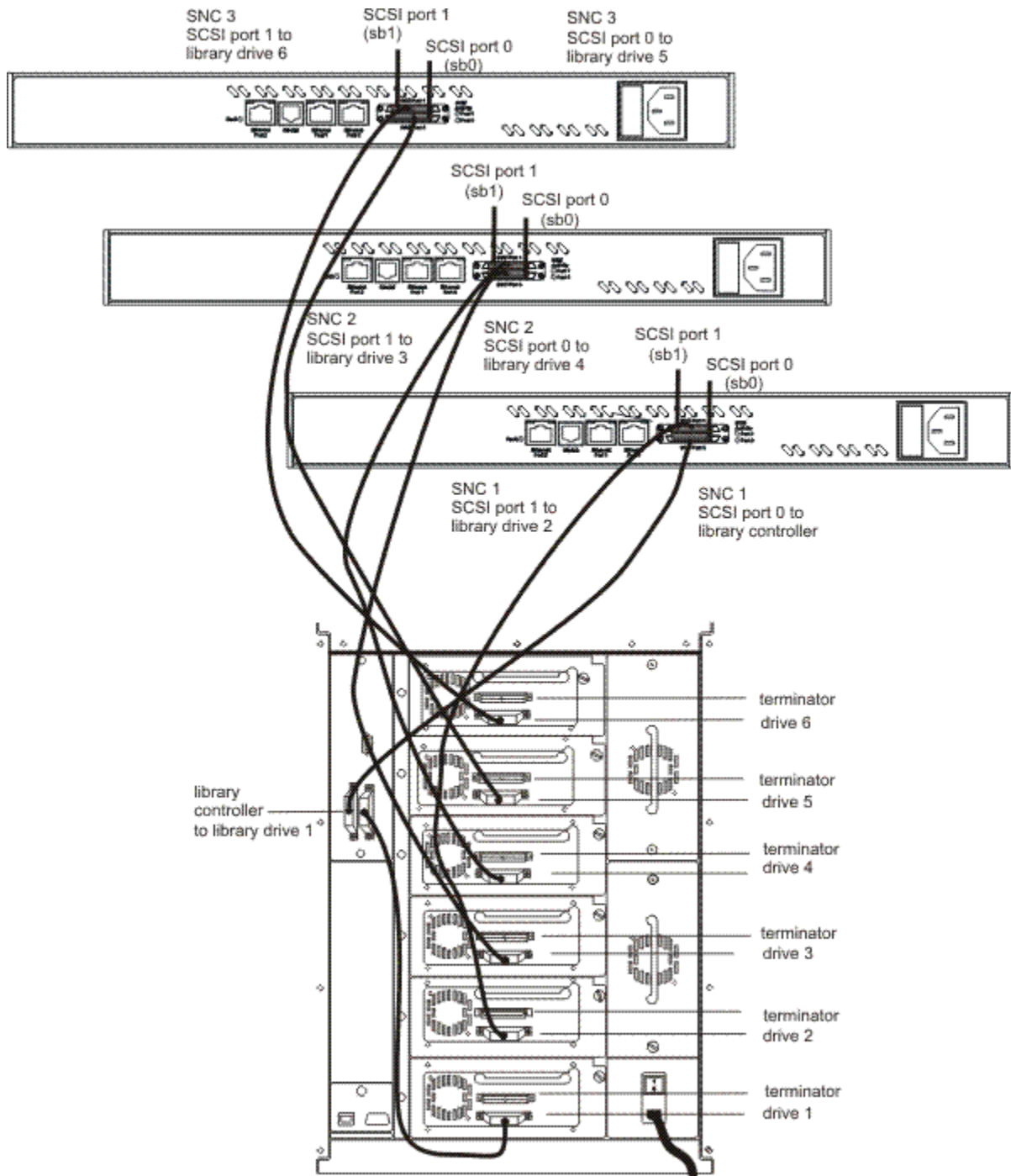
Connecting to the Serial Port

Use the serial port to log on and configure the Ethernet ports.

> **Note**   You must have completed the previous installation steps before you configure the serial port.

1   Connect the cable supplied with your SNC to the SNC RS-232 serial port, and from there to the serial (COM) port on a personal computer.

For the location of this port on the SNC 4500, see Figure 8. For its location on the SNC 4501, see Figure 9.

Figure 8   Serial Connector on the SNC 4500
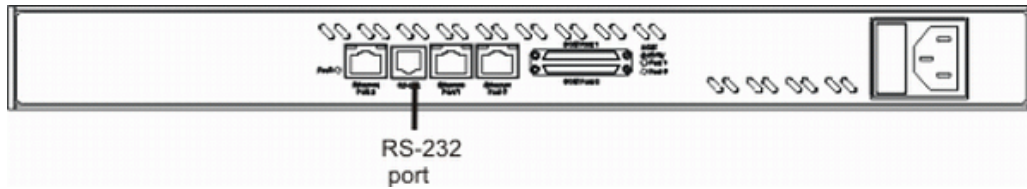
Figure 9   Serial Connector on the SNC 4501
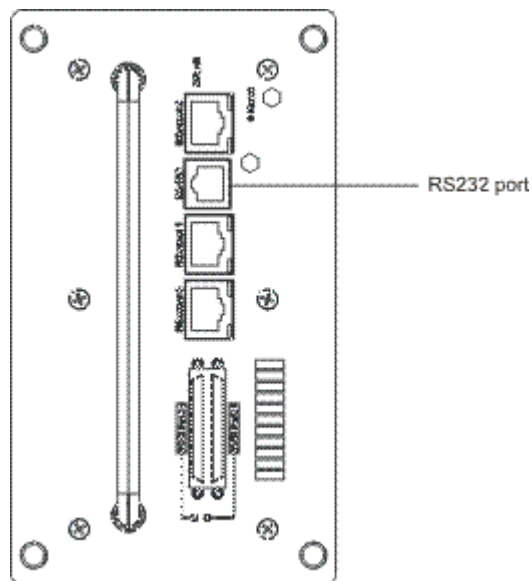
2   If you are using an SNC 4500 with a Scalar 100 and the library is off, turn on the library. After about 15 seconds, when the library has finished booting, turn on the SNC. If you are using the SNC 4501, just turn on the library.

3   Start a terminal emulation program on the personal computer, and use it to connect to the SNC.

    a.   For example, if you are using HyperTerminal on a computer running a Windows operating system, type `SNC450x` in the **New Connection** dialog box. Then click **OK**.

    b.   In the **Connect To** dialog box, for the **Connect using** field select the COM port number to which your serial cable is connected. Then click **OK**.

In the **COM Properties** dialog box select the following values:

- Bits per second: 115,200
- Data Bits: 8
- Parity: None
- Stop Bits: 1
- Flow Control: None

- • Terminal type: ASCII
- • Echo: on

c. Click **OK**.

4 After you connect to the SNC, you can see the following start-up messages. These messages are only displayed at start-up. Messages actually displayed by your SNC will differ slightly from the sample message printed below. The last line in the start-up message sequence is **Ready**.

```
Uart is Initialized

DRAM  Data Line Test        Passed
SRAM  Data Line Test        Passed
BBRAM Data Line Test        Passed

DRAM  Address Line Test     Passed
SRAM  Address Line Test     Passed
BBRAM Address Line Test     Passed

DRAM  Pattern Test      1   Passed
DRAM  Pattern Test      2   Passed
DRAM  Pattern Test      3   Passed
DRAM  Pattern Test      4   Passed
SRAM  Pattern Test      1   Passed
SRAM  Pattern Test      2   Passed
SRAM  Pattern Test      3   Passed
SRAM  Pattern Test      4   Passed
BBRAM Pattern Test      1   Passed
BBRAM Pattern Test      2   Passed
BBRAM Pattern Test      3   Passed
BBRAM Pattern Test      4   Passed
DRAM  Swap Pattern Test1    Passed
DRAM  Swap Pattern Test2    Passed
DRAM  Swap Pattern Test3    Passed
DRAM  Swap Pattern Test4    Passed


***** Memory Tests Complete *****

Memory Clear               Finished


EPLD Version 0 Detected
DS1629_DVC_TYPE initialized


     ADIC SNC 450x
(c) 2003 ATTO Technology, Incorporated.

Firmware version A61Z release date Feb  4 2004, 14:06:50 Build A61Z

Power-On Self-Test Completion Status: GOOD
128 Megabytes of RAM Installed.

2 GbE Data Port(s).
2 LVD SCSI Interface Port(s).

Bridge World Wide Name = 20 00 00 10 86 50 00 1C
```

```
Bridge Serial Number  = "IPB2500100136"
Bridge Name           = "SNC 450x"

Internal Temperature = 25 C [0 - 70]
For help, type HELP.
Active Configuration = ADIC Config File
Feb  4 2004 14:06:50 A61Z Initialization Complete
Scsi interface 0 Register R/W test     Passed
Scsi interface 0 Reset test            Passed
Scsi interface 0 FIFO test             Passed
Scsi interface 0 Master test           Passed
Scsi interface 1 Register R/W test     Passed
Scsi interface 1 Reset test            Passed
Scsi interface 1 FIFO test             Passed
Scsi interface 1 Master test           Passed

 Initializing Port DP0.....................
 Initializing Port DP1.....................
 Initializing Port MP0.....................
GBE hardware Init done.
Ready.
```

> **Note**
> - In serial port sessions, there is no prompt on the line below the word **Ready**. Begin typing commands in the blank line where the cursor is resting.
> - No username or password is required for serial port access.
> - CLI commands are case insensitive. You can type all upper or all lower case or a mixture. Upper and lower case in this guide and the **Help** screen are for clarification only.

5 To verify that you have connected successfully, type `help` after the **Ready** prompt and press **Enter.**

If a list of all available commands does not appear on the screen, review the steps in this section, check the cable, or contact service personnel until the problem is solved.

- If you wish to change the default username and password for world wide web, Telnet and FTP use, continue with the section Completing the Installation.

- If you are configuring the SNC for the first time, continue with the section Connecting to the Ethernet Management Port.

- If you were sent to this section by another procedure, return to that procedure.

Connecting to the Ethernet Management Port

The management port IP address (Ethernet port 2, also called the mp0) must be set by issuing a command from the serial port (refer to Connecting to the Serial Port on page 18).

> ⚠ **CAUTION**
> - **For best performance, all cabling, network interface cards (NICs), host bus adapters (HBAs), and network switches must be Gigabit Ethernet (GbE), and at least Cat 5e certified. Most standard offices use 2-pair wiring which is not compatible. GbE requires 4-pair wiring. For best performance, support for 9600 byte jumbo frames should be available for all switches and host iSCSI equipment.**
> - **It is recommended that you configure host access through a switch.**

1 Using at least Cat 5e cable, connect the Ethernet ports to your network switch.

Figure 1 on page 4 and Figure 2 on page 4 show the connectors on the SNC.

> ⚠️ **CAUTION**
> - **Obtain appropriate IP addresses, gateways and subnet masks from your network administrator.**
> - **The recommended configuration is one where DHCP has been disabled.**
> - **You must substitute a valid IP address for the IP address used in the example.**
> - **Some completed configuration commands do not take effect until you have issued the saveConfiguration command. When this is the case, the Ready prompt will be followed by an asterisk. You can issue the saveConfiguration command after each such configuration command or wait until the end of the configuration session before saving.**

2 Work from the computer attached to the SNC serial port. After the SNC **Ready** prompt is returned, change the IP address of the management port by issuing the **set IPAddress mp0** command. The default IP address for the management port is "**10.0.0.3.**" The example below uses a hypothetical IP address from the user's internal network.

```
Ready.
set IPAddress mp0 172.17.76.3
```

Press **Enter**.

```
Ready.*
```

> ⚠️ **CAUTION**   **You must substitute a valid subnet mask for the subnet mask used in the example.**

3 After the SNC **Ready** prompt is returned, issue the **set IPSubnetMask mp0** command. The default subnet mask is "**255.255.0.0.**"

```
Ready.
set IPSubnetMask mp0 255.255.255.0
```

Press **Enter**.

```
Ready.*
```

> ⚠️ **CAUTION**   **You must substitute a valid gateway for the gateway used in the example.**

4 After the SNC **Ready** prompt is returned, issue the **set IPGateway mp0** command. There is no default gateway.

```
Ready.
set IPGateway mp0 172.17.76.0
```

Press **Enter**.

```
Ready.*
```

Completing the Installation

To complete the installation, continue with the configuration steps. Refer to

Note	• You must have completed the previous procedures in this chapter before you complete the installation.
	• Other special configurations may be required, for example when setting up an iSNSServer or iSCSIChapSecrets. If so, consult your service representative.

4

Configuring the SNC

In the previous chapter you used the serial port to log on and configure the Ethernet ports. In this chapter you get instructions for using SNC Manager to set the time and date and to map devices.

> **✎ Note**
> - Any changes must be saved by clicking the **Submit** button and restarting the SNC.
> - Clicking the **Submit** button is the equivalent of entering **saveConfiguration norestart** at the command line.
> - Multiple changes on multiple SNC Manager pages may be made and saved by clicking the **Submit** button before restarting the SNC to permanently save the changes.

Opening an SNC Manager Session

SNC Manager is the recommended management tool for the SNC 4500 and SNC 4501. It is a web-based graphical user interface (GUI) that allows you to manage the SNC by clicking choices and commands in traditional GUI fashion or by entering CLI commands directly, as you would in a terminal emulation session.

The minimum requirement for browsers is Internet Explorer 5.5 or Netscape Navigator 6.2.

1 Obtain the IP address of the SNC mp0.

This address was set in Step 2 on page 22 in the section Connecting to the Ethernet Management Port on page 21.

2 Point your browser at the IP address of the SNC.

3 The **SNC Manager** home page is displayed. Click **Enter**.

4 Enter the username and password values.

> **✎ Note**
> The default value for the username is `admin`. The default password is `Password`. These values are case sensitive.

The SNC **Status** page appears.

Changing the Default Username and Password

⚠ CAUTION	**It is best practice to change the default username and password after you have configured your SNC. If you do so, record the new username and password in a convenient place.**

1 If you have not already, open an SNC Manager session.

For instructions, refer to <u>Opening an SNC Manager Session</u> on page 25.

2 Click **Bridge**.

The **Bridge Configuration** page is displayed. The username that you are currently logged in with is displayed in the **Username** text box.

3 Enter appropriate information into the **Username**, **Old Password**, **New Password**, and **Confirm Password** text boxes.

☒ Note	The username and password are case sensitive

4 Click **Submit**.

5 Provide the current administrative username and password when prompted to do so.

The username and password for all Telnet, FTP and SNC Manager sessions is changed.

Setting the Date and Time

Your SNC can set the time automatically by using the Network Time Protocol (NTP). NTP is enabled by default. If the SNC is left unpowered for long periods of time, you may need to reset the time and date.

⚠ CAUTION	**The SNC must remain powered on for more than 24 hours to ensure the date and time are set.**

1 If you have not already, open an SNC Manager session.

For instructions, refer to <u>Opening an SNC Manager Session</u> on page 25.

2 Click **Time & Date**.

3 If you are setting the time manually, proceed to <u>Step 4</u>. If you are using a time server on your network to set the time, click **Simple Network Time Protocol enabled**.

    a. Type the IP address of the time server in the **Time Server** text box.

    b. Click **Submit**. Exit this procedure.

4 Click **Simple Network Time Protocol disabled**.

5 Click **Submit.**

6 Select a time zone from the **Time Zone** drop-down choices.

7 In the box marked HH:MM:SS enter the desired time in hours, minutes, and seconds.

8 In the box marked MM:DD:YYYY enter the desired month, day, and year in digits.

9 Click **Submit.**

Naming the SNC

1 If you have not already, open an SNC Manager session.

For instructions, refer to <u>Opening an SNC Manager Session</u> on page 25.

2 Choose a name for the SNC. Go to the **Bridge Configuration** page and type in a name in the text box provided to identify your SNC.

The name can have no more than eight characters.

> ✍ Note   This name is an internal name only, not a network name. To set a network name, ask your system administrator to assign one through DNS.

3 Click **Submit**.

Connecting to the Ethernet Data Ports

After you have used the serial port to set an IP address for Ethernet port 2 (the management port), you can use SNC Manager to configure the Ethernet data ports 0 and 1.

> ⚠ **CAUTION**   **Obtain appropriate IP addresses, gateways and subnet masks from your network administrator.**

1 If you have not already, open an SNC Manager session.

For instructions, refer to <u>Opening an SNC Manager Session</u> on page 25.

2 Click **Ethernet**.

The **Ethernet Port Configuration** page appears.

> ✍ Note   Management port data will already be filled in when you bring up this screen.

Ethernet (Network) Port Configuration

Port Specific Options

	Data Port 0	Data Port 1	Management Port 0
Use DHCP:	○ enabled ◉ disabled	○ enabled ◉ disabled	○ enabled ◉ disabled
IP Address:	10.0.0.1	10.0.0.2	10.0.0.3
IP Gateway:	0.0.0.0	0.0.0.0	0.0.0.0
IP Subnet Mask:	255.255.0.0	255.255.0.0	255.255.0.0
Ethernet Speed:	auto ▾ (1000)	auto ▾ (1000)	auto ▾ (100)
MTU:	1514 ▾	1514 ▾	1514 ▾

Side bar: HOME, BACK, Status, Serial Port, Time & Date, Ethernet, SCSI, iSCSI, Bridge, Mapping, Advanced, Restart, Help, About

[Submit]

3   Fill in appropriate values for the data ports IP addresses, gateways, and subnet masks.

> ⚠ **CAUTION**   **Consult your service representative before changing the Ethernet speed values or the MTU (Maximum Transmission Unit) values.**

4   Click **Submit**.

5   Click the **Restart** button in the side bar. Then click **Restart**.

> ⚠ **CAUTION**   **If the host and SNC are on different subnets, ping may return "Destination Net Unreachable." Check with your network administrator to determine if pings across subnets have been disabled for security reasons. If so, you will need to perform the ping from a host on the same subnet as the SNC or rely on the host's iSCSI initiator to enumerate the SNC data ports.**

6   Wait for the reboot to be completed. Then, verify that the SNC can be accessed on the local Ethernet network by issuing the **ping** command from a service computer on the SNC network to the SNC mp0, dp0, and dp1.

Mapping

The **Mapping** page of the SNC Manager interface shows you the current mapping. When you hover the mouse over a particular device, the following information about the device is displayed:

- Bus number
- Target ID
- LUN number
- Device Type
- Vendor ID
- Product Name
- Firmware Revision Number
- Serial Number

> ⚠ **CAUTION** **If you change the SCSI IDs of tapes or the library attached to the SNC after setting up the SNC the first time, you must map the devices again using the SNC Manager Mapping page.**

Device mapping is the process of defining what storage devices, tape drives, and changers hosts can access through the SNC. Hosts determine available storage using a device map stored on the SNC. The device map routes all commands from the SNC iSCSI address to the appropriate SCSI device. This mapping needs to be defined when the SNC is first set up. See Figure 10.

Figure 10   Physical and Virtual Connection Possibilities With the SNC
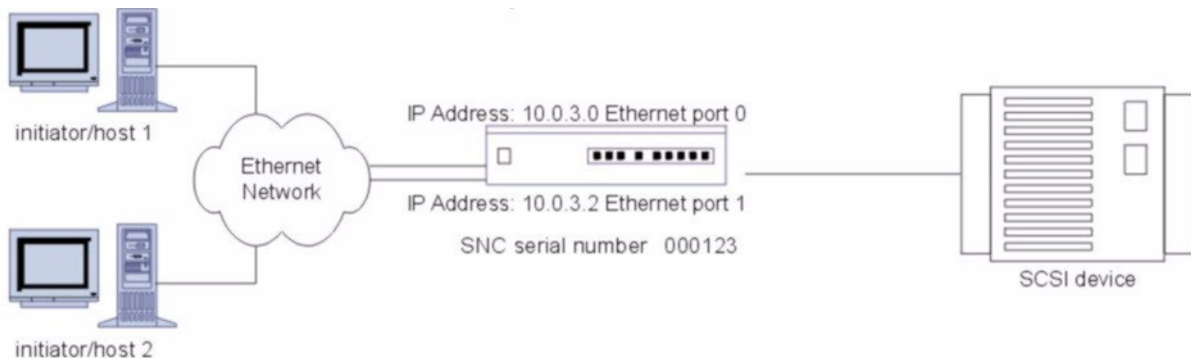
The device map is persistent across reboots, so storage will always be presented at the same LUN ID until the map is adjusted. If a storage device is off-line when device discovery occurs, its LUN ID will be reserved so that when it comes back online, it will retain the same ID. When adding new storage devices, the device map needs to be redefined.

SCSI devices are mapped using the designations for the SCSI bus, target and LUN.

Note	• Changing the device map can affect the host's view of devices and your application configuration.
	• If the SCSI devices are not cabled or terminated properly, they may not show up in the mapping.
	• SCSI devices mapped by the SNC are visible through both data ports. This allows library devices to be accessed on either data port when both data ports are connected to the IP SAN.
	• The SNC automatically maps all devices on startup.

CAUTION	**Ensure all I/O to the SNC has stopped before proceeding with mapping through the SNC Manager.**

Mapping Devices Automatically

1   If you have not already, open an SNC Manager session.

For instructions, refer to Opening an SNC Manager Session on page 25.

2   Click **Mapping**.

The **iSCSI Mapping** page is displayed.

3   Click **AutoMap**

4   Click **Submit.**

All the CLI commands necessary to enable mapping and the command `saveconfiguration norestart` will be performed.

5   On the **Mapping** page, examine the mappings.

- If devices are not properly displayed, open the SNC Manager **Advanced** page. In the **Enter a CLI command** text box, enter the **SCSITargets** command to make sure all devices are online. Then enter the **autoMap** command. Refer to SCSITargets [port number] on page 83 and autoMap on page 57.

- If devices are not properly displayed, use the SNC Manager **Advanced** page and the **route** command to manually map devices. Use the **route** command if devices have not been discovered in order by the **autoMap** command. Refer to route iSCSI [lun] [SCSI | delete] <SCSI btl> on page 81. The LUN IDs should be in the order of the SCSI IDs.

- For detailed troubleshooting procedures, refer to Troubleshooting on page 41.

- If devices still are not properly displayed, contact ATAC.

6   Go to the **Restart** page.

7   Click **Restart** to make permanent any changes you have made since the last firmware restart. Restarting the firmware can take a few minutes. Refer to firmwareRestart on page 62.

Mapping Devices Manually

1   If you have not already, open an SNC Manager session.

For instructions, refer to Opening an SNC Manager Session on page 25.

2   Click **Mapping**.
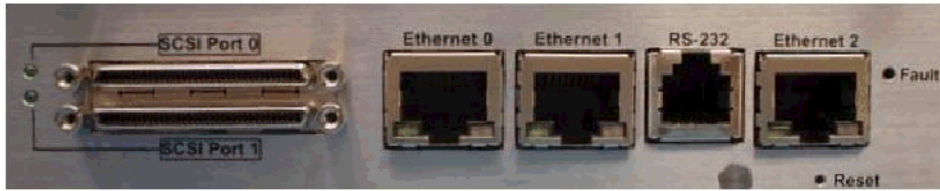
The **iSCSI Mapping** page is displayed.

3   Drag and drop icons representing the unmapped SCSI devices to the appropriate iSCSI LUN.

- Ensure the SNC is mapped to iSCSI LUN 0.

- Map the SCSI devices with sequential IDs starting at 0 for each device.

4 Click **Submit.**

All the CLI commands necessary to enable mapping and the command `saveconfiguration norestart` will be performed.

- If devices are not properly displayed, open the SNC Manager **Advanced** page. In the **Enter a CLI command** text box, enter the **SCSITargets** command to make sure all devices are online. Then enter the **autoMap** command.

- If devices are not properly displayed, you can use the SNC Manager **Advanced** page and the **route** command to manually map devices. Use the **route** command if devices have not been discovered in order by the **autoMap** command. The LUN IDs should be in the order of the SCSI IDs.

- For detailed troubleshooting procedures, refer to Troubleshooting on page 41.

- If devices still are not properly displayed, contact ATAC.

5 Go to the **Restart** page.

6 Click **Restart** to make permanent any changes you have made since the last firmware restart. Restarting the firmware can take a few minutes. Refer to firmwareRestart on page 62.

Other Ways of Connecting to and Monitoring the SNC

> **Note** The recommended management tool for the SNC 450x is the SNC Manager interface.

Using Telnet

Up to three Telnet sessions can be conducted simultaneously. A serial port session can use the CLI while Telnet sessions are open. Whichever session issues the first "set" CLI command can continue to issue set commands, while the other sessions can only issue "get" commands or display information. Once a connection is established, refer to Using the Command Line Interface (CLI) on page 51 for lists of valid commands.

1 Connect to the SNC from a computer on the same Ethernet network.

2 Start a Telnet session.

> **Note** There is more than one way to connect to the SNC using a Telnet program.Your Telnet program may operate differently than in the following instructions.

3 At the Telnet prompt, issue the **open** command:

```
telnet > open x.x.x.x
```

where x.x.x.x is the IP address of the SNC.

> **Note** To obtain the IP address of the SNC, refer to the information you recorded after completing Step 2 on page 22 in the section Connecting to the Ethernet Management Port on page 21.

4 If you have to specify a port type, enter the port type `telnet` and the terminal type `vt100`.

```
port type:telnet
terminal type: vt100
```

5   Enter the default values for the username, "admin", and the password, "Password", if you did not set new values in <u>Connecting to the Ethernet Management Port</u> on page 21.

> ✍ **Note**   The username and password are case sensitive.

```
username:admin
password:Password
```

6   Enter the appropriate CLI management commands.

5

Updating Firmware

Several processors control the flow of data in the SNC. The firmware to control these processors can easily be upgraded in the field using the **PUT** command from an FTP connection or ZModem utility over a serial connection to overwrite the previous firmware with new firmware. The SNC firmware is distributed as a compressed ZIP file. This chapter provides instructions for updating the firmware when your computers are running a Microsoft® Windows® operating system.

FTP is the faster method for updating firmware.

Updating Firmware Using FTP

1   On a computer that is on the same Ethernet network as the SNC, extract the firmware image file (its extension is *.ima) from the ZIP archive to the personal computer hard drive. Note the path and filename.

2   Start up an FTP program on the computer. The FTP program must be in binary mode.

> Note   There is more than one way to connect to the SNC using an FTP program.Your FTP program may operate differently than in the following instructions.

3   At the FTP prompt, issue the **open** command:

```
ftp > open x.x.x.x
```

where x.x.x.x is the IP address of the SNC management port.

> Note   To obtain the IP address of the SNC, refer to the information you recorded in the section Connecting to the Ethernet Management Port.

4   Enter the default values for the username, "admin", and the password, "Password", if you did not set new values in Changing the Default Username and Password on page 26.

> Note   The username and password are case sensitive.

```
username:admin
password:Password
```

5 Use the **PUT** command to download the firmware from the directory on your personal computer determined in <u>Step 1</u>. For example:

```
ftp > put c:\SNC_firmware\I2500110.ima
```

Press **Enter.**

⚠ CAUTION	**DO NOT INTERRUPT THE UPDATE PROCESS. DO NOT TURN OFF THE PERSONAL COMPUTER OR THE SNC UNTIL READY IS RETURNED AT THE END OF THE UPDATE. INTERRUPTING THE UPDATE PROCESS WILL MAKE YOUR SNC INOPERABLE AND YOU WILL HAVE TO RETURN IT FOR REPAIR.**

6 Once the download is complete, turn off power to the SNC, then turn it on again to activate the new firmware.

Updating Firmware Using ZModem

1 Ensure that all I/O through the SNC has stopped.

2 Connect to the SNC serial port.

For instructions, refer to the section <u>Connecting to the Serial Port</u> on page 18.

3 On the personal computer, extract the firmware image file (its extension is IMA) from the ZIP archive. Note the path and filename.

4 Once the **Ready** prompt appears, type the following command:

```
ZMODEM RECEIVE
```

Press **Enter.**

The SNC displays the message that it is preparing to receive a file from your terminal program.

5 On the terminal program, choose **Transfer Send File/ZModem send**.

6 In the **Send File** box, enter the current SNC IMA file name or click the **Browse** button to find it. For example:

```
Ready
put c:\SNC_firmware\I2500110.ima
```

7 Click **Send File**.

8 The SNC displays a message stating that the file has been received. Then it displays a warning not to turn off the SNC for 60 seconds. When the file transfer is complete, the **Ready** prompt reappears.

⚠ CAUTION	**DO NOT INTERRUPT THE UPDATE PROCESS. DO NOT TURN OFF THE PERSONAL COMPUTER OR THE SNC UNTIL READY IS RETURNED AT THE END OF THE UPDATE. INTERRUPTING THE UPDATE PROCESS WILL MAKE YOUR SNC INOPERABLE AND YOU WILL HAVE TO RETURN IT FOR REPAIR.**

9 When the SNC **Ready** prompt returns, issue the **firmwareRestart** command to invoke the new firmware.

6

Using the SNC Manager Interface

SNC Manager is a monitoring and configuration tool accessible through a web browser. Platform independent, SNC Manager contains all the current capabilities of the CLI in a user-friendly GUI interface. A menu provides access to various pages for information and configuration operations. For instructions on accessing SNC Manager, refer to Opening an SNC Manager Session on page 25.

Navigating SNC Manager

All pages are accessible by clicking on their links on the left side of the page. You can also go back one page or go to the home page by clicking the links on the left side of the page. See Figure 11 .

> 📝 **Note**   Clicking any of the red links displays a help window.

After making changes on a page, click the **Submit** button at the bottom. Clicking this button is equivalent to typing in the **saveConfiguration norestart** command.

If a firmware restart is required to make the requested change permanent, go to the **Restart** page and click **Restart**. For more information about this command, refer to `saveConfiguration <status>` on page 82.

Figure 11   SNC Manager Status Page

Each page in the SNC Manager interface provides information and configuration parameters based on a specific element. Each page can be reached through the menu at the left side of each page.

Checking Status

The **Status** page displays SNC information which is usually found in the POST or after using an **Info** command in the CLI. Refer to info on page 79.

- Vendor ID

- Product ID

- Firmware revision number

- Serial number

- Valid internal temperature range

- Current internal temperature

- Current voltage

- Ethernet port IP addresses

- Ethernet port status for data ports 0 and 1

Configuring the Serial Port

You can configure the serial port using the **Serial Port Configuration** page.

- Baud rate
- Echo

Configuring the Time and Date

You can configure the real-time clock or access a remote time server using the **Time & Date Configuration** page.

⚠️ **CAUTION** **The SNC must remain powered on for more than 24 hours to ensure the date and time are set.**

Configurable options are the following:

- Enables/disables the network time protocol
- Time server
- Time zone
- Manually set time
- Manually set date

Configuring the Ethernet Port

⚠️ **CAUTION** **Use the SNC Manager to manually set IP addresses for the data ports, gateway and subnet mask. Consult your service representative before making other changes to the default settings.**

The **Ethernet Port Configuration** page configures each port independently. If you change the IP address of the Ethernet port you are using to access SNC Manager (the mp0), the change does not take effect until after you reboot the SNC.

- Enable/disable DHCP
- IP address
- IP gateway
- IP subnet mask
- Ethernet speed
- MTU (Maximum Transmission Unit)

Configuring the SCSI Ports

⚠️ **CAUTION** **Consult your service representative before making changes to the default settings.**

Each SCSI port is configured separately. The display includes a list of attached devices for each bus. You can configure the following options:

- Port bus speed

- Synchronous transfer

- Wide transfer

- Initiator ID

- Bus reset on startup

- Bus termination

- SCSI port reset

Configuring iSCSI

⚠ **CAUTION** **Consult your service representative before making changes to the default settings.**

The **iSCSI Configuration** page allows you to configure iSCSI parameters. You can configure the following options:

- iSCSI alias

- iSCSI port number

- iSNSLoginControl

- iSNSServer

Configuring the SNC

You can change a number of parameters which affect the SNC on the **SNC Configuration** page. You can configure the following options:

- User name

- New password

- Confirm password

- Minimum operating temperature (internal)

- Maximum operating temperature (internal)

- Operating temperature warning

- Identify the SNC

- Restore defaults

Mapping

The **Mapping** page displays the default mapping. It allows you to change the mapping by dragging icons representing the SCSI devices to the appropriate LUN.

If you change the SCSI IDs of tapes or the library attached to the SNC after setting up the SNC the first time, you must map the devices again. Refer to Connecting to the Ethernet Data Ports on page 27.

Configuring Advanced Properties

The **Advanced** CLI configuration page allows you to input any CLI command available through the SNC. Refer to Management Port Command Reference on page 51.

> **Note**   CLI commands are case insensitive. You can type all upper or all lower case or a mixture. Upper and lower case in this guide and the **Help** screen are for clarification only.

1   In the text box, type the CLI command.

2   Click the **Submit** button.

    This is equivalent to typing in the CLI command into a TCP/IP or serial port CLI session.

3   A text field beneath the box lists the most recent commands issued to the SNC through this page. If you enter an incorrect parameter, the CLI help text is displayed, showing the parameters available.

4   If your entry was correct, type at the prompt

        saveConfiguration

5   Click the **Submit** button. Your changes are implemented.

6   To make the changes permanent, restart the SNC (refer to Restarting the Firmware).

Restarting the Firmware

The **Restart Firmware** page implements a firmware restart of the SNC and makes permanent any changes you have made since the last firmware restart. Restarting the firmware can take a few minutes. Refer to firmwareRestart on page 62.

1   Click the **Restart** button.

    A box tells you to wait until the counter gets to 0, then the browser refreshes.

2   If the browser does not refresh after the counter gets to 0, click the link to refresh it manually.

Getting Help

The **Help** page gives help information about the CLI commands and troubleshooting tips with links to pages with help text for each category of options and one link to the **Troubleshooting Tips and FAQs** page on the website.

Contact information for technical support is on the right. Help is always available by clicking any word shown in red on the screen. You can also learn about help by referring to the help [command name] on page 78.

<div align="right">7</div>

Troubleshooting

If it is clear that a particular component system is at fault in a problem situation, go directly to that component. If it is not clear, the best approach is to troubleshoot using the inside-out method. Begin with the device(s) connected to the SNC first, then work your way out:

- SCSI devices
  - SNC SCSI ports
    - SNC internal configuration
      - SNC Ethernet/IP ports
        - LAN/WAN
          - Ethernet host adapter or NIC in host
            - iSCSI OS driver
              - OS
                - Application

Check the Host Event Log

Check the event log on the host. Look for the most recent entries and determine what could be causing a problem, then go to that event and continue troubleshooting.

Check the SNC Event and Trace Logs

Check the SNC event log through the CLI. See Diagnostic Commands on page 53. Look for the most recent entries and determine what could be causing a problem. Then go to that event and continue troubleshooting.

Visually Inspect LEDs

Light Emitting Diodes (LEDs) are located on both sides of the SNC 4500 and on the front of the SNC 4501.

- For the position of these LEDs on the SNC 4500, see Figure 12 on 42 and Figure 13 on 43. Refer to Table 1 on page 42 and Table 2 on page 43.

If there is a non-fatal power supply problem, or if a problem is detected before shut down occurs, the **Fault** LED flashes. The Fault LED also flashes briefly during start up. For more information, refer to Visually Inspect LEDs on page 41.

Figure 12   LEDs on the Front of the SNC 4500
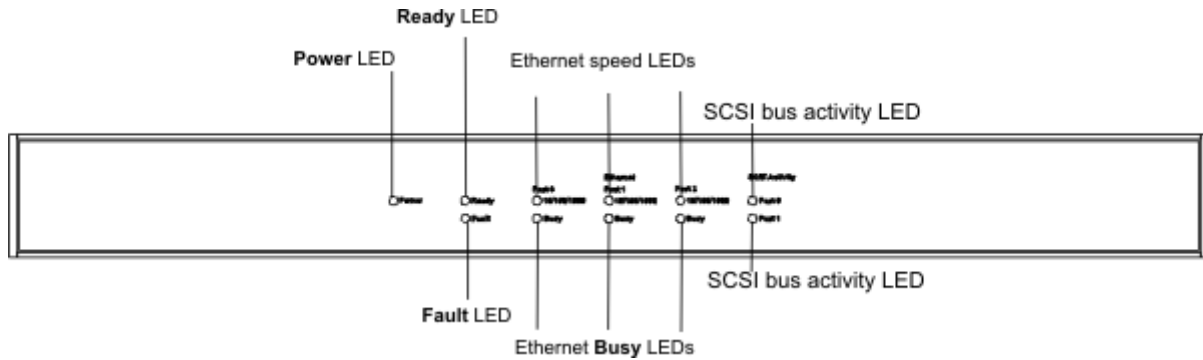
Table 1   LEDs on the Front of the SNC 4500

LED	Appearance	Meaning
Ethernet speed LED	amber	speed is 1 Gb/sec
Ethernet speed LED	green	speed is 100 MB/sec
Ethernet speed LED	off	speed is 10 MB/sec, or no link
Ethernet BUSY LED	blinking	I/O activity
Fault LED	on, amber	unit is starting up
Fault LED	blinking	fatal fault imminent
Ready LED	green on	POST completed, unit ready
SCSI bus activity LED	blinking	I/O activity
SCSI bus activity LED	solid	heavy I/O activity
Power	green on	sufficient power to operate
Power	off	power is insufficient

Figure 13   LEDs on the Back of the SNC 4500
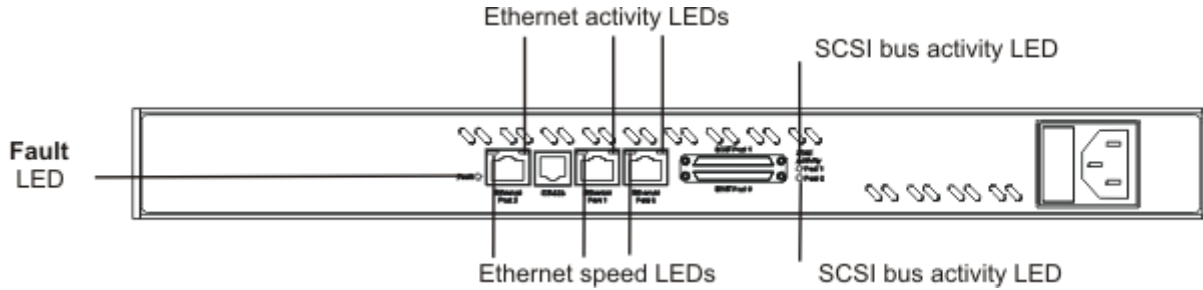
Table 2   LEDs on the Back of the SNC 4500

LED	Appearance	Meaning
Ethernet activity LEDs	green, blinking	I/O activity
Ethernet activity LED	off	no link
Ethernet speed LEDs	amber on	speed is 1 Gb/sec
Ethernet speed LED	off	speed is 10/100 MB/sec
Fault LED	on, amber	unit is starting up
Fault LED	blinking	fatal fault imminent
SCSI bus activity LED	blinking	I/O activity

Figure 14   LEDs on the SNC 4501
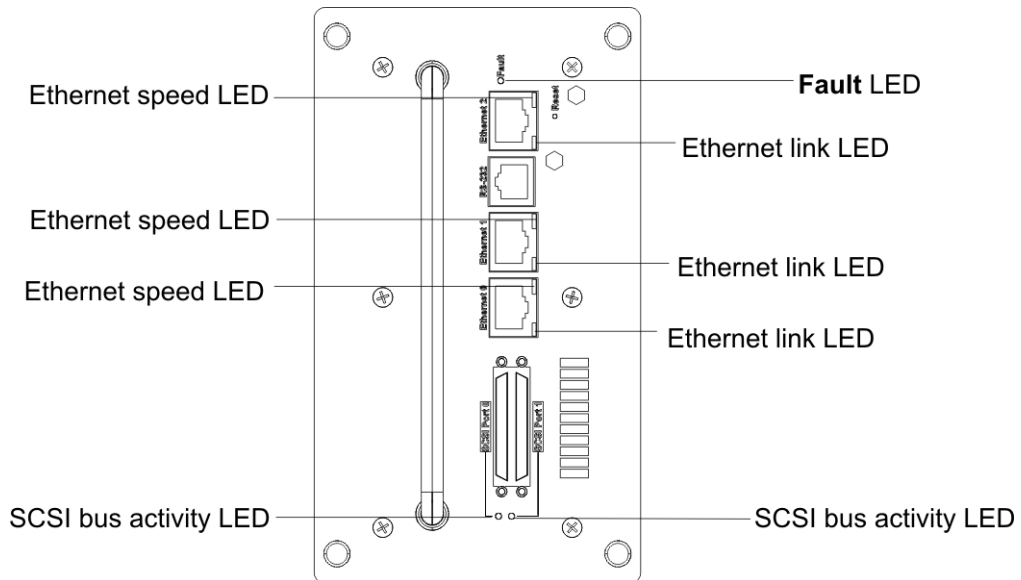
Table 3   LEDs on the SNC 4501

LED	Appearance	Meaning
Ethernet activity LEDs	green, blinking	I/O activity
Ethernet activity LED	off	no link
Ethernet speed LEDs	amber on	speed is 1 Gb/sec
Ethernet speed LED	off	speed is 1/100 Mb/sec
SCSI bus activity LED	blinking	I/O activity
Fault LED	on, amber	unit is starting up
Fault LED	blinking	fatal fault imminent

Each SCSI bus has its own LED to show activity on that bus. The LED blinks when I/O is occurring and is solid when there is heavy activity.

The **Fault** LED lights yellow when the SNC is turned on, then immediately goes dark. Software activates the LED if there is a system error.

Check for Problems on Attached Devices

Check the following in order to find problems on attached devices:

- LEDs
- Display panels
- Firmware levels
- Operability

Check Host Versions

Check the following to find problems on attached hosts:

- Operating system version
- Service pack version
- Host adapter version
- Host adapter firmware version
- Host adapter device driver version
- iSCSI driver version

If an update is required, perform the update. For an updated list of support SNC host platforms and host adapters, visit *www.adic.com*.

Check SNC Product Versions

For a current list of required updates, visit *www.adic.com*.

1 Start SNC Manager.

To start and use the interface, including how to access the version information, refer to Using the SNC Manager Interface on page 35.

2 If an update is needed, download the update from `www.adic.com`.

Refer to Updating Firmware on page 33.

Component Check

Use this procedure to check system components. For more information on the commands used in this procedure, refer to Management Port Command Reference on page 51.

Checking SCSI Devices

1 Check SCSI devices to make sure they are all set to different SCSI IDs.

By default, the SNC SCSI ports use SCSI ID 7 so drives should use IDs 0 through 6 and 8 through 15.

2 Check the SCSI device power. Make sure the devices are powering up.

3 Watch the drive lights before, during, and after startup. Many drives have term power lights that should be on before startup and turn off when system boots.

4 Verify the external terminator is the correct type and does not have damaged pins.

5 Check cable integrity. Check the cables for solid connections. Make sure they are screwed down. Inspect cable ends for bent pins.

6 If termination is correct, and the problem persists, try drives one at a time with different cables, adding drives and cables until the problem occurs. This helps pinpoint the drive or cable causing the problem.

7 Check with the manufacturer of SCSI device(s) for further troubleshooting methods.

If SCSI devices appear to be working order, move on to the SNC SCSI port section.

Checking the SNC SCSI Ports

1 Verify the SNC has its termination set properly. By default, termination is **enabled**.

2 Either through the SNC Manager or CLI, perform a SCSI bus scan on each SCSI port.

See SCSI Configuration Commands on page 54.

If no devices appear, re-check SCSI cables and termination. If garbage information appears, the problem is most likely a bad SCSI cable or termination.

3 Check the internal cabling of the SCSI device.

LVD SCSI cable lengths are limited to 12.5 meters. Longer cable lengths can cause problems. Internal cabling is also considered when calculating total cable length. For details, refer to Connecting to the Serial Port on page 18.

4 Some older SCSI devices improperly negotiate with the SNC SCSI port. If older devices are not showing up, contact your service representative.

5 If all devices appear, invoke the **ScsiTargets** command several times on each SCSI port to verify that the devices can be seen. If devices disappear and disappear, then appear again, the problem is most likely a SCSI cable. For information on the **ScsiTargets** command, refer to SCSITargets [port number] on page 83.

If all devices appear and remain, move to the SNC internal configuration section.

When changing any setting on the SNC the configuration must be saved by using either the **saveConfiguration** CLI command or through the SNC Manager interface.

Checking the Serial Port

1   Verify you have the correct settings and that your terminal is configured to:

- Baud rate: 15200

- Data bits: 8

- Stop bits: 1

- Parity: off

- Flow control: None

2   Verify that your serial cable is less then two meters in length.

Checking the SNC Internal Configuration

Verify that the SCSI devices are mapped properly. Check in the SNC Manager interface or use the **routedisplay iSCSI** command to show mappings. If devices do not appear, power down the SNC and power back on. See Mapping Commands on page 56 and Connecting to the Ethernet Data Ports on page 27.

When changing any setting on the SNC, the configuration must be saved by using either the **saveConfiguration** CLI command or through the SNC Manager interface.

Checking SNC Ethernet Ports

1   Check Ethernet cable integrity. Check the cables for solid connections. Cat5 cable can cause connection issues with Gigabit Ethernet. Cat6 cable is the best cabling for the SNC.

2   Verify the IP address, subnet mask, and gateway are properly set on each data port on the SNC for your network environment. See Configuring the Ethernet Port on page 37.

3   Verify that the Ethernet speed is set to auto: invoke the **get EthernetSpeed all** command, check the **Ethernet** page of the SNC Manager interface, or check the LED link lights to determine if the Ethernet speed is correct. Refer to Visually Inspect LEDs on page 41.

4   Determine if the SNC is set to get its IP information from a DHCP server. If so, verify that the DHCP server has available IP addresses. Refer to Ethernet Ports on page 4.

5   Verify that each used Ethernet port on the SNC can be pinged from the desired host. Refer to ping [port number] [IP address] <count> <size> on page 79.

If the host cannot ping the SNC ports and the SNC ports are properly configured, continue to the Local Area Network/Wide Area Network section, Checking the LAN/WAN on page 47.

Verify that each port on the SNC can ping each desired host. Refer to ping [port number] [IP address] <count> <size> on page 79. If the SNC cannot ping the host, continue to Checking the LAN/WAN on page 47.

6   If using DHCP, verify that the DHCP server is assigning the correct IP information to the host.

7   Some older switches/hosts cannot auto negotiate between the SNC and the switch/host at the desired speed. You could have to force the host/switch or the SNC to the desired speed.

8   Verify that the host is logging into the SNC correctly by viewing the **Connections** page and determining if there a "session open" status.

9 Verify that you are using the correct log in procedure for your initiator. For example: When connecting using the Adaptec initiator, the log on screen requests the SNC iqn (iSCSI qualified name). If left blank, Adaptec will not be able to log in. Enter "iSCSI" into this field for auto iqn discovery.

When changing any setting on the SNC the configuration must be saved by using either the **saveConfiguration** CLI command or through the SNC Manager interface.

Checking the LAN/WAN

1 Verify that the switch/switches are segmented properly so that hosts and the SNC have access to each other.

2 If there are routers involved in the setup, make sure the IP addresses and/or MAC addresses of the SNC are allowed through the router.

3 Verify that the switch can see the SNC on the port(s) in question. Refer to your switch vendor's guide for more information.

Checking the iSCSI Host Adapter or NIC

iSCSI host adapters appear as a type of Storage Controller to the host OS, not as a standard NIC. These adapters usually have hardware acceleration to offload the TCP processing from the host. Configuration of these adapters is usually done through the vendor's own utility and not through the OS itself.

NICs come in two types: accelerated and un-accelerated. Accelerated NICs use some hardware to offload some of the TCP processing from the host. Un-accelerated NICs make the OS do all TCP processing.

To check the iSCSI host adapter or NIC

1 Check cable integrity. Check the cables for solid connections. Make sure they are plugged in properly. Inspect cable ends for broken clips and improper wiring.

2 Verify that the iSCSI host adapter or NIC is configured with the correct IP information.

3 If using DHCP, verify that the DHCP server is assigning the correct IP information to the host.

4 Verify that the hosts are running the recommended driver and firmware level for the iSCSI host adapter or NIC vendor.

5 Verify that the hosts and the SNC are using the same port number to communicate iSCSI. The default port number for the SNC is 3260. Refer to get iSCSIPortNumber on page 70.

6 Make sure the host adapter/NIC is configured to log into the SNC. Some iSCSI host adapters do not re-login upon reboot or unplug/replug event without marking a check box.

7 Some older switches cannot autonegotiate between the host and the switch properly. You could have to force the host or switch to the desired speed.

For a NIC using an OS iSCSI driver, continue to the iSCSI OS driver section.

Checking the iSCSI OS Driver

This section is for hosts using a driver that allows the OS to talk to iSCSI targets via a NIC, not an iSCSI storage adapter.

1 A PC using an iSCSI storage adapter and an iSCSI OS driver might not work correctly on the same machine. Check with the vendors to make sure they are compatible.

2 Verify that the PC has the latest iSCSI driver as well as the required service packs and patches. Check with the iSCSI OS driver vendor for more information.

3 Verify that the iSCSI OS driver has started. Look under **Device Manager** for Windows or **lsmod** for Linux.

4   Verify that the iSCSI OS is still looking for the SNC at the right IP address.

5   If using DHCP, verify that the DHCP server is assigning the correct IP information to the host. Refer to Ethernet Ports on page 4.

6   Verify that the NIC is configured with the correct IP information.

7   Verify that the hosts and the SNC are using the same port number to communicate iSCSI. The default port number for the SNC is 3260. Refer to get iSCSIPortNumber on page 70.

8   Check cable integrity. Check the cables for solid connections. Make sure they are plugged in properly. Inspect cable ends for broken clips and improper wiring.

Checking the Operating System

1   Verify that the OS has the required service packs or patches installed. If not, obtain the proper service packs and patches and install them.

2   Some iSCSI host adapters and iSCSI OS drivers do not always automatically find new targets when plugged in or when forced to rescan. Reboot the hosts.

3   Check if the vendor has a new driver. If so, install it.

Checking the Applications

1   Verify that the application is running the latest device drivers for the devices connected to SNC. If not, get the latest device drivers and install them.

2   Verify with the application vendor if the iSCSI technology is supported on the version of the application being used.

Performance Issues

If the host is not getting the performance it should, check the following items.

Checking SCSI Devices

1   Verify that the devices are running at their highest possible SCSI speed. Refer to SCSI Configuration Commands on page 54.

Mixing SE and LVD devices on the same SCSI bus forces the speed of the bus to SE, thus slowing faster LVD devices. The SNC cannot accelerate an already slow device. Refer to Connecting to the Serial Port on page 18.

2   Verify that the proper terminator is being used. An SE terminator forces the SCSI bus to SE speeds.

Checking the SNC SCSI Ports

1   Verify that the SCSI port configuration is set to the highest speed using the SNC Manager interface or CLI. Refer to SCSI Configuration Commands on page 54.

The SNC SCSI port speed, wide negotiation, and sync negotiation settings all affect the speed of the port. By default, these settings are set for optimal speed.

2   Verify that the SCSI devices are equally distributed between the SCSI ports. Refer to Connecting to the Serial Port on page 18. Optimal performance is seen when only two high-speed SCSI devices are connected to each SCSI port.

Checking the SNC Ethernet Ports

1 Verify that the data ports are set to auto negotiate or forced to 1000 Mbs. The CLI command **get ethernetspeed all** shows the current speed.

Refer to Configuring the Ethernet Port on page 37.

2 Verify that the MTU size is set to optimal setting for the LAN/WAN environment.

Refer to Configuring the Ethernet Port on page 37. 9k frame size is the current optimized frame size for the SNC. Smaller frame sizes causes a decrease in performance.

3 Verify that the SNC **TraceLog** feature is disabled. Tracelog tracks certain events that occur in the SNC. With this log enabled, performance suffers.

Refer to Diagnostic Commands on page 53.

Checking the LAN/WAN

1 Verify that the MTU size is set to optimal setting for the LAN/WAN environment. Refer to set DPMTU [port number] [MTU choices] on page 86.

9k frame size is the current optimized frame size for the SNC. Smaller frame sizes causes a decrease in performance. Many switch and router vendors do not support the larger frame size of 9k or 16k. Refer to Performance Issues on page 48.

2 Verify that each associated port in the IP SAN is configured for 1000Mbs.

IP SAN traffic should be segmented so that it does not interfere with the main LAN network traffic.For better performance, the IP SAN should be on its own set of hardware.

3 Verify that packets are not being dropped along the LAN/WAN. Many utilities track packet activity and switch statistics.

Checking the Ethernet Host Adapter or NIC

Ethernet Storage Adapters generally outperform accelerated NICs and un-accelerated NICs by offloading most of the processing from the host.

An accelerated NIC provides some offloading, but still requires a host OS iSCSI driver, making the host spend more CPU cycles.

An un-accelerated NIC does not offload anything so the CPU must do much of the processing.

To check the Ethernet host adapter or NIC

1 Verify that the adapter or NIC is sent to auto-negotiate or forced to 1000 Mbs.

2 Set the MTU size to the largest MTU size supported in the LAN/WAN. Refer to set DPMTU [port number] [MTU choices] on page 86.

9k frame size is the current optimized frame size for the SNC. Smaller frame sizes causes a decrease in performance. Many switch and router vendors do not support the larger frame size of 9k or 16k. Refer to Performance Issues on page 48.

3 Set the maximum transfer size to the most efficient size for the intended target(s). For many tape drives, 64k is the optimal setting.

Checking the Applications

Some applications can be configured to change transfer sizes. Configure the application for the optimal size for the particular SCSI device(s) connected to the SNC.

Checking the Host System

The faster the host, the faster your transfer times will be. The work flow goes only as fast as the slowest connection in the host system, so transferring data from an IDE drive, 100Mb connection, a DLT 4000, a high speed RAID volume across the country, or other applications, slows the system no matter how fast everything else is in the system.

1 Verify that the iSCSI storage adapter or NIC is connected to the fastest PCI bus connector supported by the adapter or NIC.

If the adapter supports PCI-X, place the adapter in a PCI-X slot. If one is not available, the host might not achieve the optimal performance capable from the adapter.

Even placing a PCI-X adapter into a 64 bit 66 MHz slot loses performance. Some adapters adjust clock speed depending on the speed of the PCI slot into which they are plugged.

2 The host OS disk and swap disk/partition/file should be on a high speed drive such as a SCSI drive to minimize the time needed to access the host's virtual memory.

The more memory a system has, the less time it spends accessing virtual memory (hard drive space).

Checking the Operating System

If possible, eliminate swap space and virtual drives which require large amounts of system memory. However, the OS might not allow the elimination of swap space. An OS set to run many kinds of different servers spends much of its CPU cycles on other operations, thus slowing down performance.

Using Jumbo Frames

Verify that if you are using jumbo frames, your data path (all hardware between the host and target including switches and routers) supports jumbo frames. Set the host and the SNC to 1.5K frames.

Updating Firmware

3 Verify that your FTP client is set for binary mode.

4 Try uploading the firmware through the serial port using the ZModem protocol. Refer to Updating Firmware Using ZModem on page 34.

⚠️ **WARNING** **DO NOT INTERRUPT THE UPDATE PROCESS. DO NOT TURN OFF THE PERSONAL COMPUTER OR THE SNC UNTIL READY IS RETURNED AT THE END OF THE UPDATE. INTERRUPTING THE UPDATE PROCESS WILL MAKE YOUR SNC INOPERABLE AND YOU WILL HAVE TO RETURN IT FOR REPAIR.**

8

Management Port Command Reference

All available commands are listed alphabetically beginning on , and alphabetically by functional group in on page 52. References from the table connect you to an explanation of the command in the alphabetical list.

Using the Command Line Interface (CLI)

CLI commands are case insensitive. You can type all upper or all lower case or a mixture. Upper and lower case in this guide and the **help** screen are for clarification only. More than half the commands use the following format:

```
[Get|Set] Command Name [Parameter 1| Parameter 2]
```

followed by the **Enter** key. Arguments which are required are enclosed in square brackets [ ] while arguments which are optional are enclosed in angle brackets < >.

"Set" commands change the value of a parameter or configuration setting and sometimes require a **saveConfiguration** command and a restart of the system before implementation. The restart can be accomplished as part of the **saveConfiguration** command or by using a separate **firmwareRestart** command. A number of "set" commands can be issued before the **saveConfiguration** command.

> Note   The response to a "set" command is either an error message or the Ready. *. statement. The asterisk indicates you must use a **saveConfiguration** command after the "set" command has been completed. You are prompted to reboot if a restart is necessary.

Commands which are not preceded by a "get" or "set" take effect immediately. See for a list of commands that are not preceded by "get" or "set."

Table 4   Commands not Preceded by "Get" or "Set"

automap	firmwareRestart	route
clearEventLog[1]	help	routeDisplay
clearTraceLog[1]	info	saveConfiguration
displayEventLog[1]	isReserved	SCSIPortList
displayTraceLog[1]	ping	SCSIPortReset
dumpEventLog[1]	reserve	SCSITargets
dumpTraceLog[1]	restoreConfiguration	Zmodem
exit		
1 Special troubleshooting command. Use with ATAC guidance.		

The arguments to many commands in this guide are represented by the abbreviations listed in Table 5 .

Table 5   Abbreviations Used by the CLI

Abbreviation	Meaning	Numeric Argument Ranges
mp	Management port	0
dp	Data port	0 - 1
sb	SCSI bus number	0 - 1
sl	SCSI LUN ID	0 - 7
st	SCSI target ID	0 - 15

All available commands are listed alphabetically by group in Table 6 .

Table 6   Alphabetical Listing of Commands by Functional Group

Command	Meaning	Page
General Commands		
get VerboseMode	display whether or not verbose mode has been enabled	77
help	display a list of available commands or a detailed, command-specific explanation	78
restoreConfiguration	restore a previous configuration	80
saveConfiguration	save the current configuration	82
set VerboseMode	enable or disable verbose mode	101
Maintenance Commands		
firmwareRestart	cause the SNC to reboot and then re-initialize its firmware	62
get BridgeModel	display the SNC model name	63
get BridgeName	display the name of a particular SNC	63

Table 6   Alphabetical Listing of Commands by Functional Group

Command	Meaning	Page
get Date	display the current date	63
get MaxOpTemp	display the maximum internal operating temperature	71
get MinOpTemp	display the minimum internal operating temperature	71
get OpTempWarn	display the number of degrees before a thermal control event warning is output	71
get SNTP	display whether or not NTP (Time Network Protocol) has been enabled	74
get SNTPServer	display the NTP server address	74
get Time	display the current time	76
get TimeZone	display the current time zone	76
get Username	display the current username	77
reserve	prevent other users from accessing the SNC	80
SCSIPortReset	reset the specified SCSI bus	83
set BridgeName	create a name for a particular SNC	83
set Date	set the current date	84
set MaxOpTemp	set the maximum operating temperature	92
set MinOpTemp	set the minimum operating temperature	93
set OpTempWarn	set the number of degrees before a thermal control event warns about the temperature change through system log entries	93
set Password	set a password for Telnet, SNC Manager and ftp sessions	93
set SNTP	determine whether or not the SNC tries to contact a specified Network Time Protocol (NTP) server	74
set SNTPServer	set the Network Time Protocol (NTP) server address	97
set Time	set the time	99
set TimeZone	set the time zone	100
set Username	set a username for Telnet, SNC Manager and ftp sessions	101
ZModem	allow transfer of a firmware image to or from the SNC using the ZModem file transfer protocol through the RS-232 interface	102
Diagnostic Commands		
clearEvent Log	clear the contents of the event log	57
clearTraceLog	clear the contents of the trace log	58
displayEventLog	display the contents of the event log	58

Table 6 Alphabetical Listing of Commands by Functional Group

Command	Meaning	Page
displayTraceLog	display the contents of the trace log	59
dumpEventLog	dump the contents of the event log	60
dumpTraceLog	dump the contents of the trace log	61
get BridgeModel	display the SNC model name	63
get DisplayEventLogFilter	display the filters for specific SNC subsystems	64
get DisplayTraceLogFilter	display the filters for specific SNC subsystems	65
get EventLog	display the contents of the event log	66
get EventLogFilter	display the filters for specific SNC subsystems	67
get IdentifyBridge	display whether or not **IdentifyBridge** is enabled	67
get Temperature	display the current internal temperature of the SNC	76
get TraceLog	display the contents of the trace log	76
get TraceLogFilter	display the filters for specific SNC subsystems	77
get Voltage	display the current voltage	78
get WrapEventLog	display whether or not **WrapEventLog** is enabled	78
get WrapTraceLog	display whether or not **WrapTraceLog** is enabled	78
info	display version numbers and other product information	79
isReserved	display the reservation status of the current SNC session	79
SCSITargets	display a list of SCSI devices operational on the referenced SCSI port	83
set DisplayEventLogFilter	filter the data for specific SNC subsystems	84
set DisplayTraceLogFilter	filter the data for specific SNC subsystems	85
set EventLog	record various system events to the event log	87
set EventLogFilter	filter the data for specific SNC subsystems	87
set identifyBridge	cause the Fault LED on the front panel of the SNC to blink	88
set TraceLog	record various system events to the trace log	100
set TraceLogFilter	filter the data for specific SNC subsystems	100
set WrapEventLog	allow or disallow the event log to be overwritten	101
set WrapTracelog	allow or disallow the trace entries to be overwritten	102
SCSI Configuration Commands		
get SCSIInitId	display the SCSI initiator ID to be used for a specific port	72
get SCSIPortBusSpeed	display the SCSI port bus speed	72
get SCSIPortResetOnStartup	display whether or not the SCSI port resets on startup	73

Table 6   Alphabetical Listing of Commands by Functional Group

Command	Meaning	Page
get SCSIPortSyncTransfer	display whether or not the SCSI transfers are negotiated with devices	<u>73</u>
get SCSIPortTermination	display the SCSI internal termination	<u>73</u>
get SCSIPortWideTransfer	display whether or not wide SCSI transfers are negotiated	<u>74</u>
get SpeedWrite	display whether or not **SpeedWrite** has been enabled	<u>75</u>
get SpeedWriteDefault	display whether or not **SpeedWrite** state applies by default to new device mappings	<u>75</u>
SCSIPortList	display available SCSI ports and their current status	<u>83</u>
set SCSIInitId	set the SCSI initiator ID for a port	<u>94</u>
set SCSIPortBusSpeed	set the bus speed for a SCSI port	<u>94</u>
set SCSIPortResetOnStartup	specify whether or not the SCSI port should reset after turning the unit on	<u>95</u>
set SCSIPortSyncTransfer	specify whether or not synchronous SCSI transfers are negotiated	<u>95</u>
set SCSIPortTermination	set the SCSI port termination	<u>95</u>
set SCSIPortWideTransfer	specify whether or not wide SCSI transfers are negotiated	<u>96</u>
set SpeedWrite	improve the performance of **WRITE** commands	<u>98</u>
set SpeedWriteDefault	specify `SpeedWrite` as the default performance level	<u>99</u>
iSCSI Configuration Commands		
get iSCSIAlias	display the name assigned to the SNC	<u>69</u>
get iSCSIChap	display whether or not CHAP has been enabled	<u>69</u>
get iSCSIChapSecret	display the incoming and outgoing secrets (passwords) for iSCSI CHAP sessions	<u>70</u>
get iSCSIPortNumber	display the number of the SNC port that iSCSI connections use	<u>70</u>
get iSNSLoginControl	display whether or not logins are controlled by an iSNS server	<u>70</u>
get iSNSServer	display the IP address of the iSNS server	<u>71</u>
set iSCSIAlias	set the name assigned to the SNC	<u>90</u>
set iSCSIChap	determine whether or not the CHAP has been enabled	<u>90</u>
set iSCSIChapSecret	set the incoming and outgoing secrets (passwords) for iSCSI CHAP sessions	<u>90</u>
set iSCSIPortNumber	set the number of the SNC port that iSCSI connections use	<u>91</u>
set iSNSLoginControl	specify whether or not an iSNS server is being used	<u>92</u>
set iSNSServer	set the IP address of a valid iSNS server	<u>92</u>

Table 6   Alphabetical Listing of Commands by Functional Group

Command	Meaning	Page
Ethernet Configuration Commands		
exit	end the current TCP/IP CLI session	<u>62</u>
get DPMTU	display the MTU (Maximum Transmission Unit) used by SNC data ports	<u>65</u>
get EthernetSpeed	display the Ethernet speed	<u>66</u>
get IPAddress	display the IP address	<u>67</u>
get IPDHCP	display whether or not DHCP is being used to set the IP address	<u>68</u>
get IPGateway	display the IP gateway	<u>68</u>
get IPSubnetMask	display the IP subnet mask	<u>69</u>
ping	send an ICMP echo request to the specified IP Address	<u>79</u>
set DPMTU	set the MTU	<u>86</u>
set EthernetSpeed	set the Ethernet speed	<u>86</u>
set IPAddress	set the IP address	<u>88</u>
set IPDHCP	set the DHCP server as the source of the SNC IP address	<u>89</u>
set IPGateway	set the IP gateway address	<u>89</u>
set IPSubnetMask	set the IP subnet mask	<u>90</u>
set Password	set the password	<u>93</u>
set Username	set the username	<u>101</u>
Serial Port Configuration Commands		
get SerialPortBaudRate	display the serial port baud rate	<u>74</u>
get SerialPortEcho	display whether or not echo has been turned on	<u>74</u>
set SerialPortBaudRate	set the serial port baud rate	<u>96</u>
set SerialPortEcho	set the serial port echo feature on or off	<u>97</u>
Mapping Commands		
automap	rescan the SCSI bus and automatically assign iSCSI LUNs to a subset of SCSI target destination devices visible to the SNC	<u>57</u>
route	assign iSCSI LUN addresses to a target destination device	<u>81</u>
routeDisplay	display current mapping	<u>82</u>
SCSITargets	display a list of SCSI devices operational on the referenced SCSI port	<u>83</u>

Alphabetical Listing of Commands

autoMap

The **automap** command automatically assigns iSCSI LUNs to a subset of SCSI target destination devices visible to the SNC. Existing valid maps are not deleted.

The following example shows a sequence of three commands. The first command is the **routeDisplay** command. The output of this command displays the current device map. The second command is the **automap** command. The third command is the **routeDisplay** command again. This time the new mapping, the one assigned by **automap**, is displayed.

This command takes effect immediately.

📝 Note   Devices mapped by the SNC will be visible across both data ports.

Here is the existing map:

```
Ready.
routedisplay iscsi
11
;Lun    SB   ST   SL
;==================
 0       Bridge
 1       0    0    0
 2       0    1    0
 3       0    2    0
 4       0    3    0
 5       1    0    0
 6       0    0    0
 7       0    0    0
 8       0    0    0
```

Now the **automap** command is run:

```
Ready.
automap
Ready.*
```

Issue the **routedisplay** command to display the new mapping:

```
routedisplay iscsi
8
;Lun    SB   ST   SL
;==================
 0       Bridge
 1       0    0    0
 2       0    1    0
 3       1    2    0
 4       1    3    0
 5       0    6    0
Ready.
```

clearEventLog

⚠️ **CAUTION**   **Contact ATAC before using this command.**

The **clearEventLog** command clears the contents of the event log. No events are recorded until the command has been completed. This command takes effect immediately.

```
Ready.
cleareventlog
Ready.
```

clearTraceLog

CAUTION   **Contact ATAC before using this command.**

The **clearTraceLog** command clears the contents of the trace log. No events are recorded until the command has been completed.This command takes effect immediately.

```
Ready.
cleartracelog
Ready.
```

displayEventLog <scroll>

CAUTION   **Contact ATAC before using this command.**

The **displayEventLog <+|-|=|<esc>>** command displays the most recent page of event log entries. Typing a "+", "-" or "=" (no quotation marks) causes the next, previous or same page of event log entries to be displayed. No events are recorded until the command has been completed. Press **ESC**, then **Return** to exit the command and return to CLI. New log entries begin.

The following is an example of a page of the **displayeventlog** command output, followed by a request for the next page **(+)**, followed by **ESC** and **Return**.

Scroll	Meaning
+	Display the next page of trace log entries
-	Display the previous page of trace log entries
=	Display the same page of trace log entries

```
Ready.
displayeventlog
Bridge Event Log

0137 10/08/2003 10:17:19 Bridge was booted/reset.
0138 10/08/2003 10:21:34 Bridge was booted/reset.
0139 10/08/2003 10:21:43 Unable to connect to an SNTP server
0140 10/16/2003 14:21:03 Bridge was booted/reset.
0141 10/16/2003 14:22:19 Bridge was booted/reset.
0142 10/16/2003 14:24:35 Bridge was booted/reset.
0143 10/17/2003 02:25:08 Unable to connect to an SNTP server
0144 10/17/2003 08:20:07 Bridge was booted/reset.
0145 10/17/2003 08:21:45 Bridge password was modified.
0146 10/17/2003 08:21:57 Bridge password was modified.
```

```
DisplayEventLog [ + | - | = | <ESC>] >> +
0132 10/07/2003 14:32:00 Voltage VCC Warning Level reached at 4.72 Volts
0133 10/07/2003 15:00:02 Rx Packet Error. Net #2
0134 10/08/2003 08:00:39 Bridge was booted/reset.
0135 10/08/2003 08:00:48 Unable to connect to an SNTP server
0136 10/08/2003 08:01:49 Voltage VCC Warning Level reached at 4.72 Volts

DisplayEventLog [ + | - | = | <ESC>] >>
Ready.
```

displayTraceLog <scroll>

⚠ **CAUTION**   **Contact ATAC before using this command.**

The **DisplayTraceLog <+|-|=|<esc>>** command displays the most recent page of trace log entries. Typing a "+", "-" or "=" (no quotation marks) causes the next, previous or same page of trace log entries to be displayed. No events are recorded until the command has been completed. Press **ESC** and **Return** to exit the command and return to CLI. New entries begin. This command takes effect immediately.

Scroll	Meaning
+	Display the next page of trace log entries
-	Display the previous page of trace log entries
=	Display the same page of trace log entries

```
Ready.
displaytracelog
ADIC SNC  Trace Log W

0608 12/10/2003 11:25:22 Bus = 0 Target ID = 1
                        CDB = 03 00 00 00 20 00 00 00 00 00
                              00 00 00 00 00 00
                        Stat= 02
                        Sense Data = 70 00 02 00 00 00 00 1c 00 00
                                     00 00 3a 00 00 00 10 13
0609 12/10/2003 11:25:22 Bus = 0 Target ID = 1
                        CDB = 1e 00 00 00 00 00 00 00 00 00
                              00 00 00 00 00 00
                        Stat= 00
                        Sense Data = 00 00 00 00 00 00 00 00 00 00
                                     00 00 00 00 00 00 00 00
0610 12/10/2003 11:25:22 Bus = 0 Target ID = 1
                        CDB = 03 00 00 00 20 00 00 00 00 00
                              00 00 00 00 00 00
                        Stat= 02
                        Sense Data = 70 00 02 00 00 00 00 1c 00 00
                                     00 00 3a 00 00 00 10 13
0611 12/10/2003 11:25:22 Bus = 0 Target ID = 1
                        CDB = 4c 02 40 00 00 00 00 00 00 00
                              00 00 00 00 00 00
                        Stat= 00
                        Sense Data = 00 00 00 00 00 00 00 00 00 00
```

```
                                          00 00 00 00 00 00 00 00
   0612 12/10/2003 11:25:22 Bus = 0 Target ID = 1
                            CDB = 17 00 00 00 00 00 00 00 00 00
                                  00 00 00 00 00 00
                            Stat= 00
                            Sense Data = 00 00 00 00 00 00 00 00 00 00
                                         00 00 00 00 00 00 00 00
   0613 12/10/2003 11:25:22 Bus = 0 Target ID = 1
                            CDB = 03 00 00 00 20 00 00 00 00 00
                                  00 00 00 00 00 00
                            Stat= 02
                            Sense Data = 70 00 02 00 00 00 00 1c 00 00
                                         00 00 3a 00 00 00 10 13
   0614 12/10/2003 11:25:22 Bus = 0 Target ID = 1
                            CDB = 03 00 00 00 20 00 00 00 00 00
                                  00 00 00 00 00 00
                            Stat= 02
                            Sense Data = 70 00 02 00 00 00 00 1c 00 00
                                         00 00 3a 00 00 00 10 13
   0615 12/10/2003 11:25:22 Bus = 0 Target ID = 1
                            CDB = 1e 00 00 00 00 00 00 00 00 00
                                  00 00 00 00 00 00
                            Stat= 00
                            Sense Data = 00 00 00 00 00 00 00 00 00 00
                                         00 00 00 00 00 00 00 00
   0616 12/10/2003 11:25:22 Bus = 0 Target ID = 1
                            CDB = 03 00 00 00 20 00 00 00 00 00
                                  00 00 00 00 00 00
                            Stat= 02
                            Sense Data = 70 00 02 00 00 00 00 1c 00 00
                                         00 00 3a 00 00 00 10 13
   0617 12/10/2003 11:25:22 Bus = 0 Target ID = 1
                            CDB = 4c 02 40 00 00 00 00 00 00 00
                                  00 00 00 00 00 00
                            Stat= 00
                            Sense Data = 00 00 00 00 00 00 00 00 00 00
                                         00 00 00 00 00 00 00 00

   DisplayTraceLog [ + | - | = | <ESC>] >>
   Ready.
```

dumpEventLog

⚠ **CAUTION**   **Contact ATAC before using this command.**

The **dumpEventLog** command dumps the contents of the entire event log of an RS-232 or TCP/IP session without clearing the event log. No events are recorded until the command has been completed. This command takes effect immediately.

The following is an example of some verbose output of a **dumpEventLog** command:

```
   Ready.
   dumpeventlog
   ADIC SNC  Event Log W
     0238 12/13/2003 09:43:25 QueueFull.  Net #0
```

```
0239 12/13/2003 09:43:25 Rx Packet Error. Net #0
0240 12/13/2003 09:43:25 QueueFull.  Net #0
0241 12/13/2003 09:43:25 Rx Packet Error. Net #0
0242 12/13/2003 09:43:25 QueueFull.  Net #0
0243 12/13/2003 09:43:25 Rx Packet Error. Net #0
0244 12/13/2003 09:43:25 QueueFull.  Net #0
0245 12/13/2003 09:43:25 Rx Packet Error. Net #0
0246 12/13/2003 09:43:25 QueueFull.  Net #0
0247 12/13/2003 09:43:25 Rx Packet Error. Net #0
0248 12/13/2003 09:43:25 QueueFull.  Net #0
0249 12/13/2003 09:43:25 Rx Packet Error. Net #0
0250 12/13/2003 09:43:25 QueueFull.  Net #0
0251 12/13/2003 09:43:25 Rx Packet Error. Net #0
0252 12/13/2003 09:43:25 QueueFull.  Net #0
0253 12/13/2003 09:43:25 Rx Packet Error. Net #0
0254 12/13/2003 09:43:25 QueueFull.  Net #0
0255 12/13/2003 09:43:25 Rx Packet Error. Net #0
0256 12/13/2003 09:43:25 QueueFull.  Net #0
Ready.
```

dumpTraceLog

CAUTION **Contact ATAC before using this command.**

The **dumpTraceLog** command dumps the contents of the entire trace log to an RS-232 or TCP/IP session without clearing the trace log. No events are recorded until the command has been completed. This command takes effect immediately.

The following is a truncated example of the verbose output when nothing is recorded in the trace log and a **dumpTraceLog** command is entered. Output from your system will be much lengthier:

```
Ready.
dumptracelog
ADIC SNC  Trace Log

0000 12/05/2003 13:01:39 Bus = 0 Target ID = 0
                         CDB = 12 00 00 00 64 00 00 00 00 00
                               00 00 00 00 00 00
                         Stat= 02
                         Sense Data = 70 00 05 00 00 00 00 18 00 00
                                      00 00 25 00 00 00 00 00
0001 12/05/2003 13:01:39 Bus = 0 Target ID = 1
                         CDB = 12 00 00 00 64 00 00 00 00 00
                               00 00 00 00 00 00
                         Stat= 00
                         Sense Data = 00 00 00 00 00 00 00 00 00 00
                                      00 00 00 00 00 00 00 00
0002 12/05/2003 13:01:39 Bus = 0 Target ID = 1
                         CDB = 12 00 00 00 64 00 00 00 00 00
                               00 00 00 00 00 00
                         Stat= 00
                         Sense Data = 00 00 00 00 00 00 00 00 00 00
                                      00 00 00 00 00 00 00 00
0003 12/05/2003 13:01:39 Bus = 0 Target ID = 1
                         CDB = 12 01 80 00 64 00 00 00 00 00
```

```
                                   00 00 00 00 00 00
                          Stat= 00
                          Sense Data = 00 00 00 00 00 00 00 00 00 00
                                       00 00 00 00 00 00 00 00
        Ready.
```

exit

The **exit** command ends the current TCP/IP CLI session. It has no effect if used during a serial CLI session. A Telnet session ends after 15 minutes of inactivity. No more than three Telnet sessions can be active at one time. This command takes effect immediately.

firmwareRestart

The **firmwareRestart** command causes the SNC to reboot and then re-initialize its firmware. When the firmware has finished rebooting, the **Ready** prompt is displayed. This command takes effect immediately.

```
        Uart is Initialized

        DRAM  Data Line Test         Passed
        SRAM  Data Line Test         Passed
        BBRAM Data Line Test         Passed

        DRAM  Address Line Test      Passed
        SRAM  Address Line Test      Passed
        BBRAM Address Line Test      Passed

        DRAM  Pattern Test      1    Passed
        DRAM  Pattern Test      2    Passed
        DRAM  Pattern Test      3    Passed
        DRAM  Pattern Test      4    Passed
        SRAM  Pattern Test      1    Passed
        SRAM  Pattern Test      2    Passed
        SRAM  Pattern Test      3    Passed
        SRAM  Pattern Test      4    Passed
        BBRAM Pattern Test      1    Passed
        BBRAM Pattern Test      2    Passed
        BBRAM Pattern Test      3    Passed
        BBRAM Pattern Test      4    Passed
        DRAM  Swap Pattern Test1     Passed
        DRAM  Swap Pattern Test2     Passed
        DRAM  Swap Pattern Test3     Passed
        DRAM  Swap Pattern Test4     Passed


        ***** Memory Tests Complete *****

        Memory Clear                 Finished


        EPLD Version 0 Detected
        DS1629_DVC_TYPE initialized


             ADIC SNC 450x
        (c) 2003 ATTO Technology, Incorporated.
```

```
      Firmware version A61Z release date Feb  4 2004, 14:06:50 Build A61Z

      Power-On Self-Test Completion Status: GOOD
      128 Megabytes of RAM Installed.

      2 GbE Data Port(s).
      2 LVD SCSI Interface Port(s).

      Bridge World Wide Name = 20 00 00 10 86 50 00 1C
      Bridge Serial Number   = "IPB2500100136"
      Bridge Name            = "SNC 450x"

      Internal Temperature = 25 C [0 - 70]
      For help, type HELP.
      Active Configuration = ADIC Config File
      Feb  4 2004 14:06:50 A61Z Initialization Complete
      Scsi interface 0 Register R/W test     Passed
      Scsi interface 0 Reset test            Passed
      Scsi interface 0 FIFO test             Passed
      Scsi interface 0 Master test           Passed
      Scsi interface 1 Register R/W test     Passed
      Scsi interface 1 Reset test            Passed
      Scsi interface 1 FIFO test             Passed
      Scsi interface 1 Master test           Passed

       Initializing Port DP0.....................
       Initializing Port DP1.....................
       Initializing Port MP0.....................
      GBE hardware Init done.
      Ready.
```

get BridgeModel

The **get BridgeModel** displays model information about a specific SNC.

The following is an example of a verbose output from a **get BridgeModel** command:

```
      Ready.
      get BridgeModel
      "SNC 450x"
      (c)
      Firmware version 055E release date "Oct.  3 2003", 11:30:32 Build 055E
      Ready.
```

There is no **set** version of this command.

get BridgeName

The **get BridgeName** command displays the name assigned to the SNC. Refer to

```
      Ready.
      get bridgename
      BridgeName = "SNC 450x"
      Ready.
```

get Date

The **get date** command displays the current date. Refer to

```
Ready.
get date
Date = 11/11/2003
Ready.
```

get DisplayEventLogFilter [subsystem] [level]

⚠️ **CAUTION**   **Contact ATAC before using this command.**

The **get DisplayEventLogFilter** command displays the filters enabled for specific SNC subsystems when in DisplayEventLog mode. Refer to set DisplayEventLogFilter [subsystem] [level] [status] on page 84.

Subsystem Choices						
GEN	ENET	NVRAM	PERF	XCOPY	ECC	ALL

Where:

GEN =	General
ENET =	Ethernet
iSCSI =	SCSI protocol of TCP/IP
NVRAM =	Non-Volatile Random Access Memory
PERF =	Performance
ECC =	Error Correcting/Correction Code
ALL =	All of the above

Log Level Choices				
INFO	WARN	CRIT	FAIL	ALL

Where:

INFO =	Information
WARN =	Warnings
CRIT =	Critical events
FAIL =	Failures
ALL =	All of the above

The following is the verbose output from a **get DisplayEventLogFilter all all** command:

```
get displayeventlogfilter all all
 25
;Subsystem    Level      Filter Status
 ENET         INFO       disabled
 ENET         WARN    disabled
```

```
ENET          CRIT     disabled
ENET           FAIL     disabled
XCOPY         INFO   disabled
XCOPY        WARN  disabled
XCOPY         CRIT     disabled
XCOPY          FAIL    disabled
NVRAM         INFO  disabled
NVRAM       WARN disabled
NVRAM        CRIT  disabled
NVRAM        FAIL  disabled
ECC                INFO disabled
ECC              WARN disabled
ECC                CRIT   disabled
ECC                FAIL   disabled
PERF              INFO disabled
PERF            WARN  disabled
PERF              CRIT    disabled
PERF              FAIL    disabled
GEN              INFO   disabled
GEN             WARN disabled
GEN                CRIT disabled
GEN                FAIL disabled

Ready.
```

get DisplayTraceLogFilter [SCSI | all] [port number]

⚠️ **CAUTION**   **Contact ATAC before using this command.**

The **get DisplayTraceLogFilter** command displays trace log data for specific SNC ports when in
DisplayTraceLog mode. Refer to set DisplayTraceLogFilter [SCSI | all] [port number] [status] on page 85.
This command takes effect immediately.

Port Number	Meaning
0 or 1	SCSI connection labeled SCSI port 0 or SCSI port 1
all	All SCSI connections

The following is an example of the verbose output of a **get displaytracelogfilter all** command:

```
Ready.
get displaytracelogfilter all all
 3
;Port Type  Port Number        Filter Status
 SCSI       0                   disabled
 SCSI       1                   disabled
Ready.
```

get DPMTU [port number]

⚠️ **CAUTION**   **Contact ATAC before using this command.**

The **get DPMTU** command shows the MTU (Maximum Transmission Unit) used by SNC data ports. Refer to [iSCSI Performance Tuning](#) on page 107 and [set DPMTU [port number] [MTU choices]](#) on page 86.

Port Number	Meaning
dp0 or dp1	Ethernet connection labeled Ethernet port 0 or Ethernet port 1
all	All Ethernet connections

The following is a verbose output for the command **get DPMTU all**:

```
Ready.
get dpmtu all
4
; Port       MTU
;=========================
   DP0      9014
   DP1      9014
Ready.
```

> 📝 **Note**   Increasing the MTU can improve performance. To fully understand the implications and network requirements, contact your service representative before modifying this value.

get EthernetSpeed [port number]

The **get EthernetSpeed** command displays the speed of the SNC Ethernet ports. Refer to [iSCSI Performance Tuning](#) on page 107 and [set EthernetSpeed [port number] [speed]](#) on page 86.

Port Number	Meaning
mp0	Ethernet management port labeled Ethernet port 2
dp0 or dp1	Ethernet data port labeled Ethernet port 0 or Ethernet port 1
all	All Ethernet connections

```
Ready.
get ethernetspeed mp0
EthernetSpeed = auto (100)
Ready.
```

get EventLog

> ⚠️ **CAUTION**   **Contact ATAC before using this command.**

The **get EventLog** command displays whether or not **EventLog** has been enabled. Refer to [set EventLog [status]](#) on page 87.

```
Ready.
get eventlog
EventLog = enabled
Ready.
```

get EventLog Filter [subsystem]

⚠️ **CAUTION**   **Contact ATAC before using this command.**

The **get EventLogFilter** command displays the data for specific SNC subsystems. Refer to set EventLogFilter [subsystem] [event level] [status] on page 87.

Subsystem Choices						
GEN	ENET	ISCSI	NVRAM	PERF	ECC	ALL

Where:

GEN =	General
ENET =	Ethernet
ISCSI =	SCSI protocol of TCP/IP
NVRAM =	Non-Volatile Random Access Memory
PERF =	Performance
ECC =	Error Correcting/Correction Code
ALL =	All of the above

get IdentifyBridge

The **get IdentifyBridge** command displays whether or not **set IdentifyBridge** is enabled. Refer to set IdentifyBridge [status] on page 88.

```
Ready.
get IdentifyBridge
IdentifyBridge = disabled
Ready.
```

get IPAddress [port number]

The **get IPAddress** command reports the current IP address, whether it is the default setting, or whether it was assigned manually or by DHCP. Refer to get IPDHCP [port number] on page 68 and set IPAddress [port number] [IP address] on page 88.

Port Number	Meaning
mp0	Ethernet management port labeled Ethernet port 2
dp0 or dp1	Ethernet data port labeled Ethernet port 0 or Ethernet port 1
all	All Ethernet port connections

The following is an example of the verbose output for a **get ipaddress all** command:

```
Ready.
get ipaddress all
5
```

```
; Port        Address
;===============================
   DP0        172.16.5.50
   DP1        172.16.5.51
   MP0        172.16.5.198
Ready.
```

get IPDHCP [port number]

The **get IPDHCP** shows if DHCP has been enabled or disabled for any or all SNC Ethernet ports. Refer to set IPDHCP [port number] [status] on page 89. DHCP is disabled by default.

Port Number	Meaning
mp0	Ethernet management port labeled Ethernet port 2
dp0 or dp1	Ethernet data port labeled Ethernet port 0 or Ethernet port 1
all	All Ethernet port connections

The following is an example of the verbose output of a **get IPDHCP all** command:

```
Ready.
get ipdhcp all
5
; Port        DHCP
;==========================
   DP0        disabled
   DP1        disabled
   MP0        disabled
Ready.
```

get IPGateway [port number]

The **get IPGateway** command reports the current IP gateway, whether it is the default setting, or whether it was assigned manually or by DHCP. Refer to set IPGateway [port number] [IP address] on page 89.

Port Number	Meaning
mp0	Ethernet management port labeled Ethernet port 2
dp0 or dp1	Ethernet data port labeled Ethernet port 0 or Ethernet port 1
all	All Ethernet port connections

The following is an example of the verbose output of a **get IPGateway all** command.

```
Ready.
get ipgateway all
5
; Port        Gateway
;===============================
   DP0        172.16.1.44
   DP1        172.16.1.44
   MP0        172.16.1.44
Ready.
```

get IPSubnetMask [port number]

The **get IPSubnetMask** command reports the current subnet mask, whether it is the default setting, or whether it was assigned manually or by DHCP. Refer to and .

Port Number	Meaning
mp0	Ethernet management port labeled Ethernet port 2
dp0 or dp1	Ethernet data port labeled Ethernet port 0 or Ethernet port 1
all	All Ethernet port connections

The following is an example of the verbose output of a **get IPSubnetMask all** command:

```
Ready.
get ipsubnetmask all
5
; Port      SubnetMask
;===============================
    DP0      255.255.0.0
    DP1      255.255.0.0
    MP0      255.255.0.0
Ready.
```

get iSCSIAlias

The **get iSCSIAlias** command displays the name assigned to the SNC. Refer to .

```
Ready.
get iscsialias
iSCSIAlias = ""
Ready.
```

get iSCSIChap

⚠ **CAUTION**   **Contact ATAC before using this command.**

The **get iSCSIChap** shows if the CHAP has been enabled or disabled. Refer to .

Output	Meaning
enabled	The SNC tries to negotiate CHAP (Challenge-Handshake Authentication Protocol) authentication using the CHAP secret (password)
disabled	The SNC does not try to negotiate CHAP authentication

```
Ready.
get iscsichap
iSCSIchap = disabled
Ready.
```

get iSCSIChapSecret [password type | delete] [account name]

The **get iSCSIChapSecret** command displays the incoming and outgoing secrets (passwords) for iSCSI CHAP sessions. Refer to set iSCSIChapSecret [password type|delete] [account name] <secret> on page 90.

Password Type	Meaning
in	Defines the incoming secret (password) for iSCSI CHAP sessions
out	Defines the outgoing secret (password) for iSCSI CHAP sessions
delete	Removes a secret (password) from an account (username) list

Account Name	Meaning
account name	The username of the iSCSI initiator or other name to identify the secret (password), up to 223 characters
all	All account names

```
Ready.
get iscsichapsecret dev1 in all
2
Initiator Name                         | Secret
=============================================================================
TEST abcdefghijklmn02
TEST abcdefghijklmn03

Ready.
```

get iSCSIPortNumber

The **get iSCSIPortNumber** command displays the SNC port number that iSCSI connections use. Refer to set iSCSIPortNumber [port number] on page 91.

```
Ready.
get iscsiportnumber
iSCSIPortNumber = 3260
Ready.
```

get iSNSLoginControl

⚠️ **CAUTION**   **Contact ATAC before using this command.**

The **get iSNSLoginControl** command specifies whether or not logins are controlled by an iSNS server. Refer to set iSNSLoginControl [status] on page 92.

```
Ready.
get isnslogincontrol
iSNSLoginControl = disabled
Ready.
```

get iSNSServer

![CAUTION icon] **CAUTION** **Contact ATAC before using this command.**

The **get iSNSServer** specifies the IP address of a valid iSNS server the SNC uses to discover iSCSI initiators. Refer to set iSNSServer [IP address] on page 92.

```
Ready.
get isnsserver
iSNSServer = 0.0.0.0
Ready.
```

get MaxOpTemp

![CAUTION icon] **CAUTION** **Contact ATAC before using this command.**

The **get MaxOpTemp** command displays the maximum internal operating temperature of the SNC in degrees Celsius. Valid values are from 55 to 70. Refer to set MaxOpTemp [temperature].

```
Ready.
get maxoptemp
MaxOpTemp = 70 C
Ready.
```

get MinOpTemp

![CAUTION icon] **CAUTION** **Contact ATAC before using this command.**

The **get MinOpTemp** command sets the minimum internal operating temperature of the SNC in degrees Celsius. Valid values are from 0 to 15. The default setting is "0." Refer to set MinOpTemp [temperature].

```
Ready.
get minoptemp
MinOpTemp = 0 C
Ready.
```

get OpTempWarn

![CAUTION icon] **CAUTION** **Contact ATAC before using this command.**

The **get OpTempWarn** command displays the number of degrees Celsius before a thermal control event warns you if the SNC is approaching the minimum or maximum internal operating temperature. The warning is sent to the system log. Valid values are from 0 to 15. Refer to set OpTempWarn [temperature].

```
Ready.
get optempwarn
OpTempWarn = 5 C
Ready.
```

get ScsiInitID [port number] [ID choices]

⚠️ **CAUTION**   **Contact ATAC before using this command.**

The **get SCSIInitID** command displays the SCSI initiator ID to be used f**or a specific port**. You must put in a placeholder value for the initiator value used on that port, [0-15], even though the output could differ from the number you enter. The number reported in the output is correct for your configuration. A **saveConfiguration restart** command must be used to permanently save this configuration. Refer to set SCSIInitID [port number] [ID choices] on page 94.

Port Number	Meaning
0 or 1	SCSI connection labeled SCSI port 0 or SCSI port 1

SCSI Initiator ID Choices and Possible Outputs														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

You must enter the port number and the initiator ID as shown in the following examples.

```
Ready.
get scsiinitid 1
ERROR. Wrong/Missing Parameters
Usage:
get/set ScsiInitId [sb] [0-15]
get scsiinitid 1 9
Port 1 ScsiInitId = 7
Ready.
get scsiinitid 1 7
Port 1 ScsiInitId = 7
Ready.
```

get SCSIPortBusSpeed [port number]

⚠️ **CAUTION**   **Contact ATAC before using this command.**

The **get SCSIPortBusSpeed** command displays the current SCSI port bus speed. If a port number is specified, the command displays only that port number's bus speed. Refer to set SCSIPortBusSpeed [port number] [speed] on page 94.

Port Number	Meaning
0 or 1	SCSI connection labeled SCSI port 0 or SCSI port 1

Possible SCSI Bus Speed outputs			
fast	ultra	ultra2	ultra3

```
Ready.
get scsiportbusspeed 0
Port 0 ScsiPortBusSpeed = ultra3
```

```
Ready.
```

get SCSIPortResetOnStartup [port number]

⚠️ **CAUTION** **Contact ATAC before using this command.**

The **get SCSIPortResetOnStartup** command displays the current status of the SCSI port reset on startup parameter for a specific port. The default setting is "enabled." Refer to <u>set SCSIPortResetOnStartup [port number] [status]</u> on page 95.

Port Number	Meaning
0 or 1	SCSI connection labeled SCSI port 0 or SCSI port 1

```
Ready.
get scsiportresetonstartup 0
Port 0 ScsiPortResetOnStartup = enabled
Ready.
```

get SCSIPortSyncTransfer [port number]

⚠️ **CAUTION** **Contact ATAC before using this command.**

The **get SCSIPortSyncTransfer** command shows whether or not synchronous SCSI transfers have been enabled for a specific port. Refer to <u>set SCSIPortSyncTransfer [port number] [status]</u> on page 95. This command must be followed by **saveConfiguration restart**.

Port Number	Meaning
0 or 1	SCSI connection labeled SCSI port 0 or SCSI port 1

```
Ready.
get scsiportsynctransfer 0
Port 0 ScsiPortSyncTransfer = enabled
Ready.
```

get SCSIPortTermination [port number]

⚠️ **CAUTION** **Contact ATAC before using this command.**

The **get SCSIPortTermination** command displays the SCSI internal termination for a specific port. Refer to <u>set SCSIPortTermination [port number] [status]</u> on page 95. This command must be followed by **saveConfiguration restart**.

```
Ready.
get scsiporttermination 0
Port 0 ScsiPortTermination = enabled
Ready.
```

get SCSIPortWideTransfer [port number]

⚠ **CAUTION**   **Contact ATAC before using this command.**

The **get SCSIPortWideTransfer** command specifies if wide SCSI transfers are negotiated for a specific port. Refer to set SCSIPortWideTransfer [port number] [status] on page 96.This command must be followed by **saveConfiguration restart**.

Port Number	Meaning
0 or 1	SCSI connection labeled SCSI port 0 or SCSI port 1

```
Ready.
get scsiportwidetransfer 0
Port 0 ScsiPortWideTransfer = enabled
Ready.
```

get SerialPortBaudRate

The **get SerialPortBaudRate** command displays the baud rate for the RS-232 serial port. Refer to set SerialPortBaudRate [rate] on page 96.

Baud Rate Output					
2400	9600	19200	38400	57600	115200

```
Ready.
get serialportbaudrate
SerialPortBaudRate = 115200
Ready.
```

get SerialPortEcho

The **get SerialPortEcho** command shows whether or not repetition of keyboard input on the screen has been enabled. Refer to set SerialPortEcho [status] on page 97.

```
Ready.
get serialportecho
SerialPortEcho = disabled
Ready.
```

get SNTP

The **get SNTP** commands reports if the SNC is set to contact a specified Network Time Protocol (NTP) server. Refer to set SNTPServer [IP address] on page 97.

```
Ready.
get sntp
SNTP = disabled
Ready.
```

get SNTPServer

The **get SNTPServer** command displays the current NTP time server address. Refer to set SNTPServer [IP address] on page 97.

```
Ready.
get SNTPserver
5
;SNTP Server IP Addresses
;=======================
192.43.244.18
129.6.15.28 AUX
132.163.4.101 AUX
Ready.
```

get SpeedWrite SCSI [bus target LUN]

⚠️ **CAUTION**   **Contact ATAC before using this command.**

The **get SpeedWrite [sb st sl | all]** command shows whether or not SpeedWrite has been enabled for a specific SCSI bus (sb), target (st), and LUN (sl) or for all currently mapped SCSI devices on the SNC. For an explanation of the SpeedWrite capability, refer to set SpeedWrite SCSI [sb st sl | all] [status] on page 98.

Parameter	Meaning
sb	SCSI bus
st	SCSI target
sl	SCSI LUN
all	all currently-mapped devices

Output	Meaning
enabled	Provides enhanced performance of WRITE commands
disabled	Retains the current level of performance of WRITE commands

```
Ready.
get speedwrite scsi all
9
;sb st sl speedWrite State
0 1 0 disabled
0 2 0 disabled
0 3 0 disabled
0 4 0 disabled
1 0 0 disabled
1 1 0 disabled
1 2 0 disabled
1 3 0 disabled
Ready.
```

get SpeedWriteDefault

⚠️ **CAUTION**   **Contact ATAC before using this command.**

The **get SpeedWriteDefault** command shows if SpeedWrite performance has been enabled or disabled for newly-mapped SCSI devices. For an explanation of the SpeedWrite capability, refer to

Output	Meaning
enabled	Provides enhanced performance of WRITE commands for newly-mapped SCSI devices
disabled	Retains the current level of performance of WRITE commands

```
Ready.
get speedwritedefault
SpeedWriteDefault = disabled
Ready.
```

get Temperature

The **get Temperature** command displays the current internal temperature of the SNC in degrees Celsius. There is no **set** version of this command.

```
Ready.
get temperature
Temperature = 32 C
Ready.
```

get Time

The **get time** command displays the current time. Refer to

```
Ready.
get time
Time = 14:47:17
Ready.
```

get TimeZone

The **get TimeZone** command displays the current time zone. The "+" and "-" represent a numerical offset from GMT (Greenwich Mean Time). Refer to

```
Ready.
get timezone
TimeZone = EST
Ready.
```

get TraceLog

⚠ **CAUTION**   **Contact ATAC before using this command.**

The **get TraceLog** command shows whether or not trace log recording has been enabled. Refer to

Output	Meaning
enabled	SCSI traffic is recorded to the Trace Log

Output	Meaning
disabled	No SCSI traffic is recorded to the Trace Log

```
Ready.
get tracelog
TraceLog = disabled
Ready.
```

get TraceLogFilter [SCSI | all] [port number]

⚠️ **CAUTION**   **Contact ATAC before using this command.**

The **get TraceLogFilter** command displays the information in the trace log for specific SNC ports if the **set TraceLog** command has been enabled. Refer to set TraceLogFilter [SCSI | all] [port number] [status] on page 100.

Port Number	Meaning
0 or 1	SCSI connection labeled SCSI port 0 or SCSI port 1
all	All SCSI port connections

The following is an example:

```
Ready.
get tracelogfilter scsi all
 3
;Port Type  Port Number        Filter Status
 SCSI       0                  disabled
 SCSI       1                  disabled
Ready.
```

get Username [username]

The **get Username** command displays the username for all Telnet, FTP, and SNC Manager web server sessions. Refer to `set Username [username]` on page 101.

```
Ready.
get username
UserName = "admin"
Ready.
```

get VerboseMode

The **get VerboseMode** command displays whether or not verbose mode has been enabled. Refer to the `set VerboseMode [status]` command.

```
Ready.
get verbosemode
VerboseMode = enabled
Ready.
```

get Voltage

The **get Voltage** command displays the current level of voltages monitored by the SNC. There is no **set** version of this command.

```
Ready.
get voltage
5
;Voltage          Level
;=====================
 Voltage (VCC)  = 4.95 V
 Voltage (VDDA) = 3.31 V
 Voltage (VDDB) = 2.48 V

Ready.
```

get WrapEventLog

⚠ **CAUTION**   **Contact ATAC before using this command.**

The **get WrapEventLog** command displays whether or not WrapEventLog is enabled. Refer to set WrapEventLog [status] on page 101.

```
Ready.
get wrapeventlog
WrapEventLog = enabled
Ready.
```

get WrapTraceLog

⚠ **CAUTION**   **Contact ATAC before using this command.**

The **get WrapTraceLog** shows whether or not WrapTraceLog is enabled. Refer to set WrapTraceLog [status] on page 102.

```
Ready.
get wraptracelog
WrapTraceLog = enabled.
Ready.
```

help [command name]

The **Help** command displays a list of available commands. If you specify a command, a detailed command-specific explanation is displayed. If you do not specify a command name, a list of all available commands is displayed. This command takes effect immediately.

Command Name
The name of the command for which you need help

info

The **info** command displays version numbers and other product information for key components within the SNC.

```
Ready.
info
Device                = "SNC 4500"
Serial Number         = IPB2500100000
Device Version        = 055E
Device Build          = 055E
Build Date            = "Oct  3 2003" 11:30:32
Flash Revision        = 11
CLI Revision          = 1.10
Bridge Name           ="Alpha"
World Wide Name       = 20 00 00 10 86 10 48 68
Ready.
```

isReserved

The **isReserved** command displays the reservation status of the current SNC session. If the response is `Reserve Flag set,` the configuration image is being modified by another CLI session. The **set** commands are temporarily unavailable but **get** commands are available. Executing a **saveConfiguration, restoreConfiguration** or **firmwareRestart** releases the SNC so that other users can access it. At least one interface must always have access to the SNC. This command takes effect immediately.

Output	Meaning
Reserve Flag NOT set	The configuration image is not being modified by another CLI session
Reserve Flag set	The configuration image is being modified by another CLI session. The **set** commands can not be issued to the SNC

```
Ready.
isreserved
Reserve Flag "NOT set"
Ready.
```

ping [port number] [IP address] <count> <size>

![CAUTION] **CAUTION** **If the host and SNC are on different subnets, ping may return "Destination Net Unreachable." Check with your network administrator to determine if pings across subnets have been disabled for security reasons. If so, you will need to perform the ping from a host on the same subnet as the SNC or rely on the host's iSCSI initiator to enumerate the SNC data ports.**

The **ping [mp0|dp] [xxx.xxx.xxx.xxx]<count> <size>** command sends an ICMP echo request from the specified SNC management or data ports to the specified IP address. This command takes effect immediately.

Port Number	Meaning
mp0	Ethernet management port labeled Ethernet port 2
dp0 or dp1	Ethernet data port labeled Ethernet port 0 or Ethernet port 1

IP Address	Meaning
xxx.xxx.xxx.xxx	The IP address you wish to ping

Optional Parameters	Meaning
count	Specifies the number of echo requests sent
size	Specifies the length, in bytes, of the data sent

```
Ready.
ping mp0 172.16.5.198
PING: size=64; num=4; net=MP0; addr=c60510ac
1 no reply
2 no reply
3 no reply
4 no reply
Ready.

ping mp0 172.16.76.198

PING: size=64; num=4; net=MP0; addr=c64c10ac

Reply from 172.16.76.198: [   1] bytes=64 time=0 ms
Reply from 172.16.76.198: [   2] bytes=64 time=0 ms
Reply from 172.16.76.198: [   3] bytes=64 time=0 ms
Reply from 172.16.76.198: [   4] bytes=64 time=0 ms

Ready.
```

reserve

Reservation of the SNC is implicit. Once the configuration image is changed by any user, the SNC becomes reserved. Executing a **saveConfiguration**, a **restoreConfiguration**, or a **firmwareRestart** command releases the SNC so that other users can access it. When the SNC is reserved, **set** commands from other users are not executed but **get** commands will be executed. At least one interface must always have access to the SNC. This command takes effect immediately.

Output	Meaning
enabled	Allows reservation of the SNC
disabled	Does not allow reservation of the SNC

```
Ready.
reserve
Reserve Successful
Ready.
```

restoreConfiguration [status]

The **restoreConfiguration [default|saved]** command changes the configuration to either the default configuration or the configuration last saved into non-volatile memory. If you use "saved," any changes made since the last save are lost. Refer to saveConfiguration <status> on page 82. This command must be followed by a power cycle.

Status	Meaning
Default	Factory-set default configuration
Saved	Last saved configuration

The following example shows the response to **restoreConfiguration default:**

```
Ready.
restoreconfiguration default
Ready.
```

route iSCSI [lun] [SCSI | delete] <SCSI btl>

The **Route iSCSI** command assigns an iSCSI LUN protocol address to a target destination device. More than one iSCSI LUN can be assigned to a SCSI BTL (bus, target, LUN). If you try to map a new SCSI BTL to the same iSCSI LUN, the new BTL overwrites the previous map. This command takes effect immediately.

SCSI btl	Meaning
b	bus
t	target
l	LUN

The following verbose output shows the results of a **RouteDisplay iSCSI** command, followed by a **Route iSCSI** command setting the SCSI LUN 9 to the SCSI bus 0, target 9 and LUN 0, followed by another **RouteDisplay iSCSI** command to show the change in mapping:

📝 Note   Devices mapped by the SNC will be visible across both data ports.

```
routedisplay iscsi
11
;Lun    SB   ST   SL
;==================
 0      Bridge
 1      0    0    0
 2      0    1    0
 3      0    2    0
 4      0    3    0
 5      1    0    0
 6      1    1    0
 7      1    2    0
 8      1    3    0
Ready.

route iscsi 9 scsi 0 9 0
Ready.

routedisplay iscsi
12
;Lun    SB   ST   SL
;==================
```

```
      0       Bridge
      1       0     0     0
      2       0     1     0
      3       0     2     0
      4       0     3     0
      5       1     0     0
      6       1     1     0
      7       1     2     0
      8       1     3     0
      9       0     9     0
      Ready.
```

routeDisplay iSCSI <lun>

The **routeDisplay iSCSI** command displays a list of iSCSI names to SCSI bus, target, and LUN mappings. The optional LUN parameter limits the list to the map of that LUN.

```
      Ready.
      routeDisplay iscsi
      8
      ;Lun SB ST SL
      ;===================
      0 Bridge
      1 0 0 0
      2 0 1 0
      3 0 2 0
      4 1 4 0
      8 1 3 0
      Ready.
```

saveConfiguration <status>

Many commands require a **saveConfiguration** command to be executed. This is indicated by the output **Ready. ***. When you issue the **saveConfiguration** command, the current configuration is permanently saved in the SNC and the new configuration becomes the active configuration.

Some commands require a firmware restart to make the requested change permanent. The SNC cannot automatically determine whether or not to restart. After you issue the **saveConfiguration restart** command, a prompt asks you to confirm the restart. You can override this request by typing **n** on the command line. If you select the restart option, the SNC executes its complete start up cycle.

You can make several changes through commands and **saveConfiguration** before implementing the restart, but once you have restarted the SNC, all the command changes created before the restart and save are implemented.

Refer to restoreConfiguration [status] on page 80.

Status	Meaning
Restart	SNC executes its complete start up cycle
NoRestart	SNC saves the configuration without restarting

The following example shows the response to a **saveConfiguration** without specifying **restart** or **norestart:**

```
      Ready.
      saveConfiguration
      [Configuration saved
```

```
Restart is necessary...
Do you wish to restart (y/n)? y
Restarting...]
Ready.
```

SCSIPortList

The **SCSIPortList** command outputs available SCSI ports and their current status. Valid status values are "O.K." and "failed." This command takes effect immediately.

```
Ready.
scsiportlist
4
;SCSI Port     Port Status
;========================
  0            O.K.
  1            O.K.
Ready.
```

SCSIPortReset [port number]

The **SCSIPortReset** command resets the specified SCSI bus. This command takes effect immediately.

Port Number	Meaning
0 or 1	SCSI connection labeled SCSI port 0 or SCSI port 1

```
Ready.
scsiportreset 0
Resetting Port Number 0
Ready.
```

SCSITargets [port number]

The **SCSITargets** command displays a list of SCSI devices operational on the referenced SCSI port. This command takes effect immediately.

Port Number	Meaning
0 or 1	SCSI connection labeled SCSI port 0 or SCSI port 1

The following shows the information which is presented after a **SsciTargets 0** command:

```
Ready.
scsitargets 0
1
;  sb  st  sl  Device Type   Vendor ID     Product ID Rev. Serial Number
Ready.
```

set BridgeName

The **set BridgeName** command assigns a name to the SNC to identify a particular SNC. A **saveConfiguration restart** command must be used to permanently save this configuration.

Note   The **set BridgeName** command does not set the network name. It sets an internal name for your SNC 450x.

```
Ready.
set bridgename Alpha
Ready.*
```

set Date [date]

The **set Date [mm|dd|yyyy]** command sets the date for the SNC if NTP has been disabled. Refer to set SNTP [status] on page 97 and get Date on page 63. This command takes effect immediately.

Date format	Meaning
mm	Two-digit designation of desired month
dd	Two-digit designation of desired day
yyyy	Four-digit designation of desired year

The following example sets the date to 3/25/2004:

```
Ready.
set date 03/25/2004
Ready.
```

set DisplayEventLogFilter [subsystem] [level] [status]

⚠ **CAUTION**   **Contact ATAC before using this command.**

The **set DisplayEventLogFilter** command controls what information is displayed for specific SNC subsystems when issuing the **DisplayEventLog** command. The filter blocks information for one or all of the SCSI buses and Ethernet ports. The default setting is "disabled" for all subsystems and levels. Refer to get DisplayEventLogFilter [subsystem] [level] on page 64. This command takes effect immediately.

Subsystem Choices						
GEN	ENET	NVRAM	PERF	XCOPY	ECC	ALL

Where:

GEN =   General

ENET =   Ethernet

ISCSI =   SCSI protocol of TCP/IP

NVRAM =   Non-Volatile Random Access Memory

PERF =   Performance

ECC =   Error Correcting/Correction Code

ALL =   All of the above

Log Level Choices				
INFO	WARN	CRIT	FAIL	ALL

Where:

INFO =	Information
WARN =	Warnings
CRIT =	Critical events
FAIL =	Failures
ALL =	All of the above

Status	Meaning
enabled	The subsystem and log level chosen are masked when in **DisplayEventLog** mode
disabled	The subsystem and log level chosen are shown when in **DisplayEventLog** mode

```
Ready.
set displayeventlogfilter scsi warn enabled
Ready.
```

set DisplayTraceLogFilter [SCSI | all] [port number] [status]

⚠️ **CAUTION**   **Contact ATAC before using this command.**

The **set DisplayTraceLogFilter** command controls the display of data for specific SNC ports when the command DisplayTraceLog is enabled. If enabled for a particular SNC port, that port is masked when the command DisplayTraceLog is issued. The default setting is "disabled" for all ports. Refer to get DisplayTraceLogFilter [SCSI | all] [port number] on page 65. This command takes effect immediately.

Port Number	Meaning
0 or 1	SCSI connection labeled SCSI port 0 or SCSI port 1
all	All SCSI port connections

Status	Meaning
enabled	The chosen port is masked when in **DisplayEventLog** mode
disabled	The chosen port is shown when in **DisplayEventLog** mode

```
Ready.
set displaytracelogfilter scsi 0 enabled
Ready.
```

set DPMTU [port number] [MTU choices]

⚠️ **CAUTION**   **Increasing the MTU can improve performance. To fully understand the implications and network requirements, contact your service representative before modifying this value.**

The **set DPMTU** command controls the MTU (Maximum Transmission Unit) used by the SNC data ports. Increasing the MTU on the SNC can improve throughput on the SNC data ports. The host MTU must be changed to match the SNC value in accordance with manufacturer's instructions. This command must be followed by **saveConfiguration restart**.

The MTU for the management port cannot be changed. The default setting is "1514." A **saveConfiguration restart** command must be used to permanently save this configuration. Refer to iSCSI Performance Tuning on page 107 and get DPMTU [port number] on page 65.

Port Number	Meaning
dp0 or dp1	Ethernet connection labeled Ethernet port 0 or Ethernet port 1
all	All Ethernet data ports

MTU Choices		
1514	9014	16128

The following example sets the Ethernet data port 0 to MTU 1514.

```
Ready.
set DPMTU dp0 1514
Ready.*
```

set EthernetSpeed [port number] [speed]

⚠️ **CAUTION**   **Contact ATAC before using this command.**

The **set EthernetSpeed** command controls the speed of the SNC Ethernet ports.

Refer to iSCSI Performance Tuning on page 107. If auto is enabled, the speed is negotiated. When hard set, 10 and 100 speeds are half duplex. The default setting is "auto." A **saveConfiguration restart** command must be used to permanently save this configuration. Refer to get EthernetSpeed [port number] on page 66.

Port Number	Meaning
mp0	Ethernet management port labeled Ethernet port 2
dp0 or dp1	Ethernet data port labeled Ethernet port 0 or Ethernet port 1
all	All Ethernet port connections

Ethernet Speed Choices			
10	100	1000	auto

```
Ready.
set ethernetspeed dp0 auto
Ready. *
```

set EventLog [status]

⚠ **CAUTION**   **Contact ATAC before using this command.**

The **set EventLog** command, when enabled, records various system events to the event log. The default setting is "enabled." Refer to get EventLog on page 66. This command must be followed by **saveConfiguration norestart**.

Status	Meaning
enabled	The Event Log records events
disabled	The Event Log is not created

```
Ready.
set eventlog disabled
Ready.*
```

set EventLogFilter [subsystem] [event level] [status]

⚠ **CAUTION**   **Contact ATAC before using this command.**

The **set EventLogFilter** command filters the data for specific SNC subsystems. If enabled for a particular subsystem and level, that subsystem and level is masked while events are being logged. The default setting is "disabled" for all subsystems and levels. Refer to get EventLog Filter [subsystem] on page 67. This command must be followed by **saveConfiguration restart**.

Subsystem Choices						
GEN	ENET	ISCSI	NVRAM	PERF	ECC	ALL

Where:

GEN =   General

ENET =   Ethernet

ISCSI =   SCSI protocol of TCP/IP

NVRAM =   Non-Volatile Random Access Memory

PERF =   Performance

ECC =	Error Correcting/Correction Code			
ALL =	All of the above			

Log Level Choices				
INFO	WARN	CRIT	FAIL	ALL

Where:

INFO =	Information
WARN =	Warnings
CRIT =	Critical events
FAIL =	Failures
ALL =	All of the above

Status	Meaning
enabled	The subsystem and log level chosen are masked during event logging
disabled	The subsystem and log level chosen are shown during event logging

set IdentifyBridge [status]

Enabling the **set IdentifyBridge command** causes the Fault LED on the front panel of the SNC to blink until the parameter is disabled. If a fault condition makes the fault LED blink and you wish to turn it off, use **set IdentifyBridge disabled**. The default setting is "disabled." Refer to get IdentifyBridge on page 67. This command takes effect immediately.

Status	Meaning
enabled	Causes the fault LED on the front panel of the SNC to blink
disabled	Stops the fault LED on the front panel of the SNC from blinking

```
Ready.
set identifybridge enabled
Ready.*
```

set IPAddress [port number] [IP address]

The **set IPAddress** command designates the IP address of the SNC Ethernet ports if IPDHCP has not been enabled and where xxx.xxx.xxx.xxx equals the IP address. A **saveConfiguration restart** command must be used to permanently save this configuration. Refer to get IPAddress [port number] on page 67. DHCP is disabled by default. This command must be followed by **saveConfiguration restart**.

Port Number	Meaning	Default value
dp0	Ethernet data port labeled Ethernet port 0	10.0.0.1
dp1	Ethernet data port labeled Ethernet port 1	10.0.0.2

Port Number	Meaning	Default value
mp0	Ethernet management port labeled Ethernet port 2	10.0.0.3

```
Ready.
set ipaddress DP0 172.16.5.198
Ready.*
```

set IPDHCP [port number] [status]

When enabled, **set IPDHCP** allows the SNC to acquire its IP address from a network DHCP (Dynamic Host Configuration Protocol) server. The network must have at least one DHCP server. When disabled, the SNC uses the default IP address unless changed through the CLI. A **saveConfiguration restart** command must be used to permanently save this configuration. Refer to get IPAddress [port number] on page 67 **and** get IPDHCP [port number] on page 68. DHCP is disabled by default. This command must be followed by **saveConfiguration restart**.

Port Number	Meaning
mp0	Ethernet management port labeled Ethernet port 2
dp0 or dp1	Ethernet data port labeled Ethernet port 0 or Ethernet port 1
all	All Ethernet port connections

Status	Meaning
enabled	Port acquires IP address from network DHCP server
disabled	Port uses default IP address unless changed through CLI

```
Ready.
set ipdhcp all enabled.
Ready.*
```

set IPGateway [port number] [IP address]

The **set IPGateway** command controls the current gateway for the SNC Ethernet ports where `xxx.xxx.xxx.xxx` is the IP gateway address and if IPDHCP has not been enabled. The default setting is "0.0.0.0." Refer to get IPGateway [port number] on page 68. This command must be followed by **saveConfiguration restart**.

Port Number	Meaning
mp0	Ethernet management port labeled Ethernet port 2
dp0 or dp1	Ethernet data port labeled Ethernet port 0 or Ethernet port 1
all	All Ethernet port connections

```
Ready.
set ipgateway all 0.0.0.0
Ready.*
```

set IPSubnetMask [port number] [IP address]

The **IPSubnetMask** command controls the current subnet mask if DHCP is not enabled where the string xxx.xxx.xxx.xxx is the subnet mask. The default setting is "255.255.0.0." Refer to get IPSubnetMask [port number] on page 69. This command must be followed by **saveConfiguration restart**.

Port Number	Meaning
mp0	Ethernet management port labeled Ethernet port 2
dp0 or dp1	Ethernet data port labeled Ethernet port 0 or Ethernet port 1
all	All Ethernet port connections

```
Ready.
set ipsubnetmask all 255.255.0.0
Ready.*
```

set iSCSIAlias [alias]

The **set iSCSIAlias** command provides a human-readable name for the SNC when using CHAP (Challenge-Handshake Authentication Protocol) in the iSCSI protocol. Aliases are up to 64 characters long and can contain spaces if spaces are enclosed in quotation marks. If you enter the command with no alias parameter, the alias is removed. The default setting is "ADIC SNC 450x." Refer to get iSCSIAlias on page 69. This command must be followed by **saveConfiguration norestart**.

```
Ready.
set iscsialias dev1 "ADIC SNC 4501"
Ready.*
```

set iSCSIChap [status]

⚠ **CAUTION**   **Contact ATAC before using this command.**

The **set iSCSIChap** enables or disables the CHAP (Challenge-Handshake Authentication Protocol) used for iSCSI protocol. If enabled, the SNC tries to negotiate CHAP authentication using the CHAP secret. Refer to the command **iSCSIChapSecret** below. An initiator can reject this negotiation. The default setting is "disabled." Refer to get iSCSIChap on page 69. This command must be followed by **saveConfiguration norestart**.

Status	Meaning
enabled	The SNC tries to negotiate CHAP authentication.
disabled	The SNC does not try to negotiate CHAP authentication.

```
Ready.
set iscsichap dev1 enabled
Ready.*
```

set iSCSIChapSecret [password type|delete] [account name] <secret>

The **set iSCSIChapSecret** command specifies the incoming and outgoing passwords, called secrets, for iSCSI CHAP sessions. The **restoreConfiguration default** command sets the secrets to default values.

Secrets are case sensitive, 12-32 characters, or 16-32 characters for Microsoft iSCSI initiators, and cannot contain spaces. Incoming and outgoing secrets must be different.

An incoming CHAP secret authenticates the iSCSI initiator to the SNC. The SNC can store up to 32 incoming secrets, each with a unique account name, equivalent to a username, and secret (password) pair. The account name is case sensitive and can be 1 to 223 characters.

An outgoing CHAP secret is unique and authenticates the SNC to the rest of the network. The account name is ignored and defaults to root.

Refer to get iSCSIChapSecret [password type | delete] [account name] on page 70. This command must be followed by **saveConfiguration norestart**.

Password Type	Meaning
in	Defines the incoming secret (password) for iSCSI CHAP sessions
out	Defines the outgoing secret (password) for iSCSI CHAP sessions
delete	Removes a secret (password) from an account (username) list

Account Name	Meaning
account name	The username of the iSCSI initiator or other name to identify the secret (password), up to 223 characters
all	All account names

Secret
Secrets are case sensitive, 12-32 characters, or 16-32 characters for Microsoft iSCSI initiators

The following example sets the incoming password as `abcdefghijklmn02` and the outgoing password as `pqrstuvwxyz12345`:

```
Ready.
set iSCSIChapSecret in TESTL abcdefghijklmn02
Ready.*
set iSCSIChapSecret out pqrstuvwxyz12345
Ready.*
```

set iSCSIPortNumber [port number]

The **set iSCSIPortNumber** command specifies the SNC port number which listen for iSCSI connections.The port number must be between 1024 and 65535. The default setting is "3260." A **saveConfiguration restart** command must be used to permanently save this configuration. Refer to get iSCSIPortNumber on page 70. This command must be followed by **saveConfiguration restart**.

Port Number	Meaning
0 or 1	SCSI connection labeled SCSI port 0 or SCSI port 1

```
Ready.
set iscsiportnumber 1024
Ready.*
```

set iSNSLoginControl [status]

⚠️ **CAUTION**   **Contact ATAC before using this command.**

The **set iSNSLoginControl** command specifies whether or not the SNC delegates its access control and authorization to an iSNS server. The default setting is "disabled." Refer to set iSNSServer [IP address] on page 92 **and** get iSNSLoginControl on page 70.

Status	Meaning
enabled	The SNC delegates its access control and authorization to an iSNS server
disabled	The SNC retains its access control and authorization

```
Ready.
set isnslogincontrol disabled
Ready.*
```

set iSNSServer [IP address]

⚠️ **CAUTION**   **Contact ATAC before using this command.**

The **set iSNSServer** specifies the IP address of a valid iSNS server from which the SNC attempts iSCSI initiator discovery where xxx.xxx.xxx.xxx is the IP address. Setting to 0.0.0.0 disables iSNS server lookup. The default setting is "0.0.0.0." A **saveConfiguration restart** command must be used to permanently save this configuration. Refer to get iSNSServer on page 71. This command must be followed by **saveConfiguration restart**.

```
Ready.
set isnsserver 192.16.5.198
Ready.*
```

set MaxOpTemp [temperature]

⚠️ **CAUTION**   **Contact ATAC before using this command.**

The **set MaxOpTemp** command sets the maximum internal operating temperature of the SNC in degrees Celsius. If the internal temperature of the SNC rises above the maximum operating temperature, thermal control event handling occurs. Valid values are from 55 to 70**.** The default setting is "70." Refer to get MaxOpTemp on page 71. This command must be followed by **saveConfiguration restart**.

Valid Temperature Values
55-70

```
Ready.
set maxoptemp 60
Ready.*
```

set MinOpTemp [temperature]

⚠️ **CAUTION** **Contact ATAC before using this command.**

The **set MinOpTemp** command sets the minimum internal operating temperature of the SNC in degrees Celsius. If the internal temperature of the SNC falls below the minimum operating temperature, thermal control event handling occurs. Valid values are from 0 to 15. The default setting is "0." Refer to get MinOpTemp on page 71.This command must be followed by **saveConfiguration restart**.

Valid Temperature Values
0-15

```
Ready.
set minoptemp 5
Ready.*
```

set OpTempWarn [temperature]

⚠️ **CAUTION** **Contact ATAC before using this command.**

The **set OpTempWarn** command sets the number of degrees Celsius before a thermal control event warns you if the SNC is approaching the minimum or maximum internal operating temperature. The warning is sent to the system log. Valid values are from 0 to 15. The default setting is "5." Refer to set OpTempWarn [temperature]. This command must be followed by **saveConfiguration restart**.

Temperature Valid Values
0-15

```
Ready.
set optempwarn 5
Ready.*
```

set Password

The **restoreConfiguration default** command sets the password to the default value "Password." Passwords are case sensitive. They can be from 1 to 35 characters long, with no spaces. When the password is empty, Telnet and FTP do not validate the password. To create an empty password, do not type an answer to the **password** command confirmation prompts.

The following is an example of the input and output for the **set Password** command. Enter the old password. In the example below, the old password is "Password." Type in the new password at the **New Password** prompt. Re-enter the password at the **Confirm New Password** prompt. Neither entry displays on the screen. This command must be followed by **saveConfiguration norestart**.

```
Ready.
set password
Old Password: Password
New Password:
Confirm New Password:
Your password has been changed.
Ready. *
```

Because the `Ready` prompt is followed by an asterisk, you must issue the saveConfiguration <status> command to complete the change.

set SCSIInitID [port number] [ID choices]

⚠ **CAUTION**   **Contact ATAC before using this command.**

The **set SCSIInitID** command specifies the SCSI initiator ID to be used on the specified SCSI port. All maps coinciding with the user-specified SCSIInitID must be set to offline and becomes invalid upon issuing this command. Choices are 0 to 15. The default setting is "7." Refer to get ScsiInitID [port number] [ID choices] on page 72. This command must be followed by **saveConfiguration restart**.

Port Number	Meaning
0 or 1	SCSI connection labeled SCSI port 0 or SCSI port 1

SCSI Initiator ID Choices														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

The following example specifies the SCSI initiator ID on SCSI port 0 as 15.

```
Ready.
get SCSIInitID 0 1
ScsiInitID = 7
Ready.*
set SCSIInitID 0 15
Ready.*
```

set SCSIPortBusSpeed [port number] [speed]

⚠ **CAUTION**   **Contact ATAC before using this command.**

The **set SCSIPortBusSpeed** command controls the transfer rate at which the SNC negotiates with its SCSI devices. Choices are fast, ultra, ultra2 and ultra3. The default setting is "ultra3." Refer to get SCSIPortBusSpeed [port number] on page 72. This command must be followed by **saveConfiguration restart**.

Port Number	Meaning
0 or 1	SCSI connection labeled SCSI port 0 or SCSI port 1

Speed Choices			
fast	ultra	ultra2	ultra3

```
Ready.
set scsiportbusspeed 0 ultra2
Ready.*
```

set SCSIPortResetOnStartup [port number] [status]

![caution icon] **CAUTION**   **Contact ATAC before using this command.**

The **set SCSIPortResetOnStartup** command specifies if the SCSI port is reset after turning the unit on or restarting the firmware. The default setting is "enabled." Refer to get SCSIPortResetOnStartup [port number] on page 73. This command must be followed by **saveConfiguration restart**.

Port Number	Meaning
0 or 1	SCSI connection labeled SCSI port 0 or SCSI port 1

Status	Meaning
enabled	Resets the SCSI port after turning power on
disabled	Does not reset the SCSI port after turning power on

```
Ready.
set scsiportresetonstartup 0 disabled.
Ready.*
```

set SCSIPortSyncTransfer [port number] [status]

![caution icon] **CAUTION**   **Contact ATAC before using this command.**

The **set SCSIPortSyncTransfer** command specifies whether or not synchronous SCSI transfers are negotiated with devices on the specified SCSI port. A **saveConfiguration restart** command must be used to permanently save this configuration. The default setting is "enabled." Refer to get SCSIPortSyncTransfer [port number] on page 73.
.

Port Number	Meaning
0 or 1	SCSI connection labeled SCSI port 0 or SCSI port 1

Status	Meaning
enabled	Synchronous SCSI transfers are negotiated
disabled	Synchronous SCSI transfers are not negotiated

```
Ready.
set scsiportsynctransfer 0 disabled
Ready.*
```

set SCSIPortTermination [port number] [status]

![caution icon] **CAUTION**   **Contact ATAC before using this command.**

The **set SCSIPortTermination** configures the SCSI internal termination of the SCSI port. A **saveConfiguration restart** command must be used to permanently save this configuration. The default setting is "enabled." Refer to

Port Number	Meaning
0 or 1	SCSI connection labeled SCSI port 0 or SCSI port 1

Status	Meaning
enabled	The SCSI port is configured for internal termination
disabled	The SCSI port is not configured for internal termination

```
Ready.
set scsiporttermination 0 disabled
Ready.*
```

set SCSIPortWideTransfer [port number] [status]

⚠️ **CAUTION**   **Contact ATAC before using this command.**

The **set SCSIPortWideTransfer** command specifies whether or not wide SCSI transfers are negotiated. A **saveConfiguration restart** command must be used to permanently save this configuration. The default setting is "enabled." Refer to

Port Number	Meaning
0 or 1	SCSI connection labeled SCSI port 0 or SCSI port 1

Status	Meaning
enabled	Wide SCSI transfers are negotiated
disabled	Wide SCSI transfers are not negotiated

```
Ready.
set scsiportwidetransfer disabled
Ready.*
```

set SerialPortBaudRate [rate]

The **set SerialPortBaudRate** command configures the baud rate for the RS-232 serial port. The number of data bits per character is fixed at 8 with no parity. Choices are 2400, 9600, 19200, 38400, 57600, 115200. The default setting is "115200." Refer to This command must be followed by **saveConfiguration restart**.

Rate Choices					
2400	9600	19200	38400	57600	115200

Management Port Command Reference

```
Ready.
set serialportbaudrate 57600
Ready.*
```

set SerialPortEcho [status]

The **set SerialPortEcho** command enables or disables repetition of keyboard input on the screen. When enabled, all non-control character keyboard input is output to the display. Set the local ASCII terminal (or terminal emulator) echo settings to disabled if using **set SerialPortEcho enabled**. The default setting is "enabled." Refer to get SerialPortEcho on page 74. This command must be followed by **saveConfiguration restart**.

Status	Meaning
enabled	Keyboard input is repeated on the display
disabled	Keyboard input is not repeated on the display

```
Ready.
set serialportecho disabled
Ready. *
```

set SNTP [status]

The **set SNTP** command controls the NTP (Network Time Protocol) settings for the SNC. When enabled, the SNC tries to contact a specified NTP server at reset and every 12 hours after to initialize or synchronize the time. The default setting is "enabled." Refer to get SNTP on page 74. This command must be followed by **saveConfiguration restart**.

Status	Meaning
enabled	The SNC tries to contact the specified NTP server
disabled	The SNC does not try to contact an NTP server

```
Ready.
set sntp enabled
Ready.*
```

set SNTPServer [IP address]

The **set SNTPServer** command controls the IP address of the NTP time server that the SNC contacts to initialize or synchronize the time. When enabled, the SNC contacts the specified NTP time server at reset and every 12 hours thereafter. If you want contact with the NTP time server before 12 hours, issue a **firmwareRestart** command. Refer to get SNTPServer on page 74.

If the SNC is unable to contact the specified NTP server within 30 seconds, the SNC tries to contact the first auxiliary NTP time server. If the first auxiliary NTP time server is not available, the SNC tries to contact the second auxiliary NTP time server. If the second auxiliary NTP time server is not available, the SNC continues to approximate the time based on the most recent NTP time server, physical real time clock or manual initialization or synchronization. Three time servers are provided in the SNC. This command must be followed by **saveConfiguration restart**.

The default setting is "192.43.244.18" (*www.time.nist.gov*). Refer to get SNTPServer on page 74.

Possible IP Addresses	Meaning
192.43.244.18	time server at *www.time.nist.gov*

Possible IP Addresses	Meaning
129.6.15.28	time server at *www.time-a.nist.gov*
132.163.4.101	time server at *www.time-a-timefreq.bidrdoc.gov*

The following example determines the current NTP server, then changes it to a different server. The first server is no longer listed.

```
Ready.
get sntpserver
5
;SNTP Server IP Addresses
;========================
192.43.244.18
129.6.15.28          AUX
132.163.4.101        AUX

Ready.
set sntpserver 132.163.4.101
Ready.*
get sntpserver
5
;SNTP Server IP Addresses
;========================
132.163.4.101
129.6.15.28          AUX
132.163.4.101        AUX

Ready. *
```

set SpeedWrite SCSI [sb st sl | all] [status]

⚠️ **CAUTION**   **Contact ATAC before using this command.**

The **set SpeedWrite** command improves the performance of WRITE commands to SCSI devices attached to the SNC. Enabling the SpeedWrite command for a specific SCSI bus (**sb**), target (**st**), and LUN (**sl**) of a mapped SCSI device enables the SpeedWrite state for the device at that address. Enabling **all** sets the SpeedWrite state for each currently mapped SCSI device on the SNC. Disabling the **set SpeedWrite** command leaves the SNC at current WRITE performance levels. A **saveConfiguration restart** command must be used to permanently save this configuration.

The single-stream WRITE performance with SpeedWrite enabled is between 60 and 100% greater than when SpeedWrite is disabled.The SpeedWrite capability has no effect on READ commands. Refer to get SpeedWrite SCSI [bus target LUN] on page 75.

Parameter	Meaning
sb	SCSI bus
st	SCSI target
sl	SCSI LUN
all	all currently-mapped devices

Status	Meaning
enabled	Provides enhanced performance of WRITE commands
disabled	Retains the current level of performance of WRITE commands

```
Ready.
set speedwrite scsi all enabled
Ready.
```

set SpeedWriteDefault [status]

⚠️ **CAUTION**   **Contact ATAC before using this command.**

When the **set SpeedWriteDefault** command is enabled, any newly-mapped SCSI device are set at the **SpeedWrite** performance level. When **set SpeedWriteDefault** is disabled, the SNC does not attempt SpeedWrite performance enhancement to newly-mapped SCSI devices. The default setting is "disabled." A **saveConfiguration restart** command must be used to permanently save this configuration. Refer to get SpeedWriteDefault on page 75.

Status	Meaning
enabled	Provides enhanced performance of WRITE commands
disabled	Retains the current level of performance of WRITE commands

```
Ready.
set speedwritedefault enabled
Ready.*
```

set Time [time]

The **set Time [hh:mm:ss]** command sets the time for the SNC if NTP has been disabled. Refer to set SNTPServer [IP address] on page 97. This command takes effect immediately.

Time	Meaning
hh	Two-digit designation of desired hour
mm	Two-digit designation of desired minute
ss	Two-digit designation of desired seconds

The following is an example of how to set the time manually. NTP must be disabled.

```
Ready.
get time
Time = 14:47:17
Ready.
set time 12:47:17
Time Can Not be set while SNTP is enabled
ERROR Command Not Processed
Ready.
set sntp disabled
```

```
Ready.
set time 14:40:10
Ready.
get time
Time = 14:40:10
Ready.
```

set TimeZone [zone] [+/-:hh:mm]

The **Set TimeZone** command controls the time zone for the SNC. Choices are EST, CST, MST, PST or a numerical offset from GMT (Greenwich Mean Time) in the form +/-:HH:MM. When NTP is enabled using the **SNTP** command, the SNC retrieves the time from the specified NTP time server to determine local time. The default setting is "EST." Refer to get TimeZone on page 76 and set SNTP [status] on page 97. This command must be followed by **saveConfiguration norestart**.

Choices	Meaning
EST	Eastern Standard Time
CST	Central Standard Time
MST	Mountain Standard time
PST	Pacific Standard Time
+/-HH:MM	plus or minus a certain number of hours and minutes from Greenwich Mean Time

```
Ready.
Set timezone PST
Ready.*
```

set TraceLog [status]

⚠ **CAUTION**   **Contact ATAC before using this command.**

The **set TraceLog** command records various aspects of the SCSI traffic it receives to the trace log. The default setting is "disabled." Refer to get TraceLog on page 76. This command takes effect immediately.

Status	Meaning
enabled	SCSI traffic is recorded to the Trace Log
disabled	No SCSI traffic is recorded to the Trace Log

```
Ready.
set tracelog enabled
Ready.
```

set TraceLogFilter [SCSI | all] [port number] [status]

⚠ **CAUTION**   **Contact ATAC before using this command.**

The **set TraceLogFilter** command filters the data for specific SNC ports in the trace log for specific SNC ports if the **set TraceLog** command has been enabled. If the **TraceLogFilter** command is enabled for a particular SNC port, that port is masked when the command **TraceLog** is issued. The default setting is "disabled" for all ports. Refer to get TraceLogFilter [SCSI | all] [port number] on page 77. This command takes effect immediately.

Port Number	Meaning
0 or 1	SCSI connection labeled SCSI port 0 or SCSI port 1
all	All SCSI port connections

Status	Meaning
enabled	The chosen port is masked when in **TraceLog** mode
disabled	The chosen port is shown when in **TraceLog** mode

```
Ready.
set tracelogfilter scsi 0 enabled
Ready.
```

set Username [username]

The **set Username** command specifies username for all Telnet, FTP, and SNC Manager web server sessions. The name is case insensitive and must be from 1 to 32 characters with no spaces. The default setting is "admin." Refer to get Username [username] on page 77. This command must be followed by **saveConfiguration norestart**.

```
Ready.
set username alpha
Ready.*
```

set VerboseMode [status]

The **set VerboseMode** command specifies the detail of feedback for the CLI. Disabling this option removes parameter names from action commands and removes descriptions from information commands. The default setting is "enabled." Refer to get VerboseMode on page 77. This command takes effect immediately.

Status	Meaning
enabled	Provides labels of parameters after **Enter**
disabled	Removes labels of parameters after **Enter** (only output data is shown)

```
Ready.
set verbosemode disabled
Ready.
```

set WrapEventLog [status]

⚠️ **CAUTION**   **Contact ATAC before using this command.**

When the **set WrapEventLog** command is enabled, the SNC logs up to 2,048 event entries before wrapping (overwriting the first entries). If the **set WrapEventLog** command is disabled, the SNC stops logging event entries when the buffer is full. The default setting is "enabled." Refer to <u>get WrapEventLog</u> on page 78. This command must be followed by **saveConfiguration norestart**.

Status	Meaning
enabled	Provides labels of parameters
disabled	Removes labels of parameters (only output data is shown)

```
Ready.
set wrapeventlog enabled
Ready.*
```

set WrapTraceLog [status]

⚠️ **CAUTION**   **Contact ATAC before using this command.**

When the **set WrapTraceLog** command is enabled, the SNC logs up to 2,048 trace entries before wrapping (overwriting the first entries). If the **set WrapTraceLog** command is disabled, the SNC stops logging trace entries when the buffer is full. The default setting is "enabled." Refer to <u>get WrapTraceLog</u> on page 78. This command must be followed by **saveConfiguration norestart**.

Status	Meaning
enabled	Provides labels of parameters
disabled	Removes labels of parameters (only output data is shown)

```
Ready.
set wraptracelog disabled
Ready.*
```

ZModem [status]

The **ZModem Send** command allows transfer of a firmware image to or from the SNC using the ZModem file transfer protocol through the RS-232 interface. Before using this command, ensure that all I/O through the SNC has stopped. If ZModem fails, you receive an error message with status of the failure. This command takes effect immediately. Refer to <u>Updating Firmware Using ZModem</u> on page 34.

Status	Meaning
send	Sends information using the ZModem file transfer protocol
receive	Ready to receive information using the ZModem file transfer protocol

The following is an example of the verbose output of a **ZModem Send** command:

```
Ready.
zmodem send c:\SNC_firmware\I2500110.ima
Ready.
```

9

Removal and Replacement Procedures

This section describes the removal and replacement procedures for the SNC in its entirety.

Handling ESD-Sensitive Parts

When handling the SNC, it is strongly recommended that you follow the guidelines below:

- Keep the ESD-sensitive part in a static-protective bag until you are ready to install the part into the machine.

- Make the fewest possible movements with your body to prevent an increase of static electricity from clothing, fibers, carpets, and furniture.

- If instructed to do so, switch off the machine power before you remove ESD-sensitive parts.

- Just before touching the ESD-sensitive part, discharge any static electricity in your body to the machine by touching the metal frame or cover of the machine. If possible, keep one hand on the frame when you install or remove an ESD-sensitive part.

- Wear an ESD wrist strap.

- Do not place any ESD-sensitive parts on the machine cover or on a metal table because large metal objects can become discharge paths if they are not grounded. If you must set aside an ESD-sensitive part, first place it into the ESD static-protective bag.

- Prevent ESD-sensitive parts from being accidentally touched by other personnel.

- If possible, keep all ESD-sensitive parts in a grounded metal case.

- Be very careful when you work with ESD-sensitive parts in cold weather. Low humidity and heating increase static electricity.

Removing the SNC 4500

Perform these procedures if a repair action is required for any component of the SNC. They could be necessary if an SNC fuse blows, or a firmware download is interrupted, or there is a hardware failure within the SNC.

⚠️ **CAUTION**	**Shut down the host systems to ensure that all I/O through the SNC has stopped.**

1 Verify that the latest configuration has been saved.

For more information on saving the configuration, see <u>saveConfiguration <status></u> `on page 82` or <u>Opening an SNC Manager Session</u> on page 25.

2 Shutdown the Scalar 100 and disconnect the power cord.

3 For each cable attached to the SNC, repeat the following:

- Remove the cable.

- Mark what the cable was connected to (for example, SNC number 3, SCSI channel 1).

Replacing the SNC 4500

1 Remove the SNC from the protective bag.

2 Attach the new SNC to the Scalar 100.

For more information, refer to <u>Installing the SNC</u> on page 8.

3 Configure the SNC.

Refer to <u>Configuring the SNC</u> on page 25.

Before Removing and Replacing the SNC 4501

> ⚠ **CAUTION** **Shut down the host systems to ensure that all I/O through the SNC has stopped.**

1 Verify that the latest configuration has been saved.

For more information on saving the configuration, see <u>saveConfiguration <status></u> `on page 82` or <u>Opening an SNC Manager Session</u> on page 25.

2 Shutdown the Scalar 24 and disconnect the power cord.

3 For each cable attached to the SNC, repeat the following:

- Remove the cable.

- Mark what the cable was connected to (for example, SNC number 3, SCSI channel 1).

Removing the SNC from the Scalar 24

> ⚠ **CAUTION** **Follow all ESD-sensitive parts procedures while performing this procedure. For ESD information, see <u>Handling ESD-Sensitive Parts</u> on page 103.**

1 Complete all steps in <u>Before Removing and Replacing the SNC 4501</u> on page 104.

2 Loosen the four thumbscrews on the back of the SNC.

3 Slide the SNC out of the Scalar 24.

Replacing the SNC from the Scalar 24

1 Remove the SNC from the protective bag.

2 Install the new SNC in the Scalar 24.

For more information, refer to Installing the SNC on page 8.

3 Configure the SNC.

Refer to Configuring the SNC on page 25.

10

iSCSI Performance Tuning

The SNC 450x is intended to be operated in a Gigabit Ethernet (GbE) LAN switching environment without passing traffic through a router, gateway or WAN connection. As a result, CRCs at the Ethernet and TCP levels are not intentionally modified, and the possibility of errors injected and included in the CRC calculation is avoided. In this situation, the 32-bit CRC provided by Ethernet protects effectively against undetected errors generated within the fabric.

iSCSI performance depends on several factors, but in general the performance depends on the network speed and Ethernet processing performance of the host and target device.

iSCSI performance depends on several factors:

- Network speed and processing
- Host Ethernet software configuration

Network Speed and Processing

The faster the network, the higher the performance. Gigabit Ethernet (GbE) is currently the fastest network speed available for iSCSI. To implement a GbE network, three things are required: GbE host bus adapters (HBAs) in the computers accessing the target devices, GbE network switches, and GbE cabling.

> **Note** If the data path between the host and the SNC is not completely GbE but has 10/100 links, optimal performance cannot be obtained.

GbE HBAs

GbE-capable host bus adapters come in the following types:

- Standard Ethernet board
- TCP/IP checksum offload on board
- iSCSI protocol on board

A standard GbE HBA transmits and receives data at Gigabit speed, which is 10 times faster than the current 100 Base-T (100 Megabits/s) networks. The 100 Base-T is 10 times faster than the older 10 Base-T (10 Megabits/s) networks. The faster the speed of the network, the higher the performance of the network.

Typically, each Ethernet data frame transmitted requires a calculation of all the bytes in the frame to make sure that the bytes were transmitted and received correctly. At GbE speeds, the processing power required can slow the host computer down because the main CPU is used to perform the calculations. Several Ethernet HBAs implement this calculation in hardware so that the main CPU does not have to perform the calculations, which can improve performance.

The iSCSI protocol implements an additional data integrity check on iSCSI information, called header and data digests. Both of these require processing power to calculate, and at GbE speeds can consume significant main CPU cycles. Some iSCSI HBAs embed these digest calculations in hardware on the HBA, thus offloading the main CPU of the host computer even more, improving performance.

Simple direct connect or switched networks should not require the use of digests.

> **Note**   Simple direct connect or switched networks are the recommended environment for your SNC 450x.

More complex networks, such as those using routers, bridges, gateways, or WAN can introduce undetected errors. In these configurations digests are highly recommended to help protect against data corruption.

In general GbE iSCSI requires significant processing power. If you have a multiple processor host with spare processing power, a standard GbE HBA is sufficient. If your host is heavily loaded, and the CPU runs at a high utilization load, then you should use a HBA with processing offload. iSCSI GbE HBAs are available from several vendors with TCP/IP checksum and iSCSI digest processing offload. Standard GbE HBAs, many with TCP/IP checksum offload, are also available.

GbE Network Switches

Several unmanaged and managed GbE network switches are available from a variety of vendors. The important specification to check when purchasing these switches is that the switch supports jumbo frames– frames that are 9000 bytes or larger–and that all network switches in between the iSCSI host and target are GbE jumbo frame-capable.

GbE Cabling

GbE requires Cat 5e cabling quality or better to sustain the highest data rates. Most current buildings are only cabled for 100 Base-T (using two pairs of wires), and not 1000 Base-T (using four pairs of wires). If you plug a GbE HBA into a standard 100 Base-T network jack, the network runs at 100 Base-T speeds. All HBAs, network switches, and cabling must be GbE-capable to run at GbE speeds.

Host Ethernet Software Configuration

The biggest advantage in Ethernet performance may be gained by properly configuring at least the following TCP/IP parameters:

- TCP/IP window size
- TCP/IP socket read/write buffer size

GbE network traffic processing provides a high load for the host computer system and requires attention to optimize TCP/IP performance tuning. The large TCP/IP window size allows the system to buffer more data before it is confirmed to the connection pair and compensates for user process turnaround time while read/write buffer size allows for user program to use larger I/O operation sizes.

TCP/IP Window and Buffer Sizes

The TCP/IP windows and buffer sizes controls the amount of data gathered together for processing. The larger the window and buffer size, the less processing power required for processing the data.

Linux Configuration

The configuration of these parameters is through the "/proc" interface. For example, the following shell script sets the window and I/O buffer sizes to 512K.

```
#!/bin/sh
MAX_BUF=524288
echo "Configuring socket parameters TO 512k "
echo "4096 $MAX_BUF $MAX_BUF" > /proc/sys/net/ipv4/tcp_rmem
echo "4096 $MAX_BUF $MAX_BUF" > /proc/sys/net/ipv4/tcp_wmem
echo  $MAX_BUF > /proc/sys/net/core/rmem_max
echo  $MAX_BUF > /proc/sys/net/core/rmem_default
echo  $MAX_BUF > /proc/sys/net/core/wmem_max
echo  $MAX_BUF > /proc/sys/net/core/wmem_default
```

Detailed information on Linux TCP/IP performance tuning is available in the Linux kernel source tree. Refer to the file

```
LINUX-SOURCE_DIR/Documentation/networking/ip-sysctl.txt
```

Consult your operating system manuals for TCP/IP network parameter administration.

The TCP/IP standard allows maximum window sizes to be set to 64K, unless scalable windows are supported.

A
Regulatory Notices

The equipment described in this manual generates and uses radio frequency energy. If this equipment is not used in strict accordance with the manufacturer's instruction, it can and may cause interference with radio and television reception. Refer to the Technical Specification sheet for a full list of certifications.

FCC Standards: Radio and Television Interference

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide a reasonable protection against such interference when operating in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, try to correct the interference by one or more of the following measures:

- Move the receiving antenna.

- Relocate the SNC with respect to the receiver, or move the SNC away from the receiver.

- Plug the computer into a different outlet so the computer and receiver are on different branch circuits.

- If necessary, consult an authorized dealer, Technical Support Staff, or an experienced radio/television technician for additional suggestions.

The booklet *How to Identify and Resolve Radio/TV Interference Problems* prepared by the Federal Communications Commission is a helpful guide. It is available from the US Government printing office, Washington, DC 20402, Stock No. 004-000-00345-4.

In order to maintain electromagnetic compatibility, properly shielded and grounded cables and connectors are required, as well as SFPs or GBICs which do not violate the electromagnetic compatibility requirements for this product. Removal of the cover, or any other unauthorized changes or modifications, may compromise electromagnetic compatibility. ADIC is not responsible for interference caused by the use of non-conforming cables, connectors, SFPs or GBICs, or by unauthorized modification or improper installation of the product.

Class A

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause harmful interference with radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

Canadian Standards

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

European Standards

Declaration of Conformity

This following statement applies to the SNC:.

This device has been tested in the basic operating configuration and found to be compliant with the following European Union standards:

- Application of Council Directive: 89/336/EEC

- Standard(s) to which conformity is declared: EN55022, EN50082-1

This Declaration will only be valid when this product is used in conjunction with other CE approved devices and when the entire system is tested to the applicable CE standards and found to be compliant.

VCCI Notices (Japan Only)

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may occur, in which case, the user may be required to take corrective actions.

Note that VCCI regulations provide that changes or modifications not expressly approved by the tape library manufacturer could void your authority to operate this equipment.

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

BSMI Notice

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾， 在這種情況下，使用者會被要求採取某些適當的對策．

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