SX

User Guide

Part number: 5500037-16
Date: 11 September 2008

Navigating around this manual

FCC Note

The products described in this manual have been 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 instructions in this Guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his/her own expense.

EN 55022: 1998, Class A Note

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

CE

Caution: The products described in this manual are approved for commercial use only.

About this manual

Purpose of this manual

This manual tells you how to install, configure and use the Perle SX system hardware, associated drivers and utility software.

Who this manual is for

This manual is aimed at users who want to connect peripherals and terminals to a host using the Perle SX serial connectivity system. This manual requires a working knowledge of using personal computers and associated operating systems, as well as experience in installing host cards and peripherals.

Warning

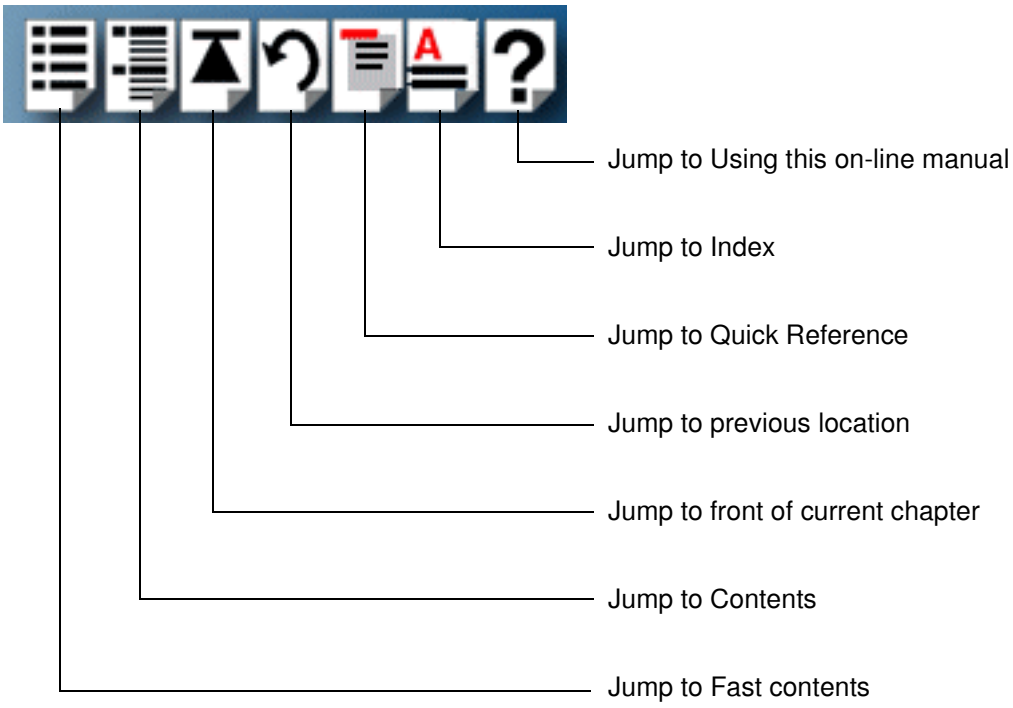
Dangerous voltages exist inside computer systems. Before installing host cards in your system, turn off the power supply and disconnect the mains lead.

Using this on-line manual

The following is a brief guide to using this manual on-line.

Document navigation

This manual features document navigation hypertext buttons in the header area as shown in the next picture;



Hypertext jumps

You can also navigate around this manual by clicking on any cross reference or text in blue for example, **Hypertext jumps**.

> Note
>
> The **Fast Contents**, **Contents** and **Index** entries are all hypertext jumps into this manual.

Revision history

Date	Part number	Description
January 2000	5500037-10	First issue of new SX+ user manual.
April 2000	5500037-11	Update of manual to include Solaris operating system
November 2001	5500037-12	Re-branding update also including improved cabling section.
July 2002	5500037-13	Re-branding update to use standardised SX product naming.
September 2002	5500037-14	Added in details of 3.3/5V universal PCI card.
October 2005	5500037-15	Added support information for SCO OpenServer 6.
September 2008	5500037-16	Added support information for Windows Server 2008.

Fast contents

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CHAPTER 3 CABLING INFORMATION 151

Chapter 1 Introduction

You need to read this chapter if you want to...

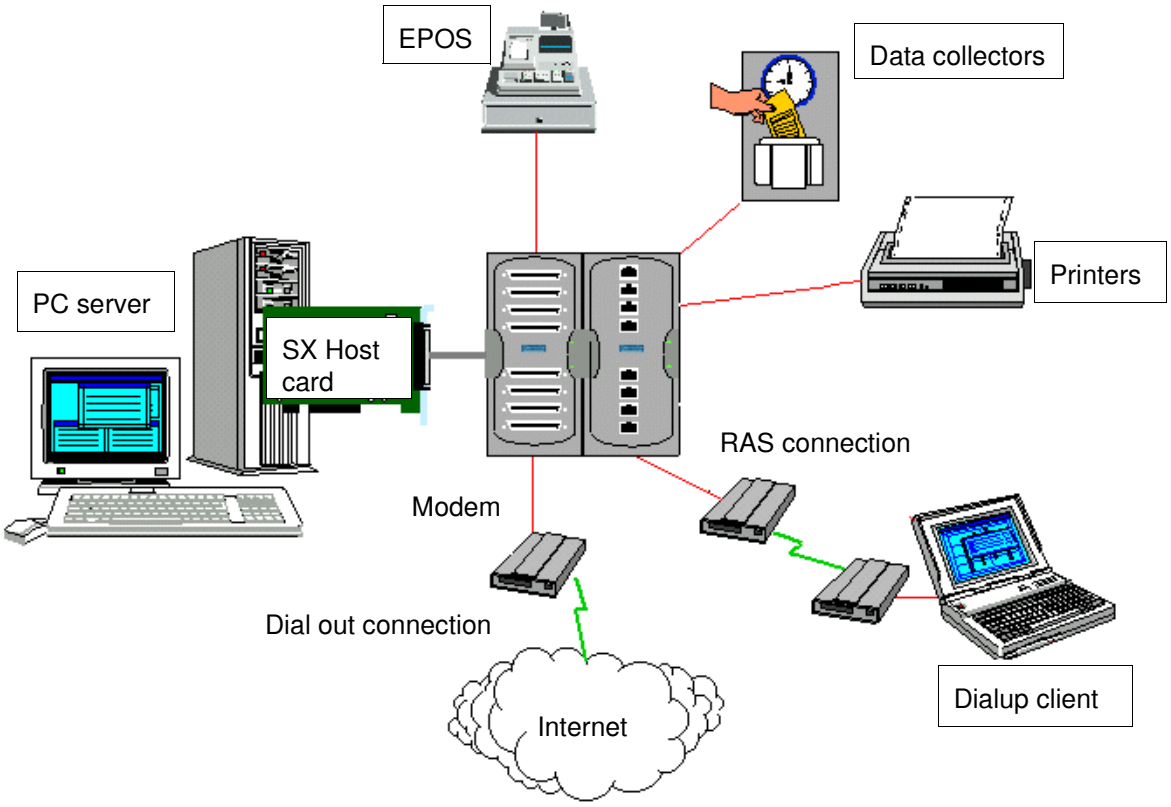
You need to read this chapter if you want an introduction to the Perle SX serial connectivity system.

This chapter provides introductory information about the Perle SX serial connectivity system, its associated components, driver software and configuration utilities.

This chapter includes the following sections;

About the SX system

The Perle SX Product Range is a high performance, intelligent, expandible connectivity system for up to 128 serial devices which provides up to 32 ports per host card. The SX Universal PCI version of the system is based on the Motorola ColdFire processor and offers superior performance to the previous SX host cards. See also **System components** on page **20**.



Typical uses of the system include RAS for NT, Internet Service Providers, corporate remote access, retail EPOS, industrial process control, dial out modems and printing. You can use the SX system in a wide range of industries including hotel/leisure management, banking and finance, manufacturing, real estate and telecommunications.

Typically, you use this product because you want a low cost connectivity system optimised for delivering high performance on multi-user systems and remote access server environments.

> Note
> SX is 100% compatible with older SX terminal adaptors and device concentrators.

System components

This section provides a brief description of the main components of the SX system and includes the following.

Host card

Host cards provide system connection to Device concentrators (**SXDCs**), terminal adaptors (**TAs**) and Modular Terminal Adaptors (**MTAs**) and are available in ISA and PCI formats. See also **Installing a Universal 3.3/5V PCI host card** on page **131**, **Installing an ISA host card** on page **133** and **Removing host cards** on page **135** in **Chapter 2 Installing hardware and software**.

1.5 metre bus extension cable

A proprietary 1.5 metre bus extension cable is supplied with the host cards which allows you to link host cards to Device concentrators or terminal adaptors.

> Note
>
> When connecting SX host cards to Device concentrators or terminal adaptors you should only use the 1.5 metre bus extension cable supplied with your SX host card. **Using any other cable will invalidate your EMC and noise warranty and may cause system lockups and crashes**.

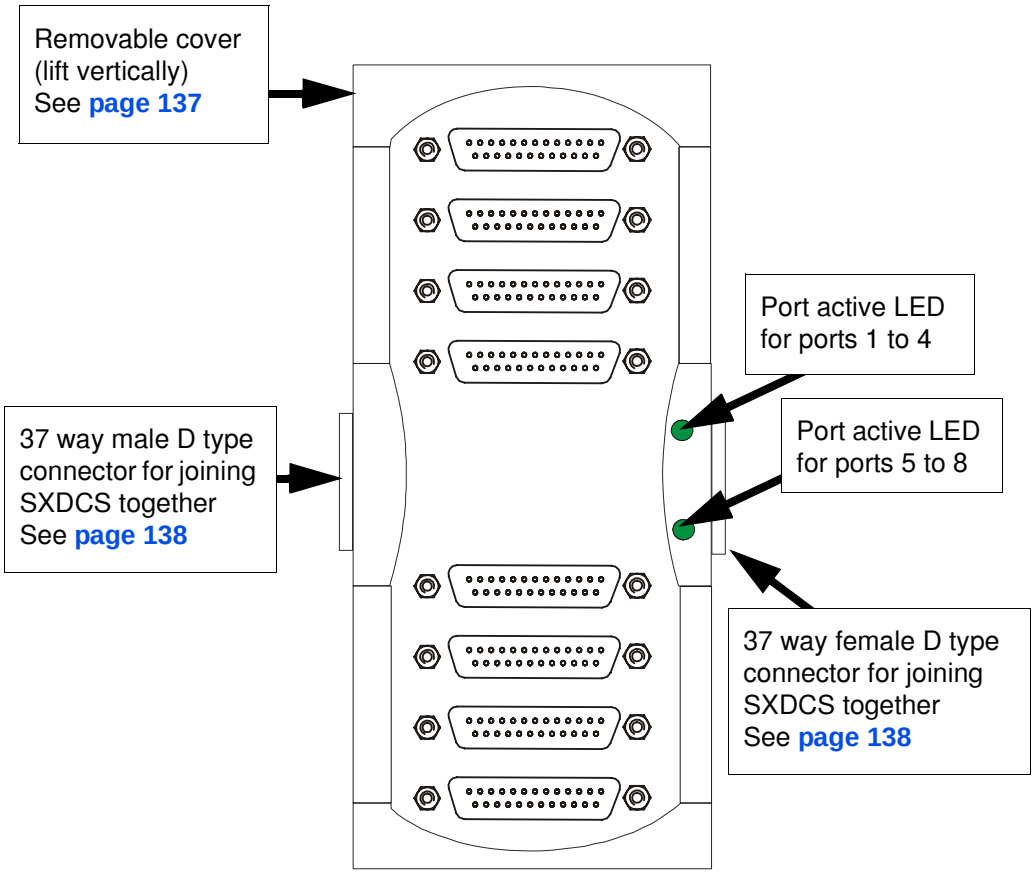
Device concentrators and terminal adaptors

Device Concentrators (**SXDCs**), Terminal Adaptors (**TAs**) and Modular Terminal Adaptors (**MTAs**) are basically serial connection blocks which provide a number of ports depending on type. See **Example SXDC8 device concentrator** on page **22**, **Example MTA8 modular terminal adaptor** on page **23** and **Example TA4 terminal adaptor** on page **24** for pictures of typical examples.The range of types available for the SX system are shown in **Overview of device concentrators and terminal adaptors** on page **21**.

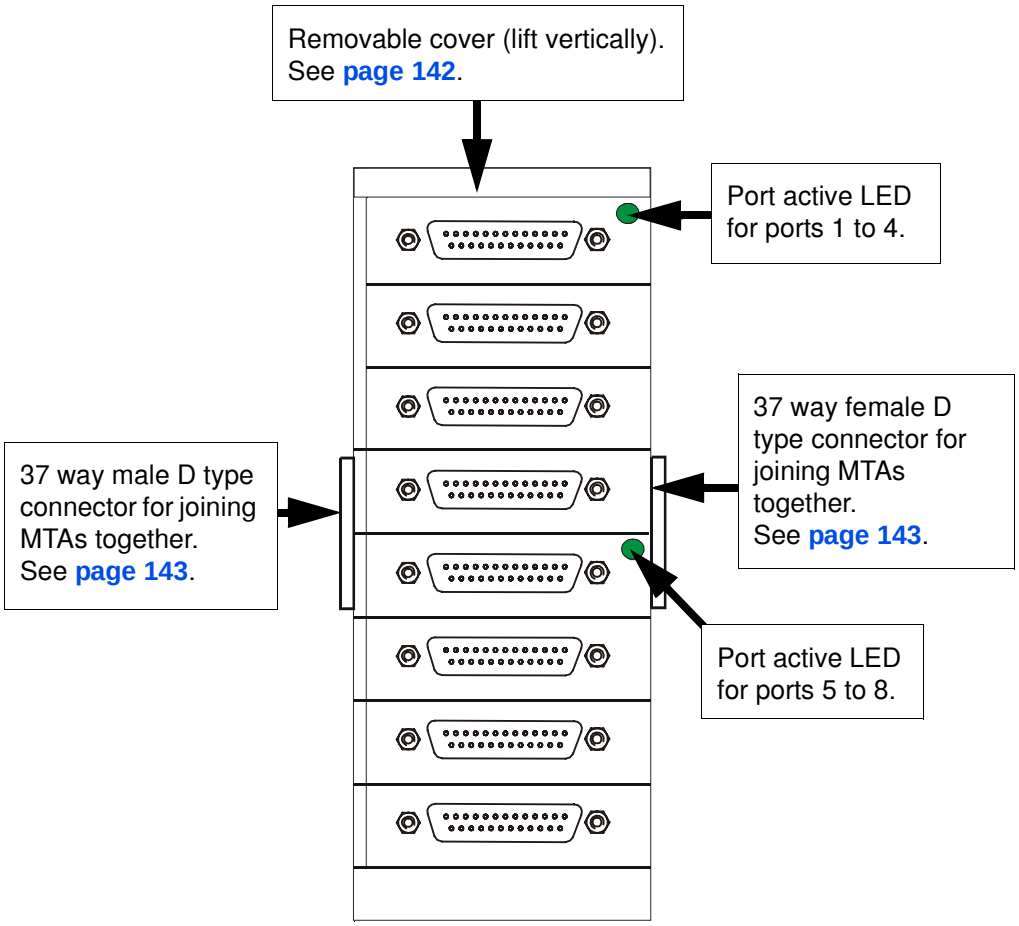
> **Note**
>
> **The permitted combinations of device concentrator types are as follows:**
>
> **SXDC8s to SXDC8s**
> **MTAs to MTAs, and**
> **TA4s/TA8s to TA4s/TA8s**

Device Concentrator	Number of ports	Type	For information on installing see...
SXDC8/RJX	8	RS232 RJ45 ports with high performance and ESD protection to 15kV.	See **page 137**.
SXDC8/DX	8	RS232 DB25 female DCE ports with high performance and ESD protection to 15kV	
SXDC8/MX	8	RS232 DB25 male DTE ports with high performance and ESD protection to 15kV. Emulates standard PC COM port pinouts	
SXDC8/PX	8	1 x DB25 Parallel, 7 x RS232 DB25 female DCE ports with high performance and ESD protection to 15kV Refer to table on **page 165** for further details.	
SXDC8/422	8	RS422 DB25 female DCE ports with high performance and ESD protection to 15kV.	
MTA8/RJX	8	RS232 RJ45 ports with ESD protection to 15kV.	See **page 142**.
MTA8/DX	8	RS232 DB25 female DCE ports with ESD protection to 15kV	
MTA8/MX	8	RS232 DB25 male DTE ports & surge suppression Note these pinouts are the same as the SXDC8/MX.	
MTA8/PX	8	1 x DB25 Parallel, 7 x RS232 DB25 female DCE ports with high performance and ESD protection to 15kV Refer to table on **page 165** for further details.	
MTA8/422	8	RS422 DB25 female ports	
TA4	4	RS232 DB25 female ports (/dx pinouts)	See **page 146**
TA8	8	RS232 ESD protected to 15kV ports with DB25 female connectors (/DX pinouts)	

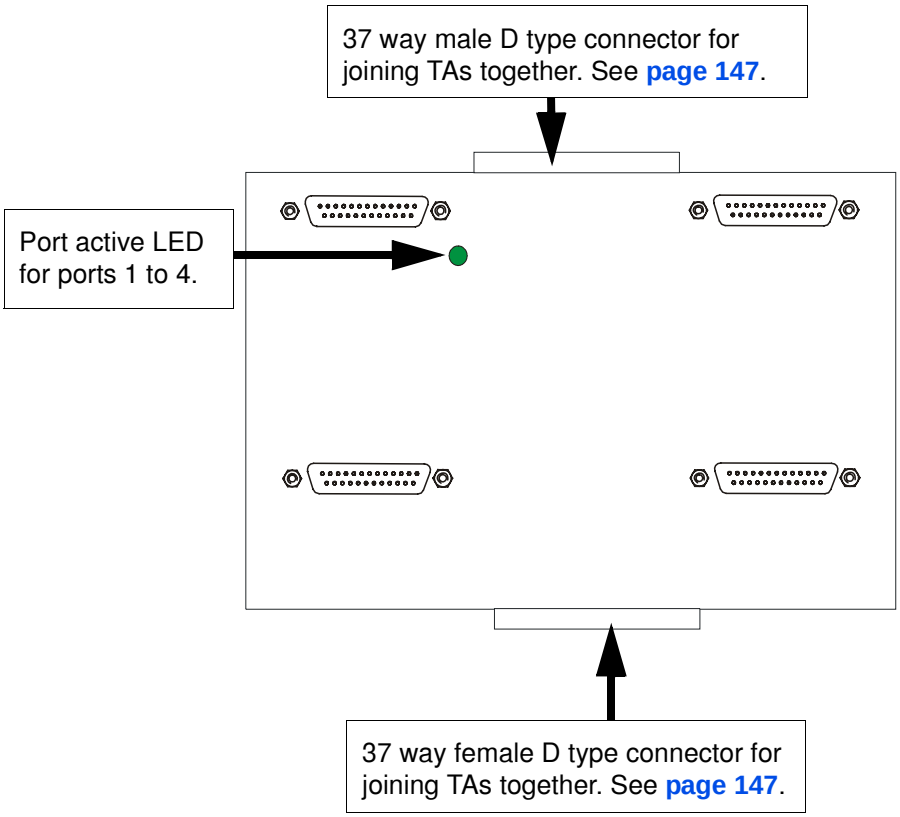
Example SXDC8 device concentrator



Example MTA8 modular terminal adaptor



Example TA4 terminal adaptor



Chapter 2 Installing hardware and software

You need to read this chapter if you want to.....

You need to read this chapter because you want to install SX device concentrators, host cards and associated software.

This chapter tells you how to install and configure SX device concentrators, host cards and associated software under the currently supported operating systems.

This chapter includes the following sections;

Before you start

Before installing your SX hardware and software, note that the procedure for installing and configuring SX hardware varies for different operating systems.

To install under a particular operating system, please refer to one of the operating system specific installation procedures listed below;

- **Installing SX under Solaris** on page **28**
- **Installing SX under SCO OpenServer 5** on page **40**
- **Installing SX under SCO UnixWare** on page **78**
- **Installing SX under Windows NT** on page **105**
- **Installing SX ISA host cards under Windows 2000** on page **112**
- **Installing SX under Linux** on page **123**

> Note
>
> The SX drivers support all previous SX and SI host cards in both ISA and PCI bus types and associated hardware.

> Note
>
> You can find the drivers for SX on the CDROM supplied with this product.

Down loading SX drivers from the Perle web site

You can install the SX driver and utility software from the Perle web site. To do this proceed as follows;

1. On your PC, start the Internet browser you want to use (for example, Netscape).
2. Within your Internet browser window, select the software directory using the following URLs;

   http://www.perle.com/downloads

   > Note
   >
   > In the event of any problems contact your System Administrator or Internet Service Provider for assistance.

3. Change to the software directory.

   The software directory is now displayed.

4. Download the files in this directory to a suitable location on your PC for example, **/tmp**.
5. Follow the instructions for installing the software.

Installing SX under Solaris

This section tells you how to install host cards, software drivers and utilities under the Solaris operating system and includes the following;

General setup procedure for Solaris

The general procedure for installing SX for the Solaris operating system is as follows:

1. If required, install any PCI host cards you require into your system. See **Installing a Universal 3.3/5V PCI host card** on page **131**
2. Install the SX Solaris drivers and utilities onto your system using the procedures described in **Installing device drivers and utilities** on page **30**.
3. If are unable to find a free interrupt level for the card you are installing, you will need to enable polling mode using the **sxiascfg** utility (see **sxisacfg utility** on page **183** in **Chapter 4 Quick reference**). To do this;
    a. At the command prompt, type **sxisacfg -l** and press the **Enter** key to display the current polling mode.
    b. If the system is in **interrupt mode** (default setting), at the command prompt type **sxisacfg -p -l** and press the **Enter** key to toggle into polled mode.
4. If required, using the **sxisacfg utility**, select and assign addresses for any additional ISA host cards you want to install from the free addresses available. See **Assigning ISA host card addresses and IRQ levels** on page **31**.
5. If required, install any ISA host cards you require into your system. See **Installing an ISA host card** on page **133**
6. If you want to remove any ISA host cards from your system,
    a. at the command prompt, type:
    /etc/sxisacfg [-d <name>] and press the **Enter** key
    where **<name>** is the host card name (for example, ISA1) and **d** is the delete command.
    b. Now physically remove any host cards you want from your system using the procedures described in **Removing host cards** on page **135**.
7. Install the device concentrators you require for your system. See **Installing device concentrators** on page **136**.
8. If required, remove any device concentrators you want from your system. See **Removing Device Concentrators from your system** on page **149**.
9. Set up any terminals attached to your system using Admintool. See **Setting up terminals using Admintool** on page **34**.
10. If required, remove any terminals from your system using Admintool. See **Removing SX serial port terminals** on page **38**.
11. If you want to use baud rates above 38400 use the **spxbaudmap** utility to obtain the values you want for each port. See **Appendix B Obtaining baud rates above 38400**.

Your system is now ready for use. If required, you can reconfigure the system following initial installation. See **page 31** and **page 34** for details.

Installing device drivers and utilities

To install the SX device drivers and utilities for the Solaris operating system proceed as follows;

> Note
>
> Before you install the SX drivers and utilities you need to obtain the driver package file **sx-sol-<ver>.pkg** - “version”.pkg for example, **sx-sol-1.1.2.pkg**.
>
> You can do this from either the CDROM (Solaris will automatically mount the CDROM when inserted, and start the file manager application), or the Perle website (see **Down loading SX drivers from the Perle web site** on page **27**).

1. Login to your system as super user and begin a terminal session.
2. At the command prompt, type one of the commands shown in the next table depending on the source of the sx-sol.pkg file you want to use, then press the **Enter** key.;

Source of sx-sol.pkg file	Type this command
CDROM Note **x** is version number	pkgadd -d /cdrom/drivers/sxplus/solaris/sx-sol-1.1.1.pkg

A series of message are now displayed ending with a question prompt:

```
This package contains scripts which will be executed with super-user
permission during the process of installing this package.

Do you want to continue with the installation of <sx-sol> [y,n,?] ▌
```

3. At the question prompt, type **Y** and press the **Enter** key.

   A series of messages are now displayed ending with a confirmation that installation was successful.

The drivers and utility software is now installed and operational. See **General setup procedure for Solaris** on page **29** for instructions on adding ISA host cards, Device Concentrators and Ports.

Assigning ISA host card addresses and IRQ levels

The **sxisacfg** Utility allows you to define addresses and IRQ levels for SX host cards you add to the system. You run this utility before installing the hardware using the following steps;

1. Decide on the name, memory address and IRQ level you require.

   > Note
   > You may need to reserve memory and Interrupt resources for ISA cards using the system BIOS setup or system configuration program.

2. On each host card, set the address you want using the procedures described in **Installing an ISA host card** on page **133**.
3. At the command prompt, enter the command to start the **sxisacfg** utility (see **page 183** for syntax) using the card parameters you decided in step **1.** as shown in the next example:

   /etc/sxisacfg -n ISA1 -m 0xD0000 -i 9

   > Note
   > We recommend using interrupt mode, which is the default (toggled using the **-p** command).

4. Press the **Enter** key.
5. Repeat steps **1.** to **4.** until you have assigned addresses to all the ISA host cards you want to install.

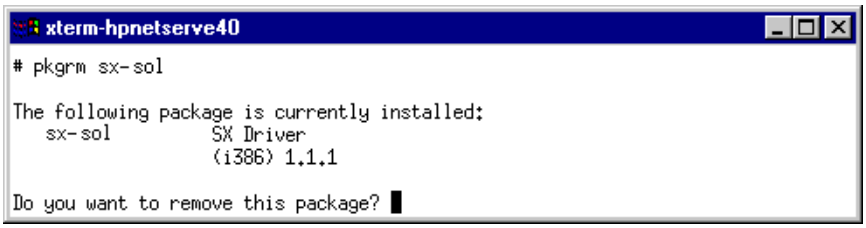
You can now continue with the rest of the procedure required to install the host card. See step **5.** in **General setup procedure for Solaris** on page **29** for details.

Removing SX drivers and utilities from your system

To remove the SX device drivers and utilities for the Solaris operating system, proceed as follows;

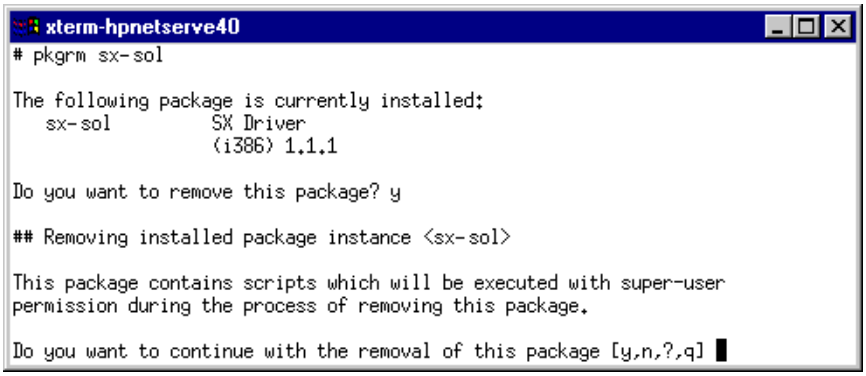
1. Login to your system as super user and begin a terminal session.
2. At the command prompt, type **pkgrm sx-sol** and press the **Enter** key.

   The following question is displayed:



3. At the question prompt, type **y** and press the **Enter** key.

   A further confirmation is displayed.



4. At the question prompt, type **y** and press the **Enter** key to remove the software package.

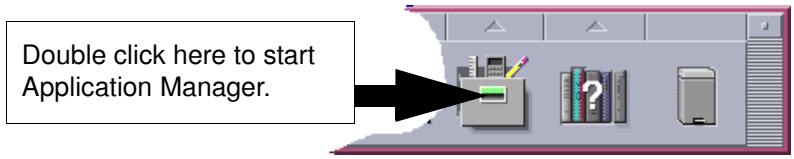
The messages shown in the next picture are now displayed and SX driver and utility software removed.


xterm-hpnetserve40
/usr/bin/sxdb
/usr/bin/spxbaudmap
/usr/bin/get_ports
/usr/bin/cardadd
/usr/bin <shared pathname not removed>
/usr <shared pathname not removed>
/platform/i86pc/kernel/drv/sx.conf
/platform/i86pc/kernel/drv/sx
/platform/i86pc/kernel/drv <shared pathname not removed>
/platform/i86pc/kernel <shared pathname not removed>
/platform/i86pc <shared pathname not removed>
/platform <shared pathname not removed>
/etc/ttytype
/etc/sxutil.ksh
/etc/sxcfg
/etc/printcap.sx
/etc/print.sx
/etc/initsx
/etc/devlink.sx
/etc <shared pathname not removed>
Updating system information.
Removal of <sxsol> was successful.
#

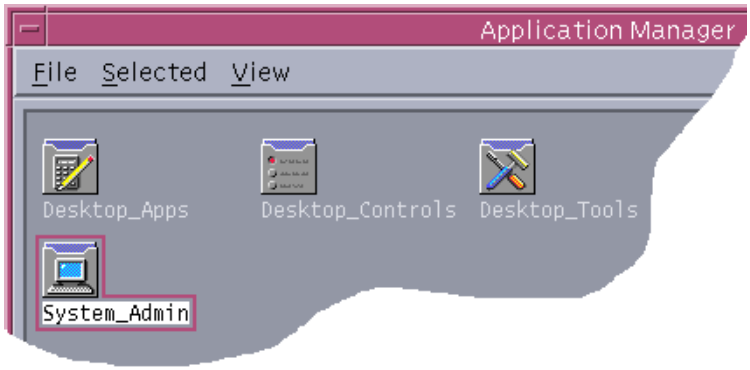
Setting up terminals using Admintool

To configure SX serial ports added to the system proceed as follows;

1. In the Solaris desktop, single click on the **Application Manager** toolbar icon shown in the next picture.

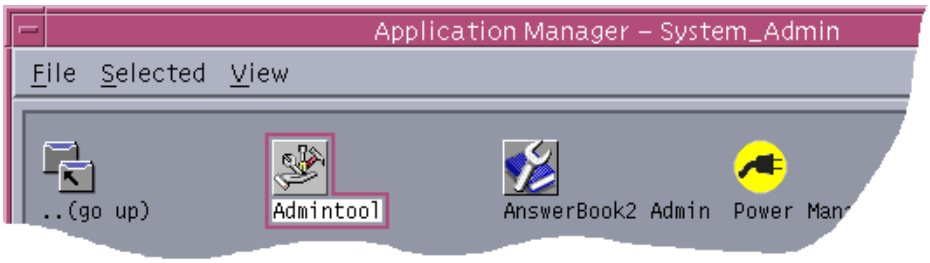


The Application Manager window is now displayed.



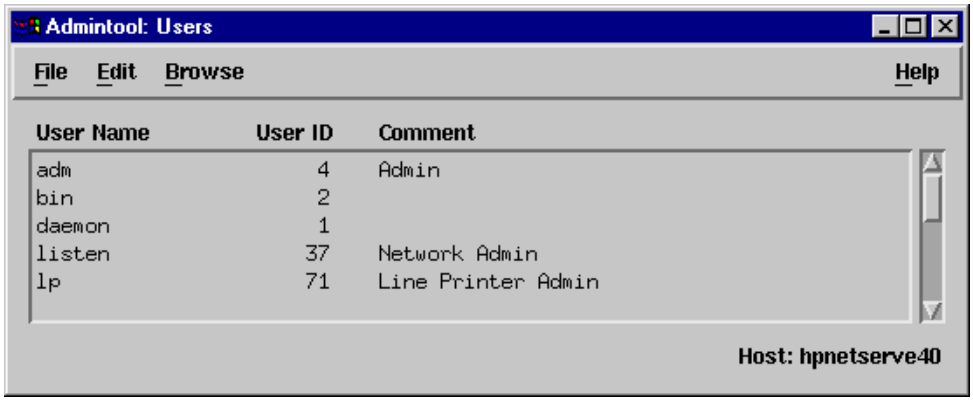
2. In the Application Manager window, double click on the **System_Admin** folder.

   The System_Admin window is now displayed.



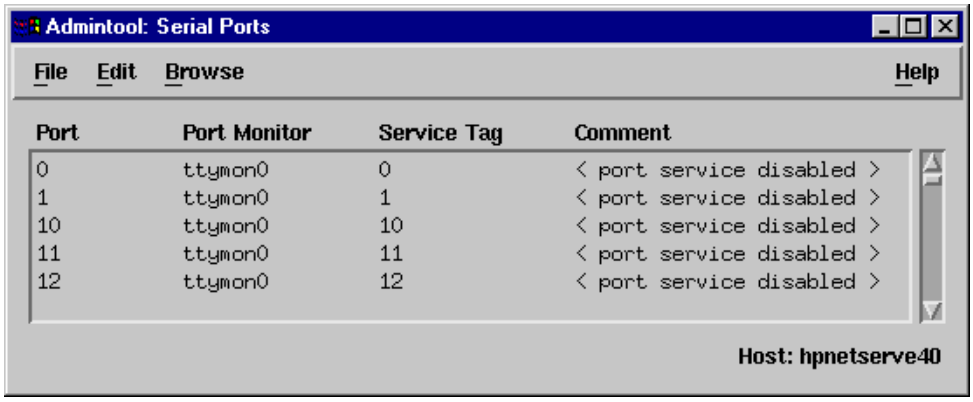
3. In the System_Admin window, double click on the **Admintool** icon.

   The main Admintool window is now displayed as shown in the next picture.



4. In the Admintool menu, click on **Browse > Serial Ports**.

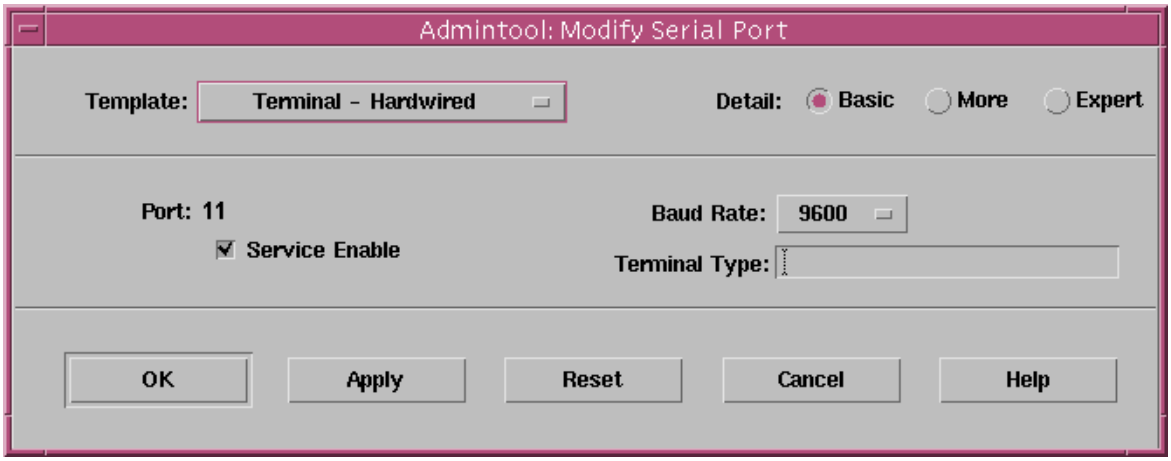
   The Serial Ports window is now displayed.



5. In the Serial Ports window, double click on the serial port you want to modify. Alternatively, click on the port to highlight it, then in the Serial Ports menu click on **Edit > Modify**.

   The Modify Serial Port window is now displayed.

6. In the Modify Serial Port window, display basic information only by clicking on the **Basic** button in the **Detail** field.



7. In the Modify Serial Port window, click on the **Template** selector and choose the type of device you want to connect to the currently selected serial port. For example, to attach a terminal to the serial port, select **Terminal-Hardwired**.

> Hint
>
> For details of the parameters in this field click on the help button to invoke the Solaris on-line help about this window.

8. In the Modify Serial Port window, click in the **Service Enable** checkbox (displaying a tick) to enable the currently selected serial port.
9. In the Modify Serial Port window, click on the **Baud Rate** selector and choose the Baud rate you want. For example, 9600.

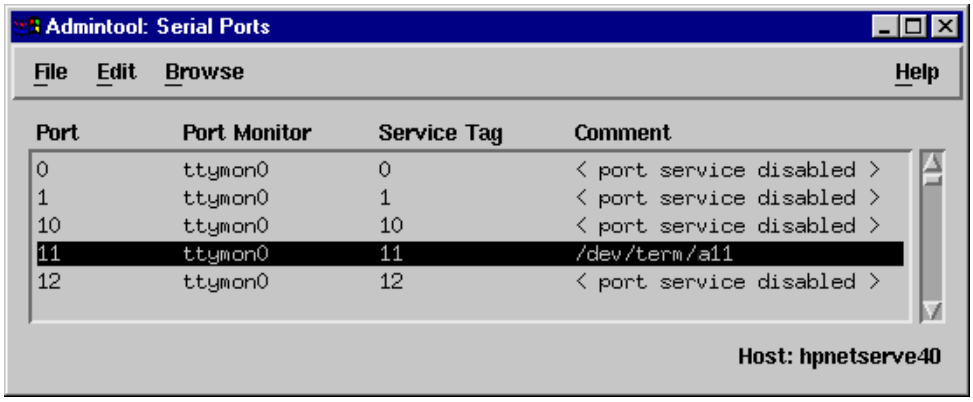
> Note
>
> If you want to use baud rates above 38400, use the **spxbaudmap** utility to obtain the values you want for each port. See **Appendix B Obtaining baud rates above 38400**. **Note that the value you choose here is used to determine the extended baud rate.**

10. In the **Terminal Type** field, enter the terminal type you want.

> Note
>
> The terminal type you enter must be a valid terminal type as defined by the **termcap** file. See the Solaris user documentation or on-line help for further details.

11. In the Modify Serial Port window, click on the **OK**

The currently selected serial port now has a terminal session enabled at the specified baud rate, even parity, 7 data bits and 1 stop bit. The Serial Ports window is now updated to show this as shown in the next picture.

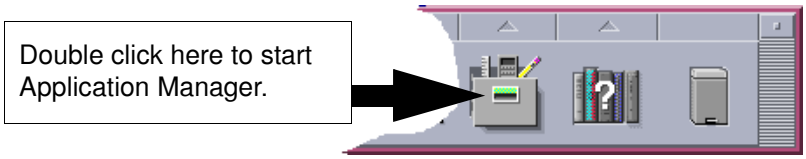


12. Repeat steps **5.** to **11.** until you have configured all the SX serial ports you require.

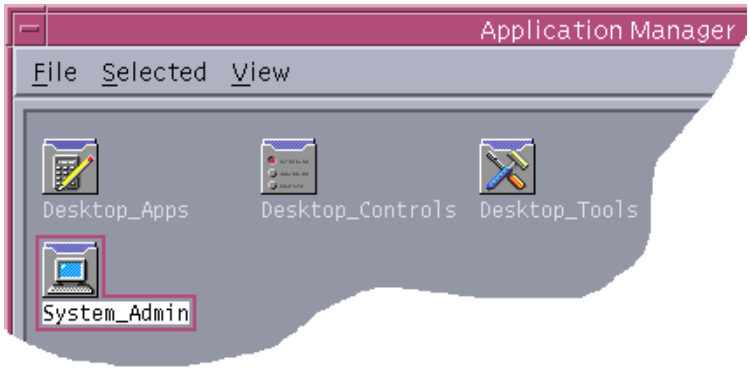
Removing SX serial port terminals

To remove any SX serial ports configured as terminals proceed as follows;

1. In the Solaris desktop, single click on the **Application Manager** toolbar icon shown in the next picture.

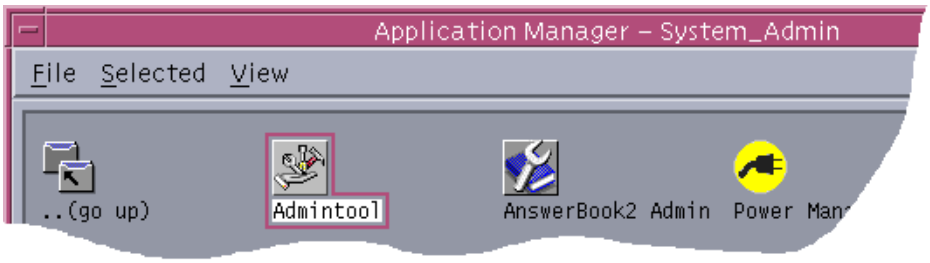


The Application Manager window is now displayed.



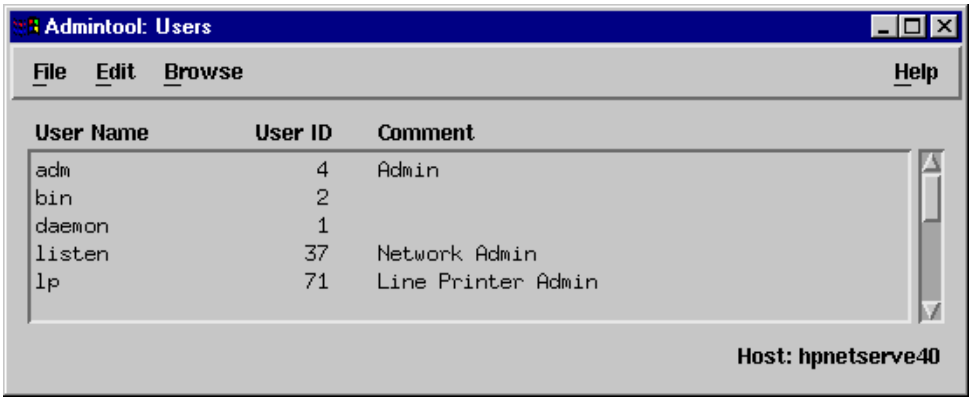
2. In the Application Manager window, double click on the **System_Admin** folder.

   The System_Admin window is now displayed.



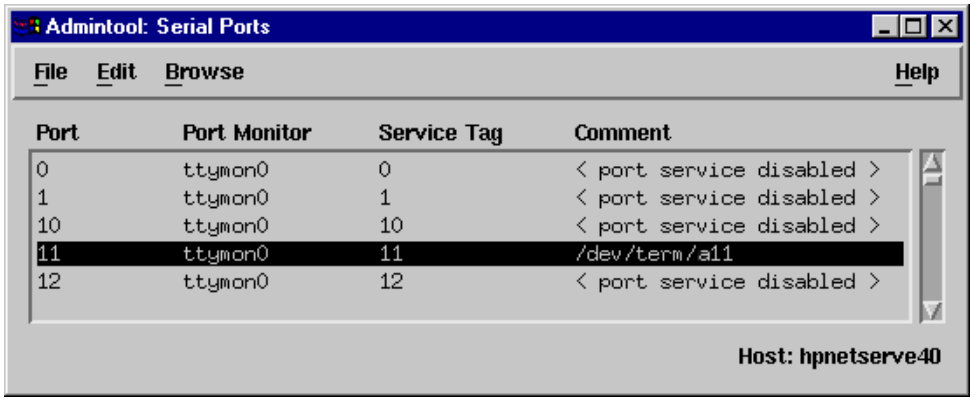
3. In the System_Admin window, double click on the **Admintool** icon.

   The main Admintool window is now displayed as shown in the next picture.



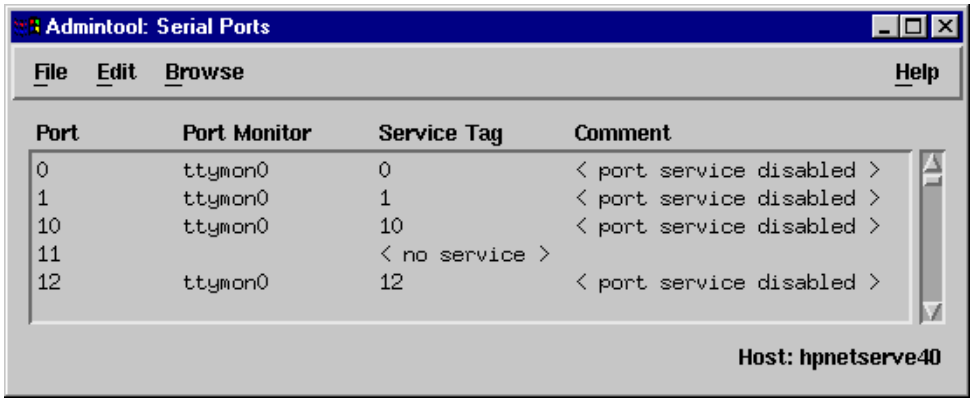
4. In the Admintool menu, click on **Browse > Serial Ports**

   The Admintool window is now updated to show the serial ports available on the system.



5. In the Admintool window, single click on the terminal you want to remove to highlight it.
6. In the Admintool menu, click on **Select Edit > Delete**.

   The terminal entry for the serial port is now deleted and the Admintool window updated.



7. Repeat steps **5.** to **6.** until you have removed all the SX terminal entries you require.

Installing SX under SCO OpenServer 5

This section tells you how to install host cards, software drivers and utilities under the SCO OpenServer 5 operating system and includes the following;

General installation procedure for SCO OpenServer 5

The general procedure for installing and configuring host cards, drivers software and associated utilities for the SCO OpenServer 5 operating system is as follows:

1. If required, install any PCI host cards you require into your system. See **Installing a Universal 3.3/5V PCI host card** on page **131**

> Note
>
> If you are installing a PCI card after having installed your driver, you will need to run the host card configuration utility to create the relevant device nodes. See **Assigning ISA host card addresses and IRQ levels** on page **47** and **Appendix A Serial port device names**.

2. If required, install the SX SCO OpenServer 5 drivers and utilities onto your system using the procedures described in **Installing device drivers and utilities** on page **42**.
3. If required, using the **Host Card Configuration tool**, select and assign addresses for any additional ISA host cards you want to install from the free addresses available. See **Assigning ISA host card addresses and IRQ levels** on page **47**.
4. Repeat step **3.** until you have assigned addresses to all the ISA host cards you want to install.
5. If required, install any ISA host cards you require into your system. See **Installing an ISA host card** on page **133**
6. If required, remove any host cards you want from your system. See **Removing host cards** on page **135**.
7. Install or remove any device concentrators you require onto your system. See **Installing device concentrators** on page **136** and **Removing Device Concentrators from your system** on page **149**
8. Using the **Port Configuration tool**, configure the serial ports you have added to the system. See **Configuring SX serial ports** on page **55**.
9. If you want to use baud rates above 38400 use the **spxbaudmap** utility to obtain the values you want for each port. See **Appendix B Obtaining baud rates above 38400**.

Your system can now use the serial adaptor cards you have installed. If required, you can reconfigure serial ports following initial installation. See **Assigning ISA host card addresses and IRQ levels** on page **47** and **Configuring SX serial ports** on page **55** for details.

Installing device drivers and utilities

To install the SX device drivers and utilities for the SCO OpenServer 5 operating system proceed as follows;

1. Login to your system as super user.
2. Load the CDROM into your system CD drive.
3. At the command prompt, make a directory for your installation by typing:

   mkdir /cdrom

4. Mount the CDROM file system using the following commands:

   mount -f ISO9660 -r /dev/cd0 /cdrom

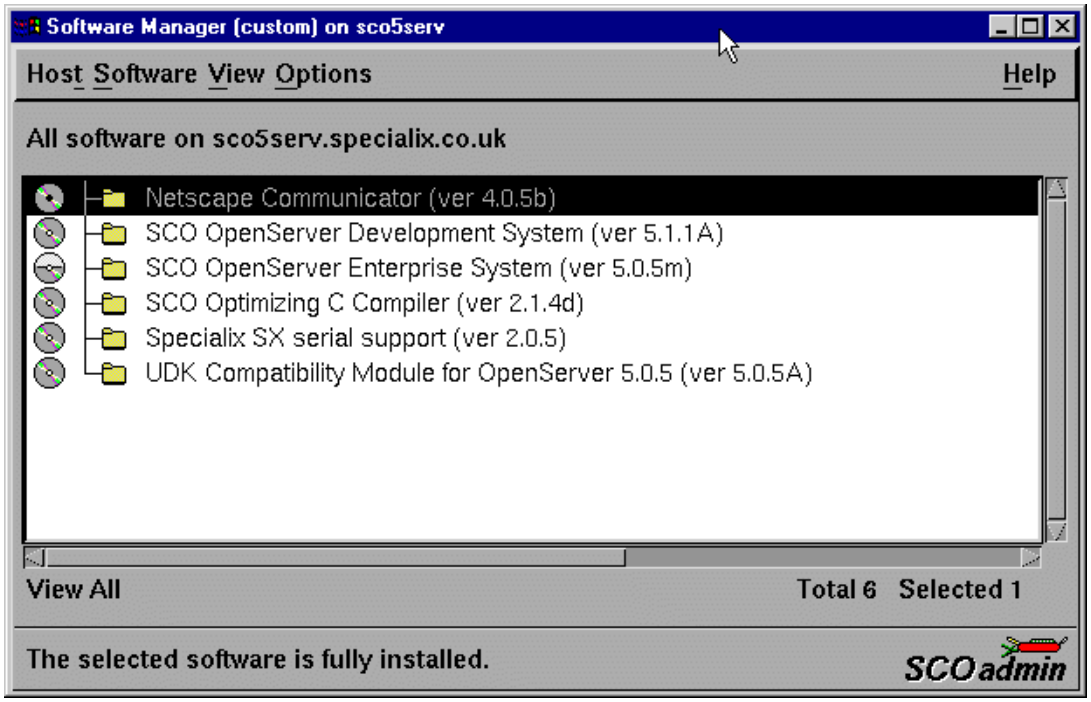
   > Note
   > The example above shows the directory name as **/cdrom**, You can either use this name or use another directory name to suit your requirements. For example, **/mnt**.

5. In the SCO OpenServer 5 desktop, double click on the System Administration folder.

   The System Administration window is now displayed.

6. In the System Administration window, double click on the Software Manager icon.

   The Software Manager window is now displayed.

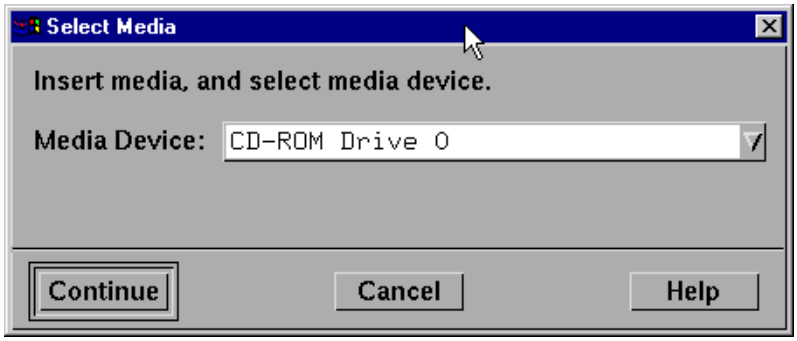


7. In the Software Manager menu, click on **Software > Install New**.

   The Begin Installation window is now displayed as shown in the next picture.

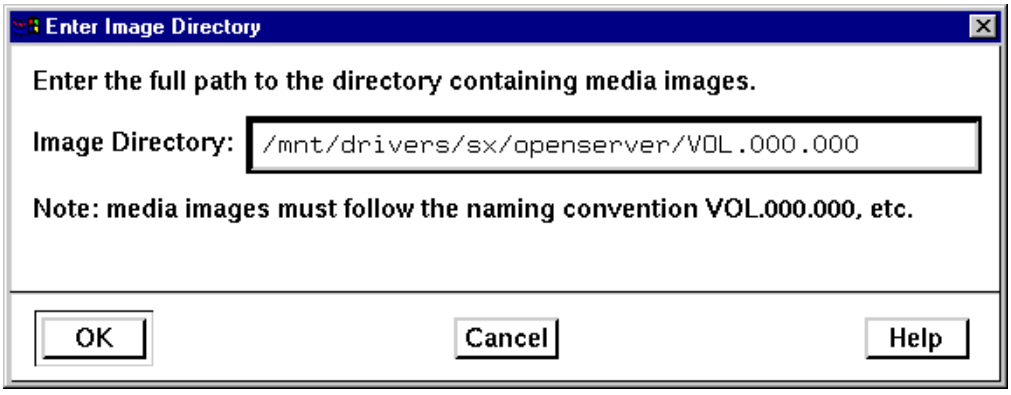
8. In the Begin Installation window, select the local host as the machine to install from by clicking on the **From localhostname** button and then click on **Continue**.

   The Select Media window is now displayed.



9. In the Select Media window, using the **Media Device** selector choose the **Media Images** option then click on **Continue**.

   The Enter Image Directory window is now displayed.



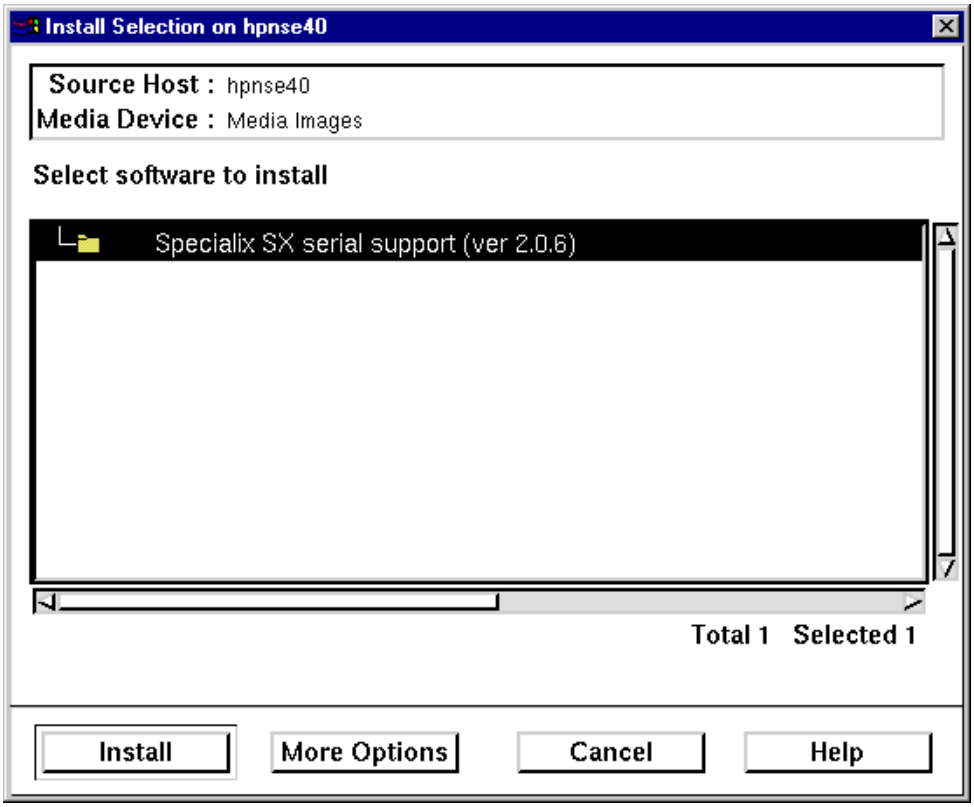
10. In the Enter Image Directory window, enter the following in the Image directory field;

    /cdrom/drivers/sx/openserver

> Note
>
> The example and picture above show a directory name including **/cdrom**, You can either include this name in the path or use another directory name to suit your requirements. For example, **/mnt**.

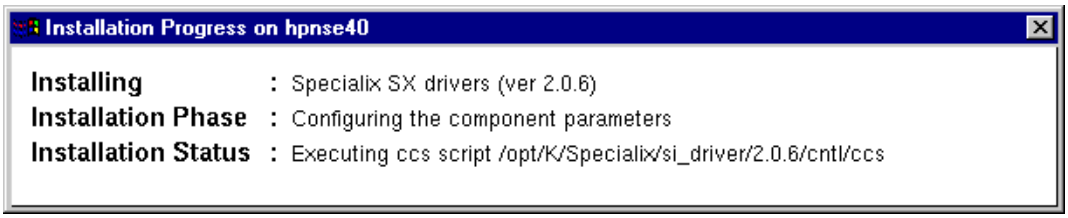
11. In the Enter Image Directory window, click on **OK**.

    The Install Selection window is now displayed.

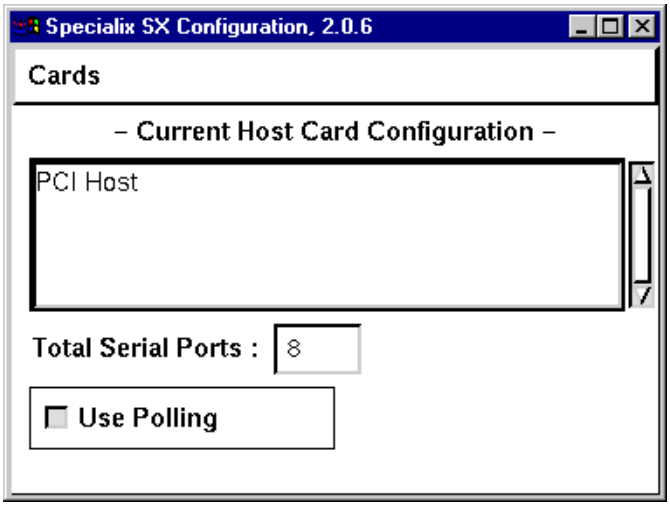


12. In the Install Selection window, click on the **Install** button.

    The following progress message is now displayed.



13. During the driver installation, the host card configuration utility window displays as follows;



14. Using the Host Card Configuration utility, add any cards you want to the system then exit the utility and save changes. See **Assigning ISA host card addresses and IRQ levels** on page **47**.

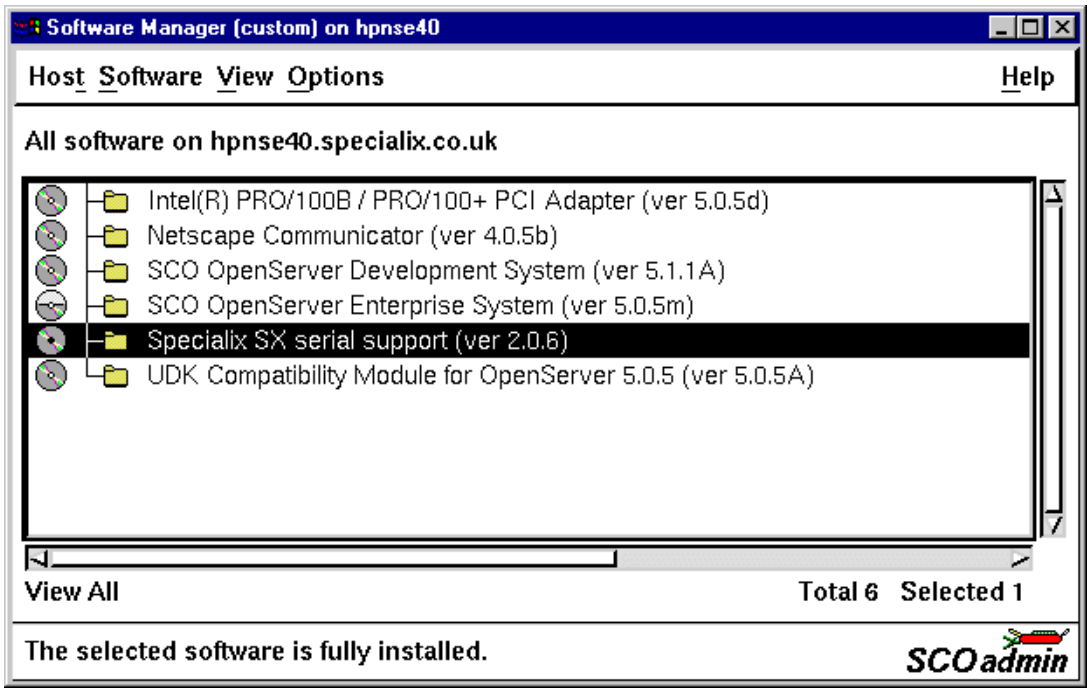
    If you have re-linked the kernel earlier in this procedure, a message window is now displayed prompting you to re-boot the system.

15. In the message window click on **OK** to continue the installation process.

    The following message is now displayed upon completion of the installation process.

16. In the message window, click on OK to close the window.

    The software manager window is now updated to show the driver you have installed as shown in the next picture.



17. In the Software Manager window, click on the **Host > Exit** menu option to close the window.

18. Shut down your system and turn the power off.

You can now continue with the rest of the installation process see **General installation procedure for SCO OpenServer 5** on page **41**.

Assigning ISA host card addresses and IRQ levels

The Host Card Configuration Utility allows you to define and edit addresses and IRQ levels for SX host cards you add to the system. In addition this utility automatically creates and removes serial port device nodes.

This section includes the following;

> Note
>
> If you make any changes to the host card addresses on the system, you will need to restart the software kernel. See **Re-building the kernel** on page **54** for details.

Starting the Host Card Configuration utility

You can start the Host Card Configuration utility in one of two ways;

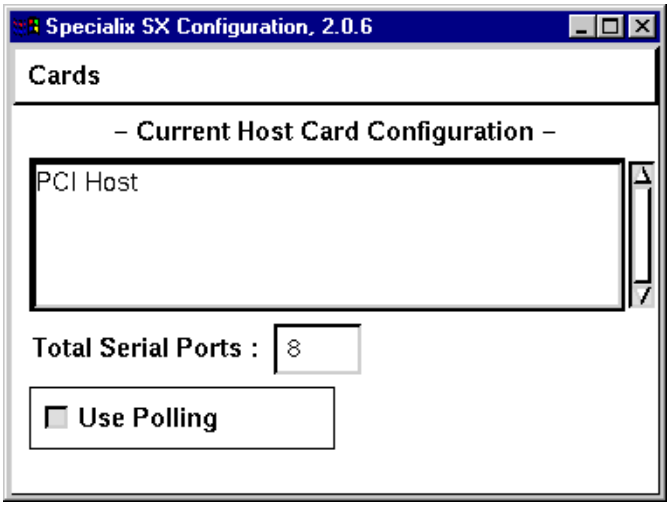
- Using the command line. See page 48.
- Using the SCO OpenServer 5 desktop. See page 49.

Using the command line

To start the Host Card Configuration Utility from the command line proceed as follows;

1. At the command prompt, type **siinit** and press the **Enter** key.

   The Configuration window is now displayed.



You can now use the utility to add, remove or edit host card parameters.

Using the SCO OpenServer 5 desktop

To start the Host Card Configuration Utility from the SCO OpenServer 5 desktop proceed as follows;

1. In the SCO OpenServer 5 desktop, open the **System Administration** folder.

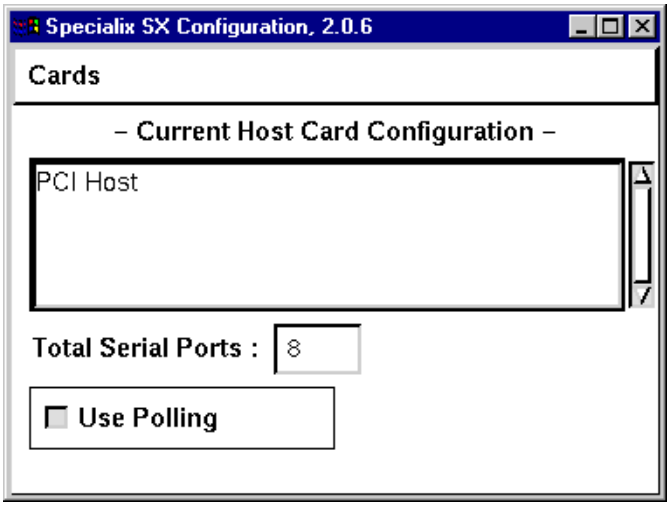
   The System Administration window is now displayed.

2. In the System Administration window, click on the **Specialix** SX folder to open it.

   The Specialix SX window is now displayed

3. In the Specialix SX window, click on the **siinit** Icon.

   The Configuration window is now displayed.

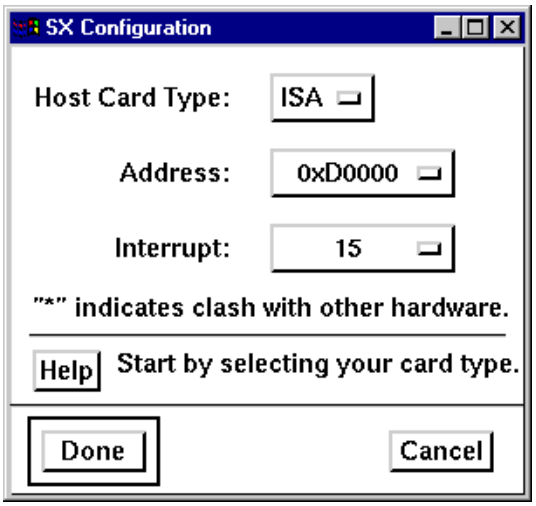


You can now use the utility to add, remove or edit host card parameters.

In order to function, each ISA host card must be allocated an available I/O address and IRQ level. The Host Card Configuration utility allows you to determine the available addresses and IRQ levels, then allocate them to a particular host card. To do this proceed as follows;

1. In the Host Card Configuration menu, click on **Card > Add**.

   The Set Address and IRQ window is now displayed which shows the next available host card address and IRQ level by default.



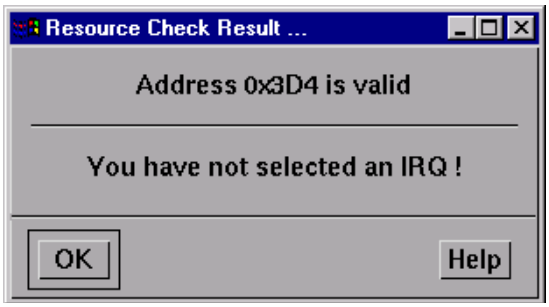
Selecting non-default address and IRQ level

2. If you want to allocate an address and IRQ level other than the default proceed as follows;
   a. In the Set Address and IRQ window, click in the **Address (hex)** field and enter the address you want in hexidecimal.
   b. In the Set Address and IRQ window, click on the **IRQ** (**I**nterrupt level **R**e**Q**uest level) selector and select a free IRQ level.

Testing your selection

3. In the Set Address and IRQ window, click on the **Check** button to verify the values you have entered.

   The Resource Check Result pop-up is now displayed telling you whether or not the selected address and IRQ level are valid. An example is shown in the next picture.



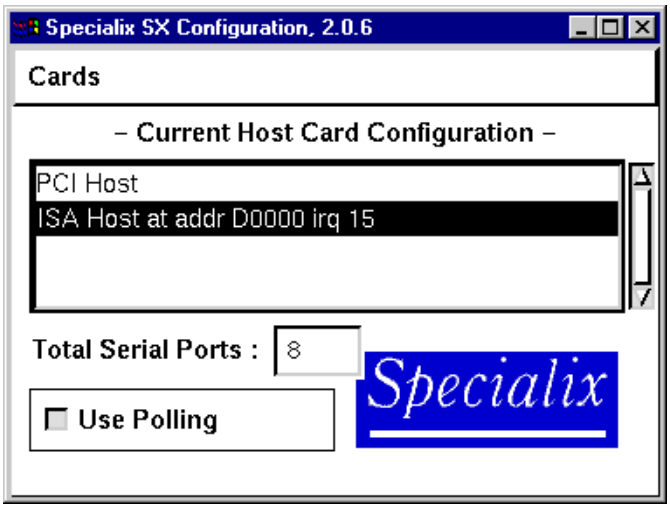
4. In the pop-up, click on **OK** to close the window.
5. In the Host Card Configuration window click on **OK** to confirm your selection and close the window.

If your selection is invalid, the Resource Check Result pop-up message is now displayed. Otherwise, the address is now set and the host card configuration window updated to show the new card and address.

Editing a host card address

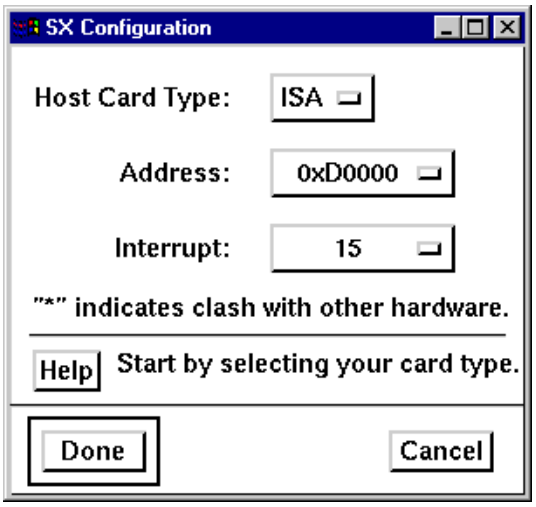
To edit an existing host card address on the system proceed as follows;

1. In the host card Configuration window, select the host card whose address you want to edit.



2. In the Host Card Configuration menu, click on **Card > Edit**.

   The Set Address and IRQ window is now displayed showing the current address and IRQ level for the selected host card.

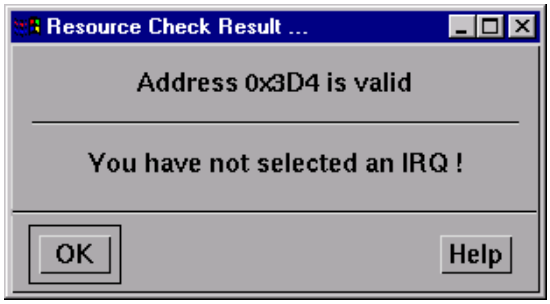


3. In the Set Address and IRQ window click in the **Address (hex)** field and enter the address you want in hexidecimal.
4. In the Set Address and IRQ window, click on the **IRQ** (**I**nterrupt level **R**e**Q**uest level) selector and choose the IRQ level you want.

Testing your selection

5. If required, in the Set Address and IRQ window, click on the **Check** button.

   The Resource Check result pop-up is now displayed telling you if the selected address and IRQ level are valid. An example is shown in the next picture.

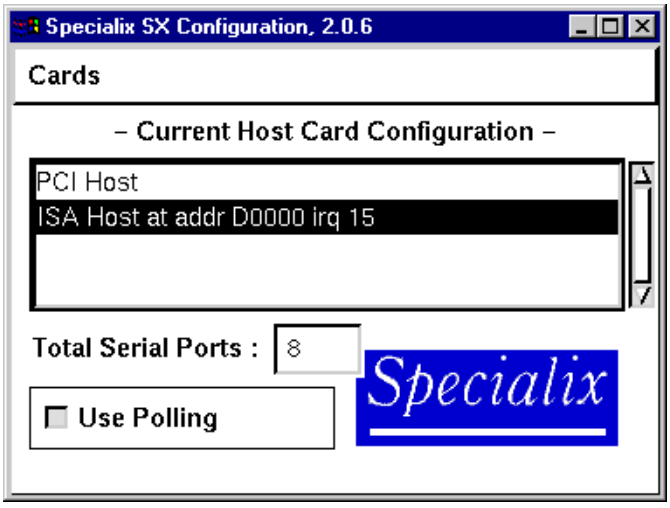


6. In the pop-up, click on **OK** to close the window
7. In the Host Card Configuration window, click on **OK** to confirm any changes and close the window.

If your selection is invalid, the Resource Check Result pop-up message is now displayed. Otherwise, the new address is now set and the host card configuration window updated to show the changes.

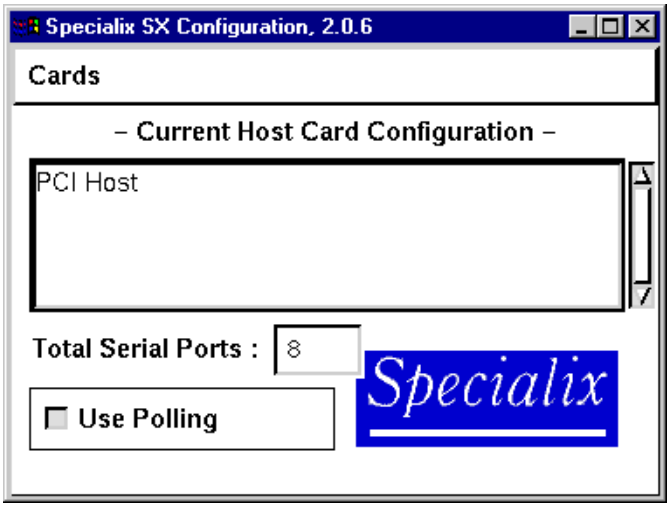
To remove a host card address from the system, proceed as follows;

1. In the host card configuration window, click on one or more of the host cards listed in the Current Host Card Configuration field highlighting them.



2. In the Host Card Configuration menu, click on **Card > Remove**.

   The Host Card Configuration window is now updated to show the remaining host cards only.



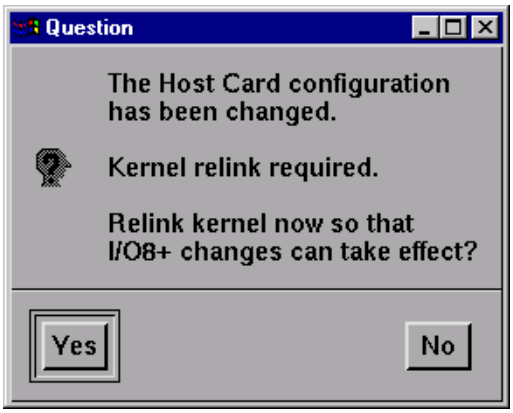
Quitting and saving

To exit the Host Card Configuration utility and save any changes you have made, proceed as follows;

1. In the Host Card Configuration menu, click on **Card > Save and exit**.

Re-building the kernel

If you have made any changes a pop-up now appears prompting you to re-build the operating system kernel, otherwise the utility closes.



2. In the pop-up, click on the **Yes** button to re-link the operating system kernel.

   The Kernel now re-links and a busy message is displayed during this process, followed by a confirmation pop-up.

3. In the confirmation pop-up, click on OK to close the window.

The Host Card Configuration utility now closes and saves any changes you have made.

> Note
>
> To quit the Host Card Configuration utility without saving any changes:
>
> - In the In the Host Card Configuration menu, click on **Card > Quit**.

Configuring SX serial ports

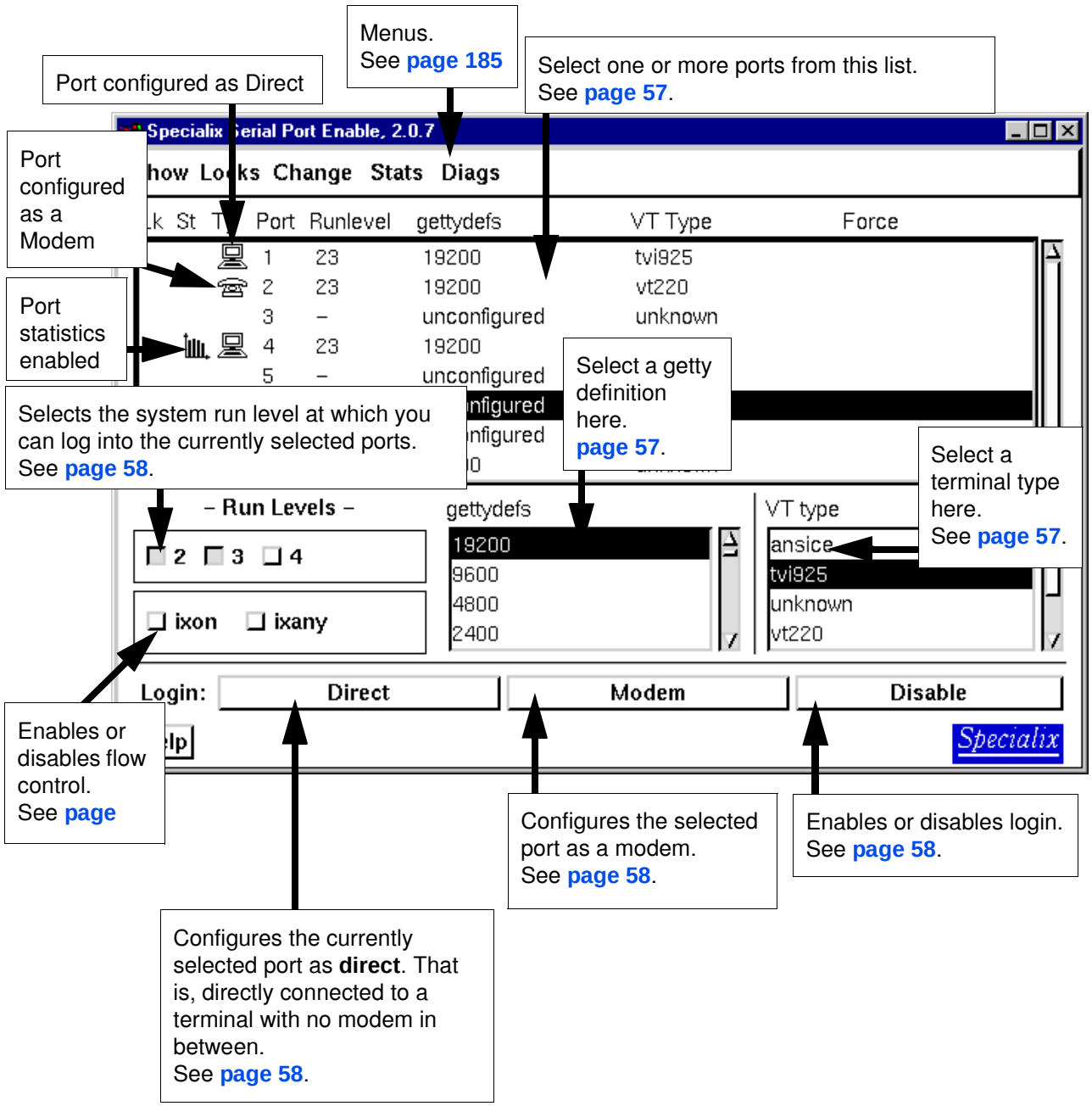
The Port Configuration utility allows you to configure the extra SX serial ports you have added to your system. To do this proceed as follows;

> Note
>
> If you want to perform transparent printing from any of the terminals attached to your system, you need to check the contents of the **printcap.slx** file to see if the terminal type you are using is supported. To do this proceed as follows;
>
> 1. Using a text editor, go to the **/etc** directory and open the file called **printcap.slx**
> 2. Check the contents of the **printcap.slx** file to see if the terminal type you are using is supported. See **page 203** in **Appendix C Transparent printing** for the syntax of the entries in this file.
> 3. If the terminal type you are using is not supported, add an entry for the new terminal type (including the type, transparent print ON and transparent print OFF strings) to the **printcap.slx** file (**page 203**). See the user guide for your terminal for details of the entries required.
>
> You can now configure the ports you want using the Port Configuration utility.

Starting the Port Configuration utility

1. In the command prompt, type **slxcfg** and press the **Enter** key. Alternatively use the SCO OpenServer 5 desktop as follows;
   a. In the SCO OpenServer 5 desktop, open the **System Administration** folder.
      The System Administration window is now displayed.
   b. In the System Administration window, click on the **Specialix Serial** folder to open it.
      The Specialix SX window is now displayed
   c. In the Specialix SX window, click on the **Serial Port Enable** Icon.

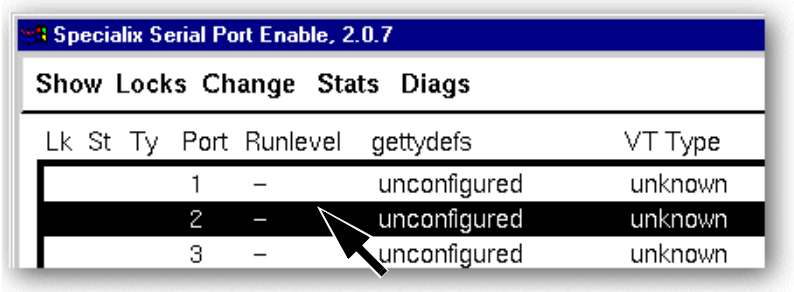
   The Serial Port Enable window is now displayed as shown in the next picture.


Menus.
See page 185
Port configured as Direct
Select one or more ports from this list.
See page 57.
Port configured as a Modem
Port statistics enabled
Selects the system run level at which you can log into the currently selected ports.
See page 58.
Select a getty definition here.
page 57.
Select a terminal type here.
See page 57.
Enables or disables flow control.
See page
Configures the selected port as a modem.
See page 58.
Enables or disables login.
See page 58.
Configures the currently selected port as direct. That is, directly connected to a terminal with no modem in between.
See page 58.
Specialix Serial Port Enable, 2.0.7
how Locks Change Stats Diags
Port Runlevel gettydefs VT Type Force
1 23 19200 tvi925
2 23 19200 vt220
3 – unconfigured unknown
4 23 19200
5 – unconfigured
– Run Levels –
2 3 4
ixon ixany
gettydefs
19200
9600
4800
2400
VT type
ansice
tvi925
unknown
vt220
Login:
Direct
Modem
Disable
Specialix

Selecting ports

2. In the Port Configuration window, select the ports you want you want to configure by clicking on one or more items in the list of ports (example in next picture).

> Hint
>
> To select multiple items which follow each other in the list, hold down the **Shift** key and click on all the items you want.
>
> To select multiple items from anywhere in the list, hold down the **Ctrl** key and click on all the items you want.



Selecting a getty definition

3. In the Serial Port Enable window, select the getty definition you want by double clicking on an item in the **gettydefs** list.

The list of currently selected ports is now updated to show the new getty definition.

> Note
>
> If you want to use baud rates above 38400, use the **spxbaudmap** utility to obtain the values you want for each port. See **Appendix B Obtaining baud rates above 38400**. **Note that the value you choose here is used to determine the extended baud rate.**

Selecting VT type

4. In the VT Type list, double click on the terminal type you want for the currently selected ports and then select the **Change > VT Type** menu option to confirm your selection.

   The list of ports is now updated to show the new terminal type.

Enabling and disabling flow control

5. If required, in the Port Configuration window, click on the **ixon** button and then select the **Change > ixon/ixany** menu option to enable flow control for Transparent printing.

> Note
>
> For information about transparent printing, see **Appendix C Transparent printing**.

6. If required, in the Serial Port Enable window, click on the **ixany** button and then select the **Change > ixon/ixany** menu option to enable sending of data on receipt of the next character (when flow control is enabled on the transparent print port).

Setting up a port login

7. In the Port Configuration window, click on one of the menu options shown in the next table to display the ports with the login status you want to change. For example, ports without logins enabled.

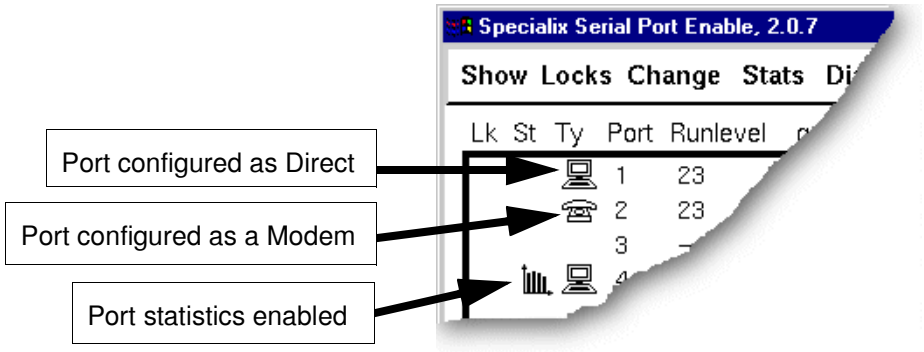
   These options allow you to filter on the type of ports you are looking for. This facility is helpful when you have a large number of ports installed.

To Display	Click menu option
Ports configured as modems	**Show > Modems**
Ports configured as direct	**Show > Direct**
Unconfigured ports	**Show > Unconfigured**
All ports	**Show > All**

8. If required, in the Port Configuration window, select the ports whose logins status you want to change, then click on one of the following to change the login status;

To...	Click on ..
Enable logins for a port	**Enable** button
Disable logins for a port	**Disable** button
Configure ports to directly connect to a terminal	**Direct** button
Configure ports as modem	**Modem** button

The selected ports in the list are now updated with their new login status. If you change the login status for a port, a symbol is displayed along side the port as shown in the next picture.



9. In the in the Serial Port Enable window, set the system run level to 2 by clicking on the **2** check box in the **Run Levels** field.

> Note
>
> **The recommended setting for this parameter is 2. Do not use any other settings unless you have a specific reason for doing so.**

10. Repeat steps **2.** to **9.** until you have configured all the ports you want.

Exiting the Port Configuration tool

11. In the Port Configuration menu, click on **Port > Save and exit**.

> Note
>
> To quit the Port Configuration tool without saving changes,
>
> - In the Port Configuration menu, click on **Port > Quit**.

The Port Configuration tool now closes and saves any changes you have made.

Removing SX drivers and utilities from your system

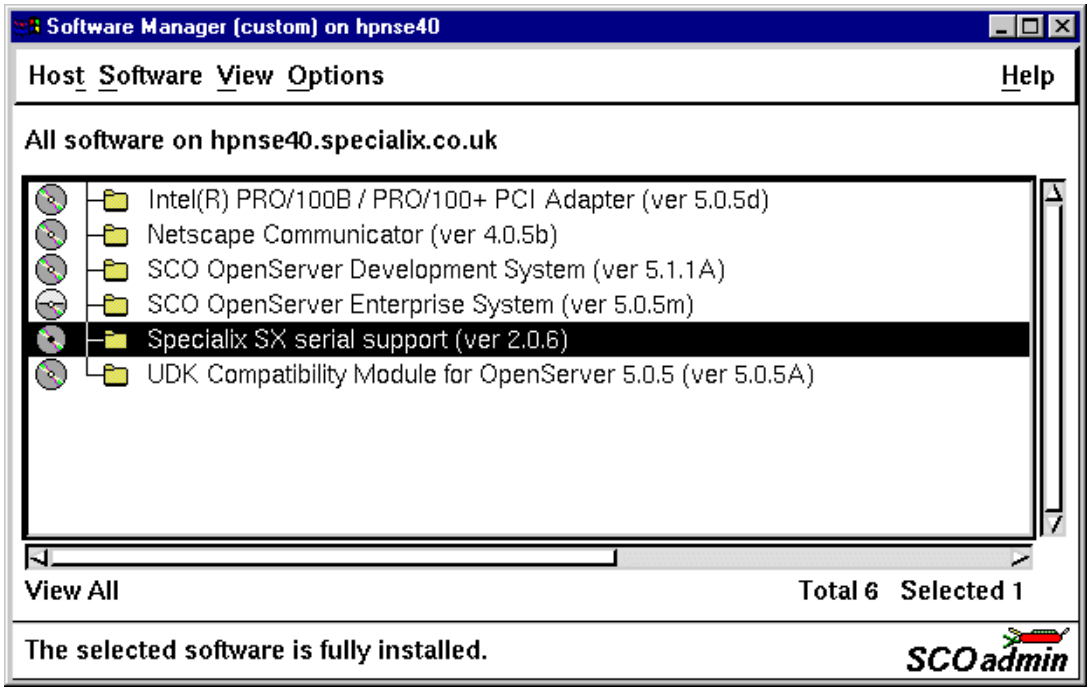
To remove the SX device drivers and utilities for the SCO OpenServer 5 operating system proceed as follows;

1. In the SCO OpenServer 5 desktop, double click on the System Administration folder.

   The System Administration window is now displayed.

2. In the System Administration window, double click on the software manager icon.

   The Software Manager window is now displayed.



3. In the Software Manager window select the driver you want to remove.
4. In the Software Manager menu, click on **Software > Remove software**.

   A confirmation window is now displayed prompting you to confirm removal

5. In the confirmation window, click on the **Remove** button.

   The software is now removed and the following Kernel re-link message is now displayed as shown in the next picture.

   The Kernel re-link message window now closes and the removal continues. A message is displayed upon completion.

6. In the message window, click on **OK** to close the window.

   The software manager window is now updated to show the remaining software.

Installing SX under SCO OpenServer 6

This section tells you how to install host cards, software drivers and utilities under the SCO OpenServer 6 operating system and includes the following;

General installation procedure for SCO OpenServer 6

The general procedure for installing and configuring host cards, drivers software and associated utilities for the SCO OpenServer 6 operating system is as follows:

1. If required, install any PCI host cards you require into your system. See **Installing a Universal 3.3/5V PCI host card** on page **131**

> Note
>
> If you are installing a PCI card after having installed your driver, you will need to run the host card configuration utility to create the relevant device nodes. See **Starting the Host Card Configuration utility** on page **69** and **Appendix A Serial port device names**.

2. If required, install the SX SCO OpenServer 6 drivers and utilities onto your system using the procedures described in **Installing device drivers and utilities** on page **64**.
3. If required, remove any host cards you want from your system. See **Removing host cards** on page **135**.
4. Install or remove any device concentrators you require onto your system. See **Installing device concentrators** on page **136** and **Removing Device Concentrators from your system** on page **149**
5. Using the **Port Configuration tool**, configure the serial ports you have added to the system. See **Configuring SX serial ports** on page **71**.
6. If you want to use baud rates above 38400 use the **spxbaudmap** utility to obtain the values you want for each port. See **Appendix B Obtaining baud rates above 38400**.

Your system can now use the serial adaptor cards you have installed. If required, you can reconfigure serial ports following initial installation. See **Starting the Host Card Configuration utility** on page **69** and **Configuring SX serial ports** on page **71** for details.

Installing device drivers and utilities

To install the SX device drivers and utilities for the SCO OpenServer 6 operating system proceed as follows;

1. Login to your system as super user.
2. Load the CDROM into your system CD drive.
3. At the command prompt, make a directory for your installation by typing:

   mkdir /cdrom

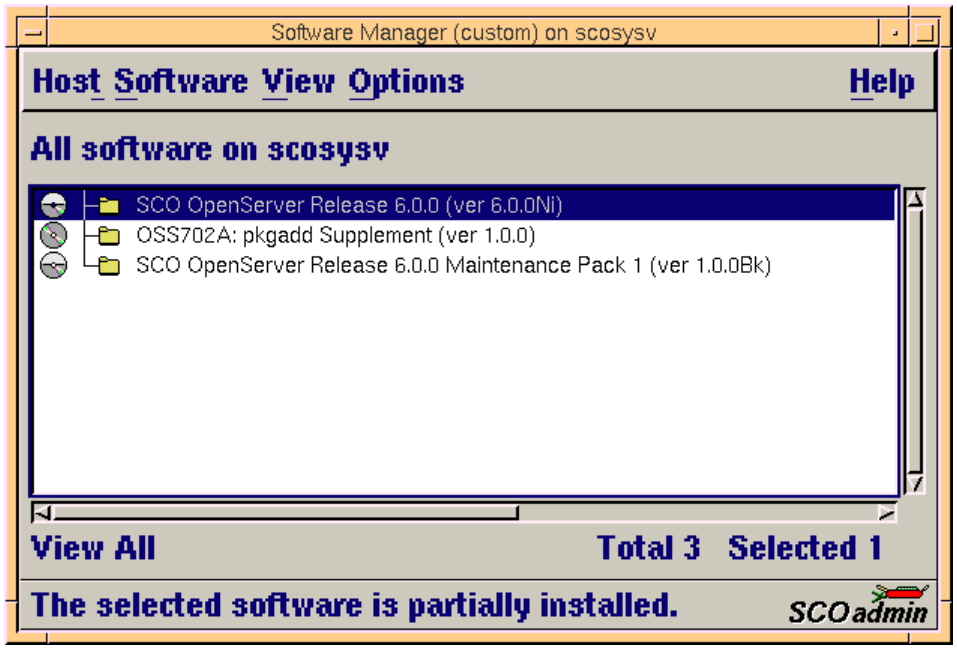
4. Mount the CDROM file system using the following commands:

   mount -f ISO9660 -r /dev/cd0 /cdrom

   > Note
   > The example above shows the directory name as **/cdrom**, You can either use this name or use another directory name to suit your requirements. For example, **/mnt**.

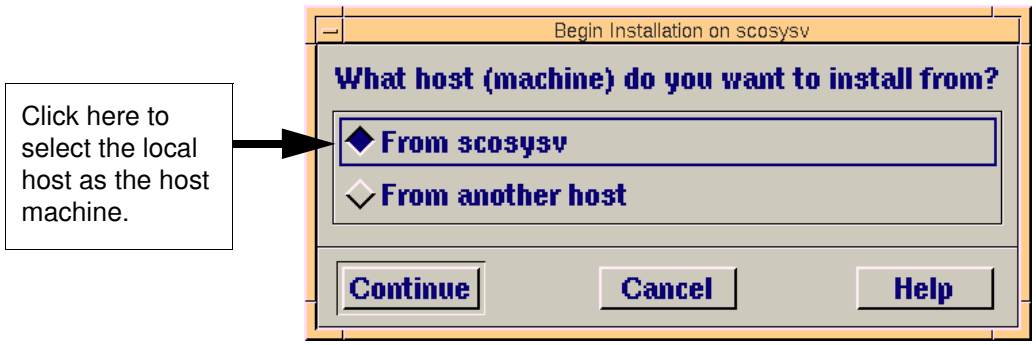
5. In the SCO OpenServer 6 desktop, double click on the Software Manager icon.

   The Software Manager window is now displayed.



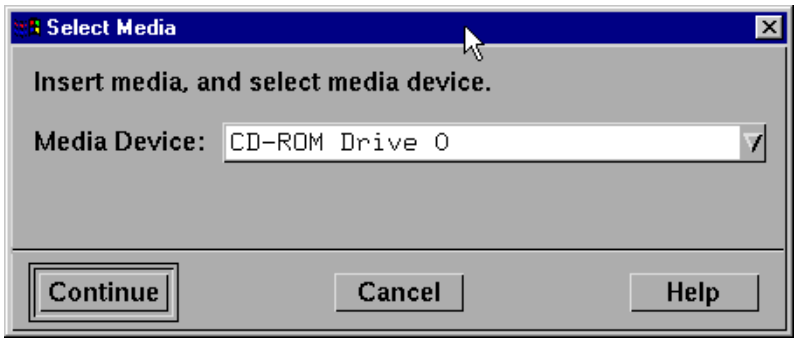
6. In the Software Manager menu, click on **Software > Install New**.

   The Begin Installation window is now displayed as shown in the next picture.



7. In the Begin Installation window, select the local host as the machine to install from by clicking on the **From localhostname** button and then click on **Continue**.

   The Select Media window is now displayed.



8. In the Select Media window, using the **Media Device** selector choose the **Media Images** option then click on **Continue**.

   The Enter Image Directory window is now displayed.

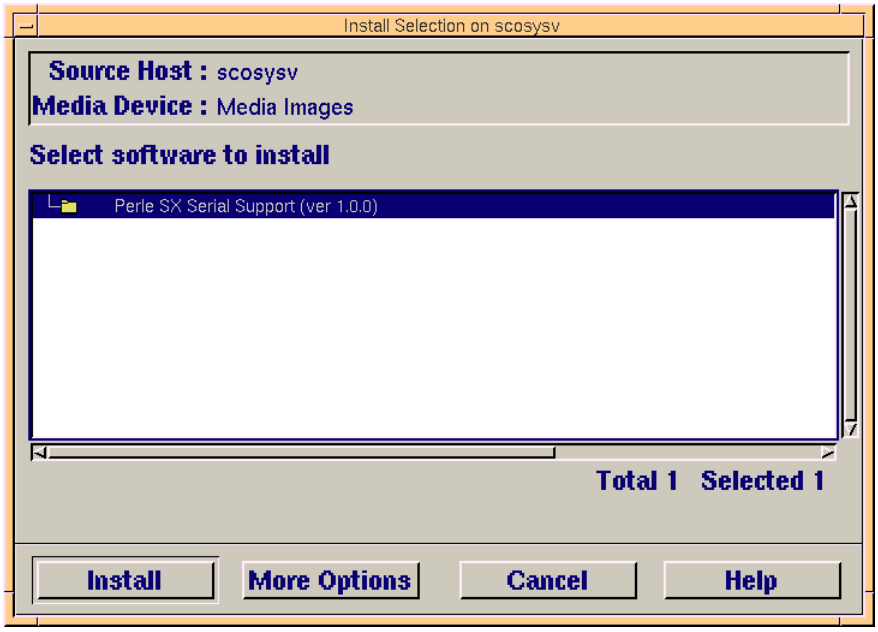
9. In the Enter Image Directory window, enter the following in the Image directory field;

   /cdrom/drivers/sx/openserver6

> Note
>
> The example and picture above show a directory name including **/cdrom**, You can either include this name in the path or use another directory name to suit your requirements. For example, **/mnt**.

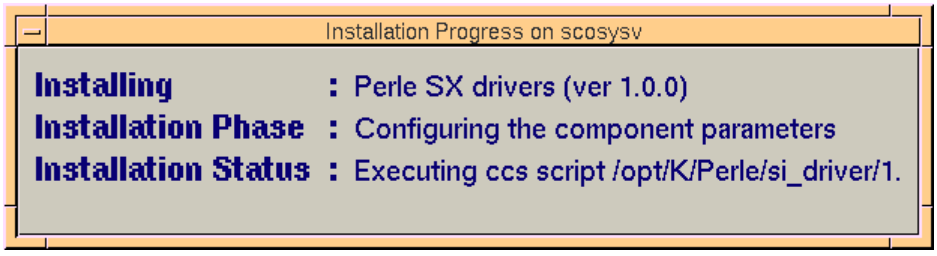
10. In the Enter Image Directory window, click on **OK**.

    The Install Selection window is now displayed.

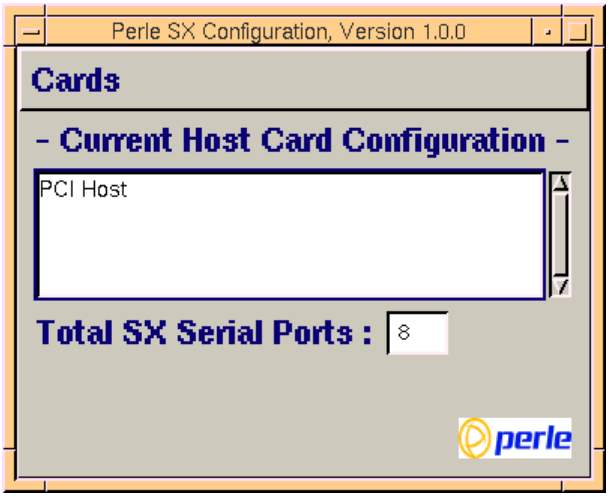


11. In the Install Selection window, click on the **Install** button.

    The following progress message is now displayed.



12. During the driver installation, the Host Card Configuration utility window displays as follows;



13. Use the Host Card Configuration utility to specify the total number of ports you have attached to your SX card(s), then exit the utility to save the changes.

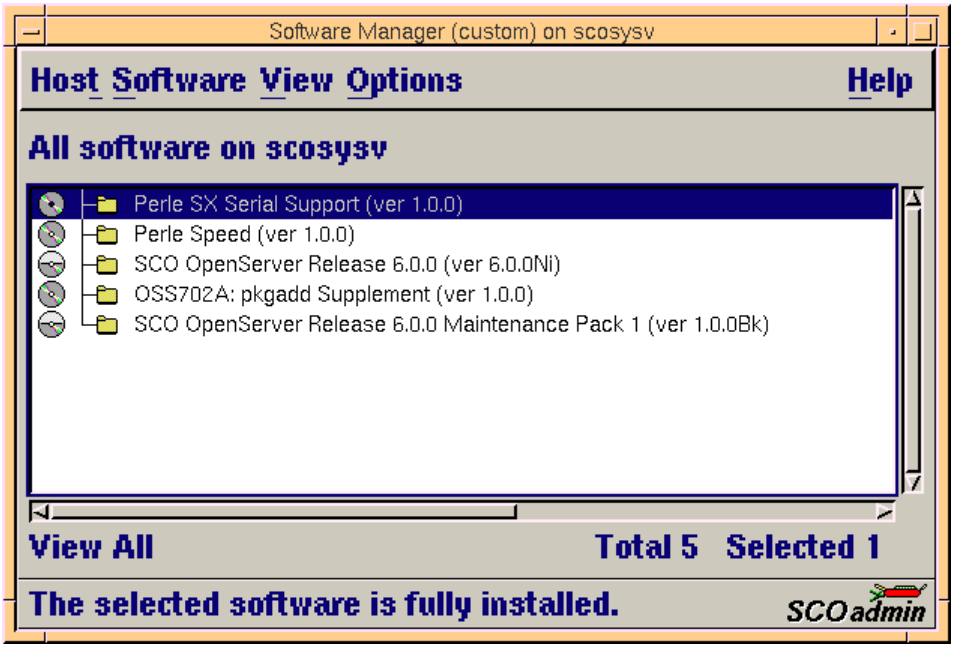
    If you change the number of ports, the kernel will be re-linked and a message window is displayed prompting you to re-boot the system.

14. In the message window click on **OK** to continue the installation process.

    The following message is now displayed upon completion of the installation process.

15. In the message window, click **OK** to close the window.

    The software manager window is now updated to show the driver you have installed as shown in the next picture.



16. In the Software Manager window, click on the **Host > Exit** menu option to close the window.

17. Shut down your system and turn the power off.

You can now continue with the rest of the installation process see **General installation procedure for SCO OpenServer 6** on page **63**.

Starting the Host Card Configuration utility

You can start the Host Card Configuration utility in one of two ways;

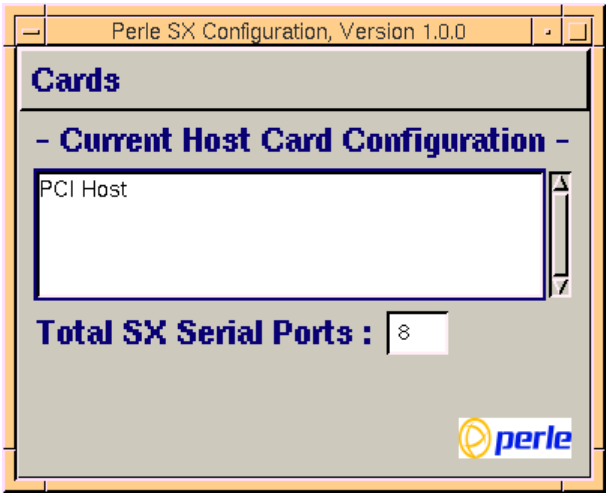
- Using the command line. See page 69.
- Using the SCO OpenServer 6 desktop. See page 70.

Using the command line

To start the Host Card Configuration Utility from the command line proceed as follows;

1. At the command prompt, type **siinit** and press the **Enter** key.

   The Configuration window is now displayed.



You can now use the utility to enter a new total number of attached serial ports.

Using the SCO OpenServer 6 desktop

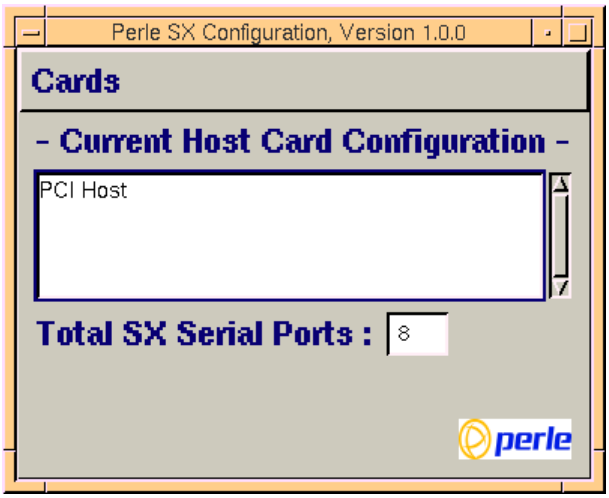
To start the Host Card Configuration Utility from the SCO OpenServer 6 desktop proceed as follows;

1. In the SCO OpenServer 6 desktop, open the **System Administration** folder.

   The System Administration window is now displayed.

2. In the System Administration window, click on the **Perle-Serial** folder to open it.
3. In the Perle-Serial window, click on the **SX Hardware Configuration** Icon.

   The Configuration window is now displayed.



You can now use the utility to enter a new total number of attached serial ports.

Quitting and saving To exit the Perle SX Configuration window and save any changes you have made, proceed as follows;

1. In the Perle SX Configuration window, click on **Card > Exit**.

   If you have made any changes, the system files will be updated when the Perle SX Configuration window closes, saving any changes you made.

Configuring SX serial ports

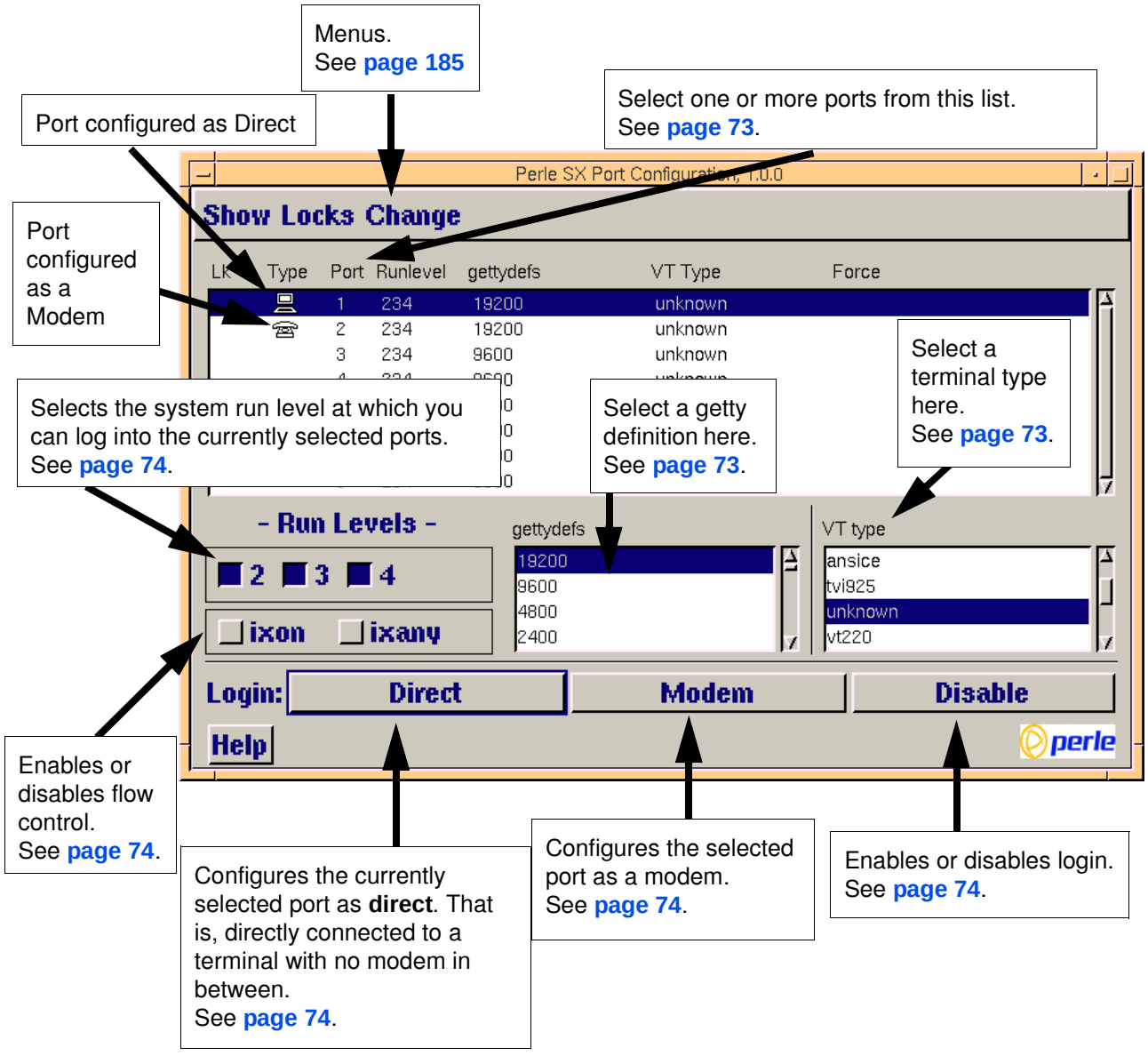
The Port Configuration utility allows you to configure the extra SX serial ports you have added to your system. To do this proceed as follows;

> Note
>
> If you want to perform transparent printing from any of the terminals attached to your system, you need to check the contents of the **printcap.si** file to see if the terminal type you are using is supported. To do this proceed as follows;
>
> 1. Using a text editor, go to the **/etc** directory and open the file called **printcap.si**
> 2. Check the contents of the **printcap.si** file to see if the terminal type you are using is supported. See **page 203** in **Appendix C Transparent printing** for the syntax of the entries in this file.
> 3. If the terminal type you are using is not supported, add an entry for the new terminal type (including the type, transparent print ON and transparent print OFF strings) to the **printcap.si** file (**page 203**). See the user guide for your terminal for details of the entries required.
>
> You can now configure the ports you want using the Port Configuration utility.

Starting the Port Configuration utility

1. At the command prompt, type **sienable** and press the **Enter** key. Alternatively use the SCO OpenServer 6 desktop as follows;
   a. In the SCO OpenServer 6 desktop, open the **System Administration** folder. The System Administration window is now displayed.
   b. In the System Administration window, click on the **Perle-Serial** folder to open it.
   c. In the Perle-Serial window, click on the **SX Port Configuration** Icon.

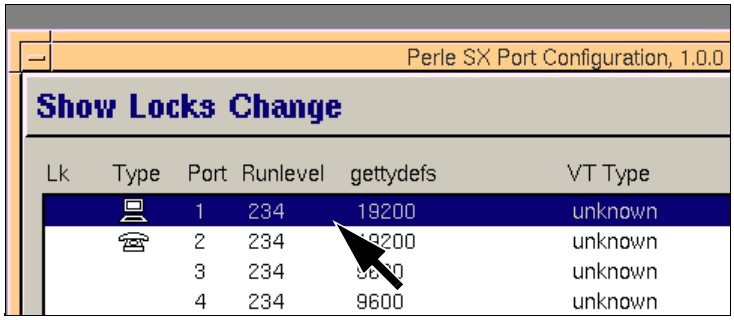
   The Serial Port Enable window is now displayed as shown in the next picture.



Selecting ports

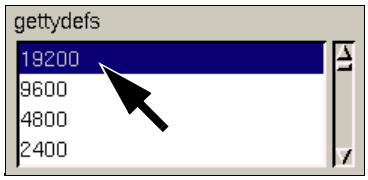
2. In the SX Port Configuration window, select the ports you want to configure by clicking on one or more items in the list of ports (example in next picture).

> Hint
>
> To select multiple items which follow each other in the list, hold down the **Shift** key and click on all the items you want.
>
> To select multiple items from anywhere in the list, hold down the **Ctrl** key and click on all the items you want.



Selecting a getty definition

3. In the SX Port Configuration window, select the getty definition you want by double clicking on an item in the **gettydefs** list.



The list of currently selected ports is now updated to show the new getty definition.

> Note
>
> If you want to use baud rates above 38400, use the **spxbaudmap** utility to obtain the values you want for each port. See **Appendix B Obtaining baud rates above 38400**. **Note that the value you choose here is used to determine the extended baud rate.**

Selecting VT type

4. In the VT Type list, double click on the terminal type you want for the currently selected ports and then select the **Change > VT Type** menu option to confirm your selection.

   The list of ports is now updated to show the new terminal type.

Enabling and disabling flow control

5. If required, in the SX Port Configuration window, click on the **ixon** button and then select the **Change > ixon/ixany** menu option to enable flow control for Transparent printing.

> Note
> For information about transparent printing, see **Appendix C Transparent printing**.

6. If required, in the SX Port Configuration window, click on the **ixany** button and then select the **Change > ixon/ixany** menu option to enable sending of data on receipt of the next character (when flow control is enabled on the transparent print port).

Setting up a port login

7. In the SX Port Configuration window, click on one of the menu options shown in the next table to display the ports with the login status you want to change. For example, ports without logins enabled.

   These options allow you to filter on the type of ports you are looking for. This facility is helpful when you have a large number of ports installed.

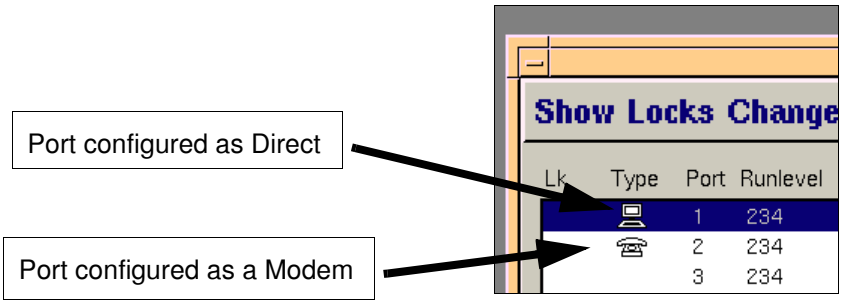
To Display	Click menu option
Ports configured as modems	**Show > Modems**
Ports configured as direct	**Show > Direct**
Unconfigured ports	**Show > Unconfigured**
All ports	**Show > All**

8. If required, in the SX Port Configuration window, select the ports whose logins status you want to change, then click on one of the following to change the login status;

To...	Click on ..
Disable logins for a port	**Disable** button
Configure ports to directly connect to a terminal	**Direct** button
Configure ports as modem	**Modem** button

The selected ports in the list are now updated with their new login status. If you change the login status for a port, a symbol is displayed along side the port as shown in the next picture.

> **NOTE:** If you already have a getty running against the port, you need to disable the port and then enable the port to make the change take effect.



9. In the in the SX Port Configuration window, set the system run level to 2 by clicking on the **2** check box in the **Run Levels** field.

> Note
>
> **The recommended setting for this parameter is 2. Do not use any other settings unless you have a specific reason for doing so.**

10. Repeat steps **2.** to **9.** until you have configured all the ports you want.

Exiting the Port Configuration tool

11. In the SX Port Configuration menu, click on **Show > Exit.**

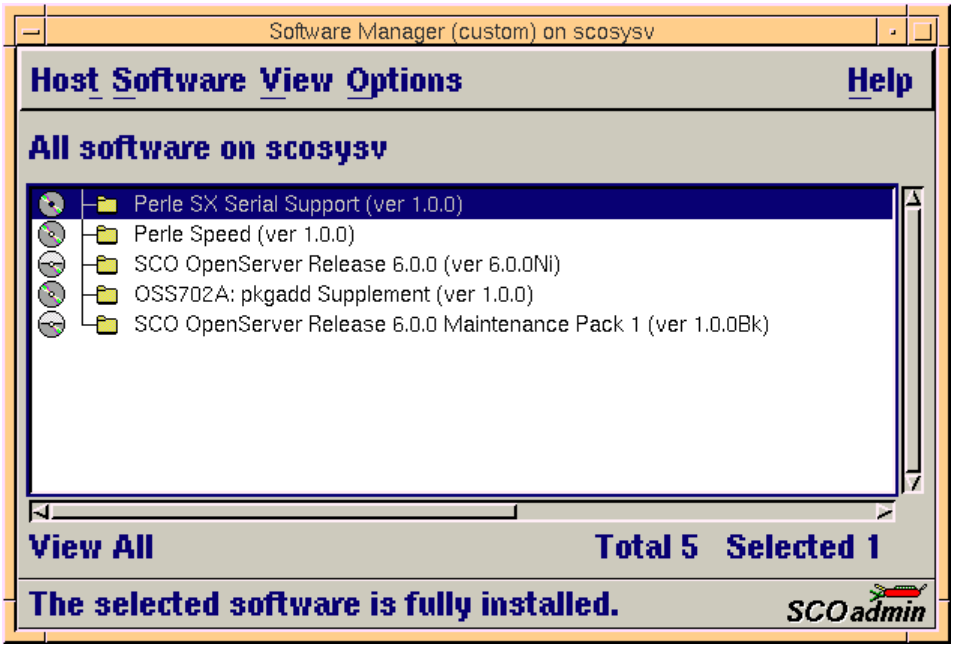
The SX Port Configuration tool now closes and saves any changes you have made.

Removing SX drivers and utilities from your system

To remove the SX device drivers and utilities for the SCO OpenServer 6 operating system proceed as follows;

1. In the SCO OpenServer 6 desktop, double click on the Software Manager icon.

   The Software Manager window is now displayed.



2. In the Software Manager window select the driver you want to remove.
3. In the Software Manager menu, click on **Software > Remove software**.

   A confirmation window is now displayed prompting you to confirm removal

4. In the confirmation window, click on the **Remove** button.

   The software is now removed and the following Kernel re-link message is now displayed as shown in the next picture.

The Kernel re-link message window now closes and the removal continues. A message is displayed upon completion.

5. In the message window, click on **OK** to close the window.

   The software manager window is now updated to show the remaining software.

Installing SX under SCO UnixWare

This section tells you how to install host cards, software drivers and utilities under the SCO UnixWare operating system and includes the following;

> Note
>
> When using SX **PCI host cards,** you will require SX SCO UnixWare driver v3.1.0 or later. You can find this driver on the CDROM supplied with this product or on our website at **http://www.perle.com**

General installation procedure for SCO UnixWare

The general procedure for installing and configuring host cards, drivers software and associated utilities for the SCO UnixWare operating system is as follows:

1. Install any PCI host cards you require into your system. See **Installing a Universal 3.3/ 5V PCI host card** on page **131**
2. If required, install the SX SCO UnixWare drivers and utilities onto your system using the procedures described in **Installing drivers and utilities onto your system** on page **81**.
3. If required, using the **UnixWare Device Configuration Utility**, select and assign addresses for any additional ISA host cards you want to install from the free addresses available. See **Assigning ISA host card addresses and IRQ levels** on page **85**.
4. Repeat step **3.** until you have assigned addresses to all the ISA host cards you want to install.
5. If required, install any ISA host cards you require into your system. See **Installing an ISA host card** on page **133**
6. If required, remove any host cards you want from your system. See **Removing host cards** on page **135**.
7. Install or remove any device concentrators you require onto your system. See **Installing device concentrators** on page **136** and **Removing Device Concentrators from your system** on page **149**
8. Using the **Serial Manager** utility, configure the serial ports you have added to the system. See **Configuring serial ports** on page **95**.

> Note
>
> If you are running version 2 of the SCO UnixWare operating system you need to use the procedures described in **Configuring serial ports under SCO UnixWare 2** on page **100**.

9. If you are adding more than 32 ports to your system, add the extra ports to your system using the procedures described in **Adding new ports** on page **102**.
10. If you want to use baud rates above 38400 use the **spxbaudmap** utility to obtain the values you want for each port. See **Appendix B Obtaining baud rates above 38400**.

Your system can now use the serial adaptor cards you have installed. If required, you can reconfigure serial ports following initial installation. See **Assigning ISA host card addresses and IRQ levels** on page **85** and **Configuring serial ports** on page **95** for details.

Upgrading from existing device drivers

If your system already has an existing Perle device driver installed, you cannot install a new device driver unless you follow the correct upgrade procedure. The procedure required depends on the device driver type currently installed as follows;

- **Upgrading from Specialix SI/XIO Svr4 driver v7.01** on page **80**
- **Upgrading from SLXOS SCO UnixWare driver v2.1.0** on page **80**
- **Upgrading from SX SCO UnixWare Driver v3.0.x** on page **80**

Upgrading from Specialix SI/XIO Svr4 driver v7.01

You cannot upgrade the Specialix SX SI/XIO Svr4 driver v7.01. You need to remove the old driver, then install its replacement as follows;

1. Remove the existing device driver using the **pkrm slx** command. See also **Removing SX drivers and utilities from your system** on page **104**.
2. Install the new device driver using the procedures described in **Installing drivers and utilities onto your system** on page **81**.
3. Continue with your installation as required using the steps listed under **General installation procedure for SCO UnixWare** on page **79**.

Upgrading from SLXOS SCO UnixWare driver v2.1.0

You cannot upgrade the Specialix SLXOS SCO UnixWare driver v2.1.0. You need to remove the old driver, then install its replacement as follows;

1. Remove the existing device driver using the **pkrm slx** command. See also **Removing SX drivers and utilities from your system** on page **104**.
2. Install the new device driver using the procedures described in **Installing drivers and utilities onto your system** on page **81**.
3. Continue with your installation as required using the steps listed under **General installation procedure for SCO UnixWare** on page **79**.

Upgrading from SX SCO UnixWare Driver v3.0.x

When you can upgrade SX drivers, you do not have to remove the previously installed driver. Simply install the driver using the procedures given in **Installing drivers and utilities onto your system** on page **81**.

Installing drivers and utilities onto your system

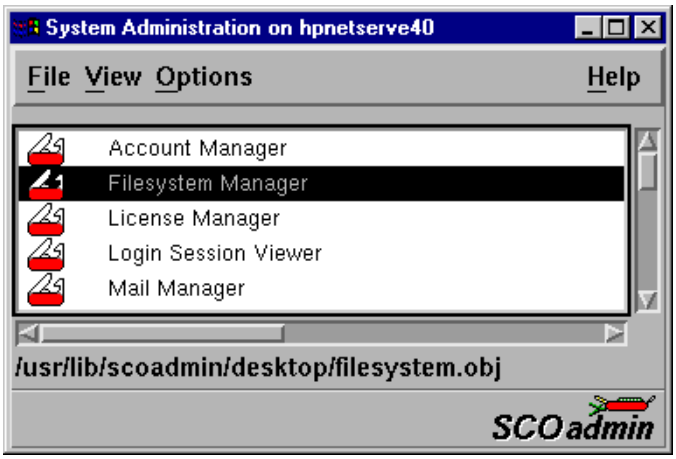
To install the SX device drivers and utilities for the SCO UnixWare operating system proceed as follows;

1. Login to your system as super user.
2. Load the CDROM into your system CD drive.

> Note
>
> When using SX **PCI host cards,** you will require SX SCO UnixWare driver v3.1.0 or later. You can find this driver on the CDROM supplied with this product..

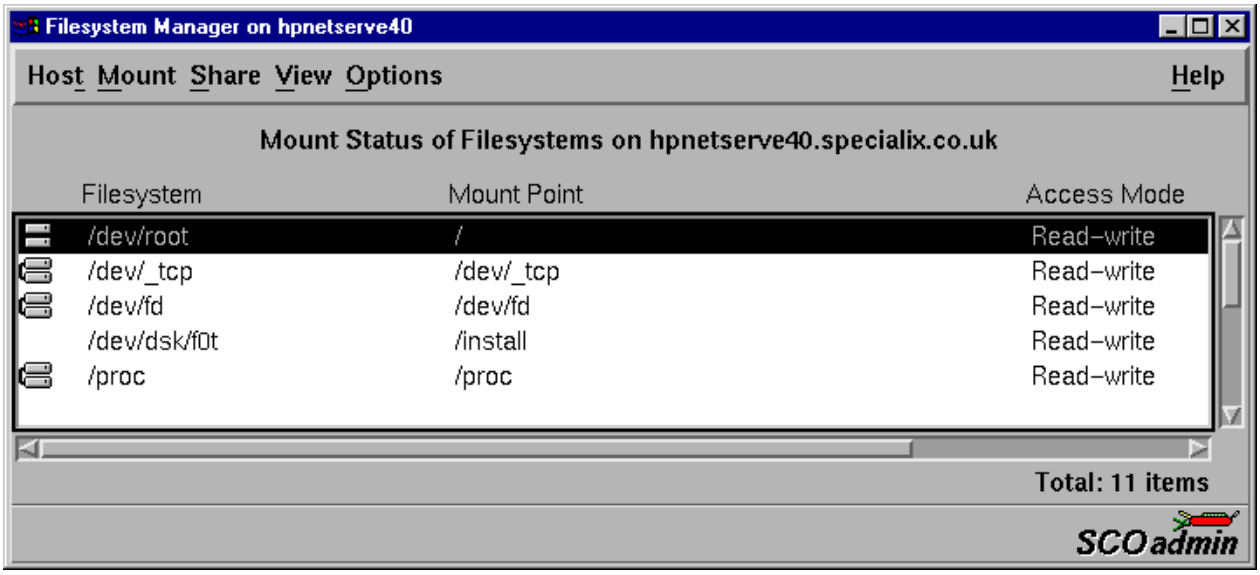
3. At the command prompt, type **scoadmin**.

   The System Administration window is now displayed.

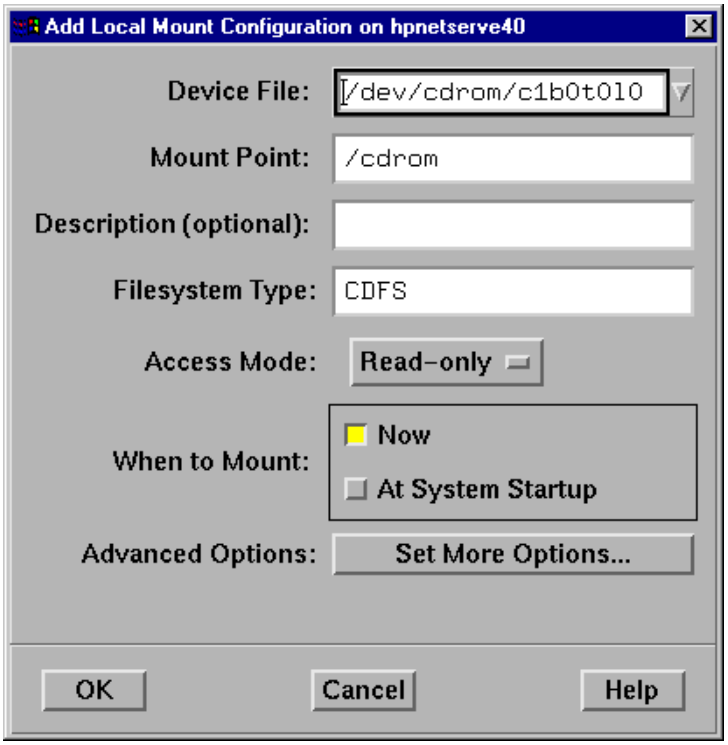


4. In the System Administration window, double click on the **Filesystem Manager** folder.

   The Filesystem Manager window is now displayed as shown in the next picture.



5. In the Filesystem Manager menu, click on **Mount > Add Mount Configuration >Local**. The Add Local Mount Configuration window is now displayed.



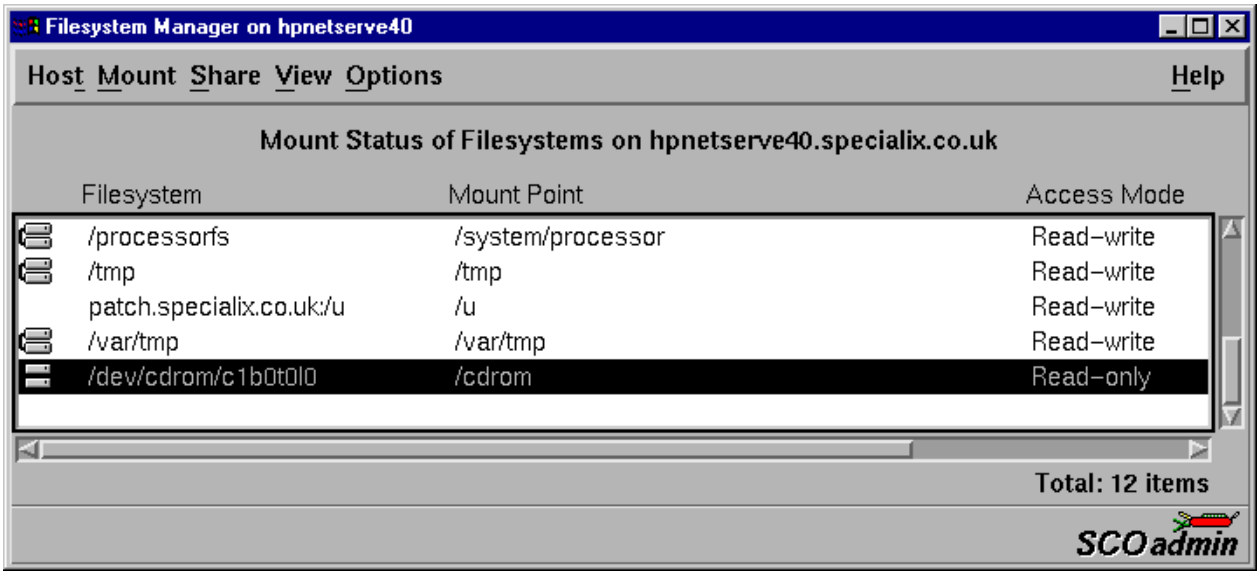
6. In the Add Local Mount Configuration window, set only the options detailed in the next table:

Option	Set to or enter....
Device File	Select **cdrom** or string containing cdrom
Mount Point	/cdrom
Access Mode	Select **Read-only**
When to Mount	Enable **Now** Disable **At System Startup**

7. In the Add Local Mount Configuration window, click on **OK** to accept the settings and close the window.

> Hint
>
> Experienced users can mount the CDROM directly by using the **mount** command.
>
> For example;
>
> **mount -r -Fcdfs -0 nmconv=c /dev/cdrom/c1b0t0l0/cdrom**

The Filesystem Manager window is now updated to show the new mount as shown in the next picture.



8. Filesystem Manager menu, click on **Host > Exit** to close the window.

9. At the command prompt, type:
   pkgadd -d /cdrom/drivers/sx/unixware/flopdisk.dd
10. Press the **Enter** key.

    The system now installs the driver and displays a series of messages ending with an installation successful message and prompt.

11. At the prompt type **q** and press the **Enter** key.
12. At the command prompt, type **shutdown -y -i6** and press the **Enter** key to shutdown and re-boot your system.

Upon completion of the system re-boot the SX drivers you have installed are ready to use.

Assigning ISA host card addresses and IRQ levels

The Unixware Device Configuration Utility allows you to define and edit addresses and IRQ levels for SX host cards you add to the system.

This section includes the following;

UnixWare provides a mechanism for adding and removing device hardware with the Device Configuration Utility. You will need to use this utility in order to add any ISA cards to your configuration.

> Note
>
> SX PCI cards are automatically deleted by the operating system. You do not need to add them manually.

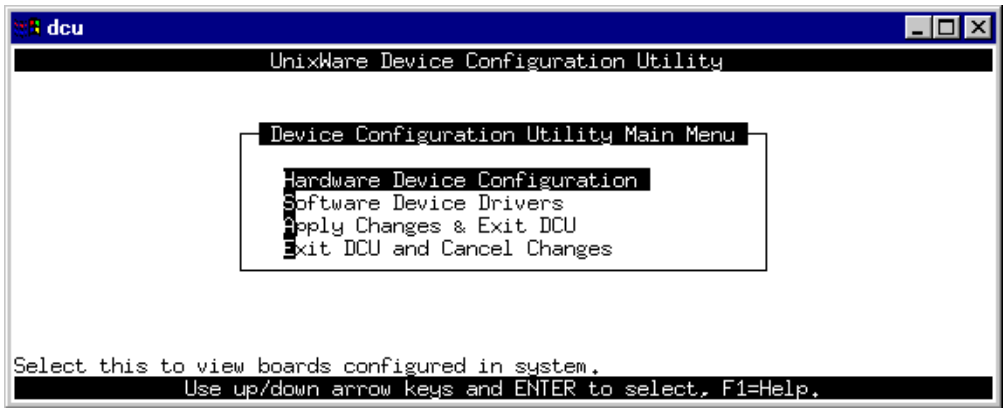
You can start the Device Configuration Utility using either the command prompt or the SCO UnixWare System Administration tool. See the following;

- **Command prompt method** on page **86**
- **System Administration tool method** on page **87**.

Command prompt method

To start the Device Configuration Utility from the command prompt, proceed as follows;

- At the command prompt, type **dcu** and press the **Enter** key.
  The Unixware Device Configuration Utility window is now displayed.



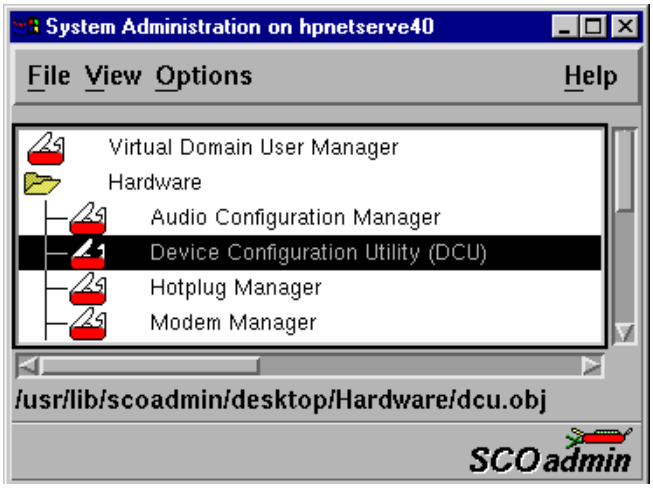
You can now use the Device Configuration Utility to configure or display host card addresses and IRQ levels. See **Adding a new host card address** on page **88**.

System Administration tool method

To start the Device Configuration Utility from the SCO UnixWare System Administration tool, proceed as follows;

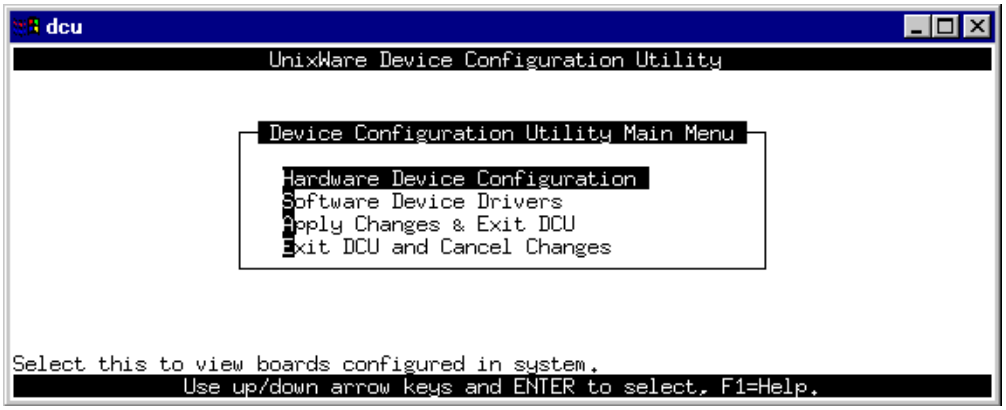
1. At the command prompt, type **scoadmin**

   The System Administration window is now displayed



2. In the System Administration tool window, click on the Hardware folder and then select **Device Configuration Utility (DCU)**

   The Unixware Device Configuration Utility window is now displayed.

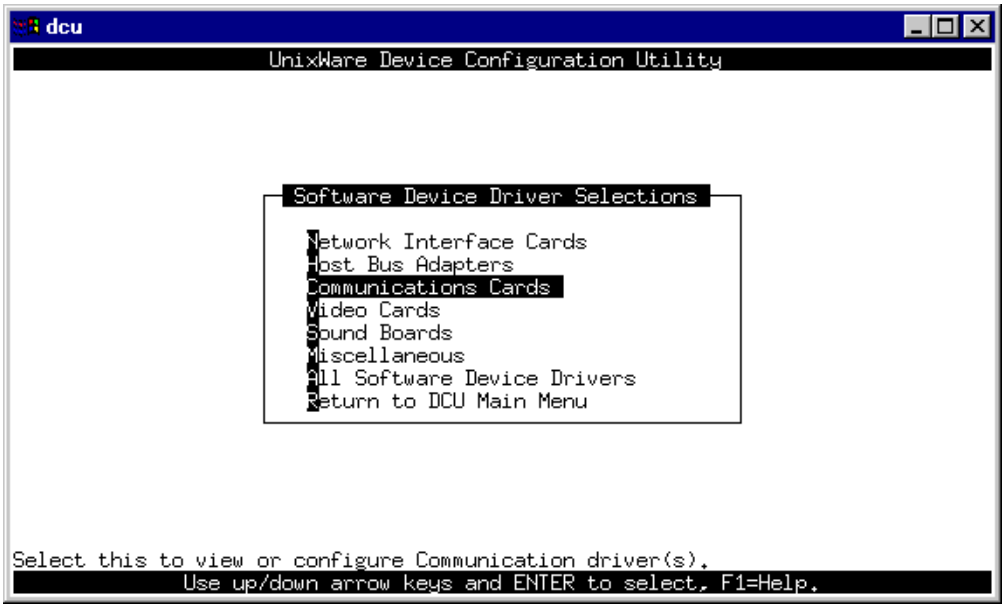


You can now use the Device Configuration Utility to configure or display host card addresses and IRQ levels. See **Adding a new host card address** on page **88**.

In order to function, each ISA host card must be allocated an available I/O address and IRQ level. The Device Configuration Utility allows you to determine the available addresses and IRQ levels, then allocate them to a particular host card. To do this proceed as follows;

1. Start the Unixware Device Configuration Utility. See **Starting the Unixware Device Configuration Utility** on page **86**.
2. In the Device Configuration Utility Main Menu, click on **Software Device Drivers.**

   The Software Device Driver Selections window is now displayed.

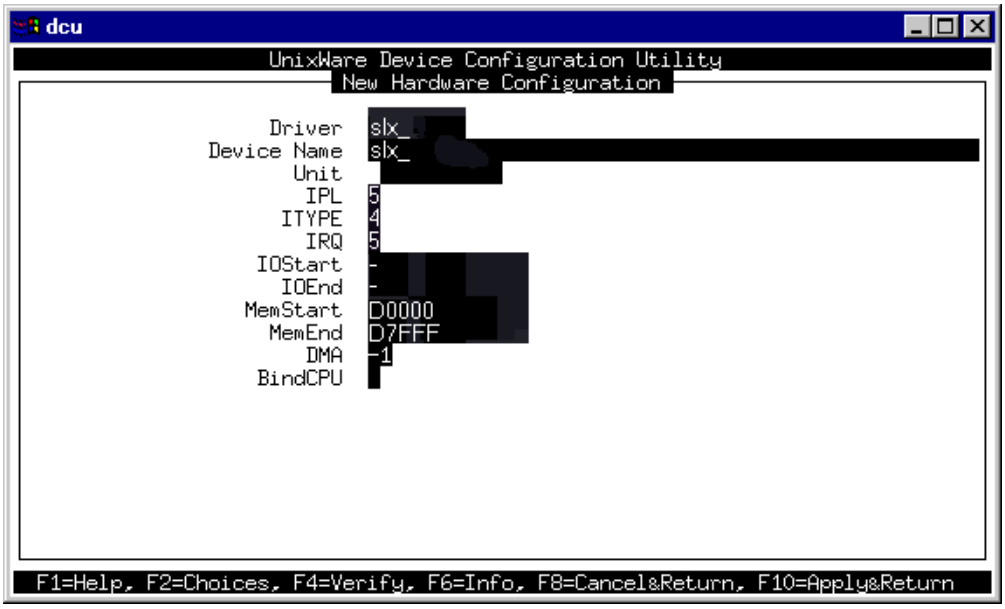


3. In the Software Device Driver Selections window, select **Communications cards** using the up and down arrow keys and press the **Enter** key to confirm your selection.

   The Software Device Drivers window is now displayed as shown in the next picture.

4. In the Software Device Drivers window, select the host card you want using the up and down arrow keys and then press the space bar to activate the card (denoted by a star symbol).
5. Press the **F5** key.

   The New Hardware Configuration window is now displayed.



6. In the New Hardware Configuration window, select **IRQ** using the up and down arrow keys and type in the new IRQ value you want to assign for the selected host card.

> Note
>
> SX allows you to run in polled mode. That is, to run without needing interrupts. This facility is useful when the normal interrupt levels used by SX are not available or you have a larger number of host cards the available interrupt levels.
>
> To set the host card to polled mode, set the **IRQ** field to **-**.

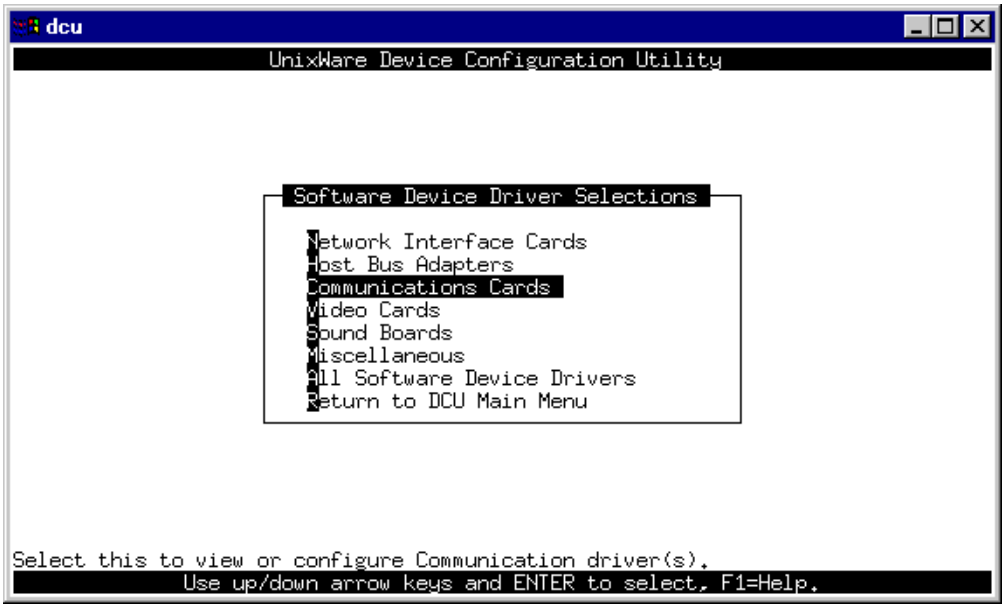
7. Repeat step **6.** to set the upper and lower address values **MemStart** and **MemEnd**. Use the same procedure to set **IOStart** and **IOEnd** to **-** so they are not used.

> Note
>
> The Host card address values you enter must match the corresponding settings on the host cards. To set the address on ISA host cards, see **Installing an ISA host card** on page **133**.

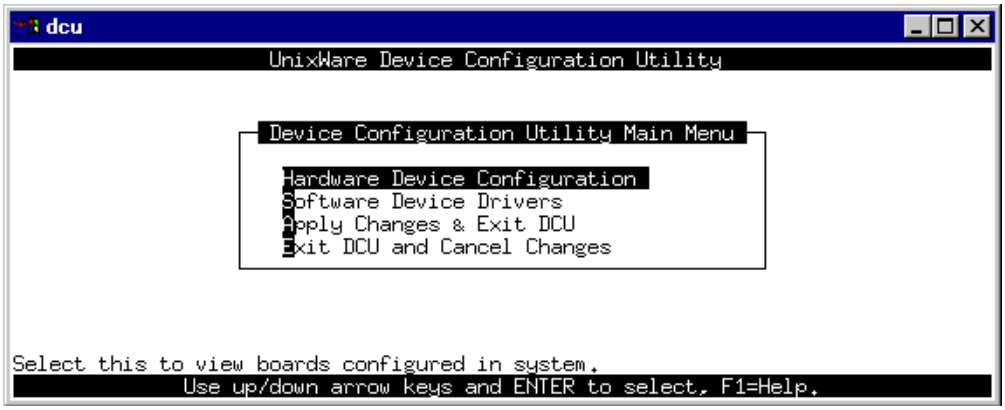
8. Repeat steps **4.** to **7.** until you have set all the IRQ levels and addresses for all the host cards you require.

9. Press the **F10** key to accept the new values and close the window.
10. In the Software drivers window, press the **Enter** key

    The Software drivers window now closes and the Device Configuration Utility window is now displayed.



11. In the Device Configuration Utility window, select the **Return to DCU Main Menu** option
12. The Device Configuration Utility Main Menu is now displayed.



13. In the Device Configuration Main Menu, select the **Apply Changes & Exit DCU** option.

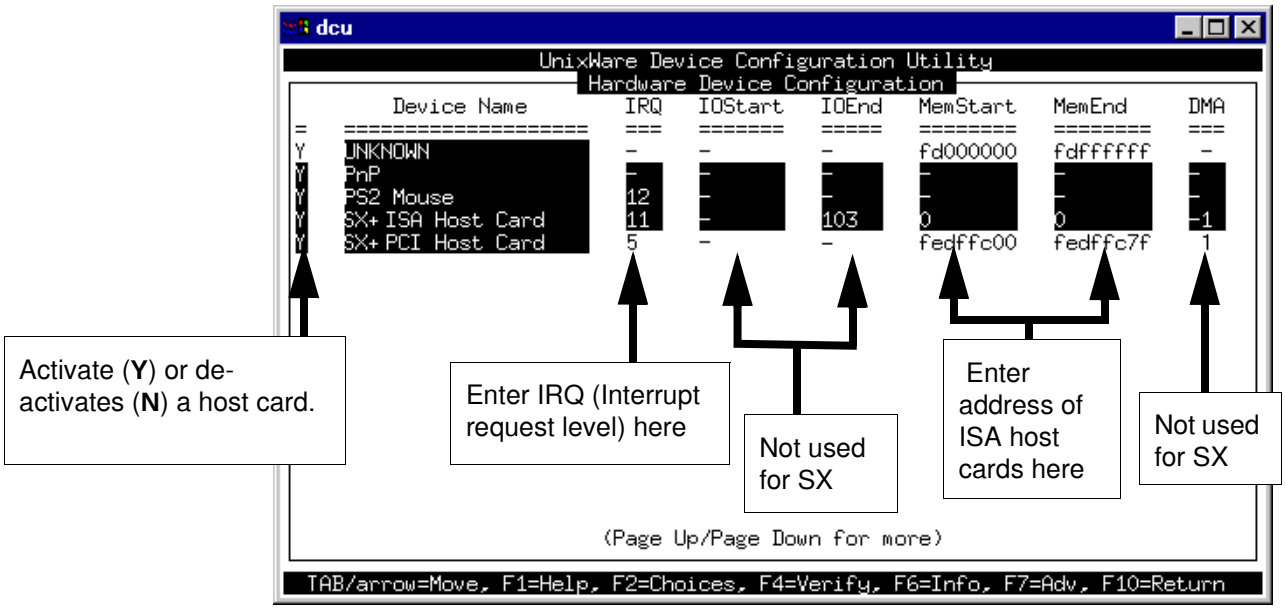
Your changes are now saved and the Device Configuration Utility window now closes.

> Note
>
> You can only edit **ISA** card properties. **PCI** card properties are set by the operating system and cannot be changed by the user.

The Device Configuration Utility allows you to edit existing host card addresses and IRQ levels. To do this proceed as follows;

1. Start the Unixware Device Configuration Utility. See **Starting the Unixware Device Configuration Utility** on page **86**.
2. In the Device Configuration Utility Main Menu, click on **Hardware Device Configuration.**

   The Hardware Device Configuration window is now displayed.

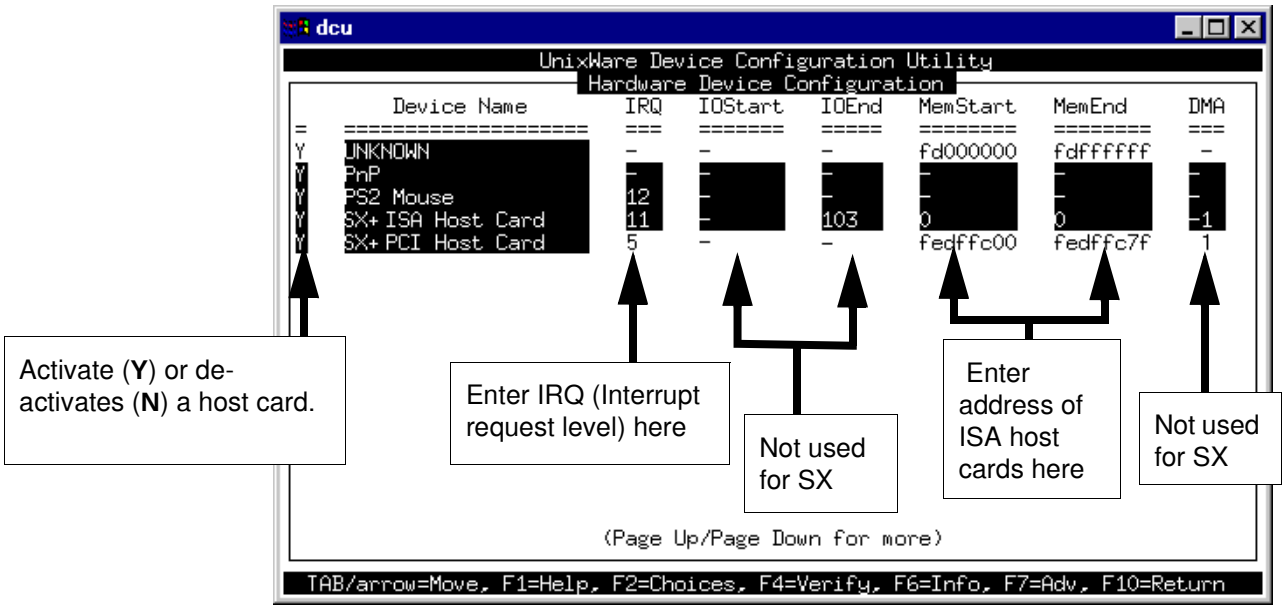


3. In the Hardware Device Configuration window, use the tab key move the cursor to the host card IRQ or address you wish to change.
4. At the selected location, type in the new IRQ or address value you want to assign for the selected host card (See also **Installing an ISA host card** on page **133**).
5. Repeat steps **3.** to **4.** until you have set all the IRQ levels and addresses you require.
6. Press the **F10** key to confirm your changes and close the window.

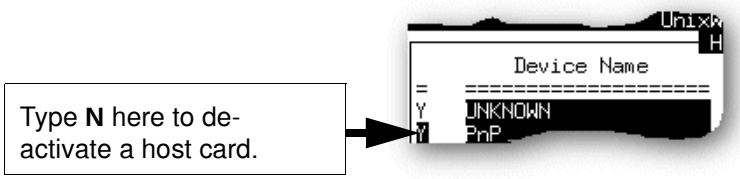
To deactivate an installed host card proceed as follows;

1. Start the Unixware Device Configuration Utility. See **Starting the Unixware Device Configuration Utility** on page **86**.
2. In the Device Configuration Utility Main Menu, click on **Hardware Device Configuration**

   The Hardware Device Configuration window is now displayed.



3. In the Hardware Device Configuration window, use the tab key to move the cursor to the activate/deactivate field for the host card you want as shown in the next picture.

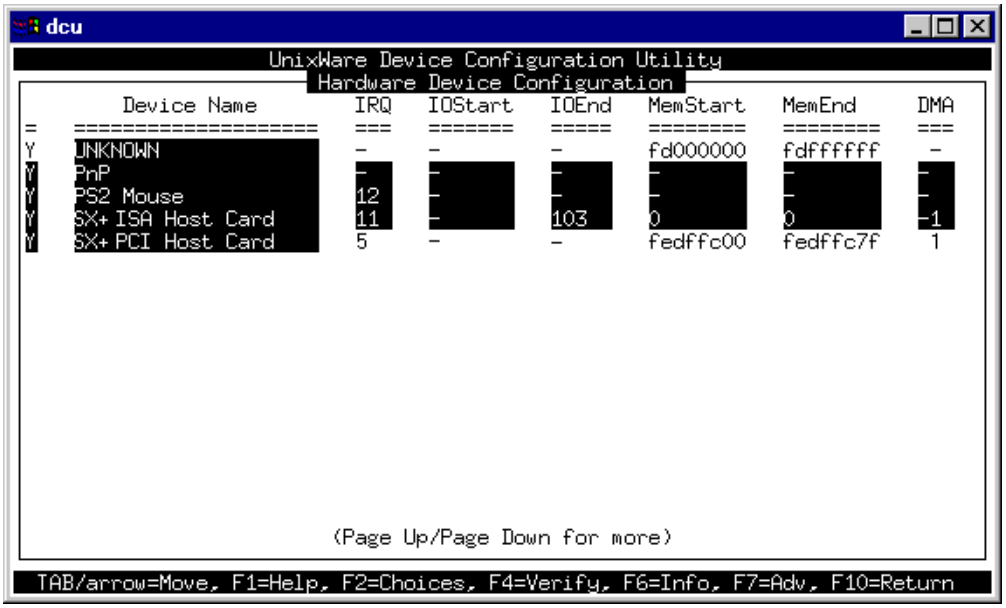


4. At the selected field type **N** to de-activate the host card (to re-activate type Y).
5. Repeat steps **3.** to **4.** until you have set all the IRQ levels and addresses you require.
6. Press the **F10** key to accept the new values and close the window.

To display details of the software device drivers present on your system proceed as follows;

1. Start the Unixware Device Configuration Utility. See **Starting the Unixware Device Configuration Utility** on page **86**.
2. In the Device Configuration Utility Main Menu, click on **Hardware Device Configuration.**

   The Hardware Device Configuration window is now displayed showing details of the software device drivers present on your system.



3. Press the **F10** key to confirm your changes and close the window.

Exiting the Device Configuration Utility

Quitting and saving

To exit the Device Configuration Utility and save any changes you have made, proceed as follows;

1. In the Device Configuration Utility Main Menu, click on **Apply Changes & Exit DCU**.

   The Device Configuration Utility now closes and saves any changes you have made.

> Note
>
> To quit the Host Card Configuration utility without saving any changes:
>
> - In the In the Host Card Configuration menu, click on **Exit DCU and Cancel Changes**.

> Note
>
> In most cases the kernel will need to be rebuilt in order for the changes to take effect to do this proceed as follows;
>
> 1. Login to your system as super user.
> 2. At the command prompt, type **/etc/conf/bin/idbuild** and press the **Enter** key.
>
>   You are now prompted to re-boot the system.
>
> 3. At the command prompt, type **Shutdown -i6 -y** to re-boot the system.
>
> The system now re-boots displaying messages as it does so.

Configuring serial ports

The SCO UnixWare 7 operating system includes a utility called Serial Manager which allows you to configure the extra SX serial ports you have added to your system.

> Note
>
> If you are running version 2 of the SCO UnixWare operating system you need to use the procedures described in **Configuring serial ports under SCO UnixWare 2** on page **100** to configure your serial ports.

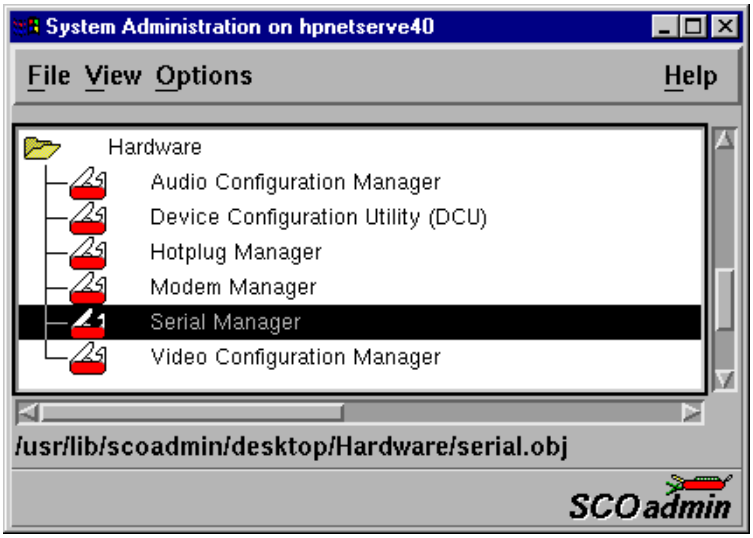
> Note
>
> On UnixWare 7.0, you must apply a patch file called **ptf7053** before using the Serial Manager. You can find the patch on the SCO web site at;
>
> **http://www.sco.com**

To configure serial ports with Serial Manager proceed as follows;

> Note
>
> If you want to perform transparent printing from any of the terminals attached to your system, you need to check the contents of the **printcap.slx** file to see if the terminal type you are using is supported. To do this proceed as follows;
>
> 1. Using a text editor, go to the **/etc** directory and open the file called **printcap.slx**
> 2. Check the contents of the **printcap.slx** file to see if the terminal type you are using is supported. See **page 203** in **Appendix C Transparent printing** for the syntax of the entries in this file.
> 3. If the terminal type you are using is not supported, add an entry for the new terminal type (including the type, transparent print ON and transparent print OFF strings) to the **printcap.slx** file (**page 203**). See the user guide for your terminal for details of the entries required.
> 4. If you have made any changes then either re-boot using by typing **Shutdown -i6 -y** or type **slxcfg** in order to re-configure the print port settings.
>
> You can now configure the ports you want using the Serial Manager utility.

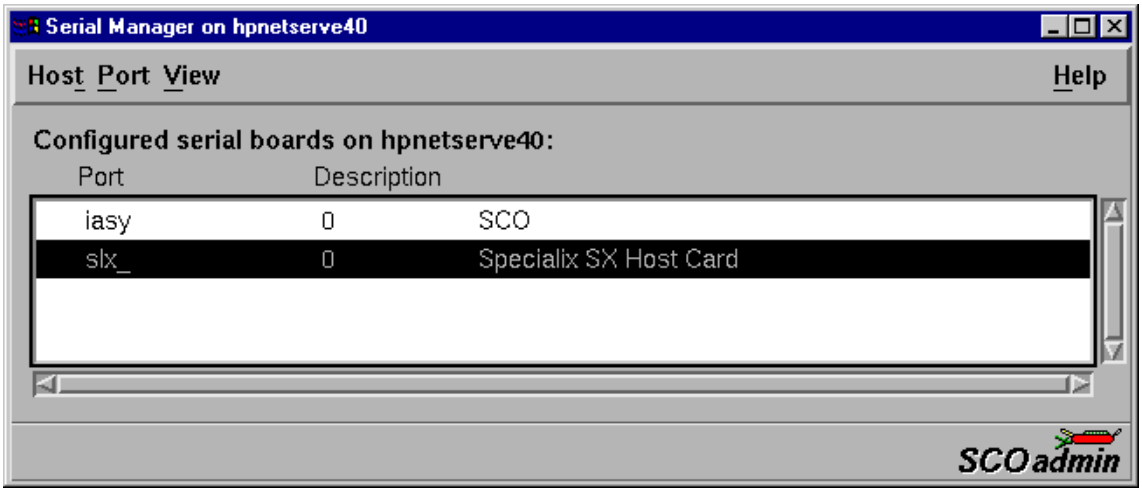
1. At the command prompt, type **scoadmin**

   The System Administration window is now displayed as shown in the next picture.



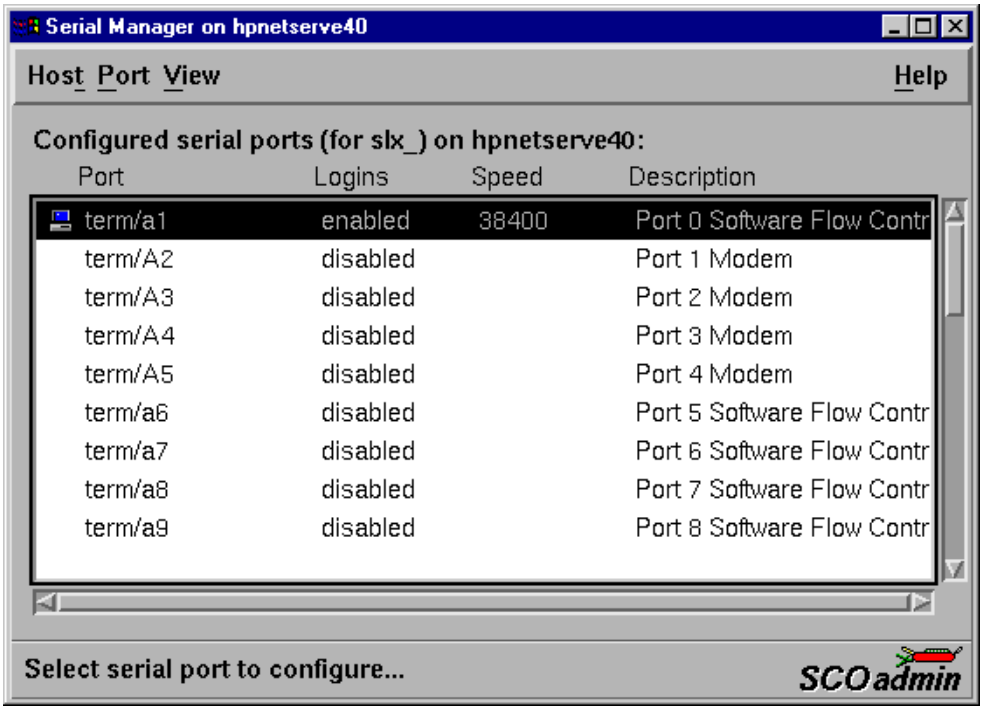
2. In the System Administration tool window, click on the Hardware folder and then select **Serial Manager**

   The Serial Manager window is now displayed showing the host cards (including SX) currently present on the system.



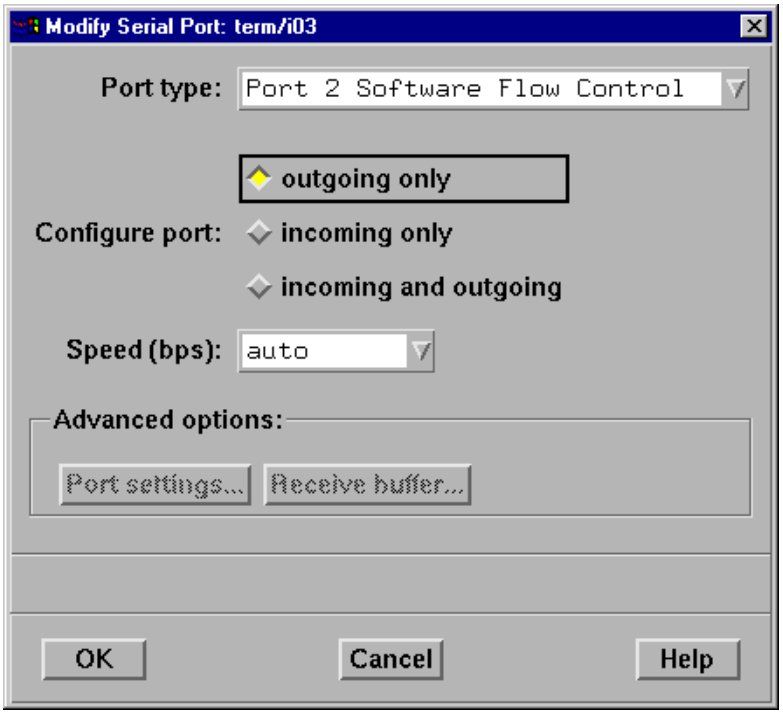
3. In the Serial Manager window, select the host card you want. Then in the Serial Manager menu, click on **View > Ports** .

   The Serial Manager window now displays the ports available for the selected host card as shown in the next picture.



4. In the Serial Manager menu, click on **Port > Modify** .

The Modify Serial Port window is now displayed.



5. In the Modify Serial Port window, set the parameters shown in the next table

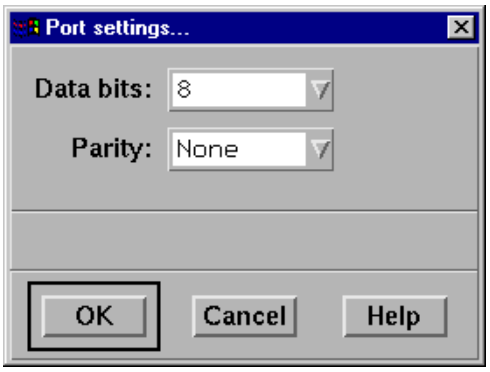
Parameter	Set to
Port Type	No change, should already be set to software flow control
Configure port	incoming only
Speed	the speed value you require

Note

If you want to use baud rates above 38400, use the **spxbaudmap** utility to obtain the values you want for each port. See **Appendix B Obtaining baud rates above 38400**. **Note that the value you choose here is used to determine the extended baud rate.**

6. In the Modify Serial Port window, click on the **Port settings** button.

   The Port settings window is now displayed.



7. In the Port settings window, select the **Data bits** and **Parity** values you require and click on **OK**.
8. In the Modify Serial Port window, click on OK to accept the changes you have made and close the window.
9. Repeat steps **3.** to **8.** until you have configured the serial ports for all the host cards you require.
10. In the Serial Manager menu click on **Host > Quit** to quit Serial Manager and close the window.

Configuring serial ports under SCO UnixWare 2

spxadmport

SCO UnixWare 2 does not include the graphical user interface based Serial Manager utility. If you are running SCO UnixWare 2 on your computer, you need to run the **spxadmport** script from the command line to configure SX serial ports. You use this by typing a single line command which contains the information required for a given configuration task using the following syntax;

Syntax

/etc/spxadmport **command svctag** [**label**] [**owner]**

where;

Item	Description	Example
command	**add**, **enable**, **disable**, **remove** or **list.**	**remove**
svctag	device number from /dev/term.	**i01**
label	/etc/ttydefs entry (optional).	**9600**
owner	user ID assigned to the port (optional).	**root**

Procedure

To use the **spxadmport** script to configure your SX serial ports proceed as follows;

1. At the command prompt, type one of the commands detailed in the next table using the following syntax;

   /etc/spxadmport [**command**] [**svctag**] [**label**] [**owner**]

Command	Description	Example command
Add	Adds a serial port to the service monitor (sxmon) and enables the port for monitoring logins.	**/etc/spxadmport add d1 9600 root**
Enable	Enables a previously disabled port for monitoring.	**/etc/spxadmport enable**
Disable	Disables a port. Has the effect of disabling all further logins on this port.	**/etc/spxadmport disable A1**
Remove	Removes the selected serial port from the service monitor (sxmon).	**/etc/spxadmport remove A2**
List	Lists the currently defined services and/or port monitors.	**/etc/spxadmport list**
List p	Lists all logins configured.	**/etc/spxadmport list p**
List s	Lists all port services configured.	**/etc/spxadmport list s**

2. Press the **Enter** key.

The revised SX port configuration is now adopted by the system.

Adding new ports

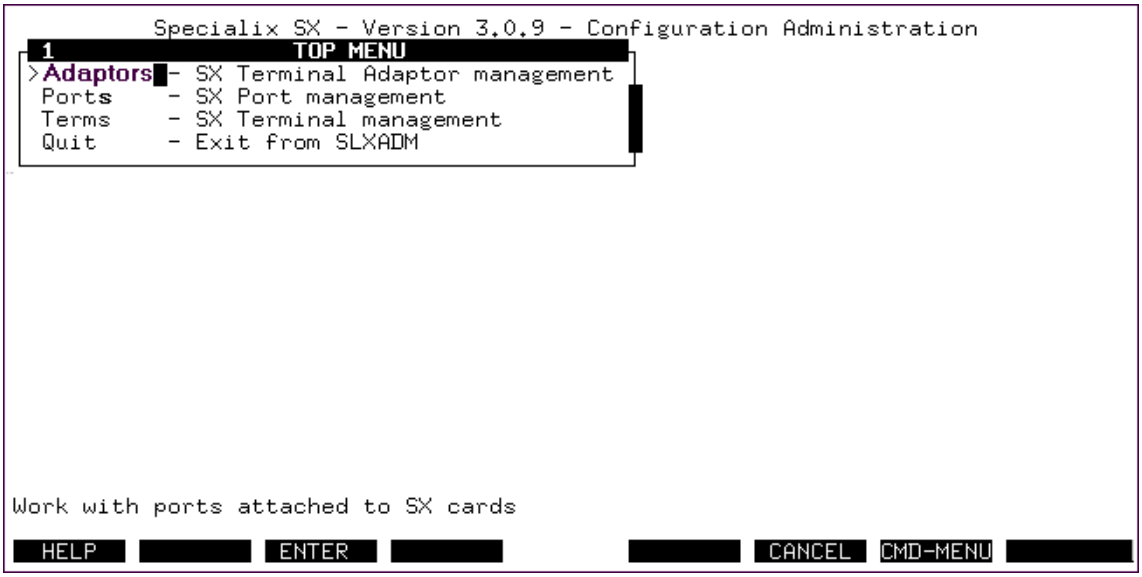
When you install an SX driver under the SCO UnixWare operating system, 32 ports are created by default. If you want to add more than 32 ports to your system (typically, when you want to add more Device Concentrators or Terminal adaptors to your system), you need to use the **Configuration Administration** utility to add more ports.

> Note
>
> If your system contains a mixture of **TA4s** and **TA8s,** then repeat steps **4.** to **5.** to enter and save the values for **Adaptor size** and **Number of adaptors** for **each type of terminal adaptor separately**.

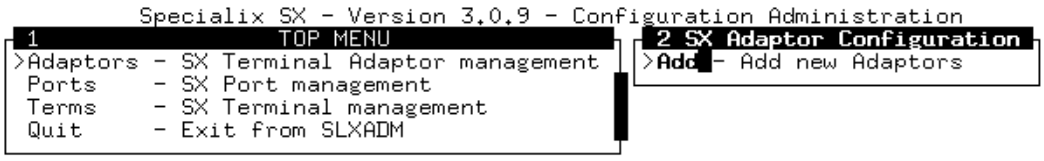
To add more ports proceed as follows;

1. At the command prompt, type **slxadm** and press the **Enter** key.

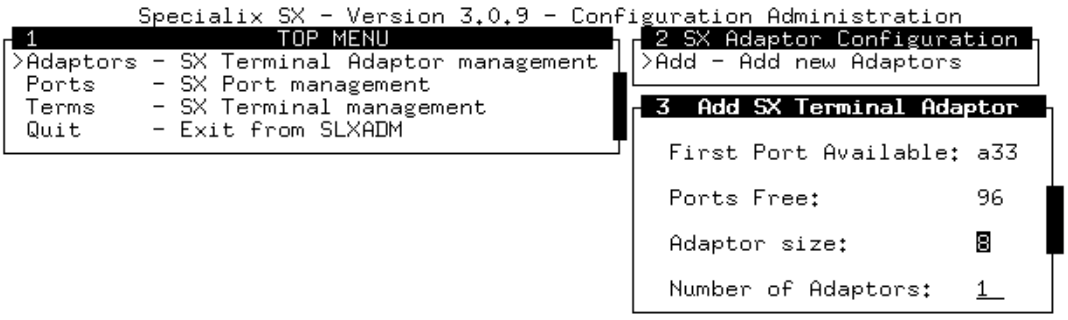
   The Configuration Administration window is now displayed showing the **TOP MENU** options.



2. In the Configuration Administration window TOP MENU select the **Adaptors** option and press **Enter** to display the **SX Adaptor configuration** sub menu as shown in the next picture.



3. In the SX Terminal Adaptor submenu, select the **Add** option to display the **Add SX Terminal Adaptor submenu**.



4. In the Add SX Terminal Adaptor submenu, use the up and down arrow keys to move the cursor to each of the fields shown in the next table, then type in the new value.

> Note
>
> If your system contains a mixture of **TA4s** and **TA8s,** then repeat steps **4.** to **5.** to enter and save the values for **Adaptor size** and **Number of adaptors** for **each type of terminal adaptor separately**.

In this field	Enter this information..
Adaptor size	Enter the number of ports for the device concentrators or terminal adaptors type you are adding to the system. For example, for a TA8 enter 8.
Number of Adaptors	Enter the number of device concentrators or terminal adaptors of this type in your system.

5. Press the **F3** key to save your changes
6. Press the **F6** key to return to the **TOP MENU.** Then in the TOP MENU, select the **Quit** option and press the **Enter** key.

The Configuration Administration window now closes and you are returned to the command prompt.

Removing SX drivers and utilities from your system

To remove the software drivers from your system under the SCO UnixWare operating system proceed as follows;

> Note
>
> Before removing a software driver you should first de-activate all SX host cards present on the system. See **De-activating a host card** on page **92**.

1. At the command prompt, type **pkgrm slxos** and press **Enter**

The SX driver and associated utilities are now removed from your system.

Installing SX under Windows NT

This section describes how to install the SX device driver software under Microsoft Windows NT.

> Note
>
> When using SX **PCI host cards,** you will require the PortDirector software version 1.1.1(or later).
>
> You can find the PortDirector software on the CDROM supplied with this product or on our website at **http://www.perle.com**

General setup procedure for Windows NT

The general procedure for installing SX under the Windows NT operating system is as follows;

1. Install the PortDirector software onto your system using the procedures described in **Chapter 2 Installing and removing PortDirector** in the **PortDirector User guide**

   > Note
   >
   > A device driver is installed with the PortDirector software, included on the CDROM supplied with this product. See the **PortDirector User guide** for further details.

2. Install or remove any PCI host cards you require on your system. See **Installing a Universal 3.3/5V PCI host card** on page **131** and **Removing host cards** on page **135**.
3. Install or remove any ISA host cards you require on your system. See **Installing an ISA host card** on page **133** and **Removing host cards** on page **135**.
4. Install or remove any device concentrators you require onto your system. See **Installing device concentrators** on page **136** and **Removing Device Concentrators from your system** on page **149**
5. Update your system to include the new host cards or device concentrators you have added or removed from your system. See **Chapter 5 Adding and deleting host cards** in the **PortDirector User guide**.
6. Configure the ports you require using the procedures described in **Chapter 6 Working with com ports** of the **PortDirector User guide**.

Your system is now ready for use. If required you can reconfigure the system following initial installation. See **Chapter 5 Adding and deleting host cards** and **Chapter 6 Working with com ports** in the **PortDirector User guide** for further details.

Installing SX PCI host cards under Windows 2000/XP/ Server 2003/Vista/Server 2008

This section describes how to install SX PCI host cards under Microsoft Windows 2000/XP/ Server 2003/Vista/Server 2008.

> Note
>
> Whenever you add any SX or SI/XIO hardware to your system, by default Windows 2000 will use its latest digitally signed driver in its driver database. To ensure you install the latest driver, run **update.exe** in the driver folder to ensure that every device currently installed in the system will use the latest driver.

This section includes the following;

> Note
>
> When using SX **PCI host cards,** you will require version 1.1.0 (or later) of the SX driver for Windows 2000/XP/Server 2003/Vista/Server 2008.
>
> You can find this version of the driver on the CDROM supplied with this product or on our website at **http://www.perle.com**.

General setup procedure for Windows 2000/XP/Server 2003/Vista/Server 2008

The general procedure for installing the SX PCI host card under the Windows 2000/XP/ Server 2003/Vista/Server 2008 operating system is as follows:

1. Install or remove any PCI host cards you require on your system. See **Installing a Universal 3.3/5V PCI host card** on page **131** and **Removing host cards** on page **135**.
2. Install or remove any device concentrators you require onto your system. See **Installing device concentrators** on page **136** and **Removing Device Concentrators from your system** on page **149**.
3. Install the SX device driver software. See **Installing PCI host card device drivers and utilities onto your system** on page **108**.

> Note
>
> The PCI host card and concentrator must be installed before you install the device drivers.

4. Using the Windows **Device Manager**, configure the serial ports you have added to the system. See **Configuring PCI host card serial ports** on page **110**.

Installing PCI host card device drivers and utilities onto your system

To install or enable the SX device drivers on your system proceed as follows:

1. Turn on your PC and if required, log in.

   If you have installed any new host cards a Found New Hardware message is briefly shown followed by the Found New Hardware wizard as shown in the next picture.

2. In the Found New Hardware wizard, click the **Cancel** button.
3. Download the lastest SX driver zip file from the Perle website for your operating system:

   sx-x86.zip for 32-bit Windows operating systems.

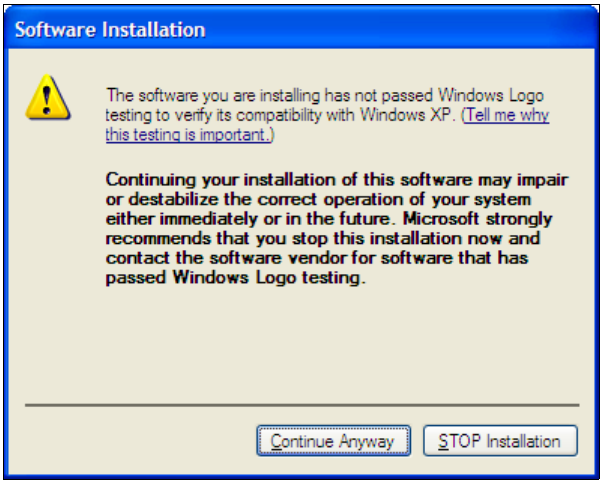
   sx-amd64.zip for 64-bit Windows operating systems.

   sx-ia64.zip for 64-bit Windows Itanium operating systems.

4. Unzip the driver zip file to a local directory. We recommend that you use the **sx-setup-<*arch*>.exe** file when installing the drivers for a SX PCI card, which will launch the installation wizard, to install the SX driver.

5. Double-click the **sx-setup-<*arch*>.exe** installation executable and follow the installation wizard steps:

6. During the installation, you may get a Windows Logo message. Click **Continue Anyway** when these appear.



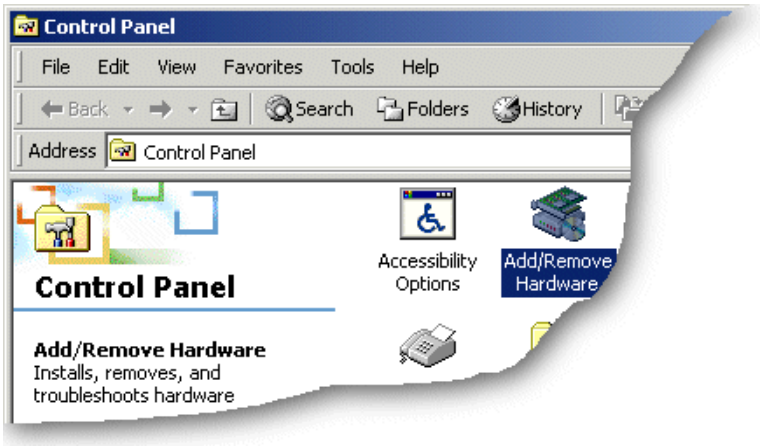
> **Note**
>
> If you are installing an unsigned driver, you may have to click through the Found New Hardware wizard for every SX card on your system.

7. Your SX driver installation is now finished.
8. To verify that you have the latest driver installed, select **Start > All Programs > Perle > SX > Update Driver**.

Configuring PCI host card serial ports

To configure SX serial ports under Windows, proceed as follows:

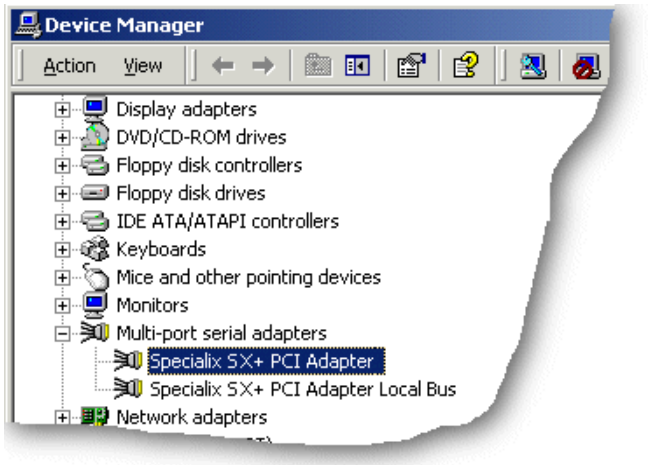
1. In the Windows desktop, click on the **Start** button and select **Settings > Control Panel**
   The control panel window is now displayed.



2. In the Control Panel window, click on the **System** icon.
   The System Properties tabbed window is now displayed.

3. In the System Properties window, click on the **Hardware** tab.
   The hardware page is now displayed.

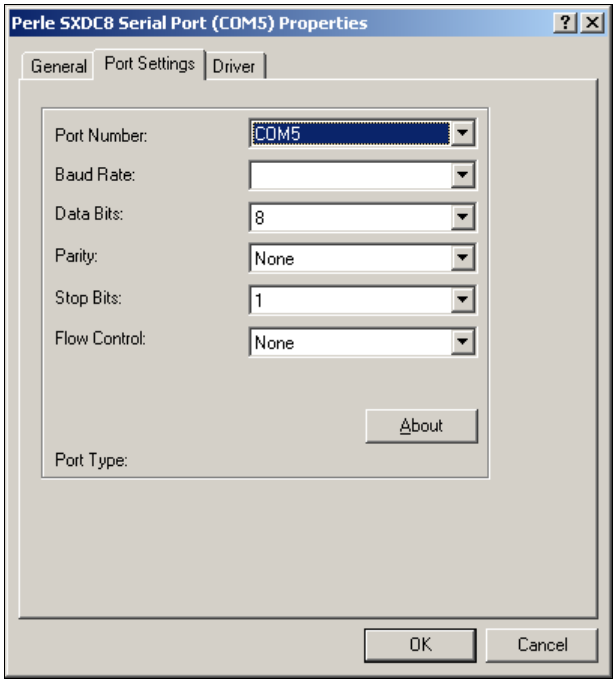
4. In the Hardware page, click on the **Device Manager** Button.
   The Device Manager window is now displayed.



5. In the Device Manager window, click on the Multiport serial adapters icon to display the currently installed devices.
6. In the Device Manager window, double click on the device whose properties you want to view or change.

   The device Properties tabbed window is now displayed.

7. In the device Properties window, click on the **Port Settings** tab to display the Port Settings page.



8. In the Port Settings page, set the **Port Number**, **Baud Rate** and other configuration parameters you require and then click on the **OK** button to save changes and close the window.

The configuration process is now complete.

Installing SX ISA host cards under Windows 2000

This section describes how to install SX ISA host cards under Microsoft Windows 2000.

> Note
>
> Whenever you add any SX or SI/XIO hardware to your system, by default Windows 2000 will use its latest digitally signed driver in its driver database. To ensure you install the latest driver, run **update.exe** in the driver folder to ensure that every device currently installed in the system will use the latest driver.

This section includes the following:

> Note
>
> The ISA host card and concentrator must be installed before you install the device drivers.

> Note
>
> You can find this version of the driver on the CDROM supplied with this product or on our website at **http://www.perle.com**

General ISA host card setup procedure for Windows 2000

The general procedure for installing SX ISA host cards under the Windows 2000 operating system is as follows:

1. If required, install any ISA host cards you require into your system. See **Installing an ISA host card** on page **133**.
2. Install or remove any device concentrators you require onto your system. See **Installing device concentrators** on page **136** and **Removing Device Concentrators from your system** on page **149**.

> Note
>
> You can find device driver on the CDROM supplied with this product or on our website at **http://www.perle.com**.

3. If required, using the Windows 2000 **Add/Remove Hardware wizard,** add any additional ISA host cards to the list of installed devices on the system using the free addresses available. See **Adding ISA host cards to the system** on page **114**.
4. Using the Windows 2000 **Device Manager**, configure the serial ports you have added to the system. See **Configuring serial ports** on page **121**.
5. If required, remove any host cards you want from your system. See **Removing host cards** on page **135**.

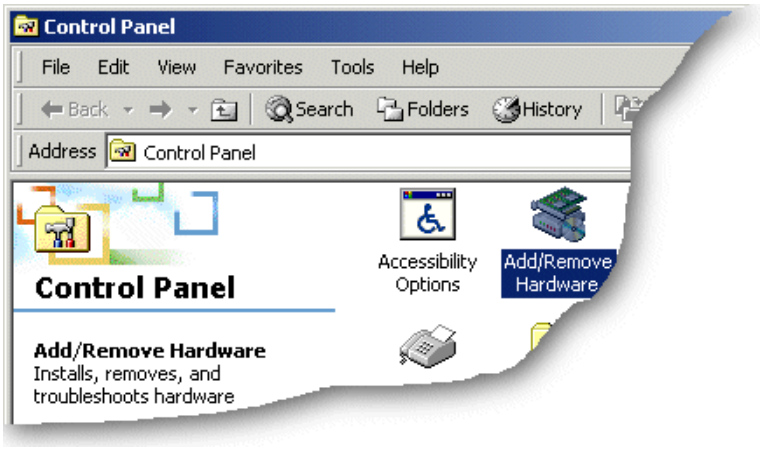
Adding ISA host cards to the system

When you physically install an ISA host card in your system you also need to add the card to the list of installed devices in the system.

To add ISA host cards to your system proceed as follows:

> Note
> The addresses used by SX host cards are normally set by default. This procedure is used when you wish to set non-standard addresses.

1. Download the lastest SXdriver zip file, **sx-x86.zip**, from the Perle website.
   for 32-bit Windows 2000, XP, Server 2003, Vista, or Server 2008 operating system.
2. Unzip the driver zip file to a local directory.
3. In the Windows desktop, click on the **Start** button and select **Settings > Control Panel**.
   The control panel window is now displayed.



4. In the control panel window, double click on the **System** icon.
   The Add/Remove Hardware Wizard is now displayed.

5. Using the instructions given in the next table, use the Add/Remove Hardware Wizard to assign the host card addresses and IRQ levels you require.

In this Wizard page	Do the following...
	6. In the Add/Remove Hardware Wizard, select **Add/Troubleshoot a device** and press the **Next >** button. The Choose a Hardware Device page is now displayed.
	7. In the Choose a Hardware Device page, scroll up the list of devices and click on **Add a new device**, then click on the **Next >** button. The **Find New Hardware page** is now displayed.
	8. In the Find New Hardware page, select **No, I want to select the hardware from a list** and click on the **Next >** button. The Hardware Type page is now displayed.
	9. In the **Hardware Type** page, select **Mutli-port serial adaptors** and click on the **Next >** button.

In this Wizard page	Do the following...
	The Select a Device Driver page is now displayed. 10. If your host card type isn't shown, in the **Select a Device Driver page** click on the **Have Disk** button. A message window is now displayed which prompts you for the driver and location you want to use. 11. In the message window, enter or select the driver you want and click on the **OK** button to accept settings and close the window. The **Select a Device Driver page** is now updated to show the new driver you have selected. 12. In the **Select a Device Driver page,** select the manufacturer and model you require, then click on the **Next >** button. The Start Hardware Installation page is now displayed.
	13. In the Start Hardware Installation page, click on the **Next >** button to accept your choice. A completion message page is now displayed as shown in the next picture

Note

If resources are not free you will have to change the resource configuration using the procedures described on **page 118**.

14. In the completion message page click on the **Finish** button to complete the new configuration.

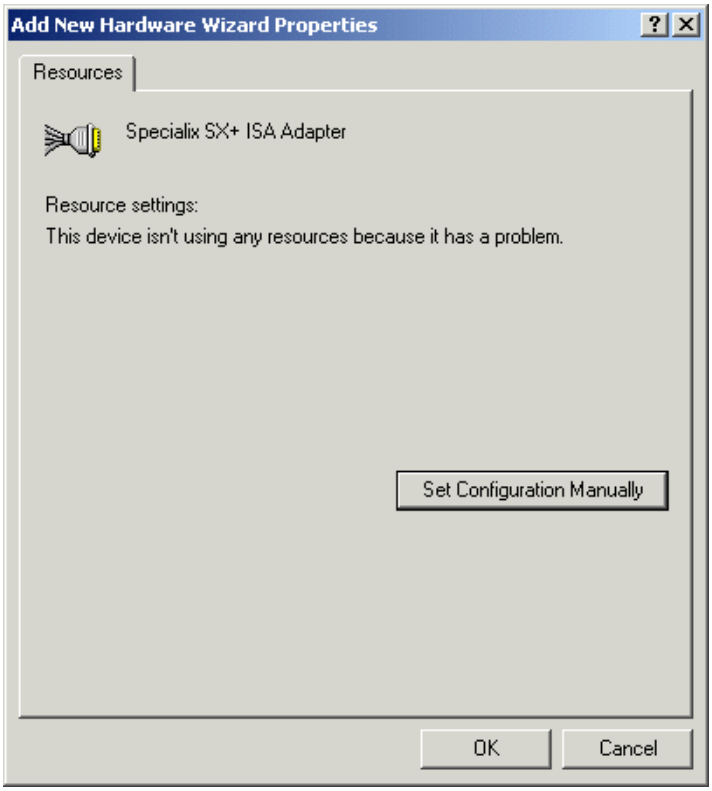
> Note
>
> To ensure you install the latest driver, run **update.exe** in the driver folder to ensure that every device currently installed in the system will use the latest driver.

Viewing and changing the resources for a device

To view or change the resources for a device proceed as follows;

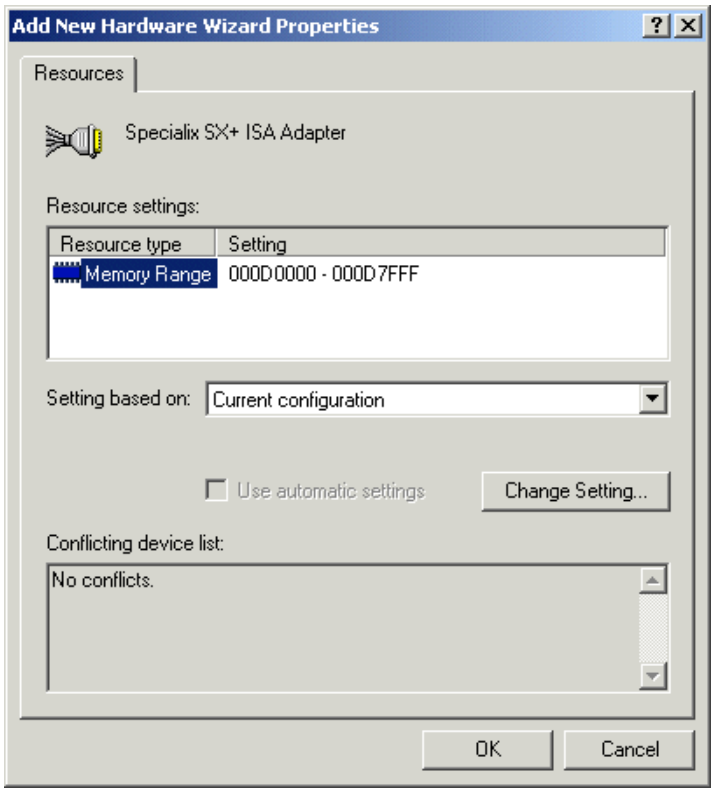
1. In the Add/Remove Hardware Wizard go to the last page and click on the Resources button.

The Add New Hardware Wizard properties window is now displayed.



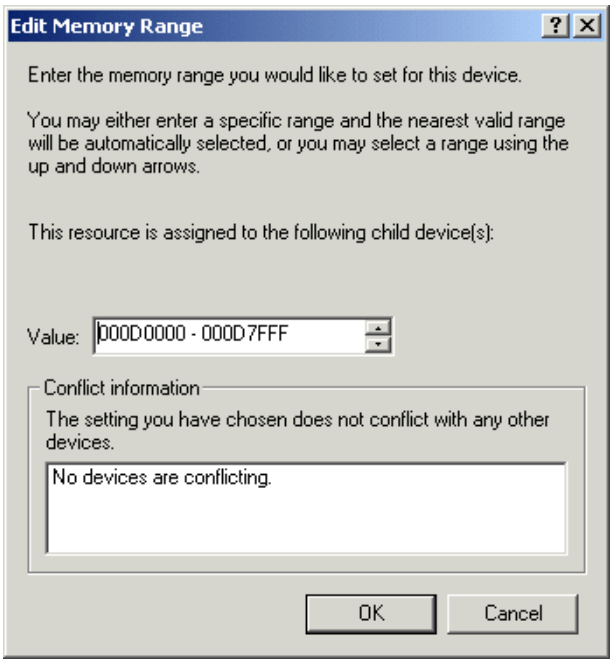
2. In the Add New Hardware Wizard properties window, select the **Resources** page and click on the **Set Configuration Manually** button.

   The resources page is now updated to show the settings for the current installed SX device.



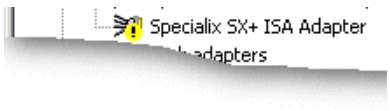
3. In the Add New Hardware Wizard properties window, select the **Resource type** you require and click on the **Change Setting** button.

   The Edit Memory Range window is now displayed.



4. In the Edit Memory Range window, enter the memory range you want and click on the **OK** button.

   If values you have selected are not acceptable to the system, then the Device Manager will display a problem icon as shown in the next picture.



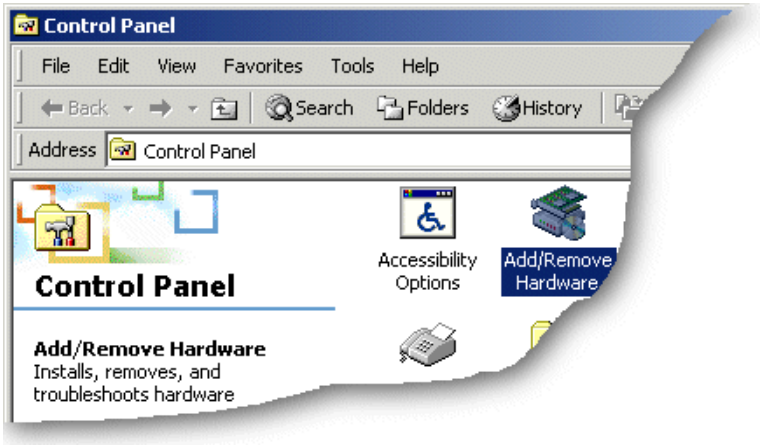
5. If the memory settings you have selected are not acceptable to the system, check your configuration settings and adjust memory address as required. Otherwise ring Technical support.

Configuring serial ports

To configure SX serial ports under Windows 2000, proceed as follows:

1. In the Windows 2000 desktop, click on the **Start** button and select **Settings > Control Panel**.

   The control panel window is now displayed.



2. In the Control Panel window, click on the **System** icon.

   The System Properties tabbed window is now displayed.

3. In the System Properties window, click on the **Hardware** tab.

   The hardware page is now displayed.

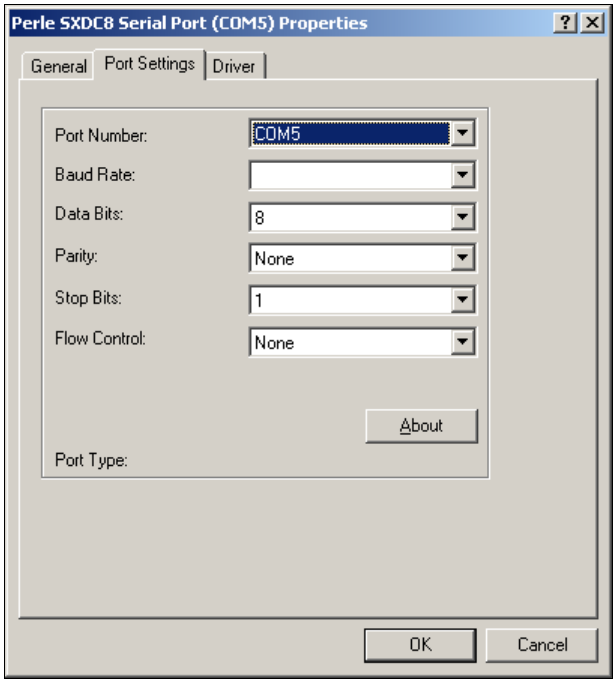
4. In the Hardware page, click on the **Device Manager** Button.

   The Device Manager window is now displayed.

5. In the Device Manager window, click on the Multiport serial adapters icon to display the currently installed devices.
6. In the Device Manager window, double click on the device whose properties you want to view or change

   The device Properties tabbed window is now displayed.

7. In the device Properties window, click on the **Port Settings** tab to display the Port Settings page.



8. In the Port Settings page, set the **Port Number**, **Baud Rate** and other configuration parameters you require and then click on the **OK** button to save changes and close the window.

The configuration process is now complete.

Installing SX under Linux

This section explains how to install the device driver software for the Linux operating system.

> Note
>
> The SX driver for Linux supports up to 4 host cards of either ISA or PCI bus types. Under most circumstances the driver will not need to be configured to recognize cards of either type.
>
> Once the host card has been installed and the machine has been powered on the driver will automatically find any PCI cards installed in the system and register the correct interrupt that has been assigned by the BIOS. This is a feature of PCI Plug & Play.

General installation procedure for Linux

The general procedure for installing and configuring host cards, drivers software and associated utilities for the Linux operating system is as follows:

1. Install any PCI host cards you require into your system. See **Installing a Universal 3.3/5V PCI host card** on page **131**.
2. Install the SX Linux drivers onto your system using the procedures described in **Installing drivers onto your system** on page **125**.
3. Install the SX Linux utilities onto your system using the procedures described in **Installing utilities** on page **127**.
4. Load the driver module into the Kernel and download the firmware onto the host card and device concentrators. See **Loading the driver module into the kernel** on page **128**.
5. Create devices for the required ports using the procedures detailed in **Creating devices for the attached ports** on page **130**.
6. Install any ISA host cards you require into your system. See **Installing an ISA host card** on page **133**.
7. Remove any host cards you want from your system. See **Removing host cards** on page **135**.
8. Install the device concentrators or Terminal Adaptors you require for your system. see **Installing device concentrators** on page **136**.
9. If required, remove any Device concentrators or Terminal Adaptors you want from your system. See **Removing Device Concentrators from your system** on page **149**.

Your system can now use the serial adaptor cards and device concentrators you have installed.

Installing drivers onto your system

To install the device driver proceed as follows:

> Note
>
> Before starting to install drivers under Linux, make sure that both a kernel patch file and utilities RPM are available. If your Linux Kernel is version 2.2.15 or higher, the Kernel does NOT need to be patched.
>
> You can find these on either of the following;
>
> - The CDROM (in the drivers/sx/linux directory)
> - Our website **http://www.perle.com**.
>
> The latest SX drivers support all host card types i.e. SX and SI/XIO in both ISA and PCI bus types.

> Note
>
> Driver version 1.30 is required to support the SX PCI host card. The driver is available on the CDROM supplied with this product, or from our web site at:
> **http://www.perle.com**

1. Make sure you have an up to date Linux kernel source directory installed. This can be obtained from **ftp://ftp.linux.org** or other major Linux web sites, along with instructions on how to install and build.
2. Copy the driver patch file onto your system in a temporary directory. For example, **/tmp**.

   The patch file will be named
   sx.patch-<driver vers>-<kernel vers>.gz
   for example:
   sx.patch.1.30.2.2.14.gz

3. At the command prompt, uncompress the driver patch file by typing
   gunzip /tmp/sx.patch-1.30-2.2.14.gz and pressing the **Enter** key.
4. At the command prompt, change directory to the kernel source directory by typing
   cd /usr/src/linux and pressing the **Enter** key.
5. At the command prompt, apply the kernel patch by typing
   patch -p1 </tmp/sx.patch-1.30-2.2.14 and pressing the **Enter** key.
6. If the patch is successful, you will need to enable the driver using the **make config** or **make xconfig kernel** utility. The SX driver appears in the **Character devices** section and is labelled **Specialix SX (and SI) card support**. Set this to **m** for modules.

> Note
>
> You will need to enable **Non-standard serial port support** in order to select the SX Driver.

7. Now rebuild and install the kernel and modules. See your Linux distribution documentation on how to rebuild and install a new kernel and modules. We recommend reading the Kernel-HOWTO available in /usr/doc/HOWTO.

Note

In order to determine if any ISA cards are present, the driver will search for SX cards at 6 well known ISA bus addresses (0xC0000, 0xC8000, 0xD0000, 0xD8000, 0xE0000, 0xE8000). It is recommended that you leave your SX ISA card at the factory default of 0xD0000, as this is the most common free ISA address slot on the majority of machines. If, for some reason your ISA card cannot be left at one of these addresses then you will need to modify the sources of the driver and recompile the sx module for inclusion into your system. You will need to modify the following line in the /usr/src/linux/drivers/char/sx.c file:

int sx_probe_addrs[]= {0xc0000,0xc8000, 0xd0000, 0xd8000, 0xe0000, 0xe8000};

Change one of the addresses to the value you have set your ISA card rotary switches to e.g. If you have set your rotary switches to F, F (reading from left to right as you look at the switches with the ISA bus edge connector closest to you). Then you will need to set the address line to:

int sx_probe_addrs[]= {0xff0000};

Once you have made this change you will need to recompile the kernel modules and install the new module on your system.

Note: Please consult your Linux distribution documentation on how to rebuild and install a new kernel and modules.

Installing utilities

The driver utilities (**sxboot** and **sxmkdev**) are provided in the form of a RedHat Package Management file, available on the CDROM or from our web site (http://www.perle.com).

The utilities file is named:
specialix_sxtools-<maj ver>-<min ver>.i386.rpm e.g. specialix_sxtools-4-1.i386.rpm

To install the utilities proceed as follows:

1. Copy the file to a temporary directory and install the utilities using the following command:

   rpm -i specialix_sxtools-4-1.i386.rpm

   The utilities are now installed in the /usr/bin directory on your machine.

Loading the driver module into the kernel

In order to make use of the SX devices the driver module must be loaded into the Kernel and the firmware must be downloaded onto the host card and device concentrators. This can be done manually every time the machine is booted or configured in to the start-up files to ensure the driver is always loaded and initialized when the machine completes its boot. See the following:

- **Loading the driver module manually** on page **128**
- **Loading the driver module automatically** on page **129**

> Note
>
> The sxboot application is installed as part of the utilities package. This application must be run each time the operating system is initialized, after the driver module has been loaded. It contains the download code for the host card and device concentrators and will boot the host card and detect the number of ports present on the system.

Loading the driver module manually

To manually load the module and firmware follow the steps below:

1. Load the SX module into the kernel: **modprobe sx**
2. Load the SX firmware into the driver: **sxboot**

   sxboot now reports the number of host cards, device concentrators and ports found.

1. To automatically configure the start up files to load the sx module and firmware copy the following script to the file **/etc/rc.d/init.d/sx**.

```
# sx           This shell script takes care of starting and stopping
#               the SX services.
#
# probe: true

# Source function library.
. /etc/rc.d/init.d/functions

#
# Exit if the sx utilities are not present
#
[ -f /usr/sbin/sxboot ] || exit 0

# See how we were called.
case "$1" in
  start)
        # Start driver and load module.
        action "Starting SX services: " /sbin/modprobe sx
        echo -n "Starting SX Firmware: "
        #
        daemon /usr/sbin/sxboot
        echo
        ;;
  stop)
        # Stop driver and unload module.
        action "Shutting down SX services: " /sbin/modprobe -r sx
        echo
        ;;
  status)
        status sx
        ;;
  restart|reload)
        $0 stop
        $0 start
        ;;
  *)
        echo "Usage: sx {start|stop|restart|reload|status}"
        exit 1
esac

exit 0
```

2. Create the following symbolic links to the file in the relevant system start-up directories. For example, if you machine normally boots into run level 5 you will need to create the following symbolic links: **ln -s /etc/rc.d/init.d/sx /etc/rc.d/rc5.d/S50sx** and **ln -s /etc/rc.d/init.d/sx /etc/rc.d/rc5.d/K50sx**
   These links will ensure that the sx start-up script S50sx is run each time the machine is booted into run level 5 and that the kill script K50sx is run whenever the machine is shutdown.

Creating devices for the attached ports

After you have installed the new kernel, modules & hardware, and have rebooted the machine. The following procedure can be followed to create devices for the attached ports.

1. Load the SX driver module using the following command:

   modprobe sx.

2. Verify the module has successfully loaded using the lsmod command. The output should contain references to the sx module.
3. Ensure all your SX device concentrators are attached. If they are not, then power down the system and attach them.
4. Upload the host card firmware to the driver and boot the attached: **sxboot**
5. Create device nodes for the attached device concentrators: **sxmkdev**

> Note
>
> When you have installed device concentrators or terminal adaptors under Linux, you need to do the following after powering up the system;
>
> a. Wait for the machine to boot,
> b. Login as root
> c. Run **sxmkdev -f** to create new port devices in the **/dev** directory.

Your system now has a number of device nodes (/dev/ttyX*) relating to the ports on the attached device concentrators.

Installing a Universal 3.3/5V PCI host card

The latest version of the SX PCI card will fit 3.3V, 5V and universal 3.3/5V PCI card slots in your system.

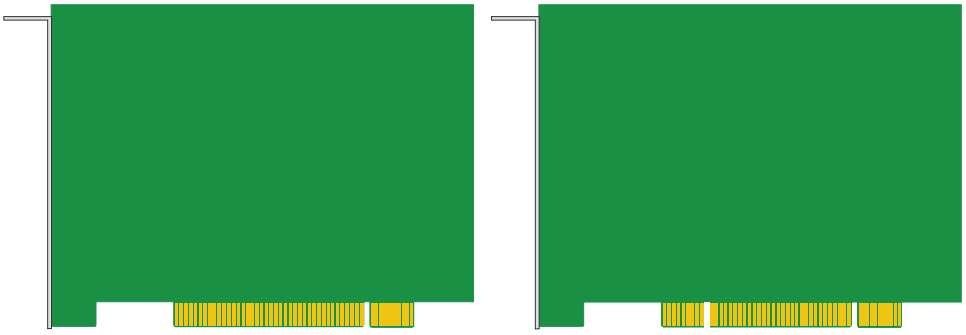
> Note
>
> Before installing your SX PCI card note the following;
> The latest Universal 3.3V/5V SX PCI card will fit into both 5V and 3.3V PCI slots in your system.
> If you are installing an older 5V SX PCI card this will not fit into 3.3V PCI slots in your system.

Before commencing installation you can identify card and slot type using the information contained in **Identifying your SX PCI card and slot type** on page **131**.You can then install your PCI card using the procedures given in **Installation procedure** on page **132**.

Identifying your SX PCI card and slot type

You can identify the PCI card type as shown in the next picture.

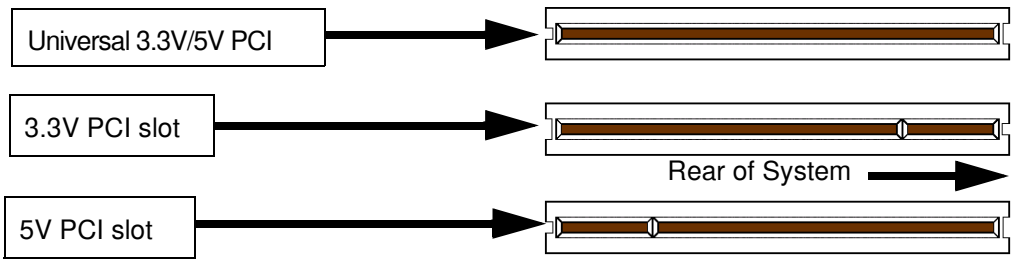
The new universal 3.3V/5V PCI car has two notches on the card edge connector where as the 5V PCI card has only one.



SX 5v PCI card

SX 3.3v/5v universal PCI card

The slots on your system will be as shown in the next picture. Note that some systems may have a 3.3V only slot as opposed to a 5V and universal 3.3V/5V.



Installation procedure

To install a PCI host card proceed as follows;

Warning

Dangerous voltages exist inside computer systems. Before installing host cards in your system, turn off the power supply and disconnect the mains lead.

1. Turn off the power to your system and disconnect the mains supply.
2. Remove the system cover to expose the inside of the connector panel for host cards.

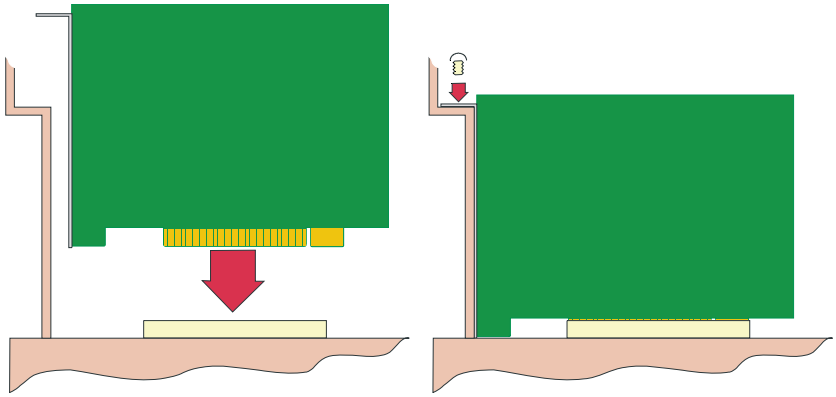
Note

If you are installing an older 5V version of the SX PCI card this will only fit into 5V PCI slots on your system. 5V SX PCI cards will not fit into the later 3.3V PCI slots.

3. Insert the PCI card you want to install into a vacant host card slot and secure in place as shown in the next picture.

Caution

Full anti-static precautions should be taken when handling host cards.



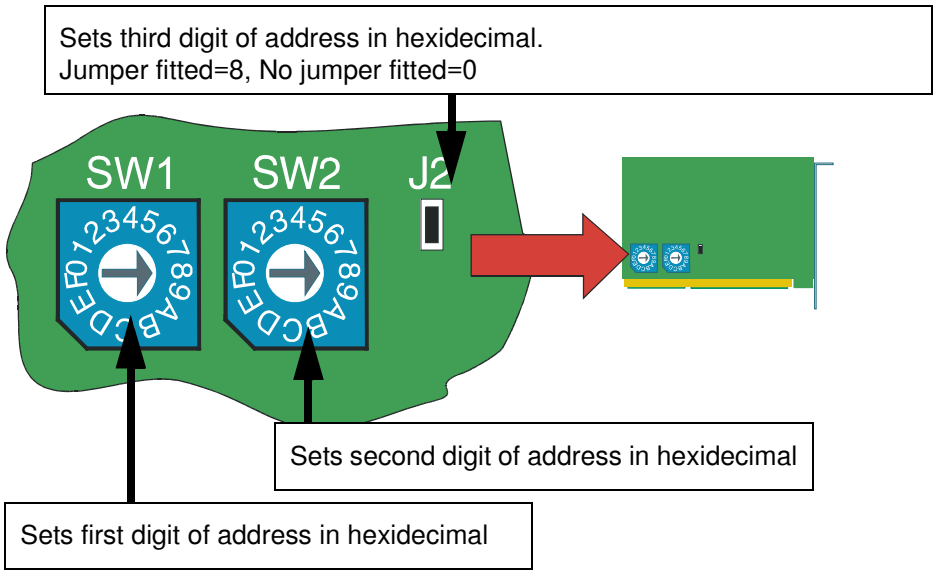
4. Repeat step **3.** until you have installed all the PCI cards you want. Now replace and secure the system cover.

Installation of PCI host cards is now complete. For further details about installing host cards including other types, see **Before you start** on page **26**.

Installing an ISA host card

Setting the address on an ISA host card

Before you install an ISA card in your system you need to physically set the address for the card using the two rotary switches **SW1** and **SW2** and jumper **J2** provided on the host card (shown in the next picture).



To set the address for an ISA host card proceed as follows;

Caution

Full anti-static precautions should be taken when handling host cards.

1. Choose an address you want to use for the host card in hexidecimal. On the host card set the two rotary switches **SW1** and **SW2** and jumper **J2** to the first three digits of the address you want as shown by the next example.

Host card Address	Set SW1 to..	Set SW2 to..	set J2 to...
C0000	0	C	No jumper
C8000	0	C	Jumper fitted
D0000 **(Default setting)**	0	D	No jumper
D8000	0	D	Jumper fitted
E0000	0	E	No jumper
E8000	0	E	Jumper fitted

Mechanical installation

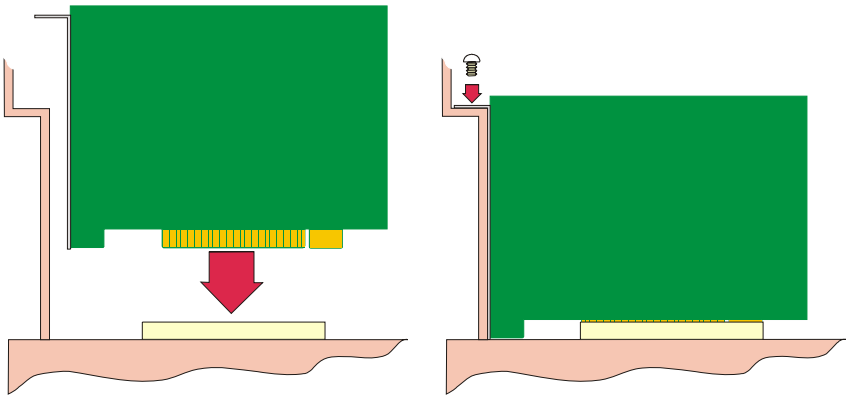
You can now install the ISA host card in your system.To do this proceed as follows;

> Note
>
> The exact location of host card slots varies for different systems, for exact mechanical details of your system, refer to your system documentation.

> **Warning**
>
> **Dangerous voltages exist inside computer systems. Before installing host cards in your system, turn off the power supply and disconnect the mains lead.**

2. Turn off the power to your system and disconnect the mains supply.
3. Remove the system cover to expose the inside of the connector panel for host cards.
4. Insert the ISA card you want to install into a vacant host card slot and secure in place as shown in the next picture.

> **Caution**
>
> **Full anti-static precautions should be taken when handling host cards.**



5. Repeat step **3.** until you have installed all the ISA cards you want.
6. Replace and secure the system cover.
7. Plug in the mains lead and turn on the power.

Installation of ISA host cards is now complete. For further details about installing host cards including other types, see **Before you start** on page **26**.

Removing host cards

To remove a host card from your system proceed as follows;

> Note
>
> The exact location of host card slots varies for different systems, for exact mechanical details of your system, refer to your system documentation.

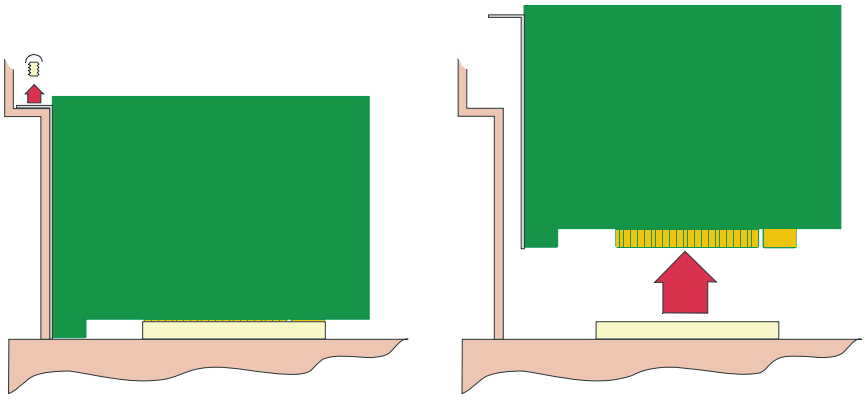
Warning

Dangerous voltages exist inside computer systems. Before removing host cards from your system, turn off the power supply and disconnect the mains lead.

1. Turn off the power to your system and disconnect the mains supply.
2. Remove the system cover to expose the inside of the connector panel for host cards.
3. Remove all cables plugged into the host card.
4. Undo the securing screw for the host card you want to remove then lift the card out of its slot as shown in the next picture (ISA card shown).

Caution

Full anti-static precautions should be taken when handling host cards.



5. Repeat step **4.** until you have removed all the host cards you want.
6. Replace and secure the system cover.
7. Plug in the mains lead and turn on the power.

Removal of host cards is now complete. For further details about installation of host cards including other types, see **Before you start** on page **26**.

Installing device concentrators

Device Concentrators (**SXDCs**), Terminal Adaptors (**TAs**) and Multiple Terminal Adaptors (**MTAs**) are basically serial connection blocks which provide a number of ports depending on type. This section describes the mechanical installation of SX Device concentrators (**SXDCs**), terminal adaptors (**TAs**) and Multiple Terminal Adaptors (**MTAs**) and includes The following;

Installing SX Device Concentrators (SXDCs)

Before installing your SXDCs, please read **Before you start** on page **26**.

Installation procedure

To install SX device concentrators (SXDCs) on your system proceed as follows;

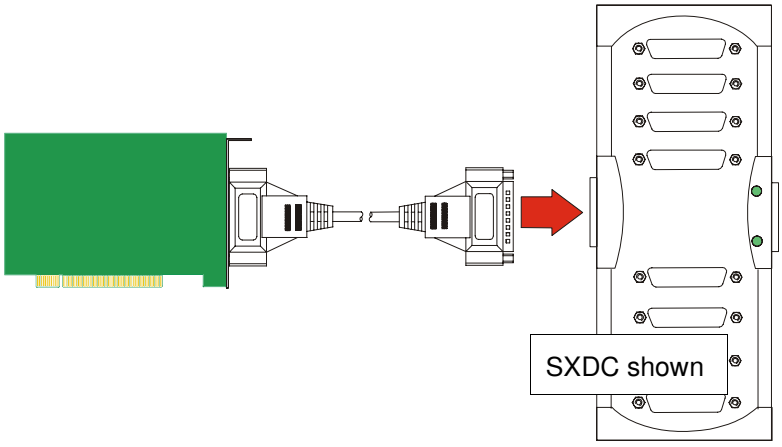
Warning

Before installing Device concentrators on your system, turn off the power supply to your system and disconnect the mains lead.

1. Turn the power off to your computer system and disconnect the supply.
2. If you want to use more than SXDC, add extra units to the first one using the procedures described in **Joining SXDCs together** on page **138**.
3. If required mount the SXDC(s) using the procedures given in **Mounting SXDCs** on page **141**.
4. Connect each host card to the first of the SXDCs you want to use using the 1.5 metre bus extension cable supplied with the host card.

Note

When connecting SX host cards to Device concentrators or terminal adaptors you should only use the 1.5 metre bus extension cable supplied with your SX host card. **Using any other cable will invalidate your EMC and noise warranty**.



5. Attach the peripherals you want to the device concentrators using suitable cables.
6. Power up your computer system.

Installation of SXDCs is now complete.

Note

Do NOT join together different device concentrator types. You can only connect device concentrators as follows;

SXDC8s to SXDC8s

MTAs to MTAs, and

TA4s/TA8s to TA4s/TA8s

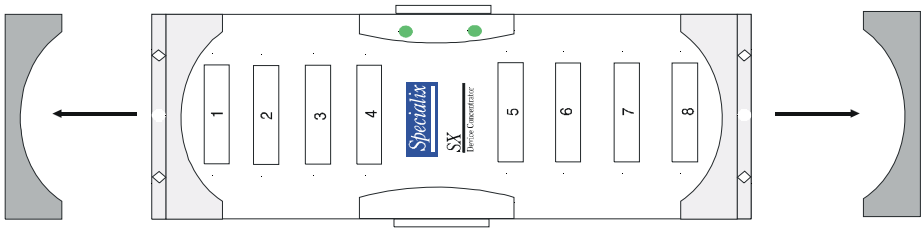
No other combinations are permitted.

Warning

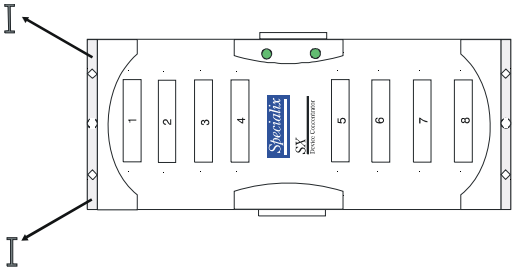
Do NOT connect and disconnect device concentrators while your machine is powered on. To do so will damage electronic circuitry and be a safety hazard.

To join SXDCs together proceed as follows;

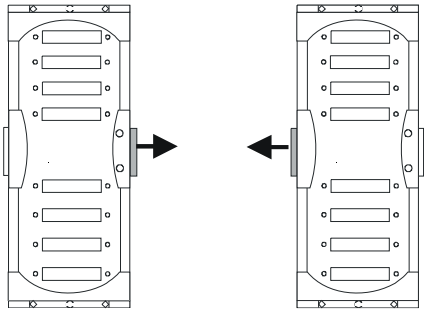
1. Remove the end covers on the Device concentrator as shown in the next picture.



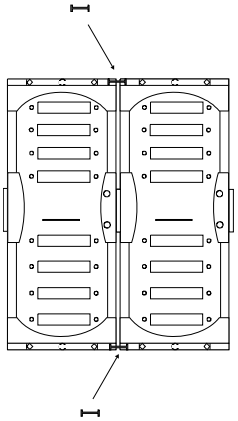
2. Remove the SXDC links (shaped like an H) from each end of the SXDC as shown in the next picture.



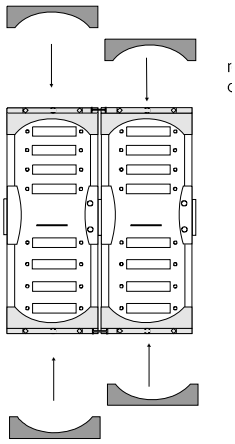
3. Push the first SXDC8 into the second SXDC8 via their bus connectors as shown in the next picture (retain the links as you will need these at a later stage).



4. Insert one SXDC link at each end of the joined pair of SXDCs into the H shaped apertures provided as shown in the next picture.



5. Replace the covers at either end of the SXDCs as shown in the next picture.



Joining is now complete.

The procedure for mounting SXDCs units is as follows;

Warning

Before you wall mount the unit, turn off and disconnect the power supply.

1. On the unit gently prize off the caps at either end of the unit to reveal the wall mounting holes as shown in the next picture.

> Note
>
> The removable caps are located on the bottom of MTA units and on the top of SXDC units.

2. Screw the unit to the wall through the holes provided using appropriate screws or fasteners for your installation.
3. Replace the caps at the ends of the unit.

Wall mounting of the unit is now complete.

Installing Modular Terminal Adaptors (MTAs)

Before installing your Modular Terminal Adaptors (**MTAs**), please read **Before you start** on page **26**.

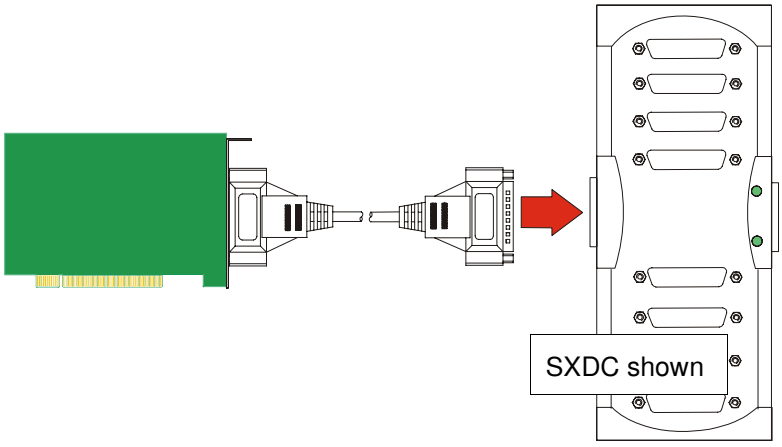
Installation procedure

To install SX Modular Terminal Adaptors (MTAs) on your system proceed as follows;

> **Warning**
>
> **Before installing MTAs on your system, turn off the power supply to your system and disconnect the mains lead.**

1. Turn the power off to your computer system and disconnect the supply.
2. If you want to use more than MTA, add extra units to the first one using the procedures described in **Joining MTAs together** on page **143**.
3. If required mount the MTA(s) using the procedures given in **Mounting MTAs** on page **145**.
4. Connect each host card to the first of the MTAs you want to use using the 1.5 metre bus extension cable supplied with the host card.

> Note
>
> When connecting SX host cards to Device concentrators or terminal adaptors you should only use the 1.5 metre bus extension cable supplied with your SX host card. **Using any other cable will invalidate your EMC and noise warranty**.



5. Attach the peripherals you want to the MTA(s) using suitable cables and power up your computer system.

Installation of MTAs is now complete.

Note

Do NOT join together different device concentrator types. You can only connect device concentrators as follows;

SXDC8s to SXDC8s

MTAs to MTAs, and

TA4s/TA8s to TA4s/TA8s

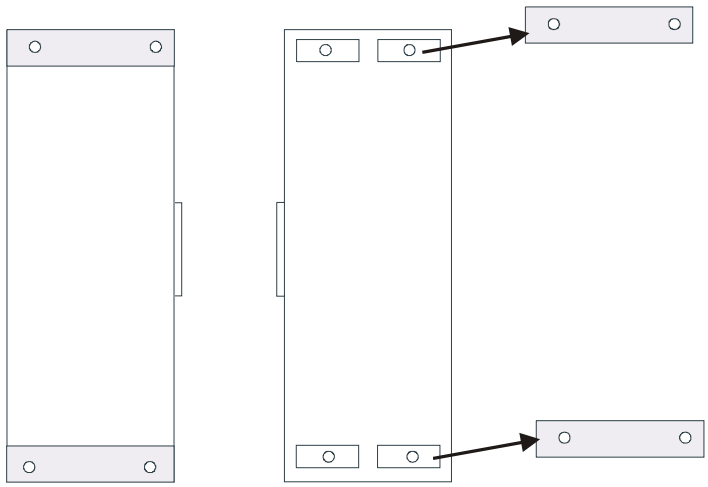
No other combinations are permitted.

Warning

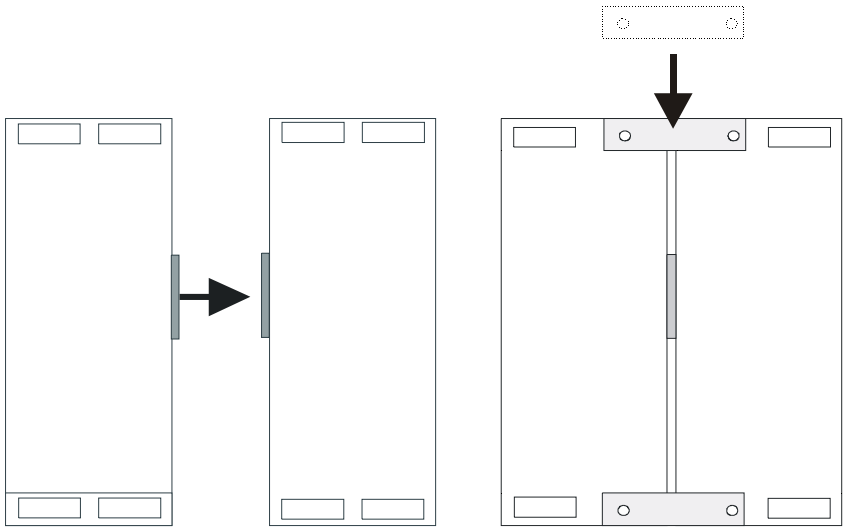
Do NOT connect and disconnect device concentrators while your machine is powered on. To do so will damage electronic circuitry and be a safety hazard.

To join MTAs together proceed as follows;

1. Remove the brackets on the underside of each MTA as shown in the next picture (hint, unclip brackets by lifting vertically).



2. Push the first MTA into the second MTA via their bus connectors, then join the two MTAs with a single bracket at each end as shown in the next picture.



The procedure for mounting SX units is as follows;

Warning

Before you wall mount the RTA, turn off and disconnect the power supply to the unit.

1. On the unit gently prize off the caps at either end of the unit to reveal the wall mounting holes as shown in the next picture.

> Note
>
> The removable caps are located on the bottom of MTA units and on the top of SXDC8 units.

2. Screw the unit to the wall through the holes provided using appropriate screws or fasteners for your installation.
3. Replace the caps at the ends of the unit.

Wall mounting of the unit is now complete.

Installing Terminal Adaptors (TAs)

Before installing your Terminal Adaptors (**TAs**), please read **Before you start** on page **26**.

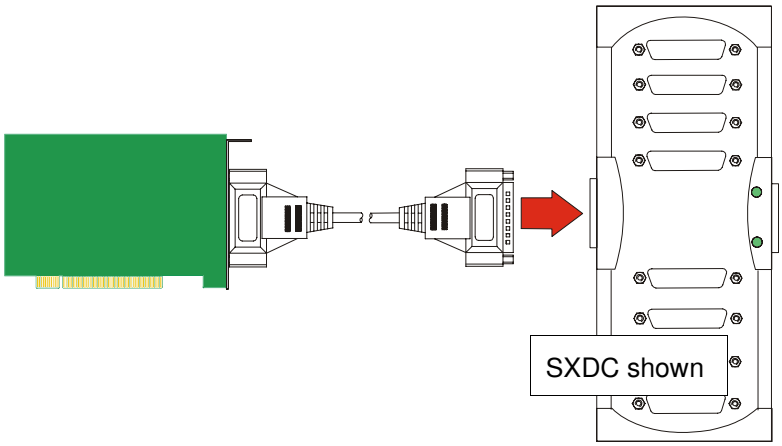
Installation procedure

To install SX Terminal Adaptors (TAs) on your system proceed as follows;

> **Warning**
>
> **Before installing Device concentrators on your system, turn off the power supply to your system and disconnect the mains lead.**

1. Turn the power off to your computer system and disconnect the supply.
2. If you want to use more than TA, add extra units to the first one using the procedures described in **Joining TAs together** on page **147**.
3. If required mount the TA(s) using the procedures given in **Mounting TAs** on page **148**.
4. Connect each host card to the first of the TAs you want to use using the 1.5 metre bus extension cable supplied with the host card.

> Note
>
> When connecting SX host cards to Device concentrators or terminal adaptors you should only use the 1.5 metre bus extension cable supplied with your SX host card. **Using any other cable will invalidate your EMC and noise warranty**.



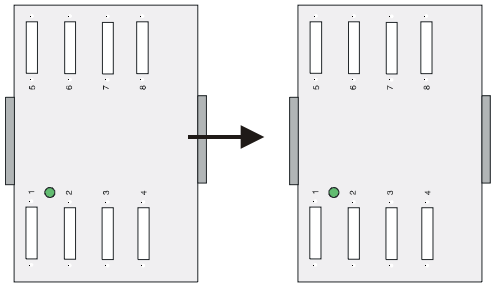
5. Attach the peripherals you want to the TAs using suitable cables.
6. Power up your computer system.

Installation of TAs is now complete.

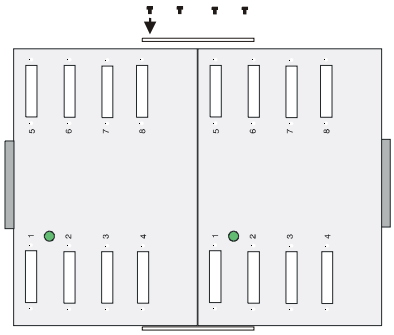
The procedure for joining TAs is as follows;

> **Note**
>
> Whether you are joining the same type of device concentrator (for example, TA4s to TA4s) or mixing TA4s and TA8s the procedure for joining them is the same:

1. Push the first TA into the second TA via their bus connectors as shown in the next picture.



2. Now join the two TAs with a single bracket at each end then secure each bracket in place with the screws provided.



> Note
>
> The TA4 or the TA8 units are designed for desktop placement only, they are not suitable for wall mounting.

Removing Device Concentrators from your system

To remove SX device concentrators (including SXDCs, MTAs and TAs) from your system proceed as follows;

Warning

Before removing device concentrators from your system, turn off the power supply to your system and disconnect the mains lead.

1. Turn the power off to your computer system and disconnect the supply.
2. If required, disconnect the bus extension cable from the device concentrators.
3. If you need to separate multiple device concentrators remove any joining brackets or links prior to separating the units.
4. Separate the device concentrators units as required to remove the unit you want.

You can now re-assemble your system in the revised configuration you require. See **Installing device concentrators** on page **136** for further details.

Chapter 3 Cabling information

You need to read this chapter if you want to...

You need to read this chapter if you want cabling information for the Perle SX serial connectivity system hardware.

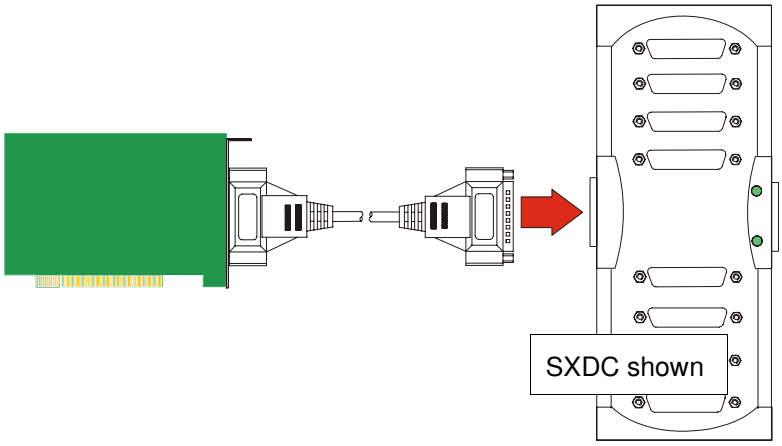
This chapter provides cabling and connector pinout information for the Perle SX system. Included are details of about which cables to use, their pinouts and details of standard cables for use with SX products available from Perle.

This chapter includes the following sections;

Connecting SX host cards to Device Concentrators

You connect each host card to the first of the Device Concentrator you want to use using the 1.5 metre bus extension cable supplied with the host card.

> Note
>
> When connecting SX host cards to Device concentrators or terminal adaptors you should only use the 1.5 metre bus extension cable supplied with your SX host card. **Using any other cable will invalidate your EMC and noise warranty**.



For details of installing host cards and device concentrators, see **Installing a Universal 3.3/ 5V PCI host card** and **Installing an ISA host card** in **Chapter 2 Installing hardware and software**.

Device Concentrator top connector pinouts

To view the connector pinout for the various types of SX device concentrators see the following;

- **SXDC top connector guide;** on page **154**
- **MTA top connector guide** on page **154**
- **TA top connector guide** on page **154**.

SXDC top connector guide;

SXDC type	To find details...
SXDC8/RJX	See **RJ45 female SXDC connector pinout** on page **155**
SXDC8/DX	See **DB25 female SXDC connector pinout** on page **157**
SXDC8/MX	See **DB25 male SXDC connector pinout** on page **160**
SXDC8/PX	See **SXDC8/PX DB25 parallel female connector pinout** on page **162**

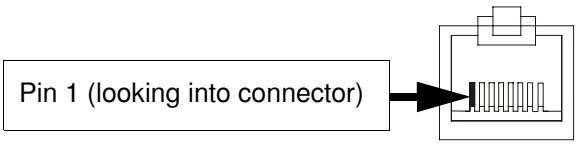
MTA top connector guide

MTA type	To find details...
MTA8/RJX	See **RJ45 female MTA connector pinout** on page **156**
MTA8/D	See **DB25 female MTA connector pinout** on page **158**
MTA8/M	See **DB25 male MTA connector pinout** on page **161**
MTA8/PX	See **SXDC8/PX DB25 parallel female connector pinout** on page **162**

TA top connector guide

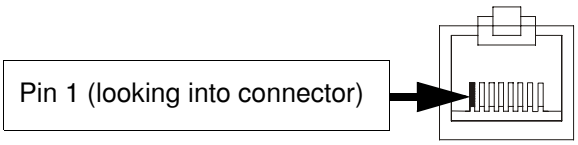
TA type	To find details...
TA4	See **DB25 female TA connector pinout** on page **159**
TA8	See **DB25 female TA connector pinout** on page **159**

RJ45 female SXDC connector pinout



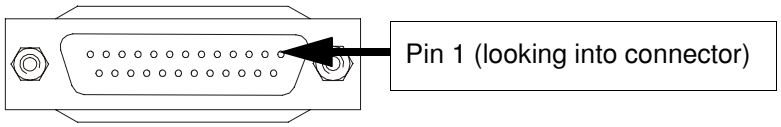
Pin	Signal	Direction	Description
1	DCD	In	Data Carrier Detect
2	DTR	Out	Data Terminal Ready
3	DSR	In	Data Set Ready
4	S/GND		Signal ground
5	TXD	Out	Transmit Data
6	RXD	In	Receive Data
7	RTS	Out	Request To Send
8	CTS	In	Clear To Send
Shield			

RJ45 female MTA connector pinout



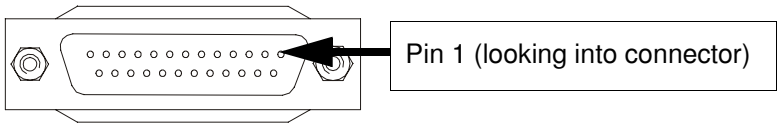
Pin	Signal	Direction	Description
1	DCD	In	Data Carrier Detect
2	DTR	Out	Data Terminal Ready
3	DSR	In	Data Set Ready
4	S/GND		Signal ground
5	TXD	Out	Transmit Data
6	RXD	In	Receive Data
7	RTS	Out	Request To Send
8	CTS	In	Clear To Send
Shield			

DB25 female SXDC connector pinout



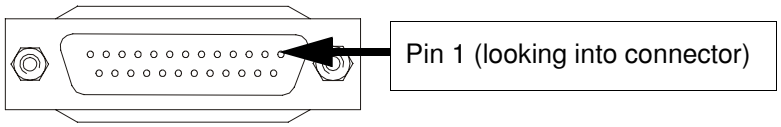
Pin	Signal	Direction	Description
1	Chassis		Chassis ground
2	RXD	In	Transmit Data
3	TXD	Out	Receive Data
4	RTS	In	Request To Send
5	CTS	Out	Clear To Send
6	DSR	Out	Data Set Ready
7	GND		Ground
8	DCD	In	Data Carrier Detect
20	DTR	In	Data Terminal Ready
22	RI	In	Ring Indicator

DB25 female MTA connector pinout



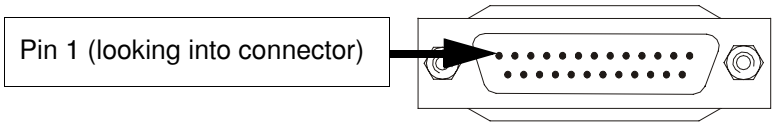
Pin	Signal	Direction	Description
1	Chassis		Chassis ground
2	RXD	In	Transmit Data
3	TXD	Out	Receive Data
4	RTS	In	Request To Send
5	CTS	Out	Clear To Send
6	DSR	Out	Data Set Ready
7	GND		Ground
8	DCD	In	Data Carrier Detect
20	DTR	In	Data Terminal Ready
22	RI	In	Ring Indicator

DB25 female TA connector pinout



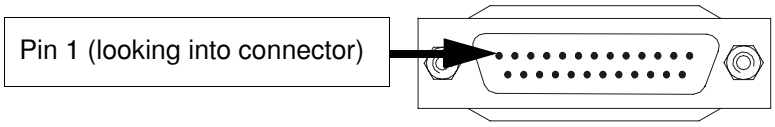
Pin	Signal	Direction	Description
1	Chassis		Chassis ground
2	RXD	In	Transmit Data
3	TXD	Out	Receive Data
4	RTS	In	Request To Send
5	CTS	Out	Clear To Send
6	DSR	Out	Data Set Ready
7	GND		Ground
8	DCD	In	Data Carrier Detect
20	DTR	In	Data Terminal Ready
22	RI	In	Ring Indicator

DB25 male SXDC connector pinout



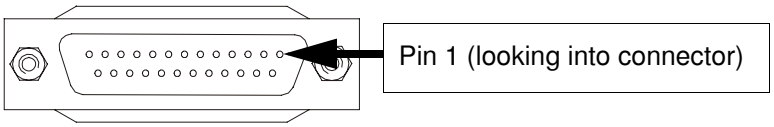
Pin	Signal	Direction	Description
2	TXD	Out	Transmit Data
3	RXD	In	Receive Data
4	RTS	Out	Request To Send
5	CTS	In	Clear To Send
6	DSR	In	Data Set Ready
7	GND		Ground
8	DCD	In	Data Carrier Detect
20	DTR	Out	Data Terminal Ready
22	RI	In	Ring Indicator

DB25 male MTA connector pinout



Pin	Signal	Direction	Description
2	TXD	Out	Transmit Data
3	RXD	In	Receive Data
4	RTS	Out	Request To Send
5	CTS	In	Clear To Send
6	DSR	In	Data Set Ready
7	GND		Ground
8	DCD	In	Data Carrier Detect
20	DTR	Out	Data Terminal Ready
22	RI	In	Ring Indicator

SXDC8/PX DB25 parallel female connector pinout



Pin	Signal	Direction	Description
1	STROBEN*	Output	PSTROBE
2	D0	Output	DATA 1
3	D1	Output	DATA 2
4	D2	Output	DATA 3
5	D3	Output	DATA 4
6	D4	Output	DATA 5
7	D5	Output	DATA 6
8	D6	Output	DATA 7
9	D7	Output	DATA 8
10	PACKN*	Input	ACK
11	PBUSY	Input	BUSY
12	PPE	Input	PE
13	PSLCT	Input	SLCT
14	AUTOFDXT*	Output	AUTOFEED
15	PERRORN*	Input	FAULT
16	PINITN*	Output	INPUT PRIME
17	PSLINN*	Output	SLCT IN
18	GND	–	GROUND
19	GND	–	GROUND
20	GND	–	GROUND
21	GND	–	GROUND
22	GND	–	GROUND
23	GND	–	GROUND
24	GND	–	GROUND
25	GND	–	GROUND

Connecting combinations of Device Concentrator types

This section explains about mixing different types of device concentrator (TA, MTA and SXDC8) on a connection to a single host card and includes the following:

Connecting a single host card to device concentrators

> Note
>
> You cannot connect multiple device concentrator types to single SX host card. For example SXDCs and MTAs.
>
> To connect multiple device concentrator types to a single machine for example, use multiple host cards, one for each device concentrator type.

Device concentrator type	Maximum number of ports per host card	Device concentrators required
TA8 and TA4	32	Any mixture of TA8s and TA4s giving 32 ports.
TA8	32	4 TA8s.
TA4	16	4 TA4s.
MTA	128	4 MTAs.
SXDC*	128	SXDC8s.

Connecting multiple host cards to device concentrators

> Note
>
> When using multiple host cards, fir example in the same machine, use one host card for each device concentrator type.
>
> You cannot connect multiple device concentrator types to s single SX host card. For example SXDCs and MTAs.

Connecting Device Concentrators to terminals

To connect your Device Concentrator to a terminal you use the cable types detailed in the next table

Device Concentrator type	Cable description (Device Concentrator to Terminal)	To find details...
SXDC8/RJX	RJ45 male to DB25 male DTE.	See page 171.
SXDC8/DX	DB25 male to DB25 male DTE	See page 172.
SXDC8/MX	DB25 female to DB25 male DTE	See page 173.
SXDC8/PX **port1**	DB25 parallel male to centronics parallel	See page 177
SXDC8/PX **ports 2,3 and 4**	DB25 male to DB25 male DTE	See page 172
SXDC8/PX **ports 5, 6,7 and 8**	DB25 male to DB25 male DTE	See page 172
SXDC8/422	DB25 male to DB25 male DTE	See page 173.
MTA/RJX	RJ45 male to DB25 male DTE.	See page 171.
MTA/DX	DB25 male to DB25 male DTE	See page 172.
MTA/MX	DB25 female to DB25 male DTE	See page 173.
MTA/PX **port1**	DB25 parallel male to centronics parallel	See page 177
MTA/PX **ports 2,3 and 4**	DB25 male to DB25 male DTE	See page 172
MTA/PX **ports 5, 6,7 and 8**	DB25 male to DB25 male DTE	See page 172
MTA/422	DB25 male to DB25 male DTE	See page 173.
TA4	DB25 male to DB25 male DTE	See page 171
TA8	DB25 male to DB25 male DTE	See page 171

Connecting Device Concentrators to modems

To connect your Device Concentrator to a modem you use the cable types detailed in the next table;

Device Concentrator type	Cable description (RTA to Terminal)	To find details ...
SXDC8/RJX	RJ45 male to DB25 male DCE	See **page 174**.
SXDC8/DX	DB25 male to DB25 male DCE	See **page 175**.
SXDC8/MX	DB25 female to DB25 male DCE	See **page 176**.
SXDC8/P **port1**	DB25 parallel male to centronics parallel	See **page 177**.
SXDC8/P **ports 2,3 and 4**	DB25 male to DB25 male DTE	See **page 172**.
SXDC8/P **ports 5, 6,7 and 8**	DB25 male to DB25 male DTE	See **page 172**.
SXDC8/422	DB25 male to DB25 male DCE	See **page 175**.
MTA/RJX	RJ45 male to DB25 male DCE	See **page 174**.
MTA/DX	DB25 male to DB25 male DCE	See **page 175**.
MTA/MX	DB25 female to DB25 male DCE	See **page 176**.
MTA/P **port1**	DB25 parallel male to centronics parallel	See **page 177**.
MTA/P **ports 2,3 and 4**	DB25 male to DB25 male DTE	See **page 172**.
MTA/P **ports 5, 6,7 and 8**	DB25 male to DB25 male DTE	See **page 172**.
MTA/422	DB25 male to DB25 male DCE	See **page 175**.
TA4	DB25 male to DB25 male DCE	See **page 175**.
TA8	DB25 male to DB25 male DCE	See **page 175**.

Connecting Device Concentrators to parallel printers

To connect your Device Concentrator to a parallel printer you use the cable types detailed in the next table;

RTA type	Cable description (RTA to Terminal)	To find details...
SXDC8/PX	DB25 Parallel male to centronics parallel connector	See page 177.
MTA/PX	DB25 Parallel male to centronics parallel connector	See page 177.

Connecting Device Concentrators to serial printers

To connect your RTA to a serial printer you use the cable types detailed in the next table

RTA type	Cable description (RTA to Terminal)	To find details...
SXDC8/RJX	RJ45 male to DB25 male DTE	See **page 171**.
SXDC8/DX	DB25 male to DB25 male DTE	See **page 172**.
SXDC8/MX	DB25 female to DB25 male DTE	See **page 173**.
SXDC8/P **port1**	DB25 parallel male to centronics parallel	See **page 177**
SXDC8/P **ports 2,3 and 4**	DB25 male to DB25 male DTE	See **page 172**
SXDC8/P **ports 5, 6,7 and 8**	DB25 male to DB25 male DTE	See **page 172**
SXDC8/422	DB25 male to DB25 male DTE	See **page 172**.
MTA/RJX	RJ45 male to DB25 male DTE	See **page 171**.
MTA/DX	DB25 male to DB25 male DTE	See **page 172**.
MTA/MX	DB25 female to DB25 male DTE	See **page 173**.
MTA/P **port1**	DB25 parallel male to centronics parallel	See **page 177**
MTA/P **ports 2,3 and 4**	DB25 male to DB25 male DTE	See **page 172**
MTA/P **ports 5, 6,7 and 8**	DB25 male to DB25 male DTE	See **page 172**
MTA/422	DB25 male to DB25 male DTE	See **page 172**.
TA4	DB25 male to DB25 male DTE	See **page 172**.
TA8	DB25 male to DB25 male DTE	See **page 172**.

Connecting Device concentrators to host cards

This section explains about mixing different types of device concentrator (TA, MTA and SXDC8) on a connection to a single host card and includes the following:

Connecting a single host card to device concentrators

> Note
>
> You cannot connect multiple device concentrator types to a single SX host card. For example SXDCs and MTAs.
>
> To connect multiple device concentrator types to a single machine for example, use multiple host cards, one for each device concentrator type.

Device concentrator type	Maximum number of ports per host card	Device concentrators required
TA8 and TA4	32	Any mixture of TA8s and TA4s giving 32 ports.
TA8	32	4 TA8s.
TA4	16	4 TA4s.
MTA	128	4 MTAs.
SXDC*	128	SXDC8s.

Connecting multiple host cards to device concentrators

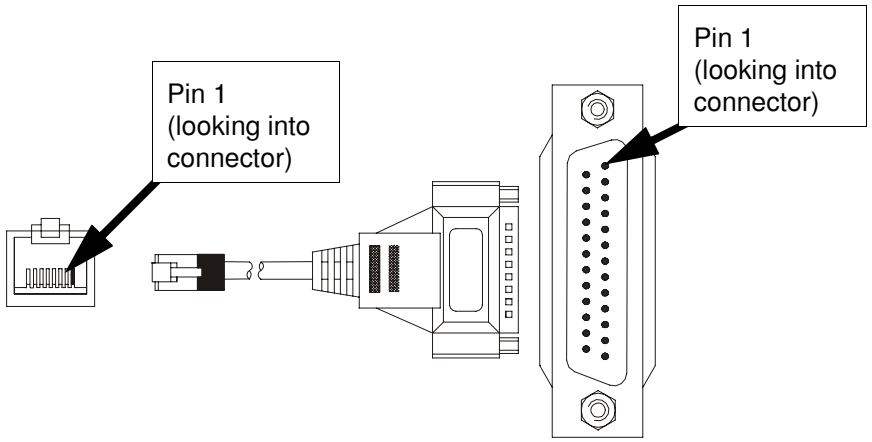
> Note
>
> When using multiple host cards, for example in the same machine, use one host cards for each device concentrator type.
>
> You cannot connect multiple device concentrator types to a single SX host card. For example SXDCs and MTAs.

Cable connector pinouts

RJ45 male to DB25 male DTE for connection to DCE devices

Typical uses This type of cable is used to connect to DCE devices such as Modems.

Cable diagram



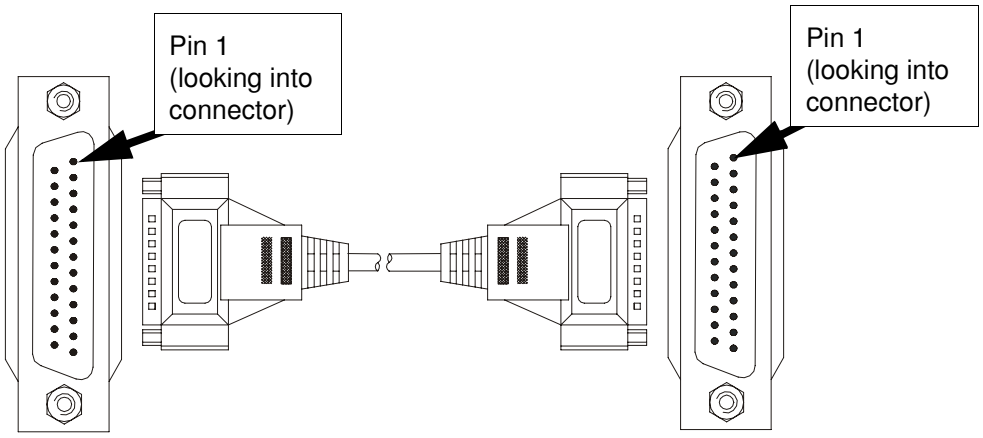
Connector pinout table

RJ45				DB25		
Pin	**Signal**	**Direction**	**Description**	**Pin**	**Signal**	**Description**
1	DCD	In	Data Carrier Detect	8	DCD	Data Carrier Detect
2	DTR	Out	Data Terminal Ready	20	DTR	Data Terminal Ready
3	DSR	In	Data Set Ready	6	DSR	Data Set Ready
4	S/GND		Signal ground	7	S/GND	Signal ground
5	TXD	Out	Transmit Data	2	TXD	Transmit Data
6	RXD	In	Receive Data	3	RXD	Receive Data
7	RTS	Out	Request To Send	4	RTS	Request To Send
8	CTS	In	Clear To Send	5	CTS	Clear To Send
Shield						Chassis ground

DB25 male to DB25 male DTE for connection to DCE devices

Typical uses This type of cable is used to connect to DCE devices such as Modems.

Cable diagram

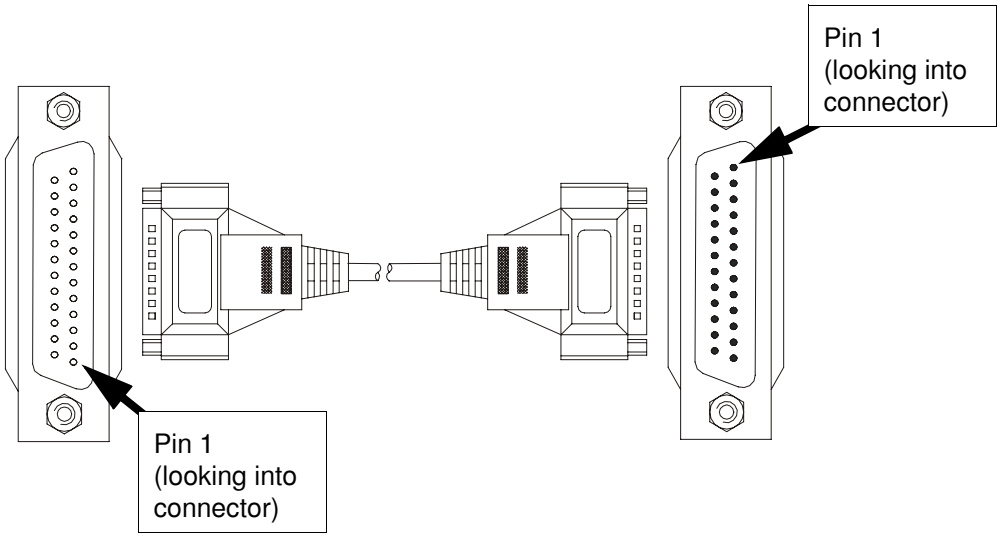


Connector pinout table

DB25				DB25		
Pin	**Signal**	**Direction**	**Description**	**Pin**	**Signal**	**Description**
1	Chassis		Chassis ground	1	Chassis	Chassis ground
2	TXD	In	Transmit Data	3	RXD	Receive Data
3	RXD	Out	Receive Data	2	TXD	Transmit Data
4	RTS	In	Request To Send	5	CTS	Clear To Send
5	CTS	Out	Clear To Send	4	RTS	Request To Send
6	DSR	Out	Data Set Ready	20	DTR	Data Terminal Ready
7	GND		Ground	7	GND	Ground
8	DCD	In	Data Carrier Detect	8	DCD	Data Carrier Detect
20	DTR	In	Data Terminal Ready	6	DSR	Data Set Ready

DB25 female to DB25 male DTE for connection to DCE devices

Cable diagram



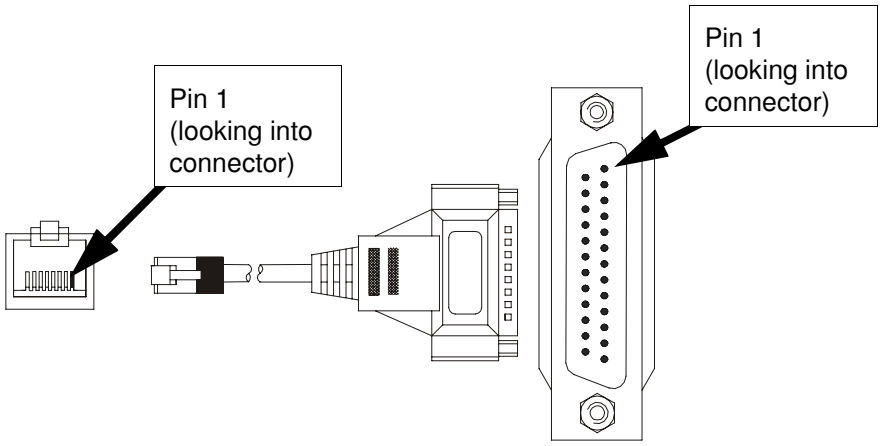
Connector pinout table

DB25				DB25		
Pin	**Signal**	**Direction**	**Description**	**Pin**	**Signal**	**Description**
2	TXD	Out	Transmit Data	2	TXD	Transmit Data
3	RXD	In	Receive Data	3	RXD	Receive Data
4	RTS	Out	Ready to send	4	RTS	Ready to send
5	CTS	In	Clear to send	5	CTS	Clear to send
6	DSR	In	Data Set Ready	6	DSR	Data Set Ready
7	GND		Ground	7	GND	Ground
8	DCD	In	Data Carrier Detect	8	DCD	Data Carrier Detect
20	DTR	Out	Data Terminal Ready	20	DTR	Data Terminal Ready

RJ45 male to DB25 female DCE for connection to DTE devices

Typical uses This type of cable is used to connect to DTE devices such as Terminals, PCs or printers.

Cable diagram



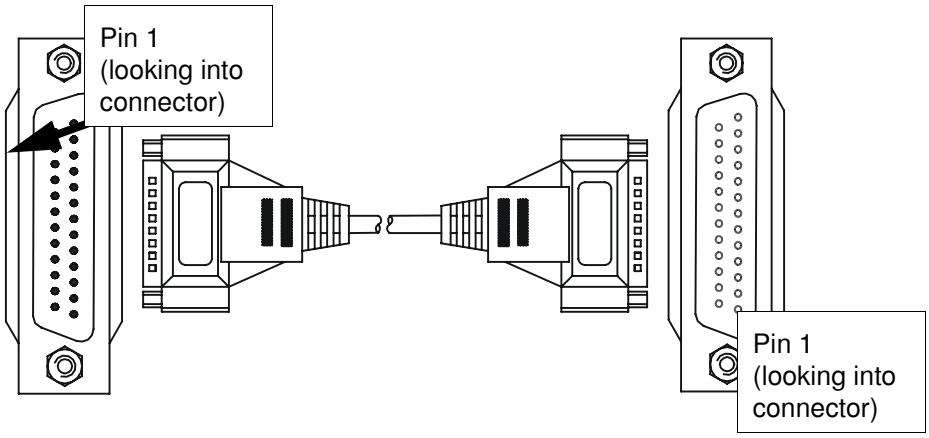
Connector pinout table

RJ45				DB25 pin		
Pin	**Signal**	**Direction**	**Description**	**Pin**	**Signal**	**Description**
1	DCD	In	Data Carrier Detect	8	DCD	Data Carrier Detect
2	DTR	Out	Data Terminal Ready	6	DSR	Data Set Ready
3	DSR	In	Data Set Ready	20	DTR	Data Terminal Ready
4	S/GND		Signal ground	7	S/GND	Signal ground
5	TXD	Out	Transmit Data	3	RXD	Receive Data
6	RXD	In	Receive Data	2	TXD	Transmit Data
7	RTS	Out	Request To Send	5	CTS	Clear To Send
8	CTS	In	Clear To Send	4	RTS	Request To Send
Shield						Chassis ground

DB25 male to DB25 female DCE for connection to DTE devices

Typical uses This type of cable is used to connect to DTE devices such as Terminals, PCs or printers.

Cable diagram



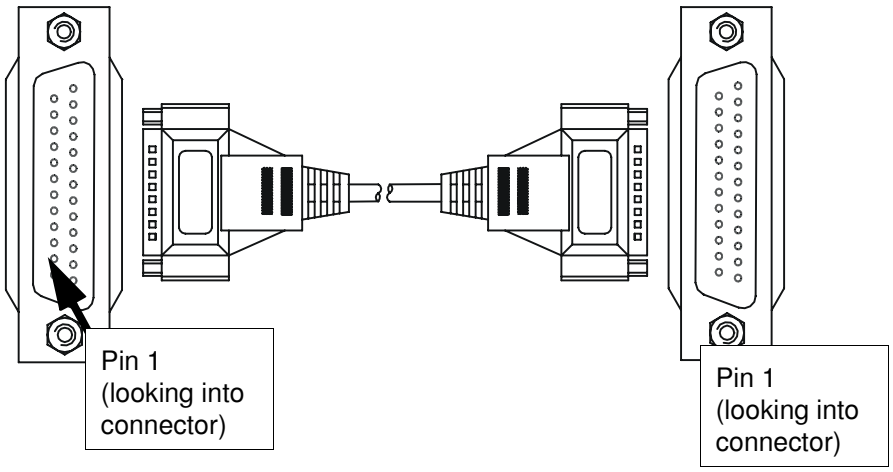
Connector pinout table

DB25				DB25		
Pin	**Signal**	**Direction**	**Description**	**Pin**	**Signal**	**Description**
2	TXD	In	Transmit Data	2	TXD	Transmit Data
3	RXD	Out	Receive Data	3	RXD	Receive Data
4	RTS	In	Request To Send	4	RTS	Request To Send
5	CTS	Out	Clear To Send	5	CTS	Clear To Send
6	DSR	Out	Data Set Ready	6	DSR	Data Set Ready
7	GND		Ground	7	GND	Ground
8	DCD	In	Data Carrier Detect	8	DCD	Data Carrier Detect
20	DTR	In	Data Terminal Ready	20	DTR	Data Terminal Ready

DB25 female to DB25 female DCE for connection to DTE devices

Typical uses This type of cable is used to connect to DTE devices such as Terminals, PCs or printers.

Cable diagram



Connector pinout table

DB25				DB25		
Pin	**Signal**	**Direction**	**Description**	**Pin**	**Signal**	**Description**
2	TXD	Out	Receive Data	3	RXD	Transmit Data
3	RXD	In	Transmit Data	2	TXD	Receive Data
4	RTS	Out	Request To Send	5	CTS	Clear To Send
5	CTS	In	Clear To Send	4	RTS	Request To Send
6	DSR	In	Data Set Ready	20	DTR	Data Terminal Ready
7	GND		Ground	7	GND	Ground
8	DCD	In	Data Carrier Detect	8	DCD	Data Carrier Detect
20	DTR	Out	Data Terminal Ready	6	DSR	Data Set Ready

DB25 parallel male to Centronics parallel

Note

The following pinout is included for information only and shows the DB25 pinout only. If you require this type of cable, we recommend obtaining a suitable standard PC parallel printer cable rather than making one.

* Denotes active low.

Pin	Signal	Direction	Description
1	STROBEN*	Output	PSTROBE
2	D0	Output	DATA 1
3	D1	Output	DATA 2
4	D2	Output	DATA 3
5	D3	Output	DATA 4
6	D4	Output	DATA 5
7	D5	Output	DATA 6
8	D6	Output	DATA 7
9	D7	Output	DATA 8
10	PACKN*	Input	ACK
11	PBUSY	Input	BUSY
12	PPE	Input	PE
13	PSLCT	Input	SLCT
14	AUTOFDXT*	Output	AUTOFEED
15	PERRORN*	Input	FAULT
16	PINITN*	Output	INPUT PRIME
17	PSLINN*	Output	SLCT IN
18	GND	–	GROUND
19	GND	–	GROUND
20	GND	–	GROUND
21	GND	–	GROUND
22	GND	–	GROUND
23	GND	–	GROUND
24	GND	–	GROUND
25	GND	–	GROUND

Loopback connector pinouts

The type of loopback connector you require depends upon the connector type fitted to your device concentrator (described in **Device Concentrator top connector pinouts** on page **153**) See one of the following sections for pinouts;

- **Loopback pinouts for RJ45 female connectors** on page **179**
- **Loopback pinouts for DB25 female connectors** on page **180**
- **Loopback pinouts for DB25 male connectors** on page **181**.

For details of loopback and other tests see **Appendix D Troubleshooting**.

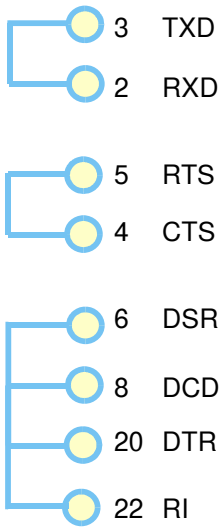
Loopback pinouts for RJ45 female connectors

To test this type of port, your loopback connector needs to join together the connector pins shown in the next picture.

For details of RJ45 female connector pinouts see **page 155**.

Loopback pinouts for DB25 female connectors

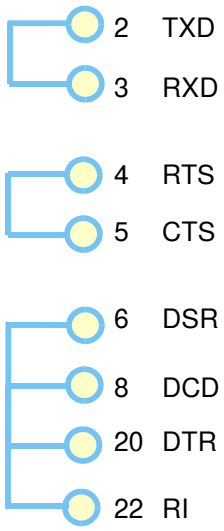
To test this type of port, your loopback connector needs to join together the connector pins shown in the next picture.



For details of DB25 female connector pinouts see **page 157**.

Loopback pinouts for DB25 male connectors

To test this type of port, your loopback connector needs to join together the connector pins shown in the next picture.



For details of DB25 male connector pinouts see **page 160**.

Chapter 4 Quick reference

You need to read this chapter if you want to...

You need to read this chapter if you want information in quick reference form about the utilities provided with the SX Serial adaptor cards.

This chapter provides a quick reference guide to the software utilities provided with the SX Serial adaptor cards. The utilities are grouped under operating system and include main windows and menus. In addition, cross references are provided for further information about each area.

This chapter includes the following sections;

Solaris utilities

sxisacfg utility

The **sxisacfg** utility allows you to define addresses and IRQ levels for SX ISA host cards you add to the system. If are unable to find a free interrupt level for the card you are installing, **sxisacfg** also allows you to toggle the driver into polled mode (this is a global property that applies to all cards).

The command syntax for this utility is as follows;

sxisacfg [**-n**<name>] [**-m**<addr>] [**-i**<irq>] [**-p**] [**-a**<ioaddr>] [**-d**<name>]

Where:

Command	Description
-n<name>	Specifies the host card name.
-m<addr>	Specifies host card memory address.
-i<irq>	Specifies host card interrupt level.
-p	Toggles the state of polling (default state is interrupt mode).
-a<ioaddr>	Specifies the host card i/o address.
-d<name>	Deletes the named host card entry.
-l	Lists the current configuration including the ISA cards installed and the Polling mode selected.

Some typical example commands are shown below;

Example command	Description
/etc/sxisacfg -n ISA1 -m 0xD0000 -i 9	Set host card parameters.
sxisacfg -p	Sets polling.
sxisacfg -d ISA1	Deletes an ISA card.

For information on using the **rioisacfg** utility to assign host card addresses and IRQ levels, see **Assigning ISA host card addresses and IRQ levels** on page **31** in **Chapter 2 Installing hardware and software**.

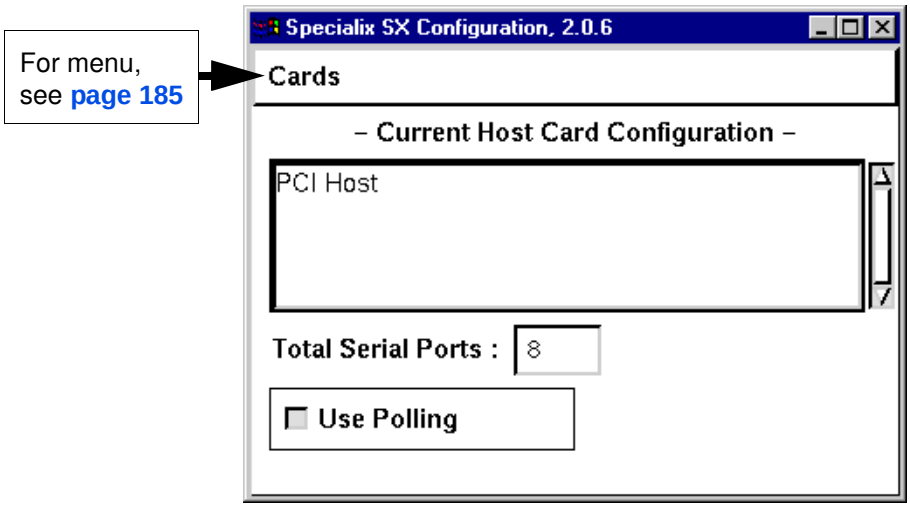
SCO OpenServer 5 utilities

A number of utilities are provided for use with the SCO OpenServer 5 operating system. See the following sections for information about main windows and menus;

- **Host Card Configuration utility** on page **184**
- **Serial Port Enable utility** on page **186**

Host Card Configuration utility

The main window for the Host Card Configuration tool is shown in the next picture. See **Menu map** on page **185** for details of menus.

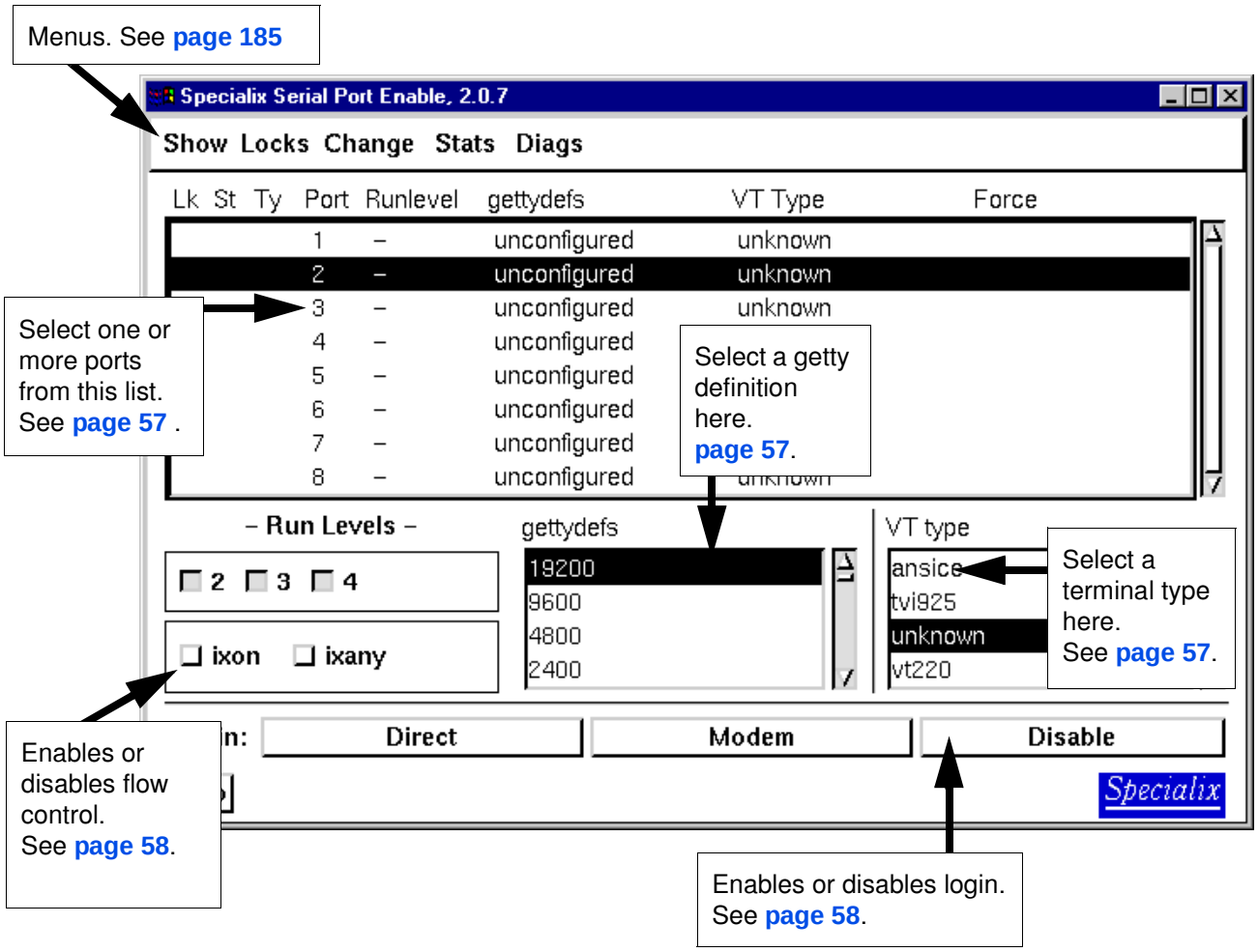


Menu map The Host Card Configuration tool menu is as follows;

Menu option		Description
Card >	**Quit**	Quit the Host Card Configuration tool without saving. See **page 47**.
	Add	Add a new host card address. See **page 47**.
	Remove	Remove a host card address. See **page 47**.
	Edit	Edit an existing host card address. See **page 47**.
	Save and exit	Exit the Host Card Configuration tool and save any changes. See **page 47**.

Serial Port Enable utility

The main window for the Serial Port Enable tool is shown in the next picture. See **Menu map** on page **187** for details of menus.



Menu map The Serial Port Enable utility menu is as follows;

Menu option		Description
Show >	**Modems**	Displays all ports configured as modems. See **page 58**.
	Direct	Shows all ports configured to directly connect to a terminal with no modem in between. See **page 58**.
	Unconfigured	Displays all unconfigured ports. See **page 58**.
	All	Displays all ports. See **page 58**.
	Exit	Exits the Serial Port Enable utility and saves any changes. See **page 59**.
Locks >	**Lock**	Locks Serial Port Enable settings preventing other users from changing them. See **page 59**.
	Unlock	Unlocks Serial Port Enable settings allowing other users to change them. See **page 59**.
Change >	**VT Type**	Changes the VT type used by the currently selected port to that currently highlighted in the **VT Type** field. See **page 57**.
	ixon/ixany	Changes the ixon/ixany setting for the currently selected port to that currently set in either the ixon/ixany toggle button. See **page 58**.

Menu option		Description
Stats >	**Enable**	Enables recording of port statistics for the currently selected port. See **page 55**.
	Disable	Disables recording of port statistics for the currently selected ports. See **page 55**.
	Clear	Clears the recorded port statistics for the currently selected ports. See **page 55**.
	Show	Displays shows the port statistics recorded for the currently selected port in a separate **Port Statistics** window. See **page 55**.
Diags >	**Test**	Runs the Ports Diagnostics Utility on the currently selected port. See **page 215**.
	Pins	Displays the pin status for the currently selected port in a separate **Pin Status** window. See **page 215**.
	Settings	Displays the port settings for the currently selected port in a separate **Port Settings** window. See **page 215**.

SCO UnixWare utilities

Device configuration utility

The main window for the Device Configuration Utility is shown in the next picture.

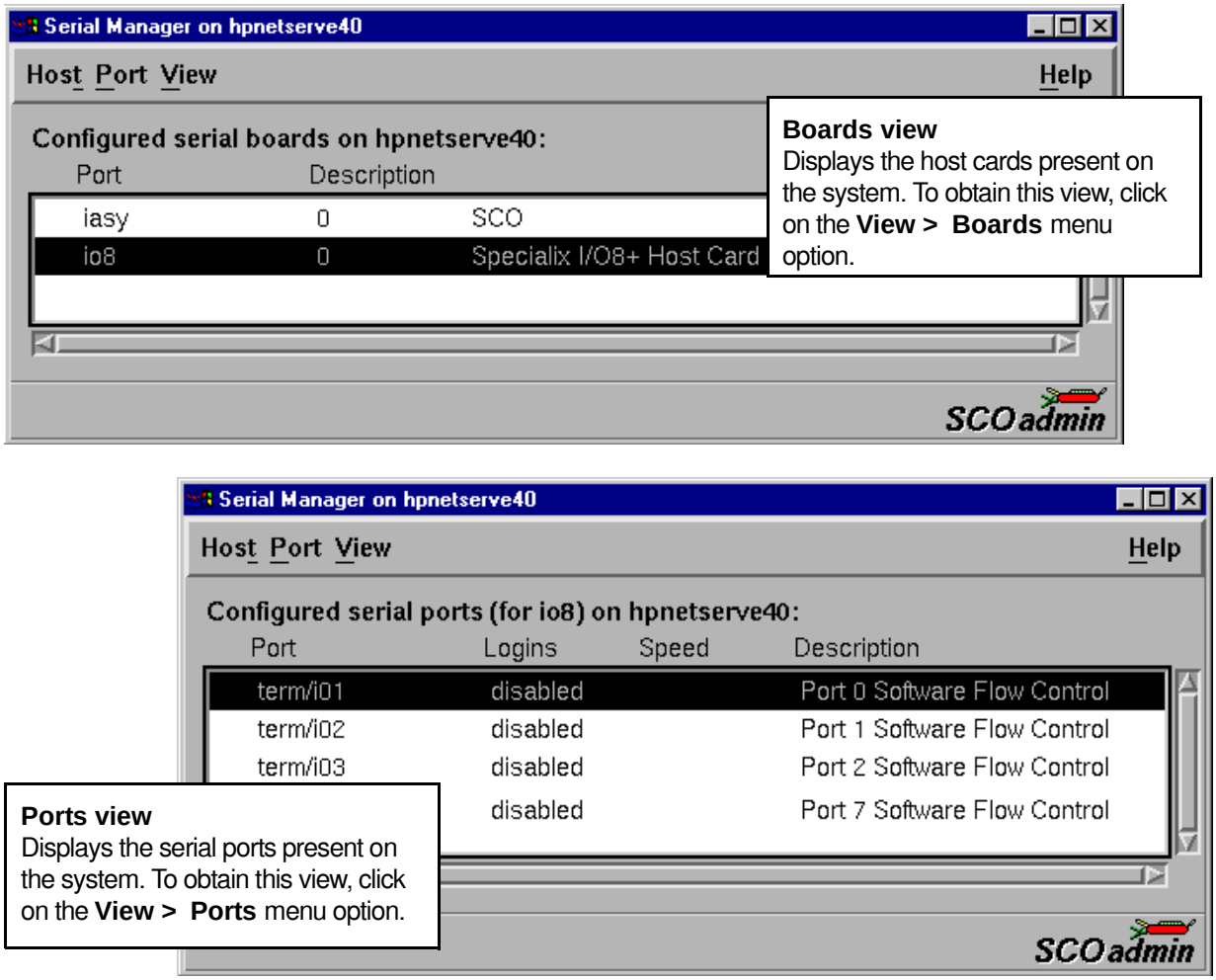
Menu map The menu is as follows;

Menu option	Description
Hardware Device Configuration >	Displays the Hardware Device Configuration window which allows you to set host card addresses and IRQ levels. See **page 85**.
Software Device Drivers >	Displays the Software Driver Device selections window which allows you to select a software device driver type to display. See **page 85**.
Apply Changes & Exit DCU >	Apply configuration changes and exit the Hardware Device Configuration Utility. See **page 85**.
Exit DCU and Cancel Changes >	Exit the Hardware Device Configuration Utility and cancel any changes. See **page 85**.

Serial Manager

Main window

The main window for the Serial Manager is shown in the next picture.You can display this window in one of two views, Board view and Ports view. See page 191 for menu maps.



Menu map The Serial Manager menu is as follows;

Menu option		Description
Host >	**Open Host**	Selects a host machine. See your SCO UnixWare documentation for further details.
	Exit	Exit Serial Manager.
Port >	**Modify**	Modifies serial port settings. See **page 95**.
View >	**Ports**	Show serial ports available for the currently selected host card. See **page 95**.
	Boards	Show host cards present on the system. See **page 95**.

Appendix A Serial port device names

You need to read this appendix if you want to...

You need to read this appendix if you want information about device names for the Perle SX serial adaptor cards.

This appendix provides information about the device nodes associated with each serial port for the Perle SX serial adaptor cards. Included are naming conventions, functions, file locations and some additional information about the Data terminal ready and Ready to send signals.

This chapter includes the following sections;

Under Solaris

Device node details

Each serial port has three device nodes associated with it. Each node takes the form of a file which you can access from operating system utilities and user applications. Details of these nodes are shown in the next table.

Device name	Function	Description	Location
a<n> where n is number of ports from 0 upwards	Normal communications port	Indicates normal communications port behaviour.	/dev/term
a<n>	Normal communications port wait for DCD on open	Indicates a port open will not complete unless the DCD signal is present.	/dev/cua
a<n>	Print device	Indicates that device should only be used for transparent print.	/dev/xprt

Under SCO OpenServer

Device node details

Each serial port has three device nodes associated with it. Each node takes the form of a file which you can access from operating system utilities and user applications. Details of these nodes are shown in the next table.

Device name	Function	Description	Location
ttya1	Normal communications port	Indicates normal communications port behaviour.	/dev
ttyA1	Normal communications port wait for DCD on open	Indicates a port open will not complete unless the DCD signal is present.	/dev
ttya1p	Print device	Indicates that device should only be used for transparent print.	/dev

DTR and RTS signal information

The serial ports on SX serial adaptor cards use the same pin (pin3 on the RJ12 connector see **Chapter 3 Cabling information**) for the **D**ata **T**erminal **R**eady and **R**eady **T**o **S**end signals. The function of the pin depends on the way you open the port as shown in the next table.

Device name	Function	Signal	Description
ttya1	Normal communications port.	RTS	**R**eady **T**o **S**end. Used for hardware flow control.
ttyA1	Normal communications port wait for DCD on open.	DTR	**D**ata **T**erminal **R**eady. This pin cannot be used for hardware flow control when this type of device is opened.

Under SCO UnixWare

Device node details

Each serial port has three device nodes associated with it. Each node takes the form of a file which you can access from operating system utilities and user applications. Details of these nodes are shown in the next table.

Device name	Function	Description	Location
a1	Normal communications port	Indicates normal communications port behaviour.	/dev/term
A1	Modem port	Indicates a port open will not complete unless the DCD signal is present.	/dev/term
a1p	Transparent print ports	Indicates that device should only be used for transparent print.	/dev/term

> Note
>
> You can only open the transparent print port can when the corresponding normal port is open.

Under Windows NT

Device node details

Each serial port has a single device name associated with it: **comx**

Under Windows 2000/XP/Server 2003/Vista/Server 2008

Device node details

Each serial port has a single device name associated with it: **comx**

Under Linux

Device node details

Each serial port has two device nodes associated with it. Each node takes the form of a file which you can access from operating system utilities and user applications. Details of these nodes are shown in the next table.

Device name	Function	Description	Location
ttyX1	Normal communications port	Indicates normal communications port behaviour.	/dev
cvx1	Modem port	Indicates a port open will not complete unless the DCD signal is present.	/dev

Appendix B Obtaining baud rates above 38400

You need to read this appendix if you want to...

You need to read this appendix if you want to use baud rates above 38400 under the Solaris, SCO OpenServer and SCO UnixWare operating systems with SX.

This appendix provides information about the spxbaudmap utility which allows you to use baud rates greater then 384000 when using SX with the Solaris, SCO OpenServer and SCO UnixWare operating systems.

This following sections are included;

Introduction to spxbaudmap

Under the Solaris, SCO OpenServer and SCO UnixWare operating systems, the SX software includes a utility called spxbaudmap which allows you to set extended baud rates for a given port above 38400 by mapping existing baud rates to higher speeds.

Typically, you use spxbaudmap when you want to use peripherals which can operate above a baud rate of 38400.

You use spxbaudmap after you have installed and configured your system using the steps given in **Chapter 2 Installing hardware and software** for your operating system. The revised settings for a port will be used the next time the port is opened.

> Note
>
> This command needs to be run before the affected devices are started.You need to run spxbaudmap on each port whose baud rate you want to extend

> Hint
>
> You can include the **spxbaudmap** command in your start up script under the **/etc/rc2.d** directory.

Using spxbaudmap

To use spxbaudmap proceed as follows;

1. Decide on the extended baud rate you require and use the next table to determine the settings you need to obtain that value.

To obtain this baud rate ..	Set Standard baud rate to... (See page 25)	Set Mapping multipier to..	Mapping state	Example command
14400	600	24	on	**spxbaudmap -f /dev/term/s1 -x 24 -m on -v**
28800	1200	24		**spxbaudmap -f /dev/term/s1 -x 24 -m on -v**
57600 (2 options)	50	1		**spxbaudmap -f /dev/term/s1 -x 1 -m on -v**
	2400	24		**spxbaudmap -f /dev/term/s1 -x 24 -m on -v**
115200 (2 options)	110	1		**spxbaudmap -f /dev/term/s1 -x 1 -m on -v**
	4800	24		**spxbaudmap -f /dev/term/s1 -x 24 -m on -v**
230400	9600	24		**spxbaudmap -f /dev/term/s1 -x 24 -m on -v**
460800	19200	24		**spxbaudmap -f /dev/term/s1 -x 24 -m on -v**
921600	38400	24		**spxbaudmap -f /dev/term/s1 -x 24 -m on -v**

2. Install and configure your system using the standard baud rate setting needed to obtain the extended baud rate you want. See **Chapter 2 Installing hardware and software**.
3. At the command prompt, type
   spxbaudmap [**-f** <device>] [**-x** <n>] [**-m** <state>] [**-q**] [**-v**] and press the **Enter** key.

   Where;

Parameter	Description	Typical values
device	device name	/dev/term/a1 or /dev/ttya1
-x <n>	mapping multiplier	1 or 24
state	enables or disables baud rate mapping	on/off
-q	Displays actual baud rate used	
-v	Echoes the current version of spxbaudmap	

NOTE: You have to be logged in as root to use the spxbaudmap command.

For example, having set a suitable standard baud rate, to use port /dev/term/a1 with a mapping multiplier of 24 you would type:
spxbaudmap -f /dev/term/a1 -x 24 -m on -v

Then type:
spxbaudmap -f /dev/term/a1 -x 24 -q

And the following line will be displayed:
Mapping: ON Multiplier:24 Baud: 230400

You can now start the device using the revised baud rate.

> **NOTE:** If you already have an application running against the port, you need to close the port and then reopen the port to make the change take effect.

Appendix C Transparent printing

You need to read this appendix if you want to...

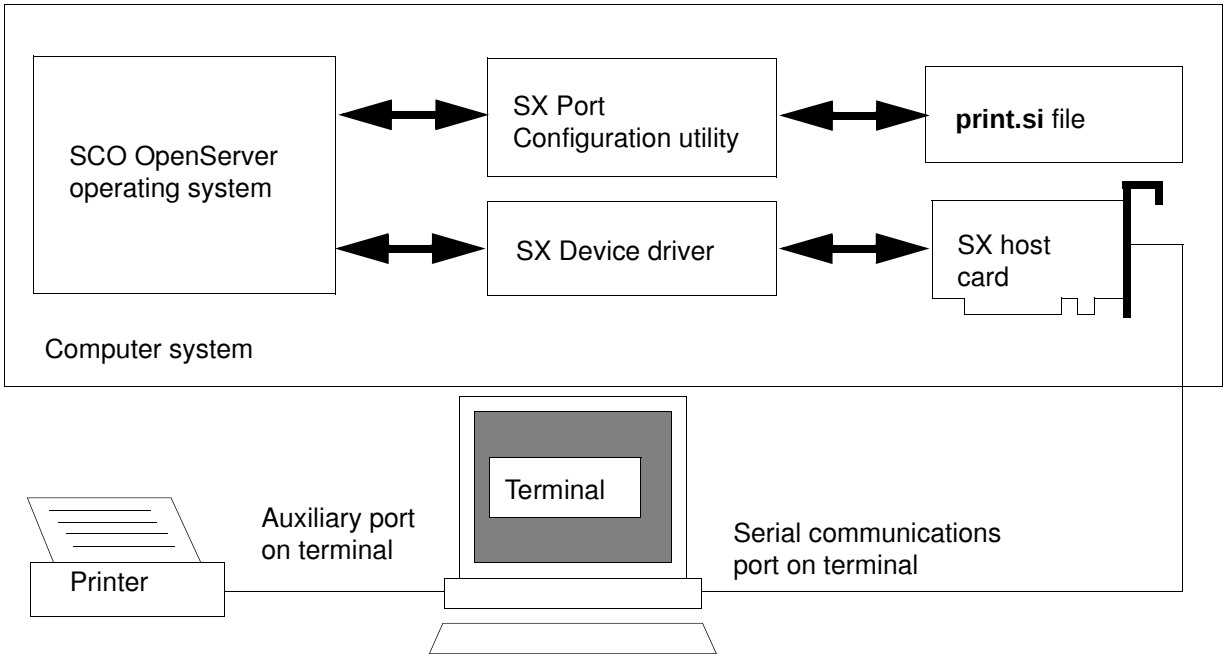
You need to read this appendix if you want general background information on transparent printing.

This appendix gives an overview of the transparent printing feature offered for the SCO OpenServer operating system (although transparent printing can be performed on other operating systems, this appendix uses SCO OpenServer for its examples) and includes details of configuration files associated with transparent printing.

This appendix includes the following sections;

What is transparent printing?

Most terminals have an auxiliary (AUX) port which can be connected to a serial printer. Data can then be output to the terminal or the printer via the same serial line. This is called **transparent print** (or print) and is designed for printing simple ASCII text. A separate print device node (ttyi**n**p where **n** is device number) is created for each port. This device is enabled automatically if either the local or modem device is enabled for the port.



When a host card receives data addressed to the transparent print device it prefixes it with the transparent print mode ON string and appends it with the transparent mode OFF string. The ON and OFF strings for each terminal type available are defined by the **printcap.si** file. See **The printcap.si configuration file** on page **203** for more details.

When the host card receives data addressed to the transparent print device, it prefixes it with the Transparent Print Mode ON string and appends it with the Transparent Print Mode OFF string. Terminal I/O has absolute priority over printer output. Transparent print data will only be sent when there is a break in output to the terminal (for more than a tenth of a second)

For each port, the transparent printing parameters are controlled by an entry in the **print.si** file found in the /etc/ directory on your system. The entry for each port includes definitions of the terminal type, transparent print throughput rate and device name. See **The print.si configuration file** on page **204** for further details.

Problems with printer output

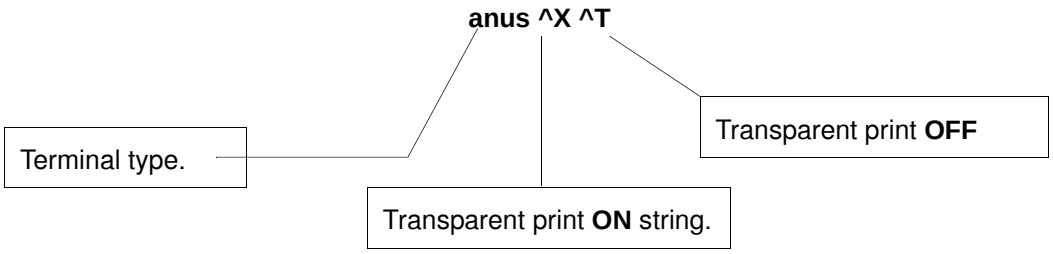
When you use transparent printing you may obtain incorrect printer output due to the following reasons;

Graphics printers may misinterpret some characters output through transparent print. This problem is more likely if the terminal is in 7-bit mode, because 8-bit characters will not be printed.

Some terminals suppress the output of certain characters to their printer or AUX ports. Such terminals can prevent essential control characters from reaching the printer thus generating incorrect printer output. This occurrence is extremely unpredictable because of the large number of potential hardware configurations.

The printcap.si configuration file

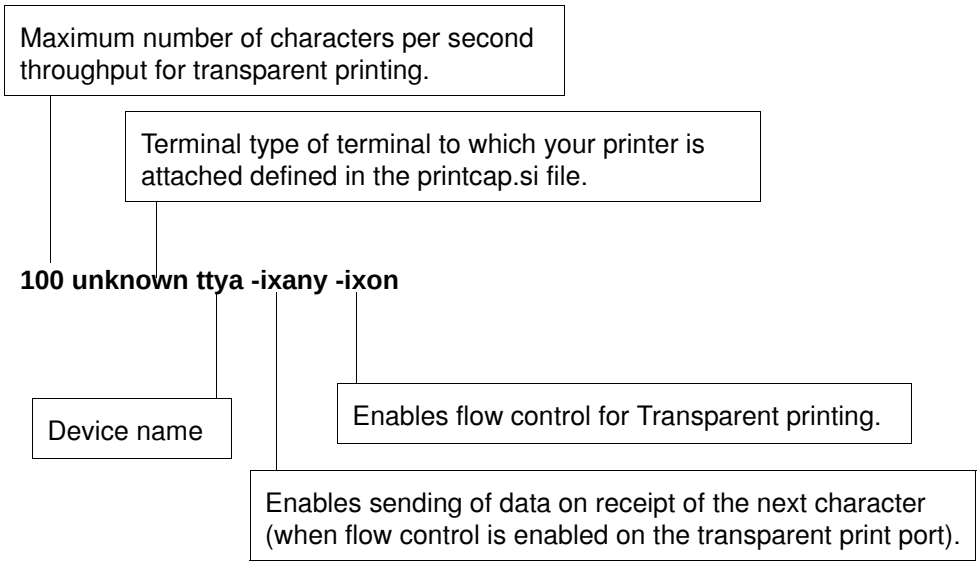
The printcap.si file defines the transparent print ON and OFF strings for each terminal type available. When a host card receives data addressed to the transparent print device it prefixes it with the transparent print mode ON string and appends it with the transparent mode OFF string.



If you don't configure a specific terminal type printcap.slx will use the default type which is "unknown"

The print.si configuration file

For each port, transparent printing is controlled by an entry in the **print.si** file. The **print.si** file is found in the ***/etc/*** directory on your system. The entry for each port includes definitions of the terminal type, transparent print throughput rate, device name. The content of the **print.si** file is normally controlled automatically by either the Port Configuration utility (SCO OpenServer) or the Serial Manager (SCO UnixWare). Under Solaris, you need to edit the file using a suitable text editor. A sample entry from a typical print.si file is shown in the next example.



Appendix D Troubleshooting

You need to read this appendix if you want to...

You need to read this appendix if you want information on troubleshooting for the SX serial connectivity system.

This appendix provides examples of normal boot up messages and a troubleshooting guide including typical problems and corrective action required for all the currently supported operating systems.

> Note
>
> To contact Perle for technical support. see **Appendix E Contacting Perle**.

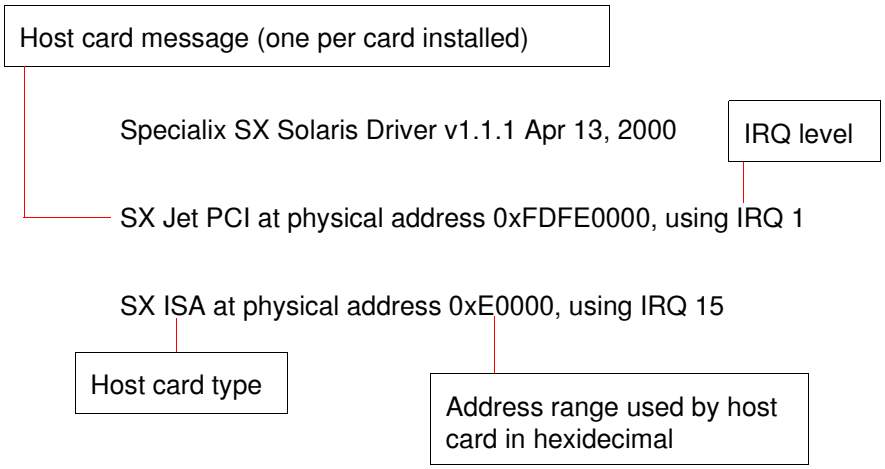
Solaris troubleshooting

This section describes troubleshooting SX products under the Solaris operating system and includes the following sections;

> Note
> To contact Perle for technical support. see **Appendix E Contacting Perle**.

Example of normal boot up messages for host cards

The normal messages for satisfactory host card detection and initialisation form part of the normal Solaris boot up messages and are shown in the next example. This example shows one ISA host card and one PCI host card.



General troubleshooting guide

Problem	Action required
Device driver does not start after installation	1. Ensure PCI host cards have been installed. 2. Ensure ISA card settings have been specified.
No host card boot up message	1. Check physical installation of PCI and ISA host cards. 2. Check ISA board memory settings and ensure they match the settings specified by the sxisacfg utility. 3. Check the interrupt setting on ISA host cards to see if the interrupt specifies by sxisacfg is available for use. 4. For ISA cards check that the memory range is enabled in the PCs BIOS. 5. Run the customer dos diagnostics to check that the card is not faulty
Host card not recognised by system	1. Check physical installation of PCI and ISA host cards, and ensure board correctly seated in bus slot. 2. Check ISA board memory settings, and ensure they match the setting specified by the **sxisacfg** file during installation. 3. Check the interrupt setting on ISA host cards, to see if the interrupt specified by the **sxisacfg** file during installation is available for ISA use. **Note that on most systems it is a requirement that ISA interrupts are reserved in either the BIOS setup, or system configuration program.**

Solaris error messages

Error message	Reason	Action required
Can't locate polling property	Missing sx.conf hardware configuration file.	1. Remove then reinstall the SX device driver and utilities software. See **page 28**
ddi_add_intr failure	Failed to configure the interrupt for a host card.	1. Select another interrupt using sxisacfg utility. See **page 31**
mod_install() failed	Possible memory shortage on system	1. Contact technical support. See **page 239**
Cannot start the card	Host card has been detected but is faulty.	1. Replace card. See **page 131** and **page 131**.
Invalid adapter combination	You have installed an invalid combination of adaptors to a host card.	1. Power down and ensure that the adaptor configuration is corrected. See **page 25**.
Host has no ports	A host card has no adapters connected.	1. Power down and remove the host card. See **page 135**.
Transparent print port still open	Tried to close a port with the transparent print node still open	1. Close the transparent print port then the direct port.
Attempt to open port for both local and modem	A port can be opened as a direct or a modem port - not both.	1. Close the port.
Attempt to open port that is exclusively locked	The port has been opened previously with an exclusive lock.	1. Close the port and re-open without the exclusive lock
Direct port not open	A transparent port has been opened without the corresponding direct port.	1. Open the corresponding direct port.
bad signature	Configuration file ISA card details do not match the actual ISA card installed or no ISA card installed.	Try each of the following in turn; 1. Remove the ISA card. See **page 135**. 2. Change ISA card details using sxisacfg. See **page 31**. 3. Change the ISA card address using the on board switches. See **page 133**.

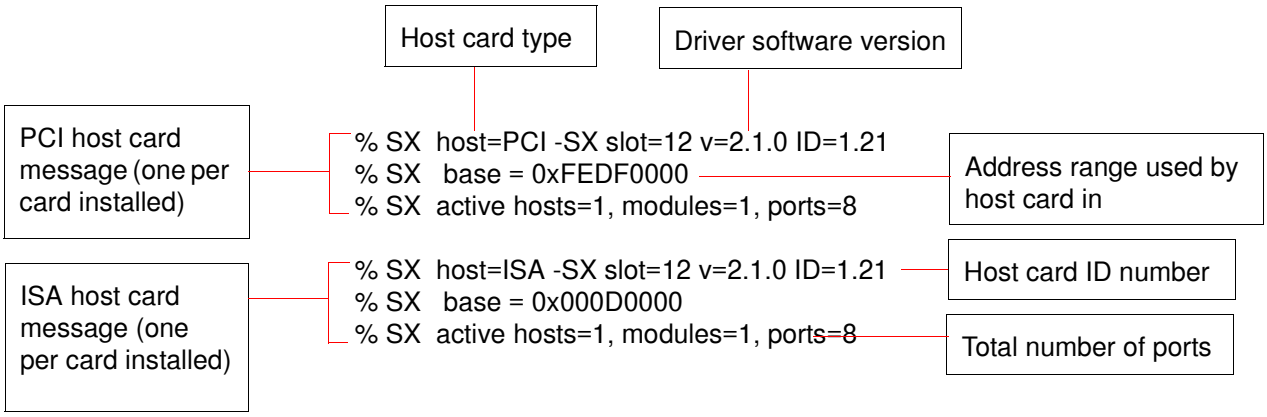
SCO OpenServer troubleshooting

This section describes troubleshooting SX products under the SCO OpenServer operating system and includes the following sections;

> Note
> To contact Perle for technical support. see **Appendix E Contacting Perle**.

Example of a normal boot up messages for host cards

The normal messages for satisfactory host card detection and initialisation form part of the normal SCO OpenServer 5 boot up messages and are shown in the next example. This example shows one ISA host card and one PCI host card.



General troubleshooting guide

General faults and suggested actions are shown in the next table.

Problem	Action required
Operating system fails to boot	1. Remove host card(s) and reboot the system. 2. Re-boot your system using the previous kernel. 3. Re-install the host cards and boot the system using a bootable floppy disk. 4. Run diagnostics to check for further problems.
Cards and/or devices not found	1. Run dos diagnostic utility to find out which devices are present and their location. 2. Ensure host cards are seated correctly 3. Ensure that cables and device concentrators are connected properly. 4. Ensure host cards are set to the correct address. 5. Check that the SX drivers and their configuration are set to the latest version.
Can't obtain login prompt on terminal	1. Check the port status LED on the device concentrators. 2. Ensure the login is enabled. 3. Check the terminal and login configuration settings. 4. Check cables are installed properly.
Data or login messages are corrupted	1. Ensure that port and device configuration settings match. 2. Check cables are properly installed. 3. Run dos diagnostics to check the system.

SCO OpenServer error messages

Error message	Reason	Action required
Attempted sleep in si_intr - command requested n device n	This is a system problem.	1. Contact Technical Support. See **Appendix E Contacting Perle**.
SX: command stack - completing n requested n device n	This is a system problem.	1. Contact Technical Support. See **Appendix E Contacting Perle**.
SX: Extra ports on card at <address> ignored	The driver has detected more ports than it can support. This means that you have connected more than four device concentrators to the host card.	1. Power your system down and remove the surplus host card(s). See **page 135**.
SX: ISA host card has invalid address - card ignored	You have installed your host card at an invalid address.	1. Check that the switches on ISA host cards are set to a valid address. See **page 133**.
SX: ISA host cards cannot share addresses - card ignored	You have attempted to install two host cards at the same address.	1. Switch your machine off. 2. Remove one of the host cards, See **page 135**. 3. On the removed card set a new address. See **page 133**.
SX: ISA host cards cannot share interrupt levels - card ignored	You have selected an interrupt already in use by another host card.	1. Re-install the SX device drivers and select a different interrupt or polled mode. See **page 78**.
SX: Invalid card type - card ignored	The device driver's configuration table has become corrupted.	1. Re-install the SX device drivers software. See **page 78**.
SX: Invalid interrupt level - card ignored	You have selected an interrupt level that doesn't exist, or is already being used.	1. Re-install the SX device drivers and select a different interrupt or polled mode. See **page 78**.
Invalid interrupt selected, using 15	You have selected an invalid interrupt level, so the device driver has selected the default (15) for you.	1. Select a valid interrupt level. See **page 85**.
SX: Warning SX interrupt handler re-entered	This is a system problem	1. Contact Technical Support. See **Appendix E Contacting Perle**.
WARNING: Host @0xnnnnnnnn SHUTDOWN **No ports detected**	The host card at the specified address has been shutdown by the driver because it reported a zero port count.	1. Ensure the host card, device concentrators and associated cables are installed securely. See **page 131**, **page 133** and **page 136**.

Error message	Reason	Action required
WARNING: Host @0xnnnnnnnn SHUTDOWN **Mixed adapter types not allowed**	The host card at the specified address has been shutdown by the driver because it reported an illegal combination of device concentrator (terminal adapter) types.	1. Shutdown the system and ensure that each host card has only one type of device concentrator connected. See **page 136**.
WARNING: No active Host Cards	Either you do not have any host cards installed, or, those that are installed suffer from one or more of the 'Host SHUTDOWN' scenarios above.	1. Ensure the host card, device concentrators and associated cables are installed securely. See **page 131**, **page 133** and **page 136**.
WARNING: No active Terminal Adapters	At least one host card is active, but the total active *port* count on your SX installation is ZERO.	1. Ensure the host card, device concentrators and associated cables are installed securely. See **page 131**, **page 133** and **page 136**. 2. Re-install the SX device drivers software. See **page 78**.

Testing SX ports with Port Diagnostics

The SX Serial Port Enable utility includes a Port Diagnostics tool. The Port Diagnostics tool allows you to Run tests on the port currently selected in Serial Port Enable, display modem pin status and stty attribute settings. See the following sections for details;

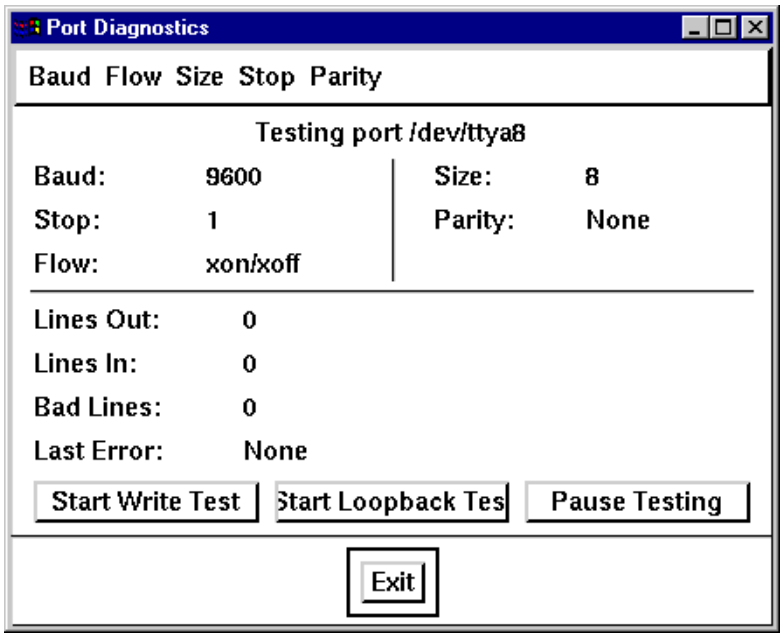
- **Running tests on a port** on page **216**
- **Performing a write test** on page **218**
- **Performing a loopback test** on page **219**
- **Displaying port settings** on page **220**
- **Displaying modem pin settings** on page **221**

For related information, see also **Connecting Device Concentrators to terminals** on page **165** and **Loopback connector pinouts** on page **178** in **Chapter 3 Cabling information**.

To run tests on a port proceed as follows;

1. Start the **Serial Port Enable** Utility, see **Configuring SX serial ports** on page **55** in **Chapter 2 Installing hardware and software**.
2. In the Serial Port Enable menu, click on the **Diags > Test** option.

   The Port Diagnostics window is now displayed.



3. Using the Port Diagnostics menu, choose the settings you want to use for testing the currently selected port using the options shown in the next table;

To set this parameter	Use one of these menu options
Baud rate	**Baud > 2400** **Baud > 4800** **Baud > 9600** **Baud > 19200**
Number of stop bits	**Stop > 1** **Stop > 2**
Flow control	**Flow > xon/xoff** **Flow > rts/cts** **Flow > None**
Size	**Size > 5** **Size > 6** **Size > 7** **Size > 8**
Parity	**Parity > None** **Parity > Even** **Parity > Odd**

You can now perform one the tests available in Port Diagnostics as detailed in the next table;

Test	For details see....
Write test	**Performing a write test** on page **218**
Loopback test	**Performing a loopback test** on page **219**

Hint

To pause a test proceed as follows:

- In the Port Diagnostics window, click on the **Pause Testing Button**.

The write test allows you to verify that data is sent out from the selected port properly. For example, you might use this test if you cannot obtain a login.

To perform this test proceed as follows;

1. Connect a terminal to the port you want to test using the cable type recommended in **Connecting Device Concentrators to terminals** on page **165** in **Chapter 3 Cabling information**.
2. Start and set up the Port Configuration utility using the procedure given in **Testing SX ports with Port Diagnostics** on page **215**.
3. In the Port Diagnostics window, click on the **Start Write Test** button.

The write test is now performed by the software and the Port Diagnostics window updated to show the result of the test in the lower half of the window. During the test the value displayed in the Line Out field should increase in proportion to the volume of data being sent.

The output on the terminal screen should be a steady scrolling text pattern. If not, then your terminal settings do not match your port settings.

A loopback test allows you to check that the selected port is receiving and sending data correctly. For example, you might use this test if you are using a modem and your remote site reports corrupted data.

This involves attaching a loopback connector to the selected port on a device concentrator, then performing the test and displaying the results from within the Port Diagnostics window.

To perform this test proceed as follows;

1. Connect a loopback connector to the port on you want to test the device concentrator. See **Loopback connector pinouts** on page **178** in **Chapter 3 Cabling information**

   > Note
   >
   > The type of loopback connector you require depends on the Device concentrator and associated connector types you are using.

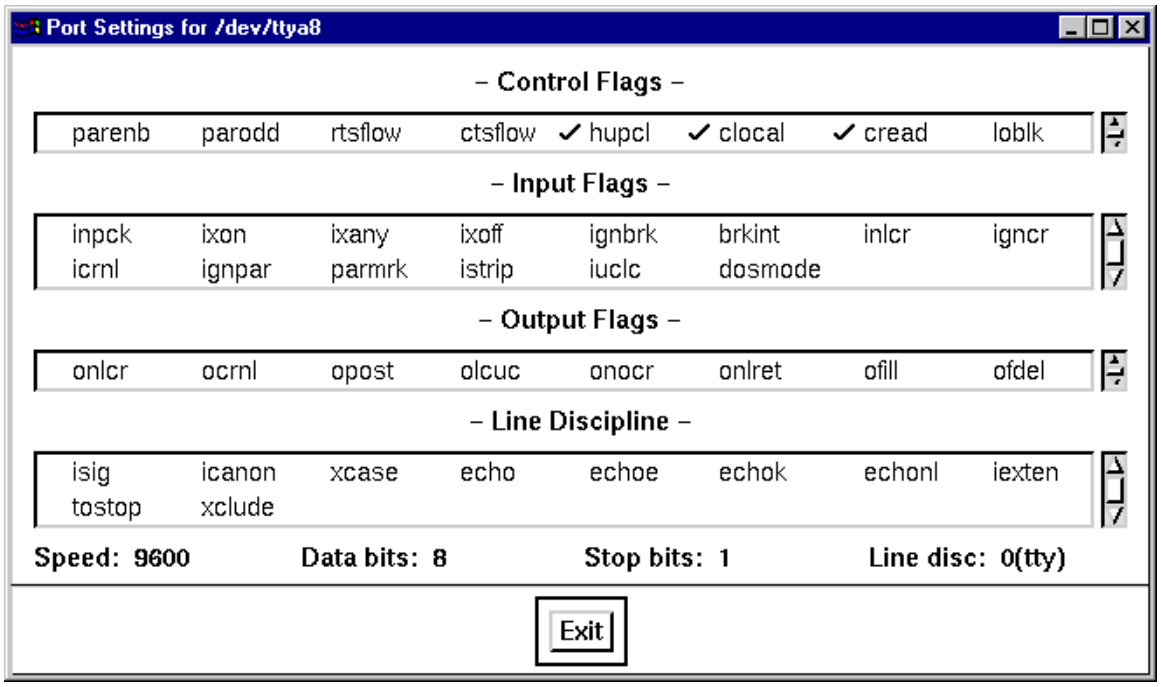
2. Start and set up the Port Configuration utility using the procedure given in **Testing SX ports with Port Diagnostics** on page **215**.
3. In the Port Diagnostics window, click on the **Start Loopback Test** button.

   The software now performs the loopback test and displays the results in the bottom half of the Port Diagnostics window. During the test, the values in the Lines In and Lines Out fields should increase in proportion to the volume of data being transferred

To display the tty attributes for the currently selected port proceed as follows;

1. Start the **Serial Port Enable** Utility, see **Configuring SX serial ports** on page **55** in **Chapter 2 Installing hardware and software**.
2. In the Serial Port Enable menu, click on the **Diags > Settings** option.

   The Port Settings window is now displayed.

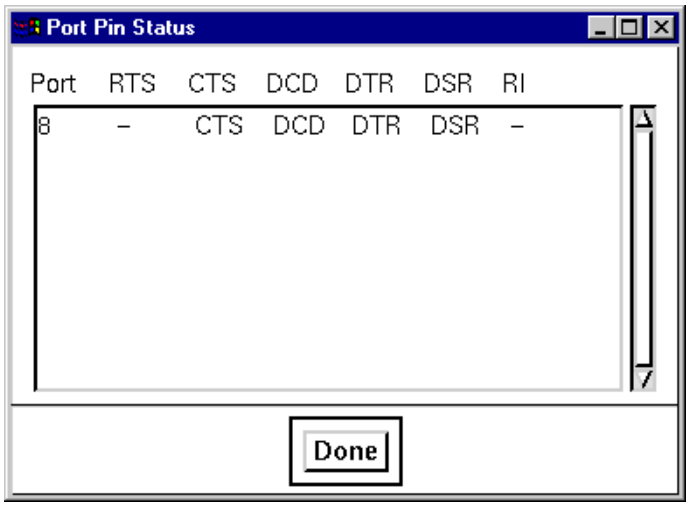


3. When you have observed the settings you require, click on the **Exit** button to close the window.

To display the modem pin settings for the currently selected port proceed as follows;

1. Start the **Serial Port Enable** Utility, see **Configuring SX serial ports** on page **55** in **Chapter 2 Installing hardware and software**.
2. In the Serial Port Enable menu, click on the **Diags > Pins** option.

   The Port Pin Status window is now displayed.



3. When you have observed the settings you require, click on the **Done** button to close the window.

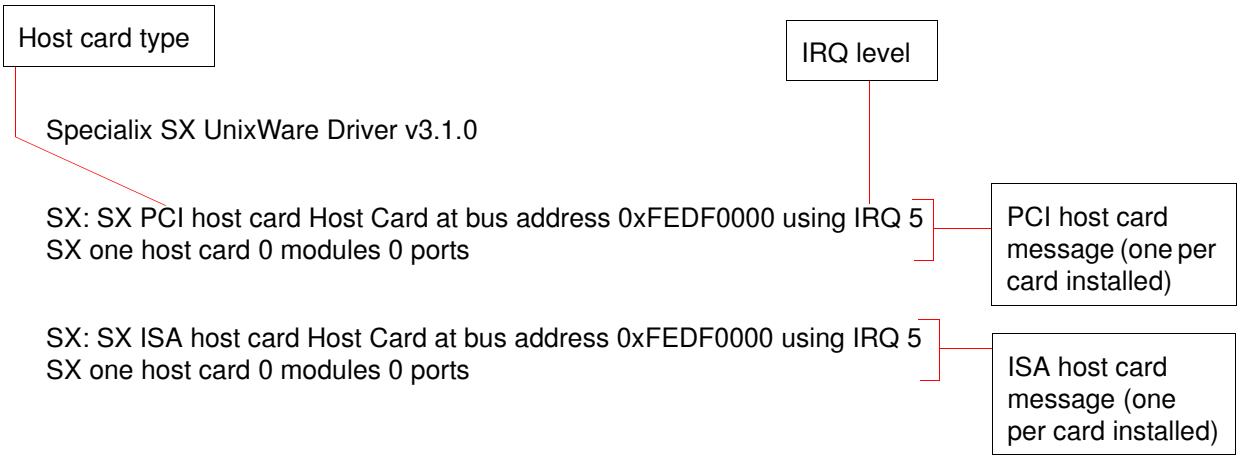
SCO UnixWare troubleshooting

This section describes troubleshooting SX products under the SCO UnixWare operating system and includes the following sections;

> Note
> To contact Perle for technical support. see **Appendix E Contacting Perle**.

Example of a normal boot up messages for host cards

The normal messages for satisfactory host card detection and initialisation form part of the normal SCO UnixWare boot up messages and are shown in the next example. This example shows one ISA host card and one PCI host card.



General troubleshooting guide

General faults and suggested actions are shown in the next table.

Problem	Action required
Operating system fails to boot	1. Remove host card(s) and reboot the system. 2. Re-boot your system using the previous kernel. 3. Re-install the host cards and boot the system using a bootable floppy disk. 4. Run diagnostics to check for further problems.
Cards and/or devices not found	1. Run dos diagnostic utility to find out which devices are present and their location. 2. Ensure host cards are seated correctly 3. Ensure that cables and device concentrators are connected properly. 4. Ensure host cards are set to the correct address. 5. Check that the SX drivers and their configuration are set to the latest version.
Can't obtain login prompt on terminal	1. Check the port status LED on the device concentrators. 2. Ensure the login is enabled. 3. Check the terminal and login configuration settings. 4. Check cables are installed properly.
Data or login messages are corrupted	1. Ensure that port and device configuration settings match. 2. Check cables are properly installed. 3. Run dos diagnostics to check the system.
System hangs	1. Using a suitable text editor open the **Space.c** file located in the **UW/slx/** directory. 2. Within the **Space.c** file edit the **int slx_PLXFix = 0;** line to read; int slx_PLXFix = **1**; 3. Save and close the **Space.c** file 4. Re-start your system. 5. If this fails, contact technical support.

SCO UnixWare error messages

Error message	Reason	Action required
An attempt has been made to open port n while a close on that port is in progress.	The streams system has called the driver open routine to open a port which it is in the process of closing. This indicates a fault in the implementation of streams within the operating system.	1. Note down the values given in the error message, and contact Technical Support. See **Appendix E Contacting Perle**.
Cannot use both polled and interrupt driven host cards in one system. All the cards will be reconfigured to use polled operation.	The SX device driver can run in polled mode or interrupt mode, not both at the same time. You have installed one or more host cards running in interrupt mode and one or more host cards running in polled mode. The driver has set all your host cards to polled mode.	1. For ISA host cards, re- install the SX device drivers, setting all your host cards to the same mode. See **page 78**.
Can't patch interrupt vector number n.	An interrupt level above 15 has been set for a host card.	1. Re-install the SX device driver. See **page 78**.
Interrupt handler re-entered! This vector = n, other vector = n, this flag = n, other flag = n.	The interrupt handling software has been called whilst the driver has been processing a previous interrupt. This should not happen as the driver protects itself against this occurring. It may be caused by the operating system using different spl protection levels for streams to the levels used by the SX driver.	1. Note down the values given in the error message, and contact Technical Support. See **Appendix E Contacting Perle**.
Message type n received by write service routine - dumped.	An unexpected message has been sent to the device driver service routine. This indicates a fault in the implementation of streams within the operating system.	1. Note down the values given in the error message, and contact Technical Support. See **Appendix E Contacting Perle**.
No host cards detected in system.	The driver has been unable to detect any host cards.	1. Ensure host cards are seated correctly. See **page 131** and **page 133**. 2. Check that the switches on ISA host cards are set to a valid address. See **page 133**. 3. If this fails to solve the problem, re-install the SXdevice drivers. See **page 78**.

Error message	Reason	Action required
SX: one host card failed to run SX: n host cards failed to run.	One or more of your host cards have failed to start up correctly.	1. Ensure the host card, device concentrators and associated cables are installed securely. See **page 131**, **page 133** and **page 136**. 2. Ensure there are a maximum of four host cards installed. See **page 78**. 3. Check that the host card isn't sharing a memory address. See **page 78**.
Port n has been re-opened, the queue passed to open is the same as for the previous open, but the private data structure pointer has changed. The read queue pointer is at address 0xXXXXX and the private data structure entry should be 0xXXXXX but is now 0xXXXXX. This Unix system may fail soon!	The driver has tried unsuccessfully to recover and it is possible that the system will crash.	1. Note down the values given in the error message and contact Technical Support. See **Appendix E Contacting Perle**.
Startup timeout on ISA host card at base address 0xXXXXX **Startup timeout on PCI host card in slot n.**	The identified host card has failed to execute its download code.	1. Ensure the host card, device concentrators and associated cables are installed securely. See **page 131**, **page 133** and **page 136**. 2. Ensure there are a maximum of four host cards installed. See **page 78**. 3. Check that the host card isn't sharing a memory address. See **page 78**.
Streams error - asked to close (xprint) queue 0xXXXXX. Private pointer is 0xXXXXX, minimum acceptable level is 0xXXXXX, maximum acceptable level is 0xXXXXX.	The driver has detected that the data structures associated with its streams interface have been corrupted.	1. Note down the values given in the error message and contact Technical Support. See **Appendix E Contacting Perle**.

Error message	Reason	Action required
There are more than 4 host cards installed in this machine. Extra host cards will be ignored.	The driver has detected more than four host cards.	1. Power your system down and remove the surplus host card(s). See **page 135**.
XPRINT message type n received by write service routine - dumped.	An unexpected message has been sent to the device driver service routine.	1. Note down the values given in the error message and contact Technical Support. See **Appendix E Contacting Perle**.
Xprint port n has been re-opened, the queue passed to open is the same as for the previous open, but the private data structure pointer has changed. The read queue pointer is at address 0xXXXXX and the private data structure entry should be 0xXXXXX but is now 0xXXXXX. This Unix system may fail soon!	The streams implementation on this operating system has changed some of the driver's private data. The driver has tried unsuccessfully to recover and it is possible that the system will crash.	1. Note down the values given in the error message and contact Technical Support. See **Appendix E Contacting Perle**.
WARNING: Host n SHUTDOWN - invalid adapter(s).	The identified host card has been shutdown by the SX device driver because it reported that it has detected more than one type of device concentrator (terminal adapter) connected. Mixing different types of device concentrators is not allowed	1. Install the correct type of device concentrators. See **page 136** and **page 149**. 2. Re-start your system.
WARNING: ISA card not found at address : 0xXXXXX	The SX device driver is unable to find an SX ISA Host Card at the address defined by the DCU.	1. Check the address settings on the ISA host card. See **page 133**.
An attempt has been made to open port n while a close on that port is in progress.	The streams system has called the driver open routine to open a port which it is in the process of closing. This indicates a fault in the implementation of streams within the operating system.	1. Note down the values given in the error message and contact Technical Support. See **Appendix E Contacting Perle**.
Cannot use both polled and interrupt driven host cards in one system. All the cards will be reconfigured to use polled operation.	You have installed one or more host cards running in interrupt mode and one or more host cards running in polled mode. The driver has set all your host cards to polled mode.	1. For ISA host cards, re- install the SX device drivers. See **page 78**. 2. set all your host cards to the same mode. See **page 78**.
Can't patch interrupt vector number n.	An interrupt level above 15 has been set for a host card.	1. Re- install the SX device drivers. See **page 78**.

Error message	Reason	Action required
Interrupt handler re-entered! This vector = n, other vector = n, this flag = n, other flag = n.	The interrupt handling software has been called whilst the driver has been processing a previous interrupt.	1. Note down the values given in the error message and contact Technical Support. See **Appendix E Contacting Perle**.
Message type n received by write service routine - dumped.	An unexpected message has been sent to the device driver service routine.	1. Note down the values given in the error message and contact Technical Support. See **Appendix E Contacting Perle**.
No host cards detected in system.	The driver has been unable to detect any host cards.	1. Ensure the host card, device concentrators and associated cables are installed securely. See **page 131**, **page 133** and **page 136**. 2. Ensure there are a maximum of four host cards installed. See **page 78**. 3. Check that the host card isn't sharing a memory address. See **page 78**.
SX: one host card failed to run SX: n host cards failed to run.	One or more of your host cards have failed to start up correctly.	1. Ensure the host card, device concentrators and associated cables are installed securely. See **page 131**, **page 133** and **page 136**. 2. Ensure there are a maximum of four host cards installed. See **page 78**. 3. Check that the host card isn't sharing a memory address. See **page 78**.
Port n has been re-opened, the queue passed to open is the same as for the previous open, but the private data structure pointer has changed. The read queue pointer is at address 0xXXXXX and the private data structure entry should be 0xXXXXX but is now 0xXXXXX. This Unix system may fail soon!	The streams implementation on this operating system has changed some of the driver's private data. The driver has tried unsuccessfully to recover and it is possible that the system will crash.	1. Note down the values given in the error message and contact Technical Support. See **Appendix E Contacting Perle**.

Error message	Reason	Action required
Startup timeout on ISA host card at base address 0xXXXXX **Startup timeout on PCI host card in slot n.**	The identified host card has failed to execute its download code.	1. Ensure the host card, device concentrators and associated cables are installed securely. See **page 131**, **page 133** and **page 136**. 2. Ensure there are a maximum of four host cards installed. See **page 78**. 3. Check that the host card isn't sharing a memory address. See **page 78**.
Streams error - asked to close (xprint) queue 0xXXXXX. Private pointer is 0xXXXXX, minimum acceptable level is 0xXXXXX, maximum acceptable level is 0xXXXXX.	The driver has detected that the data structures associated with its streams interface have been corrupted. This is an error in the implementation of streams within the operating system.	1. Note down the values given in the error message and contact Technical Support. See **Appendix E Contacting Perle**.
XPRINT message type n received by write service routine - dumped.	This message indicates that an unexpected message has been sent to the device driver service routine. This indicates a fault in the implementation of streams within the operating system.	1. Note down the values given in the error message and contact Technical Support. See **Appendix E Contacting Perle**.

Windows NT troubleshooting

This section describes troubleshooting SX products under the Windows NT operating system and includes the following sections;

> Note
> To contact Perle for technical support. see **Appendix E Contacting Perle**.

- **General troubleshooting under Windows NT** on page **231**
- **Windows NT error messages** on page **232**.

General troubleshooting under Windows NT

Problem	Action required
Machine fails to boot.	1. Turn off your machine, remove SX card(s) and reboot. See **page 135**. 2. In the BIOS setup, make sure memory and interrupts levels are reserved for any ISA cards fitted. 3. Check the memory address switch settings on any ISA cards fitted. See **page 133**. 4. Try installing a different host card in case the one currently installed is faulty. See **page 133**.
Windows NT operating system fails while loading and the system hangs.	1. Reboot machine and then switch to the last known good configuration. 2. Check for resource conflicts or faulty hardware. 3. Turn off machine, remove any SX cards fitted (**page 135**) and then reboot your system. 4. Once the machine boots properly, change the configuration settings of the SX card to match those in the BIOS setup. See **page 133**.
Windows NT operating system fails while loading and displays a blue screen.	1. Note the five hexadecimal numbers at the top line of the screen 2. Reboot your machine and then switch to the last known good configuration. 3. Check for resource conflicts or faulty hardware. 4. Turn off machine, remove any SX cards fitted (**page 135**) and then reboot your system. 5. Once the machine boots properly, change the configuration settings of the SX card to match those in the BIOS setup. See **page 133**.
NT operating system loads OK, but SX driver or another driver fails to boot A window entitled "Service Control Manager" is displayed with the message: **At least one service or driver failed during startup. Use Event Viewer to examine the event log for details.**	1. Check the Windows NT Event Viewer; and follow the actions suggested to you by the system. 2. Run Windows NT Diagnostics to find available IRQ and memory addresses. (You may need to reserve settings in the BIOS setup).
SX ports do not work after installation.	1. Check the Windows NT Event Viewer and follow the suggested actions.

Problem	Action required
SX NT driver fails during normal operation, symptom: blue screen	1. Note the five hexadecimal numbers displayed at the top line of the screen. 2. Reboot your machine and then switch to the last known good configuration. 3. Check for resource conflicts or faulty hardware. 4. Turn off machine, remove any SX cards fitted (**page 135**) and then reboot your system. 5. Once the machine boots properly, change the configuration settings of the SX card to match those in the BIOS setup. See **page 133**.
SX NT driver fails during normal operation, symptoms either: black screen, machine reboots or system hangs	1. Contact Technical Support. See **Appendix E Contacting Perle**.

Windows NT error messages

In the event of any error messages check the **Windows NT Event** Log. See your Windows NT user documentation or help system for details.

For general problems see **General troubleshooting under Windows NT** on page **231**.

Windows 2000/XP/Server 2003/Vista/Server 2008 troubleshooting

This section describes troubleshooting SX products under the Windows 2000/XP/ Server 2003/Vista/Server 2008 operating system and includes the following sections;

> Note
>
> To contact Perle for technical support. see **Appendix E Contacting Perle**.

General troubleshooting under Windows 2000/XP/Server 2003/Vista/Server 2008

Problem	Action required
Machine fails to boot.	1. Turn off your machine, remove SX card(s) and reboot. See **page 135**. 2. In the BIOS setup, make sure memory and interrupts levels are reserved for any ISA cards fitted. 3. Check the memory address switch settings on any ISA cards fitted. See **page 133**. 4. Try installing a different host card in case the one currently installed is faulty. See **page 133**.
Windows operating system fails while loading and the system hangs.	1. Reboot machine and then switch to the last known good configuration. 2. Check for resource conflicts or faulty hardware. 3. Turn off machine, remove any SX cards fitted (**page 135**) and then reboot your system. 4. Once the machine boots properly, change the configuration settings of the SX card to match those in the BIOS setup. See **page 133**.
Windows operating system fails while loading and displays a blue screen.	1. Note the five hexadecimal numbers at the top line of the screen 2. Reboot your machine and then switch to the last known good configuration. 3. Check for resource conflicts or faulty hardware. 4. Turn off machine, remove any SX cards fitted (**page 135**) and then reboot your system. 5. Once the machine boots properly, change the configuration settings of the SX card to match those in the BIOS setup. See **page 133**.
Operating system loads OK, but SX driver or another driver fails to boot	1. Run Windows Device Manager to find available IRQ and memory addresses.
SX ports do not work after installation.	1. Check the Windows Event Log and follow the suggested actions.

Problem	Action required
SX Windows driver fails during normal operation, symptom: blue screen	1. Note the five hexadecimal numbers displayed at the top line of the screen. 2. Reboot your machine and then switch to the last known good configuration. 3. Check for resource conflicts or faulty hardware. 4. Turn off machine, remove any SX cards fitted (**page 135**) and then reboot your system. 5. Once the machine boots properly, change the configuration settings of the SX card to match those in the BIOS setup. See **page 133**.
SX Windows driver fails during normal operation, symptoms either: black screen, machine reboots or system hangs	1. Contact Technical Support. See **Appendix E Contacting Perle**.

Windows 2000/XP/Server 2003/Vista/Server 2008 error messages

In the event of any error messages, check the **Windows Event Log**. Also open the Windows Device Manager and check for warming icons on the installed hardware. See your Windows user documentation or help system for details.

For general problems, see **General troubleshooting under Windows 2000/XP/Server 2003/Vista/Server 2008** on page **234**.

Linux troubleshooting

This section describes troubleshooting SX products under the Linux operating system and includes the following sections;

> Note
> To contact Perle for technical support. see **Appendix E Contacting Perle**.

General troubleshooting under Linux

Problem	Action required
Machine fails to boot.	1. Turn off your machine, remove SX card(s) and reboot. See **page 135**. 2. Ensure memory and interrupts levels are reserved for any ISA cards fitted. 3. Check the memory address switch settings on any ISA cards fitted. See **page 133**. 4. Try installing a different host card in case the one currently installed is faulty. See **page 133**.
Linux operating system fails while loading and the system hangs.	1. Reboot machine and then switch to the last known good configuration. 2. Check for resource conflicts or faulty hardware. 3. Turn off machine, remove any SX cards fitted (**page 135**) and then reboot your system.
Linux operating system fails while loading and displays a blue screen.	1. Reboot your machine and then switch to the last known good configuration. 2. Check for resource conflicts or faulty hardware. 3. Turn off machine, remove any SX cards fitted (**page 135**) and then reboot your system.
SX Linux driver fails during normal operation, symptoms either: black screen, machine reboots or system hangs	1. Contact Technical Support. See **Appendix E Contacting Perle**.

Linux error messages

In the event of any error messages check the **messages** file in the /var/log directory. See your Linux user documentation or help system for details.

For general problems see **General troubleshooting under Linux** on page **236**.

Appendix D Contacting Perle

You need to read this appendix if you want to...

You need to read this appendix if you want to contact Perle for technical support or any other queries about this product.

This appendix includes the following sections;

Internet access

Click here to access the our website at the following URL:

http://www.perle.com

Email

Click here to email Perle at the following address;

Email: ptac@perle.com

Making a technical Support Query

This section contains the following information about making a query;

Who to contact

If you bought your product from a registered Perle supplier, you must contact their Technical Support department; they are qualified to deal with your problem.

If you are a registered Perle supplier, and bought your product from Perle, contact Perle Technical Support using the details given in **Contacting Perle technical support** on page **113**.

Information needed when making a query

When you make a technical support enquiry please have the following information ready;

> Hint
>
> Print out this page and fill in the table provided with the basic information you need.

Item	Write details here
Product name and version	
Problem description	
Operating system version	
Driver version	
Details of any other cards installed in your system	
Your name	
Company Name	
Country	
Phone number	
Fax number	
Email address (if available)	

Making a support query via the Perle web page

If you have an internet connection, please send details of your problem to Technical Support using the email links provided on the Perle web site in the 'Support' area.

See also **Contacting Perle technical support** on page **113** for email links and other contact details for the Perle technical support centres.

Click here to access our website at the following URL:

http://www.perle.com

Repair procedure

Before sending a unit for repair, you must contact your Perle supplier. If, however, you bought your product directly from Perle you can contact directly. See **Contacting Perle technical support** on page **113** for contact information.

Customers who are in Europe, Africa or Middle East can submit repair details via a website form shown in the next picture. This form is on the Perle website, **www.perle.com**, in the **Support** area.

Click here to access our web site at the following URL:
http://www.perle.com/support_services/rma_form.asp

In the USA and Asia contact the office shown in the Technical Support section.

Feedback about this manual

If you have any comments or suggestions for improving this manual please email Perle using the following address;

Email: ptac@perle.com

Please include the **title**, **part number** and **date** of the manual (you can find these on the title page at the front of this manual).

Contacting Perle technical support

Note

Perle offers free technical support to Perle Authorised Distributors and Registered Perle Resellers.

To access technical support please visit the Perle website at **www.perle.com/support_services/index.shtml.**

If you are unable to find the information you require, please feel free to contact our technical support teams by email using the addresses shown in the next table.

Region	Address	Email
North America	*Perle Systems Ltd.* *60 Renfrew Drive* *Markham* *Ontario* *Canada* *L3R OE1*	***Email: ptac@perle.com***
Europe	*Perle Systems Europe Ltd.* *3 Wintersells Road* *Byfleet Surrey* *KT14 7LF* *UK*	***Email: ptac@perle.com***
Asia	*Perle Asia Pacific (Pte) Ltd.* *190 Middle Road* *#19-05 Fortune Centre* *Singapore 188979*	***Email: ptac@perle.com***
Worldwide	*Perle Systems Ltd.* *60 Renfrew Drive* *Markham* *Ontario* *Canada* *L3R OE1*	***Email: ptac@perle.com***

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