FAST Serial Adaptors

User Guide

Part number: 5500043-15
Date: 10 September 2008

Navigating around this manual

Using this on-line manual. See page 5.

Fast Contents. See page 7.

Contents. See page 8.

Index. See page 127.

Perle Systems Limited, 10 September 2008.

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 AT-FAST and PCI-FAST serial adaptor cards, distribution hardware, associated drivers and utilities.

Who this manual is for

This manual is aimed at users who want to add extra serial ports to their system using AT-CI-FAST serial adaptor cards. This manual requires a working knowledge of using personal computers and associated operating systems, as well as experience in installing host cards.

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;

- Jump to Using this on-line manual
- Jump to Index
- Jump to Quick Reference (if included)
- Jump to previous location
- Jump to front of current chapter
- Jump to Contents
- Jump to Fast contents

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
July 2000	5500043-10	First issue of new AT- FAST and PCI-FAST user manual. Includes details of drivers, utilities and installation under the Windows NT and Windows 2000 operating systems.
November 2001	5500043-11	Re-branding update.
December 2001	5500043-12	Update of manual to include installation under the SCO OpenServer, SCO UnixWare, Solaris and Linux operating systems.
October 2005	5500043-13	Added information about SCO OpenServer 6 support.
March 2007	5500043-14	Added instructions for a new Windows 2000/XP/Server 2003/Vista installation process. There are now three Windows drivers to support 32-bit, 64-bit x64, and 64-bit Itanium operating systems/processors.
September 2008	5500043-15	Added support for Windows Server 2008.

Fast Contents

Contents

CHAPTER 2 INSTALLING DRIVERS AND HOST CARDS 16

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 AT-FAST and PCI-FAST serial adaptor cards, driver software and utilities.

This chapter provides introductory information about the Perle AT-FAST and PCI-FAST serial adaptor cards, driver software and configuration utilities.

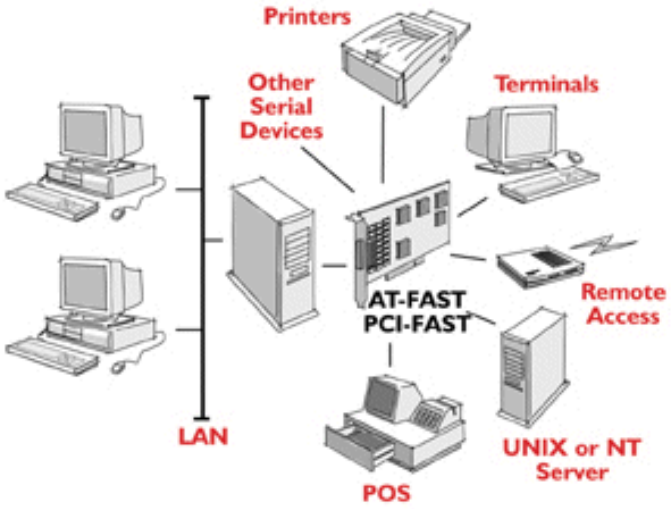
This chapter includes the following sections;

About the AT-FAST and PCI-FAST serial adaptor cards

The PCI-FAST and AT-FAST are multi-port cards which provide extra serial ports for RS-232 peripherals. These cards plug into your PC servers and provide 4, 8 or 16 high speed ports suitable for remote access, data collection, point of sale or any other RS232 applications.

You use the FAST serial adaptor cards when you want a robust entry level solution for the small office or point of sale applications. Typically you use FASTserial adaptor cards because you want to add extra serial ports to an existing computer system rather than replacing it with the considerable cost that entails. Higher data rates and ESD protection in the FAST serial adaptor cards make it suitable for any modem or ISDN TA application.

> Note
>
> To use the FAST serial adaptor cards you must first install the drivers supplied with the card and then configure each card as required prior to mechanical installation. The installation procedure varies for different operating systems. Please read **Before you start** on page **17** in **Chapter 2 Installing drivers and host cards** before commencing installation.



Guide to distribution accessories

The distribution box or cable required for the FAST product you are using depends on the number of ports and product type as detailed in the next table;

Product	Cable or distribution box options	For installation information see...
AT-FAST4 PCI-FAST4	RJ45 (8 pin) to DB25 male cable.	See **Installing 4 port cards** on page **81** in **Chapter 2 Installing drivers and host cards**.
AT-FAST8 PCI-FAST8	8 port distribution box with DB25 female connectors.	See **Installing 8 port cards and distribution accessories** on page **86** in **Chapter 2 Installing drivers and host cards**.
	8 port octopus cable with DB25 female connectors on flying leads.	
	8 port octopus cable with DB25 male connectors on flying leads.	
	8 port distribution cable with RJ45 8 pin female connector block.	
AT-FAST16 PCI-FAST16	16 port distribution box with DB25 female connectors.	See **Installing 16 port cards and distribution accessories** on page **95** in **Chapter 2 Installing drivers and host cards**.

Chapter 2 Installing drivers and host cards

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

You need to read this chapter if you want to install FAST serial adaptor cards, associated hardware and software.

This chapter provides information about installing and configuring FAST serial adaptor cards.

> Note
>
> The procedure for installing and configuring FAST serial adaptor cards varies for different operating systems. Please read **Before you start** on page **17** before commencing installation.

This chapter includes the following sections;

Before you start

Before you install your FAST host cards and software, note that the procedure for installing and configuring FAST serial adaptor cards 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;

Down loading FAST drivers from the Perle web site

You can install the FAST 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 one the following URL;

   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 zip files in this directory to a suitable location on your PC for example, **/tmp**.
5. Uncompress the files using a suitable utility.
6. You can now install the driver software using the correct procedure for your operating system. See **Before you start** on page **17**.

Installing under Windows 95

This section describes how to install the FAST device driver software under Microsoft Windows 95.

This section includes the following;

> Note
> The following Port naming conventions are applied for Windows 95;
>
> Port names under Windows 95 take the form: COMx
>
> Where the first port on each card is numbered from the next available port on the PC for COM5 upwards for Windows 95. In the case of PCI-FAST, the ports are numbered according to the system slot number occupied by the card in the PC, starting with slot 0.
>
> Example:
> After installing a PCI-FAST 4, the ports are labelled:
> COM1 - COM4 PC system
> COM5 - COM8 PCI-FAST 4
> If a new PCI-FAST 8 is installed in a preceding slot, the ports will be as follows:
> COM1 - COM4 PC System
> COM5 - COM12 PCI-FAST 8
> COM13 - COM16 PCI- FAST 4
> That is, the PCI-FAST 4 ports will be moved up.

General setup procedure for Windows 95

The general procedure for installing FAST cards under the Windows 95 operating system is as follows;

> Note
>
> Up to four PCI-FAST 4/8/16 cards or Up to four AT-FAST 4/8/16 cards PCI and AT bus cards cannot be mixed in Windows 95 machines.

1. Install any PCI host cards and distribution cables or boxes you require into your system. See **Installing host cards and distribution accessories** on page **79**.
2. If you have installed any PCI host cards, now install the driver software using the procedures given in **Installing Windows 95 drivers for PCI-FAST cards** on page **21**.

> Note
>
> To remove drivers see **De-installing the driver for PCI-FAST cards** on page **22**.

3. If you are going to install AT cards on your system, install driver software using the procedures given in **Installing Windows 95 drivers for AT-FAST cards** on page **23**.

> Note
>
> To remove drivers see **De-installing the driver for AT-FAST cards** on page **25**.

4. Install any AT cards and distribution cables or boxes you require into your system. See **Installing host cards and distribution accessories** on page **79**.
5. If required, remove any host cards you want from your system. See **Removing host cards** on page **103**.

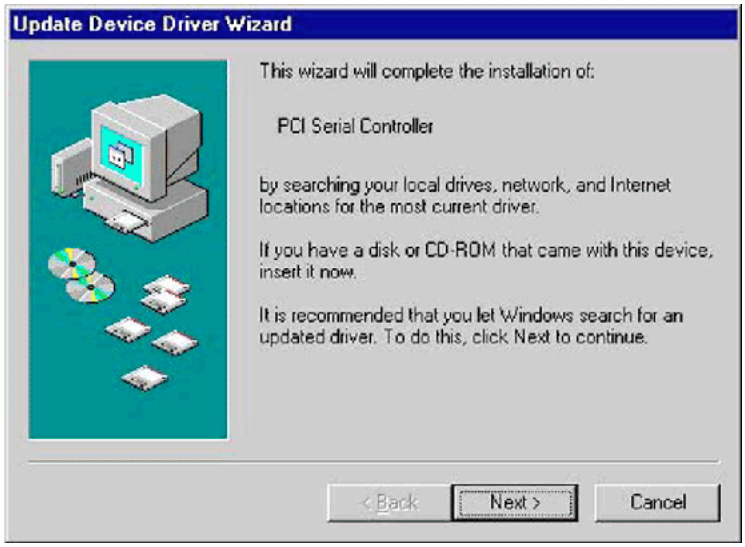
Installing Windows 95 drivers for PCI-FAST cards

PCI-FAST cards install as a Plug and Play card under Windows 95.

Once the card is installed, power up your PC and Windows 95 will automatically detect it. On older versions of Windows 95 the New Hardware Found window will appear as shown below:

1. Load the CD, select Driver from disk provided by hardware manufacturer and press OK.
2. When prompted, select the CD drive and enter the path: pci-fast\drivers\win_95 and press OK.

   On more recent versions of Windows 95 the Update DeviceDriver Wizard window will appear as follows:



3. Press Next.
4. Enter the drive name for the CD and the path: pci-fast\drivers\win_95 or browse to select the directory.
5. Press Finish.

   There will be a delay while the Update Device Driver wizard installs the ports for the PCI-FAST card.

6. Now restart your system.

When port installation is complete, driver software is installed and the card is ready for use.

De-installing the driver for PCI-FAST cards

To remove the PCI-Fast driver and card:

1. Select Control Panel from the Start menu and double click the System applet.
2. Select Device Manager and expand the Multifunction Adapter tree.
3. Select the card which you require to remove and press Remove. When complete press OK.

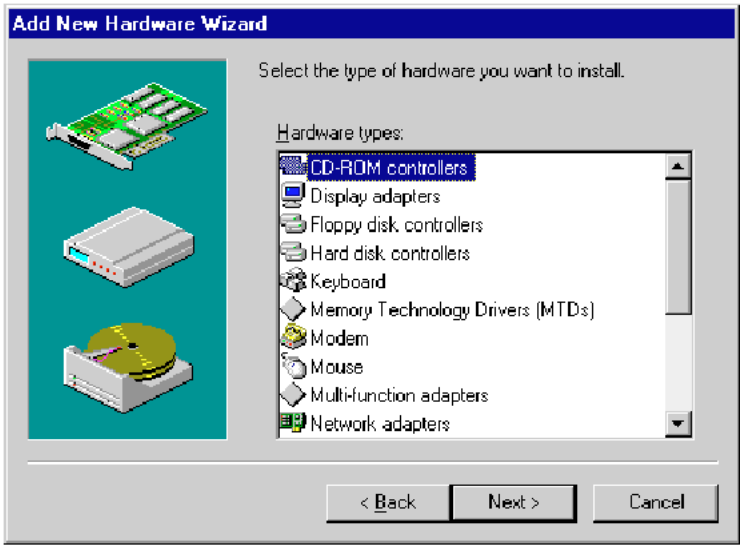
With the system shutdown and the power turned off the Card may now be physically removed from the system and the machine re-booted.

Installing Windows 95 drivers for AT-FAST cards

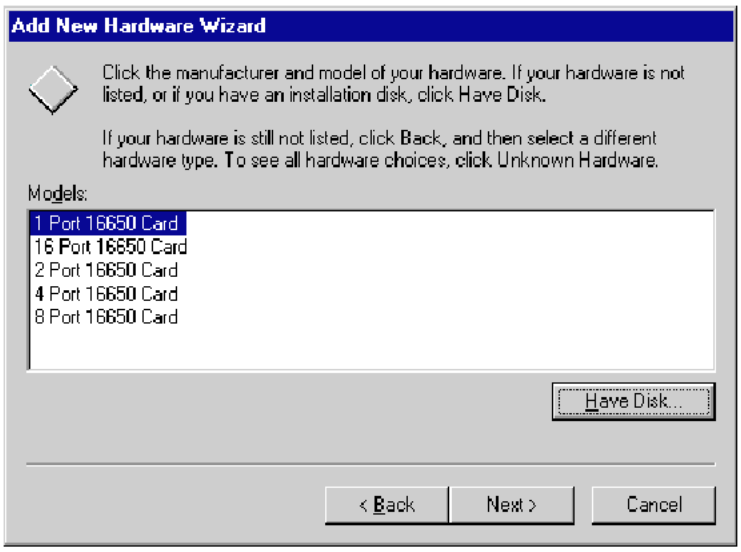
For AT-FAST Windows 95 drivers use setup.exe on the CD in the directory drivers\at-fast\win9x.

After the initial setup program has detected your system, it will start the Add New Hardware Wizard. Then:

1. Select Next .
2. Select No to Do you want Windows to search for your new hardware?



3. Select Multi-function adapters and then Next.
4. Select Have Disk and then Next.



5. Select your AT-FAST card from the list shown and then select Next.
6. Select Next when the card hardware parameters are displayed.
7. Now restart your system.

> Note:
>
> Windows 95 already has the ability to select the baud rates 230.4 kbps and 460.8 kbps, but for 16 bit programs running on the system that may not have this ability it is possible to instead map 57.6 kbps and 115.2 kbps to these rates.
>
> The AT-FAST supports auto flow control, this generally works best when linked with a device (such as another 16650) that also supports this. If you find that performance is not as good with auto flow control selected then you can disable it on a per port basis.
>
> The above options can be changed via the advanced tab on the ports properties dialog box located under the device manager tab of the system icon in Control Panel, after the card has been installed.

De-installing the driver for AT-FAST cards

To remove the driver software:

1. From Control Panel select the System icon, and select the Device manager tab.
2. Select Multi-function Adapters to list the options available.
3. Select the AT-FAST option installed earlier.
4. Select Remove, and then OK.
5. Shutdown your system and power off the PC.
6. Remove the AT-FAST card.

Installing under Windows NT

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

> Note
>
> The Perle PortDirector software contains drivers for the FAST host cards.
>
> You will need to install the PortDirector **for WIndows NT** on your system in order to use the FAST host cards.
>
> See **Chapter 5 Adding and deleting host cards** in the **PortDirector User guide** part number **5500028** for further details.

1. Install any PCI host cards and distribution cables or boxes you require into your system. See **Installing host cards and distribution accessories** on page **79**.
2. Install any AT cards and distribution cables or boxes you require into your system. See **Installing host cards and distribution accessories** on page **79**
3. If required, remove any host cards you want from your system. See **Removing host cards** on page **103**.
4. Use the PortDirector software to update your system with the revised number and type of host cards. See The PortDirector user guide part number 5500028 for further details.

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

Installing under Windows 2000/XP/Server 2003/Vista/ Server 2008

This section describes how to install the FAST device driver software under Microsoft Windows 2000/XP/Server 2003/Vista/Server 2008.

This section includes the following:

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

The general procedure for installing FAST cards under the Windows 2000/XP/Server 2003/ Vista/Server 2008operating system is as follows:

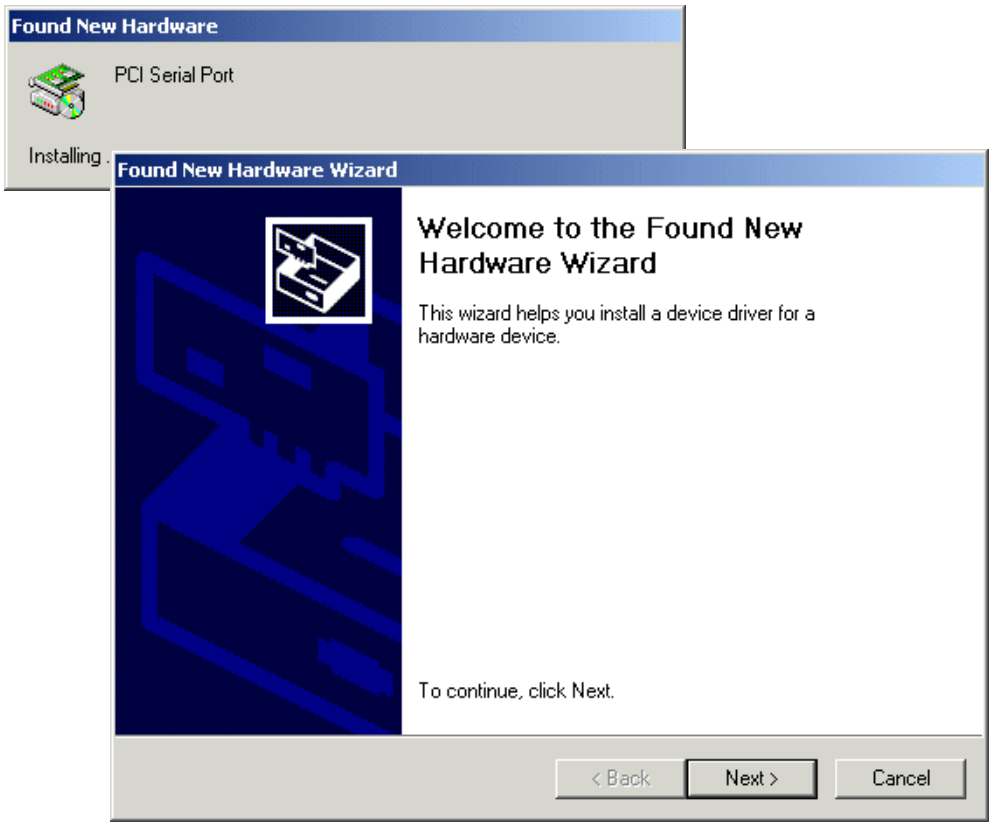
1. Install any PCI host cards and distribution cables or boxes you require into your system. See **Installing host cards and distribution accessories** on page **79**.
2. Install any AT cards and distribution cables or boxes you require into your system. See **Installing host cards and distribution accessories** on page **79**.
3. Install the FAST device driver software. See **Installing device drivers and utilities onto your system** on page **29**.
4. If you add new FAST cards, you should run Update Driver to make sure the new cards have the latest driver. See **Adding additional cards and/or updating drivers** on page **31**.
5. If required, remove any host cards you want from your system. See **Removing host cards** on page **103**.
6. Using the Windows 2000/XP/Server 2003/Vista/Server 2008 **Device Manager**, configure the serial ports you have added to the system. See **Configuring serial ports** on page **39**.

Installing device drivers and utilities onto your system

To install or enable the FAST device drivers on your system proceed as follows;

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

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



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

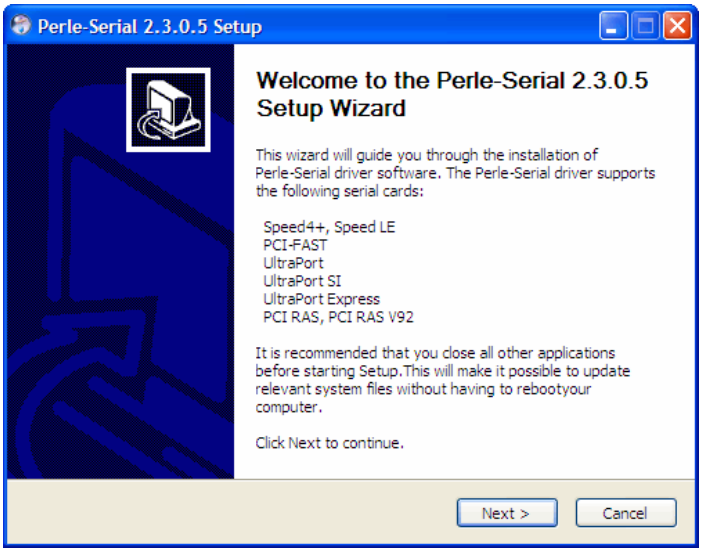
   pserial-x86.zip for 32-bit Windows operating systems.

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

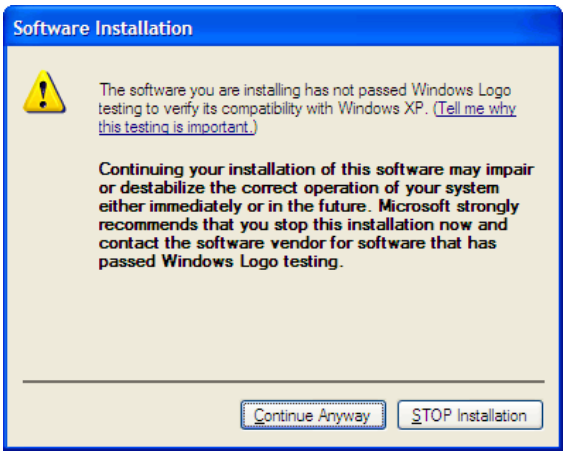
   pserial-ia64.zip for 64-bit Windows Itanium operating systems.

4. Unzip the driver zip file to a local directory. We recommend that you use the **pserial-setup-<*arch*>.exe** file, which will launch the installation wizard, to install the FAST driver.

5. Double-click the **pserial-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 FAST port on your system.

Your FAST driver installation is now finished.

Adding additional cards and/or updating drivers

Whenever you add any additional FAST hardware to your system, Windows might install the latest digitally signed driver in its database (depending on your Windows operating system and settings). To ensure you have the latest driver installed after you add new hardware, you can either:

- Click **Start > All Programs > Perle > Perle-Serial > Update Driver**

  or

- Reinstall the drivers as described in **Installing device drivers and utilities onto your system** on page **29**.

Adding AT host cards to the system

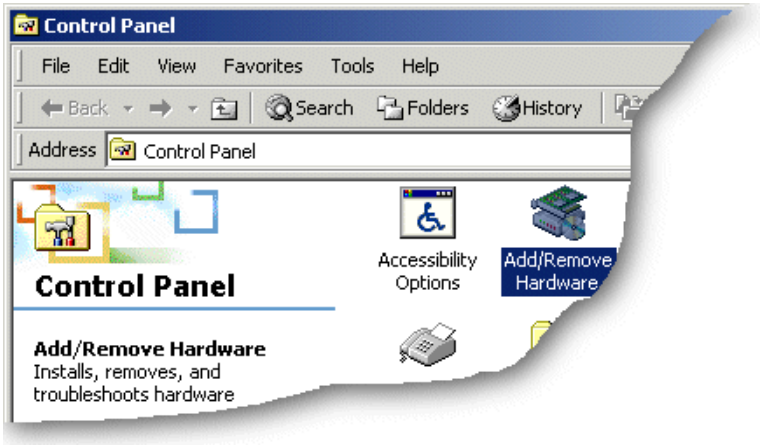
When you physically install an AT host card in your system you also need to add the card to the list of installed devices in the system.

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

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

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, double click on the **System** icon.

   The Add/Remove Hardware Wizard is now displayed.

3. 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...
	4. 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.
	5. 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.
	6. 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.
	7. 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. 8. 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. 9. 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. 10. 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.
	11. 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 35**.

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

After the you have finished adding cards to the system all connected port devices will now be detected. You should now install the latest driver for the ports from its database or you will be prompted for one if one cannot be found.

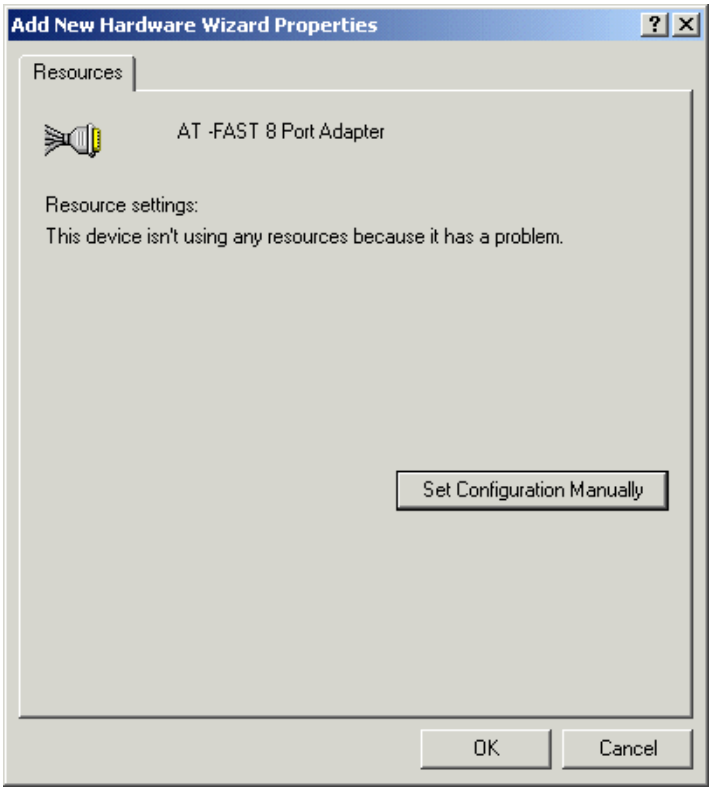
> Note
>
> Whenever you add any FAST hardware to your system, the default is to use the latest digitally signed driver, although if you are using a later unsigned driver version, the harware will automatically go through an update process. This ensures that every device currently installed in the system is updated to use the driver on the CDROM.

Viewing and changing the resources for a device

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

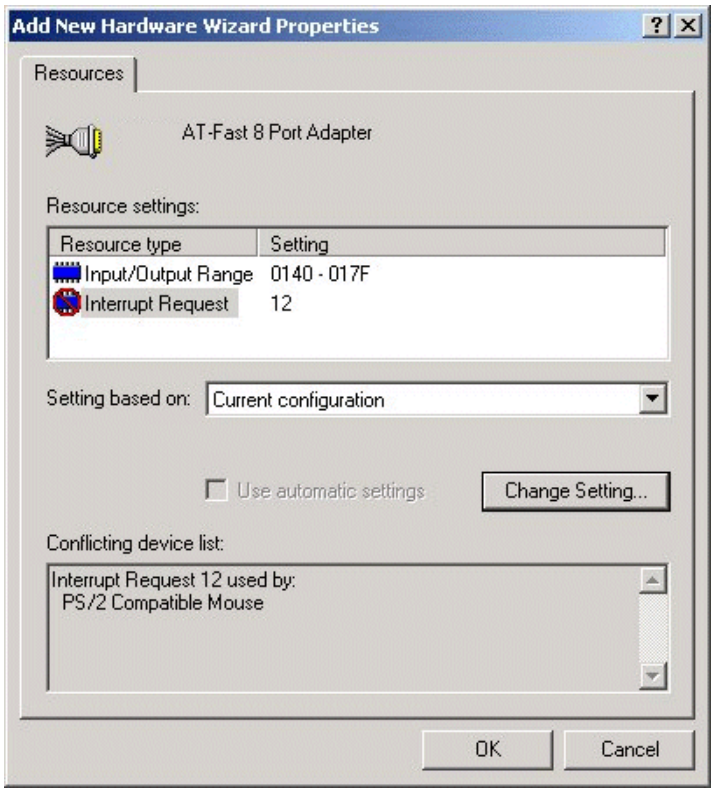
1. In the Add/Remove Hardware Wizard go to the last page and click on the Resources button.

The Add New Hardware Wizard properties window is now displayed.



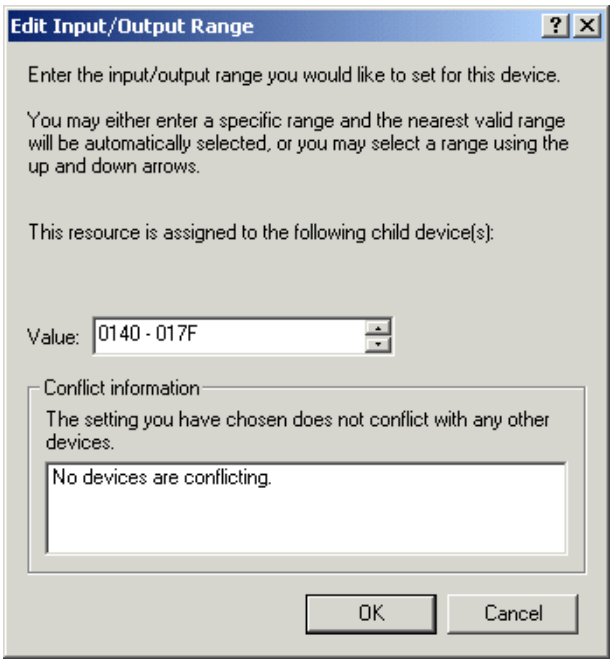
2. In the Add New Hardware Wizard properties window, select the **Resources** page and click on the **Set Configuration Manually** button.

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



3. In the Add New Hardware Wizard properties window, select the **Input/Output Range** field and click on the **Change Setting** button.

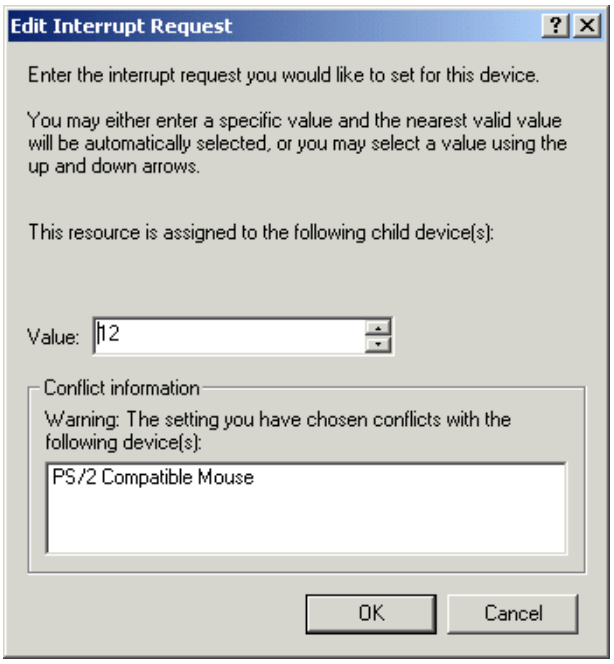
   The Edit Input/Output Range window is now displayed.



4. In the Edit Input/Output Range window, select the I/O address range for the host card you want and click on the **OK** button.

5. In the Add New Hardware Wizard properties window, select the **Interrupt Request** field and click on the **Change Setting** button.

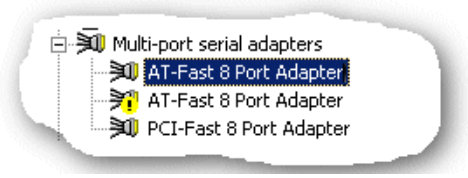
   The Edit Interrupt Request window is now displayed as shown in the next picture.



6. Within the Edit Interrupt Request window, select the Interrupt Request level you want and click on the **OK** button.

> Note
>
> Ensure any AT-FAST cards are set to the I/O address and IRQ levels you have set during this procedure. See **Installing host cards and distribution accessories** on page **79**.

   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.

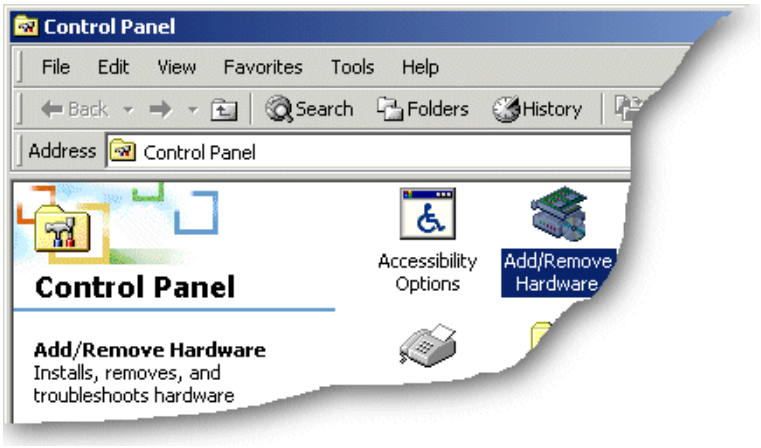


7. If the memory settings you have selected are not acceptable to the system, check your configuration settings and adjust memory address as required (**page 79**). Otherwise ring Technical support.

Configuring serial ports

To configure FAST 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.

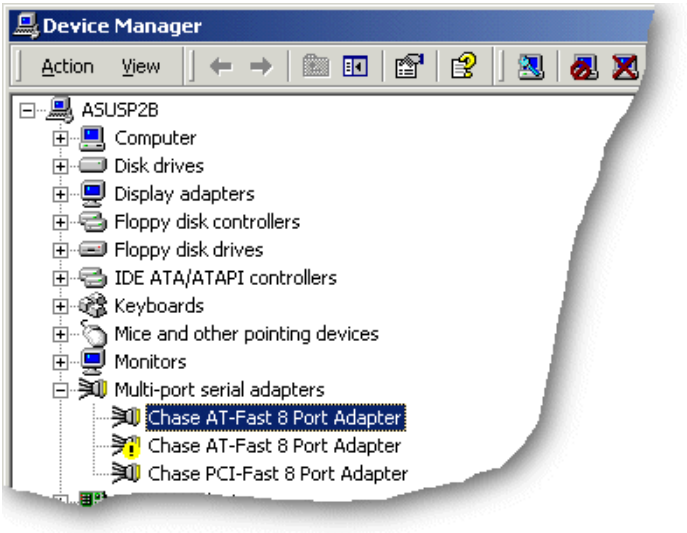


2. In the Control Panel window, click on the **System** icon.
   The System Properties tabbed window is now displayed.

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.

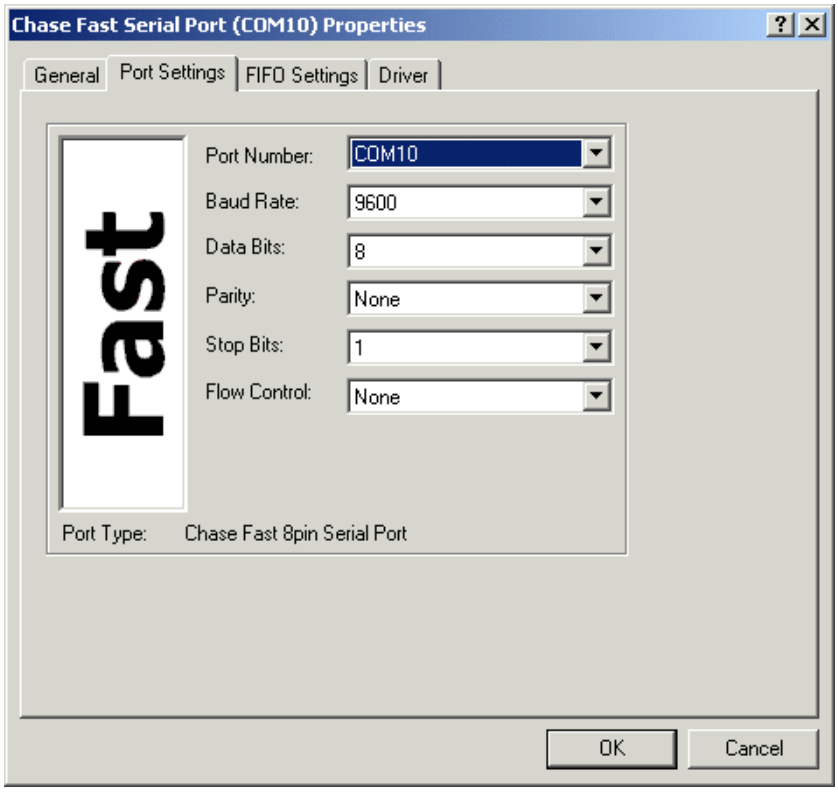
   The Device Manager window is now displayed.



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

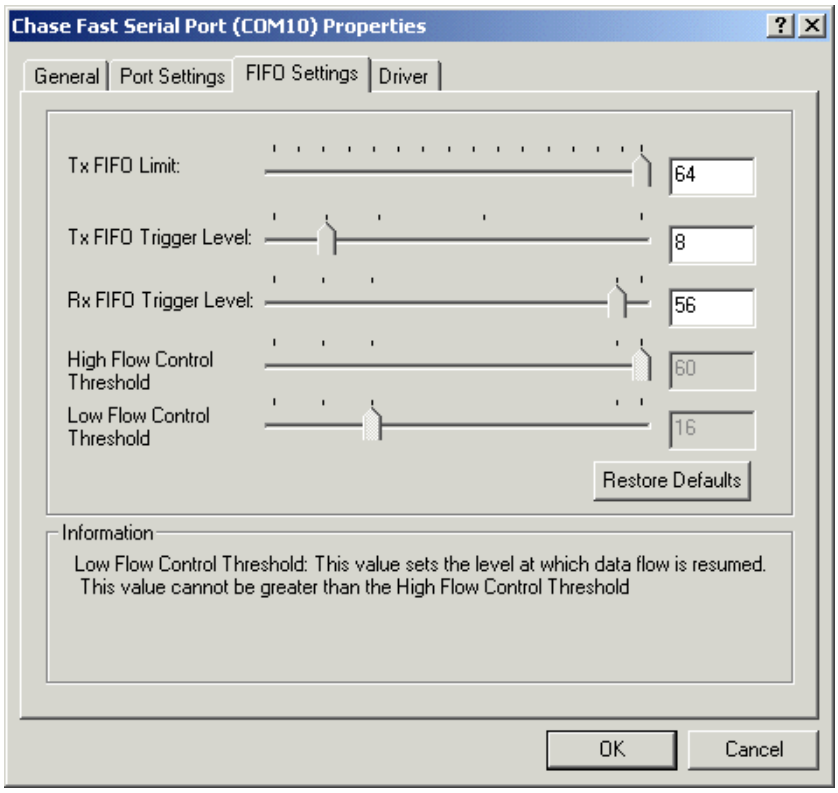
   The device Properties tabbed window is now displayed.

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.

9. If you want to change any FIFO parameters, click on the **FIFO Settings** tab.
   The FIFO Settings page is now displayed as shown in the next picture.



10. In the **FIFO Settings** page, set the FIFO buffer levels using the parameters detailed in the next table.

> Hint
>
> To restore the default settings, use the **Restore Defaults** button.

Parameter	Description
Tx FIFO Limit	Sets the overall size of the Transmit FIFO buffer.You use this when you want to restrict the size of the buffer in order to control the data flow. This is useful when your application requires you to send small amounts of data but needs acknowledgement that the data has been sent. For example, if your application is designed to receive 4 bytes at a time, a larger value of say 16 would time out. Permitted values for a FAST card are 1 to 64.
Tx FIFO Trigger Level	Sets the level at which the com port Transmit FIFO buffer is filled with data each time a request for more data is made. For example, if set to 16 bytes you get 16 bytes at a time when driver requests data. Permitted values for a FAST card are **8**, **16**, **32** and **56**.
Rx FIFO Trigger Level	Sets the level at which the com port Receive FIFO buffer is filled before the data is passed on to an application. For example, if set to 16 bytes, 16 bytes of data are accumulated at a time before data is passed on to an application. The FIFO trigger will also time out if the level is not achieved within two character periods of the last byte received. Permitted values for a FAST card are **8**, **16**, **56** and **60**.
High Flow Control Threshold	Sets the level at which data flow is suspended. If the limit is exceeded, the driver will stop collecting data. For FAST, value is **read only**, set automatically from FIFO trigger level.
Low Flow Control Threshold	Sets the level at which data flow is resumed. If the low flow threshold is exceeded, the driver requests more data. For FAST, value is **read only**, set automatically from FIFO trigger level.

11. Within the Serial Port properties window, click on the **OK** button to save changes and close the window.

The configuration process is now complete.

Installing under SCO OpenServer 5

This section describes how to install the FAST device driver software under SCO OpenServer 5.

The SCO OpenServer 5 drivers support any mix of AT-FAST and PCI-FAST cards up to a maximum of four cards. Each card can contain 4, 8 or 16 high-speed serial ports.

The drivers for Unix are supplied as 'disk images' on the CD, formatted for use with the pkgadd utility. Each package has been given the label comf for com- Fast reflecting the fact that these are fast communications ports.

This section includes the following;

> Note
> When installing additional AT or PCI cards the standard software installation creates operating system device and control entries for a single card. When you wish to add extra cards you should run the command mkdev to add new device and control entries.
>
> mkdev comf
>
> This command will prompt you with the possible actions for the addition or removal of cards.

Note

A mouse or similar device (a few scanners and non-intelligent FAX modems) can be confused by the extra buffering that the card provides. This buffering can be disabled on a port by port basis using the mkdev comf command. The unbuffered ports use similar names to those above with comf changed to com. e.g. com1a.

mkdev comf

The unbuffered ports will now work with a mouse or similar device but they are not recommended for general use as they will present a higher load on the system and their performance will be limited.

General setup procedure for SCO OpenServer 5

The general procedure for installing FAST cards under the SCO OpenServer 5 operating system is as follows;

1. Before commencing the installation process under SCO OpenServer 5, configure your system as described in **Initial configuration under SCO OpenServer 5** on page **47**.

> Note
>
> If you are installing AT-FAST hardware you should examine your system configuration and determine non-conflicting I/O addresses and IRQs for use with each ISA card.
>
> See **Suggested hardware settings for AT-FAST** on page **48**.

2. Install any PCI host cards and distribution cables or boxes you require into your system. See **Installing host cards and distribution accessories** on page **79**.
3. Install any AT cards and distribution cables or boxes you require into your system. See **Installing host cards and distribution accessories** on page **79**.
4. Install the driver software onto your system using the procedures given in **Installing the driver software** on page **49**.
5. You can then enable login access using the procedures given in **Enabling login access** on page **50**.

> Note
> For information on upgrading or re-installing drivers, see **Reinstalling or upgrading software** on page **50**.
> To remove drivers, see **Removing the driver software** on page **50**

6. If required, remove any host cards you want from your system. See **Removing host cards** on page **103**.

Initial configuration under SCO OpenServer 5

Before installing any new software on your system it is important that the existing software is correctly installed and configured.

The Perle software supplied comprises various files plus a kernel module called a device driver that has to be linked into the Unix kernel. Before attempting to install the driver software, it is advisable to check that the kernel can be rebuilt. The steps to do this are:

1. Log in as root.
2. Change directory to /etc/conf/cf.d.

   cd /etc/conf/cf.d

3. Run link_unix.

   ./link_unix -y

4. Reboot the machine.

   sync

   init 6

Any problems that cause the rebuild to fail must be resolved (by your operating system vendor or other third-party product vendor) before installing the driver software.

Suggested hardware settings for AT-FAST

If you are installing AT-FAST hardware you should examine your system configuration and determine non-conflicting I/O addresses and IRQs for use with each ISA card. Some suggested locations to try:

Card	I/O base	IRQ	Suitable for
1st	0x180	5	4 and 8 port cards. Possibly 16 port if using SCSI hard disk
2nd	0x100	10	All cards
3rd	0x240	11	4 and 8 port cards
4th	0x280	12	4 and 8 port cards. Possibly 16 port if not using COM2 Note Do not use IRQ12 if a PS/2 mouse is connected.

As can be seen from the above, I/O space is in short supply especially if installing multiple cards - particularly 16 port units. Using PCI-FAST cards in multiple card configurations is advised. If suitable non-conflicting addresses can be determined then up to four AT-FAST cards can be installed.

The command hwconfig can be used to display resources used by existing hardware.

The parameters base and offset give the start address and size of the I/O space used by a card and vec gives the IRQ number. This list is not exhaustive as some drivers do not declare all the resources they use.

On SMP (multi-processor) systems an additional command displayintr can be used to show the IRQ lines currently in use by the various device drivers.

Installing the driver software

Before commencing software installation, you will need to create a diskette using the 'diskette image' supplied on the CD supplied with this product. When you have created the installation diskette, proceed as follows:

1. Login as root.
2. Insert the created installation diskette.
3. Check for the presence of the /install directory. If this does not exist then create it.

   mkdir /install

4. Call pkgadd to install the driver software.

   pkgadd -n -d /dev/fd0135ds18 comf

5. pkgadd will remind you to insert the floppy in drive A and assuming you have done this you should enter go to continue. Before the kernel is rebuilt you will be asked if the card you are installing is an AT-FAST card.

   If you answer yes then you will be asked to supply the I/O address and IRQ you have determined for the card along with the number of serial ports on the card.

   If you are installing a PCI-FAST card simply answer no to this question as PCI configuration is automatic.

6. You will then be asked if you wish to add any additional cards with this initial installation.

   If installing more than one card you should answer Yes and will then be prompted with a general configuration menu. Otherwise say No. You may add further cards at a later date by issuing the command.

   mkdev comf

7. It may take a couple of minutes to rebuild the system kernel. You will now be asked whether you wish to use the new kernel by default and whether you want the new kernel environment to be built. You should answer Yes to both these questions.
8. Finally, to activate your new kernel you must reboot the system by typing:

   shutdown -y -g5 (Gives users 5 mins) or reboot (Immediate)

Enabling login access

Once installed, operation of the ports is identical with that of standard serial ports with the exception of the differing names described in **Port naming conventions for SCO OpenServer 5** on page **51** and higher possible baud rates described in **Higher baud rates under SCO OpenServer 5** on page **51**.

Thus to enable a login on the first port, you would use the enable command just as you would with the standard serial ports:

```
enable comf1a
```

As installed, the ports operate at 9600 bps. To change this you should edit /etc/inittab and /etc/conf/init.d/comf and change the speed letter for the port.

Remember that /etc/inittab is your current configuration but that it is rebuilt from /etc/conf/init.d/comf whenever the kernel is rebuilt, therefore it is important to update both files.

Reinstalling or upgrading software

New versions of the software can be installed over the top of any existing version using the above installation procedure.

The installation software will attempt to preserve as much of the existing configuration as possible.

Removing the driver software

No action is required when removing cards other than the standard operating system actions to disable login processing on the removed ports. Do not use pkgrm to remove the driver. However, if you wish to remove the card device names and control entries then this can be done as follows:

1. Type: mkdev comf and select the required action.

   Once all card entries have been removed using the above method, the command will prompt to remove the device driver from the kernel.

2. Select yes to remove all references to the software apart from some package management entries and the mkdev program itself.

> Note
>
> Having removed the device driver in this way you would need to reinstall from the distribution disk should you wish to use the cards again in the future.
> For information on the port labelling conventions and high-speed baud rate mapping please go to **Port naming conventions for SCO OpenServer 5** on page **51** and **Higher baud rates under SCO OpenServer 5** on page **51**.

Port naming conventions for SCO OpenServer 5

If the first card has 16 ports, the ports on the first card are named comf1a through to comf1p. Only the first four or eight names will be used on smaller cards. If a second 16 port card is subsequently added, it's ports are named comf2a to comf2p, etc.

Cards are numbered and named in PCI system slot order, with cards in the lower numbered slot on the lower numbered bus appearing first in the list.

> Note
>
> Adding a new card in a lower numbered slot than an existing one will cause the ports on the existing board to be renumbered.

For OpenServer 5, any AT-FAST cards configured will appear in the list in the order they have been configured.

To use modem control for dial in operations the port name should be used with the last letter of the name in uppercase;

e.g. comf1A. Upper case port names assume at least a five-wire connection (RXD, TXD, RTS, CTS, GND) with another serial device. Lower case port names assume a three-wire connection only (RXD, TXD, GND).

Higher baud rates under SCO OpenServer 5

Because the system does not support the selection of baud rates above 38.4 kpbs, we have permanently remapped some of the lower baud rates to support higher card speeds.

Original speed (bps)	Is mapped to (kpps)	Getty letter
50	57.6	a
75	76.8	b
110	115.2	c
134	230.4	d
150	460.8	e

Installing under SCO OpenServer 6

This section describes how to install the FAST device driver software under SCO OpenServer 6.

The SCO OpenServer 5 drivers support any mix of AT-FAST and PCI-FAST cards up to a maximum of four cards. Each card can contain 4, 8 or 16 high-speed serial ports.

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. Install any AT-FAST cards you require into your system. See **Installing host cards and distribution accessories** on page **79**
2. Install the SPEED SCO OpenServer 6 drivers and utilities onto your system using the procedures described in **Installing device drivers and utilities** on page **54**.
3. If required, remove any host cards you want from your system. See **Removing host cards** on page **103**.
4. Using the **Port Configuration tool**, configure the serial ports you have added to the system. See **Configuring serial ports** on page **60**.

Your system can now use the serial adaptor cards you have installed. If required, you can reconfigure serial ports following initial installation.

Installing device drivers and utilities

To install the PCI-FAST 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

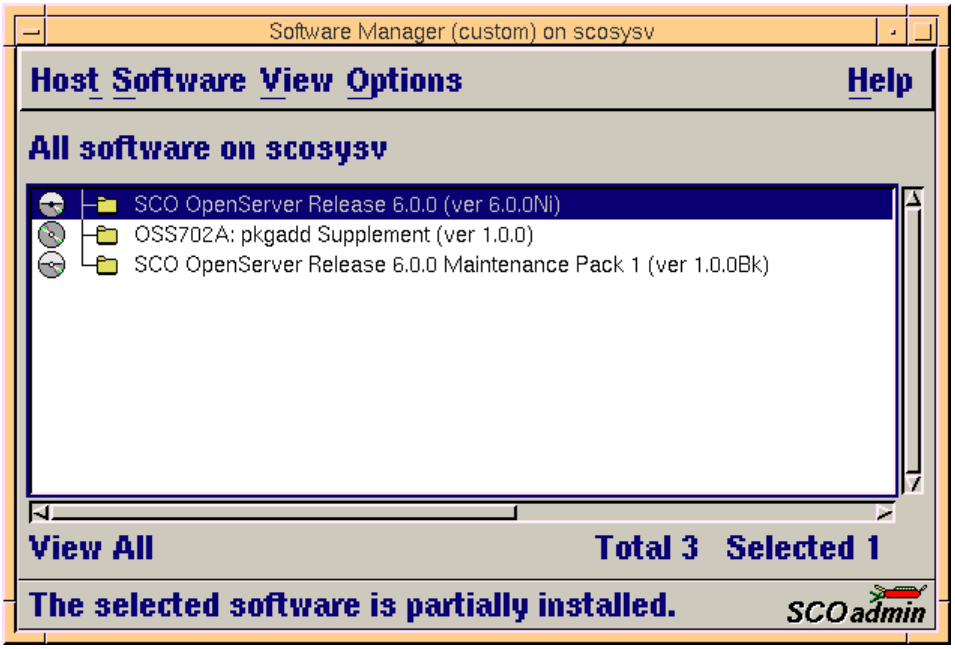
   > Note
   > The example above shows the directory name as **/cdrom**, You can either use this name or use another directory name to suit your requirements. For example, **/mnt**.

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

   The System Administration window is now displayed.

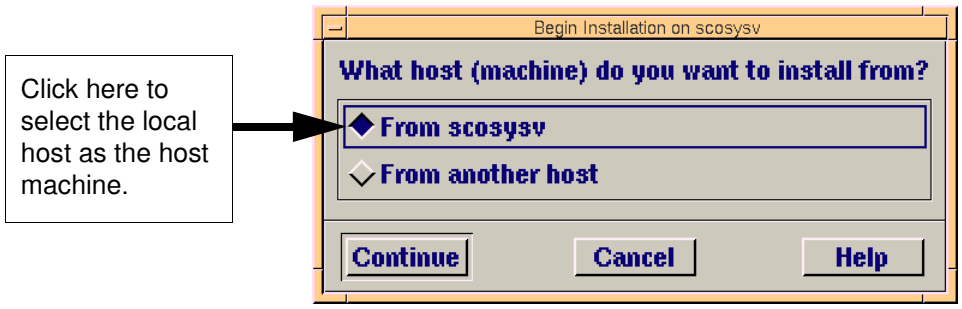
6. In the System Administration window, double click on the software manager icon.

   The Software Manager window is now displayed.



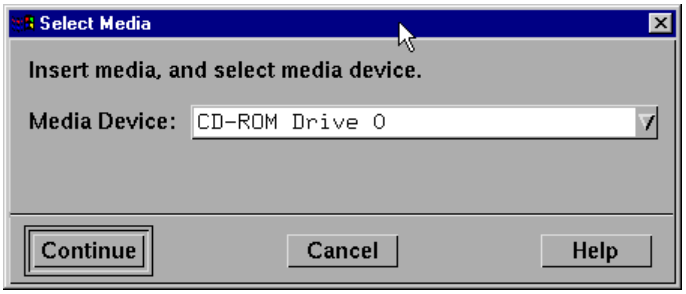
7. In the Software Manager menu, click on **Software > Install New**.

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



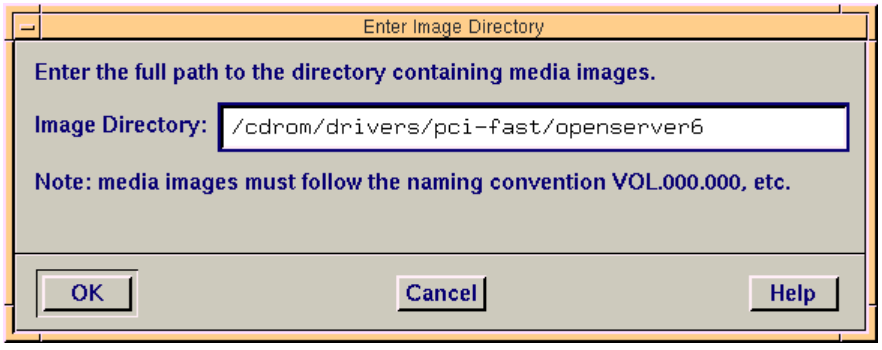
8. In the Begin Installation window, select the local host as the machine to install from by clicking on the **From localhostname** button and then click on **Continue**.

   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.



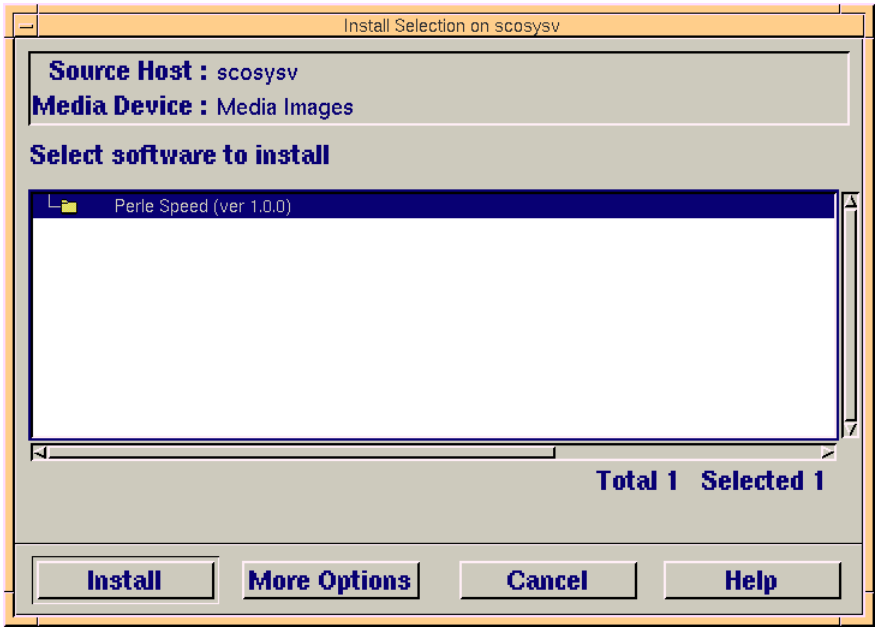
10. In the Enter Image Directory window, enter the following in the Image directory field;

    /cdrom/drivers/pci-fast/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**.

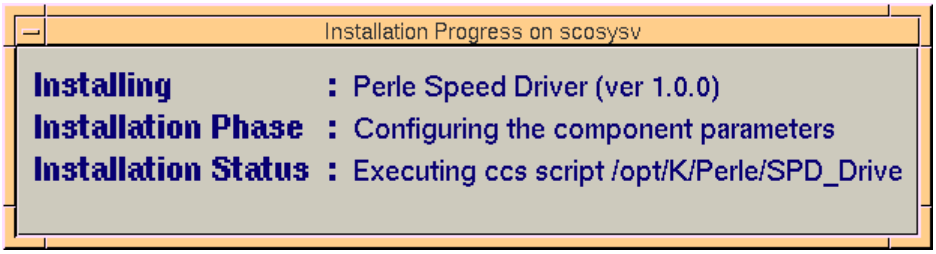
11. In the Enter Image Directory window, click on **OK**.

    The Install Selection window is now displayed.

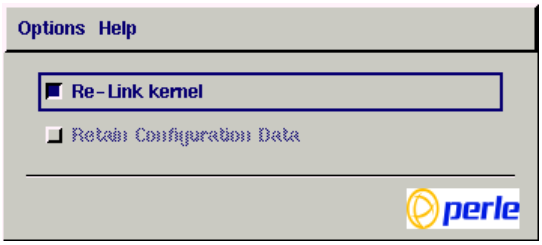


12. In the Install Selection window, click on the **Install** button.

    The following progress message is now displayed.



    The above window will display various progress messages and then the Speed Installation Options window will be displayed.



13. If required, in the Speed Installation Options window, select the **Re-Link kernel** option.

> Hint
>
> If you are installing more then one driver, you can de-select this option until you have installed all the drivers and utilities you require to save time.

14. In the Speed Window Installation menu, click on **Options > Exit** to close the window and continue the installation process.

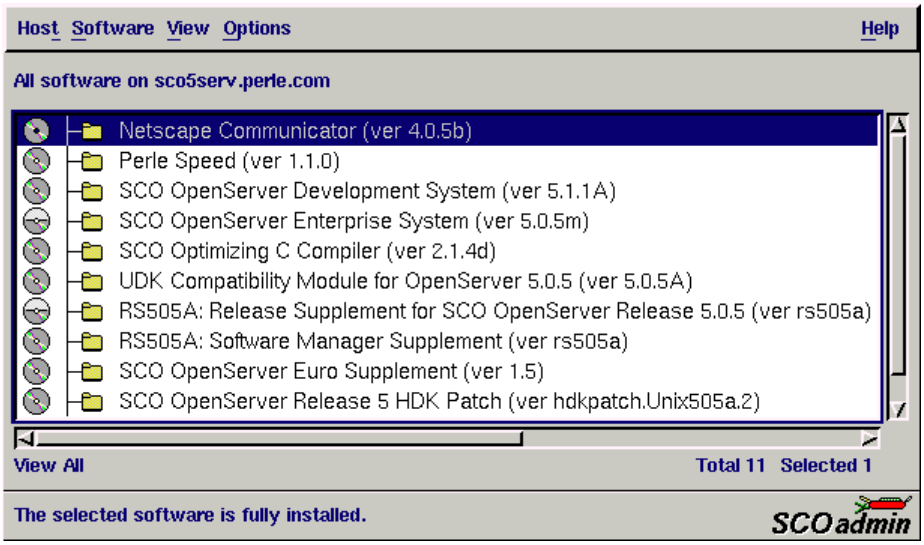
    If you select **Re-link kernel**, a message window is displayed at the end of the driver installation prompting you to re-boot the system.

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 6** on page **53**.

Serial port naming conventions

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
ttyz1	Normal communications port for local “tty” devices.	Indicates normal communications port behaviour.	/dev
ttyZ1	Modem port	Indicates that a port open will not complete unless DCD is present	/dev
ttyz1p	Transparent print port.	Indicates that device should only be used for transparent print.	/dev

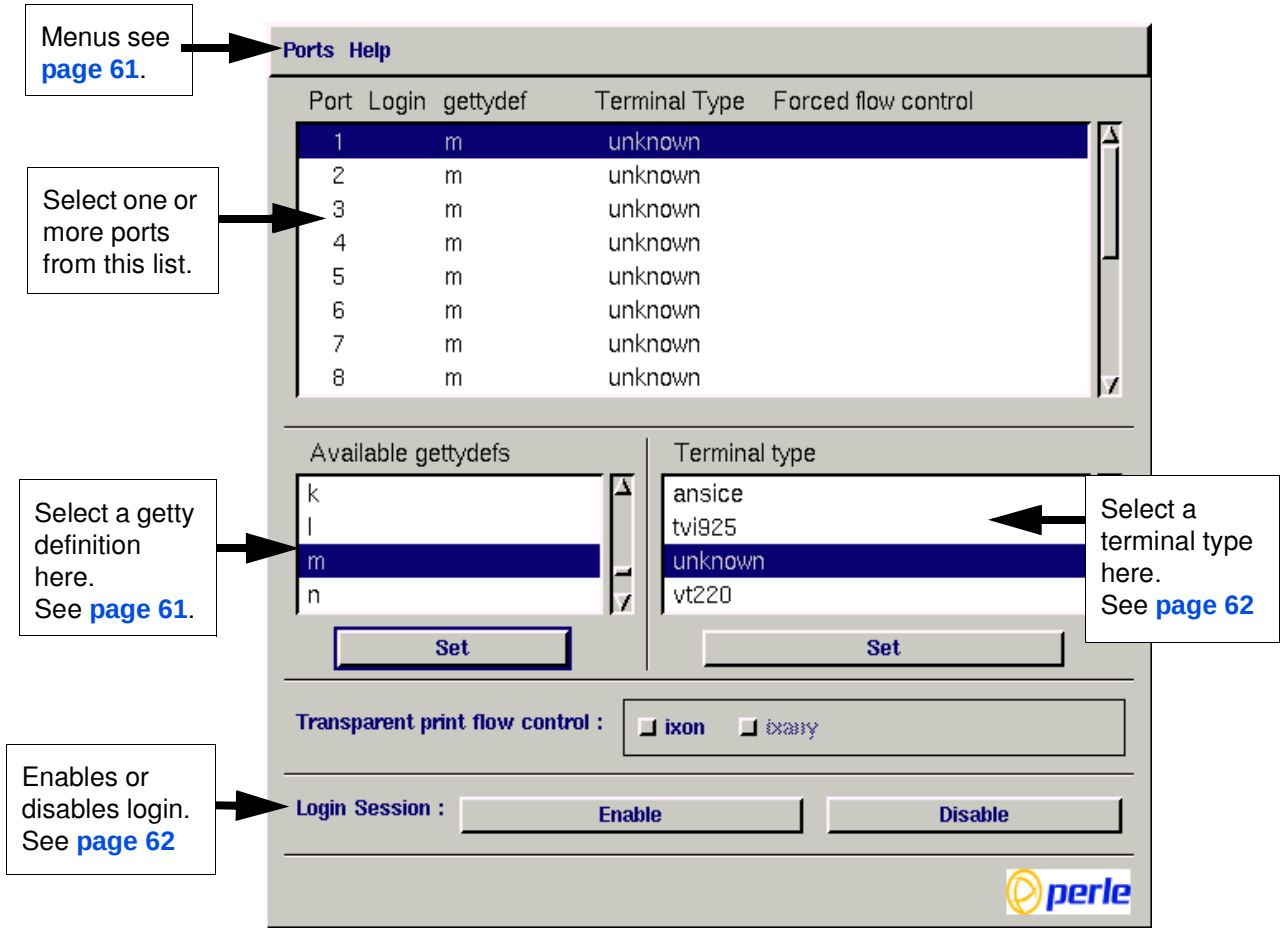
Configuring serial ports

The Port Configuration utility allows you to configure the SPEED serial ports you have installed on your system. To do this proceed as follows;

Starting the Port Configuration utility

1. In the command prompt, type **spdpcfg** and press the **Enter** key. Alternatively use the SCO OpenServer desktop as follows;
   a. In the SCO OpenServer 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. The Speed window is now displayed.
   c. In the Speed window, click on the **Speed Port Configuration** Icon.

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



Menu map

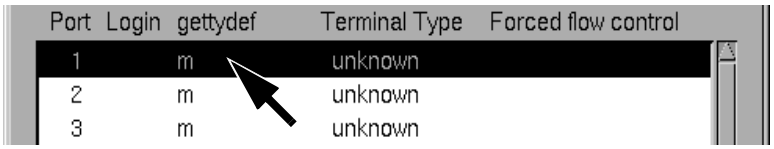
The Port Configuration tool menu is as follows;

Menu option Description		
Ports >	**Quit**	Quit Port Configuration tool without saving changes.
	Logins	Display all ports with logins enabled.
	Unconfigured	Display all ports without logins enabled.
	All	Display all ports.
	Save & Exit	Exit the Port Configuration tool and save changes.

Selecting ports

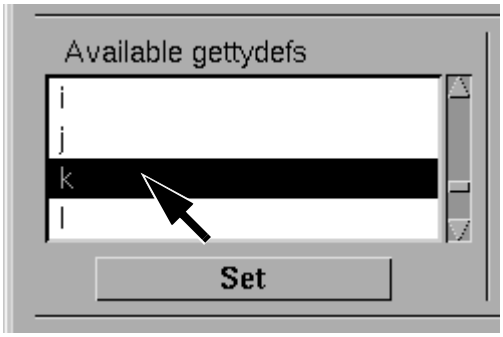
2. In the Port Configuration window, select the ports you want you want to configure by clicking on one or more items in the list of ports (example in next picture).

> 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.

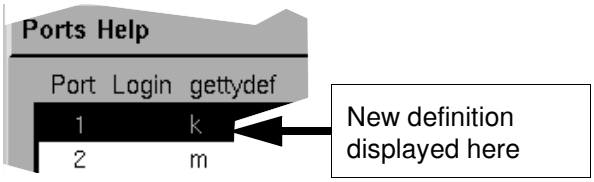


Selecting a getty definition

3. In the Port Configuration window, select the getty definition you want by double clicking on an item in the **Available gettydefs** list. Alternatively, click on the **Set** button.



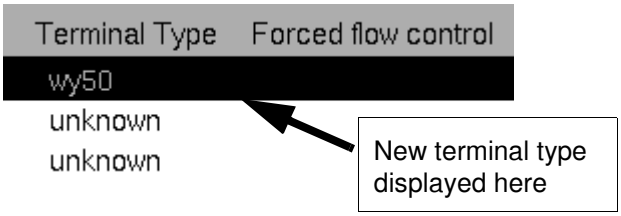
The list of currently selected ports is now updated to show the new getty definition.



Selecting terminal type

4. In the Terminal type list, double click on the terminal type you want for the currently selected ports. Alternatively, single click on the item you want in the Terminal type list and press the **Set** button.

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



Setting up a port login

5. 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.

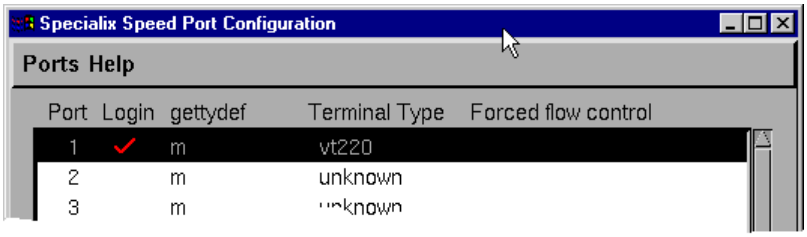
   These options allow you to filter on the type of ports you are looking for. This facility is helpful when you have a large number of ports installed.

To Display	Click menu option
All ports with logins enabled	**Ports > Logins**
All ports without logins enabled	**Ports > Unconfigured**
Display all ports	**Ports > All**

6. 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;

Tc	Click on
Enable logins for a port	**Enable** button
Disable logins for a port	**Disable** button

The selected ports in the list now are updated show their new login status. For example if you enable the login for a port, a tick is displayed along side the port as shown in the next picture.



7. Repeat steps **2.** to **6.** until you have configured all the ports you want.

Exiting the Port Configuration tool

8. In the Port Configuration menu, click on **Ports > Save & Exit**.

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

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

Removing drivers and utilities from your system

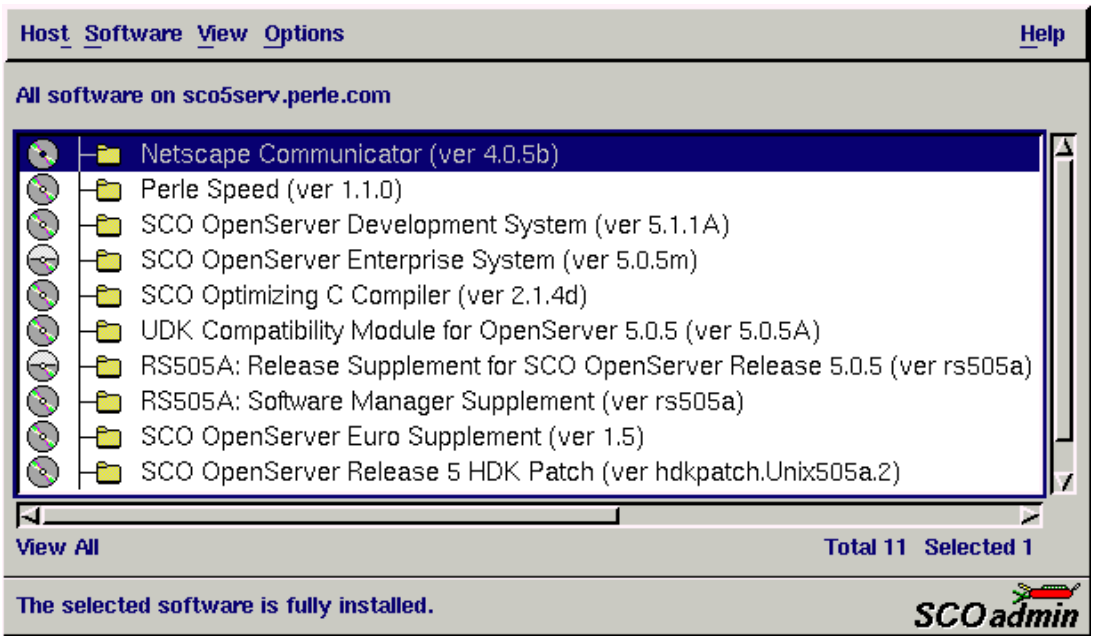
To remove the PCI-FAST device drivers and utilities for the SCO OpenServer operating system proceed as follows;

1. In the SCO OpenServer 6 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. The software manager window is now updated to show the remaining software.

Installing under SCO UnixWare

This section describes how to install the FAST device driver software under SCO UnixWare.

This section includes the following;

Note

A mouse or similar device may not work correctly on buffered ports, such as those offered with the PCI-FAST / AT-FAST cards. If possible, connect your mouse to one of the existing PC serial ports. To configure the cards for connection to a mouse, disable the buffering option as follows:

1. Run the atfconfig utility:

   /etc/comf/atfconfig

2. At the Action? prompt, select M. Add a mouse port. A list of available ports is shown and a prompt follows for the name of the port you wish to unbuffer.

   Example: Type comf2c to unbuffer the third port on the second card.

3. Repeat as required for other ports.
4. Quit the utility.

An extra device will now be added to the /dev directory for each unbuffered port configured. In the example above it is called com2c and this name should be specified to the mouse software, etc.

General setup procedure for SCO UnixWare

The general procedure for installing FAST cards under the SCO UnixWare operating system is as follows;

1. Before commencing the installation process under SCO UnixWare, configure your system as described in **Initial configuration under SCO UnixWare** on page **67**.

   Note
   If you are installing AT-FAST hardware you should examine your system configuration and determine non-conflicting I/O addresses and IRQs for use with each ISA card.

2. Install any PCI host cards and distribution cables or boxes you require into your system. See **Installing host cards and distribution accessories** on page **79**.
3. Install any AT cards and distribution cables or boxes you require into your system. See **Installing host cards and distribution accessories** on page **79**.
4. Install the driver software ionto your system using the procedures given in **Installing SCO UnixWare drivers using command line** on page **68** or **Installing SCO UnixWare drivers using the Desktop** on page **70**
5. You can then enable login access using the procedures given in **Enabling login access** on page **70**.

   Note
   For information on upgrading or re-installing drivers, see **Reinstalling or upgrading software** on page **70**.
   To remove drivers, see **Removing the driver software** on page **50**
   For information on installing additional cards see **Installing additional cards** on page **70**.

6. If required, remove any host cards you want from your system. See **Removing host cards** on page **103**.

Initial configuration under SCO UnixWare

Before installing any new software on your system it is important that the existing software is correctly installed and configured.

The software supplied comprises various files plus a kernel module called a device driver that has to be linked into the Unix kernel.

Before attempting to install the software, it is advisable to check that the kernel can be rebuilt.

The steps to do this are:

1. Log in as root.
2. Change directory to /etc/conf/bin.

   cd /etc/conf/bin

3. Run idbuild.

   ./idbuild

4. Reboot the machine.

   sync

   init 6

During the reboot, the kernel will be rebuilt. Any problems that cause the rebuild to fail must be resolved (by your operating system vendor or other third party product vendor) before installing the driver.

Installing SCO UnixWare drivers using command line

Before commencing software installation, you will need to create a diskette using the 'diskette image' supplied on the CD supplied with this product. How to use this CD-ROM When you have created the installation diskette, proceed as follows:

1. Log in as root.
2. Insert the created installation diskette.
3. Run pkgadd to install the package.

   pkgadd -d diskette1 comf

4. When prompted, give the total number of PCI-FAST and AT-FAST you want to install at this time (cards can be added later).

   Example: If you are installing 2 PCI-FAST cards and 1 AT-FAST card, enter 3.

5. You will be prompted to run the Device Configuration Utility (dcu) if you are installing any AT-FAST cards. If you are installing PCI-FAST cards only, go to step **12.**
6. Unless you are confident that you know suitable values for the IRQ line and I/O address range to use with AT-FAST cards, it is advisable to run the scansd utility.

   /etc/comf/scansd

   This produces a report such as:

```
The following IRQs are free:

2 5 7 12 13 14 15

The following IRQs are shareable (ipl level in () ):
9(5)

The following I/O address ranges are free:

0x63-0x63 0x65-0x6F 0xE0-0x2F7 0x320-0x32F
0x334-0x3EF

The following memory address ranges are free

0xC8000-0xCBFFF 0xD0800-0xDBFFF 0xDE000-0xDFFFF
```

7. Select a unique free IRQ for each AT-FAST card from the subset that is supported by the card. Then select a free I/O range from the subset supported by the card.

   The following table shows the address range required for each card type.

Ports	Range
4	base to base+0x1F
8	base to base+0x3F
1	6base to base+0x7F

   From the example above, we could select an IRQ of 15 and an I/O range of 0x100 to 0x17F to install a 16-port card.

8. Run dcu.

   dcu

9. When the main menu appears, select software Device Drivers. Then select Communications Cards or All Software Device Drivers.
10. Use the PgDn key and/or tab key to move to the comf entry and press F5. On the New Hardware Configuration form, fill in the fields as follows:

IPL	5
ITYPE	1
IRQ	[chosen value (15 in example above)]
IOStart	[chosen value (100 in example)]
IOEnd	[chosen value (17F in example)]
MemStart	-
MemEnd	-
DMA	-

11. Press F10 to leave this form, then <Enter> to return to Software Device Driver Selections menu. Press R then <Enter> to return to the main menu. Finally press A then <Enter> to make the changes.
12. Remove the installation diskette and reboot the machine.
    sync
    init 6

The new devices will be available after a successful rebuild and reboot.

> Note
>
> The default stty setting for UNIXWARE 2.1.1 is 7 bits even-parity. The default ports are 8 bit no-parity. These usually need to match the connecting device.

Installing SCO UnixWare drivers using the Desktop

The system owner can install the driver from the desktop as follows:

1. Insert the created Installation diskette.
2. Select the Admin_Tools/App_Installer icon.
3. Set the Install From box to Disk_A and wait for the comf icon to appear, then select it.
4. Select the Install button.
5. If you are installing any AT-FAST cards, see steps **4.** to **8.** of the command line installation on **page 68**. The Device Configuration Utility may be envoked from the desktop by selecting Admin_Tools/ Hardware_Setup icon.
6. Remove the diskette.
7. Select the Shutdown icon on the main desktop.

Enabling login access

Logins are not enabled by default. For example, to enable a login on the third port of the second card, type:

```
pmadm -e -p comf2 -s 2c
```

The -p parameter is comf1 for the first card to comf4 for the fourth card. The -s parameter is the last two characters of the port name (see **page 73**). See the pmadm man page for more details.

Reinstalling or upgrading software

New versions of the software can be installed over the top of any existing version using the installation procedure listed on **page 65**.

Installing additional cards

To install extra cards (up to the maximum of four):

1. Run the atfconfig utility.

   ```
   /etc/comf/atconfig
   ```

2. At the Action? prompt, select A. Add a card.
3. On completion of the program, quit and then for AT-FAST cards only, use dcu to configure the cards in the same way as discussed in Command line installation on **page 68**, or Desktop installation steps on **page 70**.
4. Finally reboot the system:

   ```
   sync
   init 6
   ```

Removing cards and software

To remove a PCI-FAST card, jump to step 5.

1. Run the atfconfig utility.

   /etc/comf/atfconfig

2. At the Action? prompt, select D. Delete a card.
3. Reboot the system.

   sync

   init 6

To remove an AT-FAST card:

1. Run dcu from the command line as root, or Admin_Tools/Hardware_Setup from the desktop as the system owner.
2. Select Hardware Device Configuration. Use the PgDn and/or Down-arrow key to move the cursor to the first column of the entry for the card to be removed.
3. Type N into this column, then press F10.
4. Press A, then <Enter>.
5. Run the atfconfig utility.

   /etc/comf/atfconfig

6. At the Action? prompt, select D. Delete a card.
7. Reboot the system.

   sync
   init 6

To remove the driver, the following steps are required:

1. Remove all ' comf'cards as per the steps in **page 71**.
2. Log in as root and type:

   pkgrm comf

3. Follow the on-screen prompts, or from Admin_Tools/App_Installer (as system owner) select the comf icon and then select Remove.
4. Reboot the system.

   sync
   init 6

Port naming conventions for SCO UnixWare

If the first card has 16 ports, the ports on the first card are named comf1a through to comf1p. Only the first four or eight names will be used on smaller cards. If a second 16 port card is subsequently added, it's ports are named comf2a to comf2p, etc.

Cards are numbered and named in PCI system slot order, with cards in the lower numbered slot on the lower numbered bus appearing first in the list.

> Note
>
> Adding a new card in a lower numbered slot than an existing one will cause the ports on the existing board to be renumbered.

For OpenServer 5, any AT-FAST cards configured will appear in the list in the order they have been configured. Under UnixWare 2.1.1 cards are numbered in the order that dcu detects them.

To use modem control for dial in operations the port name should be used with the last letter of the name in uppercase;

e.g. comf1A. Upper case port names assume at least a five-wire connection (RXD, TXD, RTS, CTS, GND) with another serial device. Lower case port names assume a three-wire connection only (RXD, TXD, GND).

Higher baud rates under SCO UnixWare

Because the system does not support the selection of baud rates above 38.4 kpbs, we have permanently remapped some of the lower baud rates to support higher card speeds.

Original speed (bps)	Is mapped to (kpps)	Getty letter
50	57.6	a
75	76.8	b
110	115.2	c
134	230.4	d
150	460.8	e

Installing under Solaris

This section describes how to install the FAST device driver software under Solaris.

This section includes the following;

General setup procedure for Solaris

The general procedure for installing FAST cards under the SCO UnixWare operating system is as follows;

1. Install any PCI host cards and distribution cables or boxes you require into your system. See **Installing host cards and distribution accessories** on page **79**.
2. Install any AT cards and distribution cables or boxes you require into your system. See **Installing host cards and distribution accessories** on page **79**.
3. Install the driver software onto your system using the procedures given in **Installing Solaris drivers** on page **76**.
4. You can then enable login access using the procedures given in **Enabling logins** on page **77**.
5. If required, remove any host cards you want from your system. See **Removing host cards** on page **103**.

Installing Solaris drivers

This driver is available either from the Perle Systems web site or on the CD supplied with this product.

1. If this package comes on a CD-ROM, the first step is to copy the image on the CD-ROM to a floppy diskette. Use the 'dd' command for this.

   For example: # dd if=sol_1_00.dd of=/dev/fd0 bs=18k

2. Insert the diskette in the floppy drive and, as root, type # pkgadd -d diskette1 comf
3. Follow the on-screen prompts until the prompt "How many AT-Fast cards to install?

   [0]" appears.

4. If you are installing PCI-Fast and/or PCI-RAS cards only, you can accept the default value of 0 AT-Fast cards. Otherwise, enter the number (1-4) of AT-Fast cards you want to install.
5. For each card you will then be prompted for a base I/O address and interrupt line (IRQ). Note: there no tools to tell you what is already in use and that the following restrictions apply:

   A 4-port card requires 32 bytes of I/O space

   An 8-port card requires 64 bytes of I/O space

   A 16-port card requires 128 bytes of I/O space

   Each AT-Fast requires exclusive use of an IRQ

> Note
>
> The jumpers on the AT-FAST card must be adjusted to agree with the above selection

The installation process will continue to the point where pkgadd reports that the package contains scripts which will be run with root permissions, offering the chance to abort the installation. Perle scripts are not intentionally destructive, but you can see for yourself by aborting the installation, mounting the floppy and the inspecting the request and postinstall scripts.

At the end of the installation, pkgadd may report that the driver was added to the kernel but the module failed to attach. This is normal if you haven't yet installed any cards.

After pkgadd completes, a reconfiguration boot is required to make AT/PCI-Fast and/or PCI-RAS ports work.

Port naming conventions

By default, each port is associated with two entries under the /dev directory. One takes the form /dev/comfxy, where x is the card number (1-4) and y is a lower-case letter in the range a-p. a is port 1, ..., p is port 16. These device names are intended for local devices or call-out modem ports. The other device name takes the form /dev/term/comfxy, where x is the card number as before and y is an upper-case letter in the range A-P. These devices are intended to use with modems. These mappings can be altered by careful modification of the mkdev and start_comf scripts in /usr/lib/i86.

Card Ordering

Cards are numbered by first taking AT-Fast cards in the order that there were entered in the installation procedure, followed by PCI cards in PCI slot order.

Enabling logins

By default, logins on cards are not enabled. Use 'pmadm' to enable logins. For example, to enable login on the fourth port of the third card, you would type #

```
pmadm -e -p comf3 -s 3d
```

Installing under Linux

Cards Supported

The driver has been rewritten to support the following Perle products only:

- 4-port AT-Fast
- 8-port AT-Fast
- 16-port AT-Fast (restricted modem control)
- 4-port PCI-Fast
- 8-port PCI-Fast
- 16-port PCI-Fast (restricted modem control)
- 16-port PCI-Fast (full modem control)
- 4-port PCI-RAS
- 8-port PCI-RAS

Enhanced Features

The range of baud rates has been extended to 460800 bits/sec. The on-chip hardware and software flow control capabilities of the 16C654 UART are utilised to reduce host load.

Known Limitations

1. The driver cannot be installed as a module on multi-processor systems. It can only be installed as a statically-linked driver. On single-processor systems it can be installed statically linked or as a module.
2. Data can be lost if multiple ports are run simultaneously at 230400 or 460800 bits/sec.

Installing host cards and distribution accessories

This section describes the mechanical installation of the FAST host cards and associated distribution boxes and cables for 4, 8 and 16 ports and includes the following;

For information on connector pinouts and cabling, see **Chapter 3 Cabling information**.

Distribution accessory guide

The distribution box or cable required for the FAST product you are using depends on the number of ports and product type as detailed in the next table;

Product	Card edge connector	Cable or distribution box options	For installation information see...
AT-FAST4 PCI-FAST4	RJ45 8 pin female See **page 106**	RJ45 (8 pin) to DB25 male cable.	See **page 81**.
AT-FAST8 PCI-FAST8	Custom D type connector, no wiring information required by user.	8 port distribution box with DB25 female connectors.	See **page 86** and **page 92**.
		8 port octopus cable with DB25 female connectors on flying leads.	See **page 86** and **page 93**.
		8 port octopus cable with DB25 male connectors on flying leads	
		8 port distribution cable with RJ45 8 pin female connector block.	See **page 86** and **page 94**.
AT-FAST16 PCI-FAST16	Custom D type connector, no wiring information required by user.	16 port distribution box with DB25 female connectors.	See **page 95** and **page 102**.

Installing 4 port cards

This section describes the mechanical installation of the 4 port FAST host cards and includes the following;

- **Installing a 4 port PCI host card** on page **81**
- **Installing a 4 port AT host card** on page **83**

For information on installing other card types and associated distribution accessories, see **Distribution accessory guide** on page **80**.

Installing a 4 port PCI host card

To install a PCI host card 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

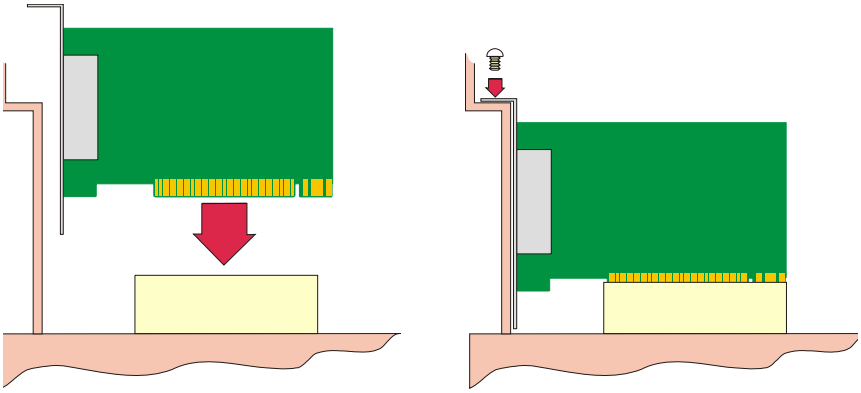
Dangerous voltages exist inside computer systems. Before installing host cards in your system, turn off the power supply and disconnect the mains lead.

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. 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.
5. 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 **17**.

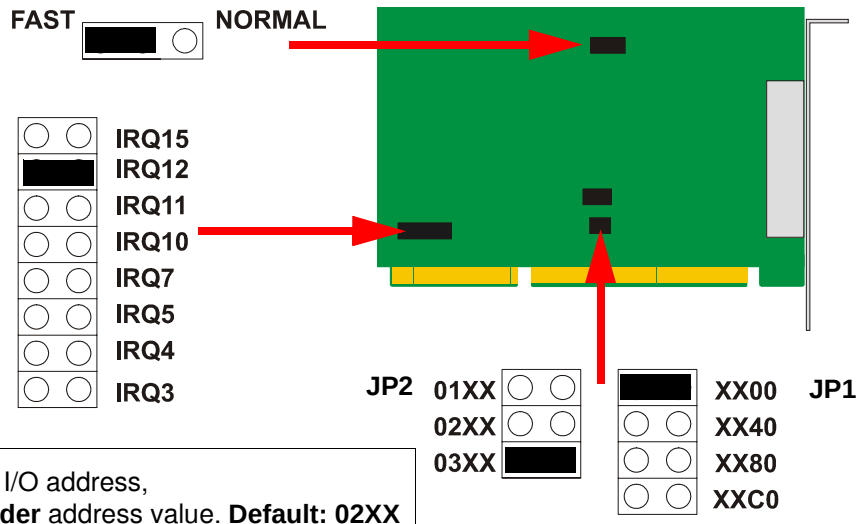
Installing a 4 port AT host card

Setting parameters on an AT host card

Before you install an AT card in your system you need to physically set the I/O address, IRQ level and operating mode for the card using the jumpers provided as follows;

JP4 sets operating mode, set to **Fast**.
Default setting: Fast
See **page 83**.

JP3 sets IRQ level, move jumper to IRQ level required.
Default setting: IRQ10
See **page 83**.



JP1 and **JP2** set I/O address,
JP2 sets **high order** address value. **Default: 02XX**
JP1 sets **low order** address value. **Default XX40**
See **page 84**.

Caution

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

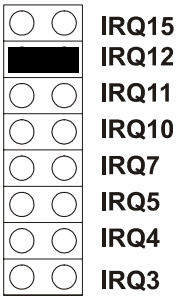
Operating mode

1. On the host card, set the jumper **JP4** to the **FAST** setting.

IRQ level

2. Using jumper **JP3** on the host card, set the IRQ level you want from the values listed on the card;

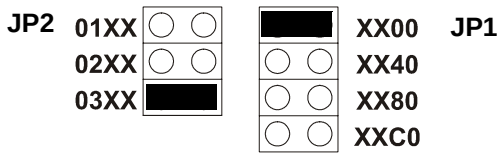
JP3 sets IRQ level, move jumper to IRQ level required.
For example to select a value of 12, move jumper to **IRQ12** position.



I/O address

3. Using jumpers **JP1** and **JP2** on the host card, set the high order and low order I/O address you want in hexidecimal using the one of the settings shown in the next table;

Address	JP2 setting	JP1 setting
0100	01XX	XX00
0140		XX40
0180		XX80
01c0		XXc0
0200	02XX	XX00
0240		XX40
0280		XX80
02c0		XXc0
0300	03XX	XX00
0340		XX40
0380		XX80
03c0		XXc0



JP1 and **JP2** set I/O address,
JP2 sets **high order** address value
JP1 sets **low order** address value

Mechanical installation

You can now install the AT 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

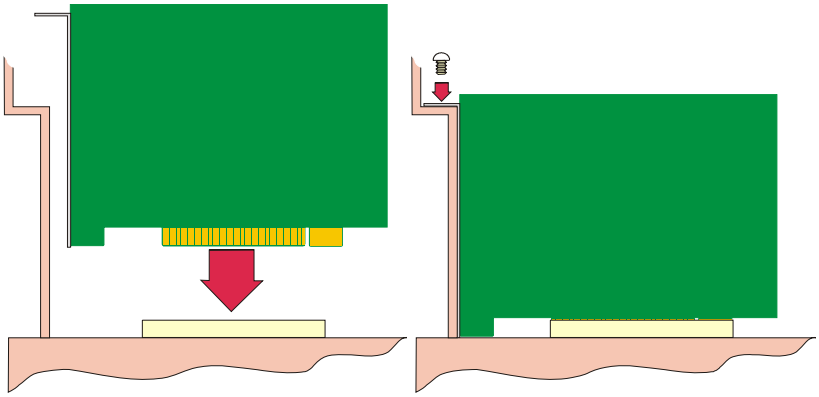
Dangerous voltages exist inside computer systems. Before installing host cards in your system, turn off the power supply and disconnect the mains lead.

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

6. Insert the AT 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.



7. Repeat steps **1.** to **6.** until you have installed all the AT cards you want.
8. Replace and secure the system cover.
9. Plug in the mains and turn on the power.

Installation of AT host cards is now complete. For further details about installing host cards including other types, see **Before you start** on page **17**.

Installing 8 port cards and distribution accessories

This section describes the mechanical installation of the 8 port FAST host cards and distribution accessories and includes the following;

For information on installing other card types and associated distribution accessories, see **Distribution accessory guide** on page **80**.

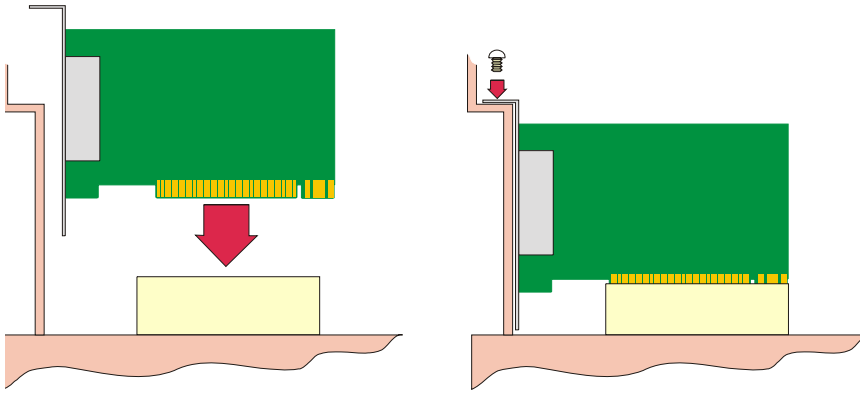
To install a PCI host card proceed as follows;

> 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.**

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. 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.

5. Replace and secure the system cover.

> Note
>
> Do not turn on the power to your system until you have connected the distribution cable or box you are using with this host card. See the following for details;
>
> - **Connecting an 8 port distribution box fitted via hardwired flying lead** on page **92**
> - **Connecting an 8 port octopus cable** on page **93**
> - **Connecting an 8 port distribution cable** on page **94**

Installation of PCI host cards is now complete. For further details about installing other host cards types and distribution accessories, see **Distribution accessory guide** on page **80**.

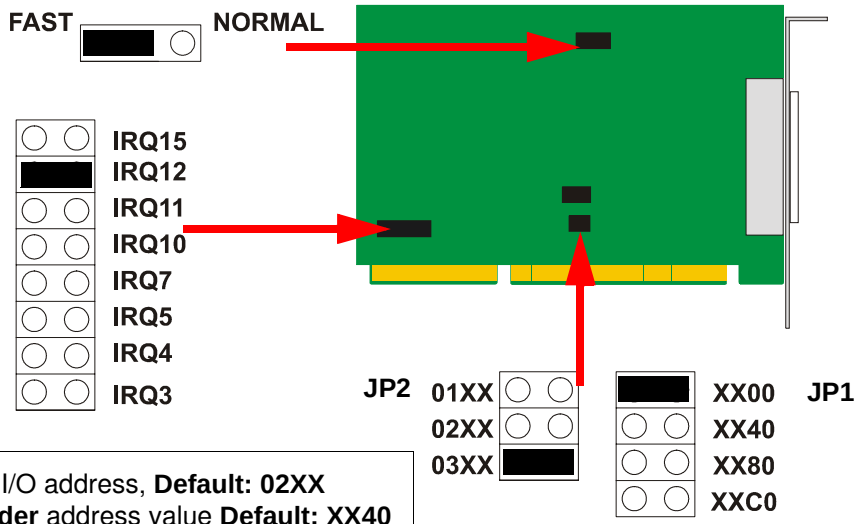
Installing an 8 port AT host card

Setting parameters on an AT host card

Before you install an AT card in your system you need to physically set the I/O address, IRQ level and operating mode for the card using the jumpers provided as follows;

JP4 sets operating mode, set to **FAST**.
Default setting: FAST
See **page 83**.

JP3 sets IRQ level, move jumper to IRQ level required.
Default setting: IRQ10
See **page 83**.



JP1 and **JP2** set I/O address, **Default: 02XX**
JP2 sets **high order** address value **Default: XX40**
JP1 sets **low order** address value. See **page 84**.

Caution

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

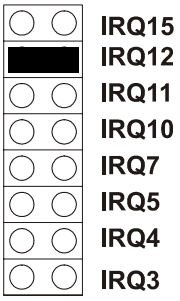
Operating mode

1. On the host card, set the jumper **JP4** to the **FAST** setting.

IRQ level

2. Using jumper **JP3** on the host card, set the IRQ level you want from the values listed on the card;

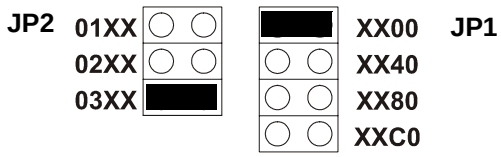
JP3 sets IRQ level, move jumper to IRQ level required.
For example to select a value of 12, move jumper to **IRQ12** position.



I/O address

3. Using jumpers **JP1** and **JP2** on the host card, set the high order and low order I/O address you want in hexidecimal using the one of the settings shown in the next table;

Address	JP2 setting	JP1 setting
0100	01XX	XX00
0140		XX40
0180		XX80
01c0		XXc0
0200	02XX	XX00
0240		XX40
0280		XX80
02c0		XXc0
0300	03XX	XX00
0340		XX40
0380		XX80
03c0		XXc0



JP1 and **JP2** set I/O address,
JP2 sets **high order** address value
JP1 sets **low order** address value

Mechanical installation

You can now install the AT 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.

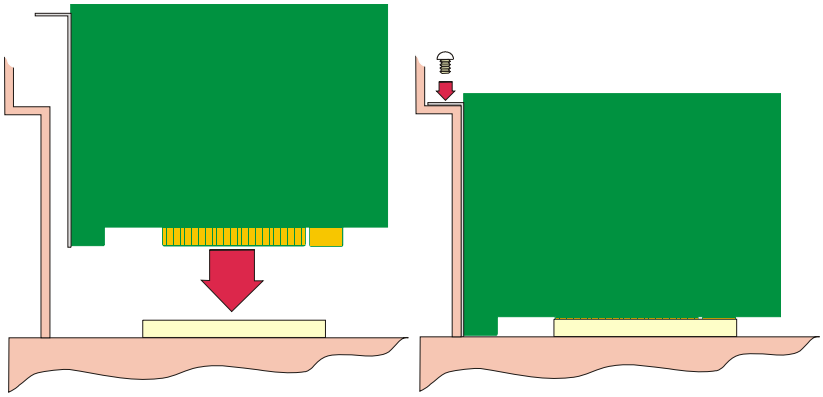
Warning

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

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

6. Insert the AT 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.**



7. Repeat steps **1.** to **6.** until you have installed all the AT cards you want.
8. Replace and secure the system cover.

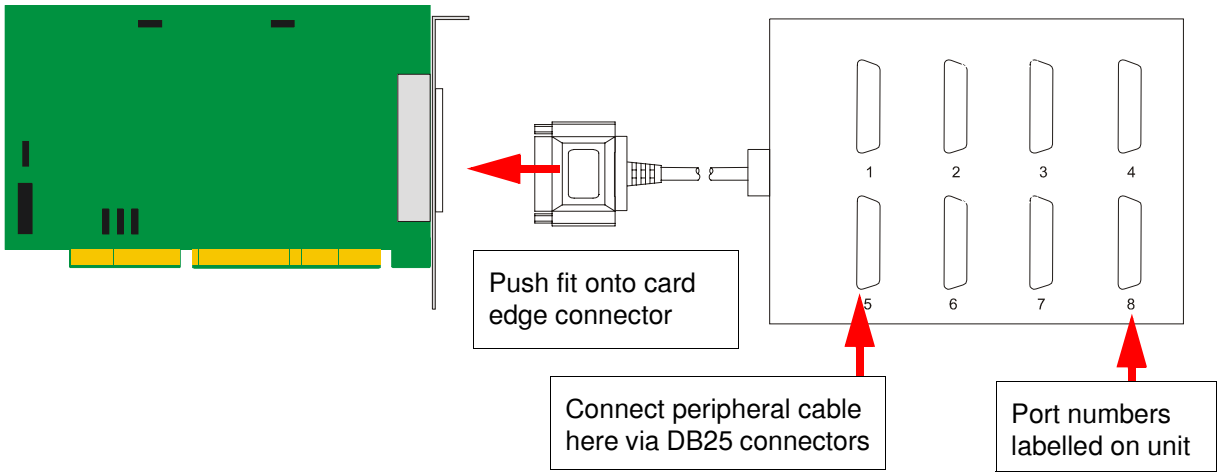
> Note
>
> Do not turn on the power to your system until you have connected the distribution cable or box you are using with this host card. See the following for details;
>
> - **Connecting an 8 port distribution box fitted via hardwired flying lead** on page **92**
> - **Connecting an 8 port octopus cable** on page **93**
> - **Connecting an 8 port distribution cable** on page **94**

Installation of AT host cards is now complete. For further details about installing host cards including other types, see **Before you start** on page **17**.

Connecting an 8 port distribution box fitted via hardwired flying lead

To allow 8 ports to be connected using a distribution box proceed as follows;

1. Install your 8 port AT or PCI FAST card using the procedures given in **Installing an 8 port PCI host card** on page **87** and **Installing an 8 port AT host card** on page **89**.
2. Turn off the power to your system.
3. Push fit the large connector on the end of the distribution box cable onto the card edge connector.
4. Secure the connector in place in place using the screws provided as shown in the next picture.



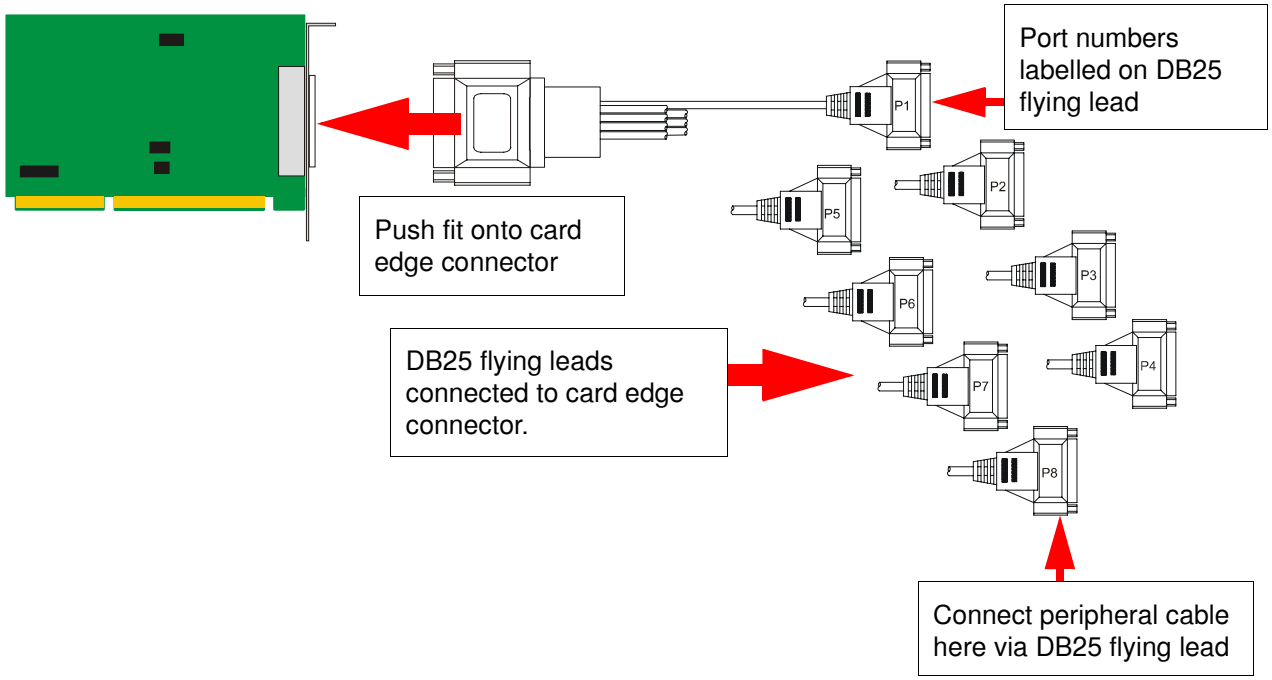
5. Connect peripherals to the required ports on the distribution box using DB25 connectors provided.
6. Turn on the power to your system.

Connecting an 8 port octopus cable

To allow 8 ports to be connected using an octopus cable proceed as follows;

> Note
> Octopus cables are available with both DB35 male and DB25 female connectors for connection to each port.

1. Install your 8 port AT-FAST or PCI-FAST card using the procedures given in **Installing an 8 port PCI host card** on page **87** and **Installing an 8 port AT host card** on page **89**.
2. Turn off the power to your system.
3. Push fit the large connector on the single end of your octopus cable onto the card edge connector and secure in place using the screws provided as shown in the next picture.

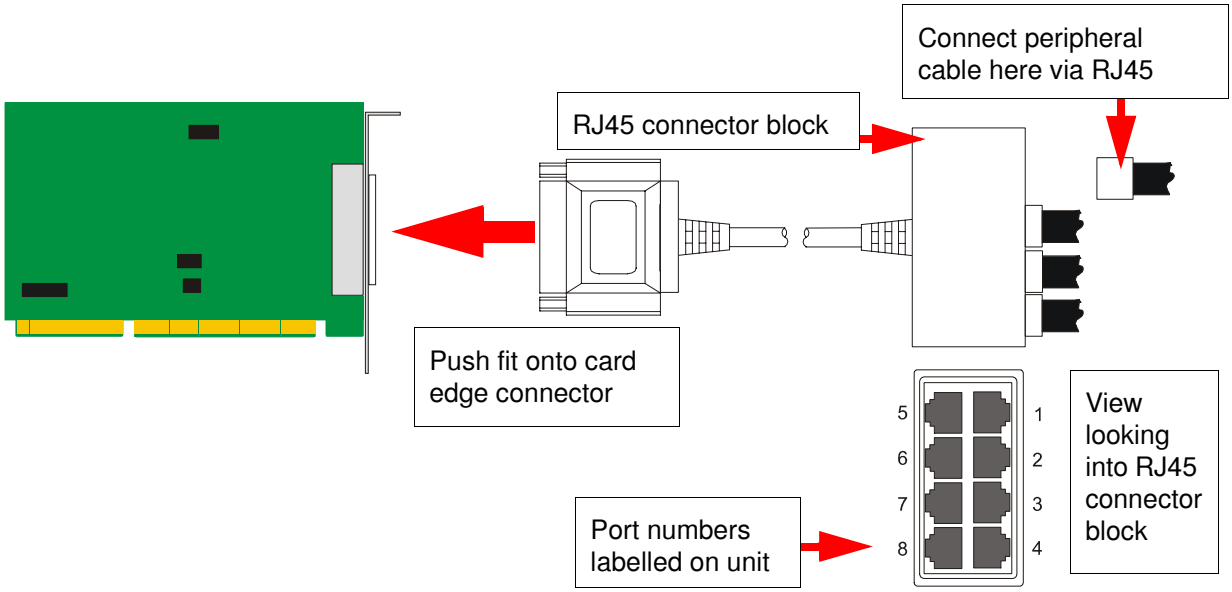


4. Connect peripherals to the required ports on the distribution box using the DB25 flying leads provided.
5. Turn on the power to your system.

Connecting an 8 port distribution cable

To allow 8 ports to be connected using a distribution cable proceed as follows;

1. Install your 8 port AT or PCI FAST card using the procedures given in **Installing an 8 port PCI host card** on page **87** and **Installing an 8 port AT host card** on page **89**.
2. Turn off the power to your system.
3. Push fit the large custom D type connector on the single end of your distribution cable onto the card edge connector and secure in place using the screws provided as shown in the next picture.



4. Connect peripherals to the required ports on the connector block on the end of the distribution cable using the RJ45 sockets provided.
5. Turn on the power to your system.

Installing 16 port cards and distribution accessories

This section describes the mechanical installation of the 8 port FAST host cards and distribution accessories and includes the following;

- **Installing a 16 port PCI host card** on page **95**
- **Installing a 16 port AT host card** on page **97**
- **Connecting a 16 port distribution box** on page **102**

For information on installing other card types and associated distribution accessories, see **Distribution accessory guide** on page **80**.

Installing a 16 port PCI host card

To install a PCI host card 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

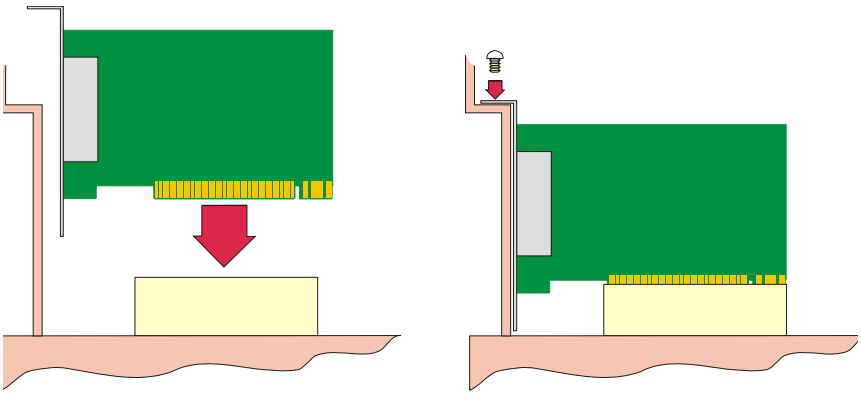
Dangerous voltages exist inside computer systems. Before installing host cards in your system, turn off the power supply and disconnect the mains lead.

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. 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.
5. Replace and secure the system cover.

Note

Do not turn on the power to your system until you have connected the distribution cable or box you are using with this host card. See the following for details;

- **Connecting an 8 port distribution box fitted via hardwired flying lead** on page **92**
- **Connecting an 8 port octopus cable** on page **93**
- **Connecting an 8 port distribution cable** on page **94**

Installation of PCI host cards is now complete. For further details about installing other host cards types and distribution accessories, see **Distribution accessory guide** on page **80**.

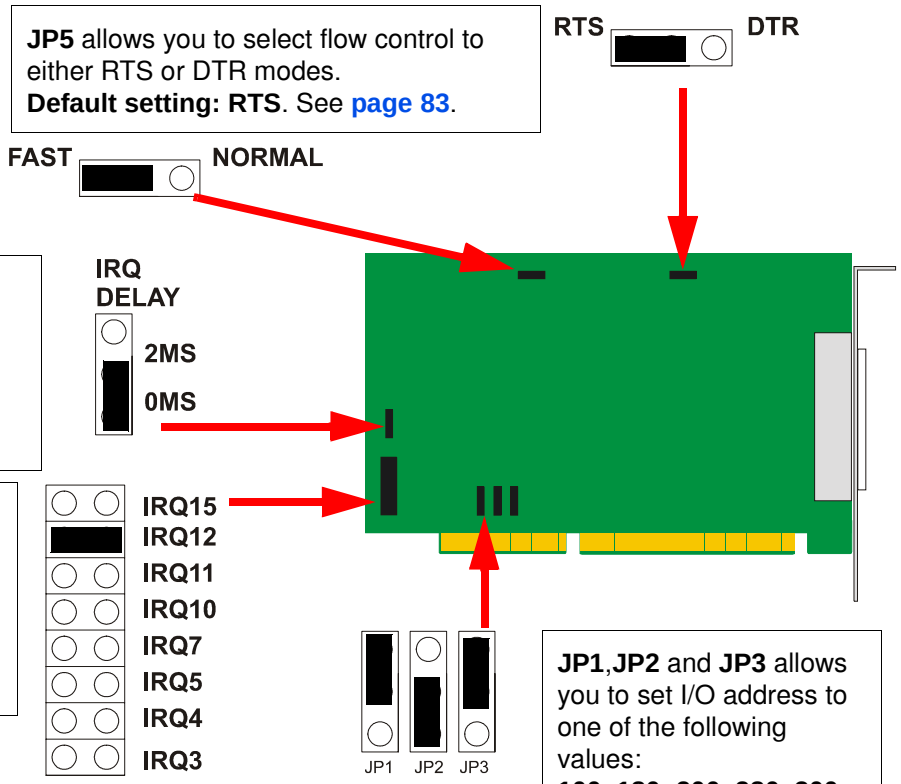
Installing a 16 port AT host card

Setting parameters on an AT host card

Before you install an AT card in your system you need to physically set the I/O address, IRQ level and operating mode for the card using the jumpers provided. On the 16 port cards you can also set an IRQ delay time and choose between DTR and RTS as follows;

JP6 sets operating mode, set to **FAST**.
Default setting: FAST.
See **page 83**.

JP5 allows you to select flow control to either RTS or DTR modes.
Default setting: RTS. See **page 83**.



JP4 sets IRQ delay time, set to **2MS for larger systems**.
Default setting: 0MS
See **page 83**.

JP7 sets IRQ level, move jumper to IRQ level required.
Default setting: IRQ10
See **page 83**.

JP1,**JP2** and **JP3** allows you to set I/O address to one of the following values:
100, **180**, **200**, **280**, **300**, and 380.
Default setting: 280
See **page 84**.

Caution

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

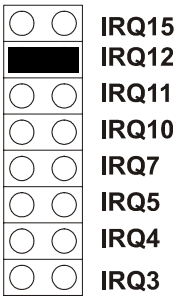
Operating mode

1. On the host card, set the jumper **JP6** to the **FAST** setting.

IRQ level

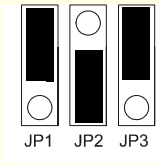
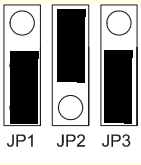
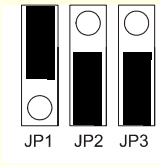
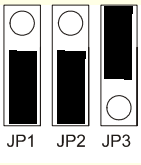
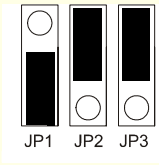
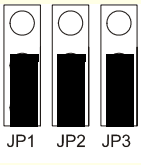
2. Using jumper **JP7** on the host card, set the IRQ level you want from the values listed on the card;

JP7 sets IRQ level, move jumper to IRQ level required.
For example to select a value of 12, move jumper to **IRQ12** position.



I/O address

3. Using jumpers **JP1**, **JP2** and **JP3** on the host card, set the I/O address you want in hexidecimal using the one of the settings shown in the next table;

Address	Jumper setting	Address	Jumper setting
100		280	
180		300	
200		380	

IRQ delay time

4. If you are using larger systems with between 12 and 16 ports simultaneously at a baud rate greater than or equal to 9600bps, you can improve system performance by setting jumper **JP4** to **2MS** setting instead of the default 0MS value.

JP4 sets IRQ delay time, set to **2MS for larger systems**.

5. Using jumper **JP5** select the flow control type to **RTS** or **DTR** as required.

Mechanical installation

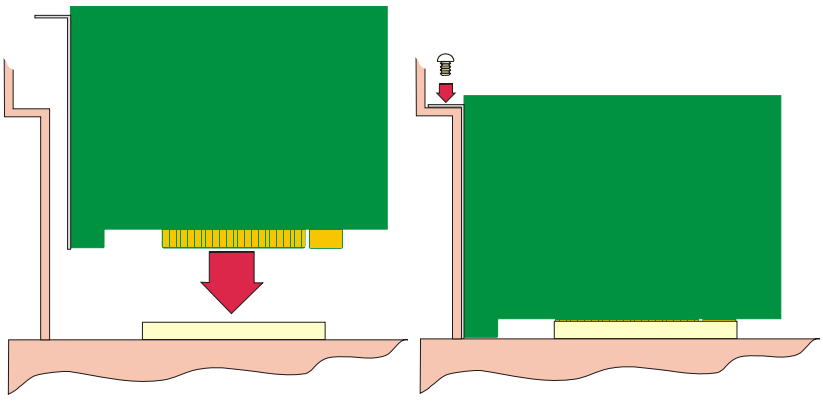
You can now install the AT host card in your system. To do this proceed as follows;

> 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.**

6. Turn off the power to your system and disconnect the mains supply.
7. Remove the system cover to expose the inside of the connector panel for host cards.
8. Insert the AT 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.**



9. Repeat steps **1.** to **8.** until you have installed all the AT cards you want.

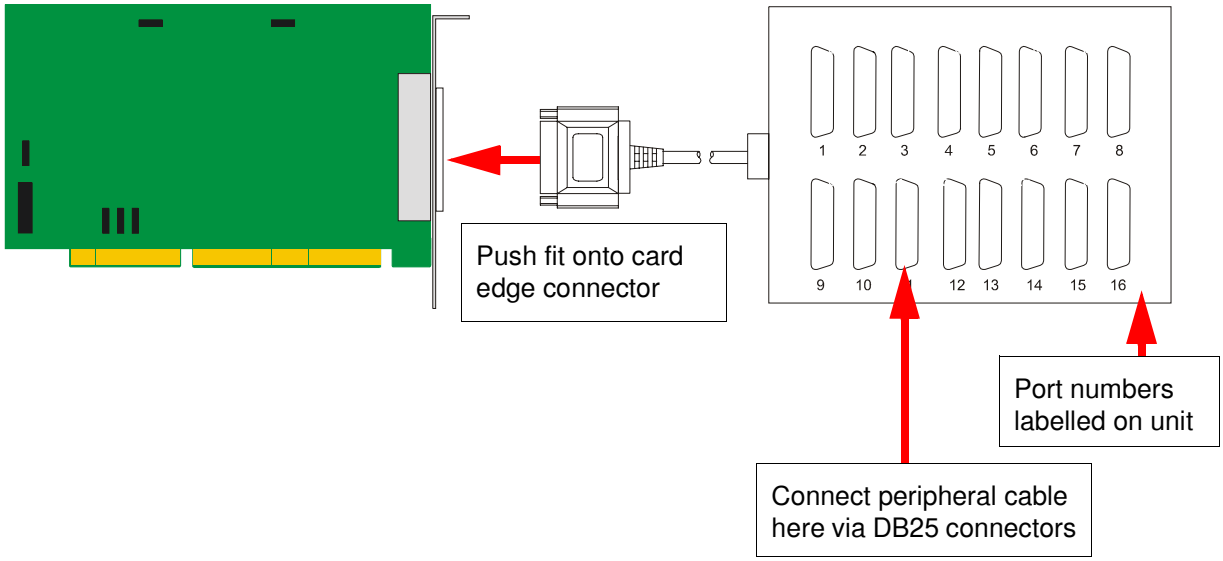
10. Replace and secure the system cover.

> Note
>
> Do not turn on the power to your system until you have connected the distribution cable or box you are using with this host card. See the following for details;
>
> - **Connecting an 8 port distribution box fitted via hardwired flying lead** on page **92**
> - **Connecting an 8 port octopus cable** on page **93**
> - **Connecting an 8 port distribution cable** on page **94**

Installation of AT host cards is now complete. For further details about installing other host cards types and distribution accessories, see **Distribution accessory guide** on page **80**.

To allow 16 ports to be connected using a distribution box proceed as follows

1. Install your 16 port AT or PCI FAST card using the procedures given in **Installing a 16 port PCI host card** on page **95** and **Installing a 16 port AT host card** on page **97**.
2. Turn off the power to your system.
3. Push fit the large connector on the single end of your octopus cable onto the card edge connector and secure in place using the screws provided as shown in the next picture.



4. Connect peripherals to the required ports on the distribution box using DB25 connectors provided, then turn on the power to your system.

Removing host cards

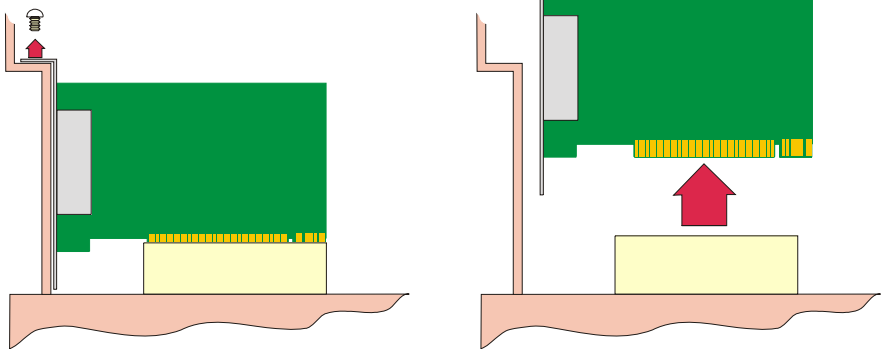
To remove a host card from your system proceed as follows;

> 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. Disconnect any distribution cables or boxes connected to the card you want to remove
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.

> **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 **17**.

Chapter 3 Cabling information

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

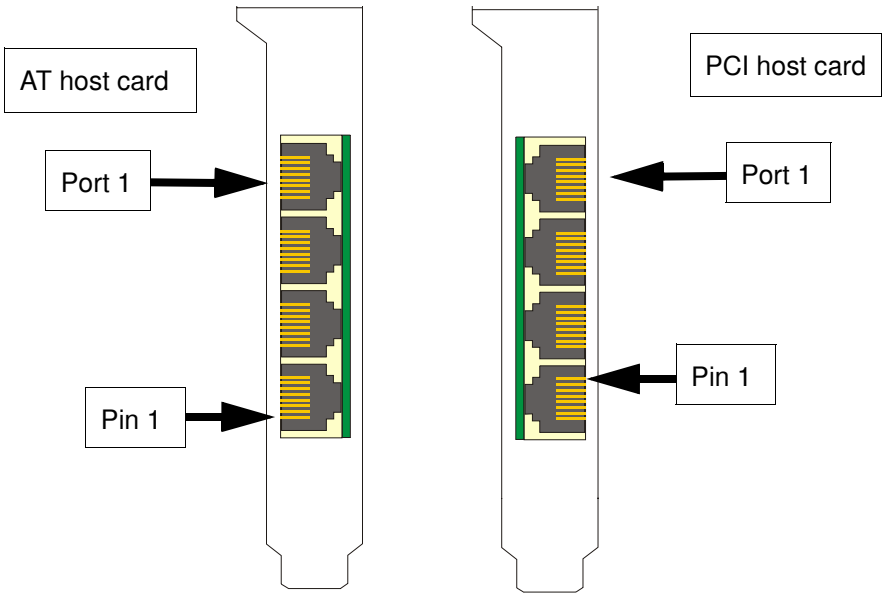
You need to read this chapter if you want cabling information for the Perle FAST serial adaptor cards.

This chapter provides cabling and connector pinout information for the Perle FAST serial adaptor cards. Included are details of standard cables for use with FAST products available from Perle.

This chapter includes the following sections;

AT- AT-FAST4 and PCI-FAST4 RJ45 card edge connectors

The connector pinout for each RJ45 socket fitted to the AT-FAST and PCI-FAST four port cards is as follows;



RJ45 pin	Signal	Direction	Description
1	DCD	In	Data Carrier Detect
2	RTS	Out	Request To Send
3	DSR	In	Data Set Ready
4	TXD	Out	Transmit Data
5	RXD	In	Receive Data
6	GND		Ground
7	CTS	In	Clear to Send
8	DTR	Out	Data Terminal Ready

Distribution box and cable guide

The connector pinout information for the FAST product you are using depends on the number of ports and type of distribution box or cable used as detailed in the next table;

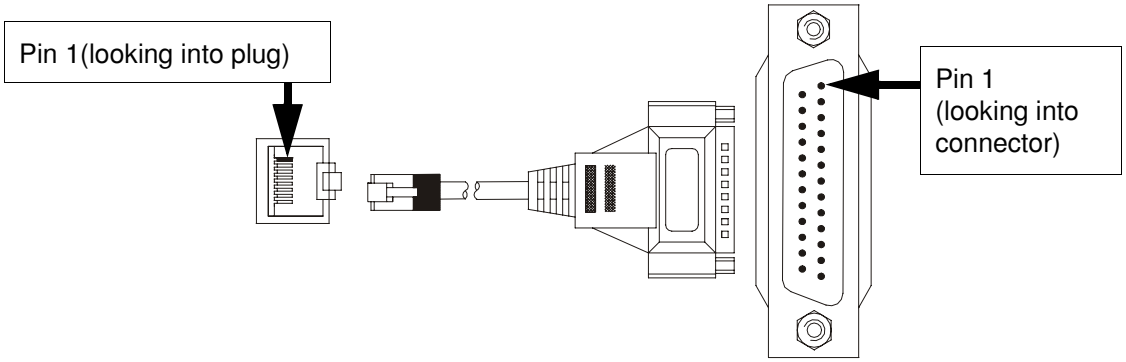
Product	Card edge connector	Cable or distribution box options	For connector pinouts see...
AT-FAST4 PCI-FAST4	RJ45 8 pin female See **page 106**	RJ45 (8 pin) to DB25 male cable.	See **page 109**.
AT-FAST8 PCI-FAST8	Custom D type connector, no wiring information required by user.	8 port distribution box with DB25 female connectors.	See **page 110**.
		8 port octopus cable with DB25 female connectors on flying leads.	See **page 111**.
		8 port octopus cable with DB25 male connectors on flying leads.	See **page 112**.
		8 port distribution cable with RJ45 8 pin female connector block.	See **page 113**.
AT-FAST16 PCI-FAST16	Custom D type connector, no wiring information required by user.	16 port distribution box with DB25 female connectors.	See **page 114**.

Distribution box and cable pinouts

This section contains pinout information for the FAST product range distribution accessories and contains the following;

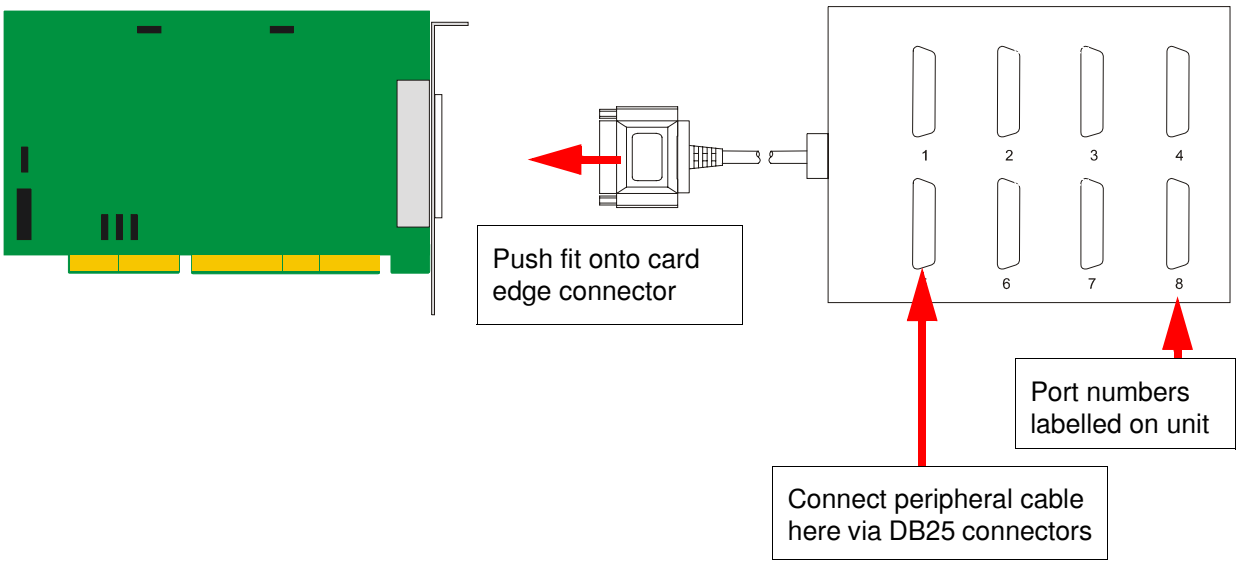
> Note
>
> For details of which cable to use with which product, see **Distribution box and cable guide** on page **107**.

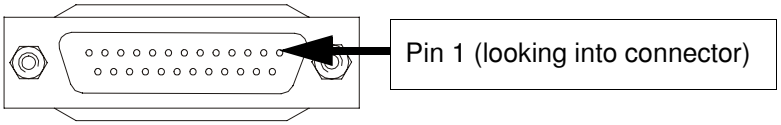
RJ45 to DB25 male cable



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

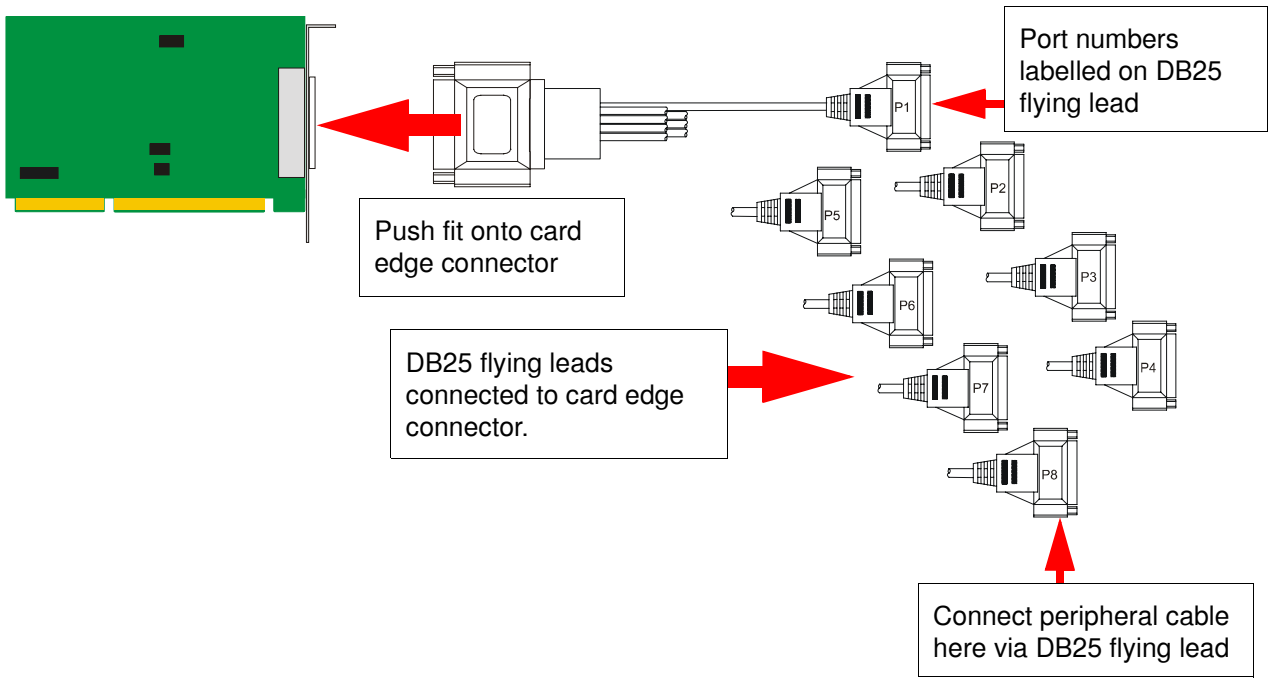
8 port distribution box with DB25 female connectors

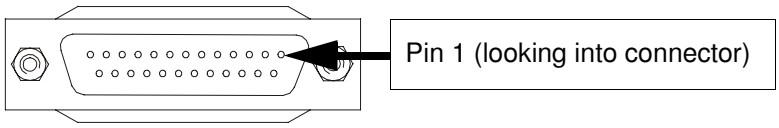




Pin	Signal	Direction	Description
1	Chassis		Chassis ground
2	TXD	Out	Transmit Data
3	RXD	In	Receive Data
4	RTS	Out	Request To Send
5	CTS	In	Clear To Send
6	DSR	In	Data Set Ready
7	GND		Ground
8	DCD	In	Data Carrier Detect
20	DTR	Out	Data Terminal Ready
22	RI	In	Ring Indicator

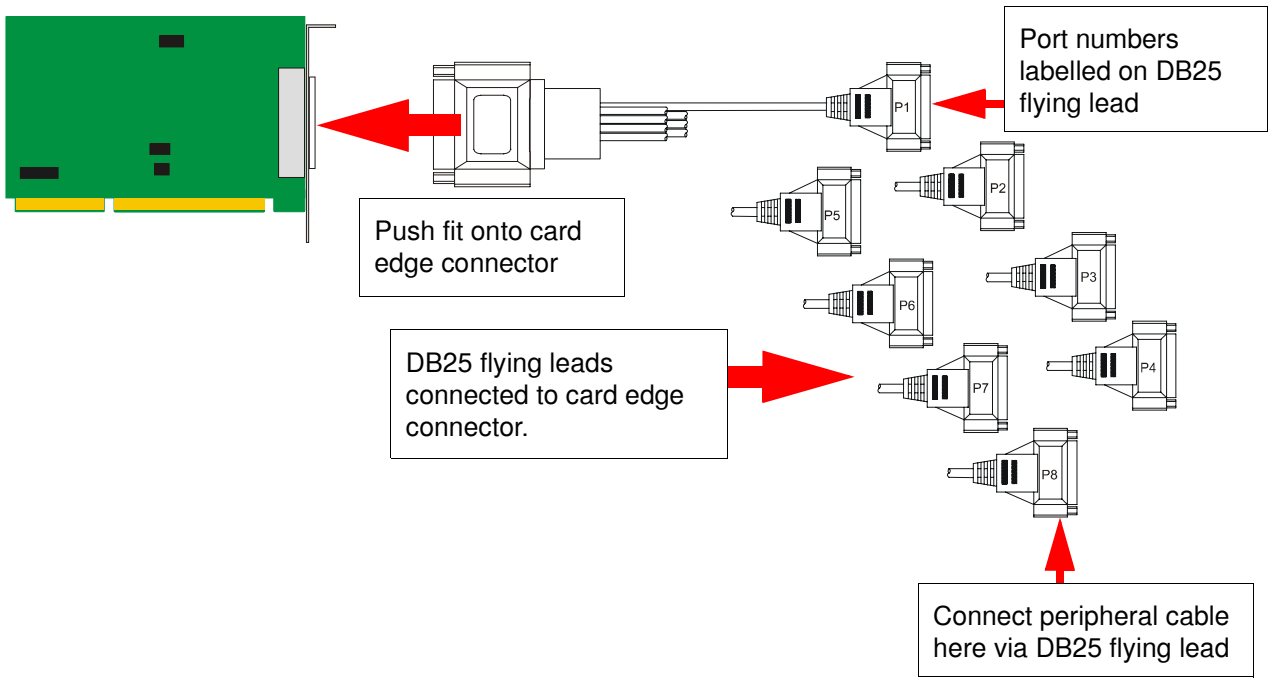
8 port octopus cable with DB25 female connectors

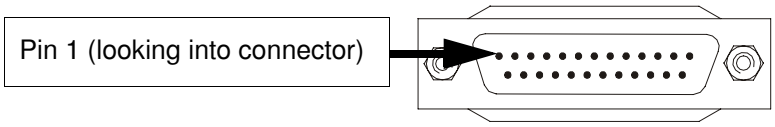




Pin	Signal	Direction	Description
1	Chassis		Chassis ground
2	TXD	Out	Transmit Data
3	RXD	In	Receive Data
4	RTS	Out	Request To Send
5	CTS	In	Clear To Send
6	DSR	In	Data Set Ready
7	GND		Ground
8	DCD	In	Data Carrier Detect
20	DTR	Out	Data Terminal Ready

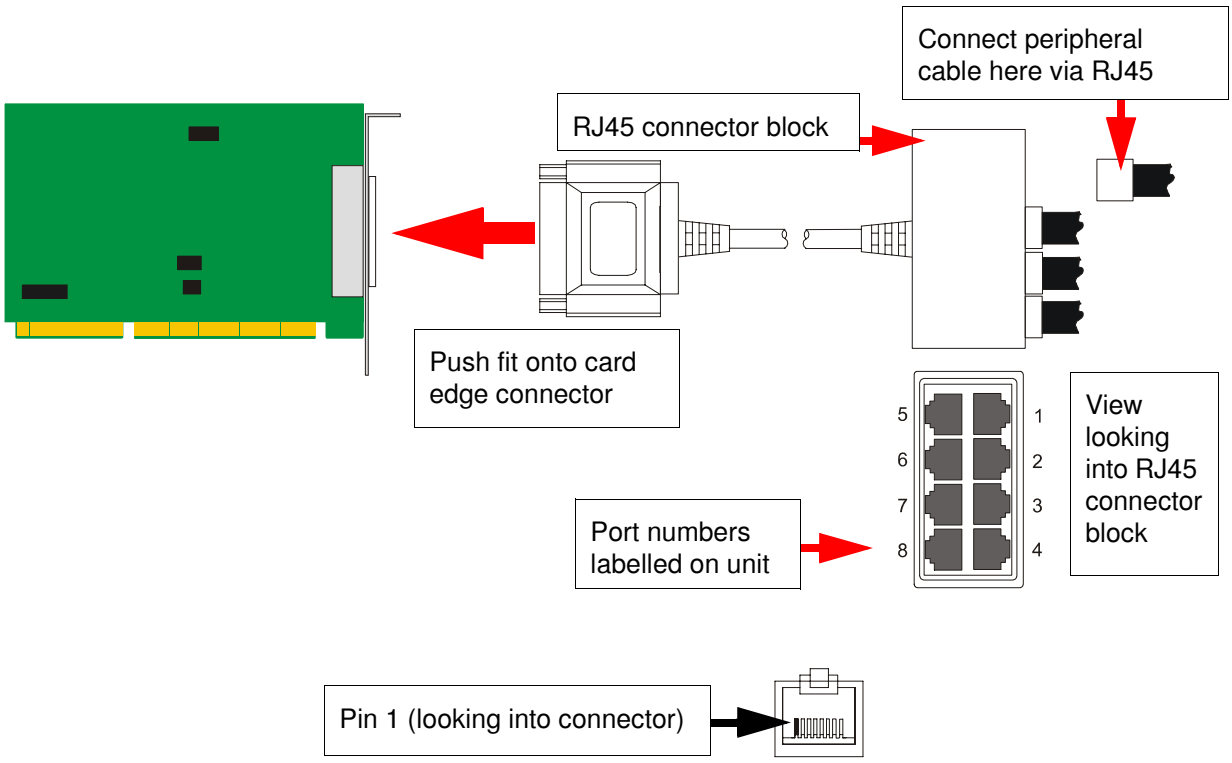
8 port octopus cable with DB25 male connectors





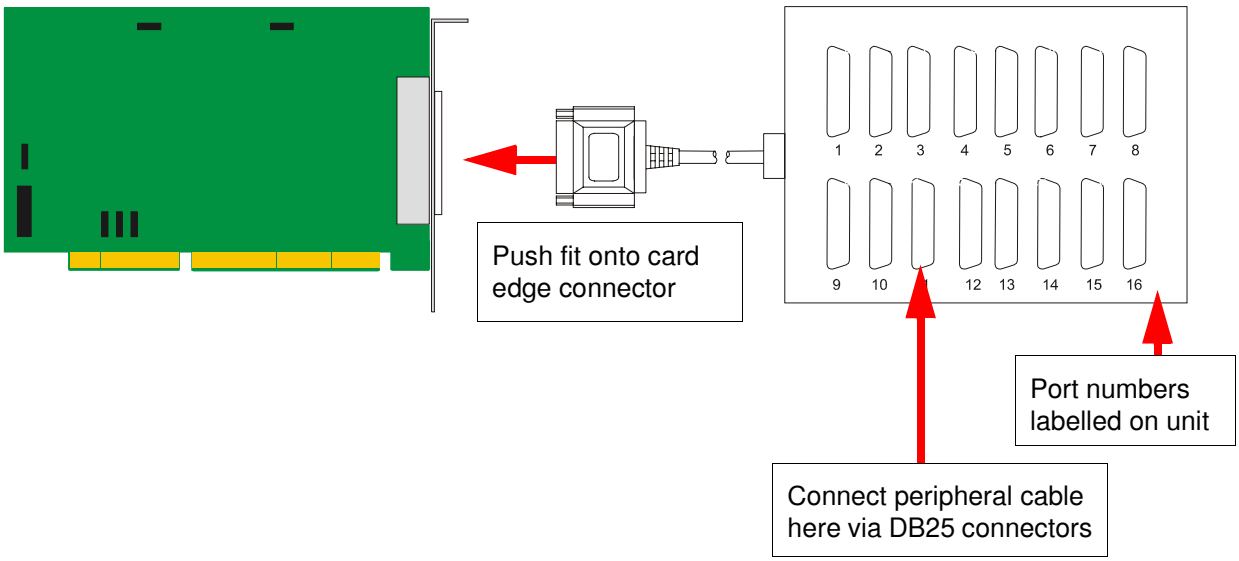
Pin	Signal	Direction	Description
2	TXD	Out	Transmit Data
3	RXD	In	Receive Data
4	RTS	Out	Request To Send
5	CTS	In	Clear To Send
6	DSR	In	Data Set Ready
7	GND		Ground
8	DCD	In	Data Carrier Detect
20	DTR	Out	Data Terminal Ready

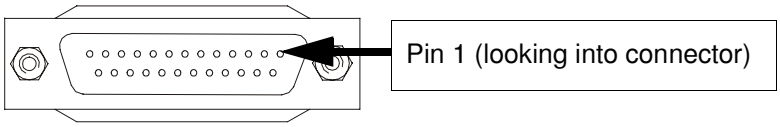
8 port distribution cable with RJ45 female connector block



RJ45 pin	Signal	Direction	Description
1	DCD	In	Data Carrier Detect
2	RTS	Out	Request To Send
3	DSR	In	Data Set Ready
4	TXD	Out	Transmit Data
5	RXD	In	Receive Data
6	GND		Ground
7	CTS	In	Clear to Send
8	DTR	Out	Data Terminal Ready

16 port distribution box with DB25 female connectors





Pin	Signal	Direction	Description
1	Chassis		Chassis ground
2	TXD	Out	Transmit Data
3	RXD	In	Receive Data
4 When jumper set to **RTS** See **page 97**.	RTS	Out	Request To Send
4 When jumper set to **DTR** See **page 97**.	DTR	Out	Data Terminal Ready
5	CTS	In	Clear To Send
7	GND		Ground

Appendix A Troubleshooting

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

You need to read this appendix if you want information on troubleshooting problems with FAST serial adaptor cards.

This appendix provides examples of normal boot up messages and a table of error messages, their meaning and corrective action required for the all the currently supported operating systems.

This appendix includes the following sections;

Windows NT

Windows NT general troubleshooting

In the event of any problems, open the **Devices** window to view the status of any installed hardware. For further details of troubleshooting under Windows NT, see your Windows NT user documentation or help system.

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

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

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

- **General troubleshooting under Windows 2000/XP/Server 2003/Vista/Server 2008** on page **119**.
- **Windows 2000/XP/Server 2003/Vista/Server 2008 error messages** on page **120**.

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

Problem	Action required
Machine fails to boot.	1. Turn off your machine, remove FAST card(s) and reboot. See **page 103**. 2. Try installing a different host card in case the one currently installed is faulty. See **page 79**.
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 FAST cards fitted (**page 103**) and then reboot your system. 4. Once the machine boots properly, change the configuration settings of the FAST card to match those in the BIOS setup. See **page 79**.
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 FAST cards fitted (**page 103**) and then reboot your system. 5. Once the machine boots properly, change the configuration settings of the FAST card to match those in the BIOS setup. See **page 79**.
Operating system loads OK, but FAST driver or another driver fails to boot	1. Run Windows Device Manager to find available IRQ and memory addresses.
FAST ports do not work after installation.	1. Check the Windows Event Log and follow the suggested actions.

Problem	Action required
FAST 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 FAST cards fitted (**page 103**) and then reboot your system. 5. Once the machine boots properly, change the configuration settings of the FAST card to match those in the BIOS setup. See **page 79**.
FAST Windows driver fails during normal operation, symptoms either: black screen, machine reboots or system hangs	1. Contact Technical Support. See **Appendix B 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 **119**.

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***

Index

#A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

L

O

P

R

S

T

W