SPEED LE
and
SPEED LE Express
Serial Adaptors

User's Guide

Part #5500174-16

May 2013

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.

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

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Table of Contents

1 Introduction to SPEED LE

About the SPEED LE Serial Adaptor cards

The SPEED LE and SPEED LE Express Serial Adaptor cards are multi-port cards which provide extra serial ports for EIA-232 peripherals. These cards plug into your PC servers and provide 1, 2, 4 and 8 high speed ports suitable for remote access, data collection, point of sale or any other EIA-232 applications. The baud rates supported on these cards are up to 921600 Kbps, the lowest baud rate supported is 50 bps.

Perle's SPEED LE Parallel Card family enables users to add parallel ports supporting the full IEEE 1284 parallel port standard to their PCs or servers

You use the SPEED LE and SPEED LE Express serial adaptor cards when you want a robust entry level solution for the small office or point of sale applications. Typically you use SPEED LE and SPEED LE Express serial adaptor cards because you want to add extra serial or parallel ports to an existing computer system rather than replacing it with the considerable cost that entails. Higher data rates and ESD protection in the SPEED LE and SPEED LE Express serial adaptor cards make it suitable for any modem or ISDN TA application.
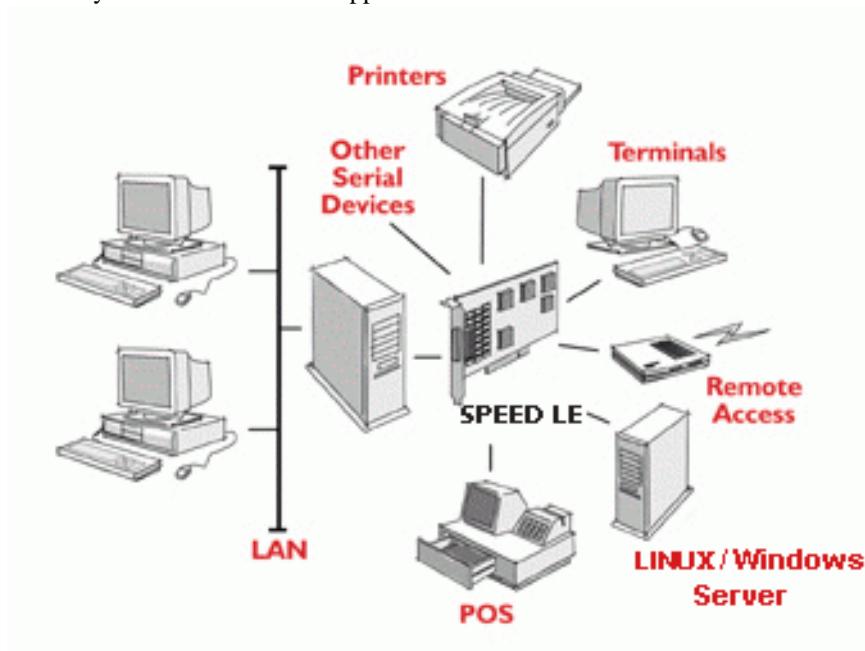
| **Note:** | To use the SPEED LE and SPEED LE Express serial adaptor cards you must first install the card, and then install the drivers supplied with the card. You can then configure each card as required. The installation procedure varies for different operating systems. Please refer to the appropriate chapter for your operating system. |

Connection accessories

The connector box or cable required for the SPEED LE products you are using depends on the number of ports and product type. For details see *Chapter 5, "Cabling Information"*

2 Installing/Removing Host Cards And Cable Accessories

Introduction

This section describes the mechanical installation of the SPEED LE and SPEED LE Express host cards and associated connector boxes and cables for 1, 2, 4 and 8 ports.

Installing SPEED LE and SPEED LE Express cards

This section describes the mechanical installation of SPEED LE cards.

To install an SPEED LE 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 unplug the power cord.

1. Turn off the power to your system and unplug the power cord.
2. Remove the system cover to expose the inside of the connector panel for host cards.
3. Insert the SPEED LE card you want to install into a vacant host PCI /PCI Express card slot and secure in place as shown in the next picture.

Caution

Full anti-static precautions should be taken when handling host cards.
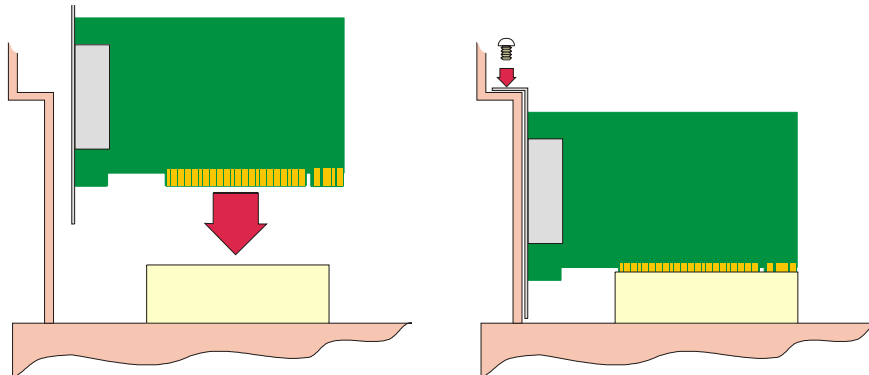
4. Repeat step 3. until you have installed all the SPEED LE cards you want.
5. Replace and secure the system cover.

Installation of SPEED LE cards is now complete.

Installing cables and connector boxes

This section describes the mechanical installation of cables and connector boxes to the SPEED LE host cards for 1, 2, 4 and 8 ports and includes the following:

- *Installing cables on SPEED1/2 LE and SPEED1/2 LE Express cards* on page 11
- *Installing converter cables on SPEED4 LE (RJ-45) and SPEED4 LE Express (RJ45) cards* on page 11
- *Installing fan-out cables and connector boxes on SPEED4 LE HD, SPEED4 LE HD Express, SPEED8 LE HD, and SPEED8 LE HD Express cards* on page 11

For information on available connectors and their pinouts and cabling, see Chapter 5, "Cabling Information"

Installing cables on SPEED1/2 LE and SPEED1/2 LE Express cards

The SPEED1 LE and SPEED1 LE Express have a single DB9 male connector on the back panel and SPEED2 LE and SPEED2 LE Express cards have two DB9 male connectors on the back panel. There is one for each serial port and they are labelled 1 to 2.

You can connect peripheral serial devices directly to the *card by using standard RS-232 DB9 female connectors on the adapter side of the cable* you are using to connect the peripheral device.

Installing converter cables on SPEED4 LE (RJ-45) and SPEED4 LE Express (RJ45) cards

SPEED4 LE and SPEED4 LE Express cards have four RJ45 10-pin connectors on the back panel. There is one for each serial port and they are labelled 1 to 4.

Converter cables with the proper connector on the opposite end can be plugged into these RJ45 connectors to provide the desired interface.

Installing fan-out cables and connector boxes on SPEED4 LE HD, SPEED4 LE HD Express, SPEED8 LE HD, and SPEED8 LE HD Express cards

SPEED4 LE HD, SPEED4 LE HD Express, SPEED8 LE HD, and SPEED8 LE HD Express cards have a single VHDCI-68 connector on the back panel. It provides the signals for 4 or 8 serial ports.

A fan-out cable or connector box with the proper individual connectors can be plugged into the card to provide the desired interface. The port numbers will be identified on the interface connectors or connector box

Note: The SPEED LE fan-out cables and connector boxes need to be secured or supported in case of sudden contact or excessive weight on the cables. Please ensure that adequate caution is taken to avoid possible damage to the SPEED LE card or Host system. This can be accomplished by securing the cable(s) to a rack or to the back of the server as shown below:

Removing host cards

To remove a SPEED LE 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 installing host cards in your system, turn off the power supply and unplug the power cord.** |

1. Turn off the power to your system and unplug the power cord.
2. Remove the system cover to expose the inside of the connector panel for host cards.
3. Disconnect any cables or connector 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.** |
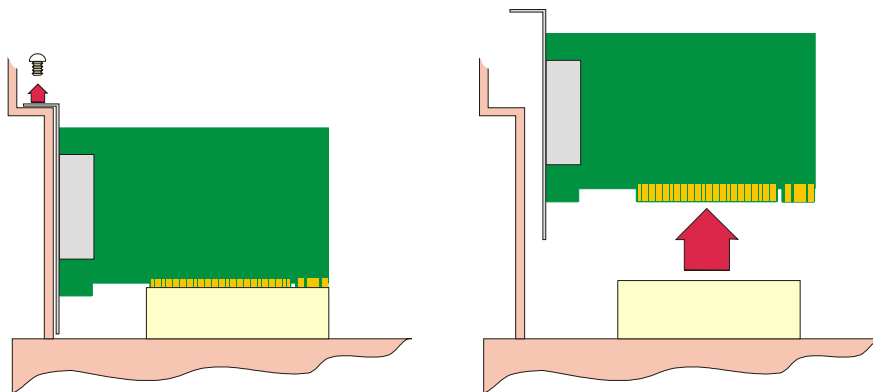
5. Repeat from step 3. until you have removed all the host cards you want.
6. Replace and secure the system cover.
7. Plug in the mains lead and turn on the power.

Removal of the SPEED LE cards is now complete.

3 Installing On Microsoft Windows

Installing Drivers

General Information

You need to read this chapter if you want to install SPEED LE and SPEED LE Express serial adaptor cards, associated hardware and software on a Microsoft Windows O/S.

The following Microsoft Windows Operating Systems are supported;

Windows Server 2012
Windows 8
Windows 7
Windows Server 2008 / 2008 R2
Windows Vista
Windows XP
Windows Server 2003
Windows 2000

Downloading the driver from the Perle web site

You can install the SPEED LE 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.

2. Within your Internet browser window, select the software directory using the following URL:

   http://www.perle.com/downloads

3. Select your product under the "Serial & Parallel Cards" option.

4. Next, select your operating system. When applicable, ensure that you select the correct architecture (i.e. 32 bit or 64 bit).

5. To download the driver, simply click on the version number under the "Drivers" tab.

General setup procedure

1. Install any SPEED LE and cards and cables or connector boxes you require into your system. See *Installing/Removing Host Cards And Cable Accessories* on page 8.

2. Install the SPEED LE or SPEED LE EXPRESS device driver software. See *Installing device drivers and utilities onto your system* on page 15.

3. If you add new SPEED LE and SPEED LE Express 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 16.

4. If required, remove any host cards you want from your system. See *Removing host cards* on page 12.

5. Using the Windows **Device Manager**, configure the serial ports you have added to the system. See *Configuring the Serial ports* on page 17.

Installing device drivers and utilities onto your system

To install or enable the SPEED LE and SPEED LE Express device drivers on your system, proceed as follows:

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

   If you have installed any new SPEED LE cards Windows will detect the new hardware and try to install driver the drivers.

   For Windows XP and older systems, a **Found New Hardware** wizard will be displayed. Click on the **Cancel** button.

   For Windows Vista and newer systems, an Installing New Hardware balloon may appear in the lower right corner of the screen. Click the **X** to close the balloon.

2. Download the latest SPEED LE driver file from the Perle website for your operating system:

3. Double-click the installation zip that you downloaded in step 2. This will display a list of files. Find the appropriate setup file and double click on it to execute it. The setup files are titled as follows;

   pserial-setup-x86.exe for 32-bit Windows operating systems

   pserial-setup-x64.exe for 64-bit Windows operating systems

   pserial-setup-ia64.exe for 64-bit Windows Itanium operating systems

4. Follow the installation wizard steps:
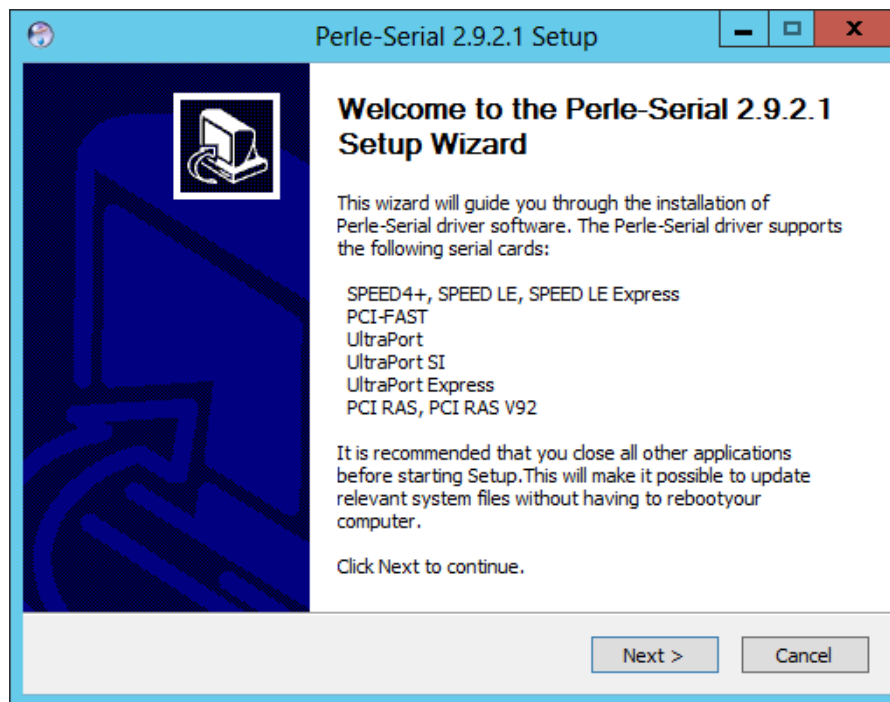
5. The general release drivers are all signed by Microsoft. In the event that you are installing a driver provided to you by our support team, you may get a Windows Security message. Click **Install** when the message appears.
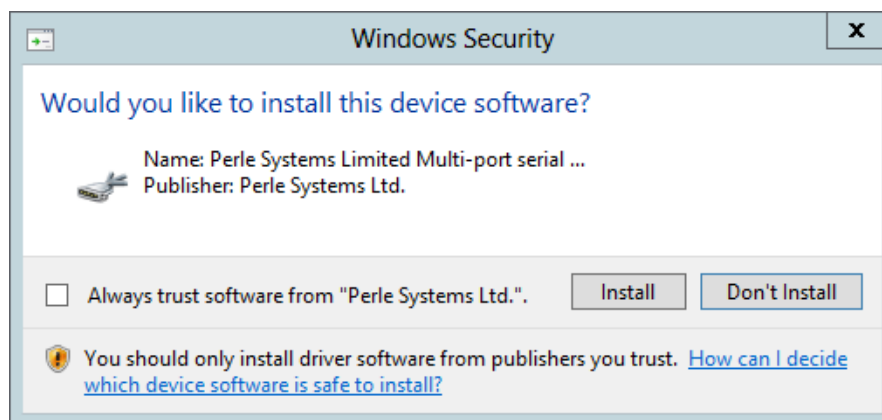
> **Note:** If you are installing an unsigned driver, you may have to click through the Found New Hardware wizard for every SPEED LE port on your system. You may click on the check box to "Always trust software from Perle Systems Limited" if your security policy allows this. This will eliminate the repeating of this security message.

Your SPEED LE driver installation is now finished.

Adding additional cards and/or updating drivers

Whenever you add any additional SPEED LE or SPEED LE Express 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 15.

Configuring the Serial ports

To configure SPEED LE and SPEED LE Express serial ports, proceed as follows:

1. **Windows XP and older systems**

   a. On the Windows desktop, click on the **Start** button and select **Control Panel**

   b. In the Control Panel window, click on the **System** icon to display the System Properties tabbed window.

   c. In the System Properties window, click on the **Hardware** tab to display the Hardware page.

   Windows Vista and newer systems

   a. On the Start page, select **Control Panel**.

   b. In the Control Panel Window, select **Hardware and Sound** or **Hardware** to display the Hardware page.

2. In the Hardware page, click on **Device Manager** link or button.

   The Device Manager window is now displayed.
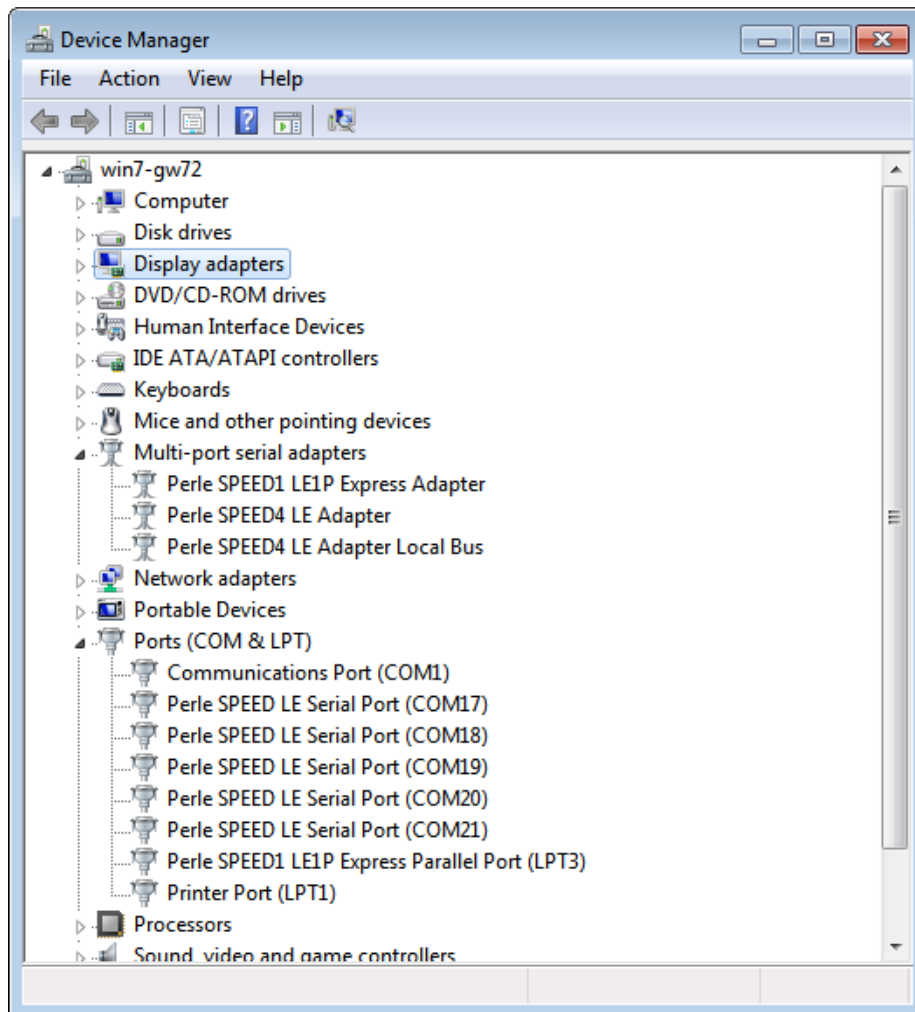
3. You can click on the **Multiport serial adapters** icon to display the currently installed devices. Each entry represents a SPEED LE card.

4. Now click on the **Ports(COM & LPT)** to view the detected ports for the SPEED LE cards.

5. Double click on the port whose properties you want to view or change

   The Port Properties tabbed window is now displayed.

6. In the Port Properties window, click on the **Port Settings** tab to display the Port Settings page.
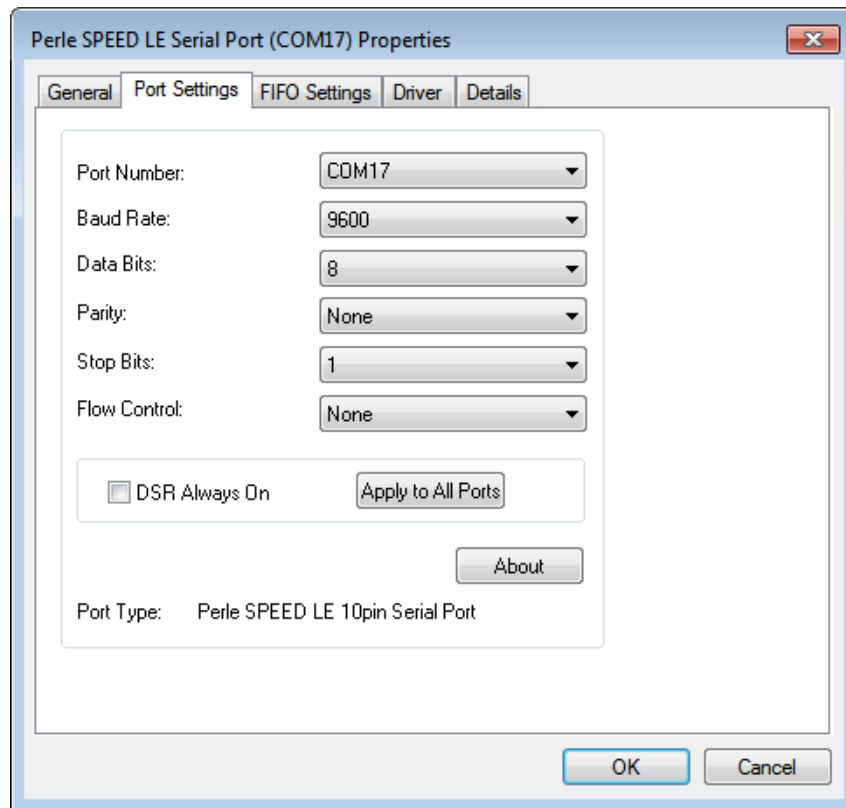
7. In the Port Settings page, set the **Port Number**, **Baud Rate** and other configuration parameters you require.

The **DSR Always On** option will, when checked, cause the driver to always report the DSR signal as active. This is used when using a cable that does not supply the DSR signal but the application being used requires this signal.

8.   In the **FIFO Settings** page, set the FIFO buffer levels using the parameters detailed in the table.
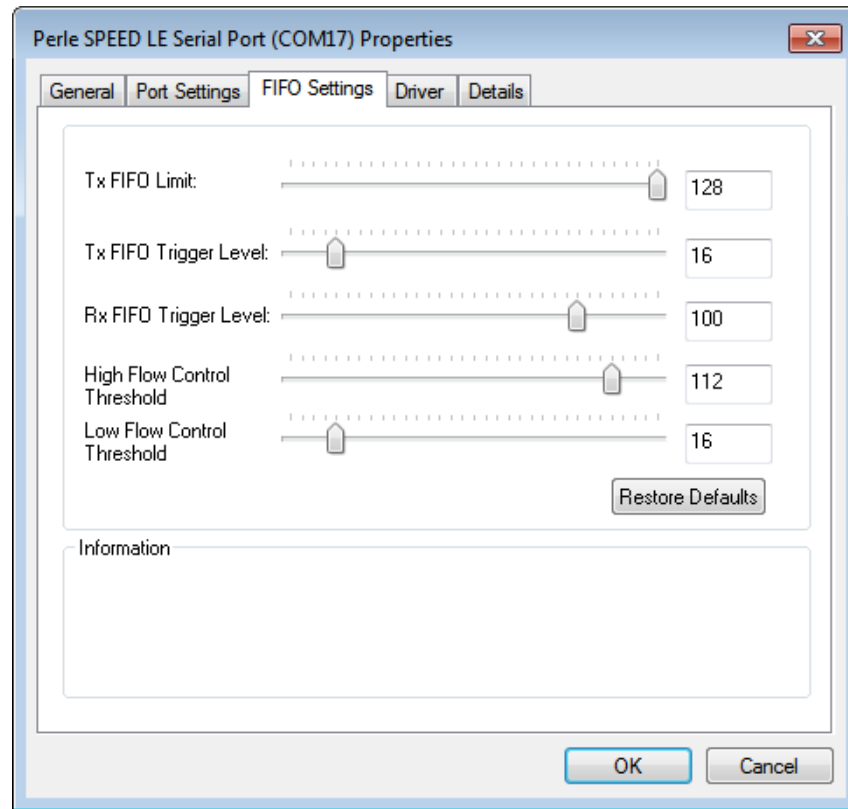
Tx FIFO Limit	Sets the overall size of the Transmit FIFO buffer. You use this when you want to restrict the size of the buffer in order to control the data flow. This is useful when your application requires you to send small amounts of data but needs acknowledgement that the data has been sent.
	For 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 an SPEED LE card are 1 to 128.
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 an SPEED LE card are 0 to 127. This value cannot exceed the value of the TX FIFO Limit.

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 an SPEED LE card are **1 to 128.** This value cannot exceed the High Flow Control Threshold.
High Flow Control Threshold	Sets the level at which data flow is suspended. If the limit is exceeded, the driver will stop collecting data.
	Permitted values for an SPEED LE card are **1 to 128.**
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. Permitted values for an SPEED LE card are **1 to 128.** This value cannot exceed the High Flow Control Threshold.

Note: To restore the default settings, use the **Restore Defaults** button.

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

The configuration process is now complete.

Removing Drivers

To uninstall the SPEED LE serial adapter driver, do the following:

1. **Windows XP and older systems**

    a. On the Windows desktop, click on the **Start** button and select **Control Panel**

    b. In the Control Panel window, double click on the **Add or Remove Programs** icon to display the Add or Remove Programs window.

    c. Scroll through the list and click on the **Perle Perle-Serial Driver** entry. Click on the **Remove** button and then follow the instructions on screen to uninstall the SPEED LE driver.

    Windows Vista and newer systems

    a. On the Start menu or page, select **Control Panel**.

    b. In the Control Panel Window, select **Uninstall a program** to display the Uninstall a program window.

    c. Scroll through the list and double click on the **Perle Perle-Serial Driver** entry and follow the instructions on screen to uninstall the SPEED LE driver.

4 Installing On Linux

Installing Drivers

Introduction

You need to read this chapter if you want to install SPEED LE and SPEED LE Express serial adaptor cards, associated hardware and software on a Linux O/S.

The following versions of Linux are supported;

Linux 3.x

Linux 2.6.x

Linux Mandriva 2007, 2009, 2011

Linux OpenSUSE 10, 11, 12.1,12.3

Linux Red Hat Fedora 7, 9, 16-18

Linux Red Hat Enterprise 5.2, 6.2, 6.4

Linux SUSE Enterprise 10 SP2, 11 SP2

Linux Debian 4.0r4, 6.0.4, 6.0.7

Linux 2.4.x

Linux 2.2.16+

General installation procedure for Linux

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

1. Install any SPEED LE cards you require into your system. See **Installing/Removing Host Cards And Cable Accessories** on page 8.

2. Install the SPEED LE Linux drivers onto your system using the procedures described in **Downloading the driver from the Perle web site** on page 22.

3. Create devices for the required ports using the procedures detailed in **Creating devices for the attached ports** on page 24.

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

Downloading the driver from the Perle web site

You can install the SPEED LE 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.

2. Within your Internet browser window, select the software directory using the following URL:

   http://www.perle.com/downloads

3. Select your product under the "Serial & Parallel Cards" option.

4. Next, select your operating system.

5. Driver packages are available as Source RPM or Compressed TAR. Select the format you wish to use. To download the driver package, click on the version number in the "Drivers" tab.

Installing Drivers onto your system

The SPEED LE and SPEED LE Express cards installed on Linux machines use the perle-serial driver for Linux. The driver supports the Linux kernel versions 2.4, 2.6 and 3.x. The Kernel header files are needed for kernel 2.4. For the 2.6 kernel and later, a configuration kernel source tree and a set of makefile rules describing how the modules are build is required

The driver is supplied in both source RPM package format and a compressed tar file. The procedure for installation of each format is as follows:

Install from Source RPM

1. Log in to the LINUX system as root user.

> **Note:** The <packages directory> path name in the following instructions will be different depending on the LINUX distribution you have installed. For example:
>
> Redhat might be: ***/usr/src/redhat***
>
> Suse might be: ***/usr/src/packages***
>
> Later rpm versions will create a directory: ***/<user home directory>/rpmbuild.***
>
> The <rpm build command> will change depending on the version of the RPM utilities installed. For newer versions (i.e. 4.2), the <rpm build command> is "rpmbuild". For older versions use "rpm".

2. At the LINUX prompt, copy the supplied perle-serial-<version>-<release>**.src.rpm** file onto your system in the **/tmp** directory.

3. Install the source rpm by typing the following command:

   ```
   rpm –ivh perle-serial-<version>-<release>.src.rpm
   ```

4. Build the binary RPM package for your system by entering the following commands:

   ```
   cd <packages directory>/SPECS
   <rpm build command> -bb perle-serial-<version>.spec
   ```

5. A prompt will ask whether the parallel port driver is to be installed. Answer yes if you are installing a SPEED LE card with a parallel port interface.

6. Install the binary RPM which was just created. Enter the following commands:

   ```
   cd <packages directory>/RPMS/<arch>
   rpm –ivh perle-serial-<version>-<release>.<arch>.rpm
   ```

   The **<arch>** value is the architecture of your LINUX machine such as "i386" or "alpha".

> **Note:** The Perle parallel port driver is compiled into a module called "pparport_pc". It is dependant on the "parport" and "lp" modules of the native parallel port driver being enabled. Most Linux distributions have these modules enabled by default.
>
> If the parallel port driver has been installed, then the system will need to be rebooted to complete the install process.

Install from Tar File

1. Log in to the LINUX system as root user.

2. At the LINUX prompt, copy the supplied perle-serial**.tgz** file onto your system in the **/tmp** directory.

3. Unpack the file using the command:

   ```
   tar –xzvf perle-serial-<version>-<release>.tgz
   ```

4. Build and install the perle-serial software by entering the following commands

   ```
   cd /tmp/perle-serial-<version>-<release>
   make
   ```

5. A prompt will ask whether the parallel port driver is to be installed. Answer yes if you are installing a SPEED LE card with a parallel port interface.

> **Note:** The Perle parallel port driver is compiled into a module called "pparport_pc". It is dependant on the "parport" and "lp" modules of the native parallel port driver being enabled. Most Linux distributions have these modules enabled by default.
>
> If the parallel port driver has been installed, then the system will need to be rebooted to complete the install process.

Creating devices for the attached ports

Serial Ports

After the SPEED LE cards and the new driver have been installed, terminal devices will need to be created for the added ports. This can be done be using the **ps_addports** utility.

To use the ps_addports script, enter the following command:

```
ps_addports m n
```

where:

> **m** is the first port device (starting at 0)

> **n** is the last port device to add.

The port devices will be created in the /dev directory and will have the following format:

```
/dev/ttyPSnn
```

where **nn** is the 2 digit port number.

The perle-serial driver has been installed so that it will automatically be loaded the first time an SPEED LE device is used. However, if more than one SPEED LE card has been installed in the Linux machine, then the driver can be manually loaded to determine which terminal device numbers have been assigned to each card.

To load the driver, enter the command:

```
modprobe perle-serial
```

Review the messages in the file **/var/log/messages.**

Once the port devices have been created, they may be used as standard LINUX serial TTYs.

Parallel Ports

The SPEED LE parallel port devices will be created in the /dev directory and have the same format as any built in parallel port:

```
/dev/lpn
```

where **n** is the parallel port number starting at 0. If there are no other parallel ports on the system, then the SPEED LE parallel port will use /dev/lp0 as the device node.

Setting the DSR Signal

The **setultrap** utility can be used to configure the DSR Always On option. This feature is used for systems where the wiring does not support the DSR signal but the Host application still requires that the DSR be active. When the DSR Always On option to set to "on," the driver will always report to the application that the DSR signal is "on". The syntax for the command is:

To use the **setultrap** utility, enter the following command:

```
setultrap -f device name -r on|off|list
```
where:

> **-f** specifies the port the action should be taken on.

- **/dev/ttyPS1** specifies port 1
- **/dev/ttyPS1,/dev/ttyPS64** specifies port 1 through port 64 (ranges are separated by a comma with no space between them)

> **-r** sets DSR Always On option on or off for serial devices. Use list to see the existing configuration. By default this option is set to off.

Uninstalling the SPEED LE Driver for Linux

Uninstalling an RPM Installation

To uninstall the driver enter the following command:

```
rpm -e perle-serial
```

Uninstalling a Tar File Installation

To uninstall the driver enter the following commands:

1. Move to the directory where you previously installed the Perle-Serial driver. For example:

    ```
    cd /tmp/perle-serial-<version>-<release>
    ```

2. **For Perle-Serial driver up to 3.4.x**

    Type the following command:

    ```
    ./uninstall.sh
    ```

    For Perle-Serial driver 3.5 and later

    ```
    make uninstall
    ```

5 Cabling Information

Introduction

You need to read this chapter if you want cabling information for the Perle SPEED LE and SPEED LE Express serial adaptor cards.

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

This chapter includes the following sections:

- **Definitions of Signals and Direction** on page 27
- **Host card back panel connectors and pinouts** on page 28
- **Connector box and cable guide** on page 37
- **Connector box and cable pinouts** on page 38
- **Low Profile Bracket Conversion** on page 49

Definitions of Signals and Direction

EIA-232	Direction	Description
RI	In	Ring Indicator
DCD	In	Data Carrier Detect
RTS	Out	Request To Send
DSR	In	Data Set Ready
TXD	Out	Transmit Data
RXD	In	Receive Data
S-GND		Signal Ground
CTS	In	Clear to Send
DTR	Out	Data Terminal Ready
C-GND		Chassis Ground

Host card back panel connectors and pinouts

This section contains diagrams and pinout information for the SPEED LE host card back panel connectors contains the following:

DB9 back panel connectors and pinout

The following diagram shows the SPEED2 LE/SPEED2 LE Express and the SPEED1 LE/SPEED1 LE Express with standard and Low Profile back panels respectively.
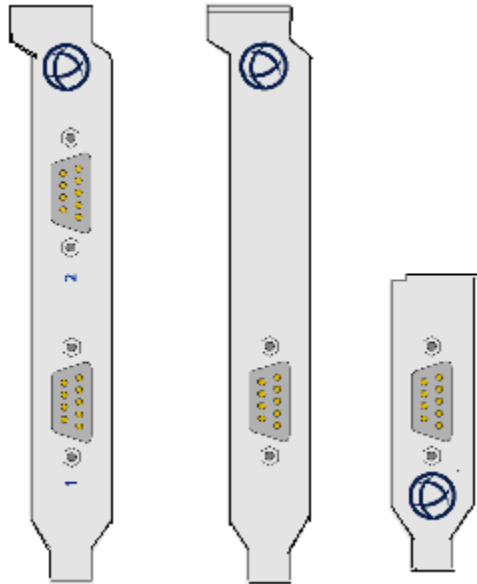
DB9M pin	EIA-232
1	DCD
2	RXD
3	TXD
4	DTR
5	S-GND
6	DSR
7	RTS
8	CTS
9	RI
Shell	C-GND

DB25 Female Parallel Port Pinouts

The SPEED LE and SPEED LE Express parallel port pinouts are provided below for cards that support the parallel port.

| DB25 Pin	Centronics Pin	Direction	Signal Name	Function Notes
1	1	out	-Strobe	Set Low p1ulse >0.5 us to send
2	2	out	Data 0	Set to least significant data
3	3	out	Data 1	
4	4	out	Data 2	
5	5	out	Data 3	
6	6	out	Data 4	
7	7	out	Data 5	
8	8	out	Data 6	
9	9	out	Data 7	Set to most significant data
10	10	in	-Ack	IRQ; Low Pulse ~ 5 uS, after accept
11	11	in	+Busy	High for Busy/Offline/Error
12	12	in	+PaperEnd	High for out of paper
13	13	in	+SelectIn	High for printer selected
14	14	out	-AutoFd	Set Low to autofeed one line
15	32	in	-Error	Low for Error/Offline/PaperEnd
16	31	out	-Init	Set Low pulse > 50uS to init
17	36	out	-Select	Set Low to select printer
18-25	19-30, 33,17,16	----	Ground	Do not connect any of these grounds to a shield

RJ45 back panel connectors and pinout

The following diagram shows the SPEED4 LE and SPEED4 LE Express cards back panel.
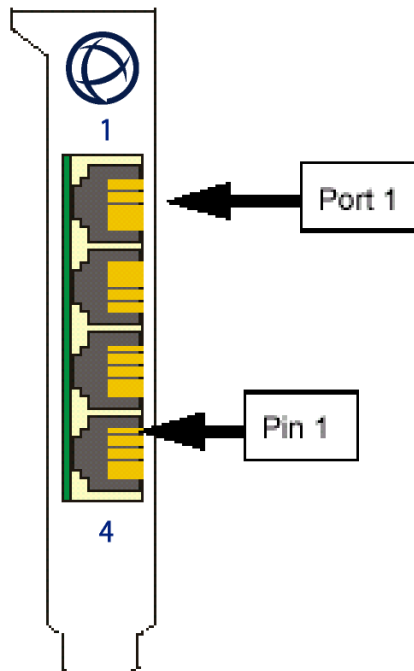

The connector pinout for each RJ45 socket fitted to the SPEED4 LE and SPEED4 LE Express cards are as follows:

RJ45 10-pin	RJ45 8-pin	EIA-232
1	N/A	RI
2	1	DCD
3	2	RTS
4	3	DSR
5	4	TXD
6	5	RXD
7	6	S-GND
8	7	CTS
9	8	DTR
10	N/A	
Shell	Shell	C-GND

VHDCI-68 Ultra SCSI back panel connectors and pinout

The following diagram shows the SPEED4 LE HD/SPEED4 LE HD Express standard and Low Profile back panels respectively.
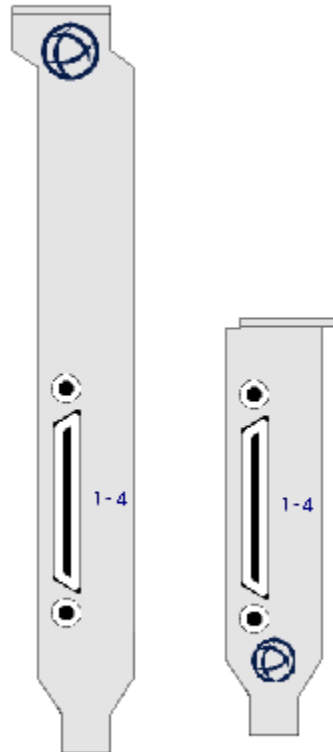
Note:	The SPEED LE fan-out cables need to be secured or supported in case of sudden contact or excessive weight on the cables. Please ensure that adequate caution is taken to avoid possible damage to the SPEED LE card or Host system. This can be accomplished by securing the cables to a rack or to the back of the server.

The pinout for each VHDCI-68 Ultra SCSI connector fitted to the SPEED4 LE HD and SPEED4 LE HD Express as follows:

VHDCI-68 Ultra SCSI Pin Number	EIA-232
1	RXD4
2	CTS4
3	RI4
4	RTS4
5	DCD4
6	DTR4
7	DSR4
8	TXD4

VHDCI-68 Ultra SCSI Pin Number	EIA-232
9	S-GND
10	TXD3
11	DSR3
12	DTR3
13	DCD3
14	RTS3
15	RI3
16	CTS3
17	RXD3
18	RXD2
19	CTS2
20	RI2
21	RTS2
22	DCD2
23	DTR2
24	DSR2
25	TXD2
26	S-GND
27	TXD1
28	DSR1
29	DTR1
30	DCD1
31	RTS1
32	RI1
33	CTS1
34	RXD1
35-42	NC
43	S-GND
44-59	NC
60	S-GND
61-68	NC

The following diagram shows the SPEED8 LE HD/SPEED8 LE HD Express standard and Low profile back panels respectively
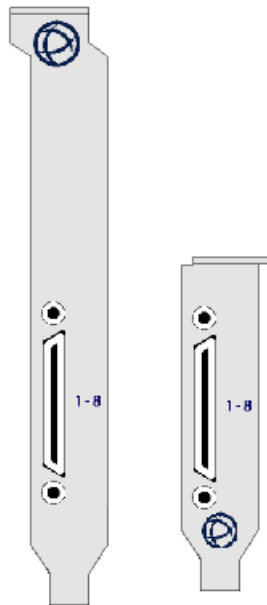

> **Note:** The SPEED LE fan-out cables need to be secured or supported in case of sudden contact or excessive weight on the cables. Please ensure that adequate caution is taken to avoid possible damage to the SPEED LE card or Host system. This can be accomplished by securing the cables to a rack or to the back of the server.

The pinout for each VHDCI-68 Ultra SCSI connector fitted to the SPEED8 LE HD and SPEED8 LE HD Express are as follows:

VHDCI-68 Ultra SCSI Pin Number	EIA-232
1	RXD7
2	CTS7
3	RI7
4	RTS7
5	DCD7
6	DTR7
7	DSR7
8	TXD7
9	S-GND
10	TXD5
11	DSR5

VHDCI-68 Ultra SCSI Pin Number	EIA-232
12	DTR5
13	DCD5
14	RTS5
15	RI5
16	CTS5
17	RXD5
18	RXD3
19	CTS3
20	RI3
21	RTS3
22	DCD3
23	DTR3
24	DSR3
25	TXD3
26	S-GND
27	TXD1
28	DSR1
29	DTR1
30	DCD1
31	RTS1
32	RI1
33	CTS1
34	RXD1
35	RXD8
36	CTS8
37	RI8
38	RTS8
39	DCD8
40	DTR8
41	DSR8
42	TXD8
43	S-GND
44	TXD6
45	DSR6

VHDCI-68 Ultra SCSI Pin Number	EIA-232
46	DTR6
47	DCD6
48	RTS6
49	RI6
50	CTS6
51	RXD6
52	RXD4
53	CTS4
54	RI4
55	RTS4
56	DCD4
57	DTR4
58	DSR4
59	TXD4
60	S-GND
61	TXD2
62	DSR2
63	DTR2
64	DCD2
65	RTS2
66	RI2
67	CTS2
68	RXD2

Connector box and cable guide

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

| Product	Card edge connector	Cable or connector box options	For connector pinouts see...
SPEED4 LE SPEED4 LE Express	RJ45 10-pin	RJ45 - DB25M Converter	See *page 39*
		RJ45 - DB25F Converter	See *page 39*
		RJ45 - DB9M Converter	See *page 40*
		RJ45 - DB9F Converter	See *page 40*
		RJ45 - SPEED Converter	See *page 41*
		RJ45 - Digi Converter	See *page 42*
		RJ45 - Digi ALTPIN Converter	See *page 43*
SPEED4 LE HD SPEED4 LE HD Express SPEED8 LE HD SPEED8 LE HD Express	VHDCI-68	RJ45 Connector Box	See *page 44*
		DB25M Connector Box	See *page 45*
		DB25F Connector Box	See *page 45*
		DB9M Connector Box	See *page 46*
		DB25M Fan-out Cable	See *page 47*
		DB25F Fan-out Cable	See *page 47*
		DB9M Fan-out Cable	See *page 48*
		DB9F Fan-out Cable	See *page 48*

Connector box and cable pinouts

This section contains pinout information for the SPEED LE product range connector box and cable accessories and contains the following:
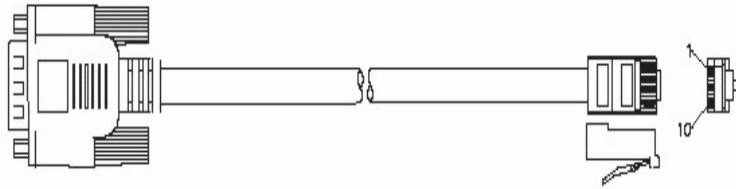
Note: For details of which cables to use with which product, see **Connector box and cable guide** on page 37.

RJ45 10-pin to DB25 converter
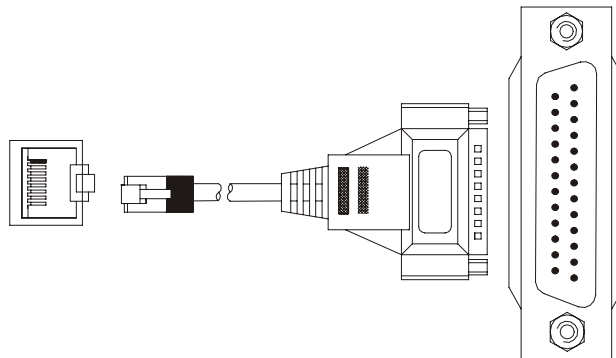
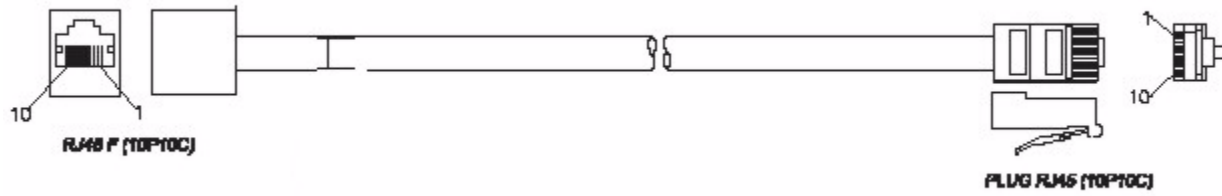| RJ45 pin	DB25 Pin	EIA-232
1	22	RI
2	8	DCD
3	4	RTS
4	6	DSR
5	2	TXD
6	3	RXD
7	7	S-GND
8	5	CTS
9	20	DTR
10	N/C	
1 & Shell	1 & Shell	C-GND

RJ45 10-pin to DB9 converter

RJ45 pin	DB9 Pin	EIA-232
1	9	RI
2	1	DCD
3	7	RTS
4	6	DSR
5	3	TXD
6	2	RXD
7	5	S-GND
8	8	CTS
9	4	DTR
10	N/C	
Shell	Shell	C-GND

RJ45 10-pin to RJ45 SPEED converter

RJ45 10-pin to card	RJ45 10-pin SPEED	RJ45 8-pin SPEED	EIA-232
1	1	N/A	RI
2	2	1	DCD
3	8	7	RTS
4	4	3	DSR
5	6	5	TXD
6	7	6	RXD
7	5	4	S-GND
8	9	8	CTS
9	3	2	DTR
10	10	N/A	
Shell	Shell	Shell	C-GND

RJ45 10-pin to RJ45 Digi converter
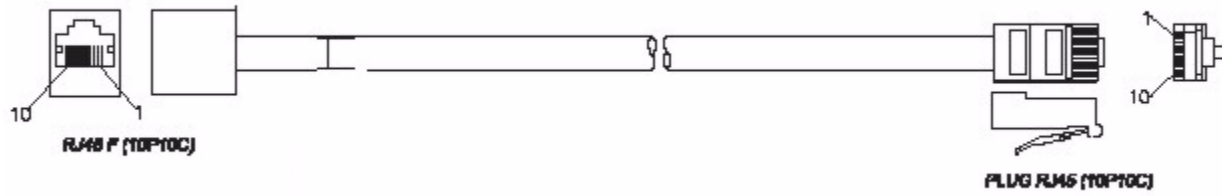
RJ45 10-pin to card	RJ45 10-pin Digi	RJ45 8-pin Digi	EIA-232
1	1	N/A	RI
2	10	N/A	DCD
3	3	2	RTS
4	2	1	DSR
5	5	4	TXD
6	6	5	RXD
7	7	6	S-GND
8	8	7	CTS
9	9	8	DTR
10	N/C	N/A	
Shell	4 & Shell	3 & Shell	C-GND

RJ45 10-pin to RJ45 Digi ALTPIN converter
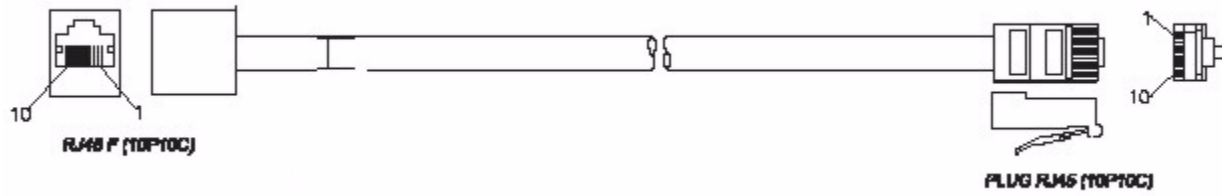
RJ45 10-pin to card	RJ45 10-pin Digi ALTPIN	RJ45 8-pin Digi ALTPIN	EIA-232
1	1	N/A	RI
2	2	1	DCD
3	3	2	RTS
4	10	N/A	DSR
5	5	4	TXD
6	6	5	RXD
7	7	6	S-GND
8	8	7	CTS
9	9	8	DTR
10	N/C	N/A	
Shell	4 & Shell	3 & Shell	C-GND

RJ45 connector box
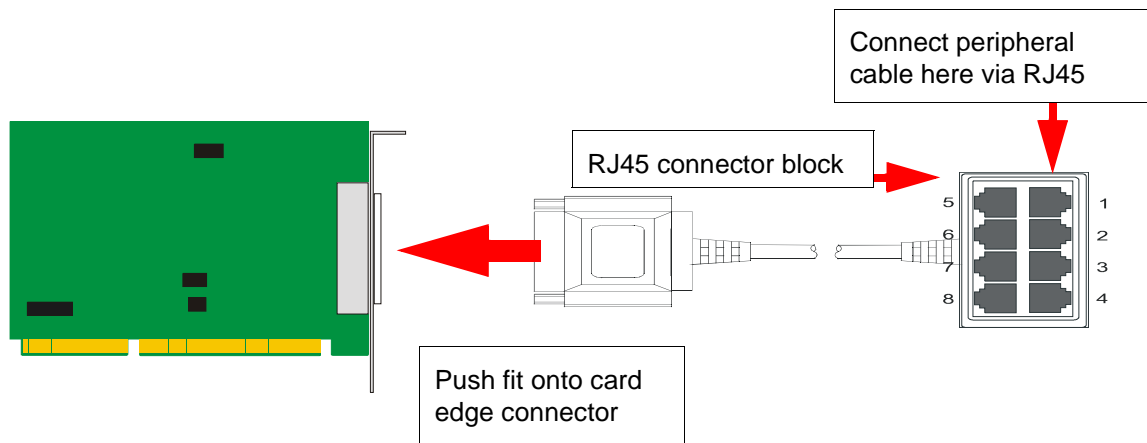
Connect peripheral cable here via RJ45

RJ45 connector block

Push fit onto card edge connector

Note: The SPEED LE connector box cable needs to be secured or supported in case of sudden contact or excessive weight on the cables. Please ensure that adequate caution is taken to avoid possible damage to the SPEED LE card or Host system. This can be accomplished by securing the cable to a rack or to the back of the server.

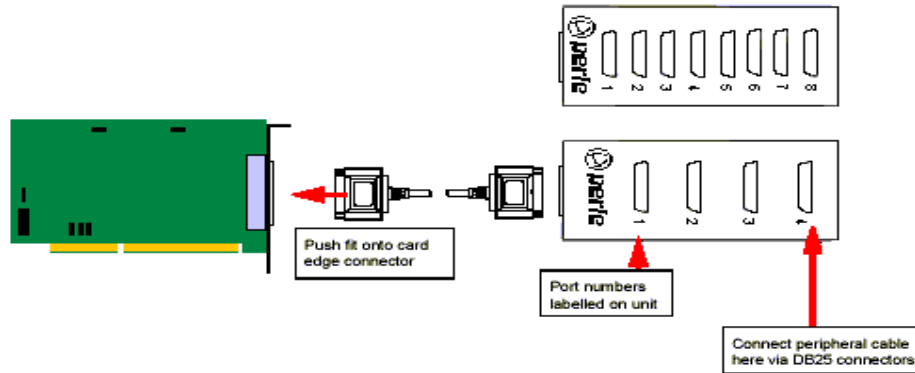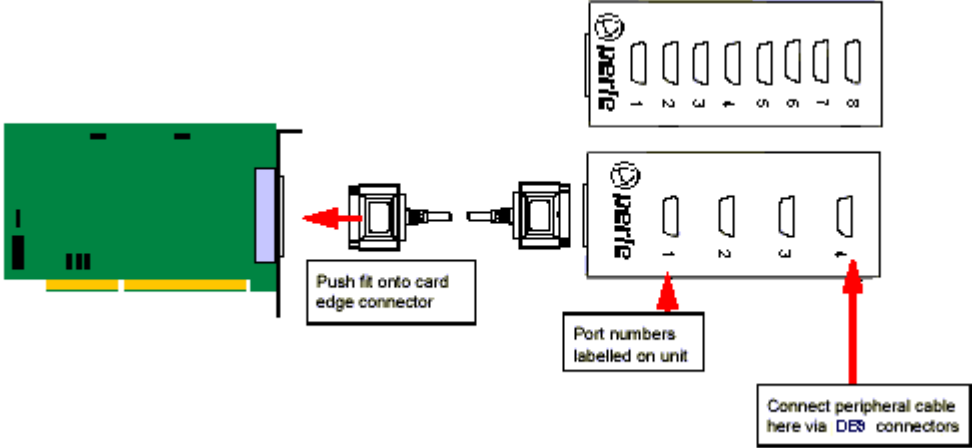| RJ45 10-pin	RJ45 8-pin	EIA-232
1	N/A	RI
2	1	DCD
3	2	RTS
4	3	DSR
5	4	TXD
6	5	RXD
7	6	S-GND
8	7	CTS
9	8	DTR
10	N/A	
Shell	Shell	C-GND

DB25 connector box

Note: The SPEED LE connector box cable needs to be secured or supported in case of sudden contact or excessive weight on the cables. Please ensure that adequate caution is taken to avoid possible damage to the SPEED LE card or Host system. This can be accomplished by securing the cable to a rack or to the back of the server.

DB25 Pin	EIA-232
1 & Shell	C-GND
2	TXD
3	RXD
4	RTS
5	CTS
6	DSR
7	S-GND
8	DCD
20	DTR
22	RI

DB9 connector box

DB9 Pin	EIA-232
1	DCD
2	RXD
3	TXD
4	DTR
5	S-GND
6	DSR
7	RTS
8	CTS
9	RI
Shell	C-GND

DB25 Fan-out cable

Port numbers labelled on DB25 connectors

Push fit onto card edge connector

Connect peripheral cable here

Note:	The SPEED LE fan-out cables need to be secured or supported in case of sudden contact or excessive weight on the cables. Please ensure that adequate caution is taken to avoid possible damage to the SPEED LE card or Host system. This can be accomplished by securing the cables to a rack or to the back of the server.

DB25 Pin	EIA-232
1 & Shell	C-GND
2	TXD
3	RXD
4	RTS
5	CTS
6	DSR
7	S-GND
8	DCD
20	DTR
22	RI

DB9 Fan-out cable

Push fit onto card edge connector
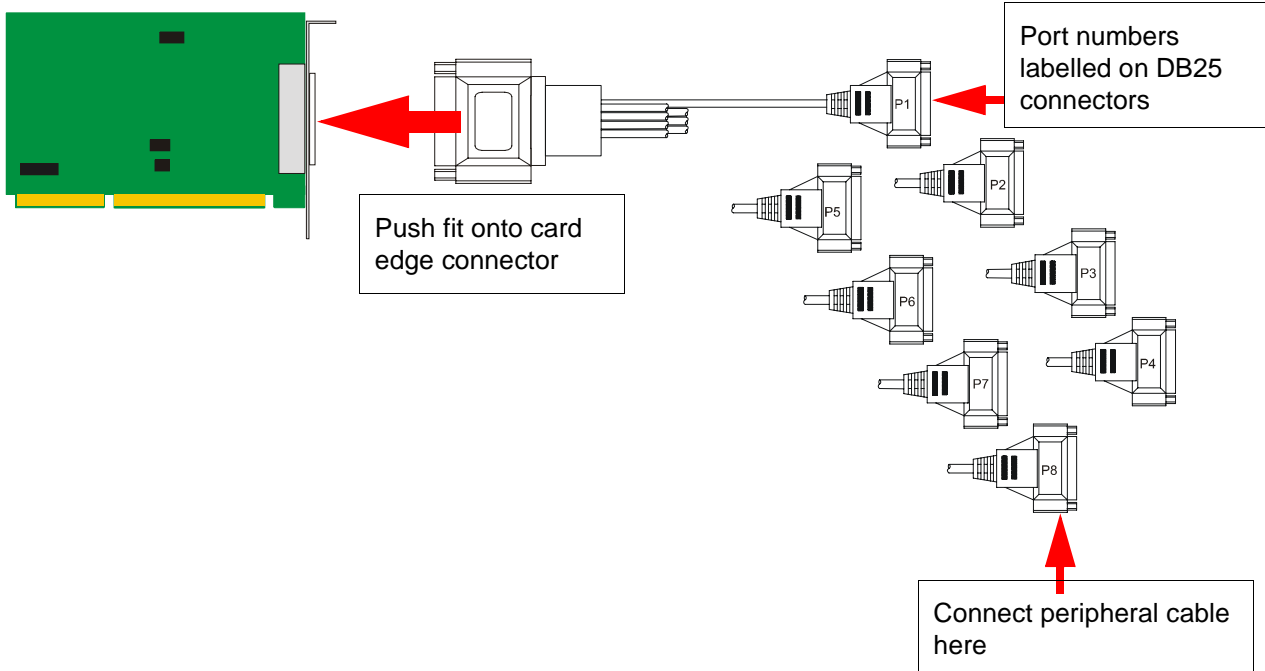
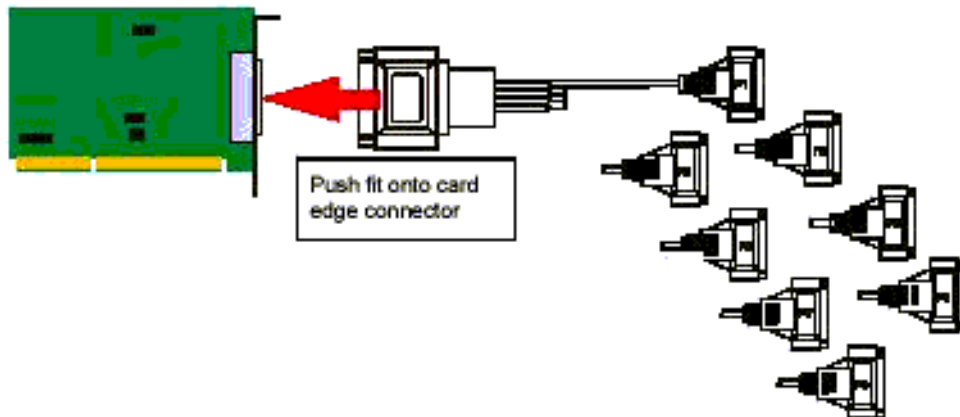> **Note:** The SPEED LE fan-out cables need to be secured or supported in case of sudden contact or excessive weight on the cables. Please ensure that adequate caution is taken to avoid possible damage to the SPEED LE card or Host system. This can be accomplished by securing the cables to a rack or to the back of the server.

DB9 Pin	EIA-232
1	DCD
2	RXD
3	TXD
4	DTR
5	S-GND
6	DSR
7	RTS
8	CTS
9	RI
Shell	C-GND

Low Profile Bracket Conversion

The SPEED LE and SPEED LE Express cards come fitted with standard brackets. Additional low profile brackets are included with your SPEED LE and SPEED LE Express cards to accommodate low profile servers. This section describes how to convert your SPEED LE and SPEED LE Express cards from standard to low profile brackets.

To convert a standard profile bracket to a low profile bracket(s) and install it, do the following:

1. Unscrew the screwlocks around each parallel/serial connector. Remove the standard profile bracket.

> **Note:** **SPEED LE 1P, 1S1P and 2S1P models only**
> Gently remove the serial/parallel connector(s) from the standard bracket and unscrew the bracket from the serial card. You will see two screws that need to be removed at the top and the bottom of the card near the bracket.

2. For all models except SPEED LE 1P and 1S1P, attach the serial low profile bracket and secure with the screwlocks around the serial connector.

> **Note:** **SPEED LE 1P 1S1P and 2S1P models only**
> 1. Attach the low profile bracket with screws to the serial card.
>   Align the serial card on top of the low profile bracket mounting tabs and then insert screws into the serial card holes (bracket mounting tabs must be under the serial card).
> 2. Secure the low profile bracket with the screwlocks around the serial/parallel connector.

3. Insert the remaining serial/parallel connectors into their appropriate low profile bracket(s) and secure to the bracket(s) with the screwlocks around the serial/parallel connector.

4. Verify that all the serial/parallel connectors are connected to the serial card. The ribbon cables have a notch in the connector that will allow them to be inserted into the serial card in only the proper way.

5. Power off the server and disconnect the power cord from the back of the server that you are going to install the serial card into.

6. Insert the serial card into the server's PCI or PCI Express slot, depending on the model, and secure it to the chassis with a screw.

7. For any remaining serial/parallel connectors, secure the low profile bracket(s) into adjacent card slots with a screw to the chassis.

8. Power up the server.

Troubleshooting

Introduction

You need to read this appendix if you want information on troubleshooting problems with SPEED LE and SPEED LE Express 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:

●   **Microsoft Windows** on page 51

Microsoft Windows

This section describes troubleshooting SPEED LE and SPEED LE Express products under the Microsoft Windows family of operating systems.

Note: To contact Perle for technical support go to Perle's web page:
http://www.perle.com

General troubleshooting under Windows

Problem	Action required
Machine fails to boot.	1. Turn off your machine, remove UltraPort card(s) and reboot. See **page 12**. 2. Try installing a different host card in case the one currently installed is faulty. See **page 8**.
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.
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.
Operating system loads OK, but SPEED driver or another driver fails to boot	1. Run Windows Device Manager to find available IRQ and memory addresses.
SPEED LE ports do not work after installation.	1. Check the Windows Event Log and follow the suggested actions.
SPEED LE 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.
SPEED LE Windows driver fails during normal operation, symptoms either: black screen, machine reboots or system hangs	1. Contact Technical Support at Perle's web page: http://www.perle.com/

Windows 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 Microsoft Windows user documentation or help system for details.