

# **AB545A PCI-X 4-Port Gigabit Ethernet Card Installation Guide**

**For IEther Driver Versions B.11.11.07 and B.11.23.05**

**HP 9000 and HP Integrity Systems**



**Manufacturing Part Number : AB545-90001  
E0305**

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**This Installation Guide has been translated to:**

日本語

<http://www.docs.hp.com/ja/index.html>

## Hardware and Software Installation Procedure

These instructions apply to AB545A PCI-X 4-Port Gigabit Ethernet cards.

If your LAN card was factory installed (ordered on product option 0D1), the software bundle required for this card -- **IEther-00** is already loaded onto your system's hard drive.<sup>1</sup>

### Adding in the card: HP-UX 11i v 1.0

If your system is HP-UX 11i v 1.0 based, you can get the software bundle from the December 2004 (or later) version of HP-UX 11i v 1.0 on the OE and/or Application Software media. You do not necessarily have to load the entire operating environment (OE) if you don't want to. To add the product for 11i v 1.0:

- You can either load the entire HP-UX 11i v 1.0 December 2004 OE from the distribution media and you will automatically get the correct LAN software bundle.

*or*

- You can just select and load the software bundle **IEther-00** required for this card.

### Adding in the card: HP-UX 11i v 2.0 of September 2004 (or later)

- In order to use the AB545A 4-port cards with HP-UX 11i v 2.0 of September 2004 (or later), your system needs to be on that OE.
- So, if your system does not have 11i v 2.0 of September 2004, you need to load the entire HP-UX 11i v 2.0 September 2004 (or later) OE from the distribution media, and you will automatically get the correct LAN driver bundle.

These AB545A cards can be added to specified systems or replaced without the need to shut down or reboot the system--a process called online addition and replacement (OLAR). If performing OLAR, patches are required -- see "Product Overview" on page 11. The following instructions assume you are not performing online addition and replacement.

### Step 1: Access the system card bay

- If the system is running, first, issue the `sync` command. Then shut down the system by executing: `shutdown -h`. Respond "y" to the continue to shutdown prompt.
- Wait for the system to shut down completely, and then power off the system by pressing the system off button. Ensure that the system is grounded.
- Open the system to gain access to the PCI backplane.
- Select an empty PCI or PCI-X slot and remove the slot cover. The card can operate in PCI 66 mode as well as PCI-X mode. Some servers have "shared" slots. If you put this card in a shared slot that is shared with a *slower* card, both cards will then operate at the slower card's speed.

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**CAUTION** This AB545A card DOES NOT SUPPORT PCI 33MHz operation. Therefore, do not place this card in the shared slot of a system where the card in the neighboring shared slot is a 33 MHz only card!!! Please see Table 5 on page 14 for the list of 33 MHz only cards.

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1. If your LAN card was factory installed (ordered on product option 0D1), you do not need to perform the hardware and software installation steps,. You still need to configure the card's IP address and possibly set other parameters and options such as those mentioned in Table 2 on page 9 The Network Card Configuration worksheet.

**Step 2: Install the card**

**Step 2: Install the card**

- Check the latest support matrix for Gigabit Ethernet to see the systems that support this card, how many cards per system, and if any software updates are needed. The support matrix is available on the web at <http://docs.hp.com> under “Networking and Communications.”
- Observe the antistatic precautions. HP recommends wearing ESD straps when installing the card.
- Record the serial number and MAC address located on the card for future reference.
- Grasp the card by its edges or faceplate with both hands, insert the card into the slot, and firmly but gently press the card in until it is fully seated.
- Secure the card and reassemble the system.

**Step 3: Connect the card to the network**

- Attach the connector from a LAN cable to one of the ports on the card (Figure 1 on page 10). Do the same for the other ports. For 1000Base-T, cabling must be Cat 5 UTP or better with RJ-45 connectors. The operating distance for 1000Base-T is up to 100 meters. Note: Port A is the top RJ-45 connector.
- Attach the free end of the LAN cable to any unused port on the switch. The 4 ports on the card operate at 10 or 100 Mbit/s in either full- or half-duplex modes and at 1000 Mbit/s only in full-duplex mode. Set the ports on the card and on your switch according to the following table.

**Table 1 HP-UX 1000Base-T Supported Configurations**

HP-UX 1000Base-T Port	Link Partner	Resulting Speed
AUTO	AUTO	Highest Common Speed (HP-UX supports 10/100/1000)
AUTO	1000 FD fixed/manual	1000 Mbit/s FD
10 HD	10 HD (for example, a 10Base-T Hub)	10 Mbit/s HD
10 FD	10 FD	10 Mbit/s FD
100 HD	100 HD	100 Mbit/s HD
100 FD	100 FD	100 Mbit/s FD

If you are using Jumbo Ethernet frames, ensure that:

- all end stations on a given LAN<sup>1</sup> have the same maximum transmission unit (MTU) setting;
- intermediate stations such as switch ports in your LAN have an MTU equal to or greater than the end station’s MTU.
- Power up the system.
- Upon power up, any error messages will appear on the terminal display or system console. You can also use the `dmesg` command to retrieve startup messages later.
- Verify that the Ethernet LAN connector’s Link LED is on.

1. In the Jumbo Frames discussion, “LAN” means that the end stations do not have any routers or layer 3 switches in between them.

- When the system is up, log in as `root` and verify that the card and its hardware path are displayed by executing the command: `ioscan`.

#### Step 4: Prepare to install the software

- Ensure you are logged in as `root`.
- Check that the `/usr/bin`, `/usr/sbin` and `/sbin` directories are in your `PATH` using the command:  
`echo $PATH`
- Check the HP-UX version by entering: `uname -r`

```
# uname -r  
B.11.11
```

or

```
B.11.23
```

The version must be B.11.11 for 11i v 1.0 or B.11.23 for 11i v 2.0.

- Check the Release Notes for **IEther-00** to see if you need to install any appropriate patches for your system. Release Notes are available on the worldwide web at <http://docs.hp.com> under Networking and Communications.

#### Step 5: Install the latest software.

- Load the software media into the appropriate drive.
  - If you are adding the Gigabit Ethernet software bundle (**IEther-00**) for 11i v 1.0, you can get the Gigabit Ethernet software bundle on the December 2004 (or later) OE and/or Application Software distribution media.
  - If you are adding the Gigabit Ethernet software bundle (**IEther-00**) for 11i v 2.0, you must use the September 2004 (or later) OE distribution media.
- Run the `swinstall` program to install the software using the command: **swinstall**.
- Change the host name after “Source Host Name,” if necessary.
- Click the Source Depot Path to identify the registered depot for the appropriate source depot path and activate the OK button to return to the Software Selection Window.
- Highlight the 1000Base-T software **IEther-00** (for cards such as AB545A).
- Choose Mark for Install from the “Actions” menu to choose the product to be installed.
- Choose Install from the “Actions” menu to begin product installation and open the Install Analysis Window.
- Activate the OK button in the Install Analysis Window when the Status field displays a “Ready” message.
- Activate the YES button at the Confirmation Window to confirm that you want to install the software. `swinstall` loads the fileset, runs the control scripts for the filesets, and builds the kernel. This should take about 3 to 5 minutes. When the status field indicates Ready, click Done. A Note Window then opens. Click the OK button to reboot the system.

#### Step 6: Configure the card using SAM

- Log in as `root` and verify that the card and its hardware path are displayed by entering: **ioscan**.
- Run the System Administration Manager by entering: `sam`.

**Step 7: Verify the LAN installation**

- Double-click Networking and Communications.
- Double-click Network Interface Cards.
- Highlight one interface port on the AB545A 4-Port Gigabit Ethernet card and choose Configure from the “Actions” menu.
- Fill in the form according to the instructions using the “Network Card Configuration Worksheet” in this document.
- Click the OK button to activate the card and then select exit from the “File” menu until you exit SAM.

**Step 7: Verify the LAN installation**

- Verify that the LAN connector’s Link LED is steadily on (this means the card and driver are installed successfully).
- Obtain the PPA number and the station address of each card by using the lanscan command. The MAC address labelled on each card refers to LAN port A (the right port). Add 1 to obtain the MAC address for LAN port B, 2 for port C, 3 for port D.
- To verify link-level connectivity with a remote system, enter:

```
$ linkloop -i PPA_number remote_station_address
```

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**NOTE** When you use linkloop, ensure that the remote system is on the same subnet and is an HP-UX-based system.

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- To verify IP-level connectivity with a remote system, enter:

```
$ping Remote_IP_Address  
and  
netstat -in
```

When you use netstat -in, the output values Ipkts and Opkts should be incrementing.

- Installation is complete when you have successfully run linkloop, ping, and netstat. To configure remote systems, see the *Ethernet Support Guide* available on the web at <http://docs.hp.com>. Do this step only if remote systems have not been previously configured.
- Optionally, if you want to verify that the iether driver appears for each installed card, enter: **ioscan -fkNClan**

The ioscan output for each port would look something like the following:

```
Class I H/W Path Driver S/W State H/W Type Description  
lan 3 0/5/1/0/4/0 iether CLAIMED INTERFACE HP AB545-60001 PCI/PCI-X 1000Base-T 4-port  
1000B-T Adapter
```

The last two digits of the hardware path (third column) reflect the path of each port.

**Optional Step: Configure Jumbo Frames Size** (Jumbo frames are supported only at 1000 Mbit/s)

- Jumbo frames for the `iether` driver on HP-UX 11i v 1.0 and on 11i v 2.0 of September 2004 (or later) have an `mtu_size` in the range from 1501 to 9000 bytes.

If you are using Jumbo Ethernet frames, ensure that:

- all end stations on a given LAN<sup>1</sup> have the same maximum transmission unit (MTU) setting;
- intermediate stations such as switch ports in your LAN have an MTU equal to or greater than the end station's MTU.
- Obtain the PPA number of the card by entering `lanscan`.
- Choose one of the following two configuration methods to permanently save your configuration.
  - use the GUI-based system admin manager (SAM).  
To use SAM, type `sam` at the HP-UX system prompt; then double-click Networking and Communications, Network Interface Cards. Click on the interface; select “Modify..” or “Configure” from the Action menu, and then select “Advanced Options” to change the MTU size. See *Ethernet Support Guide* for details, and then do the steps for verifying the MTU size;
  - or*
  - edit the following configuration file using an editor such as “vi”:  
**`/etc/rc.config.d/hpietherconf`**.  
Set the `mtusize` by editing `HP_IETHER_MTU[i]=mtusize`,  
and insert the proper interface name: `HP_IETHER_MTU[i]=HP_IETHER_INTERFACE_NAME`.

Remember that Jumbo Frames needs to be configured *for each port*. When the system reboots, the interface will be configured for jumbo frame operation.

- Verify MTU change by entering `netstat -rn`. If MTU has not changed, enter the following commands:

```
$ifconfig lanPPA_number unplumb
$ifconfig lanPPA_number ip_address netmask netmask up
```

- To check (or verify) the current Ethernet frame size, enter:

```
$lanadmin -m PPA_number
```

An alternative way to temporarily configure jumbo frame size is to enter:

```
lanadmin -M mtu_size PPA_number.
```

Using `lanadmin` will not preserve your settings across reboots.

The **PPA\_number** is the one we obtained from the output of `lanscan`. For using Jumbo Frames with the `iether` Gigabit Ethernet driver on HP-UX 11i v 1.0 or 11i v 2.0 of September 2004 (or later), set the `mtu_size` to a number from 1501 to 9000 (bytes).

**For Further Information**

For further information on this card, please refer to <http://docs.hp.com> and then look under Networking and Communications. This card's information is primarily located under the subsection called “Gigabit Ethernet.”

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1. In the Jumbo Frames discussion, “LAN” means that the end stations do not have any routers or layer 3 switches in between them.

**Maintenance and troubleshooting information** about the iether Gigabit Ethernet driver used in this product is located in the *Ethernet Support Guide*.

Information on which Ethernet driver is used with each network card can be found in the *Ethernet Support Matrix*. That matrix also tells which versions of HP-UX work with each network product as well as how many cards are supported per system.

The AB545A is a 4-port GigE version of HP's A7012A 2-port card. They both have similar features and use the same iether Gigabit Ethernet driver.

## Network Card Configuration Worksheet

Fill out one worksheet for each network card you are installing.

**Table 2** Network Card Configuration Worksheet

Data Type	Required/Optional	Default	How to Configure (see Note 1)	Example	Your System
Internet Address	Required	0.0.0.0	SAM or ifconfig or edit /etc/rc.config.d/ netconf	196.6.20.2	
Subnet mask	Required if using subnetting	Subnet mask not used	SAM or ifconfig or edit /etc/rc.config.d/ netconf	255.255.248.0	
Station address	Built-in but can be optionally changed	As shown on card	SAM or edit /etc/rc.config.d/ hpietherconf or temporarily: lanadmin -A	0x0060b0c4012f	
Host name alias for this network interface (card)	Required if the system is connected to more than 1 network	None	SAM or edit /etc/hosts	host1	
Link configuration	Required	Autonegotiating	SAM or temporarily: lanadmin -X	lanadmin -X auto_on ppa# (if already turned off)	
Link speed/duplex mode	Required	Autonegotiating	Hub or switch (see Note 2) SAM or temporarily: lanadmin -X	lanadmin -X 100fd ppa#	
MTU (Maximum Transmission Unit): Jumbo Frames	Optional	1500 bytes	SAM or edit /etc/rc.config.d/ hpietherconf or temporarily: lanadmin -M	lanadmin -M 9000 ppa# (see Note 3 below)	
Receive flow control	Optional	On	SAM or edit /etc/rc.config.d/ hpietherconf or temporarily: lanadmin -X	lanadmin -X fctrl off	

**Note 1:** To configure values permanently, edit the configuration files using SAM or an editor such as “vi”. Using lanadmin will not preserve your settings across reboots.

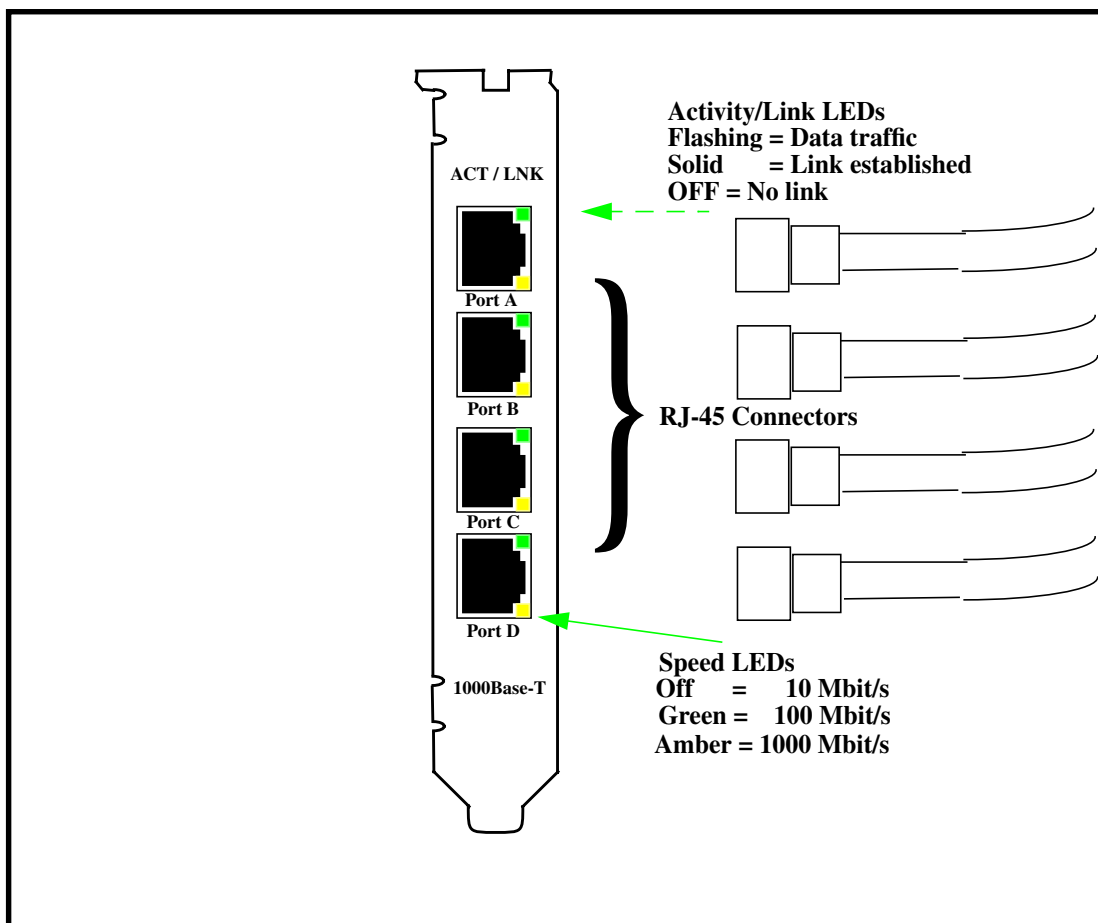
**Note 2:** The speed configuration of the card can be 10, 100, or 1000Mbit/s and is determined by the speed setting of the hub or switch port to which the card is connected. The card automatically senses this speed. The Base-T card only runs at one speed at a time. To verify the speed selection, run lanadmin -x ppa#.

**Note 3:** Following are the valid MTU sizes:

- For normal frames using the iether driver on HP-UX 11i v 1.0, the MTU size is a number from 257 to 1500 bytes. On HP-UX 11i v 2.0, the MTU size for normal frames is a number from 1024 to 1500 bytes.
- For jumbo frames using the iether driver on HP-UX 11i v 1.0 or HP-UX 11i v 2.0, the MTU size is a number from 1501 to 9000 bytes.

**Operating Distance for 1000Base-T (Copper UTP):** Up to 100 meters — Cat 5 and Cat 5E

**Figure 1 AB545A PCI-X 4-Port Gigabit Ethernet Card**



## Product Overview

The AB545A PCI-X LAN cards have the following features and requirements:

- **PCI-X 133 MHz** capable card and is keyed so it only fits in 3.3V slots. It can operate at 32-bit or 64-bit modes and is supported in the following frequencies:
  - PCI-X 133. Best performance is achieved by putting the card into one of the highest-performing (or “**dual-rope**”) PCI-X 133 slot. To identify which slots are the highest performing slots in a particular system, please refer to the hardware users’ guide for each system.
  - PCI-X 66
  - PCI 66

**The AB545A card is *not* supported in PCI 33 bus mode. See the CAUTION that follows:**

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**CAUTION** The AB545A card DOES NOT SUPPORT PCI 33 MHz operation. Therefore, do not place this card in the shared slot of a system where the card in the neighboring shared slot is a 33 MHz only card!!! Please see Table 5 on page 14 for the list of 33 MHz only cards.

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- Requires either HP-UX 11i v 2.0 (64 bit) operating environment (OE) of **September 2004 (or later)** or the software bundle, **IEther-00** , from the 11i v 1.0 of **December 2004 (or later)** OE or application software media.
  - For 11i v 2.0, your system needs to be on the September 2004 operating environment or later, so you need to load the entire OE.
  - For systems that are already running 11i v 1.0, you can either just load the required software driver bundle, or you can load the entire December 2004 11i v 1.0 OE and /or application software and you will automatically get the driver you need for this card.
- Supports **Jumbo Frames**.
- Supports HP **Serviceguard** and Auto-Port Aggregation (**APA**) for high availability.
- Supports virtual LANs (**VLANs**). This feature is described in *Using HP-UX VLANs* on <http://docs.hp.com>.
- Supports PCI-X online addition/replacement (**OLAR**) on specified systems. A patch is required. If your system is running HP-UX 11i v 1.0, use PHKL\_31227 (or later). If your system is running HP-UX 11i v 2.0, use PHKL\_31226 (or later). If the patch is not installed, the OLA operation will not succeed and the card will not be usable until the system is rebooted.

For instructions on how to perform online addition and replacement (OLAR) for PA-RISC-based systems running HP-UX 11i v 1.0, see *Configuring HP-UX For Peripherals*. For instructions on performing OL\* for Itanium-based systems and PA-RISC systems running HP-UX 11i v 2.0 of September 2004 or later, refer to the *Interface Card OL\* Support Guide* .

- Supports configuration through **SAM** or command line.
- Online/Offline Diagnostics.
- Ignite UX support.
- Supports vPars on HP-UX 11i v 1.0.
- Card resident EFI driver V 3.0.03.
- IPv4 Checksum Offload for TCP (CKO).

**Product Overview**

- IPv4 TCP Segmentation Offload (TSO).
- LAN boot support on HP Integrity systems.

## Supported Systems

The 4-Port Gigabit Ethernet card is supported in the HP Integrity (Itanium® or Itanium®2-based) systems specified in Table 3. Updated information similar to this such as which Ethernet driver is used with each network card can be found in the *Ethernet Support Matrix* on <http://docs.hp.com>.

**Table 3 4-Port GigE Card in HP Integrity Systems**

rx1600
rx1620
rx2600
rx2620
rx4640
rx7620
HP Integrity Superdome IA 16-way, 32-way, 64-way,128-way, and 192-way
rx8620 and rx8620 with I/O Expansion unit

The 4-Port Gigabit Ethernet card is supported in the HP 9000 (PA-RISC Processor-based) systems specified in Table 4.

**Table 4 4-Port GigE Card Supported in HP9000s**

HP 9000 Systems
rp3410
rp3440
rp4440
rp7420
HP 9000 Superdome in 3.3 volt slots; (PA 8700+ based 875Mhz processors and 8800-based processors) 16-way, 32-way, 64-way
rp8420 and rp8420 with I/O Expansion unit

## Unsupported Systems

The 4-Port Gigabit Ethernet AB545A is not supported on rx5670, rp7410, rp8400, or on HP9000 Superdomes that have 8600 or 8700 (650Mhz, 750Mhz) processors.

## Unsupported Shared Slot Usage with 33 MHz Cards

The AB545A 4-Port Gigabit Ethernet card is not supported in the shared slots of systems where the card in the neighboring shared slot is a 33 MHz only card. The 33 MHz only cards are specified in Table 5.

As of the date of publication of this document (March 2005), the 3 systems listed in Table 5 are the main ones where the AB545A card should not be placed in the neighboring shared slot with the cards listed. The restriction applies to all systems with shared slots even if the system isn't shown in Table 5.

**Table 5 AB545A Cannot be in Neighboring Shared Slots with These 33 MHz Cards**

HP 33 MHz Only Cards	Card Description	Systems that Have Shared Slots		
		rx4640	rp4440	rx4640-8
A3739B	FDDI Dual Attach	✓	✓	✓
A5230A	10/100B-TX (RJ45)	✓	✓	✓
A5506B	4-port 10/100B-TX	✓	✓	✓
A5513A	ATM 155 (MMF connector)	✓	✓	✓
A5783A	Token Ring (4/16/100 Mb/s)	✓	✓	✓
A5838A	2port Ultra2-SCSI + 2port 100T	✓	✓	✓
A6748A	8-port Terminal MUX	✓	✓	✓
A6749A	64-port Terminal MUX	✓	✓	✓
J3525A	2-port serial (X25/FR/SDLC)	✓	✓	✓
J3526A	4-port serial (X25/FR)	<i>not applicable</i>	✓	<i>not applicable</i>
Z7340A	8 port ACC	✓	✓	✓

## Card Physical and Environmental Specs and Regulatory Information

### Card Physical and Environmental Specifications

Following are the product physical and environmental specifications of the AB545A PCI-X 4-Port Gigabit Ethernet LAN card.

#### Physical Specifications

Form Factor	PCI full length card PCI-X (rev 2.3)
PCI support	64-bit 3.3V only 133Mhz
Height	10.668 cm (4.2 in)
Depth	16.9 cm (6.6 in)
Width	1.295 cm (0.51 in)
Weight	0.18 kg (0.4 lb) kg

#### Electrical

Power consumption:	25 Watts
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#### Environmental

Temperature

Degrees F = (1.8 x Degrees C) + 32

Operating Temperature Range (Degrees Celsius)	+5° C to 40° C
Recommended Operating Temperature Range (Degrees Celsius)	+10° C to 40° C
Non-operating/ storage Temperature Range (Degrees Celsius)	-40° C to 70° C
Temperature Shock Immunity - Max Rate of Change	20 C/hr
Non-operating/storage Humidity Range in %RH	90
Recommended Operating Humidity Range @ 22 Degrees Celsius in %RH	40 to 60
Heat Dissipation (in Watts)	17
Maximum kV (if less than 15 kV) with no loss of function	8
Maximum kV (if less than 25 kV) with no component damage	25
Operating Altitude	3,000 meters (9900) ft
Non-operating Altitude	4,500 meters (14850 ft)

#### Electromagnetic Compatibility

This document contains regulatory statements for the United States and the European community.

## FCC Statement (For U.S.A.)

### Federal Communications Commission Radio Frequency Interference Statement

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**WARNING** This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:  
(1) This device may not cause harmful interference and  
(2) this device must accept any interference received, including interference that might cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Hewlett-Packard's system certification tests were conducted with HP-supported peripheral devices and cables, such as those received with your system. Changes or modifications to this equipment not expressly approved by Hewlett-Packard could void the user's authority to operate the equipment.

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## Canada

Warning: This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

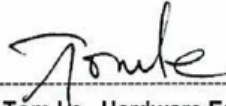
Cet appareil numérique de la classe A respecte toutes les exigences du règlement sur le matériel brouilleur du Canada.

## EMI Statement (European Community)

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**NOTE** This is a Class A product. In a domestic environment, this product may cause radio interference, in which case you may be required to take adequate measures.

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<b>DECLARATION OF CONFORMITY</b> According to ISO/IEC Guide 22 and EN 45014	
<b>Manufacturer's Name:</b>	Hewlett-Packard Company Systems Interconnect Solutions Lab
<b>Manufacturer's Address:</b>	8000 Foothills Blvd. Roseville, CA 95747 USA
<b>declares, that the product</b>	
<b>Product Name:</b>	PCI-X 4-Port 1000Base-T Ethernet Adpt
<b>Model Number(s):</b>	AB545A
<b>Product Options:</b>	All
<b>conforms to the following Product Specifications:</b>	
<b>Safety:</b>	IEC 950:1991 + A1, A2, A3, A4 / EN 60950:1992 + A1, A2, A3, A4, A11 GB 4943-1995. IEC 825-1:1993/ EN60825-1:1994+A1, Class 1 Laser
<b>EMC:</b>	CISPR 22:1997 / EN 55022:1998 - Class A CNS 13438, GB 9254-1988, CFR47, Part 15 Class A CISPR 24:1997 / EN 55024:1998 IEC 61000-4-2 IEC 61000-4-3 / ENV 50204 IEC 61000-4-4 IEC 61000-4-6
<b>Supplementary Information:</b>	
The product herewith complies with the requirements of the EMC Directive 89/336/EEC and carries the CE marking accordingly.	
1) The Product was tested in a typical configuration with Hewlett-Packard information technology equipment.	
	 ----- <b>Tom Le, Hardware Engineer</b>
Cupertino, CA, Feb, 2005	
European Contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department HQ-TRE, Herrenberger Straße 130, D-71034 Böblingen (FAX: + 49-7031-14-3143)	

