



Hardware Reference Guide

HP Compaq t5000 Thin Client

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This book provides basic hardware information for this series of thin clients.

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Hardware Reference Guide

HP Compaq t5000 Thin Client
Second Edition (April 2004)
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Product Features

Standard Thin Client Features

The HP Compaq t5000 thin clients are terminals that connect over a network to a server running Microsoft Windows 2000 or Windows NT Terminal Server Edition or either of these operating systems with Citrix MetaFrame software running atop the server operating system.

HP has partnered with Altiris to manage HP Compaq thin clients. Altiris Deployment Solution is a leading-edge tool to help with quick deployment and for on-going management of the thin clients in your organization. Each HP Compaq thin client is recognized by Altiris Deployment Solution as a supported device. As a result, customers need not track license compliancy for each device. For additional information about the Altiris Deployment Solution tool, refer to the *Altiris Deployment Solution* insert that shipped with the thin client and the *Deployment Solution User Guide* that is available at: www.altiris.com/documentation.

The next sections describe the features of the thin client. For a complete list of the hardware and software installed on a specific model, visit <http://h18004.www1.hp.com/products/thinclients/index.html> and search for a specific thin client model.

The following features are common to all HP thin clients:

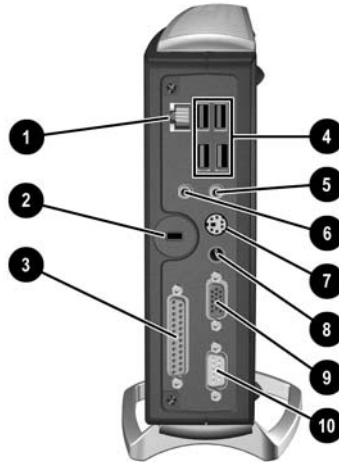
- no moving parts
- no hard drives or diskette drives (optional MultiBay hard drive and diskette drive available for select models)
- 15-minute setup time
- while software support is limited to 90 days from date of purchase, free periodic firmware upgrades during the product's warranty period help to protect your IT investment

- central deployment and management using the Altiris Deployment Solution.

Rear Panel Components



Components may vary depending on the specific model.



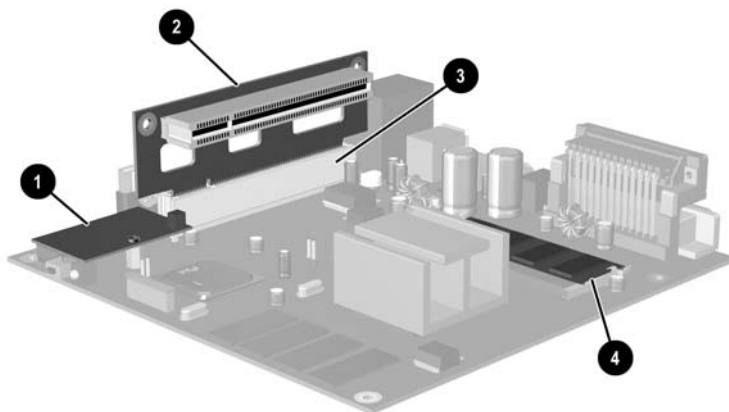
Rear Panel Components

❶ Ethernet RJ-45 Connector	❹ Universal Serial Bus (USB) Connectors (4)
❷ Cable Lock Slot	❺ Line-in Audio Connector (Microphone)
❸ Parallel Connector**	❻ Line-out Audio (Headphone) Connector
❹ Universal Serial Bus (USB) Connectors (4)	❼ PS/2 Connector*
❺ Line-in Audio Connector (Microphone)	❽ Power Connector
❻ Line-out Audio (Headphone) Connector	❾ Monitor Connector
❼ PS/2 Connector*	❿ Serial Connector**
❽ Power Connector	
❾ Monitor Connector	
❿ Serial Connector**	

* Not available on t5300, t5500, t5700 models.

**Not available on t5300 models.


System Board Components




System Board Components

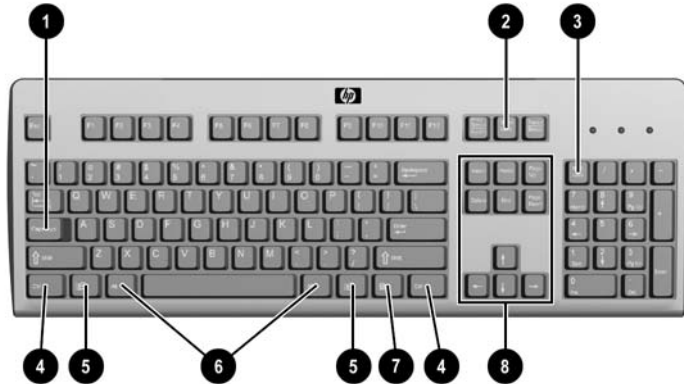
- | | |
|---|------------------|
| ❶ Flash Memory | ❸ PCI Slot* |
| ❷ PCI Riser Card* (optional; for use with units having optional PCI Expansion Module) | ❹ SODIMM Memory* |

** Not available on t5300 models.*

 Not all HP Compaq t5000 thin client models are flash memory, SODIMMs, and/or PCI Expansion Module upgradeable.

 32 MB of system RAM is reserved for processor usage.

Using the Keyboard



Keyboard Features

Enhanced Keyboard Components

❶	Caps Lock key	Used to activate/deactivate the Caps Lock feature.
❷	Scroll Lock key	Used to activate/deactivate the Scroll Lock feature.
❸	Num Lock key	Used to activate/deactivate the Num Lock feature.
❹	Ctrl key	Used in combination with another key; its effect depends on the application software you are using.
❺	Windows Logo Key ¹	Used to open the Start menu in Microsoft Windows. Used in combination with other keys to perform other functions. (See the following section.)

¹ Keys available in select geographic regions.

Enhanced Keyboard Components (Continued)

⑥ Alt Key	Used in combination with another key; its effect depends on the application software you are using.
⑦ Application Key ¹	Used (like the right mouse button) to open pop-up menus in a Microsoft Office application. May perform other functions in other software applications.
⑧ Editing Keys	Includes the following: Insert, Home, Page Up, Delete, End, and Page Down. Holding down Ctrl and Alt while pressing Delete allows you to restart the Thin Client.

¹ Keys available in select geographic regions.

Windows Logo Key

Use the Windows Logo Key in combination with other keys to perform certain functions available in the Windows operating systems.



The Windows Logo Key is not supported on Linux-based systems.

Windows Logo Key + Tab	Switch between open items
Windows Logo Key + e	Open My Computer
Windows Logo Key + f	Search for a file or folder
Windows Logo Key + Ctrl + f	Search for computers
Windows Logo Key + m	Minimizes or restore all windows
Windows Logo Key + Shift + m	Undo Minimize All
Windows Logo Key + break	Displays the System Properties dialog box
Windows Logo Key + r	Open the Run dialog box

Additional Function Keys

The following key combinations also work on HP Compaq t5000 thin client models:

With Microsoft Windows XPe	
Alt + Esc	Cycles through the minimized applications.
Alt + Tab	Cycles through open applications.
Alt + Shift + Tab	Switches to the previous session.

With Microsoft Windows CE .NET	
Alt + Esc	Cycles through open applications.
Alt + Tab	Opens Task Manager.

Special Mouse Functions

Most software applications support the use of a mouse. The functions assigned to each mouse button depend on the software applications you are using.



All HP Compaq t5000 thin client models ship with a USB scroll mouse.

Serial Number Location

Each thin client has a unique serial number which is located on the the thin client as shown in the following illustration. Keep this number available for use when contacting HP customer service for assistance.



Serial Number Location

Hardware Upgrades

General Hardware Installation Sequence

To ensure the proper installation of any thin client hardware option:

1. Back up any data if necessary.
2. If the thin client is on:
 - a. Shut the unit down.
 - b. Turn the unit and any other attached devices off.
 - c. Disconnect the power cord from the wall outlet.
 - d. Disconnect any external devices or cables.



WARNING: To reduce the risk of personal injury from electrical shock and/or hot surfaces, be sure to disconnect the power cord from the wall outlet and allow the internal system components to cool before touching.



WARNING: To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telecommunications or telephone connectors into the network interface controller (NIC) receptacles.



CAUTION: Static electricity can damage the electronic components of the thin client or optional equipment. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object. See [Appendix C, “Electrostatic Discharge”](#) for more information.

3. Remove the side access panel. See the section “[Removing and Replacing the Side Access Panel](#)” on page 2-3 for more information on how to access the system board.
4. Remove, if necessary, any hardware that will be replaced.
5. Install any optional equipment. The following options are available on select models:
 - [Flash Memory on page 2-5](#)
 - [SODIMM Upgrade on page 2-6](#)
 - [PCI Expansion Module on page 2-7](#)
 - [MultiBay Hard Drive and Diskette Drive on page 2-10](#)



More detailed instructions for installing thin client options are included in the option kits.

If it is necessary to replace the internal battery, refer to the following section:

- [Internal Battery on page 2-10.](#)
6. Replace the side access panel. Refer to the section “[Removing and Replacing the Side Access Panel](#)” on page 2-3 section for instructions on this procedure.
 7. Reconnect any external devices and power cords.
 8. Turn on the monitor, the thin client, and any devices you want to test.
 9. Load any necessary drivers.



Many of the drivers necessary for installing optional thin client hardware can be found and downloaded from the HP website at <http://www.hp.com/country/us/eng/support.html>.

10. Reconfigure the thin client, if necessary.

Removing and Replacing the Side Access Panel

To install internal hardware options, you must remove the side access panel and chassis cover as shown below.



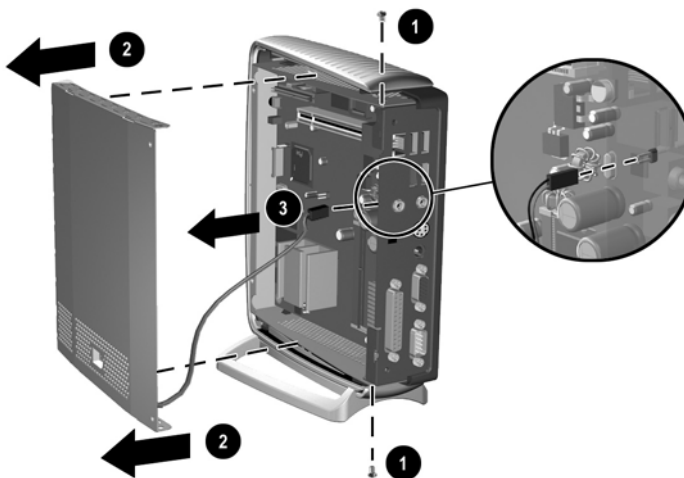
WARNING: Before removing the side access panel, ensure that the thin client is turned off and that the power cord is disconnected from the electrical outlet.

1. Remove the two back panel screws ❶.
2. Pull the side panel off ❷.



Removing the Side Access Panel

3. Remove the chassis cover by removing the two screws ❶ and pulling the chassis cover ❷ off.
4. Disconnect the speaker cable ❸ from the system board.



Removing the Chassis Cover and Disconnecting the Speaker

To replace the cover, reverse the previous steps.

Installing Thin Client Options

There are several options available for installation on the thin client such as flash memory, SODIMMs, and security hardware (see [Appendix B, “Security Provisions”](#) for security hardware information). Not all thin clients support the same options. Visit the HP website at <http://h18004.www1.hp.com/products/thinclients/options/index.html> to see what options are supported and to order available options.

The following sections contain general installation instructions for some of the available options. In all cases, see the specific installation instructions that came with the thin client option.

Before beginning the installation process, review the “General Hardware Installation Sequence” section earlier in this chapter, for instructions on what to do before and after installing any options.

Flash Memory

If the thin client can be upgraded with optional flash memory, use the following instructions as an overview of this procedure.



CAUTION: If necessary, back up any data before continuing the installation.



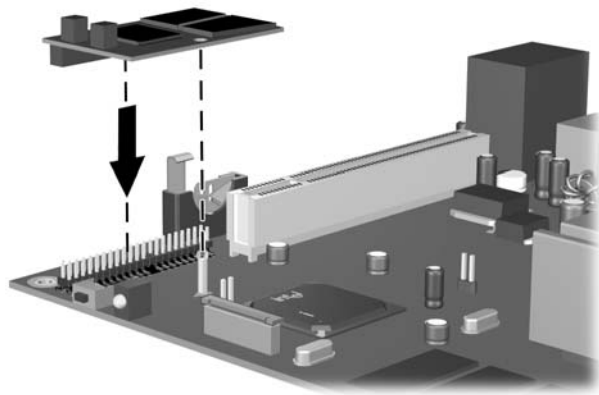
In addition to following these instructions, follow the detailed instructions that accompany the flash memory you have purchased.

1. Complete steps 1 through 4 of the [“General Hardware Installation Sequence”](#) on page 2-1.
2. Remove any existing flash memory, if installed.



A set of needle-nose pliers may be required when removing the flash memory module.

3. Verify the location of the round opening on the flash memory card and align it with the plastic stem on the system board.
4. Insert the new flash memory with the connectors facing down as shown in the following illustration.



Installing Optional Flash Memory

5. Re-attach the side access panel.

6. Restore power to the thin client and turn it on.
7. Install the thin client firmware. For installation instructions, refer to the *Troubleshooting Guide* or the *HP Compaq Thin Client Imaging Tool* white paper available on the HP website at www.hp.com/products/thinclientsoftware.

SODIMM Upgrade

If the thin client can be upgraded with an optional SODIMM module, use the following instructions as an overview of this procedure.

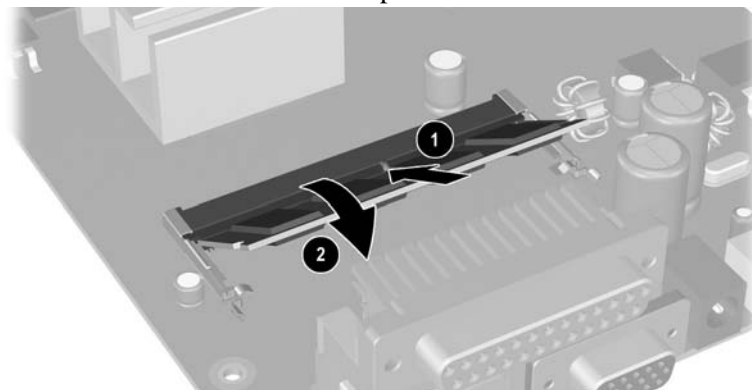


CAUTION: If necessary, back up any data before continuing the installation.



In addition to following these instructions, follow the instructions that are applicable to the specific thin client option.

1. Complete steps 1 through 4 of the “[General Hardware Installation Sequence](#)” on page 2-1.
2. Remove any existing SODIMM if one is installed.
3. Install the module into the socket at a 45° angle ❶ until it clicks, then rotate the module ❷ into position as shown.



Installing an Optional SODIMM

4. Complete steps 6 through 10 of the “[General Hardware Installation Sequence](#)” on page 2-1.

PCI Expansion Module

If the thin client supports an optional PCI Expansion Module, follow the instructions included in the option kit. The PCI Expansion Module option kit includes the following components:

- PCI riser card
- PCI Expansion Module metal chassis cover (with speaker)
- PCI Expansion Module plastic side access panel

Use the following instructions as an overview of this procedure.



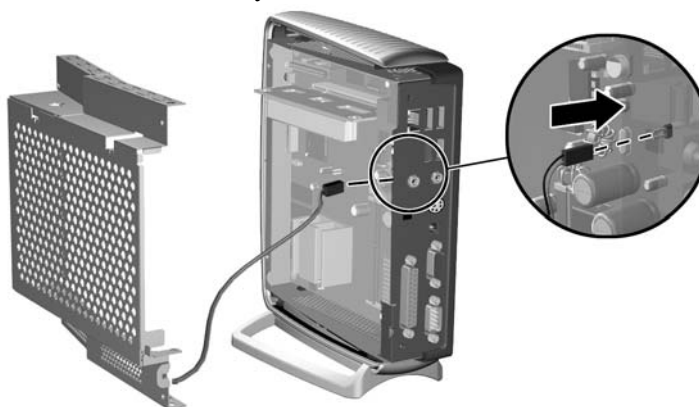
In addition to following these instructions, follow the detailed instructions that accompany the PCI card you have purchased.

1. Complete steps 1 through 4 of the [“General Hardware Installation Sequence”](#) on page 2-1.
2. Install the optional PCI riser card as shown in the following diagram:



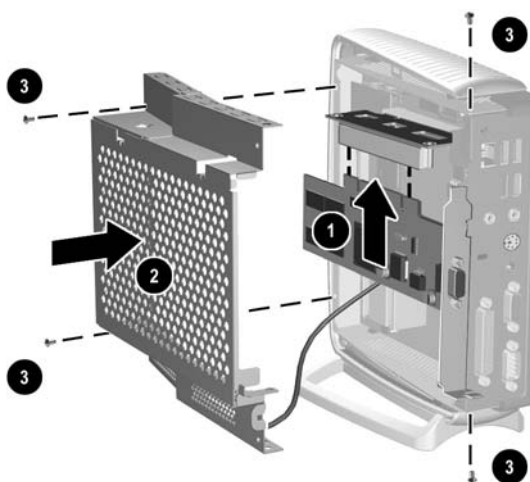
Installing Optional PCI Riser Card

3. Connect the speaker cable from the PCI Expansion Module chassis cover to the system board.



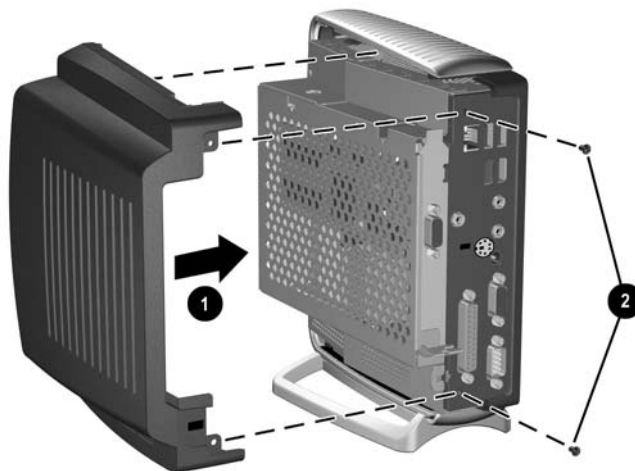
Connecting the Speaker

4. Install the PCI card **1** into the optional PCI riser card as shown in the following figure.
5. Install the optional PCI Expansion Module chassis cover **2**.
6. Secure the optional PCI Expansion Module chassis cover with the four chassis screws **3**.



Installing PCI Expansion Module and Chassis Cover

7. Install the optional PCI Expansion Module side access panel ❶.
8. Secure the panel with the two screws ❷ as shown in the following illustration.



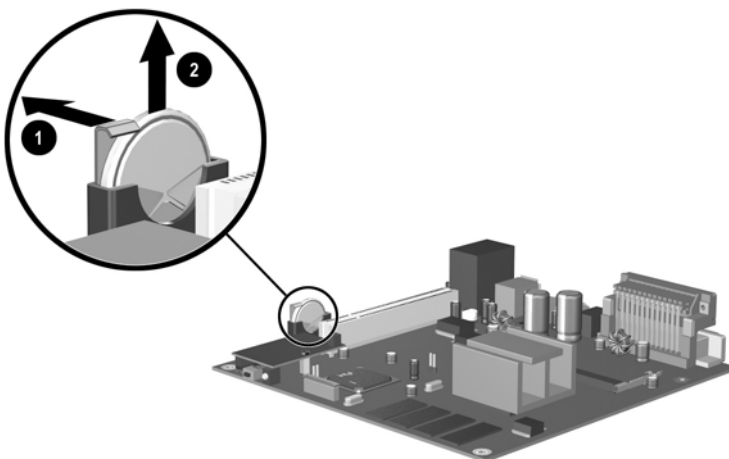
Installing PCI Expansion Module Side Access Panel

9. Complete steps 6 through 10 of the [“General Hardware Installation Sequence”](#) on page 2-1.

To remove the PCI Expansion Module, reverse the previous steps.

Internal Battery

1. Complete steps 1 through 4 of the “[General Hardware Installation Sequence](#)” on page 2-1.
2. Locate the battery on the system board.
3. Pull back on the clip ❶ that is holding the battery in place, and remove the battery ❷.
4. Insert the new battery and position the clip back into place.



Removing and Replacing the Internal Battery

5. Complete steps 6 through 10 of the “[General Hardware Installation Sequence](#)” on page 2-1.

MultiBay Hard Drive and Diskette Drive

The MultiBay hard drive and diskette drive are available as options on select thin client models. These are external USB compatible drives. For additional installation information about these drives visit www.hp.com/products/thinclientsoftware or refer to the instructions that accompany these option.

Specifications

HP Compaq t5000 thin client

Dimensions

Height	8.9 in	22.6 cm
Width	4.0 in	10.1 cm
Depth	7.7 in	19.6 cm

Approximate Weight	2.6 lb	1.3 kg
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Temperature Range (fanless design)*

Operating (max. rate of change is 10° C per hour or 18° F per hour)	50° to 95° F	10° to 35° C
Nonoperating (max. rate of change is 20° C per hour or 36° F per hour)	-22° to 140° F	-30° to 60° C

*Specifications are at sea level with altitude derating of 1° C/300m (1.8° F/1000ft) to a maximum of 3Km (10,000ft), with no direct sustained sunlight. Upper limit may be limited by the type and number of options installed.

Relative Humidity (non-condensing)

Operating (max. wet bulb temperature is 28° C or 84.2° F)	10–90%	10–90%
Nonoperating (max. wet bulb temperature is 38.7° C or 101.6° F)	5–95%	5–95%

Specifications

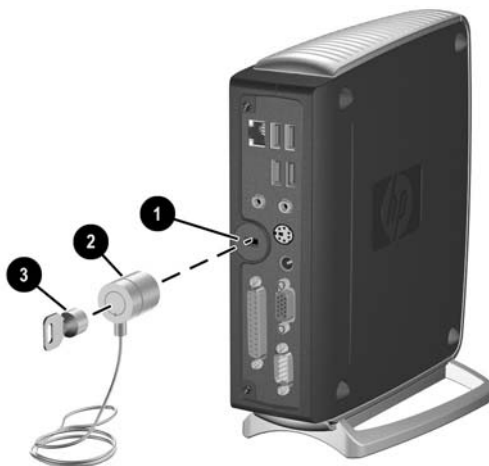
Maximum Altitude (unpressurized)		
Operating (max. allowed rate of change is 457m per minute or 1500 ft per minute)	10,000 ft	3048 m
Nonoperating (max. allowed rate of change is 457m per minute or 1500 ft per minute)	30,000 ft	9144 m
*Value may be limited by type and number of options installed.		
Power Supply		
Operating Voltage Range	90–264 VAC	90–264 VAC
Rated Line Frequency	47–63 Hz	47–63 Hz
Power Output (maximum)		
	40 W	40 W
Rated Input Current (maximum)		
	4.0 A	4.0 A
Heat Dissipation		
On	136.4 BTU/hr	34.4 kg-cal/hr
Off	2.94 BTU/hr	0.74 kg-cal/hr

Security Provisions

Securing the Thin Client

The HP Compaq t5000 thin client models are designed to accept a security cable lock. A separate security cable lock option is available for thin clients. This cable lock prevents the thin client from being removed from its location. To order this option visit the HP website at <http://h18004.www1.hp.com/products/thinclients/options/index.html>.

1. Locate the cable lock slot **1** on the back panel.
2. Insert the cable lock **2** and use the key **3** to lock it.



Securing the Thin Client

Mounting Bracket

The HP Compaq t5000 thin client models are designed to accept a mounting bracket. This mounting bracket can be used to attach the thin client to a wall or desk. To order this option visit the HP website at <http://h18004.www1.hp.com/products/thinclients/options/index.html>.



Mounting Bracket for the Thin Client

Electrostatic Discharge

A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

Preventing Electrostatic Damage

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding Methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded Thin Client chassis. Wrist straps are flexible straps with a minimum of 1 megohm +/- 10 percent resistance in the ground cords. To provide proper grounding, wear the strap snug against the skin.
- Use heelstraps, toestraps, or bootstraps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, contact an HP authorized dealer, reseller, or service provider.



For more information on static electricity, contact an HP authorized dealer, reseller, or service provider.

Routine Thin Client Care and Shipping Information

Routine Thin Client Care

Follow these suggestions to take care of the thin client:

- Operate the thin client on a sturdy, level surface. Leave a 3-inch (7.6-cm) clearance around the air vents to permit the required airflow.
- Never operate the thin client with the outside panel removed.
- Never restrict the airflow into the thin client by blocking the vents or air intake.
- Keep the thin client away from excessive moisture, direct sunlight, and extremes of heat and cold. For information about the recommended temperature and humidity ranges for the thin client, see [Appendix A, “Specifications”](#) in this guide.
- Keep liquids away from the thin client and keyboard.
- Turn off the thin client before you do either of the following:
 - ❑ Wipe the exterior of the thin client with a soft, damp cloth as needed. Using cleaning products may discolor or damage the finish.
 - ❑ Occasionally clean the air vents of the thin client. Lint and other foreign matter can block the vents and limit the airflow.

Shipping Preparation

Follow these suggestions when preparing to ship the thin client:

1. Turn off the thin client and external devices.
2. Disconnect the power cord from the electrical outlet, then from the thin client.
3. Disconnect the system components and external devices from their power sources, then from the thin client.
4. Pack the system components and external devices in their original packing boxes or similar packaging with sufficient packing material to protect them.



For environmental nonoperating ranges, see [Appendix A, “Specifications”](#) in this guide.

Important Service Repair Information

In all cases, remove and safeguard all external options before returning the thin client to HP for repair or exchange.

In countries that support customer mail-in repair by returning the same unit to the customer, HP makes every effort to return the repaired HP with the same internal memory and flash modules that were sent.

In countries that do not support customer mail-in repair by returning the same unit to the customer, all internal options should be removed and safeguarded in addition to the external options. The thin client should be restored to the original configuration before returning it to HP for repair.

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