



# Troubleshooting Guide

HP t730 Thin Client

© Copyright 2015, 2016 HP Development Company, L.P. The information contained herein is subject to change without notice.

Microsoft and Windows are U.S. registered trademarks of the Microsoft group of companies. AMD is a trademark of Advanced Micro Devices, Inc.

The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

Third Edition (December 2016)

First Edition (November 2015)

Document Part Number: 812515-003

#### **Product notice**

This user guide describes features that are common to most models. Some features may not be available on your computer.

#### **Software terms**

By installing, copying, downloading, or otherwise using any software product preinstalled on this computer, you agree to be bound by the terms of the HP End User License Agreement (EULA). If you do not accept these license terms, your sole remedy is to return the entire unused product (hardware and software) within 14 days for a full refund subject to the refund policy of your seller.

For any further information or to request a full refund of the price of the computer, please contact your seller.

## About This Book

---

 **WARNING!** Text set off in this manner indicates that failure to follow directions could result in bodily harm or loss of life.

 **CAUTION:** Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

 **NOTE:** Text set off in this manner provides important supplemental information.

---



---

# Table of contents

<b>1 Product features</b>	<b>1</b>
Front panel components	1
Rear panel components	3
Serial number location	4
<b>2 Hardware changes</b>	<b>5</b>
Warnings and cautions	5
Removing and replacing the access panel	5
Removing the access panel	5
Replacing the access panel	7
Locating internal components	8
Removing and replacing the M.2 flash storage module	9
Removing and replacing the battery	11
Replacing a low-profile PCI-Express card	13
Replacing a WLAN module	15
Installing an internal USB flash drive	17
Installing additional SDRAM system memory	18
SODIMMs	18
DDR3L-SDRAM SODIMMs	18
Populating SODIMM sockets	18
Installing SODIMMs	19
<b>Appendix A Computer Setup (F10) Utility, BIOS Settings</b>	<b>22</b>
Computer Setup (F10) Utilities	22
Using Computer Setup (F10) Utilities	22
Computer Setup—File	24
Computer Setup—Storage	25
Computer Setup—Security	26
Computer Setup—Power	28
Computer Setup—Advanced	28
Changing BIOS Settings from the HP BIOS Configure Utility (HPBCU)	30
Updating or restoring a BIOS	32
<b>Appendix B Diagnostics and troubleshooting</b>	<b>34</b>
LEDs	34
Wake-on LAN	35

Power-On Sequence .....	35
Resetting the Setup and Power-on passwords .....	36
Power-on diagnostic tests .....	36
Interpreting POST diagnostic front panel LEDs and audible codes .....	37
POST numeric codes and text messages .....	39
Troubleshooting .....	41
Basic troubleshooting .....	41
Diskless (No-Flash) unit troubleshooting .....	42
Configuring a PXE server .....	43
<b>Appendix C Using HP ThinUpdate to restore the image .....</b>	<b>44</b>
<b>Appendix D Device management .....</b>	<b>45</b>
<b>Appendix E Adding an Image Restore Tool .....</b>	<b>46</b>
<b>Appendix F Power cord set requirements .....</b>	<b>47</b>
General requirements .....	47
Japanese power cord requirements .....	47
Country-specific requirements .....	48
<b>Appendix G Statement of Volatility .....</b>	<b>49</b>
<b>Appendix H Specifications .....</b>	<b>51</b>
<b>Index .....</b>	<b>52</b>

# 1 Product features



This guide describes the features of the thin client. For more information about the hardware and software installed on this thin client, go to <http://www.hp.com/go/quickspecs> and search for this thin client.

Various options are available for your thin client. For more information about some of the available options, go to the HP website at <http://www.hp.com> and search for your specific thin client.

## Front panel components

For more information, go to <http://www.hp.com/go/quickspecs> and search for your specific thin client to find the QuickSpecs.

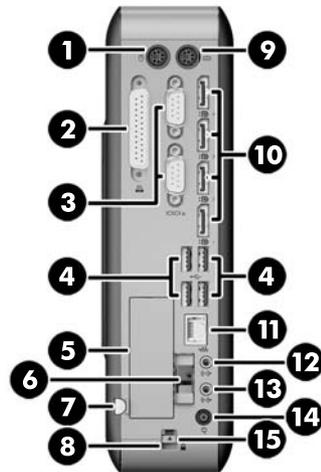


Item	Component	Item	Component
1	Power button	4	USB 3.0 ports (2)

<b>Item</b>	<b>Component</b>	<b>Item</b>	<b>Component</b>
2	Flash drive activity LED	5	Headset port
3	USB 2.0 ports (2)	6	Headphone port

## Rear panel components

For more information, go to <http://www.hp.com/go/quickspecs/> and search for your specific thin client to find the QuickSpecs.



Item	Component	Item	Component
1	PS/2 mouse port	9	PS/2 keyboard port
2	Parallel port	10	Dual-mode DisplayPort 1.2 ports (4)
3	Serial ports (2)	11	Ethernet RJ-45 port
4	USB 2.0 ports (4)	12	Audio line-in port
5	Low-profile PCIe expansion slot*	13	Audio line-out port
6	Fiber NIC slot*	14	Power
7	Retractable AC power cord retention hook	15	Rear I/O panel latch
8	Cable lock slot		

\*Optional

## Serial number location

Every thin client includes a unique serial number located as shown in the following illustration. Have this number available when contacting HP customer service for assistance.



---

## 2 Hardware changes

### Warnings and cautions

Before performing upgrades be sure to carefully read all of the applicable instructions, cautions, and warnings in this guide.

---

**⚠ WARNING!** To reduce the risk of personal injury or equipment damage from electric shock, hot surfaces, or fire:

Disconnect the AC power cord from the AC outlet and allow the internal system components to cool before you touch them.

Do not plug telecommunications or telephone connectors into the network interface controller (NIC) receptacles.

Do not disable the AC power cord grounding plug. The grounding plug is an important safety feature.

Plug the AC power cord into a grounded (earthed) AC outlet that is easily accessible at all times.

To reduce the risk of serious injury, read the *Safety & Comfort Guide*. It describes proper workstation setup, posture, and health and work habits for computer users, and provides important electrical and mechanical safety information. The *Safety & Comfort Guide* is located on the HP website at <http://www.hp.com/ergo>.

**⚠ WARNING!** Energized parts inside.

Disconnect power to the equipment before removing the enclosure.

Replace and secure the enclosure before re-energizing the equipment.

**⚠ CAUTION:** Static electricity can damage the electrical components of the thin client or optional equipment. Before beginning the following procedures, be sure that you are discharged of static electricity by briefly touching a grounded metal object.

When the thin client is plugged into an AC power source, voltage is always applied to the system board. To prevent damage to internal components, you must disconnect the AC power cord from the power source before opening the thin client.

---

### Removing and replacing the access panel

#### Removing the access panel

---

**⚠ WARNING!** To reduce the risk of personal injury or equipment damage from electric shock, hot surfaces, or fire, ALWAYS operate the thin client with the access panel in place. In addition to enhancing safety, the access panel may provide important instructions and identification information, which may be lost if the access panel is not used. DO NOT use any access panel except the one that is provided by HP for use with this thin client.

Before removing the access panel, be sure that the thin client is turned off and the AC power cord is disconnected from the AC outlet.

---

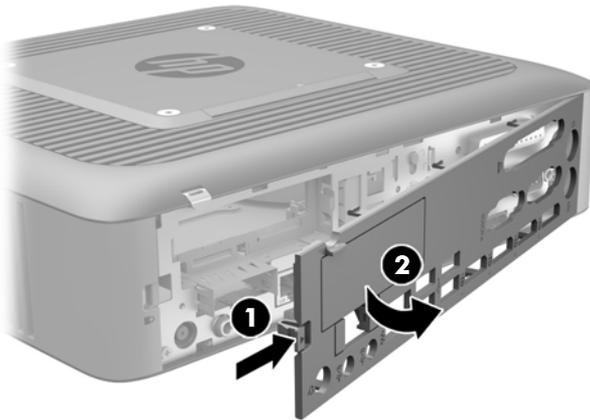
To remove the access panel:

1. Remove/disengage any security devices that prohibit opening the thin client.
2. Remove all removable media, such as USB flash drives, from the thin client.

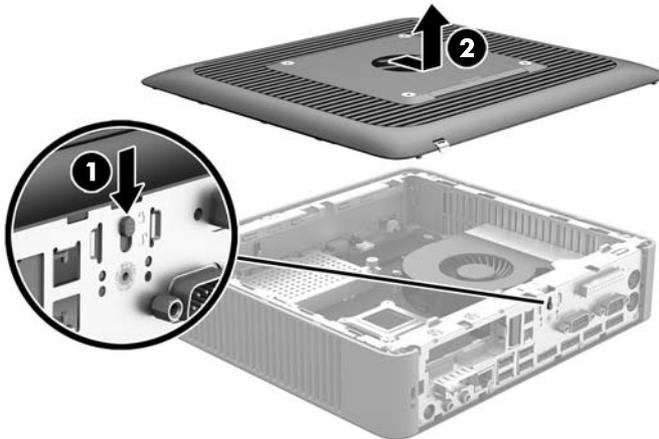
3. Turn off the thin client properly through the operating system, and then turn off any external devices.
4. Disconnect the AC power cord from the AC outlet, and disconnect any external devices.

**⚠ CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the AC power cord to avoid damage to the internal components of the thin client.

5. Remove the stand from the thin client.
6. Lay the unit flat on a stable surface with the right side up.
7. Release the latch **(1)** on the left side of the rear I/O panel, rotate the I/O panel **(2)** to the right, and then lift it off the thin client.



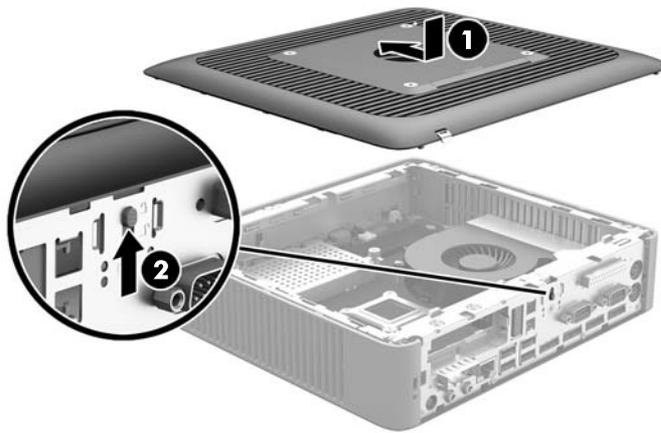
8. Move the access panel latch **(1)** down to release the access panel.
9. Slide the access panel approximately 6 mm (.24 in) toward the back of the chassis, and then lift the panel off of the thin client **(2)**.



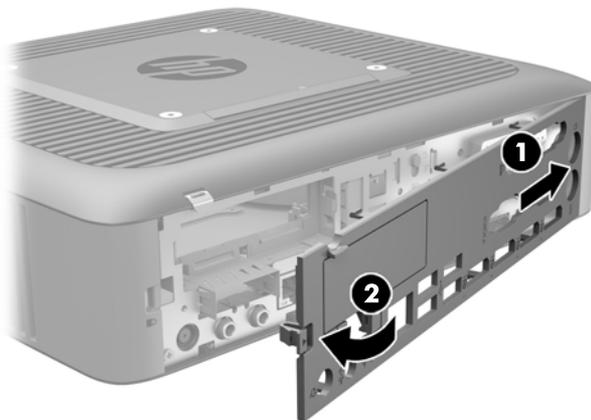
## Replacing the access panel

To replace the access panel:

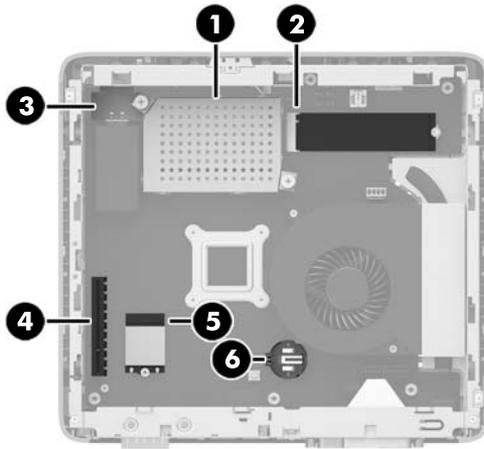
1. Position the access panel on the chassis, approximately 6 mm (.24 in) inside the edge of the chassis. Slide the panel toward the front of the chassis **(1)** until it locks into place.
2. Move the access panel latch **(2)** up to secure the access panel.



3. Insert the hooks on the right side of the rear I/O panel **(1)** into the right side of the back of the chassis, rotate the left side **(2)** to the chassis, and then press it to the chassis until it locks in place.



## Locating internal components



Item	Component	Item	Component
1	Memory compartment	4	PCIe riser connector
2	M.2 socket with flash storage module installed	5	M.2 socket with Wi-Fi module installed
3	USB 3.0 port	6	Battery

## Removing and replacing the M.2 flash storage module

To remove the M.2 flash storage module:

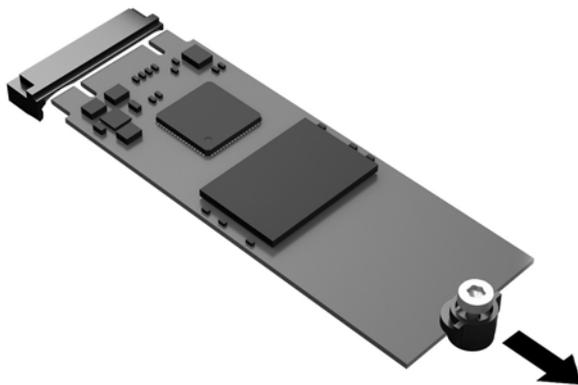
1. Remove/disengage any security devices that prohibit opening the thin client.
2. Remove all removable media, such as USB flash drives, from the thin client.
3. Turn off the thin client properly through the operating system, and then turn off any external devices.
4. Disconnect the AC power cord from the AC outlet, and disconnect any external devices.

---

**⚠ CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the AC power cord to avoid damage to the internal components of the thin client.

---

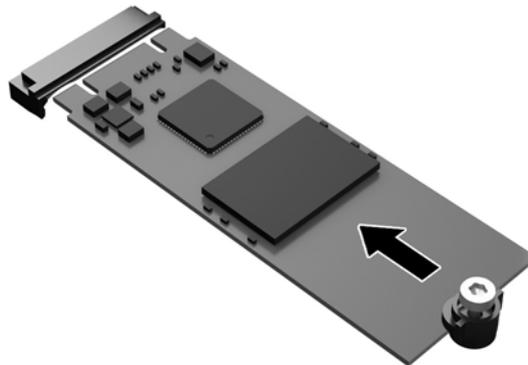
5. Remove the stand from the thin client.
6. Lay the unit flat on a stable surface with the right side up.
7. Remove the thin client access panel. See [Removing and replacing the access panel on page 5](#).
8. Locate the M.2 socket for flash storage module on the system board. See [Locating internal components on page 8](#).
9. Loosen the screw securing the flash storage module until the end of the module can be raised.
10. Pull the flash storage module out of the socket.



11. Pull the screw kit off of the flash storage module and attach it to the replacement flash storage module.



12. Slide the new flash storage module into the M.2 socket on the system board and press the module connectors firmly into the socket.

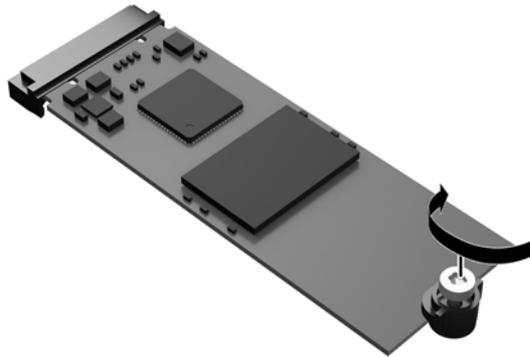


---

 **NOTE:** A flash storage module can be installed in only one way.

---

13. Press the flash storage module down and use a screwdriver to tighten the screw and secure the module to the system board.



14. Replace and latch the access panel, and then reinstall the rear I/O panel. See [Removing and replacing the access panel on page 5](#).
15. Replace the thin client stand.
16. Reconnect the AC power cord and turn on the thin client.
17. Lock any security devices that were disengaged when the thin client access panel was removed.

## Removing and replacing the battery

---

**⚠ WARNING!** Before removing the access panel, be sure that the thin client is turned off and the AC power cord is disconnected from the AC outlet.

---

To remove and replace the battery:

1. Remove/disengage any security devices that prohibit opening the thin client.
2. Remove all removable media, such as USB flash drives, from the thin client.
3. Turn off the thin client properly through the operating system, and then turn off any external devices.
4. Disconnect the AC power cord from the AC outlet, and disconnect any external devices.

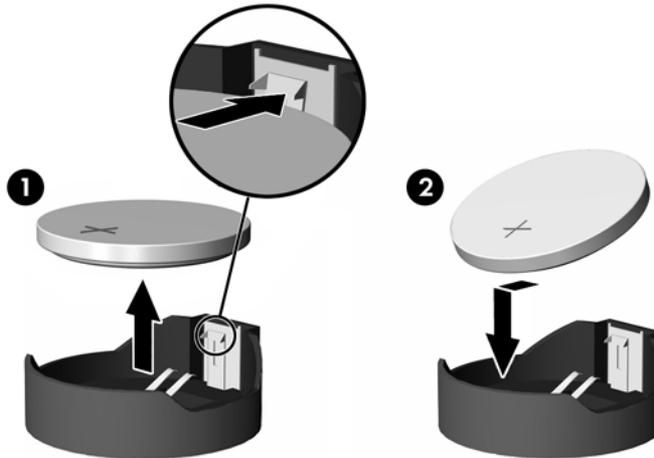
---

**⚠ CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the AC power cord to avoid damage to the internal components of the thin client.

---

5. Remove the stand from the thin client.
6. Lay the unit flat on a stable surface with the right side up.
7. Remove the thin client access panel. See [Removing and replacing the access panel on page 5](#).
8. Locate the battery on the system board. See [Locating internal components on page 8](#).
9. To release the battery from its holder, squeeze the metal clamp that extends above one edge of the battery. When the battery pops up, lift it out (1).

10. To insert the new battery, slide one edge of the replacement battery under the holder's lip with the positive side up. Push the other edge down until the clamp snaps over the other edge of the battery (2).



11. Replace and latch the access panel, and then reinstall the rear I/O panel. See [Removing and replacing the access panel on page 5](#).
12. Replace the thin client stand.
13. Reconnect the AC power cord and turn on the thin client.
14. Lock any security devices that were disengaged when the thin client access panel was removed.

HP encourages customers to recycle used electronic hardware, HP original print cartridges, and rechargeable batteries. For more information about recycling programs, go to <http://www.hp.com> and search for “recycle”.



Batteries, battery packs, and accumulators should not be disposed of together with the general household waste. In order to forward them to recycling or proper disposal, please use the public collection system or return them to HP, an authorized HP partner, or their agents.



廢電池請回收

The Taiwan EPA requires dry battery manufacturing or importing firms, in accordance with Article 15 or the Waste Disposal Act, to indicate the recovery marks on the batteries used in sales, giveaways, or promotions. Contact a qualified Taiwanese recycler for proper battery disposal.

## Replacing a low-profile PCI-Express card

An optional low-profile PCI-Express (PCIe) graphics card may be installed in the thin client. A riser card is installed in this thin client by default.

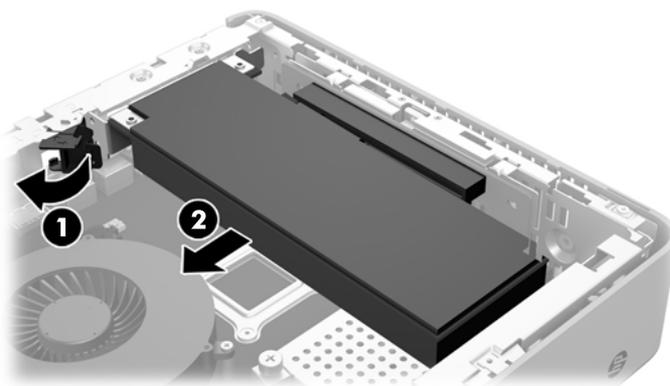
**⚠ WARNING!** To reduce the risk of personal injury or equipment damage from electric shock, hot surfaces, or fire, disconnect the AC power cord from the AC outlet and allow the internal system components to cool before you touch them.

To install a PCIe card:

1. Remove/disengage any security devices that prohibit opening the thin client.
2. Remove all removable media, such as USB flash drives, from the thin client.
3. Turn off the thin client properly through the operating system, and then turn off any external devices.
4. Disconnect the AC power cord from the AC outlet, and disconnect any external devices.

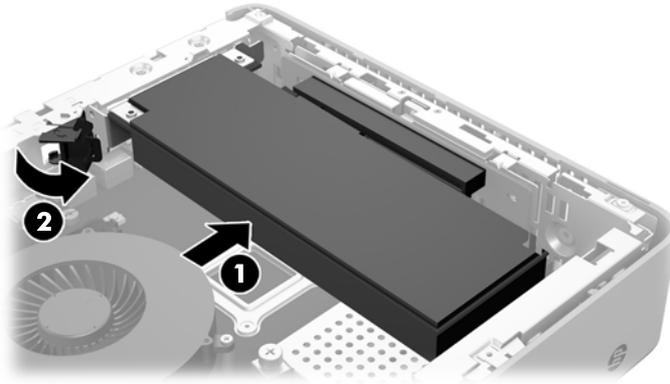
**⚠ CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the AC power cord to avoid damage to the internal components of the thin client.

5. Remove the stand from the thin client.
6. Lay the unit flat on a stable surface with the right side up.
7. Remove the thin client access panel. See [Removing and replacing the access panel on page 5](#).
8. Locate the PCIe card on the system board. See [Locating internal components on page 8](#).
9. Press the latch down and move it to the left **(1)** to release the PCIe card.
10. Carefully pull the PCIe card out of the socket **(2)**. You may need to pull one side and then the other to remove the card.



11. If you are installing a PCIe card that requires an opening in the chassis, push the expansion slot cover out of the rear I/O panel.
12. Align the PCIe card connectors with the slot in the riser card and the metal tab at the end of the card with the slot in the chassis. Press the PCIe card firmly into the slot in the riser card **(1)** until it is securely seated and the tab is in the slot.

13. Press the latch down and move it to the right until it clicks into place **(2)** to secure the PCIe card.



14. Replace and latch the access panel, and then reinstall the rear I/O panel. See [Removing and replacing the access panel on page 5](#).
15. Replace the thin client stand.
16. Reconnect the AC power cord and turn on the thin client.
17. Lock any security devices that were disengaged when the thin client access panel was removed.

# Replacing a WLAN module

An optional WLAN module may be installed in the thin client.

---

 **WARNING!** To reduce the risk of personal injury or equipment damage from electric shock, hot surfaces, or fire, disconnect the AC power cord from the AC outlet and allow the internal system components to cool before you touch them.

---

To replace a WLAN module:

1. Remove/disengage any security devices that prohibit opening the thin client.
2. Remove all removable media, such as USB flash drives, from the thin client.
3. Turn off the thin client properly through the operating system, and then turn off any external devices.
4. Disconnect the AC power cord from the AC outlet, and disconnect any external devices.

---

 **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the AC power cord to avoid damage to the internal components of the thin client.

---

5. Remove the stand from the thin client.
6. Lay the unit flat on a stable surface with the right side up.
7. Remove the thin client access panel. See [Removing and replacing the access panel on page 5](#).
8. Locate the WLAN module on the system board. See [Locating internal components on page 8](#).
9. Disconnect the WLAN antenna cables **(1)** from the terminal on the WLAN module.

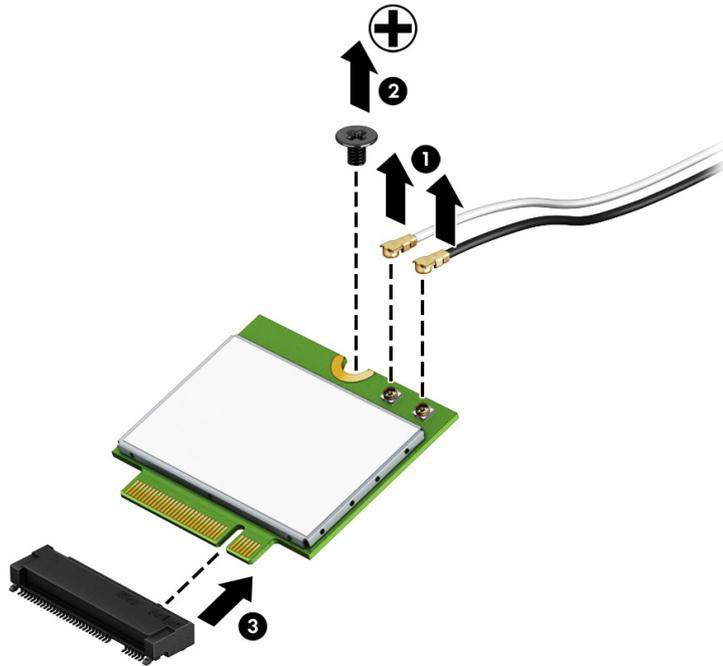
---

 **NOTE:** The number of antenna cables may vary.

---

10. Remove the Phillips PM2.0×3.0 screw **(2)** that secures the WLAN module to the system board. (The WLAN module tilts up.)

11. Remove the WLAN module by pulling the module away from the slot at an angle **(3)**.

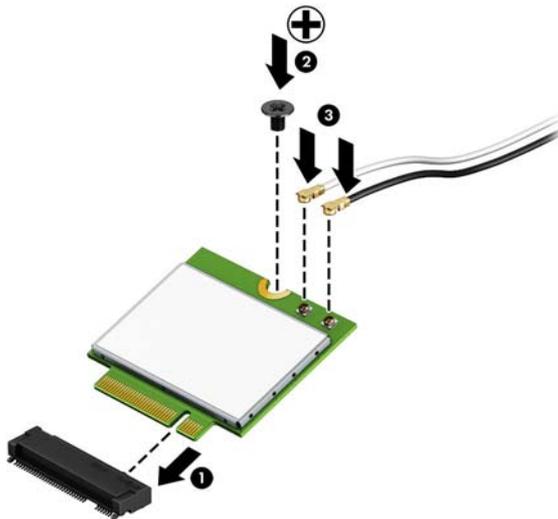


12. Insert the WLAN module into the slot **(1)**.
13. Insert the Phillips PM2.0×3.0 screw **(2)** that secures the WLAN module to the system board.
14. Connect the WLAN antenna cables **(3)** to the terminals on the WLAN module.

 **NOTE:** The number of antenna cables may vary.

 **NOTE:** The #1 WLAN antenna cable is connected to the WLAN module Main terminal.

If two antennas are connected, the #2 WLAN antenna cable is connected to the WLAN module Aux terminal.



15. Replace and latch the access panel, and then reinstall the rear I/O panel. See [Removing and replacing the access panel on page 5](#).
16. Replace the thin client stand.
17. Reconnect the AC power cord and turn on the thin client.
18. Lock any security devices that were disengaged when the thin client access panel was removed.

## Installing an internal USB flash drive

There is one USB 3.0 flash drive port on the system board.

To install a USB flash drive:

1. Remove/disengage any security devices that prohibit opening the thin client.
2. Remove all removable media, such as USB flash drives, from the thin client.
3. Turn off the thin client properly through the operating system, and then turn off any external devices.
4. Disconnect the AC power cord from the AC outlet, and disconnect any external devices.
5. Remove the stand from the thin client.
6. Lay the unit flat on a stable surface with the right side up.
7. Remove the thin client access panel. See [Removing and replacing the access panel on page 5](#).

---

**⚠ WARNING!** To reduce risk of personal injury from hot surfaces, allow the internal system components to cool before you touch them.

---

8. Locate the USB flash drive port on the system board. See [Locating internal components on page 8](#).
9. Align the USB flash drive with the USB port and press the drive firmly into the port until it is securely seated.



10. Replace and latch the access panel, and then reinstall the rear I/O panel. See [Removing and replacing the access panel on page 5](#).
11. Replace the thin client stand.

12. Reconnect the AC power cord and turn on the thin client.
13. Lock any security devices that were disengaged when the thin client access panel was removed.

## Installing additional SDRAM system memory

The thin client comes with dual channel, double data rate 3 synchronous dynamic random access memory (DDR3/DDR3L) small outline dual inline memory modules (SODIMMs).

### SODIMMs

The memory sockets on the system board can be populated with up to two industry-standard SODIMMs. These memory sockets are populated with at least one preinstalled SODIMM. To achieve the maximum memory support, you can populate the system board with up to 16 GB of memory.

### DDR3L-SDRAM SODIMMs

For proper system operation, the SODIMMs must adhere to the following specifications:

- industry-standard 204-pin
- unbuffered non-ECC PC3L-12800 DDR3L-1600 MHz-compliant
- 1.35 volt DDR3L-SDRAM SODIMMs
- support CAS latency 11 DDR3L 1600 MHz (11-11-11 timing)
- contain the mandatory Joint Electronic Device Engineering Council (JEDEC) specification

The thin client supports the following:

- 2 Gb and 4 Gb non-ECC memory technologies
- single-sided and double-sided SODIMMS
- SODIMMs constructed with x8 and x16 devices; SODIMMs constructed with x4 SDRAM are not supported



**NOTE:** The system does not operate properly when unsupported SODIMMs are installed.

### Populating SODIMM sockets

There are two SODIMM sockets on the system board. The sockets are labeled DIMM1 and DIMM2.

Item	Description	System Board Label
1	SODIMM1 socket	DIMM1
2	SODIMM2 socket	DIMM2

The system operates in dual-channel mode.

## Installing SODIMMs

---

**⚠ CAUTION:** You must disconnect the AC power cord and wait approximately 30 seconds for the power to drain before adding or removing memory modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the thin client is plugged into an active AC outlet. Adding or removing memory modules while voltage is present may cause irreparable damage to the memory modules or system board.

The memory module sockets have gold-plated metal contacts. When upgrading the memory, it is important to use memory modules with gold-plated metal contacts to prevent corrosion and/or oxidation resulting from having incompatible metals in contact with each other.

Static electricity can damage the electronic components of the thin client or optional cards. Before beginning the following procedures, be sure that you are discharged of static electricity by briefly touching a grounded metal object.

When handling a memory module, be careful not to touch any of the contacts. Doing so may damage the module.

---

1. Remove/disengage any security devices that prohibit opening the thin client.
2. Remove all removable media, such as USB flash drives, from the thin client.
3. Turn off the thin client properly through the operating system, and then turn off any external devices.
4. Disconnect the AC power cord from the AC outlet, and disconnect any external devices.

---

**⚠ CAUTION:** You must disconnect the AC power cord and wait approximately 30 seconds for the power to drain before adding or removing memory modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the thin client is plugged into an active AC outlet. Adding or removing memory modules while voltage is present may cause irreparable damage to the memory modules or system board.

---

5. Remove the stand from the thin client.
6. Lay the unit flat on a stable surface with the right side up.
7. Remove the thin client access panel. See [Removing and replacing the access panel on page 5](#).

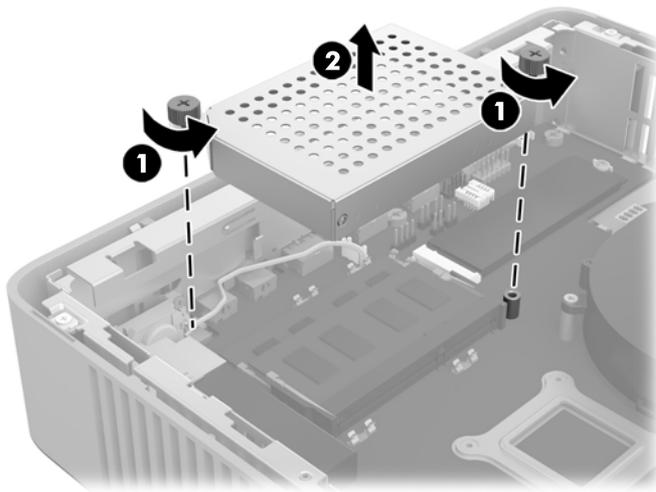
---

**⚠ WARNING!** To reduce risk of personal injury from hot surfaces, allow the internal system components to cool before you touch them.

---

8. Locate the memory compartment on the system board. See [Locating internal components on page 8](#).
9. If a PCIe card is installed, remove it.
10. Loosen the two captive screws **(1)** securing the memory compartment cover.

11. Lift the memory compartment cover out of the chassis (2).



12. To remove a SODIMM, press outward on the two latches on each side of the SODIMM (1), rotate the SODIMM up, and then pull the SODIMM out of the socket (2).



- Slide the new SODIMM (1) into the socket at approximately a 30° angle, and then press the SODIMM down (2) so that the latches lock it in place.

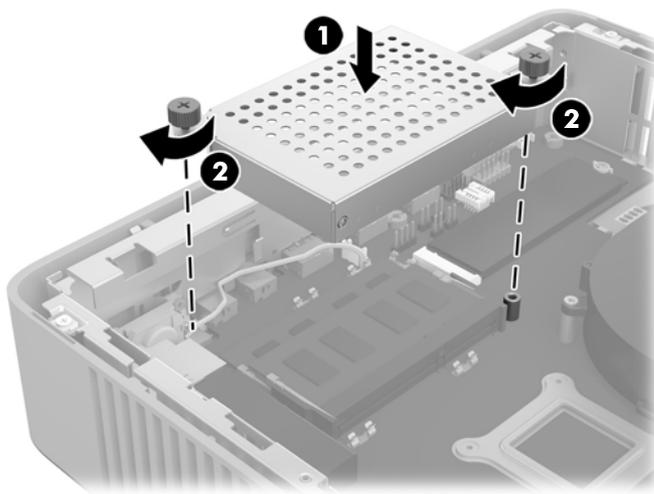


**NOTE:** A memory module can be installed in only one way. Match the notch on the module with the tab on the memory socket.

- Align the memory compartment cover with the two posts and the clips at the base of the compartment, and then set the memory compartment cover (1) over the SODIMMs.

**TIP:** The small clips are pairs. When the compartment is properly placed, one of each pair will be inside the compartment and one will be outside.

- Tighten the two captive screws (2) to secure the memory compartment cover.



- Replace and latch the access panel, and then reinstall the rear I/O panel. See [Removing and replacing the access panel on page 5](#).

- Replace the thin client stand.

- Reconnect the AC power cord and turn on the thin client.

- Lock any security devices that were disengaged when the thin client access panel was removed.

The thin client automatically recognizes the additional memory when you turn on the thin client.

---

# A Computer Setup (F10) Utility, BIOS Settings

## Computer Setup (F10) Utilities

Use Computer Setup (F10) Utility to do the following:

- Change factory default settings.
- Set the system date and time.
- Set, view, change, or verify the system configuration, including settings for processor, graphics, memory, audio, storage, communications, and input devices.
- Modify the boot order of bootable devices such as solid-state drives or USB flash media devices.
- Select Post Messages Enabled or Disabled to change the display status of Power-On Self-Test (POST) messages. Post Messages Disabled suppresses most POST messages, such as memory count, product name, and other non-error text messages. If a POST error occurs, the error is displayed regardless of the mode selected. To manually switch to Post Messages Enabled during POST, press any key (except **F1** through **F12**).
- Enter the Asset Tag or property identification number assigned by the company to this computer.
- Enable the power-on password prompt during system restarts (warm boots) as well as during power-on.
- Establish a setup password that controls access to the Computer Setup (F10) Utility and the settings described in this section.
- Secure integrated I/O functionality, including the USB, audio, or embedded NIC, so that they cannot be used until they are unsecured.

## Using Computer Setup (F10) Utilities

Computer Setup can be accessed only by turning the computer on or restarting the system. To access the Computer Setup Utilities menu, complete the following steps:

1. Turn on or restart the computer.
2. Press either **esc** or **F10** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.

Pressing **esc** displays a menu that allows you to access different options available at startup.

---

 **NOTE:** If you do not press **esc** or **F10** at the appropriate time, you must restart the computer and again press **esc** or **F10** when the monitor light turns green to access the utility.

 **NOTE:** You can select the language for most menus, settings, and messages using the Language Selection option using the **F8** key in Computer Setup.

---

3. If you pressed **esc**, press **F10** to enter Computer Setup.
4. A choice of five headings appears in the Computer Setup Utilities menu: File, Storage, Security, Power, and Advanced.

5. Use the arrow (left and right) keys to select the appropriate heading. Use the arrow (up and down) keys to select the option you want, then press [enter](#). To return to the Computer Setup Utilities menu, press [esc](#).
6. To apply and save changes, select **File > Save Changes and Exit**.
  - If you have made changes that you do not want applied, select **Ignore Changes and Exit**.
  - To reset to factory settings, select **Apply Defaults and Exit**. This option will restore the original factory system defaults.

 **CAUTION:** Do NOT turn the computer power OFF while the BIOS is saving the Computer Setup (F10) changes because the CMOS could become corrupted. It is safe to turn off the computer only after exiting the F10 Setup screen.

Heading	Table
File	<a href="#">Computer Setup—File on page 24</a>
Storage	<a href="#">Computer Setup—Storage on page 25</a>
Security	<a href="#">Computer Setup—Security on page 26</a>
Power	<a href="#">Computer Setup—Power on page 28</a>
Advanced	<a href="#">Computer Setup—Advanced on page 28</a>

## Computer Setup—File



**NOTE:** Support for specific Computer Setup options may vary depending on the hardware configuration.

Option	Description
<b>System Information</b>	Lists: <ul style="list-style-type: none"><li>• Product name</li><li>• SKU number</li><li>• System Board CT Number</li><li>• Processor type</li><li>• Processor speed</li><li>• Processor stepping</li><li>• Cache size (L1/L2)</li><li>• Memory size</li><li>• Integrated MAC</li><li>• System BIOS</li><li>• Chassis serial number</li><li>• Asset tracking number</li></ul>
<b>About</b>	Displays copyright notice.
<b>Set Time and Date</b>	Allows you to set system time and date.
<b>Flash System BIOS</b>	Allows you to flash system BIOS from a USB recovery key.
<b>Default Setup</b>	Allows you to: <ul style="list-style-type: none"><li>• Save Current Settings as Default</li><li>• Restore Factory Settings as Default</li></ul>
<b>Apply Defaults and Exit</b>	Loads the original factory system configuration settings for use by a subsequent “Apply Defaults and Exit” action.
<b>Ignore Changes and Exit</b>	Exits Computer Setup without applying or saving any changes.
<b>Save Changes and Exit</b>	Saves changes to system configuration or default settings and exits Computer Setup.

## Computer Setup—Storage

Option	Description
<b>Device Configuration</b>	<p>Lists all installed BIOS-controlled storage devices. When a device is selected, detailed information and options are displayed. The following options may be presented:</p> <p><b>Hard Disk:</b> Size, model, firmware version, serial number.</p>
<b>Storage Options</b>	<p><b>SATA Emulation</b></p> <p><b>CAUTION:</b> SATA emulation changes may prevent access to existing drive data and degrade or corrupt established volumes.</p> <p>Allows you to choose how the SATA controller and devices are accessed by the operating system. There are two supported options: IDE and AHCI (default).</p> <p>IDE - This is the most backwards-compatible setting of the three options. Operating systems usually do not require additional driver support in IDE mode.</p> <p>AHCI (default option) - Allows operating systems with AHCI device drivers loaded to take advantage of more advanced features of the SATA controller.</p> <p><b>USB Storage Boot</b></p> <p>Allows you to set USB storage device default boot option in CSM/Legacy mode.</p>
<b>DPS Self-test</b>	<p>Allows you to execute self-tests on ATA hard drives capable of performing the Drive Protection System (DPS) self-tests.</p> <p><b>NOTE:</b> This selection will only appear when at least one drive capable of performing the DPS self tests is attached to the system.</p>
<b>Boot Order</b>	<p>Allows you to:</p> <ul style="list-style-type: none"><li>• Specify the order in which EFI boot sources (such as a internal drive, USB hard drive, or USB optical drive) are checked for a bootable operating system image. Each device on the list may be individually excluded from or included for consideration as a bootable operating system source. EFI boot sources always have precedence over legacy boot sources.</li><li>• Specify the order in which legacy boot sources (such as a network interface card, internal drive, or USB optical drive) are checked for a bootable operating system image. Each device on the list may be individually excluded from or included for consideration as a bootable operating system source.</li><li>• Specify the order of attached hard drives. The first hard drive in the order will have priority in the boot sequence and will be recognized as drive C (if any devices are attached).</li></ul> <p><b>NOTE:</b> You can use <b>F5</b> to disable individual boot items, as well as disable EFI boot and/or legacy boot. MS-DOS drive lettering assignments may not apply after a non-MS-DOS operating system has started.</p> <p><b>Shortcut to Temporarily Override Boot Order</b></p> <p>To boot <b>one time</b> from a device other than the default device specified in Boot Order, restart the computer and press <b>esc</b> (to access the boot menu) and then <b>F9</b> (Boot Order), or only <b>F9</b> (skipping the boot menu) when the monitor light turns green. After POST is completed, a list of bootable devices is displayed. Use the arrow keys to select the preferred bootable device and press <b>enter</b>. The computer then boots from the selected non-default device for this one time.</p>

## Computer Setup—Security



**NOTE:** Support for specific Computer Setup options may vary depending on the hardware configuration.

**Table A-1 Computer Setup—Security**

Option	Description
<b>Setup Password</b>	Allows you to set and enable a setup (administrator) password.  <b>NOTE:</b> If the setup password is set, it is required to change Computer Setup options, flash the ROM, and make changes to certain plug and play settings under Windows.
<b>Power-On Password</b>	Allows you to set and enable a power-on password. The power-on password prompt appears after a power cycle or reboot. If the user does not enter the correct power-on password, the unit will not boot.
<b>Password Options</b>  (This selection appears only if a power-on password or setup password is set.)	Allows you to enable/disable: <ul style="list-style-type: none"><li>• Stringent Password – When set, enables a mode in which there is no physical bypass of the password function. If enabled, removing the password jumper will be ignored.</li><li>• Password Prompt on F9 &amp; F12 – Default is enabled.</li><li>• Setup Browse Mode – Allows viewing, but not changing, the F10 Setup Options without entering setup password). Default is enabled.</li></ul>
<b>Device Security</b>	Allows you to set Device Available/Device Hidden (default is 'Device Available') for: <ul style="list-style-type: none"><li>• Embedded Security Device</li><li>• System audio</li><li>• Network controller</li><li>• SATA Port 0</li></ul>
<b>USB Security</b>	Allows you to set Enabled/Disabled (default is enabled) for: <ul style="list-style-type: none"><li>• Front USB Ports<ul style="list-style-type: none"><li>— USB Port 4</li><li>— USB Port 5</li><li>— USB Port 10</li><li>— USB Port 11</li></ul></li><li>• Rear USB Ports<ul style="list-style-type: none"><li>— USB Port 0</li><li>— USB Port 1</li><li>— USB Port 2</li><li>— USB Port 3</li></ul></li><li>• Accessory USB Ports<ul style="list-style-type: none"><li>— USB Port 12</li></ul></li></ul>
<b>Slot Security</b>	Allows you to disable the PCI Express slot and Mini Card Slot. Default is enabled. <ul style="list-style-type: none"><li>• PCI Express x8 Slot 1</li><li>• M.2 PCIe x1</li></ul>
<b>Network Boot</b>	Enables/disables the computer's ability to boot from an operating system installed on a network server. (Feature available on NIC models only; the network controller must be either a PCI expansion card or embedded on the system board.) Default is enabled.

**Table A-1 Computer Setup—Security (continued)**

Option	Description
<b>System IDs</b>	<p>Allows you to set:</p> <ul style="list-style-type: none"> <li>Asset tag (18-byte identifier) – A property identification number assigned by the company to the computer.</li> <li>Ownership tag (80-byte identifier)</li> </ul>
<b>Tool-less BIOS Update</b>	<p>Allows you to enable the tool-less BIOS feature, in which BIOS invokes HpBiosUpdate.efi (HpBiosMgmt.efi) and related toolsets in internal/external storage during the last stage of POST.</p> <ul style="list-style-type: none"> <li>BIOS Update (enable/disable)</li> <li>BIOS Image File Name</li> </ul>
<b>System Security</b>	<p>Provides these options:</p> <ul style="list-style-type: none"> <li>Data Execution Prevention (enable/disable) - Helps prevent operating system security breaches. Default is enabled.</li> <li>Virtualization Technology (enable/disable) – Controls the virtualization features of the processor. Changing this setting requires turning the computer off and then back on. Default is disabled.</li> <li>Embedded Security Device (enable/disable) – Permits activation and deactivation of the Embedded Security Device. Changing this setting requires turning the computer off and then back on. <ul style="list-style-type: none"> <li><b>NOTE:</b> To configure the Embedded Security Device, a Setup password must be set. <ul style="list-style-type: none"> <li>Reset to Factory Setting (Do not reset/Reset) – Resetting to factory defaults will erase all security keys. Changing this setting requires turning the computer off and then back on. Default is 'Do not reset'.</li> <li>Measure boot variables/devices to PCR1 (disable/enable) – Typically, the computer measures the boot path and saves collected metrics to PCR5 (a register in the Embedded Security Device). Bitlocker tracks changes to any of these metrics, and forces the user to re-authenticate if it detects any changes. Enabling this feature lets you set Bitlocker to ignore detected changes to boot path metrics, thereby avoiding reauthentication issues associated with USB keys inserted in a port. Default is enabled.</li> </ul> </li> <li>OS Management of Embedded Security Device (enable/disable) – This option allows the user to limit operating system control of the Embedded Security Device. Changing this setting requires turning the computer off and then back on. This</li> <li>Reset of Embedded Security Device through OS (enable/disable) – This option allows the user to limit the operating system ability to request a Reset to Factory Settings of the Embedded Security Device. Changing this setting requires turning the computer off and then back on. Default is disable. <ul style="list-style-type: none"> <li><b>NOTE:</b> To enable this option, a Setup password must be set.</li> </ul> </li> <li>No PPI provisioning (enable/disable) – This option lets you set the operating system to bypass the PPI (Physical Presence Interface) requirement and directly enable and take ownership of the TPM on first boot. You cannot change this setting after TPM is owned/initialized, unless the TPM is reset.</li> <li>Allow PPI policy to be changed by OS (enable/disable) – Enabling this option allows the operating system to execute TPM operations without Physical Presence Interface. Default is disabled.</li> </ul> </li> </ul>
<b>Secure Boot Configuration</b>	<p>The options on this setup page are only for Windows 10 and other operating systems that support Secure Boot. Changing the default setting of the setup options on this page for operating system that do not support secure boot may prevent the system from booting successfully.</p> <p>Legacy Support (enable/disable) – Enable or disable the legacy operating system support (Windows Embedded Standard 7 and HP Thin-Pro).</p> <p>Secure Boot (enable/disable) – Only when the Legacy Support set to disable, this item can be set to enable. This item is for Secure Boot flow control. Secure boot is possible only if system run in user mode.</p> <p>Key Management</p> <ul style="list-style-type: none"> <li>Clear Secure Boot Key (Clear/Don't Clear). Lets you clear the Secure Boot Key.</li> </ul>

**Table A-1 Computer Setup—Security (continued)**

Option	Description
	<ul style="list-style-type: none"> <li>Key ownership (HP keys/Customer keys). Lets you change the keys of different owners.</li> </ul> <p>Fast Boot (Enable/Disable) – Enable Fast Boot cause system boot by initializing a minimal set of devices which is required to launch active boot option. This option has no effect for BBS boot options.</p>

## Computer Setup—Power



**NOTE:** Support for specific Computer Setup options may vary depending on the hardware configuration.

**Table A-2 Computer Setup—Power**

Option	Description
<b>OS Power Management</b>	<p>Runtime Power Management (enable/disable) – Allows certain operating systems to reduce processor voltage and frequency when the current software load does not require the full capabilities of the processor. Default is enabled.</p> <p>Idle Power Savings (Extended/Normal) – Extended/Normal. Allows certain operating systems to decrease the processors power consumption when the processor is idle. Default is 'extended'.</p> <p>ACPI S3 PS2 Mouse Wake Up (enable/disable) – Enables or disables waking from S3 due to any PS2 mouse activity or a button click only.</p>
<b>Hardware Power Management</b>	S5 Maximum Power Savings – Turns off power to all nonessential hardware when system is off to meet EUP Lot 6 requirement of less than 0.5 Watt power usage. Default is disabled.
<b>Thermal</b>	<p>Fan Idle Mode – Allows you to set default fan speed in idle mode.</p> <p>CPU Fan speed (Read-Only) – shows the CPU fan speed in RPM.</p>

## Computer Setup—Advanced



**NOTE:** Support for specific Computer Setup options may vary depending on the hardware configuration.

**Table A-3 Computer Setup—Advanced (for advanced users)**

Option	Heading
<b>Power-On Options</b>	<p>Allows you to set:</p> <ul style="list-style-type: none"> <li>POST messages (enable/disable) – Default is disabled.</li> <li>Press the ESC key for Startup Menu (Displayed/Hidden).</li> <li>After Power Loss (off/on/previous state) – Default is Power off. Set this option as follows: <ul style="list-style-type: none"> <li>Power off—causes the computer to remain powered off when power is restored.</li> <li>Power on—causes the computer to power on automatically as soon as power is restored.</li> <li>Previous state—causes the computer to power on automatically as soon as power is restored, if it was on when power was lost.</li> </ul> </li> </ul> <p><b>NOTE:</b> If you turn off power to the computer using the switch on a power strip, you will not be able to use the suspend/sleep feature or the Remote Management features.</p> <ul style="list-style-type: none"> <li>POST Delay (in seconds) – Enabling this feature will add a user-specified delay to the POST process. This delay is sometimes needed for hard disks on some PCI cards that spin up very slowly, so slowly that they are not ready to boot by the time POST is finished. The POST delay also gives you more time to select <b>F10</b> to enter Computer (F10) Setup. Default is 'None'.</li> </ul>

**Table A-3 Computer Setup—Advanced (for advanced users) (continued)**

Option	Heading
	<ul style="list-style-type: none"><li>• Bypass F1 Prompt on Configuration Changes (enable/disable).</li><li>• Remote Wakeup Boot Source (Local Hard Drive/Remote Server). Allows you to set the source from which the computer gets its boot files when remotely awakened.</li></ul>
<b>BIOS Power-On</b>	Allows you to set the computer to turn on automatically at a time you specify.
<b>Onboard Devices</b>	Allows you to set resources for or disable legacy devices.
<b>Bus Options</b>	On some models, allows you to enable or disable: <ul style="list-style-type: none"><li>• PCI SERR# Generation. Default is enabled.</li><li>• PCI VGA Palette Snooping, which sets the VGA palette snooping bit in PCI configuration space; only needed when more than one graphics controller is installed. Default is disabled.</li></ul>
<b>Device Options</b>	Allows you to set: <ul style="list-style-type: none"><li>• Integrated Graphics (Auto/Force) – Use this option to manage integrated (UMA) graphics memory allocation. The value you choose allocates memory permanently to graphics and is unavailable to the operating system. For example, if you set this value to 512M on a system with 2 GB of RAM, the system always allocates 512 MB for graphics and the other 1.5 GB for use by the BIOS and operating system. Default is Auto which sets memory allocation to 512 MB.  If you select Force, the UMA Frame Buffer Size option displays, which lets you set the UMA memory size allocation between 256 MB and 1 GB.</li><li>• USB Port Configuration (Auto/Force 2.0)</li><li>• S5 Wake on LAN (enable/disable)</li><li>• Printer mode (Bi-Directional, EPP + ECP, Output Only). Default is EPP+ECP.</li><li>• Num Lock State at Power-On (off/on). Default is off.</li><li>• Multi-Processor (enable/disable) – Use this option to disable multiprocessor support under the operating system. Default is enable.</li><li>• Internal Speaker (some models) (does not affect external speakers) – Default is enabled.</li></ul>
<b>Option ROM Launch Policy</b>	Allows you to set: <ul style="list-style-type: none"><li>• Onboard NIC PXE Option ROMs (enable/disable)</li><li>• M.2 Slot Option ROM Download (enable/disable)</li><li>• PCIE Slot Option ROM Download (enable/disable)</li></ul>

## Changing BIOS Settings from the HP BIOS Configure Utility (HPBCU)

Some BIOS settings may be changed locally within the operating system without having to go through the F10 utility. This table identifies the items that can be controlled with this method.

BIOS setting	Default value	Other values
Language	English	Francais, Espanol, Deutsch, Italiano, Dansk, Suomi, Nederlands, Norsk, Portugues, Svenska, Japanese
Set Time	00:00	00:00:23:59
Set Day	01/01/2011	01/01/2011 to current date
Default Setup	None	Save Current Settings as Default; Restore Factory Settings as Default
Apply Defaults and Exit	Disable	Enable
SATA Emulation	AHCI	IDE
USB Storage Boot	Before SATA	After SATA
UEFI Boot Sources	Windows Boot Manager	USB Floppy/CD; USB hard drive
Legacy Boot Sources	USB floppy/CD	Hard drive
Embedded Security Device(Device Security)	Device available	Device hidden
System Audio	Device available	Device hidden
Network Controller	Device available	Device hidden
SATA0	Device available	Device hidden
Front USB Ports	Enable	Disable
USB Port 4, 5, 10 & 11	Enable	Disable
Rear USB Ports	Enable	Disable
USB Port 0, 1, 2 & 3	Enable	Disable
Internal USB Ports	Enable	Disable
USB Port 12	Enable	Disable
PCI Express x8 Slot 1	Enable	Disable
M.2 PCIe x	Enable	Disable
Network Boot	Enable	Disable
Asset Tracking Number		
Ownership Tag		
BIOS Update	Disable	Auto; Force
BIOS Image File Name		
Data Execution Prevention	Enable	Disable
Virtualization Technology	Disable	Enable

<b>BIOS setting</b>	<b>Default value</b>	<b>Other values</b>
Embedded Security Device(System Security)	Disable	Enable
Reset to Factory Setting	Do not reset	Reset
Measure boot variables/ devices to PCR1	Disable	Enable
OS management of Embedded Security Device	Disable	Enable
Reset of Embedded Security Device through OS	Disable	Enable
No PPI provisioning	Disable	Enable
Allow PPI policy to be changed by OS	Disable	Enable
Legacy Support	Enable	Disable (Note: The default value may be varied depends on the OS)
Secure Boot	Disable	Enable (Note: The default value may be varied depends on the OS)
Clear Secure Boot Keys	Don't Clear	Clear
Key Ownership	HP Keys	Custom Keys
Fast Boot	Disable	Enable (Note: The default value may be varied depends on the OS)
Setup Browse Mode	Enable	Disable
Password Prompt on F9 & F12	Enable	Disable
Runtime Power Management	Enable	Disable
Idle Power Savings	Extended	Normal
ACPI S3 PS2 Mouse Wake Up	Enable	Disable
S5 Maximum Power Savings	Disable	Enable
S5 Wake on LAN	Disable	Enable
CPU Fan Check	Enable	Disable
POST Messages	Disable	Enable
Press the ESC key for Startup Menu	Displayed	Hidden
After Power Loss	Off	On, Previous State
POST Delay (in seconds)	None	5, 10, 15, 20, 60
Bypass F1 Prompt on Configuration Changes	Disable	Enable
Remote Wakeup Boot Source	Local Hard Drive	Remote Server
Power on Sunday – Saturday	Disable	Enable
Power on Time (hh:mm)	00:00	00:00:23:59
Serial Port A	IO=3F8; IRQ=4	Disable, IO=3F8h; IRQ=3, IO=2F8h; IRQ=4, IO=2F8h; IRQ=3
Serial Port B	IO=2F8h; IRQ=3	Disable, IO=3F8h; IRQ=4, IO=3F8h; IRQ=3, IO=2F8h; IRQ=4

BIOS setting	Default value	Other values
Parallel Port	IO=378h; IRQ=7; DMA=3	Disable, IO=378h; IRQ=7; DMA=1, IO=278h; IRQ=7; DMA=1, IO=278h; IRQ=7; DMA=3, IO=3BCh; IRQ=7; DMA=1, IO=3BCh; IRQ=7; DMA=3
PCI SERR# Generation	Enable	Disable
PCI VGA Palette Snooping	Disable	Enable
Integrated Graphics	Auto	Disable, Force
UMA Frame Buffer Size	512M	256M, 1G
USB Port Configuration	Auto	Force 2.0
Printer Mode	EPP+ECP	Bi-Directional, Output-Only
Num Lock State at Power- On	On	Off
Multi-Processor	Enable	Disable
Internal Speaker	Enable	Disable
Onboard NIC Option ROM Download	PXE	Disable
M.2 Solt Option ROM Download	Enable	Do Not Launch
PCIe Solt Option ROM Download	Enable	Do Not Launch

## Updating or restoring a BIOS

### HP Device Manager

HP Device Manager can be used to update the BIOS of a thin client. Customers can use a pre-built BIOS add-on or can use the standard BIOS upgrade package along with an HP Device Manager File and Registry template. For more information on HP Device Manager File and Registry templates, review the *HP Device Manager User Guide* found at [www.hp.com/go/hpdm](http://www.hp.com/go/hpdm).

### Windows BIOS Flashing

You can use the BIOS Flash Update SoftPaq to restore or upgrade the system BIOS. Several methods for changing the BIOS firmware stored on your computer are available.

The BIOS executable is a utility designed to flash the System BIOS within a Microsoft Windows environment. To display the available options for this utility, launch the executable file under the Microsoft Windows environment.

You can run the BIOS executable with or without the USB storage device. If the system does not have a USB storage device installed, the BIOS update will perform under the Microsoft Windows environment and followed by system reboot.

### Linux BIOS Flashing for ThinPro/Smart Zero 6.x

All BIOS flashing under ThinPro 6.x and later utilizes tool-less BIOS updates, in which the BIOS updates itself.

Use the following comments to flash a Linux BIOS:

- `hptc-bios-flash ImageName`  
Prepares the system to update the BIOS during the next restart. This command automatically copies the files into the correct location and prompts you to restart the thin client. This command requires that the tool-less update option in the BIOS settings is set to Auto. You can use `hpt-bios-cfg` to set the tool-less update option in the BIOS.
- `hptc-bios-flash -h`  
Displays a list of options.

### Linux BIOS Flashing for ThinPro/Smart Zero 5.2.1

BIOS flashing under ThinPro/Smart Zero 5.2.1 is similar to that in ThinPro/Smart Zero 6.x and later but the ThinPro OS performs the actual update. Use the following command to flash the BIOS (from a command shell in administrator mode):

- `hptc-bios-flash ImageName`  
Where *ImageName* is the path to the BIOS binary file.

### BitLocker Drive Encryption / BIOS Measurements

If you have Windows BitLocker Drive Encryption (BDE) enabled on your system, we recommend that you temporarily suspend BDE before updating the BIOS. You should also obtain your BDE recovery password or recovery PIN before suspending BDE. After the you flash the BIOS, you can resume BDE.

To make a change to BDE, select **Start > Control Panel > BitLocker Drive Encryption**, click **Suspend Protection** or **Resume Protection** and then click **Yes**.

As a general rule, updating the BIOS will modify measurement values stored in the Platform Configuration Registers (PCRs) of the system's security module. Temporarily disable technologies that use these PCR values to ascertain platform health (BDE is one such example) prior to flashing the BIOS. Once you update the BIOS, re-enable the functions and restart the system so that you can take new measurements.

### BootBlock Emergency Recovery Mode

In the event of a failed BIOS update (for example if power is lost while updating), the System BIOS may become corrupted. BootBlock Emergency Recovery Mode detects this condition and automatically searches the root directory of the hard drive and any USB media sources for a compatible binary image. Copy the binary (.bin) file in the DOS Flash folder to the root of the desired storage device, and then power on the system. Once the recovery process locates the binary image, it attempts the recovery process. The automatic recovery continues until it successfully restores or updates the BIOS. If the system has a BIOS Setup password, you may need to use the Startup Menu / Utilities submenu to flash the BIOS manually after providing the password. Sometimes there are restrictions on which BIOS versions are allowed to be installed on a platform. If the BIOS that was on the system had restrictions, then only allowable BIOS versions may be used for recovery.

# B Diagnostics and troubleshooting

## LEDs

**Table B-1 Power and IDE Flash Activity LEDs**

LED	Status
Power LED Off	When the unit is plugged into the wall socket and the Power LED is off, the unit is powered off. However, the network can trigger a Wake On LAN event in order to perform management functions.
Power LED On	Displays during boot sequence and while the unit is on. During boot sequence, hardware initialization is processed and startup tests are performed on the following: <ul style="list-style-type: none"><li>• Processor initialization</li><li>• Memory detection and initialization</li><li>• Video detection and initialization</li></ul> <p><b>NOTE:</b> If one of the tests fails, the unit will simply stop, but the LED will stay on. If the video test fails, the unit beeps. There are no messages sent to video for any of these failed tests.</p> <p><b>NOTE:</b> After the video is initialized, anything that fails will have an error message.</p>
<p><b>NOTE:</b> RJ-45 LEDs are located inside the RJ-45 connector on the top, rear panel of the thin client. The LEDs are visible when the connector is installed. Blinking green indicates network activity, and amber indicates a 100MB speed connection.</p>	
IDE LED is Off	When the unit is powered on and the flash activity light is off, then there is no access to the system flash.
IDE LED blinks white	Indicates the system is accessing the internal IDE flash.

## Wake-on LAN

Wake-on LAN (WOL) allows a computer to be turned on or resumed from sleep or hibernation state by a network message. You can enable or disable WOL in Computer Setup using the **S5 Maximum Power Savings** setting.

To enable or disable WOL:

1. Turn on or restart the computer.
2. Press either **esc** or **F10** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.



---

**NOTE:** If you do not press **esc** or **F10** at the appropriate time, you must restart the computer and again press **esc** or **F10** when the monitor light turns green to access the utility.

---

3. If you pressed **esc**, press **F10** to enter Computer Setup.
4. Navigate to **Power > Hardware Power Management**.
5. Set **S5 Maximum Power Savings** as follows:
  - Disable WOL = Enabled
  - Enable WOL = Disabled
6. Press **F10** to accept any changes.
7. Select **File > Save Changes and Exit**.

## Power-On Sequence

At power-on, the flash boot block code initializes the hardware to a known state, then performs basic power-on diagnostic tests to determine the integrity of the hardware. Initialization performs the following functions:

1. Initializes CPU and memory controller.
2. Initializes and configures all PCI devices.
3. Initializes video software.
4. Initializes the video to a known state.
5. Initializes USB devices to a known state.
6. Performs power-on diagnostics. For more information, see “Power-On Diagnostic Tests”.
7. The unit boots the operating system.

## Resetting the Setup and Power-on passwords

You can reset the Setup and Power-on passwords as follows:

1. Turn off the computer and disconnect the power cord from the power outlet.
2. Remove the side access panel and the metal side cover.
3. Remove the password jumper from the system board header labeled PSWD/E49.
4. Replace the metal side cover and the side access panel.
5. Connect the computer to AC power, and then turn on the computer.
6. Turn off the computer and disconnect the power cord from the power outlet.
7. Remove the side access panel and the metal side cover.
8. Replace the password jumper.
9. Replace the metal side cover and the side access panel.

## Power-on diagnostic tests

The Power-on diagnostics performs basic integrity tests of the hardware to determine its functionality and configuration. If a diagnostic test fails during hardware initialization the unit simply stops. There are no messages sent to video.



**NOTE:** You may try to restart the unit and run through the diagnostic tests a second time to confirm the first shutdown.

The following table lists the tests that are performed on the unit.

**Table B-2 Power-on diagnostic test**

Test	Description
Boot Block Checksum	Tests boot block code for proper checksum value
DRAM	Simple write/read pattern test of the first 640k of memory
Parallel Port	Initiates the port's driver and determines if the device is present
Serial Port	Tests the serial port using simple port verification test to determine if ports are present
Timer	Tests timer interrupt by using polling method
RTC CMOS battery	Tests integrity of RTC CMOS battery
NAND flash device	Tests for proper NAND flash device ID present

# Interpreting POST diagnostic front panel LEDs and audible codes

This section covers the front panel LED codes as well as the audible codes that may occur before or during POST that do not necessarily have an error code or text message associated with them.

**⚠ WARNING!** When the computer is plugged into an AC power source, voltage is always applied to the system board. 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.

**📝 NOTE:** Recommended actions in the following table are listed in the order in which they should be performed.

Not all diagnostic lights and audible codes are available on all models.

**Table B-3 Diagnostic front panel LEDs and audible codes**

Activity	Beeps	Possible Cause	Recommended Action
White Power LED On.	None	Computer on.	None
White Power LED flashes every two seconds.	None	Computer in Suspend to RAM mode (some models only) or normal Suspend mode.	None required. Press any key or move the mouse to wake the computer.
Red Power LED flashes two times, once every second, followed by a two second pause. Beeps stop after fifth iteration but LEDs continue until problem is solved.	2	Processor thermal protection activated: A fan may be blocked or not turning. OR The heat sink/fan assembly is not properly attached to the processor. OR The unit has vents blocked or is in a location where the ambient temperature is too high.	<ol style="list-style-type: none"> <li>1. Ensure that the computer air vents are not blocked and the processor cooling fan is plugged in and running, if equipped.</li> <li>2. Contact an authorized reseller or service provider.</li> </ol>
Red Power LED flashes four times, once every second, followed by a two second pause. Beeps stop after fifth iteration but LEDs continue until problem is solved.	4	Power failure (power supply is overloaded). OR The incorrect external power supply adapter is being used on the unit.	<ol style="list-style-type: none"> <li>1. Check if a device is causing the problem by removing ALL attached devices. Power on the system. If the system enters the POST, then power off and replace one device at a time and repeat this procedure until failure occurs. Replace the device that is causing the failure. Continue adding devices one at a time to ensure all devices are functioning properly.</li> <li>2. Replace the power supply.</li> <li>3. Replace the system board.</li> </ol>
Red Power LED flashes five times, once every second, followed by a two second pause. Beeps stop after fifth iteration but LEDs continue until problem is solved.	5	Pre-video memory error.	<p><b>CAUTION:</b> To avoid damage to the memory modules or the system board, you must unplug the computer power cord before attempting to reseat, install, or remove a memory module.</p> <ol style="list-style-type: none"> <li>1. Reseat memory modules.</li> <li>2. Replace memory modules one at a time to isolate the faulty module.</li> </ol>

**Table B-3 Diagnostic front panel LEDs and audible codes (continued)**

Activity	Beeps	Possible Cause	Recommended Action
			<ol style="list-style-type: none"><li>3. Replace third-party memory with HP memory.</li><li>4. Replace the system board.</li></ol>
Red Power LED flashes six times, once every second, followed by a two second pause. Beeps stop after fifth iteration but LEDs continue until problem is solved.	6	Pre-video graphics error.	<p>For systems with a graphics card:</p> <ol style="list-style-type: none"><li>1. Reseat the graphics card.</li><li>2. Replace the graphics card.</li><li>3. Replace the system board.</li></ol> <p>For systems with integrated graphics, replace the system board.</p>
Red Power LED flashes eight times, once every second, followed by a two second pause. Beeps stop after fifth iteration but LEDs continue until problem is solved.	8	Invalid ROM based on bad checksum.	<ol style="list-style-type: none"><li>1. Reflash the system ROM with the latest BIOS image using the BIOS Recovery procedure.</li><li>2. Replace the system board.</li></ol>
System does not power on and LEDs are not flashing.	None	System unable to power on.	<p>Press and hold the power button for less than four seconds. If the hard drive LED turns white, the power button is working correctly. Try the following:</p> <ol style="list-style-type: none"><li>1. Remove the power cord from the computer.</li><li>2. Open the computer and press the yellow CMOS button on the system board for four seconds (located near the front USB ports).</li><li>3. Verify that the AC cord is plugged into the power supply.</li><li>4. Close the unit and reattach the power cord.</li><li>5. Try to power on the computer.</li><li>6. Replace the unit.</li></ol>

# POST numeric codes and text messages

This section covers those POST errors that have numeric codes associated with them. The section also includes some text messages that may be encountered during POST.



**NOTE:** The computer will beep once after a POST text message is displayed on the screen.

**Table B-4 Numeric Codes and Text Messages**

Control panel message	Description	Recommended action
103-System Board Failure	DMA or timers.	<ol style="list-style-type: none"><li>1. Clear CMOS.</li><li>2. Remove expansion boards.</li><li>3. Replace the system board.</li></ol>
110-Out of Memory Space for Option ROMs	Recently added PCI expansion card contains an option ROM too large to download during POST.	<ol style="list-style-type: none"><li>1. If a PCI expansion card was recently added, remove it to see if the problem remains.</li><li>2. In Computer Setup, set <b>Advanced &gt; Device Options &gt; NIC PXE Option ROM Download</b> to <b>DISABLE</b> to prevent PXE option ROM for the internal NIC from being downloaded during POST to free more memory for an expansion card's option ROM. Internal PXE option ROM is used for booting from the NIC to a PXE server.</li></ol>
161-Real-Time Clock Power Loss	Invalid time or date in configuration memory.  RTC (real-time clock) battery may need to be replaced.	Reset the date and time under <b>Control Panel</b> (Computer Setup can also be used). If the problem persists, replace the RTC battery. See the Removal and Replacement section for instructions on installing a new battery, or contact an authorized dealer or reseller for RTC battery replacement.
164-MemorySize Error	Memory amount has changed since the last boot (memory added or removed).	Press the <b>F1</b> key to save the memory changes.
201-Memory Error	RAM failure.	<ol style="list-style-type: none"><li>1. Ensure memory modules are correctly installed.</li><li>2. Verify proper memory module type.</li><li>3. Remove and replace the identified faulty memory module(s).</li><li>4. If the error persists after replacing memory modules, replace the system board.</li></ol>
214-DIMM Configuration Warning	Populated DIMM Configuration is not optimized.	Rearrange the DIMMs so that each channel has the same amount of memory.
301-Keyboard Error	Keyboard failure.	<ol style="list-style-type: none"><li>1. Reconnect keyboard with computer turned off.</li><li>2. Check connector for bent or missing pins.</li><li>3. Ensure that none of the keys are depressed.</li><li>4. Replace keyboard.</li></ol>
510-Flash Screen Image Corrupted	Flash Screen image has errors.	Reflash the system ROM with the latest BIOS image.

**Table B-4 Numeric Codes and Text Messages (continued)**

Control panel message	Description	Recommended action
512-Chassis, Rear Chassis, or Front Chassis Fan not Detected	Chassis, rear chassis, or front chassis fan is not connected or may have malfunctioned.	<ol style="list-style-type: none"><li>1. Reseat chassis, rear chassis, or front chassis fan.</li><li>2. Reseat fan cable.</li><li>3. Replace chassis, rear chassis, or front chassis fan.</li></ol>
513-Front Chassis fan not detected	Front chassis fan is not connected or may have malfunctioned.	<ol style="list-style-type: none"><li>1. Reseat front chassis fan.</li><li>2. Reseat fan cable.</li><li>3. Replace front chassis fan.</li></ol>
912-Computer Cover Has Been Removed Since Last System Startup	Computer cover was removed since last system startup.	No action required.
921-Device in PCI Express slot failed to initialize	There is an incompatibility/problem with this device and the system or PCI Express Link could not be retrained to an x1.	Try rebooting the system. If the error reoccurs, the device may not work with this system
1720-SMART Hard Drive Detects Imminent Failure	Hard drive is about to fail. (Some hard drives have a hard drive firmware patch that will fix an erroneous error message.)	<ol style="list-style-type: none"><li>1. Determine if hard drive is giving correct error message. Run the Drive Protection System test using F2 Diagnostics.</li><li>2. Apply hard drive firmware patch if applicable. (Available at <a href="http://www.hp.com/support">http://www.hp.com/support</a>.)</li><li>3. Back up contents and replace hard drive.</li></ol>
Invalid Electronic Serial Number	Electronic serial number is missing.	Enter the correct serial number in Computer Setup.
Network Server Mode Active and No Keyboard Attached	Keyboard failure while Network Server Mode enabled.	<ol style="list-style-type: none"><li>1. Reconnect keyboard with computer turned off.</li><li>2. Check connector for bent or missing pins.</li><li>3. Ensure that none of the keys are depressed.</li><li>4. Replace keyboard.</li></ol>
Parity Check 2	Parity RAM failure.	Run Computer Setup and Diagnostic utilities.

# Troubleshooting

## Basic troubleshooting

If the thin client is experiencing operating problems or will not power on, review the following items.

**Table B-5 Power-on troubleshooting**

Issue	Procedures
The thin client unit is experiencing operating problems.	Ensure that the following connectors are securely plugged into the thin client unit: Power connector, keyboard, mouse, network RJ-45 connector, display
The thin client unit does not power on.	<ol style="list-style-type: none"><li>1. Verify that the power supply is good by installing it on a known working unit and testing it. If the power supply does not work on the test unit, replace the power supply.</li><li>2. If the unit does not work properly with the replaced power supply, have the unit serviced.</li></ol>
The thin client unit powers on and displays a splash screen, but does not connect to the server.	<ol style="list-style-type: none"><li>1. Verify that the network is operating and the network cable is working properly.</li><li>2. Verify that the unit is communicating with the server by having the System Administrator ping the unit from the server:<ul style="list-style-type: none"><li>— If the thin client pings back, then the signal was accepted and the unit is working. This indicates a configuration issue.</li><li>— If the thin client does not ping back and the thin client does not connect to the server, re-image the unit.</li></ul></li></ol>
No link or activity on the network RJ-45 LEDs or the LEDs do not illuminate blinking green after powering on the thin client unit. (The network LEDs are located inside the RJ-45 connector on the top, rear panel of the thin client. Indicator lights are visible when the connector is installed.)	<ol style="list-style-type: none"><li>1. Verify that the network is not down.</li><li>2. Make sure the RJ-45 cable is good by installing the RJ-45 cable onto a known working device—if a network signal is detected then the cable is good.</li><li>3. Verify the power supply is good by replacing the power cable to the unit with a known working power supply cable and testing it.</li><li>4. If network LEDs still do not light and you know the power supply is good, then re-image the unit.</li><li>5. If network LEDs still do not light, run the IP configuration procedure.</li><li>6. If network LEDs still do not light, have the unit serviced.</li></ol>
A newly connected unknown USB peripheral does not respond or USB peripherals connected prior to the newly connected USB peripheral will not complete their device actions.	An unknown USB peripheral may be connected and disconnected to a running platform as long as you do not reboot the system. If problems occur, disconnect the unknown USB peripheral and reboot the platform.
Video does not display.	<ol style="list-style-type: none"><li>1. Verify that the monitor brightness is set to a readable level.</li><li>2. Verify the monitor is good by connecting it to a known working computer and ensure its front LED turns green (assuming the monitor is Energy Star compliant). If the monitor is defective, replace it with a working monitor and repeat testing.</li><li>3. Re-image the thin client unit and power on the monitor again.</li><li>4. Test the thin client unit on a known working monitor. If the monitor does not display video, replace the thin client unit.</li></ol>

## Diskless (No-Flash) unit troubleshooting

This section is only for those units that do not have ATA Flash capability. Because there is no ATA Flash in this model the boot priority sequence is:

- USB device
  - PXE
1. When the unit boots, the monitor should display the following information:

**Table B-6 Diskless unit troubleshooting**

Item	Information	Action
MAC Address	NIC portion of the system board is OK	If no MAC Address, the system board is at fault. Contact the Call Center for service.
GUID	General system board information	If no GUID information, the system board is at fault and should be replaced.
Client ID	Information from server	If no Client ID information there is no network connection. This may be caused by a bad cable, the server is down, or a bad system board. Contact the Call Center for service for the bad system board.
MASK	Information from server	If no MASK information there is no network connection. This may be caused by a bad cable, the server is down, or a bad system board. Contact the Call Center for service for the bad system board.
DHCP IP	Information from server	If no DHCP IP information there is no network connection. This may be caused by a bad cable, the server is down, or a bad system board. Contact the Call Center for service for the bad system board.

If you are running in a Microsoft RIS PXE environment, go to step 2.

If you are running in a Linux environment, go to step 3.

2. If you are running in a Microsoft RIS PXE environment, press the **F12** key to activate the network service boot as soon as the DHCP IP information appears on the screen.

If the unit does not boot to the network, the server is not configured to PXE.

If you missed the F12 cue, the system will try to boot to the ATA flash that is not present. The message on the screen will read: **ERROR: Non-system disk or disk error. Replace and press any key when ready.**

Pressing any key will restart the boot cycle.

3. If you are running in a Linux environment, an error message will appear on the screen if there is no Client IP. **ERROR: Non-system disk or disk error. Replace and press any key when ready.**

## Configuring a PXE server

---

 **NOTE:** All PXE software is supported by authorized service providers on a warranty or service contract basis. Customers who call the HP Customer Service Center with PXE issues and questions should be referred to their PXE provider for assistance.

Additionally, refer to the following:

– For Windows 2008 R2: <http://technet.microsoft.com/en-us/library/7d837d88-6d8e-420c-b68f-a5b4baeb5248.aspx>

– For Windows 2012: <http://technet.microsoft.com/en-us/library/jj648426.aspx>

---

The services listed below must be running, and they may be running on different servers:

1. Domain Name Service (DNS)
2. Remote Installation Services (RIS)

---

 **NOTE:** Active Directory DHCP is not required, but is recommended.

---

---

## C Using HP ThinUpdate to restore the image

HP ThinUpdate allows you to download images and add-ons from HP, capture an HP thin client image, and create bootable USB flash drives for image deployment.

HP ThinUpdate is preinstalled on some HP thin clients, and it is also available as an add-on at <http://www.hp.com/support> (search for the thin client model and see the **Drivers & software** section of the support page for that model).

- The Image Downloads feature lets you download an image from HP to either local storage or a USB flash drive. The USB flash drive option creates a bootable USB flash drive that can be used to deploy the image to other thin clients.
- The Image Capture feature lets you capture an image from an HP thin client and save it to a USB flash drive, which can be used to deploy the image to other thin clients.
- The Add-on Downloads feature lets you download add-ons from HP to either local storage or a USB flash drive.
- The USB Drive Management feature lets you do the following:
  - Create a bootable USB flash drive from an image file on local storage
  - Copy an .ibr image file from a USB flash drive to local storage
  - Restore a USB flash drive layout

You can use a bootable USB flash drive created with HP ThinUpdate to deploy an HP thin client image to another HP thin client of the same model with the same operating system.

### System requirements

To create a recovery device for the purpose of reflashing or restoring the software image on the flash, you will need the following:

- One or more HP thin clients.
- USB flash device in the following size or larger:
  - ThinPro: 8 GB
  - Windows 10 IoT (if using the USB format): 32 GB



**NOTE:** Optionally, you can use the tool on a Windows computer.

**This restore method will not work with all USB flash devices.** USB flash devices that do not show up as removable drive in Windows do not support this restore method. USB flash devices with multiple partitions generally do not support this restore method. The range of USB flash devices available on the market is constantly changing. Not all USB flash devices have been tested with the HP Thin Client Imaging Tool.

---

## D Device management

The t730 includes a license for HP Device Manager and has a Device Manager agent pre-installed. HP Device Manager is a thin client optimized management tool used to manage the full life cycle of HP thin clients to include Discover, Asset Management, Deployment and Configuration. For more information on HP Device Manager, please visit [www.hp.com/go/hpdm](http://www.hp.com/go/hpdm).

If you wish to manage the t730 with other management tools such as Microsoft SCCM or LANDesk, go to [www.hp.com/go/clientmanagement](http://www.hp.com/go/clientmanagement) for more information.

---

## E Adding an Image Restore Tool

1. Ensure that the boot order is set to use the **Network** as the first boot device.
2. Ensure that IBR.exe (Image Restore) and Flash.dd are stored in the same directory on the server. (e.g., `c:\program files\altiris\express\deployment server\images`)
3. From the Altiris Deployment Server Console, click **File > New > Job** .
4. Enter a unique name for the job that you will use to deploy the original thin client image.
5. Click the name of the new job.
6. Near the upper right side of the screen, click **Add**.
7. Select **Run Script** from the menu.
8. Type [full path]`images\ibr\exe-y\images\flash.xx hd0`



**NOTE:** Linux uses the file name FLASH.DD while other operating system images use FLASH.IMG

---

9. Under **In which OS would you like to run this script?** Click **DOS**.
10. Click **Finish**.
11. You can now drag and drop the job onto the appropriate machine(s) or schedule it to run later, depending on your needs. Refer to the documentation for Altiris Deployment Solution (<http://www.altiris.com/support/documentation>) for more detailed information.

---

## F Power cord set requirements

The power supplies on some computers have external power switches. The voltage select switch feature on the computer permits it to operate from any line voltage between 100-120 or 220-240 volts AC. Power supplies on those computers that do not have external power switches are equipped with internal switches that sense the incoming voltage and automatically switch to the proper voltage.

The power cord set received with the computer meets the requirements for use in the country where you purchased the equipment.

Power cord sets for use in other countries must meet the requirements of the country where you use the computer.

### General requirements

The requirements listed below are applicable to all countries:

1. The power cord must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord set will be installed.
2. The power cord set must have a minimum current capacity of 10A (7A Japan only) and a nominal voltage rating of 125 or 250 volts AC, as required by each country's power system.
3. The diameter of the wire must be a minimum of 0.75 mm<sub>2</sub> or 18AWG, and the length of the cord must be between 1.8 m (6 feet) and 3.6 m (12 feet).

The power cord should be routed so that it is not likely to be walked on or pinched by items placed upon it or against it. Particular attention should be paid to the plug, electrical outlet, and the point where the cord exits from the product.

---

 **WARNING!** Do not operate this product with a damaged power cord set. If the power cord set is damaged in any manner, replace it immediately.

---

### Japanese power cord requirements

For use in Japan, use only the power cord received with this product.

---

 **CAUTION:** Do not use the power cord received with this product on any other products.

---

## Country-specific requirements

Additional requirements specific to a country are shown in parentheses and explained below.

Country	Accrediting Agency	Country	Accrediting Agency
Australia (1)	EANSW	Italy (1)	IMQ
Austria (1)	OVE	Japan (3)	METI
Belgium (1)	CEBC	Norway (1)	NEMKO
Canada (2)	CSA	Sweden (1)	SEMKO
Denmark (1)	DEMKO	Switzerland (1)	SEV
Finland (1)	SETI	United Kingdom (1)	BSI
France (1)	UTE	United States (2)	UL
Germany (1)	VDE		

1. The flexible cord must be Type H05VV-F, 3-conductor, 0.75mm<sup>2</sup> conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.
2. The flexible cord must be Type SVT or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15A, 125V) or NEMA 6-15P (15A, 250V) configuration.
3. Appliance coupler, flexible cord, and wall plug must bear a “T” mark and registration number in accordance with the Japanese Dentori Law. Flexible cord must be Type VCT or VCTF, 3-conductor, 0.75 mm<sup>2</sup> conductor size. Wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7A, 125V) configuration.

---

# G Statement of Volatility

Thin Client products typically have three types of memory devices namely, RAM, ROM, and Flash memory devices. Data stored in the RAM memory device will be lost once the power is removed from the device. RAM devices could be powered by main, aux, or battery power (power states are explained below). Therefore, even when the unit is not connected to an AC outlet, some of the RAM devices could be powered by battery power. Data stored in the ROM or Flash memory devices will retain its data even if the power is removed to the device. Manufacturers of Flash device usually specify a period of time (in the order of ten years) for data retention.

Definition of power states:

**Main Power:** Power available when the unit is turned on.

**Aux or Standby power:** Power available when the unit is in off state when the power supply is connected to an active AC outlet.

**Battery Power:** Power from a coin battery present in the Thin Client systems.

The table below lists the available memory devices and their types per the models. Please note that the Thin Client systems do not use traditional hard drives with moving parts. Instead, they use flash memory devices with an IDE/ SATA front-end interface. Hence, the operating systems interface with these flash devices similar to a regular IDE/ SATA hard drive. This IDE/ SATA flash device contains the image of the operating system. The flash device can only be written by an administrator. A special software tool is required to format the flash devices and clear the data stored in them.

Please find below a list of steps that should be taken to update BIOS and use it to set the BIOS settings to factory default settings.

1. Download the latest BIOS for your model off of the HP website.  
Download the latest BIOS (system ROM) from the HP website.  
Download the latest BIOS for your model off of the HP website.
2. Follow the instructions to flash the BIOS that are found on the website.  
Follow the instructions to flash the BIOS that are found on the website.  
Follow the instructions to flash the BIOS that are found on the website.
3. Restart the system, and while system is powering on (after the HP splash screen, if displayed) press the **F10** key to enter the BIOS setup screen.  
Turn on the system, and while system is powering on, and after the HP splash screen, press the **F10** key to enter BIOS setup screen.  
Restart the system, and while system is powering on (after the HP splash screen, if displayed) press the **F10** key to enter the BIOS setup screen.
4. If the Ownership Tag or Asset Tag is set, manually clear it under **Security > System IDs**.  
Set defaults and exit (this will clear passwords and any other settings)  
If the Ownership Tag or Asset Tag is set, manually clear it under **Security > System IDs**.
5. Select **File > Save Changes and Exit**.

6. To clear the Setup or Power-On passwords if set, and clear any other settings, power down the computer and remove the AC power cord and the computer hood.
7. Locate the (blue/green) two pin password jumper on header E49 (labeled PSWD) and remove it.
8. Remove AC power, wait ten seconds until the unit AC power has drained out, then press the clear CMOS button. (This is usually a yellow push button, labeled CMOS).
9. Replace the hood and AC power cord and turn the computer on. The passwords are now cleared and all other user-configurable, non-volatile memory settings are reset to their factory default values.
10. Re-enter the F10 setup utility.
11. Select **File > Default Setup > Restore Factory Settings as Default**. This will set the default settings back to the factory defaults.
12. Select **File > Apply Defaults and Exit**.
13. Shut down the computer, remove AC power cord, and then place the (blue/green) jumper back on header E49. Replace the computer hood and power cord.

Model	Description	Location/Size	Power	Loss of data	Comments
t730	System Boot ROM (BIOS)	SPI ROM (64 Mbit) socketed, removable.			
	System memory (RAM)	SODIMM socket. Removable (4GB/8GB)	Main power	If main power is removed	Only S0/S3/S5/G3 ACPI states are supported
	RTC (CMOS) RAM	RTC RAM is 272–byte RAM Memory embedded in AMD APU's Fusion Controller Hub (FCH).	Main/battery	If battery power is removed	
	Keyboard/mouse (ROM)	2k bytes embedded in the super I/O controller (SIO12)	Main		
	Keyboard/mouse (RAM)	256 bytes embedded in the super I/O controller (SIO12)	Main	If main power is removed	
	LOM EEPROM	256 bytes embedded in LAN Chip	Aux		One Time programmable memory (OTP)
	TPM	6 kBytes embedded in TPM Chip. It's ROM for TCG Firmware	Main		

The information contained herein is subject to change without notice.

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

If you require additional information or need assistance please contact James Smalls at 281-514-5723.

# H Specifications

For the latest specifications or additional specifications on the thin client, go to <http://www.hp.com/go/quickspecs/> and search for your specific thin client to find the QuickSpecs.

Item	Value	Value
<b>Dimensions</b>		
Width	65 mm	2.56 in.
Depth	220 mm	8.66 in.
Height (without stand)	240 mm	9.45 in.
Height (with stand)	250 mm	9.84 in.
<b>Temperature Range</b> (fanless design)*		
Operating**	10°C to 40°C	50°F to 104°F
Nonoperating (max. rate of change is 20°C per hour or 36°F per hour)	-30°C to 60°C	-22°F to 140°F
*Specifications are at sea level with altitude derating of 1°C/300 m (1.8°F/1000 ft) to a maximum of 3 Km (10,000 ft), with no direct, sustained sunlight. Upper limit may be limited by the type and number of options installed.		** The operating temperature range when the thin client is attached to a flat panel using the HP Quick Release is 10°C to 35°C (50°F to 95°F).
<b>Relative Humidity</b> (non-condensing)		
Operating (max. wet bulb temperature is 28°C or 84.2°F)		10% to 90%
Nonoperating (max. wet bulb temperature is 38.7°C or 101.6°F)		5% to 95%
<b>Maximum Altitude</b> (unpressurized)		
Operating (max. allowed rate of change is 457 m per minute or 1500 ft per minute)	3048 m	10,000 ft
Nonoperating (max. allowed rate of change is 457 m per minute or 1500 ft per minute)	9144 m	30,000 ft
<b>Power Supply</b>		
Operating Voltage Range		100 VAC to 240 VAC
Rated Line Frequency		50 Hz to 60 Hz
<b>Power Output</b> (maximum)		
		85 W
<b>Rated Output Current</b> (maximum)		
		4.36 A
<b>Output Voltage</b>		
		+19.5 V dc

# Index

- A**
  - access panel
    - removing 5
    - replacing 7
  - adding an image restore tool 46
  - altitude specifications 51
  - audible codes 37
- B**
  - basic troubleshooting 41
  - battery, replacing 11
  - beep codes 37
  - BIOS
    - updating 32
- C**
  - cautions
    - electric shock 5, 13, 15, 19
    - installing SODIMMs 19
    - removing the battery 11
    - static electricity 5
  - changing BIOS settings
    - in the REPSETUP utility 30
  - components
    - front panel 1
    - internal 8
    - rear panel 3
  - country power cord set requirements 48
- D**
  - diagnostics and troubleshooting 34
  - dimensions 51
  - disabling/enabling Wake-on LAN (WOL) 35
  - diskless troubleshooting 42
- E**
  - error
    - codes 37
    - messages 39
- F**
  - flash storage module, replacing 9
  - flashing LEDs 37
- front panel components 1
- H**
  - hardware specifications 51
  - humidity specifications 51
- I**
  - image restore tool 46
  - installation guidelines 5
  - installing
    - low-profile PCIe card 13
    - SODIMMs 18
    - system memory 18
    - USB devices 17
  - internal components 8
- L**
  - LEDs 34
    - blinking power 37
  - low-profile PCIe card, installing 13
- M**
  - memory
    - installing system 18
    - socket population 18
    - specifications 18
- N**
  - numeric error codes 39
- O**
  - options 1
- P**
  - PCIe card, low-profile, installing 13
  - power and IDE flash activity LEDs 34
  - power cord set requirements
    - country specific 48
  - power output specifications 51
  - power supply specifications 51
  - power-on diagnostic tests 36
  - power-on sequence 35
- R**
  - rated output current 51
  - rear panel components 3
  - recycling 12
  - relative humidity specifications 51
  - removing
    - access panel 5
    - battery 11
  - replacing
    - access panel 7
    - battery 11
    - flash storage module 9
    - WLAN module 15
  - resetting the Administrator password 36
  - restore 46
- S**
  - serial number location 4
  - SODIMMs
    - installing 18
    - socket population 18
  - specifications
    - altitude 51
    - dimensions 51
    - hardware 51
    - humidity 51
    - power output 51
    - power supply 51
    - rated output current 51
    - relative humidity 51
    - temperature 51
    - thin client 51
  - specifications, memory 18
  - storage module, replacing flash 9
- T**
  - temperature specifications 51
  - troubleshooting 41
- U**
  - updating a BIOS 32
  - USB devices, installing 17
  - USB ports
    - 2.0 17

location 17  
maximum size 17

## W

Wake-on LAN (WOL) 35

### warnings

burn 5, 13, 15, 17, 19

electric shock 5, 11, 13, 15

grounding plug 5

NIC receptacles 5

### websites

HP 1

wireless card, replacing 15

WLAN module, replacing 15