



HP Z1 G2 Workstation

User Guide

Copyright Information

© Copyright 2014 Hewlett-Packard Development Company, L.P.

Second Edition: September 2014

First Edition: January 2014

Part number: 735574-002

Warranty

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.

Windows® 8: Not all features are available in all editions of Windows 8. This computer may require upgraded and/or separately purchased hardware, drivers, and/or software to take full advantage of Windows 8 functionality. See <http://www.microsoft.com> for details.

Windows 7: This computer may require upgraded and/or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. See <http://windows.microsoft.com/en-us/windows7/get-know-windows-7> for details.

Trademark Credits

Bluetooth is a trademark owned by its proprietor and used by Hewlett-Packard Company under license.

Intel is a trademark of Intel Corporation in the U.S. and other countries.

Microsoft and Windows are U.S. registered trademarks of Microsoft Corporation.

Red Hat® is a registered trademark of Red Hat, Inc. in the United States and other countries.

About this guide

This guide provides setup and basic troubleshooting information for the HP Z1 G2 Workstation. It includes these topics:

Guide topics
Locating HP resources on page 1
HP Z1 G2 Workstation features on page 7
Setting up and using the workstation on page 11
Setting up, backing up, restoring, and recovering Windows 7 on page 29
Setting up, backing up, restoring, and recovering Windows 8 on page 34
Setting up and restoring Linux on page 42
Updating the workstation on page 47
Diagnostics and minor troubleshooting on page 49
Routine Care on page 55

 **TIP:** If you do not find what you are looking for in this guide:

- Find technical details in the *Maintenance and Service Guide* at http://www.hp.com/support/workstation_manuals.
 - View removal and replacement videos at <http://www.hp.com/go/sml>.
 - Go to <http://www.hp.com/go/workstations> for additional information on your workstation.
-

Table of contents

1 Locating HP resources	1
Product information	2
Support	3
Product documentation	4
Product diagnostics	5
Product updates	6
2 HP Z1 G2 Workstation features	7
Components	7
Front and bottom components	7
Side components	8
Rear components	9
Product specifications	10
Physical characteristics	10
Environmental specifications	10
3 Setting up and using the workstation	11
Setting up the workstation	11
Location and ventilation	11
Setup procedure	12
Connecting Bluetooth devices	15
Disabling Bluetooth devices	15
Disabling WLAN	16
Using touchscreen gestures	17
One-finger slide	18
Tapping	18
Scrolling	19
Pinching/stretching	19
Rotating (select models only)	20
Edge swipes (Windows 8 models only)	20
Right-edge swipe	20
Left-edge swipe	21
Bottom-edge swipe	21
Tapping	21
Flicking (Windows 7 models only)	22
Dragging	22

Setting touchscreen preferences	22
Display options	24
Adjusting display brightness	24
Controlling display panel brightness	24
Internal display panel backlight brightness	24
Controlling the brightness of the display panel and an external monitor	24
Adding an external monitor	26
Customizing the display panel or an external monitor	26
Using the HP Z1 G2 Workstation as a monitor	27
Adjusting the audio signal	28
Using the webcam	28
Installing optional components	28
Security	28
Product recycling	28
4 Setting up, backing up, restoring, and recovering Windows 7	29
Setting up the Windows 7 operating system	29
Installing or upgrading device drivers	29
Transferring files and settings	30
Backing up, restoring, and recovering Windows 7	30
Backing up your information	30
System Restore	31
System Recovery	32
System Recovery from a recovery partition image	32
Using HP Recovery Disc operating system discs	33
5 Setting up, backing up, restoring, and recovering Windows 8	34
Supplementary information	34
Setting up the Windows 8 operating system	34
Downloading Windows 8 updates	35
Backing up, restoring, and recovering Windows 8	35
Backing up your information	35
Creating recovery media and backups	37
Restoring and recovering using Windows 8 tools	37
Using Windows 8 Refresh	38
Using Windows 8 Reset	39
Recovery using the Windows 8 recovery USB flash drive	40
Recovery using Windows 8 restore media	41

6	Setting up and restoring Linux	42
	HP Linux Support Matrix	42
	HP Installer Kit for Linux (HPIKL)	43
	Setting up Red Hat Enterprise Linux	43
	HPIKL driver disc	44
	Installing with the HP Red Hat Linux driver disc	44
	Setting up SUSE Linux Enterprise Desktop (SLED)	45
	Setting up preloaded SLED	45
	Installing SLED with the DVD Installer Kit	45
	Restoring SLED (preloaded systems only)	46
	Proprietary graphics drivers	46
7	Updating the workstation	47
	Updating the workstation after first start	47
	Upgrading the BIOS	47
	Determining the current BIOS version	47
	Upgrading BIOS	48
	Upgrading device drivers	48
8	Diagnostics and minor troubleshooting	49
	Calling support	49
	Locating ID labels	50
	Locating warranty information	51
	HP troubleshooting resources and tools	51
	Online support	51
	Troubleshooting a problem	52
	Instant Support and Active Chat	52
	Customer Advisories, Customer and Security Bulletins, and Customer Notices	52
	Product Change Notifications	52
	Helpful hints	53
	At startup	53
	During operation	53
	Customer Self Repair	54
	Other troubleshooting options	54
9	Routine Care	55
	General cleaning safety precautions	55
	Cleaning products	55
	Cleaning the chassis	56

Cleaning the keyboard	56
Cleaning the monitor	56
Cleaning the mouse	57

1 Locating HP resources

This section provides information on the following resources for your HP workstation:

Topics

[Product information on page 2](#)

- Technical specifications
- Regulatory, safety and environmental notices
- Accessories
- System board
- Serial number, Certificate of Authenticity, and Genuine Microsoft Label

[Support on page 3](#)

- Product support
- Warranty information

[Product documentation on page 4](#)

- HP and third-party documentation, white papers
- Product notifications
- Technical specifications (QuickSpecs)
- Customer Advisories, Security Bulletins, Notices

[Product diagnostics on page 5](#)

- UEFI Diagnostics
- Audible beeps and light code definitions
- POST error codes

[Product updates on page 6](#)

- Driver and BIOS updates
 - Operating systems
-

Product information

Topic	Location
Technical specifications	Go to http://www.hp.com/go/quickspecs . In the left pane, select your region and then select Workstations .
Regulatory, safety and environmental notices	Refer to the <i>Regulatory, Safety and Environmental Notices</i> for product regulatory information. You can also refer to the regulatory label on the workstation chassis.
Accessories	For complete and current information on supported accessories and components, go to http://www.hp.com/go/workstations .
System board	A diagram of the system board is located on the inside of the chassis (all-in-one configuration). Additional information is located in the workstation <i>Maintenance and Service Guide</i> on the Web at http://www.hp.com/support/workstation_manuals/ .
Serial number, Certificate of Authenticity (COA), and Genuine Microsoft® Label (GML) (if applicable)	The serial number label is on a pull-out card on the side of the display (all-in-one configuration). The COA (Windows 7) and GML (Windows 8) are typically located near the serial number label. On some workstations, this label is on the bottom panel.
Linux	For information on running Linux on HP workstations, go to http://www.hp.com/linux/ , and then select Linux on Workstations from the list on the left.

Support

Topic	Location
Product support	<p>For U.S. support, go to http://www.hp.com/go/contactHP.</p> <p>For worldwide support, go to http://welcome.hp.com/country/us/en/wwcontact_us.html.</p> <p>Here you can access the following types of support:</p> <ul style="list-style-type: none">• Chat online with an HP technician• Obtain email support• Find support telephone numbers• Locate an HP service center
Warranty information	<p>To locate base warranty information, go to http://www.hp.com/support/warranty-lookuptool.</p> <p>To locate an existing Care Pack, go to http://www.hp.com/go/lookuptool.</p> <p>To extend a standard product warranty, go to http://h20219.www2.hp.com/services/us/en/warranty/carepack-overview.html. HP Care Pack Services offer upgraded service levels to extend and expand a standard product warranty.</p> <p>You can find the expressly provided HP Limited Warranty applicable to your product located with the user guides on your computer and/or on the CD or DVD provided in the box. For some countries or regions where the warranty is not provided in printed format, you may request a printed copy from http://www.hp.com/go/orderdocuments or write to:</p> <p>North America:</p> <p>Hewlett Packard, MS POD</p> <p>11311 Chinden Blvd.</p> <p>Boise, ID 83714, USA</p> <p>Europe, Middle East, Africa:</p> <p>Hewlett-Packard, POD</p> <p>Via G. Di Vittorio, 9</p> <p>20063, Cernusco /Naviglio (MI), Italy</p> <p>Asia Pacific:</p> <p>Hewlett-Packard, POD, P.O. Box 200</p> <p>Alexandra Post Office, Singapore 911507</p> <p>When you request a printed copy of your warranty, please include your product number, warranty period (found on your service label), name, and postal address.</p> <p>IMPORTANT: Do NOT return your HP product to the addresses above. For U.S. support, go to http://www.hp.com/go/contactHP.</p> <p>For worldwide support, go to http://welcome.hp.com/country/us/en/wwcontact_us.html.</p>

Product documentation

Topic	Location
HP user documentation, white papers, and third-party documentation	User documentation is located on your hard drive. On Windows 7, select Start , select HP Help and Support , and then select HP Documentation . On Windows 8, from the Start screen, select the app HP Documentation . For the latest online documentation, go to http://www.hp.com/support/workstation_manuals . The documentation includes this user guide and the <i>Maintenance and Service Guide</i> .
Removal and replacement videos	To learn how to remove and replace workstation components, go to http://www.hp.com/go/sml .
Product notifications	Subscriber's Choice is an HP program that allows you to sign up to receive driver and software alerts, proactive change notifications (PCNs), the HP newsletter, customer advisories, and more. Sign up at http://www.hp.com/go/subscriberschoice .
Technical specifications	The Product Bulletin contains QuickSpecs for HP Workstations. QuickSpecs include information about the operating system, power supply, memory, CPU, and many other system components. To access the QuickSpecs, go to http://www.hp.com/go/quickspecs/ .
Customer Advisories, Security Bulletins, and Notices	To find advisories, bulletins, and notices: <ol style="list-style-type: none">1. Go to http://www.hp.com/go/workstationsupport.2. Select the desired product.3. Use the scroll bar to select Advisories, Bulletins & Notices under the Knowledge Base heading.

Product diagnostics

Topic	Location
Windows 7 dagnostics tools	<p>The UEFI Diagnostics utility is preinstalled on select Windows 7 workstations.</p> <p>For additional information, see the workstation <i>Maintenance and Service Guide</i> at http://www.hp.com/support/workstation_manuals.</p>
Windows 8 diagnostics tools	<p>The UEFI Diagnostics utility is preinstalled on select Windows 8 workstations.</p> <p>For additional information, see the workstation <i>Maintenance and Service Guide</i> at http://www.hp.com/support/workstation_manuals.</p>
Audible beep and light code definitions	<p>See the workstation <i>Maintenance and Service Guide</i> at http://www.hp.com/support/workstation_manuals.</p>
POST error codes	<p>See the workstation <i>Maintenance and Service Guide</i> at http://www.hp.com/support/workstation_manuals.</p>

Product updates

Topic	Location
Driver and BIOS updates	<p>Go to http://www.hp.com/go/workstationsupport to verify that you have the latest drivers for the workstation.</p> <p>To determine the current workstation BIOS on your workstation, follow these steps during system startup:</p> <ol style="list-style-type: none">1. Turn on the workstation, and press Esc during startup (boot).2. Press F10 to enter the F10 Setup utility.3. Go to File > System Information. Note the BIOS version and date and compare it with the BIOS versions that appear on the HP website. <p>In Windows 7, you can also find the BIOS version number by following these steps:</p> <ol style="list-style-type: none">1. Go to Start > All Programs > Accessories > System Tools > System Information.2. In the right pane, find the line with BIOS Version/Date.3. Note the BIOS version and date and compare it with the versions that appear on the HP website. <p>In Windows 8, you can also find the BIOS version number by following these steps:</p> <ol style="list-style-type: none">1. Point to or swipe from the upper-right or lower-right corner of the Start screen to display the charms.2. Select Settings > Change PC Settings.
Operating systems	<p>For information, go to the following locations:</p> <ul style="list-style-type: none">• Operating systems supported on HP workstations, go to http://www.hp.com/go/wsos.• Windows operating systems, go to http://www.microsoft.com/support.• Linux operating systems, go to http://www.hp.com/linux.

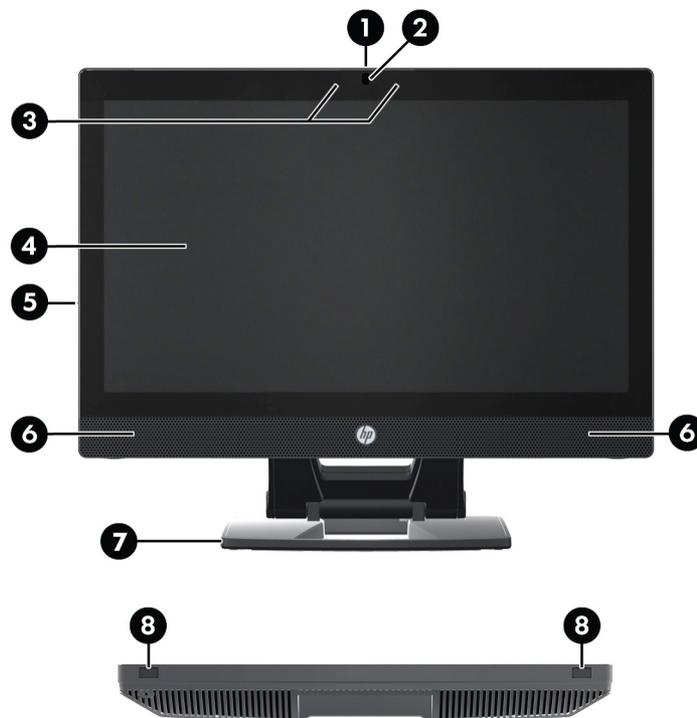
2 HP Z1 G2 Workstation features

The HP Z1 G2 Workstation is offered in both a touch and a non-touch model. The touch model has a glossy glass front, and the non-touch model has a matte surface, surrounded by a plastic bezel.

For complete and current information on supported accessories and components for the workstation, go to <http://partsurfer.hp.com>.

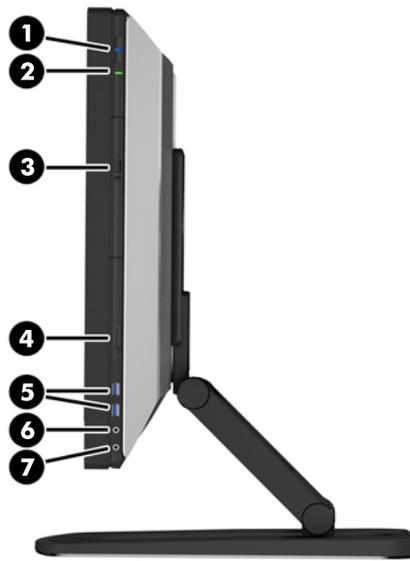
Components

Front and bottom components



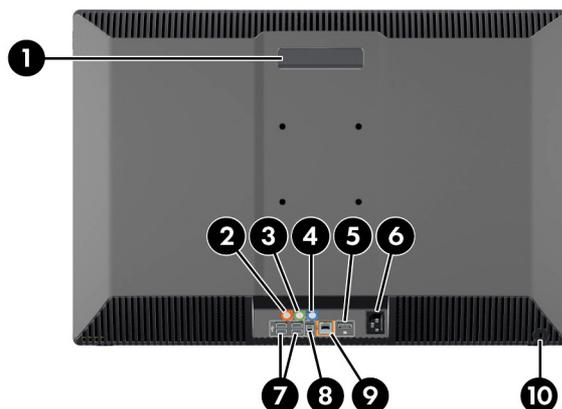
1	Camera angle adjustment dial	5	Serial number pull-out card
2	Camera	6	Speakers
3	Left and right digital microphones	7	Stand
4	Display panel	8	Chassis latches (bottom view)

Side components



1		Power button	5		USB 3.0 ports (2) The bottom USB port is also a battery charging port.
2		Hard drive activity light	6		Headphone jack
3		Slimline tray optical drive (or optional Thunderbolt module)	7		Microphone jack
4		Memory card reader			

Rear components



1		Handle	6		Power cord connector
2		Subwoofer jack (orange)	7		USB 2.0 ports (4)
3		Audio line-out jack (green)	8		Optical S/PDIF audio output
4		Audio line-in jack (blue)	9		RJ-45 network connector
5		DisplayPort connector	10		Security cable slot

Product specifications

Physical characteristics

Weight	With stand (non-touch)	19.2 kg (42.3 lbs)
	With stand (touch)	21.0 kg (46.3 lbs)
	Without stand (non-touch)	13.3 kg (29.3 lbs)
	Without stand (touch)	15.1 kg (33.3 lbs)
	Stand only	5.9 kg (13.0 lbs)
Dimensions	Upright, including stand	Height: 533.4 mm (21.0 in) Width: 660.4 mm (26.0 in) Depth: 419.1 mm (16.5 in)
	Unit only	Height: 457.2 mm (18.0 in) Width: 660.4 mm (26.0 in) Depth: 81.3 mm (3.2 in)

Environmental specifications

Temperature	Operating: 5°C to 35°C (40°F to 95°F)
	Non-operating: -40°C to 60°C (-40°F to 140°F) NOTE: The ambient upper limit of 35°C is good up to 1524 m (5000 ft) elevation. Derate by 1°C for every 305 m (1000 ft) above 1524 m (5000 ft). For example, at 3,048 m (10,000 ft), the upper ambient air temperature limit is 30°C.
Humidity	Operating: 8% to 85% relative humidity, non-condensing
	Non-operating: 8% to 90% relative humidity, non-condensing
Altitude	Operating: 0 to 3,048 m (10,000 ft)
	Non-operating: 0 to 9,144 m (30,000 ft)
Shock	Operating: ½-sine: 40g, 2-3ms (~62 cm/sec)
	Non-operating:
	<ul style="list-style-type: none">• ½-sine: 160 cm/s, 2-3ms (~105g)• 20g, square: 422 cm/s NOTE: Values represent individual shock events and do not indicate repetitive shock events.
Vibration	Operating random: 0.5g (rms), 5-300 Hz, up to 0.0025 g ² /Hz
	Non-operating random: 2.0g (rms), 5-500 Hz, up to 0.0150 g ² /Hz NOTE: Values do not indicate continuous vibration.

3 Setting up and using the workstation

Topics

[Setting up the workstation on page 11](#)

[Display options on page 24](#)

[Using the webcam on page 28](#)

[Installing optional components on page 28](#)

[Security on page 28](#)

[Product recycling on page 28](#)

Setting up the workstation

Location and ventilation

Proper ventilation for the system is important for workstation operation. To be sure that there is adequate ventilation:

- Operate the workstation on a sturdy, level surface.
- Provide at least the following clearance:
 - 12 cm (4.7 in) clearance at the front, back, top, and bottom of the workstation
 - 16 cm (6.3 in) clearance on the right side for the optical drive
- Be sure that the ambient air temperature surrounding the workstation falls within the specified limits (see [Environmental specifications on page 10](#)).
- Never restrict the incoming or outgoing airflow of the workstation by blocking any vents or air intakes.

Setup procedure

1. The HP Z1 G2 Workstation weighs 19.2 kg (42.3 lbs) for the non-touch model and 21.0 kg (46.3 lbs) for the touch model, and must be removed from the box by two people.

⚠ WARNING! If a product is shipped in packaging marked with this icon , the product must always be lifted by two people to avoid personal injury due to product weight.

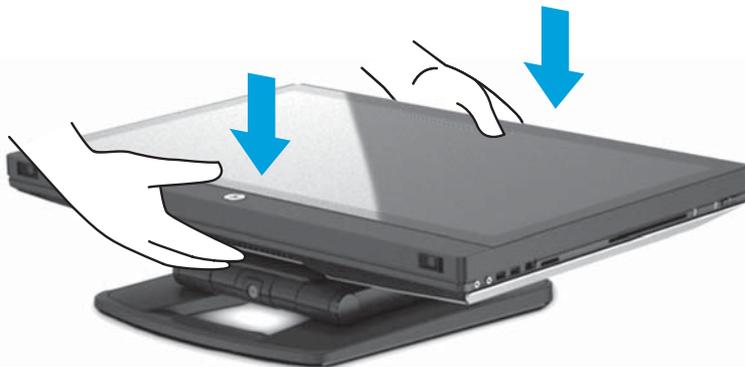
⚠ WARNING! To reduce the risk of electric shock or damage to your equipment:

- Plug the power cord into an AC outlet that is easily accessible at all times.
- Disconnect power from the computer by unplugging the power cord from the AC outlet (not by unplugging the power cord from the computer).
- If your power cord has a 3-pin attachment plug, plug the cord into a grounded (earthed) 3-pin outlet. Do not disable the power cord grounding pin, for example, by attaching a 2-pin adapter. The grounding pin is an important safety feature.

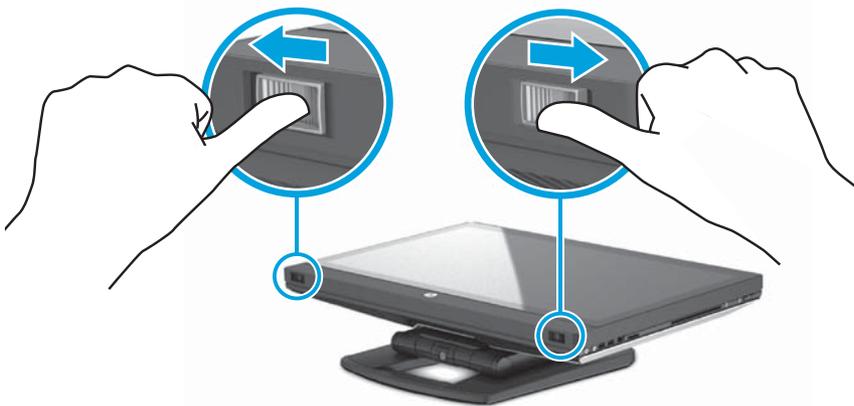
For more safety and regulatory information, refer to the *Regulatory, Safety and Environmental Notices* located with the user guide on your computer.

2. Push the unit down to its lowest horizontal position.

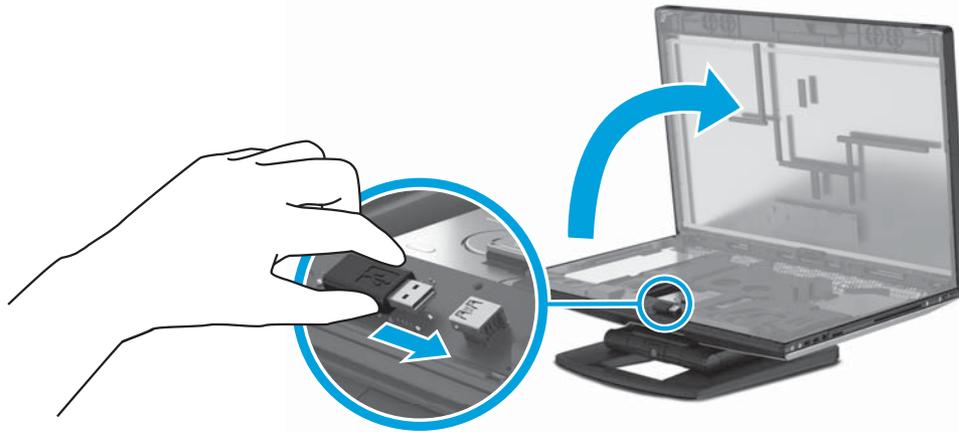
⚠ CAUTION: Never open the chassis unless it is in the lowest horizontal position. Otherwise, system components may be damaged.



3. Slide the latches on the bottom of the workstation outward and open the chassis.



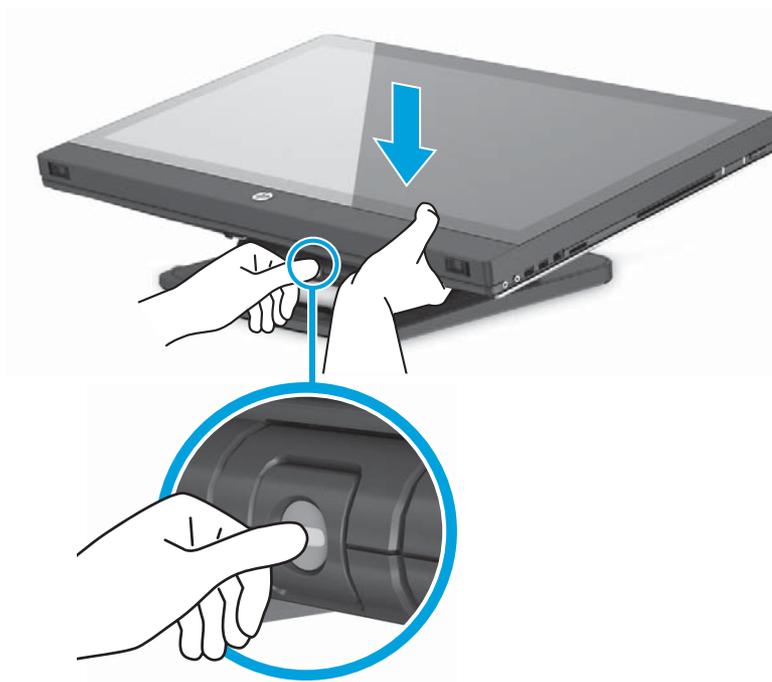
4. Insert the USB wireless transceiver in the internal USB port, and close the chassis.



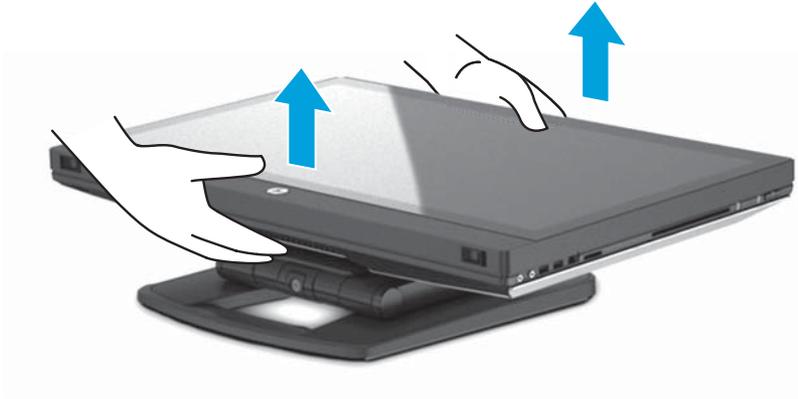
 **NOTE:** Keep in mind the following:

- An outline around the internal USB port identifies the maximum area allowed for an internal USB device. The USB wireless transceiver must fit within this area.
- The USB wireless transceiver is in the keyboard box.
- You can also install the USB wireless transceiver into a side USB port.
- Be sure that the mouse and keyboard are within 30 cm (12 in) of the workstation and away from interference from other devices.

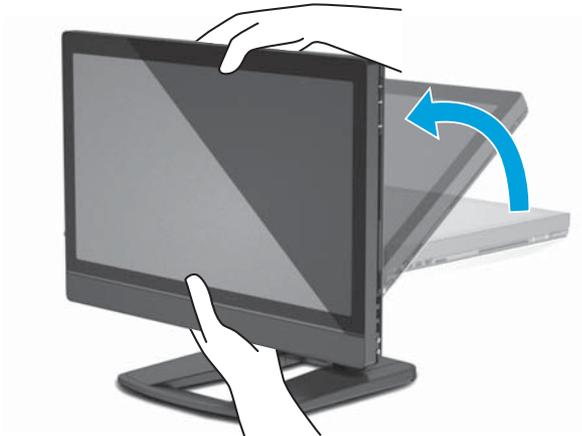
5. Press down on the front of the unit, and then press in on the green button until you hear a click.



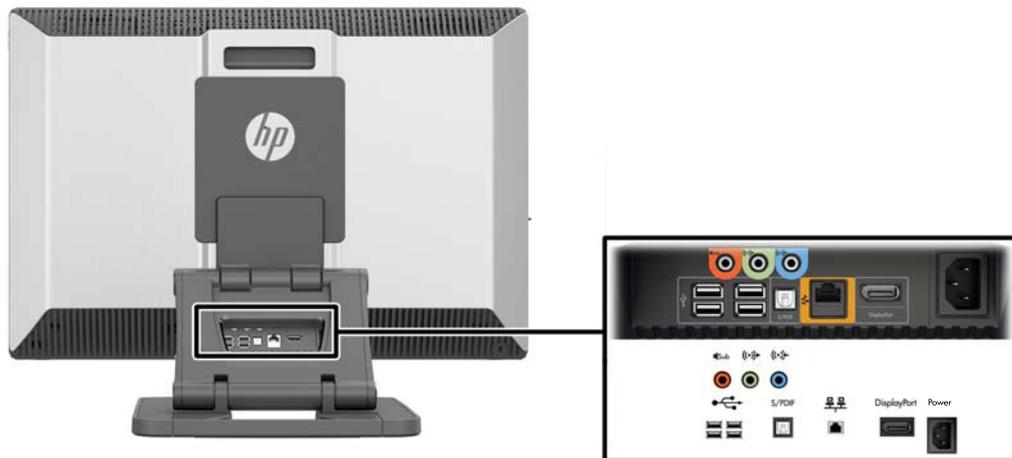
6. Raise the unit up to its highest horizontal position.



7. Rotate the monitor to its full vertical upright position (some force is required).



8. Connect the power cord and peripherals.



IMPORTANT: DO NOT insert the USB wireless transceiver at this location. Refer to steps 3 and 4 for instructions.

9. Connect the workstation to a grounded AC power outlet (1) and turn on the unit (2).



10. Connect the unit to the Internet through the wireless feature or with an RJ-45 network cable.

To set up a WLAN and connect to the Internet, you need a broadband modem (either DSL or cable) (purchased separately), high-speed Internet service purchased from an Internet service provider, and a wireless router (purchased separately).



Connecting Bluetooth devices

The workstation is Bluetooth®-enabled. To connect a Bluetooth wireless device:

1. Make your Bluetooth device send out a radio signal so that it is discoverable by the workstation (refer to the device documentation for instructions).
2. In the Windows **Control Panel**, go to **Hardware and Sound** then to **Devices and Printers**.
 - If your Bluetooth device is a printer, select **Add a printer**, select **Add a network, wireless or Bluetooth printer**, and follow the on-screen instructions.
 - For all other devices, select **Add a device**, select **Bluetooth devices**, and then follow the on-screen instructions.

Disabling Bluetooth devices

The Bluetooth features can be disabled through the system BIOS, through the operating system, or by removing the wireless modules from the system.

 **NOTE:** Disabling the Bluetooth features through the system BIOS or by removing the wireless modules from the system will also disable the WLAN functionality.

To disable the Bluetooth features using the system BIOS, do the following:

1. During system boot, press **F10** to enter the BIOS setup.
2. Locate and select the **Security** menu from the available menu selections displayed near the top of the screen.
3. Select **Slot Security**.
4. Select **Slot 1 mini PCIe / mSATA**.
5. Use the arrow keys to change **Enabled** to **Disabled**, and then press **F10** to accept the change.
6. Select **File** from the header menus, and then select **Save Changes and Exit**.

To disable the Bluetooth features in Windows 7, do the following:

1. Change **View By** from **Category** to either **Large Icon** or **Small Icon**.
2. In **Control Panel**, go to **Device Manager**.
3. Expand **Bluetooth Radios**.
4. Find **Intel® Wireless Bluetooth® 4.0 Adapter**.
5. Select **Disable**.
6. Select **Yes**.
7. To re-enable, select **Enable**.

To disable the Bluetooth features in Windows 8, do the following:

1. Change **View By** from **Category** to either **Large Icon** or **Small Icon**.
2. In **Control Panel**, go to **Device Manager**.
3. Expand **Bluetooth**.
4. Select **Intel® Wireless Bluetooth® 4.0 + HS Adapter** to open the menu.
5. Go to the **Driver** menu and select **Disable**.
6. Select **Yes**.
7. To re-enable, select **Enable**.

To remove the wireless modules, see one of the following for information on removal and replacement of components:

- The *Maintenance and Service Guide* for your workstation at http://www.hp.com/support/workstation_manuals
- Videos for your workstation at <http://www.hp.com/go/sml>

Disabling WLAN

 **NOTE:** The HP Z1 G2 Workstation is WLAN-enabled by default.

 **NOTE:** Disabling the WLAN functionality through the system BIOS or by removing the wireless modules from the system will also disable the Bluetooth features.

The WLAN can be disabled through the system BIOS, through the operating system, or by removing the wireless modules from the system.

To disable the WLAN using the system BIOS, do the following:

1. During system boot, press **F10** to enter the BIOS setup.
2. Locate and select the **Security** menu from the available menu selections displayed near the top of the screen.
3. Select **Slot Security**.
4. Select **Slot 1 mini PCIe / mSATA**.
5. Use the arrow keys to change **Enabled** to **Disabled**, and then press **F10** to accept the change.
6. Select **File** from the header menus, and then select **Save Changes and Exit**.

To disable the WLAN in Windows 7, do the following:

1. Change **View By** from **Category** to either **Large Icon** or **Small Icon**.
2. In **Control Panel**, go to **Device Manager**.
3. Expand **Network Adapters**.
4. Select **Intel® Dual Band Wireless-AC 7260**.
5. Select **Disable**.
6. Select **Yes**.
7. To re-enable, select **Enable**.

To disable the WLAN in Windows 8, do the following:

1. Change **View By** from **Category** to either **Large Icon** or **Small Icon**.
2. In **Control Panel**, go to **Device Manager**.
3. Expand **Network Adapters**.
4. Select **Intel® Dual Band Wireless-AC 7260**.
5. Go to **Driver** menu.
6. Select **Disable**.
7. Select **Yes**.
8. To re-enable, select **Enable**.

To remove the wireless modules, see one of the following for information on removal and replacement of components:

- The *Maintenance and Service Guide* for your workstation at http://www.hp.com/support/workstation_manuals
- Videos for your workstation at <http://www.hp.com/go/sml>

Using touchscreen gestures

A touchscreen computer allows you to control items on the screen directly with your fingers. To use touch gestures, you must have a touch model that has Microsoft Windows installed on it.

 **TIP:** On touchscreen computers, you can perform the gestures on the screen or using the keyboard and mouse.

 **NOTE:** Not all gestures are supported in all programs. Unless otherwise specified, gestures are supported in both Windows 7 and Windows 8.

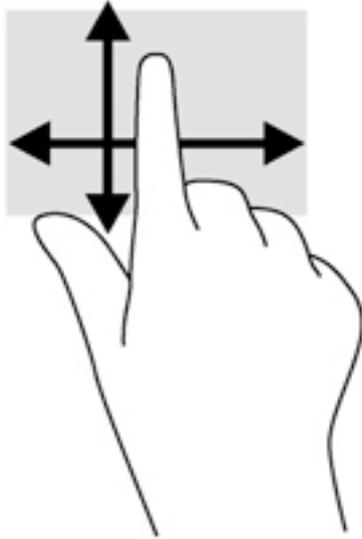
One-finger slide

The one-finger slide is mostly used to pan or scroll through lists and pages, but you can use it for other interactions, too, such as moving an object.

- To scroll across the screen, lightly slide one finger across the screen in the direction you want to move.

 **NOTE:** On Windows 8, when many apps are revealed on the Start screen, you can slide your finger to move the screen left or right.

- To drag, press and hold an object, and then drag the object to move it.



Tapping

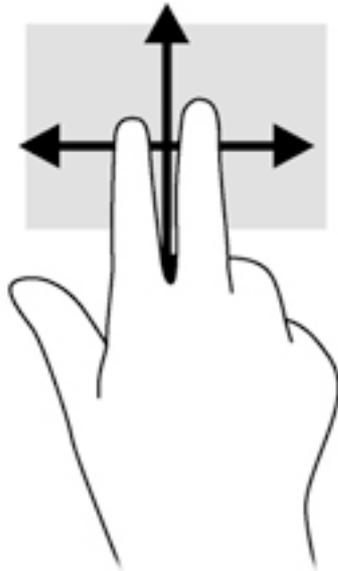
To make an on-screen selection, use the tap function.

- Use one finger to tap an object on the screen to make a selection. Double-tap an item to open it.

Scrolling

Scrolling is useful for moving the pointer up, down, left, or right on a page or image.

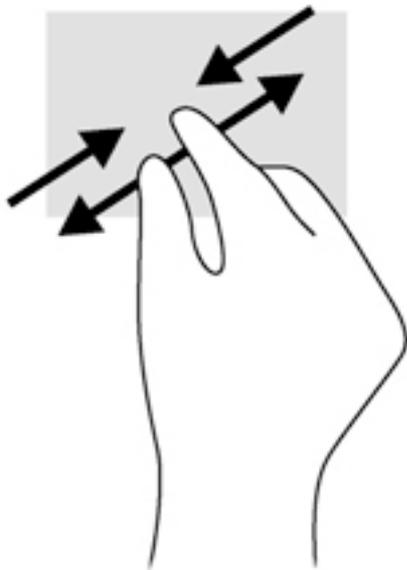
- Place two fingers on the screen and then drag them in an up, down, left, or right motion.



Pinching/stretching

Pinching and stretching allows you to zoom out or in on images or text.

- Zoom in by placing two fingers together on the display and then move your fingers apart.
- Zoom out by placing two fingers apart on the display and then move your fingers together.

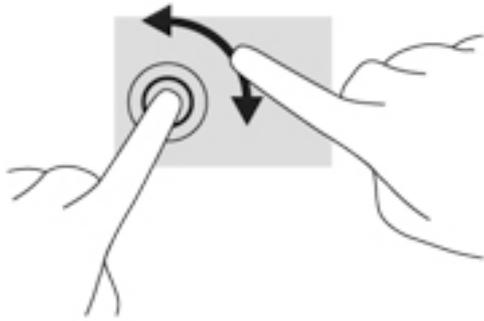


Rotating (select models only)

Rotating allows you to turn items such as photos.

- Anchor the forefinger of your left hand on the object you want to rotate. Using your right hand, slide your forefinger around in a sweeping motion from 12 o'clock to 3 o'clock. To reverse the rotation, move your forefinger from 3 o'clock to 12 o'clock.

 **NOTE:** Rotate is intended for specific apps where you can manipulate an object or image. Rotate may not be functional for all apps.



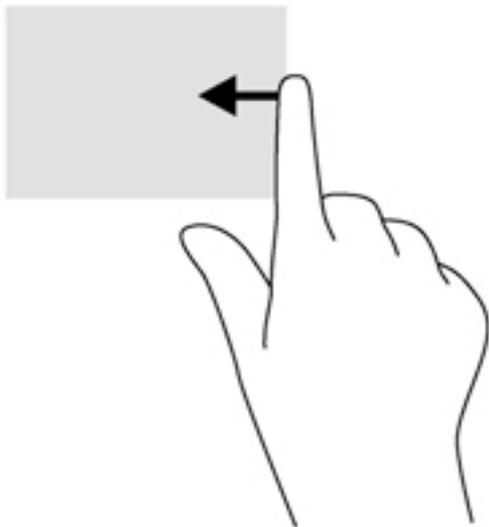
Edge swipes (Windows 8 models only)

With edge swipes you can perform tasks such as changing settings and finding or using apps.

Right-edge swipe

The right-edge swipe reveals the charms, which let you search, share, start apps, access devices, or change settings.

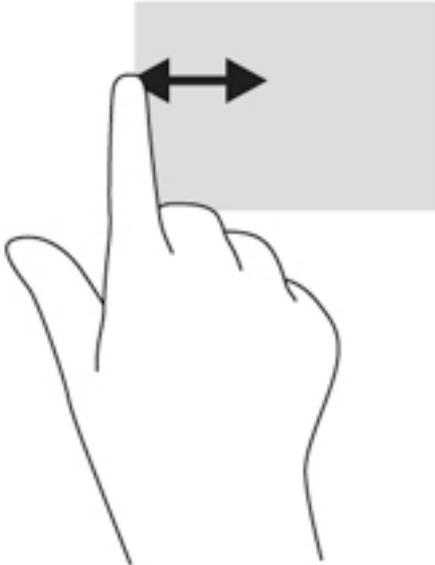
- Gently swipe your finger inward from the right edge of the display onto the screen to reveal the charms.



Left-edge swipe

The left-edge swipe reveals your open apps so that you can switch to them quickly.

- Gently swipe your finger inward from the left edge of the display to switch between apps. Without lifting your finger, swipe back toward the left edge to reveal all open apps.



Bottom-edge swipe

The bottom-edge swipe allows you to open a list of apps available on your computer.

- ▲ From the Windows Start screen, gently swipe your finger from the bottom edge of the display onto the screen to view available apps.

Tapping

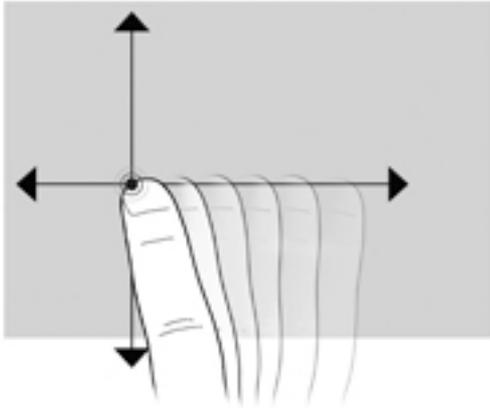
Tap or double-tap an item on the screen as you would click or double-click with an external mouse. Tap and hold an item to see the context menu.

 **NOTE:** You must tap and hold your finger until a circle appears around the area you are touching, and then the context menu appears.

Flicking (Windows 7 models only)

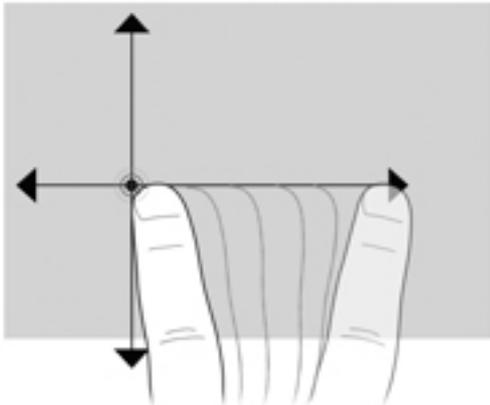
Touch the screen in a light, quick flicking motion up, down, left, or right to navigate through screens or quickly scroll through documents.

 **NOTE:** For the flick movement to work, a scrollbar must be present in the active window.



Dragging

Press your finger on an item on the screen, and then move your finger to drag the item to a new location. You can also use this motion to slowly scroll through documents.



Setting touchscreen preferences

1. To set preferences, perform one of the following:
 - (Windows 7) Select **Start > Control Panel > Hardware and Sound > Pen and Touch**.
 - (Windows 8) From the **Start** screen, select **Control Panel**, then select **Hardware and Sound**, then select **Pen and Touch**.

These preferences are specific to the touchscreen and the computer.

2. To set preferences for left-handed or right-handed users, perform one of the following:

- (Windows 7) Select **Start > Control Panel > Hardware and Sound > Tablet PC Settings> Other**.
- (Windows 8) From the **Start** screen, select **Control Panel**, then select **Hardware and Sound**, then select **Tablet PC Settings**, then select **Other**.

These preferences are specific to the touchscreen and the computer.

Display options

Adjusting display brightness

The HP Z1 G2 Workstation uses two methods to control the display brightness.

- The backlight brightness settings control the overall brightness of the internal display panel only.
- The pixel color brightness settings control the individual pixel color intensity for the internal display panel and an external monitor. Changing the pixel color brightness will affect the color of the pixels and will affect the colors of your display.

Controlling display panel brightness

Internal display panel backlight brightness

Windows 7 and Windows 8 each offer two methods for controlling the backlight brightness of the internal display panel. These two options adjust the backlight brightness from 100% down to 30%.

Windows 7

1. Change **View By** from **Category** to either **Large Icon** or **Small Icon**.
2. Select **Control Panel > Power Options**.
3. Move the screen brightness slider at the bottom of the window to make adjustments.
4. At the bottom of the window, select **Apply** or **OK** to save the changes.

– or –

1. Select **Start > Programs > Productivity and Tools > HP My Display**.
2. Select **Adjust**.
3. Move the slider to make adjustments.
4. At the bottom of the window, select **Apply** or **OK** to save the changes.

Windows 8

1. Change **View By** from **Category** to either **Large Icon** or **Small Icon**.
2. Point to the upper-right of the Start screen to display the charms.
3. Select **Settings**.
4. In the lower-right corner, select **Brightness**.
5. Move the slider to make adjustments.

Controlling the brightness of the display panel and an external monitor

Pixel color brightness is controlled with either the Intel® iGFX or the NVIDIA MXM graphics controller interface. Both controllers can adjust the internal display panel and an external monitor. This adjustment affects the brightness level of the individual RGB pixels and affects the colors of the pixels.

Intel iGFX adjustments for an internal display panel

1. Right-click a blank area on the display desktop to open the system display-control window. Select **Graphics Properties**.
2. Select the **Advanced** option, and select **OK**. The Intel Graphics and Media control panel opens.
3. From the left side of the Intel Graphics and Media control panel, select **Display > Color Enhancement**.
4. Open the **Display** drop-down menu, and then select **Built-In Display**.
5. The brightness slider is set to 0%. Move the slider to adjust the brightness up to 100% or down to -60%.
6. At the bottom of the window, select **Apply** or **OK** to save the changes.

Intel iGFX pixel color adjustments for an external monitor

1. Right-click a blank area on the display desktop to open the system display-control window. Select **Graphics Properties**.
2. Select the **Advanced** option, and then select **OK**. The Intel Graphics and Media control panel opens.
3. From the left side of the control panel, select **Display > Color Enhancement**.
4. Open the **Display** drop-down menu, and then under **External Monitor**, select the listing for your monitor. For example, if a ZR2740w monitor is connected, select **Digital Display ZR2740w**.
5. The brightness slider is set to 50%. Move the slider up or down to adjust the brightness.
6. At the bottom of the window, select **Apply** or **OK** to save the changes.

NVIDIA MXM controller pixel color adjustments for an internal display panel

1. Right-click a blank area on the display desktop to open the system display-control window. Select the **NVIDIA** control panel.
2. Select the **HP Z1 G2** display panel icon. A green box outlines the icon.
3. On the left side of the NVIDIA Control Panel, select **Adjust desktop color settings**, and select the internal display panel to adjust the settings.
4. Select the **Use NVIDIA Settings** option.
5. The brightness slider is set to 50%. Move the slider up or down to adjust the brightness.
6. At the bottom of the window, select **Apply** or **OK** to save the changes.

NVIDIA MXM controller pixel color adjustments for an external monitor

1. Right-click a blank area on the display desktop to open the system display-control window. Select the **NVIDIA** control panel.
2. Select the icon for your external monitor. A green box outlines the icon.
3. On the left side of the NVIDIA Control Panel, select **Adjust desktop color settings**, and select the external monitor to adjust the settings.
4. Select the **Use NVIDIA Settings** option.
5. The brightness slider is set to 50%. Move the slider up or down to adjust the brightness.
6. At the bottom of the window, select **Apply** or **OK** to save the changes.

Adding an external monitor

To connect a monitor to the workstation:

1. Determine the correct cable and/or adapter requirements for the monitor.

Monitor Interface	Required connection
DisplayPort	DisplayPort cable
VGA	DisplayPort to VGA adapter with VGA cable
DVI	DisplayPort to DVI adapter with DVI-D cable
Dual-Link DVI	DisplayPort to DLDVI adapter with Dual-Link cable
HDMI	DisplayPort to HDMI adapter with HDMI cable

2. Connect the DisplayPort end of the cable/adapter to the DisplayPort connector on the back of the workstation.
3. Connect the other end of the cable to the external monitor.
4. Turn on the monitor. If the workstation is running Windows and a graphics driver is installed, the workstation automatically detects the external monitor and uses it as a display.

Customizing the display panel or an external monitor

You can manually select or change the monitor refresh rates, screen resolution, color settings, font sizes, and power management settings of the workstation's display panel or external monitor. Use either the control panel of the graphics processing unit (MXM card or integrated graphics) or select the Windows **Control Panel > Display** options.

For more information about customizing your external monitor, refer to the documentation included with the monitor.

Using the HP Z1 G2 Workstation as a monitor

The DisplayPort connector on the HP Z1 G2 Workstation is bi-directional and lets you use the workstation as a display for another computer, such as a laptop. The other computer (referred to as the *external graphics source*) must have a graphics DisplayPort output connector.

A set of keystrokes on the workstation keyboard switches the port from output to input and back. While in output mode, the port drives an external monitor. While in input mode, an external graphics source drives the workstation display panel.

 **NOTE:** This feature is described here as supported on the Windows operating system. Similar functionality is available for some Linux operating systems. The Linux package is available for download at <http://www.hp.com/linux> or might be included in the pre-loaded Linux operating system.

To use the workstation as a monitor:

1. Connect one end of a DisplayPort cable to the external graphics source's DisplayPort connector. Connect the other end to the DisplayPort connector on the back of the HP Z1 G2 Workstation.



2. On the HP Z1 G2 Workstation keyboard, simultaneously press **Ctrl+Shift+S+D** (*switch display*) to enable the workstation to display output from the external graphics source.
3. To switch back, simultaneously press **Ctrl+Shift+S+D** on the HP Z1 G2 Workstation keyboard to reinstate the internal graphics source and place the workstation display panel in standby mode. On the HP Z1 G2 Workstation, move the mouse or press the space bar to wake up the display panel.

 **NOTE:** This feature relies on the **My Display** utility, which is subject to change with new software and driver releases. To download the latest software and driver, go to http://www.portrait.com/dtune/hpw/enu/upgrade_instructions.html.

Adjusting the audio signal

- There is no hardware volume control on the HP Z1 G2 Workstation. (However, some keyboards do have volume buttons, usually in the upper-right corner.)
- Volume can be adjusted with the operating system (OS) master control or the software (SW) audio player control.
- The OS master control and SW audio player control are independent. However, they are both simultaneously active and affect the overall volume of the audio signal.
- If the audio signal is not audible, check the OS master control and SW audio player control to be sure that neither is set too low.

Using the webcam

The webcam works automatically with any webcam software.

A white activity light is on when the webcam is active. Optimal performance of the fixed-focus lens is at 0.5 meters.

A dial at the top of the workstation lets you perform the following tasks:

- Adjust the camera angle.
- Disable the camera by turning the dial all the way toward the front of the workstation. A red stripe in the camera viewport indicates the lens is pointing straight down into the chassis. The user is not visible.

Installing optional components

You can install additional components such as memory, hard drives, and wireless modules in your workstation.

- To view component installation videos, go to <http://www.hp.com/go/sml>.
- For installation guidelines and technical information, refer to the *Maintenance and Service Guide* at http://www.hp.com/support/workstation_manuals.

Security

You can secure your workstation by attaching a lock to the security cable slot. The workstation includes several security features to reduce the risk of theft and to warn of chassis intrusion. Refer to the *Maintenance and Service Guide* for information about additional hardware and software security features available for your system.

Product recycling

HP encourages customers to recycle used electronic hardware, HP original print cartridges, and rechargeable batteries.

For information about recycling HP components or products, go to <http://www.hp.com/go/recycle>.

4 Setting up, backing up, restoring, and recovering Windows 7

This chapter provides setup and update information for the Windows 7 operating system. It includes these topics:

- [Setting up the Windows 7 operating system](#)
- [Backing up, restoring, and recovering Windows 7](#)

 **CAUTION:** Do not add optional hardware or third-party devices to the HP workstation until the operating system is successfully installed. Adding hardware might cause errors and prevent the operating system from installing correctly.

 **NOTE:** After you set up the operating system, be sure that the latest BIOS, drivers, and software updates are installed on the workstation. See [Updating the workstation on page 47](#).

Setting up the Windows 7 operating system

 **CAUTION:** After installation has started, do *not* turn off the workstation until the process is complete. Turning off the workstation during installation can damage the installation and operation of the software.

For complete installation and configuration instructions, go to <http://windows.microsoft.com/en-US/windows7/help>. Additional information is available in the Windows 7 online Help after you successfully install the operating system.

Installing or upgrading device drivers

You must install the appropriate device drivers before you install hardware devices. Follow the installation instructions that came with each device. For optimum performance, your operating system must have the most recent updates, patches, and service packs. See <http://www.hp.com> for HP-qualified drivers. For additional driver and software update information, see [Updating the workstation on page 47](#).

Transferring files and settings

The Windows operating system offers data migration tools that help you select and transfer files and data from one Windows-based workstation to another.

For information about these tools, go to <http://www.microsoft.com>.

Backing up, restoring, and recovering Windows 7

Your workstation includes tools provided by HP and Windows to help you safeguard your information and retrieve it if you ever need to. These tools will help you return your workstation to a proper working state or even back to the original factory state, all with simple steps.

This section provides information about the following processes:

- Creating backups
- Restoring and recovering your system



NOTE: For more details about the Windows Backup and Restore tools provided, see Help and Support. To access Help and Support: select **Start**, and then select **Help and Support**.

Recovery after a system failure is only as good as your most recent backup.

1. After you successfully set up the workstation, use Windows tools to create recovery media. In Windows 7, select **Start > Control Panel > System and Security > Backup and Restore > Create a system image**.
2. As you add hardware and software programs, create system restore points. A system restore point is a snapshot of certain hard drive contents saved by Windows System Restore at a specific time. A system restore point contains information that Windows uses, such as registry settings. Windows creates a system restore point for you automatically during a Windows update and during other system maintenance activities (such as a software update, security scanning, or system diagnostics). You can also manually create a system restore point at any time. For more information and steps for creating specific system restore points, see Help and Support. To access Help and Support: select **Start**, and then select **Help and Support**.
3. As you add photos, video, music, and other personal files, create a backup of your personal information. If files are accidentally deleted from the hard drive and they can no longer be restored from the Recycle Bin, or if files become corrupted, you can restore the files that you backed up. In case of system failure, you can use the backup files to restore the contents of your workstation. See [Backing up your information on page 30](#).



NOTE: HP recommends that you print the recovery procedures and save them for later use, in case of system instability.

Backing up your information



NOTE: Windows includes the User Account Control feature to improve the security of your workstation. You may be prompted by User Account Control for your permission or password when you perform certain tasks. To continue a task, select the appropriate option. For information about User Account Control, see Help and Support: select **Start** and then select **Help and Support**.

You should create your initial backup immediately after initial system setup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup. Your initial and subsequent backups allow you to restore your data and settings if a failure occurs.

 **NOTE:** For detailed instructions on various backup and restore options, perform a search for these topics in Help and Support. To access Help and Support: select **Start** and then select **Help and Support**.

You can back up your information to an optional external hard drive, a network drive, or discs.

Note the following when backing up your information:

- Store personal files in the Documents library, and back it up regularly.
- Back up templates that are stored in their associated directories.
- Save customized settings that appear in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to reset your preferences.
- When backing up to discs, number each disc after removing it from the drive.

To create a backup using Windows Backup and Restore:

 **NOTE:** The backup process may take over an hour, depending on file size and the speed of the workstation.

1. Select **Start > All Programs > Maintenance > Backup and Restore**.
2. Follow the on-screen instructions to set up your backup.

System Restore

If you have a problem that might be due to software that you installed on your workstation, use System Restore to return the workstation to a previous restore point. You can also set restore points manually.

 **NOTE:** Always use this System Restore procedure before you use the System Recovery feature.

To start System Restore:

1. Close all open programs.
2. Select **Start**, select **Computer**, and then select **Properties**.
3. Select **System protection > System Restore > Next**, and then follow the on-screen instructions.

System Recovery

 **CAUTION:** This procedure will delete all user information. To prevent loss of information, be sure to back up all user information so you can restore it after recovery.

Always use the System Restore procedure before you use the System Recovery program. See [System Restore on page 31](#).

System Recovery completely erases and reformats the hard disk drive, deleting all data files that you have created, and then reinstalls the operating system, programs, and drivers. However, you must reinstall any software that was not installed on the workstation at the factory. This includes software that came on media included in the workstation accessory box, and any software programs that you have installed.

You can order a recovery media set from support. For U.S. support, go to <http://www.hp.com/support>. For worldwide support, go to <http://www8.hp.com/us/en/contact-hp/ww-contact-us.html>. You can also order the recovery media set by calling support.

 **NOTE:** Some features might not be available on systems that are shipped without a Windows operating system.

You must choose one of the following methods to perform a System Recovery:

- Recovery image — Run System Recovery from a recovery image stored on your hard disk drive. The recovery image is a file that contains a copy of the original factory-shipped software. To perform a System Recovery from a recovery image, see [System Recovery from a recovery partition image on page 32](#).
- Recovery media — Run System Recovery from recovery media that you have purchased separately.

System Recovery from a recovery partition image

 **CAUTION:** System Recovery deletes all data and programs that you have created or installed.

A Windows system from the HP factory ships with a recovery partition. You can use the recovery partition to recover the factory operating system.

1. Turn off the workstation. If necessary, press and hold the power button until the workstation turns off.
2. Disconnect all peripheral devices from the workstation except the monitor, keyboard, and mouse.
3. Press the power button to turn on the workstation.
4. As soon as you see the HP logo screen, repeatedly press the **F11** key on your keyboard until the *Windows is Loading Files...* message appears on the screen.
5. At the HP Recovery Manager screen, follow the on-screen instructions to continue.
6. When Windows has loaded, shut down the workstation, reconnect all peripheral devices, and then turn the workstation back on.

Using HP Recovery Disc operating system discs

 **CAUTION:** Using a Windows 7 operating system DVD completely erases hard drive contents and reformats the hard drive. All files that you have created and any software that you have installed on the workstation are permanently removed. When reformatting is complete, the recovery process helps you restore the operating system, as well as the original drivers. Software that came with the system can be downloaded at <http://www.hp.com>.

Use the steps provided in this section if you ordered a Windows 7 operating system DVD and Driver DVD.

To order a Windows 7 operating system DVD and Driver DVD, go to the HP website. For U.S. support, go to <http://www.hp.com/cgi-bin/hpsupport/index.pl>. For worldwide support, go to <http://www8.hp.com/us/en/contact-hp/ww-contact-us.html>. You can also order the DVDs by calling support.

To initiate recovery using a Windows 7 operating system DVD:

 **NOTE:** This recovery process takes several minutes.

1. Backup all personal files.
2. Restart the workstation, and then insert the Windows 7 operating system DVD into the optical drive.

 **NOTE:** If the workstation does not boot to the DVD, restart the workstation and press **Esc** as the workstation is powering on to see the startup menu. Use the arrow keys to select the boot menu and press **enter**. Use the arrow keys to select the location where the recovery DVD is inserted to boot from that device. Booting the DVD from UEFI Boot sources will result in a GPT boot partition. Booting from Legacy Boot sources will result in an MBR boot partition.

3. When prompted, press any keyboard key.
4. Follow the on-screen instructions.

After the operating system installation has completed:

1. Eject the Windows 7 operating system DVD, and insert the Driver DVD once the system is booted into the OS for the first time.

 **NOTE:** The Driver DVD will load prerequisite software, and then allow you to load drivers.

2. Install the Hardware Enabling Drivers. HP recommends installing all available drivers.
3. You can download applications that came with the workstation at <http://www.hp.com>.

 **NOTE:** For more information on using the restore media, refer to the white paper “Restoring Windows 7 on the HP Z420, Z620 and Z820: Using HP OS DVD and Driver DVD.” This white paper can be found on <http://www.hp.com/support>.

5 Setting up, backing up, restoring, and recovering Windows 8

This chapter provides setup and update information for the Windows 8 operating system. It includes these topics:

Topics

[Setting up the Windows 8 operating system on page 34](#)

[Backing up, restoring, and recovering Windows 8 on page 35](#)

 **CAUTION:** Do not add optional hardware or third-party devices to the HP workstation until the operating system is successfully installed. Adding hardware might cause errors and prevent the operating system from installing correctly.

 **NOTE:** After you set up the operating system, be sure that the latest BIOS, drivers, and software updates are installed on the workstation. Refer to the chapter on updating the workstation.

Supplementary information

Additional information is available in Help and Support after you customize the operating system. To learn more about Windows 8, review the *Windows Basics* guide included with your computer. The guide provides information on common tasks using the touchscreen or the keyboard.

Setting up the Windows 8 operating system

The first time you turn on the computer you can customize the operating system. When you are connected to the Internet, Microsoft activates your operating system. This process takes about 15 to 30 minutes. Carefully read and follow the instructions on the screen.

We recommend that you register your computer with HP, so you can receive important software updates, request support, and sign up for special offers.

 **CAUTION:** After the initial setup process has begun, **DO NOT TURN OFF THE COMPUTER UNTIL THE PROCESS IS COMPLETE.** Turning off the computer during this process may damage the software that runs the computer or prevent its proper installation.

 **NOTE:** Windows includes the User Account Control feature to improve the security of your computer. You may be prompted by User Account Control for your permission or password when you perform certain tasks. To continue a task, select the appropriate option. For information about User Account Control, see Help and Support: from the Start screen type `help` and then select **Help and Support**.

Downloading Windows 8 updates

Microsoft may release updates to the operating system. To help keep the computer running optimally, HP recommends checking for the latest updates during the initial installation and periodically throughout the life of the computer.

Run Windows Update as soon as possible after you set up your computer.

1. Point to the upper-right or lower-right corner of the Start screen to display the charms.
2. Select **Settings > Change PC Settings > Update and Recovery > Windows Update**.

Backing up, restoring, and recovering Windows 8

Your computer includes tools provided by HP and Windows to help you safeguard your information and retrieve it if you ever need to. These tools will help you return your computer to a proper working state or even back to the original factory state, all with simple steps.

This section provides information about the following processes:

- Creating recovery media and backups
- Restoring and recovering your system

 **NOTE:** For more details about the tools provided, see Help and Support. From the Start screen, type `help`, and then select **Help and Support**.

HP recommends that you print the recovery procedures and save them for later use, in case of system instability.

Backing up your information

 **NOTE:** Windows includes the User Account Control feature to improve the security of your computer. You may be prompted by User Account Control for your permission or password when you perform certain tasks. To continue a task, select the appropriate option. For information about User Account Control, from the Start screen type `help` and then select **Help and Support**.

Recovery after a system failure is as good as your most recent backup. You should create system repair media and your initial backup immediately after initial system setup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup. The system repair media is used to start up (boot) the computer and repair the operating system in case of system instability or failure. Your initial and subsequent backups allow you to restore your data and settings if a failure occurs.

 **NOTE:** For detailed instructions on various backup and restore options, perform a search for these topics in Help and Support. To access Help and Support: from the Start screen, type `help` and then select **Help and Support**.

From the Start screen, type `backup`, and then select **Save backup copies of your files with File History**.

You can back up your information to an optional external hard drive or a network drive.

Note the following when you perform a backup:

- Store personal files in the Documents library, and back it up regularly.
- Back up templates that are stored in their associated programs.
- Save customized settings that appear in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to reset your preferences.

To create a backup using Windows Backup and Restore:



NOTE: The backup process may take more than an hour, depending on file size and the speed of the computer.

1. From the Start screen, type `backup`, and then select from the list of displayed options.
2. Follow the on-screen instructions to set up your backup, create a system image, or create system repair media.

Creating recovery media and backups

Recovery after a system failure is only as good as your most recent backup.

 **CAUTION:** Use a flash drive with a capacity of at least 8 GB. Any information on the USB flash drive will be erased before the recovery media is created.

1. After you successfully set up the computer, create recovery media. This step creates a backup of the recovery partition on the computer. The backup can be used to reinstall the original operating system in cases where the hard drive is corrupted or has been replaced.

You will use a USB flash drive to create a bootable recovery drive that can be used to troubleshoot a Windows 8 computer that is unable to start. The USB flash drive can be used to reinstall the original operating system and the programs that were installed at the factory.

 **CAUTION:** If you select **Copy contents from the recovery partition to the recovery drive**, you will have the option to delete the recovery partition when the Recovery Media creation is finished. On most systems, this partition is 10 GB in size. HP recommends that you not delete this recovery partition. If the partition is deleted, you will be unable to restore the Windows 8 factory recovery partition to the hard drive using the recovery USB drive. You can free up drive space by deleting the recovery partition, but you won't be able to refresh or reset the PC again.

To create the recovery media, from the Start screen, type `create a recovery drive`, and then select **Create a recovery drive**. Follow the on-screen instructions to continue.

2. As you add hardware and software programs, create system restore points. A system restore point is a snapshot of certain hard drive contents saved by Windows System Restore at a specific time. A system restore point contains information that Windows uses, such as registry settings. Windows automatically creates a system restore point for you during a Windows update and during other system maintenance activities (such as a software update, security scanning, or system diagnostics). You can also manually create a system restore point at any time. For more information and steps for creating specific system restore points, see Windows Help and Support. From the Start screen, type `help`, and then select **Help and Support**.
3. As you add photos, video, music, and other personal files, create a backup of your personal information. Windows File History can be set to regularly and automatically back up files from libraries, desktop, contacts, and favorites. If files are accidentally deleted from the hard drive and they can no longer be restored from the Recycle Bin, or if files become corrupted, you can use File History to restore the files that you backed up. Restoring files is also useful if you ever choose to reset the computer by reinstalling Windows.

 **NOTE:** File History is not enabled by default, so you must turn it on.

For more information and steps for enabling Windows File History, see Windows Help and Support. From the Start screen, type `help`, and then select **Help and Support**.

Restoring and recovering using Windows 8 tools

Windows recovery tools provide access to several options for recovering your system. Choose the method that best matches your situation and level of expertise:

- If you need to restore your personal files and data, you can use Windows File History to restore your information from the backups you created. For more information and steps for using File

History, see Windows Help and Support. From the Start screen, type `help`, and then select **Help and Support**.

- If you want to restore the system to a previous state without losing any personal information, Windows System Restore is an option. System Restore allows you to restore without the requirements of Windows Refresh or a reinstallation. Windows creates system restore points automatically during a Windows update and other system maintenance events. Even if you did not manually create a restore point, you can choose to restore to an automatically created restore point. For more information and steps for using Windows System Restore, see Windows Help and Support. From the Start screen, type `help`, and then select **Help and Support**.
- If you want a quick and easy way to recover the system without losing your personal information, settings, or the apps that came preinstalled on your computer or were purchased from the Windows Store, Windows Refresh is an option. This method does not require backing up data to another drive. See [Using Windows 8 Refresh on page 38](#).
- If you want to reset your computer to its original state, Windows Reset provides an easy way to remove all personal data, apps, and settings, and reinstall Windows. The Reset recovery tool reinstalls the operating system and HP programs and drivers that were installed at the factory. Software not installed at the factory must be reinstalled. Any personal files must be restored from backups you made. See [Using Windows 8 Reset on page 39](#).
- If the computer is unable to start, you can use the Windows recovery USB flash drive you created to recover the system. See [Recovery using the Windows 8 recovery USB flash drive on page 40](#).
- If the computer is unable to start and you did not create a recovery USB flash drive or the one you created does not work, see [Recovery using Windows 8 restore media on page 41](#).

Using Windows 8 Refresh

 **IMPORTANT:** Refresh removes any traditional applications that were not originally installed on the system at the factory.

 **NOTE:** You may be prompted by User Account Control for your permission or password when you perform certain tasks. To continue a task, select the appropriate option. For information about User Account Control, see Help and Support: from the Start screen type `help`, and then select **Help and Support**.

If Windows is responding, use these steps to start Refresh:

 **NOTE:** During Refresh, a list of removed traditional applications will be saved so that you have a quick way to see what you might need to reinstall. See Help and Support for instructions on reinstalling traditional applications. From the Start screen, type `help`, and then select **Help and Support**.

1. On the Start screen, point to the far-right upper or lower corner of the screen to display the charms.
2. Select **Settings**.
3. Select **Change PC settings** in the bottom-right corner of the screen, and then select **Update and Recovery > Recovery** from the PC settings screen.
4. Under **Refresh your PC without affecting your files**, select **Get started**, and follow the on-screen instructions.

If Windows is not responding, use these steps to start Refresh:

1. If possible, back up all personal files.
2. If possible, check for the presence of the HP Recovery partition: from the Start screen, type *This PC*, and then select **This PC**.



NOTE: If the HP Recovery partition is not listed, or you cannot check for its presence, you must recover using the recovery media that you created. See [Recovery using the Windows 8 recovery USB flash drive on page 40](#). If you did not create recovery media, you must use the Windows 8 restore media (available separately). See [Recovery using Windows 8 restore media on page 41](#).

3. If the HP Recovery partition is listed, restart the computer, and then press **esc** while the company logo is displayed. The computer Startup Menu opens.
4. Press **f11** to select the **System Recovery** option.
5. Choose your keyboard layout.
6. Select **Troubleshoot**.
7. Select **Refresh**.
8. Follow the on-screen instructions to continue.

Using Windows 8 Reset



IMPORTANT: Reset does not provide backups of your information. Before using Reset, back up any personal information you want to retain.

If Windows is responding, use these steps to start Reset:



NOTE: You may be prompted by User Account Control for your permission or password when you perform certain tasks. To continue a task, select the appropriate option. For information about User Account Control, see Help and Support: from the Start screen type *help*, and then select **Help and Support**.

1. On the Start screen, point to the far-right upper or lower corner of the screen to display the charms.
2. Select **Settings**.
3. Select **Change PC settings** in the bottom-right corner of the screen, select **Update and Recovery** then select **Recovery**
4. Under **Remove everything and reinstall Windows**, select **Get started**, and follow the on-screen instructions.

If Windows is not responding, use these steps to start Reset:

1. If possible, back up all personal files.
2. If possible, check for the presence of the HP Recovery partition: from the Start screen, type *This PC*, and then select **This PC**.



NOTE: If the HP Recovery partition is not listed, or you cannot check for its presence, you must recover using the recovery media that you created. See [Recovery using the Windows 8 recovery USB flash drive on page 40](#). If you did not create recovery media, you must use the Windows 8 restore media (available separately). See [Recovery using Windows 8 restore media on page 41](#).

3. If the HP Recovery partition is listed, restart the computer, and then press **esc** while the company logo is displayed. The computer Startup Menu opens.
4. Press **f11** to select the **System Recovery** option.
5. Choose your keyboard layout.
6. Select **Troubleshoot**.
7. Select **Reset**.
8. Follow the on-screen instructions to continue.

Recovery using the Windows 8 recovery USB flash drive

 **CAUTION:** Using **f11** completely erases hard drive contents and reformats the hard drive. All files that you have created and any software that you have installed on the computer are permanently removed. The **f11** recovery tool reinstalls the operating system and the HP programs and drivers that were installed at the factory. You must reinstall all other software.

To recover your system using the recovery USB flash drive you previously created:

 **NOTE:** If you did not create a recovery USB flash drive or the one you created does not work, see [Recovery using Windows 8 restore media on page 41](#).

1. If possible, back up all personal files.
2. Insert the recovery USB flash drive into a USB port on your computer.
3. Restart the computer and as soon as you see the HP logo screen, press **f9** to display a list of boot devices. Use the arrow keys to select your USB flash drive from the UEFI Boot Sources list. Press **enter**.
4. Choose your keyboard layout.
5. Select **Troubleshoot**.
6. Select **Refresh your PC**.
7. Follow the on-screen instructions.

Recovery using Windows 8 restore media

This recovery process requires Windows 8 restore discs, which can be ordered from the support website. The Windows 8 restore media consists of a Windows 8 operating system disc and a Windows 8 driver disc.

For U.S. support, go to <http://www.hp.com/support>. For worldwide support, go to <http://www8.hp.com/us/en/contact-hp/ww-contact-us.html>. You can also order the media by calling support.

 **CAUTION:** Using the Windows 8 operating system disc completely erases hard drive contents and reformats the hard drive. All files that you have created and any software that you have installed on the computer are permanently removed. When reformatting is complete, the recovery process helps you restore the operating system, as well as drivers, software, and utilities.

Begin recovery using the Windows 8 operating system disc:

 **NOTE:** It can take several minutes to load the operating system disc.

1. Back up all personal files.
2. Restart the computer, and then follow the instructions provided with the Windows 8 operating system disc to install the operating system.
3. When prompted, press any keyboard key.

 **NOTE:** If the computer does not boot to the DVD, restart the computer and press **esc** as the computer is starting to see the Startup menu. Use the arrow keys to select the boot menu, and then press **enter**. Use the arrow keys to select the location where the recovery DVD is inserted to boot from that device. Booting the DVD from UEFI Boot sources will result in a GPT boot partition. Booting from Legacy Boot sources will result in an MBR boot partition. It is recommended that you boot Windows 8 from UEFI Boot sources to take full advantage of the features available in Windows 8.

4. Follow the on-screen instructions.

After the repair is completed and the Windows 8 desktop appears:

1. Remove the Windows 8 operating system disc, and then insert the driver disc.

 **NOTE:** The driver disc will load prerequisite software, and then allow you to load drivers and applications.

2. Install the Hardware Enabling Drivers first, and then install Recommended Applications.
3. Install Recommended Applications of your choice. Only applications that are not available for download from <http://www.hp.com> are included on the driver disc.

6 Setting up and restoring Linux

HP offers a variety of Linux solutions for HP workstation customers:

- HP certifies and supports Red Hat® Enterprise Linux (RHEL) on HP workstations.
- HP certifies and supports SUSE Linux Enterprise Desktop (SLED) on HP workstations.
- HP offers a SLED 11 preload on some Z series Workstations.

This chapter describes how to set up and restore the Linux operating system. It includes these topics:

Topics
HP Installer Kit for Linux (HPIKL) on page 43
Setting up Red Hat Enterprise Linux on page 43
Setting up SUSE Linux Enterprise Desktop (SLED) on page 45
Proprietary graphics drivers on page 46

 **NOTE:** After you set up the operating system, be sure that the latest BIOS, drivers, and software updates are installed. Refer to the chapter on updating the workstation.

 **CAUTION:** Do not add optional hardware or third-party devices to the workstation until the operating system is successfully installed. Adding hardware might cause errors and prevent the operating system from installing correctly.

HP Linux Support Matrix

Not all release streams are supported on particular platforms. To find out which streams are supported on your workstation, see the *Linux certification and support matrix*.

1. Go to <http://www.hp.com/linux>.
2. On the **Platforms** tab, click **HP Workstations**.
3. Under the heading **Certification Matrix**, select your Linux version.
4. Select the appropriate tab.

HP Installer Kit for Linux (HPIKL)

The HP Installer Kit for Linux helps users install certified versions of RHEL or SLED on HP workstations. It is available as an operating system option on all HP workstations.

- The kit contains tested drivers that augment and/or replace those found in RHEL or SLED, to enable proper use and behavior on HP workstations.
- The kit does **not** include the Linux operating system, which must be purchased separately from Red Hat or SUSE. To view supported configurations and operating systems, go to http://www.hp.com/support/linux_hardware_matrix.

The HPIKL option includes a FreeDOS preload. This operating system option accommodates those who have a customized Linux distribution or who have a licensed version of RHEL or SLED and would like to install the HP-recommended driver additions.

The kit also can be downloaded using the following steps:

1. Go to http://www.hp.com/support/workstation_swdrivers.
2. Select your workstation model.
3. Select the desired operating system.
4. Select your software/driver language, and then click the **Software** quick jump link.
5. Select the **Obtain Software** link for the appropriate package (typically the most recent revision).
6. Click **I Accept** to accept the terms of the license agreement.
7. Download the software ISO image and save it on a disc. This disk is your *HP driver disc*.

Setting up Red Hat Enterprise Linux

HP Z series Workstations are certified and supported on RHEL streams appropriate to the hardware technology.

- For details of RHEL support for a particular platform, see the *Hardware Support Matrix for HP Linux Workstations* at http://www.hp.com/support/linux_hardware_matrix.
- For information about Red Hat certifications on HP workstations, go to <https://hardware.redhat.com>.

HPIKL driver disc

Recent versions of Red Hat Linux typically require only driver updates with minor fixes to support HP workstations. These releases can usually be supported with the HPIKL driver disc, which can be used as a post-installation utility for the standard Red Hat Linux install.

After you complete the standard Red Hat install and restart the system, a Red Hat *first-boot* utility runs. After you specify a number of settings (such as the security level, time and date, root password, user accounts), the utility lets you load an additional disc.

The driver disc is used during this phase. All content added by HP is in the `/HP` directory on the disc. You can use it to build your own image or to browse the HP content.

 **NOTE:** Some installations may encounter problems if they are performed with a DisplayPort connection to the monitor. This is because the default drivers that the OS installers use do not support DisplayPort functionality. If you experience problems, try overriding the monitor choice for DisplayPort during the start of the install and using the VESA driver instead. You can then set up the DisplayPort monitor later.

Installing with the HP Red Hat Linux driver disc

1. If you do not have the appropriate HP driver disc for a supported stream, create one (see [HP Installer Kit for Linux \(HPIKL\) on page 43.](#))
2. Install the operating system using the optical media included in the Red Hat Linux box-set.
3. If you have a Red Hat driver disk for the OS version you are installing, enter `linux dd` when the initial install splash screen appears, and then press **Enter**.
4. When asked if you have a driver disc, select **Yes**. Place the Red Hat driver disc in the drive, and select the appropriate `drive:hd[abcd]`. Continue the normal installation.
5. After successfully installing the operating system, reboot the workstation.
 - RHEL 5: the Red Hat Setup Agent (also known as first-boot) automatically starts. At the **Additional DVDs** screen, insert your HP driver disc and select **Install**. When the driver installation task is completed, continue following the prompts until the operating system is successfully installed.
 - RHEL 6: Insert your HP driver disc. The HPIKL installation software automatically starts. Follow the on-screen instructions to install the contents.

Setting up SUSE Linux Enterprise Desktop (SLED)

HP offers a 64-bit SLED 11 preload on some Z series Workstations and supports 64-bit SLED 11 on other workstations.

Various versions of SLED are certified and supported by SUSE on HP workstations. For more information, go to the SUSE certification bulletin search page at <https://www.suse.com/yessearch/Search.jsp>.

Setting up preloaded SLED

To set up SLED on systems preloaded with the operating system:

1. Start the workstation.
2. When prompted, enter the workstation installation settings: password, network, graphics, time, keyboard settings, and SUSE Customer Center Configuration.



NOTE: You can activate your SUSE subscription from the SUSE Customer Center Configuration screen. To view the full SUSE Customer Center documentation, go to <http://www.suse.com/documentation>, and select your operating system.

Installing SLED with the DVD Installer Kit

1. If an HP driver disc did not come with your workstation, create one (see [HP Installer Kit for Linux \(HPIKL\) on page 43](#)).
2. Install the operating system using the discs included in the SUSE box-set.
3. After successfully installing the operating system, reboot the workstation.
4. Insert your HP driver disc. The HPIKL installation software automatically starts. Follow the on-screen instructions to install the contents.

Restoring SLED (preloaded systems only)

To restore SLED, you must use the SLED restore media. To create restore media:

1. Click the SUSE ISO icon on the desktop to go to the `/iso` folder. This folder contains all ISO images used to preload your workstation.
2. Follow the instructions in the readme file in this folder to copy the ISO image file onto optical media.
3. Store the media in a safe place. If your workstation experiences a hard drive failure, use the ISO recovery images to restore your operating system.

 **CAUTION:** Restoring the operating system does **not** restore data. Back up your data using the method and media of your choice.

Proprietary graphics drivers

Most HP workstations can be ordered with graphics cards that have been through extensive verification by HP. See the *Hardware Support Matrix for HP Linux Workstations* at http://www.hp.com/support/linux_hardware_matrix for a list of supported cards.

 **NOTE:** Not all graphics cards are available on every workstation. Limitations generally occur for cards that consume large amounts of power in lower-power workstations.

Proprietary graphics drivers supported by HP and the graphics vendors are available with the HP Installer Kit for Linux, with the SLED 11 preload on Z series Workstations, and from HP Workstation Support at <http://www.hp.com/go/workstationsupport>.

These proprietary drivers are not a standard part of the RHEL or SLED distributions because they are not open source. Driver revisions more recent than those at the HP support website are supported directly by the vendor.

7 Updating the workstation

HP is constantly working on improving your total workstation experience. To be sure that your workstation leverages the latest enhancements, HP recommends that you install the latest BIOS, driver, and software updates on a regular basis.

Updating the workstation after first start

After successfully starting the workstation for the first time, you should follow these guidelines to be sure that the workstation is up to date:

- Be sure that you have the latest system BIOS loaded. See [Upgrading the BIOS on page 47](#).
- Be sure that you have the latest drivers for your system. See [Upgrading device drivers on page 48](#).
- Become familiar with your available HP resources.
- Consider a subscription to Driver Alerts at <http://www.hp.com/go/subscriberschoice>.

Upgrading the BIOS

For optimum performance, determine the BIOS revision on the workstation, and upgrade it if necessary.

Determining the current BIOS version

To determine the current BIOS version:

1. Press **Esc** during startup.
2. Press **F10** to enter the F10 Setup utility.
3. Select **File > System Information**. Note the workstation BIOS version and compare it with the BIOS versions that appear on the HP website.

 **NOTE:** Procedures for upgrading the BIOS, as well as the F10 Computer Setup utility BIOS Menu settings, are located in the *Maintenance and Service Guide* at http://www.hp.com/support/workstation_manuals.

Upgrading BIOS

To find and download the latest available BIOS, which includes the latest enhancements:

1. Go to <http://www.hp.com/go/workstationsupport>.
2. Select **Download Drivers and Software** from the left menu column under Tasks.
3. Follow the instructions to locate the latest BIOS available for the workstation.
4. If the BIOS on the website is the same as the version on your system, no further action is required.
5. If the BIOS on the website is a version later than the one on your system, download the appropriate version for the workstation. Follow the instructions in the release notes to complete the installation.

Upgrading device drivers

If you install a peripheral device (such as a printer, display adapter, or network adapter), confirm that you have the latest device drivers loaded. If you purchased your device through HP, visit the HP website to download the latest drivers for your device. These drivers have been tested to be sure the best compatibility between your device and your HP workstation.

If you did not purchase your device from HP, HP recommends visiting the HP website first to see if your device and its drivers have been tested for HP workstation compatibility. If no driver is available, go to the device manufacturer's website to download the latest drivers.

To upgrade device drivers:

1. Go to <http://www.hp.com/go/workstationsupport>.
2. Select the menu option **Download Options**, and then select **Drivers, Software & Firmware**.
3. Follow the instructions to find the latest drivers available for the workstation.

If a needed driver is not found, go to the website of the manufacturer of the peripheral device.

8 Diagnostics and minor troubleshooting

Calling support

At times you might encounter an issue that requires support. Before you call support:

- Have the computer readily accessible.
- Write down the computer serial numbers, product numbers, model names, and model numbers and have them in front of you.
- Note any applicable error messages.
- Note any add-on options.
- Note the operating system.
- Note any third-party hardware or software.
- Note the details of any blinking lights on the front of the computer (tower and desktop configurations) or on the side of the computer (all-in-one configurations).
- Note the applications you were using when you encountered the problem.

 **NOTE:** When calling in for service or support, you might be asked for the product number (example: PS988AV) of the computer. If the computer has a product number, it is generally located next to the 10- or 12-digit serial number of the computer.

 **NOTE:** The serial number and product number labels can be found on a pull-out card at the side of the display.

For a listing of all worldwide support phone numbers, go to <http://www.hp.com/support>, select your region, and then, in the upper-right corner, select **Connect with HP**.

Locating ID labels

To assist in troubleshooting, product, serial, and authentication numbers are available on each computer.

- All workstations have a serial number (unique for each workstation) and product number. Have these numbers available when you contact support.
- The Certificate of Authentication (COA) is used only for systems with Windows 7 preinstalled.
- The Genuine Microsoft Label (GML) is used only for systems with Windows 8 preinstalled.
- A service label shows the build ID and Feature Byte strings, which are needed for system board replacement.

The all-in-one service label can be found in the location shown in the figure below (pull-out card).



Locating warranty information

To locate base warranty information, go to <http://www.hp.com/support/warranty-lookuptool>.

To locate an existing Care Pack, go to <http://www.hp.com/go/lookuptool>.

To extend a standard product warranty, go to <http://www.hp.com/hps/carepack>. HP Care Pack Services offer upgraded service levels to extend and expand a standard product warranty.

HP troubleshooting resources and tools

This section provides information on the HP Help and Support Center, online support, and helpful hints for troubleshooting.

Online support

Online access and support resources include web-based troubleshooting tools, technical knowledge databases, driver and patch downloads, online communities, and product change notification services.

The following websites are also available to you:

- <http://www.hp.com>—Provides useful product information.
- http://www.hp.com/support/workstation_manuals—Provides the latest online documentation.
- <http://www.hp.com/go/workstationsupport>—Provides technical support information for workstations.
- <http://www.hp.com/support>—Provides a listing of the worldwide technical support phone numbers. Access the telephone numbers by visiting the website, select your region, and then, in the upper-right corner, select **Contact HP**.
- http://www.hp.com/support/workstation_swdrivers—Provides access to software and drivers for workstations.

Troubleshooting a problem

To help you troubleshoot problems with your system, HP provides the HP Support Center. The HP Support Center is a portal to an extensive selection of online tools. To access the HP Support Center and troubleshoot a problem with the workstation, complete the following steps:

1. Visit <http://www.hp.com/go/workstationsupport>.
2. Select the desired product.
3. Under **Select a product**, select your product.
4. On the **Troubleshoot a problem** page, select the problem that you are troubleshooting.

Instant Support and Active Chat

HP Instant Support is a set of web-based support tools that automate and speed up the resolution of problems concerning desktop computing, tape storage, and printing.

Active Chat enables you to electronically submit a support ticket to HP over the web. When you submit a support ticket, Active Chat collects information about the computer and passes it to an online support specialist. The collection of information might take up to 30 seconds, depending on the computer configuration. When you submit a support ticket, you receive a confirmation message containing your case ID, the support hours for your location, and the estimated time of response.

For more information about HP Instant Support and Active Chat and how to use them, go to <http://instantsupport.hp.com/>.



NOTE: This feature is not available for Linux.

Customer Advisories, Customer and Security Bulletins, and Customer Notices

To find advisories, bulletins, and notices:

1. Go to www.hp.com/go/workstationsupport.
2. Select a product.
3. Under the **Knowledge Base** heading, select **Advisories, Bulletins & Notices**.
4. Review the list of advisories, bulletins and notices, and select an item for viewing.

Product Change Notifications

Product Change Notifications (PCNs) are proactive notifications for product changes occurring within a 30-60 day window of the effective date of the change in the manufacturing process. PCNs give customers advanced notice of changes to their product, such as an updated BIOS version that they may need to qualify prior to the change taking place. To view a list of PCNs, see the section called "Customer Advisories, Customer and Security Bulletins, and Customer Notices."

Helpful hints

If you encounter a problem with the workstation, monitor, or software, the following general suggestions might help you isolate and focus on the problem before taking further action.

At startup

- Verify that the workstation is plugged into a functional AC power outlet.
- Remove all optical discs and USB flash drives before starting the workstation.
- Verify that the workstation is turned on and the power light is on.
- If you have installed an operating system other than the factory-installed operating system, confirm that it is supported on your system by visiting <http://www.hp.com/go/quickspecs>.
- Verify that the internal display panel is lit.
- If the internal display panel is dim, turn up the brightness.
- If you have an external monitor:
 - Verify that the monitor is plugged into a functional AC power outlet.
 - Verify that the monitor is turned on and the green monitor light is on.
 - If the monitor is dim, turn up the brightness and contrast controls.

During operation

- Look for blinking lights on the workstation. The blinking lights are error codes that will help you diagnose the problem. Refer to the *Diagnostic LED and audible (beep) codes* section in the *Maintenance and Service Guide* for your workstation for information on interpreting diagnostic lights and audible codes.
- Press and hold any key. If the system beeps, and then your keyboard is operating correctly.
- Check all cables for loose or incorrect connections.
- Wake the workstation by pressing the power button or any key on the keyboard. If the system remains in suspend mode, shut down the system by pressing and holding the power button for at least four seconds, and then press the power button again to restart the system. If the system does not shut down, unplug the power cord, wait a few seconds, and then plug it in again. If it does not restart, press the power button to start the workstation.
- Reconfigure the workstation after installing a non–plug and play expansion board or other option. Refer to the *Hardware installation problems* section of this document for instructions.
- Be sure that all required device drivers have been installed. For example, if you have connected a printer, you must install a printer driver.
- If you are working on a network, plug another workstation with a different cable into the network connection. There might be a problem with the network plug or cable.
- If you recently added new hardware, remove the hardware to see whether the workstation functions properly.
- If you recently installed new software, uninstall the software to see whether the workstation functions properly.
- If the internal display panel on an all-in-one computer is blank, open the computer and be sure that both ends of the cable between the system board and the internal display panel are connected. If you are using a graphics card, verify that the card is properly installed.

- Upgrade the BIOS. A new release of the BIOS might have been released that supports new features or fixes your problem.
- For more detailed information, see the troubleshooting chapter in the *Maintenance and Service Guide* at http://www.hp.com/support/workstation_manuals.

Customer Self Repair

Under the Customer Self Repair programs, you can order a replacement part and install the part without onsite HP technical assistance. Customer Self Repair might be required for some components. Go to <http://www.hp.com/go/selfrepair> for information on the program.



NOTE: Some components are not eligible for Customer Self Repair and must be returned to HP for service. Call support for further instructions before attempting to remove or repair these components.

Other troubleshooting options

The following additional troubleshooting techniques and tools are located in the *Maintenance and Service Guide* at http://www.hp.com/support/workstation_manuals:

- POST Error Codes
- Diagnostic lights and audible beep codes
- Troubleshooting scenarios and solutions
- UEFI Diagnostics

9 Routine Care

The cleaning methods listed below are applicable to both the touch and the non-touch models of the HP Z1 G2 Workstation.

General cleaning safety precautions

- Never use solvents or flammable solutions to clean the computer.
- Never immerse any component in water or cleaning solutions; apply any liquids to a clean cloth and then use the cloth on the component.
- Always unplug the computer before cleaning the keyboard, mouse, or air vents.
- Always disconnect the keyboard before cleaning it.
- Wear safety glasses equipped with side shields when using compressed air, to prevent dust and debris from getting into your eyes.

Cleaning products

Use the following products to safely clean your computer:

- Dimethyl benzyl ammonium chloride 0.3 percent maximum concentration, usually in the form of disposable wipes in a variety of brand names
- Alcohol-free glass cleaning fluid
- Water with mild soap solution
- Dry microfiber cleaning cloth or a chamois (static-free cloth without oil)
- Static-free cloth wipes

⚠ CAUTION: Avoid strong cleaning solvents that can permanently damage your computer. If you are not sure if a cleaning product is safe for your computer, check the product contents to be sure that ingredients such as alcohol, acetone, ammonium chloride, methylene chloride, and hydrocarbons are not included.

- Fibrous materials, such as paper towels, can scratch the computer. Over time, dirt particles and cleaning agents can get trapped in the scratches.

Cleaning the chassis

- Follow the safety precautions in the *Maintenance and Service Guide* for your workstation before cleaning the computer.
- To remove light stains or dirt, use plain water with a clean, lint-free cloth or swab.
- For stronger stains, use a soft microfiber cloth or chamois moistened with mild dish washing liquid diluted with water. Rinse well by wiping the surface with a cloth or swab dampened with clear water.
- After cleaning, always wipe the computer with a clean, lint-free cloth.
- Occasionally, clean the air vents on the computer. Lint and other foreign matter can block the vents and limit the airflow.

Cleaning the keyboard

- If the keyboard has an on/off switch, turn it off.
- Follow the safety precautions in the *Maintenance and Service Guide* for your workstation before cleaning the keyboard.
- Visible debris underneath or between the keys can be removed by vacuuming or shaking.
- Canned, pressurized air can be used to clean debris from under the keys. Use caution because too much air pressure can dislodge lubricants applied under the wide keys.
- If you remove a key, use a specially designed key remover to prevent damage to the keys. This tool is available from many electronic supply outlets.

 **CAUTION:** Never remove a wide key (like the space bar key) from the keyboard. If these keys are improperly removed or installed, the keyboard might not function properly.

- Clean under a key with a swab moistened with one of the products mentioned in [Cleaning products on page 55](#) of this guide. Be careful not to wipe away lubricants necessary for proper key functions. Allow the parts to air dry before reassembly.
- Use tweezers to remove any fibers or dirt in confined areas.

Cleaning the monitor

- Follow the safety precautions in the *Maintenance and Service Guide* for your workstation before cleaning the monitor.
- Gently wipe the display using a soft, lint-free cloth moistened with water or an alcohol-free glass cleaner.

 **CAUTION:** Do not use sprays or aerosols directly on the screen—the liquid might seep into the housing and damage a component.

Never use solvents or flammable liquids on the monitor because display or housing damage may result.

Cleaning the mouse

1. Follow the safety precautions in the *Maintenance and Service Guide* for your workstation before cleaning the mouse.
2. If the mouse has an on/off switch, turn it off.
3. Wipe the body of the mouse with a soft microfiber cloth or chamois moistened with alcohol-free glass cleaning fluid or water with mild soap solution.
4. Note these guidelines:
 - Laser or light: use a cotton swab dampened with cleaning solution to gently brush out any dust around the laser or light, and then wipe again with a dry swab. Do not wipe the laser or light directly with the swab.
 - Scroll wheel: spray canned, pressurized air into the gap between the scroll wheel and the click buttons. To avoid condensation, do not blow air directly on one spot for an extended period.
 - Roller ball: remove and clean the roller ball, remove any debris from the ball socket, wipe out the socket with a dry cloth, and reassemble the mouse.