Maintenance & Service Guide

HP Engage Go Convertible System
HP Engage Go Mobile System
HP Engage Go Dock

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Product notice

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

Software terms

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

About This Book

This guide provides basic information for upgrading this computer model.

WARNING! Indicates a hazardous situation that, if not avoided, **could** result in death or serious injury.

CAUTION: Indicates a hazardous situation that, if not avoided, **could** result in minor or moderate injury.

IMPORTANT: Indicates information considered important but not hazard-related (for example, messages related to property damage). A notice alerts the user that failure to follow a procedure exactly as described could result in loss of data or in damage to hardware or software. Also contains essential information to explain a concept or to complete a task.

NOTE: Contains additional information to emphasize or supplement important points of the main text.

TIP: Provides helpful hints for completing a task.

Table of contents

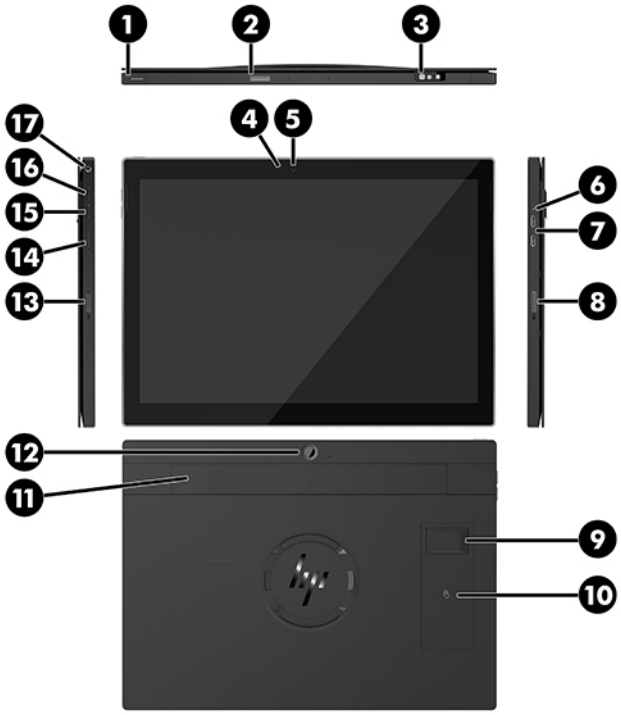
1 Product overview

Standard features

Standard features include the following:

- Modern design and slim form factor provide for a clean counter look
- High-resolution, high-nit 31.2 cm (12.3-inch) display for excellent viewing of software
- Optional integrated barcode scanner with audible and visual feedback and ergonomically positioned trigger buttons for single and dual hand scanning capability
- Powerful productivity with an Intel® Pentium® or Core™ processor, battery life of 13 hours, and HP Fast Charge
- Hand strap attachment to assist with carrying
- Blind-mate, magnet-assisted, one-handed docking experience
- Optional countertop mounting bracket
- Low-profile, electromechanical attach point for the convertible dock, enabling connectivity to a smart locking system and POS peripherals
- Indicator light that shows status of the locking state
- Optional HP peripherals:
  - Carrying case with shoulder strap for hands-free retailing or extended use outdoors
  - Integrated magnetic stripe reader (MSR) (integrated into the carrying case)
  - HP Engage One Basic or Advanced I/O Connectivity Base
  - Integrated column printer or standalone printer
  - HP Engage One biometric fingerprint reader (connects to an I/O connectivity base)
  - Swivel and tilt capability

Mobility head unit features



Features			
(1)	Power button	(10)	Near Field Communications (NFC) (optional)
(2)	Barcode scanner button	(11)	Hand strap
(3)	Barcode scanner (optional)	(12)	Rear-facing webcam
(4)	Webcam light	(13)	Barcode scanner button
(5)	Webcam	(14)	SIM card door
(6)	Charging light	(15)	Volume down button
(7)	USB-C charging ports (2)	(16)	Volume up button
(8)	Barcode scanner button	(17)	Audio jack
(9)	Fingerprint reader (optional)		
NOTE:	You cannot have a WWAN (LTE) module and a barcode scanner in the same unit. You can have neither, or either, but not both.		

Integrated features

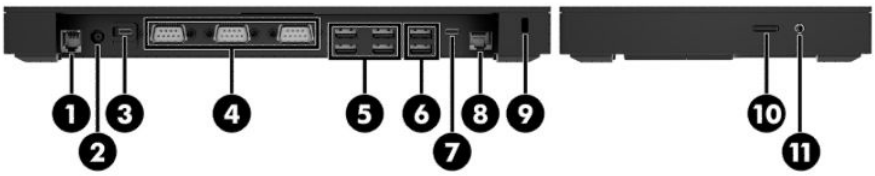
Other than the display, the integrated devices shown below are optional.

Features			
(1)	12.3” 1920 × 1280 WUXGA display	(5)	HP Engage Go Mobile Retail Case
(2)	HP Engage One Integrated Column Printer	(6)	Integrated MSR
(3)	Docking lock release button	(7)	HP Engage One Biometric Fingerprint Reader
(4)	Choice of two ElitePOS I/O Connectivity Bases		
The display panel is an anti-glare WLED SVA 400 nits panel.			
NOTE: The nits rating indicates the typical brightness of the panel prior to anti-glare coating.			

Dock options

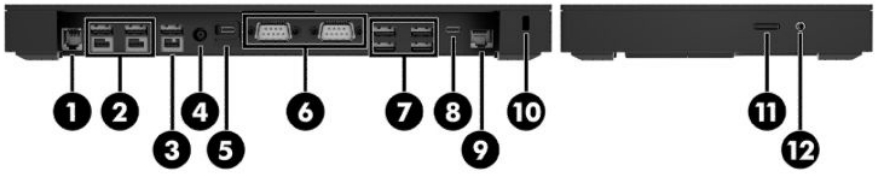
Options	
(1)	Rotate/tilt dock with integrated column printer
(2)	Rotate/tilt dock (with standard column)
NOTE:	The docks are shown on a stability base.

HP Engage One Basic I/O Connectivity Base components



Basic components			
(1)	Cash drawer jack	(7)	USB Type-C port
(2)	Power connector	(8)	RJ-45 (network) jack
(3)	USB Type-C power port	(9)	Security cable slot
(4)	Powered serial ports (3)	(10)	MicroSD card reader
(5)	USB 2.0 ports (4)	(11)	Audio-out (headphone)/Audio-in (microphone) jack
(6)	USB 3.0 ports (2)		
IMPORTANT:	To avoid damage to the system, DO NOT plug a telephone cable into the cash drawer jack.		

HP Engage One Advanced I/O Connectivity Base components

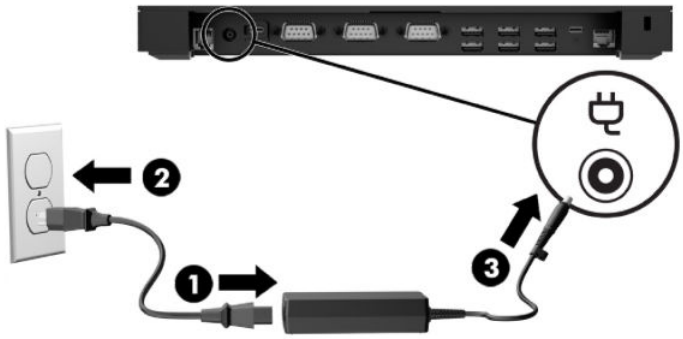


Advanced components			
(1)	Cash drawer jack	(7)	USB 3.0 ports (4)
(2)	Powered USB 12 V ports (2)	(8)	USB Type-C port
(3)	Powered USB 24 V port	(9)	RJ-45 (network) jack
(4)	Power connector	(10)	Security cable slot
(5)	USB Type-C power port	(11)	MicroSD card reader
(6)	Powered serial ports (2)	(12)	Audio-out (headphone)/Audio-in (microphone) jack

IMPORTANT: To avoid damage to the system, DO NOT plug a telephone cable into the cash drawer jack.

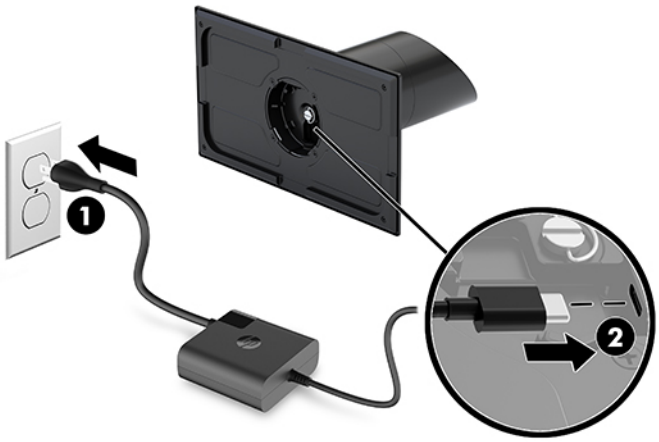
Connecting an AC adapter to power

To connect an AC adapter to the I/O connectivity base, connect one end of the power cord to the AC adapter (1) and the other end to a grounded AC outlet (2), and then connect the AC adapter to the power connector on the I/O connectivity base (3).



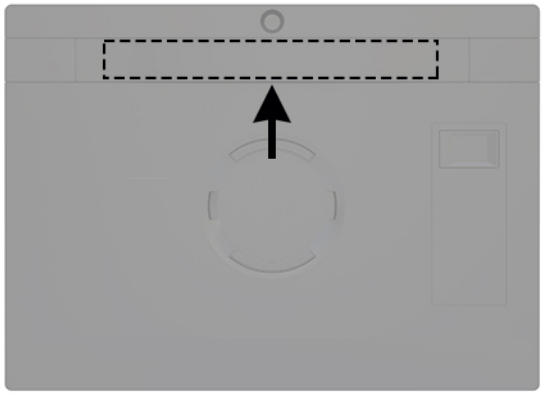
To connect an AC adapter to the mobility system when it is not connected to an I/O connectivity base, connect the AC adapter to a grounded AC outlet (1), and then connect the power adapter's USB Type-C connector to the USB Type-C power port on the underside of the dock's column (2).

NOTE: The image below is shown with a stability base.



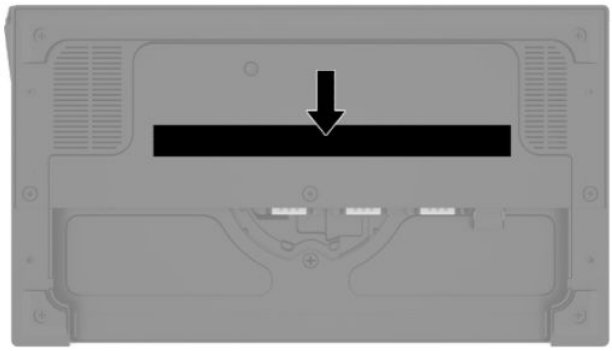
Mobility head unit serial number location

Each mobility head unit has a unique serial number and a product ID number that are located under the strap. Keep these numbers available for use when contacting customer service for assistance.



I/O connectivity base serial number location

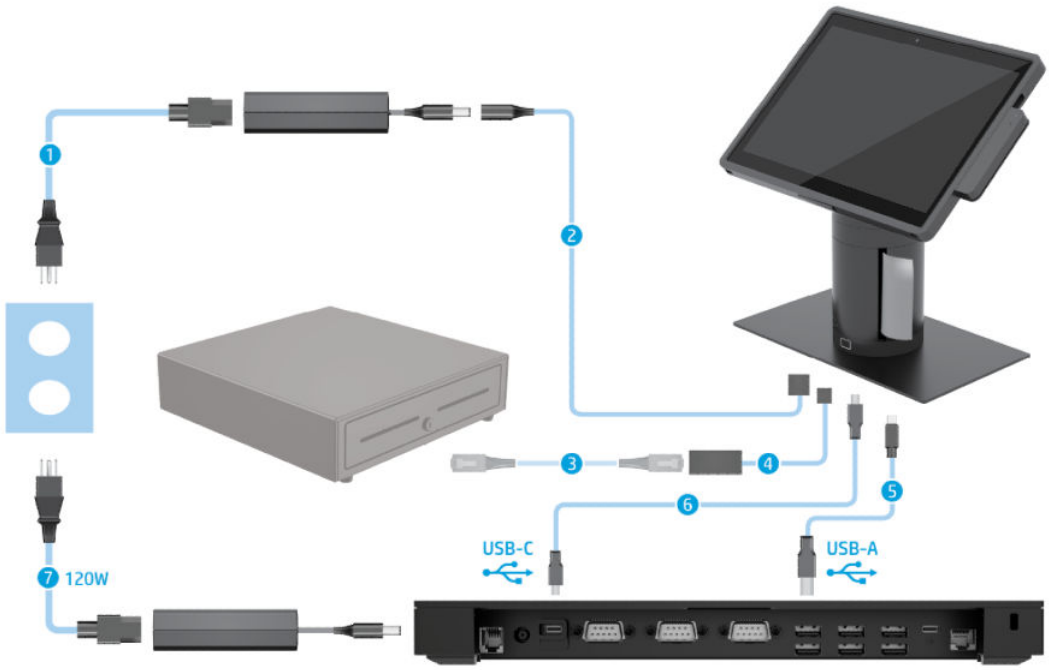
Each I/O connectivity base has a unique serial number and a product ID number that are located on the exterior of the I/O connectivity base. Keep these numbers available for use when contacting customer service for assistance.



Regulatory information is located in the base plate. Install the base plate back if it is removed.

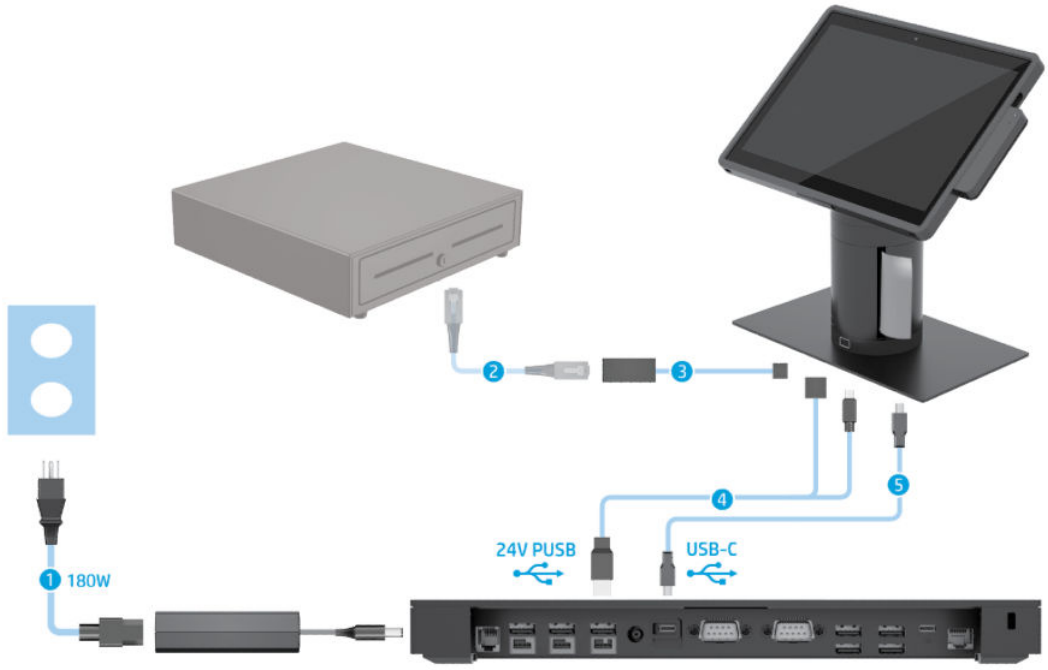
2 Cable routing configurations

Cable matrix for HP Engage Go Convertible System with integrated column printer and basic I/O connectivity base



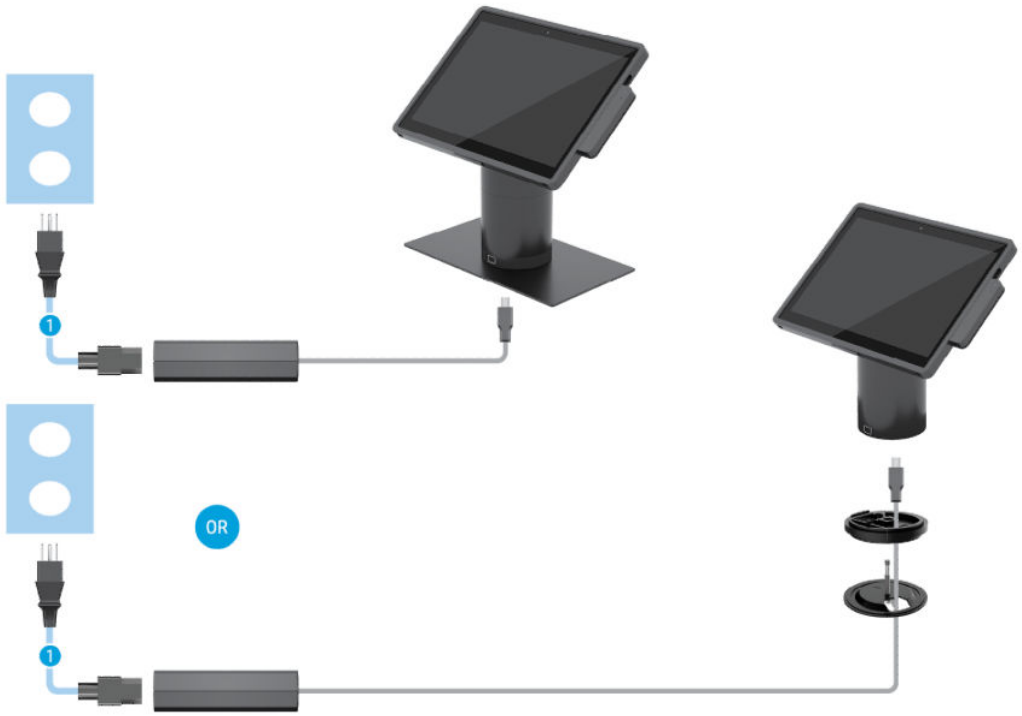
Cables			
(1)	Column printer AC power cord	(5)	I/O connectivity base mini USB Type-B to USB Type-A data cable
(2)	Column printer AC adapter cable	(6)	I/O connectivity base USB Type-C cable
(3)	Cash drawer cable (purchased separately with cash drawer)	(7)	I/O connectivity base 120 W AC power cord
(4)	Column printer cash drawer cable		

Cable matrix for HP Engage Go Convertible System with integrated column printer and advanced I/O connectivity base



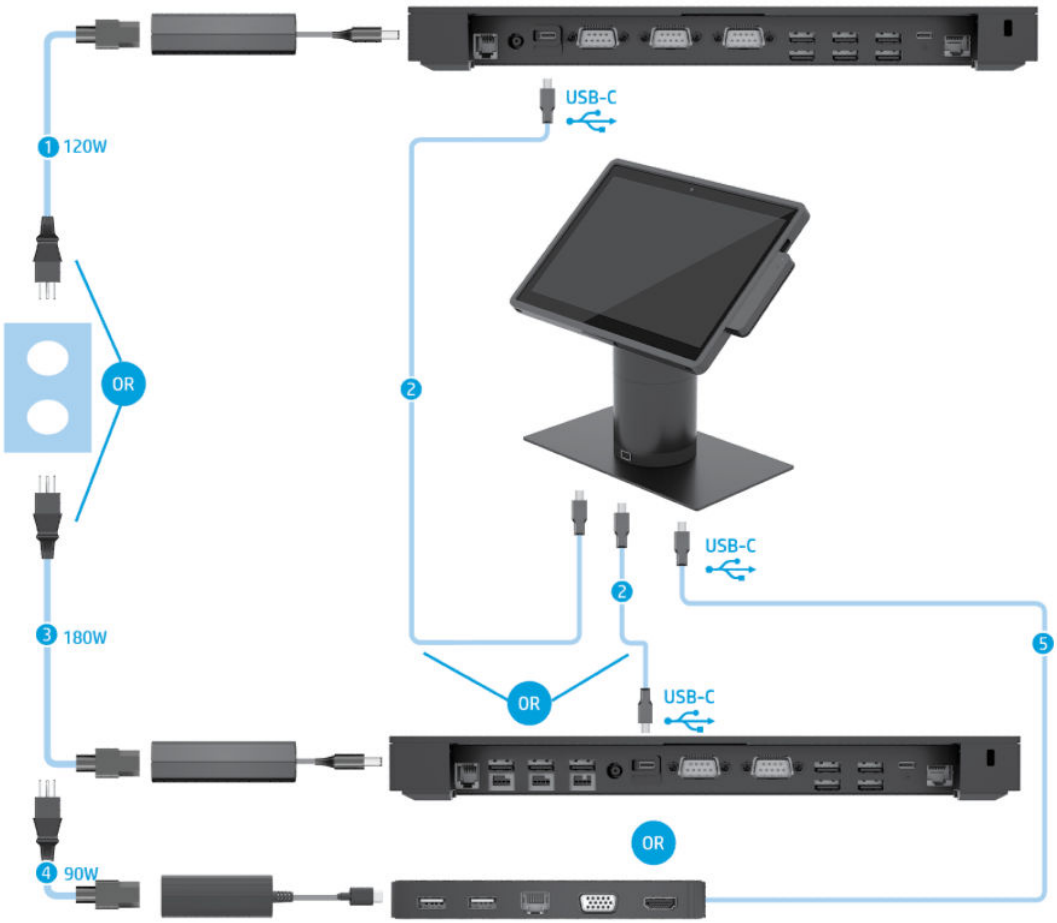
Cables			
(1)	I/O connectivity base 180 W AC power cord	(4)	Column printer 24 V PUSB power and data Y cable
(2)	Cash drawer cable (purchased separately with cash drawer)	(5)	I/O connectivity base USB Type-C cable
(3)	Column printer cash drawer cable		

Cable matrix for HP Engage Go Convertible System without I/O connectivity base



Cables	
(1)	AC power cord

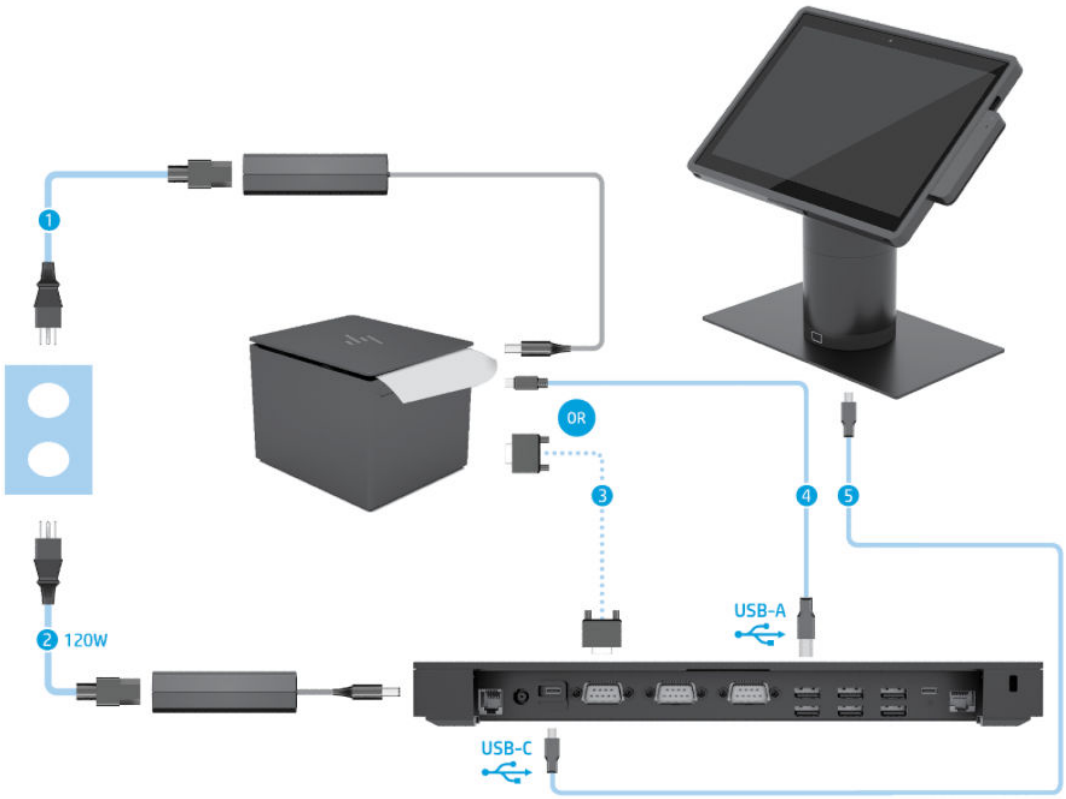
Cable matrix for HP Engage Go Convertible System with I/O connectivity base



Cables			
(1)	Basic I/O connectivity base 120 W AC power cord	(4)	USB-C mini dock 90 W AC power cord
(2)	I/O connectivity base USB Type-C cable	(5)	USB-C mini dock captive USB Type-C cable
(3)	Advanced I/O connectivity base 180 W AC power cord		

NOTE: In the European region, the USB-C mini dock is sold as an aftermarket option kit only. In all other regions, the USB-C mini dock is sold as drop-in-box option.

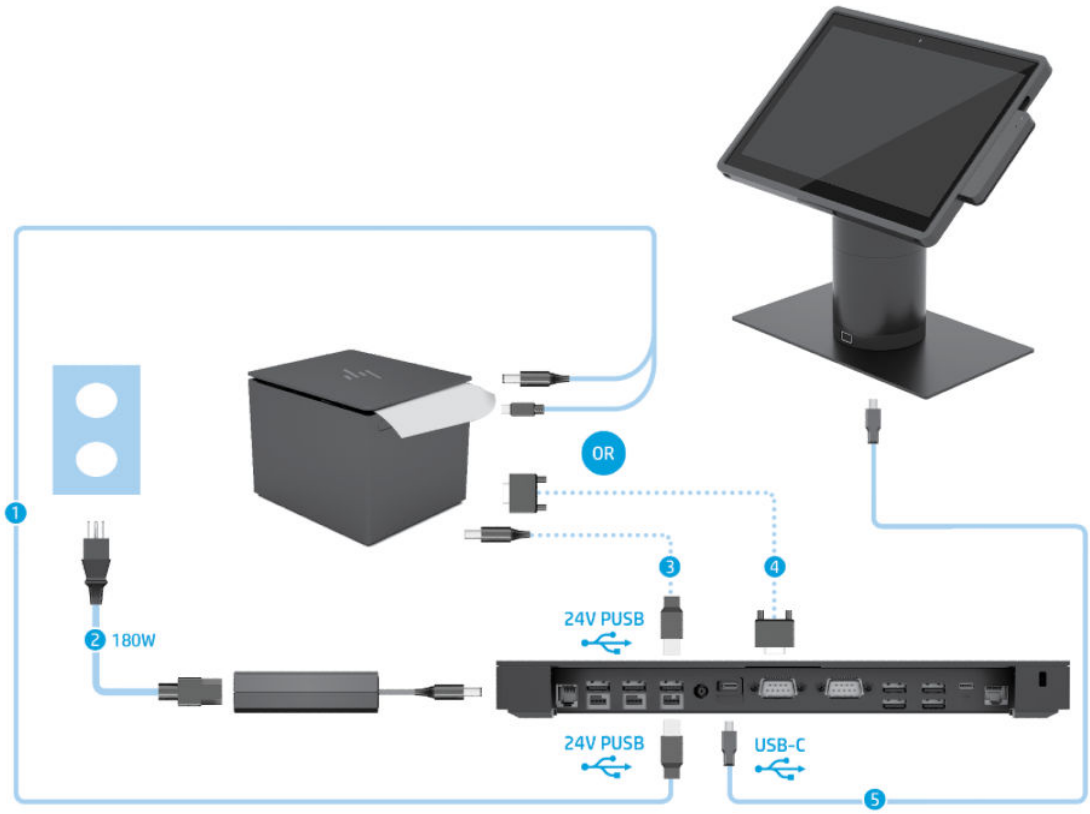
Cable matrix for HP Engage Go Convertible System with basic I/O connectivity base and standalone printer



Cables			
(1)	Printer AC power cord	(4)	Printer USB Type-A to Type-B data cable
(2)	Basic I/O connectivity base 120 W AC power cord	(5)	Basic I/O connectivity base USB Type-C cable
(3)	Printer serial data cable		

IMPORTANT: Connect either the serial data cable (3) *or* the USB Type-A data cable (4) between the I/O connectivity base and the printer. Do not connect both.

Cable matrix for HP Engage Go Convertible System with advanced I/O connectivity base and standalone printer

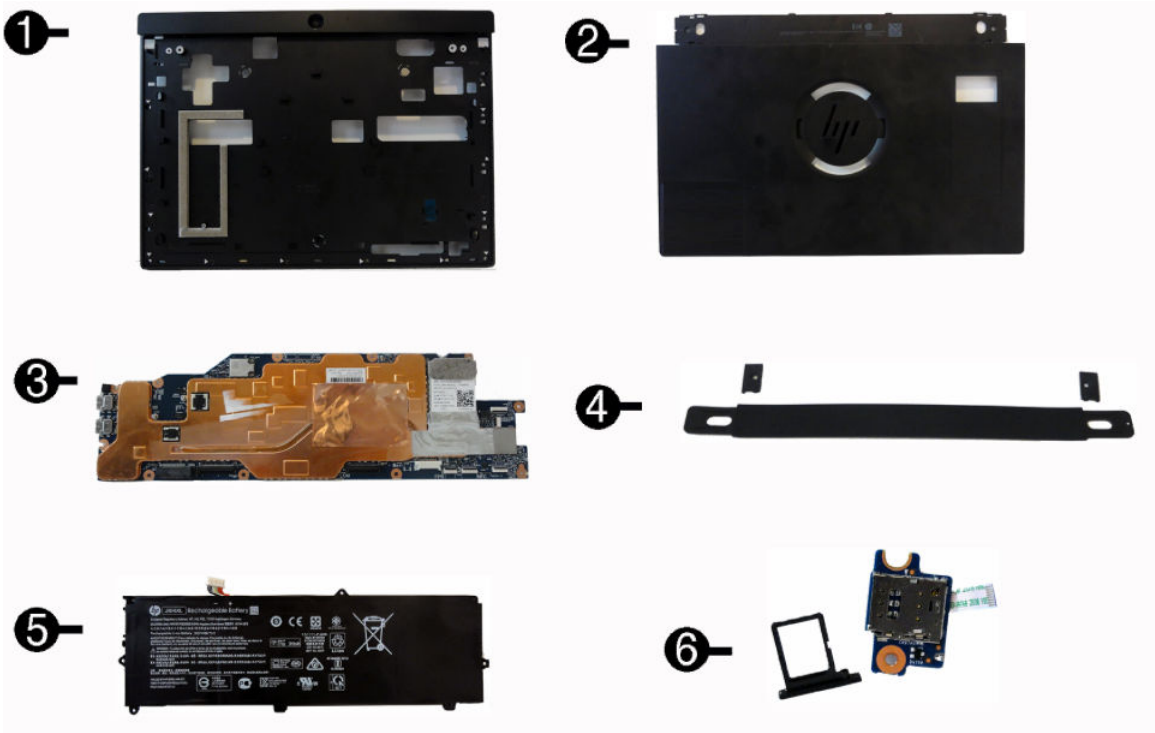


Cables			
(1)	Printer 24 V PUSB power and data Y cable	(4)	Printer serial data cable
(2)	Advanced I/O connectivity base 180 W AC power cord	(5)	Advanced I/O connectivity base USB Type-C cable
(3)	Printer 24 V PUSB power cable		

IMPORTANT: Connect either the 24 V PUSB power and data Y cable (1) *or* the 24 V PUSB power cable (3) and serial data cable (4) between the I/O connectivity base and the printer. Do not connect all three.

3 Illustrated parts catalog

NOTE: HP continually improves and changes product parts. For complete and current information on supported parts for your computer, go to http://partsurfer.hp.com, select your country or region, and then follow the on-screen instructions.



Item	Description
(1)	**Mid frame** (includes cameras, speakers, power connector/volume board and mid plate bezel)
	Black, with barcode
	Black, without barcode
	White, with barcode
	White, without barcode
(2)	**Backplate** (includes gold communication cable)
	Black, with fingerprint reader, without NFC module
	Black, without fingerprint reader, without NFC module
	Black, with fingerprint reader, with NFC module
	Black, without fingerprint reader, with NFC module
	White, with fingerprint reader, without NFC module
	White, without fingerprint reader, without NFC module

Item	Description
	White, with fingerprint reader, with NFC module
	White, without fingerprint reader, with NFC module
(3)	**System board** (includes heat sink)
	Intel Core i5-7Y57 processor
	Intel Core M3-7Y30 processor
	Intel Pentium 4410Y processor
(4)	**Hand strap**
	Black
	White
(5)	**Battery**
(6)	**SIM board**
*	**Display panel** **NOTE:** The display panel is spared with all required parts.
*	**Solid-state drive**, M.2
	256 GB, TLC, PCIe
	128 GB, SATA-3, TLC
*	**WLAN modules**
	Intel Wireless-AC 8265 802.11ac 2x2 WiFi + Bluetooth 4.2 Combo Adapter (vPro)
	Intel Wireless-AC 8265 802.11ac 2x2 WiFi + Bluetooth 4.2 Combo Adapter (non-vPro)
*	**WWAN modules**
	LTE CAT4: Huawei HP lt4132, LTE/HSPA+ w/GPS M.2
*	**AC adapter, 65 W** (external)
*	**Power cord**
	1.8 m
	1.0 m
	Duckhead
*	**Column**
	With printer
	Without printer
*	**Magnetic strip reader**
*	**HP USB-C Mini Dock**

4 Routine care, SATA drive guidelines, and disassembly preparation

This chapter provides general service information for the computer. Adherence to the procedures and precautions described in this chapter is essential for proper service.

⚠ **CAUTION:** When the computer is plugged into an AC power source, voltage is always applied to the system board. You must disconnect the power cord from the power source before opening the computer to prevent system board or component damage.

Electrostatic discharge information

A sudden discharge of static electricity from your finger or other conductor can destroy static-sensitive devices or microcircuitry. Often the spark is neither felt nor heard, but damage occurs. An electronic device exposed to electrostatic discharge (ESD) may not appear to be affected at all and can work perfectly throughout a normal cycle. The device may function normally for a while, but it has been degraded in the internal layers, reducing its life expectancy.

Networks built into many integrated circuits provide some protection, but in many cases, the discharge contains enough power to alter device parameters or melt silicon junctions.

Generating static

The following table shows that:

- Different activities generate different amounts of static electricity.
- Static electricity increases as humidity decreases.

	Relative Humidity		
Event	**55%**	**40%**	**10%**
Walking across carpet	7,500 V	15,000 V	35,000 V
Walking across vinyl floor	3,000 V	5,000 V	12,000 V
Motions of bench worker	400 V	800 V	6,000 V
Removing DIPs from plastic tube	400 V	700 V	2,000 V
Removing DIPs from vinyl tray	2,000 V	4,000 V	11,500 V
Removing DIPs from Styrofoam	3,500 V	5,000 V	14,500 V
Removing bubble pack from PCB	7,000 V	20,000 V	26,500 V
Packing PCBs in foam-lined box	5,000 V	11,000 V	21,000 V
These are then multi-packaged inside plastic tubes, trays, or Styrofoam.			

NOTE: 700 volts can degrade a product.

Preventing electrostatic damage to equipment

Many electronic components are sensitive to ESD. Circuitry design and structure determine the degree of sensitivity. The following packaging and grounding precautions are necessary to prevent damage to electric components and accessories.

- To avoid hand contact, transport products in static-safe containers such as tubes, bags, or boxes.
- Protect all electrostatic parts and assemblies with conductive or approved containers or packaging.
- Keep electrostatic sensitive parts in their containers until they arrive at static-free stations.
- Place items on a grounded surface before removing them from their container.
- Always be properly grounded when touching a sensitive component or assembly.
- Avoid contact with pins, leads, or circuitry.
- Place reusable electrostatic-sensitive parts from assemblies in protective packaging or conductive foam.

Personal grounding methods and equipment

Use the following equipment to prevent static electricity damage to equipment:

- **Wrist straps** are flexible straps with a maximum of one-megohm ± 10% resistance in the ground cords. To provide proper ground, a strap must be worn snug against bare skin. The ground cord must be connected and fit snugly into the banana plug connector on the grounding mat or workstation.
- **Heel straps/Toe straps/Boot straps** can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use them on both feet with a maximum of one-megohm ± 10% resistance between the operator and ground.

Static Shielding Protection Levels

Method	Voltage
Antistatic plastic	1,500
Carbon-loaded plastic	7,500
Metallized laminate	15,000

Grounding the work area

To prevent static damage at the work area, use the following precautions:

- Cover the work surface with approved static-dissipative material. Provide a wrist strap connected to the work surface and properly grounded tools and equipment.
- Use static-dissipative mats, foot straps, or air ionizers to give added protection.
- Handle electrostatic sensitive components, parts, and assemblies by the case or PCB laminate. Handle them only at static-free work areas.
- Turn off power and input signals before inserting and removing connectors or test equipment.
- Use fixtures made of static-safe materials when fixtures must directly contact dissipative surfaces.
- Keep work area free of nonconductive materials such as ordinary plastic assembly aids and Styrofoam.
- Use field service tools, such as cutters, screwdrivers, and vacuums, that are conductive.

Recommended materials and equipment

Materials and equipment that are recommended for use in preventing static electricity include:

- Antistatic tape
- Antistatic smocks, aprons, or sleeve protectors
- Conductive bins and other assembly or soldering aids
- Conductive foam
- Conductive tabletop workstations with ground cord of one-megohm +/- 10% resistance
- Static-dissipative table or floor mats with hard tie to ground
- Field service kits
- Static awareness labels
- Wrist straps and footwear straps providing one-megohm +/- 10% resistance
- Material handling packages
- Conductive plastic bags
- Conductive plastic tubes
- Conductive tote boxes
- Opaque shielding bags
- Transparent metallized shielding bags
- Transparent shielding tubes

Operating guidelines

To prevent overheating and to help prolong the life of the computer:

- Keep the computer away from excessive moisture, direct sunlight, and extremes of heat and cold.
- Operate the computer on a sturdy, level surface. Leave a 10.2-cm (4-inch) clearance on all vented sides of the computer and above the display to permit the required airflow.
- Never restrict the airflow into the computer by blocking any vents or air intakes. Do not place the keyboard, with the keyboard feet down, directly against the front of the desktop unit as this also restricts airflow.
- Occasionally clean the air vents on all vented sides of the computer. Lint, dust, and other foreign matter can block the vents and limit the airflow. Be sure to unplug the computer before cleaning the air vents.
- Never operate the computer with the covers removed.
- Keep liquids away from the computer and keyboard.
- Install or enable power management functions of the operating system or other software, including sleep states.

Service considerations

Listed below are some of the considerations that you should keep in mind during the disassembly and assembly of the computer.

Tools and software requirements

To service the computer, you need the following:

- Flat-bladed screwdriver
- Non-marking, non-conductive pry tool
- Phillips #2 screwdriver
- Diagnostics software

Screws

The screws used in the computer are not interchangeable. They may have standard or metric threads and may be of different lengths. If an incorrect screw is used during the reassembly process, it can damage the unit. HP strongly recommends that all screws removed during disassembly be kept with the part that was removed, then returned to their proper locations.

⚠ **CAUTION:** Metric screws have a black finish. U.S. screws have a silver finish and are used on hard drives only.

CAUTION: As each subassembly is removed from the computer, it should be placed away from the work area to prevent damage.

Cables and connectors

Most cables used throughout the unit are flat, flexible cables. These cables must be handled with care to avoid damage. Apply only the tension required to seat or unseat the cables during insertion or removal from the connector. Handle cables by the connector whenever possible. In all cases, avoid bending or twisting the cables, and ensure that the cables are routed in such a way that they cannot be caught or snagged by parts being removed or replaced.

⚠ **CAUTION:** When servicing this computer, ensure that cables are placed in their proper location during the reassembly process. Improper cable placement can damage the computer.

Hard Drives

Handle hard drives as delicate, precision components, avoiding all physical shock and vibration. This applies to failed drives as well as replacement spares.

- If a drive must be mailed, place the drive in a bubble-pack mailer or other suitable protective packaging and label the package “Fragile: Handle With Care.”
- Do not remove hard drives from the shipping package for storage. Keep hard drives in their protective packaging until they are actually mounted in the CPU.
- Avoid dropping drives from any height onto any surface.
- If you are inserting or removing a hard drive, turn off the computer. Do not remove a hard drive while the computer is on or in standby mode.
- Before handling a drive, ensure that you are discharged of static electricity. While handling a drive, avoid touching the connector. For more information about preventing electrostatic damage, refer to Electrostatic discharge information on page 16
- Do not use excessive force when inserting a drive.
- Avoid exposing a hard drive to liquids, temperature extremes, or products that have magnetic fields such as displays or speakers.

Lithium coin cell battery

The battery that comes with the computer provides power to the real-time clock and has a minimum lifetime of about three years.

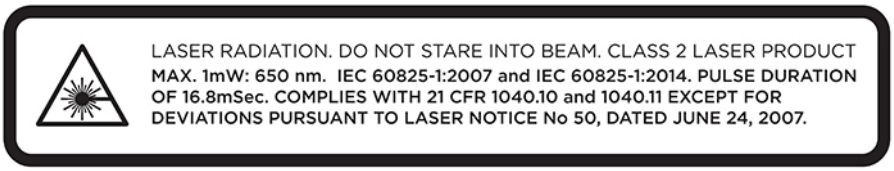
See the appropriate removal and replacement chapter for the chassis you are working on in this guide for instructions on the replacement procedures.

WARNING! This computer contains a lithium battery. There is a risk of fire and chemical burn if the battery is handled improperly. Do not disassemble, crush, puncture, short external contacts, dispose in water or fire, or expose it to temperatures higher than 140ºF (60ºC). Do not attempt to recharge the battery.

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

Laser compliance

WARNING! Use of controls or adjustments, or performance of procedures other than those specified in the laser product installation guide, may result in hazardous radiation exposure. To reduce the risk of exposure to hazardous radiation:



Input power

The power information in this section may be helpful if you plan to travel internationally with the computer.

The computer operates on DC power, which can be supplied by an AC or a DC power source. The AC power source must be rated at 100–240 V, 50–60 Hz. Although the computer can be powered from a standalone DC power source, it should be powered only with an AC adapter or a DC power source supplied and approved by HP for use with this computer.

The computer can operate on DC power within the following specifications. The voltage and current for your computer is located on the regulatory label.

Input power	Rating
Operating voltage and current	5 V dc @ 3 A / 9 V dc @ 3 A / 10 V dc @ 5 A / 12 V dc @ 5 A / 15 V dc @ 4.33 A / 20 V dc @ 3.25 A – 65 W USB-C HP Engage One Basic I/O Connectivity Base: 120 W (19.5 V / 6.15 A) HP Engage One Advanced I/O Connectivity Base: 180 W (19.5 V / 9.23 A)

NOTE: This product is designed for IT power systems in Norway with phase-to-phase voltage not exceeding 240 V ms.

Operating environment

Factor	Metric	U.S.
Temperature		
Operating (writing to optical disc)	**5°C to 35°C**	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	**10% to 90%**	10% to 90%
Nonoperating	**5% to 95%**	5% to 95%
M**aximum altitude** (unpressurized)		
Operating	**-15 m to 3,048 m**	-50 ft to 10,000 ft
Nonoperating	**-15 m to 12,192 m**	-50 ft to 40,000 ft

Operating guidelines and routine care

Follow the guidelines below to properly set up and care for the system:

- HP recommends a 17 mm clearance around the vents on the mobility head unit and I/O connectivity base for heat dissipation.
- Keep the system away from excessive moisture, direct sunlight, and extremes of heat and cold.
- Never operate the system with any access panels removed.
- Do not stack systems on top of each other or place them so near each other that they are subject to each other's recirculated or preheated air.
- If the system is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above still apply.
- Keep liquids away from the mobility system and I/O connectivity base.
- Never cover the vents on the mobility system or I/O connectivity base with any type of material.
- Install or enable power management functions of the operating system or other software, including sleep states.
- Turn off the mobility system before you do either of the following:
  - Wipe the exterior with a soft, damp cloth as necessary. Using cleaning products may discolor or damage the finish.
  - Occasionally clean the air vents on all vented sides of the mobility system. Lint, dust, and other foreign matter can block the vents and limit the airflow.

NOTE: For more information on your retail system care and maintenance, refer to "Retail Point of Sales Systems - Routine Care and Maintenance" available at http://www.hp.com/support.

Touch screen maintenance

Keep your display and touch sensor clean. The touch sensor requires very little maintenance. HP recommends that you periodically clean the glass touch sensor surface. Be sure to turn off your display before cleaning. Typically, an isopropyl alcohol and water solution ratio of 50:50 is the best cleaning agent for your touch

sensor. It is important to avoid using any caustic chemicals on the touch sensor. Do not use any vinegar-based solutions.

Apply the cleaner with a soft, lint-free cloth. Avoid using gritty cloths. Always dampen the cloth and then clean the sensor. Be sure to spray the cleaning liquid onto the cloth, not the sensor, so that drips do not seep inside the display or stain the bezel.

MSR maintenance

To clean the MSR (magnetic stripe reader), swipe a standard cleaning card through the MSR a couple of times. You can order a standard cleaning card online. You can also put a thin oil-free cloth around a credit card.

Cleaning the printer

Because of the way the printer sits while in use, it is likely there is a buildup of paper and other debris from the knife. HP recommends that you keep the printer in working order by periodically cleaning the debris from the printer.

To clean the printer, open the cover, remove the paper roll, and then use a can of compressed air to blow the debris out from the bottom plate where it accumulates.

Cleaning I/O ports

The mobility system has a series of ports. Dust and debris can collect in these ports, which can reduce connectivity and performance. Use a battery-powered vacuum to remove any debris that has accumulated in and around these ports.

Updating drivers and firmware

HP recommends that you regularly download and install the latest drivers and firmware updates to help enhance system performance, resolve known issues, and avoid replacing parts unnecessarily.

Go to http://www.hp.com/support to download and install the latest drivers and BIOS updates for your specific Retail Point of Sale model.

5 Hardware configurations and upgrades

Warnings and cautions

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

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

Disconnect the power cord from the AC outlet before removing the enclosure. Energized parts are inside.

Allow the internal system components to cool before you touch them.

Replace and secure the enclosure before restoring power to the equipment.

Do not connect telecommunications or telephone connectors to the network interface controller (NIC) receptacles.

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

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

For your safety, do not place anything on power cords or cables. Arrange them so that no one may accidentally step on or trip over them. Do not pull on a cord or cable. When unplugging from the AC outlet, grasp the cord by the plug.

To reduce the risk of serious injury, read the *Safety & Comfort Guide*. It describes proper workstation setup and provides guidelines for posture and work habits that increase your comfort and decrease your risk of injury. It also provides electrical and mechanical safety information. This guide is located on the web at http://www.hp.com/ergo.

IMPORTANT: Static electricity can damage the electrical components of the system or optional equipment. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object. See Electrostatic discharge information on page 16 for more information.

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

Locking and unlocking the mobility head unit (tablet)

The mobility head unit automatically locks to the dock when attached. To unlock the mobility head unit, press the lock release button on the front of the dock's column.

There are two authentication methods that can be used to unlock the mobility head unit. The authentication methods can be set up using the HP Smart Dock wizard.

TIP: For more information about HP Smart Dock, search for the *HP Smart Dock User Guide* at www.hp.com/support.

- **Windows® user authentication** - A group can be defined that allow users belonging to the group to unlock the mobility head unit based on their Windows login password.
- **PIN authentication** - A PIN is required to unlock the mobility head unit.

NOTE: Both authentication methods can be used or there can be no authentication method required to unlock the mobility head unit. No authentication required is the default method.

The light on the dock's lock release button indicates the locking status.

- **Amber** - The mobility head unit is locked and can not be unlocked without the proper Windows login permission.
- **White** - The mobility head unit is locked and can be unlocked but may require a PIN.
- **Green** - The mobility head unit is unlocked and can be removed.

Removing the mobility head unit (tablet) from the dock

Press the lock release button (1) on the front of the dock's column, and then lift the mobility head unit (2) off the dock.

NOTE: Your system may require a PIN to unlock the mobility head unit from the dock. See Locking and unlocking the mobility head unit (tablet) on page 24.

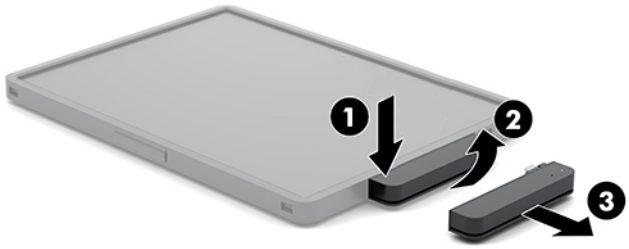
Removing the integrated MSR from the mobility head unit

1. Turn off the mobility system properly through the operating system, and turn off any external devices.
2. Disconnect the power cord from the mobility system.

IMPORTANT: Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord and wait approximately 30 seconds for the power to drain to avoid damage to the internal components of the system.

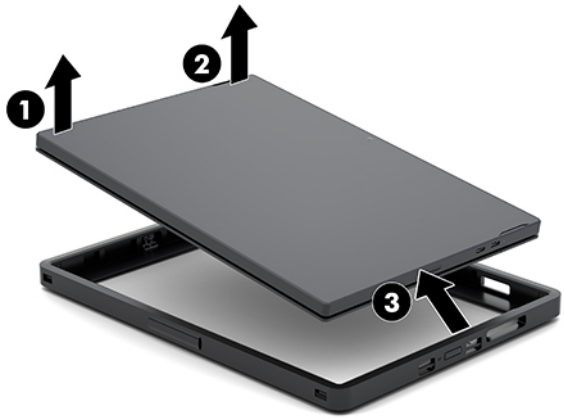
3. Insert a flat-blade screwdriver between the MSR and the mobility head unit, and then disengage the MSR (1). Tilt the MSR (2) up slightly and pull the MSR (3) from the USB Type-C port and clips.

IMPORTANT: To avoid damaging the MSR and/or the mobility head unit, be sure to follow these instructions when removing the MSR.



Removing the carry case from the mobility head unit

1. Remove the mobility head unit from the dock if it is attached.
2. Remove the MSR from the mobility head unit if it is attached.
3. Pull one corner on the left side of the mobility head unit (1) from the carry case, and then pull the other corner on the left side of the mobility head unit (2) from the carry case. Then slide the right of the mobility head unit (3) out of the carry case.



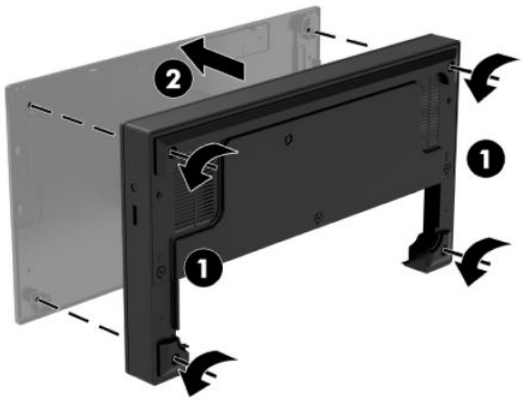
Attaching an I/O connectivity base to the HP Engage Go Convertible System

You can attach an I/O connectivity base to the bottom of the mobility system dock's stability base.

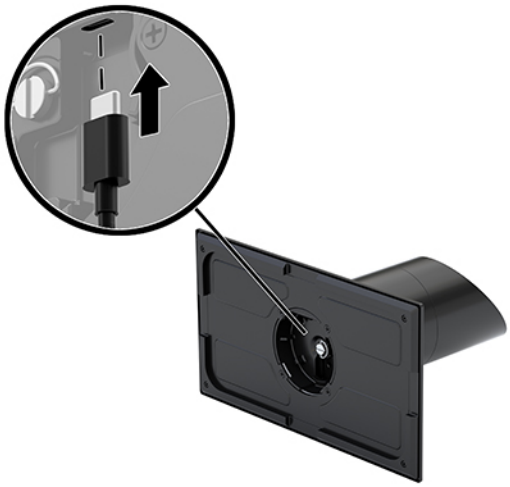
1. Turn off the mobility system properly through the operating system, and turn off any external devices.
2. Disconnect the power cords from the mobility system and I/O connectivity base.

IMPORTANT: Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord and wait approximately 30 seconds for the power to drain to avoid damage to the internal components.

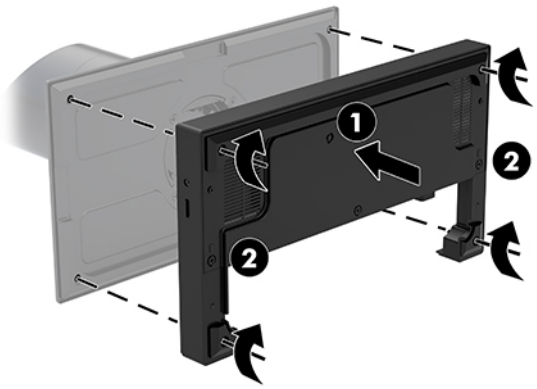
3. Remove the cover on the I/O connectivity base by removing the four screws on the underside of the I/O connectivity base (1), and then lifting the cover off the I/O connectivity base (2).



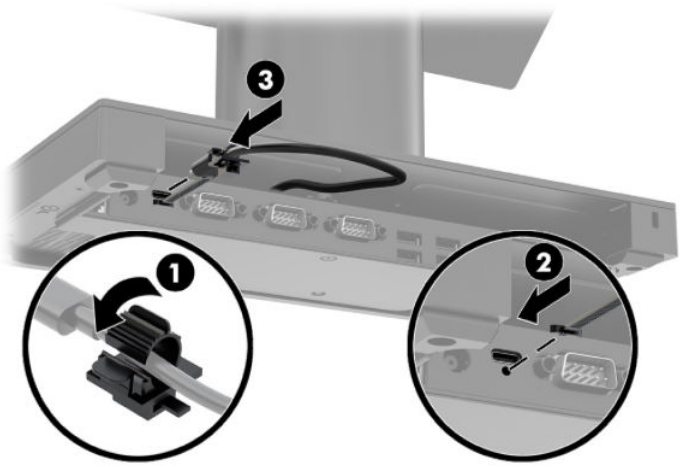
4. Connect the USB Type-C power cable to the USB Type-C port on the underside of the dock's column.



5. Place the I/O connectivity base onto the bottom of the dock's stability base (1), and then tighten the four screws on the underside of the I/O connectivity base (2) to secure the I/O connectivity base to the dock. Be sure that the USB Type-C power cable is routed through the gap between the back of the I/O connectivity base and the dock's column.



6. To connect and secure the USB Type-C power cable, attach the cable clip to the cable (1), insert the cable tie into the hole (2) below the USB Type-C port on the hub, and then slide the cable clip onto the cable tie and connect the cable to the port (3).



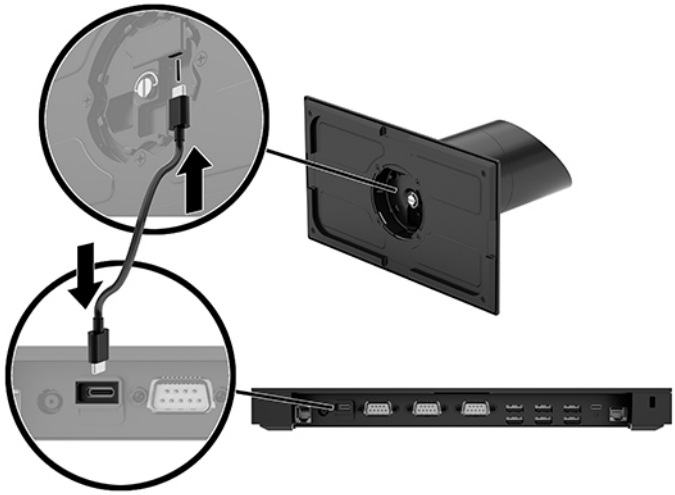
7. Connect the I/O connectivity base's AC adapter to the I/O connectivity base and a grounded AC outlet. See Connecting an AC adapter to power on page 6.

Connecting a standalone I/O connectivity base to the HP Engage Go Convertible System

1. Turn off the mobility system properly through the operating system, and turn off any external devices.
2. Disconnect the power cords from the mobility system and I/O connectivity base.

IMPORTANT: Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord and wait approximately 30 seconds for the power to drain to avoid damage to the internal components.

3. Connect the USB Type-C power cable to the USB Type-C port on the underside of the dock's column and to the USB Type-C power port on the I/O connectivity base.



4. Connect the I/O connectivity base's power supply to the I/O connectivity base and a grounded AC outlet. See Connecting an AC adapter to power on page 6.

Configuring the I/O connectivity base's powered serial ports

The serial ports can be configured as standard (non-powered) serial ports or powered serial ports. Some devices use a powered serial port. If the serial port is configured as a powered port, devices that support a powered serial interface do not require an external power source.

IMPORTANT: The system must be powered off before connecting or disconnecting serial port devices.

NOTE: The I/O connectivity base ships with all serial ports configured in standard non-powered serial mode (0 volts) by default.

There are three voltage settings for each serial port.

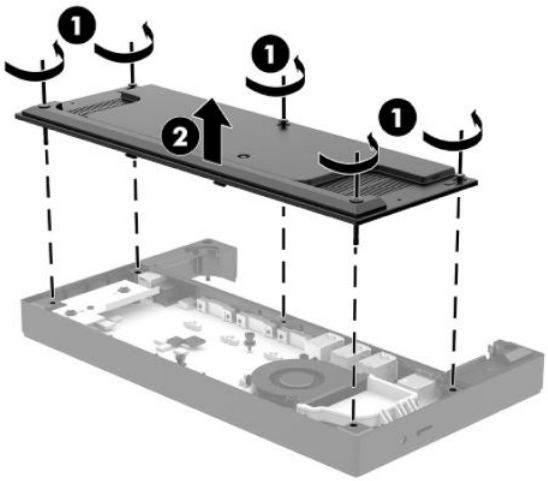
- 0 volts
- 5 volts
- 12 volts

To change the voltage settings for a powered serial port:

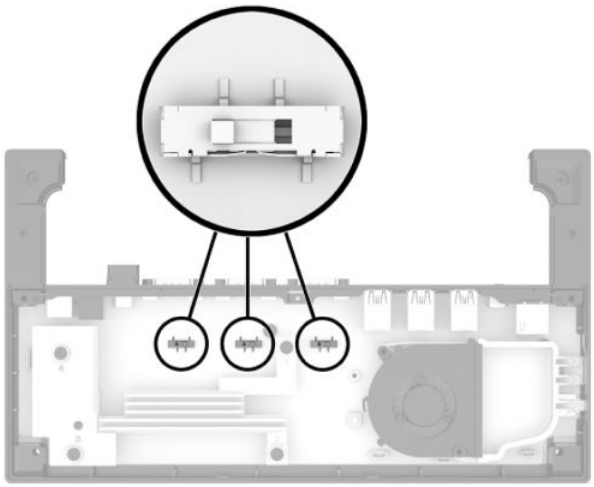
1. Turn off the mobility system properly through the operating system, and turn off any external devices.
2. Disconnect the power cord and all peripheral devices from the I/O connectivity base.

IMPORTANT: Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord and wait approximately 30 seconds for the power to drain to avoid damage to the internal components of the I/O connectivity base.

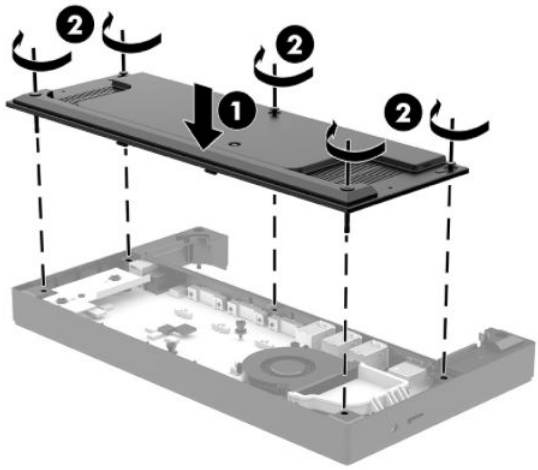
3. Remove the five screws on the underside of the I/O connectivity base (1) that secure the bottom plate to the I/O connectivity base, and then remove the bottom plate from the I/O connectivity base (2).



4. Adjust the voltage select switch behind each serial port to the appropriate setting.



5. Place the bottom plate onto the I/O connectivity base (1), and then secure the plate to the I/O connectivity base with the five screws (2).



6. Reconnect the I/O connectivity base's power cord and peripheral devices.

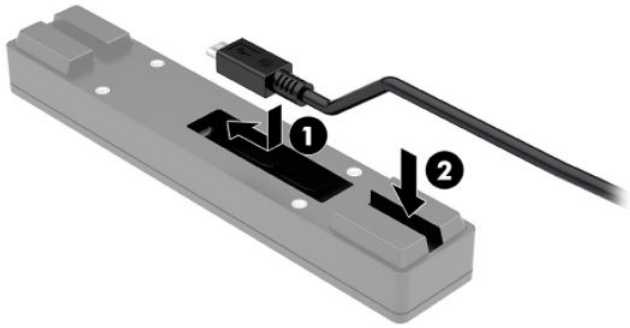
Connecting a standalone optional fingerprint reader to the I/O connectivity base

The optional fingerprint reader can be used as a standalone device or it can be attached to the I/O connectivity base. Follow the procedure below to connect a standalone fingerprint reader to the I/O connectivity base.

1. Turn off the mobility system properly through the operating system, and turn off any external devices.
2. Disconnect the power cords from the mobility system and I/O connectivity base.

IMPORTANT: Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord and wait approximately 30 seconds for the power to drain to avoid damage to the internal components.

3. Connect the USB cable to the fingerprint reader (1) and route the cable through the routing channel (2) on the fingerprint reader.



4. Connect the fingerprint reader USB cable to a USB Type-A port on the I/O connectivity base.

5. Reconnect the I/O connectivity base and power cords.

Attaching an optional fingerprint reader to the I/O connectivity base

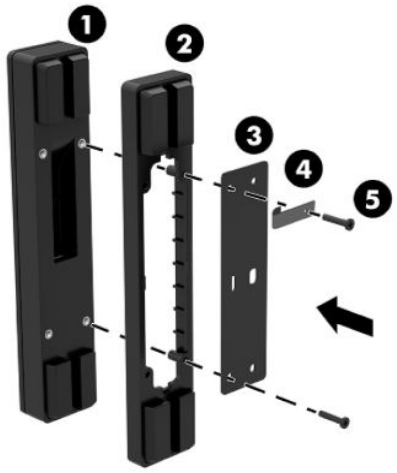
The optional fingerprint reader can be used as a standalone device or it can be attached to the I/O connectivity base. Follow the procedure below to attach the fingerprint reader to the I/O connectivity base.

NOTE: You can attach the fingerprint reader to either side of the I/O connectivity base, but if you attach it to the left side of the I/O connectivity base, the fingerprint reader covers the microSD slot and the headset jack on the I/O connectivity base.

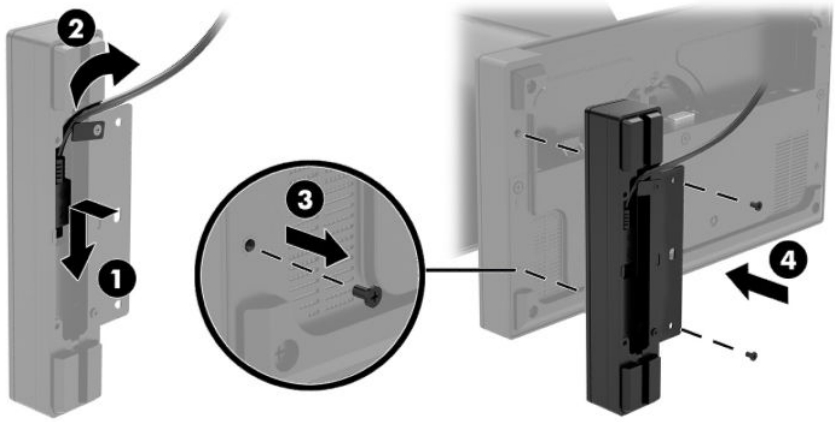
1. Turn off the mobility system properly through the operating system, and turn off any external devices.
2. Disconnect the power cords from the mobility system and I/O connectivity base.

IMPORTANT: Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord and wait approximately 30 seconds for the power to drain to avoid damage to the internal components.

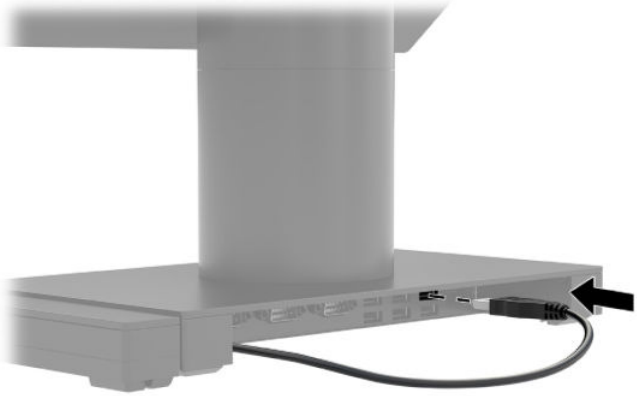
3. Place the fingerprint reader (1) on the riser (2), and then attach the mounting bracket (3) and cable routing clip (4) to the fingerprint reader and riser with the two long screws (5) included with the fingerprint reader.



4. Connect the USB cable to the fingerprint reader (1) and route the cable under the routing clip on the fingerprint reader (2). Remove the mounting screw (3) from the underside of the I/O connectivity base, and then attach the bracket on the fingerprint reader assembly to the underside of the I/O connectivity base (4) using the screw that was removed from the base and the short screw included in the kit.



5. Connect the fingerprint reader cable to a USB Type-A port on the I/O connectivity base.



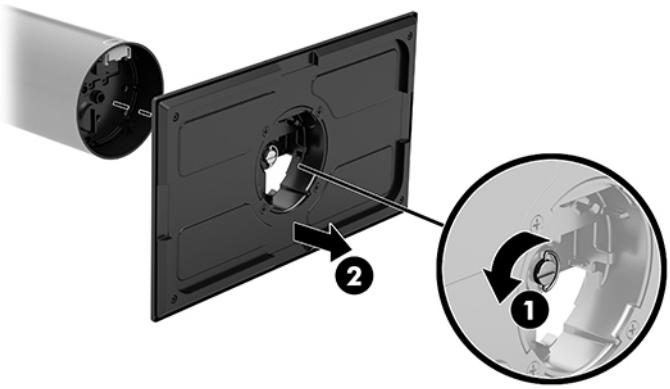
6. Reconnect the I/O connectivity base and power cords.

Mounting the HP Engage Go Convertible System to a countertop

You can use an optional countertop mounting bracket to mount the mobility system's column to a countertop.

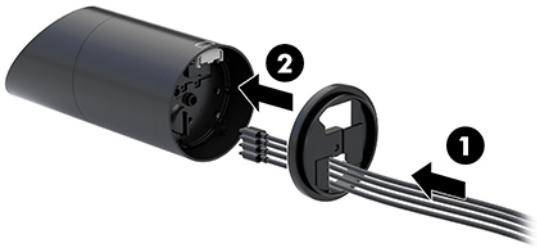
NOTE: The mounting bracket requires an 80 mm hole in the countertop. The thickness of the countertop must be 10 mm to 50 mm.

1. If the dock's stability base is attached to the column, remove the screw on the underside of the column (1), and then remove the base (2) from the column.

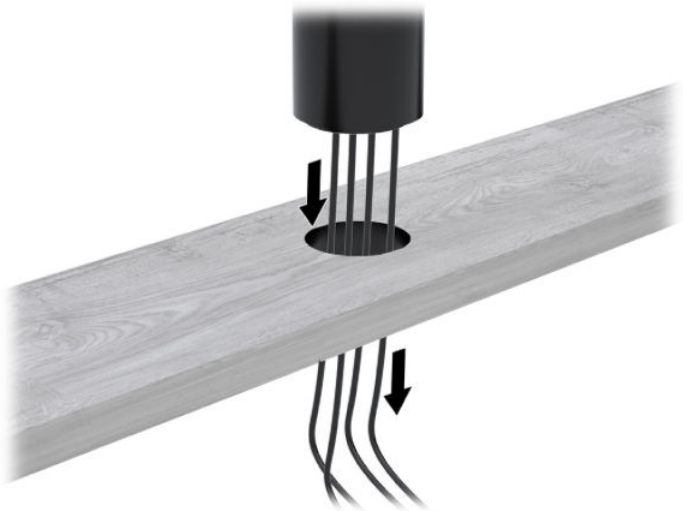


2. Route the cable(s) through the routing hole on the top piece of the mounting bracket (1) and attach the cable(s) to the bottom of the column (2).

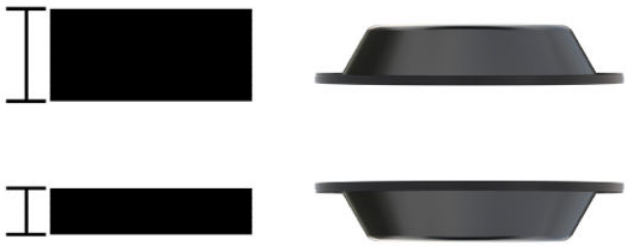
NOTE: If the column has a printer, there are four cables to connect. If it does not have a printer, there is one cable to connect.



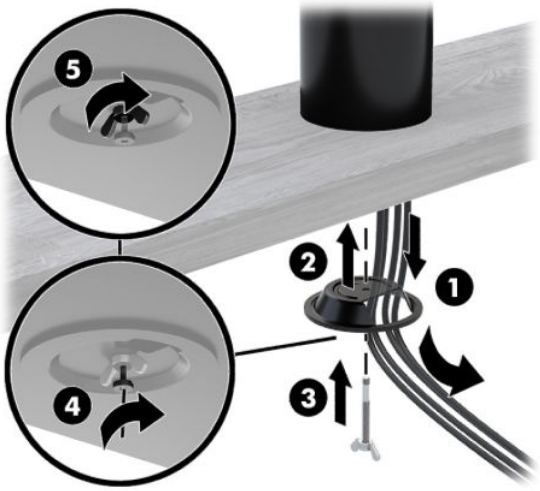
3. Hold the top piece of the mounting bracket against the bottom of the column, route the cables through the hole in the mounting surface, and then place the column over the hole on the mounting surface.



4. The bottom piece of the mounting bracket can be oriented in two ways, depending on the thickness of your mounting surface. Orient the bracket properly for your application before attaching it.



5. Route the cables through the hole in the bottom piece of the mounting bracket (1). Press the mounting bracket against the bottom of the mounting surface (2), and then insert the screw (3) though the mounting bracket. Then tighten the screw (4) so that the screw is fully inserted into the column, and then tighten the wing nut (5) on the screw to fasten the bracket to the mounting surface.



6 Removal and replacement procedures for the mobility head unit

The following sections provide information about disassembling various components of the computer.

Preparing to disassemble the computer

To avoid injury and equipment damage, always complete the following steps in order, when opening the computer.

1. Remove all removable media, such as USB flash drives, from the computer.
2. Turn off the computer properly through the operating system, and turn off any external devices.
3. Disconnect the power cord from the AC outlet and disconnect any external devices.

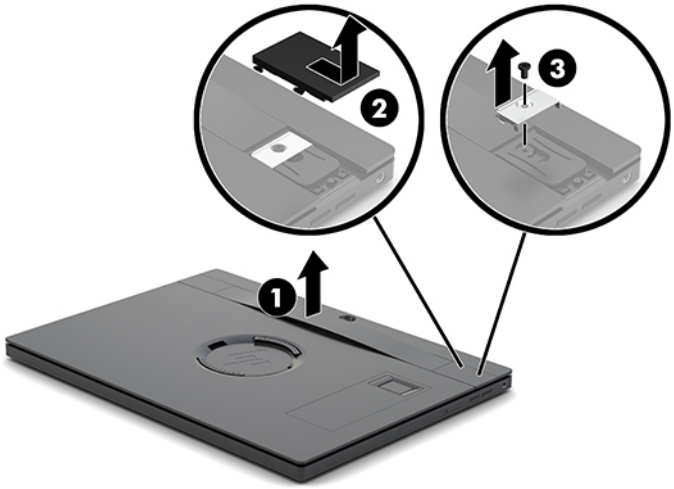
IMPORTANT: Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord and wait approximately 30 seconds for the power to drain to avoid damage to the internal components of the computer.

4. Disconnect all other attached cables from the computer.
5. Remove the mobility head unit from the dock if it is attached.

CAUTION: Beware of sharp edges inside the chassis.

Hand strap

1. Prepare the computer for disassembly (see Preparing to disassemble the computer on page 37).
2. Lift the hand strap up **(1)**.
3. Slide the screw covers **(2)** on each side of the hand strap back and then up. Remove the screws **(3)** that secure the strap to the mobility head unit.



To replace the hand strap, reverse the removal procedures.

Backplate

1. Prepare the computer for disassembly (see Preparing to disassemble the computer on page 37).
2. Remove the hand strap (see Hand strap on page 38).
3. Loosen the two screws under the hand strap **(1)**.
4. Slide the backplate upward slightly, and then lift it up enough to access the cables underneath that connect the backplate to the system board **(2)**.

IMPORTANT: Cables route from the backplate to the system board. Be sure not to accidentally disconnect the cables when lifting the backplate.

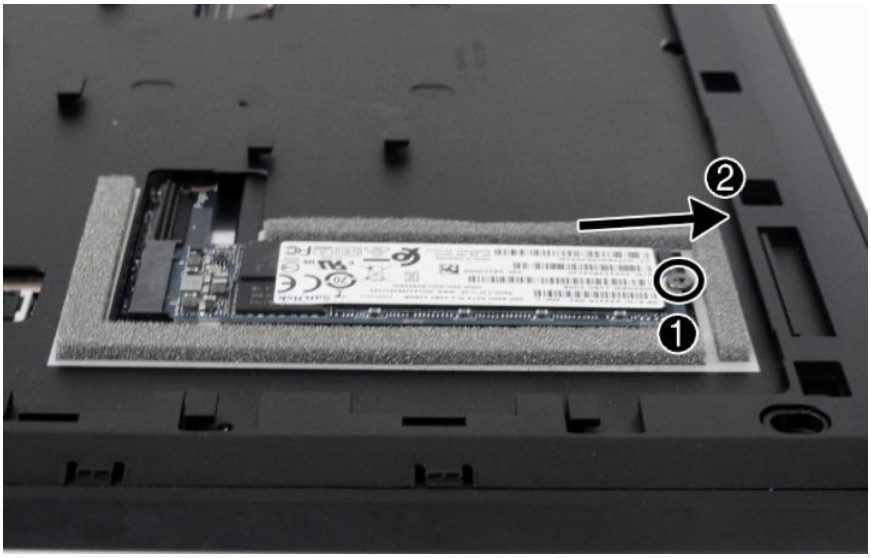
5. If equipped, disconnect the NFC and/or fingerprint reader cables from the system board **(1)**.
6. Disconnect the communication cable from the system board **(2)**, and then remove the backplate.

To replace the backplate, reverse the removal procedures.

Solid-state drive (M.2)

For a list of available solid-state drives, see Illustrated parts catalog on page 14.

1. Prepare the computer for disassembly (see Preparing to disassemble the computer on page 37).
2. Remove the hand strap (see Hand strap on page 38).
3. Remove the rear cover (see Backplate on page 39).
4. To remove the solid-state drive, remove the screw that secures the drive to the system board **(1)**, and then slide the drive out of the system board connector **(2)**.



To install a solid-state drive, reverse the removal procedures.

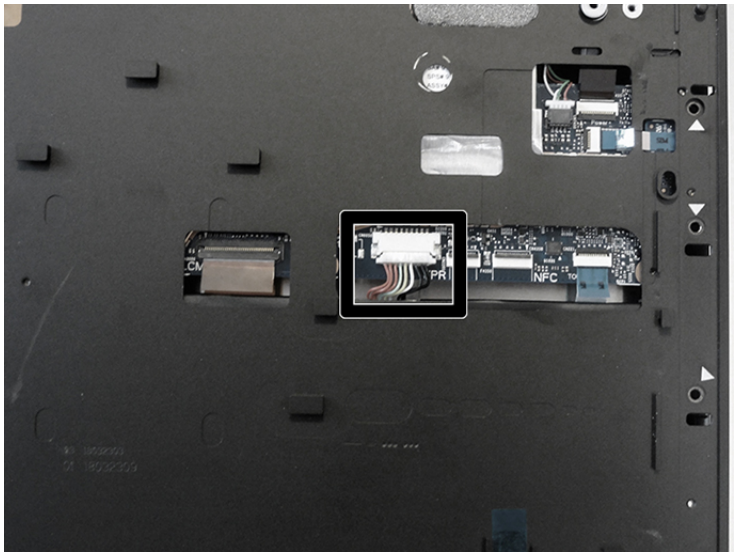
Display

NOTE: The display panel is spared with all required parts.

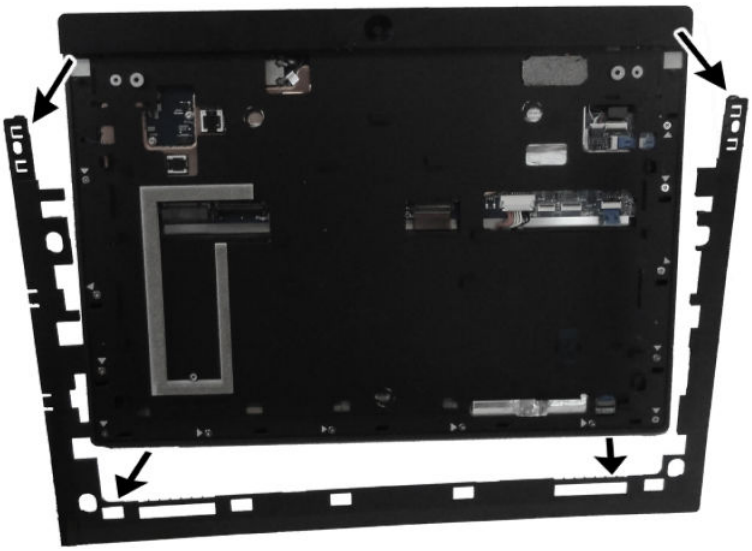
To remove the display:

1. Prepare the computer for disassembly (see Preparing to disassemble the computer on page 37).
2. Remove the hand strap (see Hand strap on page 38).
3. Remove the rear cover (see Backplate on page 39).

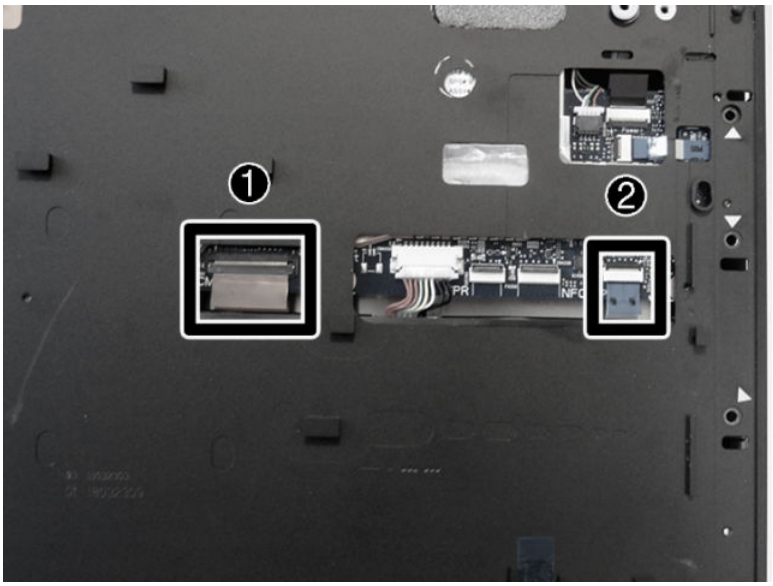
4. Disconnect the battery cable from the system board.



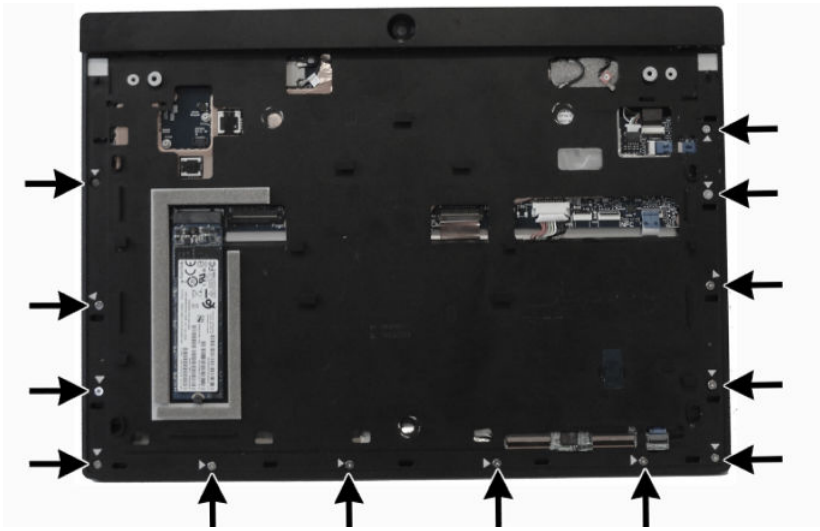
5. Pull the mid plate bezel from the chassis.



6. From the back of the computer, disconnect the display cable from the ZIF connector **(1)** and the touch cable from the reverse ZIF connector **(2)** on the system board.

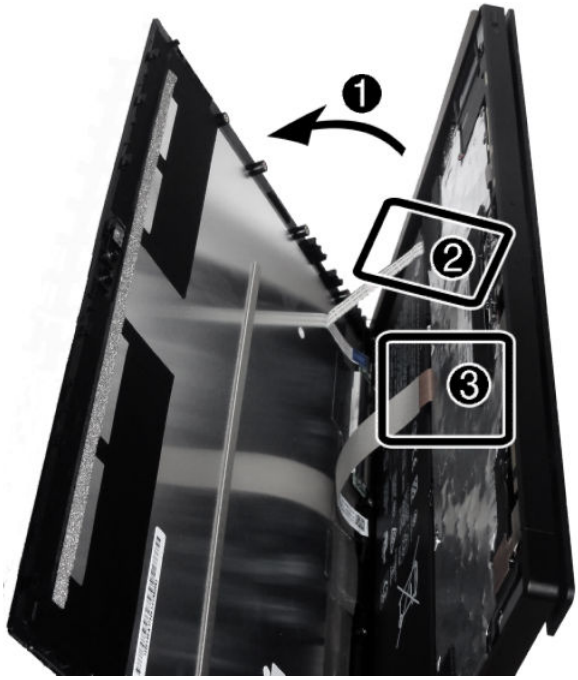


7. Remove the 13 screws that secure the display to the chassis.



8. Rotate the top of the display panel away from the computer chassis **(1)**.

9. Pull touch cable **(2)** and the display cable **(3)** through the holes in the chassis above the battery.

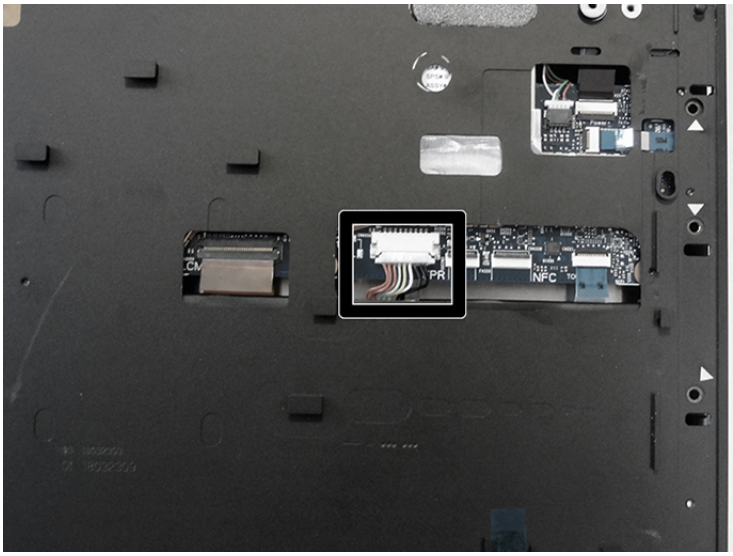


To replace the display, reverse the removal procedures.

Battery

To remove the battery:

1. Prepare the computer for disassembly (see Preparing to disassemble the computer on page 37).
2. Remove the hand strap (see Hand strap on page 38).
3. Remove the rear cover (see Backplate on page 39).
4. Remove the display (see Display on page 40).
5. From the back of the computer, disconnect the battery cable from the system board.



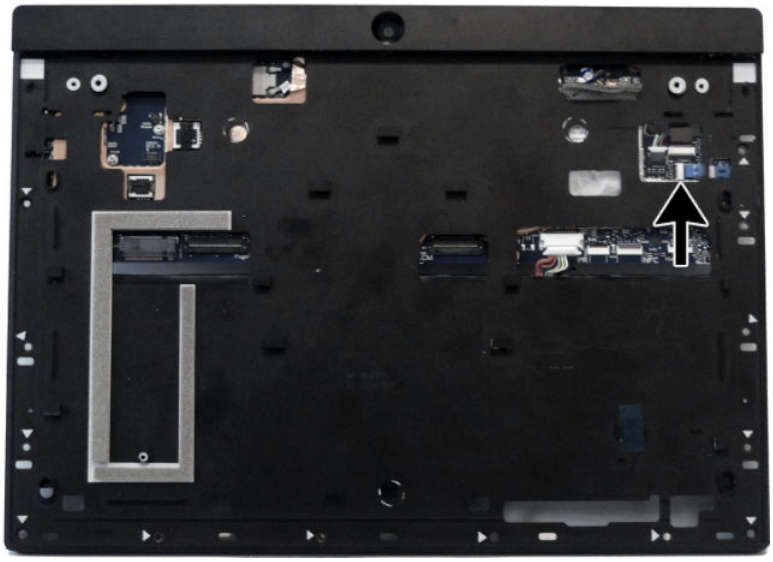
6. From the front of the computer, remove the five screws **(1)** that secure the battery, and then lift the battery out of the computer **(2)**.

To install the battery reverse the removal procedures.

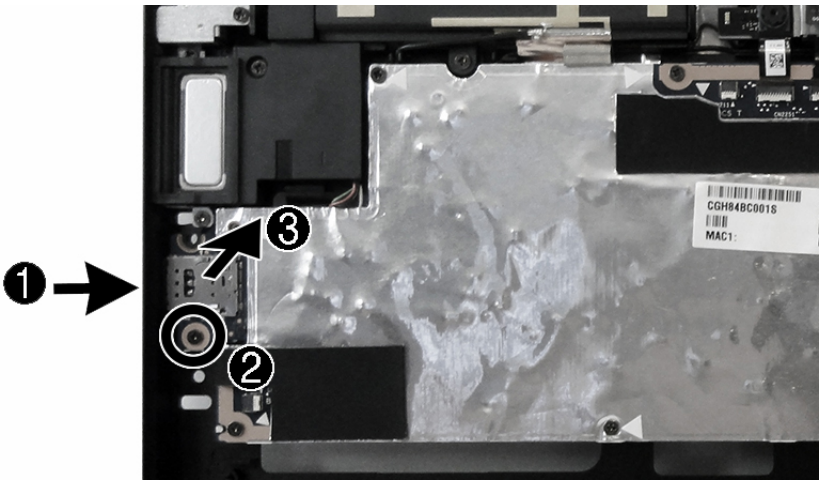
SIM board

To remove the SIM board:

1. Prepare the computer for disassembly (see Preparing to disassemble the computer on page 37).
2. Remove the hand strap (see Hand strap on page 38).
3. Remove the rear cover (see Backplate on page 39).
4. Disconnect the battery (see Battery on page 44).
5. Remove the display (see Display on page 40).
6. From the back of the chassis, disconnect the cable from the system board **(1)**.



7. From the front of the chassis, remove the SIM insert from the SIM board **(1)**.
8. Remove the screw that secures the SIM board to the computer **(2)**, and the lift the board out of the computer **(3)**.



To install the SIM board, reverse the removal procedures.

System board

To remove the system board you must first remove the stand bracket and plastic piece. You must also remove the metal I/O bracket on the side of the system board.

To remove the system board:

1. Prepare the computer for disassembly (see Preparing to disassemble the computer on page 37).
2. Remove the hand strap (see Hand strap on page 38).
3. Remove the rear cover (see Backplate on page 39).
4. Remove the solid-state drive (see Solid-state drive (M.2) on page 40).
5. Disconnect the battery (see Battery on page 44).
6. Remove the display (see Display on page 40).
7. Disconnect the following cables from the back of the system board:

   (1): WLAN antenna cables

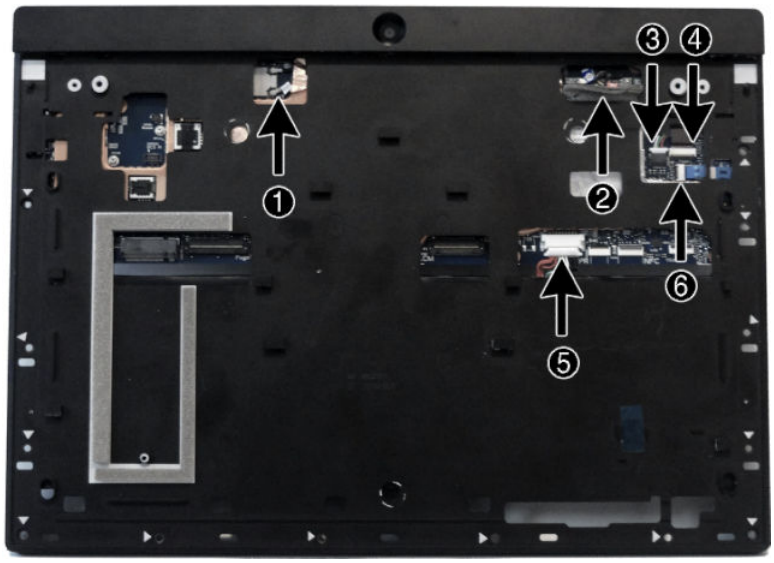
   (2): WWAN antenna cables

   (3): Speaker cable

   (4): Power cable (ZIF)

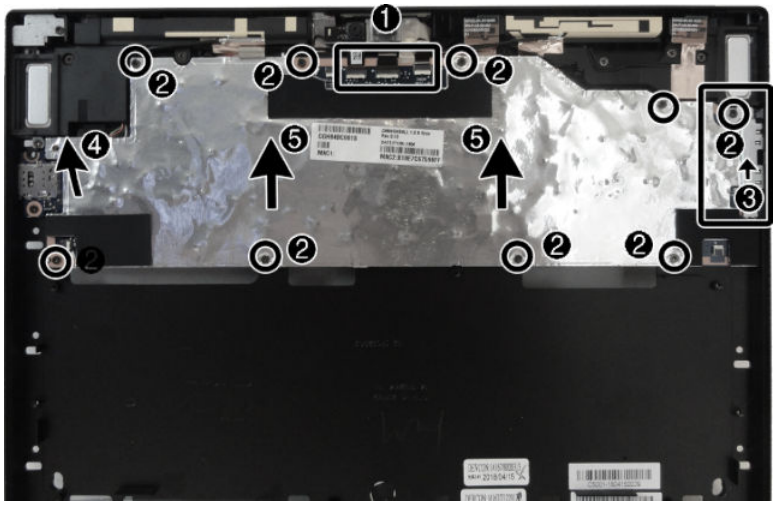
   (5): Battery cable

   (6): SIM board cable (ZIF)



8. Position the computer upright with the system board facing you.
9. Disconnect the three webcam cables from the system board **(1)**.
10. Remove the eight screws **(2)** that secure the system board to the computer.
11. Lift the USB bracket off the system board **(3)**.

12. Lift the side of the system board upward **(4)**, and the pull it away from the I/O connectors and out of the computer **(5)**.

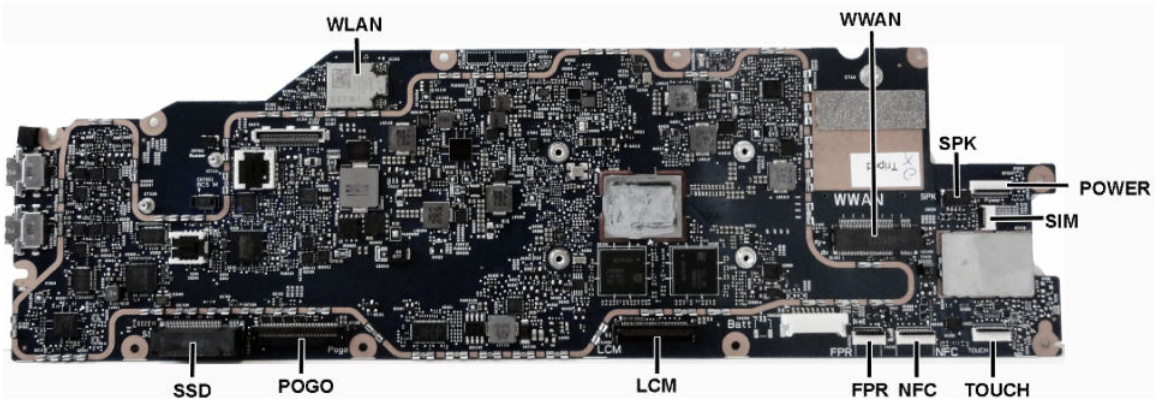


IMPORTANT: It is very important to enter the FeatureByte properly when updating the DMI configuration.

Incorrect FeatureByte information can cause various issues, such as preventing the touch screen from working.

To install the system board, reverse the removal procedures.

System board callouts



Sys Bd Label	Color	Component	Sys Bd Label	Color	Component
WLAN	Gold	WLAN module	NFC	White	NFC module
WWAN	Gold	WWAN module	FPR	White	Fingerprint reader
SPK	Black	Speakers	LCM	Black	Display
POWER	White	Power button	POGO	Black	POGO connector
SIM	White	SIM board	SSD	Black	M.2 SSD drive
TOUCH	White	Display			

Sys Bd Label	Color	Component	Sys Bd Label	Color	Component
CN2251	Black	Front-facing webcam	MIC ALS	Black	Webcam light
CN2250	Black	Rear-facing webcam			

WWAN module

For a list of available WWAN modules, see Illustrated parts catalog on page 14.

The WWAN module is located on the back of the system board. The WWAN module is secured with one Phillips screw and has two connected antennas. You must remove the system board to replace the WWAN module.

NOTE: The procedure to replace the WWAN module must be performed by an HP technician.

To remove the WWAN module:

1. Prepare the computer for disassembly (see Preparing to disassemble the computer on page 37).
2. Remove the hand strap (see Hand strap on page 38).
3. Remove the rear cover (see Backplate on page 39).
4. Disconnect the battery (see Battery on page 44).
5. Remove the display (see Display on page 40).
6. Remove the system board (see System board on page 46).
7. Lift the foam **(1)** and tape **(2)** from atop the WWAN module.

8. Remove the Phillips screw **(1)** that secures the module to the system board, and then pull the module out of the socket **(2)**.

To install the WWAN module, reverse the removal procedures.

When connecting the antennas cables, connect the cable labeled “1” (black sticker) to the AUX “1” connector on the module and the cable labeled “2” (white sticker) to the MAIN “2” connector on the module.

NOTE: WWAN modules are designed with a notch to prevent incorrect insertion.

Be sure to re-adhere the tape to across the antenna connectors when replacing the WWAN module.

7 Using the column printer

The column printer is an optional component that may be included with your system.

Standard features

Standard features	
Interface	USB
Memory/firmware	8 MB flash memory, History EEROM, 4k buffer
Energy-savings	Option to configure printer to enter low-power (1 watt) idle state if no data is received after user-specified number of minutes
Resident character sets	PC code pages 437 (US), 720 (Arabic), 737 (Greek), 775 (Baltic), 850 (Multilingual), 852 (Latin II), 857 (Turkish), 858 (with Eurosymbol), 860 (Portuguese), 862 (Hebrew), 863 (French Canadian), 864 (Arabic), 865 (Nordic), 866 (Cyrillic), 874 (Thai), 1250 (Windows Central Europe), 1251 (Windows Cyrillic), 1252 (Windows Latin I), 1254 (Windows Turkish), 1255 (Windows Hebrew), 1256 (Windows Arabic), 1257 (Windows Baltic), 28591 (Windows Latin 1), 28592 (Windows Latin 2), 28594 (Windows Baltic), 28596 (Windows Arabic), 28599 (Windows Turkish), 28605 (Windows Latin 9), Katakana, and KZ_1048 (Kazakh)
Downloadable fonts	Code pages 932 (Kanji), 949 (Korean), 936 (Simplified Chinese), and 950 (Traditional Chinese)
Integrated barcodes	Code 39, Code 93, Code 128, UPC-A, UPC-E, JAN8 (EAN), JAN13 (EAN), Interleaved 2 of 5, Codabar, Code 128, PDF-417 (two-dimensional), Code 128 extended, GS1 Databar, QR code, and Datamatrix
Print	Monochrome in either 44 (standard) or 56 (compressed) columns on 80 mm wide thermal paper
Paper path	80.0 mm
Roll Diameter	50.8 mm max. (2 inches)
Print resolution	8-dots/mm
Speed	Up to 114 mm/second throughput (monochrome)
Paper sensing	Paper out
Human interface	Audible tone from speaker (software-driven). Simple commands in configuration menu issued through paper feed button. Green status light, located next to the paper feed button.
Cash drawer driver	Connector for one or two cash drawers (obtain a " cord for two drawers)
Knife	Paper cutter standard on all units

Printing features

The printer is versatile, with diverse printing options available. Text, graphics, and barcodes can be presented in many different forms and sizes. For more information on programming the printer to change text, graphics, or other characteristics, refer to the *Programming Guide*.

When to change the receipt paper

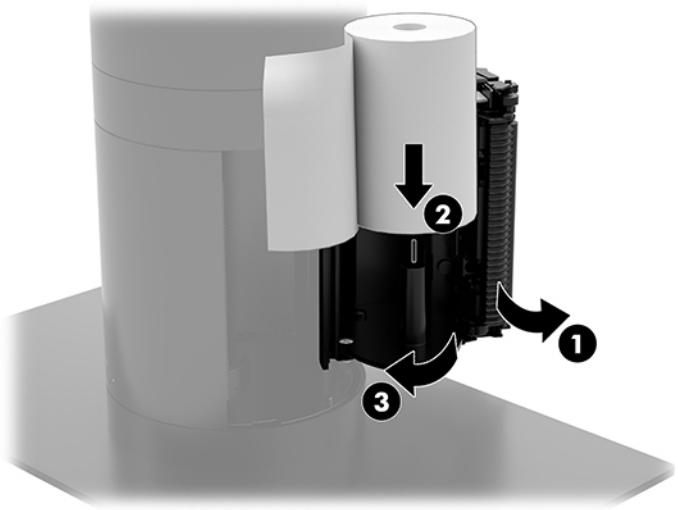
Change the paper when it is near the end of the roll or when the roll is empty. When the paper is low, you must monitor usage to avoid running out part of the way through a transaction. When the roll is empty, you must load a new roll immediately or data may be lost.

- When the paper is low, a colored stripe appears on the receipt paper (if the paper purchased has a stripe) indicating that enough paper remains for a small transaction.
- When the roll is empty, a green light on the printer flashes quickly indicating the paper must be installed.

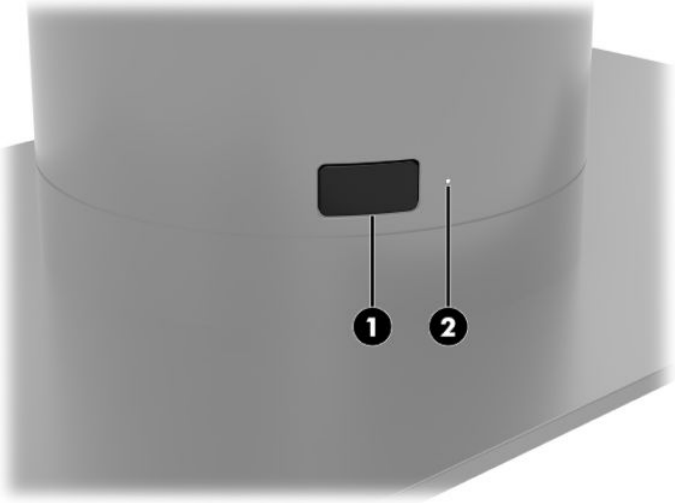
IMPORTANT: Do not try to operate the printer or host system if the printer runs out of paper. The printer may continue to accept data from the host system even though it is unable to print. Data may be lost as a result.

Loading the printer receipt paper

1. Open the receipt cover by pushing up evenly on each side of the cover (1) until it unsnaps.
2. Remove the test printout or used paper roll if necessary.
3. Place the receipt paper into the paper compartment on the spindle (2) so that it unrolls from the inside. Leave a few inches of paper sticking out of the printer. To prevent jamming, be sure that the paper is between the guidelines.
4. While holding the paper in place, close the receipt cover (3) making sure to apply a little more pressure after the first click to ensure that it is fully latched. When fully latched with paper installed, the light stops blinking.



5. To test that the paper is loaded correctly, advance the paper with the paper feed button (1), and then tear the excess paper off against the knife on the cover. A steady green light (2) means the printer is on and operating normally. If the light is flashing, the cover may not be completely shut.



Thermal paper specifications

The printer requires qualified thermal paper with the following dimensions:

- **Width**: 80 +0/-0.6 mm (3.15 +0/-0.03")
- **Diameter**: 50.8 mm max. (2”)

The paper must not be attached at the roll’s core. Use paper with a colored stripe at the end to indicate that the paper is running low.

The above figures are based on a core diameter of 22 ± 0.5 mm (0.87") outside and 11.5 ± 0.5 mm (0.45") inside.

Qualified paper grades

Contact the manufacturer of your choice to order paper. HP recommends the following paper grades produced by their respective manufacturers. There are a number of paper manufacturers qualified to provide this paper, provided the POS paper rolls are from the recommended grades for monochrome (black ink) paper.

Qualified manufacturers	Phone/Fax	Paper grade
Appvion, Inc. (USA)	Voice: (800) 922–1729	Alpha 400-2.3 (was T1030)
825 E. Wisconsin Ave.	Fax: (800) 922–1712	Alpha 800-2.4 (was T1012A)
Appleton, WI 54912		POS-Plus 600-2.4
http://www.appvion.com		Alpha 900-3.4 (was Superior)
		All current Appvion papers are BPA-free
Jujo Thermal Ltd.	Voice: 358 (0) 10 303 200	AF50KS–E3
P.O. Box 92 FI–27501	Fax: 358 (0) 10 303 2419	AP62KS–E3
Kauttua, Finland		

Qualified manufacturers	Phone/Fax	Paper grade
http://www.jujothermal.com/		
Kanzaki Specialty Papers (USA) 20 Cummings St. Ware, MA 01082–2002 http://www.kanzakiusa.com/	Voice: (888) 526–9254 Fax: (413) 731–8864	P30023 (was P–300), P31023 (was P–310), P35024 (was P–350), P35032 (was P–354), P39023 (BPA free, was P–390), P30521 (BPA free), P30523 (BPA free), P31523 (BPA free), P35532 (BPA free)
Koehler UK Ltd. (Great Britain) 2 White Oak Square London Road Swanley, Kent BR8 7AG, U.K. http://www.koehlerpaper.com/en/	Voice: (44) 1322 661010 Fax: (44) 1322 614656	KT55-F20
Koehler AG Hauptstr. 2-4 D-77704 Oberkirch, Germany http://www.koehlerpaper.com/en/	Voice: (49) 7802 81-0 Fax: (49) 7802 81-4330	KT55-F20
Mitsubishi Int'l Corp. (USA) 655 Third Ave. New York, New York 10017 http://www.mitsubishicorp.com/us/en/	Voice: (212) 605–2000 Fax: (212) 605–2597	P–5035 T–8051 TP–8065 PP-5051
OJI Paper Company Ltd. Ginza 4-chome Tokyo 104, Japan http://www.ojipaper.co.jp/english/	Voice: (81)3–3563-1111 Fax: (81)3–3563-1135	KF–60 PD–170R PD–170R
Thermal Solutions Intl, Inc. 6740 Broadview Ave, Suite D Jacksonville, FL 32254 http://thermalsolutionsinternational.com	Voice: (800) 479-6070, (904) 860-1966 Fax: (904) 646-4530	19018RDT Features: 30% post-consumer waste, recycled/BPA free

Troubleshooting the printer

The printer is generally trouble-free; however, unexpected conditions may arise. Refer to the following sections to diagnose and solve these printer conditions. To resolve complex issues, you may need to contact an authorized HP service representative.

Printer tone and green light

Condition	Possible causes	Possible solutions	Where to go for more information
Green light, quick steady flashing.	Paper roll is empty.	Load a new paper roll.	See Loading the printer receipt paper on page 52.
	Receipt cover is open.	Close the cover. If the problem persists, continue opening and closing the cover until the light stops blinking.	
	The knife is unable to return to the home position.	Stop using the printer.	Contact your authorized HP service representative.
Green light, slow steady flashing.	Other problems may be indicated.	Stop using the printer.	Contact your authorized HP service representative.
Printer beeps (two-tone—low frequency, high frequency).	Printer has been turned on and is ready to operate.	No action is required.	
Printer beeps and the green light flashes in various combinations.	These all indicate a serious condition.	Stop using the printer.	Contact your authorized HP service representative.

Printing issues

Condition	Possible causes	Possible solutions	Where to go for more information
Colored stripe on the receipt.	Paper is low.	Change the paper.	See Loading the printer receipt paper on page 52.
Receipt does not come out all the way.	Paper is jammed.	Open the receipt cover, inspect the knife, and clear any jammed paper.	
Printer starts to print, but stops while the receipt is being printed.	Paper is jammed.	Open the receipt cover, inspect the knife, and clear any jammed paper.	
Receipt is not cut.	Paper is jammed.	Open the receipt cover, inspect the knife, and clear any jammed paper.	
Print is light or spotty.	Paper roll is loaded incorrectly.	Reload the paper correctly.	See Loading the printer receipt paper on page 52.
	Thermal printhead is dirty.	Use recommended thermal receipt paper and clean the printhead with 99% isopropyl alcohol.	

Condition	Possible causes	Possible solutions	Where to go for more information
	Variations in paper.	Increase print density in **Set Hardware Options** of the printer configuration menu to 110% or 120% as necessary.	Contact your authorized HP service representative.
Vertical column of print is missing.	This indicates a serious condition with the printer electronics or missing dot on printhead.	Stop using the printer.	Contact your authorized HP service representative.
One side of receipt is missing.	This indicates a serious condition with the printer electronics.	Stop using the printer.	Contact your authorized HP service representative.

NOTE: Using nonrecommended paper may damage the printhead and void the warranty.

Printer does not function

Condition	Possible causes	Possible solutions	Where to go for more information
Printer does not function when turned on and light is off.	Power is not plugged in.	Check that the host or power supply is getting power.	
Printer does not function when turned on and the light is blinking.	Receipt cover is not fully closed.	Close and latch the receipt cover.	
Printer stops functioning.	Printhead has overheated.	Allow the printhead to cool down.	
	Printer is in energy-saving mode.	Press the paper feed button to revive the printer.	
Printer does not open.	Receipt cover is stuck.	Release the latch failsafe.	See Latch failsafe on page 57.

Latch failsafe

In the event that the receipt cover becomes stuck, the printer has a failsafe to release the cover's latches. Using a thin pointed object, press the rectangular button adjacent to the printhead. With enough pressure, the latches should release, and the receipt cover should open.

8 Configuring the software

Touch screen calibration for Windows 10 Professional and Windows 10 IoT Enterprise for Retail

NOTE: The Windows calibration tool works only in digitizer touch mode. If you install a retail touch utility, it sets the touch screen to POS mode (mouse mode) by default and does not allow the Windows calibration tool to run.

To calibrate the touch module in Windows 10 Professional and Windows 10 IoT Enterprise for Retail:

1. Open Control Panel. You can type `Control Panel` in the Search box to access it.
2. In Control Panel, type `calibrate` in the Search box. Under **Tablet PC Settings**, tap the **Calibrate the screen for pen or touch input** link. In the **Tablet PC Settings** dialog box, tap the **Calibrate** button, and then proceed to step 3.
3. Follow the on-screen instructions to press the target marks on the touch screen. At the end of the calibration process, the touch module should be aligned with the video and the touch points will be accurate.

Configuring optional HP integrated peripheral modules

To configure the integrated USB peripheral, refer to the *HP Point of Sale Configuration Guide* (available in English only). The guide is located with the documentation on your retail system and at http://www.hp.com/support. To access the guide on the retail system, select **Start**, and then select **HP Point of Sale Information**.

NOTE: Check http://www.hp.com/support for updated software or documentation that became available between the time your product was manufactured and the time it was delivered to you.

9 Computer Setup (F10) Utility

Computer Setup (F10) Utilities

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

- Change factory default settings.
- View the system configuration, including settings for processor, graphics, memory, audio, storage, communications, and input devices.
- Modify the boot order of bootable devices such as hard drives, optical drives, or USB flash media devices.
- Select Post Messages Enabled or Disabled to change the display status of Power-On Self-Test (POST) messages. Post Messages Disabled suppresses most POST messages, such as memory count, product name, and other non-error text messages. If a POST error occurs, the error is displayed regardless of the mode selected. To manually switch to Post Messages Enabled during POST, press any key (except F1 through F12).
- Establish an Ownership Tag, the text of which is displayed each time the system is turned on or restarted.
- Enter the Asset Tag or property identification number assigned by the company to this computer.
- Enable the power-on password prompt during system restarts (warm boots) as well as during power-on.
- Establish a setup password that controls access to the Computer Setup (F10) Utility and the settings described in this section.
- Secure integrated I/O functionality, including the serial, USB, or parallel ports, audio, or embedded NIC, so that they cannot be used until they are unsecured.
- Enable or disable removable media boot ability.
- Solve system configuration errors detected but not automatically fixed during the Power-On Self-Test (POST).
- Replicate the system setup by saving system configuration information on a USB device and restoring it on one or more computers.
- Enable or disable DriveLock security (when supported by drive).

Using Computer Setup (F10) Utilities

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

1. Turn on or restart the computer.
2. Repeatedly press F10 when the monitor light turns green to access the utility.

   You can also press Esc to a menu that allows you to access different options available at startup, including the Computer Setup utility.

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

3. A choice of four headings appears in the Computer Setup Utilities menu: Main, Security, Advanced, and UEFI Drivers.

NOTE: Selecting UEFI Drivers restarts the computer into the 3rd party option ROM management application. You can access this application directly by pressing F3 during startup.

4. Use the arrow (left and right) keys to select the appropriate heading. Use the arrow (up and down) keys to select the option you want, then press Enter. To return to the Computer Setup Utilities menu, press Esc.

5. To apply and save changes, select **Main** > **Save Changes and Exit**.

   - If you have made changes that you do not want applied, select **Ignore Changes and Exit**.
   - To reset to factory settings or previously saved default settings (some models), select **Apply Factory Defaults and Exit**. This option will restore the original factory system defaults.

NOTE: Not all settings shown in the following sections are available for all models

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

Computer Setup–Main

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

Table 9-1 Computer Setup—Main

Option	Description
System Information	Lists all information in following list if **Advanced System Information** is selected. Lists smaller subset if **Basic System Information** is selected. • Product Name • Memory Size • Processor Type • Processor Cache Size • Processor Speed • MicroCode Revision • Processor Stepping • Memory Speed • DIMM 1 Size • DIMM 3 Size • System BIOS version • ME Firmware Version • Reference Code Revision • Video BIOS Version • Super I/O Firmware Version • USB Type-C Controller(s) Firmware Version • Born On Date • Serial Number • SKU number • UUID (Universally Unique Identifier) • Asset Tracking Number • Feature Byte • Build ID • Product Family • System Board ID • System Board CT
System Diagnostics	Starts HP PC Hardware Diagnostics UEFI. Lets you perform the following functions: • Memory Test • Hard Drive Check • Language
Update System BIOS	Displays current BIOS information.

Table 9-1 Computer Setup—Main (continued)

Option	Description
	Check HP.com for BIOS Updates Checks for the latest BIOS release revision on the network, and lets you decide whether to download the BIOS image and update the system. **Lock BIOS Version** Clear to allow BIOS updates. Select to block BIOS updates. **BIOS Rollback Policy** • Unrestricted Rollback to older BIOS • Restricted Rollback to older BIOS **Allow BIOS Updates Using a Network** Select to enable scheduled automatic BIOS updates through the network. **BIOS Update Preferences** Lets you configure BIOS updates through the network. • Check for Update on Next Reboot • BIOS Source – select the source of the BIOS update from either HP.com or a custom URL. • Automatic BIOS Update Setting – select how BIOS is updated. **NOTE:** BitLocker Drive Encyption (BDE) must be temporarily suspended to be able to flash the BIOS. • BIOS Update Frequency – select how often the BIOS is updated. This setting is not active if **Automatic BIOS Update Setting** is set to 'Do no update'. **Network Configuration Settings** Lets you configure upload and download settings. • Proxy Server – select to enable use of a proxy server. • Edit Proxy Server – If Proxy Server is enabled, lets you specify the server address in <server>:<port> format. • Test Network Connection – select to check the network connection based on the selection in **Automatic BIOS Update Setting**. • IPv4 Configuration – select 'Automatic' or 'Manual'. If 'Manual' is selected, you can configure the address, subnet mask, and gateway. • DNS Configuration – select 'Automatic' or 'Manual'. If 'Manual' is selected, you can entered a list of DNS addresses. • Data transfer timeout – lets you configure the timeout setting. Select **Force HTTP no-cache** to disable HTTP caching. **Update BIOS Using Local Media** Lets you update the system BIOS. BIOS update binary (BIN) files must be located on the system hard drive or on a removable USB drive under the "Hewlett-Packard\BIOS\New" folder or under the "EFI\HP\BIOS\New" folder. The files can also be placed in the "Hewlett-Packard\BIOS\Previous" folder or under the "EFI\HP\BIOS\Previous" folder.
Change Date and Time	Lets you update system date and time.
System IDs	Lets you clear the following values: • Asset Tracking Number • Ownership Tag

Table 9-1 Computer Setup—Main (continued)

Option	Description
Replicated Setup	**Backup current settings to USB device** Saves system configuration to a formatted USB flash media device. **Restore current settings from USB device** Restores system configuration from a USB flash media device.
Save Custom Defaults	Saves the current system configuration settings as the default.
Apply Custom Defaults and Exit	Applies the currently selected default settings and clears any established passwords.
Apply Factory Defaults and Exit	Restores the factory system configuration settings as the default.
Ignore Changes and Exit	Exits Computer Setup without applying or saving any changes.
Save Changes and Exit	Saves changes to system configuration or default settings and exits Computer Setup.
Suppress POST Errors	Suppresses most system messages during POST (Power On Self Test). POST error messages are displayed on the display during the Power On Self Test if the BIOS encounters a problem while starting the computer. A POST error message will only display on screen if the computer is capable of booting this far. If the POST detects an error before this point, a beep code is generated instead.

Computer Setup—Security

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

Table 9-2 Computer Setup—Security

Option	Description
Create BIOS Administrator Password	Lets you set and enable a BIOS administrator password, which includes the following privileges: • Manage other BIOS users • Full access to BIOS policy and settings • Control BIOS access of other users by setting security level • Unlock the computer when other BIOS users fail the preboot authentication. **NOTE:** Creating a BIOS user disables the Fast Boot option. **NOTE:** If the password is set, it is required to change Computer Setup options, flash the ROM, and make changes to certain plug and play settings under Windows.
Change BIOS Administrator Password (This selection is active only if a BIOS administrator password is set.)	Lets you change the BIOS administrator password. You must know the current password to be able to change it.
Password Policies	Let you set the guidelines for a valid password. Options include: • Password minimum length • Requires at least one symbol

Table 9-2 Computer Setup—Security (continued)

Option	Description
	• Requires at least one number • Requires at least one upper case character • Requires at least one lower case character • Allow spaces **Clear Password Jumper** Select 'Honor' to engage or 'Ignore' to disengage the password jumper. Default is 'Honor'.
TPM Embedded Security	Displays the TPM specification version. Lets you configure the following TPM settings: **TPM Device** Lets you set the Trusted Platform Module as available or hidden. **TPM State** Select to enable the TPM. **Clear TPM** Select to reset the TPM to an unowned state. After the TPM is cleared, it is also turned off. To temporarily suspend TPM operations, turn the TPM off instead of clearing it. **CAUTION:** Clearing the TPM resets it to factory defaults and turns it off. You will lose all created keys and data protected by those keys.
BIOS SureStart	HP Sure Start verifies the integrity of HP BIOS code and critical, non-executable platform data residing in the main flash and provides self-healing mechanisms to restore any code or critical platform data that has been lost or is corrupted within the flash. **Verify Boot Block on every boot** Disabled (Default): When set to the default, HP Sure Start will verify the integrity of the BIOS in System Flash each time the system is in a Sleep, Hibernate, or Off state such that assurance is provided that it has not been tampered with before the host CPU executes that code as part of the process of resuming from the low power state. Enabled: When this box is checked, the HP Sure Start will continue to verify the integrity of the BIOS in System Flash each time the system is in a Sleep, Hibernate, or Off state. Additionally, the HP Sure Start will verify the integrity of the BIOS in System Flash on each Warm Boot (Windows Restart). **BIOS Data Recovery Policy** Automatic (Default): Any problems that are found by HP Sure Start will be automatically repaired not requiring any special actions by the local user. Manual (For Advanced Users only): Any problems found by HP Sure Start will not be repaired automatically and will require a special key sequence input by the local user to proceed with the repair. This mode is only intended for scenarios where the machine owner would prefer to perform forensics on the system flash contents before it is repaired and is not recommended for the typical user. In the case of HP Sure Start finding an issue with the initial BIOS code, the system will refuse to boot and flash a special LED sequence until the special key sequence is pressed on the internal keyboard. Network Controller Configuration Restore – This manual control will restore the network parameters (used by the Intel integrated network controller) stored in System Flash to their factory defaults. **Dynamic Runtime Scanning of Boot Block** Select to enable.
Intel Software Guard Extensions (SGX)	Let you enable or disable software guard extensions.

Table 9-2 Computer Setup—Security (continued)

Option	Description
Hard Drive Utilities	**Save/Restore MBR of System Hard Drive** Enable to save the Master Boot Record (MBR) of the hard drive. If the MBR gets changed, the user is prompted to authorize restoring the MBR. **DriveLock** Allows you to assign or modify a master or user password for hard drives. When this feature is enabled, the user is prompted to provide one of the DriveLock passwords during POST. If neither is successfully entered, the hard drive will remain inaccessible until one of the passwords is successfully provided during a subsequent cold-boot sequence. **NOTE:** This selection will only appear when at least one drive that supports the DriveLock feature is attached to the system. **CAUTION:** Be aware that these settings take place immediately. A save is not necessary. **CAUTION:** Be sure to document the DriveLock password. Losing a DriveLock password will render a drive permanently locked. After you select a drive, the following options are available: • **Set DriveLock Master Password**. Sets the drive's master password but does not enable DriveLock. • **Enable DriveLock**. Sets the drive's user password and enables DriveLock. **Secure Erase** Lets you select a hard drive to completely erase. Once a hard drive has been erased with a program that utilizes Secure Erase firmware commands, no file recovery program, partition recovery program, or other data recovery method will be able to extract data from the drive.
System Management Command	Allows authorized personnel to reset security settings during a service event. Default is enabled.
Restore Security Settings to Default	Restoring settings to default requires the BIOS Administrator password.

Computer Setup—Advanced

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

Table 9-3 Computer Setup—Advanced (for advanced users)

Option	Description
Display Language	Lets you select the language of the menus in F10 Setup and the keyboard.
Scheduled Power-On	This feature wakes the system up from a powered off state at a specified date and time.
Boot Options	**Startup Menu Delay (sec)** Enabling this feature will add a user-specified delay to the POST process. This delay is sometimes needed for hard disks on some PCI cards that spin up very slowly, so slowly that they are not ready to boot by the time POST is finished. The POST delay also gives you more time to select F10 to enter Computer (F10) Setup. Default is '0'. Select the devices that the computer can boot from, as well as other options, including: • Fast Boot. Default is disabled. • USB Storage Boot. Default is enabled. • Network (PXE) Boot. Default is enabled.

Table 9-3 Computer Setup—Advanced (for advanced users) (continued)

Option	Description
	• After Power Loss (off/on/previous state). Default is Power off. Setting this option to: ○ Power off—causes the computer to remain powered off when power is restored. ○ Power on—causes the computer to power on automatically as soon as power is restored. ○ Previous state—causes the computer to power on automatically as soon as power is restored, if it was on when power was lost. • Prompt on Memory Size Change. Default is enabled. • Prompt on Fixed Storage Change. Default is disabled. • Audio Alerts During Boot. Default is enabled. • NumLock on at boot. Default is enabled. • UEFI Boot Order. Default is enabled. • Specify the order in which UEFI boot sources (such as a internal hard drive, USB hard drive, USB optical drive, or internal optical drive) are checked for a bootable operating system image. Each device on the list may be individually excluded from or included for consideration as a bootable operating system source. UEFI boot sources always have precedence over legacy boot sources. • **Legacy Boot Order** Specify the order in which legacy boot sources (such as a network interface card, internal hard drive, USB optical drive, or internal optical drive) are checked for a bootable operating system image. Each device on the list may be individually excluded from or included for consideration as a bootable operating system source. Specify the order of attached hard drives. The first hard drive in the order will have priority in the boot sequence and will be recognized as drive C (if any devices are attached). **NOTE:** To drag a device to a preferred place, press Enter. To remove the device from consideration as a bootable device, press F5. You can use F5 to disable individual boot items, as well as disable UEFI boot and/or legacy boot. **NOTE:** MS-DOS drive lettering assignments may not apply after a non-MS-DOS operating system has started. **Shortcut to Temporarily Override Boot Order** To boot **one time** from a device other than the default device specified in Boot Order, restart the computer and press Esc (to access the boot menu) and then F9 (Boot Order), or only F9 (skipping the boot menu) when the monitor light turns green. After POST is completed, a list of bootable devices is displayed. Use the arrow keys to select the preferred bootable device and press Enter. The computer then boots from the selected non-default device for this one time.
Secure Boot Configuration	**Configure Legacy Support and Secure Boot** Legacy Support – Lets you turn off all legacy support on the computer, including booting to DOS, running legacy graphics cards, booting to legacy devices, and so on. Secure Boot – Lets you make sure an operating system is legitimate before booting to it, making Windows resistant to malicious modification from preboot to full OS booting, preventing firmware attacks. UEFI and Windows Secure Boot only allow code signed by pre-approved digital certificates to run during the firmware and OS boot process. Default is 'Legacy Support Enable and Secure Boot Disable'. **Secure Boot Key Management** Lets you manage the custom key settings. **Clear Secure Boot Keys**

Table 9-3 Computer Setup—Advanced (for advanced users) (continued)

Option	Description
	Lets you delete any previously loaded custom boot keys. Clearing keys will disable secure boot. Default is disabled. **Reset Security Boot keys to factory defaults** Default is disabled. **Enable MS UEFI CA key** Lets you enabled the Certification Authority key. Default is enabled. **Ready BIOS for Device Guard Use** Requires BIOS Administrator password to be configured and Secure Boot to be enabled.
System Options	**Hyperthreading** Lets you control processor capability. **Virtualization Technology (VTx)** Enables the virtualization features of the processor. Changing this setting requires turning the computer off and then back on. Default is disabled. **Virtualization Technology for Directed IO (VTd)** Grants virtual machines direct access to peripheral devices on select Intel-based systems. Default is disabled. **M.2 WLAN/BT** Select to show the device in the operating system. Default is enabled. **M.2 SSD** Select to show the device in the operating system. Default is enabled. **Allow PCIe/PCI SERR# Interrupt** Allows PCI devices to report PCI/PCIe System Error signals, such as address parity errors, data parity errors, and critical errors other than parity. Default is enabled. **Power Button Override** (disable/4 sec/15 sec) Lets you disable or enable and select the number of seconds you have to hold down the power button for it to override the system. Default is '4 sec'.
Built-In Device Options	**Embedded LAN Controller** Select to show the device in the operating system. Default is enabled. **Wake On LAN** Lets you either disable the Wake On LAN feature, or configure where the computer boots, including the network or hard drive. Default is Boot to Network. **Video memory size** Choose either 32 MB, 64 MB, 128 MB, 256 MB, or 512 MB. Default is 32 MB. **Touch Device** Select to show the device in the operating system. Default is enabled. **Audio Device** Select to show the device in the operating system. Default is enabled. **Internal Speakers** (does not affect external speakers) Select to show the device in the operating system. Default is enabled.

Table 9-3 Computer Setup—Advanced (for advanced users) (continued)

Option	Description
	Headphone output (does not affect external speakers) Select to allow sound to go to headphones. Default is enabled. **Increase Idle Fan Speed(%)** Sets idle fan speed percentage. This setting only changes the minimum fan speed. The fan is still automatically controlled. **M.2 USB/Bluetooth** Select to show the device in the operating system. Default is enabled.
Port Options	Allows you to configure specific ports and show or hide ports from the operating system. Clear the box to hide a device. • Serial port A • Serial port B • Bottom I/O non-powered USB ports – all • USB 3.0 Port 1 • USB 3.0 Port 2 • USB 2.0 Port 3 • USB 2.0 Port 4 • USB 2.0 Port 5 • USB 2.0 Port 6 • SATA0 • SATA1 • SATA4 • Bottom USB Type-C port • Media card reader • Cash Drawer Port • USB Type-C Controller Firmware Update
Option ROM Launch Policy	These policies control whether the Legacy Option ROM or the UEFI driver is loaded. Default is 'All UEFI'. **Configure Option ROM Launch Policy** • All legacy • All UEFI • All UEFI except video
Power Management Options	**Runtime Power Management** (enable/disable) Allows certain operating systems to reduce processor voltage and frequency when the current software load does not require the full capabilities of the processor. Default is enabled. **Extended Idle Power States** (enable/disable) Allows certain operating systems to decrease the processors power consumption when the processor is idle. Default is enabled. **S5 Maximum Power Savings** (enable/disable)

Table 9-3 Computer Setup—Advanced (for advanced users) (continued)

Option	Description
	Enabling this feature reduces the power of the system as much as possible in the S5 state. Power is removed from the wake up circuitry, the expansion slots, and any management features while in S5. Default is disabled. **SATA Power Management** (enable/disable) Enables or disables SATA bus and/or device power management. Default is enabled. **PCI Express Power Management** (enable/disable) Enabling this option permits the PCI Express links to use Active Power State Management (ASPM) to enter lower power states while not in use. Default is enabled. **Unique Sleep State Blink Rates** (enable/disable) This feature is designed to provide a visual indication of what sleep state the system is in. Each sleep state has a unique blink pattern. Default is disabled. **NOTE:** A normal shutdown goes to the S4 state. S0 (On) = Solid white LED. S3 (Stand By)= 3 blinks at 1Hz (50% duty cycle) followed by a pause of 2 seconds (white LED) — repeated cycles of 3 blinks and a pause. S4 (Hibernation)= 4 blinks at 1Hz (50% duty cycle) followed by a pause of 2 seconds (white LED) — repeated cycles of 4 blinks and a pause. S5 (Soft Off) = LED is off.

Recovering the Configuration Settings

This method of recovery requires that you first perform the **Save to Removable Media** command with the Computer Setup (F10) Utility before **Restore** is needed. (See Computer Setup–Main on page 61 in the Computer Setup—File table.)

NOTE: It is recommended that you save any modified computer configuration settings to a USB flash media device and save the device for possible future use.

To restore the configuration, insert the USB flash media device with the saved configuration and perform the **Restore from Removable Media** command with the Computer Setup (F10) Utility. (See Computer Setup–Main on page 61 in the Computer Setup—File table.)

10 Using HP PC Hardware Diagnostics

Using HP PC Hardware Diagnostics Windows (select products only)

HP PC Hardware Diagnostics Windows is a Windows-based utility that allows you to run diagnostic tests to determine whether the computer hardware is functioning properly. The tool runs within the Windows operating system in order to diagnose hardware failures.

If HP PC Hardware Diagnostics Windows is not installed on your computer, first you must download and install it. To download HP PC Hardware Diagnostics Windows, see Downloading HP PC Hardware Diagnostics Windows on page 70.

After HP PC Hardware Diagnostics Windows is installed, follow these steps to access it from HP Help and Support or HP Support Assistant.

1. To access HP PC Hardware Diagnostics Windows from HP Help and Support:

   a. Select the **Start** button, and then select **HP Help and Support**.

   b. Right-click **HP PC Hardware Diagnostics Windows**, select **More**, and then select **Run as administrator**.

   – or –

   To access HP PC Hardware Diagnostics Windows from HP Support Assistant:

   a. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.

      – or –

      Select the question mark icon in the taskbar.

   b. Select **Troubleshooting and fixes**.

   c. Select **Diagnostics**, and then select **HP PC Hardware Diagnostics Windows**.

2. When the tool opens, select the type of diagnostic test you want to run, and then follow the on-screen instructions.

   NOTE: If you need to stop a diagnostic test at any time, select **Cancel**.

3. When HP PC Hardware Diagnostics Windows detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. For assistance in correcting the problem, contact support, and then provide the Failure ID code.

Downloading HP PC Hardware Diagnostics Windows

- The HP PC Hardware Diagnostics Windows download instructions are provided in English only.
- You must use a Windows computer to download this tool because only .exe files are provided.

Downloading the latest HP PC Hardware Diagnostics Windows version

To download HP PC Hardware Diagnostics Windows, follow these steps:

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.
2. In the **HP PC Hardware Diagnostics** section, select **Download**, and then select a location on your computer or a USB flash drive.

The tool is downloaded to the selected location.

Downloading HP Hardware Diagnostics Windows by product name or number (select products only)

NOTE: For some products, it may be necessary to download the software to a USB flash drive by using the product name or number.

To download HP PC Hardware Diagnostics Windows by product name or number, follow these steps:

1. Go to http://www.hp.com/support.
2. Select **Get software and drivers**, select your type of product, and then enter the product name or number in the search box that is displayed.
3. In the **HP PC Hardware Diagnostics** section, select **Download**, and then select a location on your computer or a USB flash drive.

The tool is downloaded to the selected location.

Installing HP PC Hardware Diagnostics Windows

To install HP PC Hardware Diagnostics Windows, follow these steps:

- Navigate to the folder on your computer or the USB flash drive where the .exe file was downloaded, double-click the .exe file, and then follow the on-screen instructions.

Using HP PC Hardware Diagnostics UEFI

NOTE: For Windows 10 S computers, you must use a Windows computer and a USB flash drive to download and create the HP UEFI support environment because only .exe files are provided. For more information, see Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive on page 72.

HP PC Hardware Diagnostics UEFI (Unified Extensible Firmware Interface) allows you to run diagnostic tests to determine whether the computer hardware is functioning properly. The tool runs outside the operating system so that it can isolate hardware failures from issues that are caused by the operating system or other software components.

If your PC will not boot into Windows, you can use HP PC Hardware Diagnostics UEFI to diagnose hardware issues.

When HP PC Hardware Diagnostics UEFI detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. For assistance in correcting the problem, contact support, and provide the Failure ID code.

NOTE: To start diagnostics on a convertible computer, your computer must be in notebook mode, and you must use the attached keyboard.

NOTE: If you need to stop a diagnostic test, press esc.

Starting HP PC Hardware Diagnostics UEFI

To start HP PC Hardware Diagnostics UEFI, follow these steps:

1. Turn on or restart the computer, and quickly press esc.
2. Press f2.

   The BIOS searches three places for the diagnostic tools, in the following order:

   a. Connected USB flash drive

   NOTE: To download the HP PC Hardware Diagnostics UEFI tool to a USB flash drive, see Downloading the latest HP PC Hardware Diagnostics UEFI version on page 72.

   b. Hard drive

   c. BIOS
3. When the diagnostic tool opens, select a language, select the type of diagnostic test you want to run, and then follow the on-screen instructions.

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive can be useful in the following situations:

- HP PC Hardware Diagnostics UEFI is not included in the preinstall image.
- HP PC Hardware Diagnostics UEFI is not included in the HP Tool partition.
- The hard drive is damaged.

NOTE: The HP PC Hardware Diagnostics UEFI download instructions are provided in English only, and you must use a Windows computer to download and create the HP UEFI support environment because only .exe files are provided.

Downloading the latest HP PC Hardware Diagnostics UEFI version

To download the latest HP PC Hardware Diagnostics UEFI version to a USB flash drive:

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.
2. In the **HP PC Hardware Diagnostics UEFI** section, select **Download UEFI Diagnostics**, and then select **Run**.

Downloading HP PC Hardware Diagnostics UEFI by product name or number (select products only)

NOTE: For some products, it may be necessary to download the software to a USB flash drive by using the product name or number.

To download HP PC Hardware Diagnostics UEFI by product name or number (select products only) to a USB flash drive:

1. Go to http://www.hp.com/support.
2. Enter the product name or number, select your computer, and then select your operating system.
3. In the **Diagnostics** section, follow the on-screen instructions to select and download the specific UEFI Diagnostics version for your computer.

Using Remote HP PC Hardware Diagnostics UEFI settings (select products only)

Remote HP PC Hardware Diagnostics UEFI is a firmware (BIOS) feature that downloads HP PC Hardware Diagnostics UEFI to your computer. It can then execute the diagnostics on your computer, and it may upload results to a preconfigured server. For more information on Remote HP PC Hardware Diagnostics UEFI, go to http://www.hp.com/go/techcenter/pcdiags, and then select **Find out more**.

Downloading Remote HP PC Hardware Diagnostics UEFI

NOTE: HP Remote PC Hardware Diagnostics UEFI is also available as a Softpaq that can be downloaded to a server.

Downloading the latest Remote HP PC Hardware Diagnostics UEFI version

To download the latest Remote HP PC Hardware Diagnostics UEFI version, follow these steps:

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.
2. In the **HP PC Hardware Diagnostics UEFI** section, select **Download Remote Diagnostics**, and then select **Run**.

Downloading Remote HP PC Hardware Diagnostics UEFI by product name or number

NOTE: For some products, it may be necessary to download the software by using the product name or number.

To download HP Remote PC Hardware Diagnostics UEFI by product name or number, follow these steps:

1. Go to http://www.hp.com/support.
2. Select **Get software and drivers**, select your type of product, enter the product name or number in the search box that is displayed, select your computer, and then select your operating system.
3. In the **Diagnostics** section, follow the on-screen instructions to select and download the **Remote UEFI** version for the product.

Customizing Remote HP PC Hardware Diagnostics UEFI settings

Using the Remote HP PC Hardware Diagnostics setting in Computer Setup (BIOS), you can perform the following customizations:

- Set a schedule for running diagnostics unattended. You can also start diagnostics immediately in interactive mode by selecting **Execute Remote HP PC Hardware Diagnostics**.
- Set the location for downloading the diagnostic tools. This feature provides access to the tools from the HP website or from a server that has been preconfigured for use. Your computer does not require the traditional local storage (such as a disk drive or USB flash drive) to run remote diagnostics.
- Set a location for storing the test results. You can also set the user name and password settings used for uploads.
- Display status information about the diagnostics run previously.

To customize Remote HP PC Hardware Diagnostics UEFI settings, follow these steps:

1. Turn on or restart the computer, and when the HP logo appears, press f10 to enter Computer Setup.
2. Select **Advanced**, and then select **Settings**.

3. Make your customization selections.
4. Select **Main**, and then **Save Changes and Exit** to save your settings.

Your changes take effect when the computer restarts.

11 Backing up, restoring, and recovering

This chapter provides information about the following processes, which are standard procedure for most products:

- **Backing up your personal information**—You can use Windows tools to back up your personal information (see Using Windows tools on page 75).
- **Creating a restore point**—You can use Windows tools to create a restore point (see Using Windows tools on page 75).
- **Creating recovery media** (select products only)—You can use HP Recovery Manager or HP Cloud Recovery Download Tool (select products only) to create recovery media (see Creating HP Recovery media (select products only) on page 75).
- **Restoring and recovery**—Windows offers several options for restoring from backup, refreshing the computer, and resetting the computer to its original state (see Using Windows tools on page 75).
- **Removing the Recovery Partition**—To remove the Recovery partition to reclaim hard drive space (select products only), select the **Remove Recovery Partition** option of HP Recovery Manager. For more information, see Removing the HP Recovery partition (select products only) on page 79.

Using Windows tools

IMPORTANT: Windows is the only option that allows you to back up your personal information. Schedule regular backups to avoid information loss.

You can use Windows tools to back up personal information and create system restore points and recovery media, allowing you to restore from backup, refresh the computer, and reset the computer to its original state.

NOTE: If computer storage is 32 GB or less, Microsoft System Restore is disabled by default.

For more information and steps, see the Get Help app.

1. Select the **Start** button, and then select the **Get Help** app.
2. Enter the task you want to perform.

NOTE: You must be connected to the Internet to access the Get Help app.

Creating HP Recovery media (select products only)

After you have successfully set up the computer, use HP Recovery Manager to create a backup of the HP Recovery partition on the computer. This backup is called HP Recovery media. In cases where the hard drive is corrupted or has been replaced, the HP Recovery media can be used to reinstall the original operating system.

To check for the presence of the Recovery partition in addition to the Windows partition, right-click the **Start** button, select **File Explorer**, and then select **This PC**.

NOTE: If your computer does not list the Recovery partition in addition to the Windows partition, contact support to obtain recovery discs. Go to http://www.hp.com/support, select your country or region, and then follow the on-screen instructions.

On select products, you can use the HP Cloud Recovery Download Tool to create HP Recovery media on a bootable USB flash drive. For more information, see Using the HP Cloud Recovery Download Tool to create recovery media on page 77.

Using HP Recovery Manager to create recovery media

NOTE: If you cannot create recovery media yourself, contact support to obtain recovery discs. Go to http://www.hp.com/support, select your country or region, and then follow the on-screen instructions.

Before you begin

Before you begin, note the following:

- Only one set of recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.
- HP Recovery Manager examines the computer and determines the required media storage capacity.
- To create recovery media, use one of the following options:

  NOTE: If the computer does not have a recovery partition, HP Recovery Manager displays the Windows Create a Recovery Drive feature. Follow the on-screen instructions to create a recovery image on a blank USB flash drive or hard drive.

  - If your computer has an optical drive with DVD writer capability, be sure to use only high-quality blank DVD-R, DVD+R, DVD-R DL, or DVD+R DL discs. Do not use rewritable discs such as CD±RW, DVD±RW, double-layer DVD±RW, or BD-RE (rewritable Blu-ray) discs, which are not compatible with HP Recovery Manager software.
  - If your computer does not include an integrated optical drive with DVD writer capability, you can use an external optical drive (purchased separately) to create recovery discs, as described above. If an external optical drive is used, you must connect it directly to a USB port on the computer. It cannot be connected to a USB port on an external device, such as a USB hub.
  - To create a recovery USB flash drive, use a high-quality blank USB flash drive.
- Be sure that the computer is connected to AC power before you begin creating the recovery media.
- The creation process can take an hour or more. Do not interrupt this process.
- If necessary, you can exit the program before you have finished creating all of the recovery media. HP Recovery Manager will finish the current DVD or USB flash drive. The next time you start HP Recovery Manager, you will be prompted to continue.

Creating the recovery media

To create HP Recovery media using HP Recovery Manager:

IMPORTANT: For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning these steps.

1. Type `recovery` in the taskbar search box, and then select **HP Recovery Manager**.
2. Select **Create recovery media**, and then follow the on-screen instructions.

If you need to recover the system, see Recovering using HP Recovery Manager on page 77.

Using the HP Cloud Recovery Download Tool to create recovery media

To create HP Recovery media using the HP Cloud Recovery Download Tool:

1. Go to http://www.hp.com/support.
2. Select **Software and Drivers**, and then follow the on-screen instructions.

Restoring and recovery

Restoring and recovery can be performed using one or more of the following options: Windows tools, HP Recovery Manager, or the HP Recovery partition.

IMPORTANT: Not all methods are available on all products.

Restoring, resetting, and refreshing using Windows tools

Windows offers several options for restoring, resetting, and refreshing the computer. For details, see Using Windows tools on page 75.

Restoring using HP Recovery Manager and the HP Recovery partition

You can use HP Recovery Manager and the HP Recovery partition (select products only) to restore the computer to the original factory state:

- **Resolving problems with preinstalled applications or drivers**—To correct a problem with a preinstalled application or driver:
  1. Type `recovery` in the taskbar search box, and then select **HP Recovery Manager**.
  2. Select **Reinstall drivers and/or applications**, and then follow the on-screen instructions.
- **Using System Recovery**—To recover the Windows partition to original factory content, select the **System Recovery** option from the HP Recovery partition (select products only) or use the HP Recovery media. For more information, see Recovering using HP Recovery Manager on page 77. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 75.
- **Using Factory Reset** (select products only)—Restores the computer to its original factory state by deleting all information from the hard drive and recreating the partitions and then reinstalling the operating system and the software that was installed at the factory (select products only). To use the **Factory Reset** option, you must use HP Recovery media. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 75.

NOTE: If you have replaced the hard drive in the computer, you can use the Factory Reset option to install the operating system and the software that was installed at the factory.

Recovering using HP Recovery Manager

You can use HP Recovery Manager software to recover the computer to its original factory state by using the HP Recovery media that you either created or that you obtained from HP, or by using the HP Recovery partition (select products only).

If you have not already created HP Recovery media, see Creating HP Recovery media (select products only) on page 75.

IMPORTANT: HP Recovery Manager does not automatically provide backups of your personal data. Before beginning recovery, back up any personal data that you want to retain. See Using Windows tools on page 75.

IMPORTANT: Recovery through HP Recovery Manager should be used as a final attempt to correct computer issues.

NOTE: When you start the recovery process, only the options available for your computer are displayed.

Before you begin, note the following:

- HP Recovery Manager recovers only software that was installed at the factory. For software not provided with this computer, you must either download the software from the manufacturer's website or reinstall the software from the media provided by the manufacturer.
- If the computer hard drive fails, HP Recovery media must be used. This media is created using HP Recovery Manager. See Creating HP Recovery media (select products only) on page 75.
- If your computer does not allow the creation of HP Recovery media or if the HP Recovery media does not work, contact support to obtain recovery media. Go to http://www.hp.com/support, select your country or region, and then follow the on-screen instructions.

Recovering using the HP Recovery partition (select products only)

The HP Recovery partition allows you to perform a system recovery without recovery discs or a recovery USB flash drive. This type of recovery can be used only if the hard drive is still working.

The HP Recovery partition (select products only) allows System Recovery only.

To start HP Recovery Manager from the HP Recovery partition:

IMPORTANT: For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning these steps (select products only).

1. Type `recovery` in the taskbar search box, select **HP Recovery Manager**, and then select **Windows Recovery Environment**.

   – or –

   For computers or tablets with keyboards attached:

   ▲ Press f11 while the computer boots, or press and hold f11 as you press the power button.

   For tablets without keyboards:

   ▲ Turn on or restart the tablet, quickly hold down the volume up button, and then select **f11**.
2. Select **Troubleshoot** from the boot options menu.
3. Select **Recovery Manager**, and then follow the on-screen instructions.

   NOTE: If your computer does not automatically restart in HP Recovery Manager, change the computer boot order, and then follow the on-screen instructions. See Changing the computer boot order on page 79.

Recovering using HP Recovery media

If your computer does not have an HP Recovery partition or if the hard drive is not working properly, you can use HP Recovery media to recover the original operating system and software programs that were installed at the factory.

▲ Insert the HP Recovery media, and then restart the computer.

NOTE: If your computer does not automatically restart in HP Recovery Manager, change the computer boot order, and then follow the on-screen instructions. See Changing the computer boot order on page 79.

Changing the computer boot order

If your computer does not restart in HP Recovery Manager, you can change the computer boot order. This is the order of devices listed in BIOS where the computer looks for startup information. You can change the selection to an optical drive or a USB flash drive, depending on the location of your HP Recovery media.

To change the boot order:

IMPORTANT: For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning these steps.

1. Insert the HP Recovery media.
2. Access the system **Startup** menu.

   For computers or tablets with keyboards attached:

   ▲ Turn on or restart the computer, quickly press esc, and then press f9 for boot options.

   For tablets without keyboards:

   ▲ Turn on or restart the tablet, quickly hold down the volume up button, and then select **f9**.

   – or –

   Turn on or restart the tablet, quickly hold down the volume down button, and then select **f9**.
3. Select the optical drive or USB flash drive from which you want to boot, and then follow the on-screen instructions.

Removing the HP Recovery partition (select products only)

HP Recovery Manager software allows you to remove the HP Recovery partition (select products only) to free up hard drive space.

IMPORTANT: After you remove the HP Recovery partition, you will not be able to perform System Recovery or create HP Recovery media. Before removing the Recovery partition, create HP Recovery media. See Creating HP Recovery media (select products only) on page 75.

Follow these steps to remove the HP Recovery partition:

1. Type `recovery` in the taskbar search box, and then select **HP Recovery Manager**.
2. Select **Remove Recovery Partition**, and then follow the on-screen instructions.

A Power cord set requirements

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

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

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

General requirements

The requirements listed below are applicable to all countries:

1. The power cord must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord set will be installed.
2. The power cord set must have a minimum current capacity of 10A (7A Japan only) and a nominal voltage rating of 125 or 250 volts AC, as required by each country's power system.
3. The diameter of the wire must be a minimum of 0.75 mm_2 or 18AWG, and the length of the cord must be between 1.8 m (6 feet) and 3.6 m (12 feet).

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

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

Japanese power cord requirements

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

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

Country-specific requirements

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

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

1. The flexible cord must be Type H05VV-F, 3-conductor, 0.75mm_2 conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.
2. The flexible cord must be Type SVT or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15A, 125V) or NEMA 6-15P (15A, 250V) configuration.
3. Appliance coupler, flexible cord, and wall plug must bear a “T” mark and registration number in accordance with the Japanese Dentori Law. Flexible cord must be Type VCT or VCTF, 3-conductor, 0.75 mm_2 conductor size. Wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7A, 125V) configuration.

B Statement of memory volatility

The purpose of this chapter is to provide general information regarding nonvolatile memory in HP Business computers. This chapter also provides general instructions for restoring nonvolatile memory that can contain personal data after the system has been powered off and the hard drive has been removed.

HP Business computer products that use Intel®-based or AMD®-based system boards contain volatile DDR memory. The amount of nonvolatile memory present in the system depends upon the system configuration. Intel-based and AMD-based system boards contain nonvolatile memory subcomponents as originally shipped from HP, assuming that no subsequent modifications have been made to the system and assuming that no applications, features, or functionality have been added to or installed on the system.

Following system shutdown and removal of all power sources from an HP Business computer system, personal data can remain on volatile system memory (DIMMs) for a finite period of time and will also remain in nonvolatile memory. Use the steps below to remove personal data from the computer, including the nonvolatile memory found in Intel-based and AMD-based system boards.

NOTE: If your tablet has a keyboard base, connect to the keyboard base before beginning steps in this chapter.

Current BIOS steps

1. Follow steps (a) through (l) below to restore the nonvolatile memory that can contain personal data. Restoring or reprogramming nonvolatile memory that does not store personal data is neither necessary nor recommended.

   a. Turn on or restart the computer, and then press esc while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.

   NOTE: If the system has a BIOS administrator password, enter the password at the prompt.

   b. Select **Main**, select **Apply Factory Defaults and Exit**, and then select **Yes** to load defaults.

   The computer will reboot.

   c. During the reboot, press esc while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.

   NOTE: If the system has a BIOS administrator password, enter the password at the prompt.

   d. Select the **Security** menu, select **Restore Security Settings to Factory Defaults**, and then select **Yes** to restore security level defaults.

   The computer will reboot.

   e. During the reboot, press esc while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.

   NOTE: If the system has a BIOS administrator password, enter the password at the prompt.

   f. If an asset or ownership tag is set, select the **Security** menu and scroll down to the **Utilities** menu. Select **System IDs**, and then select **Asset Tracking Number**. Clear the tag, and then make the selection to return to the prior menu.

g. If a DriveLock password is set, select the **Security** menu, and scroll down to **Hard Drive Utilities** under the **Utilities** menu. Select **Hard Drive Utilities**, select **DriveLock**, then uncheck the checkbox for **DriveLock password on restart**. Select **OK** to proceed.

h. Select the **Main** menu, and then select **Reset BIOS Security to factory default**. Click **Yes** at the warning message.

   The computer will reboot.

i. During the reboot, press esc while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.

NOTE: If the system has a BIOS administrator password, enter the password at the prompt.

j. Select the **Main** menu, select **Apply Factory Defaults and Exit**, select **Yes** to save changes and exit, and then select **Shutdown**.

k. Reboot the system. If the system has a Trusted Platform Module (TPM) and/or fingerprint reader, one or two prompts will appear—one to clear the TPM and the other to Reset Fingerprint Sensor; press or tap F1 to accept or F2 to reject.

l. Remove all power and system batteries for at least 24 hours.

2. Complete one of the following:

   - Remove and retain the storage drive.

   – or –

   - Clear the drive contents by using a third party utility designed to erase data from an SSD.

   – or –

   - Clear the contents of the drive by using the following BIOS Setup Secure Erase command option steps:

IMPORTANT: If you clear data using Secure Erase, it cannot be recovered.

a. Turn on or restart the computer, and then press esc while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.

b. Select the **Security** menu and scroll down to the **Utilities** menu.

c. Select **Hard Drive Utilities**.

d. Under **Utilities**, select **Secure Erase**, select the hard drive storing the data you want to clear, and then follow the on-screen instructions to continue.

Nonvolatile memory usage

Nonvolatile Memory Type	Amount (Size)	Does this memory store customer data?	Does this memory retain data when power is removed?	What is the purpose of this memory?	How is data input into this memory?	How is this memory write-protected?
HP Sure Start flash (select models only)	8 MBytes	No	Yes	Provides protected backup of critical System BIOS code, EC firmware, and critical computer configuration data for select platforms that support HP Sure Start. For more information, see Using HP Sure Start (select models only) on page 87.	Data cannot be written to this device via the host processor. The content is managed solely by the HP Sure Start Embedded Controller.	This memory is protected by the HP Sure Start Embedded Controller.
Real Time Clock (RTC) battery backed-up CMOS configuration memory	256 Bytes	No	Yes	Stores system date and time and noncritical data.	RTC battery backed-up CMOS is programmed using the Computer Setup (BIOS), or changing the Microsoft Windows date & time.	This memory is not write-protected.
Controller (NIC) EEPROM	64 KBytes (not customer accessible)	No	Yes	Stores NIC configuration and NIC firmware.	NIC EEPROM is programmed using a utility from the NIC vendor that can be run from DOS.	A utility is required to write data to this memory and is available from the NIC vendor. Writing data to this ROM in an inappropriate manner will render the NIC non-functional.
DIMM Serial Presence Detect (SPD) configuration data	256 Bytes per memory module, 128 Bytes programmable (not customer accessible)	No	Yes	Stores memory module information.	DIMM SPD is programmed by the memory vendor.	Data cannot be written to this memory when the module is installed in a computer. The specific write-protection method varies by memory vendor.
System BIOS	9 MBytes	Yes	Yes	Stores system BIOS code and computer configuration data.	System BIOS code is programmed at the factory. Code is updated when the system BIOS is updated. Configuration data and settings are input using the Computer Setup (BIOS) or a custom utility.	**NOTE:** Writing data to this ROM in an inappropriate manner can render the computer non-functional. A utility is required for writing data to this memory and is available on the HP website; go to http://www.hp.com/support. Select **Find your**

Nonvolatile Memory Type	Amount (Size)	Does this memory store customer data?	Does this memory retain data when power is removed?	What is the purpose of this memory?	How is data input into this memory?	How is this memory write-protected?
						product, and then follow the on-screen instructions.
Intel Management Engine Firmware (present only in select Elite or Z models. For more information, go to http://www.hp.com/support. Select **Find your product**, and then follow the on-screen instructions.)	1.5 MBytes or 7 MBytes	Yes	Yes	Stores Management Engine Code, Settings, Provisioning Data and iAMT third-party data store.	Management Engine Code is programmed at the factory. Code is updated via Intel secure firmware update utility. Unique Provisioning Data can be entered at the factory or by an administrator using the Management Engine (MEBx) setup utility. The third party data store contents can be populated by a remote management console or local applications that have been registered by an administrator to have access to the space.	The Intel chipset is configured to enforce hardware protection to block all direct read/write access to this area. An Intel utility is required for updating the firmware. Only firmware updates digitally signed by Intel can be applied using this utility.
Bluetooth flash (select products only)	2 Mbit	No	Yes	Stores Bluetooth configuration and firmware.	Bluetooth flash is programmed at the factory. Tools for writing data to this memory are not publicly available but can be obtained from the silicon vendor.	A utility is required for writing data to this memory and is made available through newer versions of the driver whenever the flash requires an upgrade.
802.11 WLAN EEPROM	4 Kbit to 8 Kbit	No	Yes	Stores configuration and calibration data.	802.11 WLAN EEPROM is programmed at the factory. Tools for writing data to this memory are not made public.	A utility is required for writing data to this memory and is typically not made available to the public unless a firmware upgrade is necessary to address a unique issue.
Webcam (select products only)	64 Kbit	No	Yes	Stores webcam configuration and firmware.	Webcam memory is programmed using a utility from the device manufacturer that can be run from Windows.	A utility is required for writing data to this memory and is typically not made available to the public unless a firmware upgrade is necessary to address a unique issue.
Fingerprint reader (select products only)	512 KByte flash	Yes	Yes	Stores fingerprint templates.	Fingerprint reader memory is programmed by user enrollment in HP ProtectTools Security Manager.	Only a digitally signed application can make the call to write to the flash.

Questions and answers

1. **How can the BIOS settings be restored (returned to factory settings)?**

   IMPORTANT: Restore defaults does not securely erase any data on your hard drive. See question and answer 6 for steps to securely erase data.

   Restore defaults does not reset the Custom Secure Boot keys. See question and answer 7 for information about resetting the keys.

   a. Turn on or restart the computer, and then press esc while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.

   b. Select **Main**, and then select **Apply Factory Defaults and Exit**.

   c. Follow the on-screen instructions.

   d. Select **Main**, select **Save Changes and Exit**, and then follow the on-screen instructions.

2. **What is a UEFI BIOS, and how is it different from a legacy BIOS?**

   The Unified Extensible Firmware Interface (UEFI) BIOS is an industry-standard software interface between the platform firmware and an operating system (OS). It is a replacement for the older BIOS architecture, but supports much of the legacy BIOS functionality.

   Like the legacy BIOS, the UEFI BIOS provides an interface to display the system information and configuration settings and to change the configuration of your computer before an OS is loaded. BIOS provides a secure run-time environment that supports a Graphic User Interface (GUI). In this environment, you can use either a pointing device (Touchscreen, TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make menu and configuration selections. The UEFI BIOS also contains basic system diagnostics.

   The UEFI BIOS provides functionality beyond that of the legacy BIOS. In addition, the UEFI BIOS works to initialize the computer’s hardware before loading and executing the OS; the run-time environment allows the loading and execution of software programs from storage devices to provide more functionality, such as advanced hardware diagnostics (with the ability to display more detailed system information) and advanced firmware management and recovery software.

   HP has provided options in Computer Setup (BIOS) to allow you to run in legacy BIOS, if required by the operating system. Examples of this requirement would be if you upgrade or downgrade the OS.

3. **Where does the UEFI BIOS reside?**

   The UEFI BIOS resides on a flash memory chip. A utility is required to write to the chip.

4. **What kind of configuration data is stored on the DIMM Serial Presence Detect (SPD) memory module? How would this data be written?**

   The DIMM SPD memory contains information about the memory module, such as size, serial number, data width, speed/timing, voltage, and thermal information. This information is written by the module manufacturer and stored on an EEPROM. This EEPROM cannot be written to when the memory module is installed in a computer. Third-party tools do exist that can write to the EEPROM when the memory module is not installed in a computer. Various third-party tools are available to read SPD memory.

5. **What is meant by “Restore the nonvolatile memory found in Intel-based system boards”?**

   This message relates to clearing the Real Time Clock (RTC) CMOS memory that contains computer configuration data.

6. **How can the BIOS security be reset to factory defaults and data erased?**

IMPORTANT: Resetting will result in the loss of information.

These steps will not reset Custom Secure Boot Keys. See question and answer 7 for information about resetting the keys.

a. Turn on or restart the computer, and then press esc while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.

b. Select **Main**, and then select **Reset Security to Factory Defaults**.

c. Follow the on-screen instructions.

d. Select **Main**, select **Save Changes and Exit**, and then follow the on-screen instructions.

7. **How can the Custom Secure Boot Keys be reset?**

Secure Boot is a feature to ensure that only authenticated code can start on a platform. If you enabled Secure Boot and created Custom Secure Boot Keys, simply disabling Secure Boot will not clear the keys. You must also select to clear the Custom Secure Boot Keys. Use the same Secure Boot access procedure you used to create the Custom Secure Boot Keys, but make the selection to clear or delete all Secure Boot Keys.

a. Turn on or restart the computer, and then press esc while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.

b. Select the **Security** menu, select **Secure Boot Configuration**, and then follow the on-screen instructions.

c. At the **Secure Boot Configuration** window, select **Secure Boot**, select **Clear Secure Boot Keys**, and then follow the on-screen instructions to continue.

Using HP Sure Start (select models only)

Select computer models are configured with HP Sure Start, a technology that continuously monitors your computer's BIOS for attacks or corruption. If the BIOS becomes corrupted or is attacked, HP Sure Start restores the BIOS to its previously safe state, without user intervention. Those select computer models ship with HP Sure Start configured and enabled. HP Sure Start is configured and already enabled so that most users can use the HP Sure Start default configuration. The default configuration can be customized by advanced users.

To access the latest documentation on HP Sure Start, go to http://www.hp.com/support. Select **Find your product**, and then follow the on-screen instructions.

Index

S

T

V

W