TECHNICAL WHITE PAPER

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HP THUNDERBOLT DOCK G4

FEATURES AND TROUBLESHOOTING

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HP THUNDERBOLT G4 DOCK, THE DOCK THAT DOES IT ALL

Boost your security, productivity, and connectivity with the HP Thunderbolt G4 Dock. With just a single cable connection, you can protect your network and devices from the moment you log in, charge your notebook with up to 100W of power, double your Ethernet speeds, connect your peripherals, and expand your productivity with up to four 4K displays*.

Ideal for ITDMs and hybrid workers, this dock also makes home or office device management easy. Focus on your work and not your compatibility** with a dock that works seamlessly with most notebooks and operating systems. Whether you use Windows, Mac, or Chrome OS—rigorous testing and certifications ensure that one USB-C® cable*** connects your device and peripherals without issue.

*For USB-C® alt mode functionality, host PC must support Thunderbolt™ 3 or Thunderbolt™ 4.
**Backward compatible with USB-C® alt mode, ports will work at USB-C® alt mode speeds which are dependent on host specifications.
***For USB-C® alt mode functionality, host PC must support the DisplayPort™ Alt mode protocol through its USB-C® port. Charging and port replication is supported on notebooks that have implemented USB-C® Alt Mode industry specifications. Power button to turn on or wake the system, Wake-on LAN from warm and cold dock, Wake-on LAN from S4/S5, and MAC Address Pass-Through S0, S3, S4, S5 warm and cold dock features only function on HP or HP supported notebooks. HP does not provide Ethernet and audio drivers on Mac PCs.

HP THUNDERBOLT DOCK G4 SPECIFICATIONS SUMMARY

SKUs	HP Thunderbolt 120W G4 Dock (4J0A2AA) HP Thunderbolt 280W G4 Dock (4J0G4AA includes combo cable)
Design	Cube Modular Design the hybrid worker, office navigator and home offices
Power Button on dock[1]	Mechanical power button
Cable length and AMO options	Default 0.8 meter cables
USB-C® ports USB 3.2 Gen 2	1x Thunderbolt™ 4 port (back) 1x Alt Mode & Data port (back) 1x data port (front)
USB-A ports USB 3.2	4x USB-A ports (2 powered)
Video Ports	5x video ports 2x DisplayPorts, 1xHDMI, 1x USB-C® Thunderbolt™, 1x USB-C® Alt Mode
Number of Monitors supported	Up to 4 external (+notebook display) Dependent on notebook video capability
Video Resolutions	Up to DP 1.4 support Dual 4K @ 60Hz (DP1.2 systems) Triple 4K @ 60Hz (DP1.4 DSC[2] systems)
Ethernet Support[4]	Realtek 1.0 Gbps / Intel® 2.5 Gbps
System compatibility[3]	Compatible with Thunderbolt™ systems and USB-C® alt mode systems with data, power and video
Operating Systems[3]	Windows 10, Windows 11 Chrome, MacOS, Ubuntu Linux, ThinPro Linux
Power to system thru USB-C®	Up to 100W (USB-C®)
Power to system thru barrel	Up to 230W (4.5mm barrel)
AC adapter	120W/280W 7.4mm
Power Profiles	5V/5A, 9V/5A, 12V/5A, 15V/5A, 20V/5A PD 3.0

[1]The dock power button is not functional when connected to non-HP notebooks, Chrome or non-supported HP notebooks
[2]DSC: display stream compression
[3]OS and systems compatibility:
- **Operating systems supported: Windows 10 19H1 and up, Win 10 IoT Enterprise LTSC 2021, Windows 11 21H2 and up, Chrome OS v99 and up, Ubuntu Linux 20.04 LTS with 5.14 kernel, ThinPro OS 8.0 and MacOS Monterrey 12.1**
- Not all features work with all operating systems. Linux and Chrome OS testing currently underway and expected to be completed after launch.
- HP Thunderbolt Dock G4 has obtained Thunderbolt™ Certification from Intel® for Windows PC and Mac OS.
- The HP Thunderbolt Dock G4 is designed to USB-C® / Thunderbolt™ Industry specs and will support charging and port replication for notebooks that have implemented USB-C® and Thunderbolt™ industry specifications. Certain features of the dock are not functional when used with non-HP systems nor Chrome systems:
  - Power button to turn on or wake the system
  - Wake on Lan from warm and cold dock
  - Wake on Lan from S4/S5

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- MAC address pass through S0, S3, S4, S5 warm and cold dock
- Ethernet need to be installed separately on non-HP Windows. Drivers available on HP website
- For MAC PCs HP does not provide Ethernet and audio drivers
- Firmware updates on Windows and Linux host systems only

[4]For Thunderbolt™ Host systems, dock will use Intel 2.5 Gbps NIC. (To reach 2.5 Gbps speed, it requires infrastructure that supports 2.5GB Ethernet speeds.)
For Non-Thunderbolt™ (Multi-Function) Host systems, dock will use Realtek 1.0 Gbps NIC.

Note: The Ethernet driver is needed on the host system. The host connection to the Thunderbolt G4 dock will determine which Ethernet NIC is active inside the dock. For Thunderbolt™ connections, the Intel® I225 LMvP device is active. For USB-C®, or if Thunderbolt™ mode is turned off, the Realtek 1.0 Gb/s Ethernet NIC is active. Only one Ethernet is active at one time. Use the host side device manager to view Ethernet status.

FIRST-TIME CONNECTION

Figure A: HP Thunderbolt Dock G2 Left Angle and Back Side for 120W, Combo, and 230W versions.

1. 1 Power button[1]
2. 1 USB Type-C® 3.2 Gen 2 (10 Gbps) port with data and power out (15W)
3. 1 USB-C® cable to connect to host system (0.8 m cable length)
4. 1 USB-A 3.2 Gen 1 (5G bps) charging port
5. 1 Standard Kensington lock slot

[1]The dock power button is not functional when connected to non-supported HP notebooks or non-HP notebooks.

Figure B: HP Thunderbolt G4 Dock - 120W/280W (280W version with cable combo shown).

1. 1 USB 3.2 Gen 1 (5 Gbps) charging port
2. 1 4.5 mm power barrel (delivering up to 230W power to host) out (15W)
3. 1 USB-C® alt-mode cable (delivering up to 100W power)
5. 1 Power Button[1]
4. 1 USB Type-C® 3.2 Gen 2 (10 Gbps) port with data and power out (15W)

[1]The dock power button is not functional when connected to non-supported HP notebooks or non-HP notebooks.

Figure C: HP Thunderbolt G4 Dock - 120W/280W (back).

1. 2 USB 3.2 Gen 1 ports (5 Gbps)
2. 2 DP 1.4 ports
3. 1 USB-C® 3.2 Gen 1 DisplayPort
4. 1 HDMI 2.0 port
5. 1 Thunderbolt™ 4 port
6. 1 Power barrel port (120W or 280W)
7. 1 Indicator light
8. 1 Ethernet port: 2 internal NIC cards to support 1 Gb and 2.5 Gb Ethernet[1]

[1]Requires infrastructure that supports 2.5 GB Ethernet speeds.

1. When connecting a new HP Thunderbolt Dock G4 to your notebook for the first time you may need to authorize the Thunderbolt™ device. When the dialog appears, click on the pop up. A dialog will appear each time a new Thunderbolt™ dock/device is attached. See Figure D.

NOTE: You must be logged on as an administrator of the local computer. In some Thunderbolt™ security level settings the dialog may not appear (see **Thunderbolt™ Security level section**).
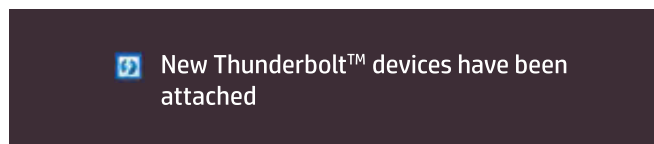

New Thunderbolt™ devices have been attached

Figure D: Dialog box requesting administrative approval of a new Thunderbolt™ device.

2. A second dialog opens. See Figure E. Select one of the following options:

- *Do Not Connect*—prevents the dock from connecting to the notebook.
- *Connect Only Once*—allows the dock to connect to the notebook until it is disconnected. Each time the dock is disconnected and reconnected, you must be logged on as an administrator to allow access to the dock.
- *Always Connect*—allows the dock to connect to the notebook. The dock can connect to the computer automatically after it is disconnected and reconnected, even if you are not logged on as an administrator.
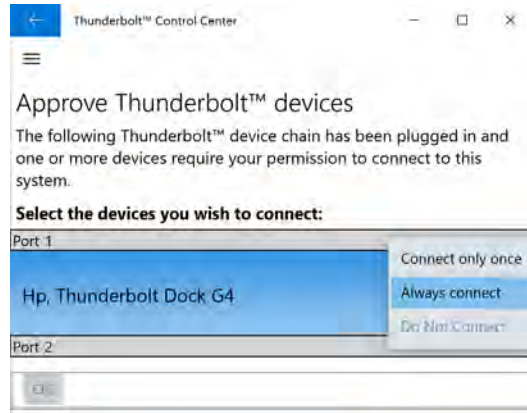
Figure E: Dialog box to configure connection settings of a new Thunderbolt™ device.

3. Select *OK*. **See Figure E above.**

If the *New Thunderbolt™ Devices* dialog box (Figure E) is missed or does not pop up from Step 1 above, go to the system tray to relaunch *Approved Thunderbolt™ Devices*.

1. Right click the Thunderbolt™ icon on the system tray
2. Select *Approve Attached Devices*

Figure F.

3. Click on the port in which the Thunderbolt™ device is connected. See Figure F above.
4. The *Approve Thunderbolt™ Devices* dialog box should now appear and you will be able to approve your Thunderbolt™ dock. See Figure D above.
5. If you miss this dialog box you may reopen it by clicking on the message icon in your system tray. See Figure G.

Figure G: Message icon in system tray.

SUPPORTED MODES (MULTI-FUNCTION AND THUNDERBOLT™ 4/USB4/ THUNDERBOLT™ 3)

The HP Thunderbolt Dock G4 can connect to systems without Thunderbolt™ through multi-function mode or USB4 mode.

Depending on the host capabilities, then the dock will connect as follows:
- If the Host has Thunderbolt™ capabilities, then the dock will connect as a Thunderbolt™ dock
- If the host has only USB4 capabilities, then the dock will connect as a USB4 dock.
- If the host does not have Thunderbolt™ or USB4 capabilities, then the dock will connect as a USB-C® dock (Multifunction mode)

Connect through the Thunderbolt™ cable to the host and the host capabilities will define the throughput speed of the dock, below a comparison when connecting a HP Thunderbolt Dock G4 to a hosts:

	Thunderbolt™ 4 or USB4 Host	Thunderbolt™ 3 Host	USB3/DP Host (Multi-function Mode)	USB3/DP Host with High Resolution mode
Overall port Bandwidth	40 Gb/s	40 Gb/s	10 Gb/s	10 Gb/s
Maximum PCIe Bandwidth	PCIe 32 Gb/s	PCIe 16 Gb/s	NA	NA
Maximum USB Bandwidth	USB 3.2 -10 Gb/s	USB 3.2 -10 Gb/s	USB 3.2 -5 Gb/s	USB 2.0 480 mb/s
Max DP Bandwidth	2 DP Streams x 4 lanes	2 DP Streams x 4 lanes	1 DP Stream x 2 lanes	1 DP Stream x 4 lanes
NIC	Intel®	Intel®	Realtek	Realtek
Intel vPro® support*	Yes (Intel® Notebooks only)	No	No	No

Table 1: Comparisons between different Host Capabilities.
* Feature support is only applicable for notebooks that support Intel vPro® technology.

There are three main differences between Thunderbolt™ mode of the HP Thunderbolt Dock G4 and multi-function mode.

- The Thunderbolt™ port on the back of the unit will degrade to USB2 only.
- The Thunderbolt™ port is only fully functional with a Thunderbolt™/ USB4 host connected.
- The number of independent video streams is decreased from two DP x4 to one DP x2.

PRE-BOOT SUPPORT

The HP Thunderbolt Dock G4 supports pre-OS environment only in Thunderbolt™ Security Level 0 and Security Level 1 (please reference the **Security Levels – Available Functions and Ports** section of this document for more details about the Thunderbolt™ Security level settings).

Supported Features:

- USB peripherals such as keyboards, mouse, and flash drives connected to the docking station
- Pre-boot Execution Environment (PXE)
- External displays (the internal panel must be closed for external panels to function at pre-boot)

For any pre-boot support with the HP Thunderbolt dock G4 you will be required to disable FastBoot in F10 BIOS settings.

Disabling FastBoot in F10 BIOS:

1. Press the power button to turn on the unit
2. At the HP logo screen press **F10** to enter the BIOS settings menu
3. Click the **Advanced** tab and select **Boot Options**
4. Unselect the **FastBoot Option**
5. Save and exit

*NOTE: Please ensure you are running the latest drivers, BIOS, and firmware to enable full functionality of all features.

LED/POWER BUTTON

On HP Commercial notebook systems the power button on the dock will simulate the power button on the host system. Additionally, the LED on the dock power button will reflect the state of the host and will behave similarly to the power LED of the host.

On non-HP notebooks, Apple, Chrome nor non-supported HP notebooks, the dock power button and power LED do not control or reflect the status of the host.

NOTE: On non-HP notebooks, Chrome or non-supported HP notebooks can have same behavior as HP supported notebooks if they have implemented the "Extended Alert Event Type" from the industry standard "Universal Serial Bus Power Delivery Specification revision 3.1 and above", then the dock power button and power LED will behave similarly to the power LED of the host.

CHARGING SUPPORT FROM THE DOCK

a. LED in back – indicates valid adapter
If an HP adaptor of 19.5V and 120W or larger is connected to the dock the white LED will light. When an HP adapter of 19.5V and 120W or larger is connected to the dock the white LED will light. All other adaptors will be rejected, and the LED will be off and the dock will not function

b. Power to Host
i. Type-C® power to host: 5V/5A, 9V/5A, 12V/5A, 15V/5A, 20V/5A
ii. Power over AC combo cable (barrel connection): 230W

c. USB ports. See Table 2

	USB-C®
Port 5 (back)* *See Figure C*	(1) - USB-C® TB pass-through USB PD; 0.9A, 1.5A, 3A @ 5V (max 15W)
Port 3 (back) *See Figure C*	(1) - USB-C® USB 3.2 Gen 2 USB PD; 0.9A, 1.5A, 3A @ 5V (max 15W)
Port 2 (front) *See Figure A*	(1) - USB-C® USB 3.2 Gen 2 USB PD; 0.9A, 1.5A, 3A @ 5V (max 15W)
USB-A	(port 1 - **See Figure C**) - USB Type-A port 3.2 Gen 1
	(port 1 - **See Figure C**) - USB Type-A port 3.2 Gen 1
	(port 4 - **See Figure A**) - USB Type-A port 3.2 Gen 1 BCS1.2 (1.5A @ 5V) - CHARGING
	(port 1 - **See Figure A**) - USB Type-A port 3.2 Gen 1 BCS1.2 (1.5A @ 5V) - CHARGING

Table 2: USB Port capabilities
*Only when connected to a Thunderbolt™ port. If Thunderbolt™ is not supported defaults to USB2.0 only port.

Thunderbolt™ Dock G4 Power/Charging
The HP Thunderbolt Dock G4 has two different configurations and provides power to the host through two different cables. The only difference is the AC adaptor and cable assembly. The USB Type-C® cable is configured and electronically marked to support 40 Gbps Thunderbolt™ speeds and 5 ampere capabilities. The capability of the cable can be read by both the HP host and the dock. If the cable must be replaced it is highly recommended to use the HP cable designed for this dock. Failure to use the HP Thunderbolt dock cable may result in decreased Thunderbolt™ performance and capabilities. Other 3rd party USB Type-C® cables may not support 40 Gbps Thunderbolt™ speeds or currents over 3 amperes.

Non-Workstation Version
An HP 120W AC adaptor and an attached USB-C® Thunderbolt™ cable that supports up to 20 volts 5 amperes (100W) is provided. The HP 19.5V 120W AC adaptor is the minimum required supply and anything less than this will be rejected. An HP adaptor that supports 19.5V and is larger than 120W is acceptable and usable.

Workstation
An HP 19.5V 280W AC adaptor and an attached USB-C®/Barrel Thunderbolt™ cable is provided. An optional cable that can split the USB-C® and Barrel connection may be provided. These cables provide connections to the USB-C® port and the barrel connector on the notebook. The USB-C® connection still supports up to 100W (20 volts 5 amperes),but is not used by the host when the barrel connector is used. The barrel connector only works when a 280W or above adaptor is attached. If a smaller adaptor is used, only the USB-C® connection is used for charging.

DISPLAY CAPABILITIES

Thunderbolt™ Dock G4 Port limitation

- The DP port 2 (lower) and USB Type-C® DP port 3 are mutually exclusive. Only one may be used at a time. See figure C.
- When used with USB Type-C® multifunction host, port 1 (USB Type-C® Thunderbolt™ port) has only USB 2.0 functionality with no video. See Figure C.

Number of Displays connected to the dock:

- Dual 4K @ 60Hz when connected to DP1.2 systems
- Triple 4K @ 60Hz when connected to DP1.4 systems with DSC (display stream compression)

Host Specification	# of displays on dock	Resolution	Supported configuration
DP 1.2 non-DSC Thunderbolt™ host	1	(1) 4096x2160 @ 60Hz	1 DP or 1 TB or 1 USB-C® alt mode 1 HDMI*
	2	(2) 3840 x 2160 @ 60Hz	1 DP + 1 TB port or 1 USB-C® Alt mode port + 1 TB port port 1 HDMI* + 1 TB port
	3	(3) 2560 x 1440 @ 60Hz	(1) 2560 x 1440 @ 60Hz from TB port (2) 2560 x1440 @ 60Hz from any 2 of the non-TB video ports.
	4	(1) 2560 x 1440 @ 60Hz + (3) 1920 x 1080 @ 60Hz+	(1) 2560 x 1440 @ 60Hz from TB port (3) 1920 x 1080 @ 60Hz from any 3 of the non-TB video ports

*HDMI port can only reach 3840x2160 @ 60Hz.

Host Specification	# of displays on dock	Resolution	Supported configuration
DP 1.2 non-DSC Multi-Function host (High Res enable)	1	(1) 4096x2160 @ 60Hz	1 DP or 1 USB-C® alt mode 1 HDMI*
	2	(2) 2560 x 1440 @ 60Hz	Any of the 2 non-TBT video ports
	3	(3) 1920 x 1080 @ 60Hz	(3) Any 3 of the non-TBT video ports

*HDMI port can only reach 3840x2160 @ 60Hz.

Host Specification	# of displays on dock	Resolution	Supported configuration
DP 1.2 non-DSC Multi-Function host (High Res Disable)	1	(1) 2560 x 1440 @ 60Hz	1 DP or 1 USB-C® alt mode 1 HDMI*
	1	(1) 4096 x 2160 @ 30Hz	1 DP or 1 USB-C® alt mode 1 HDMI*
	2	(2) 1920 x 1080 @ 60Hz	Any of the 2 non-TBT video ports
	3	(3) 1920 x 1080 @ 30Hz	(3) Any 3 of the non-TBT video ports

*HDMI port can only reach 3840x2160 @ 60Hz.

Host Specification	# of displays on dock	Resolution	Supported configuration
DP 1.4 non-DSC Thunderbolt™ host	1	(1) **5120 × 2880 @ 60Hz	1 DP or 1 TB or 1 USB-C® alt mode 1 HDMI*
	2	(2) 3840 x 2160 @ 60Hz	1 TB + 1 non-TB video port 2 non-TB video ports
	3	(2) 3840 x 2160 @ 60Hz + (1) 2560 x 1440 @ 60Hz	(2) 3840 x 2160@60Hz from any non-TB video port. (1) 2560x1440 @ 60Hz from **TB port**
	4	(4) 2560 x 1440 @ 60Hz	(3) 2560x1440 @ 60Hz from any non-TB video port (1) 2560x1440 @ 60Hz from **TB port**

*HDMI port can only reach 3840x2160 @ 60Hz.

Host Specification	# of displays on dock	Resolution	Supported configuration
DP 1.4 DSC Thunderbolt™ host	1	(1) 7680 × 4320 @ 60Hz	1 TB (**must be a DSC display**) or 1 USB-C® alt mode
	1	(1) **5120 x 2880 @ 60Hz	1 DP
	1	(1) 3840 x 2160 @ 60Hz	1 *HDMI
	2	(2) **5120 x 2880 @ 60Hz	*2 DP or 1 DP + USB-C® alt mode*
	2	(1)7680 x 4320 @ 60Hz + (1)**5120 x 2880 @ 60Hz	1 TB (**must be a DSC display**) + 1 USB-C® Alt mode 1 TB 7680 x 2880 @ 60hz (**must be a DSC display**) + 1 DP 5120x2160 @ 60hz
	2	(2) 3840 x 2160 @ 60Hz	1 TB + 1 HDMI or 1 TB + 1 USB-C® alt or 1 DP + 1 HDMI or 1 HDMI + USB-C® alt mode
	3	(3) **5120 x 2880 @ 60Hz	(2) 5120x2880@60Hz from DP ports or DP + USB-C® alt (1) 5120x2880 @ 60Hz from **TB port (must be a DSC display, if not TBT port can only support up to 2560x1440@60Hz)**
	4	(2) **5120x2880 @ 60Hz + (2) 3840 x 2160 @ 60Hz	(1) 5120x2880 @ 60Hz from DP or USB-C® Alt mode (1) 5120x2880 @ 60Hz from **TB port (must be a DSC display, if not, TBT port can only support up to 2560x1440@60Hz)** (2) 3840 x 2160@ 60Hz from **HDMI + DP** or **USB Type-C®**

*HDMI port can only reach 3840x2160 @ 60Hz.

Host Specification	# of displays on dock	Resolution	Supported configuration
DP 1.4 non-DSC Multifunction host (High Res enable)	1	(1) 5120 × 2880 @ 60Hz	1 DP or 1 USB-C® alt mode
	2	(2) 3840 x 2160 @ 60Hz	Any 2 non-TB video port
	3	(3) 2560 x 1440 @ 60Hz	Any 3 non-TB video port

*HDMI port can only reach 3840x2160 @ 60Hz.

Host Specification	# of displays on dock	Resolution	Supported configuration
DP 1.4 non-DSC Multifunction host (High Res disabled)	1	(1) 3840 × 2160 @ 60Hz	1 DP or 1 USB-C® alt mode 1 *HDMI
	2	(2) 2560 x 1600 @ 60Hz	Any 2 non-TB video port
	3	(3) 1920 x 1080 @ 60Hz	Any 3 non-TB video port

*HDMI port can only reach 3840x2160 @ 60Hz.

Host Specification	# of displays on dock	Resolution	Supported configuration
DP 1.4 DSC multifunction mode (High Res Enable)	1	(1) 7680 × 4320 @ 60Hz	1 USB-C® alt mode
	2	(2) 5120 x 2880 @ 60Hz	Any 2 non-TB video port (except HDMI port)
	3	(3) 3840 x 2160 @ 60Hz	Any 3 non-TB video port

*HDMI port can only reach 3840x2160 @ 60Hz.

Host Specification	# of displays on dock	Resolution	Supported configuration
DP 1.4 DSC multifunction mode (High Res Disable)	1	(1) 5120 × 2880 @ 60Hz	1 DP or 1 USB-C® alt mode
	2	(2) 3840 x 2160 @ 60Hz	Any 2 non-TB video port
	3	(3) 2560 x 1440 @ 60Hz	Any 3 non-TB video port

*HDMI port can only reach 3840x2160 @ 60Hz.

** 5K monitor using a single cable connection. Not for 5K with 2 cable connections.
Chart is based on 8bit displays.
* HDMI ports can only provide up to 3840 x 2160 @ 60 Hz.

NOTE: To enable High Resolution Mode in an HP notebook system:
1. Enter HP Setup (F10).
2. Select Advanced, then System Options.
3. Select Enable "High Resolution mode when connected to a USB-C® alt mode dock option".
4. Save settings by pressing the F10 key.

HP Thunderbolt Dock G4 is DSC ready
  • In order to fully support DP1.4 DSC, customers must be using a host platform that fully supports the DP1.4 DSC.

HP SURE START FOR DOCKS

HP Sure Start for Docks is a comprehensive firmware security and advanced firmware resilience solution to protect against firmware attacks and/or accidental corruption for the all critical docking station firmware. HP Sure Start for Docks can automatically detect, and recover from attacks or corruption without IT intervention and with little or no interruption to user productivity. Every time the Dock powers on, HP Sure Start for docks automatically validates the integrity of the firmware to help ensure that the dock is safeguarded from malicious attacks. In the case of an attack, the dock can self-heal using an isolated "golden copy" of the firmware in minutes. HP Sure Start for Dock docks are the only docking stations in the world that fully meets NIST 800-193 requirements.

THUNDERBOLT™ SECURITY LEVELS – AVAILABLE FUNCTIONS AND PORTS

The Thunderbolt™ interface supports Direct Memory Access (DMA), which some customers consider a security risk. The HP BIOS based settings described here for the Thunderbolt™ connection policy allow the customer to select the appropriate tradeoff between convenience and security for the Thunderbolt™ capable Type-C® interface port on the PC.

The Thunderbolt™ security level that controls the Thunderbolt™ connection policy of any Type-C® connectors on the PC can be changed in the bios setup. The bios setup can be accessed by pressing the F10 key when booting the PC. The policies are also remotely manageable via Public WMI interfaces.

• **PCIe and DisplayPort – No Security**
  o No security level. Any Thunderbolt™ device attached to the PC Type-C® port or the HP Thunderbolt G4 dock Type-C® port will automatically be enabled without local user approval.
  o External displays will function when attached directly to the PC Type-C® port or the dock through display or USB Type-C® ports.

• **PCIe and DisplayPort – User Authorization**
  o This is the default BIOS policy.
  o Same functionality as Security level 0, but the local user is prompted to approve the connection via a dialog box in windows before the Thunderbolt™ device it is connected to the system. The local user also has the option of suppressing the prompt for subsequent connections of the same device.
  o Each Thunderbolt™ peripheral, including the HP Thunderbolt G4 dock, includes a unique GUID which is saved on the PC and used to determine if the device has been previously connected. In the event the user has chosen to suppress future prompts for that particular GUID (device), the Thunderbolt™ device will automatically be enabled when attached.
  o This policy also applies to any Thunderbolt™ peripherals attached "behind" the HP Thunderbolt G4 dock via the Type-C® connector on the dock.

• **PCIe and DisplayPort – Secure Connect**
  o Same options as Security level 1 if the device contains a security certificate/chip.
  o This option offers enhanced protection for authenticating a previously connected Thunderbolt™ device beyond relying on a GUID provided by the attached Thunderbolt™ peripheral.
  o When this policy is enabled and the user chooses to suppress future prompts for connection approval, the Thunderbolt™ driver stack software on the PC will generate a unique secret that is sent to that Thunderbolt™ device and stored securely in non-volatile memory. Each time that peripheral is subsequently connected, the PC will not only verify that the GUID has been approved for auto-connect, but it will also use a challenge-response to the peripheral device to verify that the device is in possession of the previously provisioned secret. The Thunderbolt™ interface will only be enabled if it can prove that it possesses the previously provisioned secret.

• Security level 3: DisplayPort and USB
  o All Thunderbolt™ functionality of the Type-C® connectors on the PC is disabled.
  o The HP Thunderbolt G4 dock provides all peripheral device functionality via a Thunderbolt™ interface. Thus, none of the ports on the HP Thunderbolt G4 dock will function in this mode.
  o The only Type-C® peripherals that will be functional when connected to the PC Type-C® port are those that use a Native Type-C® USB mode or DisplayPort alternate mode that uses DisplayPort interfaces (and in some cases USB).

• Security level 4: Daisy Chaining Disabled (only applies to some models)
  o Same functionality as Security level 1, the local user is prompted to approve the connection via a dialog box in windows before the Thunderbolt™ device it is connected to the system. The local user also has the option of suppressing the prompt for subsequent connections of the same device.
  o Each Thunderbolt™ peripheral, including the HP Thunderbolt G4 dock, includes a unique GUID which is saved on the PC and used to determine if the device has been previously connected. In the event the user has chosen to suppress future prompts for that particular GUID (device), the Thunderbolt™ device will automatically be enabled when attached.
  o When this policy is enabled, the user will not be able to daisy chain Thunderbolt™ devices from USB-C® port B.

MANAGEABILITY

MAC Address Pass Through (MAPT)
HP Thunderbolt Dock G4 supports MAC Address Pass Through with select notebooks, which allows the notebook to override the dock's NIC factory MAC address with a "Host Based" unique MAC address (HBMA). With MAC Address Pass Through the notebook can be uniquely identified on the network when it is using the HP Thunderbolt Dock G4 dock's NIC to connect to the network using just the HBMA address.

There is also a user defined "Custom" MAC address that could be used as the MAC Address Pass Through address instead of the System HBMA address. Optionally systems that have an embedded LAN the user can choose to "Reuse the embedded LAN Address" instead of the System and Custom HBMA addresses, which allows the same MAC address to be used if either the embedded LAN or the HP Thunderbolt Dock G4 is connected to the network. The MAC Address Pass Through address is stored in BIOS at the factory and is configurable in F10.

MAC Address Pass Through feature supports UEFI PXE boot, Legacy PXE boot, Windows PE, Windows 10 and Windows 11.

MAC Address Pass Through feature is not supported on Appel OS, Chrome OS, or any Linux supported distribution.

MAC Address Pass Through is supported when the notebook is On and the dock is attached and transitions to Sleep, Hibernate or Off states, and when the dock is attached after the notebook is already in the Sleep, Hibernate, or Off state.

The MAC Address Pass Through technical white paper can be found in the following location:
http://h20195.www2.hp.com/v2/GetDocument.aspx?docname=4AA7-0690ENW

Intel vPro® support through the HP Thunderbolt Dock G4
HP Thunderbolt Dock G4 allows leverage of the Intel vPro® Technology feature Active Management Technology (AMT). When a Thunderbolt™/USB4 connection is established with the host, then the dock uses the Intel® Ethernet Controller I225-LMvP which will provide Intel vPro® support.

This feature support is only applicable for notebooks that support Intel vPro® technology.

For more information about Intel vPro® technology, please refer to:
https://www.intel.com/content/www/us/en/architecture-and-technology/vpro/vpro-platform-general.html

Automatic Switching between NICs (Intel 2.5 Gbps and Realtek 1.0 Gbps)
Depending on the type of connection between the host and the dock, if the host supports a Thunderbolt™ or USB4 connection, then the connection will automatically switch to use the Intel® Ethernet Controller I225-LMvP and if the host disables the Thunderbolt™ connection or does not support a Thunderbolt™ connection (Multifunction mode) then the connection will use the USB 1-Gb Realtek RTL8153CH USB GbE Family Controller, for detailed scenario, please refer to table below:

Host	BIOS F10 menu	Functional NIC
Thunderbolt™ 4/USB4 Host	Thunderbolt™ Mode Enabled	Intel® 2.5 Gbps
	Thunderbolt™ Mode Disabled	Realtek 1.0 Gbps
Thunderbolt™ 3 Host	Thunderbolt™ Mode Enabled	Intel® 2.5 Gbps
	Thunderbolt™ Mode Disabled	Realtek 1.0 Gbps
Non-Thunderbolt™ (Multi-Function) Host	Not applicable	Realtek 1.0 Gbps

Ethernet Driver installation
Both, the host and the dock, must be ON and attached to be able to install the dock Ethernet Driver. Windows OS carries the Realtek Ethernet driver, but for the Intel® I225-LMvP Ethernet device, the driver must be downloaded and installed.
To get so, driver can be installed by using running Windows Updates services or by downloading and installing latest Softpaq from HP.com by visiting the HP Thunderbolt Dock G4 page or visiting any supported Notebook support page (for latest Softpaq, please refer to supported platform list table under page 15).

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NOTE:
- For supported HP systems: PXE boot will be supported regardless of the NIC being used from the dock.
- For Apple systems, then PXE boot (referred as BSDP for Apple systems) will work if using the Realtek NIC from the dock.
- For Chromebook systems, there's no PXE boot support.

Wake on LAN

HP Thunderbolt Dock G4 supports Wake-on-Lan (WOL) with select notebooks from all the system sleep states (On, Sleep, Modern Standby, Hibernate, and Off) with MAC Address Pass Through feature enabled or disabled.

Wake on Lan is supported regardless if the dock connection with the host is Thunderbolt™/USB4 or Multifunction mode.

Both the NIC network adaptor and the Wake On LAN parameter needs to be configured to enable WoL.

From Windows device manager and within the NIC network adaptor properties dialog, the "Allow the device to wake the computer" option must be checked under Power Management option. The BIOS Wake On LAN parameter is located under the Built in Device BIOS F10 menu. The Wake On LAN default is enabled and set to Boot to Hard Drive.

On modern standby enabled notebooks there is no traditional Sleep state, however, WoL will continue to work when those notebooks are in Hibernate or Off states.

NOTE: For non-HP systems, Wake on Lan feature will have limitations:
- For Apple systems: Wake on Lan will only work from Standby state, as long as the system enters Standby while attached to the dock with network cable connected.
- Wake On LAN is not supported for Chrome systems.

HP One Click Installer

The HP One Click Installer allows for seamless firmware update of all HP Thunderbolt G4 docking station. The HP One Click installer dashboard displays the existing and latest firmware version of the dock firmware for user friendly experience. This generation of the installer no longer requires an external display attached to flash the display hub firmware as in previous generations. There is also a "Force All" options to allow installation of older firmware as needed.

HP Thunderbolt Dock G4 also incorporates the option to "Update on Peripheral Disconnect", by selecting this checkbox, the dock firmware will start the firmware update process once the user disconnects the dock from the host.

Requirements:

- Windows 10 and Windows 11. Does not support Chrome/Linux/ThinPro/MAC OS
- Remove all devices connected to the USB 3.0 ports except USB keyboard and mouse
- .Net Framework 4.5 or higher installed

Supported Installer Modes

- Interactive mode - User action required with UI
- Silent mode (not recommended)
- Non-interactive mode – Suggest for SSM support. This will allow the user to auto-advance through the user interface without user interaction. This is similar to a silent install but will have the UI to alert customer that FW is being installed

HP Firmware Installer Deployment User Guide can be found by searching the following location:
URL: **HP_Firmware_Installer_for_Docks_L33010-004.pdf**
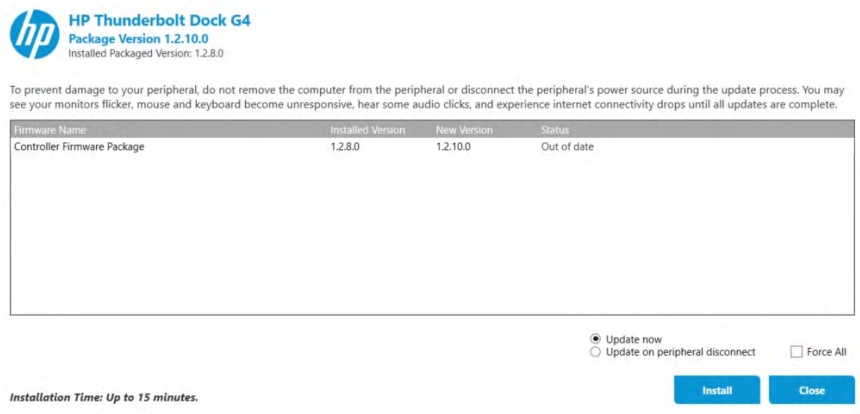
Firmware Update for Linux OS users.

Linux users can update the HP Thunderbolt Dock G4 firmware using the Linux Vendor Firmware Service (LVFS), which supports Gnome-Firmware updates.

Linux Vendor Firmware Service (LFVS) information can be found at **https://fwupd.org/**

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HP Firmware Installer Deployment Reminder
HP Thunderbolt Dock G4 has an enhanced firmware recovery method that can prevent or recover the Firmware of getting corrupted (for more information See "HP Sure Start for Docks" section in this document).

HP Thunderbolt Dock G4 also adds blinking pattern notifications to let user know when its firmware is getting updated: as the firmware gets uploaded to the dock then a slow blinking pattern visible on the power button of the dock will occur, as the firmware starts to get updated in the dock, then the blinking pattern will be faster. Blinking will stop once the upgrade is completed.

However, most importantly, disconnection during a firmware update can cause damage to the dock. Care must be taken to ensure that a user does not undock a machine during the firmware installation.

The following two installation options are available with further customization of each available:

Immediate installation of firmware onto the device
This solution requires the device to be connected to the host platform when the installer is executed. HP Firmware installer will determine which firmware on the device is out of date and flash to the latest. This method can be run silently, loud, or non-interactively, which shows UI to the user but does not require action.

Staging of firmware onto the host platform
This solution is used to deploy to machines that may or may not be connected to the device at time of installation of the package. HP Firmware Installer will be installed onto the host platform via Windows Installer same manner as any other software deliverable. The software installed will also contain the latest firmware binaries. When a compatible device is connected, the software will determine if a firmware update is needed. When the firmware update is run, a UI is displayed to the active user inform them of what to expect from the firmware update, as well as give them the option to postpone. A user must be aware and consent to a firmware update so that they can prevent disconnection of the device during the update.

HP Firmware Installer Deployment User Guide can be found by searching the following location:
URL: **HP_Firmware_Installer_for_Docks_L33010-004.pdf**

HP Thunderbolt Dock G4 Electronic tag (ETag):
Empower your IT to manage and track your docks by product name, serial number, firmware version and MAC Address from anywhere with the time-saving, easy-to-use Electronic Tag (ETag) asset management tool.

Information in eTag
This information is installed in the Dock during factory process in HP before shipping to customers. The ETag information contains the following fields:

Serial Number
- Used for asset tracking and tech inventory reconciliation. Availability of this information means saving time by virtually inventorying docks

Product Name
- Identify which dock IT is managing (ex: HP USB-C® Dock G5 vs. HP USB-C®/A Universal Dock G4). This information is helpful to customers that own a mixed fleet of docks.

Firmware Package Version
- Used to identify the dock's current firmware version. This is used to determine if a firmware update is needed. In case if dock support is needed for any issue, firmware version will be useful to HP support in resolving the customer issue.

MAC Address
- Provide a unique hardware address for the dock when connected on a local area network (LAN). This enables the network security team to take corrective action, if needed.

Gathering ETag
Following methods can be used for ETag collection from the Dock:
- **Stand alone script:** Microsoft PowerShell scripting is used by most customers versus other scripting tools.
  For example: *Get-WmiObject -Class HP_DockAccessory -Namespace root/HP/InstrumentedServices/v1 -ComputerName.*

- **Management Software:** Third party solutions can be used to send the script query to the dock in order to collect the ETag information. This functionality is also part of the HP Manageability Integration Kit.

For more information on how to collecting ETag information from the HP Thunderbolt G4 Dock, please refer to following white paper **HP_Firmware_Installer_for_Docks_L33010-004.pdf** under the **"WMI Provider"** section.

TROUBLESHOOTING ISSUES:

Each topic may have more than one recovery method. Please walk through each step until issue is resolved.

The dock or peripherals connected to the dock do not appear in the OS:
Users should do either of the following:
1. Ensure the dock is authenticated properly (Check First Time Connection section)
2. Unplug and re-plug the dock
3. Restart your notebook or mobile workstation
4. Hardware reset (see description below for more details)

Thunderbolt™ Controller and/or Intel® USB 3.1 Host controller has error code in Device Manager:
This could be the result of reinserting the dock too quickly without full de-enumeration of the dock.
1. To work around this issue you can simply unplug the Thunderbolt™ dock from the system. Wait 20 seconds and re-dock the system
2. In some rare cases, if the first recover method doesn't recover you can undock and reboot the system

In some cases you may notice that the HP Thunderbolt Dock G4 power LED may not be in sync with the system power button LED after resume from standby state:
Functionally there is no impact but the LEDs maybe out of sync. The LEDs on the system and the dock are working as expected, just out of sync.

Customers using Windows 10 build 10586 or earlier may experience a BSOD when resume from standby or hibernation with HP Thunderbolt Dock G4 attached:
In Windows 10 revision 10586 or earlier do not have full support of the USB Type-C® Connector System Software Interface. You must disable the USB Type-C® Connector System Software Interface in the HP BIOS.
How to recover:
1. Go to F10 BIOS setup
2. Go to the Advanced tab -> System Options
3. Disable the USB Type-C® Connector System Software Interface
4. Save and exit

Internal display corruption when cold boot with VGA monitor attached via USB-C® to VGA dongle:
This known issue may occur on HP Thunderbolt platforms with Intel graphics running Windows 10 in legacy boot mode.
To avoid this issue you can change the boot mode to UEFI in the F10 BIOS.
1. Go to F10 BIOS setup
2. Go to the Advanced tab -> Option ROM Launch Policy
3. Change to All UEFI
4. Save and exit

Thunderbolt™ 3 storage device disappears from "My computer" after restart with device attached:
To work around this issue users can enable Fast Boot in the BIOS.
1. Go to F10 BIOS setup
2. Go to the Advanced tab -> Boot Options
3. Unselect Fast Boot
4. Save and exit

Intermittently USB displays may not appear after restart:
To work around this issue customers may do either of the following:
1. Re-plug the display
2. Toggle the display modes from duplicate to extended

USB Type-C® Connector System driver may have error code in Windows 10 build 16299
To work around this issue end user may do either of the following:
1. Unplug the HP Thunderbolt Dock G4 and restart
2. Reload the USB Type-C® Connector System driver in device manager

Intel® Collage mode may not persist after resume from standby or hibernation
This is due to latency issue after resuming from a sleep state. The issue can recovered by re-enabling Intel® Collage mode from Intel® display control panel.

HP Thunderbolt notebooks that have Native PCIe hot plug enabled may encounter an issue where the HP Thunderbolt Dock G4 may not fully enumerate when resume from a warm dock state.
To work around this issue users may do the following:
1. Unplug and re-plug the HP Thunderbolt Dock G4

USB device connected to the dock stops functioning:
1. Unplug and re-plug the USB Device
2. Unplug and re-plug the dock
3. Restart your notebook or mobile workstation
4. Hardware reset (see description below for more details)

Monitors connected to the HP Thunderbolt Dock G4 doesn't wake from a sleep state or on a hot plug with HP display:
Some HP display have known issue waking from a "Low power "state. To work around this issue you can change
the option to "Always Active" on the On-Screen-Display Menu.
1. Open the On-Screen-Display menu on the monitor
2. Select the menu option
3. Select "Input Control"
4. Select "DP Hot-Plug Detection"
5. Select the "Always active" option and save

To perform a hardware reset of your notebook or mobile workstation, follow ALL of the following steps. A hardware reset temporarily disconnects the internal battery to fully reset the system:
1. Power off the notebook or mobile workstation
2. Remove the AC power cord and all USB cables or devices from the notebook or mobile workstation
3. Press and hold the power button for 15 seconds

To perform a hardware reset of your dock, do the following:
1. Undock the HP Thunderbolt Dock G4 from your notebook
2. Unplug the power cable from your dock 5 seconds

Unable to view video on 4K HDMI/DP monitor when connected to the USB Type-C® of the HP Thunderbolt Dock G4 by using a HDMI/DP to Type-C® dongle:
This is a known limitation, as a workaround the following can be done:
1. Plug directly the Monitor to the DP/HDMI port of the dock instead of the Type-C® port, or
2. Plug directly the Monitor to the Thunderbolt™ port of the dock

On Non-Thunderbolt™ Host, 4k Resolution @60hz is unavailable when computer is docked with 4K monitor attached
This is a known limitation, when dock is working in multi-function mode, to mitigate this issue enable Hight Resolution mode in the BIOS F10 setup as follows:
1. Enter HP Setup (F10)
2. Select Advanced, then System Options
3. Select Enable "High Resolution mode when connected to a USB-C® alt mode dock option"
4. Save settings by pressing the F10 key

The system might take around 1 minute to enumerate the HP Thunderbolt Dock G4 after resuming from Hibernation:
To prevent this issue from happening:
1. As a short-term solution: As a user, allow system to resume from hibernation first and then plug the dock after around 30 seconds, or
2. For Long term solution: Issue will be fixed by upgrading to latest version of Windows 11 version 21H2

System audio abnormal behavior when connected to certain monitors as HP Z34C G3 or HP Z24m while running Win10 OS:
The symptoms include:
• Takes a long time (over 10s) to open Camera App
• Click Volume icon under task bar and the response is slow
•Audio output responses slow when switching between Z34C G3 monitor and HDMI monitors
• F6 and F7 keys are unable to control the volume of the notebook

To resolve issue:
- Download latest Intel® SST driver from HP.com for your system

External display Apple XDR show garbage or no display when attached to HP Thunderbolt Dock G4 through the USB Type-C® port:
This issue affects notebooks running on NVIDIA® graphics cards.

To resolve issue:
- For short term solution, connect the monitor to the Type-C® port near the AC power connection
- As long-term solution, a new Graphics driver will be release

SUPPORT LIST FOR THE HP THUNDERBOLT 4 DOCK

The following chart details the support required for HP Notebooks and HP ZBook Mobile Workstations that support the initial release of the HP Thunderbolt Dock G4. For future supported platforms, please see **Dock Compatibility** (search by notebook).

For prior products not listed, HP recommends using the HP Thunderbolt G2 Dock, HP USB-C®/A Dock G2, or HP USB-C® Dock G5 docks.

HP COMMERCIAL NOTEBOOK / MWS PLATFORM SUPPORT

Power	Segment	Platform name	BIOS		Thunderbolt™ driver *		LAN Driver			
			Version	Softpaq	Driver Version	Softpaq	Driver Version for Realtek RTL8153CH	Softpaq	Driver Version for Intel® I225-LMvP	Softpaq
120W	HP EliteBook	HP Elite Dragonfly G2 Notebook PC / HP Elite Dragonfly Max Notebook PC	01.08.00	SP137075	1.41.1193.0	SP134558	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP EliteBook x360 1040 G8 Notebook PC / HP EliteBook x360 1030 G8 Notebook PC	01.08.00	SP137038	1.41.1193.0	SP134558	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP Elite x2 G8 Tablet	01.08.00	SP137060	1.41.1193.0	SP134558	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP EliteBook 850 G8 Notebook PC / HP EliteBook 840 G8 Notebook PC / EliteBook 840 Aero G8 Notebook PC / HP EliteBook 830 G8 Notebook PC	01.08.00	SP137071	1.41.1193.0	SP134558	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP EliteBook x360 830 G8 Notebook PC	01.08.00	SP137077	1.41.1193.0	SP134558	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP EliteBook 855 G8 Notebook PC / HP EliteBook 845 G8 Notebook PC / HP EliteBook 835 G8 Notebook PC	01.08.03	SP138414	NA	NA	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP EliteBook x360 1040 G7 Notebook PC / HP EliteBook x360 1030 G7 Notebook PC	01.08.00	SP137035	1.41.1193.0	SP134558	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP EliteBook 830 G7 Notebook PC / HP EliteBook 840 G7 Notebook PC	01.08.00	SP137122	1.41.1193.0	SP134558	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP EliteBook 850 G7 Notebook PC	01.08.00	SP137122	1.41.1193.0	SP134558	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP EliteBook x360 830 G7 Notebook PC	01.08.00	SP137128	1.41.1193.0	SP134558	10.46.621.2021	SP137129	1.0.2.22	SP138249

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Power	Segment	Platform name	BIOS		Thunderbolt™ driver *		LAN Driver			
			Version	Softpaq	Driver Version	Softpaq	Driver Version for Realtek RTL8153CH	Softpaq	Driver Version for Intel® I225-LMvP	Softpaq
120W	HP EliteBook	HP EliteBook 855 G7 Notebook PC / HP EliteBook 845 G7 Notebook PC / HP EliteBook 835 G7 Notebook PC	01.08.00	SP137151	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP EliteBook x360 1040 G6 Notebook PC	01.12.00	SP137029	1.41.1193.0	SP134448	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP Elite Dragonfly Notebook PC	01.12.00	SP137046	1.41.1193.0	SP134448	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP EliteBook x360 1030 G4 Notebook PC	01.12.00	SP137198	1.41.1193.0	SP134448	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP Elite x2 G4	01.12.00	SP137014	1.41.1193.0	SP134448	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP EliteBook 850 G6 Notebook PC / HP EliteBook 840 G6 Notebook PC / HP EliteBook 840 G6 Healthcare Edition Notebook PC / HP EliteBook 830 G6 Notebook PC	01.12.00	SP137078	1.41.1193.0	SP134448	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP EliteBook x360 830 G6 Notebook PC	01.12.00	SP137081	1.41.1193.0	SP134448	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP EliteBook 745 G6 Notebook PC / HP EliteBook 735 G6 Notebook PC	01.19.00	SP137147	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
	HP ProBook, ZHAN and Thin Client	HP ProBook 630 G8 Notebook PC	01.08.01	SP137022	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP ProBook 640 G8 Notebook PC / HP ProBook 650 G8 Notebook PC	01.08.01	SP137022	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP ProBook 430 G8 Notebook PC / HP ProBook 440 G8 Notebook PC / HP ProBook 450 G8 Notebook PC	01.08.02	SP137067	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP ProBook 440 G8 Notebook PC / HP ProBook 450 G8 Notebook PC	01.08.02	SP137067	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A

Power	Segment	Platform name	BIOS		Thunderbolt™ driver *		LAN Driver			
			Version	Softpaq	Driver Version	Softpaq	Driver Version for Realtek RTL8153CH	Softpaq	Driver Version for Intel® I225-LMvP	Softpaq
120W	HP ProBook, ZHAN and Thin Client	HP ProBook 430 G8 Notebook PC / HP ProBook 440 G8 Notebook PC / HP ProBook 450 G8 Notebook PC	01.08.02	SP137067	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP ProBook 440 G8 Notebook PC / HP ProBook 450 G8 Notebook PC	01.08.02	SP137067	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP ZHAN 66 Pro 14 G4 Notebook PC	01.08.02	SP137068	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP ProBook 635 Aero G8 Notebook PC	01.08.03	SP138425	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP ProBook 455 G8 Notebook PC / HP ProBook 445 G8 Notebook PC	01.08.00	SP137070	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP ZHAN 66 Pro A 14 G4 Notebook PC	01.08.00	SP137076	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP ProBook x360 435 G8 Notebook PC	01.08.02	28-feb	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP mt46 Mobile Thin Client	01.08.00	SP137190	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP ProBook 635 Aero G7 Notebook PC	01.08.00	SP137161	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP mt32 Mobile Thin Client	01.08.00	SP137192	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP ProBook 445 G7 Notebook PC / HP ProBook 455 G7 Notebook PC	01.08.00	SP137124	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP ProBook x360 435 G7 Notebook PC	01.08.00	SP137152	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP ZHAN 66 Pro A 14 G3 Notebook PC	01.08.00	SP137125	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP ProBook 640 G7 Notebook PC / HP ProBook 650 G7 Notebook PC	01.08.00	SP137127	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A

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Power	Segment	Platform name	BIOS		Thunderbolt™ driver *		LAN Driver			
			Version	Softpaq	Driver Version	Softpaq	Driver Version for Realtek RTL8153CH	Softpaq	Driver Version for Intel® I225-LMvP	Softpaq
120W	HP ProBook, ZHAN and Thin Client	HP ProBook 430 G7 Notebook PC / HP ProBook 440 G7 Notebook PC / HP ProBook 450 G7 Notebook PC	01.12.00	SP136982	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP ZHAN 66 Pro 14 G3 Notebook PC / HP ZHAN 66 Pro 15 G3 Notebook PC	01.12.00	SP136983	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP mt22 Mobile Thin Client	01.12.00	SP136984	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP ZHAN X 13 G2 Notebook PC	01.12.00	SP137082	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP mt45 Mobile Thin Client	01.19.00	SP137191	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
		HP ProBook 650 G5 Notebook PC / HP ProBook 640 G5 Notebook PC	01.12.00	SP137080	N/A	N/A	10.46.621.2021	SP137129	N/A	N/A
	HP ZBook	HP ZBook Firefly 15.6 inch G8 Mobile Workstation PC / HP ZBook Firefly 14 inch G8 Mobile Workstation PC	01.08.00	SP137071	1.41.1193.0	SP134558	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP ZBook Firefly 15 G7 Mobile Workstation / HP ZBook Firefly 14 G7 Mobile Workstation	01.08.00	SP137122	1.41.1193.0	SP134558	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP ZBook Studio 15u G6 Mobile Workstation / HP ZBook Studio 14u G6 Mobile Workstation	01.12.00	SP137078	1.41.1193.0	SP134448	10.46.621.2021	SP137129	1.0.2.22	SP138249

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Power	Segment	Platform name	BIOS		Thunderbolt™ driver *		LAN Driver			
			Version	Softpaq	Driver Version	Softpaq	Driver Version for Realtek RTL8153CH	Softpaq	Driver Version for Intel® I225-LMvP	Softpaq
230W	HP ZBook	HP ZBook Fury 17.3 Inch G8 Mobile Workstation PC / HP ZBook Fury 15.6 Inch G8 Mobile Workstation PC	01.08.01	SP138218	1.41.1193.0	SP134558	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP ZBook Studio 15.6 Inch G8 Mobile Workstation PC / HP ZBook Create 15.6 Inch G8 Notebook PC	01.08.00	SP137019	1.41.1193.0	SP134558	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP ZBook Power 15.6 inch G8 Mobile Workstation PC	01.08.00	SP137099	1.41.1193.0	SP134558	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP ZBook Power G7 Mobile Workstation	01.08.00	SP137096	1.41.1193.0	SP134558	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP ZBook Fury 17 G7 Mobile Workstation / HP ZBook Fury 15 G7 Mobile Workstation	01.08.00	SP137027	1.41.1193.0	SP134558	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP ZBook Studio G7 Mobile Workstation	01.08.00	SP137016	1.41.1193.0	SP134558	10.46.621.2021	SP137129	1.0.2.22	SP138249
		HP ZBook 17 G6 Mobile Workstation / HP ZBook 15 G6 Mobile Workstation	01.12.00	SP137057	1.41.1193.0	SP134448	10.46.621.2021	SP137129	1.0.2.22	SP138249

* Driver package includes Intel® Control Center.

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