HP Firmware Installer for Docks

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Overview

Firmware updates to external devices create a challenge in managing devices. This package allows for multiple installation options to fit customer needs.

In addition, firmware updates can be time consuming and disruptive to an end user. The user may see the monitor flicker, hear audio clicks, the internet connection may be intermittent, and the mouse and the keyboard could become unresponsive until the installation is complete.

HP Firmware Installer for Docks allows for two different installation options using the same package. HP Firmware Installer includes all firmware updates for a docking station and provides installation options for different operating system deployment or update scenarios. This document explains the different scenarios and options.

Supported docking stations

- HP USB-C/A Universal Dock G2
- HP USB-C Dock G5
- HP Thunderbolt Dock G2
- HP E24d G4 FHD Advanced Docking Monitor
- HP E27d G4 QHD Advanced Docking Monitor

Terms and definitions

Table 1. Terms and definitions

Term	Definition
Host	The computer that a supported docking station is connected to
Docking station firmware package version	The version of the whole firmware package applied to a docking station
Device firmware version	The firmware version of a device on a docking station

Update options

The following installation options, including further customization, are available:

- Stage the firmware to the host computer, and the firmware is installed when the docking station or docking monitor is connected to the host (later). This is the default and recommended option.
- Install all the applicable firmware to the docking station or monitor immediately.
- Stage the firmware to the docking station, and the firmware is installed when the host computer is disconnected from the docking station. (Select docking stations only.)[1]

Staging the firmware to the host

This solution is used to deploy firmware updates to docking stations that might not be connected to the host at the time of installation of the package. HP Firmware Installer is installed onto the host via Windows Installer, similar to most software. The software installed contains the latest firmware binaries. When a supported docking station is connected and you log into the host, the software determines if a firmware update is needed. To prevent disconnection of the device, you must first consent to the firmware update. When the firmware update is running, a UI displays information about the firmware update and the option to postpone.

Enabling firmware deployment through the host
1. To detect the operating system architecture and run the appropriate HP Firmware Installer msi file, run install.cmd
2. After installing HP Firmware Installer is installed, connect a supported docking station and log in to the host (if you are not already logged in).
3. When prompted, agree to the firmware update.

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[1] HP USB-C/A Universal Dock G2 & HP USB-C Dock G5 only

Command line arguments

Standard MSI arguments can be used to stage the firmware; for example, run Install.cmd /qn for silent installation.

To add configuration options to the command, specify the argument and value as follows:

```
Install.cmd <MSI_OPTIONS> POSTPONE_TIME=60 POSTPONE_MAX=2
```

Configuration options

There are several configuration options that can be used to customize the firmware update experience. The following configuration options can be added as command line arguments to `install.cmd`, or they can be set in the registry after installation.

- Registry Key: HKLM\Software\HP\HP Firmware Installer\DEVICE_NAMEPostpone duration

  Description: The amount of time (in minutes) that passes between a user hitting postpone and the UI notification reappearing

  Default: 60

  Allowed range: 2 to 1440 (24 hours)

  Command-line argument: POSTPONE_TIME

  Registry value: PostponeTime

- Postpone maximum

  Description: The total number of times the user can hit the postpone button

  Default: -1 (infinity)

  Allowed Range: 0 (none) to -1 (infinity)

  Command-line argument: POSTPONE_MAX

  Registry value: PostponeMax

- Disable firmware checks after successful firmware update

  Description: HP Firmware Installer only updates the first device it encounters. After the firmware update is successful, or if the device is already up to date, HP Firmware Installer does not verify firmware versions until a new firmware version is staged to the host. If you want a single host to update multiple devices, set this to 0 (false) to ensure that the software always verifies the firmware version of compatible devices it encounters and prompts you to start the firmware update.

  Default: 0 (false)

  Command-line argument: FLASH_DISABLE_ON_SUCCESS

  Registry value: FlashDisableOnSuccess

- Disable firmware checks after failed firmware update

  Description: HP Firmware Installer stops attempting to update firmware after a set number of failed attempts (set in the FlashAttemptMax option). After the maximum number of attempts have been made, if this registry key is set to 1 (true), the software stops verifying firmware versions until a new firmware version is staged to the host.

  Default: 1 (true)

  Command-line argument: FLASH_DISABLE_ON_FAIL

  Registry value: FlashDisableOnFail

- Maximum number of failed attempts

  Description: HP Firmware Installer stops attempting to update firmware after a set number of failed attempts. After this maximum number of attempts has been made, the software stops verifying firmware versions until a new firmware version is staged to the host.

  Default: 2

  Command-line argument: FLASH_ATTEMPT_MAX

  Registry value: FlashAttemptMax

- Force downgrade

  Description: Used to force HP Firmware Installer to downgrade docking stations that are newer than the deployed version, as well as upgrade older docking stations. When force is set to 1 (on), any connected devices that are not the exact version as the one deployed cause the install process to begin. When force is set to 0 (off), HP Firmware Installer only upgrades docking stations, and docking stations with a newer firmware version stay as is.

  Default: 0 (off)

  Command-line argument: `FORCE`

  Registry value: Force

- Installation log path

  Description: Saves the log file to a specified location. If not specified, the log is saved to the default location (%TEMP%). This parameter can be either a file name or a directory. If only a directory is specified, the log file name is HPFirmwareInstaller.log.

 *Default*: Not specified (`%TEMP%\HPFirmwareInstaller.log`)

  Command-line argument: `INSTALL_LOG_PATH`

  Registry value: InstallLogPath

Example

The following example demonstrates how to install the HP Thunderbolt software first, and then set up HP Firmware Installer to trigger a firmware update.

Figure 1. HP Task Sequence Example
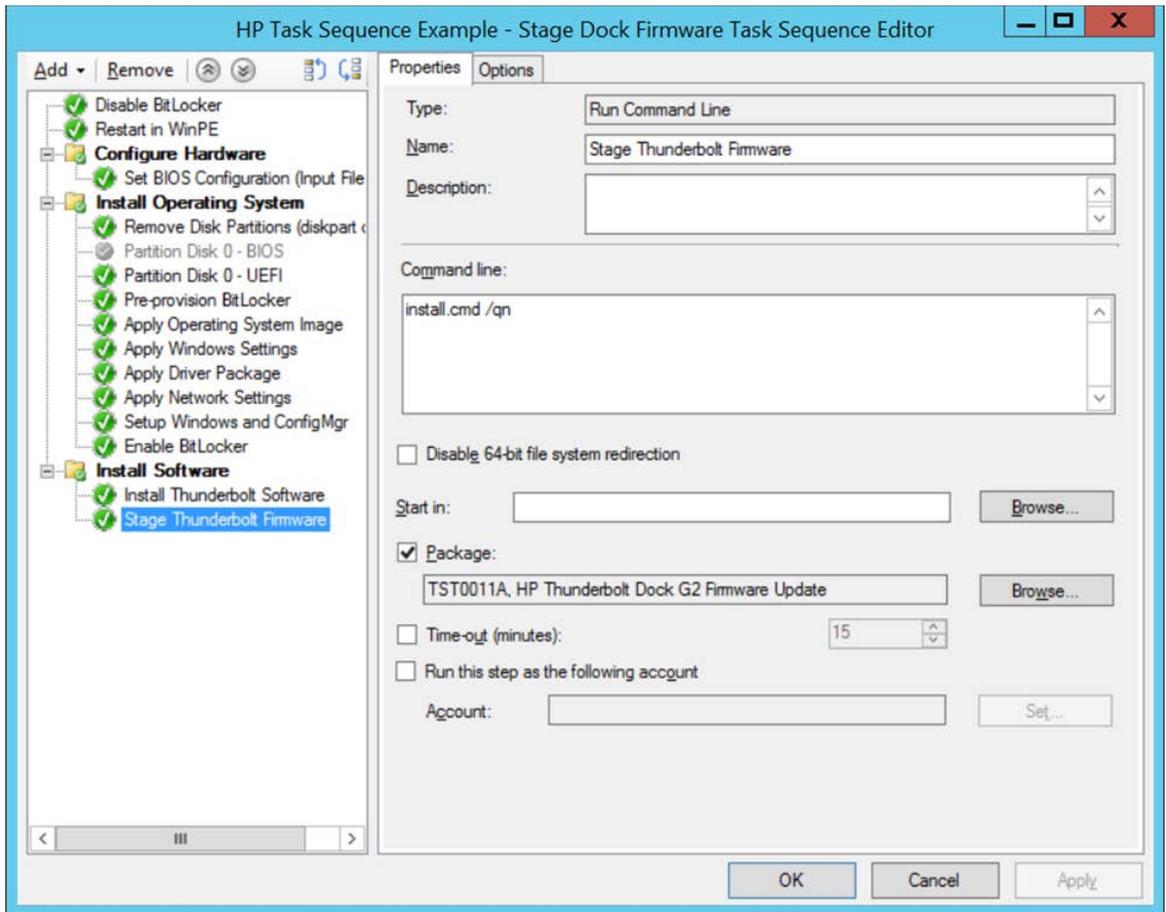
End-user experience

When the software determines that firmware update is required, a notification is displayed. The firmware update does not start until this notification is accepted; however, the notification cannot be closed or minimized. The upgrade can only be postponed; the number of postpones and the time of postponement is configurable.

Figure 2. End-user update notification
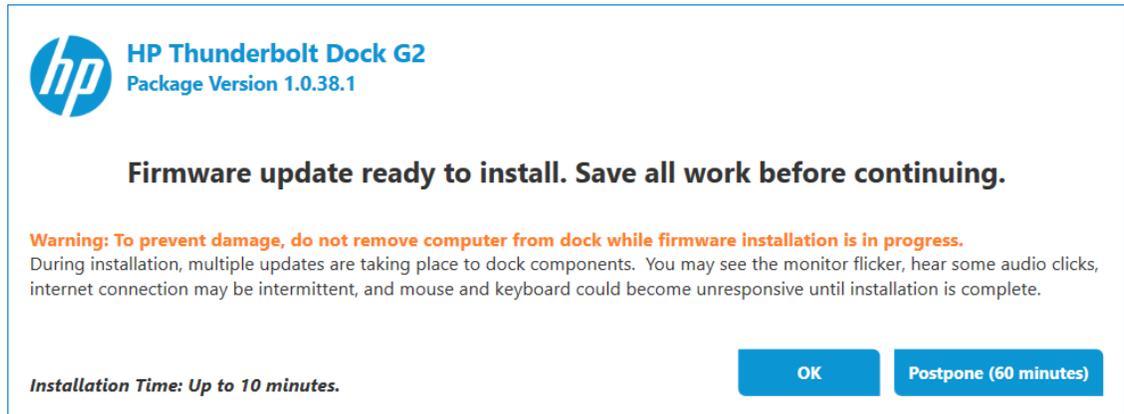
If **Postpone** is selected, the same dialog box opens again after the displayed time elapses.

If **OK** is selected, an update-in-progress dialog box is displayed.

Figure 3. Update in progress dialog box sample below:

HP Thunderbolt Dock G2
Package Version 1.0.38.1
Installed Packaged Version: 1.0.1.1

Warning: To prevent damage, do not remove computer from dock while firmware installation is in progress.
During installation, multiple updates are taking place to dock components. You may see the monitor flicker, hear some audio clicks, internet connection may be intermittent, and mouse and keyboard could become unresponsive until installation is complete.

Firmware Name	Installed Version	New Version	Status
DisplayPort Hub	5.3.0.1	5.3.0.1	Up to date
Audio Base	0.3.0.12	0.3.0.16	Installing...
(Optional) Audio Top DSP	1.0.0.109	1.0.0.137	Out of date
(Optional) Audio Top Module	0.3.1.44	0.3.1.44	Up to date
USB3.1 Gen2 Hub	7.0.1.3	7.0.1.3	Up to date
Base Microcontroller	3.0.6	3.0.6	Up to date
US USB Type-C PD Controller	3.2.12	3.2.12	Up to date
DS USB Type-C PD Controller	3.2.2	3.2.2	Up to date
(Optional) Audio Module Microcontroller	1.8.0	1.8.0	Up to date
Thunderbolt Controller	19.1.0.0.4	19.1.0.0.4	Up to date

Installing 1 of 2...

After the update is completed, the installation status is displayed.

Figure 4. Firmware update status dialog box sample below:
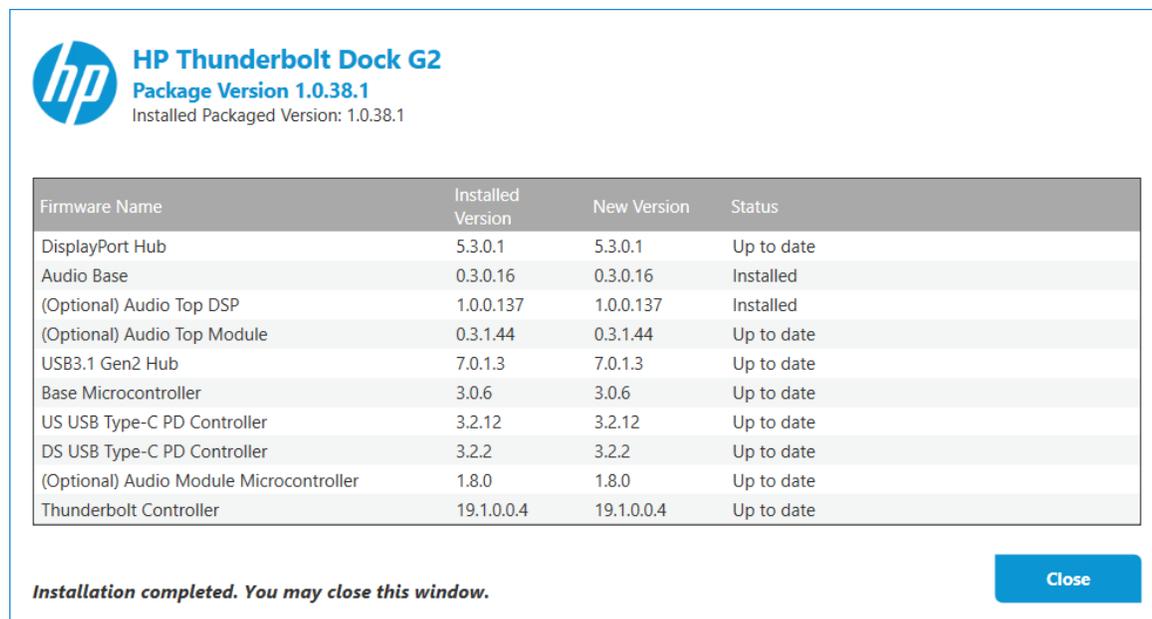
Installing the firmware immediately

The docking station or docking monitor must be connected to the host when the installer is started and must stay connected throughout the installation. HP Firmware installer determines which firmware on the docking station is out of date and updates to the latest version. This method can be run with the full UI, silently, or non-interactively, which displays the UI but does not require interaction.

Command line parameters

The following table provides the parameters for `HPFirmwareInstaller.exe`.

Table 2. Command line parameters

Parameter	Description
`-noninteractive` or `-ni`	Runs the installer without any user interaction, but still displays the UI.
`-silent` or `-s`	Runs the installer in silent mode.
`-force` or `-f`	Forces the installer to flash each firmware piece to the version included in the package, whether that is an upgrade, downgrade, or a re-flash of the same version.
`-installLogPath:<file path>`	Specifies the path of the log file generated during installation.

Interactive installation

• Double-click **HPFirmwareInstaller.exe** to run it interactively.

Note

If the program is run with the noninteractive or silent command-line parameter with the immediate firmware installation method, it returns an error code. For more details, see Return codes.

Each individual component (on the docking station) and the corresponding device firmware version is shown to the user. The status of each component is updated during the installation process.

Figure 5. List of devices and their corresponding firmware version

HP Thunderbolt Dock G2
Package Version 1.0.38.1
Installed Packaged Version: 1.0.1.1

Warning: To prevent damage, do not remove computer from dock while firmware installation is in progress.
During installation, multiple updates are taking place to dock components. You may see the monitor flicker, hear some audio clicks, internet connection may be intermittent, and mouse and keyboard could become unresponsive until installation is complete.

Firmware Name	Installed Version	New Version	Status
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(Optional) Audio Top DSP	1.0.0.109	1.0.0.137	Out of date
(Optional) Audio Top Module	0.3.1.44	0.3.1.44	Up to date
USB3.1 Gen2 Hub	7.0.1.3	7.0.1.3	Up to date
Base Microcontroller	3.0.6	3.0.6	Up to date
US USB Type-C PD Controller	3.2.12	3.2.12	Up to date
DS USB Type-C PD Controller	3.2.2	3.2.2	Up to date
(Optional) Audio Module Microcontroller	1.8.0	1.8.0	Up to date
Thunderbolt Controller	19.1.0.0.4	19.1.0.0.4	Up to date

☐ Force All

Installation Time: Up to 10 minutes. [Install] [Close]

Figure 6. Installing the firmware in progress

HP Thunderbolt Dock G2
Package Version 1.0.38.1
Installed Packaged Version: 1.0.1.1

Warning: To prevent damage, do not remove computer from dock while firmware installation is in progress.
During installation, multiple updates are taking place to dock components. You may see the monitor flicker, hear some audio clicks, internet connection may be intermittent, and mouse and keyboard could become unresponsive until installation is complete.

| Firmware Name	Installed Version	New Version	Status
DisplayPort Hub	5.3.0.1	5.3.0.1	Up to date
Audio Base	0.3.0.12	0.3.0.16	Installing...
(Optional) Audio Top DSP	1.0.0.109	1.0.0.137	Out of date
(Optional) Audio Top Module	0.3.1.44	0.3.1.44	Up to date
USB3.1 Gen2 Hub	7.0.1.3	7.0.1.3	Up to date
Base Microcontroller	3.0.6	3.0.6	Up to date
US USB Type-C PD Controller	3.2.12	3.2.12	Up to date
DS USB Type-C PD Controller	3.2.2	3.2.2	Up to date
(Optional) Audio Module Microcontroller	1.8.0	1.8.0	Up to date
Thunderbolt Controller	19.1.0.0.4	19.1.0.0.4	Up to date

☐ Force All

Installing 1 of 2... [Install] [Close]

Figure 7. Installing the firmware completed

HP Thunderbolt Dock G2
Package Version 1.0.38.1
Installed Packaged Version: 1.0.38.1

Firmware Name	Installed Version	New Version	Status
DisplayPort Hub	5.3.0.1	5.3.0.1	Up to date
Audio Base	0.3.0.16	0.3.0.16	Installed
(Optional) Audio Top DSP	1.0.0.137	1.0.0.137	Installed
(Optional) Audio Top Module	0.3.1.44	0.3.1.44	Up to date
USB3.1 Gen2 Hub	7.0.1.3	7.0.1.3	Up to date
Base Microcontroller	3.0.6	3.0.6	Up to date
US USB Type-C PD Controller	3.2.12	3.2.12	Up to date
DS USB Type-C PD Controller	3.2.2	3.2.2	Up to date
(Optional) Audio Module Microcontroller	1.8.0	1.8.0	Up to date
Thunderbolt Controller	19.1.0.0.4	19.1.0.0.4	Up to date

Installation completed. You may close this window.

Close

Example

The following screenshot shows an example deployment task sequence. The operating system deployment task sequence contains the necessary steps to install the appropriate Thunderbolt software first, then start HP Firmware Installer to update the docking station firmware immediately as the docking station is connected when the task sequence is running.

Figure 8. Installing the firmware immediately deployment task sequence
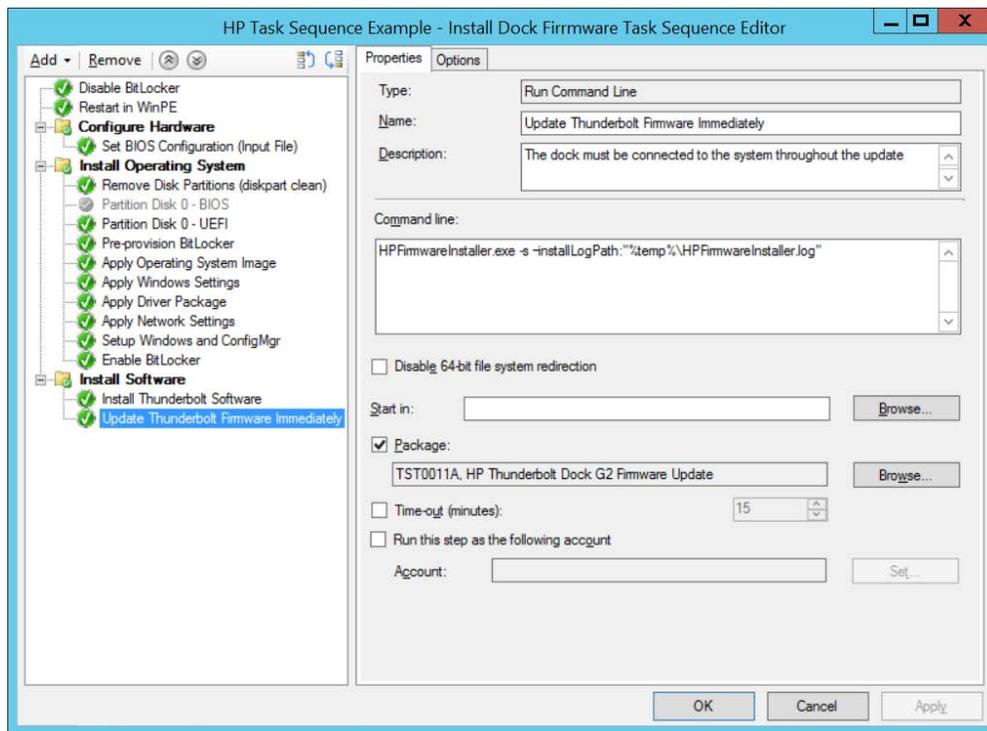
Return codes

Table 3. Return codes

Code	Description
0	Success
101	Install failed. One or more firmware failed to install.
102	Configuration file failed to load. This occurs when the file cannot be found, or if it is not properly formatted.
103	One or more firmware packages specified in the configuration file could not be loaded.
104	No devices could be communicated with. This could be because the device was not connected, or necessary drivers are missing to detect the device.
105	Out-of-date firmware detected when running with 'check' flag.
106	An instance of HP Firmware Installer is already running.
107	Device not connected
108	Force option disabled. Firmware downgrade or re-flash not possible on this device.

Installing the firmware upon disconnection

The firmware for the HP USB-C Dock G5 and the HP USB-C/A Universal Dock G2 can be updated when the docking station is disconnected from the host computer. The firmware package is staged to the docking station, and the individual components in the docking station are updated using the package the next time that the host computer is disconnected from the docking station. Thus, you can disconnect your host computer while the firmware update process is running. When the disconnected update is occurring, the power light blinks, and the docking station cannot be connected to a computer. The full update finishes in less than 4 minutes.

Command line parameters

Table 4. Command-line parameters for disconnected updates

Parameter	Description
-stage or -st	Stages the firmware package to the docking station, and then updates the firmware when the host computer is disconnected from the docking station.
-check or -c	Verifies whether the firmware is up to date. Only returns success if all firmware is up to date.

Enabling disconnected updates

1. Double-click HPFirmwareInstaller.exe.
2. Select **Update on dock disconnect**.

> **Figure 9.** Selecting disconnected updates
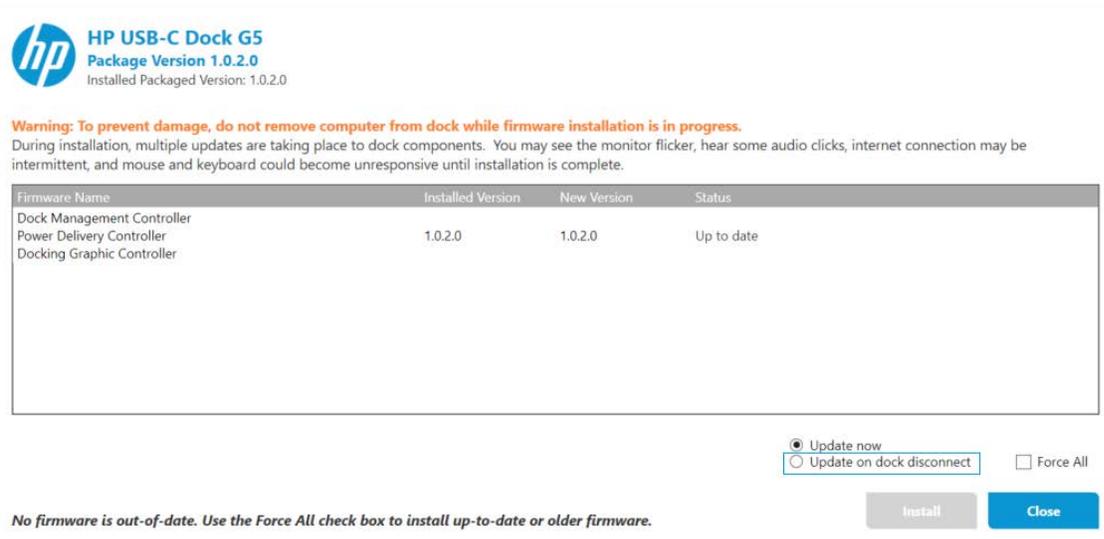
3. Select **Install**.

HP Firmware Installer stages the firmware to the docking station, and the docking station installs the update the next time the host is disconnected.

While the docking station updates, the power light blinks once per second. The docking station cannot connect to a host until the update process has finished.

Note

If the power light continues to blink after the update is completed successfully, contact HP Support.

Every time the docking station is connected to a host, HP Firmware Installer verifies the status of the disconnected update and finishes the process.

Inventory/Report (HP Thunderbolt Dock G2 only)

Docking station firmware update information location

The result of firmware updates, including error codes and versions, are stored on the host platform for querying. Several values are stored in the registry.

Registry key: `HKLM\SOFTWARE\HP\HP Firmware Installer\DEVICE_NAME`

- Available Package Version

  Description: This is the version of the firmware package that has been staged to the host. It is the same as the version that shows up for the installer in Add/Remove Programs.

  Registry value: AvailablePackageVersion
- Installed Package Version

  Description: This is the version that was installed or verified to be on the last connected device. This value is not be updated if the software has stopped checking firmware due to configuration options that might be set to disable the software after successful or failed updates.

  Registry value: InstalledPackageVersion
- Error Code

  Description: The error code produced from the last firmware update attempt. This comes from one of the error codes listed in Installing the firmware immediately.

  Registry value: ErrorCode

- Last Time Firmware Installed

  Description: The date and time a firmware update was last performed.

  Registry value: LastInstalled
- Last Time Firmware Checked

  Description: the date and time of the last firmware version check of a device.

  Registry value: LastChecked

Extending hardware inventory to include Thunderbolt docking station firmware information in Microsoft® System Center Configuration Manager

The docking station firmware upgrade information saved in the client registry can be collected by management systems. The following is an example procedure for extending Microsoft® System Center Configuration Manager to retrieve HP Thunderbolt G2 docking station firmware information.

1. Download the configuration.mof file. Go to https://ftp.hp.com/pub/caps-softpaq/cmit/whitepapers/HPThunderboltG2.RegKeyToMOF.txt.
2. On the site server, append the following to configuration.mof. The mof file can be found at C:\Program Files\Microsoft Configuration Manager\inboxes\clifiles.src\hinv. This updates the Configuration Manager client policy to retrieve the HP Thunderbolt Dock G2 firmware information from the registry of HP clients.

```
#pragma namespace ("\\\\.\\root\\cimv2")

#pragma deleteclass("HP_ThunderboltDockG2Firmware", NOFAIL)

[DYNPROPS]

Class HP_ThunderboltDockG2Firmware

{

        [key] string KeyName;

        String AvailablePackageVersion;

        String InstalledPackageVersion;

        Uint32 ErrorCode;

        String LastInstalled;

        String LastChecked;

};


[DYNPROPS]

Instance of HP_ThunderboltDockG2Firmware

{

        KeyName="RegKeyToMOF";

        [PropertyContext("Local|HKEY_LOCAL_MACHINE\\SOFTWARE\\HP\\HP Firmware
        Installer\\HP Thunderbolt Dock
        G2|AvailablePackageVersion"),Dynamic,Provider("RegPropProv")]
        AvailablePackageVersion;

        [PropertyContext("Local|HKEY_LOCAL_MACHINE\\SOFTWARE\\HP\\HP Firmware
        Installer\\HP Thunderbolt Dock
        G2|InstalledPackageVersion"),Dynamic,Provider("RegPropProv")]
        InstalledPackageVersion;

        [PropertyContext("Local|HKEY_LOCAL_MACHINE\\SOFTWARE\\HP\\HP Firmware
        Installer\\HP Thunderbolt Dock
        G2|ErrorCode"),Dynamic,Provider("RegPropProv")] ErrorCode;
```

```
[PropertyContext("Local|HKEY_LOCAL_MACHINE\\SOFTWARE\\HP\\HP
Firmware Installer\\HP Thunderbolt Dock
G2|LastInstalled"),Dynamic,Provider("RegPropProv")] LastInstalled;

[PropertyContext("Local|HKEY_LOCAL_MACHINE\\SOFTWARE\\HP\\HP Firmware
Installer\\HP Thunderbolt Dock
G2|LastChecked"),Dynamic,Provider("RegPropProv")] LastChecked;
```
      ```};```

Adding the docking station firmware information to the reported hardware inventory classes

1. Save the following to a text file named ThunderboltG2.HWInvExt.mof.

```
#pragma namespace ("\\\\.\\root\\cimv2\\SMS")

#pragma deleteclass("HP_ThunderboltDockG2Firmware", NOFAIL)

[SMS_Report(TRUE),SMS_Group_Name("HP_ThunderboltDockG2Firmware
"),SMS_Class_ID("HP_ThunderboltDockG2Firmware")]

Class HP_ThunderboltDockG2Firmware: SMS_Class_Template

{

        [SMS_Report(TRUE),key] string KeyName;

        [SMS_Report(TRUE)] String AvailablePackageVersion;

        [SMS_Report(TRUE)] String InstalledPackageVersion;

        [SMS_Report(TRUE)] Uint32 ErrorCode;

        [SMS_Report(TRUE)] String LastInstalled;

        [SMS_Report(TRUE)] String LastChecked;

};
```

2. Download the hardware inventory MOF file. Go to https://ftp.hp.com/pub/caps-softpaq/cmit/whitepapers/HPThunderboltG2.HWInvExt.mof.txt.
3. In the Configuration Manager console, open the **Administration** workspace, select **Client Settings**, right-click **Default Client Settings**, and select **Properties**. The **Default Settings** dialog box opens.
4. Select **Hardware Inventory**, and then select **Set Classes**. The **Hardware Inventory Classes** dialog box opens.
5. To open the Import dialog box, select **Import**.
6. Browse to **HP_ThunderboltG2.HWInvExt.mof** and select **Open**. HP_ThunderboltDockG2Firmware class is now added to the **Import Summary**.

7. Select **OK** to close all the opened dialog boxes.

Figure 10. HP_ThunderboltDockG2Firmware in the Import Summary
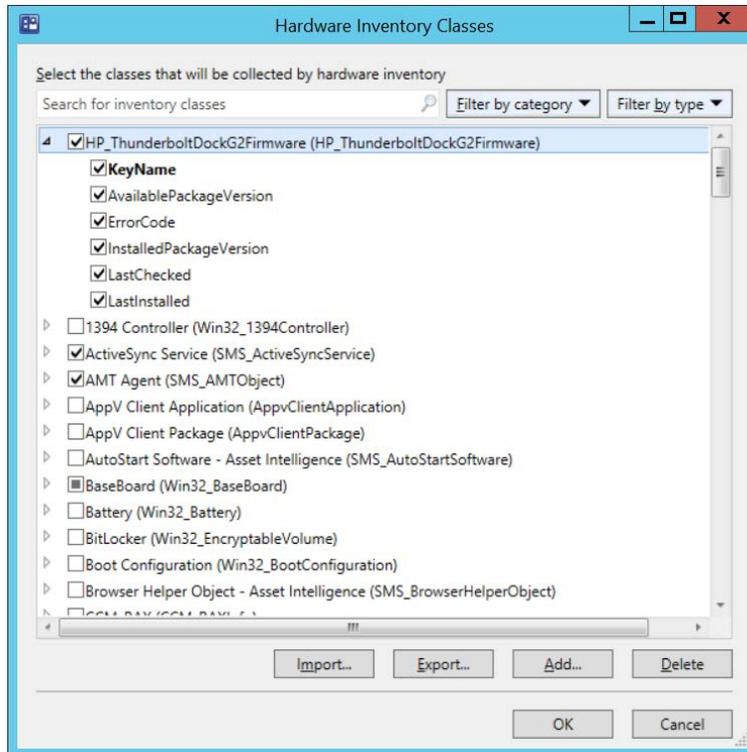
After the updated hardware inventory information from client computers has been collected and processed in Configuration Manager, the docking stations that have firmware installation information display the following in Resource Explorer:

Figure 11. Resource explorer
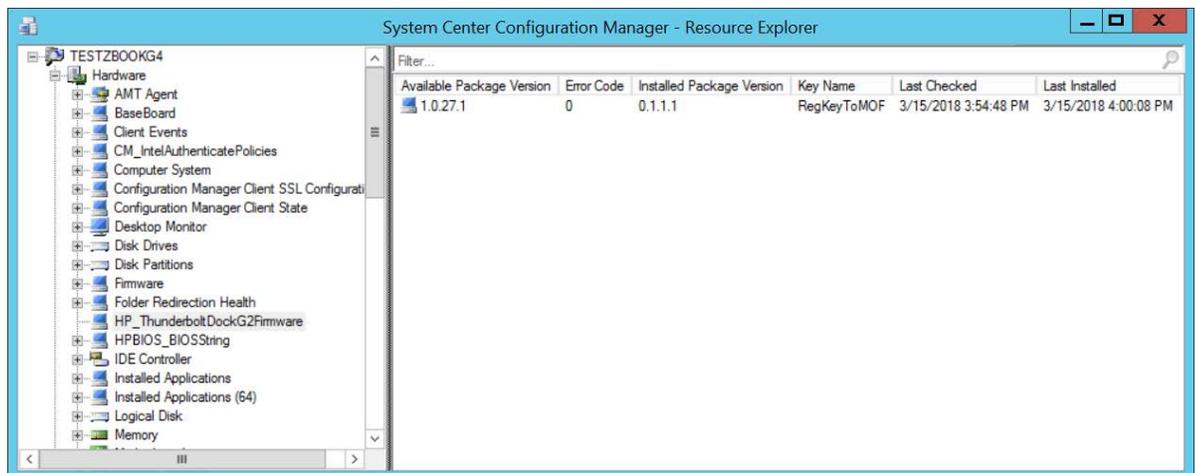
WMI provider (HP USB-C Dock G5, HP USB-C/A Universal Dock G2, HP E24D G4 Docking Monitor, and HP E27D G4 Docking Monitor only)

Select docking stations include the ability to access the serial number, the MAC address, the firmware package version, and the product name programmatically via WMI. This is enabled via a Windows® Management Information (WMI) provider that is installed in Windows. If a docking station is connected to a host that supports the WMI interface, then these values can be read via a management console over the network. This capability can enable an enterprise to better inventory and track the status of the docks in their environment.

Installation

The WMI provider must be installed on each host before the host can be connected to a docking station and read the docking station properties.

1. Double-click the **One-Click Installer installation** folder, and then select **Manageability**.
2. Open the WMI provider installer.

Figure 12. WMI provider installer package
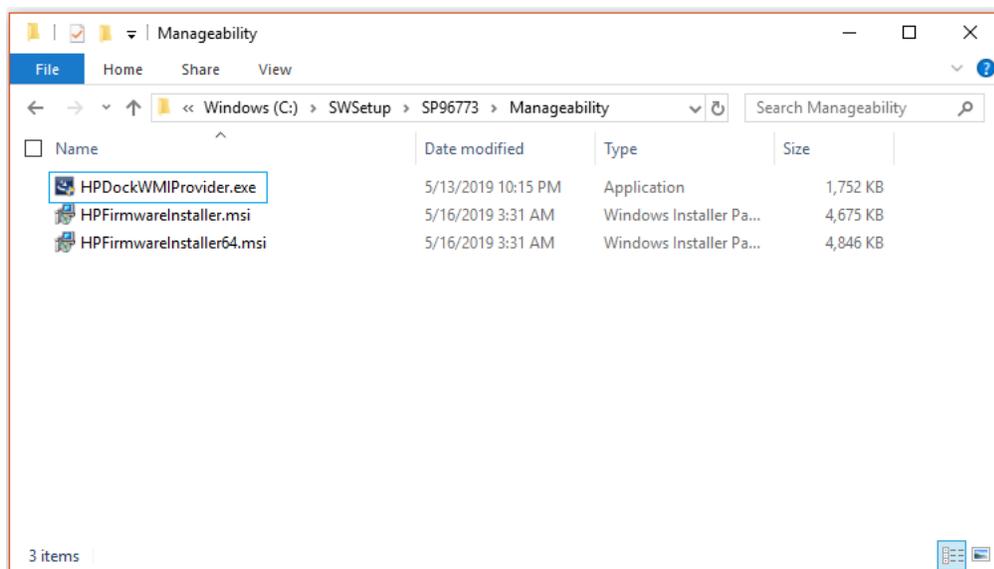
Or, to install the WMI provider silently on a supported HP system, use the following procedure;

1. From the command line, run the following command:

```
Manageability\HPDockWMIProvider.exe /S /v/qn
```

After WMI is installed, WMI call can be used to query the information of a supported docking station when it is connected to a host.

Sample WMI call with output

```
PS> Get-WmiObject -Class HP_DockAccessory -Namespace
root/HP/InstrumentedServices/v1


__GENUS              : 2

__CLASS              : HP_DockAccessory

__SUPERCLASS         : SW_ManagedInstanceService

__DYNASTY            : SW_BaseObject

__RELPATH            : HP_DockAccessory.SerialNumber="00091100C5"

__PROPERTY_COUNT     : 10

__DERIVATION         : {SW_ManagedInstanceService, SW_ManagedServiceBase,
SW_BaseObject}

__SERVER             : MYCOMPUTER

__NAMESPACE          : root\HP\InstrumentedServices\v1

__PATH               : \\MYCOMPUTER\root\HP\InstrumentedServices\v1:

                       HP_DockAccessory.SerialNumber="00091100C5"

CorrelationID        : a58fbf4e-0fb2-4e89-8cff-994a5bd0fc43

Description          : HP_DockAccessory WMI Provider

FirmwarePackageVersion : 1.0.2.0
```

```
ID                    : HP_DockAccessory

MACAddress            : C8:D9:D2:FF:A5:22

MinorSchemaVersion    :

ProductName           : HP USB-C Dock G5

Publisher             : HP Inc.

SerialNumber          : 00091100C5

State                 : 0

PSComputerName        : MYCOMPUTER
```

Extending hardware inventory to include the WMI provider information in Configuration Manager

1. After you have installed the WMI provider on the host and connected the host to either HP USB-C Dock G5 or HP USB-C/A Universal Dock G2, note the computer name of the client system and then use the name to connect to WMI.
2. In the Configuration Manager console, open the **Administration** workspace, select **Client Settings**, right-click **Default Client Settings**, and then select **Properties**. The **Default Settings** dialog box opens.
3. Select **Hardware Inventory**, and then select **Set Classes**. The **Hardware Inventory Classes** dialog box opens.
4. Select **Add**. The **Add Hardware Inventory Class** dialog box opens.
5. Selct **Connect**. The **Connect to Windows Management Instrumentation** dialog box opens.
6. Enter the information for the host where WMI provider is installed.
   A. In the **WMI namespace** box, type `ROOT\HP\InstrumentedServices\v1`.
   B. Under **WMI namespace**, select the **Recursive** check box.

Figure 13. Connect to Windows Management Instrumentation
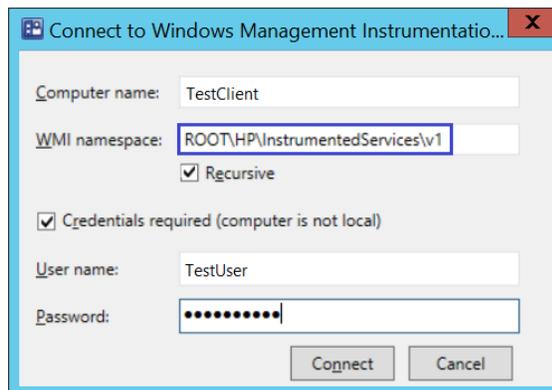
7. Select Connect.The Add Hardware Inventory Class dialog box opens.

8. Browse to the **HP_DockAccessory** class. Select **HP_DockAccessory**, and then select **OK** to add this class to the list of hardware inventory classes.

Figure 14. Add Hardware Inventory Class
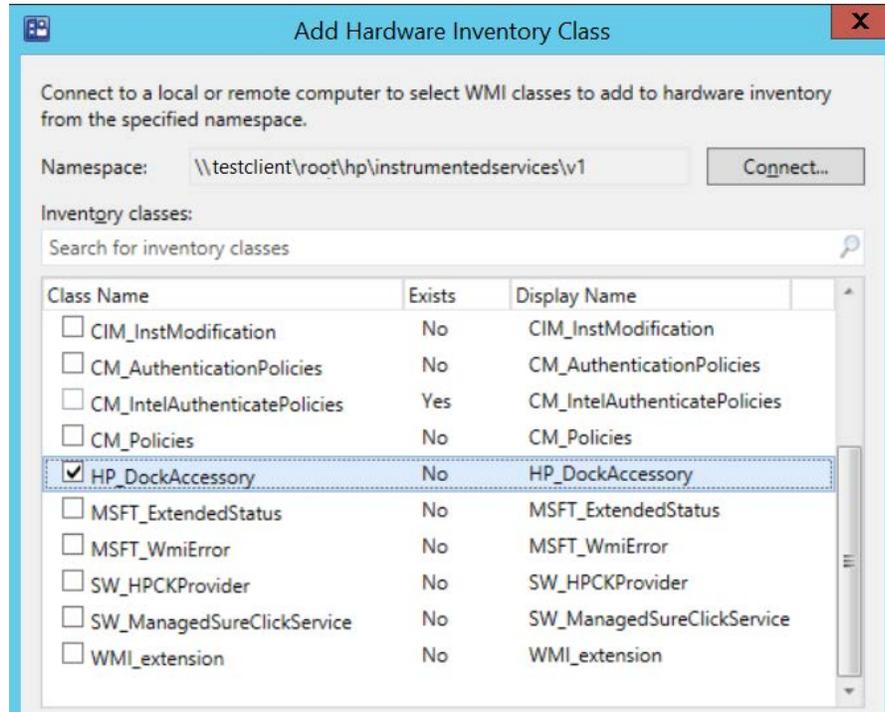
9. In the **Hardware Inventory Classes** dialog box, select attributes from the **HP_DockAccessory** class to add those attributes to the hardware inventory report. HP recommends selecting the following: **ProductName**, **FirmwarePackageVersion**, **Publisher**, and **SerialNumber**.

Figure 15. Hardware Inventory Classes
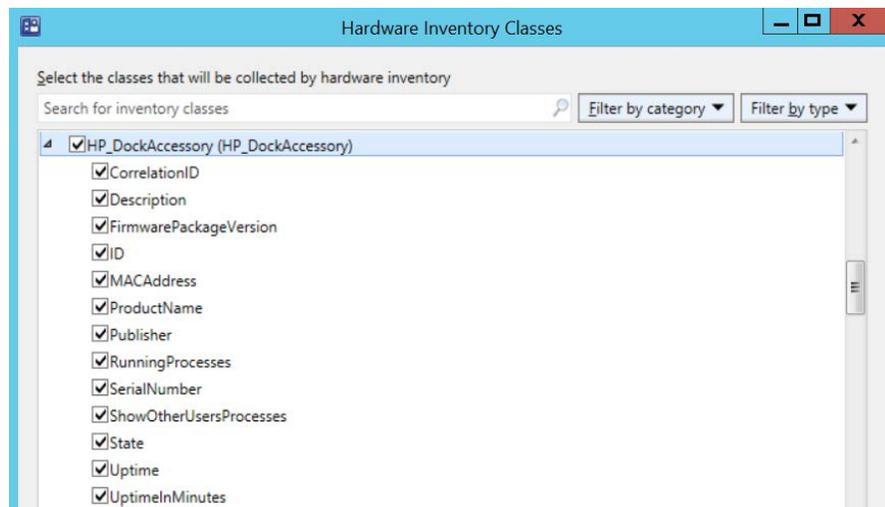
10. To close the **Hardware Inventory Classes** dialog box, select **OK**.
11. To close the **Default Settings** dialog box, select **OK**.

After the updated hardware inventory information from hosts has been collected and processed in Configuration Manager, the devices that have firmware installation information are displayed in **Resource Explorer**.

Figure 16. Resource Explorer

For more information

HP USB-C/A Universal Dock G2 specifications

https://support.hp.com/us-en/product/hp-usb-c-a-universal-dock-g2/27767208/document/c06386384

HP USB-C Dock G5 specifications

https://support.hp.com/us-en/product/hp-usb-c-dock-g5/27767205/document/c06386359

HP Thunderbolt Dock G2 specifications

https://support.hp.com/us-en/document/c05913756

HP Client Management Solutions

https://www.hp.com/go/clientmanagement

Sign up for updates
hp.com/go/getupdated