

HP Elite Dock with Thunderbolt 3 & HP ZBook Dock with Thunderbolt 3



Features and troubleshooting



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First-time connection

Note: If you purchased your computer before May 2016, you will need to perform the updates described in the “Updating BIOS, firmware and drivers related to the Thunderbolt 3 Dock” section prior to connecting the dock to your computer. If you are unsure of when your computer was purchased, HP recommends updating your computer.

1. When connecting the Dock to your notebook for the first time you may need to authorize the Thunderbolt™ Device. In the dialog that appears, select OK.

Note: You must be logged on as an administrator of the local computer.

To grant non-admin users the ability to press OK, do the following **while logged in as an administrator**:

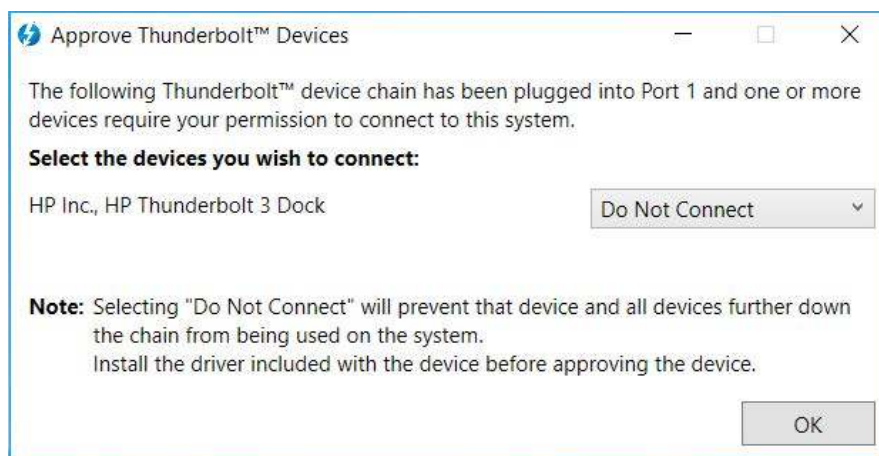
- a. Run the non-admin registry key. This can be obtained through the HP Technical Consultant assigned to your account.
- b. Then install the Thunderbolt™ software.

Figure 1. Dialog box requesting administrative approval of a new Thunderbolt™ device.



2. A second dialog opens. 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 2. Dialog box to configure connection settings of a new Thunderbolt™ device.



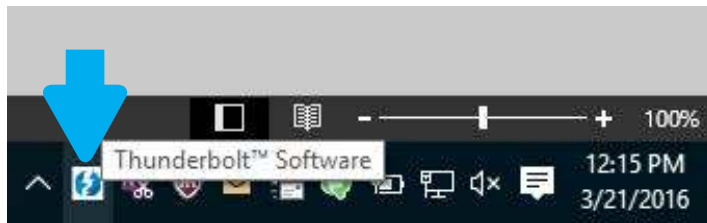
3. Select **OK**.

Best practice: docking/undocking

It is recommended that the HP Elite Dock with Thunderbolt 3 or HP ZBook Dock with Thunderbolt 3 be plugged into the HP notebook or HP ZBook Mobile Workstation while it is fully on or fully off (not in a standby or hibernate state). When detected, a Thunderbolt™ icon, shown in **Figure 3**, will appear in the system tray. At this point, the HP notebook or HP ZBook Mobile Workstation will start initializing all the devices connected to the dock, so there might be a slight delay before the devices are ready to use.

When removing the HP Elite Dock with Thunderbolt 3 or HP ZBook Dock with Thunderbolt 3 from your HP notebook or HP ZBook Mobile Workstation, it is recommended to unplug the dock first, wait until the Thunderbolt™ icon (see **Figure 3**) in the system tray is gone, and then put the notebook or mobile workstation into Standby, Hibernate, Restart or Shut-down state.

Figure 3. Thunderbolt™ Software Icon in system tray



HP Thunderbolt 3 Dock Firmware Installer

A combined installer has been created to improve the customer experience of updating the HP Thunderbolt 3 dock firmware. The HP Thunderbolt 3 dock firmware will include all of the necessary dock firmware updates into a single installer.

The installer package includes firmware updates for the following dock devices:

- Intel® Thunderbolt™ 3 Firmware for HP Dock with Thunderbolt 3
- HP Dock with Thunderbolt 3 Synaptics DisplayPort™ Hub Firmware
- ASM1042A Firmware for HP Dock with Thunderbolt 3
- ASMedia ASM1074 Firmware
- HP Audio Dock Firmware

In order to successfully update all of the dock firmware a DisplayPort™ monitor needs to be attached to the dock when running the firmware installer. The installer should also be run with elevated privileges in order to be update properly.

Updating BIOS, firmware, and drivers related to the Thunderbolt™ 3 Dock

Note: HP recommends updating the BIOS and software and drivers before connecting to the dock; otherwise, the dock might not work. For optimal performance, be sure to keep all software and drivers on your computer updated.

To update the BIOS, firmware, and software/drivers:

1. Go to hp.com/support. Select Get software and drivers, enter your computer model number (located on the computer service label), and then select Find my product.
2. Click the link for your specific computer and then select your operating system.
3. Download and install the latest BIOS.
4. Restart the computer.
5. Repeat steps 1 and 2.
6. Download and install the latest Intel® Thunderbolt™ Secure Connect driver.
7. Restart the computer.
8. Repeat steps 1 and 2.
9. Download and install the latest Intel® Thunderbolt™ Firmware Update Utility.
10. Restart the computer.

11. Repeat steps 1 and 2.
12. Download and install the following updates in any order:
 - a. Graphics drivers.
 - b. ASMedia eXtensible Host Controller Driver.
 - c. Broadcom Ethernet Controller Driver.
 - d. Conexant USB Driver.
13. Restart the computer.

Now, you can connect the dock to your computer.

Pre-boot support

The HP ZBook Dock with Thunderbolt 3 and the HP Elite Dock with Thunderbolt 3 support pre-OS environment only in Thunderbolt [Security Level 0](#).

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 ZBook Dock with Thunderbolt 3 or HP Elite Dock with Thunderbolt 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.

MAC Address Pass Through

MAC Address Pass Through is supported on select notebooks and allows the notebook to override the HP Dock with Thunderbolt 3 NIC's factory MAC address with a "Host Based" MAC address, so the notebook can be uniquely identified on the network using just the MAC address. A MAC Address Pass Through address is stored in BIOS at the factory and is configurable in F10.

MAC Address Pass Through supports preboot UEFI PXE environments, allowing the PXE network to uniquely identify and manage the PXE image based on the attached notebook MAC Address Pass Through address.

MAC Address Pass Through supports Windows 10 operating system via a software service, in on, sleep, hibernate, and off states. For MAC Address Pass Through support the notebook must be on with the HP Thunderbolt 3 dock attached before going into the designated sleep state.

See the **Troubleshooting** section for more details.

Wake-on-Lan Support

The HP ZBook Dock with Thunderbolt 3 and HP Elite Dock with Thunderbolt 3 support Wake-on-Lan (WOL) in sleep, hibernate and off states. For WOL support notebook must be on with the HP Thunderbolt 3 dock attached, and the network cable must be plugged in before going into the designated sleep state. On Windows 10 operating systems you will be required to disable Fast Startup in the OS for this feature to function as expected.

Disabling Fast startup in the OS:

1. Press the Windows key on your keyboard, type in Power Options, and then press Enter.
2. From the left-hand menu, select Choose what the power buttons do.
3. Under the Shutdown settings section, uncheck the box next to Turn on fast startup.
4. Click the Save changes button.

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

Supported features by platform

HP ZBook Dock with Thunderbolt 3 and HP Elite Dock with Thunderbolt 3	PXE Boot (SLO, UEFI)	Pre-Boot KB/Display (SLO)	USB Dock Boot (SLO)	WoL (Sleep, Hibernate, Off)	MAPT (On, Sleep, Hibernate, Off)	Lan/WLAN Switching	iAMT (vPro)
HP Elite x2 1012 G1	•	•	•				
HP Elite Folio G1		•	•	•			
HP ZBook 17 G3	•	•	•	•			
HP ZBook 15 G3	•	•	•	•			
HP ZBook Studio G3	•	•	•	•			
HP Elite x2 1012 G2	•	•	•		•	•	
HP EliteBook x360 1030 G2	•	•	•	•	•	•	
HP ZBook 17 G4	•	•	•	•	•	•	
HP ZBook 15 G4	•	•	•	•	•	•	
HP ZBook Studio G4	•	•	•	•	•	•	
HP ZBook x2 G4	•	•	•	•	•	•	
HP EliteBook 1040 G4	•	•	•	•	•	•	
HP EliteBook x360 1020 G2	•	•	•		•	•	
HP ZBook 17 G5	•	•	•	• ¹	• ¹	•	
HP ZBook 15 G5	•	•	•	• ¹	• ¹	•	
HP ZBook 15u G5	•	•	•	•	•	•	
HP ZBook 14u G5	•	•	•	•	•	•	
HP ZBook Studio G5	•	•	•	• ¹	• ¹	•	
HP ZBook x360 G5	•	•	•	• ¹	• ¹	•	
HP EliteBook 1050 G1	•	•	•	• ¹	• ¹	•	
HP Elite x2 1013 G3	•	•	•		•	•	
HP EliteBook x360 1030 G3	•	•	•		•	•	
HP EliteBook 840 G5	•	•	•	•	•	•	
HP EliteBook 850 G5	•	•	•	•	•	•	
HP EliteBook 830 G5	•	•	•	•	•	•	
HP EliteBook 840 G5 HC	•	•	•	•	•	•	

¹Wake on LAN and MAPT from the off state is not supported.

For more information, see the **Troubleshooting** section.

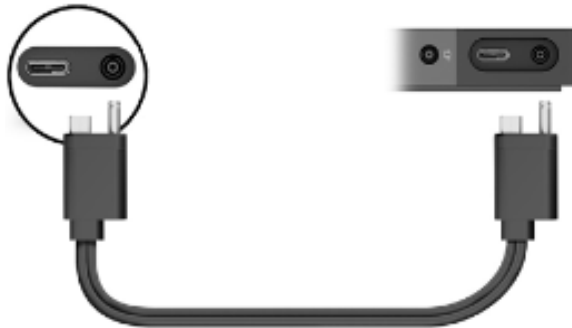
vPro™ support

vPro™ functionality is not supported through the docking station Local Area Network (LAN). To enable vPro™ support, either access through a wireless network or by plugging into the LAN on the notebook or mobile workstation where available.

Charging support from HP Dock

- HP ZBook Dock with Thunderbolt 3 dock cable: dual custom ends (AC+USB Type-C™ to AC+USB Type-C™)
 - Customized for HP ZBook Mobile Workstations only
 - High speed data transfer
 - Capable of charging mobile workstation
 - Charging is only through the AC connection, not the USB Type-C™

Figure 4. HP ZBook Thunderbolt 3 dock cable



Note: Mobile workstation charging is supported only through the AC connector on the HP ZBook Thunderbolt™ 3 dock cable (refer to Figure 4). The USB Type-C™ connector is used for data transfer. Therefore, when using the HP ZBook Thunderbolt™ 3 dock cable to charge your mobile workstation through the dock, a notification indicating a lack of support for charging through the USB port will appear (refer to Figure 5). This only applies to the USB port, and your system will continue to charge using the AC connector.

- HP Elite Dock with Thunderbolt 3 cable: single custom end (AC+USB Type-C™ to USB Type-C™)
 - Customized for the HP 1012 G1 Tablet, HP EliteBook Folio G1, HP Elite x2 1012 G2, and HP EliteBook x360 1030 G2
 - High speed data transfer
 - Capable of charging the HP 1012 G1 Tablet, HP EliteBook Folio G1, HP Elite x2 1012 G2, and HP EliteBook x360 1030 G2 only
 - Does NOT charge mobile workstations

Figure 5. USB Type-C™ connector charging support notification.

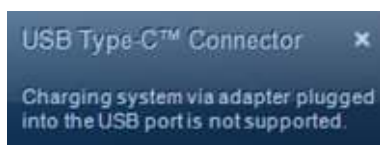


Figure 6. HP Elite Dock with Thunderbolt 3 cable



- Third Party USB Type-C™ Cable: USB Type-C™ to USB Type-C™
 - Users should ONLY use the cables that are shipped with the dock when connecting the dock to the notebook or mobile workstation
 - Third Party cables are NOT supported for connecting the dock to the notebook or mobile workstation

Display capabilities

• Multiple monitors support

- HP ZBook Mobile Workstations using only an Intel HD graphics solution can support up to three displays, including the mobile workstation display
- NVIDIA® graphics can support up to four displays, including the mobile workstation display
- AMD and Intel® graphics can support up to six displays, including the mobile workstation display
- Hybrid graphics:
 - When used together, the HP ZBook Dock with Thunderbolt 3 and HP ZBook 15/17 configured with hybrid graphics, a maximum of 6 independent displays are supported
 - When used together, the HP ZBook Dock with Thunderbolt 3 and HP ZBook Studio configured with hybrid graphics, a maximum of 5 independent displays are supported

For more information on multiple displays, refer to the [Multiple displays on HP ZBook Mobile Workstations white paper](#).

Refer to **Table 1** below for HP ZBook Dock with Thunderbolt 3 display connection options.

Table 1. HP ZBook Dock with Thunderbolt 3 display configurations.

Display Configurations	Dock Display Ports			
	USB Type-C™	DP	DP	VGA
(2) 4K Displays – (A)	4096 x 2160	4096 x 2160	X	X
(2) 4K Displays – (B)	4096 x 2160	X	4096 x 2160	X
(1) 4K and (2) 2.5k Displays	4096 x 2160	2560 x 1600	2560 x 1600	X
(1) 4K, (2) 2.5k Displays, and (1) FHD	4096 x 2160	2560 x 1600	2560 x 1600	1920 x 1200
(1) 5K – (A)	5K DP cord 1	5K DP cord 2	X	X
(1) 5K – (B)	5K DP cord 1	X	5K DP cord 2	X
(1) 5K and (1) FHD – (A)	5K DP cord 1	5K DP cord 2	1920 x 1200	X
(1) 5K and (1) FHD – (B)	5K DP cord 1	5K DP cord 2	X	1920 x 1200
(1) 5K and (1) FHD – (C)	5K DP cord 1	1920 x 1200	5K DP cord 2	X
(1) 5K and (1) FHD – (D)	5K DP cord 1	X	5K DP cord 2	1920 x 1200
(4) FHD Displays	1920 x 1200	1920 x 1200	1920 x 1200	1920 x 1200

• 5K Display

- Requires (2) DP connections
- One of the two DP connections must be made through the USB Type-C™ port. Refer to Table 1 for the dock's display connection options
- AMD and Intel® graphics require both connections of the 5K display to be made through USB Type-C™ ports
 - One of the connections must be through the notebook or mobile workstation's USB Type-C™ port
 - The second connection can be to the notebook or mobile workstation's 2nd USB Type-C™ port or the USB Type-C™ port on the dock
 - None of the display ports on the dock can be used when a 5K display is active on AMD graphics

• 4K Display

- Only one 4K at 60Hz display connection can be made to the display ports on the dock
- In order to use a 2nd 4K at 60Hz display, the connections must be made through the USB Type-C™ port on the dock or directly to the notebook or mobile workstation. Refer to Table 1 for the dock's display connection options

• **HDMI and USB Type-C™**

- Displays connected to the HDMI, USB Type-C™#1 and USB Type-C™#2 ports on the notebook or mobile workstation cannot be active at the same time
- All four displays connected to the dock may be active only when both HDMI and USB Type-C™ ports on the notebook or mobile workstation are not in use
- When a display on HDMI (or USB Type-C™) on the notebook or mobile workstation is active: either displays on (a) dock’s USB Type-C™ or (b) Dock’s VGA+DP+DP can be active, but not both sets

Legacy Thunderbolt™ support

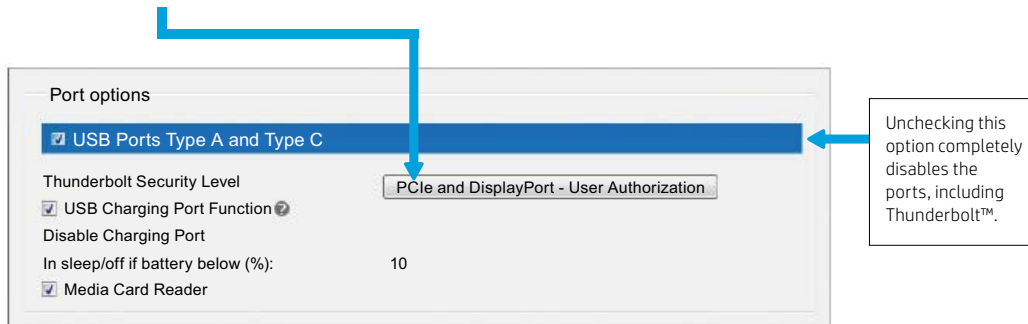
Thunderbolt™ security levels: available functions and ports

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 trade-off between convenience and security for the Thunderbolt™-capable USB Type-C™ interface port on the notebook or mobile workstation.

The Thunderbolt™ security level that controls the Thunderbolt™ connection policy of any USB Type-C™ connectors on the notebook or mobile workstation can be changed in the BIOS setup (refer to Figure 7). The BIOS setup can be accessed by pressing the F10 key when booting the HP Notebook or HP ZBook Mobile Workstation. The policies are also remotely manageable via Public WMI interfaces.

Figure 7. Thunderbolt™ security levels.

BIOS Setting for Thunderbolt™	Possible Functionality	Security
PCIe and Display port - No Security	TBT, USB, DP	Auto connects, No user response needed
PCIe and Display Port - User Authorization	TBT, USB, DP	User must approve device before functionality is allowed
PCIe and Display Port - Secure Connect	TBT, USB, DP	Only devices with saved key can connect
Display Port and USB	USB, DP	Auto connects to USB, DP. No TBT/PCIe allowed



• **Security level 0: PCIe and DisplayPort™: no security**

- No security level. Any Thunderbolt™ device attached to the notebook or mobile workstation USB Type-C™ port or the HP Elite Dock with Thunderbolt 3 or HP ZBook Dock with Thunderbolt 3 will automatically be accessible without approval
- External displays will function when attached directly to the notebook or mobile workstation USB Type-C™ port or the dock through display or USB Type-C™ ports

• **Security level 1: PCIe and DisplayPort™: user authorization**

- This is the default BIOS policy. Same functionality as Security level 0, but the customer must approve access to devices
- Each Thunderbolt™ peripheral, including the HP Elite Dock with Thunderbolt 3 and HP ZBook Dock with Thunderbolt 3, 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

- This policy also applies to any Thunderbolt™ peripherals attached “behind” the HP Elite Dock with Thunderbolt 3 and HP ZBook Dock with Thunderbolt 3 via the USB Type-C™ connector on the dock
- **Security level 2: PCIe and DisplayPort™: secure connect**
 - Same options as Security level 1 if the device contains a security certificate/chip
 - This option offers enhanced protection for authenticating a previously connected Thunderbolt™ device beyond relying on a GUID provided by the attached Thunderbolt™ peripheral
 - When this policy is enabled and the user chooses to suppress future prompts for connection approval, the Thunderbolt™ driver stack software on the notebook or mobile workstation will generate a unique secret key that is sent to that Thunderbolt™ device and stored securely in non-volatile memory. Each time that peripheral is subsequently connected, the notebook or mobile workstation 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 key. The Thunderbolt™ interface will only be enabled if it can prove that it possesses the previously provisioned secret key
- **Security level 3: DisplayPort™ and USB**
 - All Thunderbolt™ functionality of the USB Type-C™ connectors on the notebook or mobile workstation is disabled
 - The HP Elite Dock with Thunderbolt 3 and HP ZBook Dock with Thunderbolt 3 provide all peripheral device functionality via a Thunderbolt™ interface. Thus, none of the ports on the HP Elite Dock with Thunderbolt 3 and HP ZBook Dock with Thunderbolt 3 will function in this mode
 - The only USB Type-C™ peripherals that will be functional when connected to the notebook or mobile workstation USB 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)
- **Native vs. Legacy Thunderbolt 3 Mode**
 - Thunderbolt™ PCIe Hot plug Modes are Native and Legacy
 - Legacy mode means the Thunderbolt™ PCIe Hot plug enumeration is managed by the BIOS
 - Native mode means the operating system handles the Thunderbolt™ PCIe Hot plug enumeration

Troubleshooting common issues

Below are some issues that may be encountered when using the dock. For each issue, try the first step listed. If that does not work, try the second step, and so forth.

The dock or peripherals connected to the dock do not appear in the OS:

1. Unplug and re-plug the dock.
2. Restart your notebook or mobile workstation.
3. Hardware reset (see description below for more details).

A 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).

A display connected to the dock does not function:

1. Unplug and re-plug the dock and check if your display returns properly.
2. If your notebook or mobile workstation has NVIDIA graphics, open the NVIDIA Control Panel and check “Display/Set up multiple displays”. If you see “Digital Display” or one of your monitors listed twice (when you only have one of a specific model) unplug and re-plug the dock again. If this doesn’t work go to recovery method 4.
3. If the NVIDIA Control Panel lists all your displays but one is not checked, check that monitor and then click Apply in the lower right hand corner.
4. Restart your notebook or mobile workstation.
5. Hardware reset (see description below for more details).

Video distortion or corruption appears on the displays:

1. Hit the windows key on your keyboard.
2. Change DPI scaling to 225% or lower.

- a. Go to System Settings.
- b. Click on "Display".
- c. Under the section "Change the size of text, apps, and other items," set this to 225% or lower.

Display changes mode after sleep, hibernate or restart:

1. Press the FN+F4 keys (you can also press the Win+P keys) and select the desired mode (Extended, Duplicate, PC Only, Second Screen only).

**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 from the notebook or mobile workstation.
3. Press and hold the power button for 15 seconds.

MAC Address Pass Through Support (Legacy vs. Native PCIe Thunderbolt 3 Mode):

1. If Thunderbolt 3 mode is "Legacy", then MAC Address Pass Through (HBMA) is supported for the on state, sleep state, hibernation or off state.
2. If Thunderbolt 3 mode is "Native + Low Power", then MAC Address Pass Through (HMBA) is supported for the on state.

To toggle between the Native and Legacy PCIe Hot plug settings:

1. Enter the F10 Settings Menu.
2. Go to the "Advanced" tab.
3. Select "Ports Options".
4. Select from the drop down menu where you can choose Native + Low Power or Legacy modes.

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