

# Thunderbolt 3 PCIe x16 Expansion Chassis with DisplayPort

TB31PCIEX16



\*actual product may vary from photos

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For the latest information, technical specifications, and support for this product, please visit [www.StarTech.com/TB31PCIEX16](http://www.StarTech.com/TB31PCIEX16).

## FCC Compliance Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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## Industry Canada Statement

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe [B] est conforme à la norme NMB-003 du Canada.

CAN ICES-3 (B)/NMB-3(B)

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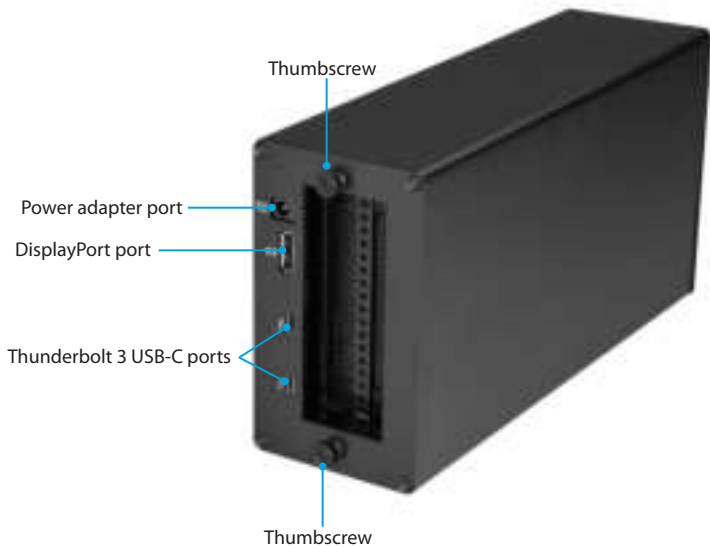
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# Product diagram

## Back view



## Back view



## Package contents

- 1 x Thunderbolt™ 3 PCIe expansion box
- 1 x Thunderbolt 3 cable
- 4 x rubber feet
- 1 x universal power adapter (NA/JP, UK, EU, ANZ)
- 1 x quick-start guide

# Requirements

- Host computer with a Thunderbolt 3 port
- PCIe card
  - PCIe cards up to x16 in size are supported but only x4 lanes are used
  - Half-length PCIe card standards are supported
  - Graphic cards aren't supported
- Any of the following operating systems:
  - Windows® 10 (32-bit or 64-bit)
  - Windows 8 (32-bit or 64-bit)
  - Windows 7 (32-bit or 64-bit)
  - macOS 10.12
- AC electrical outlet
- Phillips type screwdriver
- Display or displays equipped with DisplayPort and the necessary cables (for additional external display)
- Display or displays equipped with Thunderbolt 3 and the necessary cables (for additional external display)

**Note:** To connect a second display, you must use one of the Thunderbolt 3 USB-C ports on the expansion box. To use the expansion box with HDMI, DVI, or VGA displays, you may need to purchase additional adapters.

Video output capabilities are dependent on the video card and hardware specifications of your connected host laptop.

Requirements are subject to change. For the latest requirements, please visit [www.StarTech.com/TB31PCIEX16](http://www.StarTech.com/TB31PCIEX16).

# About Thunderbolt 3

Thunderbolt 3 technology uses the USB-C connector and offers bandwidth speeds up to 40Gbps. It supports USB 3.1, DisplayPort 1.2, and PCI Express 3.0.

Thunderbolt technology supports both video and data throughput, but prioritizes video bandwidth to help ensure seamless display performance. The performance quality of the remaining expansion box functions depends entirely on the display configuration.

You must use Thunderbolt 3 cables with any Thunderbolt 3 product.

## Updates

The Thunderbolt 3 ports on your laptop might not function properly until you update one or more of the following on your laptop:

- BIOS
- Thunderbolt firmware
- Thunderbolt 3 controller drivers
- Thunderbolt 3 software

The required updates will vary depending on your laptop. For an up-to-date list of affected computers and instructions, visit [www.thunderbolttechnology.net/updates](http://www.thunderbolttechnology.net/updates). If your manufacturer isn't listed on the Thunderbolt website, contact your manufacturer.

## Connect multiple Thunderbolt 3 devices in a daisy chain

You can connect multiple Thunderbolt 3 devices, including displays, in a daisy-chain formation.

For example, you can connect a Thunderbolt 3 display to the Thunderbolt 3 USB-C port on the PCIe expansion box. You can then connect another Thunderbolt 3 device through the Thunderbolt 3 display that you connected to the PCIe expansion box.

## DP Alt Mode (DisplayPort alternative mode)

DP Alt Mode is a specification that allows a DisplayPort video signal to be transferred over USB-C. It enables the use of the USB-C interface for DisplayPort signals. Thunderbolt 3 supports the full USB-C standard, including support for DP Alt Mode. Because the PCIe expansion box supports DP Alt Mode, you can connect Thunderbolt 3 or USB-C based video devices, cables, or adapters to the secondary Thunderbolt 3 port on the rear of the docking station.

# Install a PCIe card

**Warning!** PC components can be severely damaged by static electricity. If an anti-static strap isn't available, discharge any built-up static electricity by touching a large, grounded metal surface for several seconds.

1. Place the PCIe expansion box on its end with the thumbscrews pointing upwards.
2. Turn the thumbscrews clockwise and lift the end of the PCIe expansion box.  
**Note:** If the thumbscrews are loosened sufficiently, the drawer will slide out of the chassis as you lift it. If the drawer doesn't slide out, continue to loosen the thumbscrews.
3. Use a Phillips type screwdriver and remove the screw from one or both of the plates.
4. Align the PCIe card with the PCIe slot on the PCBA and carefully slide the PCIe card into place.
5. Line up the PCIe card bracket with the mounting hole(s) on the expansion box and insert the screw(s) that you removed in step 3.
6. Use a Phillips type screwdriver to tighten the screw(s).
7. Slide the drawer back into the PCI expansion box.
8. Turn the thumbscrews counterclockwise.

## Connect the PCIe expansion box

1. Connect the universal power adapter to a power source and to the Power adapter port on the PCIe expansion box.
2. Connect the Thunderbolt 3 cable to a Thunderbolt 3 USB-C port on the PCIe expansion box and to a Thunderbolt 3 port on your computer.  
**Note:** You don't need to install drivers to use the PCIe expansion box, but the PCIe card that you installed might require drivers. For more information about whether the installed card requires drivers or additional installation steps, see the documentation that came with the PCIe card or contact the manufacturer of the card.
3. In the **New Thunderbolt devices** pop-up message, click **OK**.
4. Next to the PCIe box, select **Always Connect** in the drop-down list, and click **OK**.
5. If necessary, connect peripheral devices to the DisplayPort port or Thunderbolt 3 USB-C port on the PCIe expansion box.



## Connect a display to the DisplayPort port

The PCIe expansion box supports Display Port 1.2.

For more information about the adapters required to use different types of displays, consult the table below.

Type of display	Required adapter (sold separately)
DisplayPort	None
HDMI	Active converter
DVI	Active converter
VGA	Active converter

To view the active converters StarTech.com offers, complete the following:

1. In a web browser, navigate to [www.StarTech.com](http://www.StarTech.com).
2. On the left side of the screen, click **Audio-Video Products**.
3. Click **DisplayPort converters**.
4. Under **Converter Type**, click **Active**.

## Connect a display to the Thunderbolt 3 USB-C port

You can connect a Thunderbolt display directly to the PCIe expansion box. To connect other types of displays, you need to use an adapter.

Type of display	Required adapter (sold separately)
Thunderbolt 3	None
DisplayPort	<a href="#">USB-C to DisplayPort Adapter Cable (CDP2DPMM1MB)</a>
HDMI	Active converter
DVI	Active converter
VGA	Active converter

To view the full range of USB-C video adapters and cables that StarTech.com offers, navigate to [www.StarTech.com/AV/usb-c-video-adapters/](http://www.StarTech.com/AV/usb-c-video-adapters/).

**Note:** Video adapters can limit the maximum available resolution. To determine the maximum resolution your video adapter supports, consult the documentation that came with the video adapter.

## Bandwidth allocation

Thunderbolt technology carries video and data bandwidth, and it prioritizes video bandwidth to help ensure seamless display performance. The performance of the remaining ports (for example, the USB 3.0 ports) depends entirely on the display and I/O (input and output) configuration that you are using.

When you connect multiple high-resolution displays, the PCIe expansion box needs to allocate additional bandwidth to the displays and the extra bandwidth is reallocated from the other I/O ports on the expansion box. In this situation there is less bandwidth available for the remaining ports (for example, the USB 3.0 ports).

Video and I/O configuration	DisplayPort resolution	Thunderbolt 3 USB-C resolution	I/O bandwidth remaining
Data only (no displays)	N/A	N/A	Download: 22Gbps Upload: 22Gbps
DisplayPort (single display - 4K)	4096 x 2160p (4K)	N/A	Download: 22Gbps Upload: 22Gbps
Thunderbolt 3 USB-C (single display - 4K)	N/A	4096 x 2160p (4K - 60Hz)	Download: 22Gbps Upload: 22Gbps
DisplayPort and Thunderbolt 3 USB-C (two displays - Dual-4K)	4096 x 2160p (4K)	4096 x 2160p (4K)	Download: 8Gbps Upload: 22Gbps

- The bandwidth values are approximate and depend on several variables including the number, type, resolution, and refresh rate of your connected display(s).
- When you connect a display to one of the Thunderbolt 3 USB-C ports, depending on the input of your display, you may require a USB-C video adapter.

## Troubleshooting

If you're experiencing issues, there are some quick tests that you can complete to narrow down the source of the issue.

### Update your computer to use Thunderbolt 3

Visit <http://thunderbolttechnology.net/updates> and look for your computer in the list of affected computers. If your computer is listed, then you must update your computer for its Thunderbolt 3 ports to function properly. To update your computer, follow the instructions on the website or contact your manufacturer.

### Verify that your components are Thunderbolt compliant

- Make sure that the port on your computer is Thunderbolt 3 compliant. Thunderbolt 3 uses the USB-C connector type, but not all USB-C connectors are compatible with Thunderbolt 3. If you're using a USB-C port that is not Thunderbolt 3 compliant, switch to a port that is Thunderbolt 3 compliant.
- Make sure that all of your connected peripherals are Thunderbolt compliant. If you use non-compliant cables or other peripherals in your setup, you could experience an unstable or non-functioning setup. If you're not sure if your cables and peripherals are Thunderbolt compliant, check with the manufacturer.

### Replace the Thunderbolt 3 cable

- Use the PCIe expansion box with a different cable that is Thunderbolt compliant.

### Test the PCIe expansion box

- Use the PCIe expansion box in a second setup. If the expansion box works in the second setup, then the first setup is probably the source of the issue.
- Use a different Thunderbolt compliant PCIe expansion box, and see if it works. Ideally, the second expansion box is one that you know works in other setups. If the second expansion works in the current setup, then there is probably an issue with the first expansion box.

## Important operation notes

- Certain monitors may be limited to 4K at 30Hz when connecting through DisplayPort. These monitors include the following models: Dell P2715Q, Viewsonic VX2475Smhl-4K, Philips 288P6LJEB, LG 31MU97C-B, Asus PB287Q (these models will need to be set to 4K at 30Hz).

# Technical support

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For the latest drivers/software, please visit [www.startech.com/downloads](http://www.startech.com/downloads)

# Warranty information

This product is backed by a two-year warranty.

StarTech.com warrants its products against defects in materials and workmanship for the periods noted, following the initial date of purchase. During this period, the products may be returned for repair, or replacement with equivalent products at our discretion. The warranty covers parts and labor costs only. StarTech.com does not warrant its products from defects or damages arising from misuse, abuse, alteration, or normal wear and tear.

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