



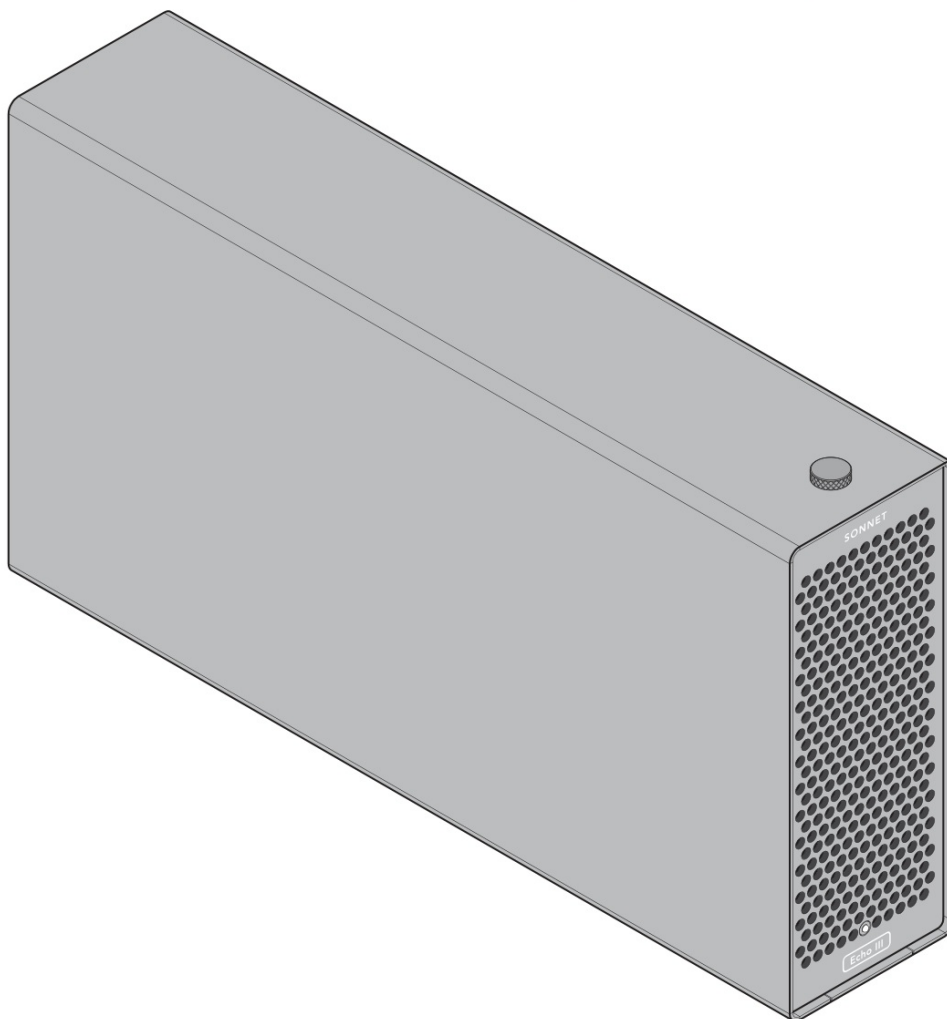
# SONNET ECHO-3D-TB3 Echo III Desktop Thunderbolt 3 to PCIe Card Expansion System User Guide

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SONNET ECHO-3D-TB3 Echo III Desktop Thunderbolt 3 to  
PCIe Card Expansion System User Guide

# User's Guide

## for Echo™ III Desktop Thunderbolt™ 3 to PCIe® Card Expansion System



**Support Note:** This document was up to date at the time of printing. However, changes to the hardware or software may have occurred since then. Please check the Sonnet website for the latest documentation.

1. Go to [www.sonnettech.com/support/kb/kb.php](http://www.sonnettech.com/support/kb/kb.php)
2. Navigate to and click the Echo III Desktop link.
3. Click the Manual link.
4. Click the Echo III Desktop User's Guide [English] link and then check the Document Version information. If the version listed is later than this document (**revision A**), click the Download Now button for the latest version.



For  
Windows

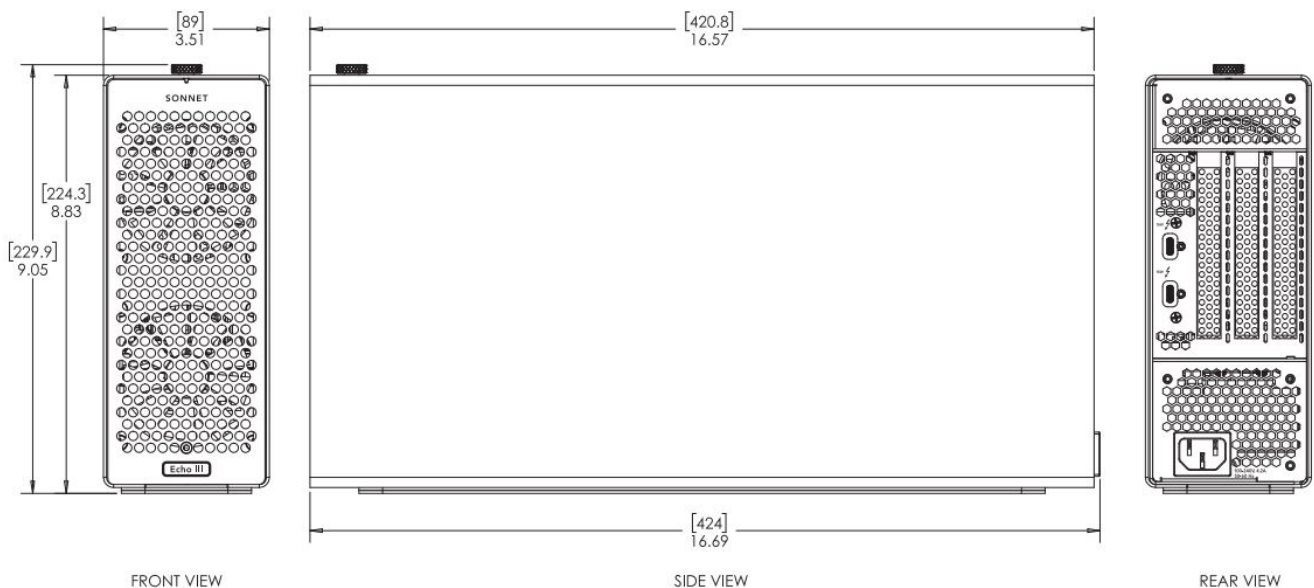


[www.sonnettech.com/support/kb/kb.php](http://www.sonnettech.com/support/kb/kb.php)

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## Chapter 1 – Introduction and System Requirements



### Introduction

Congratulations on your purchase! The Echo III Desktop is a Thunderbolt 3 expansion system for PCIe cards. Through its PCIe slots, you may connect three non-GPU adapter cards to any computer with Thunderbolt 3 ports to expand its capabilities and add connectivity beyond what's offered through its native ports.

### Mac® Compatibility

- Macs with Thunderbolt 3 ports
- Macs with Thunderbolt 2 or Thunderbolt ports via an Apple Thunderbolt 3 (USB-C) to Thunderbolt 2 Adapter plus Thunderbolt cable (both sold separately)
- macOS® 10.12.6+

### Windows® Compatibility

- PCs with Thunderbolt 3 ports
- Windows 10 (64-bit Edition Version 1809 or greater)

**Important Note:** Windows computers require the latest BIOS and Thunderbolt drivers to support this product. Check with your computer manufacturer for update information

## **Linux® Compatibility**

- Linux computer with Thunderbolt 3 ports
- Linux Kernel 5.0+

## **System Requirements**

While Echo expansion systems require no drivers beyond those pre-installed in your computer's OS, most expansion cards you install do; Thunderbolt-compatible drivers to enable them to work properly through the Thunderbolt interface are required. More information on which cards are compatible with the Echo III Desktop is available at: <https://sonnettech.com/support>

## **Preparing to Use the Echo Chassis With a Mac Computer**

The drivers required to support the Echo chassis are installed as part of macOS; there are no preparation steps beyond updating your computer to macOS 10.12.6 or newer.

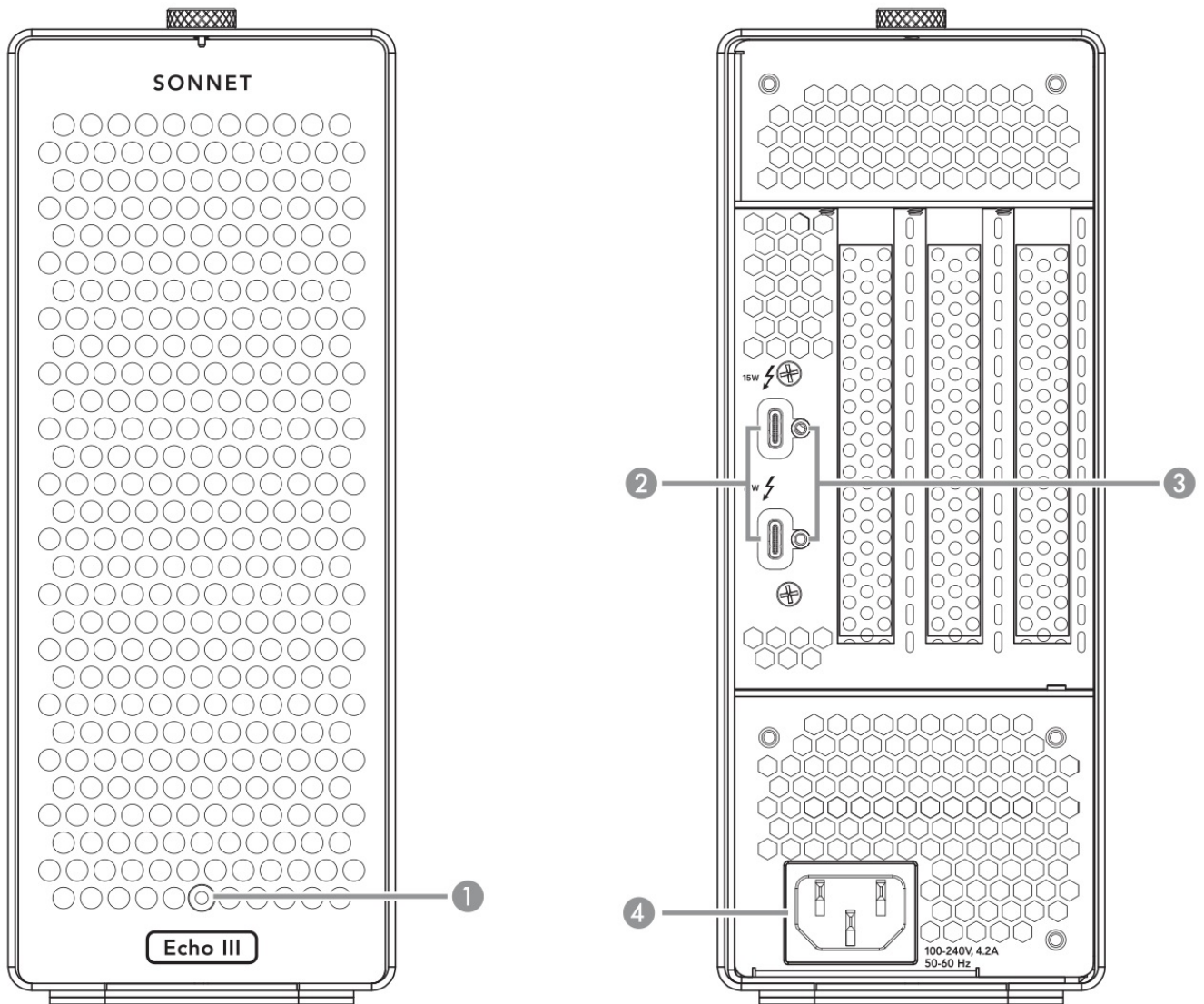
## **Preparing to Use the Echo Chassis With a Windows Computer**

1. Update Windows. You must use Windows 10, 64-Bit Version 1809 or newer. To check the version number, type winver in the search bar and click enter.
2. Update your computer's BIOS to the latest version. If you need help updating your BIOS, contact your computer manufacturer.
3. Update your Thunderbolt Bus Driver to the latest version; you will need version 16.3.61.275 or newer. To check your driver version, go to Settings:Apps:Thunderbolt(TM) Software and you will see the version number. If it is not 16.3.61.275 or newer, then you need to update it. Check with your computer manufacturer for an update.

## **Preparing to Use the Echo Chassis With a Linux Computer**

The drivers required to support the Echo chassis are installed as part of Linux Kernel 5.0 and later; there are no preparation steps beyond updating your computer to Linux Kernel 5.0 or later.

## **Chapter 2 – Echo III Desktop Description**



## Exterior

### 1 – Power Indicator LED

This indicator lights when the Echo III Desktop is powered, the Thunderbolt cable between the chassis and your computer is plugged in securely, and the computer powered on. Note that if the Echo chassis is connected to another Thunderbolt device instead of directly to the computer, any other Thunderbolt device connected between the computer and Echo chassis must also be powered on before the Echo chassis' power indicator will light up.

### 2 – Thunderbolt Ports

Connect the included Thunderbolt cable, or comparable Thunderbolt 3 (40Gbps) cable, between either port and your computer's Thunderbolt port (or other Thunderbolt device in the chain connected to the computer).

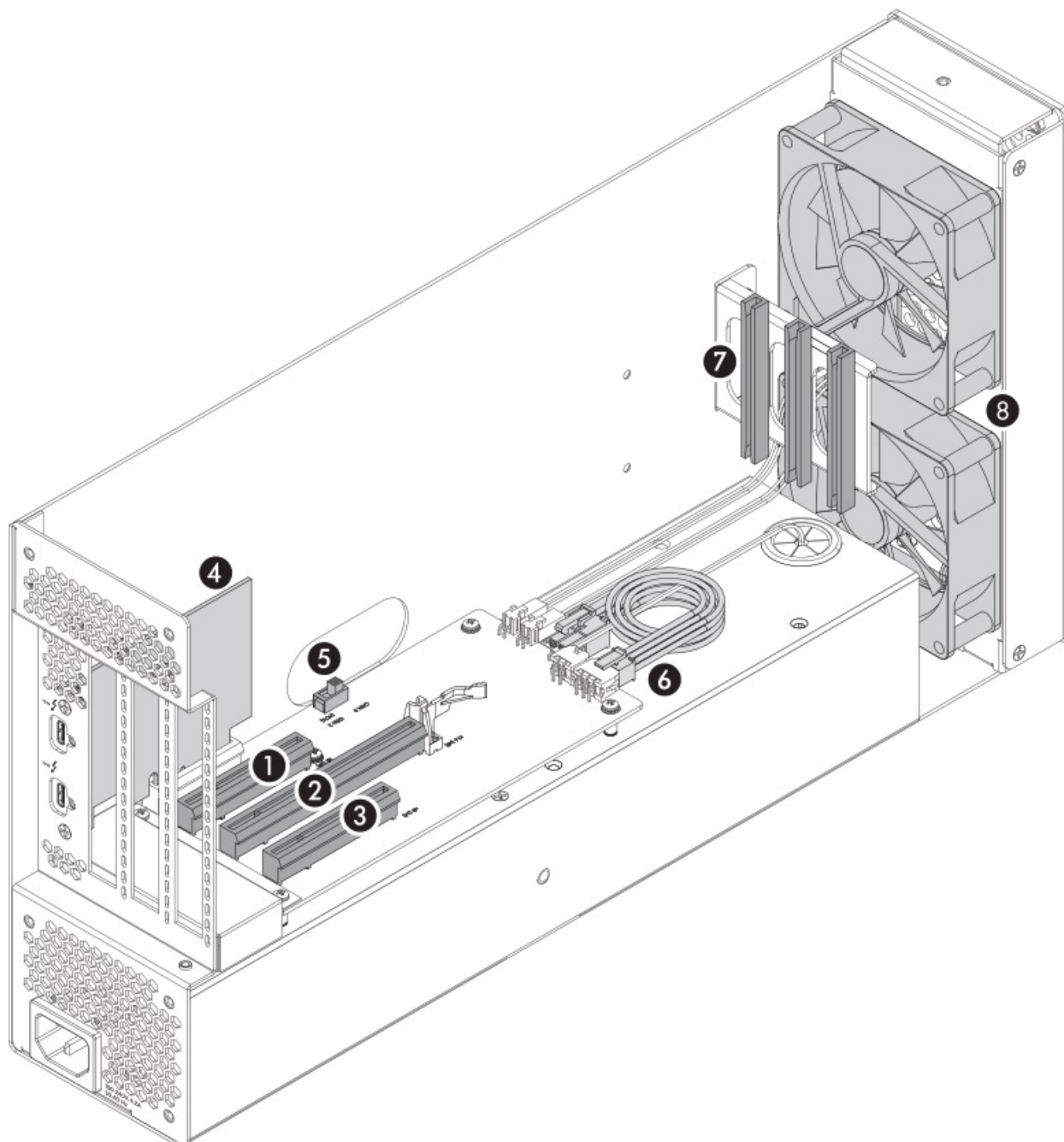
The second port may be used to connect to another Thunderbolt peripheral device, display(s), or USB device (when connected with the proper cable).

### 3 – Threaded Nuts for ThunderLok 3

Attach the included Thunderbolt connector retainer clip here. Also compatible with ThunderLok 3L.

### 4 – Power Input Socket

Connect the included AC power cable here.



## Echo III Module (Inner Assembly)

### 1 – Slot 1

This is an x8 mechanical (x8 electrical) PCIe 3.0 slot.\* It is also compatible with PCIe 2.0 and 1.1 cards.

### 2 – Slot 2

This is an x16 mechanical (x8 electrical) PCIe 3.0 slot.\* It is also compatible with PCIe 2.0 and 1.1 cards.

### 3 – Slot 3

This is an x8 mechanical (x4 electrical) PCIe 3.0 slot.\* It is also compatible with PCIe 2.0 and 1.1 cards.

### 4 – Thunderbolt Interface Card

This card is installed in its own slot and may not be moved to another slot.

### 5 – PCIe Gen 3/Gen 2 (HDX) Mode Switch

This switch enables the use of Avid Pro Tools | HDX PCIe cards in the Echo module; instructions follow.

### 6 – 6-Pin Auxiliary Power Connector and Cable

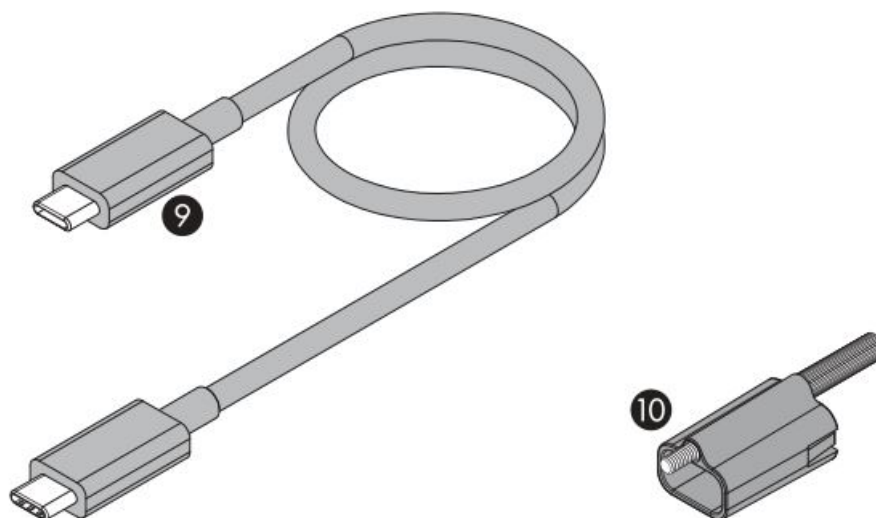
Plugged into this connector is the auxiliary power cable for cards requiring extra power. When installing Avid Pro Tools | HDX cards, disconnect the supplied cable and connect an HDX card's custom power cable in its place.

### 7 – PCIe Card Guides


When installing full-length cards, use these to support and secure the cards.

## 8 – Temperature-Controlled Fans

These provide cooling for the installed PCIe cards and the chassis' supporting Thunderbolt and power circuitry. They operate at a whisper when the cards are running cool, and automatically speed up in steps as the temperature rises. To prevent overheating, do not block the fans or the vent holes on the chassis.



## 9 – Thunderbolt 3 (40Gbps) Cable

Connect this cable between the Echo module and your computer (or other Thunderbolt device in the chain connected to the computer). Connecting the Echo module to a computer port marked with the USB icon (  ) is NOT supported.

## 10– Thunderbolt 3 Connector Retainer Clip

This clip secures the Thunderbolt 3 connector plugged into one of the Echo module's Thunderbolt 3 ports to prevent accidental cable disconnection. This clip is compatible with Sonnet 0.5- and 0.7-meter Thunderbolt 3 cables, but not with Sonnet 1- or 2-meter Thunderbolt 3 cables.

\* PCIe 2.0 slot when PCIe Gen 3/Gen 2 (HDX) Mode Switch set to Gen 2 (HDX) position.

## Chapter 3 – PCIe Card Installation and Chassis Setup Steps



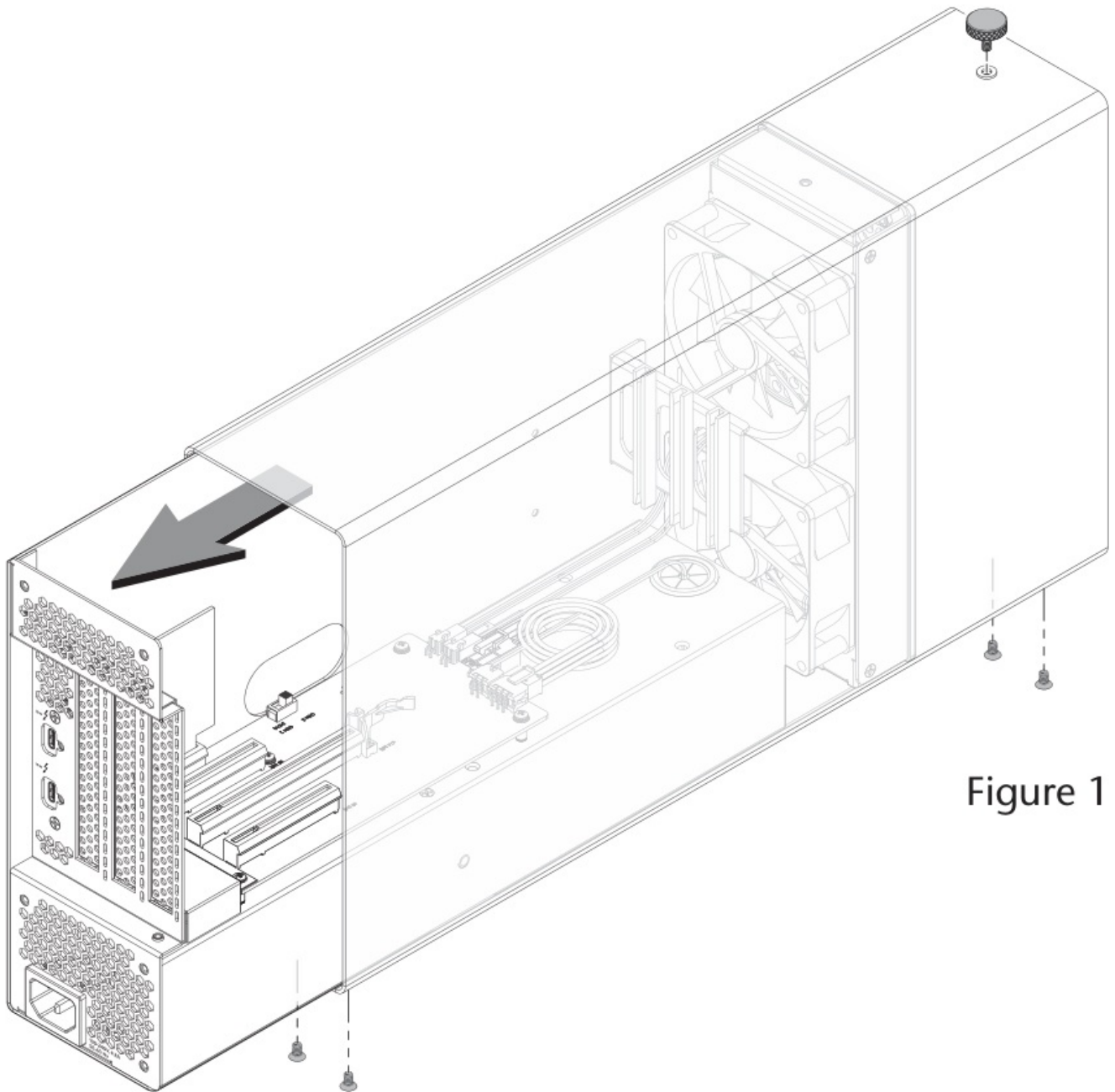


Figure 1

1. Remove the Echo III Desktop from its packaging, and then set it on a flat, level surface.
2. Using a Phillips screwdriver, remove and set aside the four screws securing the bottom of the enclosure to the Echo III Module (**Figure 1**).
3. Unscrew and set aside the thumbscrew securing the top of the enclosure to the module ( **Figure 1**).
4. Grasping the enclosure with one hand, push the front of the module part way into the enclosure, and then gently pull the module out the back (**Figure 1**). Set aside the enclosure.



**Support Note:** To avoid damaging components due to static electricity discharge, wear an antistatic wrist strap while working inside the Echo chassis.



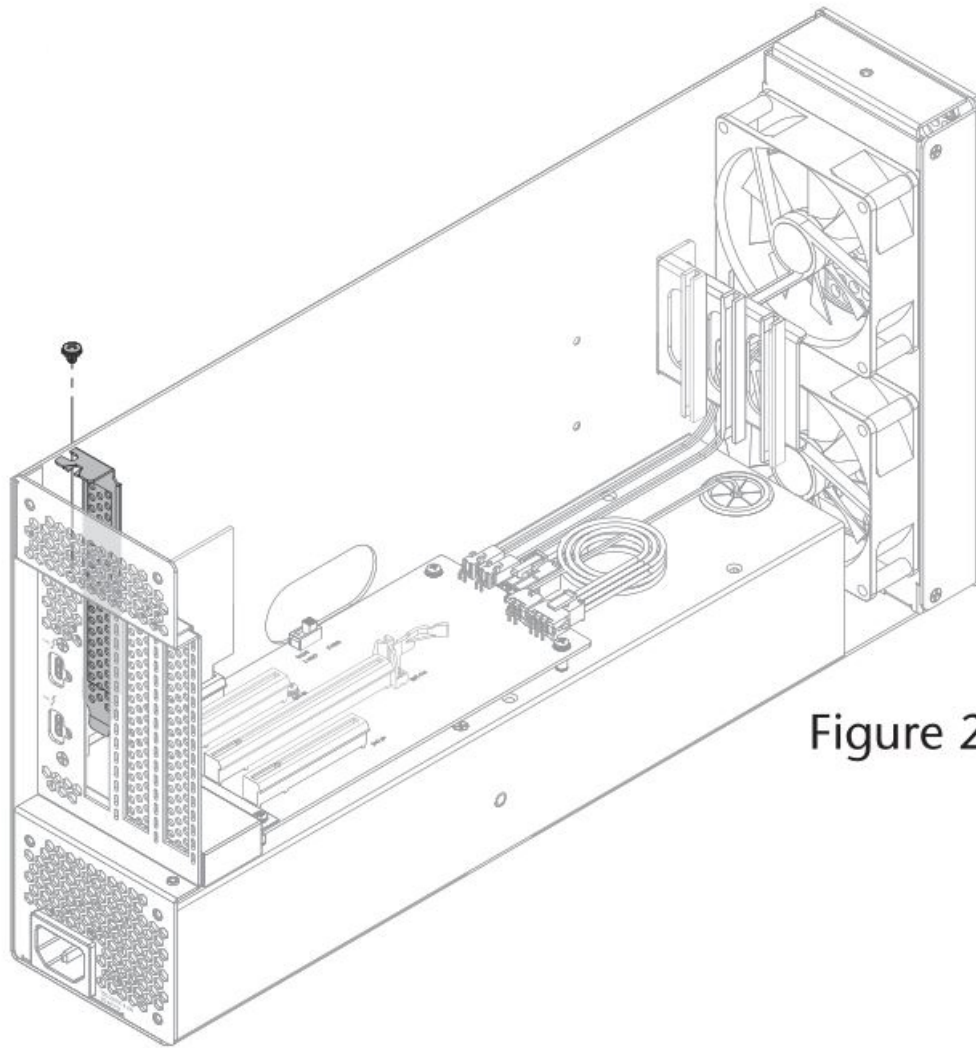


Figure 2

5. Remove and set aside the screw securing a PCIe slot cover to the module ( **Figure 2**).
6. Remove and set aside the loose PCIe slot access cover ( **Figure 2**).
7. If you are installing more than one card, repeat steps 5 and 6 as necessary with the remaining slot access covers.



**WARNING:** When handling computer products, take care to prevent components from being damaged by static electricity; avoid working in carpeted areas. Handle expansion cards only by their edges and avoid touching connector traces and component pins. Also, avoid touching the Echo chassis' circuit boards and any of its components.

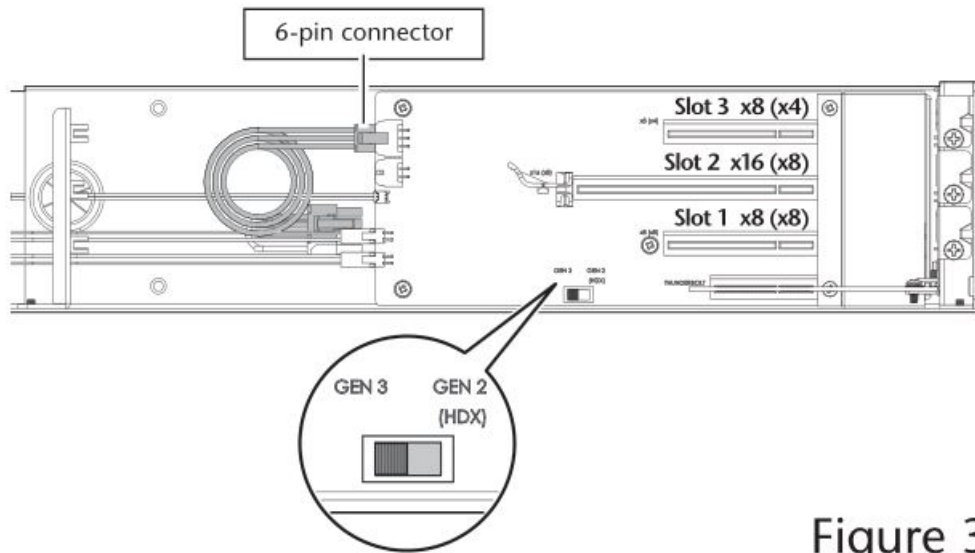


Figure 3

8. **OPTIONAL STEP 1:** If you are not installing a PCIe card which requires auxiliary power, go to step 10. Otherwise, locate the auxiliary power cable connected to the indicated 6-pin connector (**Figure 3**).
  - When installing Pro Tools | HDX PCIe cards, disconnect and set aside the power cable, replace it with the custom power cable included with an Avid card, and then move the loose connectors aside for later connection.
  - When installing cards other than the Pro Tools | HDX, remove the cable twist tie securing the power cable, and then move the loose connector aside for later connection.
9. **OPTIONAL STEP 2:** If you are installing Avid Pro Tools | HDX cards, move the Gen 3/Gen 2 (HDX) switch (**Figure 3**) to the Gen 2 (HDX) position to enable compatibility. Otherwise, the card(s) will not work in the Echo chassis.

### Chapter 3 – PCIe Card Installation and Chassis Setup Steps

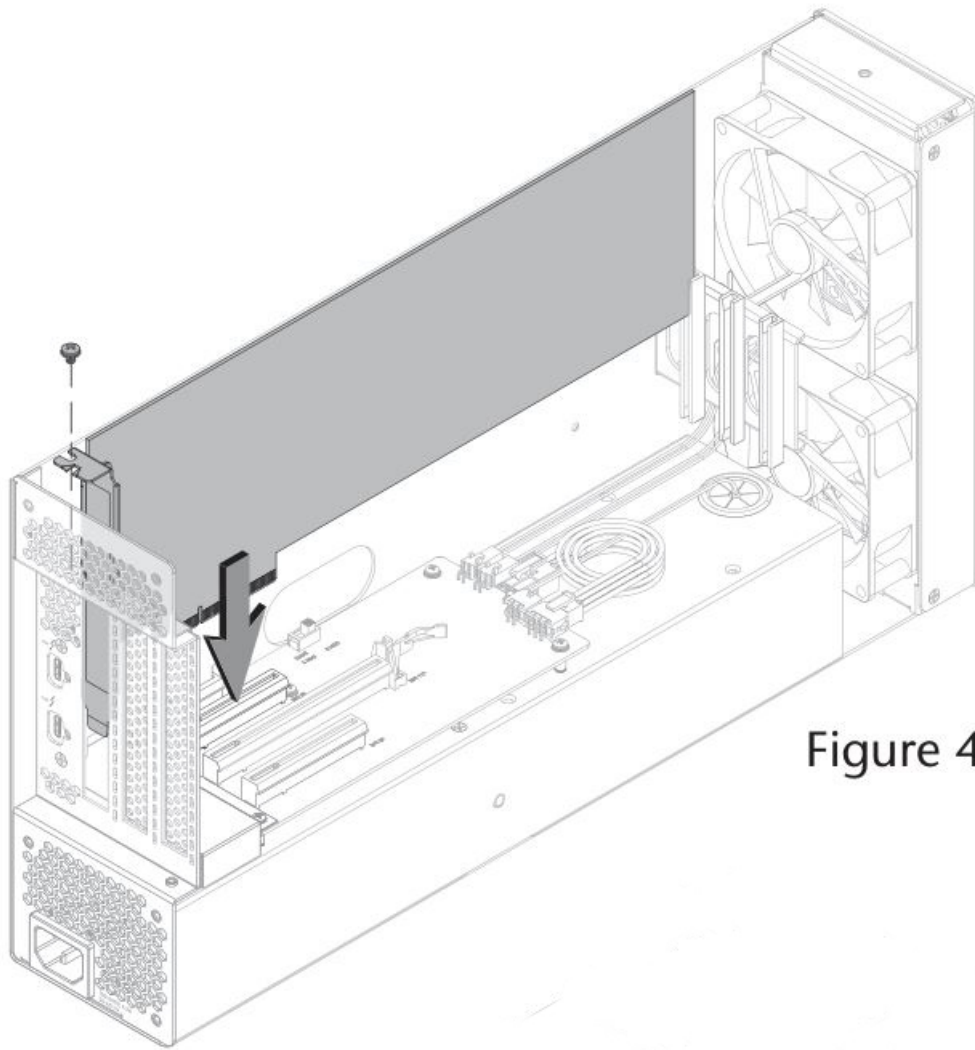


Figure 4

10. Remove a PCIe card from its packaging, handling the card by its edges and without touching any components or gold connector pins.

11. Line up the card's connector with the slot, **and then gently but firmly press the card straight into the slot**; do not rock the card or force the card into the slot. If you encounter excessive resistance, check the card's connector and the slot for damage, and then try inserting the card again (**Figure 4**).



**Support Note:** If you are installing a x8 PCIe 1.1 card like the original RED ROCKET (not RED ROCKET-X) or certain 10 Gigabit Ethernet cards, installing it into slot 2 may result in reduced performance. We recommend you install it into either slot 1 or 3 for best performance.

12. Repeat steps 10 and 11 as necessary with any remaining cards.

13. If you installed a card which requires auxiliary power, connect the auxiliary power connector to it now.

14. If there are any unoccupied slots, install the PCIe slot covers you removed previously (Figure 4).

15. Secure the cards and port access covers using the previously-removed screws (Figure 4).

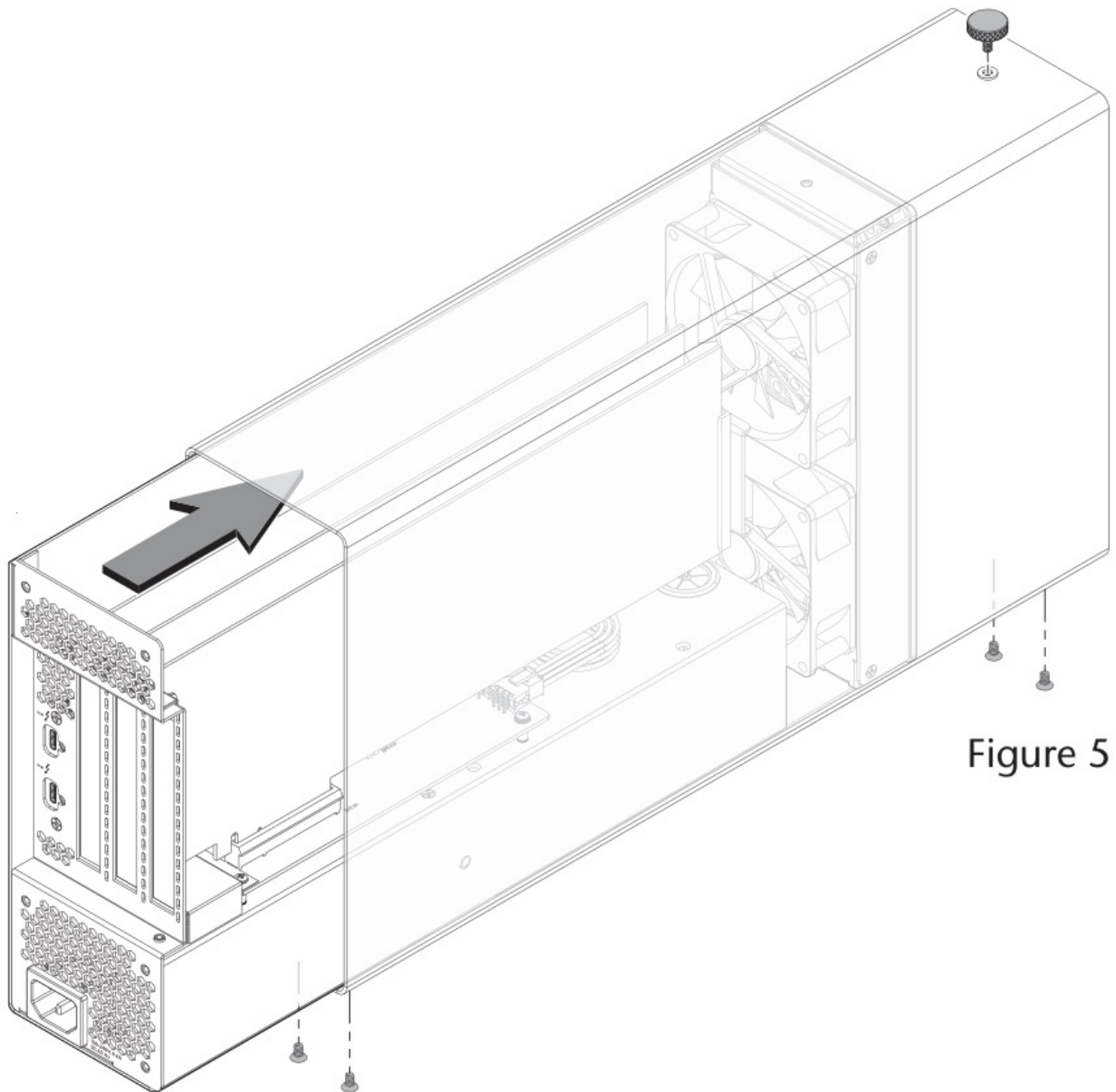


Figure 5

16. Grasping the enclosure, gently push the module back inside from the rear as shown, and then secure the enclosure to the bottom of the module using the four screws you removed previously; **do not overtighten the screws (Figure 5).**

17. Using the thumbscrew you removed previously, secure the enclosure to the top of the module; **do not overtighten the screws (Figure 5).**



**Support Note:** Sonnet's ThunderLok™ 3 Thunderbolt connector retainer clip secures the included Thunderbolt 3 (40Gbps) cable to the Echo chassis to prevent accidental disconnects. This clip is compatible with Sonnet 0.5- and 0.7-meter Thunderbolt 3 cables, but not with Sonnet 1- or 2-meter Thunderbolt 3 cables.

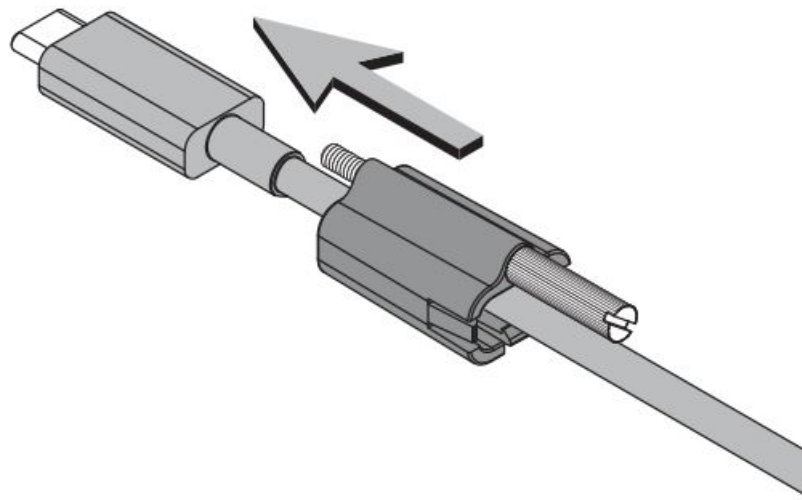


Figure 6

To attach the clip to the cable, remove both items from their packaging, and then insert the connector through the connector clip as shown (**Figure 6**). Note that the connector will pass all the way through the clip; when you connect the cable to the chassis, the clip will secure the connector.

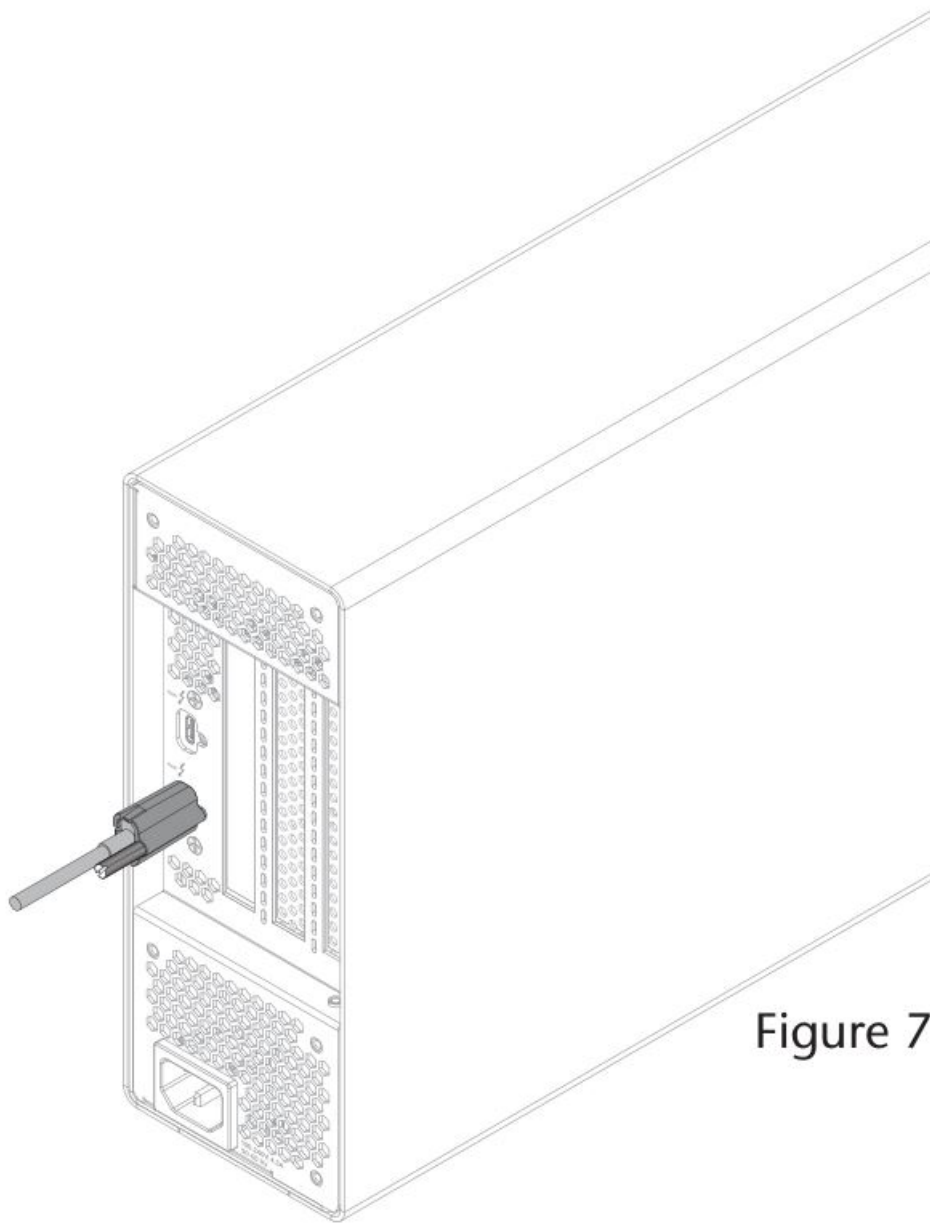



Figure 7

18. Connect the included Thunderbolt 3 cable (or a comparable Thunderbolt 3 [40Gbps] cable) between the Thunderbolt 3 port on the Echo chassis and a Thunderbolt 3 port on your computer, or mother Thunderbolt device in the chain connected to the computer

(**Figure 7**). Note that cables or computer ports marked with the USB icon (  ) are NOT compatible. Secure the retainer clip to the chassis if you attached it. If you are daisy chaining additional Thunderbolt devices, connect another Thunderbolt cable between the downstream device and the open Thunderbolt port on the Echo chassis.

19. Connect interface cables between devices, PCIe cards, and computer as necessary.

20. Connect the included power cord between a wall outlet or power strip and the Echo chassis' power socket. Note that the Echo III Desktop chassis' power indicator will not light until the computer and any other Thunderbolt device connected between it and the Echo chassis is powered on.

## Chapter 4 – Complete Setup and Configuration

### SETUP AND CONFIGURATION STEPS—MAC USERS



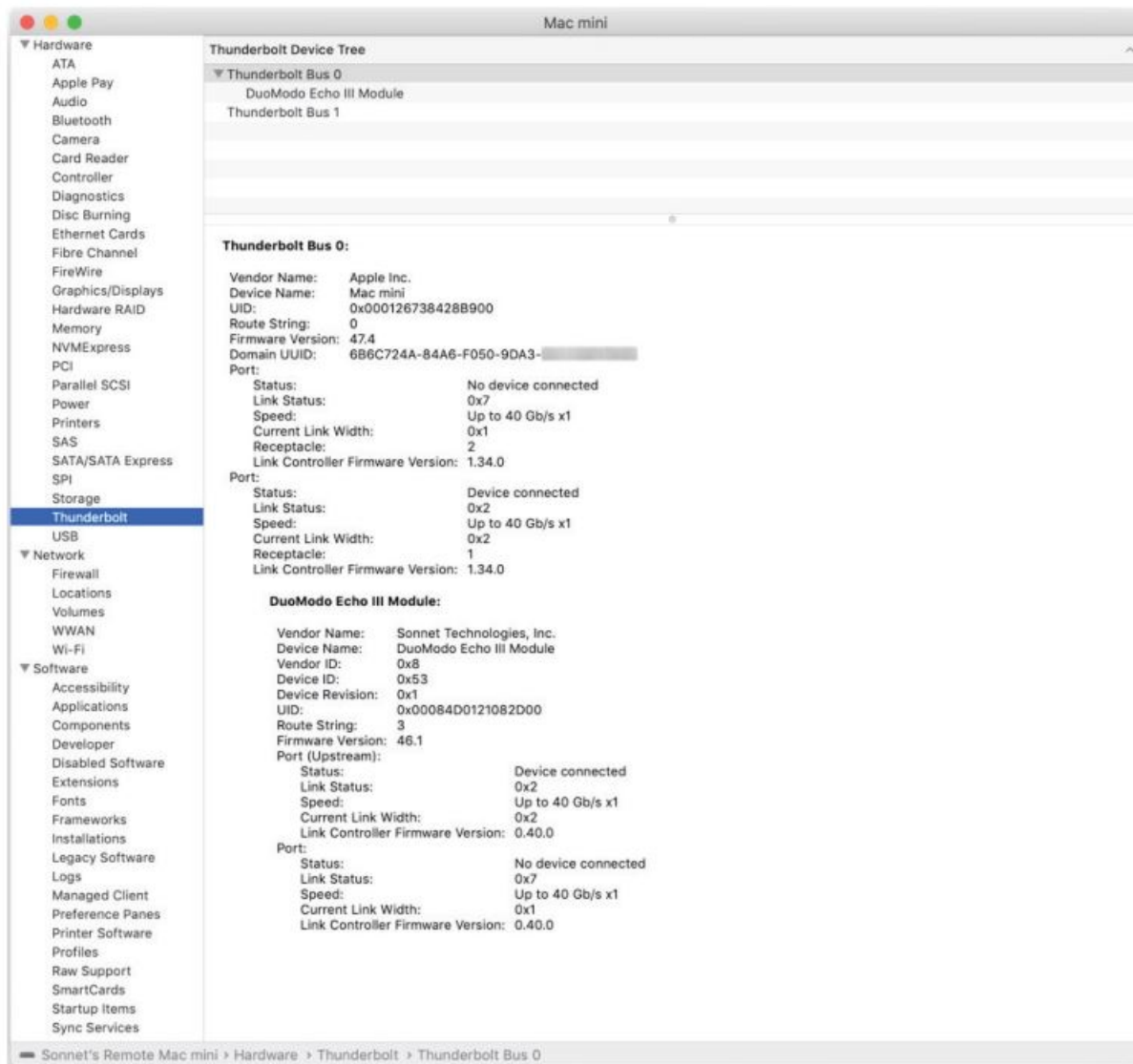


Figure 8

This page instructs Mac users how to verify the Echo chassis and installed cards are recognized by the computer; Windows users should skip to the next page.

## A – Confirm the Echo III Desktop Chassis is Recognized

1. With the Echo chassis powered and connected to the computer, turn on the computer. Note that if there are any other Thunderbolt devices connected between the Sonnet chassis and your computer, they must also be powered for you to perform the following steps.
2. Press and hold down the Option key, and then from the Apple menu, select System Information; a System Information window will open.
3. In the System Information window, click Thunderbolt under the Hardware header in the left column ( **Figure 8**).
4. In the top right column under the Thunderbolt Device Tree header, you will see Thunderbolt Bus, and then “DuoModo Echo III Module” (Figure 8).



**Support Note:** If “DuoModo Echo III Module” is not listed, disconnect and reconnect the Thunderbolt cable between the computer and Echo chassis. Note that it is not necessary to shut down the computer before disconnecting and reconnecting the cable, so long as the installed card is Thunderbolt-compatible.

## B – Confirm the Installed Cards are Recognized

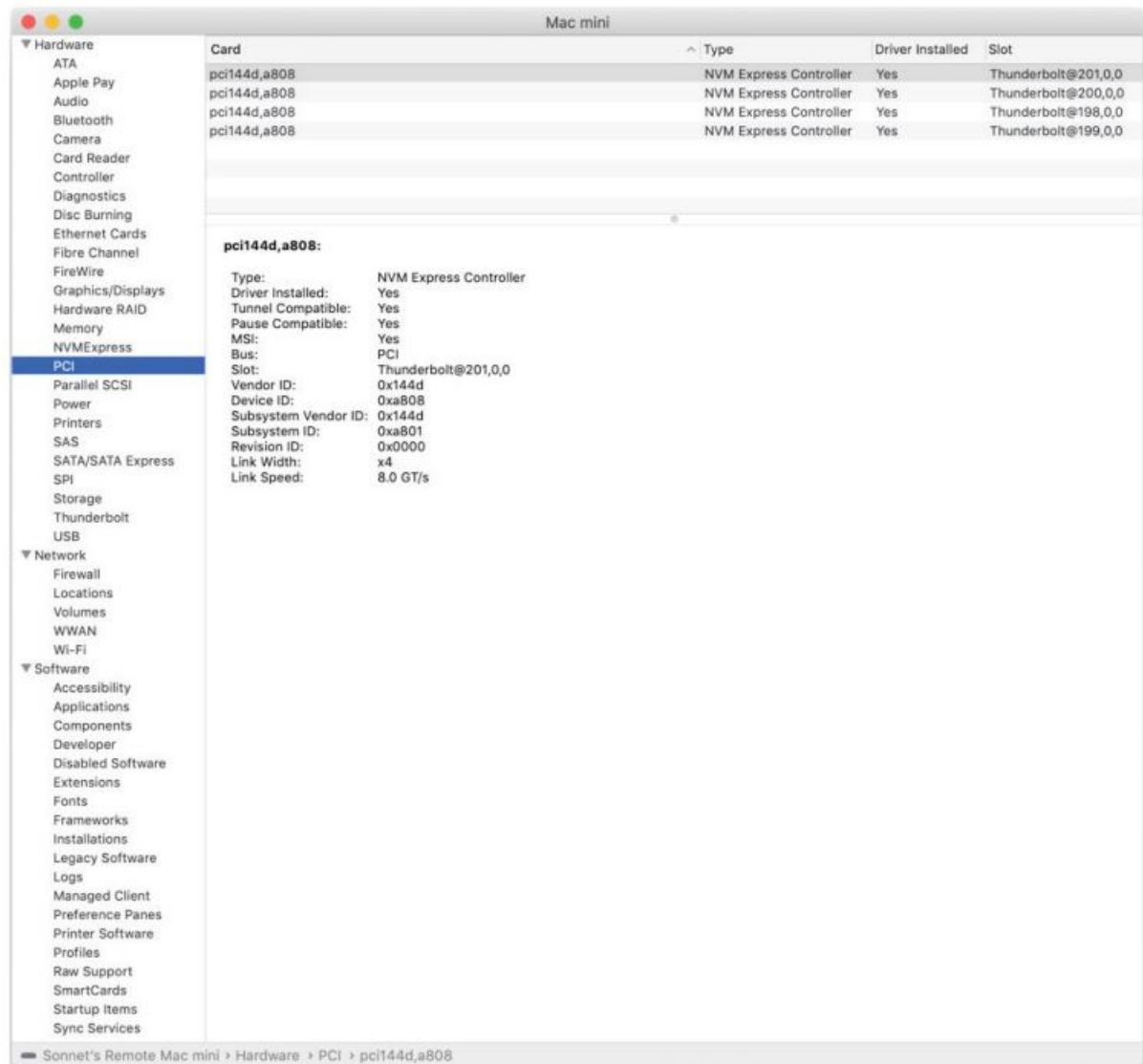


Figure 9

1. In the System Information window click PCI under the Hardware header in the left column ( **Figure 9**).
2. At the top of the right column, installed cards are listed (if not, you may to install drivers before the cards are recognized). Click one of the cards; you should see “Yes” next to Driver Installed and Tunnel Compatible, otherwise the card or driver may not be Thunderbolt-compatible (**Figure 9**).



**Support Note:** While Echo chassis don't require drivers beyond those pre-installed in your computer's OS, installed cards require Thunderbolt-compatible drivers to enable their use.

## C – Install Card Drivers (If Necessary)

1. Launch a web browser, and then go to your card manufacturer's website. Download and install the latest drivers according to the manufacturer's directions.
2. Restart your computer; your Echo chassis is ready to use!

## Chapter 4 – Complete Setup and Configuration

## **SETUP AND CONFIGURATION STEPS—WINDOWS USERS**

### **A – Confirm the Echo III Desktop Chassis and Installed Cards Are Recognized**

1. With the Echo chassis connected to a power source and to the computer, turn on the computer. Note that if there are any other Thunderbolt devices connected between the Sonnet chassis and your computer, they must also be powered for you to perform the following steps.
2. When the computer boots for the first time after you connected the Echo chassis, an Approve New Thunderbolt™ Devices window appears. From the dropdown menu select Always Connect, and then click OK.
3. Right-click the Windows Start button, and then select Manage; the Computer Management window appears.
4. In the Computer Management window, click the category of each card type you installed to expand the listing; a generic adapter listing will appear. After their drivers are installed, the listings will change to display the names of the installed cards.

### **B – Install Card Drivers, If Necessary**

1. Launch a web browser, and then go to your card manufacturer's website. Download and install the latest drivers according to the manufacturer's directions.
2. Restart your computer; your Echo chassis is ready to use!

## **Chapter 5 – Tips, General Information, and Known Issues**

### **TIPS, GENERAL INFORMATION**

#### **Keeping the Cards Cool**

With its optimized airflow design and temperature-controlled fans providing cooling at all times, the Echo chassis provides adequate cooling for the installed cards. Do not operate the Echo module outside its enclosure, and do not block any of the vents! Otherwise, the installed cards and Echo chassis' components may overheat.

#### **Hot Plugging the Echo Chassis**

When certified Thunderbolt-compatible cards (used with Thunderbolt-compatible drivers) are installed in the Echo chassis, you may connect and disconnect the chassis while the computer is on. Of course, if you have anything connected to the cards, such as storage devices, cameras, etc., follow proper procedures for disconnecting those devices before unplugging the Echo chassis.

#### **There's No Need to Unplug the Power Cable**

Because the Echo III Module automatically powers on and off with the computer to which it's connected, there's no power switch, nor is there any need to disconnect the power cable under normal use.

#### **Power Indicator LED Operation**

The module automatically powers on and off with the computer to which it's connected, and its power indicator only lights when the computer is on and turns off when the computer is sleeping or powered off.

#### **Connecting Additional Thunderbolt 3 Peripheral Devices**

The Echo III Module includes two Thunderbolt 3 ports; the first is reserved for connection to your computer, while the second supports daisy-chaining of up to five additional Thunderbolt peripheral devices.

## **Using Expansion Cards Without Installing Drivers**

Some Thunderbolt-compatible expansion cards, like Sonnet's Allegro™ Pro USB 3.2 PCIe cards, use inbox (built into the operating system) drivers, and are ready to use out of the box.

## **Replacing a Card After Initial Installation**

Shut down the computer, and then disconnect the power cable and Thunderbolt cables from the Echo III Module before removing from its enclosure and replacing the card.

## **PCIe CARDS ARE NOT HOT-PLUGGABLE!**

Never install a PCIe card into the Echo chassis while it is connected to a computer or power outlet! If you do, you risk injury, and damage to the card, chassis, and computer.



## **Echo III Desktop Provides Upstream Power**

The Echo chassis can provide up to 15 watts to bus-powered Thunderbolt 3 peripheral devices, enabling them to operate without connecting an additional power adapter.

## **Using the Echo Chassis to Charge Your Notebook Computer or Laptop Computer With Thunderbolt 3**

Apple® MacBook Air® and MacBook Pro®, and some PC laptop computers with Thunderbolt 3 may be charged slowly via the Echo chassis' Thunderbolt 3 port (via 15W Power Delivery). Computers with Thunderbolt 2 or Thunderbolt ports cannot be charged via Thunderbolt.

## **How to Identify Thunderbolt 3 (40Gbps) Cables**

Look for the Thunderbolt icon (  ) AND the number 3 on the connector housings to identify these cables. Aside from Thunderbolt cables from Apple, cables with USB-C connectors that only have the Thunderbolt icon without the number 3 may only support 20Gbps speeds, and are not recommended for PCIe cards with high bandwidth requirements. Cables marked with the USB icon (  ) are NOT compatible for connecting the Echo chassis to the computer.

## **KNOWN ISSUES**

### **Not All Computers' Thunderbolt 3 Performance is Equal**

While this product features a 40Gbps Thunderbolt 3 interface, some computers equipped with Thunderbolt 3 use an implementation of Thunderbolt 3 that limits PCIe performance to 20Gbps. Mid-2017 and earlier 13-inch MacBook Pro computers with four Thunderbolt 3 ports have this limitation in the two right-hand Thunderbolt 3 ports, while offering full performance from the left-hand ports.

### **Not all PCIe Cards Will Perform at 100%**

Thunderbolt 3's PCIe bandwidth is limited to 2,750 MB/s. While most cards will operate at full performance, some may not due to the fact they require more bandwidth than Thunderbolt 3 is capable of supporting.

### **Not All Thunderbolt 3 Cables Deliver Full Performance**

Full performance from the Echo chassis requires the use of the included Thunderbolt 3 (40Gbps) cable (which also supports up to 100W power delivery), or a comparable Thunderbolt 3 cable. When shopping for a Thunderbolt 3 cable, please be aware that some support only lower data transfer speeds (20Gbps) and/or power delivery capabilities.

### **Operating System (OS) Updates May Break Compatibility**

Specific device drivers that work under one OS version may not work under a later version. Before updating your computer to the latest OS, we recommend that you contact Sonnet or your PCIe card's manufacturer to verify that the existing drivers work. Note that other software updates for the computer may also break compatibility.

### **Some Devices' Performance May be Affected by Where They Are Connected in a Thunderbolt Chain**

However small, Thunderbolt introduces latency to a device chain. If you expand with additional Thunderbolt expansion chassis, you may need to experiment with which cards work better in chassis closer to or farther from the computer in the chain.

## **Chapter 6 – Precautions, FCC Compliance, and Support Information**

### **SAFETY PRECAUTIONS**

Please read this section carefully before proceeding. These precautions explain the correct and safe use of this device, thereby helping to prevent injury to you or others, and also help you to minimize the risk of damaging the device.

#### **Warnings**

Always follow the basic warnings listed here to avoid the risk of serious injury or death from electrical shock, short-circuiting, fire, and other hazards. These warnings include, but are not limited to:

- Do not attempt to modify the enclosure. If this device appears to be malfunctioning, contact your reseller or local distributor.
- Do not drop the chassis; dropping or mishandling chassis may result in a malfunction leaving the product inoperable.
- Do not insert foreign objects inside the slot(s).
- Do not expose the device to rain, use it near water or containers that contain liquids which might spill into any openings, or in damp or wet conditions.
- If unusual smells, sounds, or smoke come from the device, or if liquids enter it, unplug it from the electrical outlet immediately.
- Follow the instructions in this manual carefully; contact your reseller or local distributor for additional advice not covered in this User's Guide.

### **FCC Compliance**

Echo III Desktop complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: This device may not cause harmful interference, AND this device must accept any interference received, including interference that may cause undesired operation.

### **Contacting Customer Service**

The Sonnet Web site located at [www.sonnettech.com](http://www.sonnettech.com) has the most current support information and technical updates. Before contacting Customer Service, please check our Web site for the latest updates and online support files, and check this User's Guide for helpful information.

Email support requests generally receive the fastest responses, and are usually processed within a 24-hour period during normal business hours, excluding holidays. When you contact Customer Service, have the following information available so the customer service staff can better assist you:

- Product name
- Computer model
- PCIe card models
- A System Report (macOS) or a Microsoft System Information MSINFO32 (Windows) report (Windows), along with a description of the issue(s) you are encountering with your device

If further assistance is needed, please contact Sonnet Customer Service at:

E-mail: [support@sonnettech.com](mailto:support@sonnettech.com)

Tel: 1-949-472-2772

(Monday–Friday, 9 a.m.–5 p.m. Pacific Time, excluding holidays)

### Japan Customers

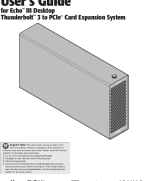
Contact Sonnet Customer Service Japan at:

E-mail: [jp.support@sonnettech.com](mailto:jp.support@sonnettech.com)



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## Documents / Resources

	<a href="#">SONNET ECHO-3D-TB3 Echo III Desktop Thunderbolt 3 to PCIe Card Expansion System [pdf] User Guide</a> ECHO-3D-TB3, Echo III Desktop Thunderbolt 3 to PCIe Card Expansion System
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