

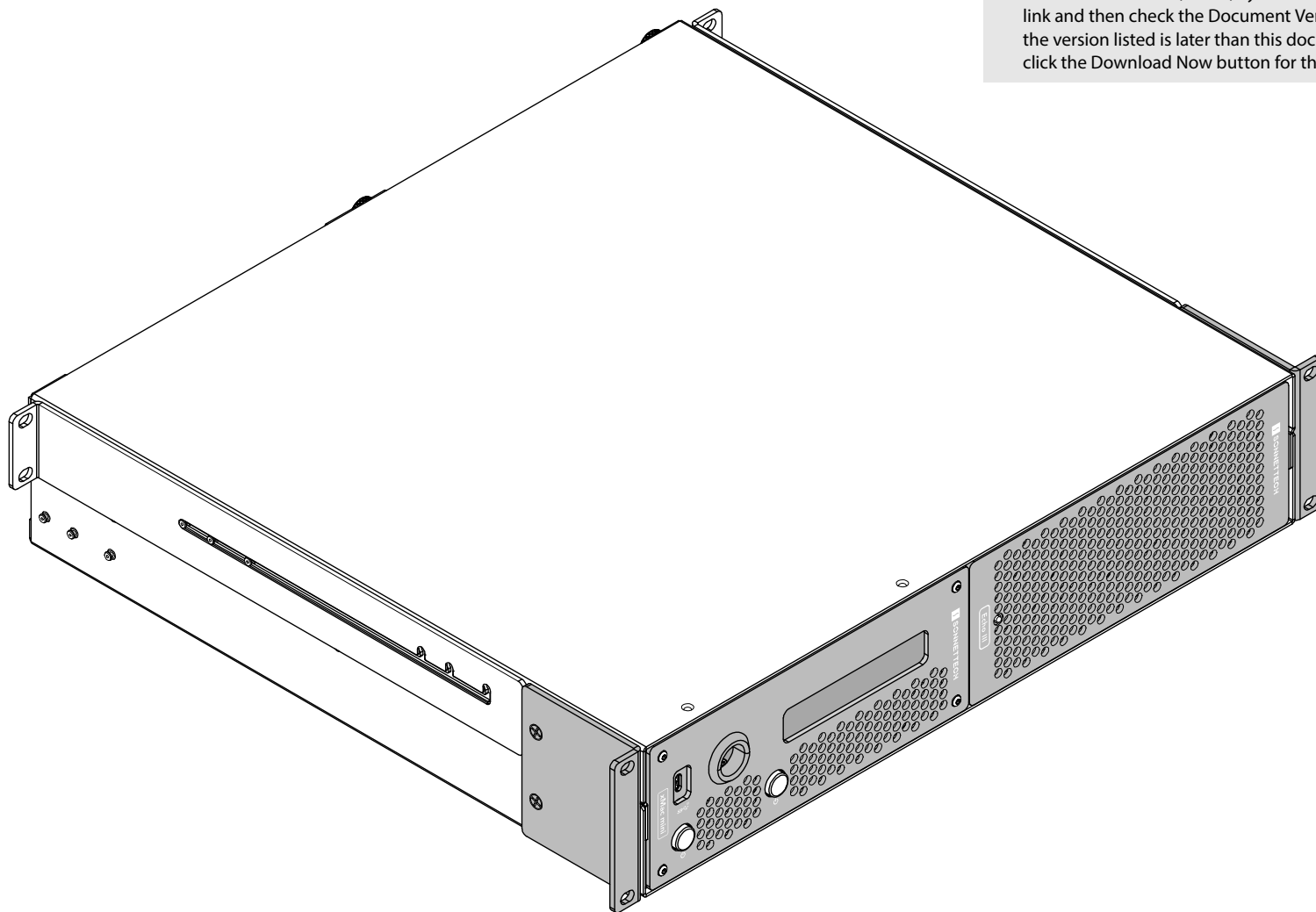
User's Guide

for xMac mini (2024+) Systems



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.

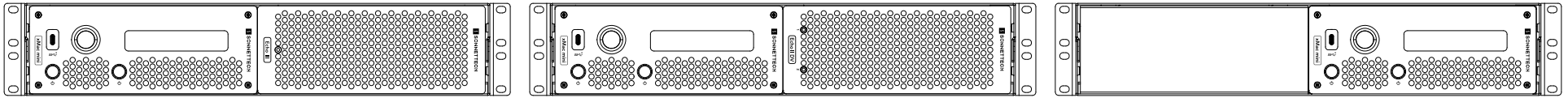
1. Go to <https://www.sonnettech.com/support/kb/kb.php>
2. Navigate to and click the xMac mini (2024+) Systems link.
3. Click the Manual link.
4. Click the xMac mini (2024+) Systems User's Guide [English] link and then check the Document Version information. If the version listed is later than this document (**revision A**), click the Download Now button for the latest version.



Contents

1 Introduction and System Requirements	1
Introduction	
Computer and OS Compatibility	
Echo Expansion System Requirements	
Preparing to Use an Echo Expansion System	
2 xMac mini (2024+) Systems Description	2
Front Panel	
Back Panel — xMac mini (2024+)/Echo III	
Back Panel — xMac mini (2024+)/Echo II DV	
xMac mini (2024+) Module Interior	
Echo III Module Interior	
Echo II DV Module Interior	
Echo I Module Interior	
Additional Package Contents	
3 Computer and PCIe Card Installation Steps	8
4 Echo III Module PCIe Card Installation Steps	10
5 Echo II DV Module PCIe Card Installation Steps	12
6 Module Installation Steps	13
7 Enclosure Installation Steps	14
8 Complete Setup and Configuration	15
9 Tips, General Information, and Known Issues	16
Tips, General Information	
Known Issues	
10 Precautions, FCC Compliance, and Support Information	17
Safety Precautions	
FCC Compliance	
Contacting Customer Service	

Section 1 – Introduction and System Requirements



Introduction

Congratulations on your purchase! xMac mini (2024+) is a modular rackmount for Mac mini computers plus an optional Thunderbolt™ expansion system for PCIe cards.

Computer and OS Compatibility

For up-to-date computer and operating system compatibility information, visit the xMac mini (2024+) systems product page at <https://www.sonnettech.com/product/xmac-mini-2024/techspecs.html#techspecs>

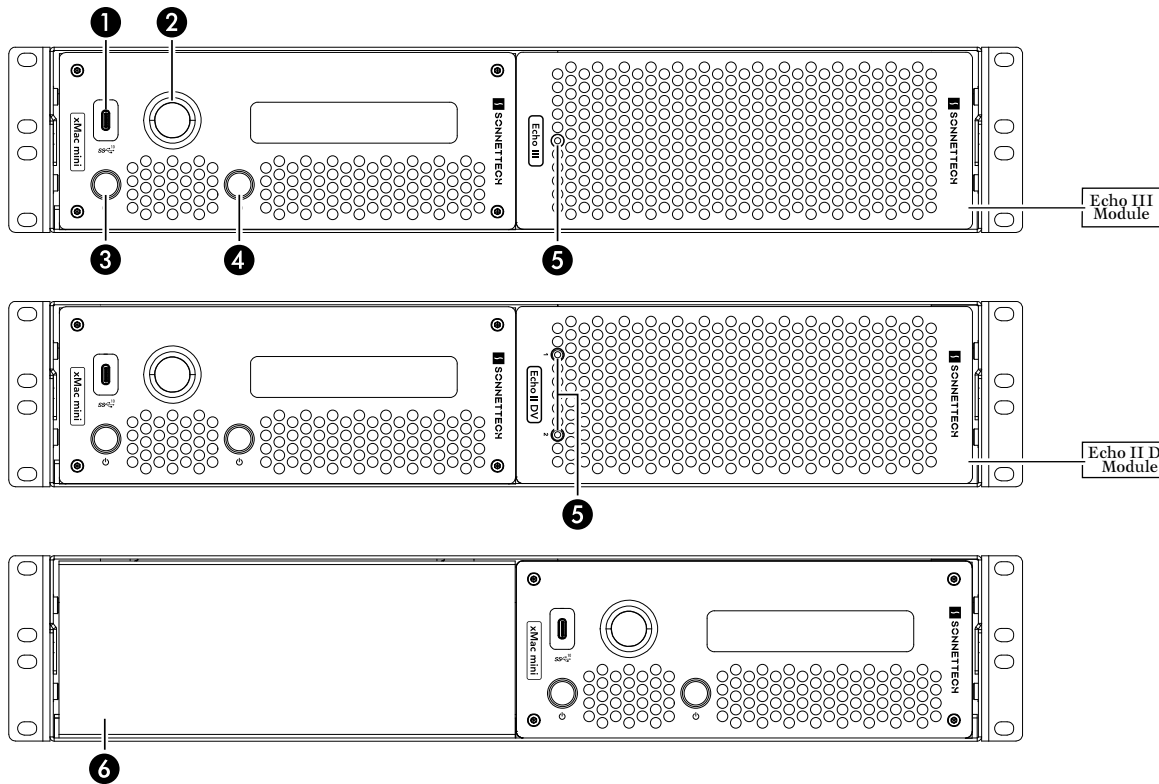
Echo Expansion System Requirements

While Echo expansion systems require no drivers, 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 Echo II DV and Echo III Modules is available at <https://sonnettech.com/support/>

Preparing to Use an Echo Expansion System

The drivers required to support an Echo expansion system are installed as part of supported operating systems; there are no preparation steps beyond updating your computer to a compatible OS.

Section 2 – xMac mini (2024+) Systems Description



Front Panel

1 – 10Gbps USB-C Port

This port's cable connects to the Mac mini mounted at the rear of the Module. Connect a USB device to this port.

2 – External Cable Passthrough Grommet

This opening enables the connection of devices to the installed computer(s) through the front panel.

3 – Rear Computer Power Switch

This button activates the power button of the Mac mini mounted toward the back of the module.

4 – Front Computer Power Switch

This button activates the power button of the Mac mini mounted at the front of the module.

5 – Power Indicator LED(s)

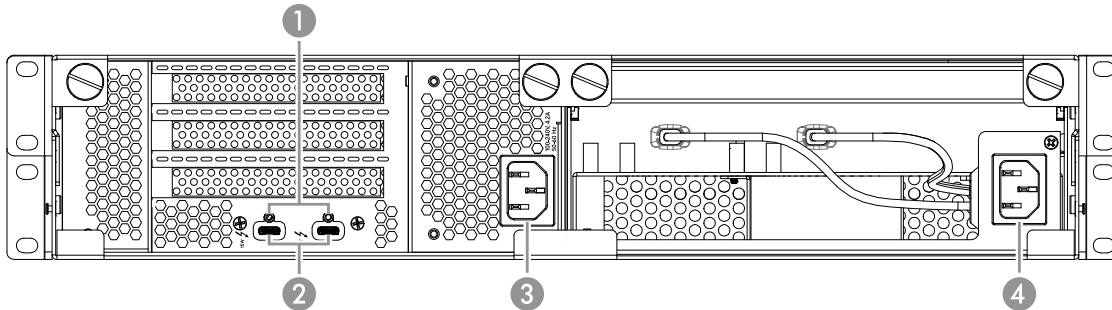
In systems including an Echo module, this lights when the Echo module is powered, the Thunderbolt cable between the module and your computer is plugged in securely, and the computer(s) powered on. Echo II DV Module includes two Power Indicator LEDs (one for each slot, which has its own Thunderbolt interface), and requires the connection of two Thunderbolt cables between the module and your computer(s).

6 – Blank Plate

In the xMac mini (2024+) system without an Echo module included, the xMac mini (2024+) Module is installed on the right side of the enclosure, and this cover is installed on the left. To install another xMac module or Echo module, remove the four screws (two on top, two on bottom) securing the plate to the enclosure.

Section 2 – xMac mini (2024+) Systems Description

Back Panel — xMac mini (2024+)/Echo III



1 – Threaded Nut(s) for ThunderLok

Attach the included Thunderbolt connector retainer clip here.

2 – Thunderbolt Port(s)

Connect the included (or other certified) Thunderbolt cable between one of these ports and one of your computer's Thunderbolt ports.

Echo III Module's second Thunderbolt port may be used to connect to another Thunderbolt peripheral device. We recommend that you connect displays and USB devices directly to your Mac mini instead of the second Thunderbolt port.

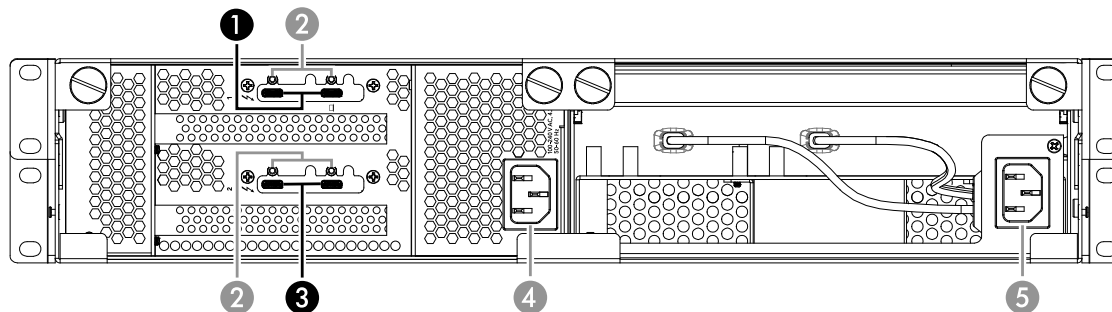
3 – Power Input Socket – Echo III Module

Connect an included AC power cord here.

4 – Power Input Socket – xMac mini (2024+) Module

Connect an included AC power cord here.

Back Panel — xMac mini (2024+)/Echo II DV



1 – Thunderbolt Ports (Slot 1)

Connect the included (or other certified) Thunderbolt cable between the port marked with the computer icon and one of your computer's Thunderbolt ports. This port pair only supports slot 1.

The second Thunderbolt port of this slot's pair may be used to connect to another Thunderbolt peripheral device. *However*, if you install a PCIe card with high bandwidth requirements, such as a DV I/O card, we recommend you do not connect a downstream device. Also, you should connect displays and USB devices directly to your Mac mini instead of the second Thunderbolt port.

2 – Threaded Nuts for ThunderLok

Attach the included Thunderbolt connector retainer clips here.

3 – Thunderbolt Ports (Slot 2)

Same as Thunderbolt Ports (Slot 1), but for slot 2.

4 – Power Input Socket – Echo II DV Module

Connect an included AC power cord here.

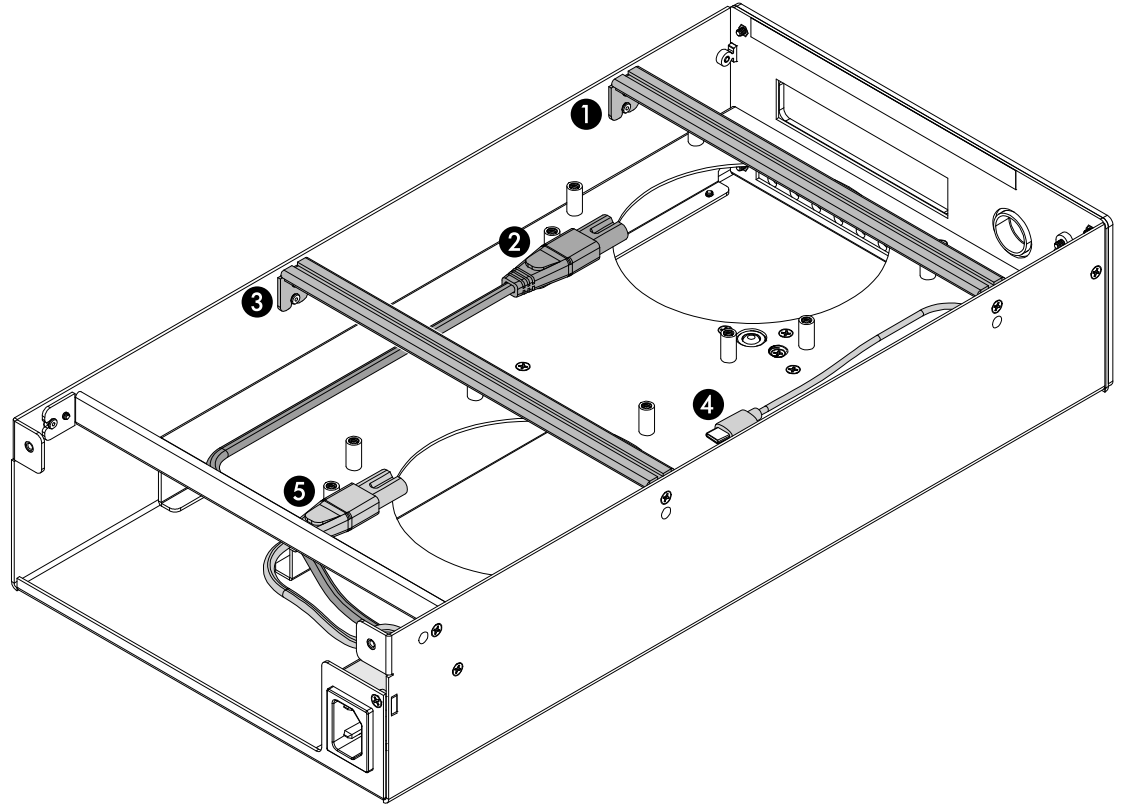
5 – Power Input Socket – xMac mini (2024+) Module

Connect an included AC power cord here.

Section 2 – xMac mini (2024+) Systems Description

xMac mini (2024+) Module Interior

- 1 – Front Computer Brace**
This bracket secures the Mac mini mounted at the front of the module.
- 2 – Front Computer Power Cable**
Connect this to the Mac mini mounted at the front of the module.
- 3 – Rear Computer Brace**
This bracket secures the Mac mini mounted at the rear of the module.
- 4 – 10Gbps USB-C Passthrough Cable for Rear Computer**
This cable connects to the front panel USB-C port of the module and the front panel USB-C port of the Mac mini mounted at the rear of the module.
- 5 – Rear Computer Power Cable**
Connect this to the Mac mini mounted at the rear of the module.



Section 2 – xMac mini (2024+) Systems Description

Echo III Module Interior

1 – Slot 1

This is an x8 mechanical (x8 electrical) PCIe 3.1 slot.* It also supports PCIe 4.0, 2.0, and 1.1 cards.

2 – Slot 2

This is an x16 mechanical (x8 electrical) PCIe 3.1 slot.* It also supports PCIe 4.0, 2.0, and 1.1 cards.

3 – Slot 3

This is an x8 mechanical (x4 electrical) PCIe 3.1 slot.* It also supports PCIe 4.0, 2.0, and 1.1 cards.

4 – 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.

5 – Thunderbolt Interface Card

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

6 – PCIe Slot Access Covers

These cover openings when PCIe slots are unoccupied.

7 – 6-Pin Auxilliary Power Connector and Cable

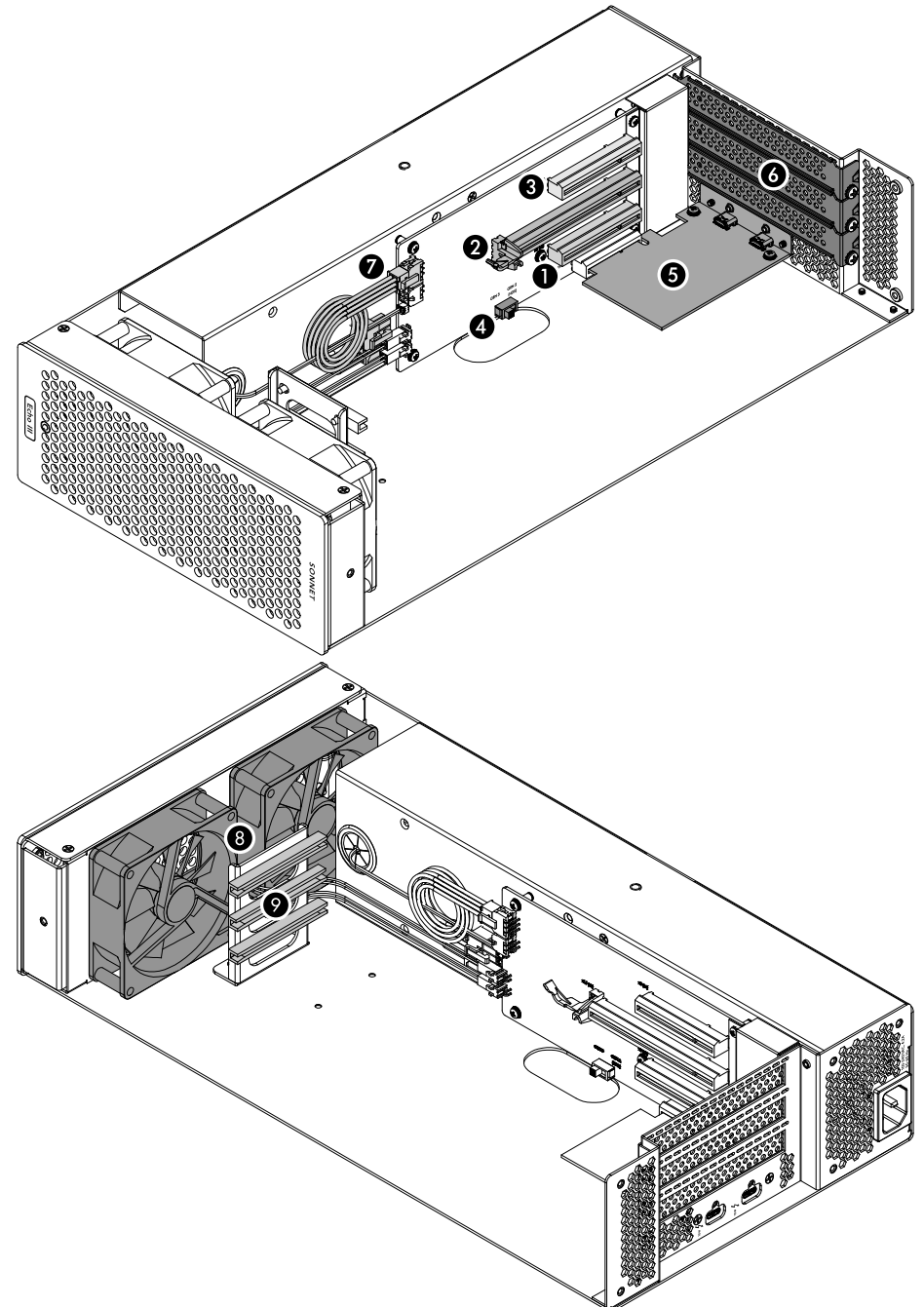
Plug in the included auxiliary power cable into this connector when you're installing cards requiring extra power. When installing Avid Pro Tools|HDX PCIe cards, connect an HDX card's custom power cable instead.

8 – Temperature-Controlled Fans

These provide cooling for the installed PCIe cards and the module's supporting Thunderbolt and power circuitry. The fans 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 module.

9 – PCIe Card Guides

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



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

Section 2 – xMac mini (2024+) Systems Description

Echo II DV Module Interior

1 – 6-Pin Auxilliary Power Connector for Slot 1

Plug in one of the included auxiliary power cables into this connector when you're installing a card requiring extra power. When installing an Avid Pro Tools|HDX PCIe card, connect an HDX card's custom power cable instead.

2 – 6-Pin Auxilliary Power Connector for Slot 2

Same as for 6-Pin Auxiliary Power Connector for Slot 1, except for slot 2.

3 – Slot 1

This is an x16 mechanical (x4 electrical) PCIe 3.1 slot. It supports PCIe 4.0, 3.0, 2.0, and 1.1 cards.

4 – Slot 2

This is an x16 mechanical (x4 electrical) PCIe 3.1 slot. It supports PCIe 4.0, 3.0, 2.0, and 1.1 cards.

5 – Thunderbolt Interface Card for Slot 1

This card is installed in its own slot and may not be moved to another. This interface card only supports slot 1.

6 – Thunderbolt Interface Card for Slot 2

This card is installed in its own slot and may not be moved to another. This interface card only supports slot 2.

7 – PCIe Slot Access Covers

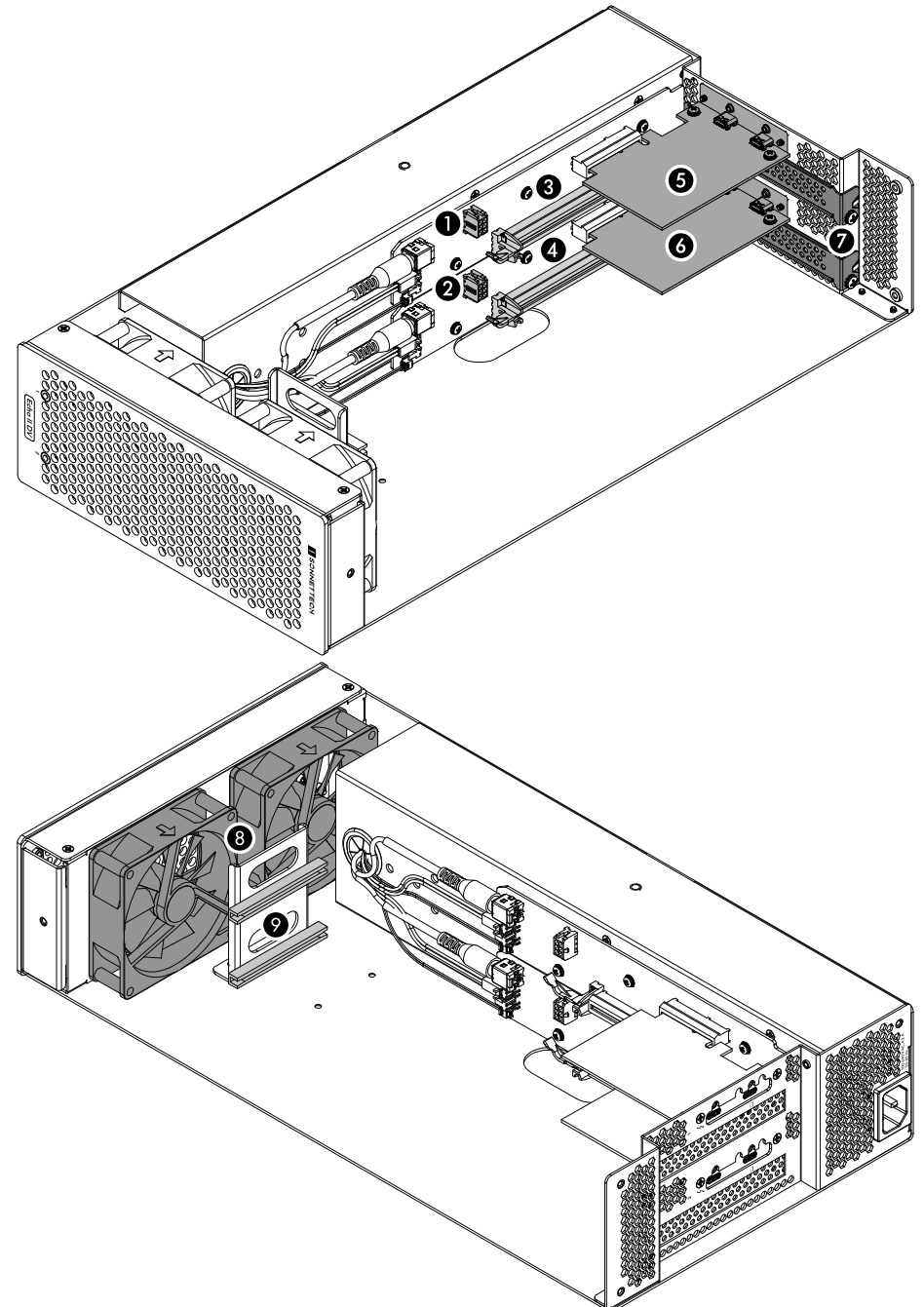
These cover openings when PCIe slots are unoccupied.

8 – Temperature-Controlled Fans

These provide cooling for the installed PCIe cards and the module's supporting Thunderbolt and power circuitry. The fans 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 module.

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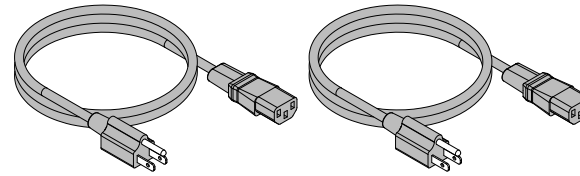


Section 2 – xMac mini (2024+) Systems Description

Additional Package Contents

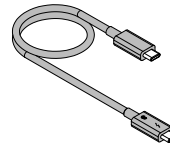
Power Cords

Connect these to power outlets and the power input sockets on xMac and Echo modules. Power cords included with your product may appear different than the one pictured here, depending on where the product was purchased. *Note that in the xMac mini (2024+) system without an Echo expansion module, only one power cord is included.*



Thunderbolt Cable

Included only with xMac mini (2024+) systems with an Echo module, connect this cable between a Thunderbolt port on the module and a Thunderbolt port on your computer. *Two cables are included with xMac mini (2024+)/Echo II DV.*



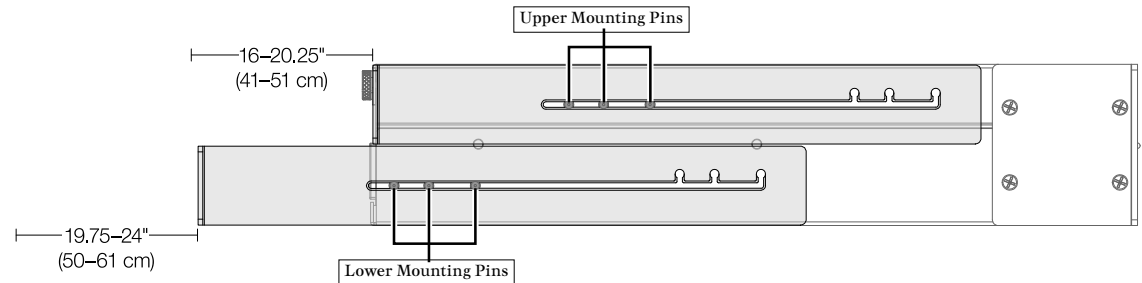
Thunderbolt Connector Retainer Clip(s)

Included only with xMac mini (2024+) systems with an Echo module, this clip secures the Thunderbolt connector plugged into one of the module's Thunderbolt ports to prevent accidental cable disconnection. *Two clips are included with xMac mini (2024+)/Echo II DV.*



Rackmount Rails

You may remove and reposition the pair of included rackmount rails. When installed on the upper mounting pins, the rails support enclosure installation in racks with mounting depths ranging from 16–20.25 inches. When installed on lower mounting pins, the rails support enclosure installation in racks with mounting depths ranging from 19.75–24 inches.



Auxiliary Power Cable (Not Shown)

Included only with xMac mini (2024+) systems with an Echo module, this cable provides extra power to cards with high power requirements. *Two auxiliary cables are included with Echo II DV Module.*

Section 3 – Computer and PCIe Card Installation Steps

1. Remove the xMac mini (2024+) system from its packaging, and then set it on a flat, level surface.
2. Remove the thumbscrews securing the module(s) to the back of the rackmount enclosure, and then set aside the screws (Figure 1).
3. Push the module(s) from the back and out of the enclosure (Figure 1). Set aside the enclosure and if included, the Echo module.

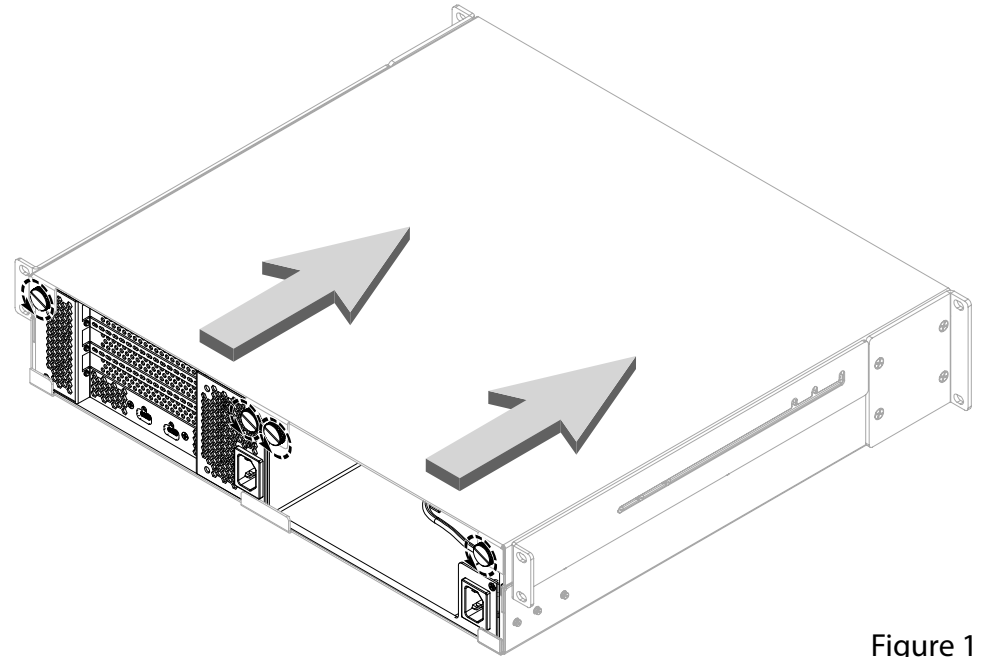


Figure 1

4. Remove the Front Computer Brace when installing one Mac mini. Remove both Front and Rear Computer Braces when installing two Mac minis (Figure 2).

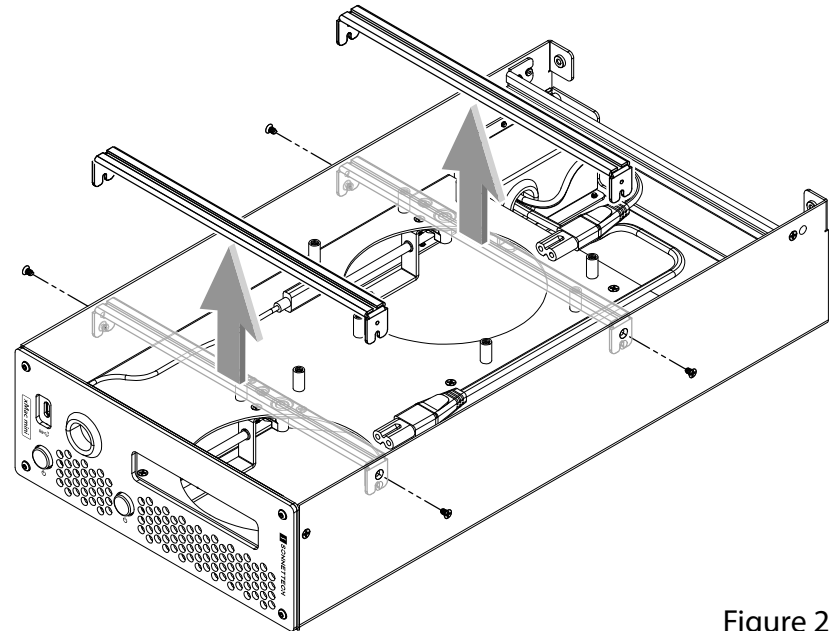


Figure 2

Section 3 – Computer and PCIe Card Installation Steps

5. Install your Mac mini(s) into the module (Figure 3).
6. Secure the Mac mini(s) to the module with the Computer Brace(s) (Figure 3).

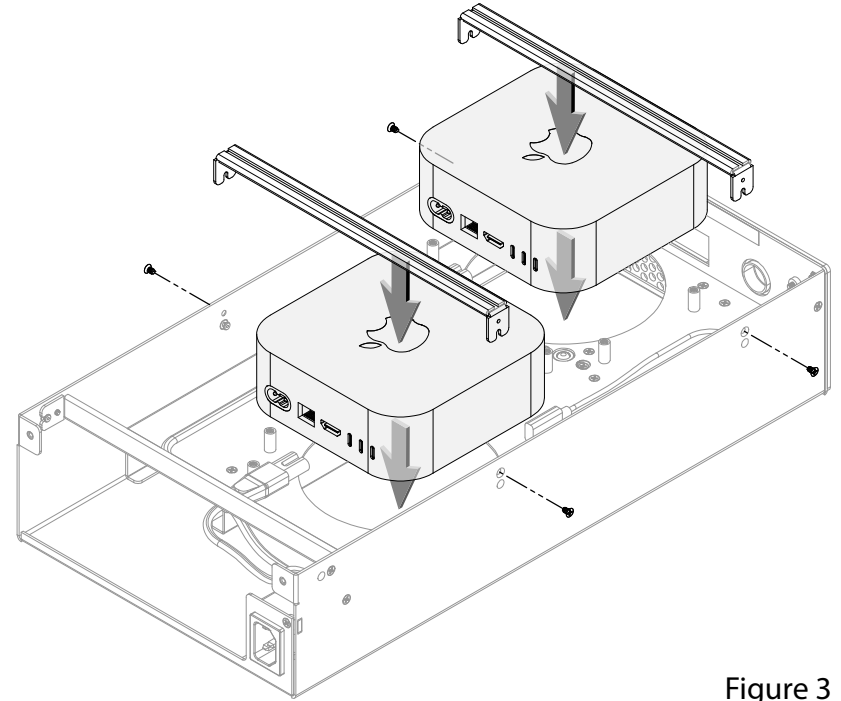


Figure 3

7. Connect the power cable(s) to the Mac mini(s). If necessary, connect the USB-C cable to the Mac mini installed at the rear of the module (Figure 4).
8. If you purchased an xMac mini (2024+) system with an Echo module, set aside xMac mini (2024+) Module and go to the next page. Otherwise, skip to page 13.

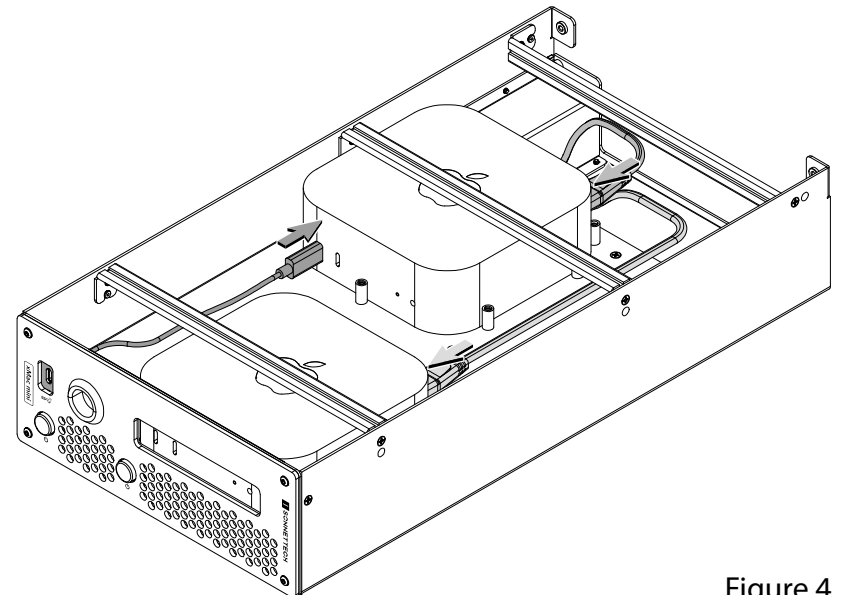


Figure 4

Section 4 – Echo III Module PCIe Card Installation Steps

This section covers the installation of PCIe cards into Echo III Module. If you purchased xMac mini (2024+) with Echo II DV Module, skip to page 12.



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

1. Remove and set aside the screw securing a PCIe slot access cover (Figure 5).
2. Remove and set aside the loose PCIe slot access cover (Figure 5).
3. If you are installing more than one card, repeat steps 1 and 2 as necessary with the remaining PCIe 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 module's circuit boards and any of its components.

4. **OPTIONAL STEP 1:** If you are *not* installing a PCIe card which requires auxiliary power, skip to step 6. Otherwise, locate the auxiliary power cable connector (Figure 6).
 - When installing one or more Pro Tools|HDX PCIe cards, connect 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, connect the included auxiliary power cable, and then move the loose connector aside for later connection.
5. **OPTIONAL STEP 2:** If you are installing one or more Avid Pro Tools|HDX cards, move the Gen 3/Gen 2 (HDX) switch (Figure 6) to the Gen 2 (HDX) position to enable compatibility. Otherwise, the card(s) will not work in Echo III Module.

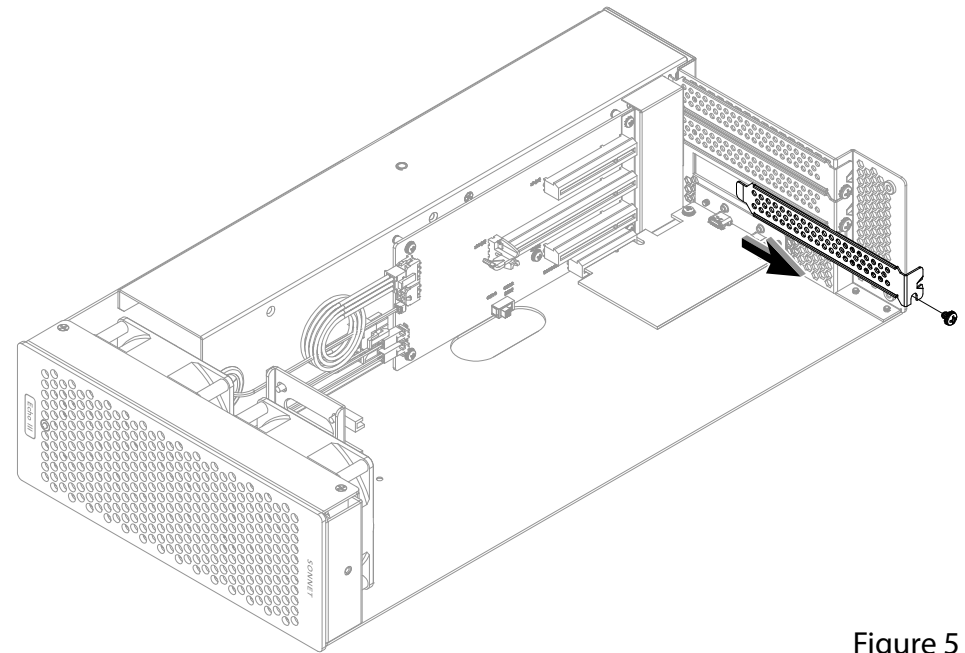


Figure 5

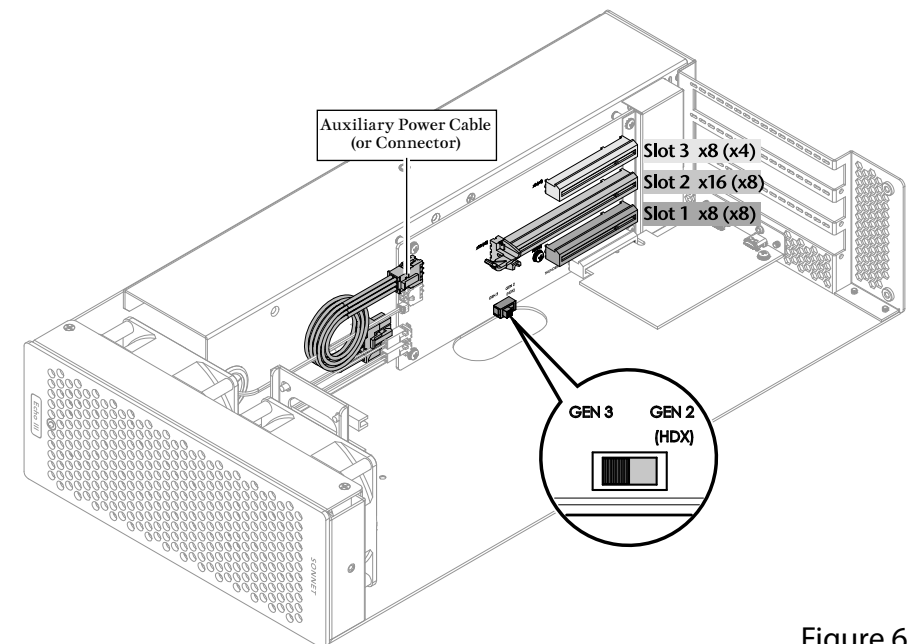


Figure 6

Section 4 – Echo III Module PCIe Card Installation Steps

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



Support Note: If you are installing an x8 PCIe 1.1 card, installing it into slot 3 may result in reduced performance. We recommend you install it into either slot 1 or 2 for best performance.

7. 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 7).
8. Repeat steps 6 and 7 as necessary with any remaining cards.
9. If you installed a card which requires auxiliary power, connect the auxiliary power connector to it now.
10. If there are any unoccupied slots, install the PCIe slot access covers you removed previously, and then secure the cards and slot covers using the previously-removed screws (Figure 7).
11. Skip to page 13.

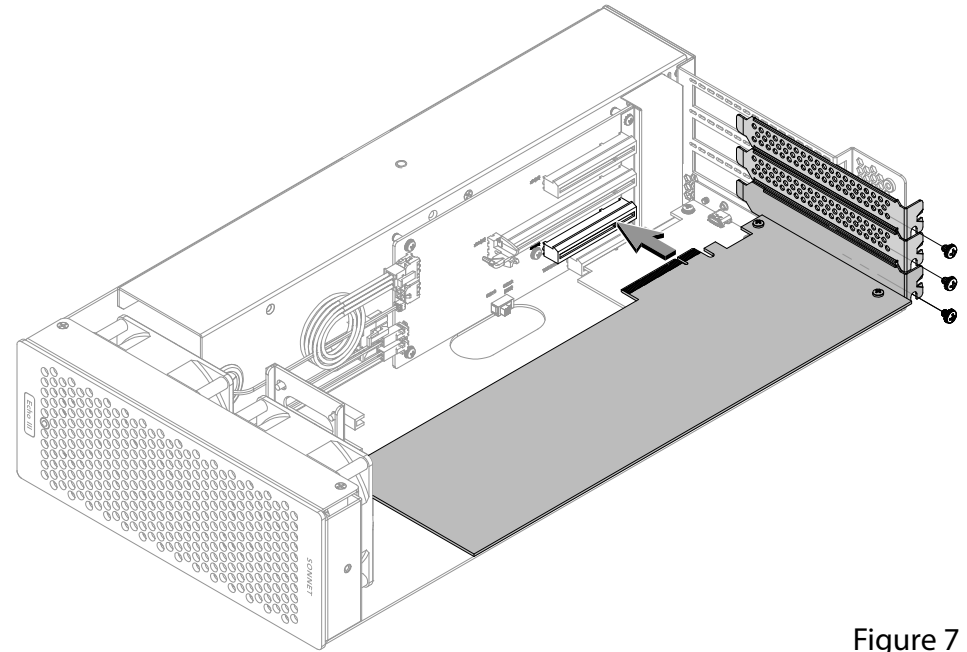


Figure 7

Section 5 – Echo II DV Module PCIe Card Installation Steps

This section covers the installation of PCIe cards into Echo II DV Module.



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

1. Remove and set aside the screw securing a PCIe slot access cover (**Figure 8**). Repeat with the other slot access cover if you are installing two cards.
2. Remove and set aside the loose PCIe slot access cover (**Figure 8**). Repeat with the other slot access cover if you are installing two cards.



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 module's circuit boards and any of its components.

3. **OPTIONAL STEP:** If you are *not* installing a PCIe card which requires auxiliary power, skip to the next step. Otherwise, locate the auxiliary power cable connector (**Figure 9**).

- When installing a Pro Tools|HDX PCIe cards, connect the custom power cable included with the card, and then move the loose connectors aside for later connection.
- When installing a card other than the Pro Tools|HDX, connect an auxiliary power cable included with the xMac system, and then move the loose connector aside for later connection.

4. Remove the PCIe card you're installing from its packaging, handling the card by its edges and without touching any components or gold connector pins.
5. 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 it 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 9**).
6. Secure the card using the screw you removed previously; do not overtighten the screw (**Figure 9**).
7. If required, connect the auxiliary power connector to the installed card; make sure the connector is plugged in securely.
8. Repeat steps 3–7 as necessary with a second card. Go to the next page.

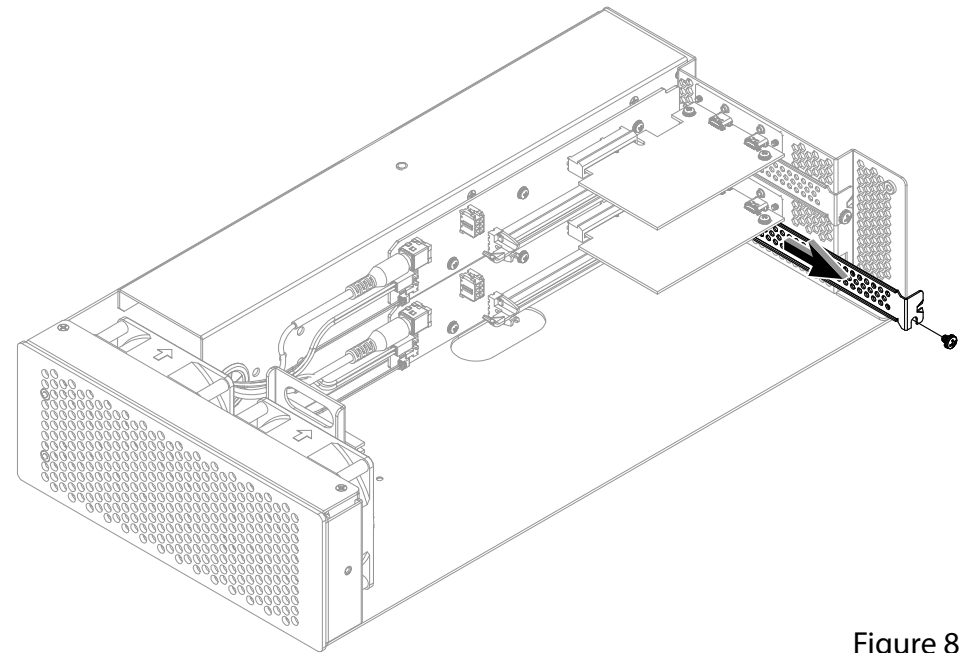


Figure 8

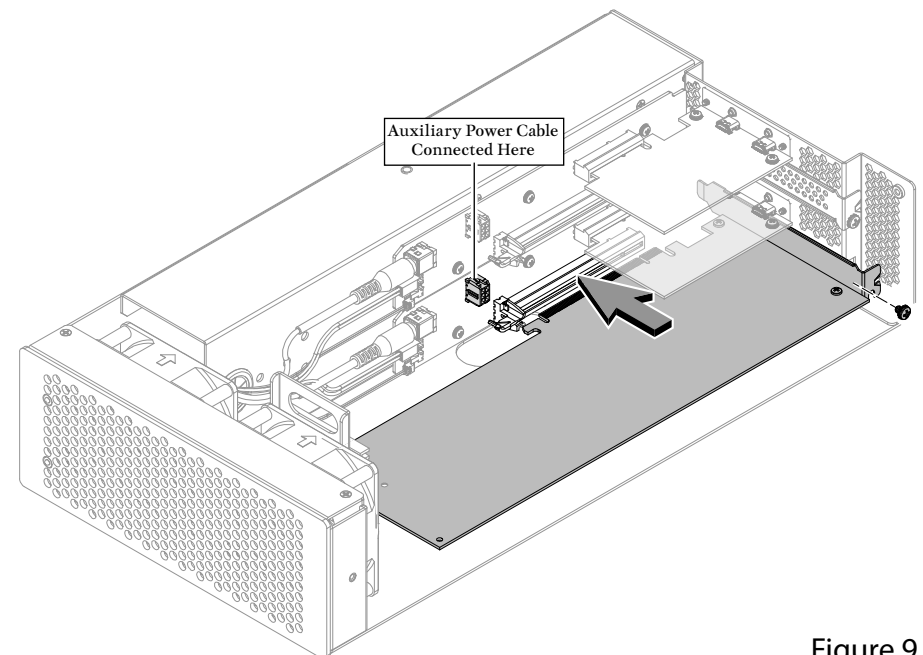


Figure 9

Section 6 – Module Installation Steps

1. Insert the xMac and Echo modules into the rackmount enclosure (Figure 10).
- 2 Using the thumbscrews you removed previously, secure the module(s) to the enclosure; do not overrighten the screws (Figure 10).

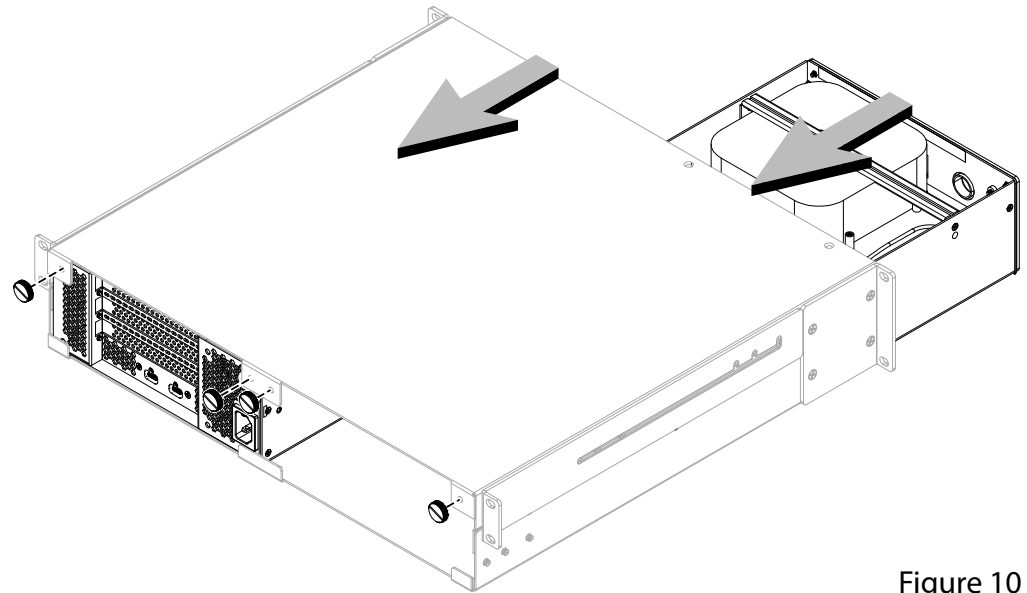


Figure 10



Support Note: The Sonnet ThunderLok™ Thunderbolt connector retainer clip secures the included Thunderbolt cable(s) to the module to prevent accidental disconnects. This clip is compatible with Sonnet Thunderbolt cables.

To attach the clip to the cable, remove both items from their packaging, and then insert the connector into the connector clip as shown (Figure 11). Note that the connector will pass all the way through the clip; when you connect the cable to the module, the clip will secure the connector.

3. Connect the included (or other certified) Thunderbolt cable between the Thunderbolt port on the Echo module and a Thunderbolt port on the back of your computer (Figure 11). Secure the retainer clip to the module if you attached it.

For Echo II DV Module Users

Connect the included (or other certified) Thunderbolt cables between the two Thunderbolt ports on Echo II DV Module marked with a computer icon and two Thunderbolt ports on the back of one Mac mini, or to one Thunderbolt port each on two Mac minis. Secure the retainer clip(s) to the module if you attached it (them).

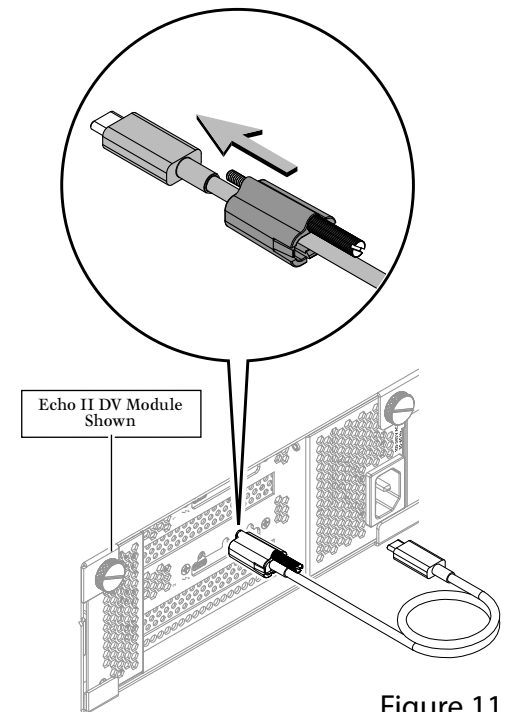


Figure 11

Section 7 – Enclosure Installation Steps

1. Install the assembled xMac mini (2024+) system into its rack or case.
2. Connect interface and power cables between devices, PCIe cards, and the computer(s) as necessary.
3. Connect the power cord(s) included with the system between a wall outlet or power strip and the modules' power sockets. Note that the
4. Go to the next page.



Support Note: If you haven't set up your Mac mini(s), you will need to connect a monitor, keyboard, and mouse to each one to complete setup.

Section 8 – Complete Setup and Configuration

ECHO MODULE SETUP AND CONFIGURATION STEPS

This page instructs you how to verify an Echo module and installed cards are recognized by the computer.

A – Confirm the Echo Module is Recognized

1. With the Echo module powered and connected to the computer, turn on the computer.
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. In the top right column under the Thunderbolt... Device Tree header, you will see Thunderbolt Bus, and then “DuoModo Echo III Module” or “Echo Express SE I TB3” (for Echo II DV Module). If you installed two card into an Echo II DV Module, you will see two “Echo Express SE I TB3” listings.



Support Note: If “DuoModo Echo III Module” or “Echo Express SE I TB3” is not listed, disconnect and reconnect the Thunderbolt cable(s) between the computer and module. Note that it is not necessary to shut down the computer before disconnecting and reconnecting the cable(s).

B – Confirm the Installed Cards are Recognized

1. In the *System Information* window click PCI under the Hardware header in the left column.
2. At the top of the right column, installed cards (and/or card controllers) are listed (if not, you may need 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- or M series processor-compatible.



Support Note: While Echo modules don’t require drivers beyond those pre-installed in macOS, 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 module is ready to use!

Section 9 – Tips, General Information, and Known Issues

TIPS, GENERAL INFORMATION

Keeping the Cards Cool

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

Replacing a PCIe Card After Initial Installation

Shut down the computer, and then disconnect the power cord and Thunderbolt cable from the Echo module before removing it from the enclosure and replacing the card; PCIe cards are not hot-pluggable!

Hot Plugging an Echo Module

When certified Thunderbolt-compatible cards (used with Thunderbolt-compatible drivers) are installed, you may connect and disconnect the module 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 module.

There's No Need to Unplug the Power Cable

Because an Echo 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

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

Connecting Additional Thunderbolt Peripherals

Because the Mac mini includes a separate Thunderbolt controller for each Thunderbolt port and provides full PCIe bandwidth to each, we recommend you use the computer's Thunderbolt ports first to connect additional peripherals.

- Echo II DV Modules include four Thunderbolt ports; two are reserved for connection to your computer, while the other two support daisy-chaining of up to five additional Thunderbolt peripheral devices each; due to an operational issue with the Mac mini, connecting displays to Echo II DV Module is not recommended.

- Echo III Modules include two Thunderbolt ports; one 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 Allegro™ Pro USB 3.2 PCIe cards, use inbox (built into the operating system) drivers, and are ready to use out of the box.

Echo Modules Provide Downstream Power

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

Not All Mac-Compatible Cards Work With Mac mini

While this product is compatible with M series processors, not all PCIe cards that work with Intel-based Macs have M series processor-compatible drivers. We recommend that you contact your PCIe card's manufacturer to verify that the existing drivers support M series Macs.

KNOWN ISSUES

Not all PCIe Cards Will Perform at 100%

Thunderbolt's PCIe bandwidth is limited to 2,880 MB/s. While most PCIe cards will operate at full performance, some may not because they require more bandwidth than Thunderbolt can provide.

Not All Thunderbolt Cables Deliver Full Performance

Full performance from the Echo module requires the use of the included (or other certified) Thunderbolt cable.

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 your PCIe card's manufacturer to verify that the existing drivers work. Note that other computer software updates may also break compatibility.

Connecting Displays to Echo III Module with Mac mini

Due to an operational issue with the Mac mini, connecting displays to Echo III Module is not recommended.

Section 10 – 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.

- 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 slots.
- 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

xMac mini (2024+) 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

Before contacting Customer Service, please check the Sonnet Web site (www.sonnettech.com) for the latest updates and files. When you contact Customer Service, please have the following information available:

- 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, contact **Sonnet Customer Service** at:

E-mail: support@sonnettech.com

Japan Customers

Contact Sonnet Customer Service Japan at:

E-mail: jp.support@sonnettech.com

