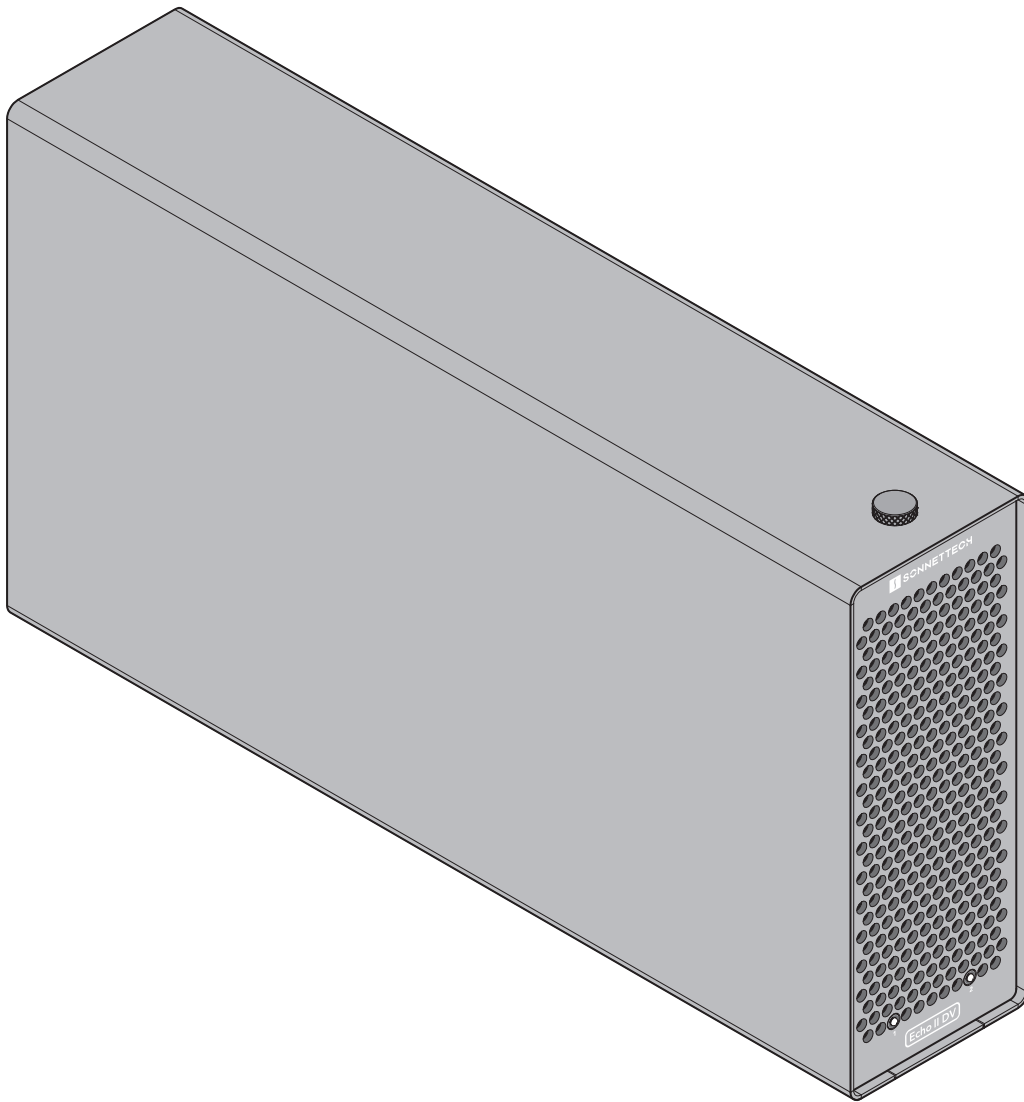


User's Guide

for Echo II DV Desktop Thunderbolt 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
2. Navigate to and click the Echo II DV Desktop link.
3. Click the Manual link.
4. Click the Echo II DV Desktop User's Guide [English] link and then check the Document Version information. If the version listed is later than this document (**revision C**), click the Download Now button for the latest version.



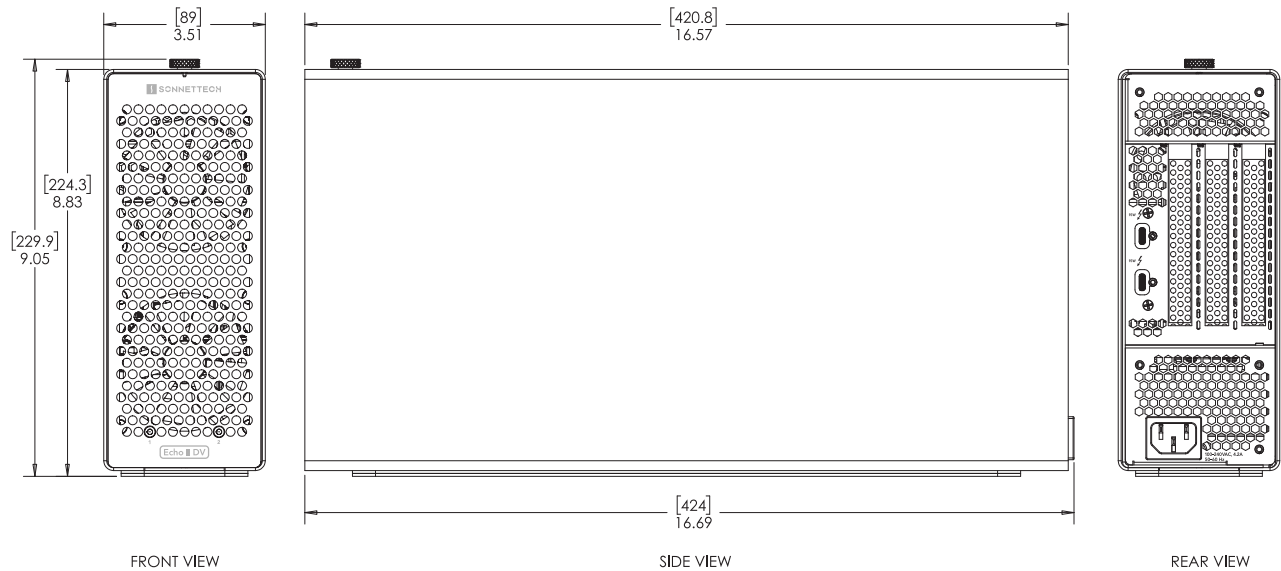
For
Windows



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Chapter 1 – Introduction and System Requirements



Introduction

Congratulations on your purchase! Echo™ II DV Desktop is a Thunderbolt™ expansion system for PCIe cards. Through its PCIe slots, you may connect two single-width, non-GPU adapter cards to a computer with Thunderbolt ports to expand its capabilities and add connectivity beyond what's offered through its native ports.

Mac Compatibility

- Mac (M series)
- Mac (Intel) with Thunderbolt 3 ports
- macOS 13+

Windows Compatibility

- Windows computer with Thunderbolt 5 or 4 ports
- Windows 11 22H2 build 22621.819 and newer

Linux Compatibility

- Linux computers with Thunderbolt 5 or 4 ports
- Linux Kernel 6.1, 6.12

System Requirements

Echo II DV Desktop features separate Thunderbolt interfaces for its two PCIe slots. For maximum performance with cards with high-bandwidth requirements, two Thunderbolt cable connections to your computer are required.

While Echo expansion systems require no drivers, most expansion cards you install do; Thunderbolt-compatible drivers to enable them to work through the Thunderbolt interface are required. More information on which cards are compatible with Echo II DV Desktop is available at <https://www.sonnettech.com/support/>

Preparing to Use Echo II DV Desktop With a Mac Computer

The drivers required to support Echo II DV Desktop are installed as part of macOS; there are no preparation steps beyond updating your computer to macOS 13 or newer.

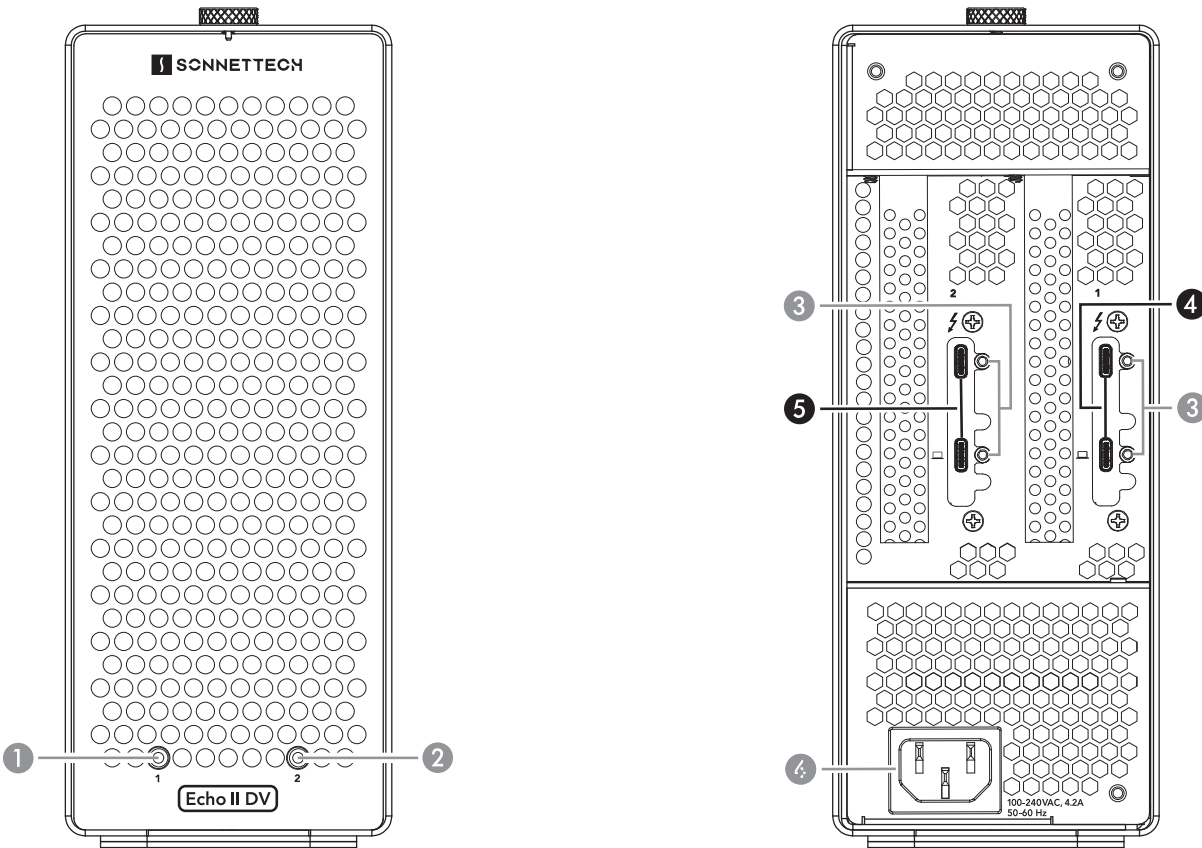
Preparing to Use Echo II DV Desktop With a Windows Computer

The drivers required to support Echo II DV Desktop are installed as part of Windows 11 22H2 build 22621.819 and newer; there are no preparation steps beyond updating your computer to that version or a later one.

Preparing to Use Echo II DV Desktop With a Linux Computer

The drivers required to support Echo II DV Desktop are installed as part of Linux Kernel 6.1 and 6.12; there are no preparation steps beyond updating your computer to a compatible Linux Kernel if necessary.

Chapter 2 – Echo II DV Desktop Description



Exterior

1 – Power Indicator LED - Slot 1

This lights when the Echo module is powered, a Thunderbolt cable is connected securely between the port marked with the computer icon (for Slot 1) and one of your computer's Thunderbolt ports, and the computer powered on. Note that if the Echo Module is connected to another Thunderbolt device instead of directly to the computer, any other Thunderbolt device connected between the computer and module must also be powered on before the module's power indicator will light up.

2 – Power Indicator LED - Slot 2

Same as Power Indicator LED - Slot 1, except for Slot 2.

3 – Threaded Nuts for ThunderLok

Attach the included Thunderbolt connector retainer clips here.

4 – Thunderbolt Ports (Slot 1)

Connect an 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 computer instead of the second Thunderbolt port.



Support Note: To support maximum performance when using two bandwidth-hungry PCIe cards, Echo II DV Module requires the following: 1) two connections between the module the host computer with the supplied Thunderbolt cables, and, 2) each Thunderbolt port used on the computer must be on a separate Thunderbolt bus (each Thunderbolt port on an M series Mac is on a separate bus).

When your computer does not meet these requirements, you may still achieve very good performance by connecting one slot's main (computer) Thunderbolt port to the computer, and then connect the same slot's secondary port to the other slot's main Thunderbolt port.

5 – Thunderbolt Ports (Slot 2)

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

6 – Power Input Socket

Connect the included AC power cord here.

Chapter 2 – Echo II DV Desktop Description

Echo II DV Module (Inner Assembly)

1 – PCIe Slot Access Covers

These cover openings when PCIe slots are unoccupied.

2 – 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.

3 – 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.

4 – PCIe Card Guides

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

5 – 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.

6 – Slot 1

This is an x16 mechanical (x4 electrical) PCIe 5.1 slot. It supports PCIe 4.0, 3.0, 2.0, and 1.1 cards.

7 – Slot 2

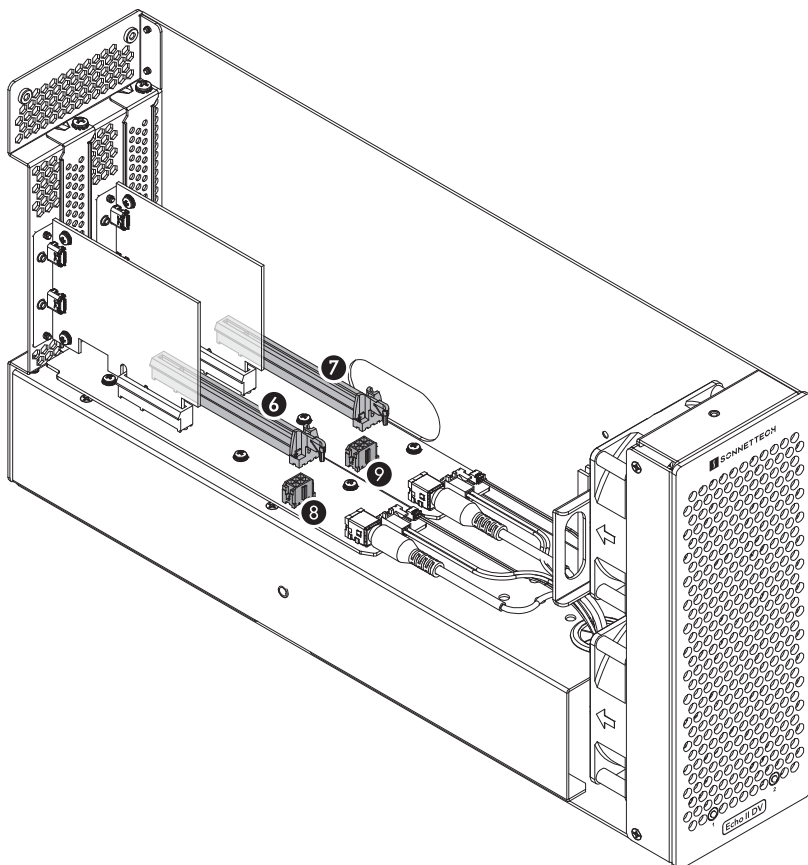
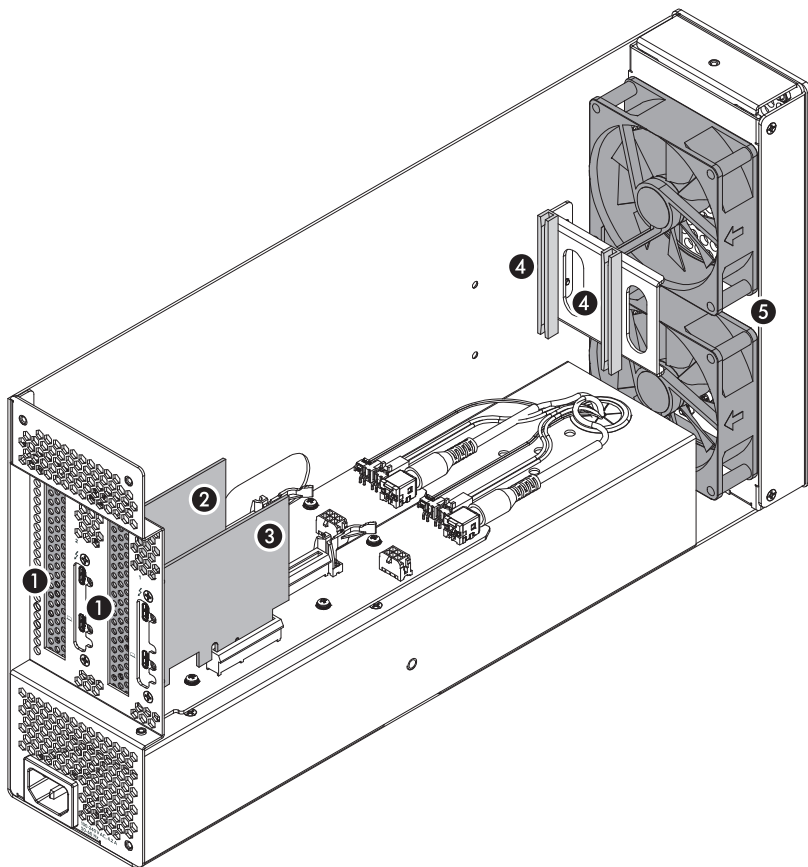
This is an x16 mechanical (x4 electrical) PCIe 5.1 slot. It supports PCIe 4.0, 3.0, 2.0, and 1.1 cards.

8 – 6-Pin Auxilliary Power Connector for Slot 1

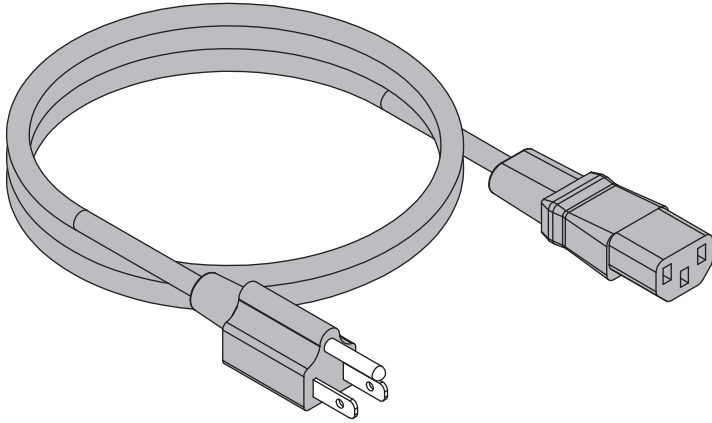
Plugged into this connector is the auxiliary power cable for cards requiring extra power. When installing Avid Pro Tools | HDX PCIe cards, disconnect the supplied cable and connect an HDX card's custom power cable in its place.

9 – 6-Pin Auxilliary Power Connector for Slot 2

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

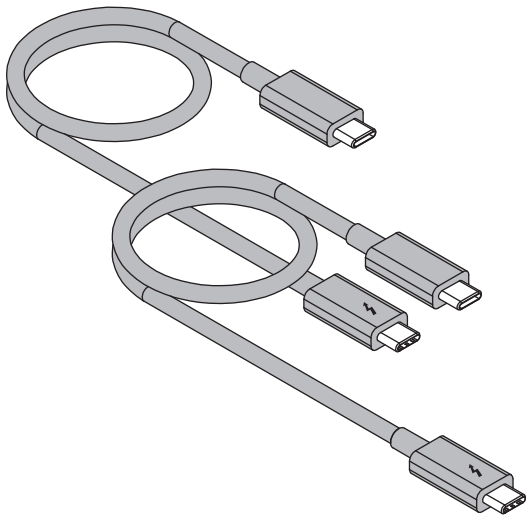


Chapter 2 – Echo II DV Desktop Description



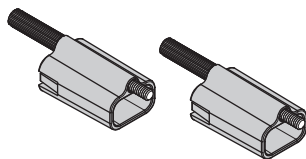
Power Cord

Connect this between a power outlet and the power input socket on the Echo Module. Note that the power cord included with your product may appear different than the one pictured here, depending on where the product was purchased.



Thunderbolt Cables

Connect these cables between the Echo module and your computer. Connecting the Echo module to a computer port marked with a generic USB icon (🔌) or USB Charging Port icon (🔌) is NOT supported.



Thunderbolt Connector Retainer Clips

These clips secure the Thunderbolt connectors plugged into the Echo module's Thunderbolt ports to prevent accidental cable disconnections. These clips are compatible with Sonnet Thunderbolt cables.

Auxiliary Power Cables (Not Shown)

When connected to auxiliary power connectors in the module, these cables provide extra power to cards with high power requirements.

Chapter 3 – PCIe Card Installation and Module Setup Steps

1. Remove Echo II DV 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 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.

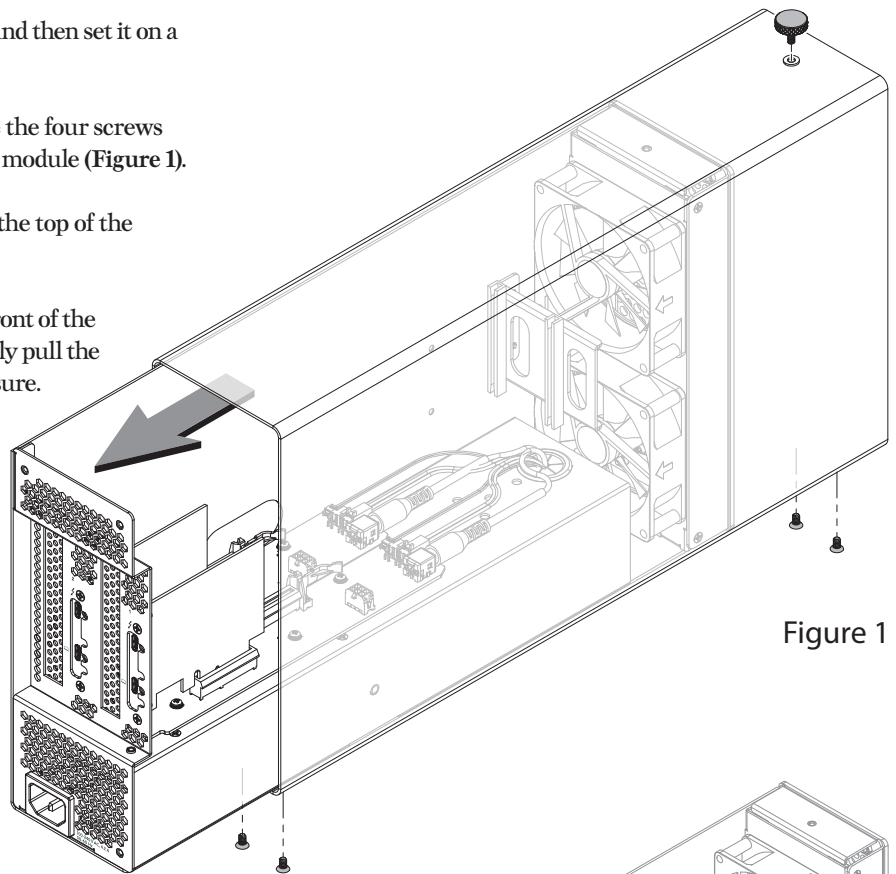


Figure 1



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.

5. Remove and set aside the screw securing a PCIe slot access cover (Figure 2). Repeat with the other slot access cover if you are installing two cards.
6. Remove and set aside the loose PCIe slot access cover (Figure 2). Repeat with the other slot access cover if you are installing two cards.
7. **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 for the slot you're installing the card into (Figure 2).

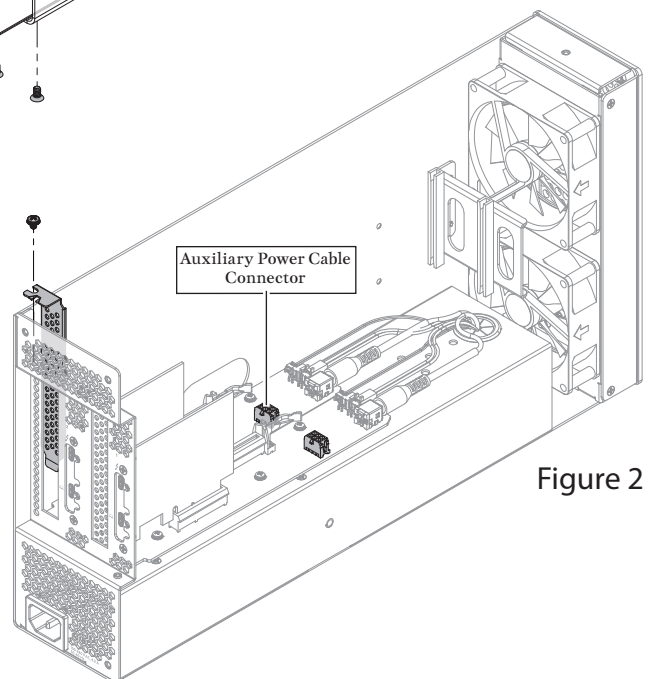


Figure 2

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

Chapter 3 – PCIe Card Installation and Module Setup Steps

8. Remove a PCIe card you're installing from its packaging, handling the card by its edges and without touching any components or gold connector pins.
9. 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 3).
10. Secure the card using the screw you removed previously; do not overtighten the screw (Figure 3).
11. If required, connect the auxiliary power connector to the installed card; make sure the connector is plugged in securely.
12. Repeat steps 7-11 as necessary with a second card.

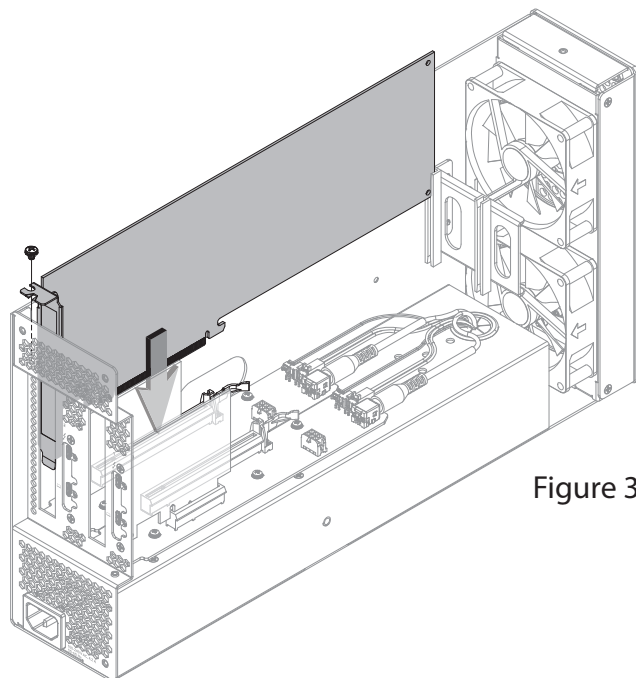


Figure 3

13. 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 4).
14. Using the thumbscrew you removed previously, secure the enclosure to the top of the module; do not overtighten the screw (Figure 4).

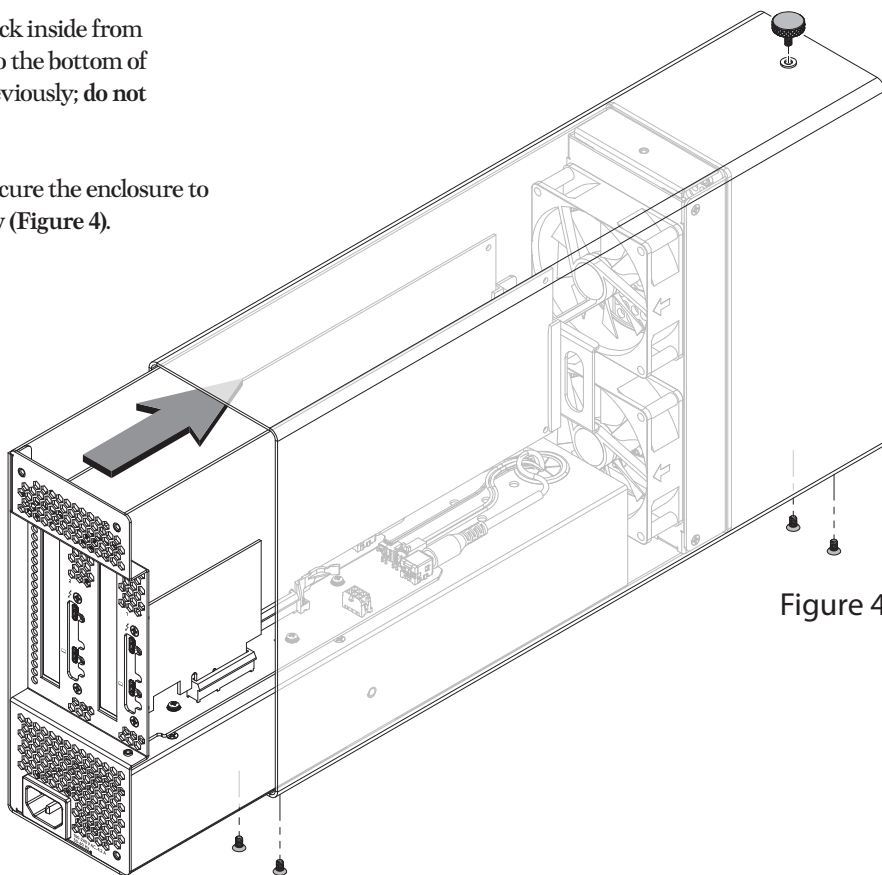


Figure 4

Chapter 3 – PCIe Card Installation and Module Setup Steps



Support Note: Sonnet's ThunderLok™ Thunderbolt connector retainer clips secure the included Thunderbolt cables to the Echo module to prevent accidental disconnects. These clips are compatible with Sonnet Thunderbolt cables.

To attach a clip to the cable, remove both items from their packaging, and then insert the connector through the connector clip as shown (Figure 5). 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.

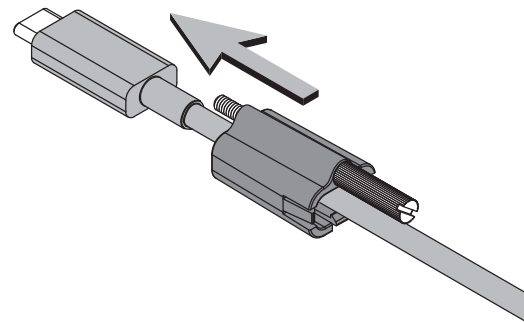


Figure 5

15. 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 your computer (Figure 6). Note that cables or computer ports marked with a generic USB icon (•⚡) or USB Charging Port icon (⚡) are NOT compatible. Secure the retainer clips to the module if you attached them.



Support Note: When necessary, you may connect one slot's main (computer) Thunderbolt port to the computer, and then connect the same slot's secondary port to the other slot's main (computer) Thunderbolt port; refer to the Support Note on page 2 for more information.

16. Connect interface cables between devices, PCIe cards, and the computer as necessary.
17. Connect the included power cord between a wall outlet or power strip and the Echo module's power socket. Note that the module's power indicators will not light until the computer and any other Thunderbolt devices connected between them and the Echo module are powered on.

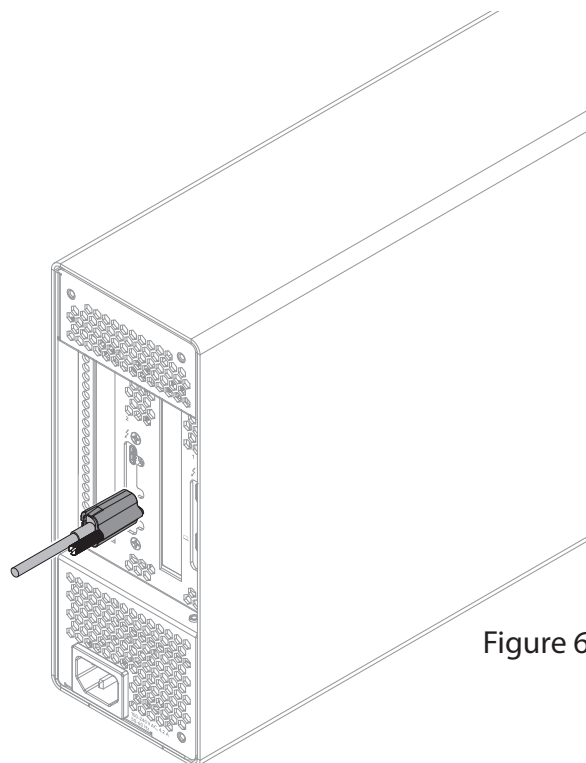


Figure 6

Chapter 4 – Complete Setup and Configuration

SETUP AND CONFIGURATION STEPS—MAC USERS

A – Confirm Echo II DV Module is Recognized

1. With the Echo module powered and connected to the computer, turn on the computer; any other Thunderbolt devices connected between the module and your computer 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. In the top right column under the Thunderbolt... Device Tree header, you will see Thunderbolt Bus, and then “Echo Express SE I TB3”. If you installed two cards, you will see two “Echo Express SE I TB3” listings.



Support Note: If “Echo Express SE I TB3” is not listed, disconnect and reconnect the Thunderbolt cables between the computer and Echo module. Note that it is not necessary to shut down the computer before disconnecting and reconnecting the cables.

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 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.



Support Note: While Echo II DV Module doesn'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 expansion system is ready to use!

SETUP AND CONFIGURATION STEPS—WINDOWS USERS

A – Confirm Echo II DV Module and Installed Cards Are Recognized

1. With the Echo module powered and connected to the computer, turn on the computer; any other Thunderbolt devices connected between the module and your computer 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 module, an *Approve New Thunderbolt™ Devices* window appears. From the drop-down 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 expansion system 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, Echo II DV Desktop provides adequate cooling for 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 Echo II DV 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 Echo II DV 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 Echo module automatically powers on and off with the computer to which it's connected, and its power indicators only light when the computer is on and turn off when the computer is sleeping or powered off.

Connecting Additional Thunderbolt Peripherals

The Echo module includes four Thunderbolt ports; two are reserved for connection to your computer, while the second port pair support daisy-chaining of up to five additional Thunderbolt peripheral devices each.

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 PCIe Card After Initial Installation

Shut down the computer, and then disconnect the power and Thunderbolt cables from Echo II DV Module before opening the chassis and replacing the card; **PCIe cards are not hot-pluggable!**

Echo II DV Desktop Provides Upstream Power

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

Using the Echo Module to Charge Your Portable Computer

MacBook Air and MacBook Pro computers with Thunderbolt 5, 4, or 3 ports, and all PC laptops with Thunderbolt 5 or 4 ports may be charged *slowly* via the Echo module's Thunderbolt ports (via 15W Power Delivery).

Not All Mac-Compatible Cards Work With M Series Macs

While this product is compatible with all M series Mac computers, not all PCIe cards that work with Intel-based Macs have M series-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 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 system 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.

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 here carefully; contact your reseller or local distributor for additional advice not covered in this User's Guide.

FCC Compliance

Echo II DV 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

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