Quick Start Guide
for Fusion™ Dual 2.5-inch SSD RAID
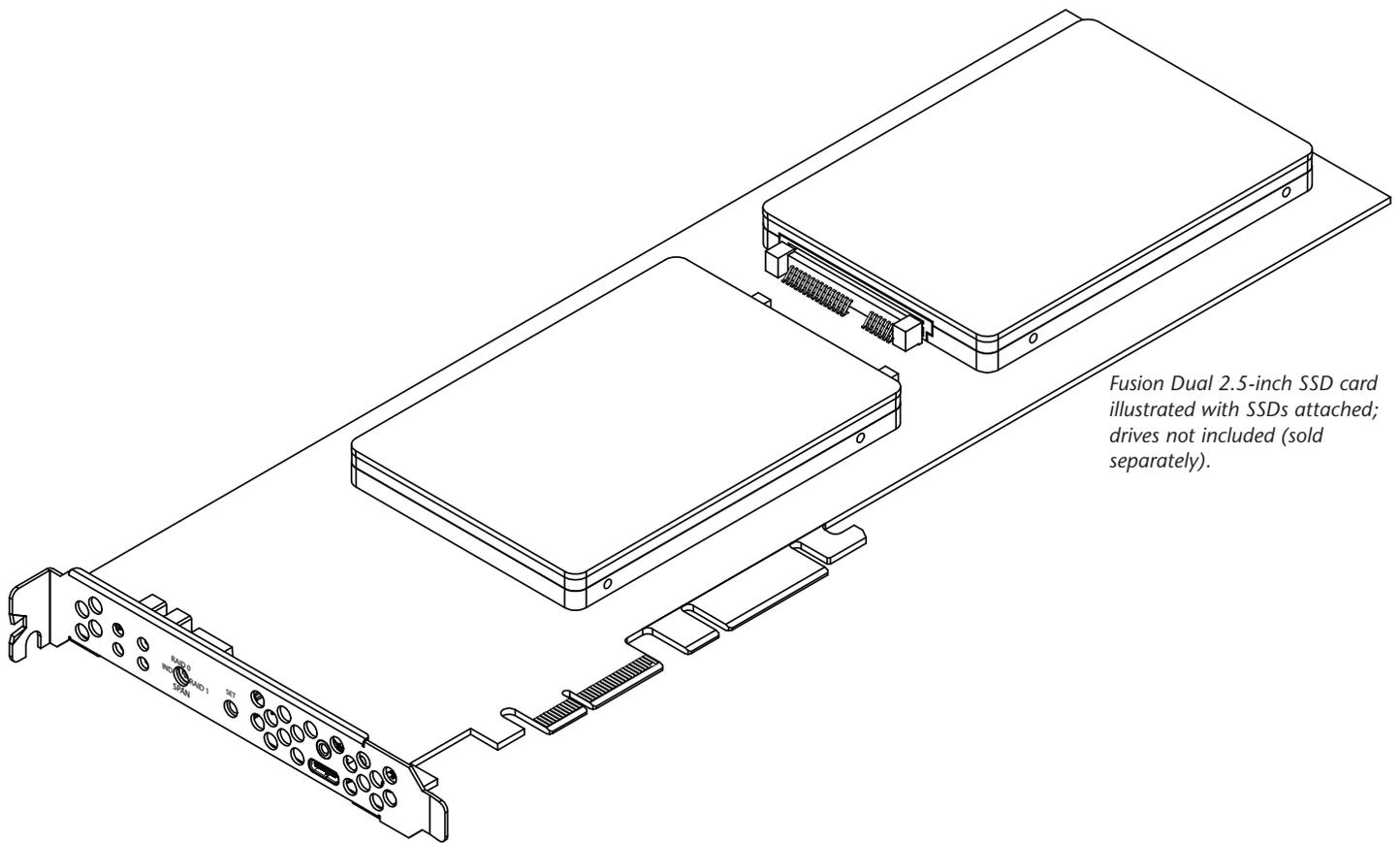
Fusion Dual 2.5-inch SSD card illustrated with SSDs attached; drives not included (sold separately).

SERIAL ATA™ 6Gb/s PCI EXPRESS® SUPERSPEED+ CERTIFIED USB 10Gbps™ Mac For Windows

SONN€T™

Introduction, Compatibility Information, USB Driver Information

Congratulations on your purchase! The Fusion™ Dual 2.5-inch SSD RAID card provides a handy way to install one or two 2.5-inch SATA SSDs (or HDDs) into a PCIe slot, and connect a USB device using a USB-C® cable. The built-in hardware RAID controller enables you to configure attached SSDs in RAID 0, RAID 1, JBOD, and Span configurations; descriptions follow.

You Should Have
The following items should be included in your product package:
• One Fusion Dual 2.5-inch SSD RAID card
• Eight drive mount screws
• Quick Start Guide

The following items may be required for installation and setup:
• Medium Phillips screwdriver
• Small (1/8-inch or 3 mm) flat-head (–) screwdriver

Mac Compatibility
• Mac Pro® (5,1, or 7,1 [2019])
• macOS 10.10.5, 10.12.6+
  (not compatible with macOS 10.11)
• macOS Catalina compatible

Windows Compatibility
• Computer with PCIe slots
• Windows 10, 8.1, 7
• Windows Server 2016, 2012, and 2008 (64-bit editions)

Linux Compatibility
• Computer with PCIe slots
• Linux Kernel 5.0+

Thunderbolt Compatibility
• Supports USB 3.1 peripherals when installed in a Thunderbolt 2 or Thunderbolt 3 to PCIe card expansion system
  (not compatible with Thunderbolt 1 to PCIe card expansion system)
• macOS 10.12.6+
• Windows 10 (64-bit Edition Version 1809 or newer)
• Linux Kernel 5.0+

Supported USB Cables
• USB-C 10Gbps
• USB-C 5Gbps
• Thunderbolt 3 (40Gbps); 0.5- or 0.7-meter only
• Thunderbolt 3 (20Gbps)

USB Driver Information
For Mac users, the standard drivers that enable the Fusion card to work in your computer or Thunderbolt expansion chassis are installed as part of macOS 10.10.5, and 10.12.6 and later; the Fusion card is ready to use when you power on your computer.

For Windows users, the drivers that enable the Fusion card to work in your computer running supported versions of Windows except Windows 7 (32- and 64-bit versions) are installed automatically. For Windows 7 users, please go to www.sonnettech.com/support/kb/kb.php, click the Computer Cards link, and then the PCIe Cards link. Locate and click Fusion Dual 2.5-inch SSD RAID link, and then click the Driver link. Locate, download, and install the appropriate drivers. For all other users, update Windows to the latest version to ensure full support and performance.

For Linux users, the drivers that enable the Fusion card to work in your computer running Linux Kernel 5.0 and later are installed automatically; the Fusion card is ready to use when you power on your computer.

> **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 Web site for the latest documentation.
> 1. Go to www.sonnettech.com/support/kb/kb.php
> 2. Click the Computer Cards link.
> 3. Click the PCIe Cards link.
> 4. Click the Fusion Dual 2.5-inch SSD RAID link, and then click the Manual link.
> 5. Click the Fusion Dual 2.5-inch SSD RAID Quick Start 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.

Card Description and Package Contents
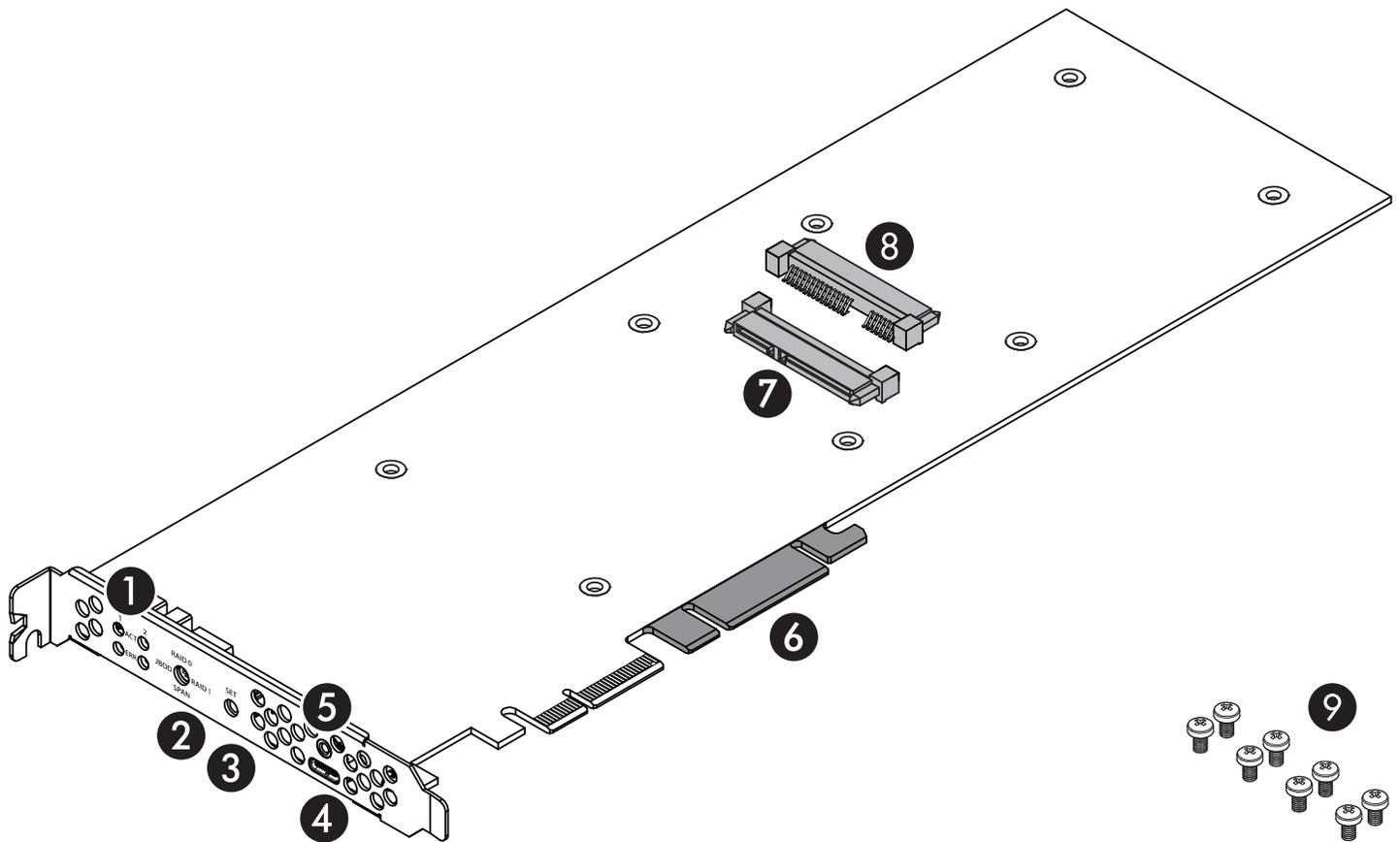
1 – Drive Activity and Error LEDs
The activity (ACT) LEDs indicate the attached drives' read and write activity, while the error (ERR) LED's indicate a fault status.

2 – Drive Mode Selection Switch
Select the drive mode setting using this switch.

3 – Drive Configuration Set Button
This button is mounted behind the front of the PCIe bracket, and is depressed with a paper clip or small screwdriver to set the drive configuration.

4 – USB-C Port
Connect a USB device to this port.

5 – Threaded Nut for ThunderLok 3
When using a Sonnet 0.5- or 0.7-meter Thunderbolt 3 cable to attach a USB-C device, you may use a Sonnet ThunderLok 3 Thunderbolt connector retainer clip to secure the cable to the card (cables and ThunderLoks sold separately).

6 – Slot Support Tabs
In longer PCIe card slots, these tabs provide additional support for the Fusion Dual 2.5-inch SSD RAID card. In some installations, it may be necessary for you to snap off one or more of the tabs to enable the card to fit properly.

7 – Drive Connector 1
Plug in a 2.5-inch SSD or hard disk drive to this connector.

8 – Drive Connector 2
Plug in a 2.5-inch SSD or hard disk drive to this connector.

9 – Drive Mount Screws
Eight screws are provided to attach SSDs to the card.

SSD Installation and Card Installation Steps

Support Notes: When handling computer products, you must take care to prevent components from being damaged by static electricity. Before opening your computer or removing parts from their packages, always ground yourself first by touching a metal part of the computer, such as a port access cover, and work in an area free of static electricity; avoid carpeted areas. Handle all electronic components by their edges, and avoid touching connector traces and component pins.

1. Remove your SSDs from their packaging.

2. Place an SSD on top of the Fusion 2.5-inch SSD RAID card with the SSD's and card's connectors aligned with each other **(Figure 1)**.

3. Push the SSD's connector into the Fusion card's connector until the SSD is completely seated **(Figure 1)**.

4. Holding the SSD firmly against the card, flip the Fusion card over again.

5. Using four of the eight screws provided, secure the SSD to the Fusion card; do not overtighten the screws **(Figure 2)**.

6. Flip the Fusion card over again, and then place the second SSD on top of the card with the SSD's and card's connectors aligned with each other **(Figure 3)**.

7. Push the SSD's connector into the Fusion card's connector until the SSD is completely seated **(Figure 3)**.

8. Holding the SSD firmly against the card, flip the Fusion card over again.
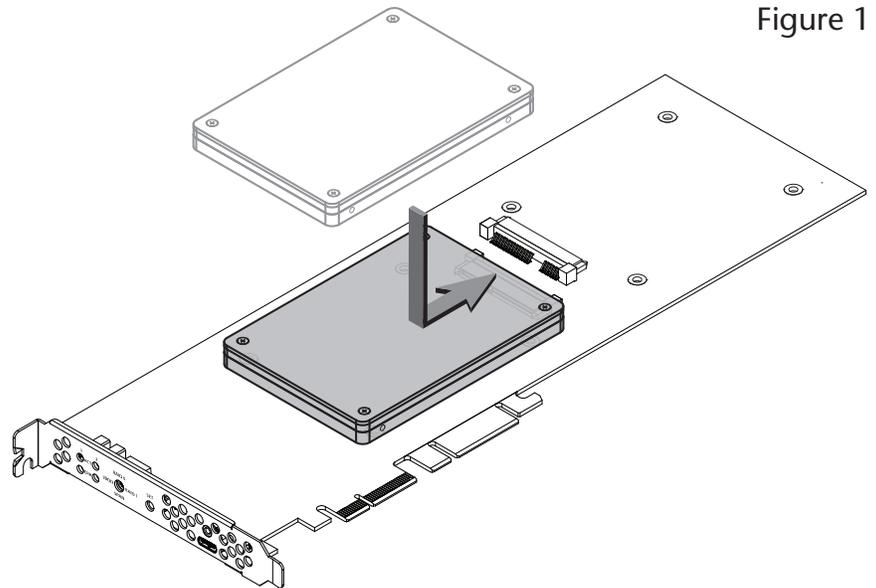
Figure 1
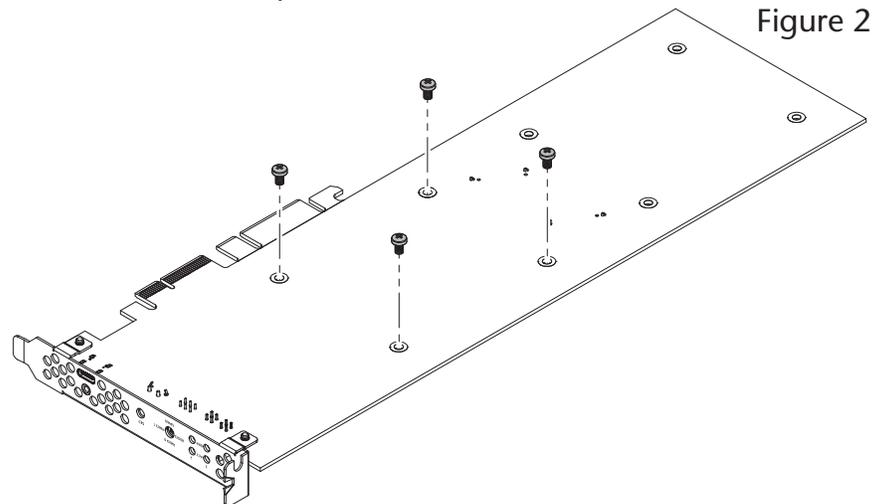
Figure 2
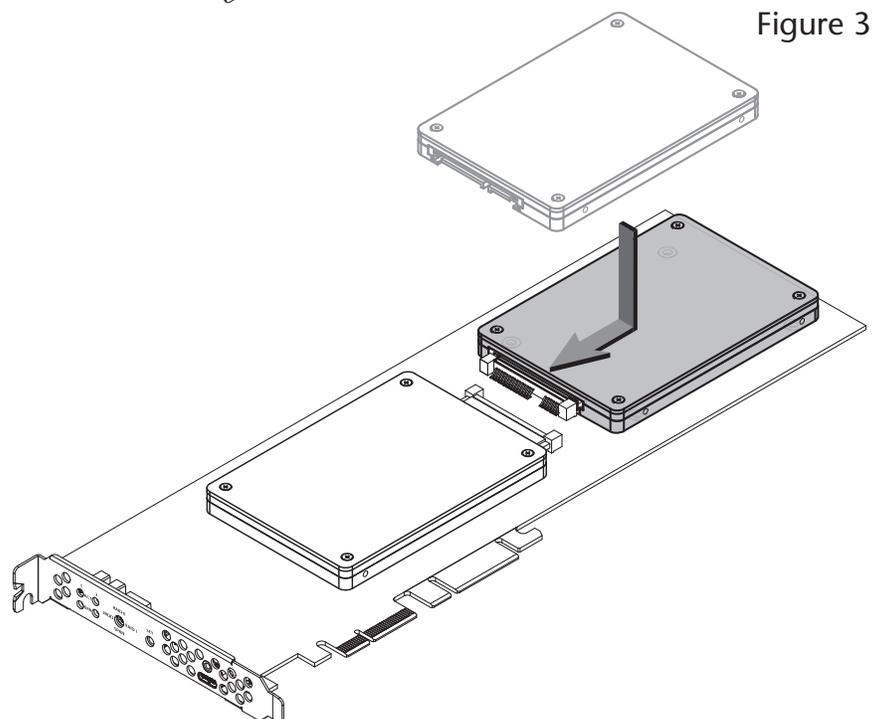
Figure 3

SSD Installation and Card Installation Steps

9. Using the remaining four screws, secure the SSD to the card; do not overtighten the screws **(Figure 4)**.

10. The Fusion Dual 2.5-inch SSD RAID card is ready for installation.

☏ **Support Note:** There is no need for you to change the Drive Mode Selection Switch setting prior to installing the Fusion card in your computer or Thunderbolt expansion system; you may change the switch setting after installing the card into your system.
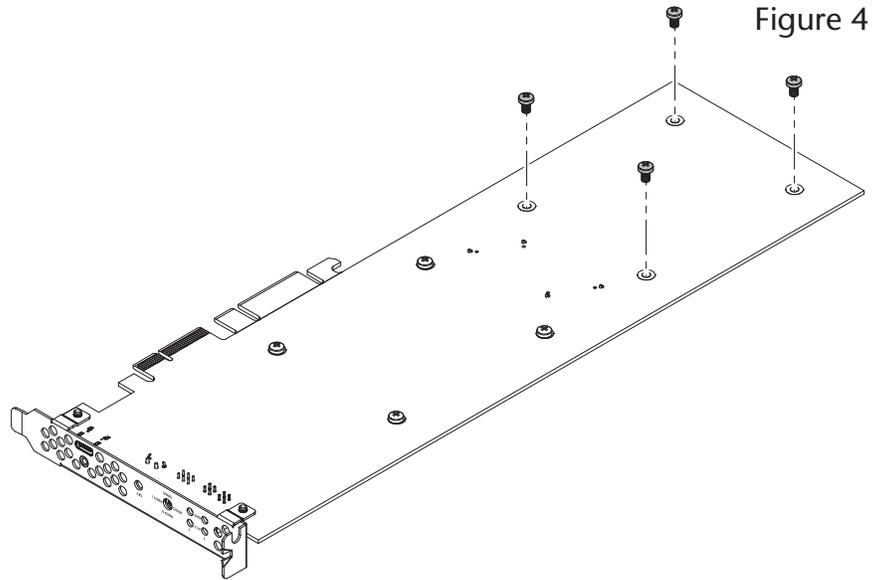
Figure 4

Card Installation Steps for All Users

1. Shut down your computer or expansion chassis, disconnect its power cable, and then open it to access the expansion card area (PCI Express slots); refer to the users manual for specific information.

2. Locate an available PCI Express slot and remove its access cover if necessary:

   • Mac Pro (2019), Mac Pro (Mid 2012), Mac Pro (Mid 2010) users may install the card into any available slot.

   • Windows and Linux computer users should install the card into a PCIe 3.0 slot when available for best performance.

   • Thunderbolt expansion chassis users may install the card into any available slot.

3. Install the Fusion Dual 2.5-inch SSD RAID card with attached SSDs into the slot; **make sure the card is firmly seated and secured (use the computer's PCIe card retaining latch if present)**. If necessary, break off one or more support tabs to allow the card to be installed in your computer or expansion chassis.

4. Close your computer or expansion chassis.

5. Reconnect the computer's or expansion chassis' power cable and other cables if necessary.

Drive Mode Configuration Steps

When you first turn on your system after installing the Fusion card, select a mode to configure the attached drives before using your operating system to format and prepare them for use.

> ⚠️ **WARNING:** Configuring the drives attached to your Fusion card results in them having to be reformatted. **Reformatting the drives will erase any data on them!** If there is any data on them, back it up first before configuring the drives attached to the Fusion card.

1. Using a small flat-head (-) screwdriver, turn the Drive Mode Selection switch to select a mode **(Figure 5)**:

- **RAID 0**: Striping, No Redundancy
  RAID 0 (striping) is best used by applications requiring high performance for non-critical data, with increased performance achieved by simultaneously accessing data across both drives. This increases data transfer rates while reducing average access time by overlapping drive seeks; drives are accessed alternately, as if stacked one on top of the other. **RAID 0 provides no data protection**, but offers the full capacity of the drives. **If one drive fails, all data within that set is lost**.

- **RAID 1**: Mirror of Two Drives
  RAID 1 ensures security by writing the exact same data simultaneously to both drives. Should one drive fail, the data is accessible on the remaining good drive. RAID 1 offers the capacity of one drive.

- **Span**: Concatenation, Volume Spans Both Drives
  Span mode creates a single, large volume that spans both drives, writing files to the capacity of the first drive, and then to the second drive. **Span mode provides no data protection**. Span formatting offers the full capacity of the two drives.

- **IND**: Independant
  IND configuration enables both drives to be available for normal storage operations and accessed individually. IND mode provides no data protection. IND offers the full capacity of each drive.

2. Press and hold the Set button for six seconds (until the ACT and ERR LEDs flash), and then release it; drive configuration is complete **(Figure 5)**. You may now format the drives using your computer's operating system drive formatting application.
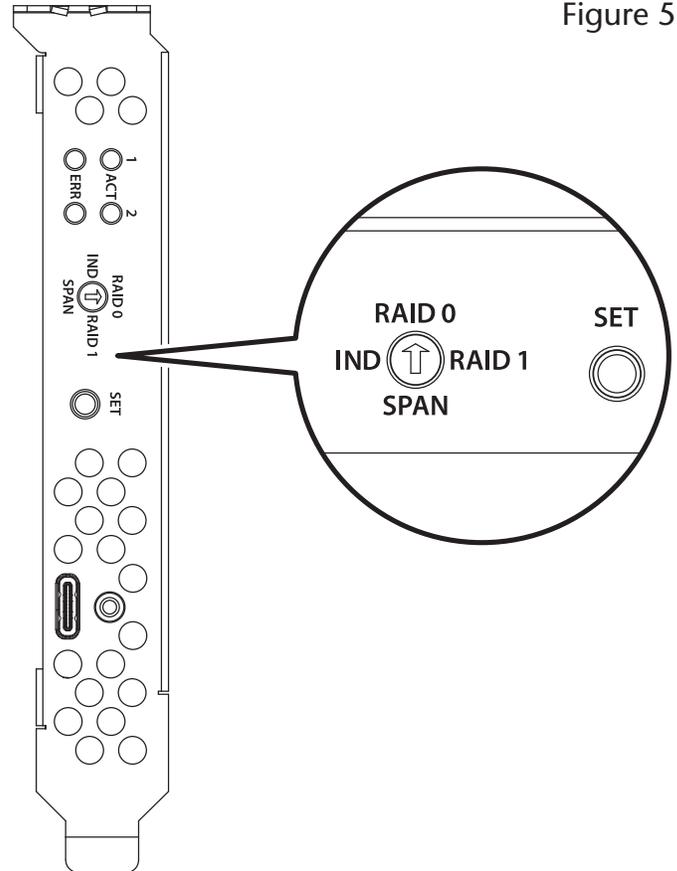
Figure 5

SSD Formatting, USB, and Support Information

Formatting SSDs

Support Note: SSDs attached to the Fusion Dual 2.5-inch SSD RAID card appear to operating systems as external drives. Under macOS, they are identified as USB drives; under Windows, they are identified as SCSI drives.

macOS:
Use Disk Utility (found in the Utilities folder within the Applications folder) to format installed SSDs.

Windows:
To format installed SSDs using Disk Management, you may locate instructions by typing "initialize disk" in Windows Help.

Linux
Use the tools or utilities you would normally use to format internal drives.

Booting From Attached SSDs?
The Fusion Dual 2.5-inch SSD RAID card does not support booting from attached SSDs.

USB-C Port Power
The Fusion card's USB-C port supports USB-C bus-powered SSD, SSD RAID, and hard drive devices with up to 15W (3.0A) power.

Known USB Limitations and Advice—All Users
USB peripherals have some limitations you should be aware of, and we have listed some additional advice here. Refer to the peripheral manufacturers' Web sites for more information.

• USB 3.2 (formerly 3.1) devices come in two varieties, Gen 1, and Gen 2. Gen 1 devices support data transfer speeds up to 5Gbps, while Gen 2 devices (such as this Sonnet adapter card) support data transfer speeds up to 10Gbps.

• The use of USB-C to USB-A cables is supported, but data transfer speeds are limited to the speeds supported by the cable and device.

• The Fusion card's USB-C port does not support Thunderbolt 3 only peripheral devices, even though they use the same connector. If the peripheral device only has the Thunderbolt icon ($\lightning$) next to its port(s), or on the connector of an attached cable, it will not work with the Sonnet card.

• Many peripherals require additional drivers and application software to operate or have full functionality. Software should be included with the device, or available to download from the manufacturer's Web site. Check the peripheral's user's manual for information about necessary software.

• While your computer is on, always "eject" any memory card from the operating system before removing it from an attached card reader, or disconnecting the reader (with the card inserted in it) from its cable or the Sonnet card.

• While your computer is on, always "eject", "stop", "unplug", or "put away" any drive (hard drive, SSD, etc.) before disconnecting it from its cable or the Sonnet card's USB-C port.

• Disconnecting drives while they are transferring or receiving data, may result in damage to the file(s) being transferred or cause your system to hang.

• Although many peripherals may draw power directly from the Sonnet card, other devices require an external power source. Remember to use external power supplies when necessary.

• 1-meter or longer Thunderbolt 3 (40Gbps) cables DO NOT support USB 3.2 Gen 1 (formerly USB 3.0 & 3.1 Gen 1) by design, only Thunderbolt 3 & USB 2.0.

Contacting Customer Service
The Sonnet Web site located at 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 Quick Start 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
• SSD model(s)
• Date and place of purchase
• Computer model
• OS version
• 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 us at:
USA, Canada, or Mexico Customers
Please contact **Sonnet Customer Service** at:
E-mail: support@sonnettech.com
Tel: 1-949-472-2772
(Monday–Friday, 9 a.m.–5 p.m. Pacific Time)

For Customers Outside North America
For support on this product, contact your reseller or local distributor.

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