# FUSION™ RX1600RAID

**Rackmount 16-Drive SATA Storage System with Internal SAS Expanders**

# Drive Enclosure User's Guide

Creativity Stored Here™

# Fusion RX1600RAID Enclosure Specs and Features

Mute Button
Power Switch
SAS Cable Connection Indicators
SES Status Indicator
Power Indicator

Drive Activity (Blue) and Identification/Fault (Red) Indicator LEDs

**Figure 1**

Power Cable Connector
Power Supply Fault Indicator
Power Supply
Fan Module
Fan Fault Indicator
SAS Expander
Fan Module
Fan Fault Indicator

Power Cable Connector
Power Supply Fault Indicator
Power Supply

Secondary/ Expansion Link Mini-SAS Port
Primary Mini-SAS Port
SCSI Enclosure Services Indicator
Secondary/ Expansion Link Mini-SAS Port
Primary Mini-SAS Port
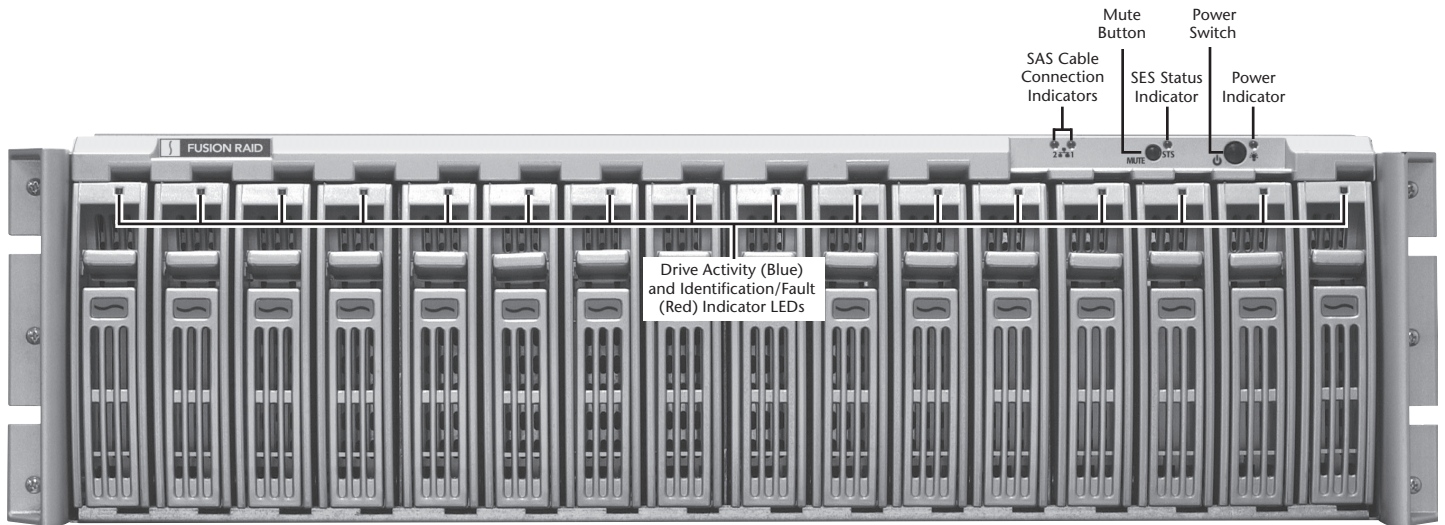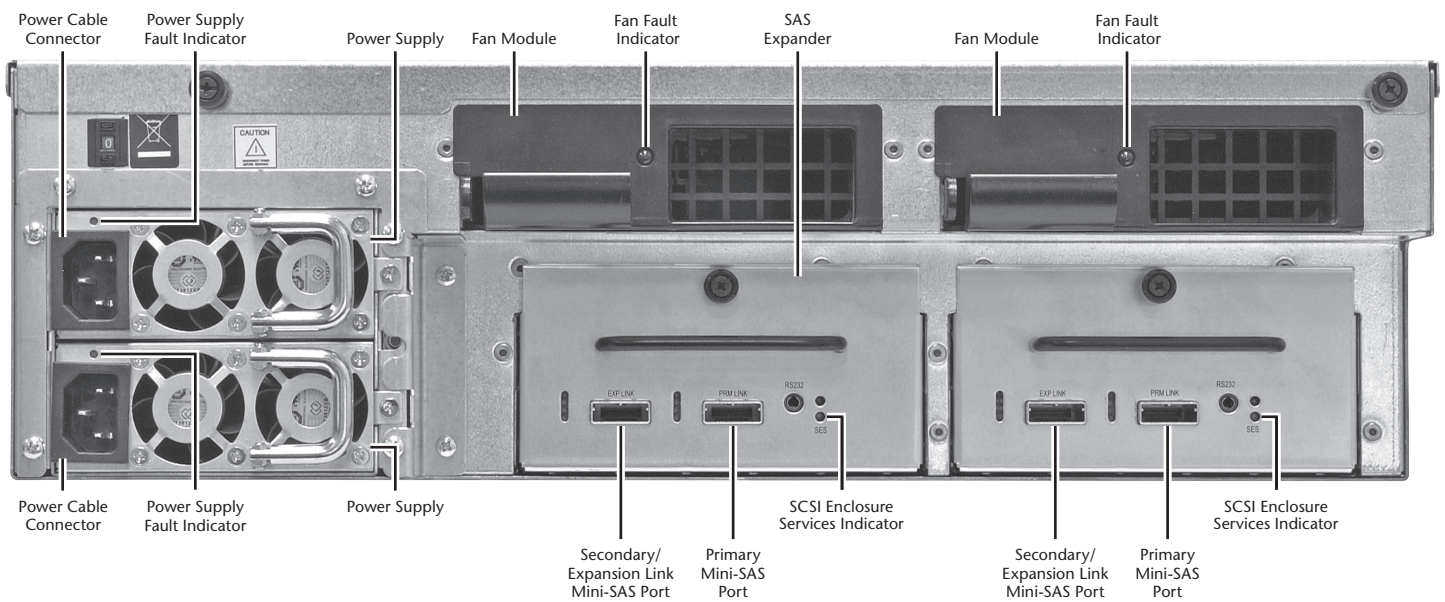SCSI Enclosure Services Indicator

**Figure 2**

## Enclosure Specifications

| | |
|---|---|
| Compatibility | Compatible with Mac, Windows, and Linux computers with a Sonnet RAID controller installed |
| Interface Connectors | 4 x mini-SAS |
| Drives Supported | 1.5, 3, and 6 Gb/s Serial ATA; 3.5" |
| Power Supply | 2 x 350W, 100–260V AC, 50/60Hz |
| Operating Temperature | 41˚ to 104˚ F (5˚ C to 40˚ C) |
| Dimensions (WxDxH) | 17.4 x 21 x 5.2 in (44,2 x 53,3 x 13.2 cm) |
| Weight (approximate) | 59.5 lbs (27 kg) |

# Safety Precautions and Disclaimers

## 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:

• With the exception of the user-swappable parts, do not attempt to disassemble or modify the enclosure. If this device appears to be malfunctioning, contact Sonnet Customer Service.

• Do not drop the enclosure or any of its drive modules; dropping or mishandling of the enclosure or drive modules may result in a malfunction.

• Do not insert your fingers or foreign objects inside the enclosure; take particular care when small children are present.

• 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, switch it off immediately and unplug it from the electrical outlet.

• Follow the instructions in this manual carefully; contact Sonnet Customer Service for additional advice not covered in this User's Guide.
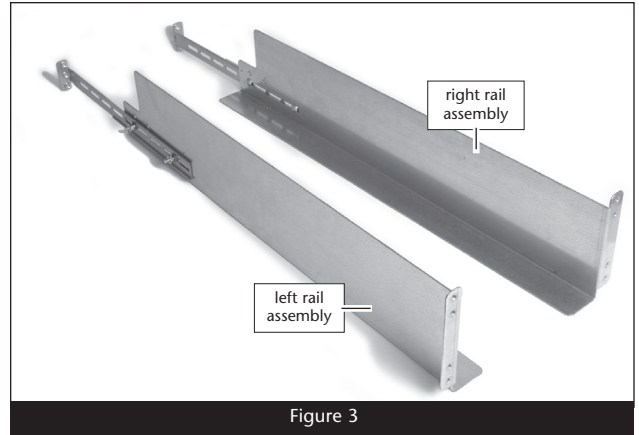
## DISCLAIMERS

**Drive Usage**:

Sonnet Technologies has qualified specific hard drives for use in Fusion RX1600RAID storage systems. These drives were chosen for their superior performance, error handling, and reliability characteristics, especially when used in RAID groups. One important difference between these drives and standard hard drives is how quickly each handles read errors—these qualified drives attempt to recover from errors for just a few seconds, while standard hard drives may take minutes. Because RAID controller cards and software-based RAID schemes allow only a very short time for drives to recover before dropping them from the RAID group, hard drive manufacturers recommend against using standard hard drives in RAID storage systems. The hard drives qualified by Sonnet also feature improved vibration characteristics that influence and support storage reliability. We recommend the use of these Enterprise/RAID edition hard drives and select, Sonnet certified desktop hard drives in your Fusion storage system to ensure system reliability and performance. STANDARD DRIVES MAY NOT BE SUPPORTED AND MAY DEGRADE SYSTEM RELIABILITY AND PERFORMANCE**. Check the Sonnet Web site for the latest list of qualified hard drives**.

# Enclosure Setup

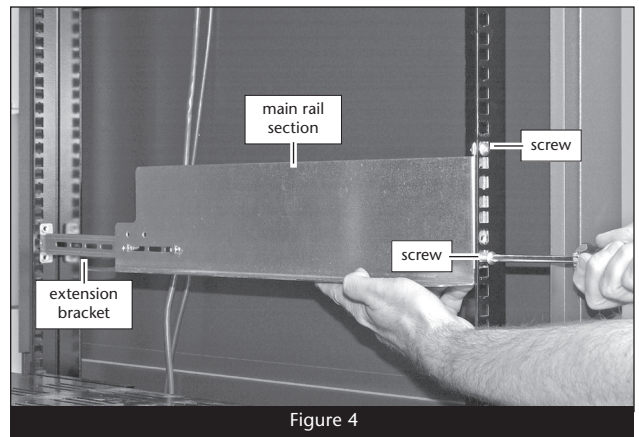## A – Assemble Rail Assemblies & Install Them Into Rack

**1.** Adjusting for the depth of the rack you will install the Fusion storage system, secure an extension bracket to a main rail using two each of the supplied screws, lock washers, flat washers, and nuts (**Figure 3**); **do not overtighten the nuts**. Secure the other extension bracket to the other main rail.



Figure 3

> **Support Notes:** The Fusion rail assemblies are mounted inside the rack rails, not hooked around them.
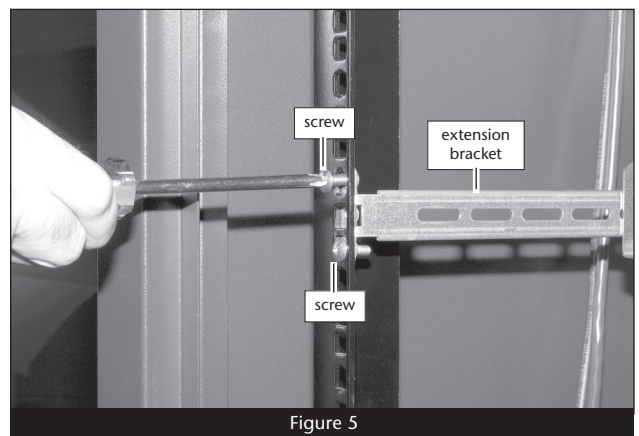>
> There are four mounting holes in the main rail. Use its top and bottom holes to secure the main rail to the rack. The two middle holes are used to secure the Fusion storage system to the rack and rails.

**2.** Using two of the supplied screws, secure the main rail section of a rail assembly to the front of the rack (**Figure 4**); **do not overtighten the screws**.



Figure 4

> **Support Note:** There are three mounting holes in the extension bracket. Depending on the rack's hole pattern, two holes should always be available for securing the extension bracket.
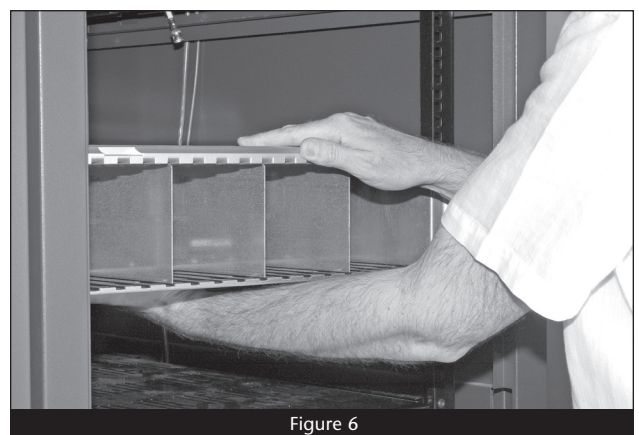
**3.** Using two of the supplied screws, secure the extension bracket section of a rail assembly to the back of the rack (**Figure 5**); **do not overtighten the screws**.

**4.** Repeat steps 2 and 3 for the remaining rail assembly.



Figure 5

> ⚠ **WARNING:** The Fusion RX1600RAID enclosure is heavy without drives installed; do not install the drive modules until after you install the enclosure into the rack.
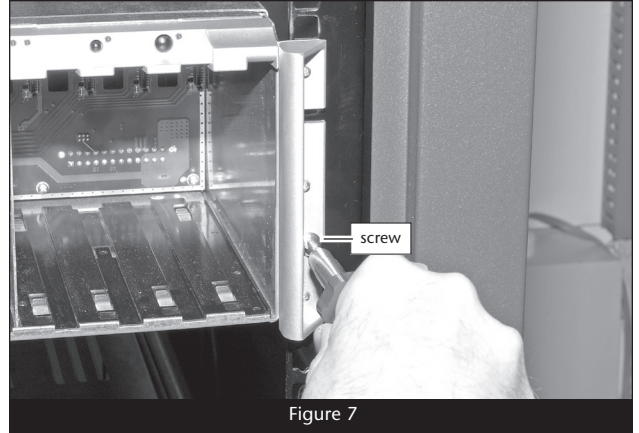
## B - Mount the Drive Enclosure Into Rack

**1.** Holding it level with the rail assemblies, slide the RX1600RAID enclosure into the rack (**Figure 6**).



Figure 6

# Enclosure Setup

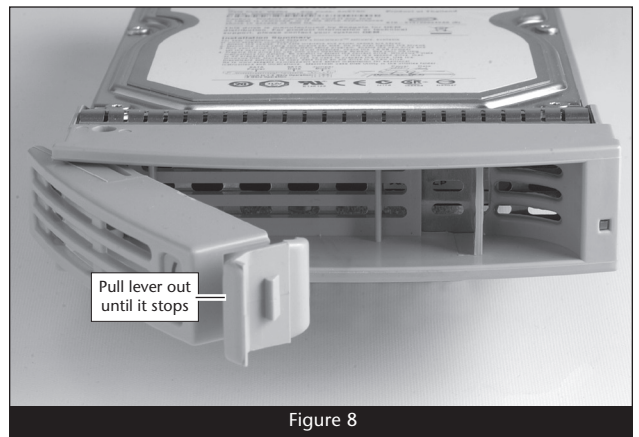2. Using four of the provided rack mounting screws, secure the RX1600RAID enclosure to the rack; **do not overtighten the screws (Figure 7)**.


Figure 7
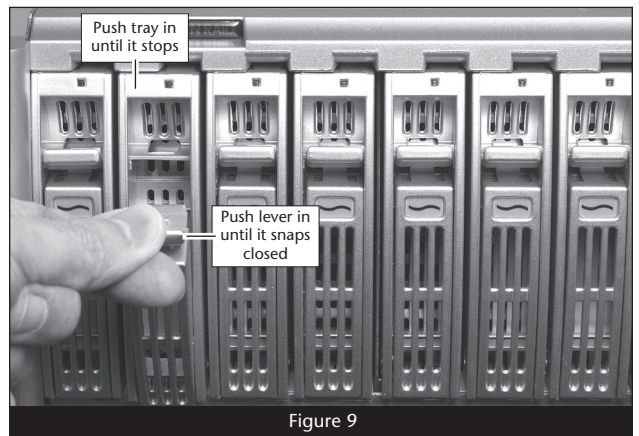
## C - Prepare the Drive Enclosure for Use

⚠️ **WARNING:** When handling computer products, take care to prevent components from being damaged by static electricity; avoid working in carpeted areas. Handle hard drives only by their edges and avoid touching connector traces and component pins.

1. Remove a drive module from its packaging, and then pull out its lever out until it stops **(Figure 8)**.

⚠️ **WARNING:** Before shipping a Fusion RX1600 storage system, Sonnet formats and tests the included drives, and then configures them as a RAID group. The individual drive modules are then removed from the enclosure and labelled with numbers from 1 – 16, and then packaged. **When setting up your Fusion storage system, it is important that you install the drive modules into the enclosure in numbered order, left-to-right**; *if you don't do this, your storage system's performance will suffer.*


Pull lever out until it stops
Figure 8

2. With its lever fully open, carefully slide the drive module into its assigned slot (drive 1 in slot 1, etc.) in the enclosure until it stops, and then secure it by pushing the lever in until it snaps closed. **(Figure 9)**.
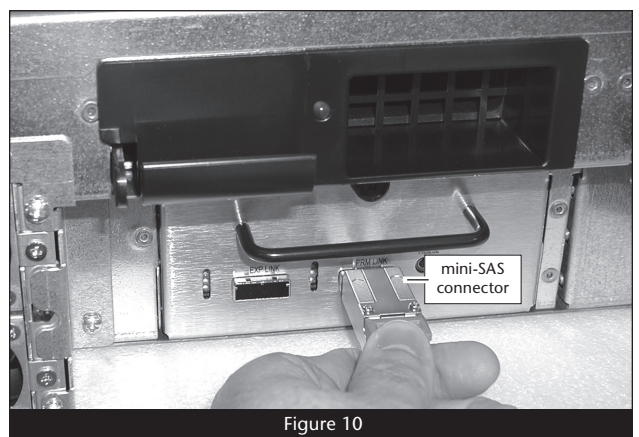
⚠️ **WARNING:** When inserting drive modules into the enclosure, **do not force the levers closed**. If a lever does not close easily, remove and reinsert the module, and then push the lever in again.

3. Repeat steps 1 and 2 for each remaining drive module.


Push tray in until it stops
Push lever in until it snaps closed
Figure 9

## D - Connect the Drive Enclosure to the Sonnet RAID Controller

This section describes the connection of the Fusion RX1600RAID drive enclosure to the Sonnet RAID controller card.

1. Insert one end of each of the supplied data cables to the PRM LINK mini-SAS ports on the enclosure; **verify the connectors are plugged in securely (Figure 10)**.


mini-SAS connector
Figure 10

## Enclosure Setup

**2.** Connect the data cables' remaining connectors to the mini-SAS ports on the Sonnet RAID controller card; **verify the connectors are plugged in securely (Figure 11).**

**3.** Connect the supplied power cables between the Fusion RX1600RAID enclosure and a grounded wall outlet or power strip; **verify the cables are plugged in securely.**

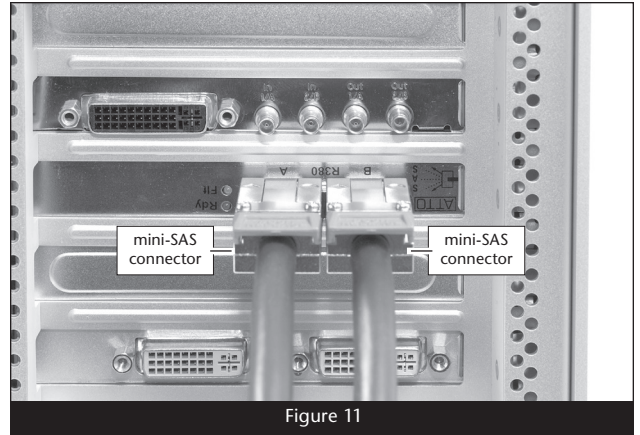**4.** Push the power switch on the front of the enclosure, and then power on your computer.



Figure 11

### How to Connect Fusion RX1600RAID Expansion Systems

This section explains how to connect Fusion RX1600RAID Expansion Systems to your system. Perform all steps listed here with your computer and Fusion storage systems powered off.

**1.** Perform all of the steps from sections A – D with the Fusion RX1600 Expansion system.

**2.** Connect the included mini-SAS to mini-SAS data cables between the expansion (EXP LNK) mini-SAS ports on the Fusion RX1600RAID enclosure the primary (PRM LNK) mini-SAS ports on the RX1600 Expansion system.

**3.** You may additional RX1600 Expansion systems by connecting data cables from one enclosure's expansion ports to another enclosure's primary ports.

# Tips and Additional Information

## Tips

This section covers some common sense tips for using the Fusion RX1600RAID enclosure.

**Connecting Fusion RX1600RAID enclosures to a Sonnet RAID controller other than the one with which it shipped:**
Fusion RX1600RAID enclosures are matched with their included Sonnet RAID controller. When you connect a Fusion RX1600RAID enclosure to a different card, you may have to force them to pair up if the card has not been updated with the latest firmware.

1. Launch the ATTO Configuration Tool. Expand the device tree in the Device Listing section on the left side of the window until ExpressSAS R380 is displayed, and then click ExpressSAS R380.

2. Select RAID Management > Auto Map from the application menu.

**Hot-swapping drives**:
Fusion RX1600RAID supports drive hot-swapping under all operating systems when replacing a faulted drive that is part of a RAID group with parity (RAID 6, RAID 5, RAID 4, DVRAID). Otherwise, drive and volume hot-swapping is only supported for Mac OS X**\*** users, enabling the exchange a drive or a set of drives without having to shut down the computer. This does not mean you can simply pull out a drive at any time; you must follow the procedures below or you may lose data in the process.

• Before removing a drive module, you must put away ("eject", "unmount", "dismount") the drive volume. Simply drag the drive icon associated with the drive(s) you wish to remove to the eject icon on the dock.

• If you remove a drive module from the Fusion RX1600RAID with a drive that was part of a RAID group, you should power off the enclosure before reinserting the module. Once the module is secured, power on the enclosure again; this will ensure that the RAID group will mount properly.

\* Windows and Linux do not provide hot swap support for drives (drive enclosures) connected to a SATA host controller card installed in a desktop PC or server.

**Connections:**
If you experience issues where a drive or volume does not appear on your computer, or you see an error message stating a drive is missing when you have the drives configured as a RAID set, the cause may be as simple as a loose connector, or a drive module that is not fully seated.

• Disconnect the data cables and reconnect them one at a time, making sure each one "clicks" in place at both ends.

• If disconnecting and reconnecting the cables does not resolve the issue, remove and reinsert the drive module.

## Contacting Sonnet Customer Service

### USA Customers
The Sonnet Web site located at www.sonnettech.com has the most current support information and technical updates. Before you call Sonnet Customer Service, please check our Web site for the latest updates and online support files, and check this User's Guide for helpful information. When you call Sonnet Customer Service, have the following information available so our customer service staff can better assist you:

• Product name
• Date and place of purchase
• Hard drive model(s)
• Computer model
• Operating system
• Software/firmware versions

If further assistance is needed, please contact us at:

**Sonnet Customer Service:**
**Online Service Form**: http://serviceform.sonnettech.com
**Tel**: 1-949-472-2772
(Monday–Friday, 7 a.m.–4 p.m. Pacific Time)
**E-mail**: support@sonnettech.com

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