

# FUSION™ D400QR5

4-Drive Serial ATA Disk Enclosure with Quad Interface

## User's Guide



USB 1.1 & Hi-SPEED  
**USB 2.0**  
READY



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# Fusion D400QR5 Specifications and Features

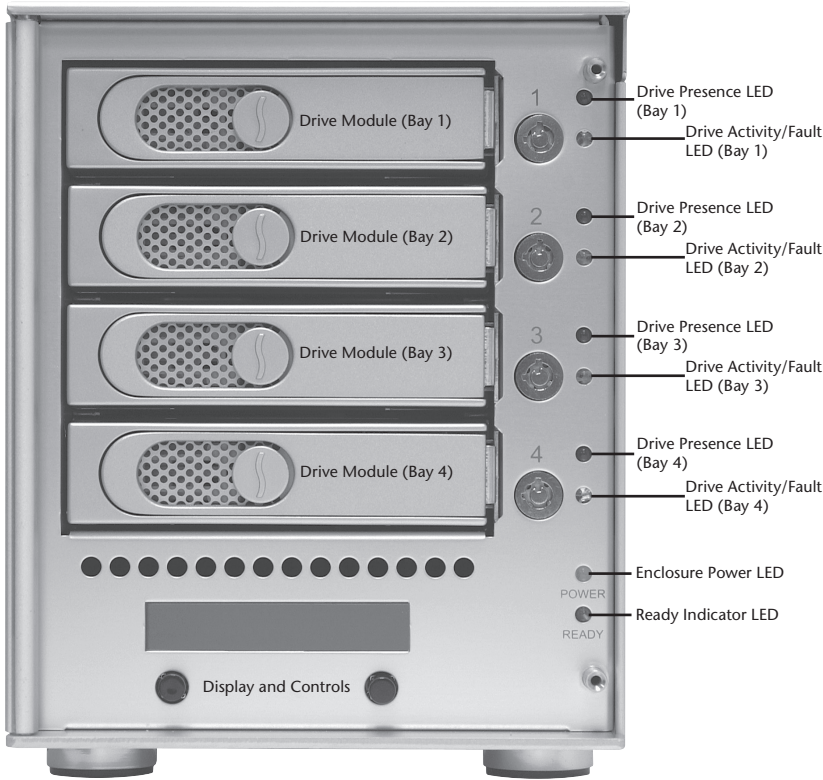


Figure 1

## Enclosure Specifications

Compatibility	Compatible with Mac®, Windows®, and Linux® computers with compatible interface
Interface Connectors	eSATA, 2x FireWire 800, FireWire 400, Mini-USB
Drives Supported	3 & 1.5 Gb/s Serial ATA; 7,200 RPM
Data Transfer Speed	Up to 225MB per second, depending on interface used and configuration
OS Support	Platform independent
Power Supply	110–240V, 50–60Hz
Operating Temperature	32 to 95° F (0° C to +35° C)
Dimensions (WxDxH)	5.9 x 11.25 x 7.5 in (14,9 x 28,5 x 19 cm)
Weight (with drives)	14.7 lbs (9.1 kg)
Package Contents	Disk enclosure, four 3.5" drive modules, drive tray keys, power cord, 2-meter locking eSATA data cable, 2-meter FireWire 800 cable, 2-meter FireWire 400 cable, 2-meter USB cable, User's Guide

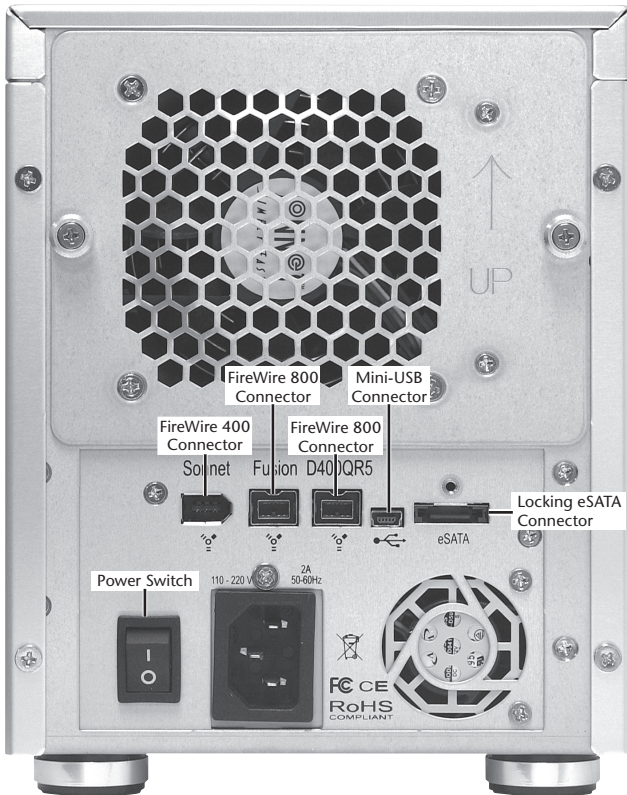


Figure 2

## 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 your reseller or local distributor.
- 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 your reseller or local distributor for additional advice not covered in this User's Guide.

### DISCLAIMERS

#### Drive Usage:

Sonnet Technologies has qualified the hard drives listed below for use in Fusion D400QR5 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.**

#### 500GB Models

- Hitachi Deskstar E7K500, # HDS725050KLA360
- Hitachi Ultrastar A7K1000, # HUA721050KLA330
- Maxtor MaXLine Pro 500, # 7H500FO
- Samsung Spinpoint F RAID, # HE502IJ
- Seagate Barracuda ES, # ST3500630NS
- Seagate Barracuda ES.2, # ST3500320NS<sup>(1)</sup>
- Western Digital RE3 Enterprise, # WD5002ABYS

#### 750GB Models

- Hitachi Ultrastar A7K1000, # HUA721075KLA330
- Samsung Spinpoint F RAID, # HE753LJ
- Seagate Barracuda ES, # ST3750640NS
- Seagate Barracuda ES.2, # ST3750330NS<sup>(1)</sup>
- Western Digital, RE3 Enterprise, # WD7502ABYS

#### 1TB Models

- Hitachi Ultrastar A7K1000, # HUA721010KLA330
- Samsung Spinpoint F RAID, # HE103UJ
- Seagate Barracuda ES.2, # ST31000340NS<sup>(1)</sup>
- Western Digital, RE3 Enterprise, # WD1002FBYS

#### 1.5TB Models

- Seagate Barracuda 7200.11, # ST31500341AS<sup>(2)</sup>

#### 2TB Models


- Western Digital RE4-GP, # WD2002FYPS

(1) Only Seagate ES.2 drives with firmware versions SN06 and newer compatible. Seagate ES.2 drives with firmware versions SN03, SN04, or SN05 are NOT compatible.


(2) Only Seagate Barracuda 7200.11 1.5TB drives with firmware versions SD1B and newer compatible.

## Drive Installation and Enclosure Setup

1. Remove the Fusion disk enclosure and drive modules from their packaging, and place them near the computer to which the enclosure will be connected.

 **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.


2. Take one of the drive modules and push its lever release button in until the lever pops out. (Figure 3).

 **WARNING:** When inserting the drive trays into the enclosure, do not force the lever closed. If the lever does not close easily, remove and reinsert the tray, and then push the lever in again.

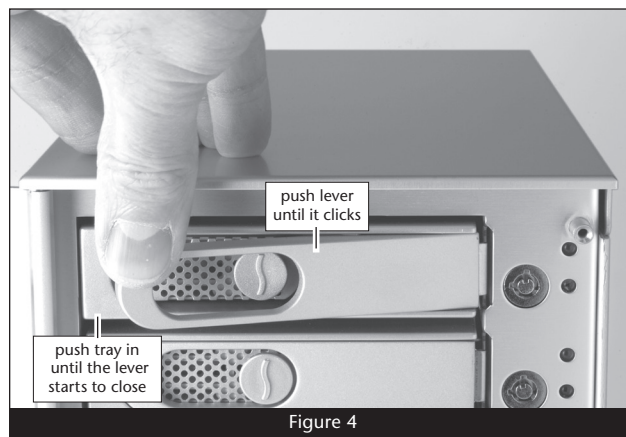
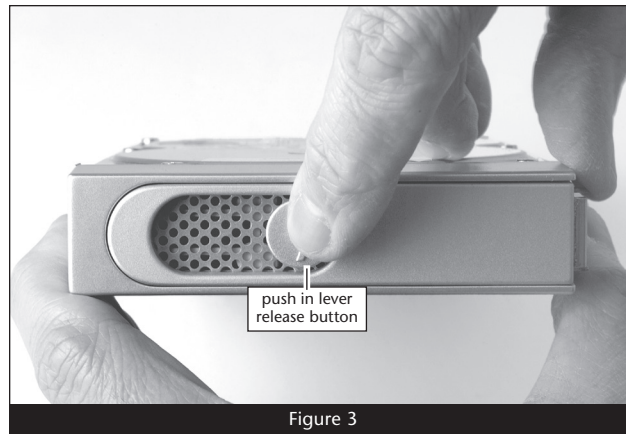
3. Carefully slide the drive module into the enclosure until its lever starts to close, and then push the lever in until it clicks to secure the drive module inside the enclosure (Figure 4).
4. Repeat steps 2-3 for each remaining drive module.

### Connect Fusion D400QR5 to Computer and Power Outlet

1. Using *one* of the supplied cables (eSATA, FireWire 800, FireWire 400, USB), connect the Fusion D400QR5 to your computer. For maximum performance, connect the D400QR5 to a SATA host controller card.

 **Support Note:** The supplied Sonnet locking eSATA cable is compatible with all eSATA ports and provides a far more secure connection when used with Sonnet drive enclosures and host controller cards with the matching connector. If necessary, you may remove the locking mechanism from the connector by removing the screws securing the two halves.

2. Connect the supplied power cable between the Fusion D400QR5 and a grounded wall outlet or power strip; **verify the cable is plugged in securely.**



## Drive Installation and Enclosure Setup

### Change Drive Configuration

The drives included with Fusion D400QR5 are configured as a RAID 5 group and Mac OS Extended-formatted. If you need to change the configuration or set it up for use with an operating system other than Mac OS X, change the configuration of the D400QR5 drives following these steps.



**WARNING:** Reconfiguring the drives in your Fusion D400QR5 enclosure requires you to reformat them. **Reformatting the drives will erase any data on them!** If there is any data on them, back it up before configuring the drives.

1. Power up the Fusion D400QR5 and press the button under *Re-Init?* on the display (Figure 5). If you do not press the button within 10 seconds of powering up the enclosure, a *Halted, Invalid RAID* message appears (Figure 6); shut off the power and then turn it back on again.
2. *Detecting Disks, waiting* appears briefly on the display, followed by *RAID0 4D*. If you want to format your drives as a RAID 0 set, press the button under *Format* on the display, and then skip to step 4. Otherwise, press the button under *Next* (Figure 5).
3. *RAID5 4D* is displayed; if you want to format your drives as a RAID 5 set, press the button under *Format* on the display. If you made a mistake, press the button under *Next* and then under *Quit*; shut off the power, turn it back on again, and then return to step 1 (Figure 5).
4. After you select the RAID mode configuration, *Are you sure?* appears; press the button under *Format* (Figure 5).
5. *Are you sure?, waiting* appears briefly while the drives are configured, and then the main menu appears (Figure 5). You may now format the drives using your computer's operating system drive formatting application; go to page 6.

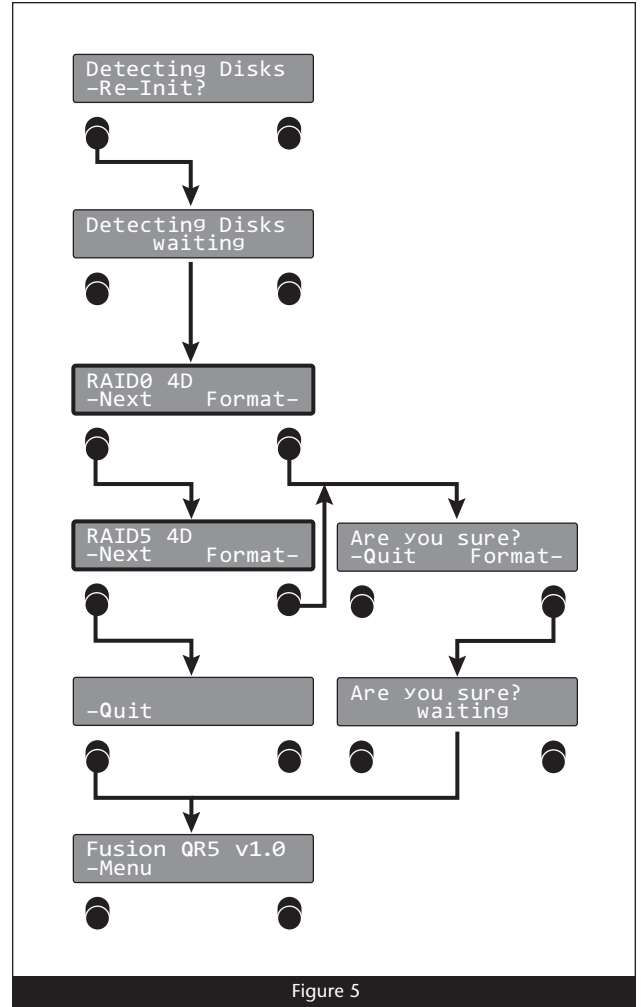


Figure 5

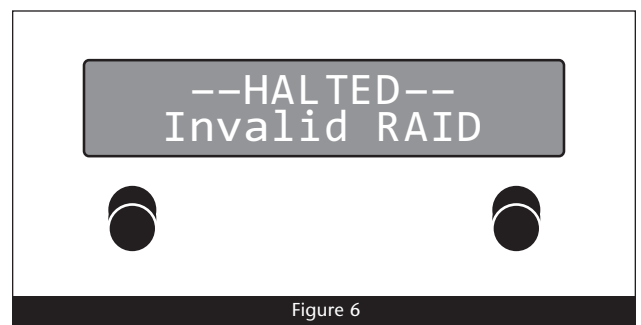


Figure 6

## Operating System Drive Formatting Instructions

### Mac OS Users' Instructions

1. Assuming your computer is turned on, after the Fusion D400QR5 configures the drives, a *Disk Insertion* window will appear stating that there is an unreadable volume; click Initialize, and then Disk Utility will open.
2. In the *Disk Utility* window, the RAID group will appear as a single volume. Select the volume, and then click the Erase tab at the top of the window.
3. Click Erase; a window will appear asking you to approve your choice.
4. Click Erase; the Fusion D400QR5 volume will appear on your computer's desktop.
5. Close Disk Utility; the drive is ready for use.

### Windows 7/Vista/Server 2008 Users' Instructions

1. Select Computer Management From the Windows Start menu. If Computer Management is not available in the Start Menu, select Start > Control Panel > Administrative Tools. In the *Administrative Tools* window, double-click Computer Management.
  2. In the *Computer Management* window, click Storage on the left, and then double-click Disk Management.
  3. When the *Initialize Disk* window appears, select the RAID volume you created. Select the MBR partition style if you need to access your RAID storage from a computer running Windows XP Professional or 32-bit Windows Server 2003; otherwise, select GPT. Click OK.
  4. In the *Disk Management* window, the Fusion D400QR5 RAID group will appear (listed as "unallocated") as a single volume. Right-click where the word "unallocated" appears, and then select New Simple Volume.
  5. When the Welcome to the *New Simple Volume Wizard* window appears, click next to start the process.
  6. Follow the remaining steps to complete the process.
- Note:** *If you do not select the quick format option, this process will take much longer to complete.*
7. When the *Assign Drive Letter or Path* window appears, select Assign the following drive letter, choose a letter, and then click Next.
  8. When the Format Partition window appears, enter a new name for the volume table if you'd like. Select Perform a quick format, and then click Next.
  9. When the next window appears, click Finish.

10. Depending on how you configured the RAID group, it may already be available to the system. Once the RAID group has been formatted and finishes building, it is ready to use.

### Windows XP/Server 2003 Users' Instructions



#### **Support Note for Windows XP Users: Windows XP 32-bit does not support volumes greater than 2TB.**

Windows XP x64, Vista Ultimate/Enterprise, 7 (Professional, Enterprise or Ultimate), and Windows Server 2008 and 2003 support volumes greater than 2TB, but must be formatted using the GPT file system, which is not accessible by Windows XP 32-bit systems.

1. Select Computer Management From the Windows Start menu. If it is not available in the Start Menu, select Start > Settings > Control Panel > Administrative Tools. In the *Administrative Tools* window, double-click Computer Management.
  2. In the *Computer Management* window, click Storage on the left, and then double-click Disk Management.
  3. When the *Initialize and Convert* window appears, click OK.
  4. When the *Select Disks to Initialize* window appears, select the RAID volume(s), and then click Next.
  5. When the next window appears, click Finish.
  6. In the *Disk Management* window, the Fusion D400QR5 RAID group will appear (listed as "unallocated") as a single volume. Right-click where the word "unallocated" appears, and then select New Partition.
  7. When the Welcome to the *New Partition Wizard* window appears, click Next.
  8. When the *Select Partition Type* window appears, select Primary Partition, and then click Next.
  9. When the *Specify Partition Size* window appears, click next.
  10. When the *Assign Drive Letter or Path* window appears, select Assign the following drive letter, choose a letter, and then click Next.
  11. When the Format Partition window appears, enter a new name for the volume table if you'd like. Select Perform a quick format, and then click Next.
  12. When the next window appears, click Finish.
- Note:** *If you do not select the quick format option, this process will take much longer to complete.*
13. Depending on how you configured the RAID group, it may already be available to the system. Once the RAID group has been formatted and finishes building, it is ready to use.

## Menus

### View the RAID Mode

1. Press the button under *Menu* on the display; *RAID Mode* appears (Figure 7).
2. Press the button under *Go* on the display; the RAID mode appears (Figure 7).
3. Press the button under *Quit* on the display to return to the main menu (Figure 7).

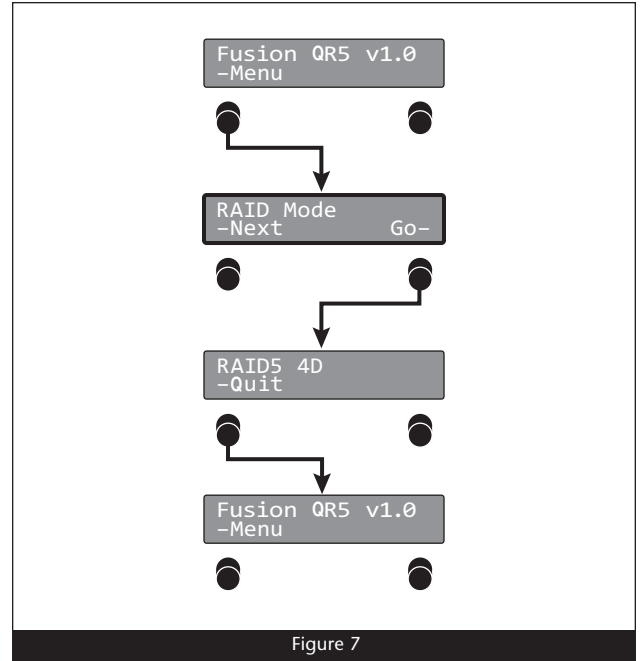


Figure 7

### View the Error Statistics

The Fusion D400QR5 enclosure displays statistics for minor (recoverable) and major (persistent) read/write errors for each of the drives.

1. Press the button under *Menu* twice; *Error Statistics* appears (Figure 8).
2. Press the button under *Go* on the display; *Persistent* appears (Figure 8).
3. Press the button under *Go* on the display to view persistent error statistics; skip to step 5. Otherwise, Press the button under *Next* on the display; *Recoverable* appears (Figure 8).
4. Press the button under *Go* on the display to view recoverable error statistics (Figure 8).
5. *Drive:1 - x* ( $x$  = the number) appears. Note the number of errors, press the button under *Next* on the display for drives 2, 3, and 4, and then press the button under *Quit* to return to the main menu (Figure 8).

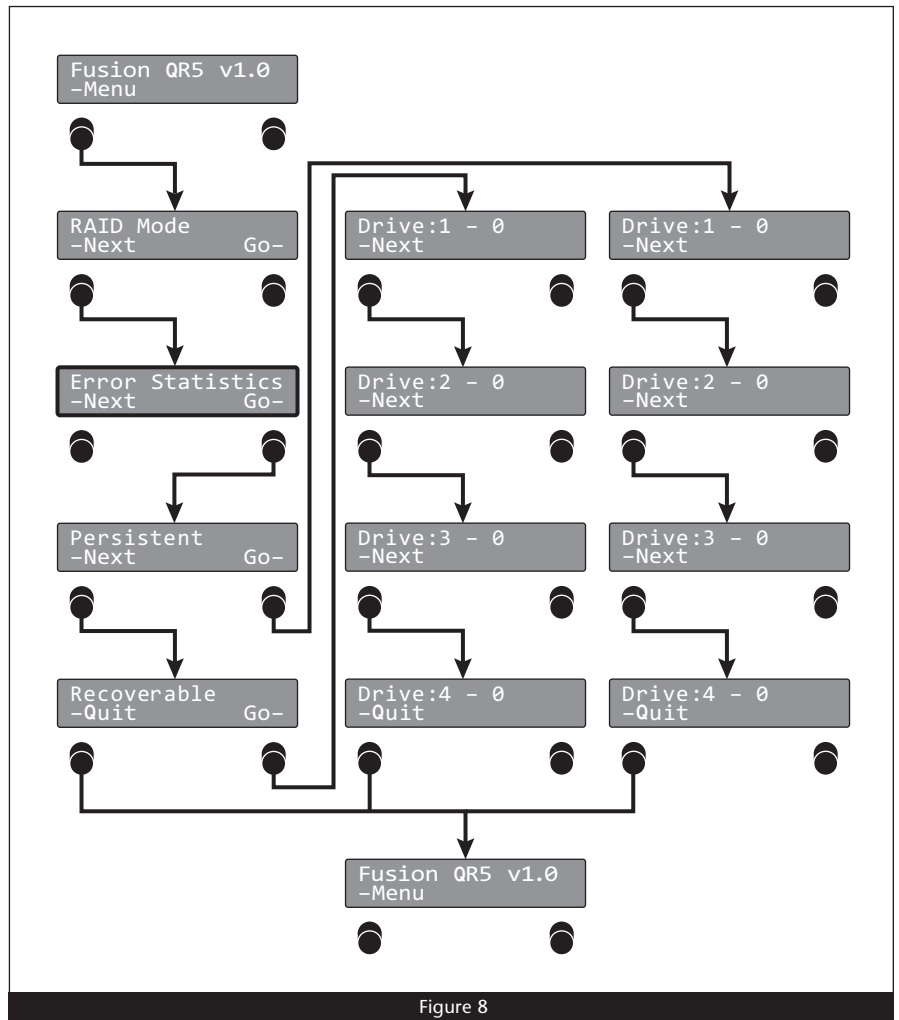


Figure 8



**Support Note:** Minor errors are generally not a cause for concern, but may be used to monitor a drive's health. Major errors generally cause the RAID group to become degraded and possibly require the drive to be replaced. When there is a major problem with a drive, a red fault indicator lights up, accompanied by a message on the display.

## Menus

### View Drive S.M.A.R.T. Status

Self-Monitoring, Analysis and Reporting Technology, or S.M.A.R.T., is a monitoring system for SATA drives to detect and report on various indicators of drive health. The S.M.A.R.T. feature keeps track and reports the status of SATA drive health using certain parameters recorded by the drives. The Fusion D400QR5 displays two possibilities: good, or failing. Drives marked as Failing should be replaced.

1. Press the button under *Menu* three times; *SMART Status* appears (Figure 9).
2. Press the button under *Go* on the display; drive 1 S.M.A.R.T. status is displayed (Figure 9).
3. Press the button under *Next* on the display for drives 2, 3, and 4, and then press the button under *Quit* to return to the main menu (Figure 9).

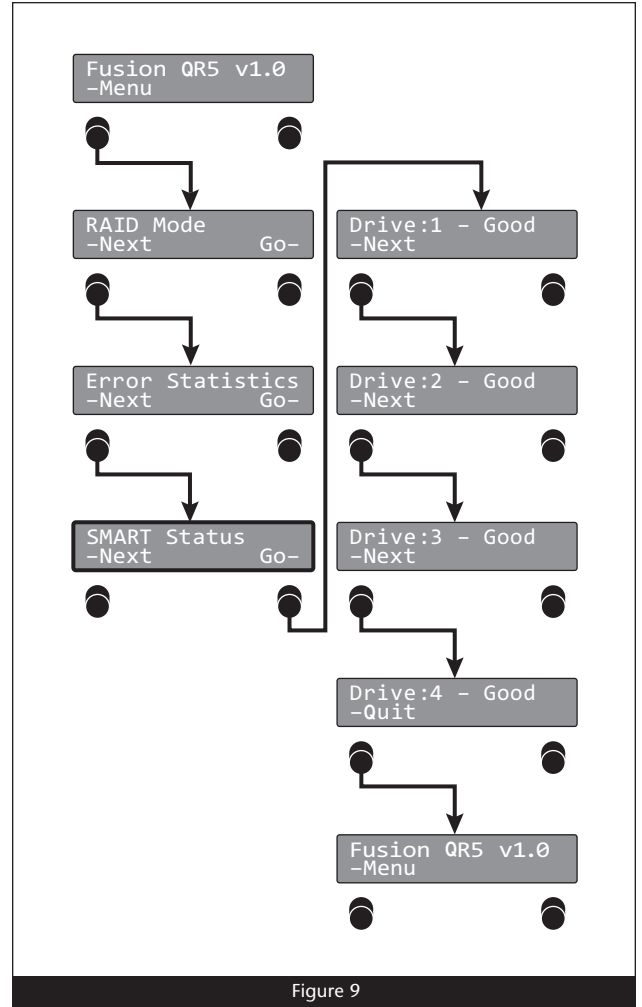


Figure 9



## Menus

### View Drive Temperatures

SATA hard drives monitor their own temperature and report it to the Fusion D400QR5.

1. Press the button under *Menu* four times; *Disk Temp* appears (Figure 10).
2. Press the button under *Go* on the display; *Drive:1* temperature is displayed in degrees celsius (Figure 10).
3. Press the button under *Next* on the display for drives 2, 3, and 4, and then press the button under *Quit* to return to the main menu (Figure 10).



**Support Note:** It is perfectly normal for the temperatures of the drives to vary from one to another within a few degrees.

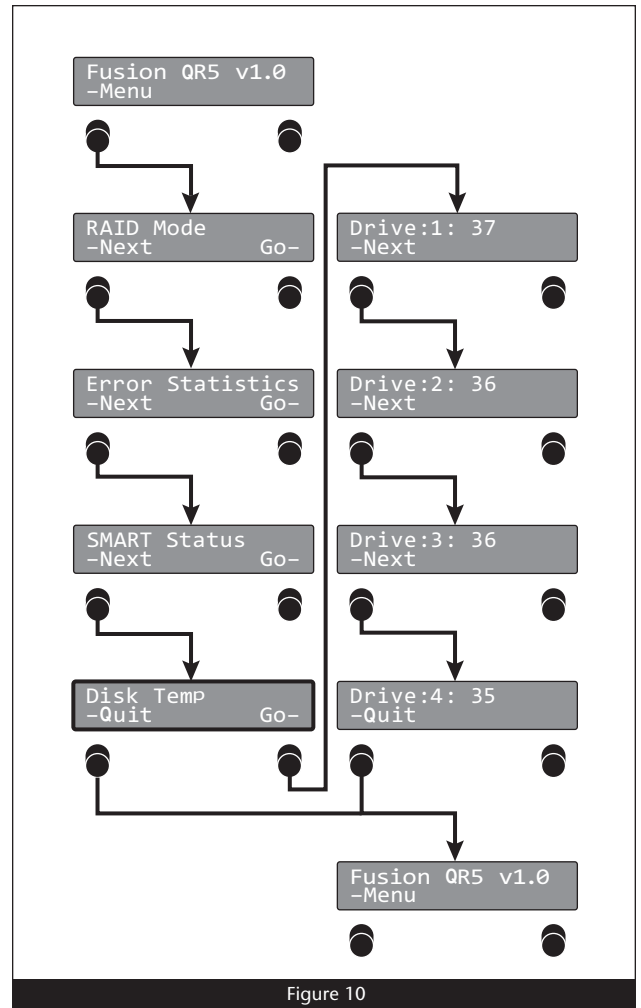


Figure 10

## Tips and Additional Information

This section covers some tips for using the Fusion D400QR5 enclosure.

### Hot-swapping:

**When connected via eSATA data cable to a Mac running Mac OS X, Fusion D400QR5 supports hot-swapping\***, enabling you to exchange a set of drives without having to shut down your computer. This does not mean you can simply pull out the drives at any time; you must follow the procedures below or you may lose data, or cause the system to go into a degraded state in the process.

- Before removing any of the drive modules, 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 (or trash can on the desktop).
- **Power off the enclosure before reinserting the drive modules.** Once the modules are secured, power on the enclosure again; this will ensure that the RAID set will mount properly.

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

### Connections:

- **Fusion D400QR5 supports only one interface at a time.** Do not connect more than one cable at a time between the enclosure and computer; no damage will occur, but only one interface will function.

## Contacting Sonnet Customer Service

### USA Customers

The Sonnet Web site located at [www.sonnettech.com](http://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)

**Fax:** 1-949-457-6349

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

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