

SATA RAID Drive Enclosure

5 Drive 3.5" eSATA to SATA RAID Drive Enclosure

SAT3550ESR

Instruction Manual



Actual product may vary from photo

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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Introduction

Thank you for purchasing a StarTech.com 5 Drive 3.5" eSATA to SATA RAID Drive Enclosure. A cost-effective storage solution, SAT3550ESR provides enhanced data protection, high-performance storage and plug-and-play functionality, making it a simple solution for professional or home users to replicate data and maintain data security.

Features

- Five separate drive bays maximize external storage capacity
- Support for both 2.5" and 3.5" SATA hard drives
- Single rear eSATA interface to host to manage access to each hard drive
- Supports data transfer speeds up to 3 Gbps
- Each hard drive bay is hot swappable
- Dual 80mm internal fans for enhanced hard drive cooling

Before You Begin

System Requirements

- x86 platform: An Intel Pentium 3 500MHz equivalent or faster
- Mac platform: A Mac G4 500MHz or faster
- CD-ROM drive (driver installation)
- 64 MB RAM
- 250 MB of available hard drive space
- SVGA capable monitor
- Mouse/pointing device
- External SATA cable connection between Host computer and SAT3550ESR
- Microsoft Windows 2000/XP/Server 2003 or Mac OS X with latest updates

Package Contents

- | | |
|--------------------------------|--|
| • 1 x External Drive Enclosure | • 1 x Driver/Application CD |
| • 1 x 2m eSATA Cable | • 1 x Power Cord |
| • 1 x Instruction Manual | • 1 x PCI-Express 1x Host RAID Controller Card |
| • 1 x Screw Kit | |

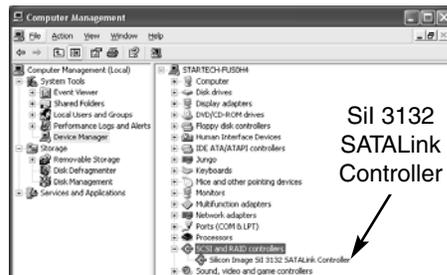
Installation

Host Controller installation

In order to provide a software and hardware link between the host computer and the SAT3550ESR Drive Enclosure, it is required that the included PCI Express Host Controller be installed on the host computer. You may also use another Host Controller, provided it features port multiplier support, however it is not guaranteed that all host controllers with port multiplier support are compatible with the drive enclosure.

1. Insert the Driver CD into your CD/DVD-ROM drive
2. Power down the computer, ensuring the system is unplugged and you are grounded.
3. Remove the cover of your system (see your computer's user manual for details, if necessary) and gently turn your computer onto its side, so that the PCI Express expansion slot on the motherboard is facing upward.
4. Locate an empty PCI Express slot and remove the metal plate that covers the corresponding rear bracket. You may need a Phillips screwdriver to perform this step. Retain the screw! You will need it to secure the card later.
5. Gently insert the card into the empty slot, making sure it is firmly seated.
6. Secure the card to the rear panel, using the screw you removed in Step 3.
7. Power on the computer. Once the operating system is fully booted, insert the Driver CD (included) into the CD/DVD-ROM drive. You will notice several message balloons originating in the taskbar, indicating that the required drivers are being installed for the devices found.

Once the card has been properly installed, you can verify that it is detected by the operating system by browsing to the device manager (i.e. **Start - Control Panel - System - Hardware - Device Manager**):



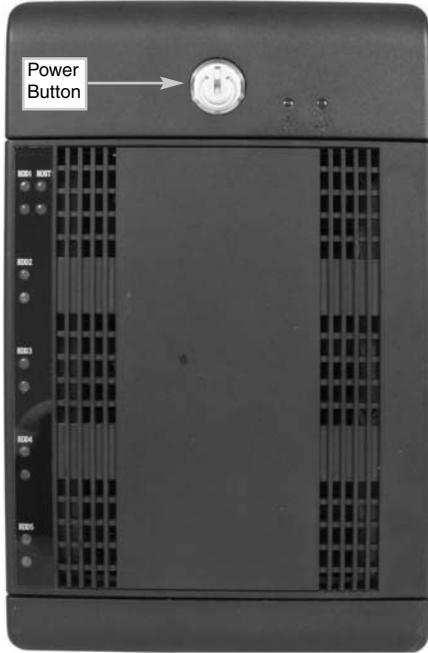
Sil 4726 Manager GUI installation

The Sil 4726 Manager GUI provides a convenient way to manage disks installed within the Drive Enclosure. To install the Sil 4726 Manager GUI:

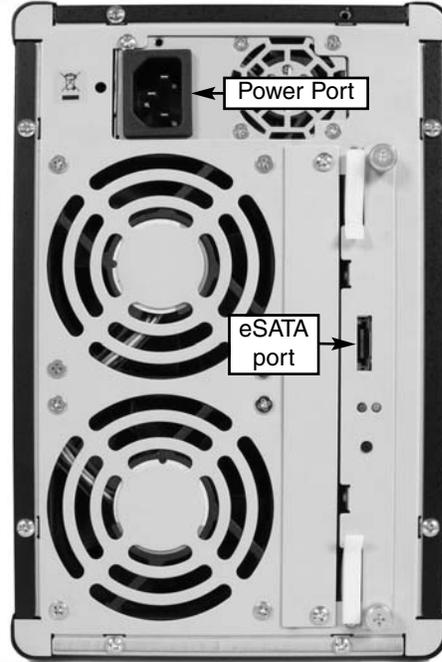
1. Locate the **Setup.exe** file, by browsing to the **BT3045_Manager\Sil_4726_Graphic_User_Interface_V4.0.0.9** subfolder.
2. Double-click on the **Setup.exe** file to begin installation. Follow the on-screen prompts to complete installation.

Hardware Guide

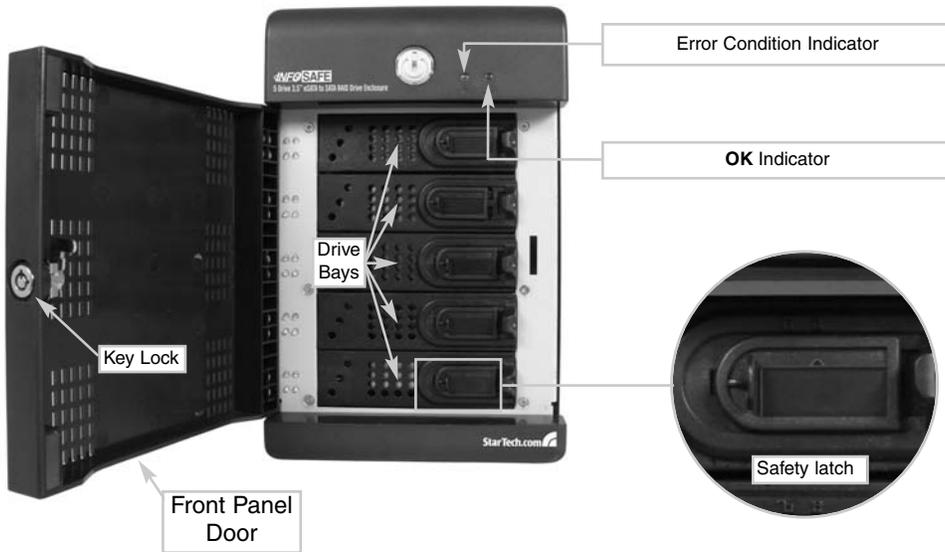
Front Panel (closed)



Rear Panel



Front Panel (open)



Hard drive installation

1. Open the Front Panel Door, exposing the individual Drive Bays.
2. To remove one of the Drive Bays from the enclosure, slide the Safety Latch on the front panel of the bay, to the left. Gently press the cover of the Drive Bay until you hear a click, allowing the Retaining Arm to move freely. Grasp the Retaining Arm and pull the Drive Bay from the enclosure.
3. Align the screwholes provided on the base of the Drive Bay, with the screws provided on the base of the hard drive. Secure the hard drive to the metal base of the Drive Bay removed in step 2, using the included screws as necessary.
4. Once the drive has been secured to the Drive Bay, replace the Drive Bay by gently sliding it into the empty slot, ensuring the Drive Bay is properly resting on the internal guide rails provided. The SATA data and power connectors located on the back of the hard drive should be in direct contact with the connectors located internally at the back of the enclosure.
5. Gently press the Retaining Arm (see step 2) until it locks back in place, now flush with the other drive bays.
6. Slide the Safety Latch to the right, to ensure that the installed drive is not accidentally released from the enclosure.
7. Repeat steps 1-6, for the remaining hard drives you wish to install.
8. Once you have secured each hard drive within the enclosure, close the Front Panel Door. Optionally, you can lock the Front Panel Door in place, using the keys provided, by turning the lock 1/4 turn in a clockwise direction.

Connecting the Drive Enclosure to the computer

To connect the SAT3550ESR Drive Enclosure to the host computer: Connect one end of a standard eSATA cable to the port located on the rear panel of the Drive Enclosure; connect the remaining end of the eSATA cable to the eSATA port provided by the newly installed host controller on the host computer.

To power the SAT3550ESR Drive Enclosure: Connect the female portion of the included power cable to the male power port located on the rear panel of the Drive Enclosure. Connect the remaining end of the power cable to an available power outlet. Press and hold the Power button for three seconds, (located on the front of the Drive Enclosure). Verify that the drives are detected by the operating system (in Windows, for example, browse to My Computer, where the newly attached drives should appear).

Configuration

Introduction

Windows

1. Click on the **Start** button, and select **All Programs**. Click on **Sil 4726 Manager** to launch the configuration program.
2. From the window that opens, you are able to monitor the status of the connected drives:

The screenshot shows the 'Sil 4726 Manager' application window. At the top, it displays 'S/N #252219'. Below this, there are two main data tables. The first table shows system status (Temp, Fan Speed) and drive status (Normal) for drives #0 through #4. The second table shows capacity and policy information for the drives.

	Temp	Fan Speed	Drive #0	Drive #1	Drive #2	Drive #3	Drive #4
Box Status	26 C / 79 F	System + PS	Normal	Normal	Normal	Normal	Normal
Drive S/N			Y48S299E	Y48S23JE	Y48SVLDE	Y48SVLBE	Y48S28DE
Exp. S/N			Y48S299E	Y48S23JE	Y48SVLDE	Y48SVLBE	Y48S28DE

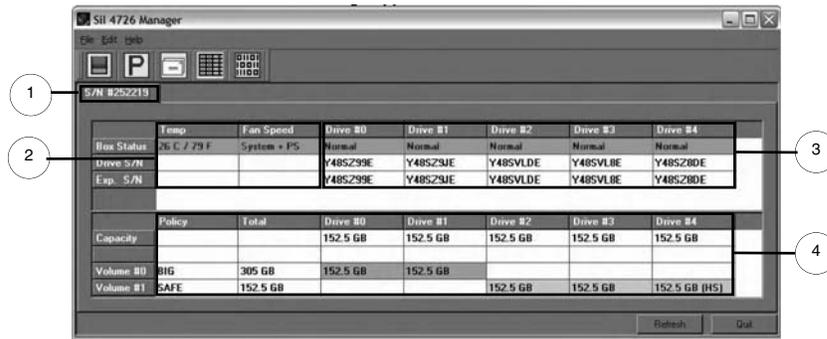
	Policy	Total	Drive #0	Drive #1	Drive #2	Drive #3	Drive #4
Capacity			152.5 GB				
Volume #0	BIG	305 GB	152.5 GB	152.5 GB			
Volume #1	SAFE	152.5 GB			152.5 GB	152.5 GB	152.5 GB (HS)

Mac OS X

1. Launch the **Finder** and locate the Sil 4726 program within the **Applications - Utilities - SteelVine** folder. Click the Sil 4726 icon to start the Sil 4726 Manager. If the launch sequence does not locate an active Daemon, a warning will appear; click **OK** to advance past the warning.
2. You will be asked to enter the administrator password. Once you have done so, click **OK** to proceed.
3. A notice will appear as the launch sequence attempts to start the Daemon. Click **OK**. If the Daemon fails to start, an error message will be displayed. Please follow the recommendations in the error message to correct the problem.
4. The window that will open (Status Window) allows you to monitor the status of the installed drives.

Status Window

The Status Window provides basic information pertaining to the installed drives and their respective configuration:



- 1 Serial Number
- 2 System Status
- 3 Drive Status
- 4 Capacity Information

Elements of the Status window

System Status section

Temp : Indicates the current internal temperature of the SAT3550ESR Drive Enclosure

Fan Speed : Indicates the system fan status. Use this data to monitor possible malfunctions

Drive Status section

Box Status : Indicates the drive status: **Normal, Rebuilding, Unplugged, Needs Rebuild, New Drive, Wrong Slot**

Drive S/N : Shows the unique serial number assigned by the disk manufacturer

Exp. S/N : Shows the expected serial number of the hard disk drive. The Daemon compares the expected and actual drive serial numbers to detect when a drive's status changes.

Capacity Information section

Policy : Shows the storage policy configured for each volume.

Total : Shows the combined capacity of the volume.

Drive # : Shows capacity information for each hard disk.

Capacity : Shows the full amount of storage space (in GB) available on each hard disk.

Volume : Shows the total volume capacity and the drive capacities assigned to each volume.

File Menu

Change Password : Opens a dialog to establish a new password.

Scan Devices : Refreshes the status list details presented on the Status window.

Change Connections : Opens a dialog to establish remote connections.

Edit Menu

Configure Box : Opens the Basic Configuration Wizard. From here, you can access the Advanced Configuration Wizard.

Specify Policy : Opens the Rebuild Policy dialog.

Specify Email Notification : Sends email notification for the selected items.

Event Log : Opens the Event Log viewer.

Specify Firmware : Opens the Firmware Selection dialog.

Toolbar button functions



Configure Box - Opens the Basic Configuration Wizard.



Specify Policy : Opens the Rebuild Policy dialog



Specify Email Notification : Sends email notification for the selected items



Event Log : Opens the Event Log viewer



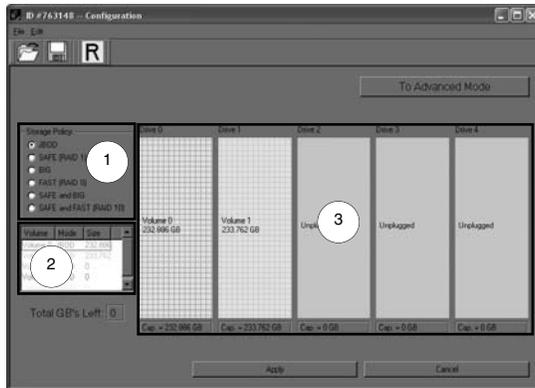
Specify Firmware : Opens the Firmware Selection dialog

Basic Configuration

The following section details the **Basic Configuration Wizard** and explains how to configure volumes (virtual drives).

Basic Configuration Wizard

The SAT3550ESR **Basic Configuration Wizard** is accessible from the Status window and allows volume management. The Wizard defines volumes based on a selected storage policy. An end-user cannot modify volume counts or capacities. To protect against unintentional changes, the SAT3550ESR prompts for a password for first time access of the Wizard. The default password is **admin**. (For additional information on the default password, please see the section entitled **Change Password**.)



- 1 Storage Policy - Identifies available storage policies to assign to the SAT3550ESR configuration.
- 2 Volume List - Shows **Volume**, **Mode** (storage policy) and **Size** details for created volumes. The **total GBs Left** field (beneath the volume list) displays the remaining capacity in GBs, for all installed hard disks.
- 3 Drive Graph - Displays disk space for each hard disk drive. All space allocated to the same volume appears in a matching color. A hatch pattern indicates a proposed configuration and a solid block represents an existing volume. The **Cap** field beneath each drive in the drive graph shows the maximum capacity in GBs for that hard disk.

Toolbar button functions



Read a configuration from a file Reads a saved configuration so the end user can apply the configuration to the SAT3550ESR Drive Enclosure.

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Write configuration from system to a file Saves a configuration to a file on the host computer.



Restore configuration to last commit Cancels proposed changes

Command buttons on the Basic Configuration Wizard

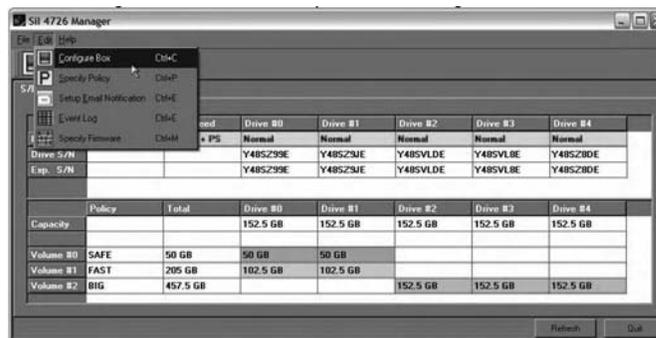
To Advanced Mode : Opens the **Advanced Configuration Wizard**

Apply : Submits configuration changes to the Drive Enclosure, and closes the **Configuration Wizard**.

Cancel : Aborts the changes and closes the **Configuration Wizard**.

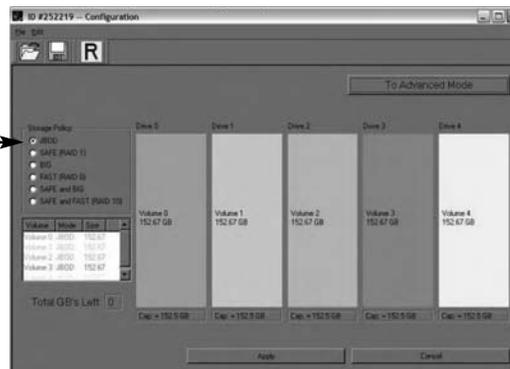
Volume Configuration

1. Select **Configure Box** from the **Edit** menu or click the **Configure Box** toolbar button to open the **Configuration Wizard**.



2. When prompted, enter the administrator password. The default password is **Admin**.

3. Select a storage policy in the **Storage Policy** frame, based on the following definitions:



*****Basic Storage Policy Options:**

JBOD (bypass): Creates a logical volume for each physical hard disk.

SAFE (RAID 1): Creates two volumes. For each volume, one hard disk is mirrored onto a second drive. Makes the remaining drive the Hot Spare for both volumes.

BIG (Span): Concatenates all hard disks into a single volume.

FAST (RAID 0) : Stripes Hard drives to increase storage operation speed.

SAFE and BIG : Concatenates half of the available space on four hard disk drives and mirrors that half to the second half of the available space. Makes the remaining drive the Hot Spare.

SAFE and FAST (RAID 1+0) : Creates one volume consisting of four hard drives (data is written to the mirrored disks in a striped format). Makes the remaining drive the Hot Spare.

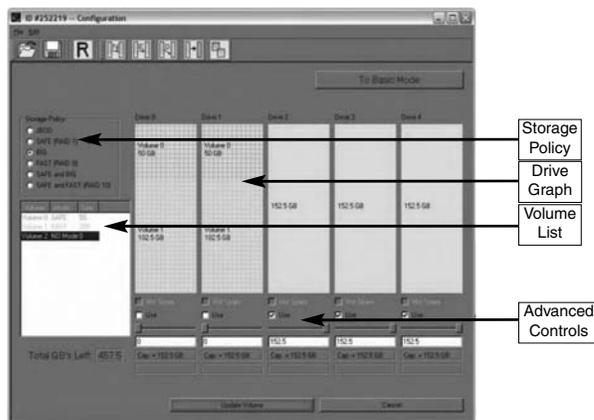
4. When prompted to acknowledge that the configuration change may result in data loss, click **Yes** to accept the configuration.
5. Select **Save to Config File** from the **File** menu to save the configuration.
6. Click **Apply** to create the selected configuration. The **Volume** display will close automatically and the **Status** window will refresh (within a minute or so).
7. Partition the configured volume(s) to complete the implementation. Please refer to the section entitled **Partitioning Configured Volumes** for further information.

Advanced Configuration

The following section details how to use the **Advanced Configuration Wizard** to apply more than one storage policy to volumes in the SAT3550ESR Drive Enclosure.

While the **Basic Configuration** provides six predefined storage policies to quickly configure the Drive Enclosure, the **Advanced Configuration Wizard** allows you to configure up to ten volumes, each with different storage policies and capacities.

The **Advanced Configuration Wizard** is an extension of **Basic** mode that allows you to create two volumes (virtual drives) on each physical hard disk.



Elements of the Advanced Configuration Wizard

Storage Policy : Displays available storage policies that you can assign to volumes. The options are enabled after you create a new volume or select an existing volume to edit.

Volume List : Displays **Volume**, **Mode** (storage policy) and size details for currently configured volumes. Select a volume to edit or delete. The Total GBs left field beneath the volume list displays the remaining capacity in gigabytes for all hard disks.

Drive Graph : Displays disk space for each installed hard disk. All space allocated to the same volume appears in a matching color. A hatch pattern indicates a proposed configuration and a solid block indicates an existing volume.

Advanced Controls : Permit volume creation and modification on each hard disk:

The **Hot Spare** check box indicates space on this drive is allocated as rebuild space for the selected SAFE volume.

The **Use** check box indicates drive membership within a volume.

The **Slider** specifies capacity allocated to a volume.

Text Field displays the capacity specified by manipulating the slider.

The **Cap** field displays the maximum capacity for the hard drive

Vol# shows the virtual volume with which each hard disk drive is associated

Toolbar button functions

	<i>Read a configuration from a file</i>	Reads a saved configuration into the Advanced Configuration Wizard so you can apply the configuration to the Drive Enclosure. Available in Basic and Advanced modes.
	<i>Write system configuration to a file</i>	Saves a configuration to a file on the host computer. Available in Basic and Advanced modes.
	<i>Restore configuration to last Commit</i>	Cancels proposed changes. Available in Basic and Advanced modes.
	<i>Create a new volume</i>	Creates a new volume on which to set the storage policy and capacity. You can create up to 2 volumes on each hard disk drive (10 total).
	<i>Edit selected volume</i>	Permits the storage policy and capacity of an existing volume to be modified.
	<i>Delete selected volume</i>	Deletes the volume that is currently selected in the volume list.
	<i>Delete all volumes</i>	Deletes all configured volumes.
	<i>Copy configuration from other device in the system</i>	Copies the configuration of another SAT3550ESR to the current SAT3550ESR.

Command buttons on the Advanced Configuration Wizard

To Basic Mode : Opens the **Basic Configuration Wizard**.

Update Volume : Applies the selected storage policy to a specific portion of a hard disk, as a proposed configuration.

Cancel : Aborts the pending changes and returns the Wizard to the point where you can perform different advanced configuration functions.

Command buttons on the Advanced Configuration Wizard - Cont'd

Apply : Submits configuration changes to the Drive Enclosure, closes the Wizard, and displays the updated configuration on the **Status** Window.

Cancel : Aborts the in-progress changes and closes the Wizard.

Multiple Volume Configuration

The **Advanced Configuration Wizard** allows many combinations of storage policies and capacities. This procedure shows how to modify a basic SAFE configuration so that it contains several volumes, each with different storage policies. This example illustrates one possible combination that allocates all of the system's available capacity to:

One 50-gigabyte (GB) **SAFE** volume on drives 0 and 1, with no reserved space for a Hot Spare.

One **FAST** volume that uses the remaining capacity on drives 0 and 1.

One **BIG** volume that uses all of the capacity on drives 2, 3, and 4.

The same sequence of steps applies to any configuration you choose to implement; only the storage policy and capacity allocation vary for different configuration options.



NOTE: Before reconfiguring an existing SAT3550ESR Drive Enclosure with a new configuration, backup the data. Use the **Disk Management** utility provided by your OS to delete all partitions - *except* the unallocated, un-initialized disk that represents the SteelVine processor. Once the configuration and partitioning of the new volumes has taken place, it is safe to restore the backed up data to the new configuration. See the section entitled **Partitioning Configured Volumes** for details.

1. Click the **Configure Box** toolbar button to open the **Basic Configuration Wizard**.
2. Click **To Advanced Mode** to open the **Advanced Configuration Wizard**.
3. Select **Delete all volumes** from the toolbar.



Click **Delete All Volumes**

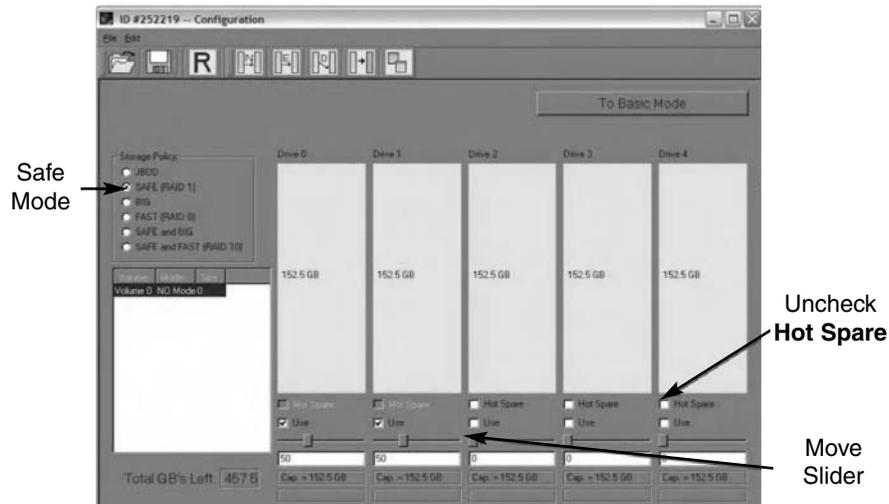
4. When prompted to confirm the deletion of the volumes, click **Yes**.
5. Select **Create a new volume** from the toolbar.



Click **Create a new volume**

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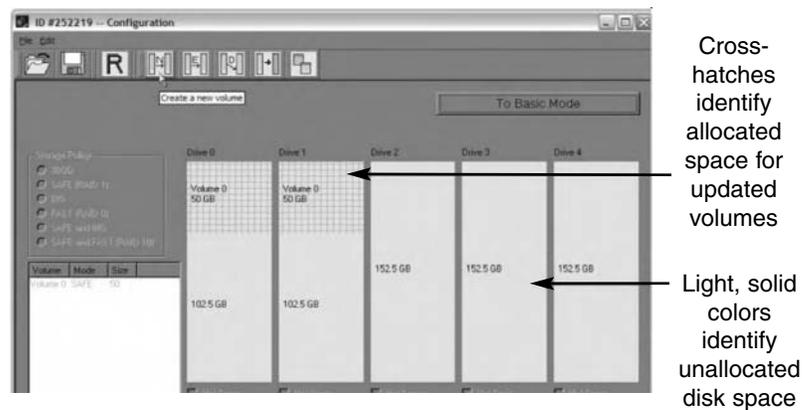
Select **SAFE (RAID1)** as the Storage Policy. Click on the **Use** check boxes underneath Drives 0 and 1. Move the slide to 50.



7. Click **Update Volume**.

8. When prompted whether to create a Hot Spare for the SAFE volume, click **No**. In some configurations, you may want the added redundancy of a Hot Spare. The goal of this example is to use all available system capacity to deliberately avoid the Hot Spare.

9. Click the **Create a New Volume** toolbar button.



10. Select the **FAST** radio button in the Storage Policy section.

11. Select the **Use** check box beneath both Drive 0 and Drive 1.

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12. Move the slider beneath Drive 0 all the way to the right to allocate the remaining capacity on the two drives to the **FAST** volume. If you wish, you can allocate less than the total remaining capacity to the new volume. However, doing so makes the unallocated capacity unavailable and unused.
 13. Click **Update Volume**.
 14. Click the **Create a New Volume** toolbar button.
 15. Select the **BIG** radio button in the **Storage Policy** section.
 16. Select the **Use** check box beneath Drive 2, Drive 3, and Drive 4 to allocate all of the remaining system capacity to the **BIG** volume.
 17. Click **Update Volume**.
- Please note:** Only the last Volume listed (in the above example, Volume 2) can be edited. In order to edit Volume 1, Volume 2 must be deleted. In order to edit Volume 0, all Volumes must be deleted and the end-user will need to start with a New Volume.
18. Click the **Write Configuration for System to a File** toolbar button to save the configuration.
 19. Click **Update Volume** to create the multi-volume configuration, close the Wizard, and will display the volumes in the Status window (within a minute or so):

The screenshot shows the SMI 4726 Manager Status window. It contains several data tables:

Temp	Fan Speed	Drive #0	Drive #1	Drive #2	Drive #3	Drive #4
25 C / 79 F	System = PS	Normal	Normal	Normal	Normal	Normal
Drive S/N		Y485299E	Y485299E	Y485VLDE	Y485VLBE	Y48520DE
Exp. S/N		Y485299E	Y485299E	Y485VLDE	Y485VLBE	Y48520DE

Capacity	Policy	Total	Drive #0	Drive #1	Drive #2	Drive #3	Drive #4
			152.5 GB				
Volume #0	SAFE	50 GB	50 GB	50 GB			
Volume #1	FAST	205 GB	102.5 GB	102.5 GB			
Volume #2	BIG	457.5 GB			152.5 GB	152.5 GB	152.5 GB

11. Partition the configured volumes to complete the implementation. See the section entitled **Partitioning Configured Volumes** for details.

Manage Configuration files

The **Basic Configuration Wizard** provides menus and icons to manage configuration files.

The **Read Config File** command from the **File** menu in the **Basic Configuration Wizard** imports a configuration file so that the end-user can restore a previously saved configuration (storage policy).

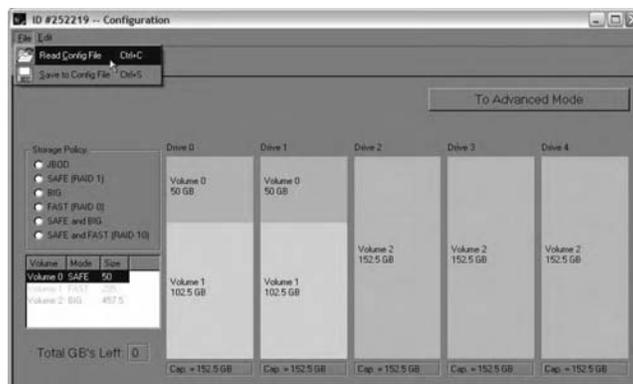
The **Save to Config File** command from the **File** menu in the **Basic Configuration Wizard** exports an SAT3550ESR Drive Enclosure configuration to a file.

Each of the procedures in the **Basic Configuration** chapter prompts you to save a configuration file.

Import a configuration file

Please note: A configuration file must be saved and available, prior to being able to import it. Please see the section entitled **Save a Configuration File** for details.

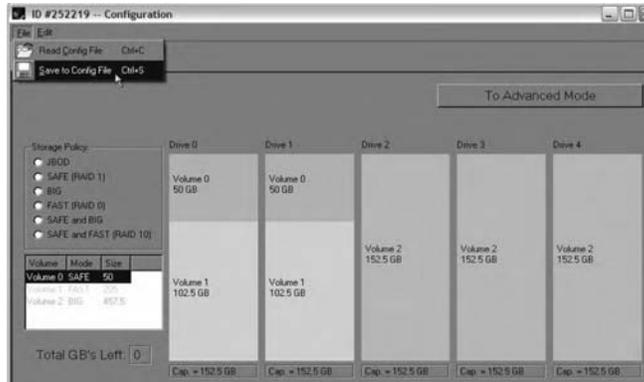
1. Select **Configure Box** from the **Edit** menu or click the **Configure Box** toolbar button in the **Status window** to open the **Basic Configuration Wizard**.
2. Select **Read Config File** from the **File** menu in the **Basic Configuration Wizard**.



3. Navigate to the required file and click **Open** to import it. The **Basic Configuration Wizard** provides notice of a successful import and graphically displays the imported volumes.
4. Click **OK** to implement the imported configuration.

Save a Configuration File

1. Select **Configure Box** from the **Edit** menu or click the **Configure Box** toolbar button in the **Status** window to open the **Basic Configuration Wizard**.
2. Select **Save to Config File** from the **File** menu in the **Basic Configuration Wizard**.



3. Navigate to the appropriate directory, specify a file name in the **File Name** text box, and click the **Save** button.



Partition Configured Volumes

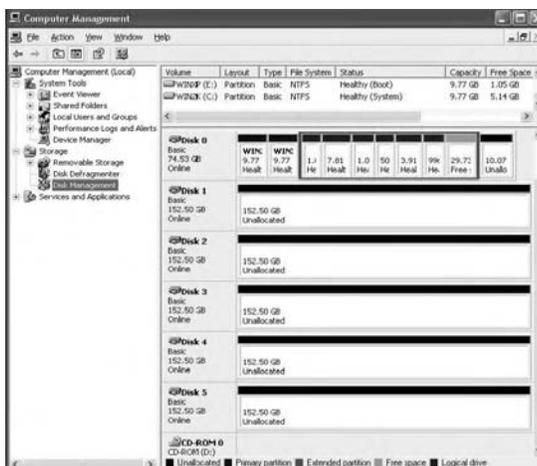
This chapter explains how to partition volumes after configuring them with the Sil 4726 Manager software. The end-user must partition volumes for the host computer's operating system prior to storing data on the volumes. Please refer to the operating system documentation for further guidance.

Windows



Note: Before reconfiguring a volume, back up the data and delete previously defined partitions. *Do not*, however, delete the partition that represents the SteelVine processor (the “Not Initialized” disk with no capacity allocated to it). After the new volumes are configured and partitioned, the backed up data can be restored to the new configuration.

1. Right-click the **My Computer** icon and select **Manage** from the pop-up window.
2. From the **Computer Management** window select **Disk Management** under **Storage** to open **Windows Disk Manager**.



Note: The Disk numbers in the Windows Disk Manager may be different from the Volume numbers shown in the **Sil 4726 Manager Status** window, the **Basic Configuration Wizard**, and the **Advanced Configuration Wizard**. Be sure to select the correct disk based on the expected disk capacity to create a partition.

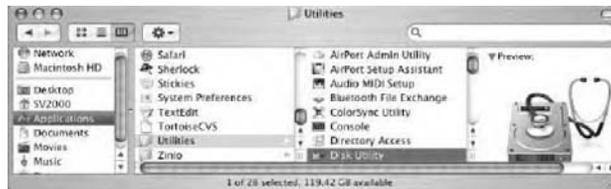
3. Right-click on the configured disk's unallocated space and select **New Partition**. If the **New Partition** option is not available, select the disk and initialize it first. To do this, right-click on the disk item and select **Initialize Disk**.
4. The **Partition Wizard** will launch. Click **Next** to begin.
5. Select the **Primary** or **Extended** option and click **Next**.
6. Specify the partition size. By default, the partition occupies the entire volume. Click **Next** to proceed.

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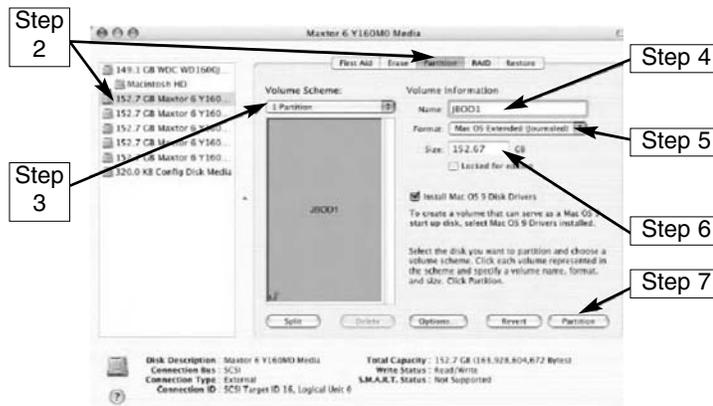
7. Assign a drive letter or mount path and click **Next**.
8. Select the appropriate file system, name the partition and click **Next**.
9. Review the file system settings and click **Finish** to create the logical partition.
10. Repeat steps 1 through 9 to partition any remaining disks you configured in the Sil 4726 Manager software. Remember, **do not** partition the disk that represents the SteelVine processor.

Mac OS X

1. Launch **Disk Utility** from the **Application > Utilities** folder.



2. Select a configured disk and click the **Partition** tab.



3. Select **1 Partition** from the **Volume Scheme** drop-down list.
4. Enter a name for the volume in the **Name** field.
5. Select **Mac OS Extended (journaled)** from the **Format** drop-down list.
6. Specify the size of the partition in the **Size** field.
7. Click the **Partition** button.

8. You will receive a warning that “*Partitioning a disk will destroy all information on the disk*”. Click **Partition** to acknowledge the warning. **Disk Utility** mounts the created partition and represents it with an icon on the desktop. The icon is labeled with the partition name.
9. Repeat steps 1 through 8 to partition any remaining disks you configured in the Sil 4726 Manager software. Remember, **do not** partition the 320.0 KB Config Disk that represents the SteelVine processor.

Administering the SAT3550ESR Drive Enclosure

Change Password

The Sil 4726 Manager software limits configuration access with a password prompt. The password information is stored locally on the server running the Daemon. The default password is **admin**.

1. Select **Change Password** from the **File** menu.



2. Enter the current password (or use **admin** if the default password has not yet been changed).
3. Enter the new password of five or more characters in both fields.
4. Click **OK** to implement the new password.

Managing the Client Connection to the Daemon

The Sil 4726 Manager software consists of two modules, the **Daemon** and the **User Interface**.

The **Daemon** monitors the status of the Drive Enclosure and performs **SAFE** volume rebuilds. By default, the user interface attaches to a Daemon running on the same host to display the information gathered by the Daemon. The interface can be configured to display information tracked by a Daemon running on a remote host. Having the user interface remote to the Daemon allows remote monitoring for system fan and hard disk drive failures. Identification of a failed part allows the necessary repairs or replacement to be made before further complications arise.

Set up a remote connection

Before a remote connection can be established, the following conditions must be true:

- The Daemon is installed and running on a host computer connected to the Drive Enclosure
- The user interface is installed and running on a remote host computer.
- A TCP/IP connection can be established between the Daemon and the user interface. The Daemon listens for connections on TCP port 51115. *Do not change this port number.*

1. In the **Status** window, select **Change Connection** from the **File** menu.
2. Enter the hostname or IP address of the PC hosting the Daemon. Click **OK**. The User Interface will establish the requested connection and will display the information gathered by the remote Daemon in the **Status** window.

Configuring SAFE Volume Rebuild Storage Policy

A rebuild is initiated to restore data redundancy for a SAFE volume that has entered a vulnerable state. In a vulnerable state, one of the two mirrored disks goes offline or is inaccessible. Although the SAFE volume remains available during the rebuild process, the volume is susceptible to data loss through damage of the remaining disk until data redundancy is restored through a rebuild. Host access takes precedence over the rebuild process. If continuing to use the SAFE volume during the rebuild, the rebuild process will take a longer time to complete.

Please note that the Rebuild feature also applies to other SAFE policies such as SAFE and BIG, and SAFE and FAST.

What happens during a rebuild?

The rebuild process restores data redundancy by first utilizing space allocated for a Hot Spare. In case Hot Spare space does not exist or has already been rebuilt, the SteelVine processor rebuilds to empty space on a hard disk, other than the one containing vulnerable data. Following a rebuild, it is not necessary to designate space to a Hot Spare for a subsequent rebuild to occur.

With **Automatic Rebuild** and **Immediate Rebuild** options selected, the Daemon automatically initiates an immediate rebuild. If the end-user wants the Daemon to delay the rebuild until after the first write to the SAFE volume, select the **Rebuild Only If Needed** option. The latter setup allows temporary removal of a hard disk drive without requiring a rebuild. To minimize the possibility of data loss, the rebuild process should be set up to start immediately. With Manual Rebuild selected, the end-user decides when to initiate rebuild following a rebuild prompt. Unless the Sil 4726 Manager and the Drive

Enclosure are actively monitored, the **Automatic Rebuild** should be set up to minimize the possibility of data loss.

Please Note: In case **No** is selected in response to a rebuild prompt, select **Scan Devices** from the **File** menu of the **Status** window to trigger a new prompt.

Please Note: Once the Daemon rebuilds to a designated Hot Spare, a designated Hot Spare will not exist.

Configure a rebuild

1. Select **Specify Policy** from the **Edit** menu of the **Status** window.
2. Select one of the following policy options:
 - The **Manual Rebuild** radio button requires a user to manually initiate a rebuild of the volume
 - The **Automatic Rebuild** option forces the Daemon to initiate the rebuild process automatically and minimize the possibility of data loss.
3. If the **Automatic Rebuild** option is selected, the end-user will have the following additional choices:
 - **Immediate Rebuild** causes the Daemon to rebuild immediately following detection of an offline hard disk drive.
 - **Rebuild Only If Needed** delays the rebuild for a SAFE volume with an offline hard disk drive until the write occurs to the SAFE volume.
4. Click the **Accept** button to commit the selected options.

Email Notification

The Email Notification feature allows an end-user or administrator to have the Sil 4726 Manager send an email if any of the following conditions/situations occur:

- Partition Rebuild Start
- System Fan Too Slow
- Partition Rebuild Complete
- Power Supply FanToo Slow
- Drive Inserted
- Partition Rebuild Resume
- Partition Verify Start
- No Boxes Found
- Partition Verify Complete
- Box Removed
- Drive Unplugged
- Temperature Too High

Each of the above conditions can be customized for sending options as well as the message that is sent. Please see an example of the **Setup Email Notification** screen on the following page.



Setting-up Email Notification

1. The box available for the **SMTP Server Name** can be left blank. The Sil 4726 Manager software will perform a DNS lookup and automatically find the correct address.
2. The box available for the **SMTP Server Port#** uses **Port 25** as a default.
3. The **From**, **To**, and **CC** boxes are for specifying the intended receivers of the condition notifications. **Note:** In the **From:** box, the end-user should type in his/her own email address.
4. Select **Test Email** at the bottom of the screen to verify that you have correctly set-up the email portions of this feature.
5. The **Email Notification** feature also allows an end-user to customize a message for each of the line items (of which each has its own default message already built in). For instance, if the end-user wants to edit the message for **Drive Unplugged...**

a) Click on the **Message** box:



b) The following message will appear:

```

SiI4726: $B
Drive Slot: # $DN
Temperature: $T
System Fan Speed: $SF
Power-Supply Fan Speed: $PSF

The drive was unplugged.
    
```

- c) The message information can be customized to suit the end-user's needs. The Daemon can extract the following data from the Sil 4726 hardware:

\$B - Box Serial Number
\$DS - Drive Serial Number
\$DN - Drive ID [slot #]
\$V - Current Volume
\$T - Current Temperature
\$SF - System Fan OK Flag
\$PSF - Power Supply Fan OK Flag

- d) If there is information that the end-user would like included in the error message, it can be entered by typing in a selected message code listed above.

For instance: to put in the **Box Serial Number**, type in the descriptive text followed by the message code as demonstrated below.

```
SiI4726: $B
Drive Slot: # $DN
Temperature: $T
System Fan Speed: $SF
Power-Supply Fan Speed: $PSF
Box Serial Number: $B

The drive was unplugged.
```

Install New Firmware & Software



Warning: Do not power off or access the Drive Enclosure while upgrading firmware. Please note that this process may take several minutes.

1. Click the **Specify Firmware** toolbar button or select **Specify Firmware** from the **Edit** menu of the **Status** window. The **Firmware Selection** dialog displays all of the SAT3550ESR Drive Enclosures attached to the host, the integrated circuit (IC) revision, and the current firmware installed on each Drive Enclosure (assuming more than one SAT550ESR is in use).
2. Select the Sil 4726 Drive Enclosure that requires a firmware upgrade.
3. Click the **Browse** button next to the **Update Firmware from File** text box, navigate to the new firmware file you wish to load from a CD or hard disk drive, and select the .bin file.
4. Click **Install Firmware** to begin the upgrade.

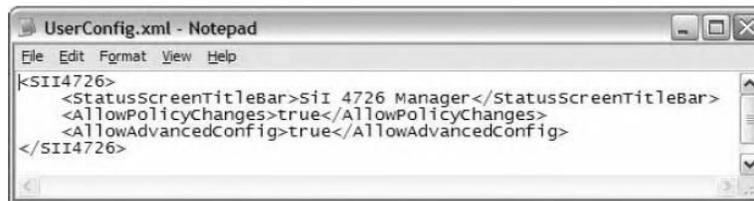
- Click **OK** to dismiss a message box that states the firmware was successfully downloaded.

Editing the UserConfig.xml

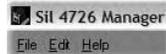
The **UserConfig.xml** file is used to define the **Status Screen Title Bar** and allow configuration of the **Policy Change** as well as the **Advanced Configuration** features. The **UserConfig.xml** file can be found in the following location:

C:\Program Files\Sil4726\Sil 4726 Manager\Sil 4726 Config

To edit this file, **Right Click** on the file name, select **Open With**, and select **Notepad**. Once opened, the following will be displayed:



As an example, to change the **Status Screen Title Bar**:



Change the line that reads:

`<StatusScreenTitleBar>Sil 4726 Manager</StatusScreenTitleBar>`

To:

`<StatusScreenTitleBar>Your Company Name</StatusScreenTitleBar>`

In order to display:



The 'AllowPolicyChanges'—**True**—turns on the **Policy** feature. If the end-user changes the XML tag value to **False**, the Policy Icon will not appear in the GUI and the feature will not be available.

For example:

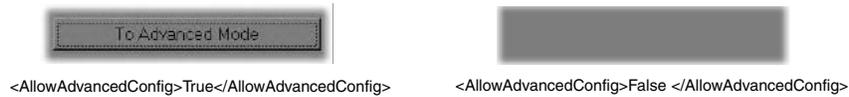


`<AllowPolicyChanges>True</AllowPolicyChanges>`



`<AllowPolicyChanges>False</AllowPolicyChanges>`

The '**AllowAdvancedConfig**'-**True**-turns on the **Advanced Config** feature. If the end-user changes the XML tag value to **False**, the general **Configure** feature will still be available, but the **Advanced** button (inside the **Configuration** feature) will not be available:



Please Note: If the file is missing from the working directory, the GUI will allow both policy changes and advanced mode, as well as the status screen title to be set to "Sil4726". If there are any errors in the XML tag value, the **Advanced Configuration** button will not be available in the **Configuration Setup**.

If there is an error in the XML tag value, a pop-up window will appear, displaying the error and the tag where it can be found.

Creating a Splash Screen

The Drive Enclosure/Sil 4726 Manager software can further be customized by creating a personalized splash screen:

1. Create the logo for your splash screen – there are no image size limitations.
2. Save the logo as '**UserLogo.xpm**' (The .xpm file type is UNIX based)
3. Put the **UserLogo.xpm** file in the following location:

C:\Program Files\Sil4726\Sil 4726 Manager\Sil 4726 Config

The splash screen will come up each time the end-user starts the Sil 4726 Manager software. It will stay up for 2 seconds.

Monitoring and Troubleshooting

Monitoring drive status

The color of the drives in the **Status** window indicates the status of the hard disk drives:

Color	State	Description	Resolution
Green	Normal	Drive is active.	
Red	Needs Rebuild	Drive is in a failed state. That is, a write has occurred to a SAFE volume while the disk drive was offline.	
Gray or Red	Unplugged	Drive is offline or unplugged. The background will appear red after a write to the volume.	Verify the disk is securely in the bay. Otherwise, replace as necessary.
Light Blue	New drive	New drive.	
Yellow	Rebuilding	Drive is being rebuilt.	
Purple	Wrong slot	There is a mismatch between the Serial # and Expected Serial # because a hard disk drive has been installed into the wrong bay.	Install the correct disk drive into the bay.

Monitoring temperature

The following colors indicate temperature status.

Color	Description	Resolution
Green	Temperature is normal.	
Yellow	Temperature is greater than 50°C (122° F).	Remove object(s) that interfere with airflow around the Drive Enclosure
Red	Temperature is greater than 53° C (127° F).	Ensure constant airflow around the Drive Enclosure. If there is no airflow, replace the fan. Identify the drive causing the temperature increase and replace it.

Monitoring fan status

Color	Value	Description	Resoluti
Green	System + PS	Both system and power supply fans are functioning within limits.	
Red	System	The system fan is not spinning or spinning is slower than expected.	Repair required.
Red	PS	The power supply fan is not spinning spinning slower than expected.	
Red	System + PS	Both system and power supply fans are not spinning or spinning slower than expected.	

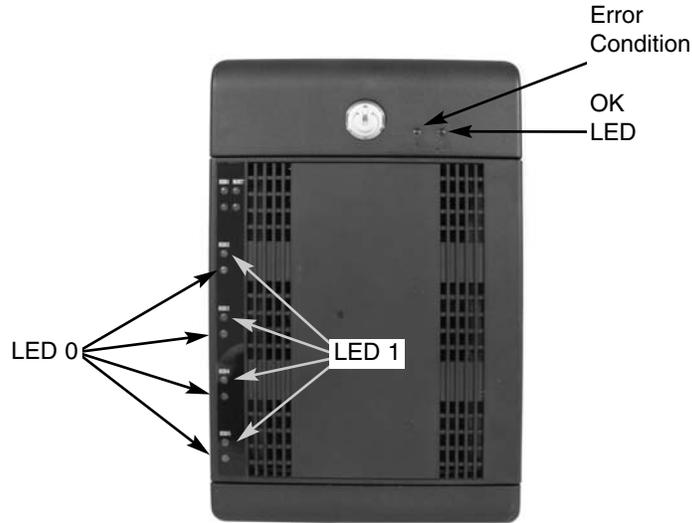
Review Event Logs

Event logs are helpful for troubleshooting and locating a system malfunction.

1. Select **Event Log** from the **Edit** menu in the **Status** window.
2. The **Event Log** screen displays a list of events in a tabular format. The Date column displays the date and time of the event. The **Box SN** and **Drive SN** columns display the respective serial numbers for the event. The **Drive Manufacturer** column displays vendor information. The **Message** column gives an event description.
3. Click **Refresh** to update the log or click **Close** to close the log.

Front Panel LED Indicators

Each disk drive and the host connection have two LEDs to indicate drive status and/or host communication status. **LED 0** is on the left and is typically blue; **LED 1** is on the right and is typically green. In addition, there is one error-condition LED, labeled '!' and the SAT3550ESR power on indicator **OK**.



When SAT3550ESR is powered on, the host scans the disks in sequence, as indicated by a brief flash of lights on **LED 1**. Once the host scan is complete, **LED 1** is lit for each drive present. During disk operations, **LED 0** flashes as data is transferred to and from the drive and the host.

If a **SAFE** volume is being rebuilt, **LED 1** blinks slowly on both mirrored disks.
 Table 15 Status Indicators for 0 and 1 LEDs

LED 0	LED 1	Description
Off	Off	Power on, no device attached
Off	On	PHY communication established (Activity = LED0 On)
On	Blink	Rebuild
Blink	Blink	Error

Status Indicators for ! and OK LEDs

!	OK	Description
Off	On	Startup or ON indication. OK LED will flash during reset and will remain green in all other cases.
On		ERROR. The !LED will light as a result of an EEPROM error during boot or following a runtime error.

Storage Policies Glossary

SAT3550ESR provides the following storage policies, for mapping physical to virtual drives. You can use the **Basic Configuration Wizard** or the **Advanced Configuration Wizard** to choose from these policies. It is important to choose a suitable policy to make the best use of available storage.

JBOD	<p>This storage policy grants the host computer direct access to a physical disk drive. With JBOD (Just a Bunch of Disks), the number of available virtual drives is equal to the number of physical drives. JBOD is also called the bypass mode because the host bypasses the virtualization engine to access the drive directly.</p>
SAFE	<p>This storage policy stores all data in duplicate on separate hard disk drives in order to prevent data loss due to drive failure. At least two hard disk drives mirror each other at all times, equivalent to RAID 1. Every write operation goes to both drives. SAFE provides the highest level of data protection, but halves the amount of storage space because all data must be stored twice.</p> <p>To implement the SAFE storage policy, the Basic Configuration Wizard creates two volumes. Each volume consists of two hard disk drives that mirror each other. The remaining hard disk drive is specified as a Hot Spare for both volumes.</p>
BIG	<p>This storage policy concatenates multiple physical hard disk drives, treating them as one large volume, in turn allowing you to increase logical volume size beyond the capacity of individual hard disk drives.</p> <p>BIG provides the maximum amount of storage space, but no additional data redundancy.</p>
FAST	<p>In the FAST storage policy, I/O processing is balanced evenly to all drives in a method known as striping, equivalent to RAID 0. Striping increases storage operation speed by using several disk drives in parallel, while each portion of data is divided into segments that are written to different disks simultaneously. Striping provides improved performance but does not enhance reliability because there is no way to retrieve or reconstruct data stored on a failed drive. To implement the FAST storage policy, the Basic Configuration Wizard creates a single volume of four hard disk drives in a striped format. The remaining hard disk drive is designated as a standalone volume using the BIG storage policy.</p>

SAFE and BIG	<p>A storage policy in which one-half of the available storage space is concatenated, while the other half mirrors the first half to provide full data redundancy.</p> <p>In the SAFE and BIG storage policy, the Basic Configuration Wizard mirrors the concatenated disks to create a volume consisting of four disk drives, designating the remaining hard disk drive as a Hot Spare.</p>
SAFE and FAST	<p>Also classified as RAID 10 by some industry standards, a storage policy in which an array of stripes is created. Each strip consists of two mirrored drives. SAFE and FAST provide the I/O load balancing features of striping and the added reliability of mirrored data, equivalent to RAID 1+0. Data are written to mirrored disks in a striped format.</p> <p>In the SAFE and FAST storage policy, data is written to mirrored disks in a striped format. The Basic Configuration Wizard creates a virtual drive consisting of four hard disk drives, designating the remaining drive as a Hot Spare.</p>
Volume	<p>One or more hard disk drives are unused during normal operation and are configured to be a spare. If an active drive in a SAFE volume fails, the data on the remaining hard disk drive is duplicated onto the Hot Spare to regain redundancy.</p> <p>All SAFE volumes can have a designated Hot Spare</p>
Hot Spare	<p>A virtual or logical drive comprised of one or more physical hard disk drives. Once you create a volume, the operation system uses and maintains the volume as if it were a single physical disk drive, allowing software to overcome size restrictions imposed by physical disk drives.</p>
Daemon	<p>Component of the Controller Configuration Utility responsible for status tracking and SAFE volume rebuilds.</p>

Specifications

Regulatory Certifications	FCC, CE, UL, RoHS
Bus Type	eSATA
Form Factor	3.5 inch SATA HD Drive bays
Connectors	Enclosure: eSATA 7 pin
LED indicators	One per Drive (presence and activity) Host connection(presence & activity) Fault indication Power indication
Power	Internal 200W Power Supply
Controller Card	eSATA PCI-Express Host RAID card
Maximum Data Transfer Rate	eSATA 3 Gb/s
OS Support	Windows: 98SE (Setup driver CD incl.), ME, 2000, XP, Vista MAC OS X (10.3.or later)
Dimensions	300 x 150 x 230 mm (L W H)
Weight	5 kg

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