



**POPDRIVE
USER'S GUIDE**

VERSION 0.91

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Please check the popdrive.com website to see if there is an updated version of this document prior to reading further.

Table of Contents

I.	PopDrive Features	1
A.	Notes for non-Computer Gurus	1
B.	Notes for Computer Gurus.....	2
C.	Known Issues / Future Software Releases	3
II.	Quick Start Guide	4
A.	Installation Overview	4
B.	Software Installation	4
C.	Inserting the Hard Drives.....	4
D.	Connecting the Data Cable – USB or eSATA?	5
E.	Create the Hard Drive Array.....	6
F.	Verify the Hard Drive Array.....	10
G.	Create and Format the Drive Partition.....	12
III.	Using the SteelVine Manager.....	21
A.	Running the SteelVine Manager.....	21
B.	The SteelVine Interface	24
C.	Basic Configuration	26
Configure Volumes.....	29	
D.	Advanced Configuration.....	33
E.	View Policy Settings.....	34
F.	Rebuilding Drives	35
Start Rebuild	36	
Abort Rebuild.....	36	
G.	Manual Verification.....	36
H.	Scheduled Verification.....	38
Create a New Schedule	38	
Modify/Delete Verification Schedule.....	39	
I.	E-Mail Notifications	39
J.	Pop-Up Error Notification	43
K.	SteelVine Administration.....	44
Changing the Administrative Password.....	44	

Manage Configuration Files	45
Manage the Client Connection to the Daemon	47
Install New Firmware	48
Install New SteelVine Manager Software.....	50
L. Monitoring	51
M. Event Log	53
N. Features not implemented	54
IV. Safely Removing the PopDrive from your Computer	55
When using the USB port	55
When using the eSata port.....	56
V. In Case of Emergency – Don’t Panic.....	57
How to recover from a Hard Drive crash.....	57
Appendix A – Technical Specifications	58
Appendix B – Warranty Information.....	59

I. PopDrive Features

Thank you for purchasing the PopDrive. We created the PopDrive to give you a small, fast, and portable external hard drive that you can safely save your data on. Many people are expanding the data storage on their computers by buying external hard drives. The only problem with that strategy is that 99% of all of the external hard drives out there have the same problem as internal hard drives. Sometimes they crash and the user loses all of their data.

While the PopDrive has a number of great features, the main feature that we believe that you are going to use it for is the safety function of having dual hard drives. When configured and operated correctly, *you should never lose your data, even if a single hard drive fails.*

Here is the short list of features of the PopDrive:

1. The PopDrive holds two Sata hard drives.
2. While the PopDrive is currently sold with either 500Gb or 750Gb hard drives, it is upgradable with any 2.5" Sata hard drive that is no more than 10.5mm high.
3. When configured in RAID1 mode, all data is copied to both hard drives at the same time. The drives will be mirror images of each other.
4. Supports RAID0 and JBOD mode as well.
5. When loaded with two hard drives, it weighs about 21 ounces.
6. The PopDrive has a USB2.0 and eSata port.
7. When operated via eSata, the hard drives are hot-swappable.
8. The PopDrive includes the SteelVine management software package.
9. The SteelVine software is used to configure the PopDrive.
10. The SteelVine software is configured to inform the user of a number of events on the PopDrive including: hard drive failure, connection and removal from the computer, device temperature, and more.
11. When set up, the SteelVine software can send e-mail notices of the events listed above.

A. Notes for non-Computer Gurus

Most non-Computer people will appreciate the fact that the PopDrive will appear as a single hard drive on your computer. This makes it very easy to use. It is important to note that it also operates like any other hard drive as well. If you delete a file from the PopDrive, it will be deleted from both hard drives. Please keep this in mind.

If your goal is to prevent data loss from accidental deletion, we strongly recommend that you implement a backup software program with the PopDrive or consult a computer professional. The safety features of the PopDrive are designed to keep you from losing data in the event of a

hardware failure, not user error. Backup software like Apple's Time Machine or Roxio's Retrospect are designed to protect from the loss of data due to user error. These backup software programs as well as many others are fully compatible with the PopDrive. DHK Storage has chosen to not include backup software with the PopDrive for the following reasons:

- Doing so would unnecessarily raise the cost of the PopDrive. If you already have a backup software package that you like to use, you would be paying for something that you don't need.
- We do not want to limit you to a software package that is bundled with the device. At the popdrive.com store, we offer a number of backup software packages that work well with the PopDrive.
- Backup software is not necessary to take advantage of the hard drive mirroring function of the PopDrive. Please note, backup software is only necessary if you are looking to protect yourself from the accidental deletion of data.

The first time setup of the PopDrive can run as long as 10 – 15 hours depending on the size of your hard drives. Most of this time is spent on the mirroring of the hard drives for the first time. We suggest that you begin the process at night so that you can use the PopDrive the following morning. The first time setup does require a little patience, but the safety that the device provides is worth it.

Last, many non-computer users are not familiar with setting up a mirrored hard drive system. Please read through the Quick Start guide carefully. If you have any questions or are unsure of what you are doing, please go to the popdrive.com website. There are a number of support guides and venues available there.

B. Notes for Computer Gurus

If you are reading this section you are probably very familiar with RAID1 array setups. The quick start guide below should be easy for you to follow. There is nothing out of the ordinary in our process versus any other RAID1 setup you have performed.

The best features of this device that you should implement are the e-mail alerts. If setup correctly, you should be able to receive notices from all of your customer's PopDrives. This will allow you to be informed when the correct PopDrive is attached to the customer computer, when it is removed from the computer, and let you know when a hard drive fails. If you point all of your customer's PopDrives to a single e-mail account, you will be able to manage your customer backups and hard drive arrays better than 99% of your competitors.

In addition, the PopDrive keeps an internal event log. Please see the section, "Event Log" later in this manual for details.

Last, it is important to note the SteelVine management software installs itself both as a system tray program and as a Windows service (daemon).

If you have any questions about the PopDrive, please see the support offerings at the popdrive.com website. We do offer different levels of support for PopDrive resellers. Please see the website for details.

C. Known Issues / Future Software Releases

DHK Storage is aware that the SteelVine manager for the PopDrive is somewhat complicated for the general computer user. We are in the process of developing an easier version of the software that should be released in the summer of 2011. If there is a feature that you would like to see in the future program, please let us know. Our goal is to make the management software as functional and easy to use as possible. Please send your suggestions to features@popdrive.com.

II. Quick Start Guide

A. Installation Overview

In order to get up and running with your PopDrive, here is an overview of the first-time installation of the device:

1. Install the PopDrive Management software onto your computer.
2. Insert the hard drives into the PopDrive.
3. Connect the PopDrive to your computer.
4. Insert the power connector into the PopDrive
5. Build the hard drive array
6. Verify the hard drive array
7. Create the drive partition
8. Format the partition

When the partition has been formatted, the PopDrive will appear like any other hard drive on your system. Please remember that once this is done, even though it will appear as one hard drive, your data will always be copied onto both hard drives at the same time if you set it in RAID1 (SAFE) Mode.

You can always check the status of the hard drive configuration of the PopDrive by running the SteelVine management software.

B. Software Installation

Once you have inserted the CD into your computer, please navigate to the folder matching the operating system of your computer. Inside each folder is an appropriate program to execute that will install all software drivers and management software for the PopDrive.

After installing the software, you must restart your computer before moving on to the next step!

C. Inserting the Hard Drives

In order to open the hard drive doors, use your fingernail to slide the silver latch downwards (towards the opposite side of the door or the hinge).

Once the door is open, slide the hard drive in until it rests on its own. Do not force or push the hard drive into place. Tilt the PopDrive drive vertically so that the hard drives fall to their natural resting point. When the hard drive is resting in place, close the door. As you close the door, the hard drive will automatically slide into the proper location and attach to the internal connector.

When the door is nearly closed, you should encounter a small amount of resistance and then click when complete.

Please use the following picture to make sure that you have put the hard drives in correctly.



When the door hinge is on the right, the hard drive label side should be facing up. If you attempt to install the drives upside down, the PopDrive doors will not close.

D. Connecting the Data Cable – USB or eSATA?

On the back of the PopDrive, there are two data ports, one is USB2.0 and the other is eSata. There are a number of differences between the two. The USB port runs at 480Mb/s and is one of the most common data ports available on computers today. If you don't have an eSata port on your computer, you should plug the PopDrive into the USB port.

WARNING - It is very important that you do not disconnect the PopDrive from your computer without safely removing it from your computer when using the USB cable. Not following this step can potentially cause damage to the data on your PopDrive. There are a few ways to safely remove the PopDrive. Please see the section in this manual titled "Safely Removing the PopDrive from your Computer".

There are some big advantages for using the eSata port if you have one on your computer. If you don't have one, please go to the popdrive.com website to find a compatible eSata card for your computer.

The best feature of eSata is speed. An eSata port runs at 3Gb/s. In addition, when using the eSata cable, the hard drives are hot-swappable. This means that you can remove an unused or bad hard drive while the PopDrive is connected to the computer. You can also add a new hard drive while

the PopDrive is connected as well. Please remember, this only applies when you have connected the PopDrive to your computer with an eSata Cable.

WARNING – DO NOT CONNECT AN ESATA AND USB CABLE TO THE POPDRIVE AND YOUR COMPUTER AT THE SAME TIME. DOING SO RISKS DAMMAGING THE DATA ON THE POPDRIVE AND YOUR COMPUTER.

E. Create the Hard Drive Array

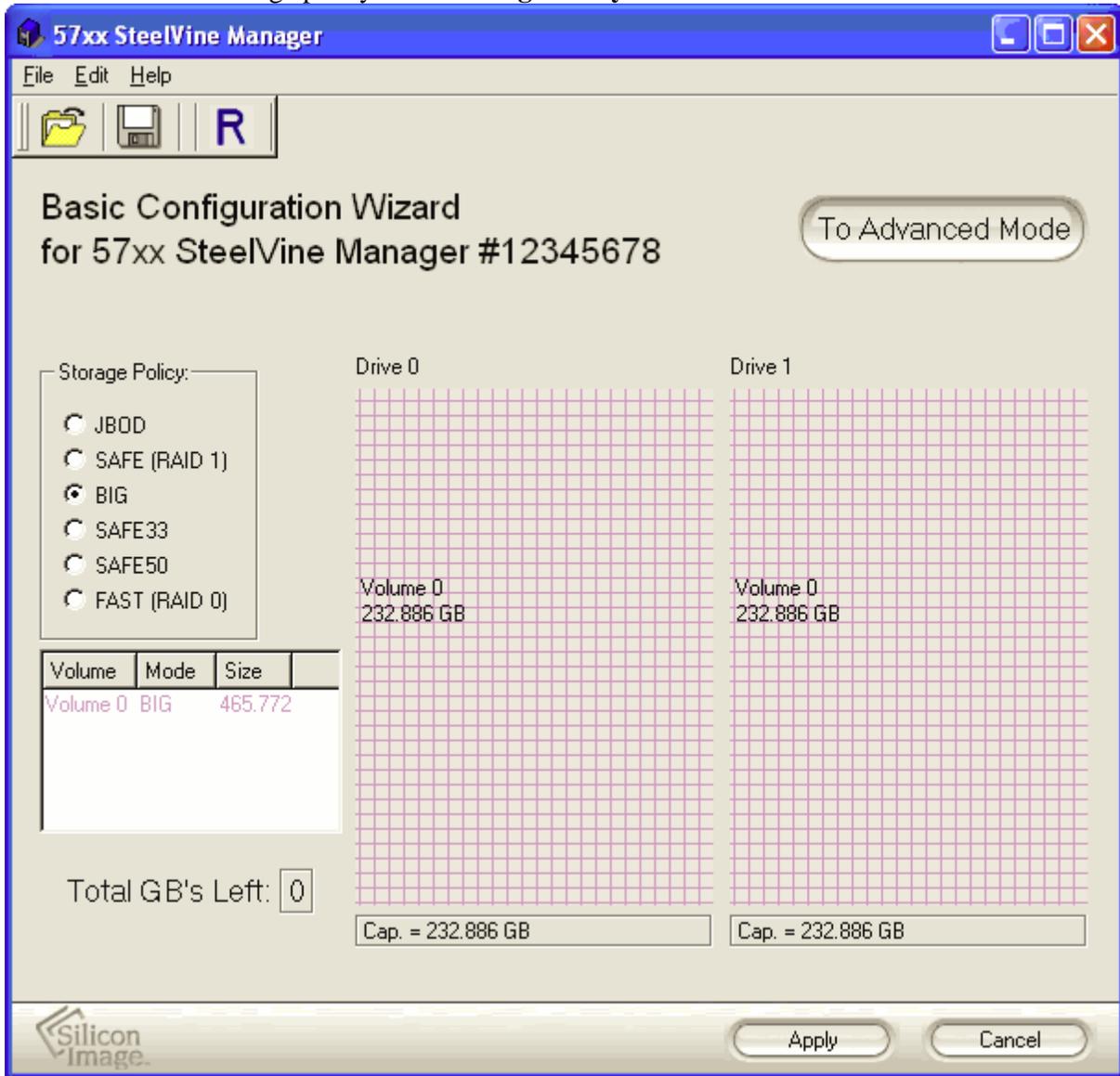
1. Select **Configure Box** from the Edit menu or click the **Configure Box** toolbar button to open the Basic Configuration Wizard.



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



3. Select a storage policy in the **Storage Policy** frame.

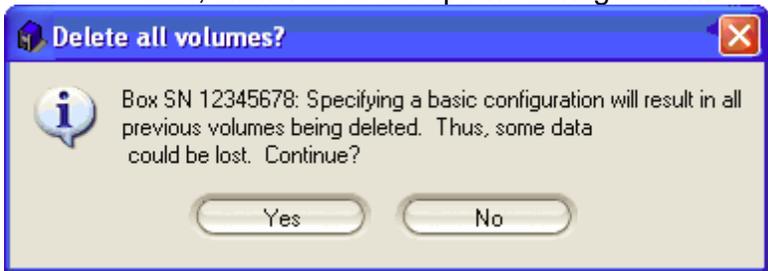


Even though the picture shows the BIG policy, we strongly recommend using the SAFE (RAID 1) policy.

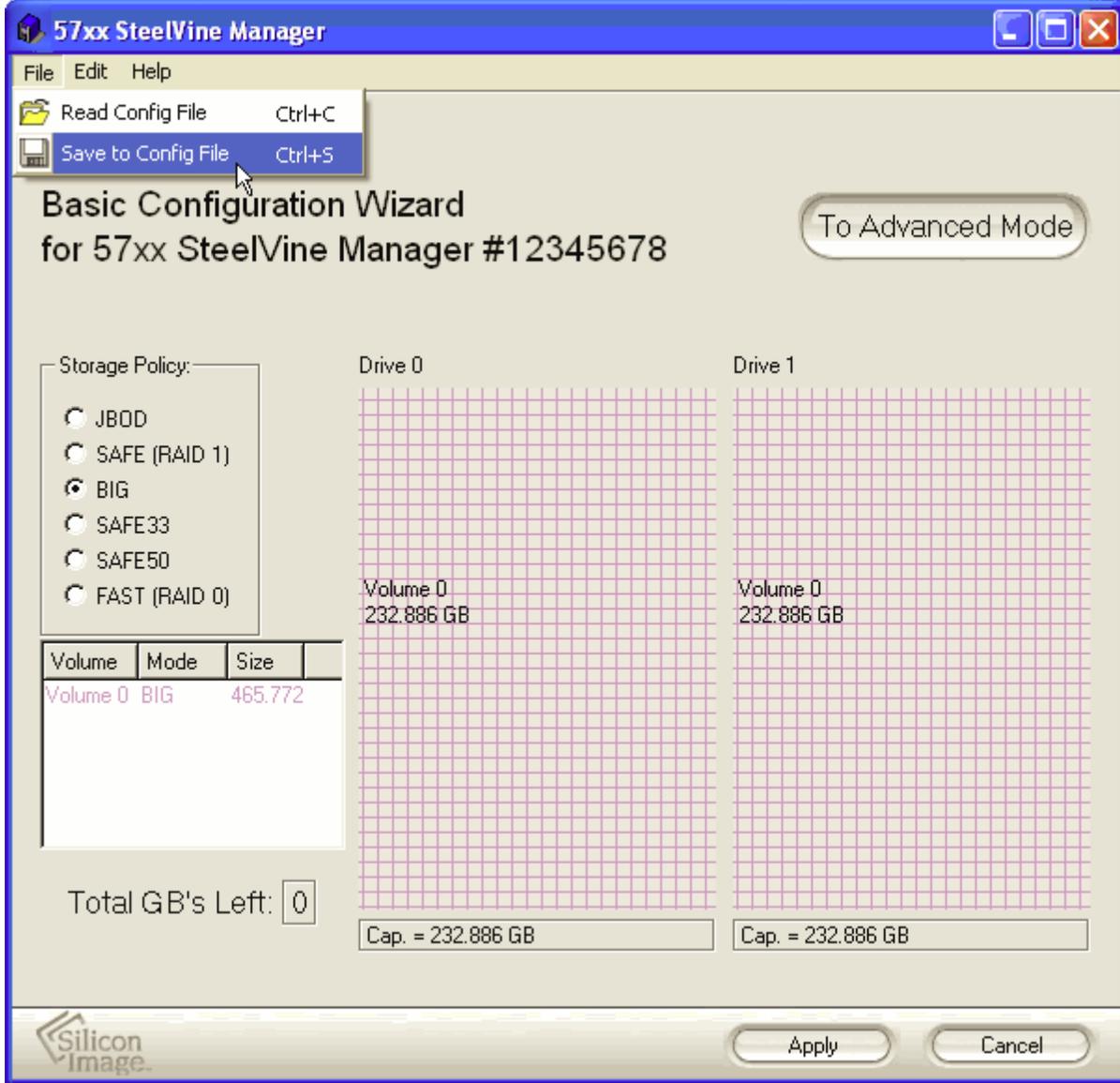
Policy	Description
SAFE (RAID 1) RECOMMENDED	Creates one volume. One hard drive mirrors the other. The system automatically restores data redundancy to a SAFE volume when an offline drive comes back online.
JBOD (bypass)	Creates a logical volume for each physical hard drive. Available only for SATA host controllers that provide Port Multiplier support, and only available for the top-level node of a cascaded configuration.

BIG	Concatenates all hard drives into a single volume.
SAFE33	Not recommended for the PopDrive.
SAFE50	Not recommended for the PopDrive.
FAST (RAID 0)	Not recommended for the PopDrive.

4. When prompted to acknowledge that the configuration change may result in data loss, click **Yes** to accept the configuration.

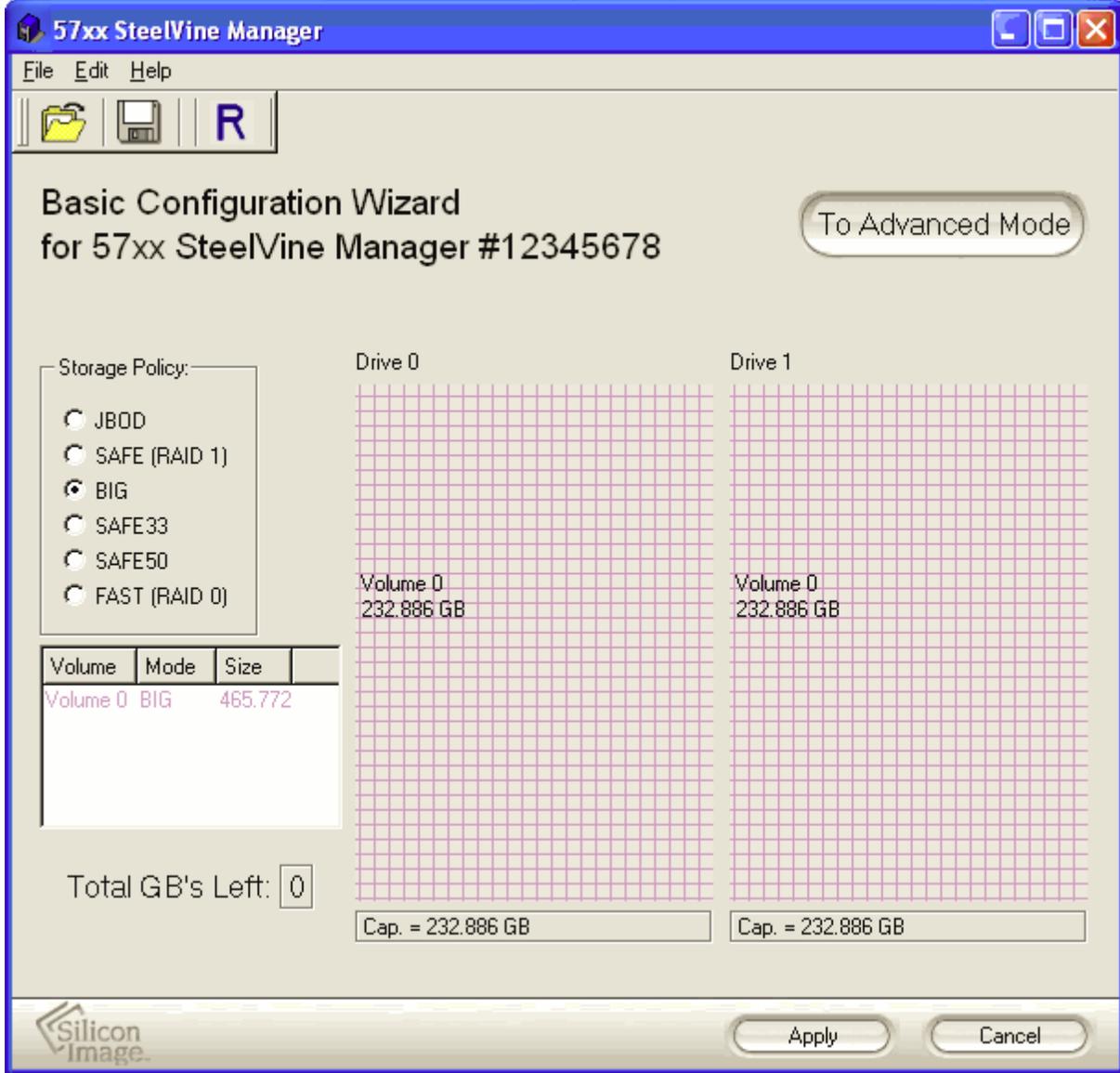


5. Select **Save to Config File** from the File menu or click the **Write configuration for system to a file** toolbar button to save the configuration.



Even though the picture shows the BIG policy, we strongly recommend using the SAFE (RAID 1) policy.

6. Click **Apply** to create the selected configuration, close the Wizard, and display the volumes in the [Status Window](#) (may take up to one minute to display).



Even though the picture shows the BIG policy, we strongly recommend using the SAFE (RAID 1) policy.

7. Partition the configured volumes to complete the implementation. Refer to section II-G [Create and Format the Drive Partition](#) for details.

F. Verify the Hard Drive Array

To confirm that the two hard disks that comprise a single SAFE (RAID1) volume are exact copies, you can execute a Verify Disk task manually.



When the SteelVine manager is open and you select “**Start Verify**”, there is a 60 second delay. The “**Start Verify**” selection will be disabled during this time. Otherwise, if the drive is in normal or verify abort mode, you can manually start the verify operation.

A pop-up will inform you of the action taking place.

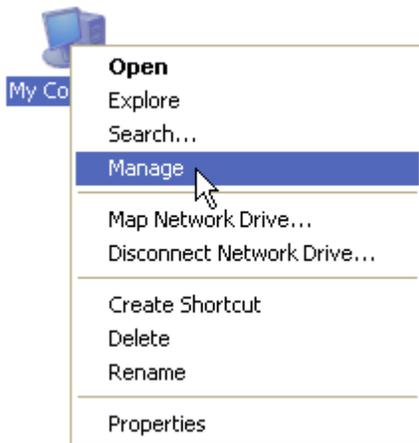


G. Create and Format the Drive Partition

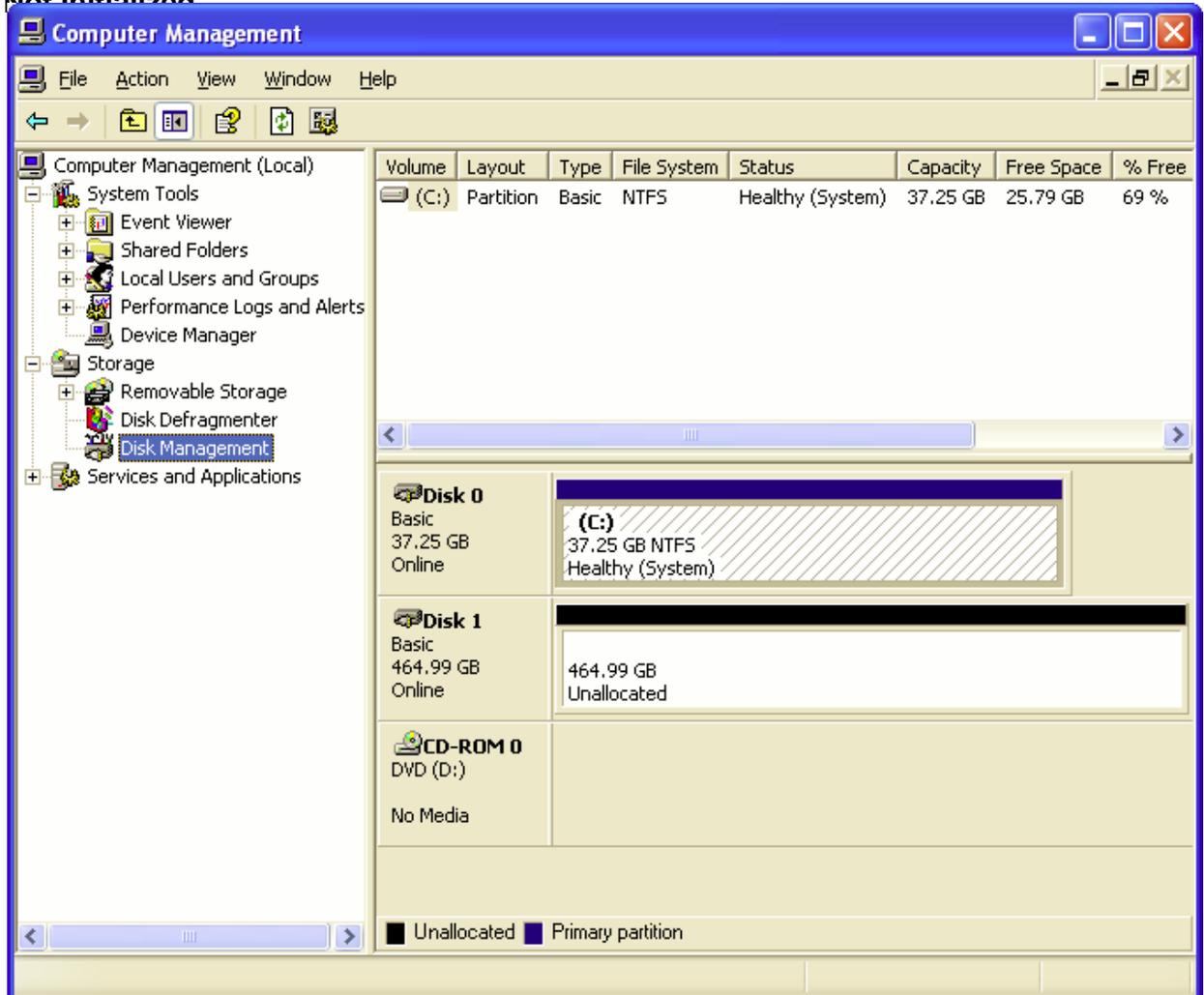
You must partition volumes for the host computer's operating system before you can store data on the volumes. Refer to the operating system's documentation for further guidance.

On Windows

1. Right-click the **My Computer** icon on your desktop and select **Manage** from the pop-up window.



2. Select **Disk Management** under **Storage** to open the Windows Disk Manager. This example illustrates the **SAFE** storage policy, which duplicates the data on both hard drives connected to the PopDrive. Every disk should appear with the word "**Basic**", a size value that shows the available storage capacity, and a status of "**Online**". Instead of **Basic**, a disk could appear **Unknown**, **Dynamic**, or **Not Initialized**.



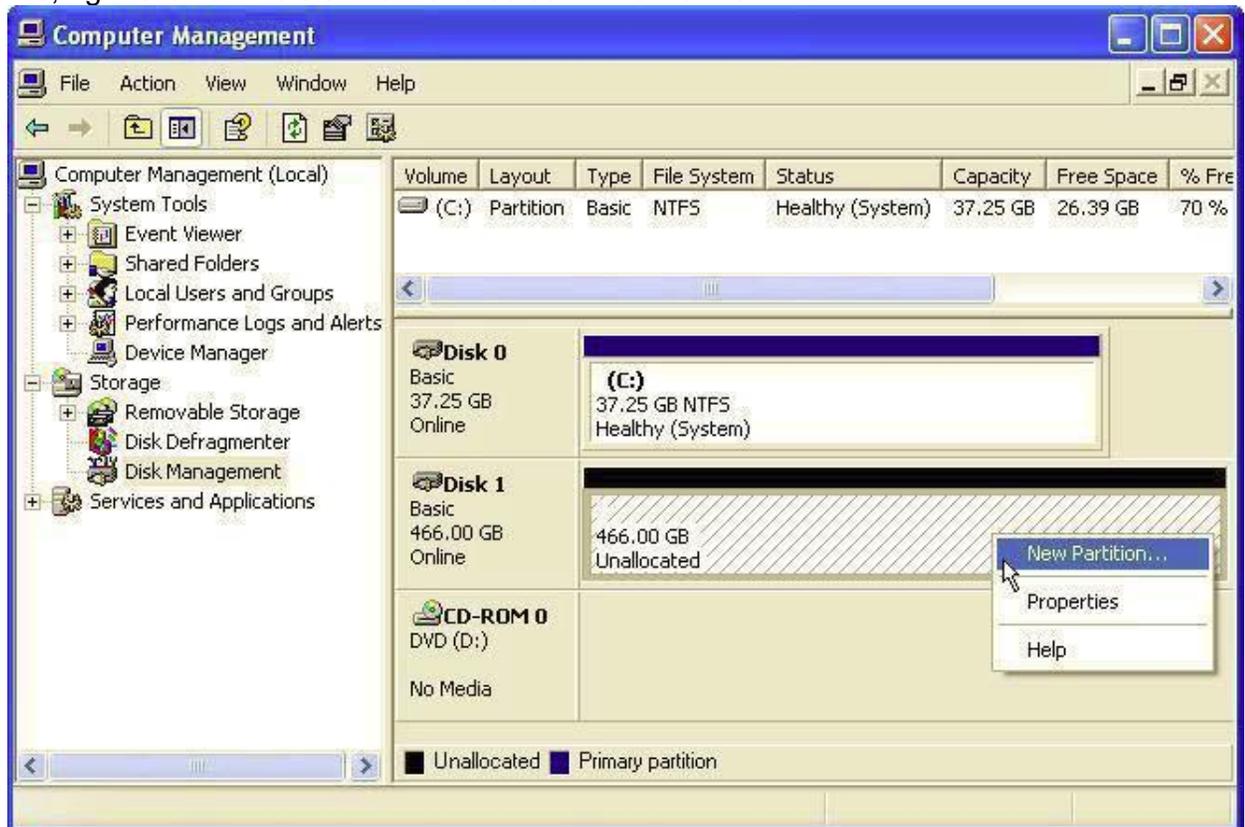
If the disk appears as "**Unknown**", right-click the disk icon and select **Write Signature**. A window opens with the selected disk (all Unknown disks may appear in this window). Make sure the box next to each disk is checked and click **OK**. The disk should now be marked as a **Basic** disk.

If a disk appears as "**Dynamic**", right-click the disk icon, and select **Revert to Basic Disk**. Within a few seconds, the disk should be marked as a **Basic** disk.

If a disk is marked "**Not Initialized**", right-click the disk icon and select **Initialize Disk**. An additional dialog box appears allowing you to select which disks to initialize. Uncheck the SteelVine Processor Disk item and click **OK**. Within a few seconds, the selected disk(s) should be marked as a **Basic** disk.

Note: The disk numbers in the Windows Disk Manager may be different from the Volume numbers shown in the SteelVine Manager [Status Window](#), [Basic Configuration Wizard](#), or [Advanced Configuration Wizard](#). Be sure that you select the correct disk based on the expected disk capacity to create a partition.

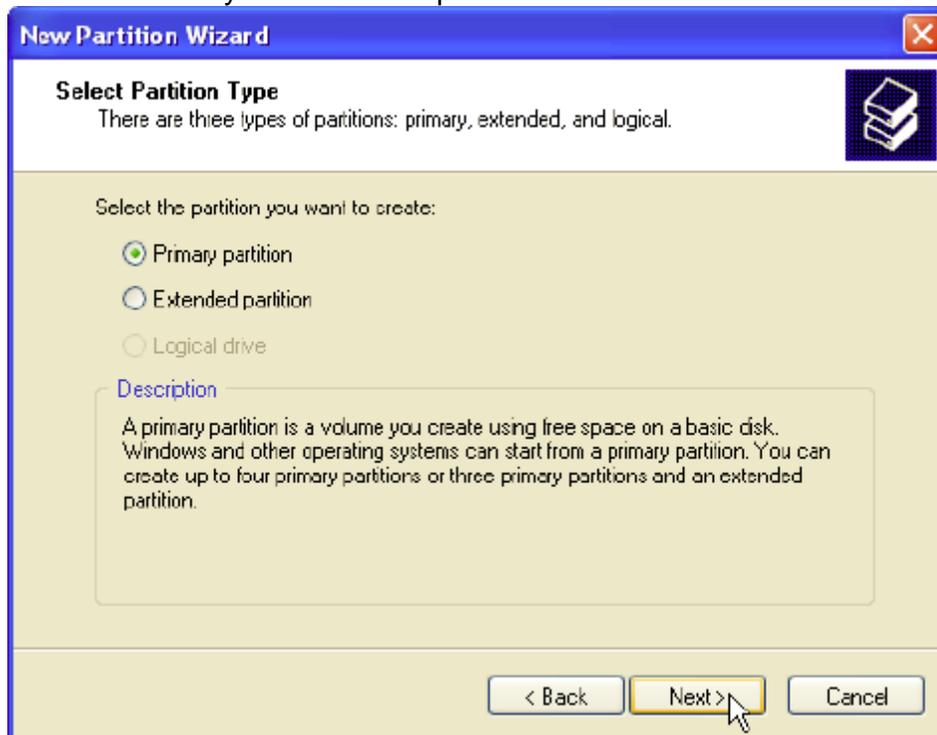
3. Right-click the configured disk's unallocated space and select **New Partition**. If the New Partition option is not available, select the disk and initialize it first. To do this, right-click on the disk item and select "Initialize Disk".



4. Click **Next** to start the Partition Wizard.



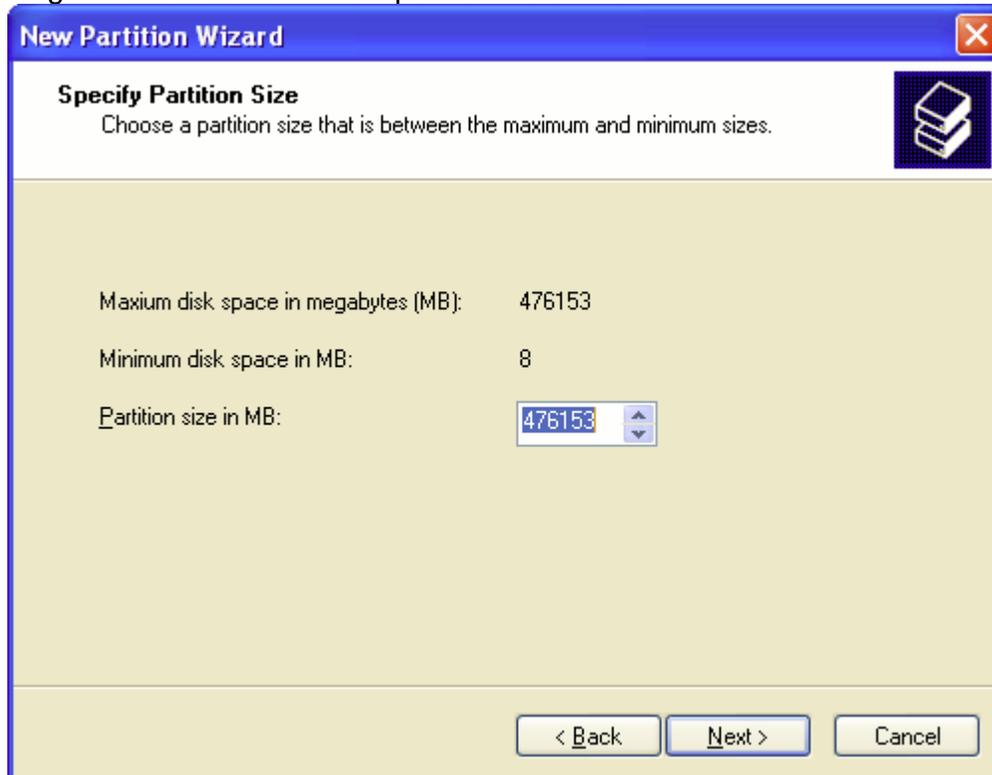
5. Select the Primary or Extended option and click **Next**.



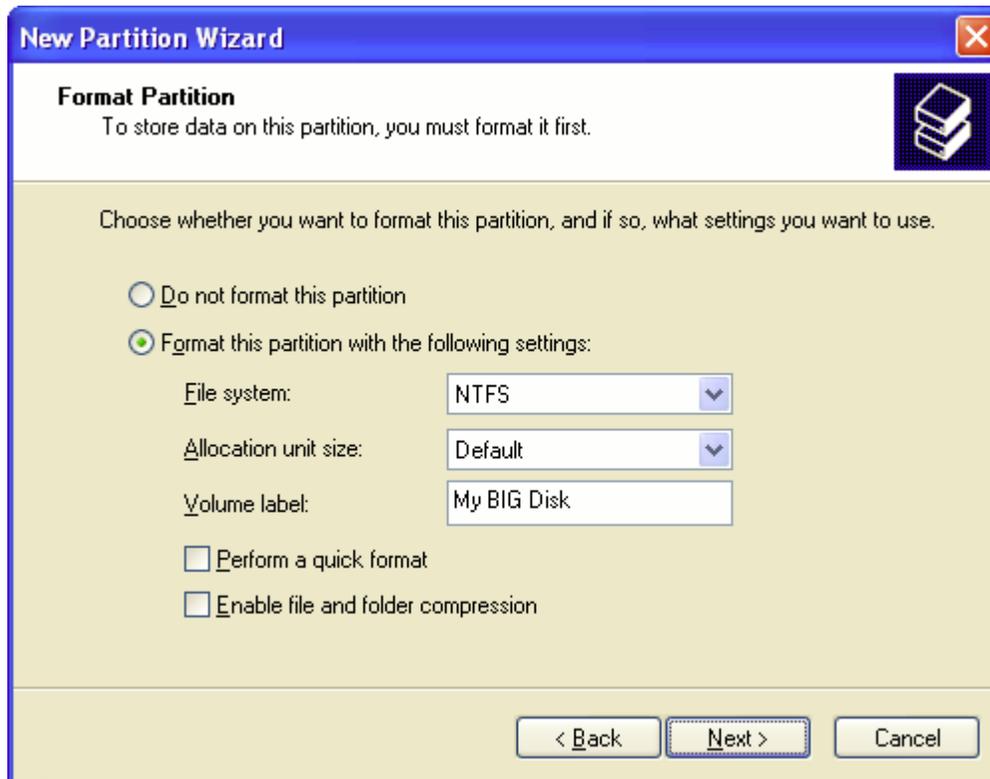
6. Specify the partition size. By default, the partition occupies the entire volume. Click **Next**.



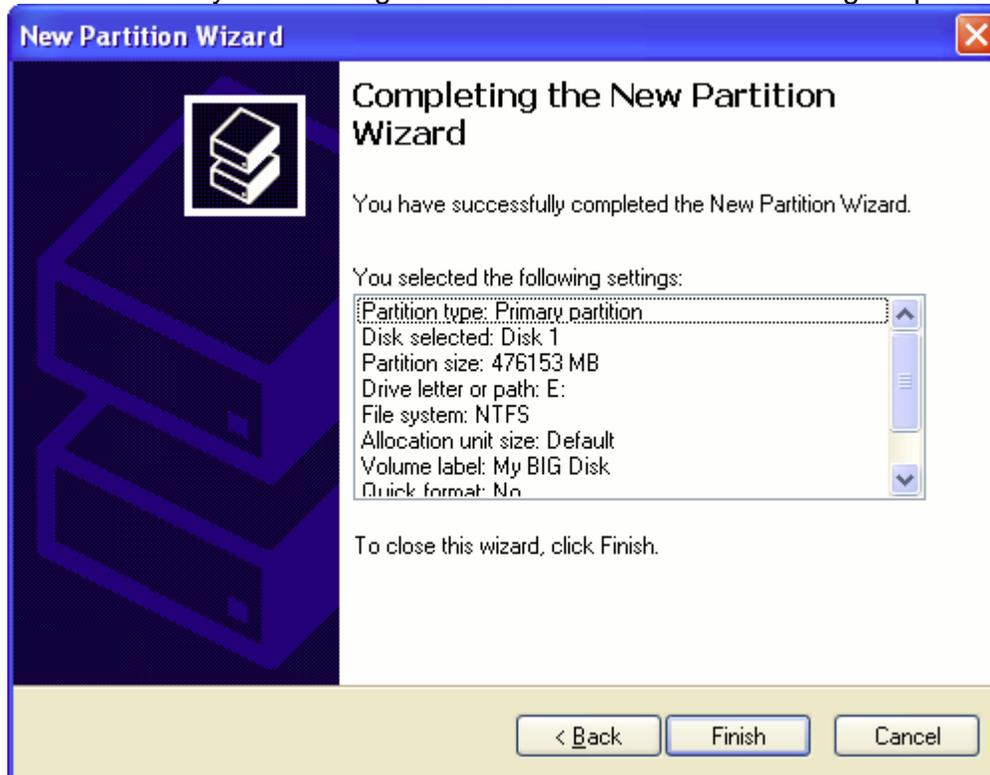
7. Assign a drive letter or mount path and click **Next**.



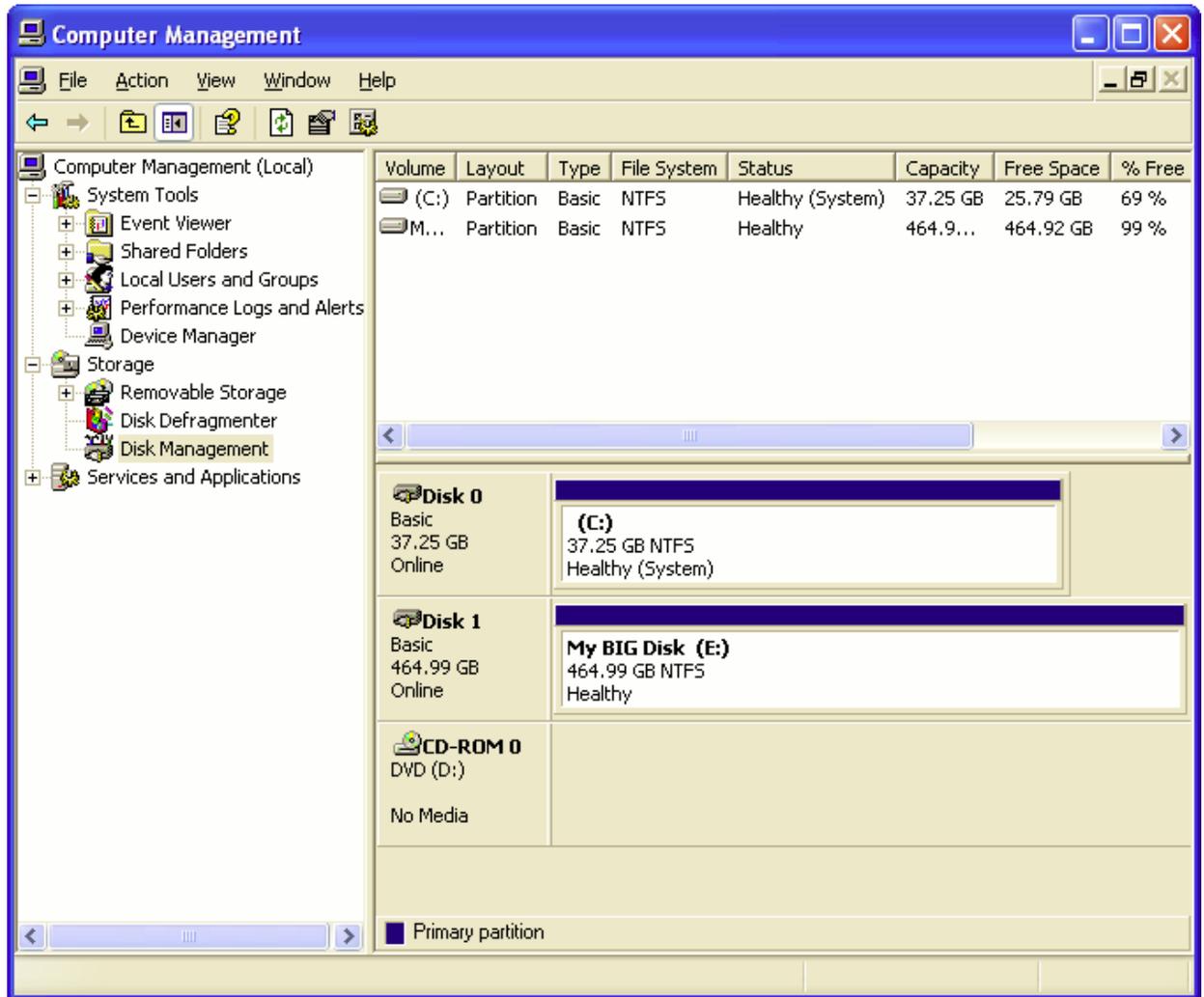
8. Name and format the partition and click **Next**.



9. Review the file system settings and click **Finish** to create the logical partition.



- Repeat steps 1 through 9 to partition any remaining disks you configured in the SteelVine Manager GUI.



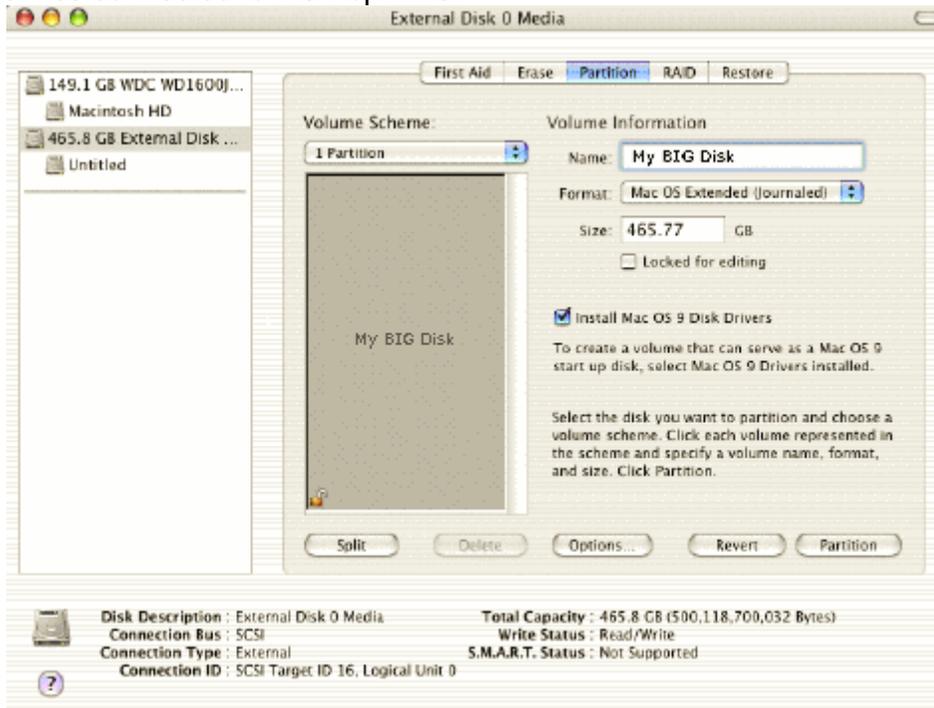
On Macintosh

Important: If no hard drives are connected to the Storage Appliance, the SteelVine Processor disk (8.0 GB Config Disk Media) will appear. Do not remove or modify that partition.

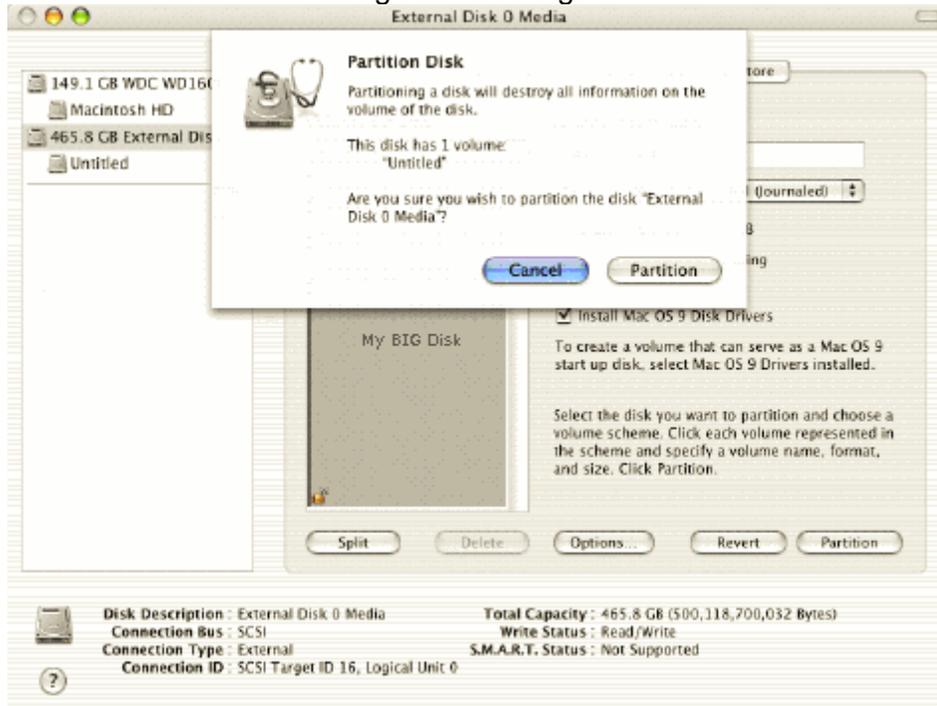
1. Launch **Disk Utility** from the **Application > Utilities** folder.



2. Select a configured disk and click the Partition tab. This procedure illustrates the **BIG** Storage Policy configuration, which concatenates the capacity of all hard drives connected to the PopDrive.



3. Select **1 Partition** from the **Volume Scheme** drop-down list.
4. Enter a name for the volume in the **Name** field (such as “My BIG disk”).
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. 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 SteelVine Manager GUI. Remember, do not partition the disk that represents the SteelVine processor.

On Linux

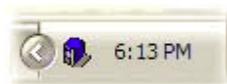
Note: For a more detailed instruction to install the SteelVine Manager, please refer to the *Quick Installation Guide for Linux*.

III. Using the SteelVine Manager

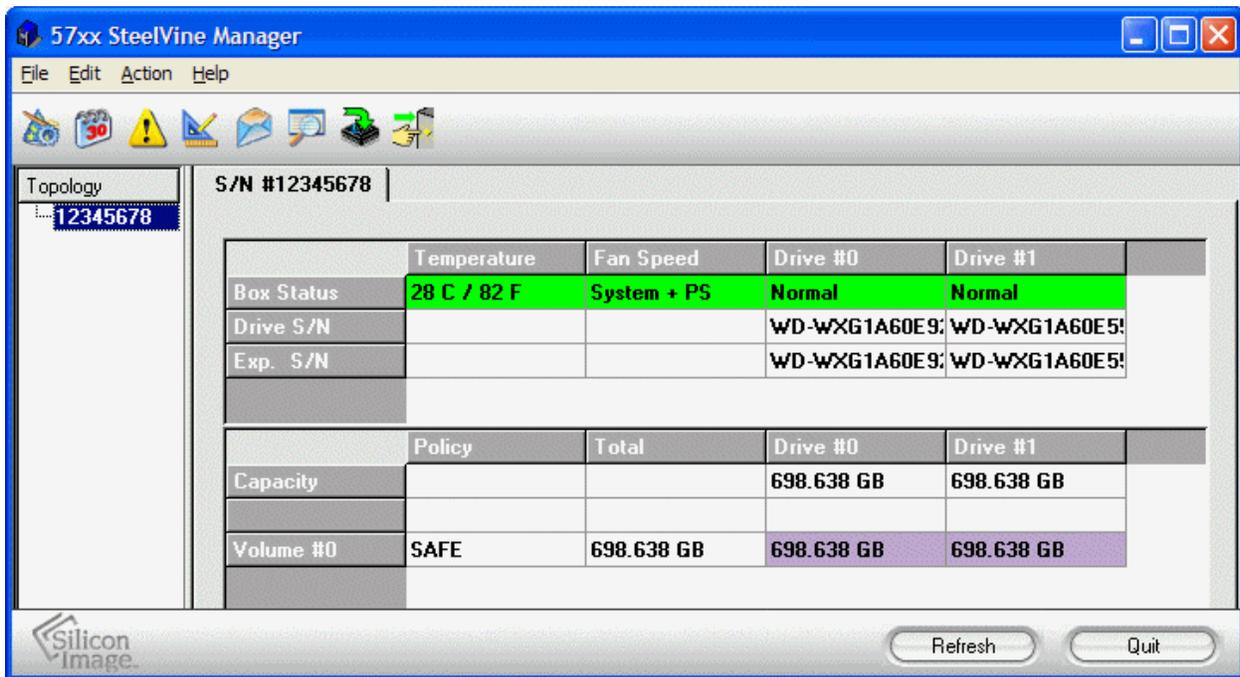
A. Running the SteelVine Manager

Windows

Click **Start > Program Files > Silicon Image > 57XX SteelVine > SteelVineManager**. Once started, the SteelVine Manager Application icon can be found in the Notification Tray located at the bottom right hand corner of the screen. Double click the notification tray icon to open the SteelVine Manager GUI status window. The SteelVine Manager icon remains active in the notification tray even if you close the SteelVine Manager window. It can be closed by right-clicking on the icon and selecting “**Exit**”.



The SteelVine Manager starts with the Status Window visible so you can monitor the PopDrive(s) connected to the host computer. Up to four PopDrives can be managed through a single session.



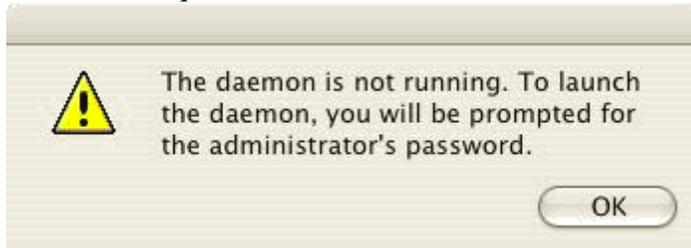
Select menu options and follow the instructions in the remainder of this guide to configure the PopDrive. When prompted, enter the administrative password (default password is **admin**).

Mac OS X

The SteelVine Manager software is installed in the **Applications > Utilities > SteelVine** folder. Before the SteelVine Manager starts, the launch sequence searches for an active daemon and launches it if the daemon is not active.

1. Launch the Finder and navigate to the **Applications > Utilities > SteelVine** folder. Double-click the **SteelVine** icon to start the SteelVine Manager.

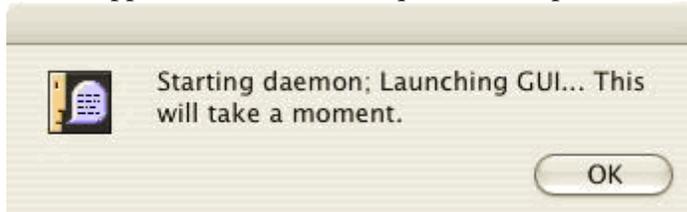
2. If the launch sequence does not find the daemon, a warning message appears. Click **OK**.



3. Enter the system administrator (root) password and click **OK**.

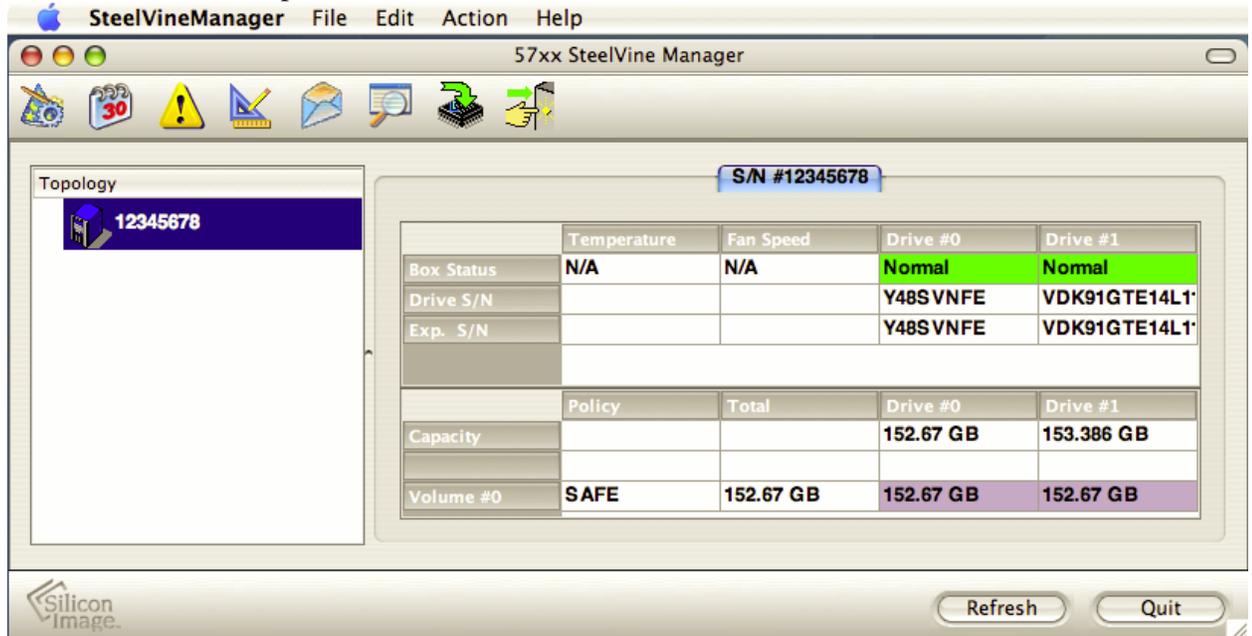


4. A notice appears as the launch sequence attempts to start the daemon. Click **OK**.



If the daemon fails to start, an error appears. Follow the recommendations in the error message to correct the problem.

5. Monitor the status of PopDrive(s) on the Status window.



6. Select menu options and follow the instructions in the remainder of this guide to configure PopDrive(s). When prompted, enter the administrative password (default password is **admin**).

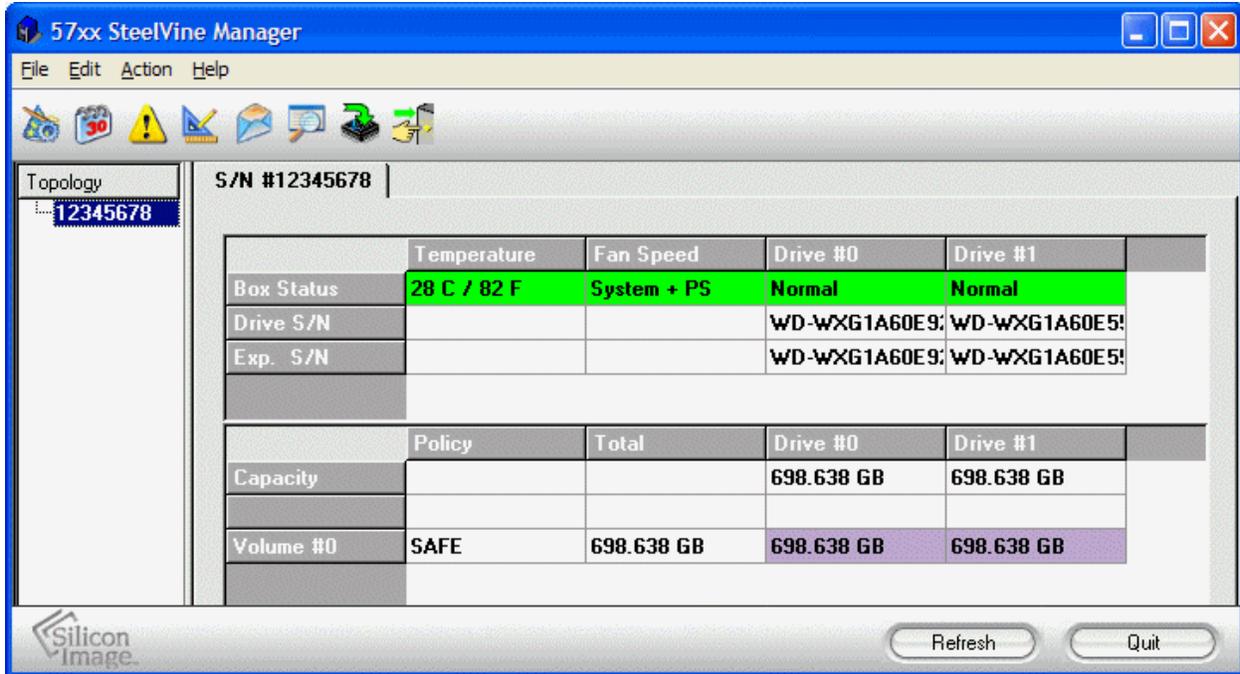
Linux

Use the following procedure to launch the SteelVine Manager on a Linux system.

1. Change to the directory in which the SteelVine Manager GUI and daemon software was installed (such as **/usr/local/SiliconImage**)
2. Start the daemon by entering the command: **./SiI57XX -e**
3. Open a new terminal window and start the GUI by entering the command: **./SiI57XXUI**

B. The SteelVine Interface

The SteelVine Manager starts with the Status window visible so you can monitor the PopDrive.



Note: The appearance of this screen will vary depending on the current Storage Policy. Refer to the tables below for a description of which items appear.

Status Cells	Description
Topology Section	
Device Listing	All PopDrives that are attached to the computer will have their serial number listed in the Topology column on the left side of the window.
System Status Section	
Temperature	Indicates the current temperature of the PopDrive. The field displays “N/A” if there is no temperature sensor installed in your storage enclosure.
Fan Speed	Indicates the system fan state. The field displays “N/A” if there is no fan speed sensor installed in your storage enclosure.
Drive Status Section	
Box Status	Shows the drive state: Normal, Rebuilding, Verifying, Unplugged, Needs Rebuild, New Drive, Wrong Slot, Use Bigger Drive, Mismatch, Not Readable, Locked or Unavailable.

Drive S/N	Shows the unique serial number assigned by the disk manufacturer.
Exp. S/N	Shows the expected serial number. The PopDrive compares the expected and actual drive serial numbers to detect when a drive's status changes.
Capacity & Volume Information Section	
Policy	Shows the storage policy configured for each volume. If the volume is in any state other than "Normal", the additional status information will also appear in this item.
Total	Shows the combined capacity of the volume.
Capacity	Shows the amount of storage space (in GB) available on each hard drive.
Volume	Shows the total volume capacity and the drive capacities assigned to each volume.

File Menu Item	Description
Change Password	Opens a dialog to establish a new password.
Scan Devices	Refreshes the status details presented on the Status window.
Change Connections	Opens a dialog to establish remote connections.
Quit	Exits the SteelVine Manager GUI (Windows systems only)

Edit Menu Item	Description
Configure Box	Opens the Basic Configuration Wizard .
Schedule Disk Verify	Schedule a disk Verify activity (enabled only in SAFE mode)
Configure Pop-Ups	Configure the Pop-Up messages. This selection is only available for the top-level node of a cascaded configuration.
View Policy Settings	Display the Rebuild policy settings. This selection is only enabled when using SAFE (RAID1) mode.
Setup Email Notification	Opens the Setting-up Email Notification dialog.
Event Log	Opens the Event Log viewer.
Specify Firmware	Opens the Firmware Selection dialog.
Backup Button	Not used by the PopDrive.

These selections are only available when one SAFE volume has been configured on the system.

Edit Menu Item	Description
Start Rebuild	Initiates a Rebuild to the target drive
Start Verify	Initiates a Verify activity on the selected drive
Abort Rebuild	Abort the rebuild process (only selectable when a Rebuild operation is active)
Abort Verify	Abort the Verify process (only selectable when a Verify operation is active)

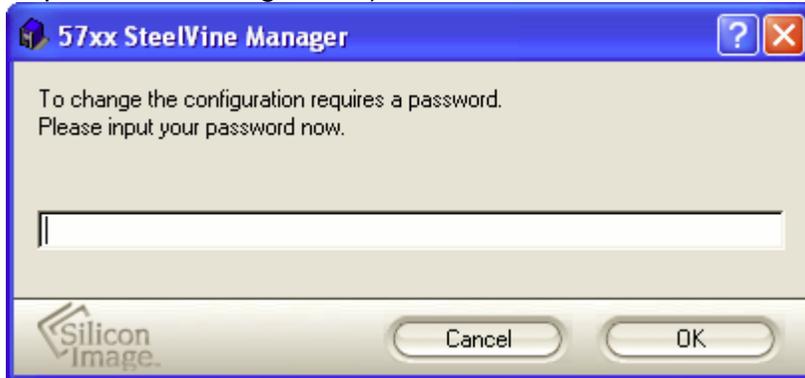
Button	Tooltip	Description
	Configure Box	Opens the Basic Configuration Wizard.
	Schedule Disk Verify	Schedule a disk Verify activity. This selection only appears when one SAFE (RAID1) volume exists.
	Configure Pop-Ups	Configure the Pop-Up messages.
	View Policy Settings	Shows the Rebuild Policy.
	Show Event Log	View the Event Log.
	Specify Firmware	View the current version or download an updated version of the PopDrive firmware.
	Email Notification	Configure the operation of email message notification. This selection is only available for the top-level node of a cascaded configuration.
	Backup Button	Not used by the PopDrive.

C. Basic Configuration

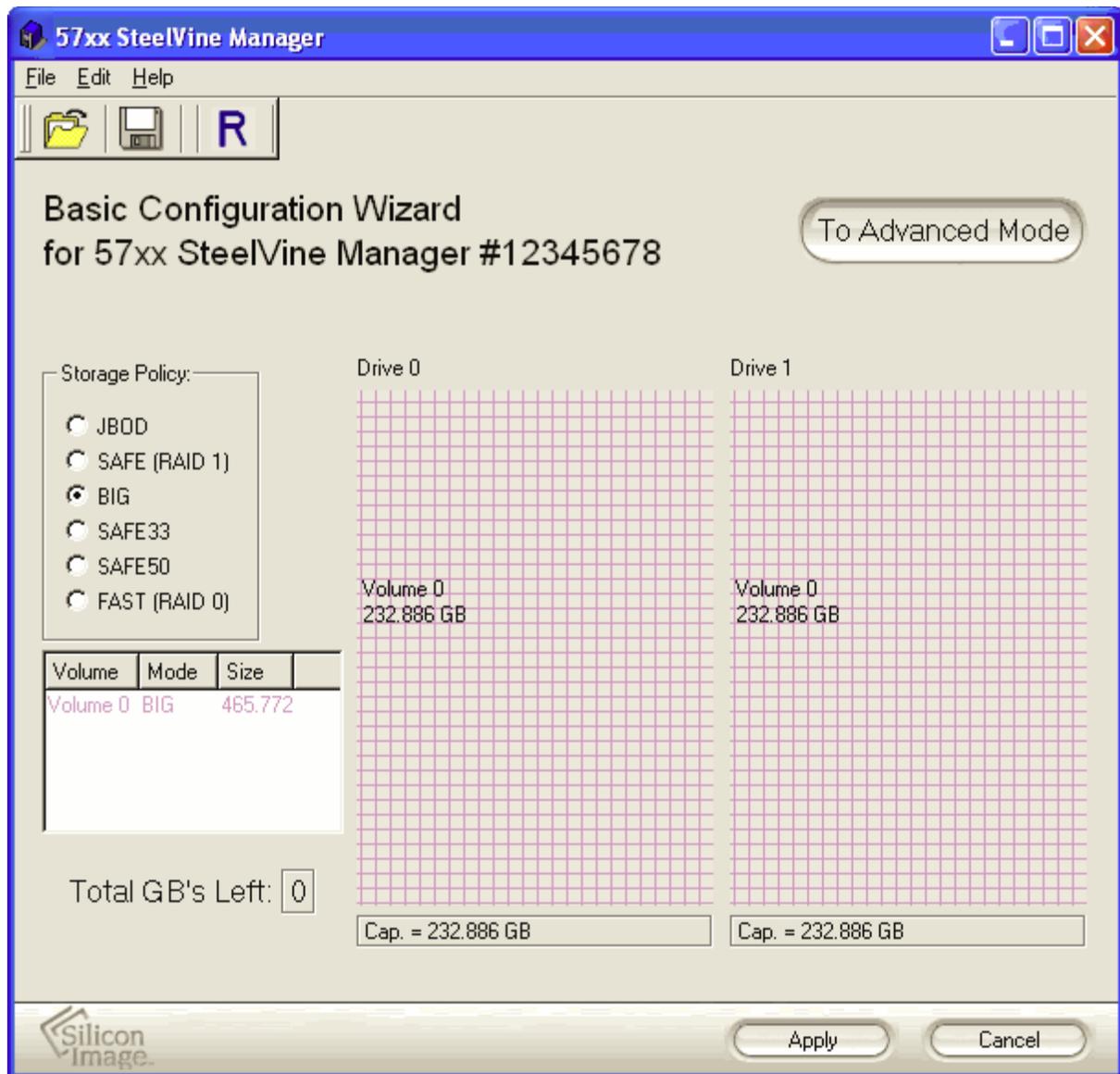
To access the Basic Configuration Wizard, click on the **Configure Box** icon along the top of the SteelVine Manager [Status Window](#).



To protect against unintended changes, the SteelVine Manager prompts for a password the first time you access the Wizard. Enter the administrator password. The default password is **admin**. (See [Change the Password](#) in section III-K for additional information on password management.)



The Basic Configuration Wizard dialog will appear (see Figure 11 below).



Wizard Section	Description
Storage Policy	Identifies available SteelVine Storage Policies to assign to the PopDrive.
Volume List	Shows Volume, Mode (storage policy), and Size details for logical volumes. The “ Total GB’s Left ” field (below the volume list) shows the remaining capacity in gigabytes for all hard drives.
Drive Graph	Displays disk space for each hard drive. Storage capacity that is 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. The “ Cap ” field (below each drive in the

	drive graph) shows the maximum capacity in gigabytes for that hard drive.
--	---

Button	Tooltip	Description
	Read a configuration from a file	Reads a saved configuration into the Basic Configuration Wizard so you can apply the configuration to the PopDrive.
	Write configuration from system to a file	Save a Configuration File to a file on the host computer.
	Restore configuration to last commit	Cancels proposed changes.

Button Label	Description
To Advanced Mode (NOT RECOMMENDED)	Opens the Advanced Configuration Wizard . This option is only available if the Advanced Configuration mode is enabled for you system. If you are using a SATA host connection, this option is only available if your SATA controller is PM-aware.
Apply	Submits configuration changes to the PopDrive, closes the Wizard, and displays the updated configuration on the Status Window .
Cancel	Aborts the changes and closes the Wizard.

Configure Volumes

Note: Before reconfiguring the PopDrive, you must delete any previously defined partitions. See [Partition a Volume](#) for details.

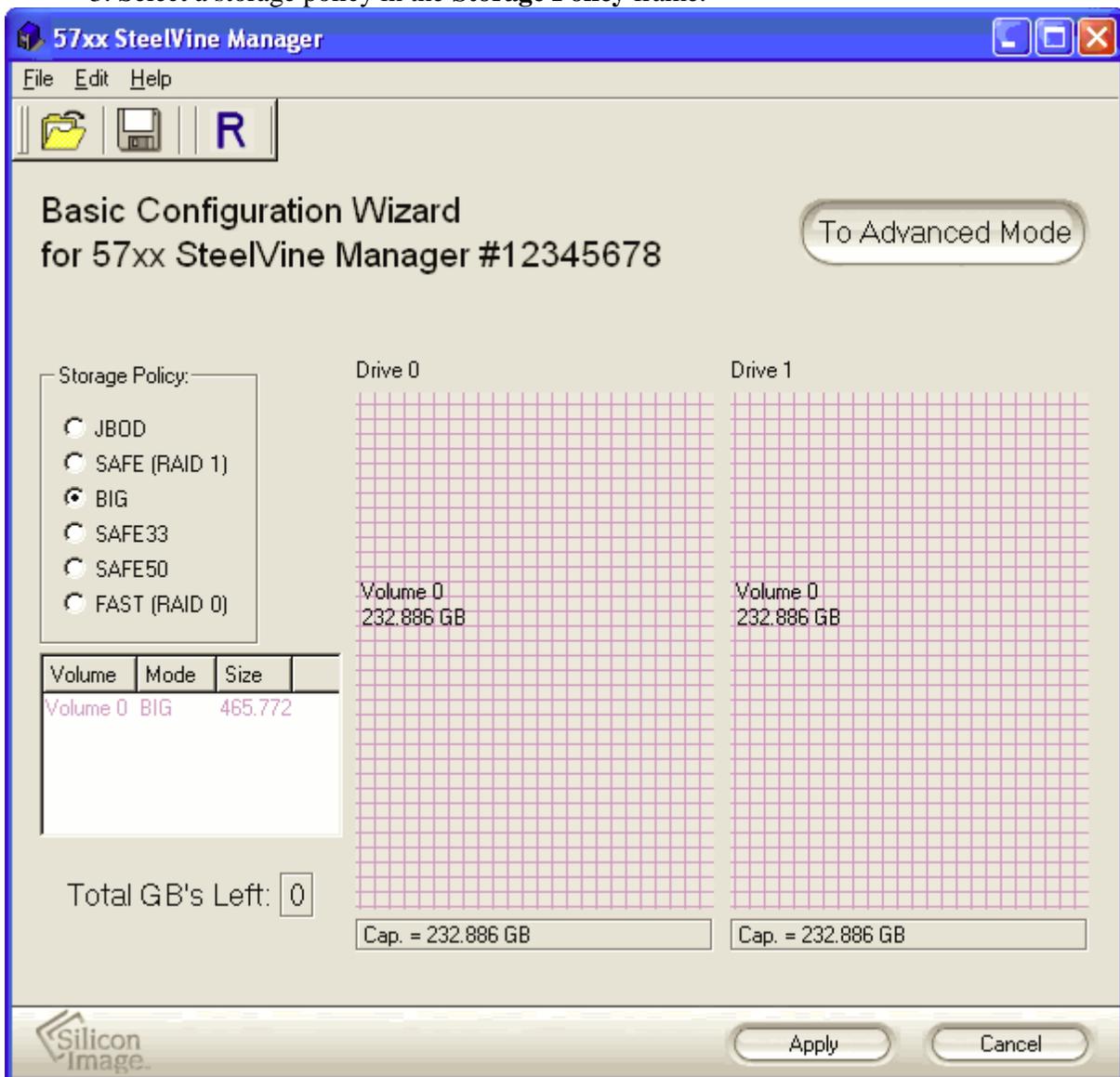
1. Select **Configure Box** from the Edit menu or click the **Configure Box** toolbar button to open the Basic Configuration Wizard.



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

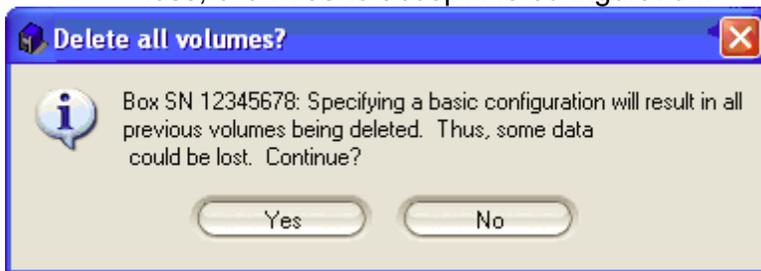


3. Select a storage policy in the **Storage Policy** frame.

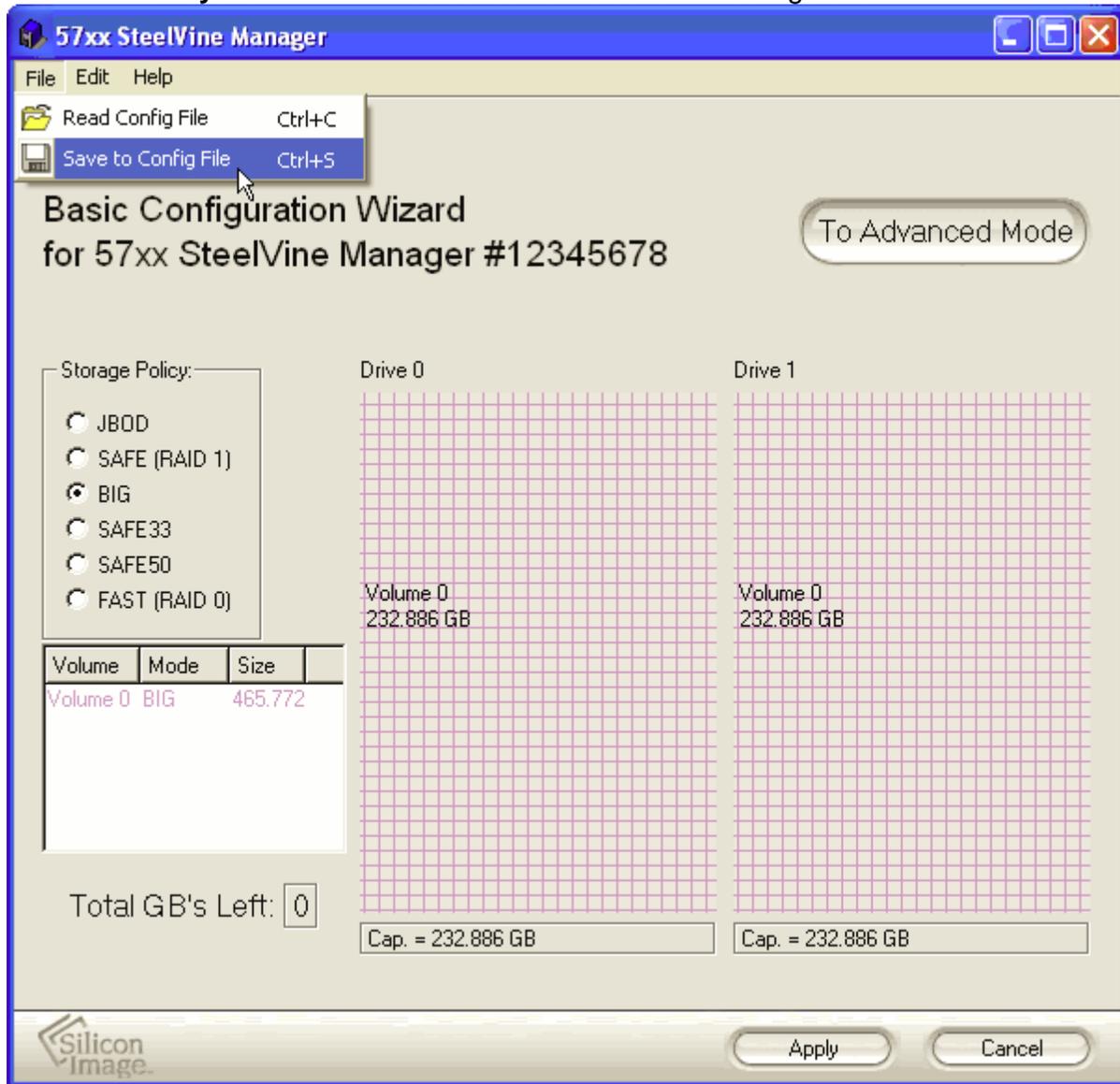


Policy	Description
SAFE (RAID 1) RECOMMENDED	Creates one volume. One hard drive mirrors the other. The system automatically restores data redundancy to a SAFE volume when an offline drive comes back online.
JBOD (bypass)	Creates a logical volume for each physical hard drive. Available only for SATA host controllers that provide Port Multiplier support, and only available for the top-level node of a cascaded configuration.
BIG	Concatenates all hard drives into a single volume.
SAFE33	Not recommended for the PopDrive.
SAFE50	Not recommended for the PopDrive.
FAST (RAID 0)	Not recommended for the PopDrive.

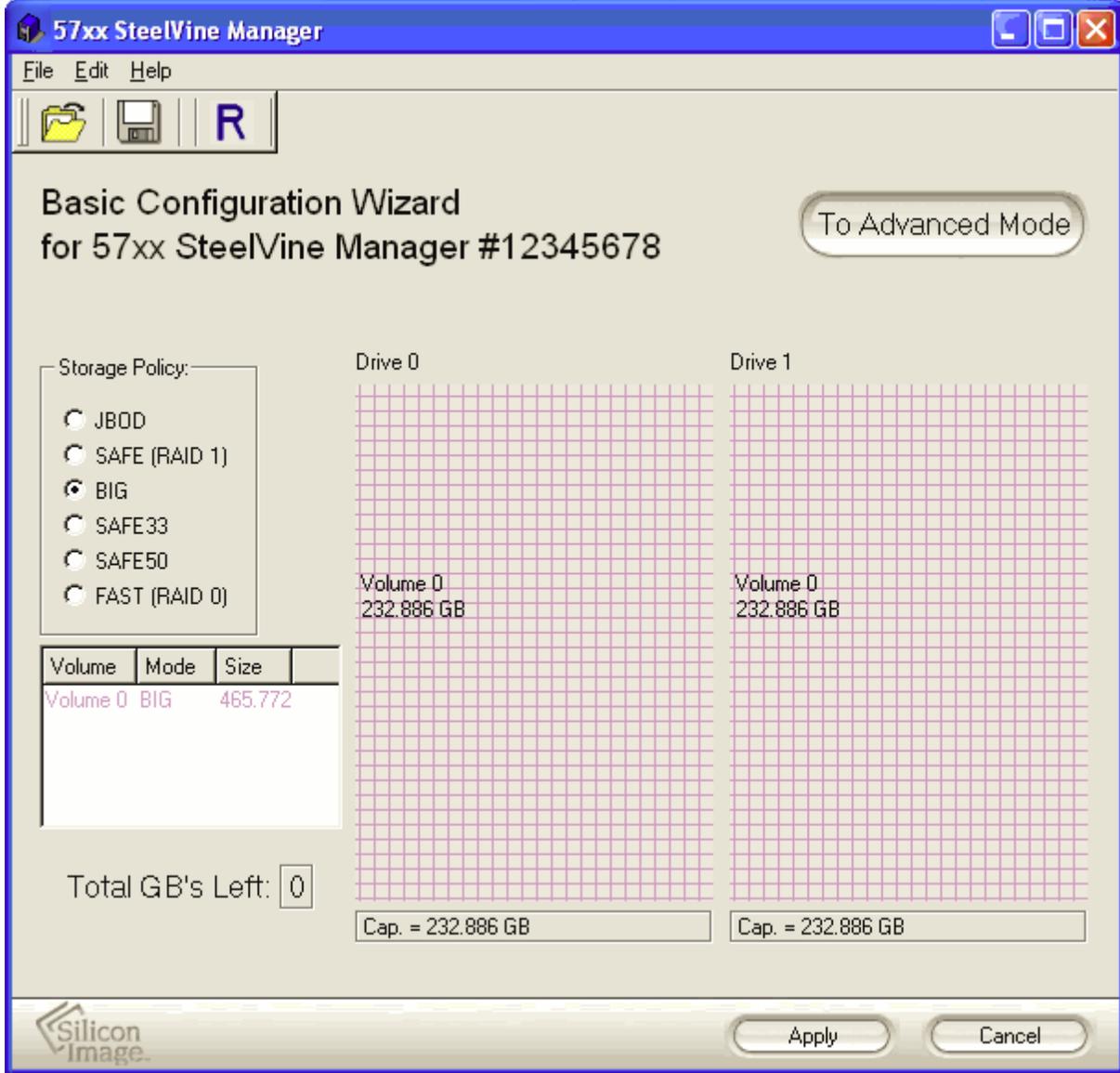
4. When prompted to acknowledge that the configuration change may result in data loss, click **Yes** to accept the configuration.



5. Select **Save to Config File** from the File menu or click the **Write configuration for system to a file** toolbar button to save the configuration.



6. Click **Apply** to create the selected configuration, close the Wizard, and display the volumes in the [Status Window](#) (may take up to one minute to display).



7. Partition the configured volumes to complete the implementation. Refer to section II-G [Create and Format the Drive Partition](#) for details.

D. Advanced Configuration

Even though there is an advanced configuration button available in the SteelVine manager, we recommend that you do not use it. The SteelVine advanced configuration allows you to have multiple partition types on the PopDrive. We believe that this is a level of complexity that is not necessary for most PopDrive implementations.

In future releases of the PopDrive management software, the advanced configuration features will not be available.

E. View Policy Settings

The Policy Settings dialog allows you to view the current settings for **Rebuild** and **Verify** operations for SAFE volumes, including:

Init Rebuild: Defines whether to automatically copy (mirror) the contents of Disk 0 to Disk 1 whenever a new SAFE volume configuration is created. When this policy is “**Enabled**”, the data from Disk 0 will be automatically copied (mirrored) to Disk 1. When this policy is “**Disabled**”, no automatic copy is performed.

Auto Rebuild: Defines whether to remember the non-usable state of a hard drive if it is disconnected and then re-connected to the SteelVine Storage Processor. When this policy is “**Enabled**”, the system will always attempt to rebuild a disk that has been inserted, even if that disk had previously been identified as non-usable. When this policy is “**Disabled**”, the system will not rebuild a disk that had previously been identified as non-usable.

Verify Rebuild: Defines whether to automatically perform a verification of the data after a rebuild operation is completed. When this policy is set to “**Enabled**”, a verification of the copied data is automatically performed. When this policy is “**Disabled**”, an automatic verification of the copied data is not performed, and any verification would need to be launched manually through the SteelVine Manager GUI.

These settings are set in the hardware of the PopDrive and cannot be modified through the SteelVine Manager GUI.

Use the following procedure to open the Policy Settings Dialog.

1. Click on the Policy Settings icon along the top of the SteelVine Manager Status window.



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



3. The **Policy Settings** dialog shown below will appear.



For more information about how manually rebuild and verify a SAFE volume, refer to the following sections: **Rebuilding Drives, Manual Verification, and Scheduled Verification.**

F. Rebuilding Drives

Note: This set of features is only enabled when exactly one SAFE volume exists.

Start Rebuild

If the hard drive should fail in any way, the SteelVine Manager is set up by default to automatically begin the rebuild process. Once the Rebuild and Verify operation has been completed, the disk will be available for optimal use.

When exactly one SAFE volume exists, you can request a drive rebuild if the disk was marked bad or a previous rebuild operation was aborted. To start the rebuild, select **Action > Start Rebuild > Select Drive n**. Once a rebuild process has been started, it can also be aborted.



Once the rebuild has taken place, the **Verify** process will begin automatically if your system is configured to do so. If the rebuild process is ever interrupted, the rebuild process will resume from the last 10 GB segment that was completed before the interruption occurred.

Abort Rebuild

To abort a rebuild process that is already active, select **Action > Abort Rebuild**. The rebuild process will be terminated, and the SAFE volume will remain in a degraded (vulnerable) state until the rebuild is restarted and allowed to complete.



G. Manual Verification

To confirm that the two hard disks that comprise a single SAFE volume are exact copies, you can also execute a Verify Disk task manually.



When the SteelVine Storage Reference Design is powered on and you select “**Start Verify**”, there is a 60 second delay. The “**Start Verify**” selection will be disabled during this time. Otherwise, if the drive is in normal or verify abort mode, you can manually start the verify operation.

A pop-up will inform you of the action taking place.



H. Scheduled Verification

Create a New Schedule

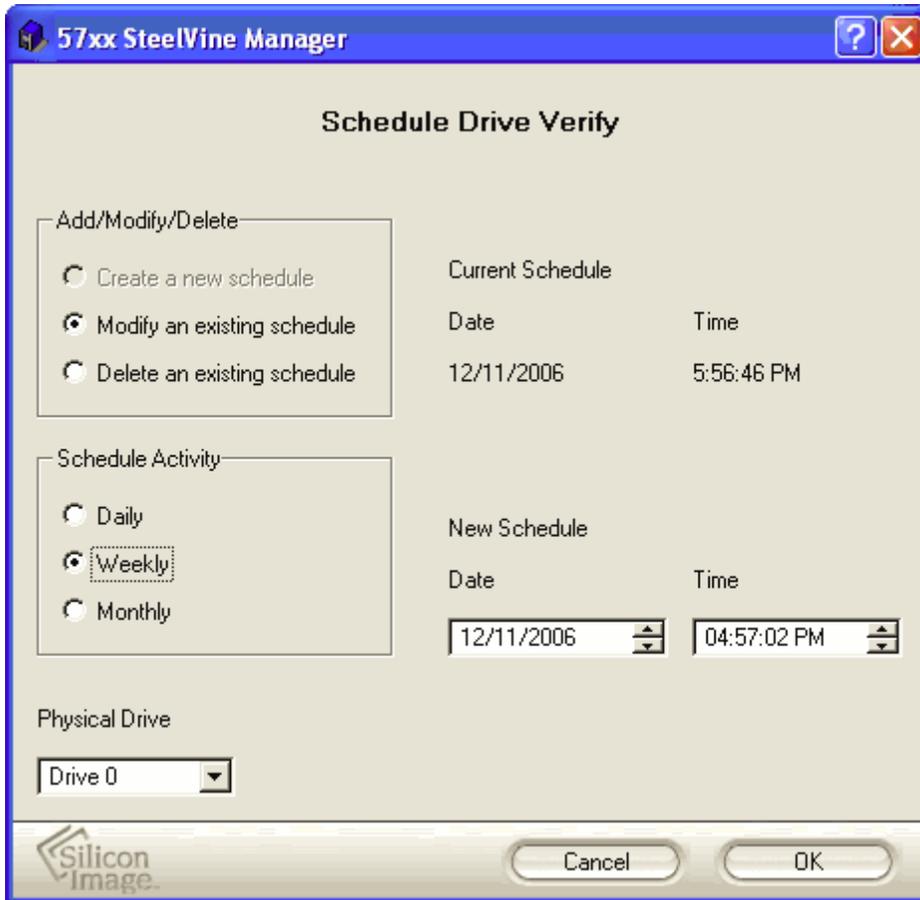
The SteelVine Manager software is set up to automatically verify the rebuild of a hard disk drive. However, you can also create a verification schedule at your discretion.

The schedule can be set for daily, weekly, or monthly. The default setting is weekly. It can be customized to run during the off-hours so as to not interfere with your normal back-up routine. A schedule can be run for each individual hard drive.



Modify/Delete Verification Schedule

You can modify or delete an existing schedule by selecting the desired radio button, then changing the parameters and clicking the **OK** button.



I. E-Mail Notifications

Overview

The Email Notification feature allows you to have the SteelVine Manager automatically send an email message if any of the following conditions or situations occur: Partition Rebuild Start

Partition Verify Start

Partition Rebuild Resume

System Fan Too Slow

No Boxes Found

Drive Unplugged

Partition Rebuild Complete

Partition Verify Complete

Temperature Too High

Power supply Fan Too Slow

Box Removed

Drive Inserted

Each of the above conditions can be customized for sending options as well as the message that is sent.

Accessing the Email Notification Dialog

Use the following procedure to enable the security feature and lock all of the hard drives.

1. Click on the **Configure Email Notification** icon along the top of the SteelVine Manager [Status Window](#) or select the Setup Email Notification item from the Edit menu pull-down list.



2. Enter the Administrative password for your system (the default password is **admin**).



3. The **Email Notification** setup screen show below will appear.

SMTP Server Name: (Use DNS lookup if blank)

SMTP Server Port #: (Use '25' if blank)

From:

To:

CC:

	When to send	Edit Message
Partition Rebuild Start	<input type="radio"/> Never <input checked="" type="radio"/> Every time <input type="radio"/> Once Every <input type="text" value="Minute"/>	<input type="button" value="Message"/>
Partition Rebuild Complete	<input type="radio"/> Never <input checked="" type="radio"/> Every time <input type="radio"/> Once Every <input type="text" value="Minute"/>	<input type="button" value="Message"/>
Partition Verify Start	<input type="radio"/> Never <input checked="" type="radio"/> Every time <input type="radio"/> Once Every <input type="text" value="Minute"/>	<input type="button" value="Message"/>
Partition Verify Complete	<input type="radio"/> Never <input checked="" type="radio"/> Every time <input type="radio"/> Once Every <input type="text" value="Minute"/>	<input type="button" value="Message"/>
Partition Rebuild Resume	<input type="radio"/> Never <input checked="" type="radio"/> Every time <input type="radio"/> Once Every <input type="text" value="Minute"/>	<input type="button" value="Message"/>
Temperature Too High	<input type="radio"/> Never <input type="radio"/> Every time <input checked="" type="radio"/> Once Every <input type="text" value="Minute"/>	<input type="button" value="Message"/>
System Fan Too Slow	<input type="radio"/> Never <input type="radio"/> Every time <input checked="" type="radio"/> Once Every <input type="text" value="Hour"/>	<input type="button" value="Message"/>
Power Supply Fan Too Slow	<input type="radio"/> Never <input type="radio"/> Every time <input checked="" type="radio"/> Once Every <input type="text" value="Hour"/>	<input type="button" value="Message"/>
No boxes found.	<input checked="" type="radio"/> Never <input type="radio"/> Every time <input type="radio"/> Once Every <input type="text" value="Minute"/>	<input type="button" value="Message"/>
Box Removed	<input type="radio"/> Never <input checked="" type="radio"/> Every time <input type="radio"/> Once Every <input type="text" value="Minute"/>	<input type="button" value="Message"/>
Drive Unplugged	<input checked="" type="radio"/> Never <input type="radio"/> Every time <input type="radio"/> Once Every <input type="text" value="Minute"/>	<input type="button" value="Message"/>
Drive Inserted	<input checked="" type="radio"/> Never <input type="radio"/> Every time <input type="radio"/> Once Every <input type="text" value="Minute"/>	<input type="button" value="Message"/>

Silicon Image

Setting-up Email Notification

1. Enter the hostname or IP address of the SMTP server. If you leave this blank, the SteelVine Manager will perform a DNS lookup and will attempt to find the address of the SMTP server automatically.

SMTP Server Name: (Use DNS lookup if blank)

2. Enter the SMTP Server Port number or use the default value of Port 25.

SMTP Server Port #: (Use '25' if blank)

3. Enter your full email address into the From box, and enter the full email address(es) of the intended recipient(s) of the condition notifications into the **To** and **CC** boxes.

From:

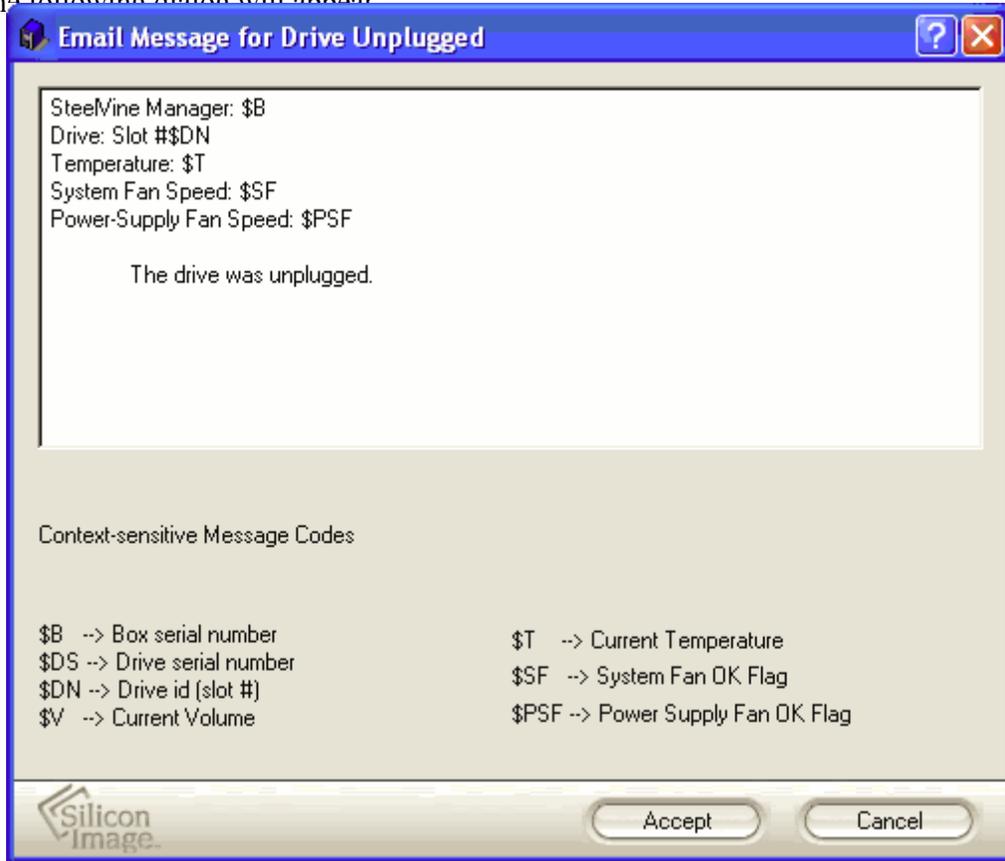
To:

CC:

4. Click on the “**Test Email**” button at the bottom of the screen to verify that you have correctly set-up the email portions of this feature. You may need some assistance from your network administrators if you have any problems.
5. For each error condition or event item, you can use the “**When to send**” radio button items to specify the frequency of sending an e-mail notification message to prevent a flood of email messages, especially when the same error condition or event occurs multiple times.
6. The Email Notification feature also you to customize a message for each of the error condition or event items (of which each has its own default message already built in). For example, use the following procedure to edit the message for “Drive Unplugged”.
 - Click on the “**Message**” button.

Drive Unplugged Never Every time Once Every

- The following dialog will appear:



- The message information can be customized to suit your needs. The Daemon can extract the following data from the SteelVine hardware:

J. Pop-Up Error Notification

Overview

You can enable or disable the Error Popup Notification. The default setting is that this feature is enabled and set to display for 30 seconds. Popup messages can appear for up to 60 seconds.

To set the option for manual closure of the pop-up window, set the seconds to “0”. This will keep the pop-up window from closing until you click **OK** to dismiss the pop-up message.

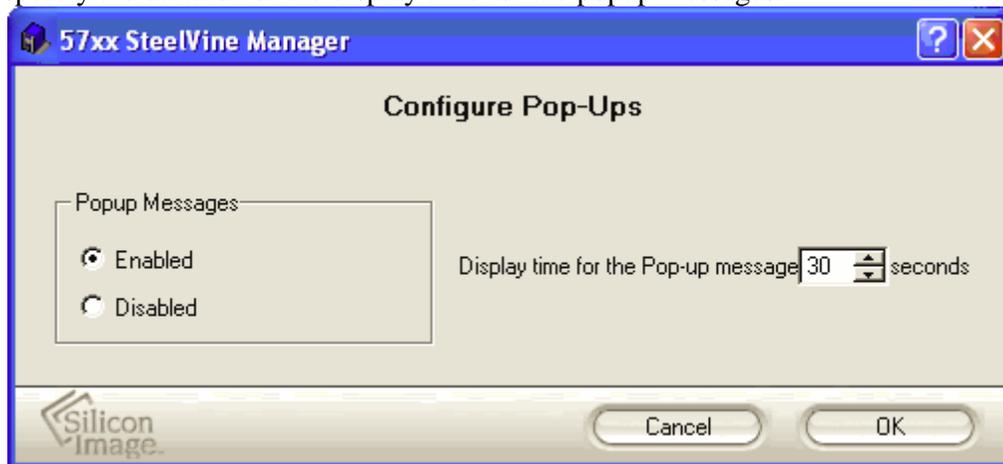
Accessing the Pop-Up Error Notification Dialog

Use the following procedure to enable the security feature and lock all of the hard drives.

1. Click on the **Pop-Up Error Notification** icon along the top of the SteelVine Manager [Status Window](#) or select the **Configure Pop-Ups** item from the Edit menu pull-down list.



2. Enter the Administrative password for your system (the default password is **admin**).
3. The **Pop-Up Error Notification** setup screen show below will appear. You can Enable or Disable the popup message by selecting the appropriate radio button. You can also specify the duration of the display time for the popup messages.



4. Click "**OK**" to save your settings.

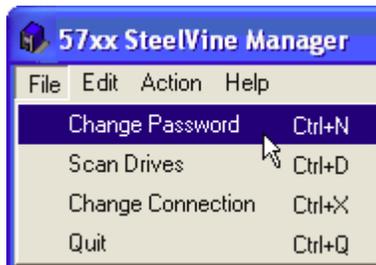
K. SteelVine Administration

This section explains how to perform administrative functions in the SteelVine Manager.

Changing the Administrative Password

The SteelVine Manager restricts configuration access with a password prompt. The password information is stored locally on the host running the daemon. The default password is **admin**. See to the [Manage the Client Connection Daemon](#) section for a description of the daemon.

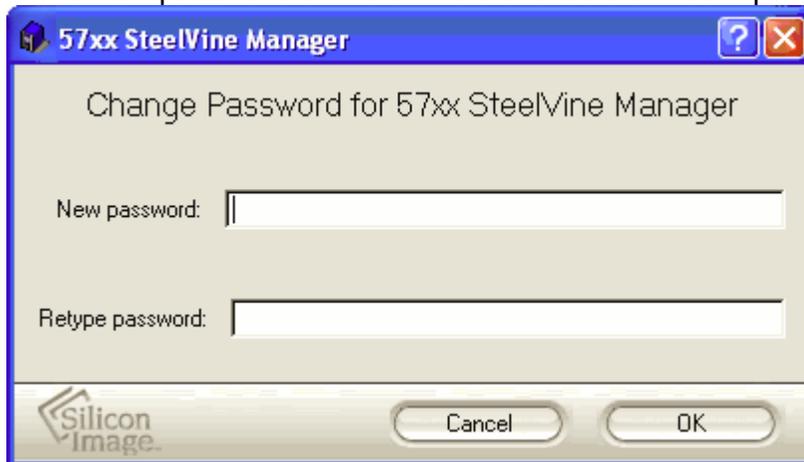
1. Select **Change Password** from the File menu.



2. Enter the current password (or use **admin** if you have not changed the default password) and click **OK**.



3. Enter a new password of five or more characters in both password fields.



4. Click **OK** to save the new password.

Manage Configuration Files

The Configuration Wizard provides menus and toolbar buttons to manage configuration files.

- The Read Config File command in the File menu imports a configuration file so that the user can restore a previously saved configuration (storage policy). This feature will only be available in the GUI Only mode on the rotary switch.

- The Save to Config File command in the File menu exports the SteelVine Storage Reference Design configuration to a file.

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

Import (Read) a Configuration File

Note: You must have previously [saved a configuration file](#) so that one is available to import.

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



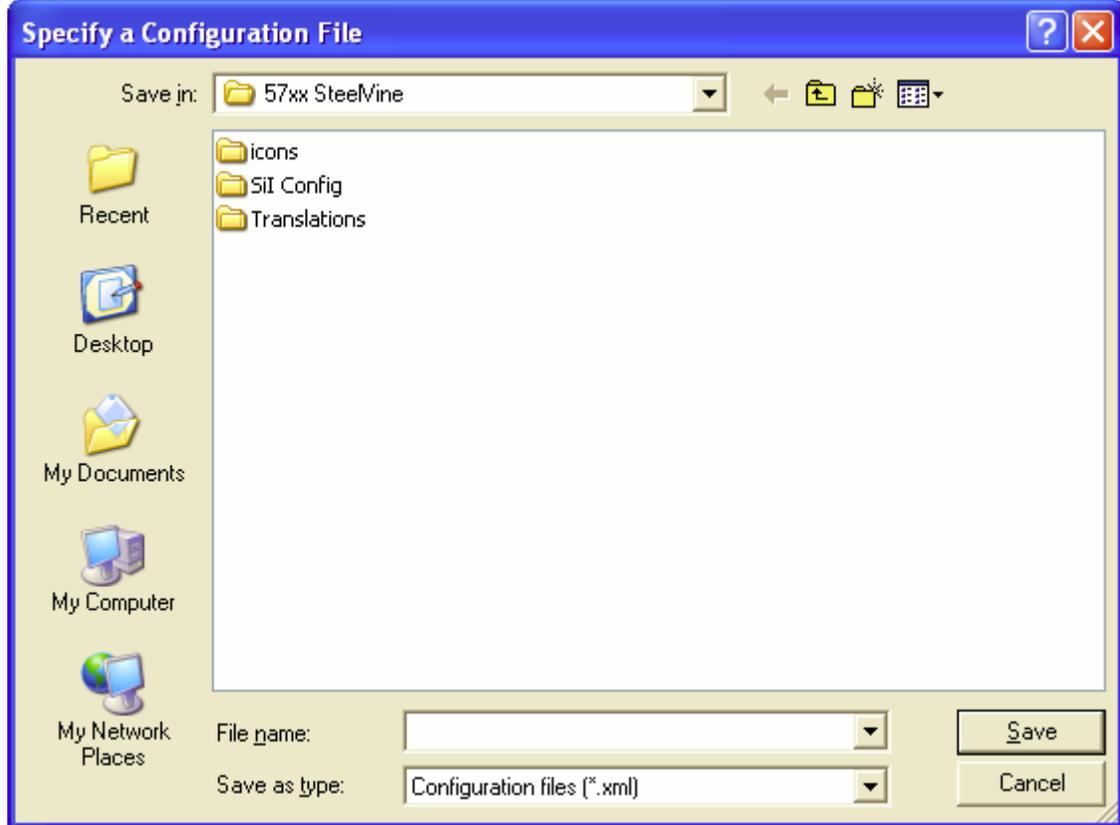
3. Navigate to the required file and click **Open** to import it. The Wizard provides notice of a successful import and graphically displays the imported volumes.
4. Click **Apply** to implement the imported configuration.

Save a Configuration File

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



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



Manage the Client Connection to the Daemon

The SteelVine Manager software consists of two modules:

- **Daemon:** a background process that establishes communication with the SteelVine Storage Processors (implemented as a Service on Windows platforms)
- **SteelVine Manager GUI:** an application that provides the graphical user interface

The *daemon* monitors the status of the PopDrive. By default, the user interface attaches to a daemon running on the same host to display the information gathered by the daemon. You can configure the user interface 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 drive failures. Identification of a failed part may then allow the service provider to replace failed components before further complications arise.

Prerequisites

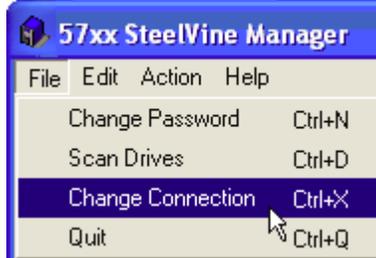
Ensure you have the following before you establish the remote connection:

- The daemon software is installed and running on a host computer connected to the PopDrive.
- The SteelVine Manager GUI software 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 51116. Do not change this port number.

Set Up a Remote Connection

1. In the [Status Window](#), select **Change Connection** from the File menu.



2. Enter the host name or IP address of the host computer on which the daemon is installed and enter the default port number of 51116.
3. Click **OK**.



The user interface establishes the requested connection and displays information gathered by the remote daemon in the [Status Window](#).

Note: The host name or IP address is not saved across sessions.

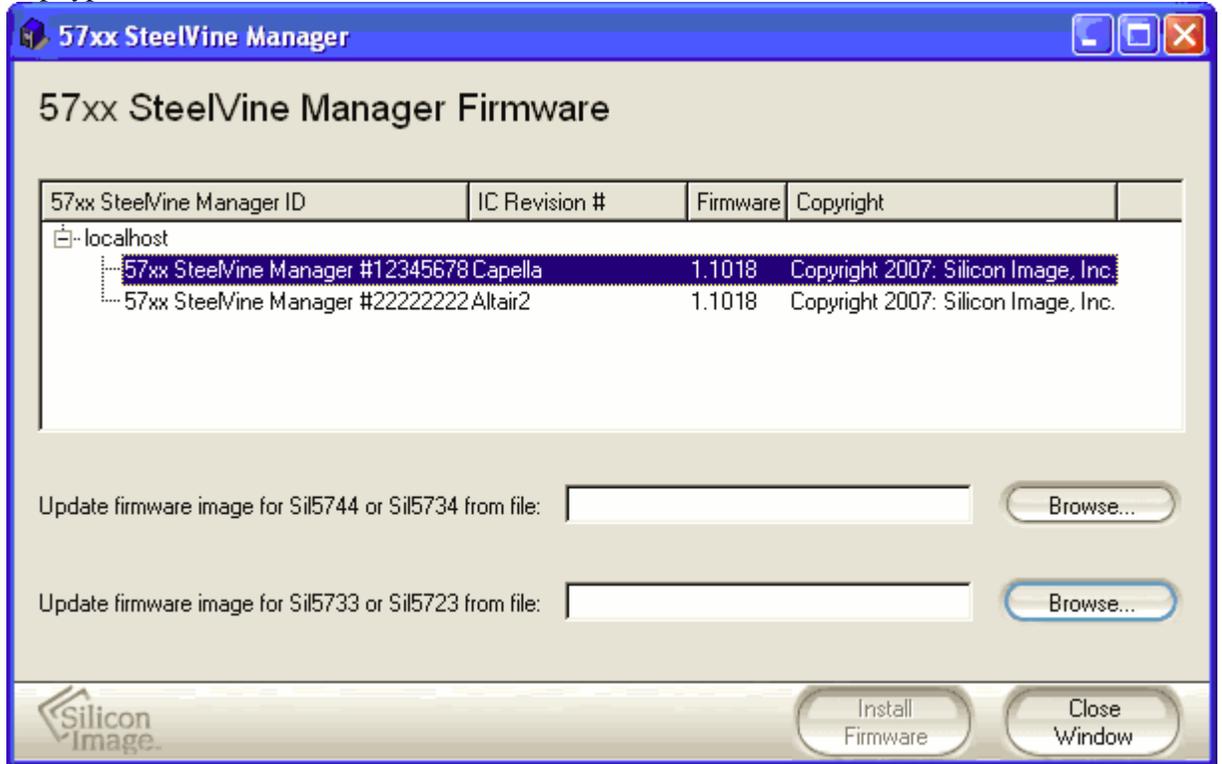
Install New Firmware

1. Select **Specify Firmware** from the Edit menu of the [Status Window](#) or click the **Specify Firmware** toolbar button.



2. Enter the current password (or use **admin** if you have not changed the default password) and click **OK**.

The Firmware Selection dialog shows the PopDrives that are attached to your host system, the integrated circuit (IC) revision, and the current firmware installed on each chip type.



3. Select the PopDrive that requires a firmware upgrade.
4. 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, and select the desired firmware image file with a **.bin** filename extension for your specific SteelVine chip.
5. Click **Install Firmware** to begin the upgrade process. A progress bar along the bottom of the dialog box will show the progress of the upgrade process.

Important: Do not access or power-off the PopDrive while installing the firmware image. The firmware installation process takes less than two minutes to complete for a standalone system.

6. After the firmware download is completed, a confirmation dialog appears directing you to restart your system. In addition, you should cycle the power on the PopDrive.

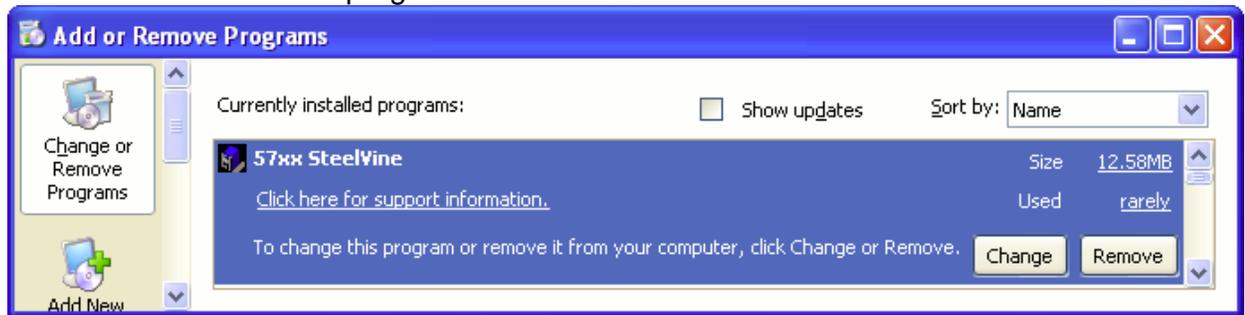
Install New SteelVine Manager Software

Before you install new software, uninstall the current version. The un-installation process stops the daemon so it can be removed along with the user interface. The new version of the daemon starts automatically when you install new software.

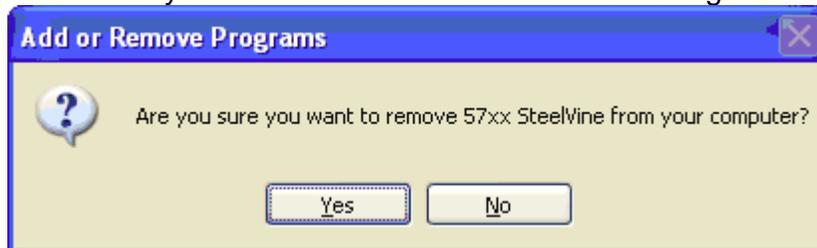
Uninstall Current Software

Windows

1. Exit the SteelVine Manager GUI.
2. From the Windows taskbar, select **Start > Control Panel > Add or Remove Programs**.
3. Select the 57xx SteelVine program and click **Remove**.



4. Confirm that you want to remove the SteelVine Manager software by clicking **Yes**.



Mac OS X

1. Drag the **Applications > Utilities > SteelVine** folder to the trash to remove the GUI [modules](#) and supporting files.
2. Drag the **Library > StartupItems > SteelVineDaemon** folder to the trash to remove the daemon startup scripts.

Install New Software

For Windows, Mac, or Linux, follow the instructions in the *SteelVine Quick Installation Guide* for your operating system to install a new version of the SteelVine Manager software.

L. Monitoring

Monitor Drive Status

The color of the drives and the labels in the [Status Window](#) indicate the state of the drive.

Color	Label	Definition	Resolution
Green	Normal	Drive is active.	No action is needed.
Gray or Red	Unplugged	Drive is offline. The color is initially gray, and may turn red after writing to a SAFE volume.	Secure drive in its bay. Replace drive if needed.
Red	Needs Rebuild	Drive is in a failed state. Data was written to a SAFE volume while the drive was offline.	Replace the failed drive.
	Use Bigger Drive	Drive was replaced with a smaller drive. The appliance is configured with the SAFE , FAST , or BIG storage policy , and these policies cannot accommodate the smaller drive.	Insert a drive that is the same size as or bigger than the original hard disk drive.
	Mismatch	A drive with an unexpected Serial Number was inserted for a SAFE , FAST or BIG volume.	Insert the correct hard disk drive.
	Not Readable	A bad sector was found on a SAFE volume's source drive while rebuilding.	None; the mirror copy cannot be completed.
	Locked	A drive that has been locked by a different system has been connected to the SteelVine Storage Process and cannot be used.	Unlock the drive or use a different drive.
	Unavailable	Drive is connected to the second port of the SteelVine Storage Processor, but the host system is not Port Multiplier aware.	None; the drive cannot be accessed from a non-PM aware host.
Orange	Rebuilding or Verifying	Drive is being rebuilt or the rebuild is being verified. The percentage complete also appears.	No action is needed; wait for the rebuild or verify operation to complete.
Light Blue	New drive	New drive was installed.	No action is needed.
Purple	Wrong slot	Mismatched Serial # and Expected Serial # because a drive is installed in the wrong bay.	Install the correct drive into the bay.

Monitor Temperature

The SteelVine Manager uses the following colors to indicate temperature status inside the appliance.

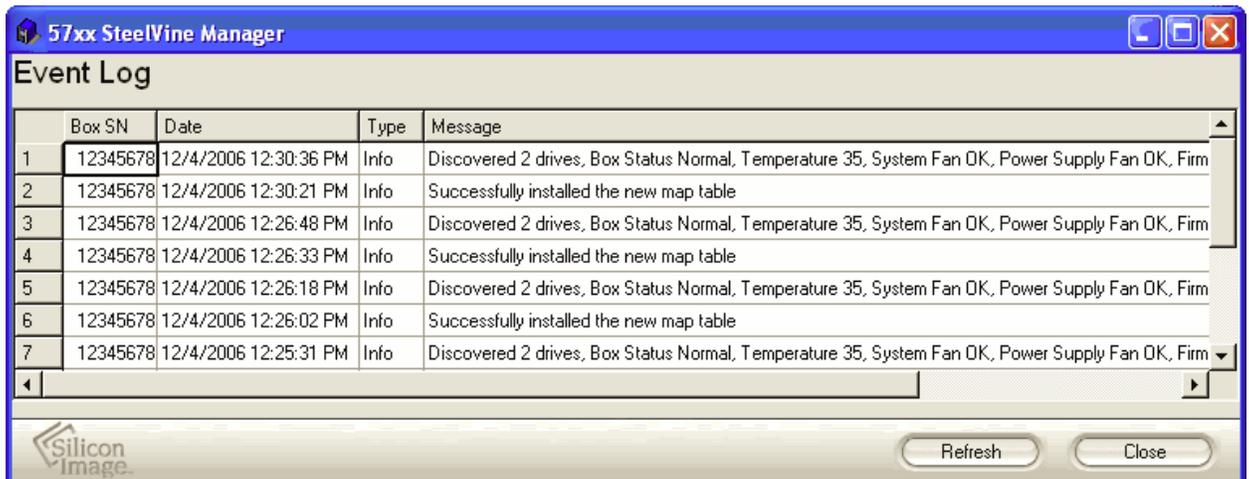
Color	Value	Definition	Resolution
Green	Normal	Both system and power supply fans are functioning within limits.	None required.
Red	System	The system fan is not spinning or is spinning slower than expected.	Contact point of sale for repair.
Red	PS	The power supply fan is not spinning or is spinning slower than expected.	
Red	System + PS	Both system and power supply fans are not spinning or are spinning slower than expected.	

Note: If no fan speed sensor is installed, a value of "n/a" will appear.

M. Event Log

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

1. Select **Event Log** from the Edit menu in the [Status Window](#).



The Event Log screen displays a list of events in a table format of columns and rows.

- **Date** displays the date and time of the event.
- **Box SN** and **Drive SN** display the respective serial numbers for the event.
- **Drive Manufacturer** displays vendor information.
- **Message** gives an event description.

2. Click **Refresh** to update the log or click **Close** to close the log.

N. Features not implemented

While there is a backup button option in the SteelVine manager software, there is no physical backup button on the PopDrive. This option will be removed from future versions of the PopDrive Management software.

IV. Safely Removing the PopDrive from your Computer

When using the USB port

USB 2.0 external devices provide support for “plug & play” connection, so that your USB storage device can be connected and disconnected while the computer is running. To prevent data loss or other failures, you must follow these steps when disconnecting your USB 2.0 storage device from your host computer system. Once the physical USB device is disconnected, any volumes that are associated with that device will become unavailable. On Windows systems, the SteelVine Manager GUI and daemon software must be stopped before any devices can be disconnected.

Windows Systems

- 1) Close the SteelVine Manager GUI and exit the icon in the Notification Tray.
- 2) Stop the SteelVine daemon by selecting **Start** → **Program Files** → **Silicon Image** → **57XX SteelVine** → **Control** → **Stop SteelVineService**. **Note:** Before using this procedure in Windows Vista, you must **disable** the **User Access Control** feature in Vista (refer to your Vista documentation for details).
- 3) Click on the **Eject** icon (a small green arrow over a hardware image) in the System Tray located in the lower right-hand side of your screen
A screenshot of the Windows System Tray. It shows a blue taskbar with a clock displaying '2:49 PM'. To the left of the clock is the 'Safely Remove Hardware' icon, which consists of a green arrow pointing right over a small hardware icon. A mouse cursor is hovering over the icon, and a tooltip box is visible above it with the text 'Safely Remove Hardware'.
- 4) A message will appear listing all of the devices that the Eject icon controls. Click on the “**Safely remove USB Mass Storage Device**” item.
- 5) The following message then appears: “**Safe to Remove Hardware**”. You can now safely disconnect the device from your computer.

Note: If your host USB adapter does not support this feature, the device should be disabled using the Device Manager or your system should be shut down cleanly and powered off before disconnecting the USB device.

Macintosh Systems

You must un-mount the hard drive system by dragging the hard drive icon to the trash before disconnecting it or powering it down.

Linux Systems

You must manually un-mount the volume using the appropriate Linux command for your specific system type before disconnecting it.

When using the eSata port

When using a SATA host connection, the hard disk drives can be hot-plugged or hot-unplugged while the system is running. However, to avoid data corruption or loss, care should be taken to ensure that the host system is not currently using any drive that is about to be hot-unplugged. When using a USB host connection, the hard disk drives should not be hot-plugged or hot-unplugged while the system is running. Instead, you should eject the drives or shut down your host system before connecting or disconnecting any hard disk drives.

V. In Case of Emergency – Don't Panic

How to recover from a Hard Drive crash

The most important thing to remember is: don't panic. If the SteelVine manager is indicating that one of the two hard drives in your RAID1 array is no longer functioning, then following these steps will ensure that you don't lose the data on the hard drive that is still good.

At this stage:

- 1) DO NOT turn off or log out of your computer.
- 2) DO NOT attempt to disconnect the PopDrive.
- 3) DO NOT remove any of the hard drives from the PopDrive.

This is what you should do:

Step 1) Do you have a replacement hard drive ready to put into the PopDrive?

Yes – move on to step 2

No – move on to step 1a

Step 1a) Go to the popdrive.com website and order a replacement hard drive.

Step 1b) Copy the data on your PopDrive somewhere else.

Depending on how much data you have, you may want to copy the data back to a folder on the hard drive of your computer, onto a flash stick, or onto another fully operational PopDrive. While it is extremely rare for two hard drives to fail within a week of each other, it's better to be safe than sorry. Once you have replaced the hard drive in the PopDrive and rebuilt the mirror, you can delete the emergency backup that you are making in this procedure.

Step 2) Open the SteelVine management software.

Step 3) Identify and remove the bad hard drive.

Step 4) Insert the new hard drive.

Step 5) Rebuild the drive array.

Step 6) Verify the drive array.

Appendix A – Technical Specifications

PopDrive

Length:	~6 3/8”
Width:	4”
Height:	1 1/8”

Weight (empty)	13 oz
Weight (w/ 2 hard drives)	21 oz.

Power: 5v, 2a

External connectors: eSata – 3Gb/s
USB2.0 – 480Mb/s

Hard Drive Requirements

Width	2.5”
Max height	10.5mm
Interface	Sata
Data capacity	limited only by the operating system of the connected computer

SteelVine Software Requirements

Windows Systems

- Intel Pentium-III 500MHz equivalent or faster
- Windows XP, 2003 Server, Windows 2008 Server, Windows Vista, or Windows 7 with the latest Service Packs
- CD-ROM drive
- 64 MB of RAM (minimum)
- 250 MB of free disk space
- Super VGA (800 x 600) or higher resolution display with at least 256 colors
- Mouse or compatible pointing device
- SATA connection: SteelVine Host Bus Adapter card (part number SV-HBA3124, or SV-HBA3132) and associated software drivers, or any other third-party SATA host controller with Port Multiplier support
- USB connection: USB 1.0 or 2.0 direct host connection or USB hub

Macintosh Systems

- PowerMac G5, MacBook Pro or Mac Pro
- MacOS X, 10.4.8 (or later)
- CD-ROM drive
- Mouse or compatible pointing device

- SATA connection: SteelVine Host Bus Adapter card (part number SV-HBA3124 or SV-HBA3132) and associated software drivers, or any other third-party SATA host controller with Port Multiplier support
- USB connection: USB 1.0 or 2.0 direct host connection or USB hub

Appendix B – Warranty Information

DHK Storage provides a one year warranty on the PopDrive. The warranties for the hard drives are covered by their respective manufacturers. For warranty repair on the PopDrive, please see the support section of the popdrive.com website.