

Owner's Manual

SATA II LCD Hot-Swap Systems

SATAVue™



EXTERNAL SYSTEM



INTERNAL 5.25" SYSTEM



DUAL EXTERNAL SYSTEM

Granite
D•I•G•I•T•A•L

Macintosh, Windows, Linux

SATA (Serial ATA) Hot-Swap Drive System / Case Kit

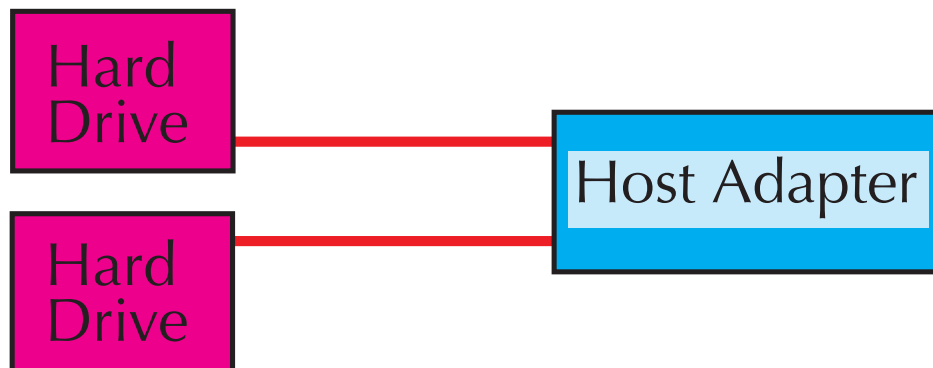
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How SATA Works

SATA II (Serial ATA) is a High Performance Serial Bus designed to transfer data at up to 300MBytes per second. This ultra-fast data transfer rate is perfect for storage applications where speed is a critical issue. The low cost of the SATA drives also provide affordable backup and archiving solutions.

Granite offers a variety of host adapters that support the Hot-Swap capabilities of SATA. These PCI cards and PCMCIA adapters support multiple drives. Check the Granite website (www.granitedigital.com) for a complete listing all our host adapters.

SATA is simple to configure because each drive operates on a separate channel. The cable goes from the host adapter to the drive and ends there. Installation is only a matter of plugging in the host adapter, plugging in the cable, turning on the drive and booting up the computer.



How SATA Works

In order to get SATA to perform at its maximum speed, the following items should be considered:

- 1)** Pick the controller card that best suits your needs. SATA Host Adapters come in a variety of models from 2 channel to 16 channel RAID cards. Also it is important to note that not all SATA Host Adapters support Hot-Swap and without that ability the drive can only be removed when the computer is turned off.
- 2)** The drive mechanism must go fast. Currently SATA drives are rated at 300MB/s burst rate and most drives can sustain 55MB/s data transfer rates. In order to get SATA to go faster, a Stripped RAID (also known as RAID 0) must be created. RAID is supported by most operating systems so having a knowledge of the operating system is important. The other alternative is to purchase a RAID Host Adapter. The advantage here is that most RAID Host Adapters will perform at higher data transfer rates than their software alternatives.
- 3)** The computer and the speed of its PCI bus will directly affect the performance of the SATA Bus and their drives. Earlier computer models run at a fraction of the speed of the newer models. In order for the drives to transfer at their highest performance levels use of a high performance computer is also a must. Again, the newer computer technologies offer the greatest performance levels.

There are two types of SATA cables (shielded for external use and unshielded for internal use) and two types of connectors. The original SATA connector is known as the “L” type because it’s opening looks like an “L”. The new eSATA connector, known as an “I” type because the connector is similar to the letter “I”. The eSATA “I” connector is almost identical to the SATA “L” with the exception that it is designed to be used as a Hot-Swap type of connection with many more insertions and removals than the original “L” type.

Connecting SATA Devices

Granite cases use the “L” type connector because we Hot-Swap the drive mechanism not the cable. Host adapters use both the “L” or “I” types with the eSATA becoming more popular as the external connection, “I” internal.

Since SATA uses one channel per drive, each SATA drive must be directly connected to a SATA host adapter channel. Cable length can be up to 72” using Granite shielded external cables.

Granite manufactures a variety of cables, brackets, and adapters that allow SATA to be used in a variety of applications. Our website (www.granitedigital.com) lists all of these products. Our cable selection includes internal and external shielded cables.

After installing the hardware some operating systems may require additional drivers. The host adapter may include a CD with these necessary drivers. Make sure the host adapter supports your operating system because different adapters support different systems.

Installing the SATA drive mechanism in our Hot-Swap System is easy. SATA drives do not have terminators or switch settings, so all that is usually necessary is to plug them into the power and data cables.

Temperature is always a consideration with drive mechanisms and our Hot-Swap System includes an alarm system that monitors the drive temperature. Should the system detect an abnormally high temperature immediately shut down the drive to prevent data loss. Abnormal drive temperatures are usually either fan malfunction or drive mechanism malfunction.

Removing the Hot-Swap Tray

We have designed our Hot-Swap System to be as simple as possible when installing a hard drive mechanism. The tray is easily removed from the frame by pulling on the handle. Removing the tray allows you to swap drives in and out quickly and easily.

Removing the tray is done by lifting the handle up and gently pulling out the tray. Make sure that the key lock is in the unlocked position before trying to remove the tray.

The system ships with the the key in the unlock position and the key is located inside the tray along with the hardware for fastening the hard drive to the tray.



When the key lock is unlocked, the slots will be lined up at the bottom.

Grip the tray firmly when removing it so that it does not get accidentally dropped. This is very important after you have installed the hard drive. Drives are fragile and should be handled with care. The tray protects the drive but the mechanism can still be damaged if it gets dropped.

Gently pull the tray out. If you ship the drive mechanism, make sure to package the drive in a box with at least 4" of foam all around the tray.



Removing the Hot-Swap Tray

The Tray should be placed on a flat work surface. When installing the hard drive, static electricity can cause damage to the drive mechanism. Take care to

make sure you are grounded properly and are working on a surface that is not prone to static discharge. One way to add a little security is to touch something that has a good ground before touching the drive mechanism. One area that is grounded is the rear of the Hot-Swap Case when it is properly plugged into a grounded outlet.



Press the tab on the front of the tray lid and gently slide it back.

Once the cover is removed and the hardware package opened, prepare the drive mechanism for installation. SATA drives do not need to be jumpered so installation is very simple and straight forward.



Installing the Drive

Gently slide the SATA Drive Mechanism in from the rear of the tray. Make sure the wires do not get pinched. Locate the 4 screw holes and line up the drive mechanism.



Check to make sure that the wires are inside their channel and not sticking up. Do not pinch them when the drive is secured with the attachment screws.

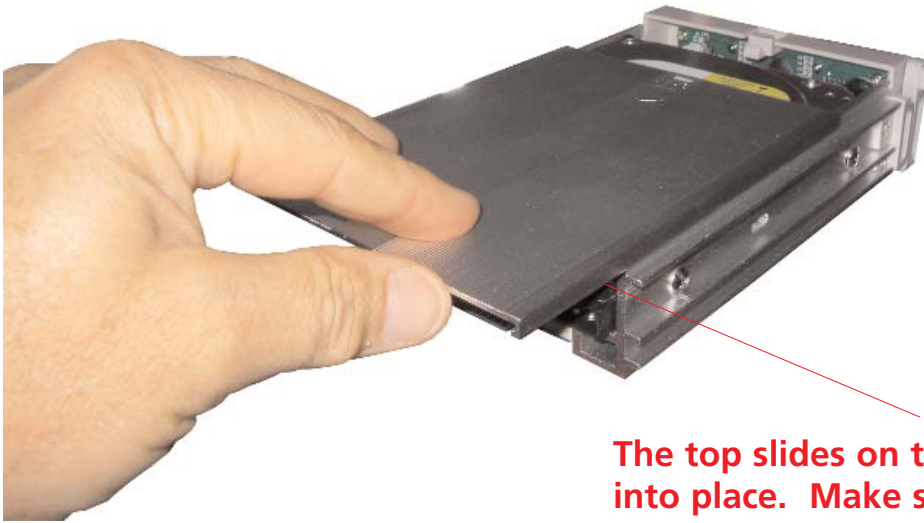
Using a phillips head screw driver install the (4) mounting screws that hold the drive in place. These screws secure the drive and guarantee that it will be properly grounded when inserted into the system. Do not over tighten the screws. Once the (4) screws are inserted check to make sure that no cables are pinched and that the drive is centered properly.



There are two different types of screws used on drive mechanisms. We supply both types. Test the screws to make sure they are the correct size.

Installing the Drive

Reinstall the top of the tray. The side with the notch goes to the front. When sliding the top into place, it will snap into its final position. You are now ready to install the tray back into the Hot-Swap System.



The top slides on two rails and locks into place. Make sure that both sides are even when the top is slid on.



The top locks into place when the tab at the front of the tray clicks into place. Make sure this tab is securely fastened.

Installing the Drive



The tray slides back into the Hot-Swap System with very little effort. As the tray reaches the last 1/4 inch, push it in using the handle. The tray will now be flush with the front and has been seated properly. Never force the tray into place and always make sure there is nothing in the opening before inserting it.

When the tray is flush with the front it has been inserted correctly. Turn the key lock on to protect the drive from being accidentally removed.

As soon as the tray is inserted the RED (Drive Inserted LED) will come on indicating that the drive mechanism has been installed.



Note : There is a master power switch that must be turned on. This switch can remain on all the time. The tray insertion is what powers the drive and can be used as the power switch. Simply lift the handle and remove the tray to turn the drive off.

Testing the Drive



Without connecting the drive to the computer, plug in the power cable and turn the drive on using the main power switch on the rear of the case. The Green Power LED and Green Frame Power LED should both come on immediately.

If the Drive Tray is already inserted, the RED (Drive Inserted) LED should come on and the Blue LCD Display should show both the temperature and the fan speed (RPMs).

If the Drive Tray is not inserted, do so now, and the RED (Drive Inserted) LED along with the Blue LCD should come on as soon as the handle is pushed down in place.

Troubleshooting

1- THE DRIVE DOESN'T MOUNT:

Macintosh OS 9: The Host Adapter manufacturer may have special drivers that will need to be installed with the PCI Host Adapter. Check the manufacturer's installation instructions for details.

Macintosh OS X: When you install a new drive mechanism using OSX the Application "Disk Utility" is what you use to Partition, Format, RAID, Test, or Erase the drive. Disk Utility is located in the Applications / Utility folder.

Windows:

New drive mechanisms that are plugged into the Windows operating systems will need to be partitioned and formatted before they will show up as a new drive letter. Check the Microsoft website for details on how to use Fdisk and Format (98SE or ME) and how to use Disk Management Utility (2000 and XP). Formatting and partitioning a SATA drive is exactly the same as any other Microsoft supported drive.

You should also read the Host Adapter manufacturer's instructions on driver installation. Every PCI Host is different and may need specific files to work.

2- COPIED FILES ARE MUCH BIGGER THAN ORIGINAL:

This problem is specific to the Macintosh. If you initialize a drive using Standard HFS partition, the files will appear very large. The solution is to reinitialize the drive using "Extended HFS+ Partitioning".

Troubleshooting

3- THE DRIVE DOES NOT RUN AS FAST AS IT SHOULD:

SATA bus speed is determined by four things:

1- The drive performance level. Faster drives (10,000rpm) have higher data transfer rates and make a difference in speed. A larger buffer size also improves drive performance.

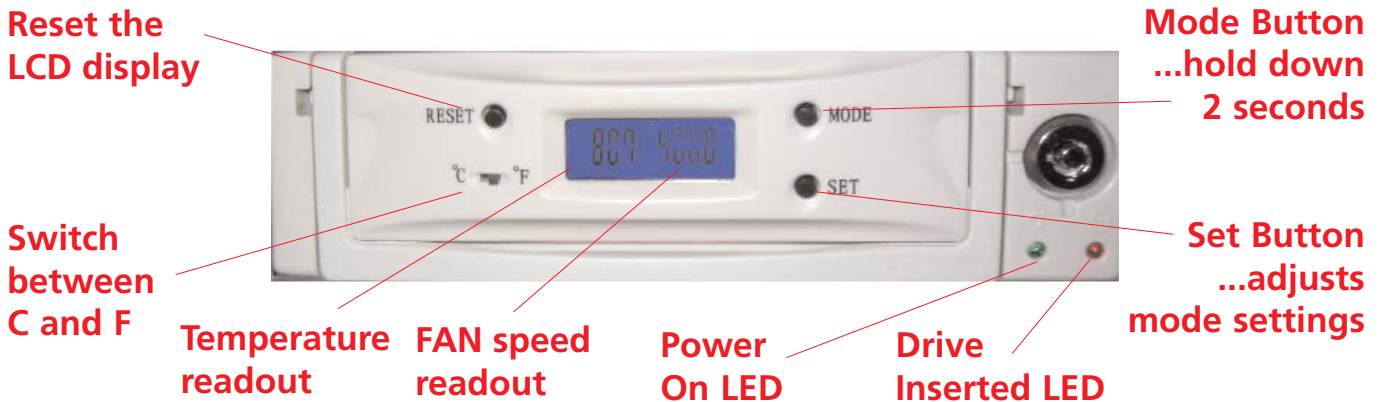
2- The Host Adapter technology. SATA Host Adapters come in a variety of speeds and support RAID for even faster performance. Check the specifications on your Host Adapter to make sure that it fits your needs.

3- The computer itself and its PCI Bus. The faster the computer the faster its PCI performance. The SATA host adapter will work faster with faster PCI speeds.

4- The Operating System. Older Mac OS's and Windows OS's do not perform as well as newer ones. Using the most advanced and recent OS will offer a dramatic improvement in speed.

Setting the Temperature Alarm

The Mode and Set Buttons are used to adjust the alarm. Push the Mode Button for 2 seconds to enter the set mode. There are a total of 4 settings that can be changed. The first is T1 (Temperature 1), then F1 (Fan 1), T2 (Temperature 2), and F2 (Fan 2). Pressing the Mode Button allows you to select any of the 4 settings. When the desired mode has been picked, use the Set Button to adjust its value. To exit the Set Mode simply hold the Mode Button down for 2 seconds and it will return to the operation mode.



Once the alarm settings have been established the alarm will monitor both the temperature and the fan speed. Should either go above its threshold a buzzer and flashing display will alert the user to the problem. This buzzer automatically stops after 30 seconds but the display will continue to flash.

Internal Hot-Swap Specifics

The Internal SATA Hot-Swap fits into any standard 5.25" opening. It comes complete with the necessary screws to mount it into the computer bay. Power to the SATA Hot-Swap is via a standard 4-Pin Power Connector. The data is supplied using the standard 7 pin SATA connector. Depending on the type of SATA Host Adapter the drives will be either hot-swappable or removable. Some cards do not support the hot-swap feature and the computer will need to be powered down before removing the drive mechanism.



**SATA data
7 pin connector**

**Standard 4 pin
power connector**



The External SATA Hot-Swap System comes complete with everything needed to plug and play except the data cables and host adapter. The enclosure has a built in power supply and plugs into it via a standard IEC computer power cable. In the rear are 2 SATA data connectors that need to be plugged into the optional 3' or 6' Shielded SATA cables available for the system. Once the power has been plugged in the front power switch can be pressed to test the system.



When the switch is pressed, the green power LEDs should come on indicating that the enclosure and the Hot-Swap frames are working properly. If you have drives installed, the red (drive inserted) LEDs will also come on indicating that the drives have been detected. If all checks out, the computer can now be turned on and the drives will be ready for formatting and partitioning. For more detailed instructions, see page 12.

Specifications

DIMENSIONS :

2.4"H x 8.25"W x 10.5"D - External System

6.0"H x 7.00"W x 11"D - Dual External System

POWER SUPPLY :

50W TUV/CE/UL/CSA - 90-264 VAC In. - External System

80W TUV/CE/UL/CSA - 90-264 VAC In. - Dual External System

DATA TRANSFER RATE :

300 MB/second (actual speed depends upon the drive and the computer, see page 4 for details)

DEVICE SUPPORT :

3.5" SATA Hard Drives

CONNECTORS :

1 SATA 7 Pin / 1 IDC Power In - External System

2 SATA 7 Pin / 1 IDC Power In - Dual External System

OS COMPATIBILITY :

Works with all OS's that support SATA Hot-Swap or that have a compliant card and software. This includes Mac OS OS X.xx, Windows 98SE, ME, 2000, and XP.

CABLE LIMITATIONS :

72" using Granite Shielded External Cables.

Warranty and Service

Granite Digital warrants your SATAVue Hot-Swap System against any defects in material and workmanship, under normal use, for a period of one year following its date of purchase. In the event this product is found to be defective within the warranty period, Granite Digital will, at its option, repair or replace the defective unit.

This warranty is void: a) if the unit is operated or stored under abnormal use and maintenance conditions; b) if the unit is repaired, modified or altered, unless such repair, modification or alteration is expressly authorized in writing by Granite Digital; c) if the unit is subjected to abuse, neglect, lightning strike, electrical fault, improper packaging, or accident; d) if the unit is installed improperly; e) if the serial number of the unit is defaced or missing.

Granite Digital will not, under any circumstances, be liable for direct, special, or consequential damages such as, but not limited to, damage or loss of property or equipment, loss of profits or revenues, cost of replacement goods, or expense or inconvenience caused by service interruptions. Under no circumstances will any person be entitled to any sum greater than the purchase price paid for the unit.

To obtain warranty service, you must contact Granite Digital's Technical Support Department by calling 510-471-6442. They will attempt to diagnose and correct your problem by phone. If the unit does not function properly, they will issue a Return Material Authorization (RMA) number. You may be asked to furnish proof of purchase to confirm that the unit is still under warranty. Also have the serial number available.

All enclosures returned to Granite Digital must be securely packaged and shipped postage prepaid. All the product returns must be authorized in advance by Granite Digital's Technical Support Department. Authorization is confirmed by issuance of the RMA number, which must be written prominently on the outside of the box in which the defective unit is returned to Granite Digital.