

Disk Subsystem

User Manual



Zzyzx Peripherals, Inc.



Storage solutions by design

DISK SUBSYSTEM INSTALLATION GUIDE

Zzyzx Peripherals, Inc. Limited Warranty

Thank you for purchasing this product from Zzyzx Peripherals, Inc. We are constantly striving to provide our customers with the best product available, and while we make every effort to ensure that you receive your purchase trouble-free, we realize that problems will occur. In the event that any such problem should occur, please refer to the following warranty statement for information.

STANDARD WARRANTY

Zzyzx Peripherals, Inc. warrants our products to be free of defects in workmanship and materials for a period of one (1) year, unless otherwise stated. Our disk drives over 1.OGB include a five (5) year warranty, unless otherwise stated. This standard warranty is a return-to-factory warranty. Zzyzx reserves the right to repair, replace or upgrade at our option with new or refurbished product which is in good working order.

All major components that require repair will be returned to the Original Equipment Manufacturer for service. The standard turnaround for any repair is 30 to 45 days, though Zzyzx will make every effort to keep the turnaround time to an absolute minimum.

All repairs carry a warranty for the remainder of the original warranty, or for ninety (90) days, whichever is greater, unless otherwise stated. Upon completion of the repair, Zzyzx will return the product to the customer freight prepaid via second day delivery, unless the customer makes other arrangements.

This warranty only applies to defects encountered during normal use of the product while following operating instructions. It does not apply to any damage or defect due to negligence, mishandling, misuse, accident or the use of unauthorized parts or service by the customer.

48-HOUR EXPRESS EXCHANGE WARRANTY (Optional)

An optional Express Exchange Warranty is available for some products for an additional fee at the time of purchase. The Express Exchange Warranty applies for the duration of the standard warranty period. For availability and fee schedule contact your Zzyzx Account Manager.

A defective item with an Express Exchange Warranty will have an advance replacement shipped to the customer within two (2) working days upon issuance of an RMA number by Zzyzx Customer Service. The replacement item will be shipped freight prepaid via second day delivery, unless the customer makes other arrangements. Upon receipt of the replacement item, the customer must return the defective item to Zzyzx freight prepaid within ten (10) days. Otherwise the customer will be billed for the replacement item at the then current price.

EXTENDED WARRANTIES (Optional)

Extended Warranties are available for all products per the standard warranty terms. Some items may also be eligible for an extended Express Exchange Warranty as well. For details contact your Zzyzx Account Manager.

DOA POLICY

Zzyzx' Policy on Dead On Arrivals (DOA's) applies only to new equipment during the initial thirty (30) days, commencing from date of shipment. If the equipment is discovered to be defective, obtain an RMA number from Zzyzx Customer Service per the instructions under "Repairs/Returns". Upon issuance of the RMA number, Zzyzx will ship an advanced replacement item normally within two (2) working days, subject to the replacement item being in stock. The DOA policy does not cover physical damage incurred in shipping. The customer is responsible for placing all freight damage claims with the carrier.

RESTOCKING FEES

Zzyzx charges a minimum 15% restocking fee for any shipped product that is returned or refused not due to a Zzyzx error. All such returns must include all items shipped, including any documentation, software and accessories.

REPAIRS/RETURNS

Prior to returning any product, Zzyzx Customer Service must first authorize and issue a Return Material Authorization (RMA) number. Any item returned without an RMA number is subject to refusal. Freight collect or COD returns will be refused. To receive an RMA number contact Zzyzx Customer Service. When contacting Zzyzx Customer Service please have the Zzyzx part number, serial number, Zzyzx invoice number, date of purchase and a detailed description of the problem.

All returned goods must be shipped freight prepaid in their original boxes and packing materials with the Zzyzx RMA number prominently displayed on the outside of each shipping container. Once an RMA has been issued, the items must be returned to Zzyzx within thirty (30) days, or else the RMA will be cancelled.

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INSPECTION

Before unpacking your new Zzyzx Disk Subsystem, you should carefully inspect the shipping container for damage that may have been caused during shipping. If there is any damage that incurred during shipping, take note of this damage and immediately notify the shipping company that delivered the package. Do this BEFORE unpacking the shipping container. The shipping company will fill out a claim and inform you on how to proceed.

UNPACKING

If the shipping container is not damaged, you may unpack its contents. The shipping container should contain the following items:

- Zzyzx warranty sheet (also on pages I-II of this manual)
- Zzyzx disk subsystem
- Power cord
- This manual

The container may also contain one or more additional accessories such as:

- SCSI cables
- SCSI terminator
- Software

After unpacking and verifying that you have received all items as indicated on the packing list, please be sure to keep all of the packing and shipping materials. In the event that you need to return the Disk Subsystem back to Zzyzx, you need to ship it in the original packing.

INSTALLATION

Preparing for the new drive

Some planning should be taken when installing a new SCSI device, and the following questions should be answered before proceeding.

- What type of SCSI bus am I attaching this to?
- What is my maximum bus length and will the new device be within specs?
- Do I have a free SCSI ID and what is it?
- Do I have all the proper cables and terminators?

What type of SCSI bus am I attaching this to?

Mostly all current computers ship with Ultra Wide Single Ended SCSI buses (SUN, SGI, H.P., etc.). Different SCSI buses may not work with others and knowing what you are connecting to helps resolve compatibility problems.

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Brief List of Computers and Their Native SCSI Bus Types

Computer	Type	SCSI bus
Sun/Tatung	Ultra 1,2	Fast Wide Single Ended
Sun/Tatung	Ultra 30,60,450	Dual ported Ultra Wide Single Ended
Sun	Sparc 5,10,20	Fast Narrow Single Ended
Sun	Ultra 5,10	IDE
Tatung	Ultra 10	Dual ported Ultra Wide Single Ended
Adaptec	2940U	Ultra Narrow Single Ended
Adaptec	2940UW	Ultra Wide Single Ended
SGI	O2	Dual ported Ultra Wide Single Ended
SGI	Origin 2000	One Ultra Wide Single Ended and One Ultra Narrow Single Ended
SGI	Octane	Dual ported Ultra Wide Single Ended
H.P.	B/C/J-class	One Fast Narrow Single Ended and One Ultra Wide Single Ended

What is my maximum bus length and will the new device be within specs?

Once the SCSI bus of the host (computer that you are connecting to) has been determined, you should verify that the device can be connected to the host machine. The SCSI bus specs have restrictions on how many devices and how long the SCSI bus can be (from end to end including all internal cables). Please confirm the SCSI bus lengths using the following chart.

SCSI Bus speed	*HVD/SE/LVD	Wide/Narrow	Max bus length in ft.	Number of Devices
Fast	SE	Narrow	18	7
SCSI2	SE	Narrow	18	7
SCSI2	SE	Wide	12	15
SCSI2	HVD	Narrow	72	7
SCSI2	HVD	Wide	72	15
ULTRA	SE	Narrow/Wide	4	4
ULTRA	HVD	Narrow	36	7
ULTRA	HVD	Wide	36	15
ULTRA2	LVD	Wide	36	15

* HVD=High Voltage Differential / SE=Single Ended / LVD=Low Voltage Differential

Note about LVD: The Ultra-II LVD supports backward compatibility with Ultra SE. This means you can plug an LDV drive onto a SE bus or vice-versa and still have it work. However, doing this will cause the bus to revert to SE specs and speeds (example: Ultra is 1.4m / 4ft at 40MB / sec). The only way to achieve the listed speeds is to have both the host and the drives support Ultra-II LVD. If any device in the bus is SE (including the terminator), the whole bus reverts to SE and all of the benefits of LVD are lost. This is what we call "dual mode operation". This feature may not be supported indefinitely. Please check before installing.

Do I have a free SCSI ID and what is it?

Before installing the SCSI device, make sure that there is an unused SCSI ID and what ID you can use. You cannot select a SCSI ID that is in use by another device. Each computer has a different way of verifying the open SCSI ID's. Please verify with the system administrator what SCSI ID the new device should be set to.

Do I have all of the proper cables and terminators?

Before installing the SCSI device, it is wise to verify that all of the parts necessary to install are available. To add a device, you need a SCSI cable, the subsystem and a terminator. Please verify that you have these items on hand prior to shutting down the computer.

If the required parts are not all there, please verify the packing list to make sure that they were sent. Sometimes the product was not purchased and you may only receive one or two parts.

HALTING YOUR SYSTEM

To ensure that there are no problems during the installation, all users should be logged off the system.

On almost all Unix systems:

- 1) Open a terminal window or Unix shell
- 2) Type su and enter the superuser password
- 3) Type shutdown -i 0 -g 120 "System going down in two minutes"

This will work on almost all versions of Unix. These commands will shutdown the server and bring it to a bios level. If the above fails to work, please contact your System Administrator for details pertaining to your system.

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On NT/95/98 systems:

- 1) Select start from the bottom menu
- 2) Select Shut Down
- 3) Select Shut Down the computer?
- 4) Select OK

SCSI ID (TARGET) SELECTION

The SCSI ID or target of the disk subsystem should be set to an unused ID on the SCSI bus to which you are attaching it. The SCSI specification allows eight (8) devices to be configured at targets zero (0) thru seven (7) on a narrow SCSI bus. On a wide SCSI bus, sixteen (16) devices are allowed at targets zero (0) thru fifteen (15). Most systems reserve target seven (7) for the SCSI controller itself. Some reserve target zero (SGI machines being the most popular).

After determining which targets are available for use, you should verify which target(s) are configured for use with a disk drive. Some systems allow you to set a target for a drive at any unused SCSI ID. However, others are more specific as to what target a drive can be set to. For example, Sun machines reserve SCSI ID six for the CD ROM device. Please refer to your system documentation for further information.

The SCSI ID select is located on the rear of the enclosure. Depending on the type of enclosure, the switch will be either an 8-position or a 16-position rotary switch. The switch is usually located by the fan on single bay enclosures or on the top right on multi-bay enclosures.

To change the SCSI ID of a device simply use a pen and depress the + or the – button until the display shows the appropriate SCSI ID.

CABLING

You may now connect your Zzyzx Subsystem to your SCSI bus with a SCSI cable. This cable should be as short as possible to minimize SCSI bus problems. Keep in mind that all SCSI buses have a maximum cable length. The cable length is the total bus length including internal cables. Here are the maximum bus lengths for all of the current SCSI buses.

SCSI Bus speed	*HVD/SE/LVD	Wide/Narrow	Max bus length in ft.	Number of Devices
Fast	SE	Narrow	18	7
SCSI2	SE	Narrow	18	7
SCSI2	SE	Wide	12	15
SCSI2	HVD	Narrow	72	7
SCSI2	HVD	Wide	72	15
ULTRA	SE	Narrow/Wide	4	4
ULTRA	HVD	Narrow	36	7
ULTRA	HVD	Wide	36	15
ULTRA2	LVD	Wide	36	15

Cables play a very important role in all of this. A high quality cable is designed to be used on HVD, SE or LVD buses. What really matters is the SCSI bus speed. The SCSI bus speed determines the characteristics of the cables and lower speed cables should NEVER be used on higher speed buses.

For example, a high quality SCSI2 wide cable can be used in either a HVD or SE configuration but cannot be used in a ULTRA wide system. However, an ULTRA wide cable can be used in a SCSI2 wide configuration. This should be kept in mind when upgrading current SCSI devices. This includes all cables, not only the external but also the internal cabling.

For all of its intelligence, a SCSI device cannot detect improper cabling and termination. During the initialization phase of a SCSI bus, the host and device talk to each other to set up transfer rates. It doesn't test or can tell if the termination and cables are correct. It just talks at the highest speed that the host and device are set for.

For example: You have an ULTRA host and an ULTRA drive and plug them together using a SCSI2 spec cable. The drive and host will talk at ULTRA speeds, but the lower spec SCSI2 cable will cause bus errors and drive problems.

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NOTE ON COMPATIBILITY

The SCSI bus was designed from the beginning to be backward and forward compatible. Basically, this allows you to put any drive on any bus. There are a few VERY IMPORTANT things to remember when doing this.

- 1) HVD devices (controller and drives) cannot be plugged into LVD or SE devices.
- 2) The controller will talk to the device at the highest possible speed regardless of termination or cables.
- 3) SCSI bus speed is only as fast as the controller.
- 4) SCSI bus speed is determined on a device per device basis.
LVD is the exception to this rule.

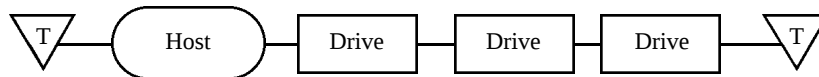
The Ultra-II LVD supports backward compatibility with Ultra SE. This means you can plug an LVD drive onto a SE bus or vice-versa and still have it work. However, doing this will cause the bus to revert to Ultra specs and speeds (1.4m/4ft at 40MB/sec). The only way to achieve the listed speeds is to have both the host and the drives support Ultra-II LVD. If any device in the bus is SE (including the terminator), the whole bus reverts to Ultra and all of the benefits of LVD are lost. This is what we call dual mode operation. This feature may not be supported indefinitely. If you have concerns about this please contact your Zzyzx Account Manager or Zzyzx Technical Support before installing the subsystem.

Examples

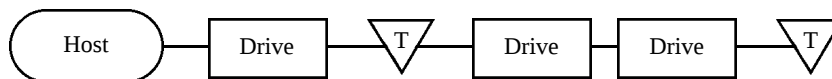
Host Controller	Device1	Device2	SCSI bus speed
Fast SCSI	Fast SCSI	ULTRA	Fast SCSI
ULTRA	ULTRA	SCSI2	Device 1 ULTRA Device 2 SCSI2
SCSI2	ULTRA	ULTRA	SCSI2
LVD	LVD	LVD	LVD
LVD	LVD	ULTRA	ULTRA

TERMINATION

Termination is required for proper stability of the SCSI bus. Termination must be provided at each end of the SCSI bus. Termination provides a way to reduce signal bounce back and interference. The terminator basically kills the signal at the terminator.



Properly Terminated SCSI bus



Improperly Terminated SCSI bus

On the properly terminated SCSI bus, all of the drives and hosts have the ability to communicate with one another and the signal is killed at the end of the bus (basically a one way ticket). On the improperly terminated SCSI bus, the host would fail to see any device past the first drive. Depending on how long the cable from the host to the drive is, the host may not see the first drive at all, or worse, have bad data.

POWER

You can now connect the power cord supplied with your Zzyzx Subsystem. The subsystem uses an auto-switching power supply and can be connected to either a 110 or a 220-volt power source. The standard power cord supplied is for a 110-volt power source. If you need a 220-volt power cord, contact your Zzyzx Account Manager.

O.S. CONFIGURATION

At this time double-check all of your work. Once all of the connections have been verified, proceed to power on the subsystem. Power on the reset of the external devices then power on the host system last.

Important: The following instructions may vary from machine to machine and can be dangerous. These are meant to be general guidelines, not definitive instructions. They also assume that you have a working SCSI controller. If you have any questions please contact your System Administrator, System Documentation, or Zzyzx Technical Support.

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SUN machines with Solaris 2.x:

- 1) Turn on power to the server / workstation.
- 2) During the boot up press stop A.
- 3) At the O.K. prompt type probe-scsi-all. This will probe all of the SCSI buses. Look for the new device and verify the SCSI ID.
- 4) Once the new device has been seen type boot -rv at the O.K. prompt. This will reboot the machine and reconfigure the kernel for the new SCSI ID.
- 5) At the login screen login as root.
- 6) Run the format command.
- 7) Select the new device and modify the partition table as needed.
- 8) Run the newfs command on all the new partitions.
- 9) Run the fsck command on all the new partitions.
- 10) Run the mount command to mount all the new partitions.
- 11) Edit the /etc/vfstab to make the mount point permanent.

Windows 95/98

- 1) Turn on power to the system.
- 2) Select Start (located on the lower left of the task bar).
- 3) Select Programs.
- 4) Select MS-DOS prompt.
- 5) Run the fdisk command. Select y to enable large disk support.
- 6) Select 5 to change current fixed disk.
- 7) Select the new drive.
- 8) Select 1 to create DOS partition or Logical DOS drive.
- 9) Select 1 to create Primary DOS partition.
- 10) Reboot the machine.
- 11) When the machine reboots select the MY COMPUTER icon.
- 12) Move the pointer to the new drive icon and press the right mouse button.
- 13) Select the format option.

Windows 98

- 1) Turn on power to the server / workstation.
- 2) Log in as administrator.
- 3) Select Start / Programs / Administrative Tools (common) / Disk Administrator.
- 4) Select OK in window warning you that there is a new drive in the system.
- 5) Select Yes in window asking Do you want a signature on Disk ? so that Disk Administrator can access the drive.
- 6) Move the pointer to the new drive and press the right mouse button.
- 7) Select create and then OK.
- 8) Select Yes in window asking Do you want to create the partition?
- 9) Move the pointer to the new drive and press the right mouse button.
- 10) Select Commit changes now.
- 11) Select Yes in the window asking Do you want to save the changes.
- 12) Move the pointer to the new drive and press the right mouse button.
- 13) Select Format.
- 14) Select the correct file system and press OK.
- 15) When the drive is done formatting it will be ready to be used by the system.

SGI machines 6.x:

- 1) Turn on power to the server / workstation.
- 2) During the bootup select the Stop for System Maintenance icon.
- 3) Select the command monitor icon.
- 4) Run `hinv -t` command to look for the new drive.
- 5) Once the new device has been found select the done icon.
- 6) Select the Start System icon.
- 7) Login as root and enter root password.
- 8) Open a unix shell.
- 9) Run the `fx -x` command.
- 10) Select the (r)epartition option.
- 11) Select the type of partition.
- 12) Select the file system type (xfs is recommended).
- 13) Exit out of `fx`.
- 14) Run the `mkfs_xfs` command.
- 15) Edit the `fstab` command to make the mount point permanent.

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MAINTENANCE

The main concern is with the subsystem overheating. This will normally not be a problem. However, to ensure that this should not happen, be sure not to place anything obstructing the air vents on the front sides of the enclosure. Also, be sure not to obstruct the fan in any way that would prevent proper airflow. Doing so can void your warranty.

If the enclosure is in an extremely dusty environment, the air slots on the cover and the fan housing can become clogged with dust, preventing proper airflow and cooling of the device. If this is the case, the air slots and fan housing should be vacuumed clean.

TECHNICAL SUPPORT AND SERVICE

If you should ever require assistance integrating or using your Zzyzx Subsystem please contact Zzyzx Technical Support for help. Zzyzx Technical Support may be contacted at any of the following:

Phone: (800)876-7818

Fax: (858)558-0813

E-mail: tech@zzyzx.com

If your Zzyzx Subsystem should fail and require repairing, you should contact Zzyzx Technical Support for assistance.

Technical Support is available from 8:00AM to 5:00PM Pacific Standard Time.

When contacting Zzyzx for support, please have the following information available prior to placing your call. This will expedite the call and get you the support you require.

Zzyzx Subsystem Part # _____

Zzyzx Subsystem Serial # _____

Invoice and / or PO # _____

Date Purchased _____

Platform attached to _____

Operating System _____

Problem / Error Messages _____

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NOTE: ZZYZX PERIPHERALS, INC. reserves the right to change specifications without notice, based on advances in technology, firmware, hardware and components. For the latest information, and the implementation capabilities and constraints contact Zzyzx Peripherals.

Trademark Acknowledgements

All product names mentioned herein are the trademarks of their respective owners.

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