Dulce
SYSTEMS

Video Storage Solutions

PRO Duo-FireWire

and

Duo-FireWire

Installation and User's Manual

Table of Content

1. Introduction

We appreciate your purchase of this product from Dulce Systems. You have everything you need to quickly and easily connect the storage unit to your editing computer. You are a short time way from your next blockbuster creation.

This Installation and User's Manual is intended to streamline the process of getting your RAID storage system up and running so you can get to work quickly.

For most typical video editing storage requirements, we have pre-configured the PRO / Duo-FireWire for a much more streamlined installation. The storage is pre-configured for RAID 0 (performance striping) and pre-formatted for Mac OS X. Just simply follow the installation steps outlined in this manual, and you will up and running in no time.

1.1. *Safety Considerations*

1.1.1. SAFETY CONSIDERATIONS

⚠ **WARNING** ⚠

**RISK OF ELECTRIC SHOCK
DO NOT OPEN**
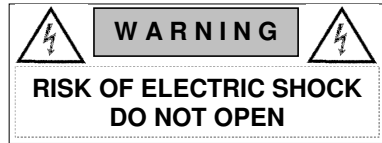
WATER AND MOISTURE
To reduce the risk of fire or electrical shock, do not expose unit to rain or moisture. Do not operate unit near water – such as: bathtub, washbowl, kitchen sink or laundry tub, wet basement, or near a swimming pool.

STABILITY
Do not place this unit on an unstable cart, stand, bracket, or table. Unit may fall, causing serious injury.

VENTILATION
Do not block front and rear ventilation. Proper airflow is required to ensure reliable operation and prevents unit from over heating. Do not place unit in an enclosed space where no or insufficient ventilation is available.

ELECTRICAL
Do not defeat the safety purpose of the grounding power plug. The power cord should be routed so that it is not likely to be walked on or pinched by items placed upon or against them.

SERVICING
Do not attempt to service this unit yourself. Opening or removing the top, side and rear covers will expose you to dangerous voltages or other hazards.

1.1.2. CONSIDÉRATIONS DE SÉCURITÉ

⚠ **AVERTISSEMENT** ⚠

**RISQUE DE DÉCHARGE ÉLECTRIQUE
N'OUVRIR PAS**
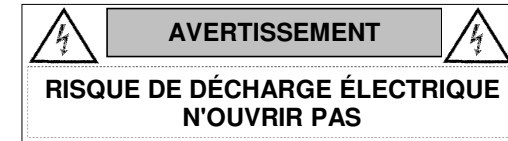
EAU ET HUMIDITÉ
Pour réduire le risque de feu ou de choc électrique, n'exposez pas d'unité pour pleuvoir ou l'humidité. Ne faites pas marcher d'unité près de l'eau – comme; la baignoire, la cuvette, l'évier ou la cuve de blanchisserie, la cave mouillée ou près d'une piscine.

STABILITÉ
Ne placez pas cette unité sur un chariot instable, un éventaire, une parenthèse ou une table. L'unité peut tomber, en provoquant la blessure sérieuse.

VENTILATION
Ne bloquez pas de devant et élevez la ventilation. L'écoulement d'air nécessaire est tenu de garantir l'opération sûre et prévient l'unité de sur le chauffage. L'unité ne peut pas placé dans un espace fermé où aucune ventilation ou dans suffisant n'est disponible.

ÉLECTRIQUE
Ne vainquez pas le but de sécurité de la prise de courant de pouvoir de bases. La corde de pouvoir devrait être mise en déroute pour qu'ils ne seront pas probablement marchés sur ou pincés par les articles placés sur ou contre eux.

ENTRETIEN
N'essayez pas d'assurer l'entretien de cette unité vous-même. En s'ouvrant ou le fait d'enlever le haut, le côté et les couvertures arrière vous exposeront aux voltages dangereux ou à d'autres hasards.

1.1.3. SAFTY BERÜCKSICHTIGUNGEN

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┌─────────────────────────────────┐
│  ⚠   W A R N U N G    ⚠         │
├─────────────────────────────────┤
│     ELEKTROSCHOCKGEFAHR          │
│        NICHT ÖFFNEN              │
└─────────────────────────────────┘
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WASSER UND FEUCHTIGKEIT
Um eine Brand- oder Elektroschockgefahr weitgehend auszuschließen, Gerät nicht Regen oder Feuchtigkeit aussetzen. Gerät nicht in der Nähe von Bade- oder Waschwannen, Wasch- oder Spülbecken, feuchten Kellern oder Schwimmbecken betreiben.

STABILITÄT
Das Gerät nicht auf wacklige Karren, Ständer, Halterungen oder Tische stellen, da es herunterfallen und Verletzungen verursachen könnte.

BELÜFTUNG
Vordere und hintere Belüftungsöffnungen nicht versperren. Das Gerät muss ausreichend be- und entlüftet werden können, damit es sich nicht während des Betriebs überhitzt. Daher darf das Gerät nicht in geschlossenen Räumen aufgestellt werden, in denen keine ausreichende Be- und Entlüftung gewährleistet ist.

STROMVERSORGUNG
Nicht den Schukostecker modifizieren. Das Stromkabel sollte so verlegt werden, dass es nicht durch Auftreten oder durch spitze oder scharfe Gegenstände beschädigt werden kann.

WARTUNG
Das Gerät nicht eigenmächtig warten. Durch das Öffnen des Geräts (Abziehen der oberen, seitlichen und hinteren Abdeckung) setzen Sie sich lebensgefährlichen Spannungen aus.

1.1.4. CONSIDERACIONES DE SEGURIDAD

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┌─────────────────────────────────┐
│  ⚠   ADVERTENCIA    ⚠           │
├─────────────────────────────────┤
│    GEFAHR DES STROMSCHLAGS       │
│        NICHT ÖFFNEN              │
└─────────────────────────────────┘
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AGUA Y HUMEDAD
Para reducir el riesgo de fuego o electrochoque, no exponga la unidad para llover o humedad. No haga funcionar la unidad cerca del agua – como; bañera, lavatorio, fregadero o tina de lavandería, sótano mojado o cerca de una piscina.

ESTABILIDAD
No coloque esta unidad en un carro inestable, soporte, soporte o mesa. La unidad puede caerse, causando la herida seria.

VENTILACIÓN
No bloquee delantero y críe la ventilación. El corriente de aire apropiado es requerido asegurar la operación confiable y previene la unidad de sobre la calefacción. La unidad no puede colocado en un espacio incluido donde ninguna ventilación o en suficiente está disponible.

ELÉCTRICO
No derrote el objetivo de seguridad del enchufe de poder que da buenos conocimientos. La cuerda de poder debería ser derrotada de modo que ellos probablemente no sean andados en o pellizcados por artículos colocados sobre o contra ellos.

REVISIÓN
No intente atender esta unidad usted mismo. Abriéndose o quitar la cumbre, el lado y las tapas traseras le expondrán a voltajes peligrosos u otros riesgos.

1.2. System Requirements

- Windows PC, Microsoft XP / Vista
- Apple Mac, Mac OS X 10.4 or higher.
- FireWire 800 port (IEEE 1394b, 9 pin)
- FireWire 400 port (IEEE 1394, 4 pin)
- USB 2.0 /1.1 / 1.0

1.3. Technical Support

Phone	818-435-6007
FAX	818-576-0324
E-mail	support@dulcesystems.com
Web	www.dulcesystems.com

If the product requires service, please contact Dulce Systems' Technical Support and obtain an RMA number. Ship the product properly packaged to:

Dulce Systems
Attn: RMA
9620 Topanga Canyon Place, Suite E Chatsworth, CA 91311

2. Getting Started

The PRO / Duo-FireWire comes pre-assembled and ready for use, just connect the supplied FireWire or USB cable to your computer. For Mac users, a PRO / Duo-FireWire icon will simply appear on your desktop. For Windows, a small format procedure is needed.

2.1. Packaging

Please do not discard the boxes and packing materials in case you might need to reuse them later. Always ship the product in its original packaging. Improperly packaged products will be subjected to shipping damage, for which you will be liable for the repair.

2.2. Check List

- Installation and User's Manual
- PRO / Duo-FireWire enclosure with two disk drives
- Power Module
- Power Cord (North America user only)
- FireWire 800 to FireWire 800 (9 pin) cable
- FireWire 800 to FireWire 400 (6 pin) cable
- USB 2.0 A to B cable

3. Overview

The PRO / Duo-FireWire supports the latest FireWire 800 interface and the latest USB 2.0 interface. The FireWire 800 is backward compatible with the FireWire 400 and the USB 2.0 is backward compatible with the USB 1.1 / 1.0.

3.1. The Classic and PRO look

The newer PRO Duo-FireWire has exactly the same performance and operation specification as the original classic Duo-FireWire, except the PRO has a new finish. The PRO Duo-FireWire has a darker, shiny, smooth brushed finished, where the classic Duo-FireWire has a textured gray paint finish.

Duo-FireWire
The Classic look

PRO Duo-FireWire
The PRO look

3.2. Front Indicators

Indicators

Power (white)
DISK 1 Active (blue)
DISK 2 Active (blue)

POWER
DISK 1
DISK 2

3.3. Rear Panel

Cooling Fan   Operating Mode

Power on / off

Power Source

Security Slot

FireWire 800 Ports   USB 2.0 Port
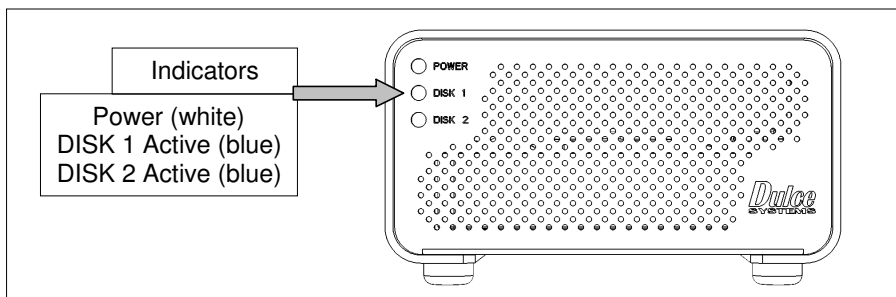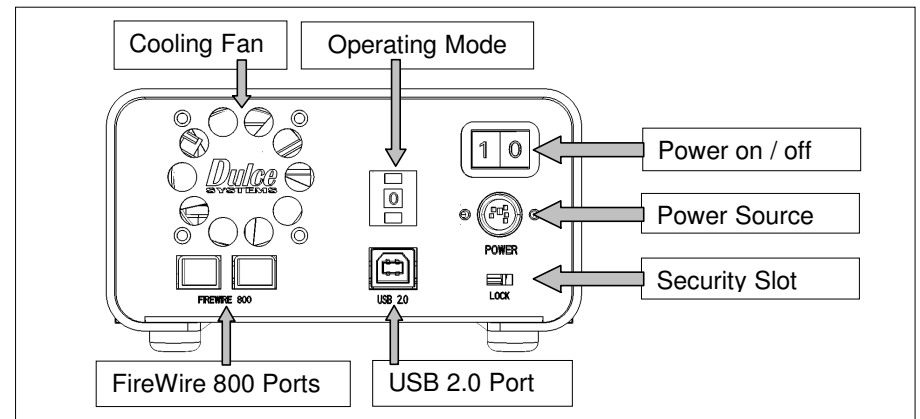
3.4.   Performance

For optimum performance, use the FireWire 800 with the Duo-FireWire configured in the RAID 0 performance stripe mode.

The performance results below shows the Duo-FireWire can support an amazing 10+ streams of DV25 and 3 streams of 8 bit un-compress SD.

Starting from the far left, the graph shows the data rate of an empty drive. As the graph line moves right it shows the data rate as the drive fills with data, ending at far right showing data rate of a completely full drive.

The spectacular RAID 0 performance shows the drive keeps up with its maximum data rate all the way from empty to full.
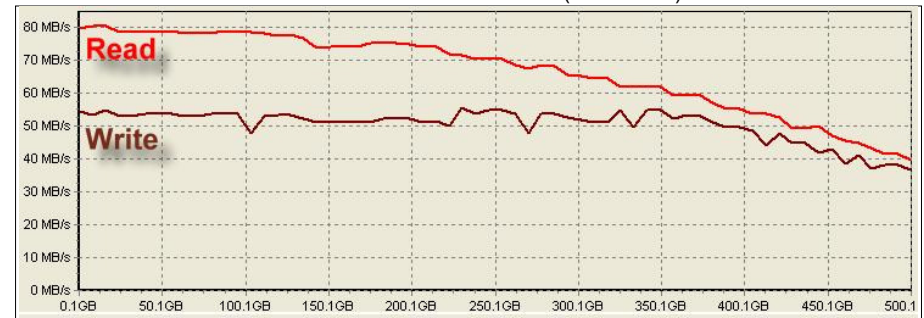
RAID 0 - Stripe Mode (Performance)*
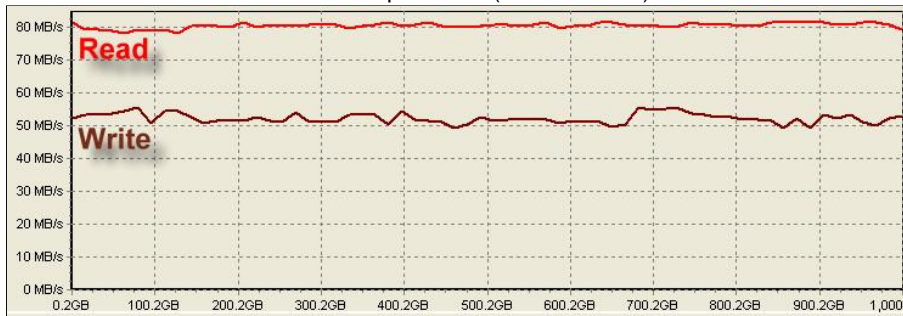
RAID 1 - Mirror Mode (Protection)*
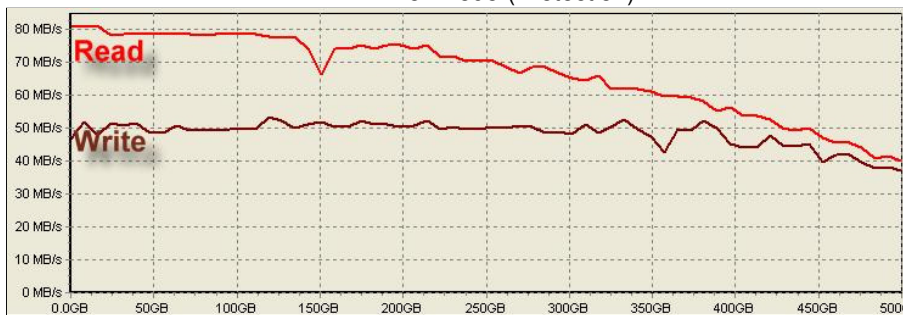
* For additional information on the various Operating Modes, please refer to the Operating section of this manual.

JBOD – Just a Bunch of Disk (Individual)*

SPAN – Link Mode (Simplicity)*

* For additional information on the various Operating Modes, please refer to the Operating section of this manual.

The performance graphs are provided for reference only, they are based on 500GB disk drives, measured in a Windows XP computer with a FireWire 800 interface. Apple Mac should have similar results.

Your exact measurements could vary.

4. Installation

You are just a few small steps away from having extra storage for your next block buster creation.

- Ensure the power switch of the Duo-FireWire is in the off (0) position.
- Attach the power connector from the power module to the Duo-FireWire (flat side down).
- Attach the AC power cord to the power module.
- Attach the AC power cord to an AC power source.
- Attach the Duo-FireWire to computer with one of the supplied FireWire or USB cables.
- Switch the Duo-FireWire on (1).

The Duo-FireWire is pre-configured for RAID 0 (performance striping) and pre-formatted for Mac OS X. The Duo-FireWire drive icon will simply pop up on your desktop.

Windows operation will require a format/partition process. The Duo-FireWire is already pre-configured in RAID 0, simply run the Windows Disk Management utility to prepare the Duo-FireWire for Windows usage. See the Format and Partitioning section of this manual.

4.1. Power Cable Connection

Use only the power module supplied with your Duo-FireWire. Not all power modules with the same plug are compatible.
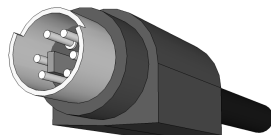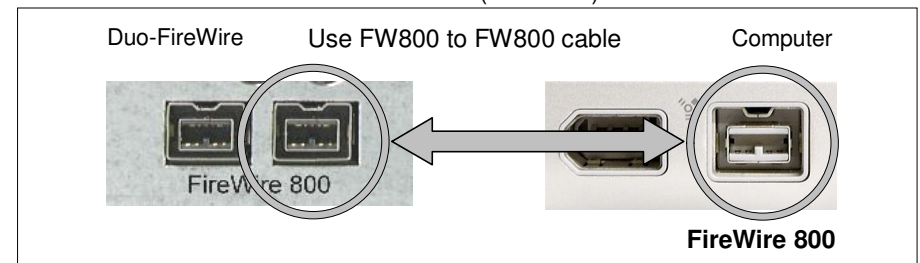
Flat side down.

4.2. Data Cable Connection

Use either FireWire or USB connection, but not both.

The preferred data connection is FireWire 800, it will provide optimal performance. Your computer must also support FireWire 800.
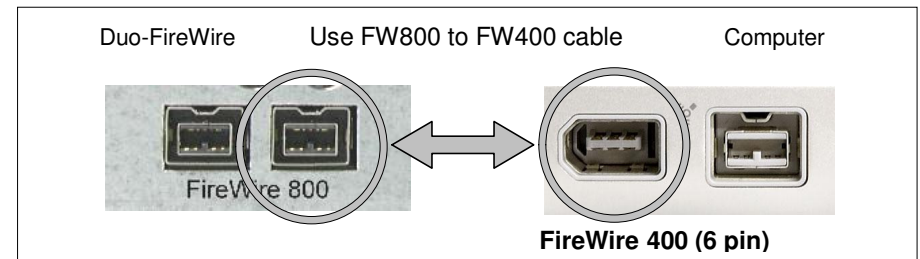
Duo-FireWire also supports FireWire 400, but the performance would be about half.

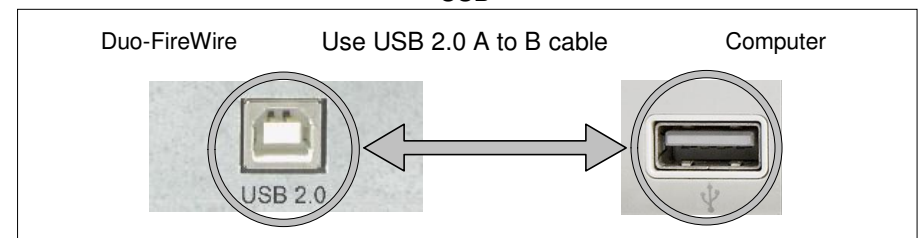USB 2.0 will result in least performance.

FireWire 800 (Preferred)

Duo-FireWire   Use FW800 to FW800 cable   Computer

FireWire 800

FireWire 800

FireWire 400

Duo-FireWire   Use FW800 to FW400 cable   Computer

FireWire 800

FireWire 400 (6 pin)

USB

Duo-FireWire   Use USB 2.0 A to B cable   Computer

USB 2.0

5. Formatting and Partitioning

5.1.   Apple OS X Formatting

The Duo-FireWire is shipped pre-configured for Mac OS X, the Duo-FireWire does not require formatting before use.

Should it be necessary to re-format and partition the RAID, use the Apple Disk Utility.

To start Disk Utility, move pointer to upper left corner of screen, click on Go then click on Utilities. Locate and launch Disk Utility.
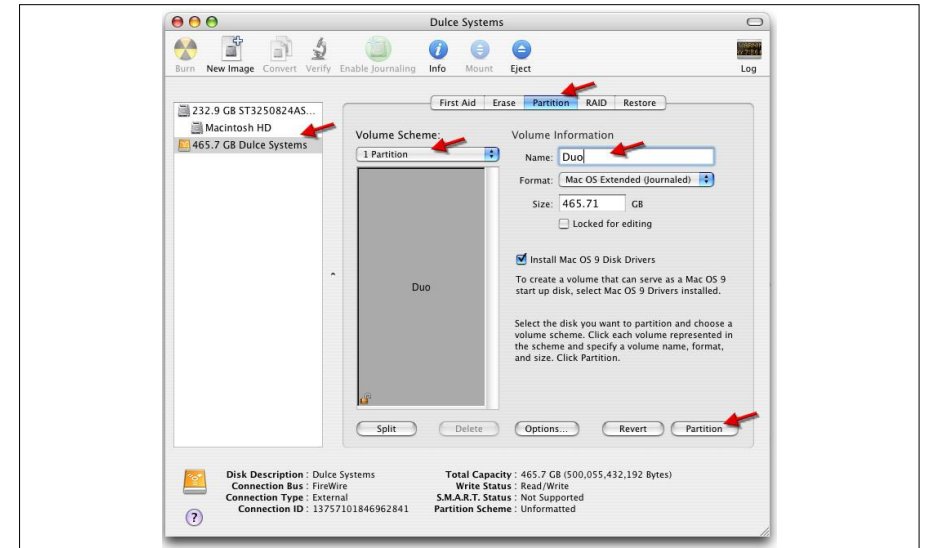
5.1.1. Erase an Existing Partition

Select the Duo-FireWire on the left drive list, click on Partition tab, select Free Space. Click on Partition on lower right.
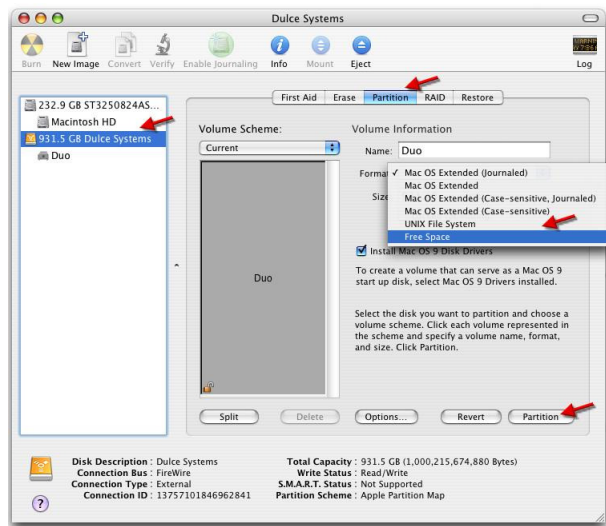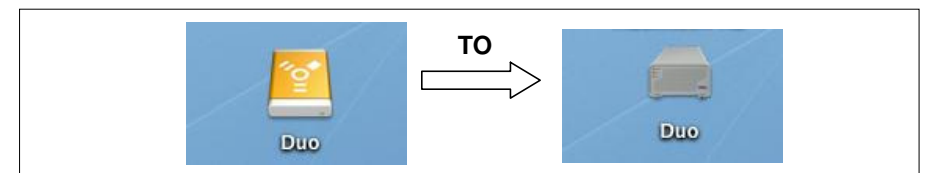

5.1.2. Create a New Partition

Select RAID on the left side drive list, click on Partition tab, change Volume Scheme to 1 Partition, change Name as desired, click on Partition on lower right.

The drive will appear on the desktop after successful completion of the Partition.

5.1.3. Change the Icon

Disk Utility uses a generic default icon for the drives, this can be changed to the cooler looking Dulce icon. Visit our download page to get the icons and instructions.
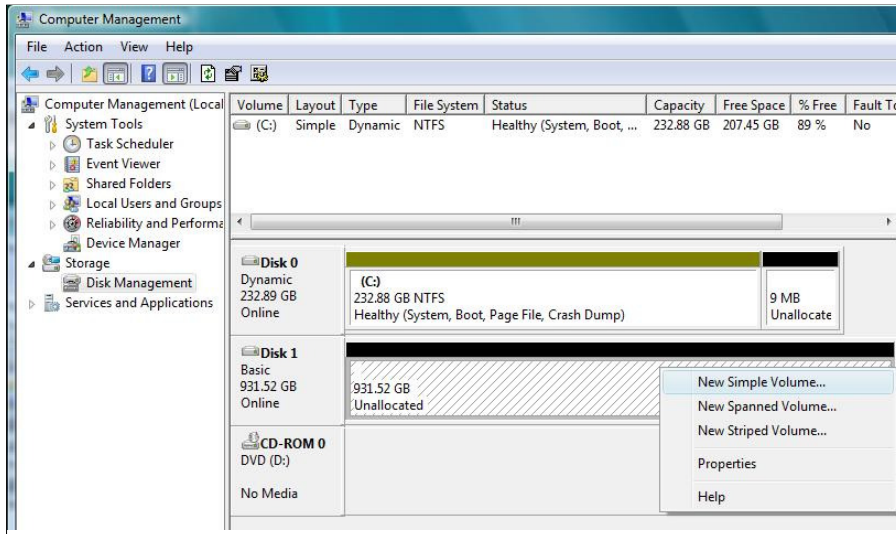
www.dulcesystems.com/download

## 5.2. Windows XP / Vista Formatting

Start Disk Management (can be found at Control Panel > System and Maintenance > Administrative Tools > Computer Management. Under Storage.)

If the RAID shows up as Unknown / Not Initialized, right click on the disk and Initialize it.

Right click the Unallocated segment and select New Simple Volume. Enter the desired Volume Size, Assign the desired Drive Letter or Path, check Perform a Quick Format at the Format Partition screen.
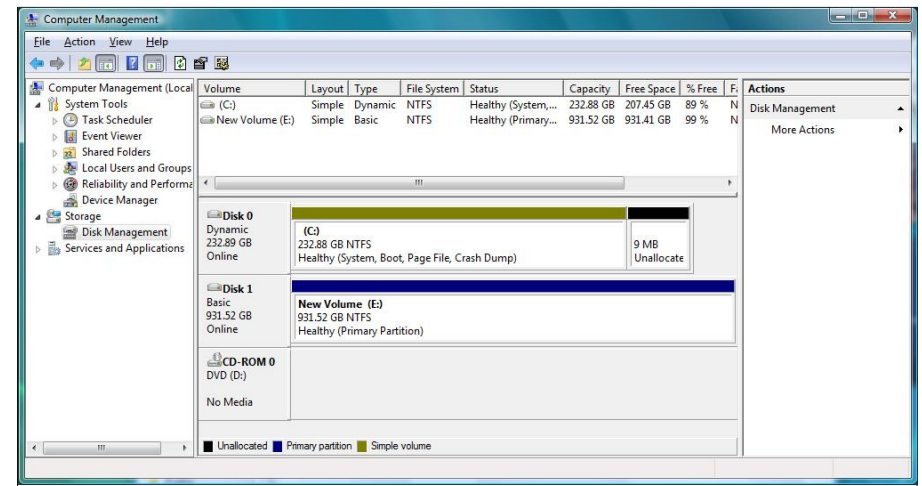
6. Operating

6.1. DISK Activity Indicators

The DISK 1 and DISK2 Indicators show the activities of the two disk drives in the Duo-FireWire. When the indicator is on it shows the particular drive is active. DISK 1 and DISK 2 indicators do not always come on at the same time. Depending on the Operating Mode selected, these indicators will act differently. See the particular selected mode for more specific details.

6.1.1. RAID 0 - Stripe Mode (Performance)
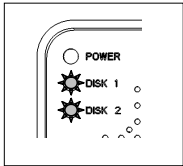
The DISK1 and DISK2 indicators will be mostly active at the same time. In the RAID 0 scheme data is alternately stored between the two drives at a rapid rate. For example, when a file is written to the Duo-FireWire, a small portion will be stored on DISK 1, the next small portion on DISK 2, the next small portion back on DISK 1. This process is called data striping. This scheme provides the highest data rate that is the sum of the two individual disk drives.
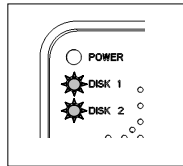
6.1.2. RAID 1 - Mirror Mode (Protection)

## RAID 1 - During read operation
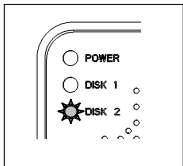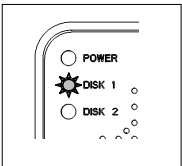
During read operating, one of the DISK indicators will come on, either DISK 1 or DISK 2. Since data on both drives are identical, the internal controller will pick the most efficient disk to use.

RAID 1 - During write operation

During write operation, both DISK 1 and DISK 2's indicators will come on. In Mirror Mode, data sent to the Duo-FireWire will be written to both disk drives for redundancy. If one of the DISK indicators do not come on during write operations, that disk has failed and the unit will need servicing. Normal operating continues on the remaining surviving disk drive.
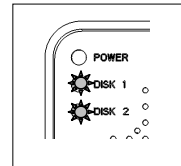
RAID 1 - During write operation (with a failed disk drive)
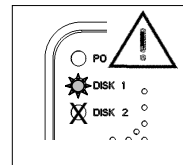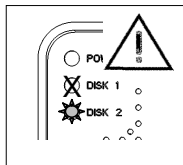
A failed disk is indicated by the absence of disk activities during write operations. Should a disk become inoperative (defective), the DISK indicator of that drive will never come on. In such a case, the unit will need servicing.

RAID 1 - No operation (DISKs blinks)

If there are no read or write activities to the Duo-FireWire and both DISK 1 and DISK 2 indicators are blinking, this indicates the Duo-FireWire is performing a Syncing operation. This is where the Duo-FireWire has detected a Mirror Mode out of sync condition and is in the process of updating the portion of the disk drive that is out of sync.

During the Syncing operation, data access to the unit will be slow. It is best to allow the unit to be dedicated fulltime to complete the Syncing. This process can take a few minutes to a few hours.

6.1.3. SPAN - Linking Mode (Simplicity)
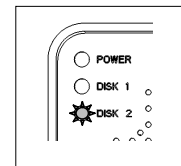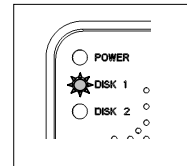
DISK 1 indicator comes on when accessing data on the 1st half of the Duo-FireWire space. DISK 2 indicator will come on when accessing on the 2nd half of the Duo-FireWire space.

6.1.4. JBOD - Just a Bunch of Disks Mode (Individual)
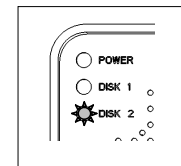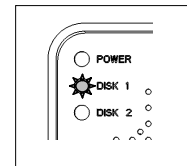
DISK 1 indicator comes on when disk 1 is being accessed. DISK 2 indicator comes on when disk 2 is being accessed. Each of the two disk drives in the Duo-FireWire shows up as two independent disk drives.

6.2.   Daisy Chain FireWire devices.

The two FireWire 800 ports on the Duo-FireWire can be used to daisy chain multiple devices. The FireWire interface design limit is for 63 devices, but we recommend limiting the chain to four devices.

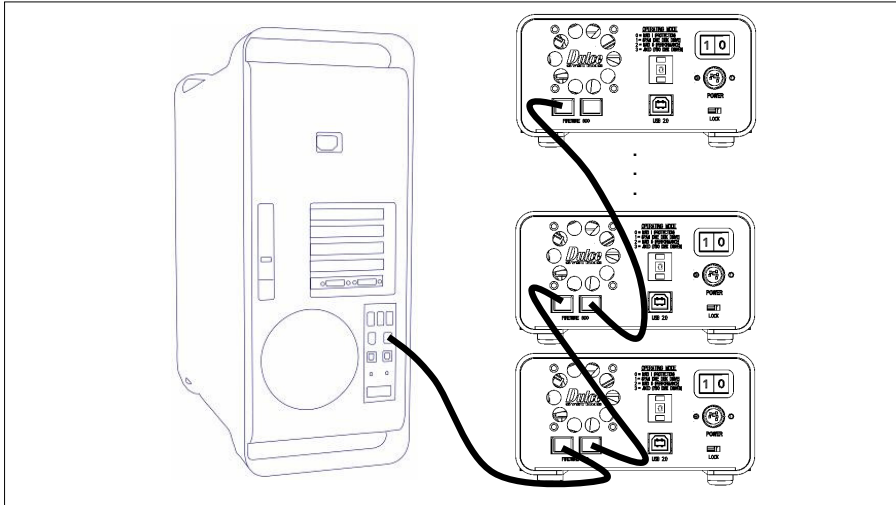All the devices must be turned on for down stream devices to be seen by the computer. There should be no performance degradation as a result of daisy chaining.

7. RAID Mode Options

⚠ This procedure will erase all data on the Duo-FireWire.

Changing RAID Mode will cause your existing data on the Duo-FireWire to be erased. Make sure any important data is backed up.

- Delete the existing partition with the disk format utility.
- Shutdown computer or eject the Duo-FireWire.
- Turn off the Duo-FireWire.
- Use a pointy device and change the Operating Mode to the desired setting
- Turn on the Duo-FireWire.
- Format / Partition using the Operating System.

Consult the Operating section to get familiar with the DISK Activity Indicators for the particular mode selected.

Operating Mode	RAID Level	Description	Advantage	Disadvantage	Ideal for
2	0	Striping disk drives.	Highest performance.	No disk redundancy, one drive failure will lose all data.	Highest resolution SD, HDV, DV and maximum multiple streams.
0	1	Mirroring disk drives.	Highest redundancy.	Capacity and performance of 1 disk drive.	Data protection is paramount, maximum disk failure protection.
1	SPAN	Linking disk drives.	Mix un-equal sized disk drives.	No redundancy, performance of one disk drive.	Use up extra spare drives.
3	JBOD	Just a Bunch of Disks.	Each drive can be accessed individually from operating system.	No redundancy, performance of one disk drive.	Audio applications.

8. Limited Warranty

WHAT THE WARRANTY COVERS

Dulce Systems warrants your product against any defect in material and workmanship and conforms to Dulce published specifications under normal use.

WHAT THE WARRANTY DOES NOT COVER

The warranty does not cover equipment which has been damaged due to accident, misuse, abuse, fire, flood, "Acts of God," or other contingencies beyond our control; use of incorrect line voltages; improper or insufficient ventilation; failure to follow operating instructions; or improper or unauthorized repair; improperly packaged for shipping; packaged in non-approved shipping container; shipping damage.

The warranty is voided by removal or alteration of the product or parts identification labels.

Dulce has no liability for general, consequential, incidental or special damages. These include loss of recorded data, the cost of recovery of lost data, lost profits and the cost of the installation or removal of any Products, the installation of replacement Products, and any inspection, testing, or redesign caused by any defect or by the repair or replacement of Products arising from a defect in any Product.

WHAT THE WARRANTY PERIOD IS

Dulce Systems warrants your Quad or Duo Quad product for 36 months and if the product is registered with Dulce within 30 days of purchase, we will extend the warranty for another 6 months totaling 42 months. We warrant the Duo for 36 months. The warranty period begins at the date of shipment to the original end user, company or organization.

Our warranty applies to repaired or replaced Products for the balance of the applicable period of the original warranty or ninety days from the date of shipment of a repaired or replaced Product, whichever is longer.

WHAT WE WILL DO TO CORRECT THE PROBLEM

We may elect which remedy or combination of remedies to provide at our sole discretion. We shall have a reasonable time after determining that a defective Product exists to repair or replace a defective Product. Our replacement Product under its limited warranty will be manufactured from new or reconditioned parts.

Your exclusive remedy for any defective Product is limited to the repair or replacement of the defective Product.

We will return the repaired or replacement Product to you prepaid using the same method of shipping (ex: overnight, ground, 2nd day, …) as was shipped to us. If a more expedited return shipping method is required, extra charges might apply at our discretion.

HOW YOU CAN GET SERVICE

Contact our Technical Support to obtain a RMA (Return Materials Authorization) number. The model number, serial number, and description of the problem will be required. A valid proof of purchase might be required to further validate the Products warranty eligibility, the valid proof of purchase document must show the product model, serial number, purchase date, and supplier name. If the valid proof of purchase is not available, the original manufacturing date of the product will be used to determine the warranty period.

No returns will be accepted without a RMA number. We reserve the right to refuse the delivery of the return.

You shall bear all shipping, packing and insurance costs and all other costs, excluding parts and labor, necessary to effectuate repair or replacement under this warranty.

All products returned to us must be shipped in the original packaging or Dulce approved packaging. If you do not have the original packaging, call us to request packaging. A nominal fee will be charged for the requested packaging and for shipment. Ship the RMA to us pre-paid.

Products that are improperly packaged for shipping; packaged in a non-approved shipping container; or incur shipping damages are not covered under warranty.

HOW STATE LAW RELATES TO WARRANTY

In the United States, some states do not allow exclusion or limitation of incidental or consequential damages, so the limitations above may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

9. Product Registration

R E G I S T E R   N O W

Please visit our web site and register online.

www.dulcesystems.com/register

A valid proof of purchase might be required to further validate the Products warranty eligibility, the valid proof of purchase document must show the product model, serial number, purchase date, and supplier name. If the valid proof of purchase is not available, the original manufacturing date of the product will be used to determine the warranty period.

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