



USER MANUAL

DupliDisk3 : MicroRaid



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Data Protection Solutions by Arco

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Hollywood, Florida 33020 U.S.A.
E-mail: info@arcoide.com
Web Site: [http:// www.arcoide.com](http://www.arcoide.com)

Telephone: 954-925-2688
Facsimile: 954-925-2889
Tech Support: 954-925-7347

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1 Introduction

About RAID

RAID (Redundant Array of Inexpensive Disks) is a technology which allows the computer to see multiple drives as a single drive. Originally designed for use with mainframe computers, it is now, with Arco's patented IDE process, commonly implemented on PCs to provide varying levels of redundancy. **RAID Level 1 (RAID 1)**, which is also called **disk mirroring**, is a two-drive array in which each drive is an exact duplicate of the other.

About the DupliDisk3

The **DupliDisk3** is a driverless IDE, EIDE, U/DMA RAID 1 controller designed to provide continuous real-time data redundancy of IDE drives through hardware based mirroring.

The **DupliDisk3** uses patented technology which adds RAID Level 1 disk mirroring to any IDE enabled computer.

Key DupliDisk3 Features

- Uses no system resources - no interrupts or IO addresses
- Provides intelligent monitoring of drive status
- Automatically detects new drives inserted in system
- Rebuilds drives in background on all Windows based systems (Shut down not required with the RaidCase model only)
- WindowsTMbased setup, monitor/maintenance program
- Automatic drive switching in the event of drive failure
- Supports one pair of IDE, EIDE or U/DMA drives of any size
- Drive status indicators and audible alarm
- Driverless design permits operation under virtually any operating system
DOS, OS/2, Macintosh, Windows 3.1, 9x, Me, X64 addition, NT, 2000, 2003, XP, XP Pro, Vista, Netware, Unix, and Linux.
- Flashable ROM BIOS
- Jumperless, software configurable design
- Serial Port (remote monitoring - optional)
- Remote Notification (Email)
- Extended LBA Addressing supports drive capacities up to 128,000 Terrabytes.
- ATA100 Support

2 Contents of the Box

You should find the following items:

DupliDisk3 MicroRaid:

- DupliDisk3 MicroRaid controller
- DupliDisk Raid Management CD
- DupliDisk3 Quick Start Guide
- 18-inch Host Cable

Note: ATA Specifications limit maximum length of host cable to 18". This is the length of the supplied cable. **The use of any length greater than 18" may result in data corruption or loss. Arco does not support the use of cables not supplied by Arco.** If use of these cables presents a problem, call Arco to obtain an alternative.

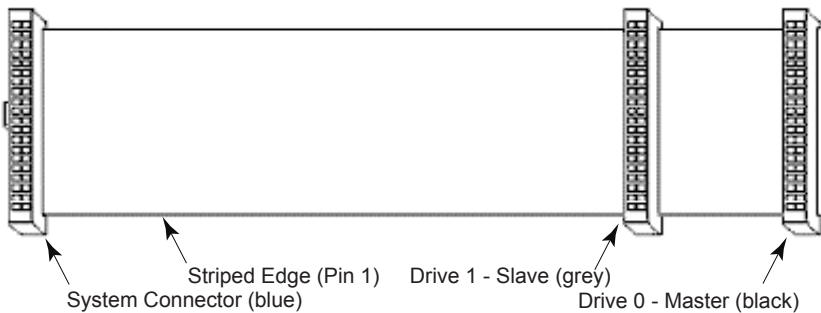
3 Before You Begin

Before installing your DupliDisk3

- Be sure you have a current backup on removable media, such as tape. This will not be required for the installation of your **DupliDisk3**. However, backing up before adding equipment to your system is always a wise precaution.
- Turn the system OFF and remove the cover. **Protect your computer and DupliDisk3 from static discharge. Make sure you are well grounded before touching any electronic components.**
- Locate the IDE controller connector, also referred to in this manual as the **Host**.

Note: The IDE/SATA cable connectors are color coded. The Blue connector for the host cable goes into the IDE connector on the motherboard. The Blue connectors for the drive channels go into the **DupliDisk3**.

Cable / Connector Layout



4 The Essentials

- Only one DupliDisk3 product can be installed on your system.
- **Host, Primary** and **Mirrored** connectors are used to connect the existing IDE interface (host) and primary and mirror drives to the **DupliDisk3** via 80-wire (40 pin connector) data cables.

Warning: *Cables are provided for these connections. Arco will not warrant operation of the product if the user substitutes a non-Arco cable for the original equipment cable.*

If your System BIOS does not automatically detect the hard drives on boot up, reboot your system and enter CMOS Setup to set up the drive once the DupliDisk3 is installed.

Set the drive type to **AUTO**. Reboot Computer.
(See the manual which was supplied by your computer manufacturer for details regarding your specific system BIOS.)

Drive Jumpers

Mirrored drive pairs must be jumpered identically. Data Protection Solutions by Arco recommends configuring both drive as **Master** or **Single**. In some cases, configuring as **Cable Select** is required. Please refer to the hard drive manufacturer's manual for the proper jumpering of your drives.

Drives Can Be Dissimilar

Mirrored drives do not need to have the same physical geometry but, when mirroring two drives of different sizes, drive capacity will be limited to that of the smaller capacity drive. For example:

PRIMARY CHANNEL	MIRROR CHANNEL	ACTUAL SIZE
SEAGATE ST340016A (40GB)	MAXTOR 6L060L3 (60GB)	40GB

Note: *It is recommended that the smaller capacity drive be attached to the Primary Channel.*

5 Interpreting the LED's

Interpreting the External Control Panel Lights (LED's)

Each **DupliDisk3** is outfitted with an external control panel which provides feedback via colored lights (LED's) as well as a reset switch for the audible alarm (Buzzer).

The control panel signals will indicate whether your **DupliDisk3** is operating properly and will notify you if a drive fails.

The following provides an interpretation of the Control Panel display and functions:

- **Primary and Mirror LED's** monitor status of the channels as follows:

Solid Green	Drive installed on the current channel
Flashing Orange	Scanning the channel for drives
Solid Red	Drive not installed
Flashing Red	Drive failed to performed last operation. Drives are not identical. To fix this, re-mirror the drives.
Orange	Channel activity (read/write)
Flashing Green	Drive is marked as bad (see note in section replacing a failed drive)

- **Status LED's** show the status of the **DupliDisk3** master channels as follows:

Solid Green	Drives are in Mirror mode, data is identical.
Flashing Green	Drives may not be identical
Solid Red	Drives are not in Mirror mode
Flashing Red	Copy/Compare is in progress
Orange	Copy/Compare in progress (under Windows)

- **Buzzer** provides the following indications:
 - Short beep during **power on** (system boot up) indicates successful **DupliDisk3** self test.
 - Second beep indicates the **DupliDisk3** is running in single mode.
 - Continuous or intermittent beep indicates a drive failure.
 - **Buzzer Off** switch can be depressed to stop the beeping.

6 Installing The Hardware

The MicroRaid Model

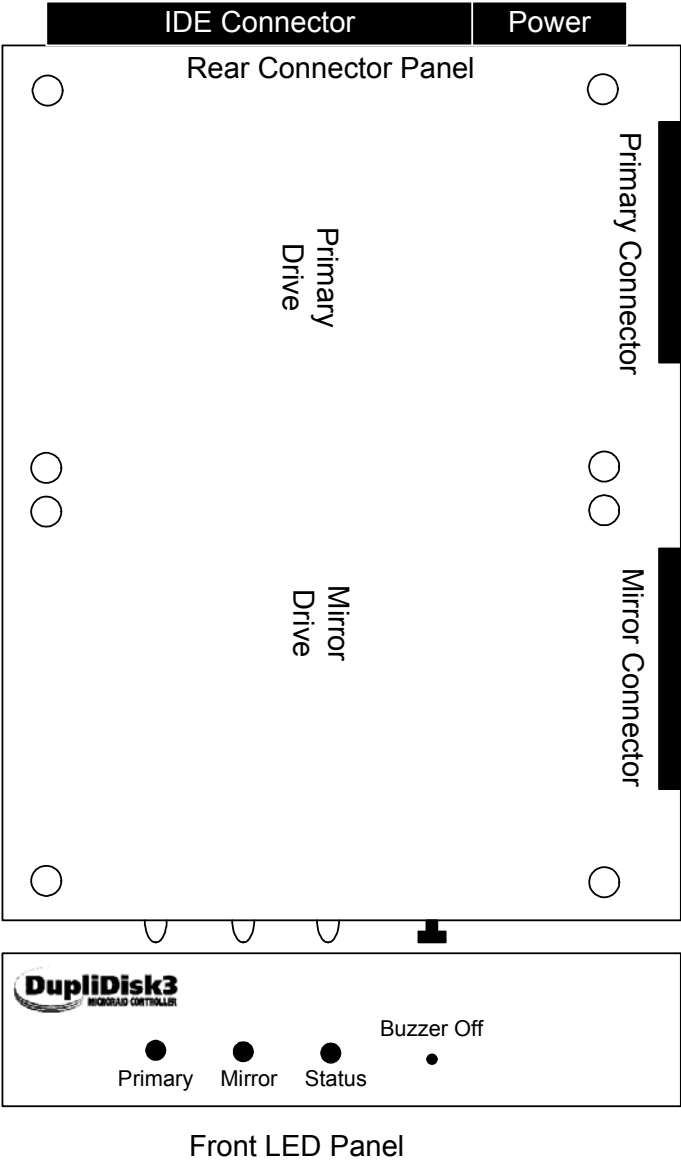
Installing the hardware

- Before beginning installation, please read pages 3-6 in this manual.
- When installing the pair of mirrored drives, make sure that each of the drives is configured as **Device 0 (Master)** or **(Single)**. In some cases you may need to configure the drives as **Cable Select**. Check the diagram on the drive or the manufacturer's manual for proper jumper settings.
- Remove the **DupliDisk3-MicroRaid** from its package.
- Install the drives on the **DupliDisk3-MicroRaid** (see diagram). If one drive contains existing data, make sure this drive is installed in the Primary location and the blank drive on the Mirror location.

Note: Make sure to align the hard drive properly to the connectors.

- Secure the two hard drives with screws to the **DupliDisk3-MicroRaid**.
- Using the provided IDE Cable, connect the black connector to the Host connector on the **DupliDisk3-MicroRaid**.
- Install the **MicroRaid** in the appropriate 3.5" empty bay and secure it with screws.
- Connect an unused internal power connector to the **DupliDisk3-MicroRaid**.
- Install the **DupliDisk3-MicroRaid** in the appropriate 3.5" empty bay and secure it with screws.
- Connect the provided IDE cable connector (Blue connector) to the Motherboard's **primary** or secondary IDE connector.

Top view of the MicroRaid



7 Initial Raid 1 Mirroring

The **DupliDisk3** does not need any resident software or software drivers to maintain a mirrored pair to constantly monitor the drive quality, and to isolate defective drives when needed. **However, upon installation, you must perform an initial setup and mirroring using one of the available Raid Management Utility programs.** These programs are supplied free of charge with this product, or may be downloaded from our web site.

Each Utility is described in detail further along in this manual. For example, you can configure certain startup options, such as monitor interval, and alarm (beep) conditions. The utility will also determine if the drives are compatible (mirror drive cannot be smaller than primary drive), perform an initialization process (here we register drive characteristics, and create a “logical” drive that is seen by the operating system), and finally, copy 100% of the data from the primary drive to the mirror drive. **No data on the primary drive is changed during this process.** After the initial mirroring is completed, you may never need to use the utility again. However, some utilities offer additional services, such as drive monitoring, logging, remote notification. These may continue to be utilized throughout the life of the product.

Selecting From the Three Mirroring Methods

1. From the Bootable DOS Floppy/CD

The advantage to using the floppy/CD-based version of the Raid Management Utility is that it offers an attractive, easy-to-use graphical interface and is the ***fastest*** and most efficient method of mirroring your drives. Users of any operating system can mirror their drives from the floppy/CD version, **as long as their hardware is compatible with DOS.**

2. From Windows, Raid Management Utility, under Windows NT/XP/ 2000/ 2003/Vista

Users operating in one of the Microsoft Windows environments may find it convenient to run mirroring from windows, RAID Management Utility. The Windows version allows for the copying or rebuilding of drives in the background. This is slower than using the DOS copy but permits continued operation of other applications while drive copying or rebuilding takes place. See Windows Software for additional details.

3. From Linux V2.2.18 and above

Users operating in one of the Linux operating environments may find it convenient to run mirroring from Linux Raid Management Utility. The Linux version allows for the copying and rebuilding of drives in the background. See Linux Software for additional details.

8 DOS Software

Using The DOS Raid Management Utility Program

The DOS version of the Dupli-Raid Management Utility cannot be run as a task (in a DOS window) under any version of windows. It must be run from the floppy disk or from a DOS bootable CD.

To simplify this process follow this links:

1. For the DOS bootable diskette, please follow this link:
http://ezd2d.com/download_dupli309.php
2. For the DOS bootable CD, please follow this link:
http://www.ezd2d.com/download_DUPLI_CD_ISO.php

Once the **DupliDisk3** is installed, insert the diskette/CD and boot the computer to DOS. Then, select option number 2.

The Status Screen

The status screen will appear. The status screen displays drive parameters which include: capacity, model number, and initialization status. Initializing the drive means that the **DupliDisk3** saves the identifying information off the drive on a flash memory so it can keep track of them.

```
DUPLI Raid Management Utility (3.09.02) - DUPLIDISK 3 (BAY)
onfigure Copy Uninit Compare Utility View Help Exit

Operation Mode
R
S
S
R
F
Initialization Status

Primary Channel(Active for Reads)
Master: Maxtor 6Y120L0 capacity(114.5 GB)
Slave: not installed

Mirror Channel(Not Active for Reads)
Master: Maxtor 5A300J0 capacity(279.4 GB)
Slave: not installed

Initialization Information
Primary Master: Maxtor 6Y120L0 Initialized
Mirror Master: Maxtor 5A300J0 Initialized
Master Drives are in MIRROR mode

Firmware Rev-3.39.2.02 B B Serial Number: 2005080000106DBE

Ctrl-Alt-Del has been disabled.
```

Press any key to continue.

DOS Pull Down Menu Options

The following options are available from the **DupliDisk3** Raid Management Utility Menu:



Configure

Operation Mode allows the user to disable the mirroring function and operate from either the primary or the mirror drive only. This option is useful for isolating drive problems.

- **Read Schedule** allows the user to select either the **Primary** or **Mirror** drive as the drive to be used for read operations.
- **Status Screen** displays drive parameters which include: capacity, model number, and initialization status. Initializing the drive means that the **DupliDisk3** saves the identifying information off the drive on a flash memory so it can keep track of them.
Firmware revision of the board and serial number may also be found on the Status screen.
- **Start-up Options**
 - Beep on Drive Failure
 - Beep after cold boot if drive failure is detected
 - Beep after cold boot if running in single mode
 - Time to turn buzzer off after cold boot
 - Master Drive Detection
 - Slave Drive Detection
 - Set Baud Rates
 - Ultra UDMA support
 - Multimode DMA support
 - UDMA Extended Cycle

- **Restore Factory Defaults**

Allows the user to restore the following settings:

- Read Schedule: **Primary Only**
- Beep on drive failure: **Continuously**
- Beep after cold boot if drive failure is detected: **Disabled**
- Beep after cold boot if running in single mode: **Disabled**
- Time to turn buzzer off after cold boot: **Disabled**
- Master Drive Detection: **ON**
- Slave Drive Detection: **OFF** (Not support)
- Ultra UDMA: **Med 5 (100)**
- Multword DMA: **Auto**
- UDMA Extended Cycle: **Disable**
- Bypass Host Warm boot: **NO**

- When **“Beep on drive failure”** is enabled, beeping will occur if a failure is detected on one of the drives and will continue until the Buzzer Off switch is depressed or the machine is turned off. If this feature is disabled, there will be no notification if a drive fails. The other options available are for the buzzer to beep intermittently approximately every 5, 10, 30 or 60 seconds or every 2, 5, 10, or 15 minutes.

- **Firmware Upgrade** allows the user to flash the ROM. Firmware upgrades can be obtained from Arco or downloaded from our website. For firmware upgrade process please see section “Firmware Upgrade.”

Copy

- **A surface to surface copy operation can be initiated:**
 - From Primary Master to Mirror Master
 - From Mirror Master to Primary Master
 - From Primary Slave to Mirror Slave (**No support for slave drive**)
 - From Mirror Slave to Primary Slave (**No support for slave drive**)
- **Rebuild Drive Marked As Bad** is used after the **DupliDisk3** signals a drive failure. This option allows the user to restore a mirrored drive from a defined good drive. It will automatically set up the source and destination drives for the copy process.

NOTE: *The “Rebuild Drive” option will automatically initialize the replacement drive.*

Uninit

Allows the user to remove the initialization information from the **DupliDisk3**. It removes the identifying information of the drives from the **DupliDisk3's** flash memory. Caution must be taken when removing the initialization buffer from a **DupliDisk3** with existing data on it.

NOTE: *In cases where the drive geometry is different from the current standard (16hds / 63sec) and where the number of heads of the original mirrored drive pair were not identical, removing the initialization buffer from one of the drives could cause it not to boot.*

Compare

Allows the user to compare the drives on the Primary and Mirror channels to determine if the data is identical. If the data is not identical the Dupli Raid Management Utility program will create a log file called dupli.log indicating the head and cylinder where the data is not identical. The dupli.log file is a text file and can be read with any text editor.

Utility

- **Set Copy/Compare Size** allows users to copy only a portion of the drive to be copied. This option is designed to reduce downtime by eliminating the need to copy the entire contents of a large drive which contains only a small amount of data.

Arco recommends that you copy the whole drive when installing for the first time. If the drive is not completely copied, any data over the initial copy amount cannot be guaranteed to be identical!

- **Create User Default Settings** allows users to override and replace the factory default settings with user preferred default settings. Factory default settings will no longer be available. Creating your own User Default Settings places a file on the Dupli Raid Management Utility diskette called "factory.bin". ***If ever you wish to return to the Arco factory defaults, you must either rename or delete the "factory.bin" file.***
- **System Information** The contents of several internal files are written to the "dupli.inf" file on the floppy disk; these are used for diagnostic purposes.
- **Read LBA** is designed for diagnostic purposes.
- **Set Lazy Drive Delay** allows users to account for drives that are slow to respond.

View

- **DupliDisk Info** provides information about the **DupliDisk3**.
- **Drive Info** provides information about the **Primary** and **Mirror** drives as well as the logical drive.

Help

- **Company Information** is available from for Help Menu. If you need help beyond what is offered in this manual, please contact Technical Support.

Exit

Exit to the DOS prompt Menu.

9 Windows Software

The DupliDisk3 Raid Management Utility Program for Windows®

The **DupliDisk3** Utility Program under Windows NT/XP/2000/2003/Vista, may be installed from the Windows CD provided with your **DupliDisk3** or you may download the installation from our website at http://www.ezd2d.com/support_downloads_dupli_utility.php

Software Installation and Setup

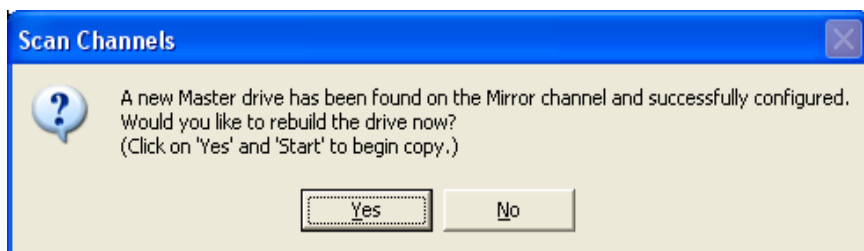
To install the **DupliDisk3** Utility Program, insert the Installation Disc into your CD-ROM drive. When the installation screen appears, follow the on-screen instructions. If the installation screen does not appear automatically, open My Computer or right click on the Start button and select Explore to navigate to your CD-ROM drive. Double-click on the CD-ROM drive icon to launch the installation screen. Alternatively, you can right click on the CD-ROM drive icon and select Explore. Locate and open the Windows folder on the CD-ROM drive, then open the Install folder and double-click on the **setup.exe** file.

Before running your **DupliDisk3** Raid Management Utility, make sure your drive pair (Primary/Mirror) is properly installed, and that the drive with data that you wish to keep is connected to the Primary channel. **This is important because the utility will copy data from the Primary to the Mirror drive by default, thus destroying all previous data on the Mirror drive.**

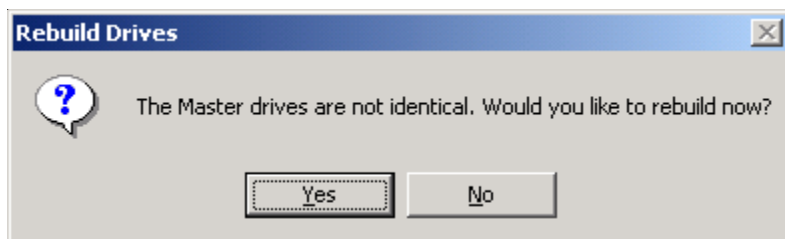
Note: When a drive failure occurs after the drives have been mirrored and a bad drive has been replaced, a copy will be performed from the "Active Drive for Read" drive to the "Non-Active for Read" drive.

From your Desktop, double click the **DupliDisk3** icon.

If you have both drives installed and have never mirrored the drives, the utility will automatically scan the channels and the following screen will appear:

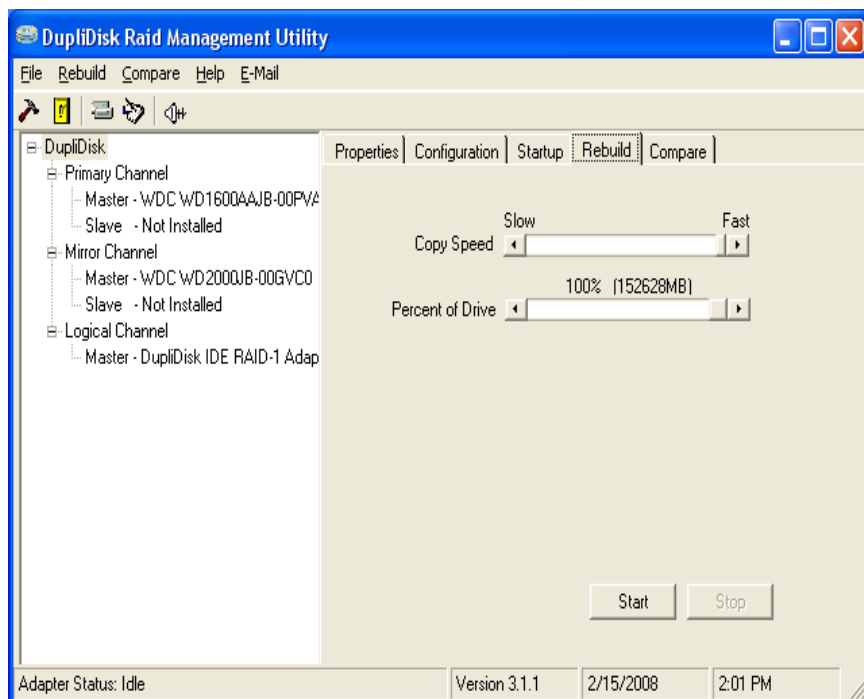


If you have already run the **DupliDisk3** Raid Management Utility, but performed a “Rebuild” the following message will appear:



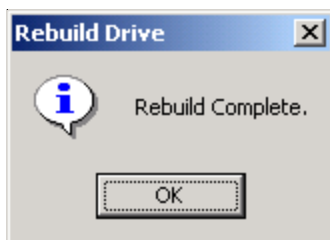
In either of the above cases, select **YES** to start the rebuild (copy) process. Again, during the initial process, all data on the Primary Drive will be copied to the Mirrored drive. If you want to keep any data on the Mirrored drive, select **NO** and proceed to back up the data.

If you select **YES** the following screen will appear:



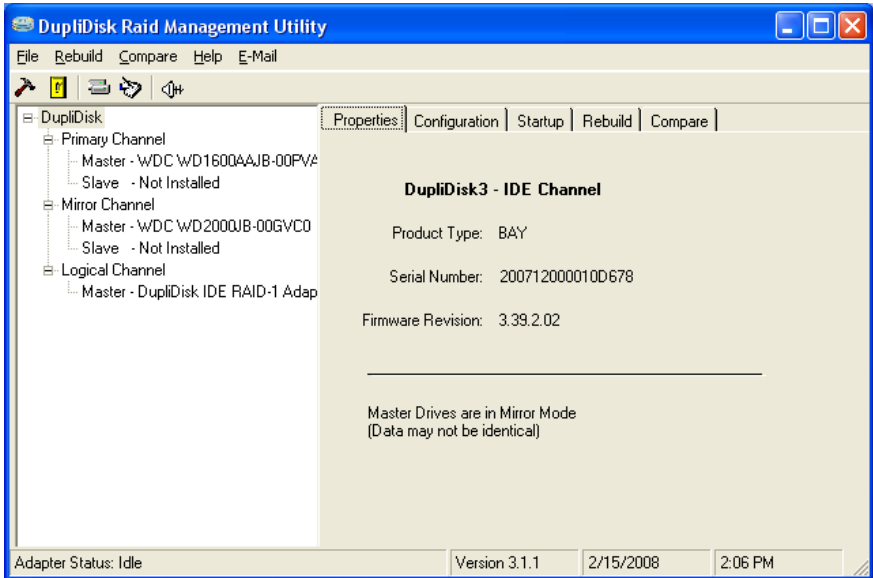
Click **Start** to begin the copy.

If the copy was successful, the following message will appear:



If rebuild was not completed successfully, you should check the log file to address any errors. To do this, click on the FILE Menu, then select VIEW LOG.

Windows Menu Options



Properties Tab

Click on the Properties tab to view **DupliDisk3** system status information.

Configuration Tab

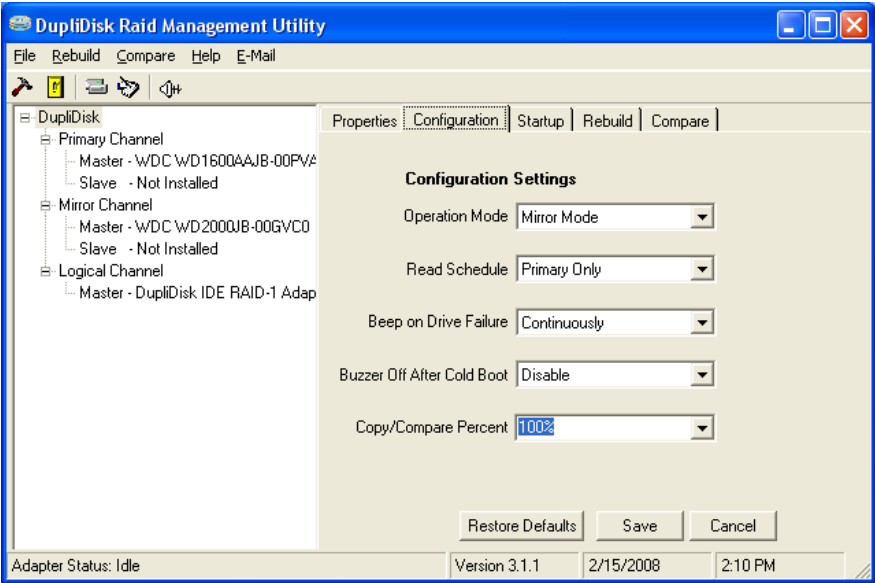
- **Operation Mode** allows the user to disable the mirroring function and operate from either the primary or the mirror drive only. This option is useful for isolating drive problems.
- **Read Schedule** allows the user to select either the **Primary** or **Mirror** drive as the drive to be used for read operations.
- **Beep on Drive Failure** provides options for configuring the time interval between beeps when the siren alarm (Buzzer) signal is activated by a drive failure. The default value for this option is "Continuously". If set to the default, the alarm will sound a continuous beep if a drive fails. It is also possible to set the alarm to beep at periodic intervals.
- **Buzzer Off After Cold Boot** controls the behavior of the siren alarm after a disk failure has been signaled and recognized. If it is not possible to replace the failed drive immediately and the user wishes to power down the computer, the alarm will beep (continuously, unless set differently) each time the computer is shut down. "Buzzer Off After Cold Boot" is designed to eliminate the need to manually turn off the Buzzer each time the computer is rebooted after a drive failure. Use this option to establish the length of the start-up beep or to disable beep on cold boot altogether.

Configuration Tab(cont.)

- **Copy/Compare Percent** allows only a portion of the drive to be copied/ compared. This option is designed to reduce downtime by eliminating the need to copy/compare the entire contents of a large drive which contains only a small amount of data.

Warning: *It is recommended that the Percent of Drive option be set to 100% to insure complete initial rebuild.*

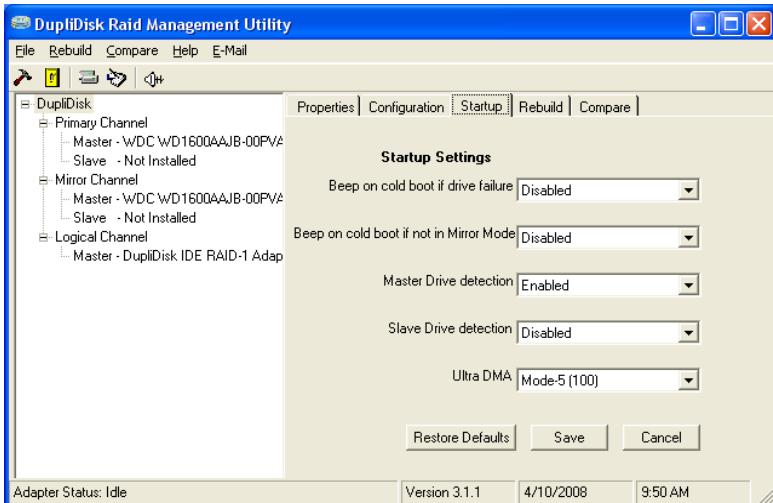
Configuration Settings Screen



Startup Tab

The startup tab contains settings fundamental to the configuration of the **DupliDisk3** system startup.

- Beep on cold boot if drive failure
- Beep on cold boot if not in Mirror Mode
- Master Drive detection
- Slave Drive detection (**Not supported**)
- Ultra DMA



Rebuild Tab

- Copy Speed
- Percent of Drive

Copy Speed

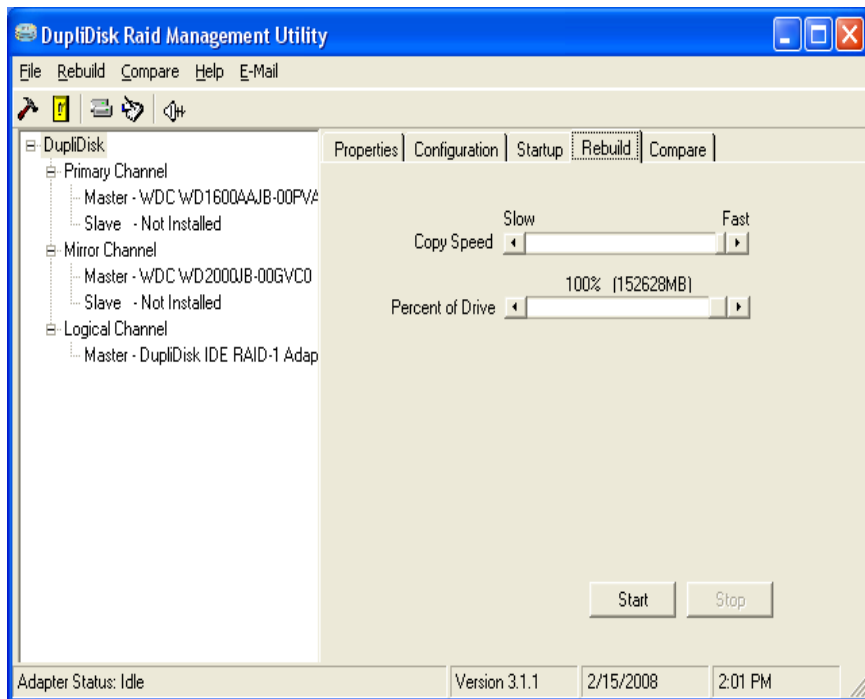
The Windows version of the **DupliDisk3** Raid Management Utility offers the unique feature of background rebuild. The background rebuild feature allows users to continue to run Windows applications in foreground while the drive copy is taking place in background. A sliding selection bar allows you to determine how much of the computer's resources to allocate to the copy process. For example, if you are running no other Windows applications during the Copy, move the selection bar to **Fast**. If your foreground applications must take precedence, move the selection bar to **Slow**.

Percent of Drive to Copy

By default, the **DupliDisk3** Raid Management Utility performs a bit-by-bit copy of the entire drive. The sliding selection bar in the “Rebuild” menu makes it possible for users to copy only a portion of the drive.

To save time when copying a large drive which contains only a small amount of data, users may prefer to use the Percent of Drive Copy option.

Arco recommends that you set the percent of Drive Copy to the default (100%). If the drive is not completely copied, any data over the initial copy amount cannot be guaranteed to be identical.



Compare Tab

- Compare Speed
- Percent of Drive

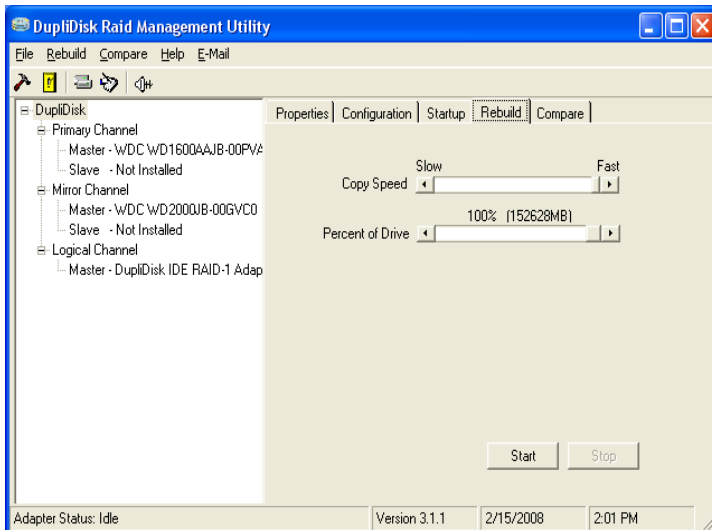
Copy Speed

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Arco recommends that you set the percent of Drive Copy to the default (100%). If the drive is not completely copied, any data over the initial copy amount cannot be guaranteed to be identical



E-Mail/Remote Notification

Under Windows the **DupliDisk3** system provides the option of Remote Notification via Email. When properly configured, this feature will provide email notification of the **DupliDisk3** system status. Configuration can be setup to provide routine status checks at periodic intervals or to provide **Only On Drive Failure** alerts.

Configuration and Setup

1. Choose EMail from the main application screen.
2. Enter the email addresses for the sender and receiver.
3. Enter the SMTP Host. (i.e. smtp.yourhost.com)
4. Choose the intervals that notification will take place.

Options include:

- **Only On Drive Failure** - Email will be generated only if a drive failure occurs.
- **At Monitor Intervals** - Email will be generated at a chosen periodical time

E-Mail Setup Screen

Configure E-Mail

ARCO COMPUTER PRODUCTS LLC

E-Mail Configuration Setup

E-Mail Address To:

E-Mail Address From:

SMTP Host:

E-Mail Interval:

☒ Only After Drive Failure

☐ After Drive Failure and At Intervals:

Disabled 12:01:00 AM

Save Cancel

E-Mail Subject:

DupliDisk Status Report

10 Linux Software

The DupliDisk Raid Management Utility Program for Linux

This distribution CD contains all of the applications necessary for the **DupliDisk3** when operating in a Linux environment.

Software Installation and Setup

Copy the Files

Insert the CD into the CD-ROM drive and copy all the applications from the CD directory **Linux/** to the directory **/user/bin/** or any other directory you wish to keep this information. Go to the directory **/user/bin/** (or the chosen directory you saved this information at), and double-click on the **InstallDL3.zip** to unzip the file. Type: **"unzip InstallDL3.zip"**. Make the InstallDL3 executable by typing; **chmod + xInstallDL3**

Install the Program

Run the InstallDL3 program from **/user/bin/** or from the directory you saved the InstallDL3. Once located type: **./InstallDL3**.

***Note:** Since we are compiling the module at installation time, it is necessary for the user to have GCC and MAKE installed, and have the kernel source code in their file system. If these are installed, the InstallDL3 program should reach a message that reads "Congratulations. DL3 Utility is ready."*

Before running your **DupliDisk3** Raid Management Utility, make sure your drive pair (**Primary/Mirror**) is properly installed, and that your drive with valid data is connected to the **Primary Channel**. This is important because the utility will initially copy data from the **Primary** to the **Mirror** drive by default, thus destroying all previous data on the mirror drive.

***Note:** When the drive failure occurs after the drives were mirrored and a bad drive was replaced, the copy will be performed from the "Active for Read" drive to the "Non-Active for Read" drive.*

Run the Program

Using terminal mode, or terminal window under x-windows, goes to the directory where the files were installed. Enter the command **./dl3** to start the program. Remember, you must be logged in as **"root"** to run this application.

Linux Main Menu Options

The following options are available from the **DupliDisk3** main menu.

1. **Configure DupliDisk3**
2. **Copy Drives**
3. **Compare Drives**
4. **DupliDisk3 Utilities**
5. **View**
6. **HELP**

0. **Exit**

Enter Choice [0]

Note: The DEFAULT selection is in brackets. In this case [0], will exit the Main Menu.

Configure DupliDisk3

Operation Mode

Allows the user to disable the mirroring function and operate from either the primary or the mirror drive only. This option is useful for isolating drive problems.

1. **Single Mode Primary Only** Single Primary mode will break the mirror and all system read/writes will be directed to only the Primary (The factory default) drive unless the operator changes the read schedule to the mirror drive.
2. **Single Mode Mirror Only** Single Mirror mode will break the mirror and all system read/writes will be directed to only the drive set in the read schedule.
3. **Operate in Mirror Mode** Mirror mode used both drives at the same time. all systems reads will be directed to only the Primary drive, and all writes will be directed to both drives.

0. **Return to Previous Menu**

Enter Choice [0]

Note: The DEFAULT selection is in brackets. In this case [0], returns to the Main Menu.

Read Schedule

Allows the user to select either the **Primary** or **Mirror** drive as the drive to be used for read operations.

1. Primary Drive Setting the **Primary** drive on the Read Schedule will force all system reads to be directed to only the **Primary** drive. This is the factory default setting for the **DupliDisk3**. The **DupliDisk3** writes to both drives whenever the system goes to save or update data on the drives; however when the system or O/S requires data from the drives, the **DupliDisk3** will read from the drive selected in the read schedule.

2. Mirror Drive Setting the **Mirror** drive on the Read Schedule will force all system reads to be directed to only the **Mirror** drive.

0. Return to Previous Menu

Enter Choice [0]

Note: The DEFAULT selection is in brackets. In this case [0], returns to the Configure **DupliDisk3** Menu.

Note: *The DupliDisk3 reads data only ONE of the drives in the mirrored pair, but all writes are directed to BOTH drives. See Read Schedule above for additional details.*

Status Screen

Displays drive parameters, capacity, model number, and initialization status.

General Status Information

- **DupliDisk3 Serial Number** Record this number, you may need it when contacting TechSupport
- **DupliDisk3 Type** Screen will display the type of **DupliDisk3** you have such as Bay, PCI, ISA etc...
- **BIOS Version** 1.xx.1xx are the two different code levels on the **DupliDisk3**
- **Installed Port** /dev/hda will most likely be displayed.

Master Status Information

- **Primary Master Maker Model** (Initialized/ Uninitialized) (active/not active for reads)
- **Mirror Master Maker Model** (Initialized/Uninitialized) (active/not active for reads) hd (16) Cyl (16383) spt (63) cap (19464) mb

- **Operation Mode Mirror Mode** Operation Status Drives Are/ Are Not in mirror mode. They can also be in single mode
- **Primary Slave Maker Model** (Initialized/Uninitialized) (active/not active for reads) hp (16) Cyl (16383) spt (63) cap (19464) mb
- **Mirror Slave Maker Model** Initialized/Uninitialized) (active/not active for reads) hp (16) Cyl (16383) spt (63) cap (19464) mb
- **Operation Mode Mirror Mode** Operation Status Drives Are/ Are Not in mirror mode. They can be in single mode.

Return to Previous Menu

Enter Choice [0]

Note: *If no drive is installed, the drive fields will say NOT INSTALLED in the drive headers, and N/A in the Mode and Status header.*

Note: To return to the configuration **DupliDisk3** Menu press the Enter key

Startup Options

1. **Beep Cycle Setup** Offers you the option to have the beep cycle Disable or Continuously. Choose **Continuously** and select the interval from 5 seconds to 4 minutes.
2. **Beep After Cold boot if drive failure detected**
Options are: Enable/[**Disable**]
3. **Beep After Cold boot if running in Single Mode**
Options are Enable/ [**Disable**]
4. **Turn Buzzer off after Cold Start**
Options are: [**Disable**] Selectable from 1-6 minutes
5. **Idle Mode Support**
Options are 8-64 seconds Enable/Disable
6. **Master Drive Detect**
Options are: [**Enable**]/Disable
7. **Slave Drive Detect**
Options are: Enable/[**Disable**]
8. **Boot Sector Protection**
Options are: Enable/[**Disable**]
9. **Set Baud Rate**
Options are: [9600] / 19,200 bps
10. **Ultra DMA**
Options are: Disable 16,24,[**33**], 48,66, and Auto

0. Return to Previous Menu

Enter Choice [0]

Note: The DEFAULT selection is in brackets. In this case [0], returns to the Configure **DupliDisk3** Menu

Restore Factory Defaults

Allows the user to restore the following settings.

- 1. All settings** that were modified after the default settings were set at the factory will be restored.
- 2. Configuration Settings** Only settings that were set by the user such as Mirror Mode and Read Schedule will be restored to factory defaults.
- 3. Startup Options** Only STARTUP settings that were set by the user such as Beep options, Idle mode, Slave Drive Detect, IDMA, and Serial Port baud rate configuration will be restored to factory defaults.
- 4. Restore USER Default Settings** The **DupliDisk3** will restore settings that the user had previously saved

0. Return to Previous Menu

Enter Choice [0]

Note: The DEFAULT selection is in brackets. In this case [0], returns to the Configure **DupliDisk3** Menu.

Upgrade DupliDisk3 ROM BIOS

This option will “flash” upgrade the Firmware on the **DupliDisk3**. Arco supplies two to four files with each code revision. There will ALWAYS be a duplixxx.txt file, along with one to three additional code segments that are going to be upgraded.

To perform the upgrade, you will need to have a floppy disk, a CD ROM, or a directory on the hard drive with the appropriate files. You may download the upgrade files from our website at: http://www.ezd2d.com/support_downloads.php. Unzip these files using Windows, and copy the files to either a floppy, or a CD.

Run DL3, and select the BIOS Upgrade option. You will be prompted for a path to the files. We assume that basic device mounting procedures are understood by the user, but a short synopsis of the operation for CD ROM follows.

```
mount/dev/cdrom/mnt/cdrom
cp/mnt/cdrom/bios/*.tar/usr/anyplace(anyplace )
```

When **DupliDisk3** Raid Management Utility asks for the path to the upgrade files you can either use the **/mnt/cdrom/bios** directory, or the directory you copied the files to.

Copy Drives

1. Rebuild New Master Drive Choose this option in the event of a drive failure, the **DupliDisk3** will stop that drive from participating in read and write activity. When the drive is replaced, this option will allow you to rebuild the drive while the system is in operation.

2. Rebuild Slave Drive (Not supported by Arco) This option is the same as “Rebuild New Master Drive”, except with the drives on the slave connector.

0. Return to Previous Menu

Enter Choice [0]

Note: The DEFAULT selection is in brackets. In this case [0], returns to the Main Menu.

Compare Drives

Allows the user to compare the drives on the Primary and Mirror channels to determine if the data is identical. If the data is not identical the Dupli Raid Management Utility program will create a log file called dupli.log indicating the head and cylinder where the data is not identical. The dupli.log is a text file and can be read with any text editor.

1. Compare Master Drives This option compares the ACTIVE MASTER to the INACTIVE MASTER. The Active Master is the drive setup in the configuration settings that is active for system READS. See “Read Schedule” for more details on Read Schedule.

2. Compare Slave Drives (Not Supported by Arco) The **DupliDisk3** supports two pair of drives in mirror mode. If you have two pairs of drives in mirror mode, the ACTIVE drive (the PRIMARY channel by default) will copy its data to the inactive or mirror drive.

3. Return to Previous Menu

Enter Choice [0]

Note: The DEFAULT selection is in brackets. In this case [0], returns to the Main Menu.

DupliDisk3 Utilities

1. Set Copy/ Compare Size This option sets the size that the small partition on a large drive with data on it. In this event it is not necessary to copy the entire drive.

The user is advised to ALWAYS copy 100% of the drive because some file allocation systems may fragment data, or drives with multiple operating systems cannot be copied fully with a small percentage of the drive copied.

2. Create User Default Settings - The **DupliDisk3** is set up with factory defaults for the large majority of systems where the user does not need an in depth understanding of the **DupliDisk3**. There are however some situations where users will change options on the **DupliDisk3** and need their customized version to be saved to rapidly restore the **DupliDisk3** to their unique settings. This option allows the user to save their settings to a file named factory.bin in the /root directory.

3. Create a DupliDisk3 Status File - This option should be rarely used, and if selected a file named dupli.inf will be written to the /root directory. Dupli.inf records information about the **DupliDisk3**, the drives and other items unique to the system it is installed into. If users have a problem which is difficult to diagnose, technical support will ask that you Email this file to them for the Arco Engineering team to evaluate.

4. Test Buzzer - This option turns on the buzzer for four seconds, and then turns off. This is meant as a test to make sure the buzzer works.

5. Change Copy/Compare Speed (Fast/Slow) When using a **DupliDisk3**-BayMount, PCI, No Slot, RaidCase, or FlexMount, this option sets the copy/compare speed under Linux. **Slow** allows more time for the OS and other applications to work, but it takes longer to copy/compare. **Fast** allows less time for the OS and other applications to work, but it takes less time to copy/compare. This does not apply to EzRaid or SATA FlexMount units.

6. Enable Background Monitor Choose this option to enable the monitor program if you are going to leave your computer unattended for some time. This program will send an email according to the options chosen in "Set up Email and Background Monitor", if the drives are not identical or not in mirror mode.

7. Disable Background Monitor If the monitor had been turned on with "Enable Background Monitor", it will be turned off.

0. Return to Previous Menu

Enter Choice [0]

Note: The DEFAULT selection in the brackets, in this case [0], RETURN to the Main Menu.

Set Up Email and Background Monitor

1. Set email options
2. Set background monitor options

1. Set email options You will be asked to enter the following information:

- The email address where these emails will be sent to.
- The email address these emails will be sent from.
- **The subject** you wish to have on the email. Example you can name it "DupliDisk3 Status".

Press enter to continue.

2. Set background monitor options - You will be asked to select from the following options:

1. Send email message once when failure is detected
 2. Send email message at interval when failure is detected
- Enter your choice [default/currently selected]

- **Select option 1** to receive only one email the first time an error is detected. With this option, the program saves your choice and returns to the previous screen.

- **Select option 2** to receive emails at interval times. With this option, you are asked to enter the desired intervals.

- **Select the interval**

1. Every Hour
2. Every 2 Hours
3. Every 3 Hours
4. Every 6 Hours
7. Every 12 Hours
6. Daily

Enter your choice [default/currently selected]:

If you elect an option between 1 and 5, the program saves your choice and returns to the previous screen.

If you select option 6, you will be asked to enter the time at which to send the Email

2. Display current settings
 0. Return to Previous Menu
- Enter Choice [0]

Enter the time of day to send the email in the form HHMM [ap]m Example:
0630pm, 1100am)

Military time (i.e. 13, 14, 15....24 hours) or single digit hours (2, 3, 4) will not be accepted. Military time must be written in am/pm format, and single digit hours must be written with a zero in front.

3. Display Current Settings This option will show the e-mail addresses you have selected the computer to send emails when there is a drive failure. It will show you to whom it will be sent, from what email address this will be sent from, and the subject of the email

Command line processing

This dl3 application can be programmed from the command line to perform a series of tasks without further operator intervention. This can be particularly useful in a production environment.

To create a program, just write a command line consisting of the program name, followed by a list of commands you desire, each separated by a space. This then, can be run from a shell program.

Where the program asks for ENTER, just use "Y" or "y" in the command line. For example, try: `"/dl3 2 1 y"` (this starts a rebuild of a new drive). `"/dl3 0 y"` (this exits the utility immediately.) You can enter up to 64 commands in one line. After all commands have been read, you can continue to key choices in directly if the program has not been terminated.

11 Remote Monitoring

Serial Port

If a drive goes bad & you are near the computer you will hear the siren. However, if the computer into which you install your **DupliDisk3** is in an area where the alarm siren and LED's are not likely to be noticed (such as a closed room, a remote unmanned location or a noisy factory floor) you may wish to make use of Arco's remote monitoring feature to check the status of the drives.

Note: Currently DupliDisk3 BayMount, No Slot, PCI, and MicroRaid do not include serial port support, unless it is specified when the order is placed.

The serial port is currently designed to I/O and gives the computer system the ability to READ the status of the **DupliDisk3**. The **DupliDisk3** will send a status byte to this optional serial port after receiving a 55h at its input pin. The communications parameters are as follows:

No Parity, 8 Bits, 1 Stop Bits

Your computer's Serial port must support 9600 BPS. Other baud rates may be available on special order. You will require an applet written in your own operating system which sends a 55h from any serial port in your computer to the **DupliDisk3**'s serial port via the cable wiring diagram below.

Cable Connections	
YOUR PORT	DupliDisk3 PORT
Pin 1 (GRND)	Pin 1 (GRND)
Pin 2 (Rx)	Pin 3 (Tx)
Pin 3 (Tx)	Pin 2 (Rx)

When the **55h** is received, the **DupliDisk3** will output a status byte with the following status bits to be decoded.

When the **55h** is received, the **DupliDisk3** will output a status byte with the following status bits to be decoded:

Bits 1 -10	00	Primary Channel OK
	01	Primary Channel <u>not</u> in use (no drives)
	10	Reserved
	11	Primary Channel marked as <u>bad</u>
Bits 3-2	00	Mirrored Channel is OK
	01	Mirrored Channel <u>not</u> in use (no drives)
	10	Reserved
	11	Mirrored Channel marked as <u>bad</u>
Bit 4	0	Data is <u>not</u> identical
	1	Data is identical
Bit 5	0	Beeper is OFF
	1	Beeper is ON
Bit 6	0	Controller is running in <u>SINGLE</u> Mode
	1	Controller is running in <u>MIRROR</u> Mode
Bit 7	0	Current active channel for reads is the PRIMARY
	1	Current active channel for reads is the MIRROR

Your applet should be designed so that, if the response to the **55h** query indicates that the **DupliDisk3** status has changed from the default (40h returned), this information is written to a file on your hard disk. You can then easily dial in to the remote system via a software package like PC Anywhere or CARbon Copy and read the response file from the hard disk.

Optional Status Chip Use (ISA Model Only!)

The optional STATUS chip on the **DupliDisk3** -ISA model will report status constantly to an applet without sending a "Get Status" command. To read the chip, simply perform an I/O read from port 320h, the factory default. Below is an example.

```
mov dx, 320h    ;port 320
in al, dx       ; read the data from the port
```

Decoding the data received in AL is the same as the serial port option.

12 Replacing a Failed Drive

If one of the hard drives becomes inoperable, the buzzer will sound, indicating the drive has failed and both the drive and status LED's will turn red. The beep will continue until the system is turned off or the buzzer reset switch on the **DupliDisk3** is depressed.

Once the **DupliDisk3** is set up properly (i.e. the drives were in mirror mode and the data was identical), and a failure is detected, the working drive will automatically take over and allow the user to continue working until the failed drive is replaced. **Please replace the failed drive as soon as possible. It is important to do so to guarantee successful recovery in the future.**

Important: Never switch drives' position unless you instructed to do so by DPS technical support personnel.

To Replace The Drive

1. Before replacing the drive, **make sure the capacity of the new drive is at least as large as the working drive.**
2. If you have a **DupliDisk3** EzRaid, or **DupliDisk3** RaidCase, you don't need to turn the power down. Simply, unlock the failed drive's caddy and replace the drive. Make sure to follow the steps described in section 6, "Installing the Hardware". Go to step #4.
3. For all other products, close any open applications and shut the computer down. Turn off power to the computer. Replace the failed drive and make sure to reconnect the drive as described in section 6, "Installing the Hardware".
4. For operating systems other than Windows and Linux, boot the computer from the floppy diskette or the bootable CD and run the DOS RAID Management Utility. Follow the onscreen instructions to complete the rebuild. When the rebuild is completed, please remove the floppy/CD and reboot the computer.

5. For Window operation system, refer to section 9, “Windows Software” for copying a drive.

6. For Linux operating system, refer to section 10, “Linux Software” for copying a drive.

Note: For products that require a boot after the failed drive was replaced, the new drive's LED green light will be blinking. This light, indicates that the previous drive was “Marked as Bad”. Once the RAID Management Utility runs, it will clear the drive status and turn the LED green light to be solid.

13 Firmware Upgrade

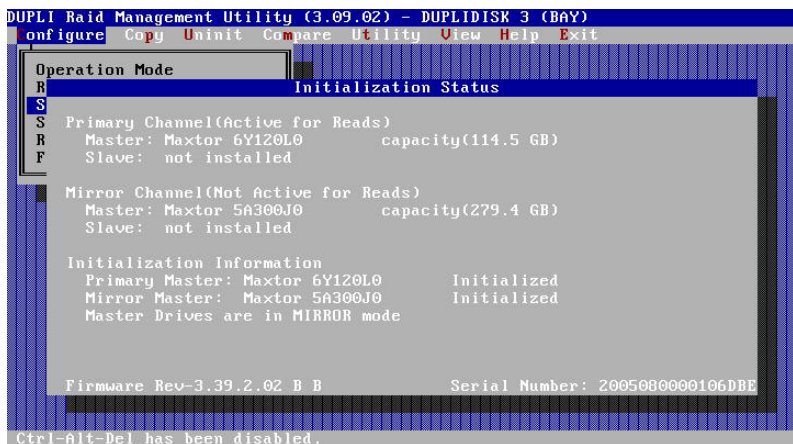
In the event that you need to upgrade your **DupliDisk3** Firmware, for enhanced features, or additional drive support, download the firmware upgrade from our download section at: http://www.ezd2d.com/support_downloads_firmware.php.

1. If you have a floppy drive in your system, create a DOS bootable diskette with DPS's DOS RAID Management Utility. This can be found at http://ezd2d.com/download_dupli309.php. Unzip the file and copy the files to the diskette.
2. If a floppy drive is not available, you can use one of our four available **DupliDisk3** Boot CD-ROMS with the appropriate firmware upgrade. This can be found at http://www.ezd2d.com/support_downloads_firmware.php. (look for the section: DD3 Boot CD-ROM with DOS RAID Management Utilities).

Note: Make sure to use the CD-ROM with the firmware that suits your product.

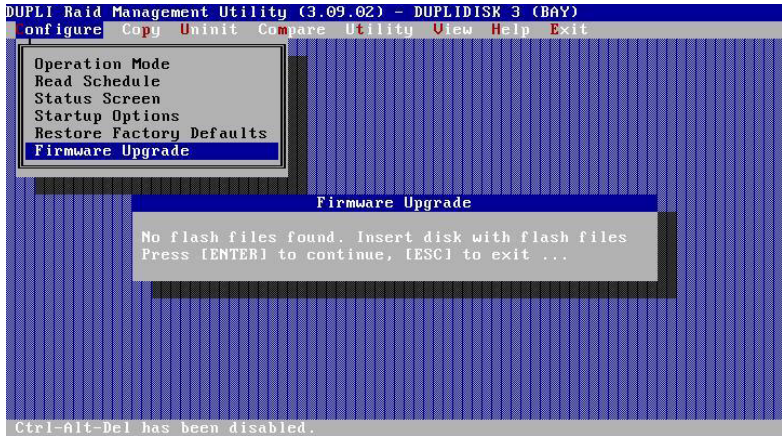
Firmware Upgrade using a floppy diskette

1. Turn the computer off and insert the diskette into the floppy drive.
2. Turn the computer and boot from the diskette.
3. Once the system boots, choose option #2.
4. Once the DOS RAID Management Utility comes up, the following screen will appear.



5. Press any key to continue.

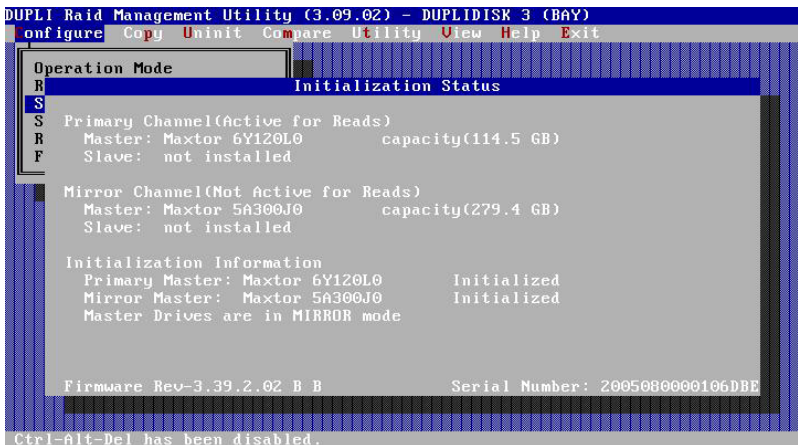
6. From the Configure pull down menu, choose **Firmware Upgrade**.



7. Follow the onscreen instructions to complete the firmware upgrade.
8. When firmware upgrade is completed, exit the application and choose option #3 to exit. Remove the floppy diskette and reboot the computer.

Firmware Upgrade using DOS CD

1. Turn the computer off and insert the CD into the CD-ROM
2. Turn the computer on and boot from the CD.
3. Once the system boots choose option # 2.
4. Once the DOS RAID Management Utility comes up, the following screen will appear.



-
5. Press any key to continue.
 6. From the Configure pull down menu choose **Firmware Upgrade**.
 7. When you press enter and the following message appears: "Enter path for flash files" . Please type **A:** press enter to continue.
 8. Follow the onscreen instructions to complete the firmware upgrade,
 9. When firmware upgrade is completed, exit the application and choose option 3 to Exit. Remove the CD and reboot the computer.

14 Upgrading from a small drive to a larger drive capacity

Note: To take advantage of the full drive capacity, a third party partition expanding software is required.

If a need arise for changing the drive capacity from a small size to a larger drive, please follow these easy steps.

There are three drive size scenarios:

1. **Primary** drive is **smaller** than **Mirror** drive.
2. **Mirror** drive is **smaller** than **Primary** drive.
3. **Primary** and **Mirror** drives are the same size.

Primary drive is smaller than Mirror drive or Mirror drive is smaller than Primary drive size (upgrading small drive to a larger drive).

1. Power the system off.
2. Remove the power from the **DupliDisk3**.
3. Remove the **old large drive** and the **small** drive from the **DupliDisk3**.
4. Connect the **old large** drive directly to the motherboard.
5. Using the third party partition expanding software, expand the **old large** drive to its full capacity.
6. Reboot the system with only the **old large** drive to insure proper operation after the partition was expanded.
7. Re-connect **only** the **old large** drive back to its original position on the **DupliDisk3**.
8. Re-connect the power to the **DupliDisk3**.
9. Boot the system to either the floppy diskette or the bootable CD and run the DOS RAID Management Utility.
10. The buzzer will sound, please depress the buzzer reset switch on the **DupliDisk3**.
11. Once the DOS RAID Management Utility comes up, the following screen appears:

```
DUPLI Raid Management Utility (3.09.02) - DUPLIDISK 3 (BAY)
Configure Copy Uninit Compare Utility View Help Exit

Operation Mode
R
S
S Primary Channel(Active for Reads)
R Master: Maxtor 6Y120L0 capacity(114.5 GB)
F Slave: not installed

Mirror Channel(Not Active for Reads)
Master: Maxtor 5A300J0 capacity(279.4 GB)
Slave: not installed

Initialization Information
Primary Master: Maxtor 6Y120L0 Initialized
Mirror Master: Maxtor 5A300J0 Initialized
Master Drives are in MIRROR mode

Firmware Rev-3.39.2.02 B B Serial Number: 2005080000106DBE

Ctrl-Alt-Del has been disabled.
```

12. Press any key to continue.
13. From the “Uninit” pull down menu choose “Uninitialized all Drives”.
Un-initializing the drive simply means that the identifying information about the drive is being cleared from the **DupliDisk3’s** memory. No harm will be caused to the drives.

```
DUPLI Raid Management Utility (3.09.02) - DUPLIDISK 3 (BAY)
Configure Copy Uninit Compare Utility View Help Exit

Uninitialize all Drives
Uninitialize Primary Master Drive
Uninitialize Mirror Master Drive
Uninitialize Primary Slave Drive
Uninitialize Mirror Slave Drive

Ctrl-Alt-Del has been disabled.
```

14. Exit the RAID Management Utility. Power your system off and connect the **new large** drive. Important: **Be sure that the new large drive is at least as large as the old large drive.**
15. Follow steps number 4 or 5 in section “Replacing a Failed drive”, to rebuild the new drive.

Primary drive and the Mirror drive are the same size (Upgrading both drives to larger drives).

1. Power the system off.
2. Replace any drive with the first new large drive.
3. Turn the system on. The buzzer will sound, please depress the buzzer reset switch on the **DupliDisk3**.
4. Follow steps number 4 or 5 in section "Replacing a Failed drive", to rebuild the new drive.
5. After rebuild is completed, power the system off.
6. Remove the **first new and the old small** drives from the **DupliDisk3**.
7. Disconnect the power from the **DupliDisk3**.
8. Connect the **first new large** drive directly to the motherboard.
9. Using the third party partition expanding software, expand the **first new large** drive to its full capacity.
10. Reboot the system with only the **first new large** drive to insure proper operation after the partition was expanded.
11. Re-connect the **only the first new large** drive back to its original position on the **DupliDisk3**.
12. Re-connect the power to the **DupliDisk3**.
13. Boot the system to either the floppy diskette or the bootable CD and run the DOS RAID Management Utility.
14. The buzzer will sound, please depress the buzzer reset switch on the **DupliDisk3**.
15. Once the DOS RAID Management Utility comes up, the following screen appears:

```
DUPLI Raid Management Utility (3.09.02) - DUPLIDISK 3 (BAY)
Configure Copy Uninit Compare Utility View Help Exit

Operation Mode
R
S
S
R
F

Initialization Status

Primary Channel(Active for Reads)
Master: Maxtor 6Y120L0 capacity(114.5 GB)
Slave: not installed

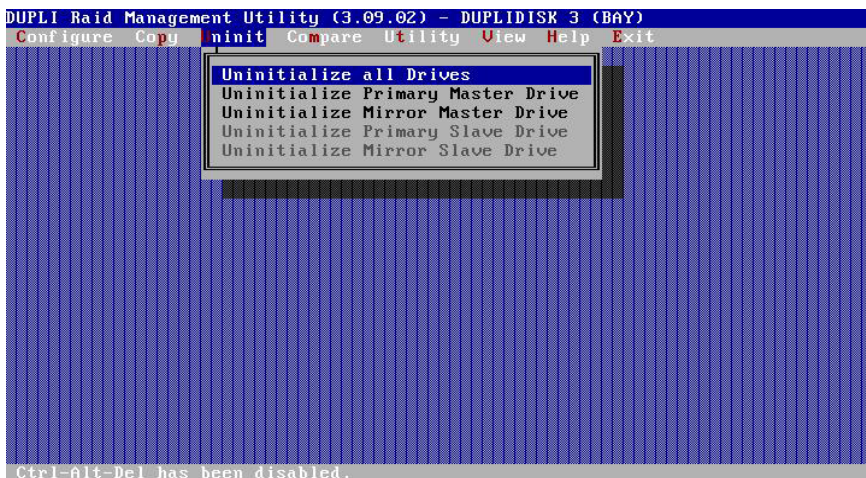
Mirror Channel(Not Active for Reads)
Master: Maxtor 5A300J0 capacity(279.4 GB)
Slave: not installed

Initialization Information
Primary Master: Maxtor 6Y120L0 Initialized
Mirror Master: Maxtor 5A300J0 Initialized
Master Drives are in MIRROR mode

Firmware Rev-3.39.2.02 B B Serial Number: 2005080000106DBE

Ctrl-Alt-Del has been disabled.
```

16. Press any key to continue.
17. From the “Uninit” pull down menu choose “Uninitialized all Drives”. Uninitializing the drive simply means that the identifying information about the drive is being cleared from the **DupliDisk3’s memory**. No harm will be caused to the drives.



18. Exit the RAID Management Utility. Power your system off and connect the **second new large** drive. Important: **Be sure that the new large drive is at least as large as the first new large drive.**
19. Follow steps number 4 or 5 in section “Replacing a Failed drive”, to rebuild the new drive.

15 Primary/Mirror LED Blinking Green

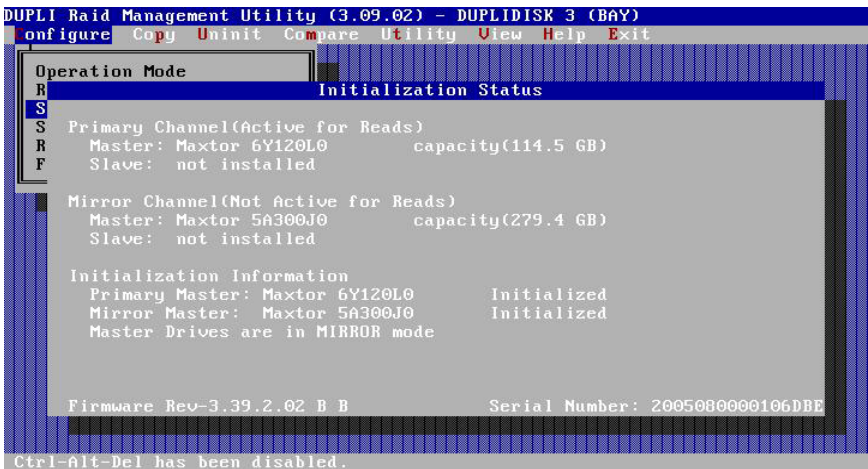
Overcome Primary/Mirror LED Blinking Green and Primary/Mirror channel is marked as Bad.

When a failed drive was replaced, the new drive's LED Green light will be **blinking**. This light indicates that the previous drive was "Marked as Bad".

Once the RAID Management Utility runs and rebuild the drives, it will clear the drive status and turn the LED Green light to be **solid**. If the RAID Management Utility doesn't turn the LED to solid Green and the channel is still "Marked as Bad", please follow these steps:

Primary LED is Blinking Green

1. Boot the system to either the floppy diskette or the bootable CD and run the DOS RAID Management Utility.
2. Once the DOS RAID Management Utility comes up, the following screen appears:



3. Press any key to continue.
4. From the "Uninit" pull down menu choose "Uninitialize **Primary** Master Drive" and press Enter.
5. The following popup window appears: "Are you sure you want to uninitialize the **Primary** Master drive? (Y/N). Answer Y.
6. The following popup window appears: "**Primary** Master drive has been uninitialized. Press [ENTER] to continue...". Press Enter.
7. Exit the program.

8. The buzzer will sound, please depress the buzzer reset switch on the **DupliDisk3**.
9. If you have the Windows RAID Management Utility, boot from the **DupliDisk3** and rebuild the Primary drive.
10. If you choose to use the DOS RAID Management Utility, Boot the system to either the floppy diskette or the bootable CD and run the DOS RAID Management Utility.
11. At the status screen, press any key to continue.
12. Choose this option: "Initializing drives using the Mirror drive initialization".
13. The following popup window appears: "Drives were successfully initialized. Press [ENTER] to continue ...". Press Enter.
14. **Important:** From the "Copy" pull down menu choose: "Mirror Master to Primary Master".
15. Once the rebuild is completed, exit the program and boot your system.
16. The **Primary** LED should light solid Green as well as the Mirror and Status LED.

Primary LED is Blinking Green

1. Follow steps 1 to 3 under "Primary LED is Blinking Green."
2. From the "Uninit" pull down menu choose "Uninitialize **Mirror** Master Drive" and press enter.
4. The following message form a pop-up menu appears: "Are you sure you want to uninitialize the **Mirror** Master drive? (Y/N) Press Y.
5. Exit the program.
6. The Buzzer will make a noice, please depress the buzzer reset switch on the **DupliDisk3**.
7. If you choose to use the DOS RAID Management Utility, boot from the **DupliDisk3** and rebuild the Mirror drive.
8. If you choose to use the DOS RAID Management Utility, boot the system to either the floppy diskette or the bootable CD and run the DOS RAID Management Utility.
9. At the status screen, press any key to continue.
10. Choose the option that says: "Initializing drives using the Primary drive initialization."
11. The following pop-up window message appears: "Drives were successfully initialized. Press [ENTER] to continue.." Press Enter
12. **Important: From the "Copy" pull down menu, choose: "Primary Master to Mirror Master."**
13. **Once** the rebuild is completed, exit the program and boot your system. The **Mirror** LED should light solid Green as well as the **Mirror** and Status LED

16 Troubleshooting

Both drives appear on the DupliDisk3 Raid Management Utility status screen but your operating system displays only one drive.

The mirror drive can only be seen by the **DupliDisk3** Raid Management Utility Program. It is invisible to your operating system. If you are mirroring a C:\ drive, for example, only the C:\ drive will appear.

Only one drive appears on the DupliDisk3 Raid Management Utility status screen.

Both the Primary and Mirror drives must be configured as Master or Single mode. Make sure one of the drives has not been configured as Slave. Check to see that the power cables to the drives are securely connected and the drives are operational.

The drives are connected to the DupliDisk3 but the system BIOS doesn't see any drives. Running the DupliDisk3 Raid Management Utility Program returns an "adapter not found" message.

Make sure the **DupliDisk3** is securely mounted and that the Host and power cables are properly connected. The **DupliDisk3** should emit a beep and all of the LED's should indicate green when the system is powered up

All you have done is to initialize the drives with the DupliDisk3 Raid Management Utility but the computer is saying you have made changes to the BIOS and asking if you want to accept them.

Do not be concerned. No changes have been made to the computer's system BIOS. Select "ACCEPT" to continue your **DupliDisk3** installation.

What is the meaning of the term initialized

The **DupliDisk3** reads the identifying information from the drives and saves it to its internal memory. The purpose is for keeping track of drives that are connected to the Primary channel and to the Mirror channel.

Is any harm done to my hard drive when I am asked to un-initialize the drives?

Un-Initializing the drives on the **DupliDisk3** simply mean that identifying information about the drive is being cleared from the **DupliDisk3's** internal memory. No harm will be caused by this action.

My Primary drive failed, I replaced with a new drive and when the rebuilt completed, the Primary LED is blinking Green. When running Windows RAID Management Utility, the Primary Channel is "Marked as Bad".

Please refer to the section "Primary/Mirror LED is blinking Green section.

For the latest information and software upgrades, please visit the technical support section on our website at <http://www.ezd2d.com>. You may also visit the FAQ (Frequent Answered Questions) on the web at http://www.ezd2d.com/support_faqs.php

17 Specifications

Model	MicroRaid
Drive interface	IDE / E-IDE / UDMA
Data Path	IDE / E-IDE / UDMA (Defined by the host controller)
Hard Disk Interface	Cable: 80 wire - 40-pin Connector
Supplied Cable Length (inches)	18
Host Interface	Cable: 80 wire - 40-pin Connector
Supplied Cable Length (inches)	N/A
Electrical Input	Voltage: 5v DC (+/- 5%)
	Current: 450 MA Operating 600 MA Peak
Length (inches)	6.65
Width (inches)	4.00
Height (inches)	
Operating Temp.	Internal Raid Solutions 0 to 50 degrees Celsius External Raid Solution 0 to 45 degrees Celsius
Humidity	8% to 87% non-condensing
Capacity / Addressing	Utilizes 48 bit Logical Block Addressing - 128 PetaBytes
MTBF	MIL - HDBK - 217 = 580,383 Hours Bellcore Rating = 2, 695,498 Hours
EMC/EMI Compliance	ICC Class B Certification CE Certification

