

GDT
DataFast-X5
USER MANUAL

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Approvals	Title	Date	Signature

1 Introduction

The **DataFast-X5** disk duplicator is designed to be used as a stand-alone IDE and SATA duplication system to selectively copy program software and data from one *master source drive* to five *target disk drives*, simultaneously. Ideal for volume applications, its intelligent duplication mode enables the custom configuration of drives, including partitioning and formatting during the duplication process. Target drives that are identical to the source drive may also be "mirrored", or duplicated exactly, sector by sector.

- With the front panel, the **DataFast-X5** does not require a monitor, keyboard or mouse.
- The interface is friendly and easy to use with large 5.0-inch graphic LCD (800*480) and capacitive touch-screen.
- Supports full SATA III giving the full and fastest duplication speeds for SATA drives.
- Supports TGC-OPAL security for duplication of OPAL compliant SED drives.
- Supports the OPAL Trusted Platform Module (TPM).
- Supports DOD 5220M disk drive erasure.
- Has a special erasure mode for the quickest erasure of SATA III drives.
- With user configurable options even difficult to duplicate drives can be duplicated.
- Duplication of HPA areas are supported.
- One button duplication supported. Insert drives and push button to duplicate.

2 Mechanical interface

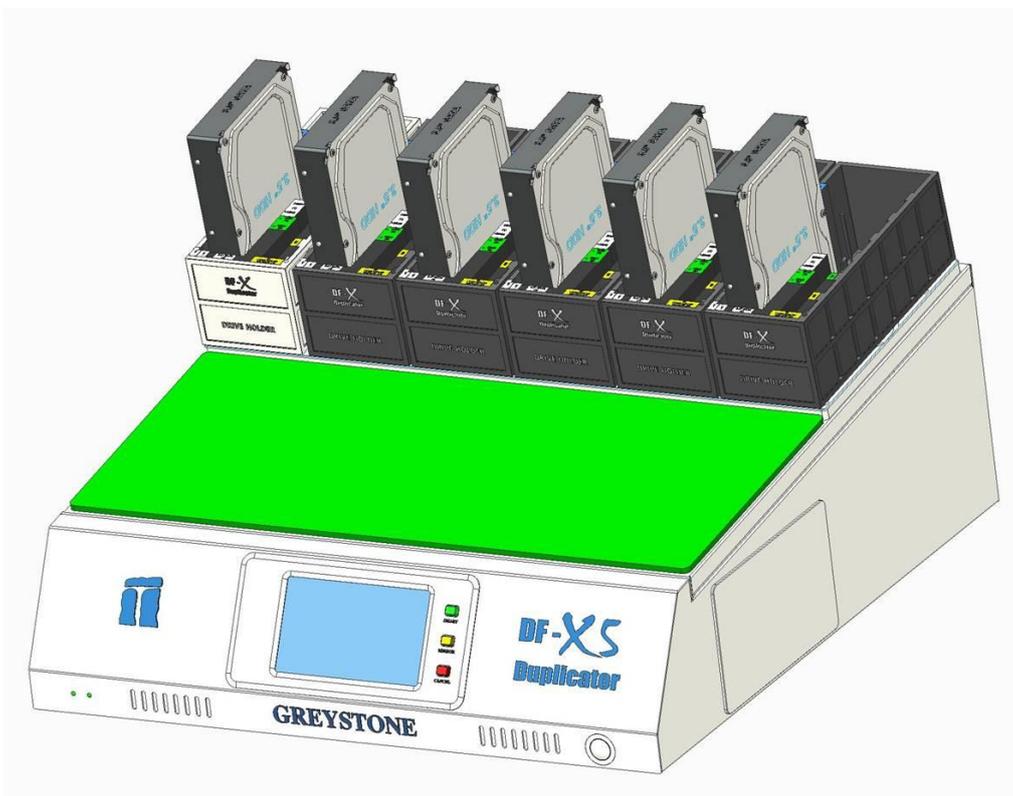


Figure 1: Mechanical interface

- 1 POWER button
- 2 Front Panel (It includes: a 5.0-inch color LCD (800*480) user display with capacitive touch-screen, buttons to control (CANCEL, MIRROR, SMART))
- 3 Source drive port
- 4 Target 1 drive port
- 5 Target 2 drive port
- 6 Target 3 drive port
- 7 Target 4 drive port
- 8 Target 5 drive port

3 Definitions and Abbreviations

- LCD: Liquid Crystal Display.
- SATA: Serial Advanced Technology Attachment.
- PATA: Parallel Advanced Technology Attachment.
- DF: Data Fast.
- OPAL: Disk drive security specification by the Trusted Computing Group
- SED: Self encrypting disk drive

4 User guide

4.1 Getting start

Here is the process to turn on the machine:

- **Step 1a:** Plug in the power cord to a 110 VAC power source.
- **Step 1b:** Turn on the power supply from the switch on the rear of the machine.
- **Step 2:** Press the POWER button on the front of machine.
- **Step 3:** The machine will boot follow with below process:
 - o As the **DataFast-X5** booting, the LCD will show the blue screen and then switch to the Loading screen (Total time about 60 seconds).



Figure 2: Loading screen

- o Then the **DF-X** logo will be showed as an opened door step by step.

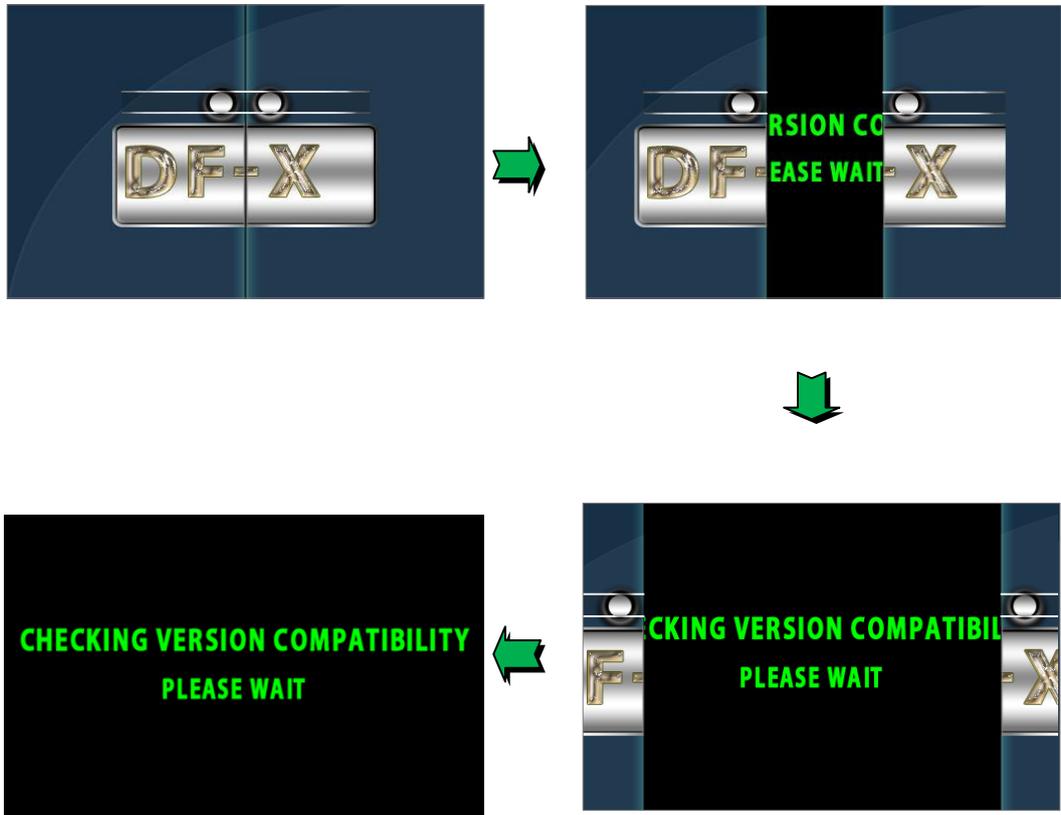


Figure 3: Open the Door screen

- The software will check the version compatibility between software and firmware.
 - If compatible, the machine will login to the main menu.
 - If they are not compatible, the machine will upgrade the corresponding firmware automatically.
- **Step 4:** The machine is ready to use when the main menu is shown:



Figure 4: Main Menu

4.2 Front Panel

- The **New DataFast-X5** front panel consists of a 5.0-inch graphic LCD screen (800*480) with capacitive touch-screen and 3 control buttons (MIRROR, SMART, CANCEL) to support one button duplication.



Figure 5: Front Panel with LCD, status LED and control buttons

- **CANCEL:** Cancel a process, a setting... or come back the previous screen.
- **MIRROR:** Execute the Mirror Copy function.
 - This function can be used directly or after the check disk process to execute the Mirror Copy function.
- **SMART:** Execute the Smart Copy or Twin copy function (dependent on the Smart Copy mode settings).
 - This function can be used directly or after the check disk process to execute the Smart Copy function.

4.3 User interface structure

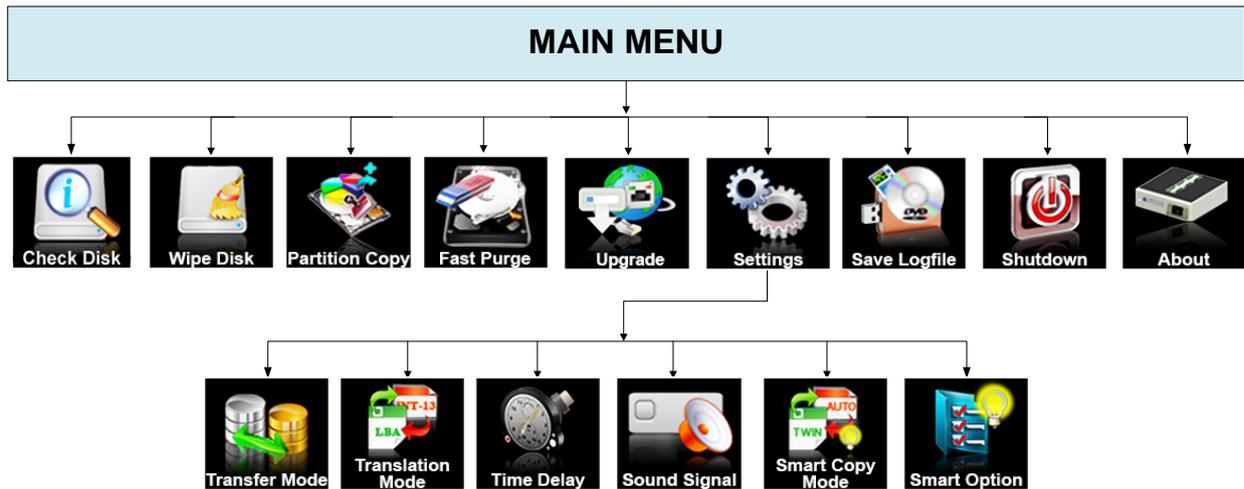


Figure 6: User interface structure

4.4 Main functions

- The main functions of the **DataFast-X5** are:
 - o [Check Disk](#)
 - o [Wipe Disk](#), [Mirror Copy](#), [Smart Copy](#), [Partition Copy](#) (Standard Jobs)
 - o [FAST Purge](#)
 - o [Check for Update](#)
 - o [Settings](#)
 - o [Save Logfile](#)
 - o [Shutdown](#)
 - o [About](#)

4.4.1 Check Disk



Figure 7: Main menu: Check Disk function

- Check Disk powers up the drives and reads the drive information. The DF-X5 user can view information about the drive or use this as a preparation step before executing any of the standard jobs such as: Mirror Copy, Smart Copy, Partition Copy, Wipe Disk and FAST Purge.
- When the user chooses the Check Disk function, the screen will show the following:



Figure 8: Checking disk screen

- During the Checking Disk process, the user can touch the drive icons on the LCD touch-screen to select or remove a disk.
 - o Each disk icon has a LED icon. The meaning of each LED icon is:
 - ● Green: Active and getting disk information.
 - ● Red: The drive startup and information processed error.
 - ● Grey: The drive was removed from the process by the end user.
 - o The disk icon indicates participation in the process by its color:
 -  Colored Icon: indicates the disk is part of the Check Disk function.
 -  Grey Icon: indicates the disk has been removed from the process by the user.
 - o The Check Disk process goes through several steps as follows:
 - START-UP: preparing to check disk.
 - TURNING ON: the drive is powered on, and waiting to boot up.
 - CHECKING: waiting for disk to come ready.
 - IDENTIFYING: getting the drive information.
 - READY: drive identified successfully.
 - ERROR: an error occurred during Check Disk.
 - REMOVED: drive removed by end user.
- After completed the Check Disk process, the REVIEW JOB SETUP screen will appear:



Figure 9: Review Job Setup screen

- This screen is the same as the Check Disk screen except:
 - o All LEDs are solid.
 - o Status text: NO DISK, READY or brief drive information.
- The user can view the drive's information in detail by touching the icon on LCD. All information of the drive is given in one page.



Figure 10: Detail of disk

When the Review Job Setup screen appears, you can execute two Standard Jobs: Mirror Copy and Smart Copy by pressing either the MIRROR or SMART button.

4.4.2 Mirror Copy

- The Mirror Copy mode is valid only for target drives which have the same number of cylinders, heads and sectors per track as the source drive.
- There are two methods used to execute the Mirror Copy function:
 - o The first method: press the Yellow MIRROR button on the console. The DF-X5 will go to the Checking Disk screen and then go to the MIRROR COPY process without showing the Review Job Setup screen.
 - o The second method: press the MIRROR button on Review Job Setup screen after the [Checking Disk](#) process.
- If the Source drive or Target drives have an HPA region, the following screen will be shown before the duplication process:

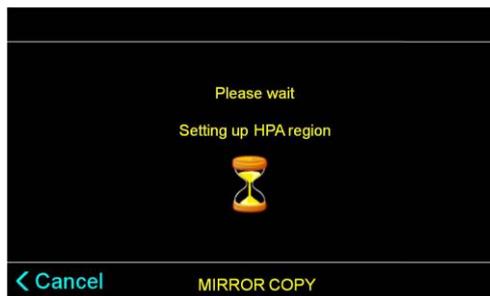


Figure 11: Setting up HPA region screen

- Here is the duplication process screen:

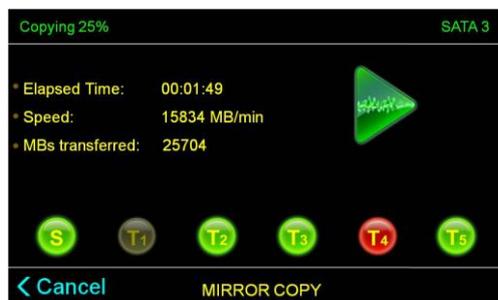


Figure 12: Copying process

- This screen is divided into three areas:
 - o The status area (on the top):

- Shows the current status: Copying /Wiping / Paused.
 - Shows the percent (0% to 100%).
 - Shows the [current transfer mode](#).
 - The job name (on the bottom): MIRROR COPY (SMART COPY / TWIN COPY / WIPE DISK / PARTITION MIRROR / PARTITION SMART)
 - The current job information:
 - Elapsed time in hh:mm:ss format
 - Speed in MB/min
 - Total of MBs transferred
 - Animation icons for each drive:
 -  /  ...  : Source / Target is working
 -  /  ...  : Source / Target is idle
 -  /  ...  : Source / Target is error
 -  ...  : Target is removed
- During the copying process, the user can pause the process by touching Cancel button on LCD screen (or pushing the CANCEL button on the front panel). The following screen will be shown:

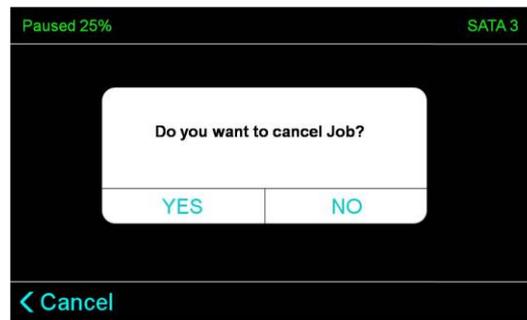


Figure 13: Pause screen while copying

- User can continue the process by touching NO button on the message box (or touching Cancel button on screen or pushing CANCEL button on front panel). To cancel the process, touch the YES button on the message box.

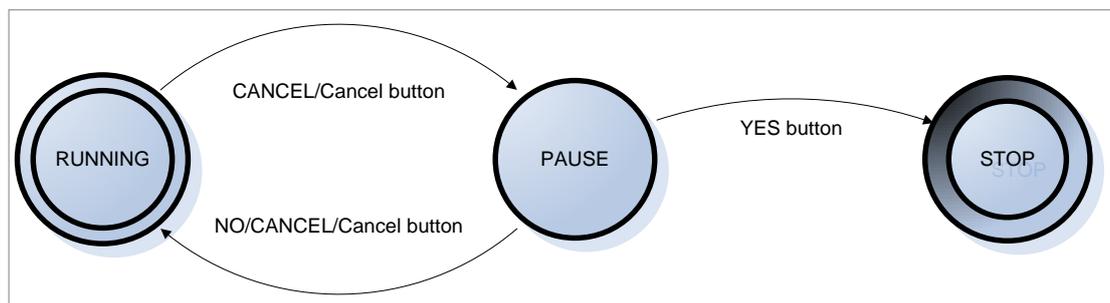


Figure 14: Copying process cycle

- When the duplication process is completed, the result screen will be shown as follows:
- Job completed successfully:



Figure 15: Job Completed successfully screen

- Job completed unsuccessfully:



Figure 16: Job Completed unsuccessfully screen

- The Alert Sound will be activated when the job is completed if the [sound signal](#) is enabled in the system options.
- On the result screen, the user can touch the Detail button to view the duplication status report and touch the Cancel button to return to the Main Menu. Here is the status report:



Figure 17: Status report for the copying process

4.4.3 Smart Copy

- This Smart Copy mode duplicates the files system structures and user data from the source drive to the designated targets keeping the basic source's partition structure intact.
- If the file system of a source partition is unknown and the source and target drives have matching heads and sector/track configuration, the target partition size will be set equal to the source partition, and the contents will be "partition mirror" copied.
- If the file system is known (with FAT12, FAT16, FAT32, NTFAT, or NTFS, Ext2, Ext3), the target partition size will be automatically adjusted, based on the ratio of the capacitive of the source drive to the capacitive of the target drive. Data will be copied file-by-file, adjusting target FAT size, and cluster size as needed.
- There are two methods to execute the Smart Copy function:
 - The first method: press the SMART button on Main Menu.
 - The second method: press the SMART button on Review Job Setup screen after the [Checking Disk](#) process.
- The interface of the Smart Copy process is the same as the [Mirror Copy process](#).

4.4.4 Wipe Disk

- When the "Wipe Disk" option is enabled, you can erase your target drives. This option will fill the target drives with zeros. To use the DOD Wipeout Smart Option you should visit the [Smart Options](#) section.
- To execute the Wipe Disk function, the user can select the Wipe Disk function on the Main Menu.



Figure 18: Main Menu: Wipe Disk function

- The interface of the Wipe Disk process is same as the [Mirror Copy process](#).

4.4.5 Partition Copy

- When in the "Partition Copy" mode, the user can easily add partitions from the source drive to the target drive by selecting the desired partitions.
- To execute the Partition Copy function, the user can select the Partition Copy function on the Main Menu.



Figure 19: Main menu: Partition Copy function

- In this function, instead of displaying the Review Job Screen after Checking Disk, the screen will show the Partition List Info of Source drive:

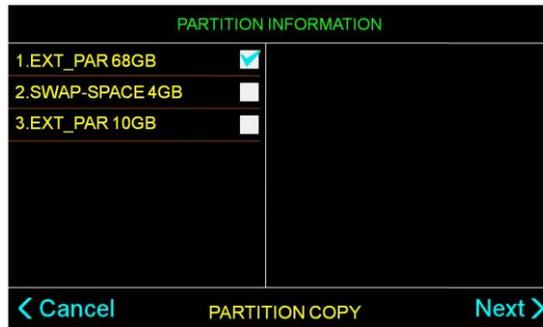


Figure 20: Partition List Info screen

- In this screen, the control buttons function as follows:
 - o Checkbox: Touch the Partition checkbox to check or uncheck the Partition.
 - o Cancel button: Touch to cancel the Partition Copy process.
 - o Next button: Touch to continue after choosing Partition. If user did not choose any Partition, the screen will appear a message to notify:

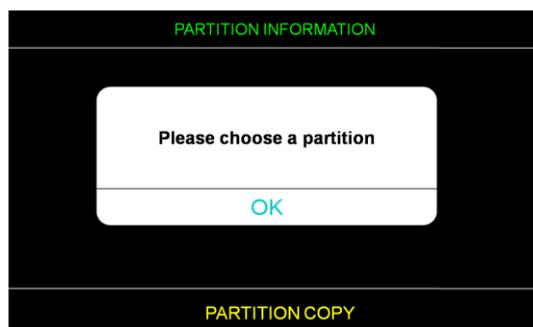


Figure 21: Partition copy - Notification message

If a partition is chosen, user can press MIRROR or SMART button on the front panel to execute the Partition Mirror/Smart copy function.



Figure 22: Partition Mirror/Smart copy

- o MIRROR button: execute the Partition Mirror copy function.
- o SMART button: execute the Partition Smart copy function.
- The interface of the copying process is same as the [Mirror Copy process](#) interface.

4.4.6 FAST Purge

- When the "FAST Purge" option is enabled you can erase target drives. This option will fill the target drives with zeros. This process is faster than the [Wipe Disk](#) function.
- To execute the FAST Purge function, the user can select the FAST Purge function on the Main Menu.



Figure 23: Main menu: FAST Purge function

- The interface of the FAST purge process is the same as the [Mirror Copy process](#).

4.4.7 Check for Upgrade

- The function is used to check for upgrading the software and firmware. Please touch the Upgrade icon to upgrade.



Figure 24: Main Menu: Check for Upgrade function

- There are two ways to upgrade the **DataFast-X5**: “Upgrade via USB” and “Upgrade via Internet”.

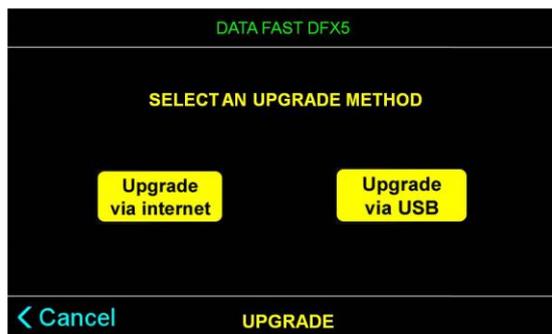


Figure 25: Check for Upgrade: select protocol screen

- After selecting an upgrade method, the **DataFast-X5** will find the upgrade software:



Figure 26: Check for Upgrade: Found a new version screen

- The downloading and upgrading process:



Figure 27: Check for Upgrade: Upgrading software screen.

- Downloading firmware process:

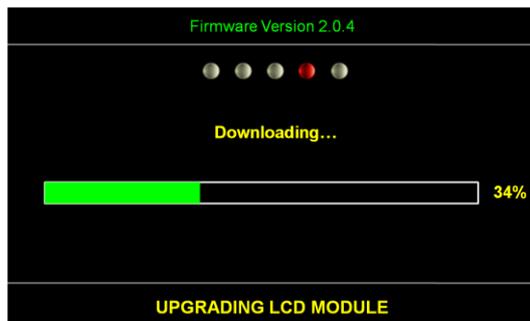


Figure 28: Check for Upgrade: Downloading firmware for LCD module process

- Writing the device driver:



Figure 29: Check for upgrade: Writing device driver for LCD module screen

- Writing upgrade file:

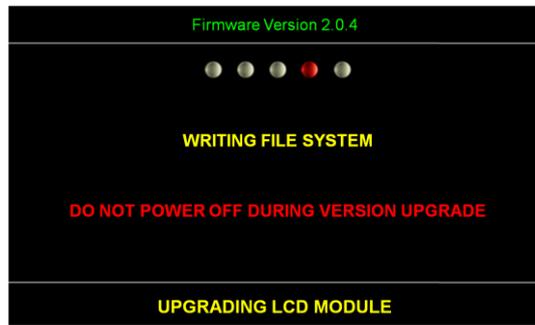


Figure 30: Check for Upgrade: Writing upgrade file

- Writing the application:

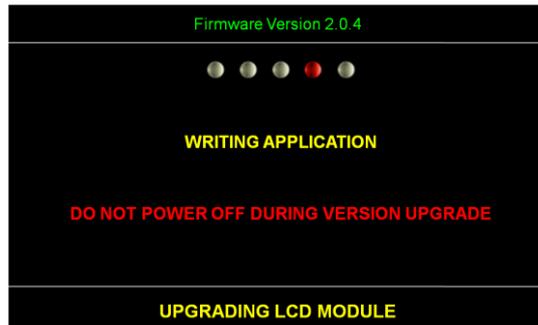


Figure 31: Check for Upgrade: Writing the application

- If the upgrade is successful, the **DataFast-X5** will appear a notification screen:

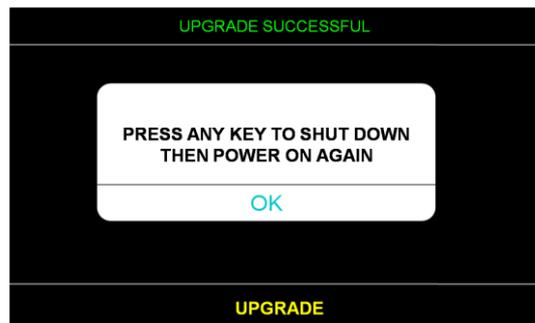


Figure 32: Check for Upgrade: Upgrade successful

Otherwise, a failure message will be displayed.

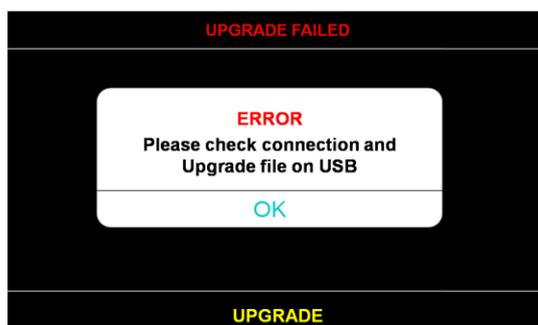


Figure 33: Check for Upgrade: Upgrade failed

4.4.8 Settings

- The system settings permit the user to set global parameters that are common to all jobs. Select settings from the main menu to set system settings.



Figure 34: Main Menu: Settings function

- The System Settings function includes the following functions:
 - o [Transfer Mode](#)
 - o [Translation Mode](#)
 - o [Time Delay for Drive](#)
 - o [Verification](#)
 - o [Sound Signal](#)
 - o [Smart Copy Mode](#)
 - o [Smart Options](#)

4.4.8.1 Transfer Mode



Figure 35: Settings Menu: Set Transfer Mode

Transfer Mode

- This option permits setting the maximum UDMA mode to be used in the duplication process. Sometimes older drives cannot support the higher UDMA speeds. The DF-X5 will automatically reduce the UDMA mode during the copy process, however this setting gives more control of the UDMA mode to the user.

Sectors/Transaction

- This option permits setting the number of sectors for each read or write transaction.

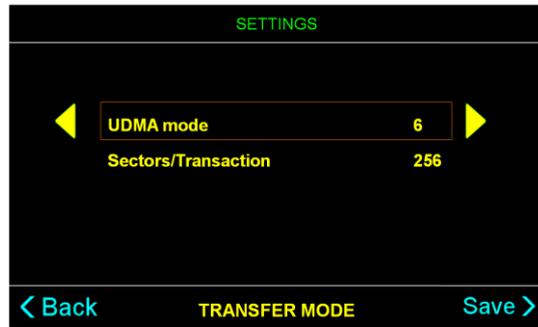


Figure 36: Set Transfer Mode screen

- In this screen the control buttons operate as follows:
 - o Touch the option to select the UDMA mode or Sectors per Transaction option.
 - o Touch the yellow LEFT/RIGHT button to decrease/increase the value of the options.
 - o Back button: Touch to return to the Settings Menu without saving the new settings.
 - o Save button: Save the new settings.

4.4.8.2 Translation Mode



Figure 37: Settings Menu: Set Translation Mode

Enable LBA translation

- When enabled, this option will ensure the translated heads value will be a power of 2. When disabled, the translated heads value may or may not be a power of 2.

Enable Interrupt 13 translation

- When enabled, drives larger than 4GB with 16 heads will automatically have their head count reduced to 15 heads for translation purposes.

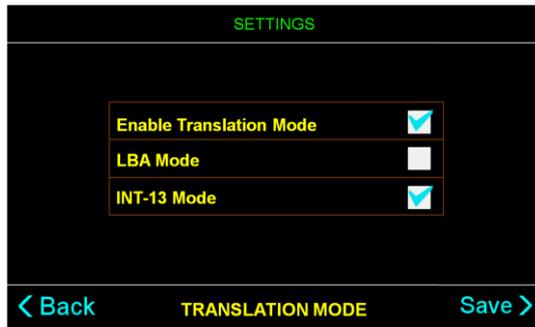


Figure 38: Set Translation Mode screen

- There are 3 options for this setting:
 - o Enable LBA Mode.
 - o Enable INT-13 Mode
 - o Disable both LBA Mode and INT-13 Mode (Uncheck the “Enable Translation Mode” Checkbox.

- In this screen the control buttons operate as follows:
 - o Touch to disable/enable the selected mode.
 - o Back button: return to the Settings Menu without saving the new settings.
 - o Save button: Save the new settings.

4.4.8.3 Time Delay for Drive



Figure 39: Settings Menu: Set Time Delay for Drive

Drive power-up delay

- A slight delay is added between each drive power on step. This is to protect the power supply and electronics from power supply surges. This parameter sets the time delay in seconds between each drive spin-up. (Default is 5 sec.) At the default delay setting all drives will be powered up after 60 seconds.

Drive power-setting time

- This is a time delay used after power is applied to allow the drive electronics to settle and the drive to come up to speed before further interrogation and recalibration of the drive. (Default is 5 sec.)

Drive command timeout

- This is the time allowed for a drive to respond to a command before declaring a timeout error. If the drive does not respond within the allowed time, it has failed - indicating a problem, such as not connected. Most drives will respond in 5 seconds. (Default is 15 sec.)

Drive spin down time

- This is the time allowed for spin down after power is turned off to the drives and before the 'Safe to remove drive' message is displayed. This setting gives the drive time to store the last data written to the drive after the power is removed. (Default is 7 sec.)

Drive command delay

- After the drive has received and acknowledged a command, the system will delay before checking for completion of the command.

Drive command retry

- This is the number of times the system will send a command to the drive before declaring the drive is not operable.



Figure 40: Set Time Delay for Drive

- In this screen, the control buttons operate as follows:
 - o Touch the option to select.
 - o Touch the yellow LEFT/RIGHT button to decrease/increase the value of the selected option.
 - o Back button: return to the Settings Menu without saving the new settings.
 - o Save button: Save the new settings.

4.4.8.4 Verification



Figure 41: Settings Menu: Set Verification

- When this option is enabled, the data on the target drives is read back and compared to the source drive after the duplication process.

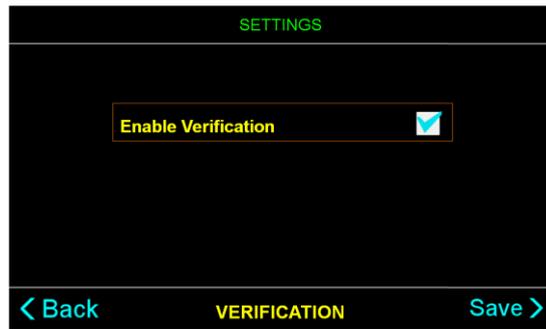


Figure 42: Set Verification screen

- In this screen, the control buttons operate as follows:
 - o Touch the checkbox to disable/enable Verification.
 - o Back button: return to the Settings Menu without saving the new settings.
 - o Save button: Save the new settings.

4.4.8.5 Sound Signal



Figure 43: Settings Menu: Set Sound signal

Sound Signal

- When this option is checked, at the end of every job the DF-X5 emits an alert sound on the speaker.
- When the button sound is selected, every button press on the LCD or front console will produce a sound.

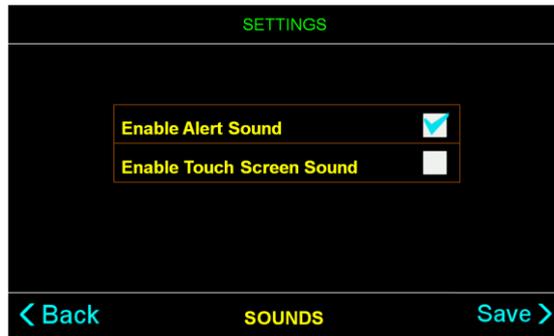


Figure 44: Set Sound signal screen

- In this screen, the control buttons operate as follows:
 - o Touch the checkbox to disable/enable the Sound option.
 - o Back button: return to the Settings Menu without saving the new settings.
 - o Save button: Save the new settings.

4.4.8.6 Smart Copy Mode



Figure 45: Settings Menu: Set Smart Copy Mode

Delta Smart Copy

- If the system has different drives (differences of capacity, manufacturer, model, cylinders, sectors or heads) or file systems of FAT, FAT32, NTFS and EXT2/3/4, choosing Smart Copy for duplicating from a source to target will require less time than Mirror Copy.
- With this copy mode, the target partitions will be resized to the ratio of the master's partitions and the sectors that contain data will be cloned from a source drive to a target and skip the blank sectors.

Twin Smart Copy

- For faster Smart copying when the source and target drives have the same capacity, the Twin Smart Copy mode identifies data and file system structure locations on the source disk and uses a quick mirror copy to duplicate only those areas to the target disks. The Twin Smart Copy supports the following file systems: FAT, FAT32, NTFS and EXT2/3/4(Linux).



Figure 46: Set Smart Copy Mode screen

- There are 2 options for this setting:
 - o Enable Delta Smart Copy.
 - o Enable Twin Smart Copy.

- The control buttons operates as follows:
 - o Touch the checkbox to enable/disable the Delta Smart or Twin Smart Copy modes.
 - o Back button: return to the Settings Menu without saving the new settings.
 - o Save button: Save the new settings.

4.4.8.7 Smart Options

- The *Smart Option* suite of utilities is designed to make the DataFast-X5 hard disk duplication product line more productive and useful. The *Smart Option* utilities are not part of the standard DataFast-X5 features; they are available as add-on order options with the initial purchase or can be ordered later on as an upgrade.



Figure 47: Settings Menu: Set Smart Options

NTFS Smart Option

- This option allows the DataFast unit to Smart Copy an NTFS partition from the Source to the Target Drives. The target partitions will be scaled correctly for the size of the target drives. This greatly reduces the time required to duplicate most disks with the Microsoft Windows NT file system. For example, a 640GB NTFS drive requires approximately 50 minutes to duplicate in the standard NTFS Partition Mirror copy mode that is part of all Greystone IDE duplication products.
- The *NTFS Smart Option* will enhance the duplication process by only copying the data from the Source drive to the Target drives and NOT copying blank sectors. A typical 640GB partition with 64 GB of actual data will take about 10 minutes (80% less time) to duplicate using the *NTFS Smart Option*. Approximately 40 minutes is saved with the *NTFS Smart*

Option. This means the NTFS Smart Option can duplicate 25 disk drives in the same time the default copy mode will duplicate 5 disk drives.

- Using an NTFS Source drive with a data load that is 5% the size of the NTFS partition, it is possible to duplicate approximately 50 drives using the *NTFS Smart Option* in the same time it takes to duplicate 5 drives using the standard NTFS Partition *Mirror copy*, a gain of 10 to 1.

Ext2/3

- Ext2/3/4 is the Linux supported file system. This option enables the DataFast unit to copy the data found on the EXT-2/3/4 file system partition to the targets while ignoring empty or unused sectors. The benefits are similar to the benefits of the NTFS Smart Copy.

DoD Wipeout

- The *DoD Wipeout Smart Option* enables Target drives to be completely "sanitized" (erased) or otherwise overwritten in accordance with the Department of Defense document number DoD 5220.22-M specifications. The only higher security measure recommended is the destruction of the disk drive - (a.k.a.) also known as "pulverization of drive".
- The disk sanitization is performed in the following steps:
 - o Overwrite all addressable locations with a random character.
 - o Overwrite all addressable locations with the complement of the character.
 - o Overwrite all addressable locations with a random character.
 - o Verify all addressable locations were overwritten with the random character.

Enable SATA

- The *Enable SATA Smart Option* enables the operator to work with the Serial ATA (SATA) disk drives.

HPA Copy Smart Option

- *Host Protect Area (HPA)* is a feature that was defined in ATA standard. A reserved area for data storage outside the normal operating system file system which is required for several specialized applications.
- When the HPA feature is activated on Smart Option, you can see the HPA status of disk drives.
- The HPA Smart Option expands the HPA area permitting duplication of the HPA area to the target drives.
- You can also expand target drives to full capacitive and then set the HPA address to a user specified value.

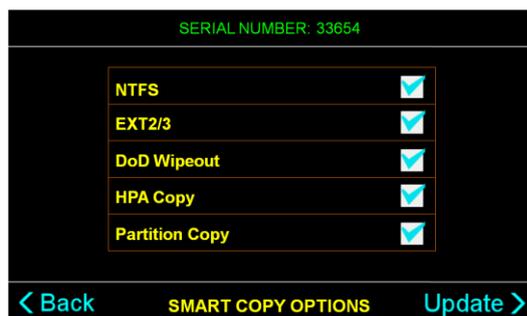


Figure 48: Set Smart Options screen

- The buttons for this screen work as follows:
 - o Touch the checkbox to disable/enable the item.
 - o Back button: return to the Settings Menu without saving the new settings.
 - o Update button: update Smart Options from the license file that contain on the USB drive.

How do I get a Smart Option License file?

- When the Smart Options screen is displayed, write down the internal serial number that is displayed on the top. Call **Greystone Data Technologies** at (510) 661-6793 (Pacific Time) or send an email to techsupport@greystonedatatech.com to ask technical support.

4.4.9 Save Logfile



Figure 49: Main menu: Save Logfile function

- This function is used to copy the logfile from the DataFast-X5 to the USB.
- All jobs will be recorded in the INFORMATION.TXT file. The following information is logged:
 - o Date and time
 - o Type of copy
 - o Source and target drives
 - o Status of copy operation
 - o Total MB copied
 - o Duration of Copy
 - o Startup and shutdown times of the program
- Before executing this function, the user has to put the USB memory stick into the upper right hand USB slot in the back of the DF-X5.
- Then the DataFast-X5 will copy the latest Logfile into the USB memory stick and show the following screen:



Figure 50: Copying Logfile screen

- Here is the result screen:



Figure 51: Copying Logfile result

4.4.10 Shutdown



Figure 52: Main Menu: Shut down function

- There are three actions in Shutdown menu: Cancel, Restart or Shut down the system

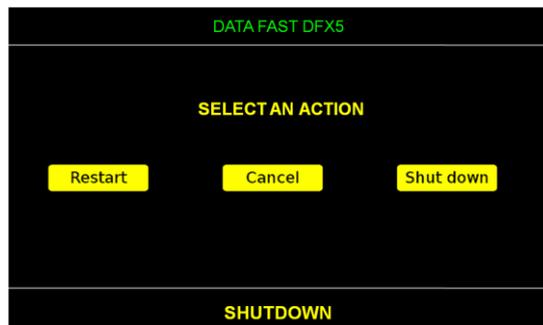


Figure 53: Shutdown screen

- The buttons have the following actions in this screen:
 - Restart button: To restart DataFast-X5 system.
 - Shut down button: To shut down DataFast-X5 system.
 - Cancel button: return the Main Menu.
- When user selects Shut down or Restart, the **DataFast-X5** will show a door closing.
 - If user chooses Shut down: the closed door logo will be displayed until the machine's power is shutdown.
 - If user chooses Restart option the screen will go back the booting screen.

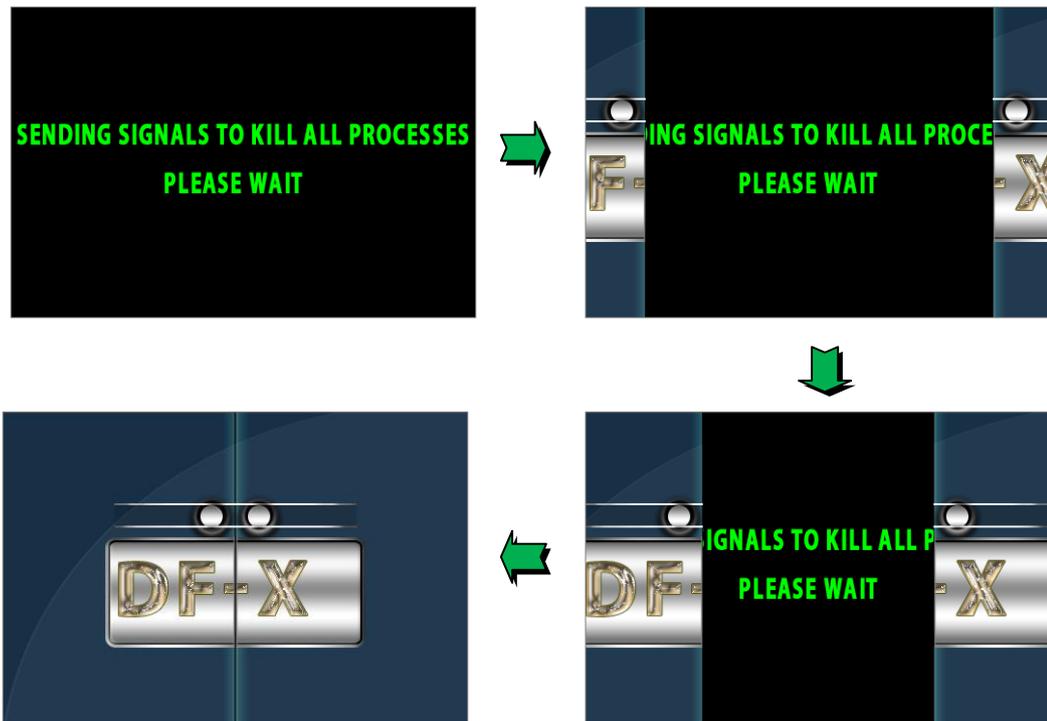


Figure 54: Close the door screen

4.4.11 About



Figure 55: Main Menu: About function

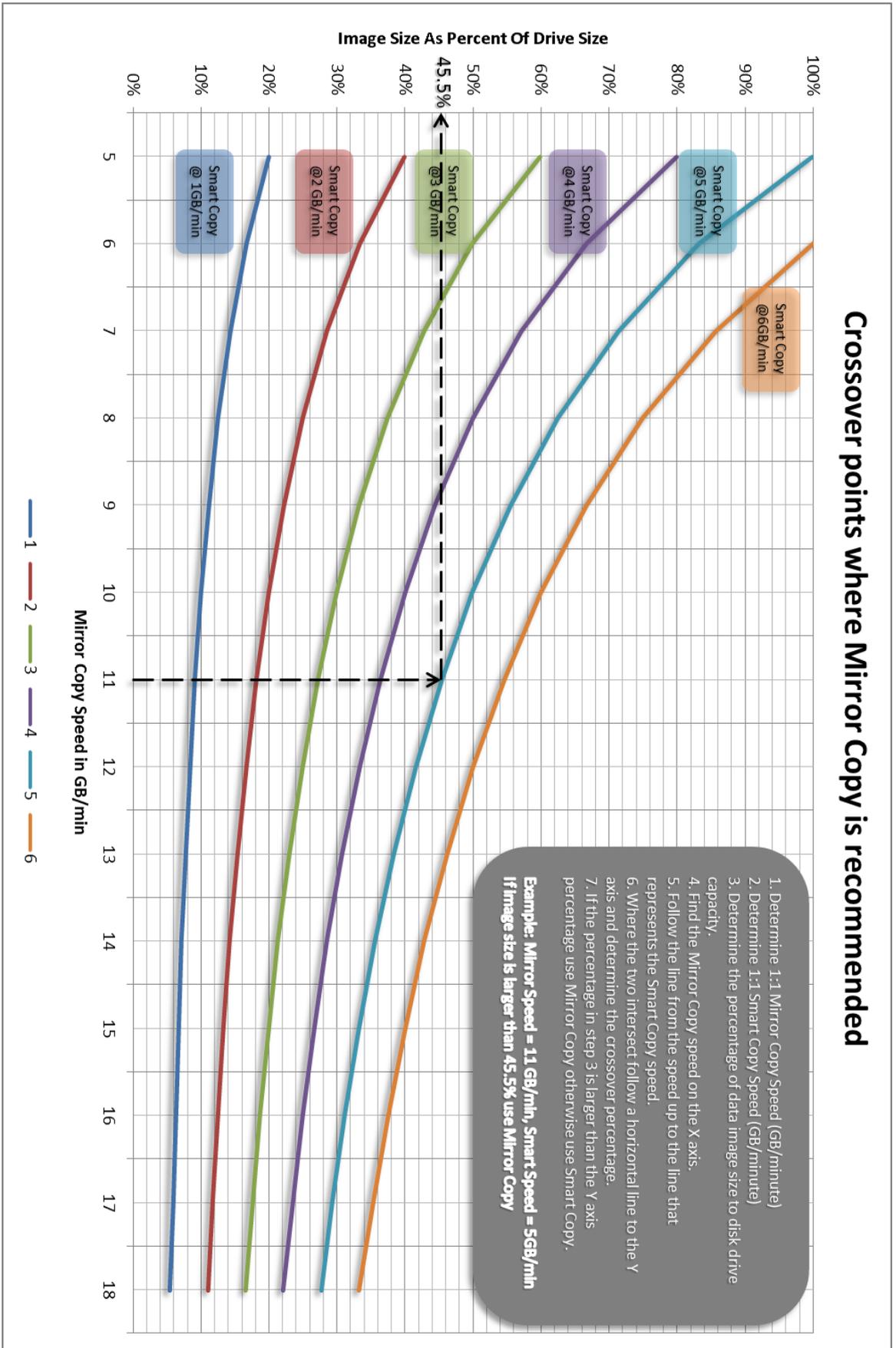
- The About screen shows information about the **DataFast-X5** including the following information: Software Version, Hardware Version, Firmware Version, and Serial Number.



Figure 56: About screen

----- End -----

5 Mirror Copy Decision Chart



For example: If the file system image size is 20GB and the drive size is 120GB with the example shown the choice would be to **Smart Copy** because *17% is less than the 45.5% crossover point.*