miniSAS (1:1)

SAS/SATA Duplicator

User Manual

EN

Index

Product Disclaimer

U-Reach is not accountable for any incidental or consequential damages, which includes, but is not constrained to property harm, loss of time or data from use of a U-Reach product, or any other damages attributable to product malfunction or failure (including without limitation, those attributable to: (1) reliance of the materials provided, (2) costs of product replacement, (3) loss of use, data or profits, (4) delays or business interruptions, (5) and any principle of legal responsibility, arising out of or in reference to the use or overall performance or from delays in servicing or lack of ability to render service) of any U-Reach product. U-Reach makes every effort to ensure proper operation of all products. However, the customer is responsible to affirm that out of the U-Reach product meets the customer's quality requirement. The customer further acknowledges that fallacious operation of U-Reach product and/or software program, or hardware issues, can cause loss of data, defective formatting, or data loading. U-Reach will make efforts to resolve or repair any issues recognized by customer either within the warranty period or on a time and materials basis.

Specifications and features subject to change without notice or obligation.

Warranty

U-Reach provides a basic one-year parts and labor warranty for all of its products (excluding cables, adapters, and other consumable items). An optional extended warranty is also available for an added cost. Telephone and email support is available for the life of the product as defined by U-Reach.

All warranties will be restricted and defined by the market region from which customers purchased.

Piracy Statement

U-Reach accepts no responsibility for copyright infringement or misuse of any U-Reach equipment. Copying all forms of data: audio, video, or software without the permission of the copyright holder is illegal. It is the sole responsibility of the user to ensure that the legal copyrights of the copyright owners are respected.

Preparation Tips before You Start

- Make sure to use a stable power supply.
- Please use in a clean & dry environment.
- Please keep the environment well ventilated.
- When the duplicator operates, it is normal for the machine to heat up.
- Please do not move the duplicator during operation to ensure better operation.
- Please do not remove HDDs during operation to avoid damage.
- Please use original manufacturer power supply to ensure safe operation.
- Static electricity may cause duplication error. Please pay attention to the duplicator environment and operators' equipment. It is recommended to purchase static electricity elimination equipment to avoid static electricity shock when in high static electricity environment.

Features

Ultra-High Speed

High copy speed for duplication and data comparison. Speed Transfers up to 18GB/min.

Support Various Interface

Support 2.5" and 3.5" SAS/SATA HDD, IDE HDD and SSD.

4 Kinds of Copy Areas

Systems and Files, All Partitions, Whole HDD, and Percentage Copy.

6 Erase Methods

Quick Erase, Full Erase, DoD Erase, 7-Pass Overwrite, Secure Erase and Enhanced Secure Erase.

Quick Copy Mode

Quick copy mode copies only Data and System area can greatly increase copy efficiency.

Bad Sector Check

Auto detect and show bad sector quantity.

Auto Power Control System

Protect the HDD from damage during hot removal from the duplicator.

Portable Design

Light weight for easy carry.

Product Overview

A. System Overview

Red: Fail

Green: Pass

Yellow: Powering

Backward

Forward

Confirm / OK

Cancel / Back

B. LCD Configuration

Function

Target HDD

Copy x1   2047M

0:11   41%   860M

Total size (Source)

Copied Processed size (Target)

Time (mm:ss)

Copy Progress %
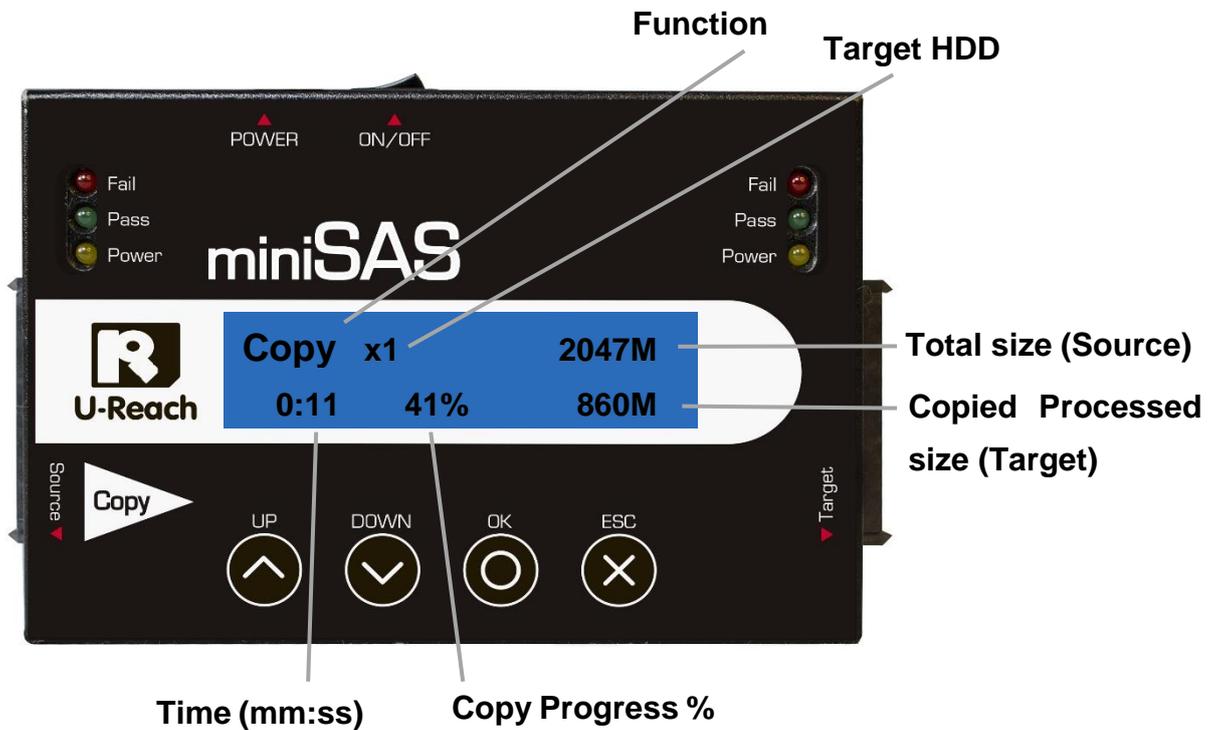
Function Table

Function	Item & Description
1. Copy	Copies source device to connected target device(s). Refer to function 6.1 Copy Area for 4 different copy modes.
2. Compare	Verifies target device(s) bit by bit to the master device.
3. Copy +Compare	Automates copy and compare by first duplicating and then verifying all the data, bit by bit.
4. Erase	**4.1 Quick Erase** Erases the index table only.
	4.2 Full Erase Erases the entire device capacity. Complies with NIST 800-88 Standards.
	4.3 DoD erase 3-Pass erases the entire device capacity. Complies with DoD5220.22-M Standards.
	4.4 DoD EraseComp 3-Pass erases the entire device capacity and verifies. Complies with DoD5220.22-M Standards.
	4.5 7-Pass Overwrite 7-Pass erases the entire device capacity. Complies with DoD5220.22-M(ECE) Standards.
	4.6 Secure Erase Performs by sending ATA commands to the device(s) requiring complete purging of data by its internal methods, which conforms to NIST 800-88 standards. If you interrupt the secure erase process, your device(s) will be unusable.
	4.7 Enhanced Secure Erase Erases devices that support this feature.

5. Utility	**5.1 Show Disk info** Displays connected device(s) detail information.	
	5.2 Update **system**	**5.2.1 Update BIOS** Updates system firmware from source port.
		5.2.2 Create Update HDD Formats HDD with a 2GB FAT partition for the operator to save the new firmware.
	5.3 System Info Displays information of the duplicator system, including controller model number and firmware version.	
	5.4 Read Speed Performs a full reading speed test on the desired, connected device(s).	
	5.5 Write Speed Performs a full writing speed test on the desired, connected device(s).	
6. Setup	**6.1 Copy Area (Copy Modes)**	**6.1.1 System and Files** Copies only data and skips empty spaces. Supports only NTFS, FAT16/32/64, HFS/HFS+/HFSX, and EXT2/3/4.
		6.1.2 All Partitions Copies all partitions and data, unallocated partitions not included.
		6.1.3 Whole HDD Copies all data and partitions including proprietary formats.
		6.1.4 Percentage (%) Copies the defined capacity percentage that operators set. (0%-99%)
	6.2 Skip Error Sets the number of bad sectors to skip. (0-65535 or unlimited)	
	6.3 Language Selects preferred language. English or Japanese	

6. Setup	6.4 Advanced Setup	6.4.1 Unknown Format	**Copy Unknown** Copies unknown formats.	
			Skip Unknown Skips unknown formats.	
		6.4.2 Erase Master	**6.4.2.1 Disable** Disables source port sanitization.	
			6.4.2.2 Enable Enables source port sanitization.	
		6.4.3 Erase Pattern	**6.4.3.1 One Byte** Writes a random character per byte.	
			6.4.3.2 Big Random Data Writes a set of random characters into a set area.	
		6.4.4 Wait HDD Time Enables operator to set a time delay for the HDD motor to spin up. (Push "OK" to Start or delay from 3-30 seconds)		
		6.4.5 Copy HPA Area	Do Not Copy HPA	No, keep HPA
				No, clear HPA
			No, setting HPA	
			Copy and Setting	
		6.4.6 Clear HPA at Erase	Clear HPA Setting	
			Keep HPA Setting	
		6.4.7 Transfer Rate Sets transfer speeds, selectable from UDMA 2 through UDMA 7.		
		6.4.8 Stop Motor Time Enables operators to define the number of seconds for the HDD motors to spin down to a stop. (1-20 seconds)		
	6.5 Restore Default Restores system back to factory defaults.			

*Above functions and features subject to change without notice.

Function Introduction

1. Copy

The copy function copies data from source HDD to target HDD. You can set following settings before copy.　(You can check more detail in "6. Setup".)
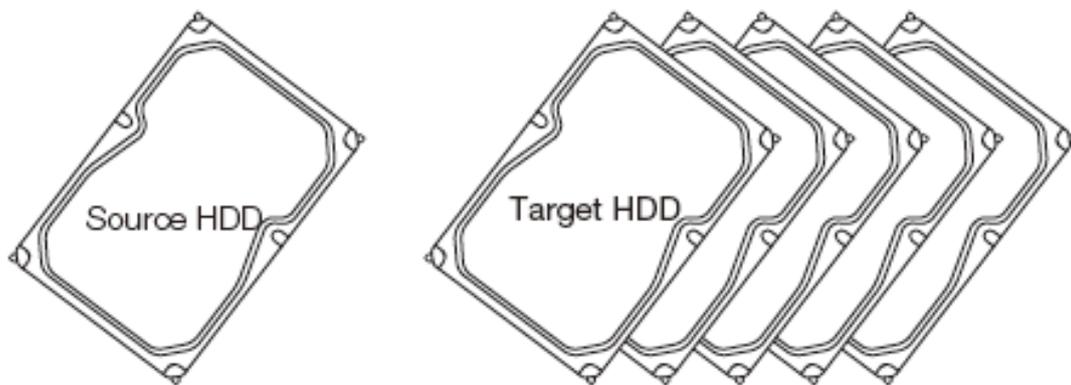
I.　Set Copy Area of Source HDD　　　→ 6.1 Copy Area
II.　Set Copy Unknown Format Area　　→ 6.4.1 Unknown Format

➤ **Start to copy**

Step 1: Prepare Source & Targets

Prepare a source HDD and target HDDs.
(It's strongly recommended that the source and target are the same capacity.)

Caution	Various adapters are required to copy devices with different interfaces, e.g. IDE, eSATA, mSATA, and etc.

Step 2: Connect Source & Targets

Connect source HDD to source port, target HDDs to Target ports.

Step 3: Enter Function "1.Copy"

Use ▲▼ to select "1.Copy", and then press "OK". Duplication will start.

Note	If the user set "6.4.4 Wait HDD Time" at 3-30 seconds, the machine will start duplicating automatically after HDDs initialize. If "wait key to start" is set, user needs to press "OK" to start.

The information below shows on the LCD during duplication.

Copy Process

| Function | ———— | Copy | | 224M | ———— | Total Data |

```
┌─────────────────────────────┐
│ Copy            224M        │
│ 0:02   85%      190M        │
└─────────────────────────────┘
```

Function ———— Copy ... 224M ———— Total Data
Copied Time ———— 0:02   85%   190M ———— Copied Data

Copy Process
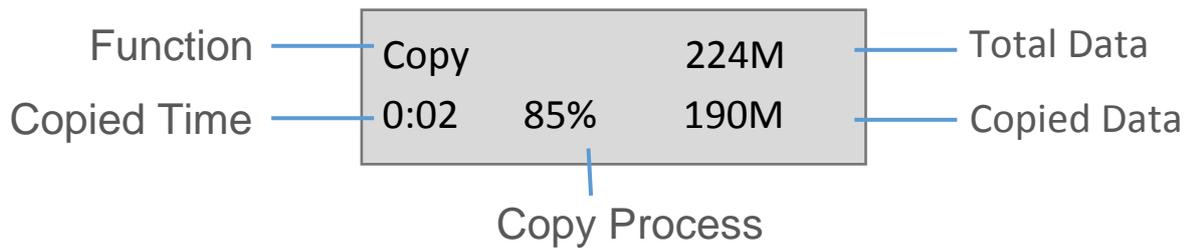
(if there is any bad sector)

```
┌─────────────────────────────┐
│ Bad Sector        R:0       │
│ 0:01      48%     W:1       │
└─────────────────────────────┘
```

Bad Sector ... R:0 ———— Source bad sector
Copied ———— 0:01   48%   W:1 ———— Target bad sector

Copy Process

Step 4: Completion!

The copy result (Pass/Fail), total copy time and bad sectors will show on LCD.

Copy result

Pass

```
┌─────────────────────────────┐
│ Pass     0:05               │
│ No Bad Sector!              │
└─────────────────────────────┘
```

Pass   0:05 ———— Total copy time
No Bad Sector!

Fail

```
┌─────────────────────────────┐
│ Fail       0:05             │
│ Bad Sector    R0   W1       │
└─────────────────────────────┘
```

Fail   0:05
Bad Sector   R0   W1

| Note | The default setting of error counter is 0. If users want to adjust the accepted error sectors of the HDD, they can set "6.2 Skip Error". |

2. Compare

The compare function is used to check if the data on source HDD is identical to target HDD after duplication.

➢ **Start to compare**

Step 1: Prepare Source and Targets

Prepare the source HDD and target HDDs to compare after duplication is completed.

Step 2: Connect Source and Targets

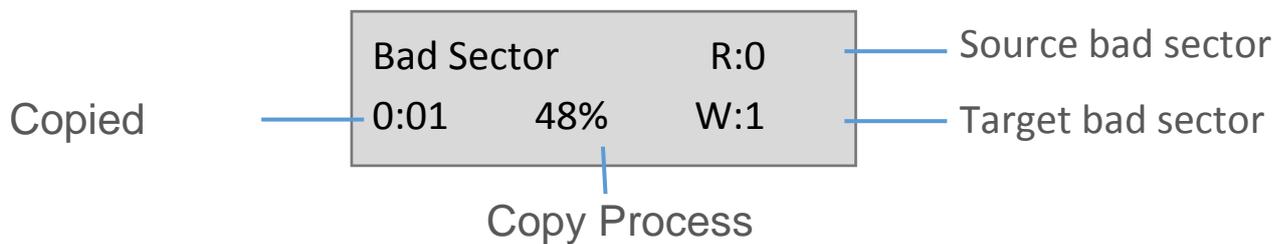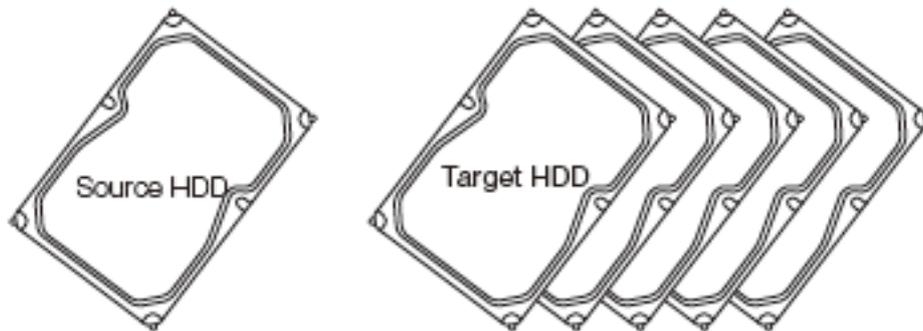Connect the source HDD to Source port, target HDDs to Target ports.

Step 3: Enter "2.Compare"

Use ▲▼ to select "2.Compare" then press "OK". Data compare will proceed.

Step 4: Completion!

The result (Pass/Fail) and time will show on LCD after comparison completes.

Caution	The user is responsible for verifying the targets' quality. Please pick a few completed targets for testing in a mass production environment for QC.

3. Copy+Compare

The Copy+Compare function makes copies first and then compares copied HDDs with source HDD to confirm the accuracy.

Note	It is recommended to execute Compare after Copy to confirm the accuracy. Users can use the function "3. Copy+Compare".

4. Erase

Please choose the appropriate erase method when you like to dispose or re-use the HDDs. You can set the following settings before erasing:

(You can check more detail in "6. Setup".)

I.   Set Erase mode
II. Set Erase Master   → 6.4.2 Erase Master
III. Set Erase Pattern   → 6.4.3 Erase Pattern

Caution	It will erase the data in the HDD, please make sure you back up all important data before using this function.

➢ Start to erase

Step 1: Prepare HDDs
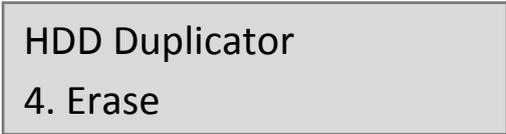
Prepare HDDs for disposal.

Step 2: Place HDDs

Insert HDDs for disposal into target ports.

Note	Function "6.4.2 Erase Master" is to determine erase source HDD or not.

Step 3: Enter function "4. Erase"

Use ▲ ▼ to select the mode of erasing method, and then press "OK". Data Erase will proceed.

```
HDD Duplicator
4. Erase
```

Note	During erasing, press ▲ ▼ to view the status of each port. Press "OK" to see the details for each port.

There are several erase methods:

(1) Quick Erase   (2) Full Erase   (3) DoD Erase (4) 7-Pass Overwrite (5) Secure Erase (6) Enhanced Secure Erase
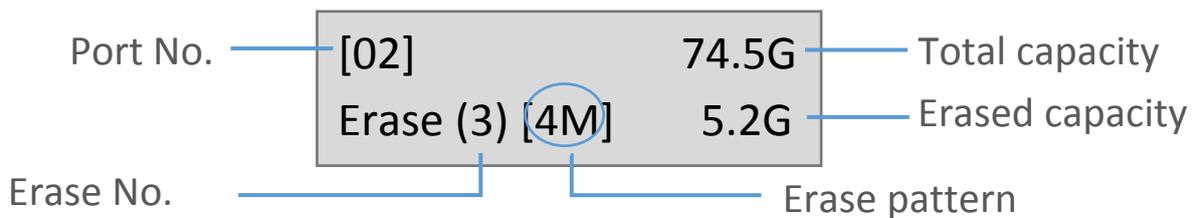
4.1 Quick Erase

This function will ONLY erase the index of the HDD. It is the quickest way to erase the HDD.

4.2 Full Erase

This function will erase the whole sectors on the target HDD. It will take longer than quick erase. Complies with NIST800-88 Standards.

4.3 DoD Erase

This function complies with the U.S.A. Department of Defense (DoD5220.22-M) standard to fully erase the HDD three times bit by bit to overwrite HDD data and guarantees data will not be recoverable. This DoD erase method will erase HDD over each sector three times: the first time with zeros (0x00), second time with FF (0xFF) and the third time with random characters.
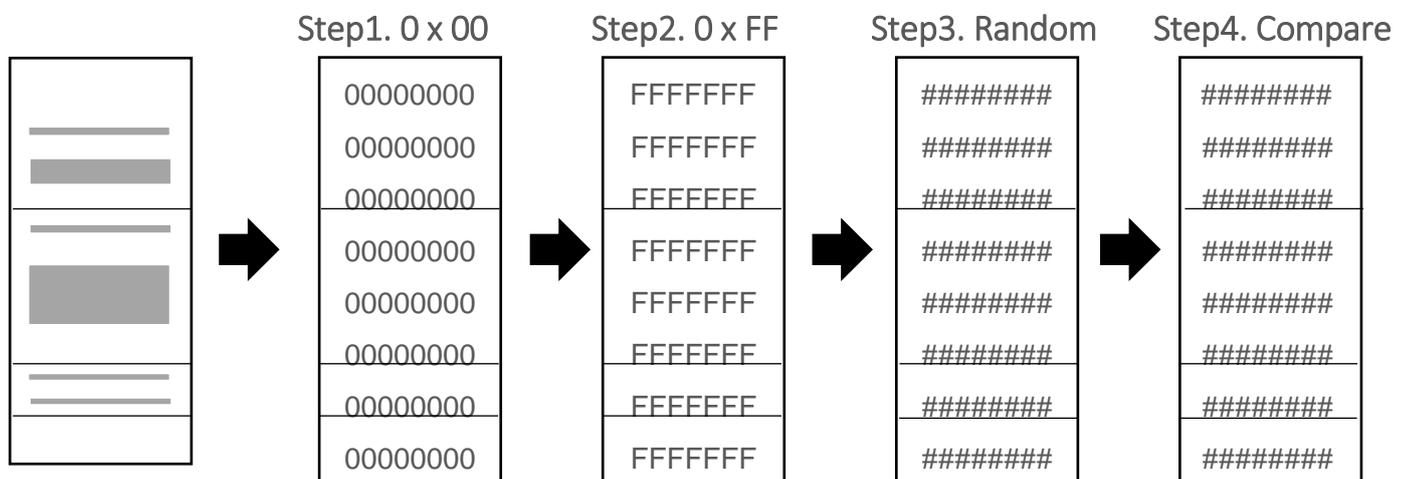
Port No. ——— [02]   74.5G ——— Total capacity

Erase (3) [4M]   5.2G ——— Erased capacity

Erase No. ———   ——— Erase pattern

*The third times of erase.

4.4 DoD Erase & Compare

Besides DoD erase 3 times, this function will also execute comparison to make sure the random bit is correctly written.

DoD EraseComp Method:

	Step1. 0 x 00	Step2. 0 x FF	Step3. Random	Step4. Compare
	00000000	FFFFFFF	########	########
	00000000	FFFFFFF	########	########
	00000000	FFFFFFF	########	########
	00000000	FFFFFFF	########	########
	00000000	FFFFFFF	########	########
	00000000	FFFFFFF	########	########
	00000000	FFFFFFF	########	########
	00000000	FFFFFFF	########	########

Note	1. The erasing duration of DoD Erase mode is 3 times longer than full erase mode. 2. The duration of DoD EraseComp is 4 times longer than full erase mode.

4.5 7-Pass Overwrite

This mode is a DOD 7-pass and complies with the DoD5220.22-M (ECE) standard. It fully erases the HDD 7 times bit by bit to overwrite HDD data and guarantees data is not recoverable. The 7-Pass Erase mode spends 7 times longer than full erase mode.

4.6 Secure Erase

This function sends an ATA Secure Erase command. It overwrites every single track on the hard drive with "00". Even HPA/DCO or other hidden data areas can be erased all together.

Note	If you want to cancel execution of Copy/Compare/Erase, you can press "ESC" for few seconds to stop the task.

Caution	The user is responsible for verifying the targets' quality. Please pick a few completed targets for testing in a mass production environment for QC.

4.7 Enhanced Secure Erase

This function erases devices that supports this feature.
Scroll to select "4.7 Enhanced Secure Erase", then press "OK" to start the erasing process.

5. Utility

5.1 Show Disk Info.

This function will show HDD's S.M.A.R.T information. After selecting the port, press ▼ to check detail information.

- **Model Number**

Show HDD's model number.

- **Version of Firmware**

Show HDD's firmware version.

- **Serial Number**

Show the serial number of HDD.

- **Device Power Cycle**

Show the count of HDD's turning on and off.

- **Power-on Hours**

Show the total power-on hours of HDD.

- **Reallocation Event Count**

Show the count of reallocating events.

When the HDD fails to save data, it will need to redefine the location to store data. Therefore, a higher count of reallocation events represents more errors.

- **Off-Line Scan Uncorrectable Sector Count**

Show the sector volume that is uncorrectable when scanned offline. The more the uncorrectable sector volume is, the more serious the HDD's damage.

- **Seek Error Rate**

Show the error rate of searching for data. It can represent the damage rate of data stored in the HDD.

- **Temperature**

Show the temperature of HDD.

5.2 Update System

Step 1: Create an Update HDD

Connect a SDD/HDD to the duplicator. Select function "5.2 Create Update HDD".

> [Update System]
> 2. Create Update HDD

Step 2: Format BIOS HDD

Click "OK" to format the BIOS hard disk. One FAT, 2GB partition will be formatted on the HDD. Creating such a partition reduces searching time, and speeds up the firmware update.

> Do FORMAT HDD#1
>
> Confirm ?

Caution	The data saved in this HDD will be erased.

Step 3: Download Firmware

Connect the BIOS HDD to a PC. Download the latest firmware and save it to the HDD. Unzip BIOS and save it to the root directory.
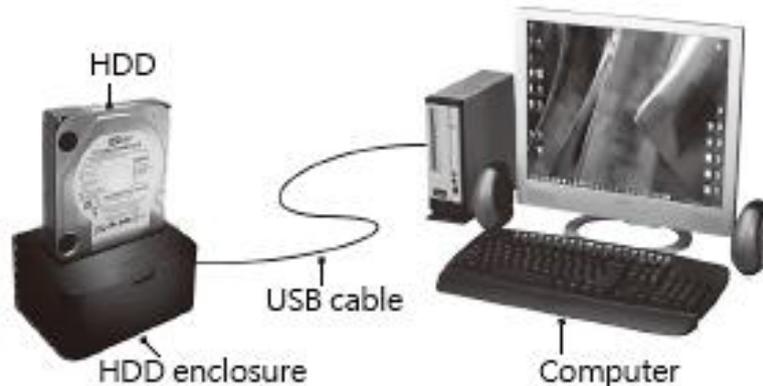
Step 4: Enter "Update BIOS"

Connect the BIOS HDD to the source port. Enter function "5.2.1 Update BIOS". Update will take about a minute to complete.

> [Update System]
>
> 1. Update BIOS

Caution	The firmware update process may take longer than 5 minutes. Please do not disrupt power or process during BIOS update. If interrupted, the system will become useless. U-Reach will not be held responsible for any damages.

5.3 System Info.

This function shows information about the duplicator including model name and firmware version.

> SAS/SATA Dup 1-1
>
> Ver: 2.36.3

5.4 Read Speed

Measures the reading speed of the HDD by reading the whole HDD.
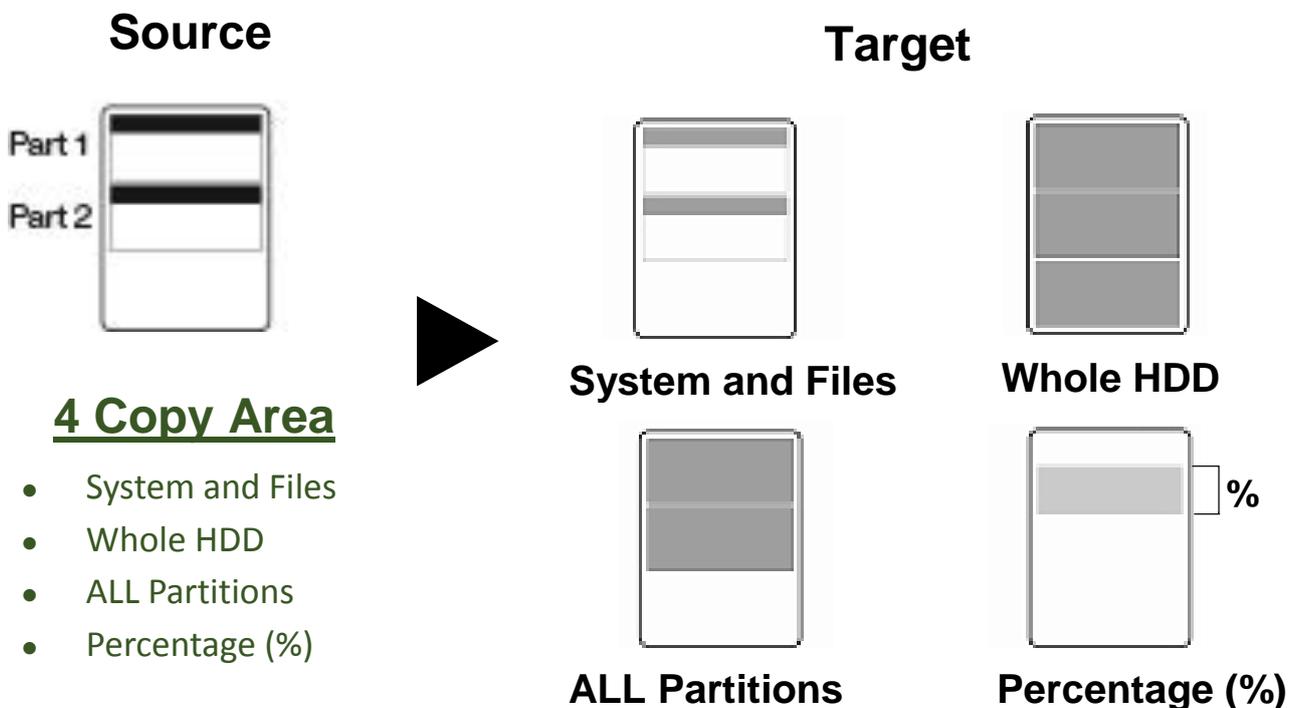
5.5 Write Speed

Measures the writing speed of the HDD by writing the whole HDD.
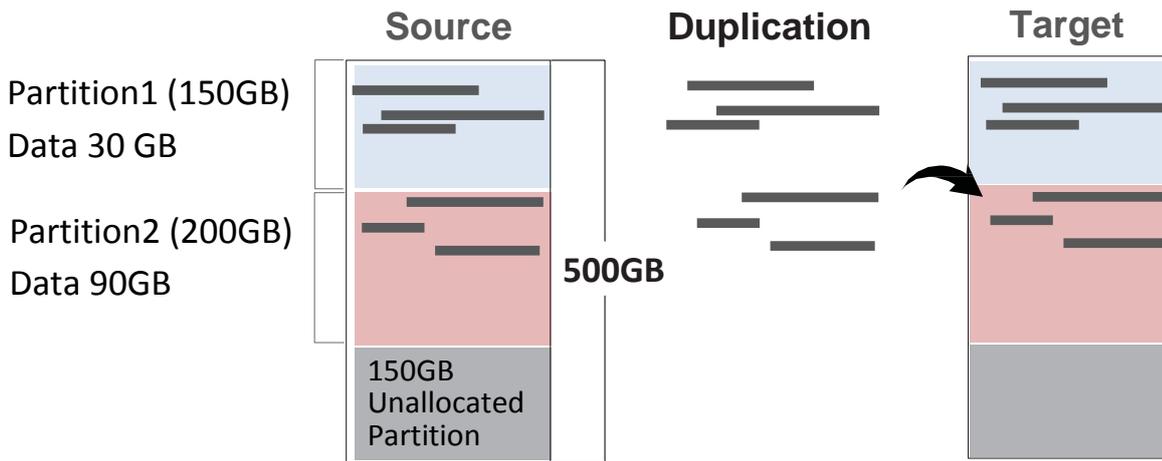
6. Setup

6.1 Copy Area

Users can set the copy area of source HDD. Appropriate copy area can greatly reduce operation time and provide better efficiency. There are four copy modes with different copy areas:

Source

Target

4 Copy Area

- System and Files
- Whole HDD
- ALL Partitions
- Percentage (%)

System and Files

Whole HDD

ALL Partitions

Percentage (%)

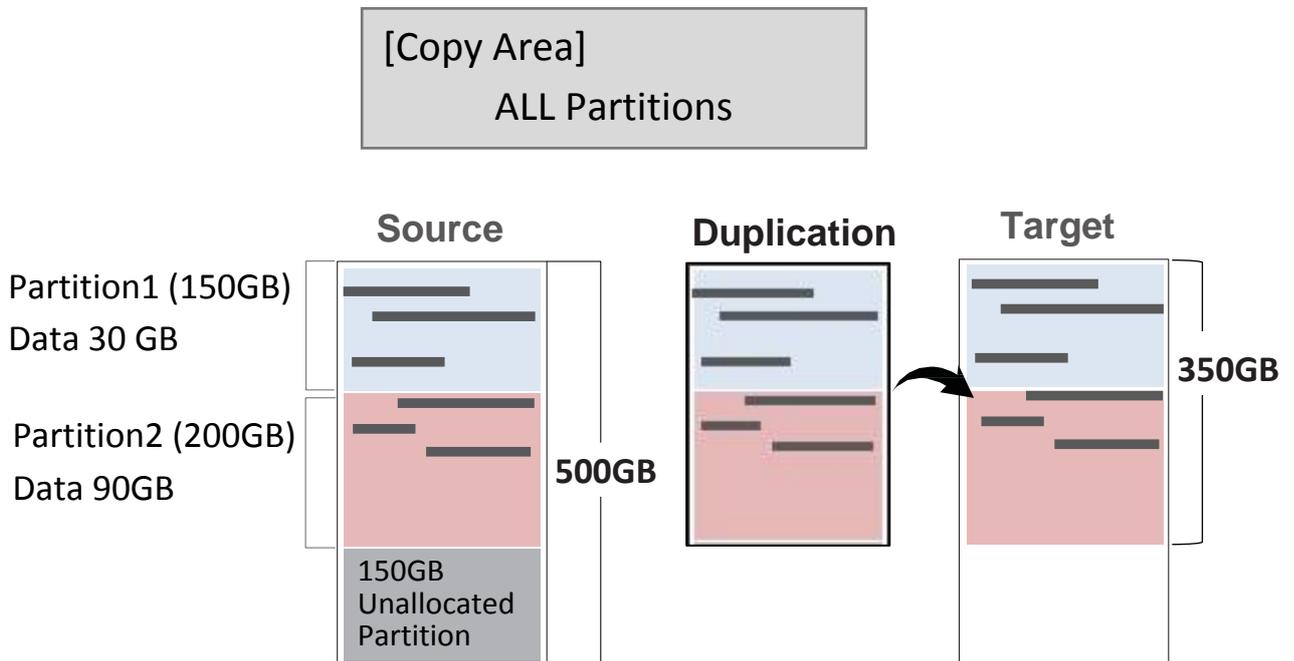### 6.1.1 System and Files (Quick Copy data area only)

This setting will copy source HDD's System and Files instead of the whole HDD. The system will analyze the source HDD and identify the data area to copy. As long as the source HDD's data is within the target HDD's space, the copy will be processed. FAT16/32/64, NTFS, ext2/3/4, HFS/HFS+/HFSX are supported for this copy mode.

Source   Duplication   Target

Partition1 (150GB)
Data 30 GB

Partition2 (200GB)
Data 90GB

500GB

150GB
Unallocated
Partition

Only 120G data area will be copied.

6.1.2 ALL Partitions
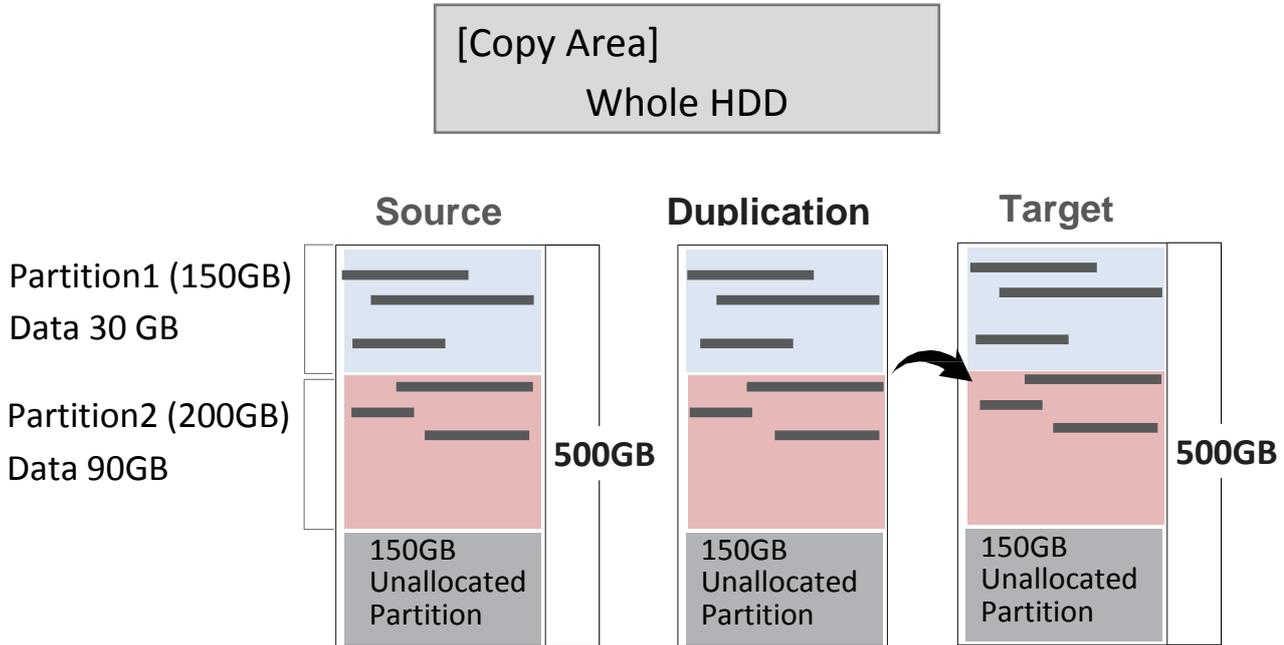
Copies all of the partitions bit by bit whether or not there is existing data. The capacity of target HDDs must be bigger than the partitions' required capacity.

[Copy Area]
ALL Partitions

Source   Duplication   Target

Partition1 (150GB)
Data 30 GB

Partition2 (200GB)
Data 90GB

500GB

350GB

150GB
Unallocated
Partition

350GB of all Partitions along with its contents will be copied.

6.1.3 Whole HDD

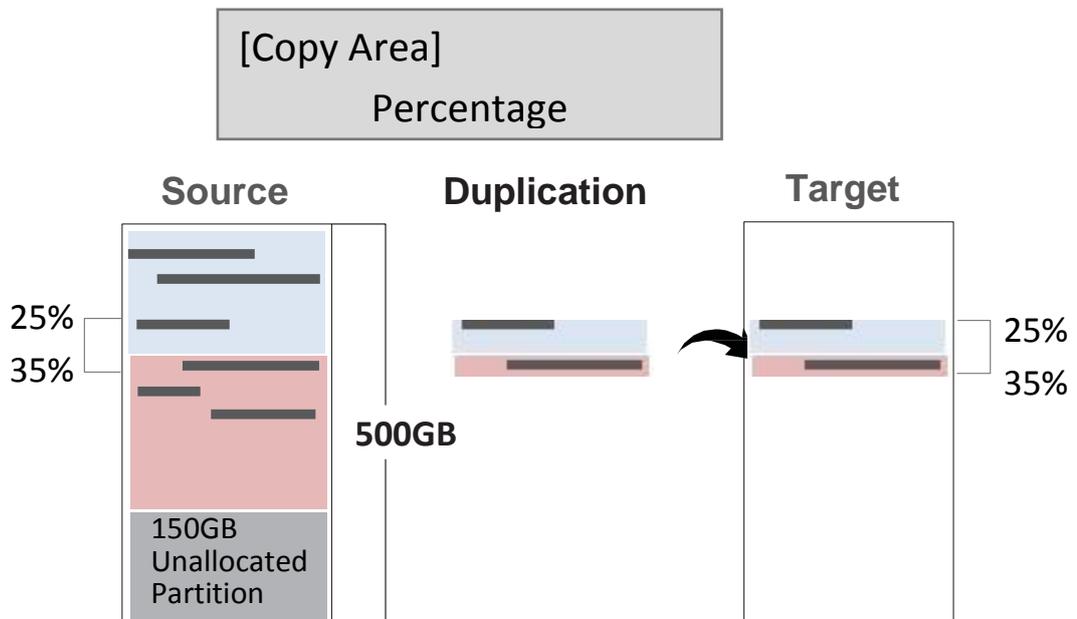Copies the whole source HDD, no matter the content, format, partition or empty space. This mode does not analyze the data.

[Copy Area]
Whole HDD

Source	Duplication	Target

Partition1 (150GB)
Data 30 GB

Partition2 (200GB)
Data 90 GB

500GB

500GB

150GB Unallocated Partition

150GB Unallocated Partition

150GB Unallocated Partition

All 500GB of data will be copied.

6.1.4 Percentage (%)

Defines the selected percentage range of source HDD.

[Copy Area]
Percentage

Source	Duplication	Target

25%
35%

500GB

25%
35%

150GB Unallocated Partition

Only copies the selected area.

How to select the proper copy area?

Example: There are two partitions in one 500G HDD.

System and files	All Partitions	Whole Device
100GB — 30GB Data / (gray)	100GB — 30GB Data / 70GB	100GB — 30GB Data / 70GB
250GB — 60GB Data / (gray)	250GB — 60GB Data / 190GB	250GB — 60GB Data / 190GB
500GB — 150GB Unallocated Partition	500GB — 150GB Unallocated Partition	500GB — 150GB Unallocated Partition
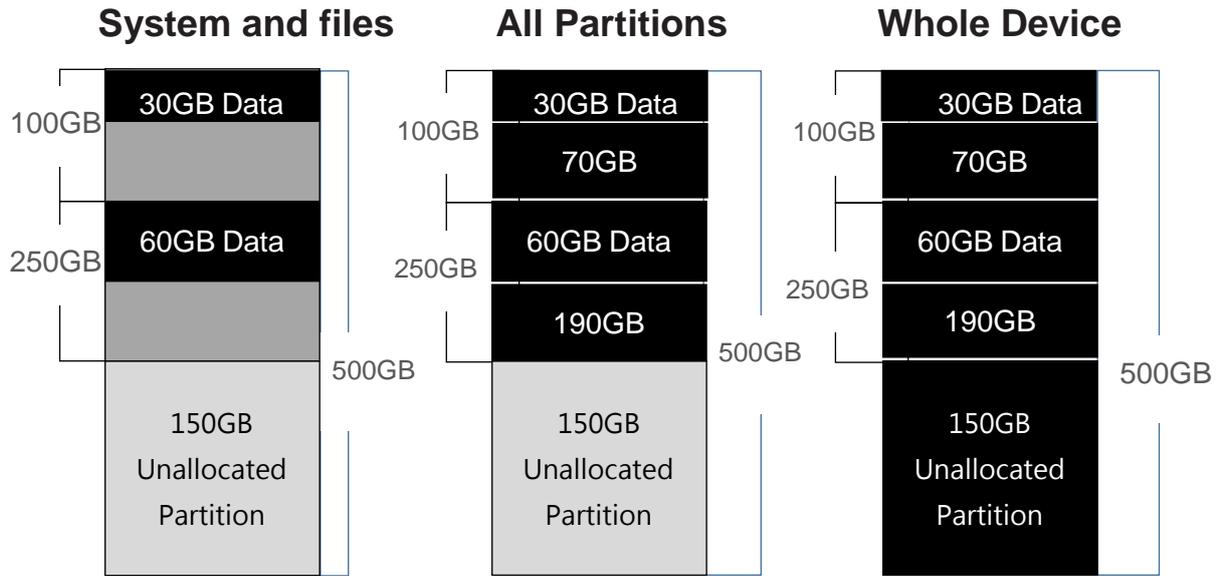
This function will analyze and copy only data and skip empty spaces.

This function will copy all data within the defined partitions.

This function will copy the entire device.

6.2 Skip Error

This function sets the number of errors you would like to skip during copy / compare / erase process. The default is 0. You can choose 0-65535 or unlimited.

```
[Skip Error]
        0
```

6.3 Language

Select preferred language. You can select English or Japanese.

6.4 Advanced Setup

6.4.1 Unknown Format

This function allows you to select whether or not to copy the unknown format areas. This function will only affect Quick Copy.

■ Copy Unknown

Copy all the unknown areas if device cannot identify the format during copy.

■ Skip Unknown

Skip the unknown areas if device cannot identify the format during copy.

```
[Unknown Format]
   Copy Unknown
```

6.4.2 Erase Master

Setting to Enable allows erasure of source HDD. Please make sure this setting is correct before executing DoD erase. The default setting is "Disable".

```
[Erase Master]
      Disable
```

6.4.3 Erase Pattern

Enable to select overwrite data pattern mode during erase.

■ ONE Byte

[00] or a fixed character will be written into every byte.

```
[02]              74.5G
Erase [00]        5432M
```

```
3535353535
3535353535
3535353535
3535353535
3535353535
3535353535
```

■ Big Random Data

A random character to be written into every byte.
It will show [4M] while erase.

```
[02]              74.5G
Erase [4M]        5432M
```

```
JXDOD142X
JMIKDS14C
WQ2XLSA2
E5VKOZE14
OFEW2ZB2
59E4X2DGR
```

6.4.4 Wait HDD Time

Sets an automatic wait time between 3 and 30 seconds for the device to start up before functions begin. The default is 15 seconds.

```
[Wait HDD Time]
    15 seconds
```

6.4.5 Copy HPA Area

This menu contains submenus related to HPA Copy Modes.

■ Do Not Copy HPA

Do not copy source device's HPA data and setting.

· No, keep HPA

Does not copy HPA data, but keeps target device 's original HPA setting.

· No, Clear HPA

Does not copy HPA data and clears target device's HPA setting.

■ No, Setting HPA

Do not copy the source device's HPA data but set the targets' HPA to be the same as the source HDD.

■ Copy and Setting

Copy source HPA data and set to the target.

6.4.6 Clear HPA at Erase

■ Clear HPA Setting

Erase the existing HPA in the connected target device(s).

■ Keep HPA Setting

Retain all HPA in connected device(s) while erasing all non-HPA areas.

6.4.7 Transfer Rate

Transfer speeds selectable from UDMA 2 through UDMA 7. If a high failure rate is experienced with copy or compare, then try to reduce the UDMA Mode.

```
[Transfer Speed]
      UDMA 5
```

6.4.8 Stop Motor Time

When the system finishes executing functions, the motor won't stop running immediately. This function is used to set the motor stopping time after finishing function execution. User can select between 1 and 20 seconds.

```
[Stop Motor Time]
     8 Seconds
```

6.5 Restore Default

Select to go back to the manufacturer's default setting.

Specification Table

Product Name	SAS Duplicator and Sanitizer
Targets	1:1
Display	Monochrome LCD
OS	Supports all operating systems (Windows, Linux, RAID, other stand-alone systems)
Control Panel	4 push buttons (UP, DOWN, OK, ESC)
Status LED	LED(Red/Green/Yellow) on each slot: Yellow(powering), Green (pass), Red(fail)
Compatible HDD	Directly support all major brand of 2.5"/3.5" SAS/SATA HDD, SSD.
	Interface via optional adapter: 2.5"/3.5" IDE HDD, mSATA SSD, micro SATA, eSATA, iVDR
Copy	Systems & Files, Whole HDD, All Partitions, Percentage Copy
Erase	Quick Erase, Full Erase, DoD Erase, 7-Pass overwrite, Secure Erase, Enhanced Secure Erase
Support Format	System and Files: Supports FAT, NTFS, Linux(Ext2/3/4) and Mac(HFS/HFS+/HFSX)
	All Partitions / Whole HDD / Percentage: Supports all format.
Temperature	Storage	-20°C~85°C (-4°F~185°F)
	Working	5°C~45°C (41°F~113°F)
Humidity	Storage	5%~95%
	Working	20%~80%
Certification	FCC, CE, RoHS

*Specifications subject to change without notice.