ZClone™ User's Manual

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MAN-ZCLONE

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Logicube Technical Support Contact Information

1. By website: www.logicube.com
2. By email: techsupport@logicube.com
3. By telephone: 1 - (818) 700 8488 ext. 3 between the hours of 7am –5pm PST, Monday through Friday, excluding U.S. legal holidays.

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1: Introduction to the Logicube ZClone

1.0 Introduction

Congratulations on your purchase of the Logicube ZClone™. ZClone is the next generation in our series of advanced, professional hard drive duplication solutions. An ultra-fast, multi-target, multi-task duplicator, the ZClone delivers advanced technology with an intuitive, easy to use interface. Designed for volume duplication the ZClone provides IT professionals a fast and efficient solution for day-to-day hard drive imaging tasks.

1.1 Features

- **High-speed cloning**. The ZClone will clone at speeds of 15GB/min (based on a 1 to 1 mirror clone using solid state drives. Speeds will vary depending on type of drives and number of targets)
- Supports standard-height 3.5” SAS and 3.5”/2.5” SATA hard drives, USB enclosures and thumb drives. Optional support available for 2.5” SAS, 1.8/2.5/3.5” IDE and IDE ZIF drives, eSATA, microSATA, mSATA and flash media. Optional support available for non-standard (over 9mm) height drives.
- **Multi-target cloning**. 8 dedicated 3.5” SAS/SATA bays, 2 3.5” SATA-only bays, one internal image storage drive, for maximum of 10 targets (clone from internal image master to 10 SATA drives or 8 3.5” SAS drives)
- **Cable-free, slide-in** bays provide fast, worry-free, insertion/removal of drives

- Supports **multiple master/source and target drives**; user can assign any bay as a master/source drive
- Supports **cloning from an image**; either stored within ZClone or clone from an external network drive location
- **Network sharing. Allows network access (**upload/download) to drive images and log files
- **Multi-session capability**. Allows user to perform multiple tasks, including cloning, wiping or hashing concurrently
- Supports cloning **USB enclosures and USB thumb drives**. 6 USB 2.0 ports. Optional support for USB 3.0 will be available in a future release
- Supports **FAT16, FAT32, NTFS, ext, ext2, ext3, and ext4 file systems**
- Supports **large capacity drives** (>2TB)
- **Wipe feature**. DoD, Secure Erase and custom pass settings.
- **Color touch screen display** provides an intuitive and easy to use interface
- **Hash verification (SHA1, SHA256 or MD5)** allows the user to clone and verify the exact replication of the source drive. Optional High-Speed Hash Verification will be available in a future release
- **Multiple cloning modes**:
    - **Mirror Copy** (bit-by-bit copy)
    - **CleverCopy** (copies only data areas, skips blank sectors, scales partitions to target, supports most O/S including Linux)
    - **Multi-Image Master**: Store multiple images on ZClone's internal storage or on a network location and clone to selected targets
    - **Partition Cloning:** For multiple partition drives, ZClone automatically selects the optimum cloning method (Clever or Mirror)
- **Remote operation.** ZClone allows you to control all operations from a remote computer using a web browser or CLI interface.
- **Advanced administrative functions** allow an administrator to create/manage image repositories, manage network settings, create user profiles, save configurations, manage drive bay assignments
- **Audit trail/log report**
- **Optional light stack & audible beeper** alerts user when tasks complete or when attention required
- **HPA/DCO support**. Clone or wipe HPA/DCO areas of a drive
- **Rackmount.** The ZClone can be mounted in a 23" rack using off-the-shelf mounting hardware

1.2 System description

The complete ZClone system includes the following:

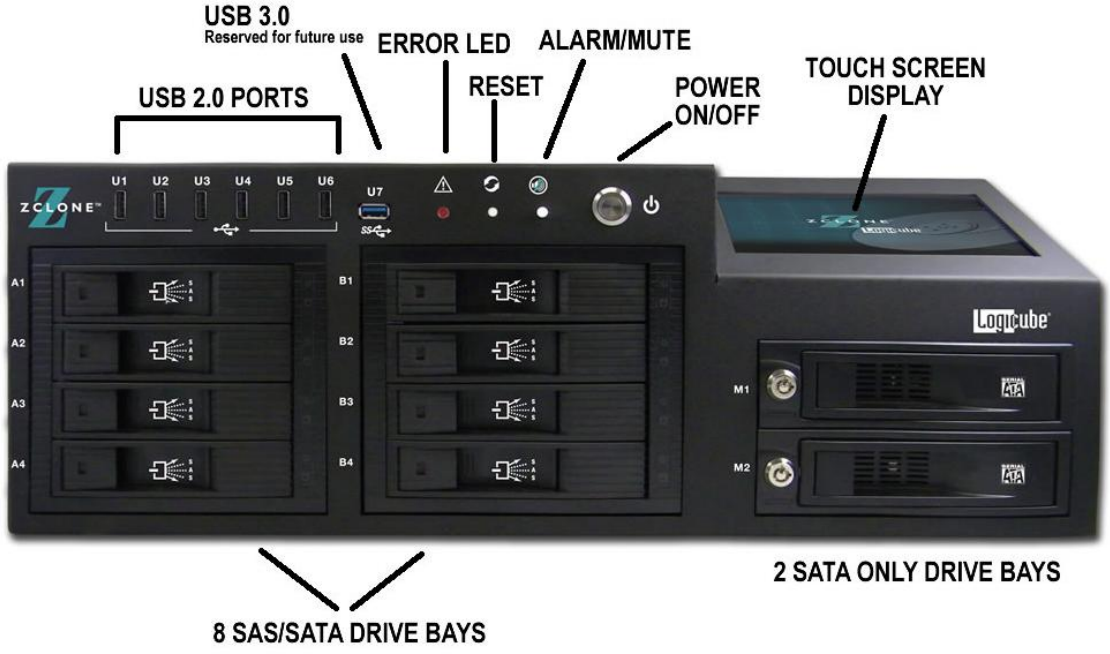
- The Logicube ZClone unit
- 10 2.5” SATA drive caddies. Caddies are shipped inside the ZClone drive bays.
- Power cord
- A CD-ROM containing:
  - A backup copy of the software that is already pre-installed on the Logicube ZClone.
  - A copy of this manual.

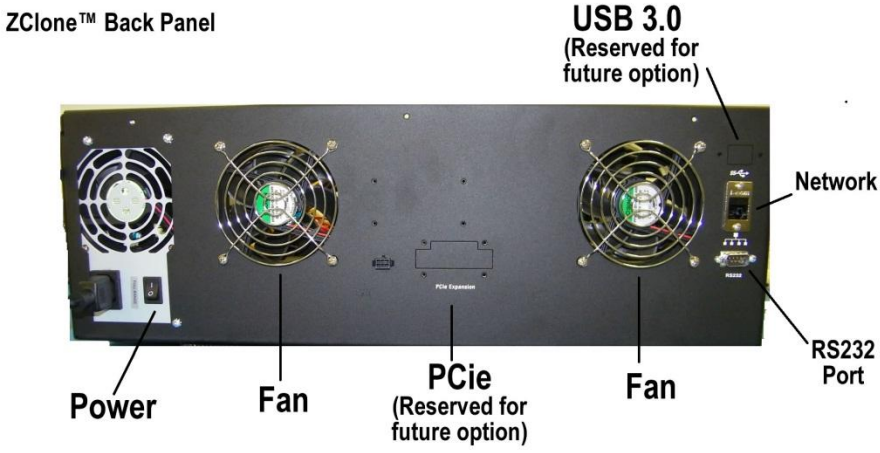
Caution: Avoid dropping the Logicube ZClone or subjecting it to sharp jolts. When in use, place it on a flat surface.

Caution: Keep the unit dry. If you need to clean your Logicube ZClone, use a lightly damp, lint free cloth. Avoid using soap or other cleaning agents particularly those containing bleach, ammonia, alcohol or other harsh chemicals.

Caution: Do not attempt to service or open the Logicube ZClone. Doing so may void the warranty. If your unit requires service, please contact Logicube Technical Support for assistance.

2.0 Overview of the ZClone





2.1 Applying power to the ZClone

The ZClone has a power supply located in the back of the device. Attach the included power cable to the ZClone's power supply and make sure the switch on the power supply is set to the 'ON' position.

The ZClone also has a power button located in the front of the device and is used to turn the ZClone on and off. When the ZClone is turned on, the power button shows a green light.

2.2 Connecting 3.5" Serial ATA (SATA) and Serial Attached SCSI (SAS) Drives

The ZClone has hot swappable drive bays located in the front of the unit. There are ten (10) 3.5" drive bays labeled M1, M2, A1 through A4, and B1 through B4.

The drive bay doors have two LEDs. The green LED shows that the drive is connected and has power. A blinking amber LED should light up showing there is activity on the drive. This amber LED will light up when you initially connect a drive and will also blink when the drive is being used for a process (for example cloning or wiping).

Each drive bay is hot swappable and drives can be removed or added as long as there is no activity on the drives.

1. Open the drive bay of your choice by gently pulling the release latch.
2. Carefully swing the drive bay door open all the way to the right.
3. Insert the 3.5" drive face up (connector ports should be facing in toward the drive bay) and push it mostly in. Do not push it in all the way.
4. To push the SATA drive all the way in, close the drive bay door. You should hear a 'click' when the drive bay door is closed all the way.

Bays M1 and M2 are SATA only bays. Bays A1 through A4 and B1 through B4 are compatible with both SATA and SAS drives.

2.3 Connecting 2.5” Serial ATA (SATA) Drives

2.5” Serial ATA (SATA) drives are connected by using the 2.5” SATA drive caddies (included). Simply slide in the 2.5” SATA drive into the 2.5” SATA drive caddy, and then insert the caddy into one of the ZClone drive bays.

The 2.5” SATA drive caddies can accommodate most common 2.5” SATA drives (100mm x 69.85mm x 9.5mm, L x W x H).

2.4 Connecting USB Drives

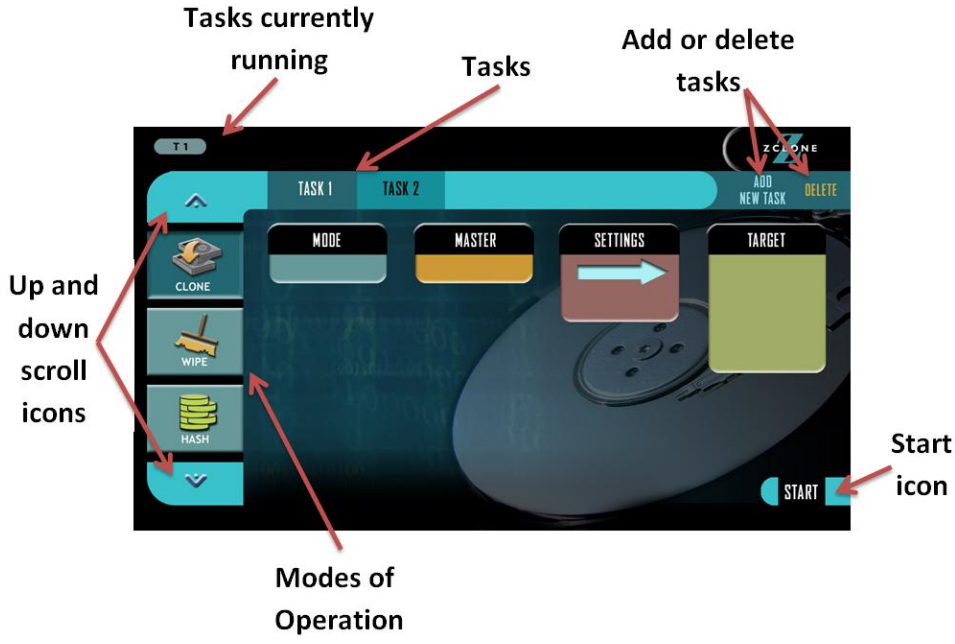
USB drives can be connected to the front of the ZClone. Up to 6 USB drives can be connected (U1 through U6) and each USB port can be used as a Master or Target drive. You can clone from USB to one of the drive bays, drive bay to USB, USB to Image, or Image to USB.

2.5 Connecting Other Drive Types

ZClone supports other drive types, including IDE, mSATA, microSATA, 2.5” SAS and eSATA that require optional adapters. More information on the types of drives supported and available optional adapters can be found in **Chapter 9: Optional Adapters**.

2.6 The user interface

The user interface (UI) has been designed to quickly and easily input commands. It is simple and intuitive showing common icons such as tasks, modes of operation, and scroll icons on the screen.



2.7 Touch Screen

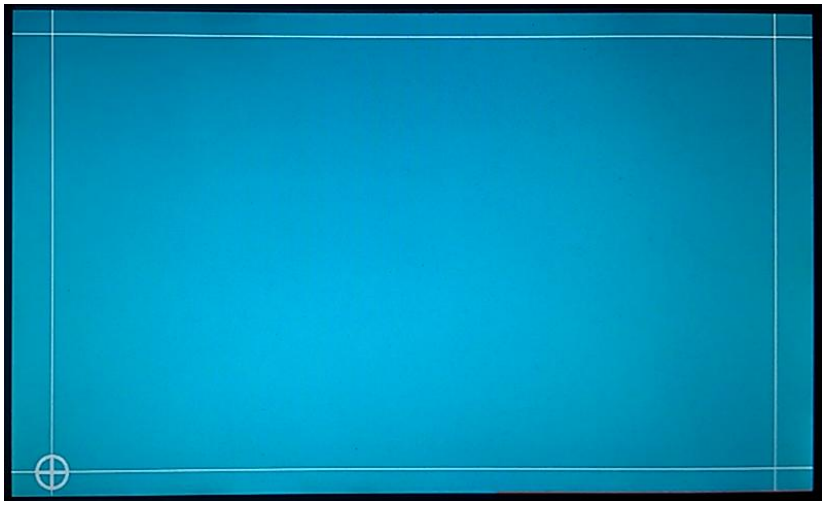
The ZClone features a color LCD Touch Screen that allows the user to quickly input commands. The screen is bright and easy to read.

2.7.1 Touch Screen Calibration

From time to time, the touch screen may require calibration. Calibration is typically needed when the touch screen becomes unresponsive. The ZClone touch screen can be calibrated by following these steps:

1. With the ZClone turned on, make sure no tasks are running.

2. On the front panel, press and hold the mute/buzzer button for 10 to 15 seconds. The screen should change to a calibration screen as seen below:



3. Press and hold the blinking target for 3 seconds. The blinking target should move to the next position.
4. Repeat step 3 for all 4 positions. It will start on the bottom left, then bottom right, then top right, and finally top left. On the final position (top left), the blinking target will not automatically move. Simply remove your finger from the screen and the screen will go back to the previous menu you were on.

2.8 Buttons

There are three buttons on the front panel.

- **Reset –** This button is used to reset or reboot the ZClone.
- **Mute/Buzzer –** This button, when pressed, stops the buzzer from the optional light tower.
- **Power –** This button is used to turn the ZClone on and off.

2.9 Light Tower

The ZClone is compatible with an optional light tower that may be purchased from Logicube. The light tower has three lights and a speaker to allow visual and audible notification of the progress of tasks performed.

The **GREEN** light on the light tower indicates a successful task completed.

The **AMBER** light is on when there is activity on the ZClone.

The **RED** light will come on if a problem is encountered during any task. If this occurs, check the screen for an error message and instructions on what to do next.

2.9.1 Buzzer

In addition to the indicator lights, the light tower also has an audible buzzer to alert the operator of the following conditions:

The buzzer will sound when the ZClone successfully completes a task or if a problem is encountered during any task.

The buzzer will be off by default and can be enabled or disabled via the CLI (Command Line Interface). The CLI is further explained in Chapter 7: Remote Operation and Chapter 8: Command Line Interface Menus.

2.9.2 Installing and Removing the Light Tower

The light tower is attached to the back of the ZClone and can be removed if desired. This will not affect the performance of the unit.

1. To install the light tower on the ZClone, it first needs to be attached to the back of the unit with four supplied thumb-screws attached to the light tower.
2. Attach the light tower's connector to the six-hole Molex™ connector that is located on the back of the unit.
3. Light bar removal is the opposite of installation.

3: Quick Start

3.0 Quick Start Guide

The following instructions give a basic overview and steps on how to perform a clone. Details on each operation, menu, or selection can be found in Chapter 4. Modes of Operation.

3.1 Performing a Clone

Follow these steps to perform a clone:

1. Select ***Clone*** from the modes of operation on the left side.
2. Tap the ***Mode*** icon and select ***Drive to Drive, Image to Drive or Drive to Image***.
3. Tap the ***Master*** icon and choose the master drive or repository image.
4. Tap the ***Settings*** icon and select ***Clever*** or ***Mirror***.
5. Change any of the optional settings (Partition Resize Settings, Mirror Settings, HPA/DCO, and Verification).
6. Tap the ***Target*** icon and select one or more target locations or select the repository to be used.
7. Tap the ***Start*** icon to start the cloning task.

3.2 Performing a Wipe

Follow these steps to perform a wipe:

1. Select ***Wipe*** from the modes of operation on the left side.
2. Tap the ***Target*** icon and select one or more target locations.
3. Tap the ***Settings*** icon and choose the type of wipe you would like to perform (Secure Erase or wipe mode). If wipe mode is selected, choose the type of wipe mode to perform (DoD or Custom).
4. Tap ***HPA/DCO*** to wipe the HPA or DCO area of the drive.
5. Tap the ***Passes*** icon to edit the number of passes and what gets written on each pass.
6. Tap the ***Start*** icon to start the wipe task.

3.3 Performing a Hash

Follow these steps to perform a hash:

1. Select ***Hash*** from the modes of operation on the left side.
2. Tap the ***Target*** icon and select one target location.
3. Tap the ***Settings*** icon to select the hash method or algorithm. Choose from SHA-1, SHA-256 or MD5 (SHA-1 or SHA-256 are the recommended algorithms).
4. Leave the expected hash value at zeros to hash the drive.
5. Change any of the optional settings (LBA settings or percentage of the drive to be hashed).
6. Tap the ***Start*** icon to start the hash task.

4: Modes of Operation

4.0 Modes of Operation

There are six (6) modes of operation available on the ZClone. The left side of the screen shows the different modes that can be set.

CLONE – Performs a clone to and from drives and/or images (drive to drive, image to drive, or drive to image).

WIPE – This mode is used to wipe drives. Drives can be wiped using Secure Erase, DoD, or a custom wipe setting.

HASH – This mode will perform a SHA1, SHA-256, or MD5 hash of a drive.

LOGS – This mode will display logs of each task that has been performed on the ZClone.

ZCLONE STATISTICS – This will display information about the ZClone including the current software installed.

SYSTEM SETTINGS – This mode allows changes to the system settings on the ZClone which includes restart options, software updates, and configuring and viewing user profiles/configurations.

Configuring/viewing user profiles/configurations will be available via the user interface in a future update. Managing repositories (not shown on Graphical User Interface (GUI)) and configuring/viewing user profiles can be performed by using the Command Line Interface (CLI). The CLI is further explained in Chapter 7: Remote Operation and Chapter 8: Command Line Interface Menus.

4.1 Clone

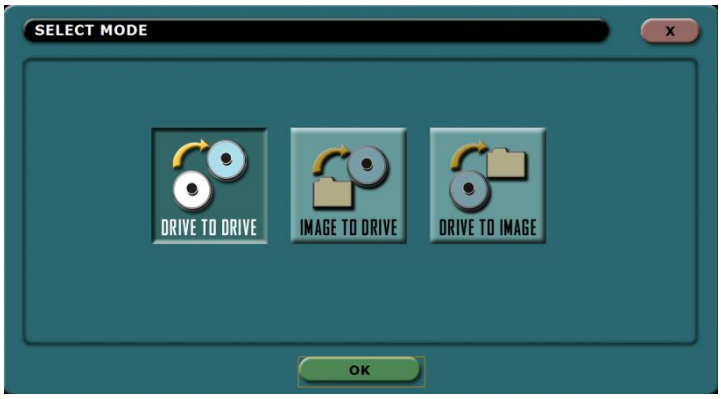
This mode allows you to clone one drive to one or more drives, one drive to an image, or an image to one or more drives. There are different cloning methods and settings to choose from. These selections should be performed in order from left to right.

There are four selections when performing a Clone:

- **Mode**
- **Master**
- **Settings**
- **Target**

4.1.1 Mode

– Tap this icon to choose between the following cloning modes:



- **DRIVE TO DRIVE –** Allows cloning from one Master drive to one or more Target drives.
- **IMAGE TO DRIVE –** Allows cloning from one image file to one or more Target drives.
- **DRIVE TO IMAGE –** Allows cloning from one Master drive to one image drive.

4.1.2 Master

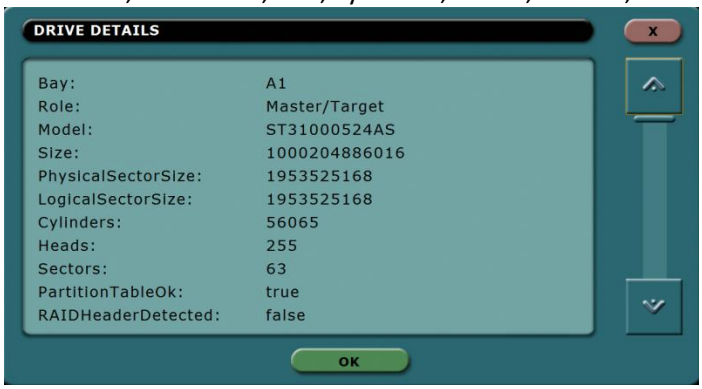
– Tap this icon to select which drive or image file will be used as the Master drive or image. When 'DRIVE TO DRIVE' or 'DRIVE TO IMAGE' is chosen from the previous selection, this will show the different drives connected to the ZClone. When 'IMAGE TO DRIVE' is chosen from the previous selection, this will show the repository screen which contains the different images located on the ZClone's repository drive.

If a drive has been selected for a previous task, it will show as unavailable for other additional tasks.

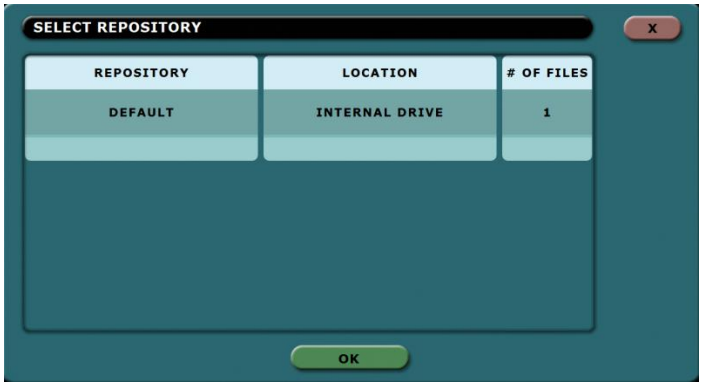
4.1.2.1 Selecting Master drives or images

If 'DRIVE TO DRIVE' or 'DRIVE TO IMAGE' was chosen as the mode the following screen will appear. This will allow you to select a Master drive. It will display all available drives that are connected. If a drive has been selected for a different task, it will be greyed out and cannot be selected.

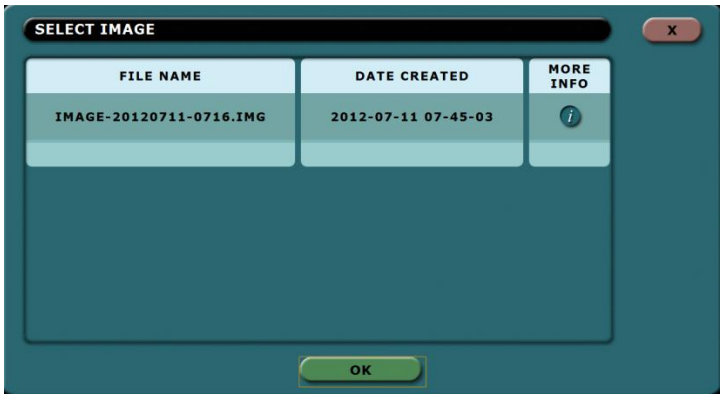
You can also tap the 'MORE INFO' icon to see more information on the drive. The drive details window will appear showing information about the drive such as the which bay it is connected to, the model, size, cylinders, heads, sectors, etc.



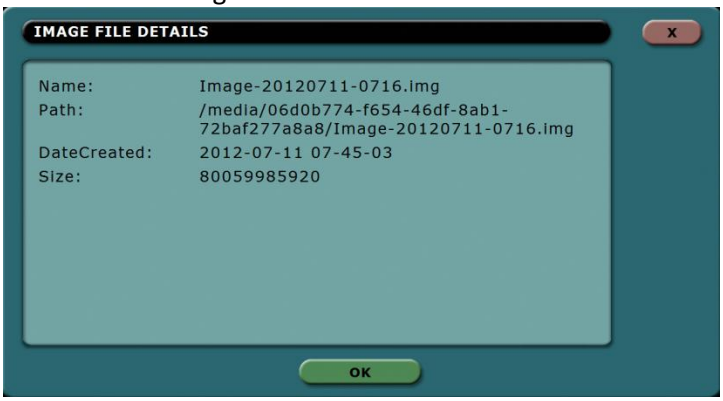
If 'IMAGE TO DRIVE' was chosen as the mode the following screen will appear. This will allow you to select from a list of repositories configured for the ZClone. Select a repository location from the list then tap the ***OK*** icon. ZClone's internal drive is listed as 'Default'.



Once a repository is selected, you can select the image to be cloned.

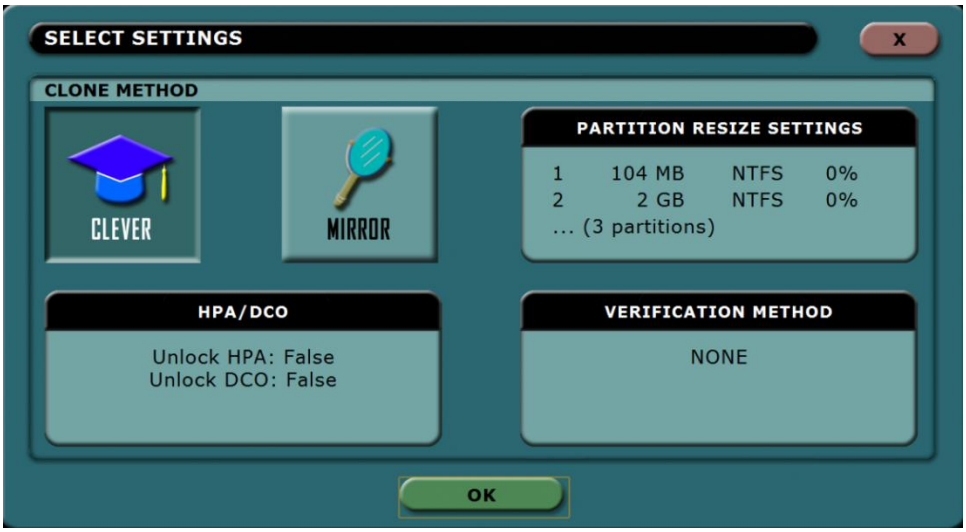


You can also select 'MORE INFO' to see more information about the image. When selected, a screen will appear showing details on the selected image file.



4.1.3 Settings

– Tap this icon to change the clone settings. The following screen will appear:



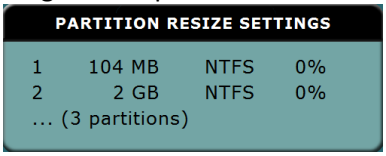
4.1.3.1 Clone Method

– Select between Clever and Mirror. Clever clone copies data sectors, skips blank sectors, and resizes partitions. Mirror clone performs a bit-by-bit copy of the drive

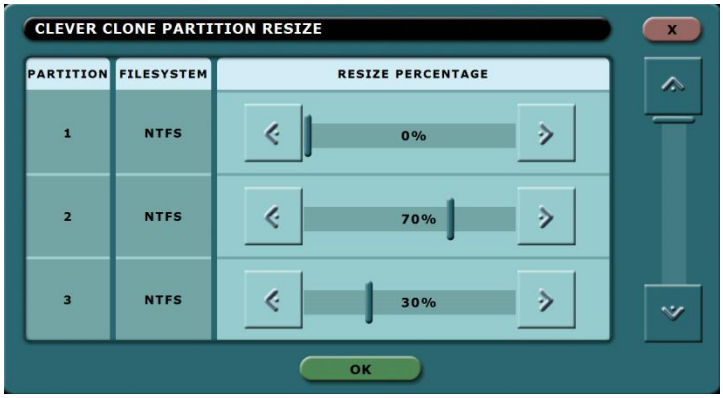
4.1.3.2 Partition Resize Settings or Mirror Settings

The ***Partition Resize Settings*** or ***Mirror Settings*** window will show the different clone settings available based on which clone method (above) was chosen.

- If Clever was chosen, the following screen will appear showing a list of partitions seen on the Master drive.

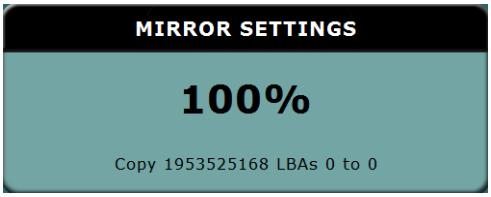


Tap ***Partition Resize Settings*** to bring up the ***Clever Clone Partition Resize*** window. This screen displays each partition on the selected Master drive, the Filesystem, and for each partition, a resize percentage bar to set the percentage to resize each partition.



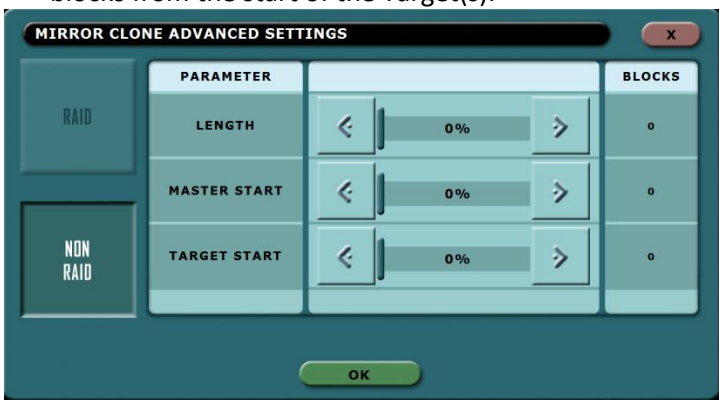
- Setting the slider/percentage to 0% will instruct the ZClone to keep the same partition size.
- The percentage value, when set from 1 to 100 will determine what percentage of the Target drive(s) will be used. For example, setting the percentage value to 100% would instruct the ZClone to use the entire Target drive for that partition.
- When attempting to clone to a Target drive that is smaller in capacity than the Master drive, the partitions on the Master drive need to be adjusted to be no more than the same size of the Target drives.
- Windows Vista, 7, and 8 have a built-in partition utility that can shrink volumes or partitions. For more information on how to shrink volumes, you can search the Internet for ***technet shrink volume***. Although there are several ways of shrinking a partition or volume, we recommend using Microsoft's recommended method.
- The capacity of a hard drive may be smaller than the capacity on the label. For example, the typical capacity of a 500 GB hard drive is 465 GB.

- If Mirror was chosen, the following screen will appear showing a percentage of the Master drive to copy. By default, it will be set to 100% to copy the entire Master drive.

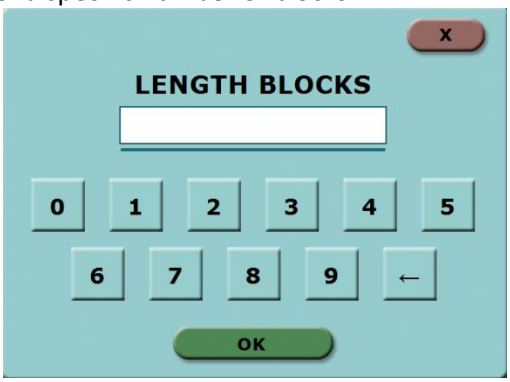


Tap ***Mirror Settings*** to bring up the ***Mirror Clone Advanced Settings*** window. This screen displays an option to select whether the Master drive is a RAID configuration or a NON RAID configuration. There are also 3 other parameters that can be set:

- LENGTH – Set the percentage or number of blocks to clone.
- MASTER START – Set the percentage or number of blocks from the start of the Master.
- TARGET START – Set the percentage or number of blocks from the start of the Target(s).

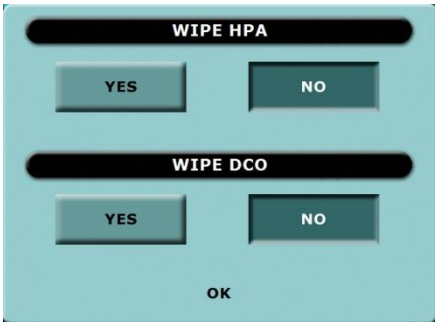


To enter an LBA number (number of blocks), press and hold one of the left or right arrows on the Length, Master Start, or Target Start. A window will appear similar to the one below allowing you to enter a specific number of blocks.



4.1.3.3 HPA/DCO

– Tap this to bring up the HPA/DCO window. Select ***YES*** to unlock and copy a Host Protected Area (HPA) or Device Configuration Overlay (DCO). Some PC manufacturers will employ a utility that creates a HPA or DCO configuration on a hard drive. These configurations are designed to change drive characteristics such as drive capacity, speed and other settings as they are reported to the PC BIOS.



HPA – Host Protected Area can limit the size of a hard drive, but it can also change many other settings such as speed and S.M.A.R.T. status.

DCO – Device Configuration Overlay limits the size of a drive only. For example, a 160GB drive can be made to look like a 100GB drive to a PC.

4.1.3.4 VERIFICATION METHOD

Select this to choose a verification method. SHA-1 and SHA-256 are recommended. There are 4 different options:

- **NONE (default) –** No verification.
- **SHA-1 –** Select this to verify the Target drives using the SHA-1 algorithm.
- **SHA-256 –** Select this to verify the Target drives using the SHA-256 algorithm.
- **MD5 –** Select this to verify the Target drives using the MD5 algorithm.

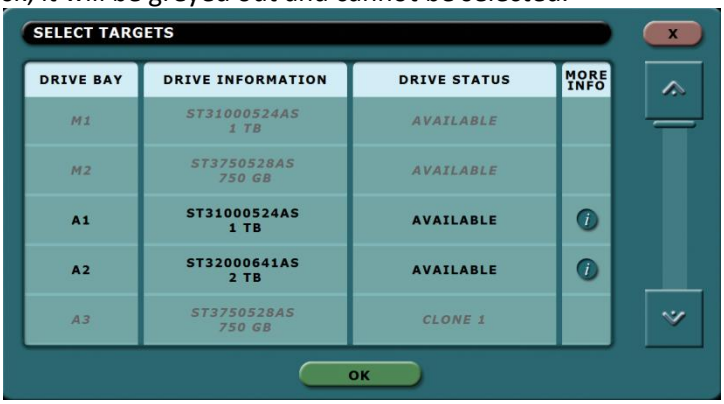
4.1.4 Target

– Tap this icon to select which drive(s) or image file will be used as the Target drive or image. When 'DRIVE TO DRIVE' or 'IMAGE TO DRIVE' is chosen from the Mode settings, this will show the different drives connected to the ZClone. When 'DRIVE TO IMAGE' is chosen from the Mode settings, this will show the repository screen which contains the different images located on the ZClone's repository drive.

If a drive has been selected for a previous task, it will show as unavailable for other additional tasks.

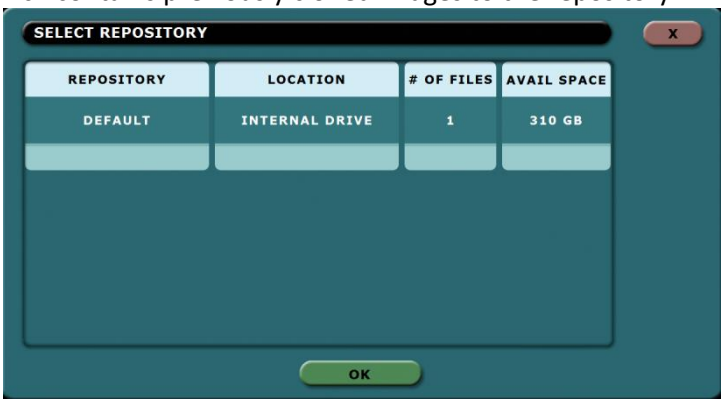
4.1.4.1 Selecting Target drives or images

If 'DRIVE TO DRIVE' or 'IMAGE TO DRIVE' was chosen as the mode the following screen will appear. This will allow you to select one or more Targets. It will display all available drives that are connected. If a drive has been selected for a different task, it will be greyed out and cannot be selected.

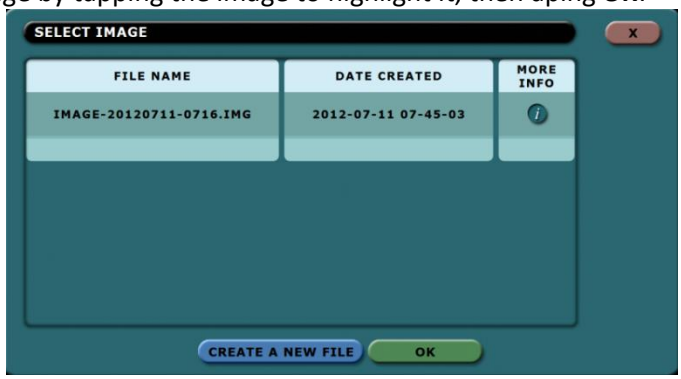


You can also tap the 'MORE INFO' icon to see more information on the drive. The drive details window will appear showing information about the drive such as the which bay it is connected to, the model, size, cylinders, heads, sectors, etc.

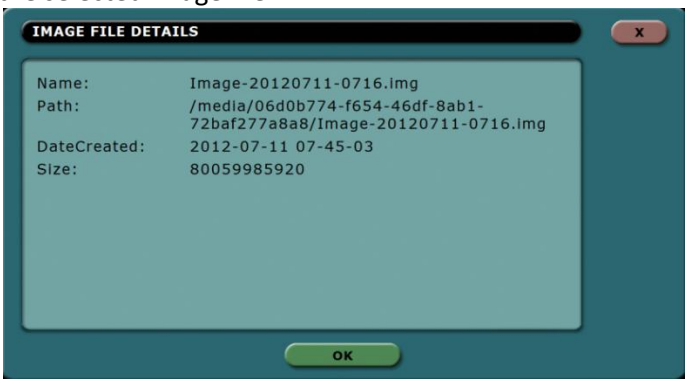
If 'DRIVE TO IMAGE' was chosen as the mode the following screen will appear. This will allow you to select a repository which contains previously cloned images to the repository.



Once a repository is selected, you can create a new image file by tapping the ***Create A New File*** icon or overwrite an existing image by tapping the image to highlight it, then aping ***OK***.



You can also select 'MORE INFO' to see more information about the image. When selected, a screen will appear showing details on the selected image file.



4.2 Wipe

This mode allows you to wipe (or sanitize) one or more drives. There are two main settings: Secure Erase and Wipe Mode.

At this time, the Secure Erase has a limitation listed below. Improvements and updates to the Secure Erase feature will be available in a future software release.

Drive bays M1 and M2 support Secure Erase for SATA drives only but must be configured as Target only bays (by default, they are configured as Master only bays). This can be done via Command Line Interface (CLI). The CLI is further explained in Chapter 7: Remote Operation and Chapter 8: Command Line Interface Menus.

DoD Wipe and Wipe using custom passes are not affected by the limitations above.

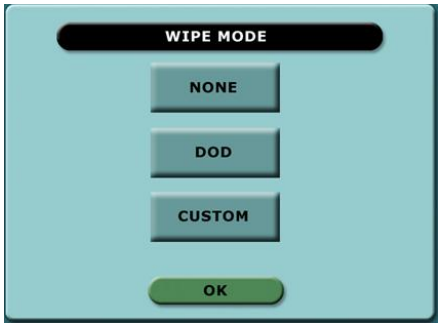
4.2.1 Secure Erase

Choose 'ON' to turn Secure Erase on. Most drives support this function. Secure Erase will send an AT (attention) command to the hard drive instructing it to wipe or reset itself to the specifications that the hard drive manufacturer has set. For information on what happens when the Secure Erase command is sent, please contact the drive manufacturer. If you are unsure if the drive supports this function, please contact the drive manufacturer.

For SAS (Serial Attached SCSI) drives, Secure Erase sends a 'Format' command. For SATA (Serial-ATA) drives, Secure Erase sends a 'Security Erase Unit' command. For SATA drives that support 'Enhanced Security Erase Unit' commands, the enhanced command will be sent. For questions on how each drive supports these features, or what the drive will do with these commands, please contact the drive manufacturer.

4.2.2 Mode

Selecting this will open the Wipe Mode window allowing you to choose 3 options:



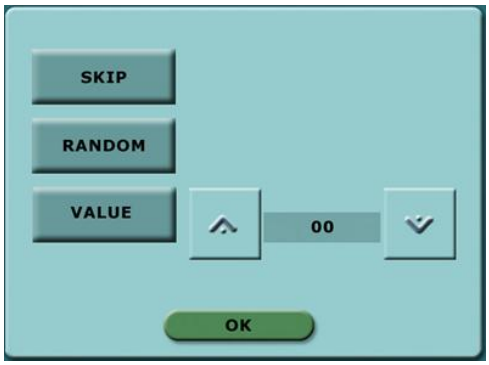
- **NONE –** Choosing this will instruct the ZClone not to perform a wipe using Wipe Mode.
- **DOD –** Choosing this will instruct the ZClone to perform a wipe conforming to the DoD M-5220 standards. This will open a new window allowing you to specify what value will be written on the 7th and final pass.

The ZClone automatically enters default values for pass numbers 1 through 6. It is mandatory that the user enters a value for the 7th pass or the ZClone will not proceed with the wipe operation. Values can be changed or added by tapping the (edit) icon.

- **CUSTOM –** Choosing this will open the Custom window allowing you to specify how many passes you would like performed and what values each pass will be written on each of the passes selected.

There is no default value entered for any passes. It is mandatory that the user select a value for at least the first pass or the ZClone will not proceed with the wipe operation. Values can be changed or added by tapping the (edit) icon.

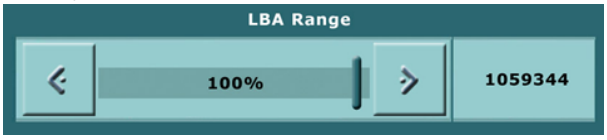
Editing one or more of the passes in DOD or CUSTOM mode will bring up the following window.



- **SKIP –** Allows you to skip the pass.
- **RANDOM –** Instructs the ZClone to perform a random pattern or value.
- **VALUE –** Allows you to select a specific hex value to be written. The values can range anywhere from 00 to FF.

4.2.3 LBA SETTING

This setting will only be used if Wipe Mode is selected. This range or percentage determines what percentage or LBA range will be wiped on the Target drive. To wipe the entire drive, leave this at 100%.

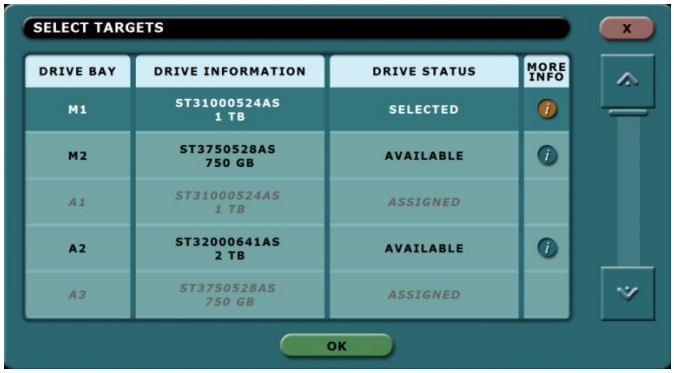


4.3 Hash

This mode allows you to hash one drive using the SHA-1, SHA-256, or MD5 algorithm. The recommended algorithm is SHA-1 or SHA-256.

4.3.1 Target

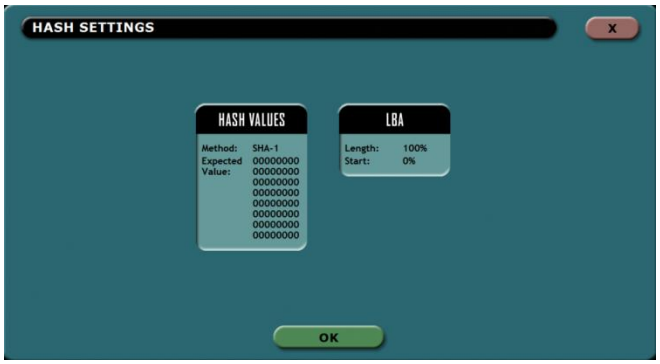
– Tap this icon to select which drive(s) will be hashed or verified.



If a drive has been selected for a previous task, it will show as unavailable for other additional tasks.

4.3.2 Settings

– Tap this icon to change the hash settings. The following screen will appear:



4.3.2.1 Hash Values

– This icon brings up the hash method and values screen as seen below.

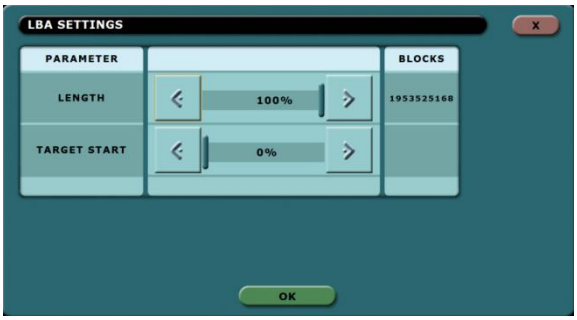
- **Hash Method –** There are 3 selections. Select one of the following hash methods:
  - **SHA-1 –** Select this to hash or verify the Target drives using the SHA-1 algorithm.
  - **SHA-256 –** Select this to hash or verify the Target drives using the SHA-256 algorithm.
  - **MD5 –** Select this to verify the Target drives using the MD5 algorithm.

The recommended method is SHA-1 or SHA-256.

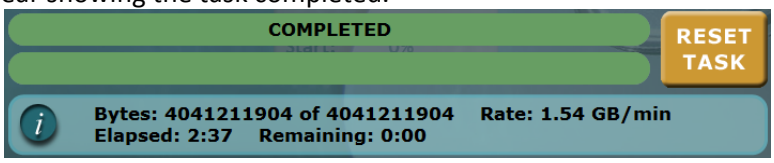
- **Hash Values -** By default, this value will have 0s (zeros). If this is not changed, or no value is entered or edited, this will instruct the ZClone to hash the Target drive using the selected algorithm in the previous step. If a value is entered or edited, the ZClone will hash the selected Target drive(s) and verify hash with the value entered/edited.

4.3.2.2 LBA

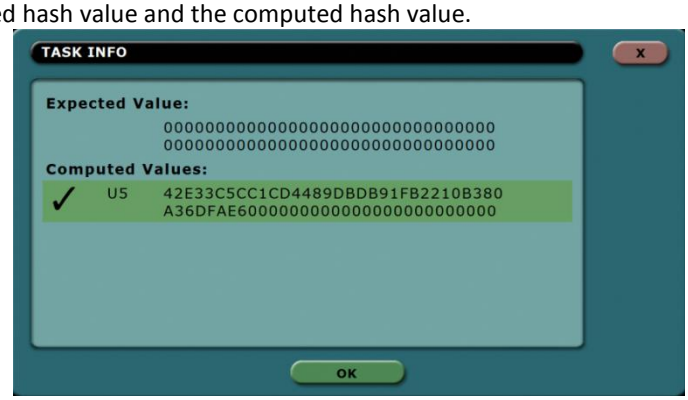
– The he LBA icon will bring up the LBA settings. On this screen you will be able to adjust a percentage or the number of blocks of the drive to hash. If the length is set less than 100%, you can also set the starting percentage or block to hash from.



When the ZClone finishes hashing the drive the following screen will appear showing the task completed.



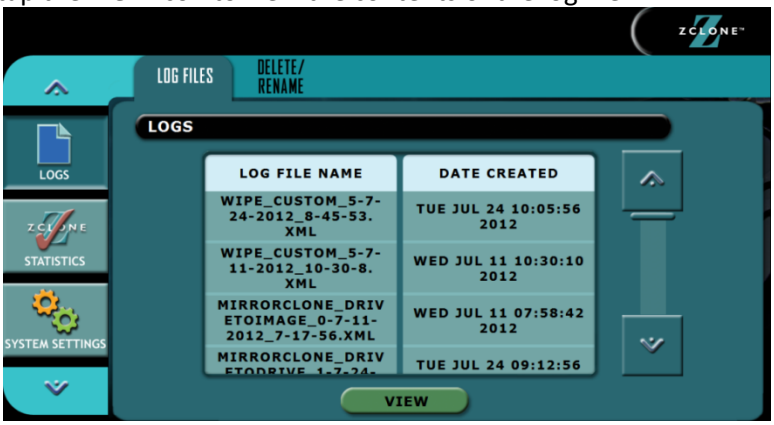
Tap the 'info' icon on the left of the completed screen (above) to see both the expected hash value and the computed hash value.



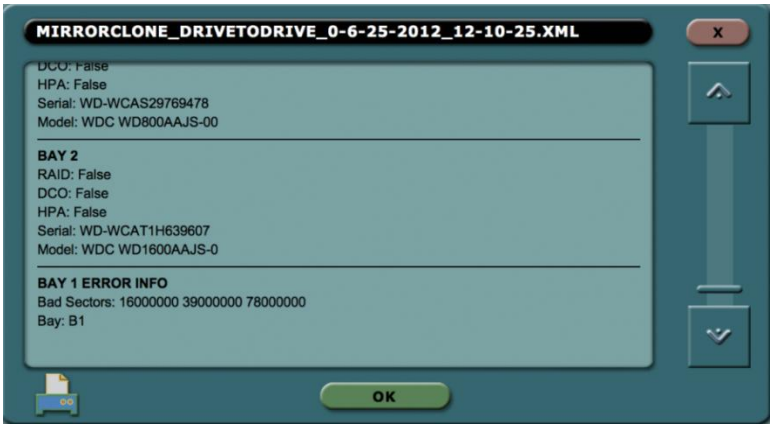
4.4 Logs

Selecting this will bring up a list of all the log files for previous tasks (clone, wipe and hash). Each log file can be selected and viewed on-screen.

Use the up and down scroll arrows to scroll through the list of log files. Tap the desired log file to highlight it and tap the ***View*** icon to view the contents of the log file.

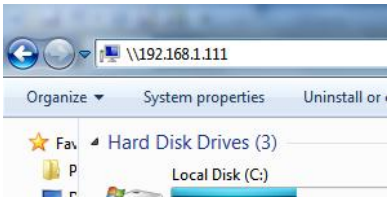


Use the up and down scroll arrows to view the contents of the log file.

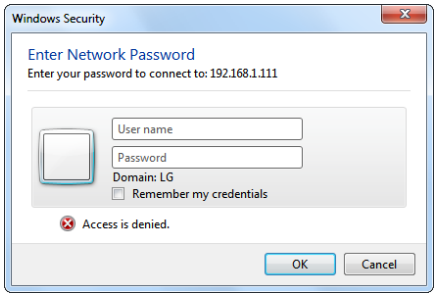


To print the log files, use the web interface as described in Chapter 7: Remote Operation and click the print icon on the bottom left corner of the screen. Your browser's print menu will appear and you can print the log files to a configured printer on your PC.

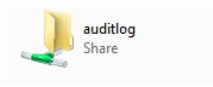
Alternatively, you can browse the raw XML data of the log files through a computer that is connected to the same network the ZClone is connected to. In Windows Explorer or My Computer (not Internet Explorer), enter the path to the hostname or IP address of the ZClone. For example: \\zclone-12345 or \\192.168.1.111.



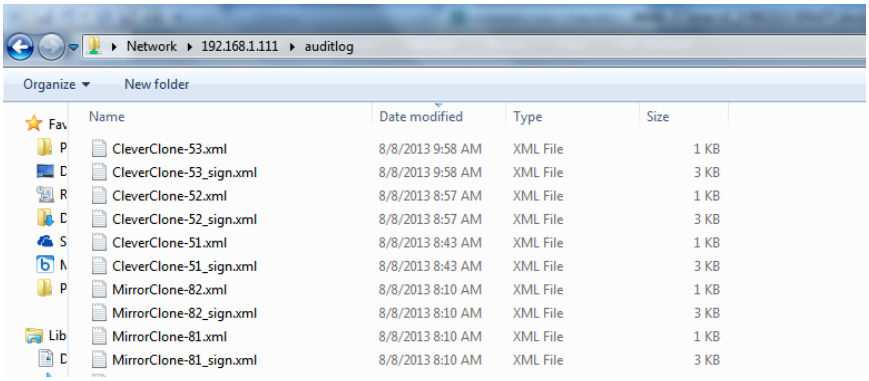
A login screen will appear. Enter the user name ***it*** and the password ***it***.



Once connected, an auditlog folder will appear:

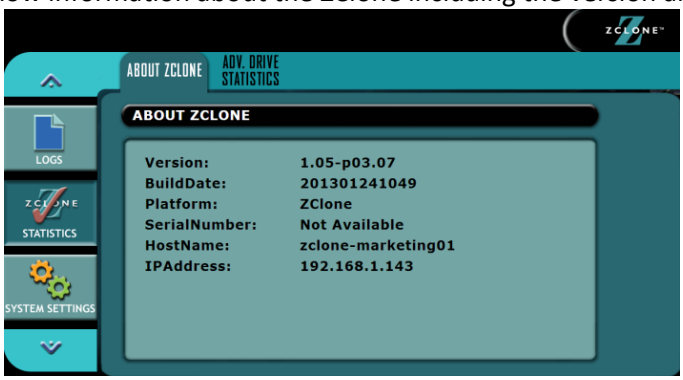


Double-click the auditlog folder and the xml log files will be seen.

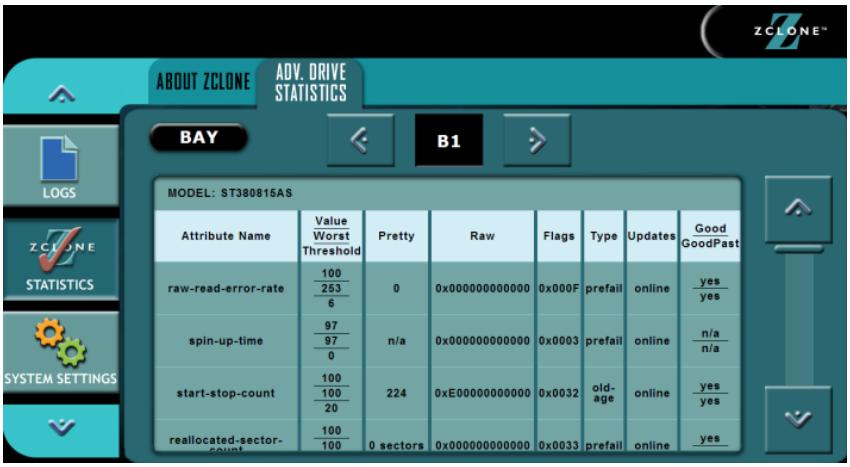


4.5 ZClone Statistics

Selecting this will show information about the ZClone including the version and serial number.



The Advanced Drive Statistics tab shows advanced statistics on each of the drives attached. The information displayed is the S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) information taken directly from what the drive is reporting. You can use the left and right scroll arrows to switch between drives. The up and down scroll arrows scroll through the different information.

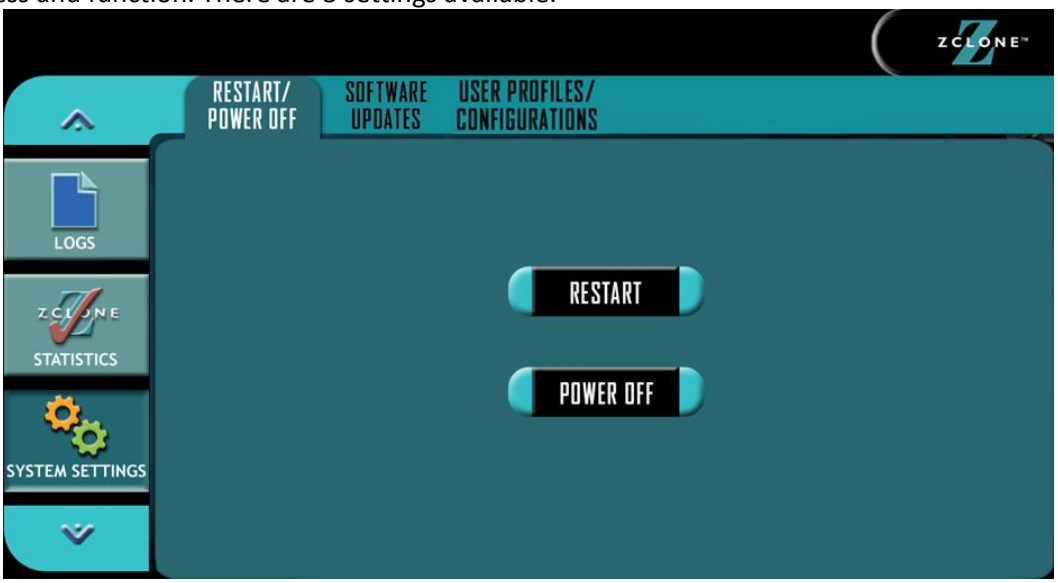


4.6 System Settings

Detailed information on this mode can be found in **Chapter 5: System Settings**.

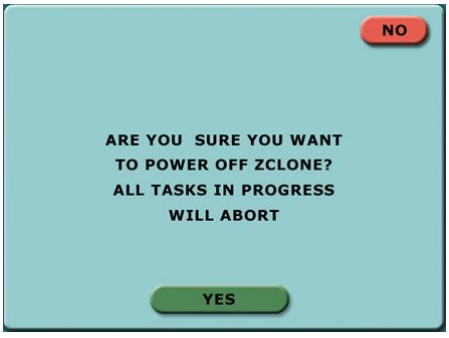
5.0 System Settings

This mode allows changes to be made to the ZClone's system settings to allow administrative access and function. There are 3 settings available.



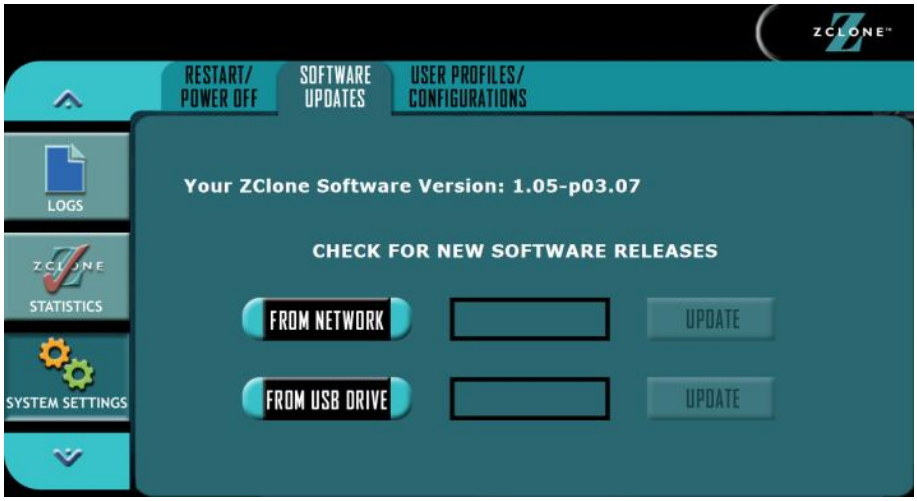
5.0.1 Restart/Power Off

Allows the ZClone to either be restarted or turned off. Depending on the choice, one of two screens will appear:



5.0.2 Software Updates

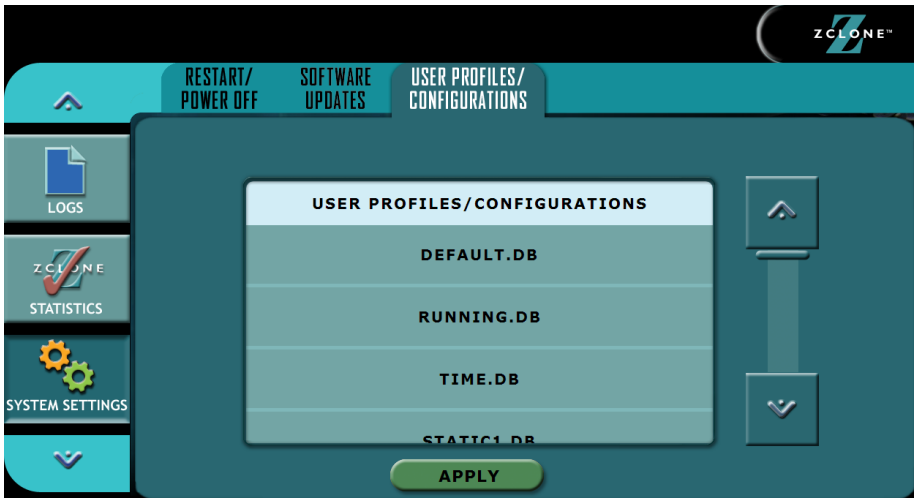
Software updates can be performed either from a network location or from a USB drive.



Detailed information on updating the software can be found in Chapter 6: Updating the ZClone Software.

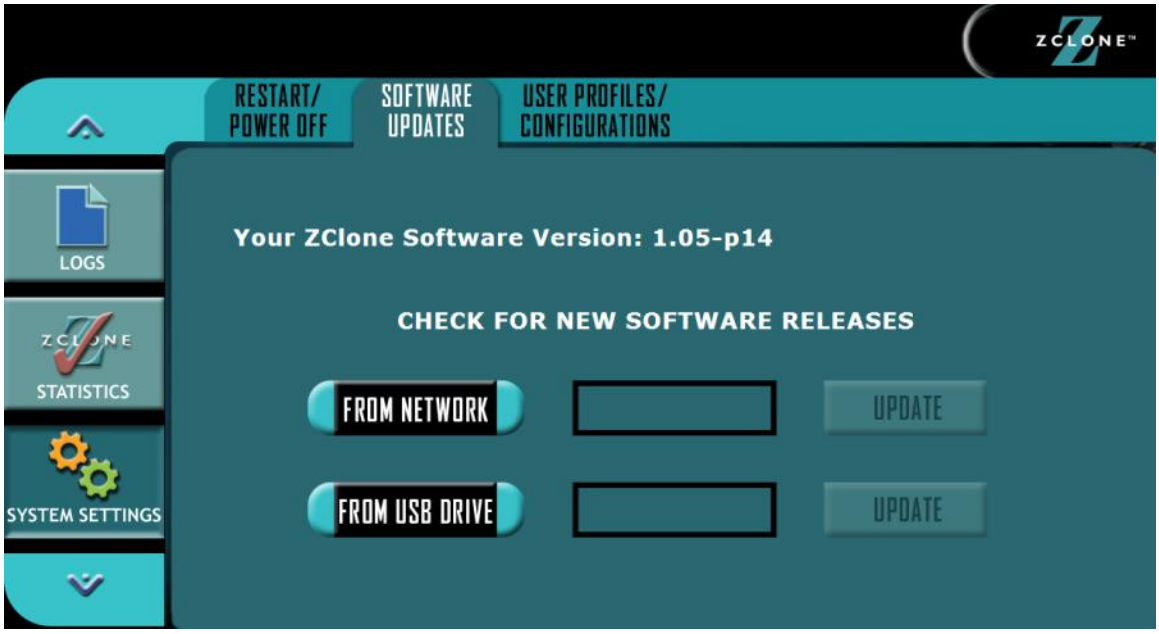
5.0.3 User Profile Configurations

Saved User Profiles or Configurations can be accessed from this screen. This will display any profiles or configurations (also called databases) that were saved using the CLI command “db”. From this screen, you can highlight a saved configuration then tap or click ***Apply*** and reboot the ZClone to load that configuration.



6.0 Loading New Software

New and improved software will be released from time to time. There are two ways to update the software on the ZClone: From the web via a network connection or from a USB drive.



6.1 Software Loading Instructions

There are two methods of how to update the ZClone software:

A. **FROM NETWORK –** Via the web through an internet connection
B. **FROM USB DRIVE** – Via software file download onto a USB drive.

The most up-to-date instructions on updating the software can be found in a readme file located on the ZCLone's support page at: http://www.logicube.com/knowledge/zclone.

6.1.1 From Network – Via the web

1. Connect the ZClone to a network with Internet access. Attach a network cable to the back of the ZClone.

The ZClone is DHCP enabled by default. Please contact your IT department if you are unsure if your network supports DHCP.

2. From the main menu on the ZClone, tap the ***System Settings*** icon.
3. Tap ***Software Updates*** on the top of the menu. A screen will appear showing the current version of software installed towards the top of the screen.
4. Select ***From Network***. The ZClone will check for a newer version on the web. If one is found, it will display the version on the screen and the ***Update*** icon will be selectable.
5. Tap the ***Update*** icon to begin the update. A confirmation screen will appear. Tap ***Yes*** to continue the update.
6. Do not interrupt the update process. It may take several minutes. Once completed, a 'Successful' screen will appear.
7. Verify the software version at the top of the 'Software Updates' screen.
8. Reboot the ZClone by either turning the unit off then back on using the Power button or by going through the System Settings menu (Restart/Power Off option).

6.1.2 From USB Drive – Via software file download

The latest software can also be downloaded from Logicube's website and be placed onto a USB flash drive.

It is recommended to use a blank USB drive.

1. Download the latest software from the ZClone product support page at http://www.logicube.com/knowledge/zclone.
2. Format a USB flash drive with a FAT, FAT32, or NTFS file system.
3. Once the software is downloaded, extract all the contents of the *.zip file to the root of the USB flash drive (the files must not be in any folder). Do not connect the USB flash drive yet. The ZClone will instruct you when to connect the USB flash drive.
4. From the main menu on the ZClone, tap the ***System Settings*** icon.
5. Tap ***Software Updates*** on the top of the menu. A screen will appear showing the current version of software installed towards the top of the screen.
6. Connect the USB drive containing the software to the USB port labeled ***U6***.

7. Select ***From USB Drive***. The ZClone will then check for the version of the software on the USB drive and will display that version on the box next to the selected location.
8. Tap the ***Update*** icon to begin the update. A confirmation screen will appear. Tap ***Yes*** to continue the update.
9. Do not interrupt the update process. It may take several minutes. Once completed, a 'Successful' screen will appear.
10. Verify the software version at the top of the 'Software Updates' screen.
11. Reboot the ZClone by either turning the unit off then back on using the Power button or by going through the System Settings menu (Restart/Power Off option).

7: Remote Operation

7.0 Introduction

The ZClone comes with a network connection in the back of the unit. Connecting the ZClone to a network allows remote access to the ZClone from any computer within the same network.

The ZClone is setup with a Zero Configuration Network (Zeroconf). There are two ways to access the ZClone:

- Web interface – A graphical interface where the screens are exactly the way you would see it on the ZClone
- Command Line Interface (CLI) – A text only command line interface that can be accessed one of three ways:
    i. Telnet (via a network connection)
    ii. SSH (Secure Shell via a network connection)
    iii. Serial Port (via the RS-232 serial port)

7.1 Web Interface

Using a web browser, go to the IP address or the name of the ZClone with its serial number. For example, browse to http://192.168.1.100 or http://zclone-XXXXXX/ where XXXXX is the 6 digit serial number of the ZClone. The ZClone's web interface will appear on the browser screen. All screens and operations available on the ZClone will be available on the browser.

On some browsers or other Operating Systems, the ZClone will need to be accessed by browsing to http://zclone-XXXXXX.local/.

The ZClone can be controlled by clicking on the icons appearing on the browser window.

7.2 Command Line Interface (CLI)

The ZClone also has a CLI, or Command Line Interface. This interface has no graphical content and is all command line (text) based. This type of connection requires a telnet client, SSH client, or terminal client. There are several telnet, SSH, and terminal clients available from different software companies. Microsoft Windows also has a built-in Telnet client that can be used.

- Windows XP has a built-in Telnet client and a built-in terminal client, but no built-in SSH client.
- Windows Vista and 7 has a built-in Telnet client but is not installed by default. Installing it may require assistance from your IT department. You can also use any other Telnet program of your choice. Windows Vista and 7 do not have built-in terminal or SSH clients.
- The instructions in this manual only refer to the clients that come with Windows. There are many third party Telnet, SSH, and Terminal clients available. For instructions and support for third party clients, please contact the software manufacturer.

7.2.1 Installing Telnet in Windows Vista or 7

By default, Telnet is not installed with Windows, but you can install it by following the steps below.

1. Click ***Start > Control Panel*** and select either ***Programs & Features*** (for Windows Vista) or ***Programs*** (for Windows 7).
2. Click ***Turn Windows features on or off***. If you are prompted for an administrator password or confirmation, type the administrator password or provide confirmation (for assistance with administrator passwords, check with your IT department).
3. In the Windows Features dialog box, select the Telnet Client check box.
4. Click OK. The installation might take several minutes.

7.2.2 Connecting via Telnet

Once Telnet is installed, follow the steps below to connect using the Windows Telnet client.

1. Connect the ZClone to the network by attaching a network cable (CAT 6 type) to the RJ45 connector in the back of the ZClone.
2. Turn the ZClone on and allow it to boot up completely.
3. Open the Telnet client.
    a. For Windows XP, click ***Start > Run.*** The Run window should appear. Type ***telnet*** in the Open: field and press Enter. The Telnet window should appear.
    b. For Windows Vista or 7, click ***Start*** and in the ***Search*** field, type ***Telnet***. Telnet should appear in search results.
4. Type ***open*** followed by the IP address or name of the ZClone. For example ***open 192.168.1.100*** or ***open zclone-XXXXXX*** where XXXXXX is the 6 digit serial number of the ZClone, then press Enter. The ZClone login screen should appear.

On some Operating Systems, the ZClone will need to be accessed by opening zclone-XXXXXX.local.

5. Login with the username "***it***" (without the quotes) and the password "***it***" (without the quotes).
6. You should be logged in and see the following prompt in the Telnet window:

7. You can now control and manage the ZClone remotely via the command line interface. The available commands are listed in Chapter 8: Command Line Interface Menus

7.2.3 Connecting via SSH

Connecting to the ZClone via SSH (Secure Shell) is very similar to connecting via Telnet. Since Windows does not have a built-in SSH client, you will need to download and install one if you want to connect via SSH. For instructions and support on how to use third party SSH clients, please contact the SSH client's manufacturer.

1. Connect the ZClone to the network by attaching a network cable (CAT 6 type) to the RJ45 connector in the back of the ZClone.
2. Turn the ZClone on and allow it to boot up completely.
3. Open the SSH client and select an SSH connection.
4. Connect to the ZClone either by IP address or by name. The name of the ZCloen will be **zclone-*XXXXX*** where XXXXX is the serial number of the ZClone).

On some Operating Systems, the ZClone will need to be accessed by opening zclone-XXXXXX.local.

5. Login with the username "***it***" (without the quotes) and the password "***it***" (without the quotes).
6. You should be logged in and see the following prompt in the Telnet window:

7. You can now control and manage the ZClone remotely via the command line interface. The available commands are listed in Chapter 8: Command Line Interface Menus

7.2.4 Connecting via Serial Port

Connecting to the ZClone via Serial port requires a terminal client. Windows XP has a built-in terminal client called Hyperterminal. Windows Vista and 7 do not have a built-in terminal client. Since these two versions of Windows do not a built-in terminal client, you will need to download and install one if you want to connect via the serial port. For support on how to use third party terminal clients, please contact the terminal client's manufacturer.

The instructions below are for Hyperterminal in Windows XP. If you are using a third party terminal client, you will need the following settings:

Settings:

Port speed: 115200

Data bits: 8

Parity: None

Stop Bits: 1

Flow Control: None

1. Go to Start - Programs - Accessories - Communication - Hyperterminal.
2. 2. Choose "File - New Connection" or follow the connection wizard if it comes up automatically.
3. Set a name for the Connection.
4. In the next screen, choose the COM Port assigned to the ZClone. You can also refer back to Windows Device Manager to determine the correct port. Typically, it is the highest COM Port assigned.
5. In the next screen, set Bits Per Second: 115200, Data Bits: 8, Parity: None, Stop Bits: 1 and Flow Control: None. Click ***OK*** when finished.
6. The ZClone CLI should appear. Login with the username "***it***" (without the quotes) and the password "***it***" (without the quotes).\
7. You should be logged in and see the following prompt in the terminal window:

8. You can now control and manage the ZClone remotely via the command line interface. The available commands are listed in Chapter 8: Command Line Interface Menus

8: Command Line Interface Menus

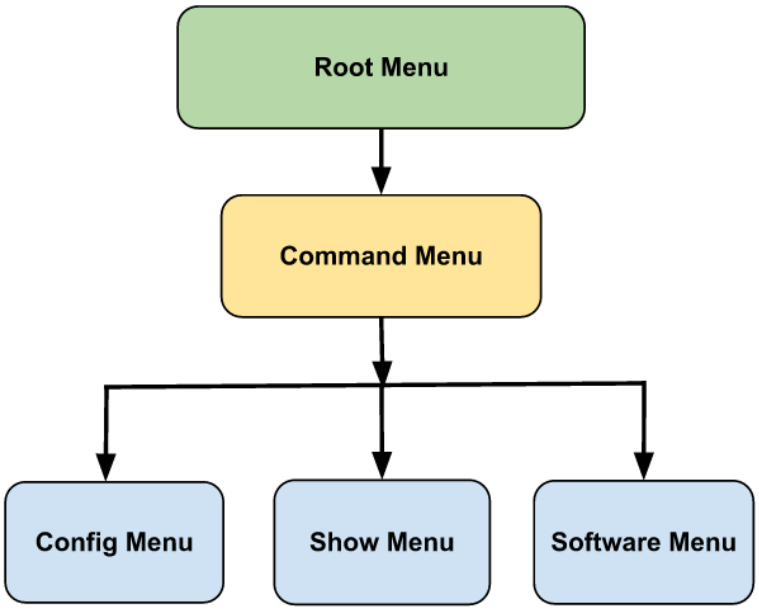
8.0 Introduction

This chapter shows the different commands in each of the Command Line Interface (CLI) menus. The CLI allows for remote management of the ZClone via Telnet, SSH, or Terminal clients. The CLI is designed for advanced users and is a non-graphical interface for the ZClone.

More information on how to use the CLI along with examples on common tasks can be found in an Application Note (appnote). This appnote can be found in the Product Documentation section of the ZClone support page at http://www.logicube.com/knowledge/zclone.

8.1 Command Line Interface Menus

The following details each of the Command Line Interface (CLI) menus. Below is a visual diagram of the menus.



Top level menu – The commands below are available in the top level menu.

it@zclone>	
help	Show available commands
quit	Disconnect
logout	Disconnect
exit	Exit from current mode
history	Show a list of previously run commands
enable	Turn on privileged commands
command	Zclone menu

Command level menu – The commands below are available in the Command level menu.

it@zclone(command)>	
help	Show available commands
quit	Disconnect
logout	Disconnect
exit	Exit from current mode
history	Show a list of previously run commands
config	configure unit
show	show information
Software	software tasks

Config level menu – The commands below are available in the Config level menu which include configuring the database, network, user, repository, drive bays, tasks, buzzer, printer, and temperature.

it@zclone(command-config)>	
help	Show available commands
quit	Disconnect
logout	Disconnect
exit	Exit from current mode
history	Show a list of previously run commands
db	configure database
net	configure network
user	configure user
repo	repo - configure a repository; use --help|-h for more info
bay	bay - configure bay role; use --help|-h for more info
task	task - configure a task; use --help|-h for more info
export	export - configure a filesystem export; use --help|-h for more info
buzzer	buzzer [success|error] [on|off] - configure the light tower buzzer for an event

printer	printer - configure a printer; use --help|-h for more info
temperature	temperature [disk|system] [<temperature>] - set the temperature threshold in degrees celcius
image	image - image management - Use --help|-h for more info
audit	audit - audit log management - Use --help|-h for more info

Show level menu – The commands below are available in the Show level menu which include showing the bay status, task configuration or status, repository list (or contents of one), or the configuration

it@zclone(command-show)>	
help	Show available commands
quit	Disconnect
logout	Disconnect
exit	Exit from current mode
history	Show a list of previously run commands
bay	bay - show bay status
task	task [config <task id>| status <task id>| list] - show task configuration or status
repo	repos [list | <repo name>]; list repositories or the contents of one
config	config; show configuration

Software level menu – The commands below are available in the Software level menu which include showing the software version currently installed, checking for software updates (both via web and USB), and updating the software (both via web or USB).

it@zclone(command-sw)>	
help	Show available commands
quit	Disconnect
logout	Disconnect
exit	Exit from current mode
history	Show a list of previously run commands
version	version - show software version
check	check [www|usb] - check for software updates
update	update [www|usb] - update software

9: Optional Adapters

9.0 Introduction

Logicube has many different adapters that allow you to tackle almost any drive cloning job. This chapter lists the available optional adapters that can be used with the ZClone. Please refer to our ZClone Adapter Guide (available on our website) for illustrations on how these adapters connect to ZClone.

9.1 2.5” SAS/SATA Extension Adapter

ZClone SATA/SAS Extension Adapter

The 2.5” SAS/SATA Extension Adapter (P/N F-ADP-SATA-X-ZC) allows the connection of 2.5” SAS (Serial Attached SCSI) or SATA drives. The adapter is inserted into one of the ZClone drive bays. Up to 8 drives can be connected to ZClone using this adapter (Drive bays labeled A1 through A4, and B1 through B4). This extension adapter is required for of the majority of the other drive adapters listed in this section.

9.2 3.5” and 2.5” Parallel ATA (PATA/IDE) Drives

3.5” and 2.5” PATA/IDE drives can be connected using the 3.5” adapter shown above. The 3.5” adapter connects to the SATA/SAS Extension Adapter.

Technical Note: If PATA/IDE drives are not being detected by the ZClone, change the jumper settings on the drive to 'Master' or 'Single Master'.

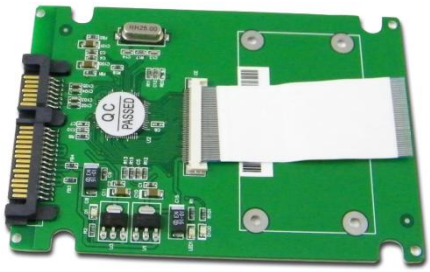
The SATA/SAS Extension Adapter is required when using this adapter and can only be used on Drive bays A1 through A4 and B1 through B4).

9.3 1.8" Parallel ATA (PATA/IDE) Drives

1.8" PATA/IDE drives can be connected using the 1.8" adapter shown above. This 1.8" adapter connects to the SATA/SAS Extension Adapter.

The SATA/SAS Extension Adapter is required when using this adapter and can only be used on Drive bays A1 through A4 and B1 through B4).

9.4 1.8" ZIF Drives



1.8" ZIF Drives can be connected using the adapter shown above. This ZIF adapter connects to the SAS/SATA Extension Adapter.

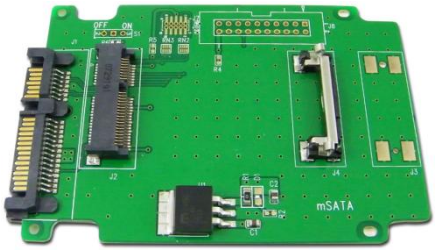
The SATA/SAS Extension Adapter is required when using this adapter and can only be used on Drive bays A1 through A4 and B1 through B4).

9.5 1.8” microSATA Drives

1.8” microSATA drives can be connected using the adapter shown above. This microSATA adapter connects to the SAS/SATA Extension Adapter.

The SATA/SAS Extension Adapter is required when using this adapter and can only be used on Drive bays A1 through A4 and B1 through B4).

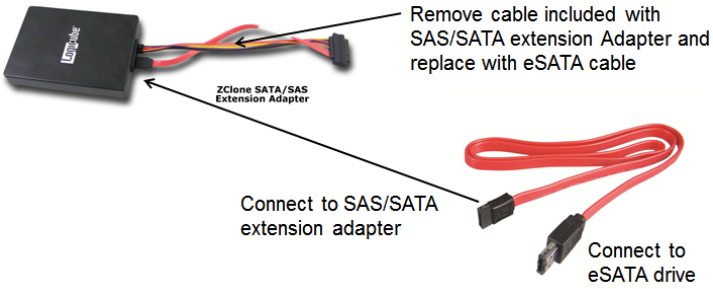
9.6 mSATA (mini-SATA) Drives



mSATA (mini-SATA) drives can be connected using the adapter shown above. This mSATA adapter connects to the SAS/SATA Extension Adapter.

The SATA/SAS Extension Adapter is required when using this adapter and can only be used on Drive bays A1 through A4 and B1 through B4).

9.7 eSATA Drives



eSATA drives can be connected using the SAS/SATA Extension Adapter. The SAS/SATA cable included with the Extension Adapter will need to be removed and replaced with the eSATA cable. Connect the SATA end of the eSATA cable to the Extension Adapter and connect the

eSATA end of the cable to the eSATA drive. Power to the eSATA drive should come with the drive (typically some type of external AC adapter or power cable).

The SATA/SAS Extension Adapter is required when using this adapter and can only be used on Drive bays A1 through A4 and B1 through B4).

9.8 Flash Memory Cards

Flash memory cards can be connected using the adapter shown above. This multi-card reader connects to one of the USB ports in the front of the ZClone.

Third party multi-card readers are not supported and may not work with the ZClone.

The multi-card reader supports the following formats:

- CF (CompactFlash)
- SD/SDXC/MMC
- Micro SD
- Memory Stick (MS)
- Memory Stick Duo (M2)
- X-Card

Attach only one flash memory card to the multi-card reader at a time.

10: Cloning Guides

10.1 Introduction

This section has guides and information on cloning drives. When cloning, the Target drives must be at least the same capacity or greater than the Master drive.

10.2 Using Mirror Mode

Mirror is a bit-by-bit copy of the Master drive. This will produce an exact duplicate of the Master drive. When cloning using Mirror mode to a Target drive that has a higher capacity than the Master, the remaining space on the drive will be seen as unallocated space. Using non-Logicube utilities, this unallocated space can be used to expand certain partitions, or to create new partitions.

Since Mirror mode is a bit-by-bit copy of the Master drive, it can be used with any Operating System and any File System.

10.2 Using Clever Mode

Clever mode can be used with FAT, FAT32, NTFS, and EXT, EXT2, EXT3, and EXT4. Clever copies the contents of sectors with data to the Target drive, then fills the rest of the drive with blank sectors and adjusts the partition size(s).

In Windows, only the partition containing the Operating System can be expanded. The System Restore and any utility partitions cannot be expanded.

Clever mode supports both MBR (Master Boot Record) and GPT (GUID Partition Table) partitioning schemes.

10.3 Smaller Capacity Target Drives

When attempting to clone to a Target drive that is smaller in capacity than the Master drive, the partitions on the Master drive need to be adjusted to be no more than the same size of the Target drives.

Windows Vista, 7, and 8 have a built-in partition utility that can shrink volumes or partitions. For more information on how to shrink volumes, you can search the Internet for ***technet shrink volume***. Although there are several ways of shrinking a partition or volume, we recommend

using Microsoft's recommended method. At this time, Microsoft does not have a recommended way of shrinking a volume in Windows 8.

Once the partitions have been adjusted to fit the Target drive, you can use the same steps found in Scenario 1 or 2 and use either Clever Copy mode, Selective mode, or Mirror mode based on the scenario.

The capacity of a hard drive may be smaller than the capacity on the label. For example, the typical capacity of a 500 GB hard drive is 465 GB.

11: FREQUENTLY ASKED QUESTIONS

FAQs

Q. What is the duty cycle of the ZClone drive bays?
A. The ZClone drive bays are rated for 50,000 insertions.

Q. How many concurrent tasks can the ZClone run?
A. The ZClone can run up to 5 concurrent tasks.

Q. Do Target drives have to be formatted and partitioned prior to cloning?
A. No. Target drives do not need to be formatted, partitioned or otherwise modified prior to cloning. The Logicube ZClone disregards everything on the Target drive, reformatting and partitioning it during cloning.

Q. Will Clever Clone work with Linux partitions?
A. Yes. ZClone's Clever Clone will work with Linux partitions.

Q. Will Clever Clone work with Hierarchical File System (HFS)?
A. No. For Hierarchical File Systems, Mirror mode must be used.

Q. Can you connect multiple ZClone units with just one Master drive?
A. The ZClone cannot be 'daisy chained' with other Zclone units. However, you can create an image to a network location (repository location on a network) and use multiple ZClones, all connected to the same network and access the image on the network location at the same time. Cloning speeds will depend on the network speeds and network traffic.

12: Index

Technical Support Information

For further assistance please contact
Logicube Technical Support at: (**001) 818 700 8488 7am-5pm PST, M-F (excluding US legal holidays)**
or by email to **techsupport@logicube.com**

Software Attribution

Ubuntu 12.04 LTS (http://www.ubuntu.com)
Linux Kernel (3.2.14) (GPL v2) (http://www.kernel.org) (modified)
libcli (1.9.5) (LGPL v2.1) (https://github.com/dparrish/libcli) (modified)
monitorix (2.5.2) (GPL v2) (http://www.monitorix.org) (modified)