Logicube

Talon[®] Enhanced User's Manual



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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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TECHNICAL SUPPORT INFORMATION	
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1. Introduction to the Talon Enhanced

Introduction



Thank you for purchasing the Logicube Talon Enhanced. With proper use, this unit will provide you with accurate HDD capturing for years to come.

The Logicube Talon Enhanced is a drive-to-drive duplication device. Typically, a suspect hard drive and a destination drive will be connected to the unit. Within minutes of starting the process, the contents of the suspect drive are accurately copied over to the target drive for further examination. Handling of the suspect drive is held to a minimum with zero alteration of its contents.

Designed with the Forensics investigator in mind, the system ensures that proper evidence capture procedures are maintained, while speeding up the process significantly.

Specifications

The Talon Enhanced is the next generation of the Forensic Talon[®], the most widely used forensic imaging solution on the market today. The compact and rugged Talon Enhanced provides unbeatable forensic imaging speed along with industry-leading reliability, quality, and durability. The easy to use Talon Enhanced is engineered specifically for forensic investigations in the field or in the lab. The Talon Enhanced is available as a standalone unit that includes a carrying case or purchase the Talon Enhanced Field ToughKit that includes a rugged hard-sided carrying case and accessories.



Power Requirements	90 to 230V AC 47/63 Hz
Power Consumption (w/drive	es) <96 watts
Operating Temperature	10°-35°C (50°-95°F)
Relative Humidity	10%-80%
Net Weight	1.5 lbs. (.680 kg)
Dimensions	6" W x 2.7" H x 9" D
	(15.24cm X 6.8cm X 22.86cm)
Agency Approvals	RoHS compliant

Features

- Ruggedized, scratch-resistant exterior and impact resistant display.
- Compact, lightweight, and portable. With a footprint of only 9" x 6" x 2.7" it fits easily into a backpack for easy transporting, or use the sturdy carrying case (included with Talon E) that includes room for storing accessories.
- Capture to multiple image formats for greater flexibility and compatibility with forensic analysis software. Formats include mirror copy, DD image, E01 file format (featuring hardware-based compression to maintain line speed performance).
- Capture from 1 suspect to 1 or 2 evidence drives at speeds over 7GB/min. Supports drive spanning.
- Uses the highest level of authentication. The Talon-E computes MD5 and SHA-256 hash concurrently in real time at full capturing speed.
- Provides 100% write-protection (source drive) Use the Talon-E as an external write-blocker for easy drive preview/image transfer, eliminating the need for additional write-block hardware.
- Industry-proven, easy to use, password-based security system (based on the ATA security specification T13) protects evidence drives from unauthorized access.
- Optional encryption feature (available in a future update) provides maximum security when transporting sensitive data. Decryption is facilitated using the write protected eSATA port.
- Support for IDE/SATA drives is built-in to the Talon Enhanced. Support for SCSI, SAS, eSATA, and microSATA drives is available with optional adapters.

These adapters also provide an optional high-speed (up to 2GB/min) USB device capture feature.

- Built-in eSATA port provides faster transfer of data to a PC post-capture.
- Keyword search capability. Search for hundreds of words concurrently on a hard drive either during the capture process or on a single drive.
- Use with optional NETConnect[®] networking module (kit version) for fast transfer of forensic data to network locations.
- Features include audit trail report (time-stamped), wipe mode (including DoD level wipe and Secure Erase), USB port, touch screen display, embedded, back-lit keypad (that can be turned off when stealth is required), and support for imaging DCO/HPA disk regions

Using this guide

This user guide is made up of 11 sections:

- Introduction
- Getting Started (Fast Start)
- Drive Capture Modes and Settings
- Other Modes
- Capturing RAID Configurations
- USB and eSATA Connection
- Keyword Searching
- Optional Peripherals
- Internal Flash Memory
- Software and Firmware Loading Instructions
- Reference / FAQ's / Index

Please read **Chapter 1: Introduction** and **Chapter 2: Getting Started** before attempting a drive capture. It is recommended that you practice with a test or scratch drive to fully appreciate the unit's features.

System description

The Talon Enhanced Standalone system is packed in a molded soft carrying case. Inside, you will find the following components:

- Power supply
- A set of 5" & 9" PATA (IDE) data and power cables



- One 5" (inside the Talon Enhanced) and two 9" SATA data/power cable
- eSATA to eSATA cable
- USB mini cable
- CompactFlash card
- CD with Talon Enhanced software and a user's manual

NOTE: It is recommended that you always use the carrying case to store and carry the unit.

The Talon Enhanced Kit is packed in a rugged hard-sided carrying case. Inside, you will find the following components:

- Power supply
- A set of 5" & 9" PATA (IDE) data and power cables
- One 5" (inside the Talon Enhanced) and two 9" SATA data/power cable
- eSATA to eSATA cable
- USB mini cable
- CompactFlash card
- 18" extended length IDE and SATA data & power cables
- 2.5" IDE adapter
- 1.8" IDE adapter
- 1.8" ZIF IDE adapter
- microSATA cable for microSATA interface drives
- eSATA cable for eSATA interface drives
- SAS adapter supports capture from SAS drives
- High-speed USB drive acquisition software key code option. Enable the USB port on the SAS adapter to capture USB enclosures and thumb/flash drives
- CD with Talon Enhanced software and a user's manual

NOTE: It is recommended that you always use the carrying case to store and carry the unit.

Caution: Incorrectly connecting the suspect drive to the system can result in data on the suspect drive to be lost forever. <u>Never place a suspect drive inside the Talon Enhanced as data may be overwritten</u>.

Caution: Never place a suspect drive into any other Logicube products (e.g. $SuperSonix^{®}$) that are used for Operating System cloning.

Logicube



Figure 1, Talon Enhanced

2. Getting Started

Drive Names and Locations

The following naming conventions will be used throughout this manual:

The Hard disk drive attached inside the Talon Enhanced is always referred to as the **Destination 1 or D1** (or **Evidence**) drive. The drive attached on the outside above the touch screen display is always referred to as the **Source** (or **Suspect**) drive. The drive attached on the outside to the right side is always referred to as the **Destination 2 or D2**. **PATA** (Parallel-ATA) will be used instead of the older term, IDE or E-IDE.

NOTE: Please refer to Fig. 2 as you read the information below.





IMPORTANT NOTE!

DESTINATION DRIVES

Before connecting, disconnecting, or swapping Destination drives (D1 or D2), the Talon Enhanced must be turned off first.

Setting Up the Talon Enhanced

The Logicube Talon Enhanced is able to detect whether PATA (or Parallel-ATA, commonly known as IDE) or SATA (Serial-ATA) drives are attached to any of the Source or Destination positions. The unit is capable of capturing to SATA drives from PATA drives and vice versa (as well as PATA to PATA and SATA to SATA).

NOTE1: An optional IDE Cloning Adapter (F-ADP-IDE) is required to capture **to** IDE/PATA **destination** drives. The adapter is not necessary to capture **from** IDE/PATA **source** drives. Contact Logicube Sales for information regarding this adapter.

NOTE2: Never attach both a PATA and SATA drive to a single Source or Destination position. The unit can only handle one drive on each position. It is perfectly fine to attach a PATA drive to one position (e.g. Source) and a SATA drive to the other position (e.g. Destination).

Before applying power perform the steps listed below:

Opening the Logicube Talon Enhanced

The first Destination drive is attached to the inside of the Logicube Talon Enhanced. To open the unit, press the two latches at the base of the unit and lift the top lid. You will notice two connections:

- a. A 4-pin power connector.
- b. A SATA data connector.

NOTE: The Talon Enhanced can have two Destination drives. The Destination positions will be called **D1** for Destination 1 and **D2** for Destination 2. **D1** is located inside the Talon Enhanced while **D2** is located on the outside to the right of the Talon Enhanced.

Connecting a PATA Drive

PATA Destination Drive

IMPORTANT NOTE!

DESTINATION DRIVES

Before connecting, disconnecting, or swapping Destination drives (D1 or D2), the Talon Enhanced must be turned off first.

The following steps describe how to connect a PATA drive to the Destination position:

NOTE: The SATA cables in the Destination position must be removed from the Talon



Enhanced when a PATA drive is connected to the Destination position.

- 1. Open the Logicube Talon Enhanced by following the steps previously mentioned.
- 2. Attach the optional SATA to PATA (IDE) adapter (F-ADP-IDE) to the SATA cable inside the Talon Enhanced.
- Connect the 5" power cable to the 4-pin power molex on the PATA adapter.
 Connect the PATA drive to the SATA to PATA adapter along with the other end of the power cable.

PATA Source Drive

The following steps describe how to connect a PATA drive to the Source position:

NOTE: The SATA cables in the Source position must be removed from the Talon Enhanced when a PATA drive is connected to the Source position.

- 1. Connect the 9" power cable to the 4-pin black molex outside the Talon Enhanced, next to the 40-pin data connector.
- Connect the 9" PATA (IDE) data cable to the 40-pin data connector outside the Talon Enhanced. When connecting the 9" PATA data cable to the 40-pin data connector inside the Talon, make sure you connect the side marked "DUPLICATOR SIDE".
- 3. Connect the PATA drive to the other end of the power and data cables. When connecting the PATA data cable to the drive, make sure you connect the side marked "HDD SIDE".

Note: In order for a capture to work, most PATA drives must be configured as a master drive. If you are going to capture a drive that is used as a slave drive, move the jumper to the master position. Before moving a jumper note its position so you can return the suspect drive to its original state when the capture operation has been completed.

There are some drives that do not follow the requirement stated above. Those drives are:

 Western Digital – Most Western Digital drives require that the jumpers be removed for a capture to work. The exception to this requirement is for the Western Digital "Xpert" series hard drives (an older manufactured

version) where the jumper is set to the master position.

 Quantum - The jumper must be placed in the "DS" position. The "DS" position is adjacent to the 40-pin connector. See figure 3.



Connecting a SATA Drive

NOTE: Internal drives are always referred to as the **Destination 1** (or **D1** or **Evidence**) drive. The outside drives to the right side of the Talon Enhanced are always referred to as the **Destination 2** (or **D2** or **Evidence**) drive. The outside drives towards the top of the Talon Enhanced are always referred to as the **Source** (or **Suspect**) drives.

SATA Destination Drive

IMPORTANT NOTE!

DESTINATION DRIVES

Before connecting, disconnecting, or swapping Destination drives (D1 or D2), the Talon Enhanced must be turned off first.

The following steps describe how to connect a SATA drive to the D1 Destination position:

- 1. Open the Logicube Talon Enhanced by following the steps previously mentioned.
- 2. Connect the 5" SATA cable to the 4-pin black molex and to the SATA port inside the Talon Enhanced.
- 3. Connect the SATA drive to the other end of the SATA cable.
- 4. Close the Talon Enhanced lid.

NOTE: A SATA drive can be connected on the D2 Destination position. The D2 Destination position is used in some modes

(e.g. S1=>D1&D2). If a single Destination drive is being used, it must be attached to the D1 Destination position.

SATA Source Drive

The following steps describe how to connect a SATA drive to the Source position:

NOTE: The PATA cables in the Source position must be removed from the Talon Enhanced when a SATA drive is connected to the Source position.

- 1. Connect the 9" SATA cable to the 4-pin black molex and SATA port outside the Talon Enhanced.
- 2. Connect the SATA drive to the other end of the SATA cable.

Connecting other types of drives

Logicube sells specialized adapters that allow other types of drives to be connected to the Logicube Talon Enhanced. Such drives include 2.5" PATA (IDE) drives, 1.8" PATA (IDE) or SATA drives and USB drives. SCSI and SAS drive adapters are also available. The SAS adapter is included in the Talon Enhanced Field ToughKit.

If you are unsure about the type of drive that you have, please contact Logicube Technical Support for assistance.

The user interface

The user interface (UI) has been re-designed with the professional in mind. It is fast, responsive, and to the point; which means it requires very few keystrokes to achieve a desired action.

NOTE: Please refer to Fig. 4 as you read the information below.



Figure 4, Buttons and Interface

Touch Screen

The Talon Enhanced features an LCD Touch Screen that allows the user to quickly input commands. This screen replaces many of the buttons that were present on older Logicube Forensic Talon models. The screen is bright and easy to read. It also has an audible beep every time the touch screen is pressed. This lets the user know that the touch screen is active and can be turned off, if desired.

Calibrating the Touch Screen

There may be times when the user wants to recalibrate the Touch Screen. The procedure for this is very simple as outlined in the procedure below:

- 1. Turn the Talon Enhanced off using the power switch located on the right side of the device.
- 2. Press and hold the **SET** button, then turn the Talon Enhanced on using the power switch.
- Hold the SET button until the Talon Enhanced boots to a screen that reads "Touchpad Calibration. Touch the center of square (1/5)".

NOTE: You can also calibrate the touch screen with a stylus or the dull plastic tip of a writing instrument. Do not use any writing instrument that will leave marks on the unit.



- 4. Look for a square at the top of the screen. Touch the square when it is located. The square should move to a different part of the screen.
- 5. Repeat the previous step four more times. The unit will count each time the square is pressed correctly. It will count (1/5), (2/5), etc.
- 6. Once the screen has been calibrated, it will show the Main Menu Screen.

Stealth Mode

The Talon Enhanced has a Stealth Mode feature. Stealth mode will hide what is currently being processed or captured by doing the following:

- Display a blank screen
- Turn off the backlight on the display

Turning On Stealth Mode

To turn Stealth Mode on, press and hold the **SET** button for 5 seconds. The screen should go blank.

Turning Off Stealth Mode

To turn Stealth mode off, press and release the **BACK** button.

Date & Time

The time can be adjusted by setting the correct Time Zone along with the Daylight Savings setting. Please refer to *Time Zone* and *Daylight Savings* in the *Misc. Menu* section of **Chapter 4: Other Modes** for more information on these two settings.

Buttons

The Talon Enhanced features three buttons that are located below the touch screen display.

• START/STOP Button – Pressing this button twice from the Main Menu to begin a DD Image Capture using the currently saved settings. Pressing and holding down the START/STOP button in the middle of a capture will abort the process. Pressing this button once presents a preview screen where you can decide whether to press it again to begin the selected process, or back out to reconfigure.

- **BACK Button** This button is used to go back to the previous screen or to cancel out of a given operation.
- SET Button Hold this button while powering up the Talon Enhanced for screen calibration or to finalize log file names. The Set button is also used extensively in some menu settings like Keyword Search and Calculate Hash.

Alphanumeric Keypad

The alphanumeric keypad is used for labeling capture sessions, entering passwords and other functions.

Indicator Lights

The indicator lights (LED) are located to the left of the touch screen. The three indicator lights give some information about the Talon Enhanced and its current status or operation:

Top LED – This is the power indicator. This LED is green and remains on while the Logicube Talon Enhanced is receiving power.

Middle LED – This is the status indicator for Destination 1 (D1). This LED blinks green during capture operations and any operation that accesses the drive in the D1 position. This LED will turn solid red if there is an error involving the drive in the D1 position.

Bottom LED – This is the status indicator for Destination 2 (D2). This LED blinks green during capture operations and any operation that accesses the drive in the D2 position. This LED will turn solid red if there is an error involving the drive in the D2 position.

E01 Resume (Incomplete Sessions)

When an E01 capture is being performed and the capture process is interrupted (for example, the AC adapter was disconnected or the power switch accidentally turned off), the Talon Enhanced has the ability to resume the unfinished capture. When this occurs, the Talon Enhanced will boot to a special screen that states:

Found Incomplete Session

This screen will contain the case name that was used before the session was interrupted along with the capture mode and status. On this screen, there are three options:

Don't ask – Selecting this option will place a check mark on the box. This will instruct the Talon Enhanced to no longer show you the resume screen for this capture. Unless this option is checked, the 'Found Incomplete Session' screen will come up every time the Talon Enhanced is turned on.



Res – Resume button. Selecting this will resume the E01 capture that was interrupted.

Skip – This button will skip the resume function allowing you to either start from the beginning or start a different capture.

NOTE: There is a way to go back and resume previously skipped sessions even after 'Don't ask' was checked. For more information on viewing previously skipped sections, see the *E01 Resume* section in *Chapter 4: Other Modes*.

NOTE: When resuming an incomplete session, the same Source and Destination drive(s) must be attached to the Talon Enhanced. An error will appear if the serial numbers of the Source or Destination drive(s) do not match.

3. Drive Capture Modes and Settings

Main Screen

The main menu screen appears when the Logicube Talon Enhanced is first powered up. It displays the Title Screen and four menu options: Misc., Drives, Settings, and About.



Misc

Tap the *Misc.* icon to access the following functions:

- Backlight (on or off) •
- Authenticate Trail
- Manage Settings •
- Manage Destination menu •
- Print Options menu •
- Debug (on or off) •
- Beeper (on or off) •
- Audio Notice (on or off) •
- Security •
- SCSI/SAS Adapter •
- Retries (adjustable) •
- Install Options •
- File System •
- Time Zone .
- E01 Resume •
- **Daylight Saving** •
- Audio Test

These options are explained in more detail under Chapter 4: Other Modes.





Drives

Tap the **Drives** icon. Another screen will come up asking you to select S1, D1, or D2. Depending on what is connected to the unit, make your choice by tapping the desired drive's icon. The unit will then access the drive selected and report back the drive's model number, capacity, geometry and other information.



Settings

Tap the Settings icon to access the settings screen.

NOTE: All of the features available in the Settings menu are explained starting on the next section (Modes of Operation).



About

Tap the **About** icon to display the serial number of your unit along with the software and firmware versions that are loaded. In addition, the About screen provides contact information for Logicube Technical Support.

Modes of Operation

The Logicube Talon Enhanced supports three different operations to capture data from a suspect drive: **Mirror Capture**, **DD Image Capture**, and **E01 Image Capture**. These modes are found in the Settings Menu along with several other operations. The different modes of operation are briefly described below.

NOTE: Each time the Logicube Talon Enhanced is powered off, the cloning mode and preference settings are returned to their default settings.

The following Modes of Operation are found in the Mode Setting Menu:



Capture

This process captures all data from the source drive to the destination drive. This mode is also called a "Native Capture" or "Mirror Capture" since data is captured bit-by-bit to one or two destination drives.



DD Image

This mode creates a subdirectory per drive captured. The files created are in DD file format. The file size choices are 650 MB, 2 GB, 4 GB, or DISK. These files are directly accessible by popular Forensic analysis software tools, such as, FTK and iLook.



E01 Image

This mode captures drives directly into the E01 format. The evidence or destination drive can then be easily opened to the analysis software in a ready-to-analyze state. This eliminates the time consuming conversion step that users typically must perform today.



Drive Defect Scan

This operation performs a surface scan of the drive media using the drive controller to verify the media, and detect bad or "weak" sectors. This mode is described in **Chapter 4. Other Modes**.



Wipe Destination

This is used to erase all data on the destination drive prior to a Mirror Capture. This mode is described in **Chapter 4: Other Modes**.



Calculate HASH

This is used to compute SHA-256 and MD5 values of the source, or destination drives. This mode is described in **Chapter 4: Other Modes**.



USB / eSATA

This mode is used to connect the Talon Enhanced to a PC through the USB or eSATA port. This mode is described in **Chapter 6: USB and eSATA Connection**.



Used to perform a binary or hexadecimal keyword search on a given drive. This mode is described in **Chapter 7: Keyword Search**.

Capturing a Drive

Connect the drives as previously described.

For Mirror Capture – The Destination drive must be at least the same or larger in capacity than the Source drive (Suspect drive).

For DD Image and E01 Image – The destination drive must be larger in capacity than the Source drive (Suspect drive).

NOTE: Logicube has split the Talon Enhanced firmware into multiple files in order to optimize performance. This requires a short 45-60 second reconfiguration process that will occur when the user is switching between E01 mode to or from all other capture modes.



Mirror Capture – Step-by-Step

- 1. Make sure that the Source and Destination drives are attached to the device and the Talon Enhanced is turned on.
- 2. From the Main Screen, tap the **Settings** icon to enter the Settings menu.
- 3. Tap the *Capture* icon.
- 4. Tap the *Mode* icon and choose the configuration that is best suited for your capture session.

NOTE: See the <u>Optional Preference Settings</u> section of this chapter for more information on the Mode setting.

 Scroll through the other optional preferences – <u>Verify</u>, <u>On Error</u>, <u>Speed</u>, <u>Word List</u>, and <u>Modify List</u>. Modify them as needed by tapping the different settings for each.

> **NOTE**: See the <u>Optional Preference Settings</u> section of this chapter for more information on these preference settings.

6. Press the START/STOP button twice.

NOTE: If you have used E01 mode in a capture session immediately prior to this capture session the following message will appear:

"Need to reconfigure, continue?"

Tap the **YES** icon to continue. This process takes 45-60 seconds. When the Talon Enhanced finishes reconfiguring, a message will appear:

"Reconfiguration COMPLETED. Press any key to continue".

Press any of the three buttons below the touch screen to continue.

- 7. The following message will appear: "Continuing will overwrite a portion of your destination drive(s). Are you sure?" Tap the **YES** icon. The Talon Enhanced will apply power to the drives then access the System CF card. The following message will appear: "Enter Log file name and press SET"
- Use the alphanumeric keypad to enter a Log file name of 8 characters or less. Press the SET button when finished.
- 9. If the Destination drive has not been erased with the Wipe Destination function, the unit will ask if you wish to erase the Destination drive. Choose YES or NO. If YES is chosen, the unit will completely wipe the destination drive before it begins to capture data. This process adds significant time to the duration of the capture session.

NOTE: The log file will state whether or not the Destination drive has been properly erased.

- 10. The unit will capture bit-by-bit every readable sector from the Suspect drive to the Destination drive, whether or not it contains data.
- After all sectors have been captured, if the destination drive was not erased, the unit will ask if you wish to erase the remainder of the Destination drive. Choose Yes or No. If Yes is chosen, the unit will completely wipe the remainder of the destination drive.

NOTE: The log file will state whether or not the Destination drive has been properly erased.

12. If Auto Print was set to "Yes" in the Misc. menu, the user will be prompted to connect the printer and make sure that it is powered up and online. Press SET to print or BACK to skip printing.

NOTE: Please refer to "*Printing a Report*" later in this chapter for more printing options.

13. A copy of the final capture report is written to the System CF card. It is titled <Log file name>.LOG. The report can be accessed and printed from Windows, if the Talon Enhanced unit is connected to a PC via USB or eSATA.

NOTE: Please refer to **Chapter 6: USB and eSATA Ports** for more information.

14. The capture ends with a "Capture Successful" message. It also displays the SHA-256 and MD5 Hash values for the Source and Destination drives together when the Verify setting is set to HASH + V.

Special Settings for Mirror Capture Mode

The settings below are unique to the DD Image Capture mode:



Verify

For Mirror Capture Mode, the Verify Setting has some optional settings which are not available in any other mode. The settings available in Mirror Capture mode are:

- NONE No verification. This setting is only recommended for non-Forensic cloning operations.
 - **NOTE:** Without verification, bad or weak sectors on the Destination drive will not be detected. This could cause the copy to be invalid.
- HASH This setting uses special hardware to compute 256-bit SHA-256

and 128-bit MD5 values at an extremely fast and accurate rate.

• HASH + V – This setting behaves like HASH, except that it also reads back captured data and compares it to the Source drive in 50MB chunks. This setting is recommended to ensure the accuracy of the hash values.

NOTE: The "+ V" settings will double the cloning time of a capture session.

DD Image Capture – Step-by-Step

1. Make sure that the Source and Destination drives are attached to the device and the Talon Enhanced is turned on.



- 2. From the Main Screen, tap the Settings icon.
- 3. Tap the *DD Image* icon.
- 4. Tap the *Mode* icon and choose the configuration that is best suited for your capture session.

NOTE: See the <u>Optional Preference Settings</u> section of this chapter for more information on the Mode setting.

 Scroll through the other optional preferences – <u>Verify</u>, <u>File Size</u>, <u>On Error</u>, <u>Speed</u>, <u>Word List</u>, and <u>Modify List</u>. Modify them as needed by tapping the different settings for each.

> **NOTE**: See the <u>Optional Preference Settings</u> section of this chapter for more information on these preference settings.

6. Press the **START/STOP** button twice.

NOTE: If you have used E01 mode in a capture session immediately prior to this capture session the following message will appear:

"Need to reconfigure, continue?"

Tap the **YES** icon to continue. This process takes 45-60 seconds. When the Talon Enhanced finishes reconfiguring, a message will appear:

"Reconfiguration COMPLETED. Press any key to continue".

Press any of the three buttons below the touch screen to continue.

 The following message will appear: "Continuing will overwrite a portion of your destination drive(s). Are you sure?" Tap YES. **NOTE:** The Destination drive needs to be formatted before data capture is possible. If it hasn't been formatted yet, or if the drive format is different from the saved setting (FAT32 vs. NTFS), a prompt will come up. Tap **YES** to format the drive. A confirmation prompt will appear confirming that you want to continue. Tap **YES** to begin formatting the Destination drive.

See **Chapter 4: Other Modes** for more information on managing the Destination drive.

 The next screen prompts you to enter a Case file name using the keypad. For a DD Capture, the character limit is 195 characters except when using Spanning mode (S1 => D1 + D2) which has a character limit of 193 characters.

NOTE: If a Case file already exists on the destination drive (i.e. from a previous DD Image capture) the unit will not allow you to enter the same file name again.

NOTE: If the file system on your Destination drive differs from the *File System* setting, you will be prompted with the following message:

"D1 File System is different from setting! Would you like to change setting(No) or reformat(Yes)?"

Choosing (No) will abort the capture. Choosing (Yes) will format the destination drive based on the *File System* setting. For more information, see the *File System* section in *Chapter 4: Other Modes*.

- 9. A sub-directory (by the same name) will be created under the root directory on the destination drive.
- 10. The capturing process will create as many files as necessary within this sub-directory, with increasing extension numbers (e.g. my_disk.001, my_disk.002, etc.)
- 11. At the end of the process, a file with the **.log** extension is created and placed in the same sub-directory. The file is also written to the System CF card. It includes (among other things), the SHA-256 and MD5 Hash values of all captured DD files or the entire Source Drive. Refer to the **Special Settings** section later in this chapter.
- 12. If Auto Print was set to "Yes" in the Misc. menu, you will be prompted to connect the printer and make sure that it is powered up and online. Press SET to print or BACK to skip printing.

NOTE: Please refer to the "*Printing a Report*" section later in this chapter for more printing options.

 The capture ends with a "DD Capture Successful!" message. It also displays the SHA-256 and MD5 Hash values for the Source and Destination drives together when Verify setting is set to Disk or Disk + V.



Special Settings for DD Image Mode

The settings below are unique to the DD Image Capture mode:



Verify

For DD Image Mode, the Verify Setting has some optional settings which are not available in any other mode. The settings available in DD Image mode are:

 NONE – No verification. This setting is only recommended for non-Forensic cloning operations.

NOTE: Without verification, bad or weak sectors on the Destination drive will not be detected. This could cause the copy to be invalid.

- File This is the default setting for verification and uses special hardware to compute SHA-256 and MD5 values for each individual DD Image file.
- File + V This setting behaves like File, except that it also reads back captured data and compares it to the Source drive.
- **Disk** This setting uses special hardware to compute the SHA-256 and MD5 values for the entire Source drive.
- Disk + V- This setting behaves like Disk, except that it also reads back captured data and compares it to the Source drive.



File Size

This setting allows the user to choose the size of captured DD Image files. The choices are:

- 650MB Image files of this size can be archived on a CD-ROM.
- 2GB Image files of this size can be archived on Flash Memory cards or Thumb Drives.
- 4GB Image files of this size can be archived on larger Flash memory / USB drives or a DVD-ROM.

• **DRIVE** – This selection will create a single DD image file. The size of the file depends on the size of the Source drive captured.

Loading DD Image files into a Forensic Investigative Tool

Once the DD Image files are captured to a Destination drive, they can be easily loaded into a Forensic Investigative tool that supports DD Images. Consult your software's manual for more information.

- 1. Attach the Talon Enhanced to the PC via the USB or eSATA, (please refer to **Chapter 6. USB and eSATA Ports**).
- 2. Load the DD Image into your software as per the software manufacturer's instructions.

NOTE: If there is an option for the number of "Bytes per sector", set it to 512. Also, some software may ask to mount a drive as either "physical" or "logical". If your software gives you this option, select "physical".



E01 Image – Step-by-Step

The E01 option captures hard disk drives directly into the E01 format. The evidence or destination drive can then be easily uploaded to the analysis software in a ready-to-analyze state. This eliminates the time-consuming conversion step that users typically must perform.

Note: At this time, the E01 Image format is supported with Encase v6.x and Forensic Toolkit (FTK) v3.x.

1. Make sure that the Source and Destination drives are attached to the device and the Talon Enhanced is turned on.



- 2. From the Main Screen, tap the Settings icon.
- 3. Tap the *E01 Image* icon.
- 4. Tap the *Mode* icon and choose the configuration that is best suited for your capture session.

NOTE: See the **Special Settings for E01 Image Mode** section of this chapter for more information on these preference settings.

 Scroll through the other optional preferences – <u>Verify</u>, and <u>On Error</u>. Modify them as needed by tapping the different settings for each.

> **NOTE:** See the **Special Settings for E01 Image Mode** section of this chapter for more information on these preference settings.

6. Tap the Setting icon to go to the E01 Setting Menu.



- To enter any notes or to select the Info Show icon press D1 or D2 respectively depending on which Destination drive(s) you are working on.
- 8. Press the START/STOP button twice.

NOTE: If you have used a mode other than E01 in a capture session immediately prior to this capture session the following message will appear:

"Need to reconfigure, continue?"

Tap the **YES** icon to continue. The process takes 45-60 seconds. When the Talon Enhanced finishes reconfiguring, a message will appear:

"Reconfiguration COMPLETED. Press any key to continue".

Press any of the three buttons below the touch screen to continue.

9. The following message will appear: "Continuing will overwrite a portion of your destination drive(s). Are you sure?" Tap **YES**.

NOTE: If the file system on your Destination drive differs from the *File System* setting, you will be prompted with the following message:

"D1 File System is different from setting! Would you like to change setting(No) or reformat(Yes)?"

Choosing (No) will abort the capture. Choosing (Yes) will format the destination drive based on the *File System* setting. For more information, see the *File System* section in *Chapter 4: Other Modes*.

 The next screen prompts you to enter a Case file name using the keypad. For an E01 Image Capture, the character limit is 195 characters except when using Spanning mode (S1 => D1 + D2) which has a character limit of 193 characters.

NOTE: If a Case file already exists on the destination drive (i.e. from a previous E01 Image capture) the unit will not allow you to enter the same file name again.

- 11. A sub-directory (by the same name) will be created under the root directory on the destination drive.
- 12. The capturing process will create as many files as necessary within this sub-directory, with increasing extension numbers (e.g. my_disk.e01, my_disk.e02, etc.)
- 13. At the end of the process, a file with the **.log** extension is created and placed in the same sub-directory. The file is also written to the internal Flash memory. It includes

(among other things) the MD5 Hash values of all captured E01 Image files.

14. If Auto Print was set to "Yes" in the Misc. menu, you will be prompted to connect the printer and make sure that it is powered up and online. Press SET to print or BACK to skip printing.

NOTE: Please refer to the "*Printing a Report*" section later in this chapter for more printing options.

15. The capture ends with an "E01 Capture Successful!" message. It also displays the MD5 Hash values for the Source and Destination drives together when Verify setting is set to Disk or Disk + V.

Special Settings for E01 Image Mode

The E01 selection choices for the settings Mode, Speed, Verify and On Error are different from the other modes. The selection choices are as follows:

Mode	S1=>D1 (Default)
	S1=>D1&D2
	S1=>D1+D2
Speed	Select UDMA-5 or UDMA-4 (Default is UDMA-5)
Verify	Select DISK or DISK+V
On Error Retry	Select Retry or Abort
	The remaining icons are specific to E01 and are explained below.
Segment Size	Select 1500M Byte or 4000M Byte
Compression	Select YES or NO
Setting	The Settings icon is used to add relevant case information using the keypad and must be entered for the capture to initiate:



Case Number

Examiner

Time information (yyyy/mm/dd hh:mm)

Notes



Press the Notes icon to enter up to 64 characters of pertinent information using the keypad.

Press the **SET** button to save a note. Press the **BACK** button to leave the screen without saving a note.

Info Show

Pressing the Info Show icon will display the current case information that will be tied to the E01 capture report.

Sample E01 Info

Case No: GFK008

Examiner: R_SMITH

Notes: Any notes you wish to add.

Timestamp: 200910141439

Printing a report

At completion of a capture, you might want to print a report. You must keep the Talon Enhanced powered on in order for it to retain the report information from the last session.

NOTE: A Brother MW-120 portable thermal printer is available for purchase from Logicube.

Printing with the Brother (thermal) Printer

- 1. Connect the Brother printer to the Talon Enhanced using the special serial cable included with the printer.
- 2. Power the printer using the printer power adapter.

CAUTION: Don't confuse this power adapter with the Talon Enhanced power adapter. Press the power button on the printer until it lights up.

3. Make sure that the Brother printer is loaded with A7 size thermal paper. For paper loading instructions, refer to the Brother printer User Manual.
NOTE: Do not use plain paper in the Brother printer.

- From the Talon Enhanced main screen, tap the *Misc* icon, then tap the *Print Options* icon.
- 5. Tap the *Print Reports* icon, and then tap the *Print Last Session* icon.
- 6. Follow the instructions on the screen. A report should now print.

Every operation performed with the Talon Enhanced also writes a copy of the report to the CF Card. This report can be easily accessed in Windows and printed from a text editor like Notepad.

Optional Preference Settings

All of the preference settings below are available for Mirror Capture and DD Image Capture modes. For E01 preferences, please see the section **"Special Settings for E01 Image Mode"** earlier in this chapter.

Mode

The Mode option allows the Talon Enhanced to be configured to capture from 1 Source drive to 1 or 2 Destination drives.



S1 (Source 1) to D1 (Destination 1) – This mode allows one Source drive to be captured to one Destination drive. This is the default mode setting.



S1 to D1 and D2 – This captures the contents of one Source drive to two Destination drives. This is ideal for making a copy to keep in evidence and an extra copy for investigation.



S1 to D1 + D2 – This image Spanning mode is available only under DD image capture and allows you to capture from one large suspect drive and span DD images to two smaller evidence drives. Any subsequent DD capture performed using this mode will be added provided drive space is available. Case data is not overwritten.

NOTE: A very fast free space check enhancement has been incorporated into the latest software and firmware release. Check your Talon Enhanced frequently to ensure you benefit from these enhancements.





Verify

The Verify option is provided to add an increased level of confidence in the capture process. The choices are: **HASH**, **HASH + V** and **NONE**.

- **HASH** This setting uses special hardware to compute 256-bit SHA-256 and 128-bit MD5 values at an extremely fast and accurate rate.
- HASH + V This setting behaves like HASH, except that it also reads back captured data and compares it to the Source drive in 50MB chunks. This setting is recommended to ensure the accuracy of the hash values.

NOTE: The "+ V" settings will double the cloning time of a capture session.

 NONE – No verification. This setting is only recommended for non-Forensic cloning operations.

NOTE: Without verification, bad or weak sectors on the Destination drive will not be detected. This could cause the copy to be invalid.



Speed

The speed setting provides the option to set the speed at which an operation will be performed at.

 UDMA-6 – The software performs a test procedure to determine the fastest setting that the drives will tolerate while streaming data from one to the other.

When set to UDMA-6, all speeds grades below will be tested (i.e. UDMA 0-6, PIO-AUTO PIO-PIO Medium and PIO-SLOW).

• **UDMA-5** – With UDMA-5 selected, the software performs a test to determine the fastest speed setting that the drives will tolerate while streaming data from one drive to another.

When set to UDMA-5, all lower speed grades will be tested (i.e. UDMA 0-4, PIO-AUTO PIO-PIO Medium and PIO-SLOW)

- UDMA-4 Force the unit to use at most this speed. Set the unit to this mode in some rare situations where one or both drives do not support the higher speeds, and "misbehave" during our automatic speed benchmarking.
- UDMA-3 Same as UDMA-4.
- UDMA-2 Same as UDMA-4.

- UDMA-1 Same as UDMA-4.
- UDMA-0 Same as UDMA-4.
- PIO-Auto (PIO-4) Force the unit to use this as the highest speed (PIO-4). Set the unit to this mode in some rare situations where one or both drives do not support higher speeds, and "misbehave" during our automatic speed benchmarking.
- **PIO-Medium** This is a fixed value that almost all drives will tolerate. It will result in copying speeds from about 200 to over 500 MB per minute depending upon the characteristics of the drives.
- PIO-Slow This is a speed value that all drives will be able to tolerate. It supports copying speeds from 100 to over 300 MB per minute depending on the characteristics of the drives.

NOTE: Use the MEDIUM or SLOW modes if you encounter drive "time-outs" or if you are capturing very old drives.



On Error

The On Error setting determines the behavior of the unit in the case where bad spots are detected on the source (suspect) drive. This setting has four options, which include:

- Skip This is the default setting. Skip will allow the Talon Enhanced to continue by stepping over the bad sector.
- Abort This mode will cause the Talon Enhanced to halt if an error such as a bad suspect drive sector is encountered.
- **Retry** Retry will instruct the Talon Enhanced to make several attempts to read data from the damaged area of the drive. The user can configure the number of retry attempts from 0 to 1000 by pressing the Retries icon under Misc. to set the desired value.
- Recover Recover will attempt to recover as many bytes of data as possible from each bad sector that is encountered
 - **NOTE:** Data in any skipped sectors will NOT be copied to the destination drive. The corresponding sector of the Destination drive will instead be "padded" with zeroes. The padded sector will then be included in the final SHA-256 and MD5 values.

ADDITIONAL NOTE: The absolute location of each skipped sector will also be listed on the final Capture Report. The first 200 bad sectors will be recorded, after which the unit will



continue to skip bad sectors but it will not record their absolute locations. The final capture report will show the total number of sectors skipped.

Option	Action	Time to complete
Abort	A bad sector aborts the cloning operation	Immediate
Skip (default)	Skips the bad sector	Fast
Retry	Attempts several retries to recover data of sector, then skips	Slower
Recover	Attempts a full-blown recovery algorithm, then skips	Very slow

Table 1, Error settings

NOTE: When capturing a Source drive that is known to have many bad sectors, the speed should be set to PIO-AUTO. Also, if the drive is captured or scanned multiple times, the SHA-256/MD5 Hash value of each session could differ. This is because some bad sectors will read intermittently.



Word List

The Word List Option is described in more detail in **Chapter 7: Keyword Searching**.



Modify List

The Modify List Option is described in more detail in **Chapter 7: Keyword Searching**.

Capturing Data from HPA and DCO Configurations

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 Or 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** Or Device Configuration Overlay limits the size of a drive only. For example, a 60GB drive can be made to look like a 30GB drive to a PC.

The Talon Enhanced is able to unlock and capture data from both HPA and DCO configurations. The Talon Enhanced will then re-lock the DCO. HPA's are relocked when the Source drive is hard-booted after capture.

The Final capture report is also able to report any HPA and/or DCO that is found.

The report only shows the existence of an HPA and if it was unlocked.

The report also shows the existence of a DCO and if it was unlocked and captured. It also lists the maximum LBA, size and speed setting of the DCO

The report looks something like this:

**** Talon Enhanced Sei	rial No.:97001 *****			
* Software: V1.0.0RC00-48 Firmv	vare: V0.3 *			
* Time Zone: -8 Davlight Saving: +0 *				
* Date: 11/15/2011 Time: 11:04:12 *				
*	*			
* Acquired by	Location *			
*	*			
* Acquired on	AT *			

* Operating Mode: Capture:S1=>D1	Address Mode: LBA *			
* Verify : (SHA-256 & MD5)	+ V Speed : UDMA-6 *			
* Connection : Direct	*			
*	*			
* Operator declined FULL a	and remainder D1 erase! *			
****** counce porce ************************************				
* \$1				
* Model · Maxter 6V060M0	Modol • 97332041839			
* Comial: V21VAOWE	Comini. SUM2CEMA			
* Sellal. IZIAAQIE	Sellal. SVMSGSR4			
" * с. 110150 п. 16 с. 62	с. 620191 н. 16 с. 62 *			
~ C: 119150 H: 10 S: 05	C: 620161 H: 16 S: 65 ~			
* Total Sectors Drive Size	Total Sectors Drive Size			
* 120103200 57.0GB	625142448 298.0GB *			
	×			
* Computed SHA-256 Value:	Computed SHA-256 Value: *			
* 988E363B F84F9E/C FFBC4FFB	988E363B F84F9E7C FFBC4FFB *			
* CF109A0D 04D1D327 1827023F	CF109A0D 04D1D327 1827023F *			
* 43D82FD3 74F1159D	43D82FD3 74F1159D *			
*	*			
* Computed MD5 Value:	Computed MD5 Value: *			
* D53BB379 FF5F2B84	D53BB379 FF5F2B84 *			
* B998C818 BFF2C85D	B998C818 BFF2C85D *			
*	*			
******	********************************			

*	*			
 * Skipped Sectors: 0 H 	Recovered Sectors: 0 *			
*	*			

Audit Trail Checksum: 5F730028 E7D029FD 5F1E5AC0 1CC8C1CF				



HPA and DCO configurations can only be detected on the Source drive. They cannot be seen on the Destination drive. The following Modes are able to detect, unlock and work with data inside HPA and DCO configurations when the drive is in the Source position:

- Drive Info
- Capture
- DD Image Capture
- Drive Defect Scan
- Calc. HASH
- Keyword Search

4. Other Modes

Introduction

This chapter discusses other options that are found in the Settings menu. They are **Drive Defect Scan**, **Wipeclean™ Destination** and **HASH Scan**. This chapter also discusses the options in the **Misc Menu** accessible from the Main Screen.

NOTE: Keyword Search and related settings are discussed in Chapter 7 and USB/eSATA Mode is discussed in Chapter 6.

Settings Menu Options



Drive Defect Scan

This function performs a surface scan of the drive media using the drive controller to verify the media. It is designed to look for bad sectors, weak sectors or weak spots, which it reports at the end of the scan.

Drive Defect Scan – Step-by-Step

- 1. From the Main Screen, tap the Settings icon.
- 2. Tap the Drive Defect Scan icon.



3. Tap the "Drives" icon. Choose one of the following drives: S1, D1, or D2. Press the Set button to confirm.



- I. Tap the "Speed" icon. Here you have two choices:
 - FAST (default): This mode does a single surface scan of the drive.
 - SLOW: This mode performs three surface scans in a row to better check for bad or weak sectors.
- 5. Press the **START/STOP** button to start the scan.



- The Talon Enhanced will access internal flash memory, then the following message will appear: "KEYPAD ENTRY: Enter Log file name. Press Set when done".
- 7. Use the alphanumeric keypad to enter a Log file name of 8 characters or less. Press the Set button when finished.
- When finished scanning, the Talon Enhanced will display the number of bad or weak sectors found on the drive. A copy of the session report will also be copied to the internal flash memory as <Log file name>.LOG.
- 9. If the Printer was set to "Auto Print", the user will be prompted to connect the printer and make sure that it is powered up and online. Choose YES to print or NO to skip printing.

NOTE: Please refer to **Chapter 3. Drive Capture Modes and Settings** for more printing options.



Wipe Destination

This function is the process that erases or wipes all existing information from the surface of the Destination drive. It is a good idea to erase the drive prior to performing Mirror captures. It ensures that no old data remains on the drive, to be later confused as evidence. Note; information regarding performing a wipe to DoD specifications can be found in the Other Settings section under Manage Destination.

Many newer drives will also support **Security Erase Mode**, which is a much more automated process for wiping data. This mode sends "Security AT" commands to the Destination drive, which allows it to wipe at a very high rate of speed. The unit will automatically switch to Security Erase if it is supported by the attached drives.

NOTE: Security Erase will not run as part of a Mirror Capture session. Ordinary Wipeclean mode is used instead.

Wipe Destination – Step-by-Step

1. From the Main Screen, tap the Settings icon to enter the Settings menu.





- 3. Tap the "Drives" icon. Choose one of the following: D1, D2 or D1 & D2 to wipe both drives simultaneously.
- 4. Tap the "Speed" icon to set the desired UDMA or PIO speed.





- Set the Signature setting to the desired position, there are two choices:
- YES (Default): Writes a small signature to the drive every 16,065 sectors (or every logical cylinder). During a later capture session, this signature tells the Talon Enhanced that the drive(s) have been correctly erased.
- NO: Leaves the signature off the drive. The Talon Enhanced will not detect that the drive has been erased.
- 6. Press the <Start/Stop> button to begin wiping.
- 7. The Talon Enhanced will access internal flash memory, then the following message will appear: "KEYPAD ENTRY: Enter Log file name. Press Set when done".
- 8. Use the alphanumeric keypad to enter a Log file name of 8 characters or less. Press the Set button when finished.
- 9. The Talon Enhanced will automatically detect whether or not the Destination drive will support a Security Erase. If not, then the Talon Enhanced will perform an ordinary Wipeclean operation based on the settings chosen by the user.

NOTE: Just before the wipe starts you may see a message on the UI that says "Set Dest PW to Spaces" This means that a Password key command has been sent to retrieve the security erase support status of the destination drive. No user action is required. If the Talon Enhanced performs a Security Erase, it will do a rough estimate of the Time Remaining. This estimate will appear on the progress bar while an "Elapsed Time" counter will count up the actual erase time.

NOTE: The Progress bar will appear to "hang" at 99% if the actual erase time is longer than the estimated time. The elapsed time counter will continue to run and the Status light will keep blinking until the wipe is finished.

 When finished, the Talon Enhanced will display the following message "drive successfully erased". A copy of the session report will also be copied to the internal flash memory as <Log file name>.LOG.

NOTE: The operation will abort with an error message if bad sectors are encountered on the Destination drive.



11. If the Printer was set to "Auto Print", the user will be prompted to connect the printer and make sure that it is powered up and online. Choose YES to print or NO to skip printing.

NOTE: Please refer to **Chapter 3. Drive Capture Modes and Settings** for more printing options.



HASH Scan

This mode computes the SHA-256 and MD5 Hash values for a given drive (S1, D1, or D2). It can also scan individual files (on the Destination Drive).

Hash Scan – Step-by-Step

- 1. From the Main Screen, tap the Settings icon to enter the Settings menu.
- 2. Tap the Hash Scan icon.
- 3. Tap the "Drives" icon. Choose one of the following drives: S1, D1, D2, File on D1 or File on D2.
- Service Street
- Tap the "Speed" icon to set the desired UDMA or PIO speed.
- **B**^{5.}
 - 5. If a certain number of sectors need to be scanned, go to the "Size" setting. Use the keypad to enter a size in number of sectors. Press the Set button to confirm.
 - 6. Press the <START/STOP> button to begin the scan.
 - The Talon Enhanced will access the CF Card, then the following message will appear: "KEYPAD ENTRY: Use the alphanumeric keypad to enter a Log file name of 8 characters or less. Press the Select button when finished.

NOTE: The operation will abort with an error if bad sectors are found on the drive.

- When finished, the Talon Enhanced will display the SHA-256 and MD5 Hash values. A copy of the session report will also be copied to the CF Card as <Log file name>.LOG.
- 9. If the Printer was set to "Yes", the user will be prompted to connect the printer and make sure that it is powered up and online. Press SELECT to print or BACK to skip printing.



NOTE: Please refer to **Chapter3**. **Drive Capture Modes and Settings** for more printing options.

Misc Menu Settings



This section describes the settings that are available under the **Misc Menu** that can be accessed from the Main Screen.



Backlight

Use this setting to turn the Touch Screen's backlight on and off. This setting is useful for seeing the Touch Screen in low light conditions. The default setting is OFF.



Authenticate Trail

This mode is used to verify the authenticity of a report that has been written to the internal flash memory. It is designed to check the report for alteration. It verifies a proprietary Hash value that is written to the end of each report at the time of creation.

Procedure

- 1. From the Main Screen, tap the Misc icon.
- 2. Tap the Authenticate Trail icon.
- The Talon Enhanced will display a list of the Log files that are on the internal flash memory.
- 4. Tap the desired Log file and press OK.
- 5. If the report has not been altered, the message will read "Log file authenticated. Press any key to return".
- If the report has been altered in any way, the message will read "Log File not authenticated. Press any key to return".
- 7. Press the Back icon to return to the Main Screen.



Manage Settings

This icon brings up a series of icons that allow you to adjust, save and reset various default settings.





Contrast

Use this setting along with the two Up Down arrow icons to increase or decrease the Touch Screen's Contrast setting to your desired preference. The contrast setting will be retained in memory by pressing the OK icon.



Save Settings

Use this icon to save current configuration settings. Settings that can be saved through power recycle are: Mode, Speed, Verify, On Error, Contrast, Wipe Signature ON/OFF and Defect Scan Speed Fast or Slow.



Factory Settings

Changes all adjustable settings to the default factory settings.



Manage Destination

This menu is used to prep the Destination drive(s) prior to running a DD Image or E01 Image capture. The settings available are:



Format Destination – This function allows you to format a Destination drive and also select the type of formatting to be performed on the Destination Drive(s). There are three options in this menu:

Format D1 – This option will format the drive connected to D1. The drive will be formatted either NTFS or FAT32 depending on the Format setting below.

Format D2 – This option will format the drive connected to D2. The drive will be formatted either NTFS or FAT32 depending on the Format setting below.

Format - This option has two settings:

NTFS – This formats the drive(s) with a single partition using the NT File System (NTFS). This is the default setting.

FAT32 – This formats the drive(s) with a single partition using the FAT32 file system.

When Format D1 or Format D2 is selected, the following prompt appears:

"Reformatting the Drive D1! All data on your Internal Drive will be lost! Continue?"

D1 will be replaced by D2 if Format D2 was chosen.

By choosing <Yes>, Talon Enhanced will format the drive.

By choosing <No>, the display show an error. Tap the <Back> button to go back to the Format Destination menu.



Scan Disk – This function checks the Destination Drive for proper formatting. It functions much like Microsoft Windows Scandisk or Chkdsk.

Choose <Yes> to run Scan disk. After 30 seconds, it will display a list of errors, if any.



DoD Wipe – In compliance with DoD M-5220, the Talon Enhanced will wipe either destination as follows: The drive will be wiped with all 0's followed by all 1's THREE consecutive times; after this the final value of 0xF6 will be written to all locations on the drive. To summarize, the Talon Enhanced will write the following 7 patterns to all the locations on the destination drive: all 0's, all 1's, all 0's, all 1's, all 0's, all 1's, 0xF6



Browse Destination – If the Destination drive is formatted with a FAT32 or NTFS partition, Browse Destination will allow the user to navigate directories on the drive. It will also show the size of files on the drive. Use the Arrow and Select icon to navigate the directories.



Print Options

This mode is used to print reports directly from the Talon Enhanced through the serial port. This menu is used to prep the Destination drive(s) prior to running a DD Image capture. The settings available are:



Eject Page

This function sends a form feed signal to the printer. This function may be required to load paper in some printers.





Print Report

This function is used to manually print a report after a capture session. It also prints different reports associated with Keyword Search.



Print Last Session – This function prints the report from the last performed session (drive capture, defect scan, wipe, etc.). It is not able to print reports prior to the last session.



Print Search Detail – This function prints all of the found keywords from the last keyword search as well as their absolute locations on the Source drive.

NOTE: For more information, please refer to **Chapter 7: Keyword Searching**.



Print Search Text – This function prints a fragment of text before and after each found keyword. This allows each keyword to be viewed in context.

NOTE: For more information, please refer to **Chapter 7: Keyword Searching**.



Auto Print (After Capture)

This function tells the Talon Enhanced to print a report after the next capture session. It can be set to YES or NO (default).



Debug

Use this setting to turn the Debug reporting tool on and off. This setting is used in conjunction with the Serial Port and a terminal link program. The default setting is OFF. Debug should only be turned on when the user is directed to do so by Logicube Technical Support.



Beeper

Use this setting to turn the beeper on and off. This setting is useful when in "stealth" mode or in an environment that requires no noise. The default setting is OFF. Any change to the setting is preserved after power off.





Audio Notice

Use this setting to provide an audible beep if the data capture has been completed successfully. A different audible beep will occur to alert the user that the capture has encountered an error. This beep will sound with a 50% duty cycle for approximately 2 minutes or until the user acknowledges the error via the user interface. The default setting for Audio Notice is OFF. Once enabled the Talon Enhanced will retain the setting last used prior to power recycle.



Security

This feature provides the user with a password-based security system (based on the ATA security specification T13) to protect their data from unauthorized access.

This feature has two security levels; **High** or **Maximum** and the ability to set a **Master** along with a **User** password. The **Master** password is typically used by an administrator – this password is kept secret from the user and may be used to unlock the device if the **User** password is lost. If **High** security is selected the drive can be unlocked for use with either the **User** or **Master** password. Under **Maximum** security mode the drive can only be unlocked with the **User** password.

NOTE: Not all hard drive models support the Secure Lock function. Make sure the drives you are using support the ATA lock command. See the **Get Security Level** feature defined below for information on how to determine if a particular drive supports the ATA lock command.

The security system is enabled by sending a user password to the device. When the security system is enabled, access to user data on the drive is denied after a power cycle until the User password is sent to the device with the Unlock command.

Note: Passwords should be limited to 16 characters or less. Password entry confirmation has been implemented.

WARNING! Please be very careful when entering passwords so you are not inadvertently locked out of any drives permanently.

The security menu is accessed from the Preferences Settings Menu under Misc. (Press the "More" button to see the Security icon). The Security menu contains the following options:



High Security

When selected the drive can be set to lock with **User** and then the **Master** password. In High security mode, the **Master** password should be entered after the **User** password.





Maximum Security

This security setting can only be set to lock by the User password.



Туре

This setting determines which user is currently accessing the drive and which password will be used to lock/unlock the drive. The choices are Master or User.

If Master password is selected ;



Set Password

When selected, the user is prompted to select the location of the hard disk drive that will be locked, either S1, D1 or D2. Next the user will be prompted to enter the password to be assigned. Passwords can be alphanumeric, are case sensitive and should be limited to 16 characters or less The user will be asked to enter the password a second time and once the operation has been completed the user will see the following message:

Setting drive (XX) Master password is successful!



Unlock Password

When selected, the user is prompted to select the location of the hard disk drive to unlock. either S1, D1 or D2. Next the user will be prompted to enter the password to unlock the drive. When the operation has been completed the user will see the following message:

Unlocking drive (XX) Master password is successful!

Note: This unlock is temporary and the user can access the drive only once. The password will need to be reentered every time you want access to the drive even if you don't cycle the power of the Talon Enhanced.

If User password is selected ;



Set Password

When selected, the user is prompted to select the location of the hard disk drive that will be locked, either S1, D1 or D2. Next the user will be prompted to enter the password to be assigned. Passwords can be alphanumeric, are case sensitive and should be limited to 16 characters or less. The user will be asked to enter the password a second time and once the operation has been completed the user will see the following message:

Setting drive (XX) User password is successful!



Unlock Password

When selected, the user is prompted to select the location of the hard disk drive to unlock, either S1, D1 or D2. Next the user will be prompted to enter the password to unlock the drive. When the operation has been completed the user will see the following message:

Unlocking drive (XX) **User** password is successful!

Note: This unlock is temporary and the user can access the drive only once. The password will need to be reentered every time you want access to the drive even if you don't cycle the power of the Talon Enhanced.



Get

To initialize the **Get** update the user must recycle system power after any setting change. **Get** will access hard disk drive security infromation for one user selectable drive; S1, D1 or D2. The feature reports the security settings that are implemented on the selected drive. For example:

Security supported	Yes
Security enabled	Yes
Security locked	Yes
Security frozen	Yes
Count expired	Yes
Security level	High



Disabled

This option will permanently remove any previous security feature passwords from the hard disk drive, allowing anyone access to the drive even after drive power is recycled. Users can select one drive at a time to disable, either



S1, D1, D2. In high security mode the security feature can be disabled using either the **User** or **Master** password.



SCSI/SAS Adapter

The SCSI and SAS Adapters are designed to attach directly to the Talon Enhanced. These optional adapters can be purchased from Logicube, the SAS Adapter is included in the Talon Enhanced Field ToughKit. Contact the Logicube Sales Department for more information.

Functionally each adapter acts like a pass through device and allows for external connection and capture of SCSI and or SAS source drives through the PATA (IDE) port of Talon Enhanced.



Info is used to display the Serial Number and current Firmware, BIOS, Kernel and Software revisions for the SCSI or SAS adapter you have connected to the source position of Talon Enhanced.



BIOS Upgrade is used to upgrade the BIOS of the adapters PCB assembly.



Kernel Upgrade is used to upgrade the OS of the adapter.



FPGA Upgrade is used to upgrade the Firmware of the adapters PCB assembly.



The Application Upgrade icon is used to upgrade the Capture Application for both the SCSI and SAS adapters. This update will most likely to be performed more frequently than those listed above.

Performing SAS and SCSI Adapter Updates

It's good practice to occasionally verify that your Adapter is running the current BIOS, Kernel, Firmware and Software Application. This is not something that will need to be updated frequently.

The Application Upgrade icon is used to upgrade the Capture Application for the both adapters. This update will most likely to be performed more frequently than those listed above.

Press the following icons in succession to display a list of the current programming installed in the attached adapter:



A list will display showing which version of BIOS, Kernel, FPGA (Firmware) and Application Software currently installed in the adapter.

Sample Info list:

Serial number: 1 Firmware Rev: 101 Bios Rev: 150 Kernel Rev. 200 Software Rev: 302

Compare the versions in your list to the current versions posted and available on the Logicube website. If updates are necessary download the files that need updating from www.logicube.com/support Select product F-ADP-SAS or F-ADP-SCSI and the applicable download links will be visible. The download files are in ZIP format. Unzip the contents to the root directory of a USB flash drive then follow the update instructions starting at step 1 below.

NOTE: The USB port on the adapter is used to update all Adapter programming even if the USB port cloning option has not been purchased and enabled.

The following are Step-by-Step instructions on how to update Adapter BIOS using the Talon Enhanced. Kernel, FPGA and Software are updated similarly.

- Disconnect the power supply cord from the Logicube Hard Disk Drive capture device.
- 2. Locate the PATA (IDE) ribbon cable P/N CBL-037B and plug the end labeled HDD SIDE into the adapter port marked IDE CONNECTOR IN.
- Connect the other side of the ribbon cable labeled DUPLICATOR SIDE to an external IDE port on the Logicube capture device you are using.
- Locate the cable labeled CBL-002B and connect the end with the large white plug to the mating receptacle next to the PATA (IDE) ribbon cable on the adapter.
- 5. Connect the other side of the CBL-002B to the external power port of the



Logicube capture device. Use the power port closest to the ribbon cable.

- Copying the files to be updated to the root directory of a USB flash drive. Updated files are located at www.logicube.com/support Select product F-ADP-SAS or F-ADP-SCSI and the download links will be visible.
- 7. Insert the USB flash drive into the adapter USB port.
- 8. Insert the power supply cord to power the duplication device.

NOTE: The remaining steps provide instructions to update BIOS but are also applicable for updating Firmware, Kernel and Software.

9. Press Misc. more



- 10. Enter the password *logicube* in lower case.
- 11. You will be prompted to enter a revision number. If this example it is the current BIOS revision number. This and all current revision numbers are provided in the readme.txt file that accompanied the previously downloaded update files. As of this writing the value for Bios Revision is 150. Entering an incorrect revision value will cause the process to error out.
- 12. Enter the current revision for the respective item you are updating. If the revision number matches the excepted number the update process will begin.

NOTE: It is imperative that power be maintained throughout the SAS adapter update.

NOTE: Please refer to **Section 8: Optional Peripherals** for information regarding use of the optional SCSI/SAS adapters.



Use this setting to set the number of "read/write error" retry attempts from 0 to 1,000. Use the keypad on the Talon Enhanced to set the number. The default setting is 50.



Install Options

As optional features become available, use the install options icon to activate purchased options by pressing Misc. and the Install Options icon on Talon Enhanced.

Enter the alphanumeric option code provided at time of optional purchase using the touch screen display. The option will automatically become available.

NOTE: New and improved Talon Enhanced software will appear from time to time on our web site located at www.logicube.com. Verify your software is up to date by comparing the software revision on the Logicube website with the software revision listed under About on the main menu.



File System

This function allows you to select the file system used for Destination drives. If the file system on your Destination drive differs from this setting, you will be prompted with the following message:

"D1 File System is different from setting! Would you like to change setting(No) or reformat(Yes)?"

The two choices for the type of formatting are:

NTFS – This formats the drive(s) with a single partition using the NT file system (NTFS). This is the default setting.

FAT32 – This formats the drive(s) with a single partition using the FAT32 file system.

Time Zone

This function allows you to set the time zone. A value from -12 to 12 can be used (UTC or GMT). Set this to your time zone offset. For example, -08 for Pacific Time.

NOTE – For time zones with half hour increments, please see the setting for 'Daylight Saving' later in this section.

E01 Resume

This function allows you to view previously skipped incomplete sessions. When this function is selected, the Talon Enhanced will access its journal and display each previously skipped incomplete session one at a time. From this screen you can resume the incomplete session by tapping the Res button or skip to the next incomplete session by tapping the Skip button.

NOTE: When resuming an incomplete session, the same Source and Destination drive(s) must be attached to the Talon



Enhanced. An error will appear if the serial numbers of the Source or Destination drive(s) do not match.

Daylight Saving

In this section you can place an offset for daylight savings time. The format is HH:MM. For example, if you are currently observing Daylight Savings, input 01:00 to add an hour.

For time zones with half hour or quarter hour increments (for example, IST or IRST), you can input 00:30 to add 30 minutes to the time zone.

6. USB and eSATA Ports

Introduction

The integral USB and eSATA ports on your Logicube Talon Enhanced provide connectivity of the unit and its connected drives to any PC with active USB and/or eSATA ports. It also ensures zero alteration to Source and Destination drives under any operating system. USB 1.x and 2.0 are supported.

IMPORTANT NOTE: The System CF is not write-protected. Exercise caution when connecting to the System CF card so that log reports are not deleted.

Minimum requirements

- A Logicube Talon Enhanced unit with integral USB / eSATA ports
- A 586 or better PC compatible computer with CD-ROM drive
- An active USB port and/or an active eSATA port
- Microsoft Windows 98SE/ME/2000/XP/Vista/7 operating system (for drive access under Windows)

NOTE: WIN98 USB drivers can be found on the CD-ROM included with the Talon Enhanced



Figure 5, USB Port on Logicube Talon Enhanced





USB Connection to Windows (for Drive Management)

- 1. Make sure that the desired drive(s) are attached to the Talon Enhanced.
- 2. Make sure your PC is running Windows 98 or above.
- 3. With the Talon Enhanced turned on, connect the USB cable (provided) to a PC USB slot on one end. Do not attach the other end to the Talon Enhanced yet.
- 4. From the Main Screen of the Talon Enhanced, tap the Settings icon.
- 5. Tap the More icon. Locate and tap the USB / eSATA icon.
- 6. Tap the USB icon.
- 7. Tap the drive to connect to. The choices are S1, D1, D2 and System CF.
- Press START/STOP twice and Talon Enhanced will power up the chosen drive. A prompt will appear saying "USB Link Up..."
- It is now safe to attach the USB cable to the Talon Enhanced. You should now see some activity on your PC screen, which depends on the operating system.
- If running ME/2000/XP/Vista/7 your drive will automatically be mounted and drive letters assigned to all recognizable partitions.
- 11. If running 98/98SE you will be prompted to install drivers. At the "have disk..." prompt please point the PC to the drivers floppy (provided), and the installation should complete smoothly.
- 12. The chosen drive is now visible on Windows as an external drive. Any partitions that can be accessed by your Operating System will be assigned a Drive Letter.

At this point the drive is fully visible to any Forensic analysis tool, such as EnCase, iLook, and FTK. The drive contents, however, cannot be altered in any way. Note that since Windows keeps caching information for every drive, some operations (such as file read), may appear to show changes in file access time etc. but these are purely virtual, and do not change anything on the drive itself.

eSATA Connection to Windows (for Drive Management)

- 1. Make sure that the desired drive(s) are attached to the Talon Enhanced
- 2. Make sure your PC has an eSATA connection.
- 3. Reboot both the PC and the Talon.

- 4. With the Talon Enhanced turned on, connect the eSATA cable (provided) to a PC eSATA port on one end. Do not attach the other end to the Talon Enhanced yet.
- 5. From the Main Screen of the Talon Enhanced, tap the Settings icon or press the Set button.
- 6. Tap the More icon. Locate and tap the USB / eSATA icon
- 7. Tap the eSATA icon
- 8. Tap the drive to connect to. The choices are S1, D1, D2 and System CF.

NOTE: If you have just connected one drive (for example, D1) and would like to view the contents of a different drive (for example, System CF) reboot both the PC and the Talon Enhanced prior to connecting the other drive to view its contents.

- Press START/STOP twice and Talon Enhanced will power up the chosen drive. A prompt will appear saying "eSATA Link Up..."
- 10. It is now safe to attach the eSATA cable to the Talon Enhanced. You should now see some activity on your PC screen, which depends on the operating system.
- 11. Your drive will automatically be mounted and drive letters assigned to all recognizable partitions.
- 12. The chosen drive is now visible on Windows as an external drive. Any partitions that can be accessed by your Operating System will be assigned a Drive Letter.

At this point the drive is fully visible to any Forensic analysis tool, such as Encase, iLook, and FTK. The drive contents, however, cannot be altered in any way. Note that since Windows keeps caching information for every drive, some operations (such as file read), may appear to show changes in file access time etc. but these are purely virtual, and do not change anything on the drive itself.



Removing USB devices

Before physically disconnecting the USB cable and/or shutting down power to the Talon Enhanced, the unit has to be properly "unmounted" from Windows. To do that:

1. Locate the USB icon in the system tray (typically at the bottom right of screen).

2. Click the icon once.

3. Wait for Windows to bring up a message that it is safe to remove the device. (Different versions of windows will behave slightly differently).

7. Keyword Searching

Introduction



The Talon Enhanced unit can search for multiple keywords while capturing a suspect drive. This is a useful feature to provide early screening of a drive. For example, you could search for the names of all common drugs or the names of known offenders on a given drive. Presence of these keywords might indicate a connection between the suspect and the keywords.

In general, you select a pre-defined list of words which is loaded into the hardware based search engine. These words are automatically searched for during the next Capture session. At the end of the session, you can print one of several reports that indicate the number of occurrences, and absolute location on the drive of all matches found.

Searching for Keywords

Searching During Capture

- 1. From the Main Screen of the Talon Enhanced, tap the Settings icon.
- 2. Choose either (Mirror) Capture or DD Image Capture mode.

NOTE: Keyword search during capture is only available in Mirror Capture and DD Image Capture modes. It is not available during an E01 Image capture.

3. Set all of the optional cloning settings as desired (verify, speed, etc.)



- 4. Tap the 'Word List' icon.
- 5. The unit will read the list of available keyword lists from the Compact Flash, and display it on the screen.
- 6. Choose the desired list, and press the OK icon.

NOTE: As of this writing, matches during capture are automatically logged in the capture report. Other settings will be accessible in later versions of the software under the **On Match** icon.

7. From now on, the words in this list will be searched for as a by-product of any of the Capture modes.



- 8. At the end of a session, the Final Capture report will also list any keywords found. You can then print one or both Keyword Search reports:
 - a. **Print Search Detail**: This report lists every keyword found and the sector where it resides.
 - b. **Print Search Text**: This report lists every keyword and the surrounding line of text.

NOTE: The DD Image Capture Report will not automatically list keywords. We suggest running the Search Detail report after the Capture Session to list any keywords found.

NOTE: Please refer to **Chapter 3. Drive Capture Modes and Settings** for more printing options.



Searching with Keyword Search Mode

In addition to searching for Keywords during a capture, the Talon Enhanced can also perform a separate Keyword Search session.

NOTE: If a Flash Media Card is chosen for a Keyword Search then the speed will drop to PIO-AUTO.

Procedure

- 1. From the Main Screen, tap the Settings icon to enter the Settings menu.
- 2. Tap the Keyword Search icon.
- 3. Tap the "Drives" icon. Choose one of the following drives: S1, D1, D2, or D1 & D2.



- 4. Tap the "Speed" icon to set the desired UDMA or PIO speed.
- 5. Tap the 'Word List' icon.
- 6. The unit will read the list of available keyword lists from the Compact Flash, and display it on the screen.
- 7. Choose the desired list, and press the OK button.
- 8. Press the Start/Stop button twice to begin scanning.
- 9. Enter a Log file name and press SET.
- 10. At the end of a session, the Final Capture report will also list any keywords found. You can then print one or both Keyword Search reports:



Print Search Detail: This report lists every keyword found and the sector where it resides.





Print Search Text: This report lists every keyword and the surrounding line of text.

NOTE: The DD Image Capture Report will not automatically list keywords. We suggest running the Search Detail report after the Capture Session to list any keywords found.

NOTE: Please refer to **Chapter 3. Drive Capture Modes and Settings** for more printing options.

Keyword Lists

All keyword lists are stored on the Compact Flash in a file called keyword1.lst. The file is a simple text file which can be edited by any plain text editor, such as Notepad. The file can also contain hexadecimal values.

A sample file might look like this:

[Terrorism]

ABU NIDAL=case:yes,unicode:no,signature:no ABU SAYYAF=case:yes,unicode:no,signature:no AL-QAIDA=case:yes,unicode:no,signature:no BLACK SEPTEMBER=case:yes,unicode:no,signature:no DEMORALIZE=case:yes,unicode:no,signature:no HAMAS=case:yes,unicode:no,signature:no HIZBALLAH=case:yes,unicode:no,signature:no

[Computer crimes] 2600 =case:yes,unicode:no,signature:no BACK ORIFICE=case:yes,unicode:no,signature:no CRACK=case:yes,unicode:no,signature:no DEFCON=case:yes,unicode:no,signature:no ENCRYPTION=case:yes,unicode:no,signature:no FLAME=case:yes,unicode:no,signature:no HACK =case:yes,unicode:no,signature:no IP SPOOFING=case:yes,unicode:no,signature:no

In the above example, two lists ([Terrorism] and [computer Crimes]), are listed. You can select only one for each search session. Many more lists with many more words can be defined.

Three options are available for each word:

- 1. **Case**: yes/no. If Yes, the word is searched exactly as typed. No will search for all lower-case, all upper case, and First letter upper-case.
- 2. **Unicode**: yes/no. If No, the plain ASCII of the word will be searched for. Yes, the Unicode encoding of word is searched for.

NOTE: The Unicode search utilizes the "little endian" code that is utilized by Microsoft operating systems. Other systems, like Linux, UNIX, Mac, etc.

utilize the "big endian" code. A future version of the Talon Enhanced software will also support big endian Unicode.

3. **Signature**: the word is only searched at the beginning of sector. This is useful to find all files of a certain type, e.g. all graphic files.

The unit allows some editing of the keyword lists. Please refer to the **Modify** Lists section below for more details.

NOTE: As of this writing, only the English alphabet is supported. Future software updates will include support for different languages. Please contact Logicube for further details.

Modify List Settings

Keyword Lists can also be created, modified and deleted from the Talon Enhanced itself. The following settings are accessed from the Optional Preference Settings under Keyword Search or by using the More button to access the Optional Preferences under Capture and DD Capture.



Modify Lists

Follow this procedure to directly access the Modify Lists menu:

- 1. From the Main Screen, press the Settings icon.
- 2. Press the Search icon.
- 3. Press the Modify List icon.
- 4. Three sub-menu functions appear:



Add New List: This setting allows you to add a new Keyword Search List to the Compact Flash Card. When selected, you will see the words Enter new list name at the top of the screen. Enter the new list name and press Set and a screen will prompt you to add a Keyword to the list you just created. At this point you have an opportunity to assign whether or not Case Sensitivity, Unicode and Signature are to be factored into the search criteria. Enter YES or No for each of these setting and press the Set icon when finished. You can continue to add more keywords to the list at this time by pressing the Add icon. Once all of the Keywords have been added you must press the Save icon to add the new list.

Pressing Abort at any time will take you back to the Modify List Menu



Edit List: This setting allows Keywords in existing lists to be modified or removed. It also allows new Keywords to be added. When selected, the Talon Enhanced will ask which list needs to be modified. Use the arrow icons on the screen to scroll through the list of file names. Once the list you wish to edit is located press the OK icon. The contents of the list



and several selectable icons will display along the bottom of the screen. The icon choices within Edit List are:

- 1. Add which allows you to add a new Keyword to the List.
- Edit which allows you to modify the Keywords Name, Case Sensitivity, Unicode and Signature search criteria.
- 3. Delete which removes the Keyword from the list.
- 4. Save which is a necessary step for the changes to be written to the CF card.
- 5. Abort which will take you back to the Modify List Menu.

•-----•----- **Remove List**: This setting removes a chosen list from the Compact Flash Card. When selected, the tool asks which list needs to be removed. Use the arrow icons on the screen to scroll through the list of file names. Once the Search List is located press the OK icon.

WARNING: There is no "are you sure" screen either when a list is chosen or before tapping OK for removal.

Pressing Abort at any time will take you back to the Modify List Menu.

Press the Back icon in the Modify List Menu will take you back to the Main Screen.

8. Optional Peripherals

Introduction

Logicube has many different adapters and other peripherals that allow you to tackle almost any drive capturing job. This chapter focuses on five particular devices –the NETConnect[™], the Clone Card Pro[™], the Portable Battery Pack, the SCSI Adapter, and the SAS Adapter.

Logicube NETConnect™



The NETConnect provides the convenience of allowing multiple investigators to access a single set of case files, streamlining the analysis process by allowing broad access either locally or remotely to the evidence data post capture. Talon Enhanced users can capture suspect data and then, using the NETConnect (Kit version) transfer data quickly to a network location.

Features

- Uses CIFS, NFS or FTP file access protocols
- 10/100/1000 Gigabit Ethernet interface
- Supports Windows, MAC, Linux operating systems
- Data transfer rate approaching 7GB/min
- Network protocols supported include ARP, IP, UDP, TCP, HTTP, ICMP, BOOTP/DHCP, DNS, MDNS, Telnet
- NETConnect can be configured as a "client" for a network file system or as an actual network file system server or NAS



- Allows you to "push" or transfer evidence data to predefined network destinations, verify network transfer, format and wipe drives
- Administrative functions allow users to establish user names, passwords, manage access control, maintain credentials, set destination IP addresses and domain names
- Convenient "Macro" feature allows users to easily initiate preconfigured commands from the control panel of NETConnect

Using NETConnect Kit with Talon Enhanced

Destination drives used with the Talon Enhanced can be used with the Logicube NETConnect (Kit Version). Destination drives are attached to the Forensic Dossier[®] tray included with the NETConnect Kit. The NETConnect is then attached to the Dossier tray.

NOTE: All drives attached in the Dossier tray, when attached to the NETConnect, must be set to 1.5 Gigabits per second. Typically, instructions on how to set hard disk drives to 1.5 Gb/s can be found on the label of the hard disk drive. If instructions are not found on the label, please check the hard disk drive manufacturer's website for more support.

Usage Notes: For more information on how to use the NETConnect, consult the NETConnect manual.

Logicube Clone Card Pro™

The optional CloneCard Pro is an intelligent PCMCIA adapter designed to provide fast cloning to and from laptop PC's. When used properly, it will support up to 115 MB/min transfer speed.

The CloneCard Pro is a real time-saver when a laptop drive needs to be captured, and it is undesirable to remove the internal hard drive from the PC. It is designed to work in both PCMCIA (16-bit) and CARDBUS (32-bit) systems.

In general, the user would boot the laptop from the supplied CD-ROM and run a client program. This client program detects the PCMCIA chip-set inside the laptop and will enable communication to the CloneCard Pro. Now the Talon Enhanced can be connected to the external cable of the card, and operation commences as if the Talon Enhanced is connected directly to the suspect drive. All Talon Enhanced modes and options are operational as though an actual drive is connected, with the exception of the speed of transfer.





Before Capturing

Logicube provides a bootable CD-ROM which runs off the FREEDOS operating system. Follow the loading directions that come with your Clone Card Pro.

Using the Logicube CloneCard Pro to Capture a Drive

Cloning with the CloneCard takes just a few steps.

- 1. Insert the CloneCard Pro into one of the PCMCIA slots on the laptop you are about to clone (make sure to remove all other PCMCIA cards.
- 2. Insert the CD-ROM into the laptop CD drive.

Turn laptop on. Ensure that the laptop is set to boot from a CD-ROM. This is done through the setup screens that can be accessed by pressing F2 or key during initial boot (consult your laptop manual regarding how to set the boot order).

- 3. The CD-ROM is configured to run the client application (CCclient.exe or pcmcia.exe) automatically.
- 4. Connect the S1 position of the Talon Enhanced to the flat cable provided with the CloneCard Pro.

NOTE: Only use the cable that came with the CloneCard Pro.

- 5. Make all the necessary settings on your Talon Enhanced.
- 6. Set the Speed setting to PIO-Slow. No settings are available on the client program.
- 7. Press the **START/STOP** button and wait for the process to complete.



Improving Speed of Transfer

Several settings in the CMOS setup screens can potentially improve the speed of transfer.

- 1. **PCI latency timer** Try to reduce the value of this number as much as possible.
- 2. **PCI write buffer** Set to enable to improve writing speed to the local drive.
- 3. **PCI zero-wait states** Enable to decrease PCI cycle time.
- 4. **PCI delay transaction -** Disable to decrease PCI cycle time.
- 5. PCI dynamic bursting Set to yes.
- 6. Enable 32-bit access to hard drive We test for that, and if available, we use it to improve transfer speed, so no action is required on behalf of the user.

NOTE: Some of these settings may not be present on your machine. Also, some of these settings may cause other peripherals to not function properly, so use with caution, and always change one setting at a time.

Logicube SCSI Adapter

The Logicube SCSI adapter is designed to attach directly to specific Logicube HDD duplication devices. Functionally the adapter acts like a pass through device and allows for external connection and capture of SCSI drive data through the IDE port of the Logicube Talon Enhanced. Optionally, USB and USB Thumb/Flash drives can also be captured through the adapter.

The SCSI adapter is designed to capture from SCSI to SATA/PATA (IDE) not from SCSI to SCSI type drives.

NOTE: The Optional SCSI Adapter is compatible with the Talon Enhanced but does not support Wipe or capture from RAID pairs.





What's Included

- Qty. (1) F-ADP-SCSI Adapter
- Qty. (1) CBL-031A SCSI Ribbon Cable
- Qty. (1) CBL-002B Power Cable

What's Needed

- Qty. (1) CBL-037B IDE Ribbon Cable
- Qty. (1) CBL-002B Power Cable

NOTE: These cables ship with the Talon Enhanced

Installation Setup

- 1. Disconnect the power supply cord from the Logicube Talon Enhanced.
- Locate the IDE ribbon cable P/N CBL-037B and plug the end labeled HDD SIDE into the SCSI adapter port marked IDE CONNECTOR IN.
- Connect the other side of the ribbon cable labeled DUPLICATOR SIDE to an external IDE port on the Talon Enhanced.
- 4. Locate the cable labeled CBL-002B and connect the end with the large white plug to the mating receptacle next to the IDE ribbon cable on the SCSI adapter.
- 5. Connect the other side of the CBL-002B to the external power port of the Talon Enhanced. Use the power port closest to the ribbon cable.
- 6. To capture a SCSI drive connect one side of cable CBL-031A to the SCSI HDD and plug the other side into the connector on the SCSI adapter located below the label SCSI CONNECTOR.
- 7. Connect one end of CBL-002B (power cable #2) between the adapter connector labeled SCSI POWER and the mating receptacle on the SCSI HDD.

How to use the SCSI Adapter

Duplicating using Talon Enhanced

 Install one or two destination hard drive(s) on the Logicube Talon Enhanced.

NOTES: For forensic captures the destination drive(s) should be at least as large as the drive(s) to be captured. The exception is if you are using the Talon Enhanced's Spanning mode



which allows you to capture across two destination drives.

Capture from HPA and DCO areas is not supported.

- Reinsert the power supply cord to turn on the Logicube Talon Enhanced. The LED located on top of the SCSI adapter near the RESET button will illuminate solid green indicating that the adapter is receiving power correctly.
- 3. At this point you can perform a standard drive info check to verify that the Logicube Talon Enhanced recognizes the drive connected through the SCSI adapter.
- 4. Adjust the Talon Enhanced capture settings as desired.
- Start the capture process according to the instructions outlined in the Talon Enhanced User's Manual under Capture Modes and Settings.

Optional USB cloning with the SCSI Adapter

In order to use the USB port located on the Logicube SCSI Adapter, the USB cloning option must have been purchased and the feature enabled on the cloning device to which the adapter is connected. To verify if the USB cloning feature has been enabled, turn on the Logicube cloning device and press the About icon on the main menu. If *SCSI Adapter USB Option* is visible under Options installed; you can tap the BACK icon and continue to the next step. If *SCSI Adapter USB Option* is not in the list the feature has not been enabled. To verify if the option has been purchased contact Logicube Technical Support and provide the S/N of the cloning device listed at the top of the About screen. Once you have obtained an activation code follow the activation instructions listed below to enable the USB cloning feature.

Press Misc., More, Install Options, [Enter the code] and press the SET button. Once complete the About screen will read: *Options installed: SCSI Adapter USB Option* along with any other options that may be installed.

- To clone or capture a USB powered HDD connect a USB cable between the USB Drive and the SCSI adapter connector labeled USB PORT and proceed to step 1 the Duplicate Using section.
- To clone or capture a USB thumb drive connect the USB thumb drive directly into the SCSI connector labeled USB PORT and proceed to step 1 of the Duplicate Using section.
NOTE: A second LED located on top of the SCSI adapter will flash green during adapter control and whenever data transfer occurs.

The RESET button on the side of the SCSI adapter located next to the USB PORT is not active at this time and is reserved for future enhancements.

USB functionality via the SCSI adapter is tied to the S/N of the cloning device that receives the activation code. Once the USB option is activated, the USB cloning feature can only be used in conjunction with that specific cloning device.

SCSI/USB enabled Talon Enhanced may be able to clone flash media cards by using a USB multi card reader in conjunction with the SCSI adapter. Note that this functionality has not been fully verified and is not guaranteed.

Logicube SAS Adapter

The Logicube SAS adapter is designed to attach directly to the Logicube Talon Enhanced. Functionally the adapter acts like a pass through device and allows for external connection and capture of SAS drive data through the IDE port of Talon Enhanced. Optionally, USB and USB Thumb/Flash drives can also be captured through the adapter.

The SAS adapter is designed to capture from SAS to SATA/IDE not from SAS to SAS type drives with Talon Enhanced.

NOTE: The Optional SAS Adapter is compatible with the Talon Enhanced but does not support Wipe or capture from RAID pairs.



What's Included

- Qty. (1) F-ADP-SAS Adapter
- Qty. (2) CBL-SAS-001-A SAS Data/Power Cable



What's Needed

- Qty. (1) CBL-037B IDE Ribbon Cable
- Qty. (1) CBL-002B Power Cable

NOTE: These cables ship with the Talon Enhanced

Installation Setup

- 1. Disconnect the power supply cord from the Logicube Talon Enhanced.
- Locate the PATA (IDE) ribbon cable P/N CBL-037B and plug the end labeled HDD SIDE into the SAS adapter port marked IDE CONNECTOR IN.
- Connect the other side of the ribbon cable labeled DUPLICATOR SIDE to an external IDE port on the Talon Enhanced.
- 4. Locate the cable labeled CBL-002B and connect the end with the large white plug to the mating receptacle next to the PATA (IDE) ribbon cable on the SAS adapter.
- 5. Connect the other side of the CBL-002B to the external power port of Talon Enhanced. Use the power port closest to the ribbon cable.
- 6. To clone a SAS drive connect one side of cable CBL-SAS-001-A to the SAS HDD and plug the other side (which splits and forms the shape of a 'Y') into the SAS data and power ports located on the SAS adapter above the label MASTER and proceed to step 1.

How to use the SAS Adapter

Duplicating using Talon Enhanced

1. Install a destination hard drive inside the Logicube Talon Enhanced.

NOTE: For forensic captures the destination drive should be at least as large as the drive to be captured.

- Reinsert the power supply cord to turn Talon Enhanced on. The LED located on top of the SAS adapter near the RESET button will illuminate solid green indicating that the adapter is receiving power correctly.
- 3. At this point you can perform a standard drive info check to verify that the Talon Enhanced recognizes the drive connected through the SAS adapter.
- 4. Adjust the Talon Enhanced capture settings as desired. When ready, start the capture process

according to the instructions outlined in the Talon Enhanced User's Manual under Capture Modes and Settings.

Optional USB cloning with the SAS Adapter

In order to use the USB port located on the Logicube SAS Adapter, the USB cloning option must have been purchased and the feature enabled on the cloning device to which the adapter is connected. To verify the USB cloning feature has been enabled, turn on the Logicube cloning device and press the About icon on the main menu. If SAS Adapter USB Option is visible under Options installed; you can tap the BACK icon and continue to the next step. If SAS Adapter USB Option is not in the list the feature has not been enabled. To verify if the option has been purchased contact Logicube Technical Support and provide the S/N of the cloning device listed at the top of the About screen. Once you have obtained an activation code follow the activation instructions listed below to enable the USB cloning feature.

Press Misc., More, Install Options, [Enter the code] and press the SET button. Once complete the About screen will read: *Options installed: SAS Adapter USB Option* along with any other options that may be installed.

- To clone a USB powered HDD connect a USB cable between the USB Drive and the SAS adapter connector labeled USB PORT and proceed to step 1of the appropriate Duplicate Using section for your device.
- To clone a USB thumb drive connect the USB thumb drive directly into the SAS connector labeled USB PORT and proceed to step 1 of the appropriate Duplicate Using section for your device.

NOTES: A second LED located on top of the SAS adapter will flash green during adapter control and whenever data transfer occurs.

The RESET button on the side of the SAS adapter located next to the USB PORT is not active at this time and is reserved for future enhancements.

USB functionality via the SAS adapter is tied to the S/N of the cloning device that receives the activation code. Once the USB option is activated, the USB cloning feature can only be used in conjunction with that specific cloning device.

A SAS/USB enabled Talon Enhanced and may be able to clone flash media cards by using a USB multi card reader in conjunction with the SAS adapter. Note that this functionality has not been fully verified and is not guaranteed.

9. System CF Card

Introduction

The Logicube Talon Enhanced comes with a Compact Flash (CF) Card that is located at the bottom end of the unit below the keyboard. This drive is used mostly for loading software and firmware on the Talon Enhanced, storing Keyword Search lists and storing session reports.

To access the CF Card, remove the CF Card slot cover and push the eject button to the left of the CF Card.

NOTE: Please check our website periodically at www.logicube.com, any new CF functions will be posted there.

To load new software from the System CF Card, please refer to **Chapter 10. Software and Firmware Loading Instructions**



Connecting the CF Card to Windows via USB or eSATA

This procedure is necessary to load new software files to the System CF card. It is also necessary to pull session reports off the Talon Enhanced and add new Keyword lists created on the PC.

Connecting Through USB or eSATA Mode

- 1. Make sure your PC is running Win98 or above.
- 2. Connect the USB or eSATA cable (provided) to a PC USB or eSATA port on one end. Do not attach the other end to the Talon Enhanced yet.

- 3. From the Main Screen of the Talon Enhanced, tap the Settings icon or press the Set button.
- 4. Tap the USB / eSATA icon.
- 5. Tap the USB or eSATA icon.
- 6. Change the Drive to System CF by tapping on the Drive icon.
- 7. The Talon Enhanced will power up the chosen drive. A prompt will appear that reads "USB Link Up" or "eSATA Link Up".
- 8. Press the START/STOP button twice.
- 9. Attach the USB or eSATA cable to the Talon Enhanced. You should now see some activity on your PC screen, which depends on the operating system.
- If running ME/2000/XP/Vista/7 your drive will automatically be mounted and drive letters assigned to all recognizable partitions.
- 11. If running 98/98SE you will be prompted to install drivers. At the "have disk..." prompt please point the PC to the drivers floppy (provided), and the installation should complete smoothly.
- 12. The System CF is now visible on Windows as an external drive. The System CF card is not write-protected, so files can be modified on the card itself.

Removing USB devices

Before physically disconnecting the USB cable and/or shutting down power to the Logicube Talon Enhanced, the unit has to be properly "unmounted" from Windows. To do that:

- 1. Locate the USB icon in the system tray (typically at the bottom right of screen).
- 2. Click the icon once.
- 3. Wait for Windows to bring up a message that it is safe to remove the device. (Different versions of windows will behave slightly differently.

Replacing the CompactFlash Card

In rare occasions, it may become necessary to replace the System CF Card. The CF card includes software and firmware that is loaded each time the Talon Enhanced is turned on.

CF Card Removal and Installation

1. Turn the Talon Enhanced off using the power switch.



- 2. Unplug the Talon Enhanced from the power supply.
- 3. Remove the CF card cover and eject the CF card.
- 4. The replacement CF card must be formatted using the FAT (not FAT32 or NTFS) file system. Copy the contents of the included CD-ROM to the CF card. If you do not have access to the included CD-ROM, please contact Logicube Technical Support at support@logicube.com or 818-700-8488 opt. 3.
- 5. Insert the replacement CF card back to the CF card slot.
- 6. Replace the CF card cover.

10. Software and Firmware Loading Instructions

Introduction

New and improved software will appear from time to time on our web site at www.logicube.com. It is possible to update both the operating software and the firmware in the field by a user.

NOTE: Logicube provides a CD-ROM that contains a backup copy of the Talon Enhanced software. This software is already loaded on your unit.

Loading New Software and Firmware

The new software and firmware have to be placed on the root directory of the System CF card.

- 1. Turn the Talon Enhanced on using the power switch.
- 2. From the Main Menu, tap the **Settings** icon.
- 3. From the Settings Menu, tap the *More* icon.
- 4. Tap the **USB/eSATA** icon. The USB/eSATA Menu should appear.
- 5. Tap the **USB** icon. The USB Mode Menu should appear.
- 6. Tap the *Drive* icon. 4 choices will appear: S1, D1, D2 and System CF.
- 7. Tap the System CF icon to select it.
- 8. Press the **START/STOP** button twice.
- 9. The next screen should show the following:

USB/eSATA Mode

USB Link Up...

Press <BACK> to disengage

USB Engaged to System CF



- 10. Attach a USB cable to a PC and to the Talon Enhanced (one is included with the Talon Enhanced, but any A to mini-B USB cable will work).
- 11. Windows will detect the System CF card and automatically assign a drive letter to the System CF card.
- 12. Extract the contents of the downloaded zip file to the root of the System CF card. Overwrite all duplicate files.
- 13. Press the **BACK** button to disengage the USB link.
- 14. Once the USB link has been disengaged, turn the Talon Enhanced off using the power switch. Wait at least 10 seconds then turn the Talon Enhanced back on using the power switch.
- 15. The Talon Enhanced will load the new Software and Firmware during the boot process.
- 16. Check the version and date of the new software and firmware by tapping the "About" icon at the Main Screen.

Further Notes on Modes Available for the Talon Enhanced

Capture – Mirror Capture or DD image

This process captures all data from the source drive to the destination drive. See the "**Anatomy of a Drive Capture**" section below for more information.

Drive Defect Scan

The Drive Defect Scan operation performs a surface scan of the drive media using the drive controller to verify the media. This is done without transferring any data from the drive and results in extremely fast operation at the maximum media speed of the drive. This is typically faster than the maximum sustained transfer speed of the drive. The media is scanned in blocks of 256 sectors. If a block fails to verify, it is retried once at the block level. If it fails again, each of the 256 sectors is scanned individually. Each sector is scanned up to ten times. If a sector fails immediately, it is classified as bad. If the sector fails to verify after a good read any time up to the tenth read it is classified as weak. If the sector is verified good for ten reads it is classified as good. If, after the individual sectors are all scanned and there are no bad sectors found, the block is classified as a weak Spot.

Options

Drive – Choices are S1, D1 or D2 **Speed –** The choices are Fast or Slow

Wipe Destination

The Wipe Destination function is the process that erases or wipes all existing information from the surface of destination disk drive.

Options

These are the user configurable options for the Talon Enhanced erase process.



Speed – The speed setting provides the option to set the speed at which an operation will be performed.

The choices are UDMA-6 to UDMA-0, PIO-AUTO, PIO-MED and PIO-SLOW.

Signature – A unique digital signature is written to the destination drive on the first sector of each logical cylinder boundary across the entire drive.

Choose Yes or No

Erase process with Security Erase.

The software sends an ATA command to the drive to instructing it to erase itself as per its manufacturer's specification.

Erase process using non Security Erase drives

The software will do a CPU-erase. This is a process where the Talon Enhanced's CPU writes a pattern of 0's to the drive.

Additional Commands

Verify

The Verify option adds an increased level of confidence in the capture process. The choices are: HASH, HASH + V and None.

HASH

This mode uses special hardware to compute SHA-256 and MD5 Hash values at an extremely fast and accurate rate.

NOTE: If the Destination drive has bad or weak sectors, this mode may not guarantee the accuracy of the Hash values. If the destination drive's health is unknown, use the "+V" setting.

HASH + V

This mode uses special hardware to compute SHA-256 and MD5 Hash values at an extremely fast and accurate rate. It also performs a readback and comparison of each block of data as it is captured. It is highly recommended that this mode be selected to ensure the accuracy of the Hash values.

None

(Default setting). This method performs no special verification and is used only for non-forensic cloning purposes.

On Error

The On Error option controls what actions are taken when the software runs into problem areas on the source drive. The choices are:

ABORT – The Abort option causes the software to stop the copying process and display an error message when an unreadable area is encountered on the source drive.

SKIP – The Skip option causes the software to ignore a bad sector and not copy it to the destination drive. All prior and subsequent sectors are copied while only the unreadable sector is skipped. This Sector is filled with zeros on the destination drive.

RETRY – The Retry option attempts to reread an offending sector. The user can set the number of retry attempts from zero to 1,000 attempts. The default setting is 50. The Talon Enhanced uses the following sequence for retry:

- 1. Reinitialize the source drive.
- 2. Dump the drive's cache buffer.
- 3. Reread the offending sector. If a good read occurs then the retry loop is aborted immediately and copying continues.

If the sector is still unreadable after the maximum number of retries, then it is skipped and the copying process continues with the following sectors. As with the skip option, if the sector is skipped, it is filled with zeros on the destination drive.

RECOVER – At least one reinitialize and retry is performed for all choices before recovery is attempted. This prevents recoverable errors from halting the completion of the copying process. For all modes, except ABORT, the hardcopy printout will provide a list of sector numbers that failed.

The Recover option makes up to 50 attempts to reread an offending sector using the following sequence:

- 1. Reinitialize the source drive.
- 2. Dump the drive's cache buffer.
- 3. Reread the offending sector. If a good read occurs then the retry loop is aborted immediately and copying continues.
- 4. If the read failed, the low level code transfers the drive's buffer contents anyway. The buffer is examined and information is collected for a majority vote algorithm.

5. If the sector is still unreadable after the maximum number of retries, the software will then attempt to reconstruct the sector by applying a majority vote algorithm to the data collected while performing the retries. The sector is then written to the destination drive and the copying process continues with the following sectors.

Printer

The printer option contains a submenu with various functions controlling the generation of hardcopy printouts of Capture, DD Imaging, Scan or Wipe Sessions.

AUTO PRINT – The print report option controls whether or not a hardcopy printout is automatically generated immediately following a Capture, Scan, or Wipe session. The choices are YES, or NO.

PRINT LAST SESSION – The Print Last Session option enables the user to get a hardcopy printout of the previous Capture, Scan or Wipe session even if the Print Report option above was not enabled. As long as <u>power remains applied to the unit</u>, the previous session's results are available.

PRINT SEARCH DETAIL – Prints a detailed report of all words matched during the last session, and their absolute location

PRINT SEARCH TEXT – Prints a snippet of text before and after the matched word, for every word matched during the last session

EJECT PAGE – The Eject Page option is a utility function that will send a page eject or form feed command to the printer. This may be necessary when using certain kinds of laser printers.

Anatomy of a Drive Capture

The drive capture process implemented in the Talon Enhanced is a specific and detailed process designed to ensure maximum integrity and certifiable performance. It consists of a number of checks and procedures that are detailed in the following section.

Power-up and Initialization

Power and reset are applied to both source and destination drives, then the software waits for up to 30 seconds for the source drive to become ready.

When the source drive is ready, the software identifies the drive configuration and initializes drive parameters.

The software then checks the destination drive for ready status and waits, if necessary. When the destination drive becomes ready, the software identifies the drive configuration and initializes drive parameters.

If the initialization of either drive fails, the software aborts the process with an error message.

The software verifies that the destination drive capacity is equal to or greater than the source drive. If the destination capacity is insufficient, then the user is informed and the software will abort the capture process.

Log file name entry

The unit initializes the CF card, and then asks the user to enter a case name. Case name(s) must be less than 195 characters or less and use DOS naming conventions.

Note: When using Spanning mode the maximum character length is 193. For Mirror/Wipe/Scan/HASH modes the maximum length is 8 characters.

The Log file name is used for the report that is created at the end of the capturing session and written to the System CF card. The report can be opened and printed from any text editor in Windows (like Notepad).

Calibration of Transfer Speed

If the Speed option described previously is set to any UDMA speed, then the calibration procedure is performed as follows:

- 1. In the drive identification process, the maximum speed of each drive is identified and stored.
- 2. The UDMA calibration process, simply takes the lowest common denominator of all drives involved in the process.

If none of the involved drives are UDMA capable, OR, if the Speed option described previously is set to any of the PIO speeds, then the following PIO calibration procedure is performed:

- 1. The transfer speed is set to a conservative initial value.
- 2. A chunk of the source drive is copied to the destination drive.
- 3. If there are no errors, then the elapsed time is stored. If there is an error, then the software will set the transfer speed to a lower value and exit the routine.
- 4. The transfer speed is set to the next higher value and the process is repeated until the highest speed is reached that does not result in any errors.

Capture Integrity Check

This procedure tests the integrity of the data path including the following items.

- Drive interface
- Data cables
- Unit integrity



• Loose connectors.

The method used is as follows:

 For drives that are running at PIO speeds: All bits of the data lines of the source drive are checked for toggling between one and zero while reading data from the drive. This is necessary because the data lines can be broken or unreliable and we can still communicate with and control the drive without transferring data.

NOTE: For this test, the unit checks an 8 MB portion of the drive that starts 50MB from the start of the drive. If the drive is wiped, or there is no data in that area, then the unit will pause with an error: **"Source drive data lines cannot be identified. Do you wish to continue?"** Choose <Yes> to continue with the Capture or choose <No> to abort. If the capture is continued, then the error message will not show up on the final capture report.

NOTE: This step does not apply to Flash Media Cards, even though they run at PIO-AUTO speeds.

- 2. A chunk of the source drive is then copied to the destination drive at the speed previously set in the calibration procedure.
- 3. Every byte of every sector copied is then compared on the source and destination drives.
- 4. If the data on both drives match, then the software will exit the Integrity check and continue the capture process. If the data does not match, the transfer speed is lowered to the next available setting. The process is then repeated until the data is identical on each drive.

NOTE: If a match does not occur, the unit will fail with an error.

Verification of Destination Drive being erased

The destination drive is checked to be sure it has been erased before copying the data from the source to the destination drive. Verifying the existence of a unique digital signature that is written to the drive during the Wipe-clean or erase function performs this check. The signature is written periodically across the entire drive when the Talon Enhanced erases it. If the drive is verified as erased, then the Capture process will proceed without any user intervention. If the erase is not verified, the user is asked if the drive should be erased now. If the user says yes, then the drive is erased and the Capture process will proceed. If the user declines, then this is noted and will show on the printed report. The Capture process will proceed.

Wipe Destination

The next section only applies if Wipe Destination is chosen during a capture session:

Erase Process

The software will write zero-filled sectors directly to the entire destination drive using programmed I/O.

If the words Security Erasing show in the UI during the wipe the drive is Security Erase enabled.

If the word Erasing shows in the UI during the wipe the drive is not Security Erase enabled.

Write a unique signature to the destination drive.

By default, the software writes a unique digital signature to the destination drive on the first sector of each logical cylinder boundary across the entire drive. This enables the Capture process to quickly verify that the destination drive has been erased prior to the Capture process. The unique signature is written to the last 12 bytes of the sector. The data pattern is

0xAAAA, 0x5555, followed by the character string "Logicube".

If needed, the user can disable the signature by selecting "NO" on the "Signature" menu located in the settings menu.

Capture Source Drive Data To Destination Drive

All Data on the source drive is copied sector-by-sector to the destination drive.

Check for Erasure of Unused Portion of Destination Drive

If the destination drive has not been previously verified as erased and the source drive has less capacity than the destination drive, then the software will ask the user whether or not to erase the unused remaining portion of the destination drive. If the user accepts, then the remainder of the destination drive will be erased and the Capture process will continue. If the user declines, then this is noted and will show on the printed report. The Capture process will proceed. This is to ensure that there is no leftover data from any previous usage on the extra portion of the drive. Note: In the DD imaging modes, erasure of remainder of drive is not an option.

Print Final Capture Report

If the Auto Print setting was set to YES prior to Capture, then the unit will prompt the user with a message: "Make sure that the printer is connected, powered up and online. Press <OK> to print". Press the Select button to initiate printing. A Final Capture Report will then be printed.



If the Printer setting was set to NO prior to capture, then a report can still be printed as long as the unit hasn't been powered down, rebooted or used to clone more drives. Just go to the Misc Menu, tap the Print Options icon, tap the "Additional Reports" icon, find "Print Last Session", tap it and press the Set button.

A copy of the report is also written to the CF card. It is named <Log file name>.LOG.

Final Capture Report (Hardcopy Printout)

The hardcopy printout available on the Talon Enhanced was designed to provide sufficient information for use as an evidence identification tag. It contains information on the unit used to acquire the evidence, the personnel acquiring the evidence, and the important information for the actual capture session.

Information Format

This section describes the information format that appears on the Talon Enhanced hardcopy printouts. For an example, see the included page at the end of this section.

Unit Information – The unit Information section identifies the model name of the acquiring unit, the unit serial number, and the software version installed.

Forensic Information – The Forensic Information section contains several lines for the user to enter the necessary information relevant to each investigation.

There are spaces for the following information:

- Evidence number and/or any alias identifier.
- The name of the person(s) acquiring the evidence.
- The date and time that the evidence was acquired.
- The location at the scene of the investigation where the evidence was acquired.
- A description of the acquired evidence.

Session Information – This section of the printout contains information specific to the actual Capture session.

Session Settings Information – This section contains information pertaining to the actual Session that is not specific to either drive. It contains the following:

- Operating Mode. This can be Capture, DD Capture, E01, Scan or Wipe clean.
- Verify. This reflects the Verify option setting for each operating mode as explained in previous sections of this text. When a DD capture is performed with Verify the Destination Hash Value is reported in the verify section of the audit trail report.

- Speed. This reflects the Speed option setting for each operating mode as explained previously.
- Connection. This is the connection method for the operating mode. This is meant to indicate whether a direct IDE, SATA or USB connection was used for the operating mode.
- Results. This line appears on the hardcopy only if the operating mode was Capture. It will contain one of the following lines.
 - "MIRROR COPY OF THE DRIVE HAS BEEN SUCCESSFULLY EXECUTED!"
 - "SESSION RESULTS ARE INVALID BECAUSE THE OPERATION WAS ABORTED!"
 - "SESSION RESULTS ARE INVALID BECAUSE THE OPERATION WAS IN ERROR!"
- Extra information. This line appears on the hardcopy only if the operating mode was Capture. It will contain one of the following lines:
 - The destination drive was verified as erased before Capture!
 - The destination drive was erased during the Capture!
 - Operator declined FULL destination drive erase and erased remainder.
 - Operator declined FULL and remainder destination drive erase!

Source drive Information – This section of the printout contains information specific to the Source or Suspect drive. This will only appear if the operating mode was (Mirror) Capture or DD Image Capture with Verify set to **HASH** or **HASH-Disk**. It contains the following:

- Drive Identification. These lines print the model and serial number as reported by the source drive.
- Physical Geometry. These lines indicate the number of cylinders, heads and sectors, the total number of sectors, and the drive size.
- HASH Value. This line prints the computed SHA-256 and MD5 values for the source drive.
- Error recovery information. These lines will only appear if the On Error setting for the Capture operation was set to something other than abort.

If the setting was set to "skip", then a single line containing the total number of skipped sectors will be printed.

If the setting was "retry" or "recover", two lines will be printed: One containing the total number of recovered sectors; one



containing the total number of non-recovered or skipped sectors.

Destination drive Information – This section of the printout contains information specific to the destination drive. It contains the following.

- Drive Identification. These lines print the model and serial number as reported by the destination drive.
- Physical Geometry. These lines indicate the number of cylinders, heads and sectors, the total number of sectors, and the drive size.
- HASH Value. This line prints the computed SHA-256 and MD5 value for the destination drive. This will only appear if the operating mode was (Mirror) Capture with Verify set to **HASH**.
- Media Verify information. These lines will only appear if the operating mode was set to Scan.
 If after a Scan operation, any bad sectors, weak sectors, or weak spots are detected, then the addresses of those sectors are printed followed by the grand totals for each type.
- If one of the DD imaging modes was used with verify set to **HASH-File**, a list of file names with their respective SHA-256 and MD5 values will be printed at the bottom of the page.

Audit Trail Authentication Checksum – This number is used to verify if the report which resides on the CF card has not been altered in any way. The Checksum is a proprietary Hash value.

Note: The Audit Trail Authentication Checksum value is not a standard MD5 Hash value and it will not match the value calculated by third-party software or other means.

Keyword List – If a keyword search was performed during the capture, a list of the found keywords will appear at the very end of the Final Capture report.

Example of Hardcopy Printout

```
**** Talon Enhanced
                      -- Serial No.:97008 --
* Software: V2.1.0RC01-18 Firmware: V1.10.5 fs:FAT32
* Time Zone: -7 hour Daylight Saving: 0 hour
* Date: 2011/07/13
                       Time: 23:16:58
                  Location
* Acquired by
* Acquired on
                                   AΠ
* Operating Mode: 4G E01:S1=>D1 Address Mode: LBA
* Verify : Hash-Dsk+V
                                     Speed : UDMA-5 *
* Connection : Direct
            E01 CAPTURE OF S1 HAS BEEN ACHIEVED.
* S1 |

* Model : ST3500418AS |

* Serial: 6VMRN000
                                        D1
                           | Model : WDC WD2001FASS-00U0B0 *
* Serial: 6VMPNQQQ
                            | Serial: WD-WMAUR0045762
* C: 969021 H: 16 S: 63 | C: 3876021H: 16 S: 63
* Total Sectors Drive Size | Total Sectors Drive Size
    976773168 465.0GB | 3907029168 1863.0GB
                            *********
*** E01TN.E01: S1: 0 To:131432447
* start MD5: 67452301 EFCDAB89 98BADCFE 10325476
* end MD5: 292C732C 9E5C132B 30720FAF B48ECB7B
* Verified : 292C732C 9E5C132B 30720FAF B48ECB7B
*** E01TN.E02: S1: 131432448 To:305963007
* start MD5: 292C732C 9E5C132B 30720FAF B48ECB7B
* end MD5: 4AE746D8 D00AB549 94B4AA93 BEE96AC6
* Verified : 4AE746D8 D00AB549 94B4AA93 BEE96AC6
*** E01TN.E03: S1: 305963008 To:764583935
* start MD5: 4AE746D8 D00AB549 94B4AA93 BEE96AC6
* end MD5: EBCF3416 AE0CA623 6AEDD63C 768E0837
* Verified : EBCF3416 AE0CA623 6AEDD63C 768E0837
*** E01TN.E04: S1: 764583936 To:976773167
* start MD5: EBCF3416 AE0CA623 6AEDD63C 768E0837
* end MD5: 5ED600C0 E12A9668 96F20FE8 EB0A8001
* Verified : 5ED600C0 E12A9668 96F20FE8 EB0A8001
*** S1 From: 0, To: 976773167, Size: 976773168
* Source MD5:
* ...9EBE474D 7D5650C0 4FBC572F 92DBA963...
* Verified :
* ...9EBE474D 7D5650C0 4FBC572F 92DBA963...
*****
       Skipped Sectors: 0 Recovered Sectors: 0
Compression Ratio is : 35.33 : 1
Audit Trail Checksum: E1765737 0ED632BB 0E1F2AD6 092F2D2A
```

12. Frequently Asked Talon Enhanced Questions and Answers

- **Q.** The Talon Enhanced boots up to a screen that states *Found incomplete session*. What does it mean and how can I get past this message?
- A. This feature is currently under development. Simply place a check mark on the box next to "Don't ask" then tap the *Skip* button to continue booting up the Talon Enhanced to the main menu.
- **Q.** By comparison my Talon Enhanced appears to be operating slower than other units.
- A. Make sure that your unit is using the latest software. Visit http://www.logicube.com and go to the support page to view the latest software level and if necessary download the software for your system.
- **Q.** My Talon Enhanced continues to ask if I want to wipe a brand new capture HDD.
- **A.** This is a normal Talon Enhanced question that will be asked unless the new HDD is wiped by the Talon Enhanced. Using the Talon Enhanced to prepare (pre-wipe) a new Destination HDD will eliminate this screen from displaying while on site thus speeding up the capture process.
- **Q.** After installing a brand new destination drive in my Talon Enhanced and starting a capture, I received a message that the drive was not erased, is this normal?
- A. Even though new drives are usually blank, they still need to be wiped to guarantee that they do not contain any data. The Talon Enhanced writes a signature to the destination drive during the wipe session. It is this signature that tells the Talon Enhanced that the destination or capture drive was previously wiped. Destination drives can be prepared ahead of time by wiping them with signature set to "YES".
- Q. Can I make bootable "Clone" with the Talon Enhanced?
- A. While the Talon Enhanced was not designed to produce a bootable "clone", it will create a copy of the source drive with bit-for-bit accuracy. Whether or not the destination drive will boot depends upon many factors that include drive geometry, operating systems, and PC BIOS issues.
- **Q.** On my capture drive the information displayed on the Talon Enhanced does not agree with the label fixed to the target HDD. Example: The number of cylinders displayed is different than the label
- **A.** This issue has come up on Seagate HDDs. Although the information displayed may not agree, the correct information will be on the printed report generated at the end of the capture session.
- **Q**. Drive information as displayed on the Talon Enhanced does not agree with the label fixed to the target HDD. Example: The number of cylinders displayed is different than the label

- Logicube
- A. Drive labels will only show Cylinders, Heads, and Sectors for a maximum of 8.5GB (example: 16383, 16, 63.) The actual drive parameters will be displayed both in drive information, and in the printed session report. Most of the newer drives only have an LBA (Logical Block Addressing) value printed on the label showing the drive's capacity in sectors
- Q. Capturing data from a PATA (IDE) Western Digital HDD is not working.
- **A.** Most Western Digital drives require that the jumpers be removed for a capture to work. The exception to this statement is for the Western Digital "Xpert" series Hard Drives (an older manufactured version), where the jumper is set to the master position.
- Q. Will DD Image capture files have the same "odd sector" problem of the Linux operating system?
- **A.** Although DD Image capture files are formatted as "DD Linux" files, they do not utilize the Linux kernel. The Linux OS is unable to see the last sector of a drive that has an odd number of sectors. Some users have asked if this problem will prevent the last sector of an odd sector drive from being captured. The answer is no.
- Q. What happens if a HASH mismatch occurs during a Mirror or DD capture with verification on?
- **A.** The capture session will immediately abort and this message will be displayed on the Talon Enhanced:

Error

Error Capturing Drive! Drive error.

Either the speed setting is too high

Or a bad sector was found!

- Q. What will happen if a drive cable makes intermittent contact during a capture?
- A. The capture session will immediately abort and an error message will be displayed on the Talon Enhanced display.
- **Q.** If a verification mismatch occurs during a capture will the clone complete?
- **A.** No. The capture session will immediately abort and display an error message on the Talon Enhanced indicating that an error has occurred. A Log file is not generated when a mismatch occurs.
- **Q.** When two drives are created from one source drive as a DD image with Disk + Verification turned ON how do I know both copies have been verified by Talon Enhanced to be exactly the same as the source?
- A. If at any time during the capture either of the two copies encounters a hash mismatch as part of the verification process, Talon Enhanced will terminate the capture before the log file can be created. If the capture completes successfully the SHA- 256 and MD5 digests for S1 will be displayed on Talon Enhanced and in the log file along with the message AN EXACT DD IMAGE FILE COPY OF S1 HAS BEEN ACHIEVED.
- Q. Does the Talon Enhanced support E01 file format?

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A. Yes, the Talon Enhanced has a feature to capture suspect drive data in the E01 file format. It can be used with Encase ver.6.X and with Access Data's FTK Imager v3.X

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