Protecting Your Digital Assets™

CRU® WiebeTech® Ditto® DX Forensic FieldStation

User Manual

Features

- Create local, remote, or networked disk clones and images
- Configure and manage Ditto DX via a VPN, network, or on the unit itself
- Time saving logical imaging twice as fast as the original Ditto Forensic FieldStation
- Natively supports write-blocked SATA, eSATA, PATA, and USB 3.0/2.0
- Write to dual destinations simultaneously - Any combination of eSATA, USB 3.0, or Gigabit Ethernet
- Output images to portable RAID enclosures, NAS units, and other network destinations
- Data acquisition modes – Clone, DD, E01, L01, and simultaneous clone & image
- Hash types – MD5, SHA-1, MD5 + SHA-1, SHA-256, MD5+SHA-256
- Securely sanitize drives with preset erase modes or a user configurable pattern
- Stealth Mode available for use with night vision goggles (not included)

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1 GENERAL INFORMATION

1.1 PACKAGE CONTENTS

The following list contains the items that are included in the complete configuration for this device. Please contact CRU if any items are missing or damaged:

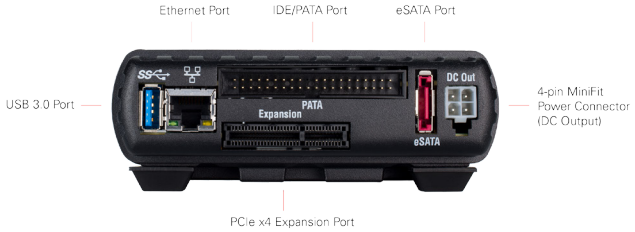
Ditto DX Forensic FieldStation Unit	1
Unitized SAS-to-eSATA + Mini-Fit power cable	3
IDE cable	1
12V power supply	1
Power cord	1
Legacy power-to-Mini-Fit cable	1
Ethernet cable (RJ45)	1
Power adapter, legacy-to-SATA	1
Velcro cable wrap	6
eSATA cable	2
8GB SD card (pre-installed)	1

1.2 IDENTIFYING PARTS

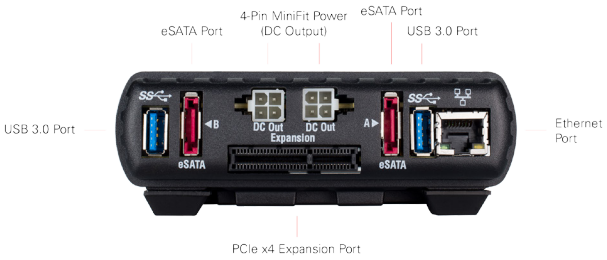
Take a moment to familiarize yourself with the parts of the Ditto DX Forensic FieldStation. This will help you to better understand the following instructions.

TOP OF UNIT

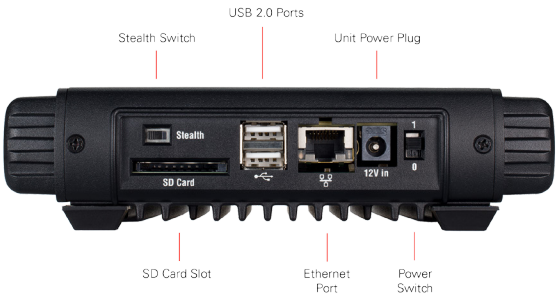
SOURCE INPUTS
(all inputs are write-blocked)



DESTINATION OUTPUTS



CONTROL INTERFACE



1.3 LIGHTBAR STATUS

COLOR	STATE	DESCRIPTION
Teal	Solid	Idle
Magenta	Solid	An action is in progress
Green	Solid	An action has successfully completed
Red	Solid	An error has been detected or the running action has been aborted by the user
Amber	Solid	The processor is close to reaching its recommended thermal limit. CRU suggests that you use the Ditto DX external fan (sold separately).
	Blinking	The currently running action has been suspended by the Ditto DX Forensic FieldStation's thermal management and will automatically resume from where it left off when temperatures have sufficiently lowered.

1.4 THERMAL MANAGEMENT

The Ditto DX Forensic FieldStation is a passively cooled system that pulls heat out of the processor and other electronics into the aluminum housing where it dissipates. The heat generated by the Ditto DX Forensic FieldStation is an intended design feature that eliminates the need of a noisy internal cooling fan and drastically reduces the amount of particulates that are pulled through the system.

The passively cooled system includes automatic thermal monitoring and protection. If the Ditto DX Forensic FieldStation detects that the internal temperature is reaching a specific threshold, the Lightbar will change to amber and a message will be presented on the front panel LCD suggesting that an external fan may be required. If the temperature continues to increase and reaches the secondary threshold, the Ditto DX Forensic FieldStation will suspend any currently running action and the Lightbar will begin blinking amber. Once the internal temperature lowers, the action will resume automatically from where it left off.

If you are operating the Ditto DX Forensic FieldStation in an environment warmer than 95° F/35° C, CRU recommends the use of an external fan (very little air movement is required). CRU offers such a fan specifically designed for use with Ditto DX (Part Number: 30000-0100-0001). The Ditto DX fan is powered from one of the USB2 ports on the control interface and operates very quietly.

2 SETUP

The **Control Interface** side of the Ditto DX Forensic FieldStation has a power switch and 12V input for the included power supply, an SD card slot, two USB 2.0 ports for use with a keyboard or wifi adapter, an RJ45 gigabit Ethernet port to allow network access to the Ditto DX's browser interface (see Section 3), and a stealth switch that will turn off all external lights and enable nightvision mode (see Section 10).

Plug the "suspect" disks or devices into the **Source Inputs** side of the Ditto DX Forensic FieldStation. All source inputs are write-blocked to prevent alteration. The source inputs include a USB 3.0 port for USB devices, an RJ45 gigabit Ethernet port, an IDE/PATA disk port, an eSATA port for SATA disks or an eSATA device, and a PCIe x4 port which can be used with the Ditto DX PCIe Adapter Bundle, and the SAS and FireWire expansion modules, all sold separately.

Use the **Destination Outputs** side of the Ditto DX Forensic FieldStation to store acquired data. The destination output connections include two USB 3.0 ports for USB devices, an RJ45 gigabit Ethernet port, a two eSATA ports for SATA disks or eSATA devices, and a PCIe x4 port which can also be used with the above mentioned PCIe adapter bundle and expansion modules.

NOTE CRU recommends that you switch the power off to the Ditto DX when you add or remove a device from it in order to avoid disk damage and data corruption.

3 BROWSER INTERFACE

The Ditto DX Forensic FieldStation can be configured and operated either from the Front Panel (see Section 9) or through a web browser.

3.1 ACCESSING THE BROWSER INTERFACE

3.1.1 Accessing Via Network

a. Plug an Ethernet cable into the Ethernet port on the "Control Interface" side of the Ditto DX Forensic FieldStation.

b. Connect the other end of the Ethernet cable to your network. This usually means plugging it into a router or hub. In an office environment, you may have a network jack built into your office wall.

c. Connect the power cable to the rear of the Ditto DX Forensic FieldStation and to the provided AC adapter.

d. Turn on the Ditto DX Forensic FieldStation's power using the switch on the rear panel. (0 = off, 1 = on)

e. If you have previously configured the Ditto DX and you know the IP address it uses, go down to the last step of this section. If you have not configured the Ditto DX, use one of the two following ways to configure it.

Configure Ditto to Use DHCP

DHCP is the protocol used by most network environments today. Unless your network administrator directs otherwise, you should probably follow these steps.

a. Press the **Down** navigation button on the Ditto DX Forensic FieldStation until you reach the "Settings" menu (see Figure 1). Then press the **Right** navigation button to view the Settings.

b. Press **Up** or **Down** until you reach the "Ctl Network Settings" screen shown in Figure 2 and press **Right**.

c. Press **Up** or **Down** until you reach the "Ctl Network" screen shown in Figure 3.

d. If the text on the second line says "Disabled", press the **Right** button to edit the setting. Press **Up** once and then **Right** to commit the change. If the text says "Enabled", continue to the next step.

e. Press **Up** or **Down** until you reach the "Ctl Network Mode" screen shown in Figure 4.

f. If the text on the second line says anything other than "Client (DHCP)", press **Right** to edit the setting. Press **Up** until the second line says "Client (DHCP)" and then press **Right** to commit the change. If the text already says "Client (DHCP)", continue on to the next step.

g. Press **Up** or **Down** until you reach the "Ctl IP Address" screen shown in Figure 5.

h. Continue to Step G below to log into the browser interface.

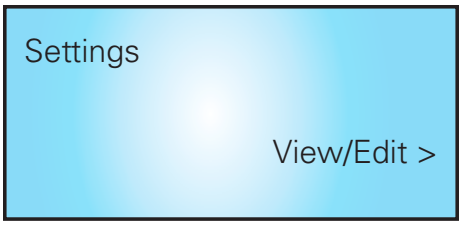


Figure 1. A depiction of the "Settings" menu on the Ditto DX Forensic FieldStation.

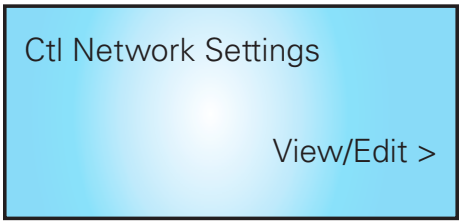


Figure 2. A depiction of the "Ctl Network Settings" screen on the Ditto DX Forensic FieldStation.

Figure 3. A depiction of the "Ctl Network" screen on the Ditto DX Forensic FieldStation.

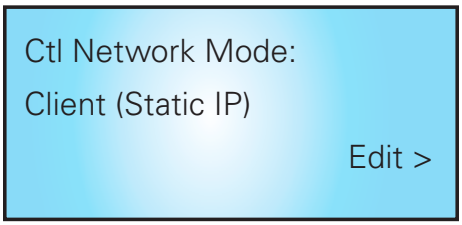


Figure 4. A depiction of the "Ctl Network Mode" screen on the Ditto DX Forensic FieldStation.

Figure 5. A depiction of the "Ctl IP Address" screen on the Ditto DX Forensic FieldStation.

Configure Ditto to Use a Static IP Address

If your network administrator directs you to use a static IP address, follow these steps.

a. Press the **Down** navigation button on the Ditto DX Forensic FieldStation until you reach the "Settings" menu (see Figure 1). Then press the **Right** navigation button to view the Settings.

b. Press **Up** or **Down** until you reach the "Ctl Network Settings" screen shown in Figure 2 and press **Right**.

c. Press **Up** or **Down** until you reach the "Ctl Network" screen shown in Figure 3.

d. If the text on the second line says "Disabled", press the Right button to edit the setting. Press **Up** once and then **Right** to commit the change. If the text says "Enabled", continue to the next step.

e. Press **Up** or **Down** until you reach the "Ctl Network Mode" screen shown in Figure 4.

f. If the text on the second line says anything other than "Client (Static IP)", press **Right** to edit the setting. Press **Up** until the second line says "Client (Static IP)" and then press **Right** to commit the change. If the text already says "Client (Static IP)", continue on to the next step.

g. Press **Up** or **Down** until you reach the "Ctl IP Address" screen shown in Figure 5.

h. Press **Right** to edit the IP address. You can use a keyboard that you've attached to the USB 2.0 ports on the "Control Interface" side of the Ditto DX to enter the static IP address your network administrator gave you.

   If you do not have a keyboard, press **Right** and **Left** to scroll the cursor right and left, and press **Up** or **Down** to increase or decrease the number highlighted by the cursor.

   When you have finished, press **Right** to commit the changes.

f. Type the IP address shown into your web browser.

g. Log into the browser interface (the default user name and password for the administrator account are both "**admin**").

NOTE CRU recommends that you change the admin account password and create user accounts for individual users as best data management practices.

You are now ready to use the browser interface to configure settings and preview, image, or clone attached disks.

3.1.2 Accessing Via Direct Connection to Your Computer

a. Plug an Ethernet cable into the Ethernet port on the "Control Interface" side of the Ditto DX Forensic FieldStation.

b. Connect the other end of the Ethernet cable to your computer's Ethernet port.

STOP! The control Ethernet port can be configured to act as a server. Attaching a Ditto DX Forensic FieldStation acting as a server to an existing network through the control Ethernet port will cause network conflicts. Therefore it is important to attach the Ditto DX Forensic FieldStation directly to your computer instead. To change this setting so that the Ditto DX Forensic FieldStation no longer acts as a server, see Section 5.2.3.

c. Connect the power cable to the rear of the Ditto DX Forensic FieldStation and to the provided AC adapter.

d. Turn on the Ditto DX Forensic FieldStation's power using the switch on the rear panel. (0 = off, 1 = on)

e. Press the **Down** navigation button on the Ditto DX Forensic FieldStation until you reach the "Settings" menu (see Figure 1). Then press the **Right** navigation button to view the Settings.

f. Press **Up** or **Down** until you reach the "Ctl Network Settings" screen shown in Figure 2 and press **Right**.

g. Press **Up** or **Down** until you reach the "Ctl Network" screen shown in Figure 3.

h. If the text on the second line says "Disabled", press the Right button to edit the setting. Press **Up** once and then **Right** to commit the change. If the text says "Enabled", continue to the next step.

i. Press **Up** or **Down** until you reach the "Ctl Network Mode" screen shown in Figure 4.

j. If the text on the second line says anything other than "Server", press **Right** to edit the setting. Press **Up** until the second line says "Server" and then press **Right** to commit the change. If the text already says "Server, continue on to the next step.

k. Press **Up** or **Down** until you reach the "Ctl IP Address" screen shown in Figure 5.

l. The default IP address for the control Ethernet port is **10.10.0.1**. If you wish to change the address, press **Right** to do so. Otherwise proceed to Step N.

m. You can use a keyboard that you've attached to the USB 2.0 ports on the "Control Interface" side of the Ditto DX to enter the static IP address your network administrator gave you.

   If you do not have a keyboard, press **Right** and **Left** to scroll the cursor right and left, and press **Up** or **Down** to increase or decrease the number highlighted by the cursor.

   When you have finished, press **Right** to commit the changes.

n. Type the Ditto DX Forensic FieldStation's control IP address into your web browser.

o. Log into the browser interface (the default user name and password for the administrator account are both "**admin**").

NOTE CRU recommends that you change the admin account password and create user accounts for individual users as best data management practices.

You are now ready to use the browser interface to configure settings and preview, image, or clone attached disks.

3.2 ICONS USED IN THE BROWSER INTERFACE

The browser interface uses several icons that may be clicked on to perform certain actions.

ICON	ACTION
 Information	Opens a window with a brief description of the setting the information icon appears next to.
 Refresh	Refreshes the field that the icon appears next to in order to give updated information.

More icons are detailed on the next page.

Icons Used in the Browser Interface, continued...

ICON	ACTION
Reset	Loads the defaults for the setting that the Refresh icon appears next to.
Add	Adds a user defined field to a list of items.
Remove	Removes a user defined field from a list of items.

3.3 USER ACCOUNTS

The Ditto DX Forensic FieldStation employs a user account system to control access to its features. The "Login" screen presents you with the ability to log in through http, or you can click the **Secure Login (HTTPS)** link to log in securely. Accept the certificate and/or continue to the website, even if your browser tells you it does not recognize it.

The default user name and password for the Administrator account are both "**admin**". CRU recommends that you change the admin account password and create user accounts for individual users as best data management practices.

Click on the **Log Out button** at the top right of the browser interface to log out.

4 HOME SCREEN

The "Home" screen is where you will perform most of your operations with the Ditto DX Forensic FieldStation, and is the default screen to load upon logging into the browser interface. Click on the **Home tab** to access the "Home" sceen from any other area of the browser interface.

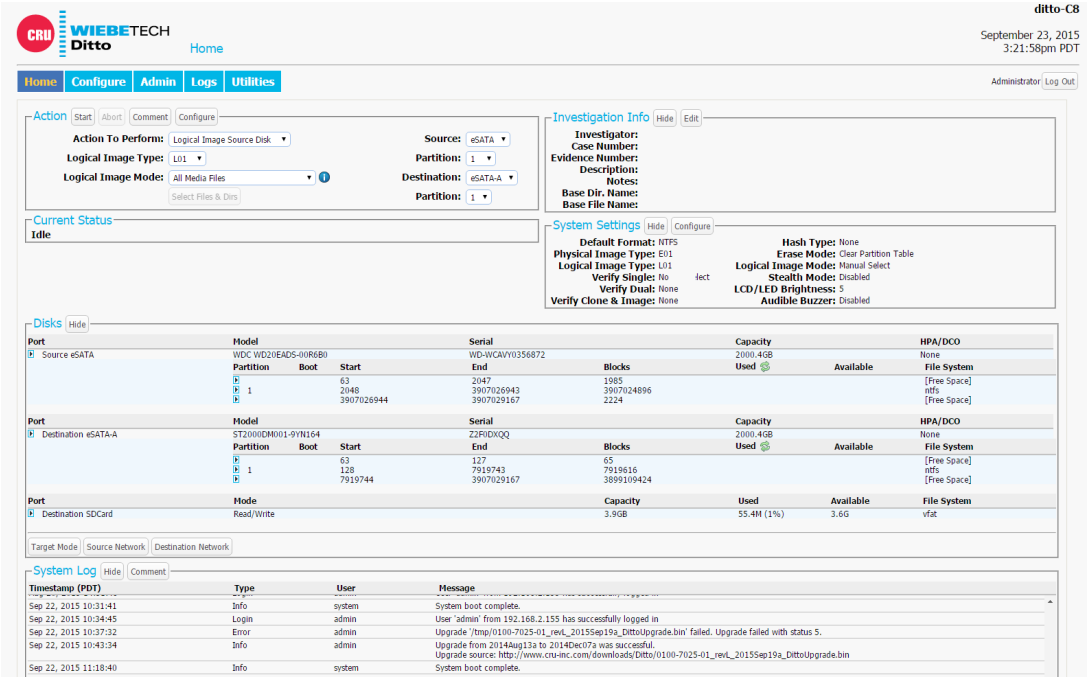


Figure 6. The "Home" screen.

4.1 ACTION

The "Action" panel lets you start, abort, and document the following actions. The "Start" button begins the action. The "Abort" button stops the action in progress. Click the **Comment button** to write a note that will be appended to the log. Click the **Configure button** to modify the default settings for each action, which can also be modified on the "Configure" screen (See Section 5).

4.1.1 Clone Source Disk

The Ditto DX Forensic FieldStation makes an exact duplicate of the source disk on one or two destination disks.

NOTE While cloning the source disk, the Ditto DX Forensic FieldStation can also hash the source disk using the MD5, SHA-1, SHA-256, MD5 & SHA-1, or MD5 & SHA-256 algorithms. Select the hash type under the "System Settings" panel on the "Home" screen. See Section 4.3.

To clone, follow these steps:

a. Using the browser interface, select **Clone Source Disk** from the "Action to Perform" drop-down box.

b. Select the source disk to clone from the "Source" drop-down box.

c. Select the destination disk from the "Destination" drop-down box.

Destination disks do not have to be the same physical media as the source disk, but each must be larger than the source disk.

d. Click the **Start button**. A "Completed" message box will pop up when the action has finished. Click on the message to continue.

NOTE You can increase the performance of the operation by clicking off of the browser interface window so that it is not continually updated.

You can view the results of the clone action by scrolling down to the "System Log" panel on the "Home" screen. Find and click on the latest link, which will be denoted by a filename with a date/timestamp format: "S_yyyymmddhhmmss". Alternatively, you can click on the **Logs button** from the top menu bar.

4.1.2 Physical Image Source Disk

The Ditto DX Forensic FieldStation creates an E01 or DD image of the source disk on one or two destination disks.

NOTE While imaging the source disk, the Ditto DX Forensic FieldStation can also hash the source disk using the MD5, SHA-1, SHA-256, MD5 & SHA-1, or MD5 & SHA-256 algorithms. Select the hash type under the "System Settings" panel on the "Home" screen. See Section 4.3.

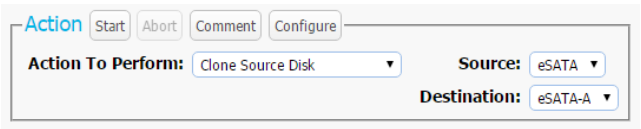


Figure 7. The "Action" section on the "Home" screen, showing the options available for the "Clone Source Disk" action.

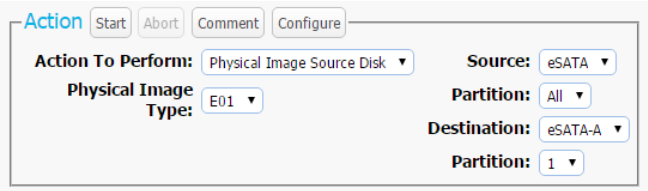


Figure 8. The "Action" section on the "Home" screen, showing the options available for the "Physical Image Source Disk" action.

For the fastest performance, we recommend utilizing an NTFS file system for Windows, HFS+ for Mac, or XFS for Linux machines. To create a physical image, follow these steps:

a. Using the browser interface, select **Physical Image Source Disk** from the "Action to Perform" drop-down box.

b. Select which type of physical image you would like to create from the "Physical Image Type" drop-down box. The image types available are **E01** or **DD**. You can modify which image type appears by default in the drop-down box on the "Home" screen's "System Settings" section (see Section 4.3), or on the "Configure" screen's "System" tab (see Section 5.1).

c. Select the source disk to image from the "Source" drop-down box.

d. Select which partition(s) to image from the "Partition" drop-down box. Choose **All** to image the entire source disk.

e. Select the destination disk from the "Destination" drop-down box.

   To image to two destination disks at the same time, "Dual Destinations" must be enabled in the "Configure" screen → "System" tab → "Advanced Settings" section. Once enabled, the first destination disk and its partition can be chosen from the "Destination" and "Partition" drop-down boxes, and the second destination and its partition can be chosen from the "Destination 2" and "Partition 2" drop-down boxes.

NOTE Destination disks do not have to be the same physical media as the source disk, but each must be larger than the source disk. Using E01 compression can help.

f. Click the **Start button**. A "Completed" message box will pop up when the action has finished. Click on the message to continue.

NOTE You can increase the performance of the operation by clicking off of the browser interface window so that it is not continually updated.

You can view the results of the image action by scrolling down to the "System Log" panel on the "Home" screen. Find and click on the latest link, which will be denoted by a filename with a date/timestamp format: "S_yyyymmddhhmmss". Alternatively, you can click on the **Logs button** from the top menu bar.

4.1.3 Logical Image Source Disk

Logical imaging allows an investigator to quickly scan the contents of a hard disk and image only the files and folders relevant to the investigation into an L01, ZIP, TAR, or LIST file format. Data can be imaged to one or two destination disks. To create a logical image, follow these steps:

a. Select **Logical Image Source Disk** from the "Action to Perform" drop-down box.

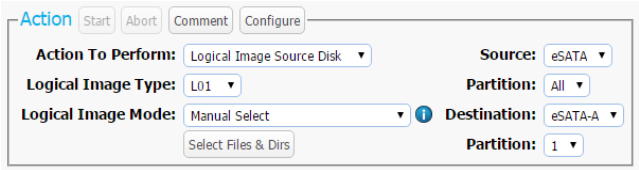


Figure 9. The "Action" section on the "Home" screen, showing the options available for the "Logical Image Source Disk" action.

b. Select which type of logical image you would like to create from the "Logical Image Type" drop-down box. The format options available are L01, TAR, ZIP, or LIST. (You can modify which logical image type appears by default in the drop-down box on the "Configure" screen's "System" tab. See Section 5.1.)

NOTE "Logical Image Source Disk" actions create a report of directories and files chosen from the source disk as well as their file sizes and any error messages encountered. This report can be viewed from within the browser interface and can be exported as an Excel spreadsheet. See Section 7.1.4.

c. Select the Logical Image Mode from the "Logical Image Mode" drop-down box. See the list of logical image modes at the end of this subsection for information on what each mode does.

d. Select the source disk to image from the "Source" drop-down box, then choose which partition(s) to image from the "Partition" drop-down box underneath the "Source" drop-down box. If you select "All", partitions will be imaged sequentially.

e. Select the destination disk for the logical image from the "Destination" drop-down box, then choose the destination disk partition from the "Partition" drop-down box underneath.

f. If you chose any other Logical Image Mode besides "Manual Select", click the **Start button** at the top of Action section. A "Completed" message box will pop up when the action has finished. Click on the message to continue.

   If you chose "Manual Select", follow these steps:

   i. Click on **Select Files & Dirs**. A dialog box will open.

   ii. Use the navigation tree to select the files and folders you wish to image (see Figure 10).

   iii. Click the **Start button** at the bottom of the dialog box. A "Completed" message box will pop up when the action has finished. Click on the message to continue.

You can view the results of the logical image action by scrolling down to the "System Log" panel on the "Home" screen. Find and click on the latest link, which will be denoted by a filename with a date/timestamp format: "S_yyyymmddhhmmss". Alternatively, you can click on the **Logs button** from the top menu bar.

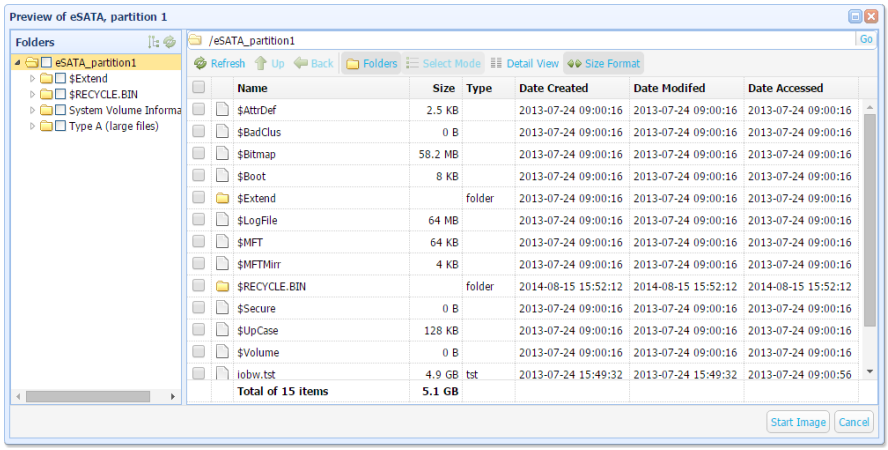


Figure 10. The file navigation tree.

Logical Image Modes

The Logical Image action can automatically search for files that fit the following Logical Image Modes. The action will search for specific file extensions specified by the Logical Image Mode.

- **Manual Select:** Enables the "Select Files & Dirs" button so that you can manually select which files to logically image.
- **All Files and Dirs:** Images all files and directories.
- **All Except Windows:** Images all files and directories except for the Windows directory.
- **All Except Windows and Programs:** Images all files and directories except for the Windows, Program Files, Program Files (x86), and ProgramData directories.
- **All Users - Windows:** Images the Windows "Users" directory.
- **All Temporary - Windows:** Images the Windows/Temp and Temp directories.
- **All Except Swap and Hibernate:** Images all files and directories except files named hiberfil.sys, pagefile.sys, Win386.swp, and 386part.par.
- **All Media Files:** Images all .avi, .jpeg, .jpg, .wav, and .mov files, as well as all files with extensions beginning in ".mp" (.mpeg, .mp4, .mp3, etc.) and all files with extensions beginning in ".m4" (.m4a, .m4v, etc.).
- **All Office Files:** Images all .txt and .pdf files, as well as all files with extensions beginning in ".doc", ".xls", ".ppt" (.doc, .docx, .xlsx, .pptx, etc.).
- **All Financial Files:** Images all .ifx, .ofx, .qfx, .qif, and .tax files.

You may also add your own customized logical image mode profiles to this drop-down list. To do so, see Section 11.5.

4.1.4 Clone and Image Source Disk

This action simultaneously creates a clone of the source disk on one destination disk and creates an image on a second destination disk. **Two destination disks are required for this action.**

NOTE While cloning and imaging the source disk, the Ditto DX Forensic FieldStation can also hash the source disk using the MD5, SHA-1, SHA-256, MD5 & SHA-1, or MD5 & SHA-256 algorithms. Select the hash type under the "System Settings" panel on the "Home" screen. See Section 4.3.

To simultaneously create a clone and a physical image of the source disk, follow these steps:

a. Select **Clone & Image Source Disk** from the "Action to Perform" drop-down box.

b. Select the source disk to clone and image from the "Source" drop-down box.

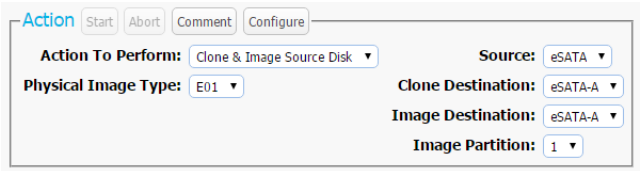


Figure 11. The "Action" section on the "Home" screen, showing the options available for the "Clone & Image Source Disk" action.

c. Select the destination disk for the clone from the "Clone Destination" drop-down box and the destination disk for the image from the "Image Destination" drop-down box.

NOTE Destination disks do not have to be the same physical media as the source disk, but each must be larger than the source disk.

d. Select the destination disk partition on which to save the image file from the "Image Partition" drop-down box.

e. Select which type of physical image you would like to create from the "Physical Image Type" drop-down box. The image types available are **E01** or **DD**. (You can modify which image type appears by default in the drop-down box on the "Configure" screen's "System" tab. See Section 5.1.)

f. Click the **Start button**. A "Completed" message box will pop up when the action has finished. Click on the message to continue.

You can view the results of the clone and image action by scrolling down to the "System Log" panel on the "Home" screen. Find and click on the latest links, which will be denoted by a filename with a date/timestamp format: "S_yyyymmddhhmmss". Alternatively, you can click on the **Logs button** from the top menu bar.

4.1.5 Restore Physical Image

Image files of an entire disk or partition can be restored to a new disk using this action. The image file must be in either E01 or DD format. Image files of a single partition will be restored as if the original had no partitions. The destination disk must also be the same size as or larger than the original.

To restore a physical image, follow these steps:

a. Select **Restore Physical Image** from the "Action to Perform" drop-down box.

b. From the "Source" drop-down box, select the source disk where the physical image you wish to restore resides.

c. From the "Partition" drop-down box, choose the partition on the source disk where the physical image resides.

d. Select the destination disk for the image from the "Destination" drop-down box.

NOTE Destination disks must be larger than the source image.

e. Click the **Select Image to Restore** button, navigate to the physical image you wish to restore, select the image file to restore.

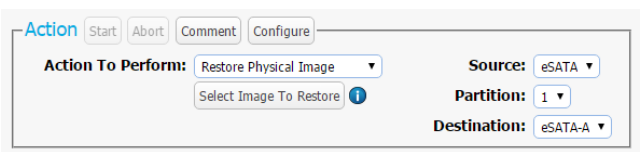


Figure 12. The "Action" section on the "Home" screen, showing the options available for the "Restore Physical Image" action.

NOTE If the image was originally created as a set of files, select the first file in the set.

f. Click the **Start Restore** button. The Ditto DX will being restoring the image to the destination disk.

4.1.6 Erase Destination Disk

The Ditto DX Forensic FieldStation erases the destination disk using your preferred Erase Mode. The Erase Modes available are Clear Partition Table, Quick Erase, LBA/Offset Pattern, Custom Erase, Secure Erase Normal, Secure Erase Enhanced, DOD Clear, DOD Sanitize, NIST800-88 Clear, and NIST800-88 Purge.

To erase a disk, follow these steps:

a. Select **Erase Destination Disk** from the "Action to Perform" drop-down box.

b. Select the Erase Mode to use from the "Erase Mode" drop-down box. (You can modify which erase mode appears by default in the drop-down box on the "Configure" screen's "System" tab. See Section 5.1.)

c. Select the target destination disk(s) from the "Target" drop-down box.

d. Click the **Start button**. A "Completed" message box will pop up when the action has finished. Click on the message to continue.

You can view the results of the erasure action by scrolling down to the "System Log" panel on the "Home" screen. Find and click on the latest link, which will be denoted by a filename with a date/timestamp format: "S_yyyymmddhhmmss". Alternatively, you can click on the **Logs button** from the top menu bar.

Format After Erase

You can configure the Ditto DX Forensic FieldStation to automatically format a disk after you erase it. Click on the **Configure tab** to go to the "Configure" screen. Then click on the **Erase tab** make sure that "Format After Erase" is checked for each of the erase modes on which you'd like to enable this setting.

4.1.7 Hash Disk

The Ditto DX Forensic FieldStation will hash any source or a destination disk using your preferred algorithm. Hash values are saved in the System Log. The available algorithms are MD5, SHA-1, SHA-256, MD5 & SHA-1, or MD5 & SHA-256.

To hash a disk, follow these steps:

a. Select **Hash Disk** from the "Action to Perform" drop-down box.

b. Select your preferred hash algorithm from the "Hash Type" drop-down box. (You can modify which hash algorithm appears by default in the drop-down box on the "Configure" screen's "System" tab. See Section 5.1.)

c. Select the target disk from the "Target" drop-down box.

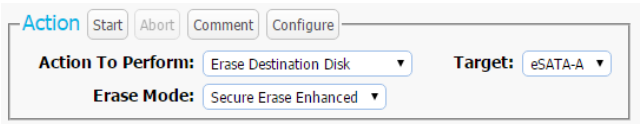


Figure 13. The "Action" section on the "Home" screen, showing the options available for the "Erase Destination Disk" action.

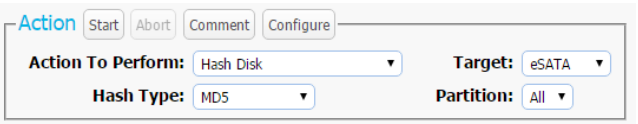


Figure 14. The "Action" section on the "Home" screen, showing the options available for the "Hash Disk" action.

d. Select the partition you want to hash from the "Partition" drop-down box.

e. Click the **Start button**. A "Completed" message box will pop up when the action has finished. Click on the message to continue.

You can view the results of the hash action by scrolling down to the "System Log" panel on the "Home" screen. Find and click on the latest link, which will be denoted by a filename with a date/timestamp format: "S_yyyymmddhhmmss". Alternatively, you can click on the **Logs button** from the top menu bar.

4.1.8 Snapshot Disk

The Ditto DX Forensic FieldStation provides S.M.A.R.T. and hdparm information for any source or destination disk connected to itself. No clone or image request needs to be done.

To create a snapshot of a disk, follow these steps:

a. Select **Snapshot Disk** from the "Action to Perform" drop-down box.

b. Select the target disk from the "Target" drop-down box.

c. Click the **Start button**. A "Completed" message box will pop up when the action has finished. Click on the message to continue.

You can view the results of the snapshot action by scrolling down to the "System Log" panel on the "Home" screen. Find and click on the latest link, which will be denoted by a filename with a date/timestamp format: "S_yyyymmddhhmmss". Alternatively, you can click on the **Logs button** from the top menu bar.

Scroll to "eSATA Extended Disk Info" to see recorded data, including S.M.A.R.T. and hdparm information.

4.1.9 NetView Scan

NetView is a network tool that can be used to discover machines on a network and even probe them for specific services that they may be running. This capability can help an investigator locate physically hidden computers or quickly determine whether a machine is acting as a data storage device that the Ditto DX Forensic FieldStation can image.

See Section 11.1 for more information about the NetView Scan feature.

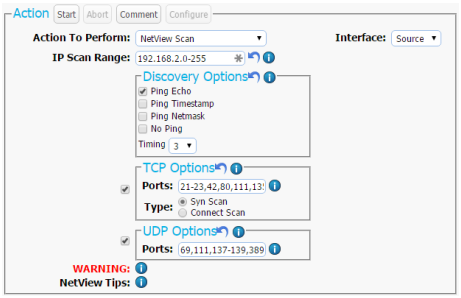


Figure 15. The "Action" section on the "Home" screen, showing the options available for the "Netview Scan" action.

4.2 INVESTIGATION INFO

The Investigation Info panel groups related information that may also be used in creating custom directories and file names (see Section 5.9). The "Hide" button allows you to minimize the panel.

Click the **Edit button** to enter information about the Investigator, Case Number, Evidence Number, Description, Notes, Base directory prefix, and a Base filename prefix for an E01 or DD image.

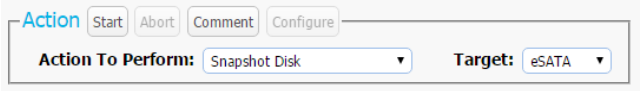


Figure 16. The "Action" section on the "Home" screen, showing the options available for the "Snapshot Disk" action.

Each field is filtered to block non-printable ASCII characters. Any characters at the file system level that may not be safe for a directory name or file name will be filtered out and replaced with an underscore. Only printable ASCII characters are currently allowed for directory and filenames. Multiple underscores will also be reduced to a single underscore per naming item.

The Ditto DX Forensic FieldStation will generate an error message if you enter a non-printable ASCII character or if your message exceeds the 58 character limit. Additionally, when the final directory or filename that uses any of these fields is created, another level of filtering is applied.

STOP! Using apostrophes (') in the name fields will cause an error when the file or folder name is created. They should not be used in the Investigation Info fields.

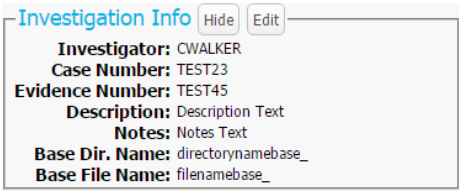


Figure 17. The "Investigation Info" section.

4.2.1 User Defined Fields

Click on the **green plus sign icon** to open the "Add User Defined Field" window (see Figure 18). You may add as many user defined fields as you wish. Each user defined field must have a title, XML tag, and value.

The title identifies the value in the Ditto DX Forensic FieldStation's browser and LCD interfaces, and the XML tag only appears in the configuration and log files.

To remove a user defined field, click on the **green minus sign icon**.

Figure 18. The "Add User Defined Field" window.

4.3 SYSTEM SETTINGS

Displays the most commonly used configuration settings of the Ditto DX Forensic FieldStation. These settings are loaded as the default settings for the actions you perform in the "Action" panel. The "Hide" button allows you to minimize the panel. Click the **Edit button** to customize these settings as well as additional advanced settings. See Section 5.1 for details on each option.

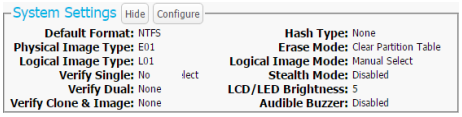


Figure 19. The "System Settings" section.

4.4 CURRENT STATUS

Reports either as "Idle" or displays info about the action that the Ditto DX Forensic FieldStation is currently performing.

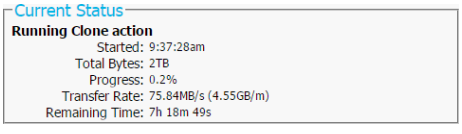


Figure 20. The "Current Status" section, displaying a the status of a Physical Image action.

4.5 DISKS

Displays information about the attatched disks that are currently connected to the Ditto DX Forensic FieldStation.The "Hide" button allows you to minimize the panel. To see the available space a disk has, click the **green double arrow icon** next in the "Used" column header (see Figure 21). The disk usage will refresh and give an updated amount.

The "Target Mode" button allows you to present the disks attached to the Ditto DX Forensic FieldStation as iSCSI disks on a network. This is useful if you wish to use third party data acquisition tools against the disks without creating an image. The "Source Network" and "Source Destination" buttons are used for mounting iSCSI devices as well as NFS and SMB shares to the Ditto DX Forensic FieldStation. For more information, see Section 11.

Figure 21. Clicking the green double arrow icon displays and updates amount of space currently used and available.

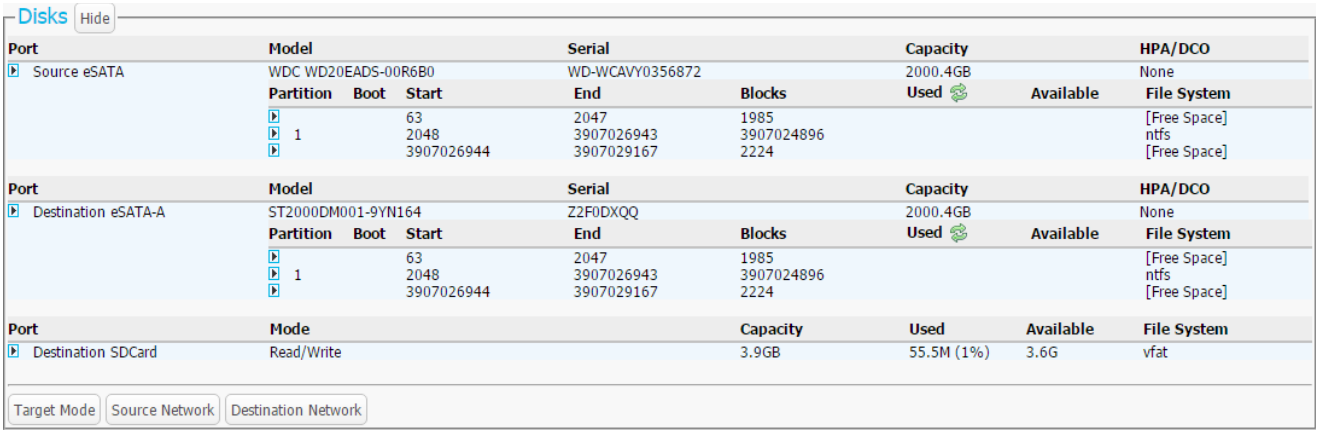


Figure 22. The "Disks" section on the "Home" screen.

4.5.1 Previewing and Browsing Disks

To browse or download disk data, or to select files and folders for logical imaging, click on a partition's number under the disk's "Partition" column and then select **Preview** (see Figure 23). This opens up a file explorer window where you can navigate through the files and folders on the disk.

Directory Toolbar and Right-Click Context Menu Items

ICON	ACTION
Collapse Folder Tree	Collapses the entire folder tree so that only the previewed partition's folder is visible.
Refresh	Refreshes the folder contents in order to give updated information.
Up	Moves up to the parent folder.
Back	Moves back to the previously viewed folder.
Folders	Toggles whether folders are displayed in the contents panel.
Select Mode	Toggles the ability to select individual files for logical imaging.
Detail View/List View	Toggles whether the Size, Type, Date Created, Date Modfied, and Date Accessed columns are visible.
Size Format	Changes whether file sizes in the "Size" column are measured as bytes or as megabytes, gigabytes, etc.
View	Opens the selected file. Images and PDF files will open in a preview window. Other files will open a dialog box to download the file to your computer.
Download	Opens a dialog box to download the selected file to your computer.
Hash	Opens an info window with the selected file's name, MD5 hash, and file size in bytes.
HexView	Opens the file in the Ditto DX Forensic FieldStation's built-in hexadecimal viewer.

Logically Image Data

To logically image data using the "Preview" window, click on the **Select Mode button** and then check the box next to each file or folder you want to logically image. When you are finished, click on the **Stage button** in the lower right corner of the "Preview" window. You will be taken back to the "Home" screen. Use the "Action" control panel as directed in Section 4.1.3. When you click on "Select Files & Dirs", you will be asked to confirm whether to logically image the files and folders you have selected, or to select new files and folders.

4.5.2 View Hexidecimal Data

To view a disk's hexidecimal data, click on the disk name under the "Port" column and then select **HexView.** To view a disk partition's hexidecimal data, click on the partition's number under the disk's "Partition" column and then select **HexView** (see Figure 23).

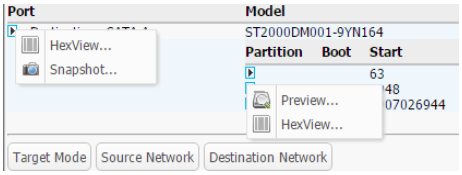


Figure 23. Drop-down menus for a disk (left) and a disk's partition (right).

4.5.3 View Snapshot Data

To view a disk's snapshot information, click on the disk name under the "Port" column and then select **Snapshot**.

4.6 SYSTEM LOG

Shows the actions that the Ditto DX Forensic FieldStation has performed (see Figure 24). The "Hide" button allows you to minimize the panel. The "Comment" button allows you to write a note that is appended to the System log.

If there is no SD card present in the SD card slot, this panel displays the logs that have been stored in volatile memory since the Ditto DX Forensic FieldStation's last power cycle. These logs are deleted when the Ditto DX Forensic FieldStation is powered down. If there is an SD card present, this panel displays all actions saved on the SD Card.

To view the log details of a particular action, click on the link under the "Message" column. which will be denoted by a filename with a date/timestamp format: "S_yyyymmddhhmmss". Alternatively, you can click on the **Logs button** from the top menu bar.

System Log Hide Comment

Timestamp (PDT)	Type	User	Message
Aug 19, 2014 14:18:31	Info	system	System boot complete.
Aug 19, 2014 14:52:20	Login	admin	User 'admin' from 192.168.10.42 has successfully logged in
Aug 19, 2014 14:52:47	Clone	admin	========== Clone ==========
Aug 19, 2014 14:52:49	Clone	admin	Starting Clone action from eSATA to eSATA-A.
Aug 19, 2014 14:52:49	Clone	admin	S_20140819145247
Aug 19, 2014 14:52:50	Clone	admin	Filling eSATA-A to End of Disk.
Aug 19, 2014 14:53:08	Abort	admin	Aborting Clone action
Aug 19, 2014 14:53:08	Error	admin	Failed to fill eSATA-A to end of disk.
Aug 19, 2014 14:53:08	Abort	admin	Clone action has been aborted
Aug 19, 2014 14:53:51	Logical Image	admin	========== Logical Image ==========
Aug 19, 2014 14:54:00	Notice	admin	Partitioned eSATA-A and added XFS filesystem.
Aug 19, 2014 14:54:00	Notice	admin	Using default Image File Segment Size of '8E'.
Aug 19, 2014 14:54:01	Logical Image	admin	Starting Logical Image L01 action from eSATA, partition 2 to eSATA-A.
Aug 19, 2014 14:54:01	Logical Image	admin	S_20140819145351
Aug 19, 2014 14:56:12	Logical Image	admin	Finished Logical Image L01 action.
Aug 19, 2014 15:37:37	Snapshot	admin	========== Snapshot ==========

Figure 24. The "System Logs" section on the "Home" screen.

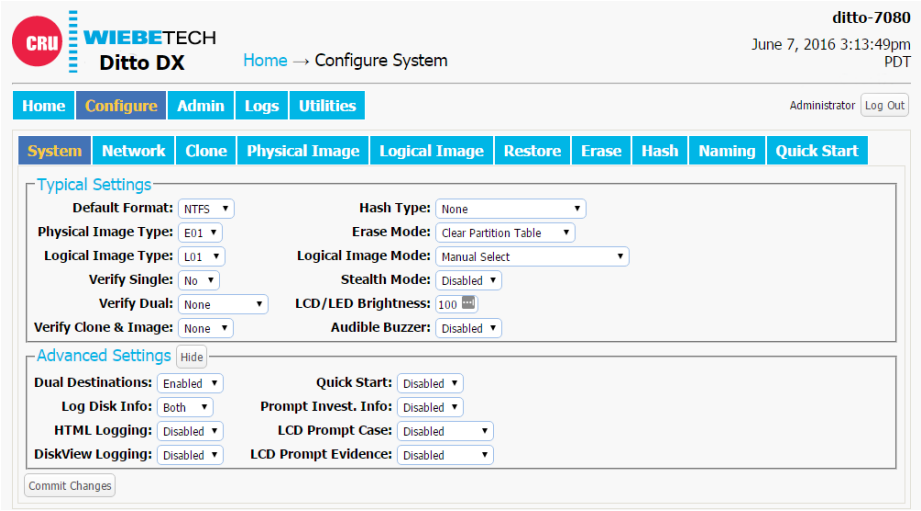


Figure 25. The "Configure" screen, showing the "System" tab.

5 CONFIGURE SCREEN

The "Configure" screen allows you to modify the way the Ditto DX Forensic FieldStation functions to suit your specific needs. Click on the **Configure tab** to access the "Configure" screen from the browser interface.

5.1 SYSTEM

The "System" tab allows you to view and customize the following settings. This information is also displayed in the "System Settings" panel on the "Home" screen. When you are finished, click the **Commit Changes** button to save the changes.

5.1.1 Typical Settings

- **Default Format:** This is the default file system that will be used to format destination disks when they are used in actions that the Ditto DX Forensic FieldStation performs.
- **Physical Image Type:** Sets the default physical image type for all actions that create a physical image.
- **Logical Image Type:** Sets the default logical image type for the "Logical Image Source Disk" action.
- **Verify Single:** Determines whether individual destination disks are hashed and compared to the hash value of the source disk.
- **Verify Dual:** Requires that the "Dual Destinations" option below is enabled (see Section 5.1.2). Compares the hash value of both destinations to the hash value of the source. You can choose to verify Destination 1 or Destination 2 individually, both, or none. Destination 1 and Destination 2 are selected from the "Action" section of the "Home" screen.
- **Verify Clone & Image:** Determines whether cloned and imaged disks are hashed and compared to the hash value of the source disk's hash value during a "Clone & Image Source Disk" action. You can choose to verify the clone, the image, both, or none.
- **Hash Type:** Sets the default hash algorithm that will be used for disk verification and the "Hash Disk" action. The available algorithms are None, MD5, SHA-1, SHA-256, MD5 & SHA-1, or MD5 & SHA-256.

More settings are available on the next page.

Typical Settings, continued...

- **Erase Mode:** Sets the default erase mode that will be used for all actions that require erasing disks.
- **Logical Image Mode:** Sets the default Logical Image Mode for the "Logical Image Source Disk" action.
- **Stealth Mode:** Turns off all LEDs and LCDs on the Ditto DX Forensic FieldStation. The physical "Stealth Mode" Switch serves the same purpose (see Section 1.2). If Stealth Mode is enabled from the browser interface, the physical switch cannot override it.
- **LCD/LED Brightness:** Sets the relative brightness of the LCDs and LEDs on the face of the Ditto DX Forensic FieldStation on a scale of 0 to 6. Setting a value of "0" will turn off all LCDs and LEDs on the unit.
- **Audible Buzzer:** Alerts the user to various actions that occur when using the Ditto DX Forensic FieldStation.

5.1.2 Advanced Settings

- **CPU Speed:** Sets the speed of the Ditto DX Forensic FieldStation's CPU. The available settings from fastest to slowest are Turbo, Default, Economy, and Power Saver.
- **Dual Destinations:** Enables software mirroring mode to write the same data to two destinations at the same time.
- **Log Disk Info:** Determines whether S.M.A.R.T. and hdparm disk information is logged before running an action, after running an action, both, or not at all. CRU recommends that you log disk information before and after an action.
- **HTML Logging:** Logs are always saved in .XML format. This option causes the Ditto DX Forensic FieldStation to save logs in HTML format as well.
- **DiskView Logging:** Logs any action to preview a disk or actions performed while previewing a disk (i.e. starting or finishing a preview of a disk, starting or finishing a HexView action).
- **Lightbar Mode:** Enables or disables the lightbar on the face of the Ditto DX Forensic FieldStation. The available settings are Off and Color.
- **Quick Start:** Enables the "Quick Start" screen on the LCD that appears after you boot or reboot the Ditto DX Forensic FieldStation. The settings for this mode may be modified in the "Quick Start" tab. See Section 5.10.
- **Prompt Invest. Info:** Opens a "Configure Investigation Info" window after the user has hit the "Start" button in the "Action" section on the "Home" screen. This allows the user to customize the Investigator, Case Number, Evidence Number, Description, Notes, Base Directory Name, and the Base File Name information prior to performing the requested action.
- **LCD Prompt Case:** Five options may be chosen to modify the case number specified in the "Investigation Info" section of the "Home" screen. The case number is included in the log for the requested action. "Disabled" leaves the case number as it is. "Inc/Dec" allows you to manually increment the case number up or down using the navigation buttons on the face of the Ditto DX Forensic FieldStation. "AutoInc" automatically increments the case number, and "AutoInc/Pause" automatically increments the case number, but displays a confirmation prompt the LCD screen before beginning

the requested action. These options require a number to be present on the end of the Case Number specified in the "Investigation Info" section.

- **LCD Prompt Evidence:** Five options may be chosen to modify the evidence number specified in the "Investigation Info" section of the "Home" screen. The evidence number is included in the log for the requested action. "Disabled" leaves the evidence number as it is. "Inc/Dec" allows you to manually increment the evidence number up or down using the navigation buttons on the face of the Ditto DX Forensic FieldStation. "AutoInc" automatically increments the evidence number, and "AutoInc/Pause" automatically increments the evidence number, but displays a confirmation prompt the LCD screen before beginning the requested action. These options require a number to be present on the end of the Evidence Number specified in the "Investigation Info" section.

5.2 NETWORK

The "Network" tab allows you to view and customize the following settings. If you are unsure or have questions about changing your network settings, contact your network administrator. When you are finished, click the **Commit Changes** button to save the changes.

5.2.1 Host Name

Allows you to change what name for the Ditto DX Forensic FieldStation will be displayed on a network. Host names are **not** case sensitive, but **must** begin with any letter "A-Z". They can contain the the letters

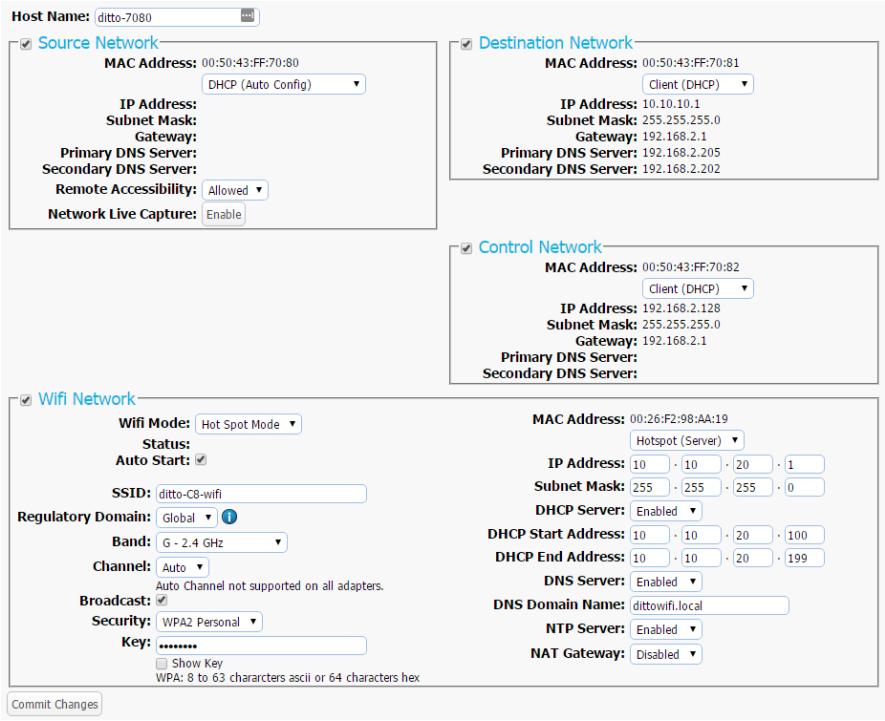


Figure 26. The "Network" tab on the "Configure" screen, showing the "Source Network", "Destination Network", "Control Network" and "Wifi Network" settings. The "Wifi Network" section only appears when a USB wireless network adapter has been plugged in.

A-Z, numbers 0-9, underscore "_", and dash "-" characters. Host names must also be limited to 64 characters.

5.2.2 Source Network

The "Source Network" section displays the source Ethernet port's MAC Address as well as its network mode. You can enable or disable it using the check box.

To set the network mode, choose either "DHCP (Auto Config)" or "Static IP (Manual Settings)" from the top drop-down box.

The "Remote Accessibility" drop-down box allows you to choose whether or not the Ditto DX Forensic FieldStation responds to any network traffic via the source Ethernet port.

5.2.3 Destination Network

The "Destination Network" section displays the destination Ethernet port's MAC Address as well as its network mode. You can enable or disable it using the check box.

To set the network mode, choose either "Server", "Client (DHCP)", or "Client (Static IP)" from the drop-down box.

Server

"Server" allows you to configure the Ditto DX Forensic FieldStation for use as a server. This can be helpful if you are connecting an iSCSI device to the destination Ethernet port, for example (see Section 11.3.2), or you are connecting Ditto DX directly to your computer instead of through your office network. The default settings below will work for most environments. This is an advanced option, so do not customize the default server configuration below unless directed to do so by your network administrator.

IP Address: 10.10.10.1
Subnet Mask: 255.255.255.0
DHCP Server: Enabled
DHCP Start Address: 10.10.10.100
DHCP End Address: 10.10.10.199
DNS Server: Enabled
DNS Domain Name: ditto.local
NTP Server: Enabled
NAT Gateway: Disabled

STOP! Do not connect the Ditto DX Forensic FieldStation to another network while it is configured as a server. Doing so will cause network conflicts and may disrupt network traffic.

Client (DHCP)

This option automatically configures the destination Ethernet port to connect to the attached network.

Client (Static IP)

This option allows you to manually configure the destination Ethernet port to connect to the attached network.

5.2.4 Control Network

The "Control Network" section displays the control Ethernet port's MAC Address as well as its network mode. You can enable or disable it using the check box.

To set the network mode, choose either "Server", "Client (DHCP)", or "Client (Static IP)" from the drop-down box.

Server

"Server" allows you to configure the Ditto DX Forensic FieldStation for use as a server so that you can connect the Ditto DX Forensic FieldStation directly to your computer instead of through your office network. The default settings below will work for most environments. This is an advanced option, so do not customize the default server configuration below unless directed to do so by your network administrator.

IP Address: 10.10.10.1
Subnet Mask: 255.255.255.0
DHCP Server: Enabled
DHCP Start Address: 10.10.10.100
DHCP End Address: 10.10.10.199
DNS Server: Enabled
DNS Domain Name: dittoctl.local
NTP Server: Enabled
NAT Gateway: Disabled

STOP! Do not connect the Ditto DX Forensic FieldStation to another network while it is configured as a server. Doing so will cause network conflicts and may disrupt network traffic.

Client (DHCP)

This option automatically configures the control Ethernet port to connect to the attached network.

Client (Static IP)

This option allows you to manually configure the control Ethernet port to connect to the attached network.

5.2.5 Wifi Network

The "Wifi Network" section allows you to configure a third party USB wifi network adapter that's been plugged into one of the "Control Interface" USB ports. You can enable or disable it using the check box.

This section also displays that port's MAC Address. Adapters with an Atheros chipset and some adapters with Realtek chipsets are compatible.

"Wifi Mode" allows you to determine whether the Ditto DX Forensic FieldStation connects to a wifi network or acts as a wifi hot spot itself. Hot Spot Mode is helpful if you are working in a separate location from the Ditto DX Forensic FieldStation that is still within range of a wireless network, or if there is no hardwired network available in the location.

Choose "Client Mode" to connect to an existing wifi network or "Hot Spot Mode" to make the Ditto DX Forensic FieldStation into a wifi hot spot.

Client Mode

Check "Status: Auto Start" if you want the Ditto DX Forensic FieldStation to connect to the specified wireless network automatically.

To select the client mode's networking mode, you can choose either "Client (DHCP)" or "Client (Static IP) from the drop-down box underneath the MAC Address. "Client (DHCP)" automatically configures the USB wifi network adapter to connect to a wifi network. "Client (Static IP)" allows you to manually configure the connection.

Hot Spot Mode

Check "Status: Auto Start" if you want the Ditto DX Forensic FieldStation to begin broadcasting as a hot spot automatically whenever a wifi adapter is plugged in.

The default settings below will work for most environments, with several exceptions.

STOP! Input your own key to ensure that your Ditto DX Forensic FieldStation remains secure.

STOP! You may be required to conform to your country's laws and regulations regarding wireless radio frequency usage. Select your two-digit country code from the "Regulatory Domain" drop down list, and the Ditto DX Forensic FieldStation will limit the frequencies it may broadcast on to only those in the permitted range(s).

STOP! Do not connect the Ditto DX Forensic FieldStation to a wired network while it is configured as a hot spot. Doing so will cause network conflicts and may disrupt network traffic.

SSID: {Host Name}-wifi
Regulatory Domain: Global
Band: G - 2.4 GHz
Channel: Auto
Broadcast: Checked
Security: WPA2 Personal
Key: ditto123
Show Key: Unchecked
IP Address: 10.10.10.1
Subnet Mask: 255.255.255.0
DHCP Server: Enabled
DHCP Start Address: 10.10.20.100
DHCP End Address: 10.10.20.199
DNS Server: Enabled
DNS Domain Name: dittowifi.local
NTP Server: Enabled
NAT Gateway: Disabled

5.3 CLONE

The "Clone" tab allows you to view and customize the following settings for disk cloning actions, including the "Clone & Image Source Disk" action. When you are finished, click the **Commit Changes** button to save the changes.

5.3.1 Typical Settings

- **Source HPA/DCO:** Sets whether the cloning action should indicate in the log that there is an HPA (host protected area) or DCO (device configuration overlay) present, temporarily bypass the HPA, permanently unhide the HPA, or permanently unhide both the HPA and DCO.
- **Fill to End of Disk:** Check this box to enable zeroes to be written to the end of the disk.
- **Reset After Fill:** Choose whether an HPA or DCO is set on the destination disk so that the capacity of the destination disk becomes identical to the capacity on the source disk.

5.3.2 Advanced Settings

The advanced settings may be hidden. Click the **Show button** to reveal them.

- **Buffer Size:** Sets the the buffer size used by the Ditto DX Forensic FieldStation during a cloning action. The minimum size is 512K (kilobytes). The default size of 1M (megabyte) works best for most uses. The maximum size is limited by the target file system.
- **Exit when a bad sector is encountered:** Aborts the cloning action if the Ditto DX Forensic FieldStation encounters a bad sector on the source disk.

5.4 PHYSICAL IMAGE

The "Physical Image" tab allows you to view and customize the following settings for physical imaging actions, including the "Clone & Image Source Disk" action. There are separate options available for both the "E01" and "DD" image types. When you are finished, click the **Commit Changes** button to save the changes.

5.4.1 E01

Click on the **E01 tab** to reveal the E01 image settings.

Typical Settings

- **Image File Segment Size:** Allows you to specify the size in bytes that image file segments should be. The minimum size is 1M (megabyte). The maximum size is limited by the target file system. If this field is left blank, the maximum size will be used. Click the "I" information icon for more information.
- **Source HPA/DCO:** Sets whether the physical image action should indicate in the log that there is an HPA (host protected area) or DCO (device configuration overlay) present, temporarily bypass the HPA, permanently unhide the HPA, or permanently unhide both the HPA and DCO.
- **Compression Type:** Sets whether the action should use empty block compression or no compression.
- **EWF File Format:** Choose which EnCase image file format should be used during E01 physical images. CRU recommends using "encase6" for most acquisitions.

Advanced Settings

The advanced settings may be hidden. Click the **Show button** to reveal them.

- **Buffer Size:** Sets the the buffer size used by the Ditto DX Forensic FieldStation during an E01 physical image action. The minimum size is 512K (kilobytes). The default size of 1M (megabyte) works best for most uses. The maximum size is limited by the target file system.
- **Error Granularity:** Determines how many sectors are ignored on a read error. The minimum size is 512 bytes. The default size is the Buffer Size. The maximum size is limited by the target file system.
- **Swap Byte Pairs of the Media Data (endian conversion):** Check this box if you need to convert from big-endian to little-endian or vice-versa, which may be necessary for disks used in older x86 or PowerPC-based systems.
- **Wipe Sectors on Read Error (mimic EnCase-like behavior):** If a read error is encountered during an E01 physical image action, the Ditto DX Forensic FieldStation will write out zeroes to fill the sector.
- **Read Error Retries:** Specifies the number of tries the Ditto DX Forensic FieldStation will try to read a sector before moving on to the next sector.

5.4.2 DD

Click on the **DD tab** to configure the DD image settings.

Typical Settings

- **Image File Segment Size:** Allows you to specify the size in bytes that image file segments should be. The minimum size is 1M (megabyte). The maximum size is limited by the target file system. If this field is left blank, the maximum size will be used. Click the "I" information icon for more information.
- **Source HPA/DCO:** Sets whether the physical image action should indicate that there is an HPA (host protected area) or DCO (device configuration overlay) present, temporarily bypass the HPA, permanently unhide the HPA, or permanently unhide both the HPA and DCO.

Advanced Settings

The advanced settings may be hidden. Click the **Show button** to reveal them.

- **Buffer Size:** Sets the the buffer size used by the Ditto DX Forensic FieldStation during a DD physical image action. The minimum size is 512K (kilobytes). The default size of 1M (megabyte) works best for most uses. The maximum size is limited by the target file system.
- **Exit when a bad sector is encountered:** Aborts the DD physical image action if the Ditto DX Forensic FieldStation encounters a bad sector on the source disk.

5.5 LOGICAL IMAGE

The "Logical Image" tab allows you to view and customize the following settings for the "Logical Image Source Disk" action. There are different options available for each of the L01, ZIP, TAR, and LIST file types. When you are finished, click the **Commit Changes** button to save the changes.

5.5.1 L01

Click on the **L01 tab** to configure the L01 image settings.

Typical Settings

- **Image File Segment Size:** Allows you to specify the size in bytes that image file segments should be. The minimum size is 1M (megabyte). The maximum size is limited by the target file system. If this field is left blank, the maximum size will be used. Click the "I" information icon for more information.
- **Log File Access/Modify/Change Times:** Check this box to log the access, modify, and change timestamps of files and directories during an L01 logical image action.
- **Compression Type:** Sets whether the action should use empty block compression or no compression.
- **Per File Hash Type:** Sets the default hash algorithm that will be used for individual file verification. The available algorithms are MD5 or SHA-1. The default setting is "None".

Advanced Settings

The advanced settings may be hidden. Click the **Show button** to reveal them.

- **Buffer Size:** Sets the the buffer size used by the Ditto DX Forensic FieldStation during an L01 logical image action. The minimum size is 512K (kilobytes). The default size of 1M (megabyte) works best for most uses. The maximum size is limited by the target file system.
- **Read Error Retries:** Specifies the number of tries the Ditto DX Forensic FieldStation will try to read a sector before moving on to the next sector.

5.5.2 ZIP and TAR Settings

Click on the **ZIP or TAR tab** to configure the settings for either of those logical image types.

- **Log File Access/Modify/Change Times:** Check this box to log the access, modify, and change timestamps of files and directories during the logical image action. This setting is format-dependent.

5.5.3 LIST Settings

Click on the **LIST tab** to configure the LIST image settings.

- **Log File Access/Modify/Change Times:** Check this box to log the access, modify, and change timestamps of files and directories during the logical image action. This setting is format-dependent.
- **Validate File Extensions:** Uses MIME to make sure that the file headers of the files within the newly created logical image list match their file extensions. Any questionable files are highlighted in the Logical Image Report.

5.6 RESTORE

The "Restore" tab allows you to view and customize the following settings for the "Restore Physical Image" action. When you are finished, click the **Commit Changes** button to save the changes.

5.6.1 Typical Settings

- **Fill to End of Disk:** Check this box to enable zeroes to be written to the end of the disk.
- **Reset After Fill:** Choose whether an HPA or DCO is set on the destination disk so that the capacity of the destination disk becomes identical to the capacity on the source disk.

5.6.2 Advanced Settings

The advanced settings may be hidden. Click the **Show button** to reveal them.

- **Buffer Size:** Sets the the buffer size used by the Ditto DX Forensic FieldStation during a restore action. The minimum size is 512K (kilobytes). The default size of 1M (megabyte) works best for most uses. The maximum size is limited by the target file system.

5.7 ERASE

The Ditto DX Forensic FieldStation allows you to view and customize settings for how the Ditto DX Forensic FieldStation erases disks.

5.7.1 Available Erase Modes

ERASE MODE	EXPLANATION
Clear Partition Table	Removes the partition table on the disk.
Quick Erase	Performs a single pass writing all zeroes.

More Erase Modes are available on the next page.

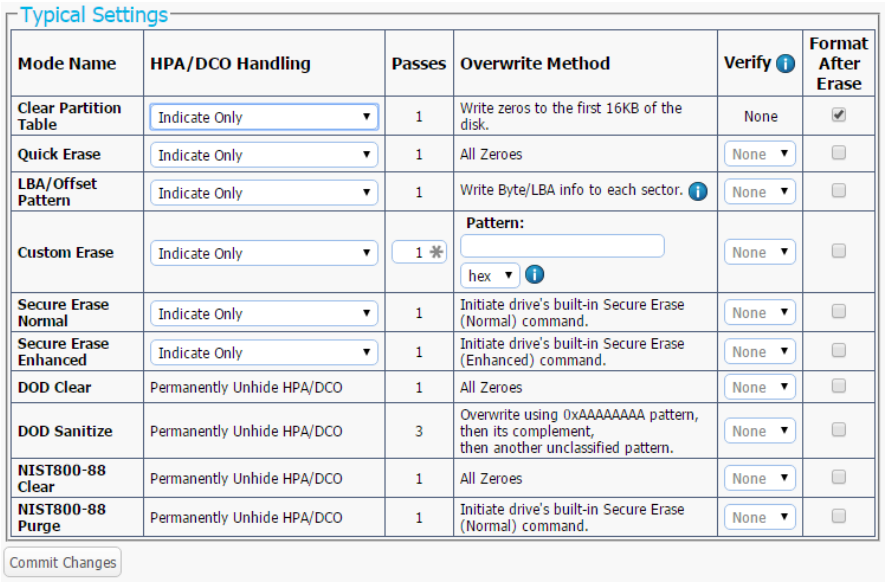


Figure 27. The "Erase" tab on the "Configure" screen, showing all available erase modes and their customizable settings.

Available Erase Modes, continued...

ERASE MODE	EXPLANATION
LBA/Offset Pattern	Writes byte/LBA info to each sector. Each 512 byte sector is written with: B_XXXXXXXXXXXXX L_DDDDDDDDDDD 'XXXXXXXXXXXXX' is the Byte offset as a hexadecimal string, and 'DDDDDDDDDDD' is the LBA number as a decimal string. The remainder of the sector is filled with zero.
Custom Erase	Performs 1-99 passes, overwriting the disk with zeroes or a user-selected pattern.
Secure Erase Normal	Initiates the disk's built-in Secure Erase Normal function.
Secure Erase Enhanced	Initiates the disk's built-in Secure Erase Enhanced function.
DOD Clear	Performs the U.S. Department of Defense "Clear" standard by writing all zeroes to the disk in one pass.
DOD Sanitize	Performs the U.S. Department of Defense "Sanitize" standard by using a 0xAAAAAAA pattern, then its complement, and then another unclassified pattern.
NIST800-88 Clear	Performs the "Clear" standard defined by NIST special publication 800-88 by writing all zeroes to the drive.
NIST800-88 Purge	Performs the "Purge" standard defined by NIST special publication 800-88. by initiating the drive's built-in Secure Erase (Normal) command.

5.7.2 Customizable Settings

Some Erase Modes require several of the following settings to be configured a certain way as part of their standard. In these cases, the settings cannot be modified.

- **Mode Name:** The name of the erase mode.
- **HPA/DCO Handling:** Sets how erase actions using the specified erase mode should handle HPAs and DCOs. It can indicate in the log that there is an HPA (host protected area) or DCO (device configuration overlay) present, temporarily bypass the HPA, permanently unhide the HPA, or permanently unhide both the HPA and DCO.
- **Passes:** For the "Custom Erase" setting only, this allows you to specify the number of passes the disk is overwritten during the erase action. You can specify between 1 and 99 passes.
- **Overwrite Method:** For the "Custom Erase" setting only, you can specify a pattern for the disk to write repeatedly across the entire disk. If "text" is selected from the drop-down box, the "Pattern" field must contain one or more ASCII characters. If "hex" is selected, the "Pattern" field must contain an even number of ASCII characters representing hexadecimal digits (e.g. 17a64F). Leaving the "Pattern" field blank tells the Ditto DX Forensic FieldStation to use zeroes.
- **Verify:** This is a planned feature that is not currently implemented. The "Verify" drop-down box will allow you to verify the erased disk after it has been fully erased. If "Quick" is selected, the beginning, middle, and end of the disk will be read to ensure that the last pattern was actually written. If "Full" is selected, the entire disk will be read to ensure that the last pattern was actually written. If "None" is selected, no verification will be performed.
- **Format After Erase:** Check this box to format the disk with the default format. The default format can be set in the "System" tab on the "Configure" screen (see Section 5.1).

5.8 HASH

The "Hash" tab allows you to view and customize the following settings for all hash actions. When you are finished, click the **Commit Changes** button to save the changes.

5.8.1 Advanced Settings

- **Buffer Size:** Sets the the buffer size used by the Ditto DX Forensic FieldStation during a hash action. The minimum size is 512K (kilobytes). The default size of 1M (megabyte) works best for most uses. The maximum size is limited by the target file system.
- **Exit when a bad sector is encountered:** Aborts the hash disk action if the Ditto DX Forensic FieldStation encounters a bad sector on the target disk.

5.9 NAMING

The "Naming" tab allows you to customize how the Ditto DX Forensic FieldStation names directories and files during imaging actions. When you are finished, click the **Commit Changes button** to save the changes.

As shown in Figure 28, the file directory used in imaging actions can be a name that contains up to six user-selectable fields, and the file name used in imaging actions can contain up to four user-selectable fields. As you customize these fields, the "Directory Name Template", "Final Directory Name", "File Name Template", and "Final File Name" fields will update. The template fields show the order of variables will appear in the name, whereas the final name fields display the directory or file name using the actual information from the "Investigation Info" panel on the "Home" screen and the source disk.

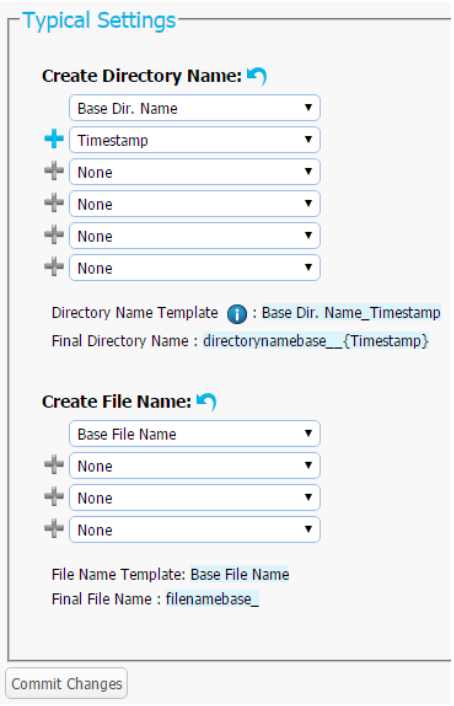


Figure 28. The "Naming" tab on the "Configure" screen.

5.9.1 Variables

To modify the any of the user-customizable variables, navigate to the "Investigation Info" panel on the "Home" screen (see Section 4.2).

- **Timestamp/{Timestamp}:** Displays the timestamp. The timestamp is required to be included in all directory names, but it is optional for file names.
- **Base Filename:** Displays the base file name. This option is the default first variable for file names, but may be changed. User customizable.
- **Case Number:** Displays the case number. User customizable.
- **Description:** Displays the description field. User customizable.
- **Evidence Number:** Displays the evidence number. User customizable.
- **Investigator:** Displays the investigator. User customizable.
- **Source Drive Model Type:** Displays the model number of the source disk.
- **Source Drive Unique ID:** Displays the unique ID number of the source disk.

5.10 QUICK START

The "Quick Start" tab allows you to customize the quick start mode that appears on the LCD of the Ditto DX Forensic FieldStation when the "Quick Start" option is enabled in the "System" tab. Many of the settings on

the next page are visible only when certain types of actions are selected in the "Action to perform" drop-down box.

Quick Start Settings

- **Action to perform:** Sets the action that is performed by the quick start mode.
- **Allowed Sources:** Place a check mark next to each source where you want the Ditto DX Forensic FieldStation to search for a connected source.
- **Allowed Targets:** Place a check mark next to each target where you want the Ditto DX Forensic FieldStation to search for a connected target.
- **Clone Destination:** For the "Clone Source Disk" and "Clone & Image Source Disk" actions only. Specifies the target destination where the source disk will be cloned.
- **Source Partition:** Determines which partition(s) will be imaged from the source disk. Choose **All** to image the entire source disk.
- **Image Destination:** Specifies the target destination where the image will be placed.
- **Image Partition:** Specifies the partition on the target destination where the image will be placed.
- **Action Target:** For the "Erase Destination Disk" action only. Specifies which target volume will be erased.

6 ADMIN SCREEN

The "Admin" screen allows the administrator to manage user accounts and assign permission levels for each user. Click on the **Admin tab** to access the "Admin" screen from the browser interface.

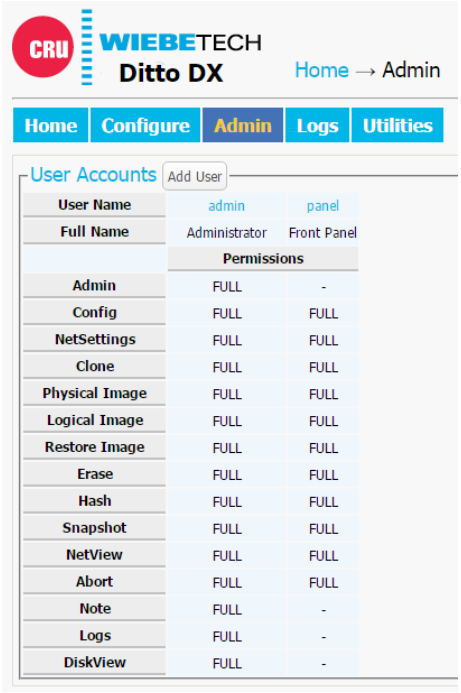


Figure 29. The "Admin" screen.

6.1 USER ACCOUNTS

The Ditto DX Forensic FieldStation contains two permanent accounts; "admin" and "panel". The "admin" account is the Administrator account, and only the Full Name and password may be modified. The "panel" account is the Front Panel account, and modifies access permissions for functionality that can be accessed through the LCD screen and navigation buttons on the Ditto DX Forensic FieldStation.

6.2 PERMISSIONS

6.2.1 Permission Levels

Permission levels on the browser interface are displayed as "FULL", "AUTH", or as a hyphen, and as "Full Access, "Must Authenticate", and "None", respectively, when editing or creating a user. "FULL" and "Full Access" indicate that the user has complete access to the features governed by that permission and is not required to enter a password. "AUTH" and "Must Authenticate" indicate that the user must authenticate his credentials with a password in order to change a setting or perform an action that that permission governs. A hyphen or "None" indicates that the user does not have access to the features governed by that permission.

6.2.2 Configurable Permissions

The following list of permissions specifies what each controls, and can be configured when adding or editing a user account. Some permissions for the Administrator and Front Panel accounts will be greyed out by default.

- **Admin:** "None" allows access to modify the User Name and Full Name of the Administrator, Front Panel, and the user's own account, and allows the user to change his or her own password, but blocks the user from viewing any account's permission levels. "Modify Users" enables the user to be able to modify user accounts, passwords, and permissions (except for the "Admin" permission). "Full Access" additionally enables the ability to create and delete users and assign the "Admin" permission.
- **Config:** Governs all non-network configuration settings, including those found in the "System Settings" panel on the "Home" screen and on all tabs on the "Configure" screen.
- **NetSettings:** Controls access to the network settings on the "Configure" screen.
- **Clone:** Controls access to the "Clone Source Disk" and "Clone & Image Source Disk" actions.
- **Physical Image:** Controls access to the "Physical Image Source Disk" and "Clone & Image Source Disk" actions.
- **Logical Image:** Controls access to the "Logical Image Source Disk" action.
- **Restore Image:** Controls access to the "Restore Physical Image" action.
- **Erase:** Controls access to the "Erase Destination Disk" action.
- **Hash:** Controls access to the "Hash Disk" action.
- **Snapshot:** Controls access to the "Snapshot Disk" action.
- **Netview:** Controls access to the "Netview Scan" action.
- **Abort:** Controls access to the ability to abort actions in progress.
- **Note:** Controls access to the "Comment" buttons in the "Action" and "System Log" panels on the "Home" screen.
- **Logs:** Controls the ability to delete log files from the "Logs" screen.
- **DiskView:** Controls the ability to preview and download files from the suspect drive via the "Disks" panel on the "Home" screen.

6.3 ADDING A NEW USER

To add a new user, click the **Add User button**, enter the user's information, and set the permission levels. When finished, click on the **Commit Add button**.

6.4 EDITING AN EXISTING USER

To update a user's name, password, or permissions, click on the user account under the "User Name" column, update the information, and then click the **Commit Edits button**.

6.5 DELETING A USER

To delete a user, click on the user account under the "User Name" column and click on the **Delete User button**. Do not click this button unless you are absolutely certain you wish to delete the account.

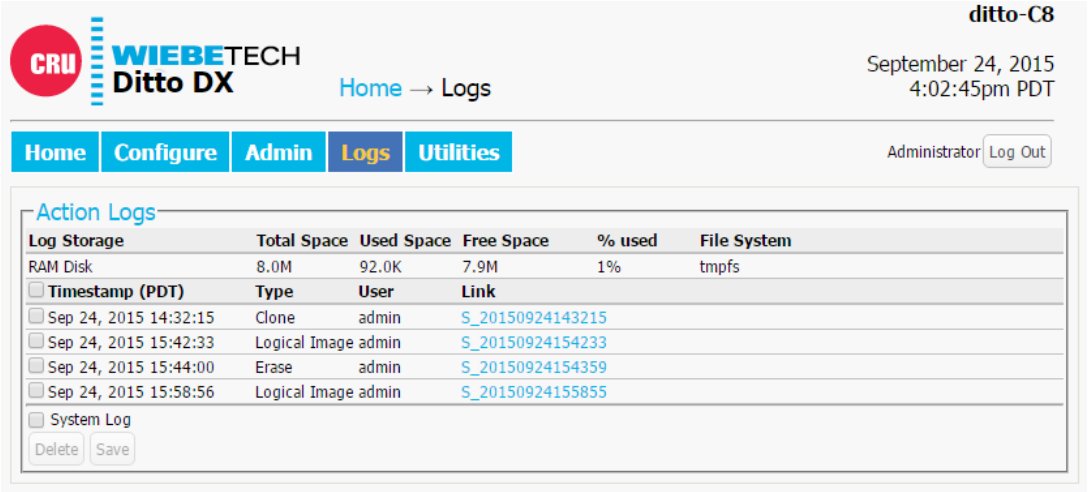


Figure 30. The "Logs" screen.

7 LOGS SCREEN

The "Logs" screen provides information about the Ditto DX Forensic FieldStation's actions. Click on the **Logs tab** to access the "Logs" screen from the browser interface.

Action logs show the timestamp, the type of action performed, the user who performed the action, and a link to the "Action Log" screen that provides more information about the performed action.

7.1 ACTION LOG

7.1.1 Settings

Displays the settings of the Ditto DX Forensic FieldStation that were active when the particular action was performed.

7.1.2 User Permissions

Displays the permissions of the user that were in place when the particular action was performed.

7.1.3 Extended Disk Info

This report displays the information of the disk used (which is noted in the title of this report) in the action, including the interface, model, serial number, capacity, the presence of HPAs (host protected areas) or DCOs (device configuration overlays), partition information, hdparm information, and S.M.A.R.T information. If multiple disks are used in the action, then multiple reports are created.

7.1.4 Logical Image Report

This report appears in action logs of "Logical Image Source Disk" actions and displays each directory and file that was imaged, along with their size and any error messages that were generated. If "Validate File Extensions" is enabled for LIST logical images in the "Configure" screen, it will also log any files in LIST logical images that have a mismatched file header and extension (see Section 5.5.3). Click on the **Export button** to save a copy of the log as an Excel spreadsheet. Click on the **Export Suspects button** to save a copy of all of the suspect files where there is a mismatch between the file's MIME type and file extension.

7.1.5 Netview Report

This report appears in action logs of "Netview Scan" actions and displays summaries of the discovered hosts, including the IP address, MAC address, and the manufacturer associated with the MAC address if that information can be determined. The "Hostname" will be blank if a DNS lookup could not associate the host's IP address to a name.

8 UTILITIES SCREEN

The "Utilities" screen allows you to perform various miscellaneous functions, including the ability to upgrade firmware, import customized configurations, remotely reboot the Ditto DX Forensic FieldStation, modify date and time settings, and perform a factory reset. Click on the **Utilities tab** to access the "Utilities" screen from the browser interface.

8.1 SYSTEM MAINTENANCE

8.1.1 Firmware Upgrade

For information on how to upgrade the firmware, see Section 12.

8.1.2 Configuration

You can save and load configurations for the Ditto DX Forensic FieldStation. The file generated saves a copy of every customizable setting for the unit.

Save Configuration

To save a configuration, click on the **Save Config button**. Name the file, and then click **Continue** to open a Save As dialog box and save the file to your computer.

Load Configuration

a. Click on the **Load Config button**, browse to the .xml configuration file you want to load, highlight it, and click **Open**.

b. The "Confirm Import" window will open. Place a check next to each setting you want to load, and then click **Continue**. By selecting these settings, you will be overwriting the existing settings, so be sure to save the current configuration first.

c. The Ditto DX Forensic FieldStation will import the configuration settings. Click **OK** when it's finished.

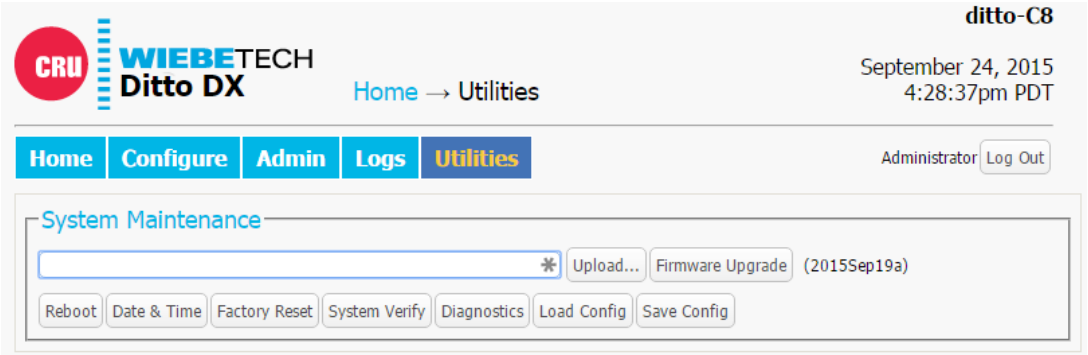


Figure 31. The "Utilities" screen.

8.1.3 Other Buttons

- **Reboot:** Opens a confirmation to reboot the Ditto DX Forensic FieldStation.
- **Date & Time:** Allows you to set the current date, time, and timezone. Click the **Synchronize button** to sync these settings with your browser's operating system.
- **Factory Reset:** Opens a confirmation dialog to return the Ditto DX Forensic FieldStation to factory settings. Check the **Purge Ditto SD card log files** box to remove all log files from the SD card in the unit. You can also use the Front Panel to perform a factory reset. See Section 9.3.
- **System Verify:** Verifies that the Ditto DX Forensic FieldStation's operating system files have not been modified and places a statement in the system log. If the verification fails, the details can be viewed by exporting the System Diagnostics.
- **Diagnostics:** Exports a diagnostics log file in HTML format. The diagnostics log contains information about the Ditto DX Forensic FieldStation's current configuration, including user accounts, kernel messages, logs, process information, disks, PHP errors, and system verify results.

8.2 UPGRADE LOG MESSAGES

This section displays the status log of firmware upgrades and is only visible after a firmware upgrade has been performed.

8.3 IMPORT LOG MESSAGES

This section displays the status log of configuration file exports and imports and is only visible after a configuration file has been loaded.

9 USING THE FRONT PANEL INTERFACE IN STANDALONE MODE

The Ditto DX Forensic FieldStation can work as a standalone device with no additional computer required, which can be useful when working with evidence disks in the field.

The Front Panel interface allows you to clone, physically image, perform a logical image using a Logical Image Mode, simultaneously clone and image, erase, hash a disk, or perform a snapshot of a disk. You can also adjust settings, view information about attached disks, or check on the Ditto DX Forensic FieldStation's operational status. The administrator account can assign access permissions to the Front Panel's actions and settings using the browser interface.

9.1 HOW TO NAVIGATE

9.1.1 Using the Navigation Buttons

The navigation buttons on the front of the Ditto DX Forensic FieldStation allow you to navigate through the menu. **Up** and **Down** allow you to scroll through the available options on the Front Panel, while **Right** selects the option and **Left** goes back to the previous screen. If Quick Start Mode is enabled, press **Left** to exit it.

9.1.2 Using a Keyboard

Plug a PC USB keyboard into a USB port on the "Control Interface" side of the Ditto DX Forensic FieldStation. You can navigate using the arrow keys. Press **Enter or the Right Arrow keys** to select a menu option. Press **the Left Arrow key** to back out of a menu or setting. If Quick Start Mode is enabled, you can press the **Escape key** to exit it.

9.2 MENU SCREENS

The Ditto DX Forensic FieldStation menu consists of the following screens:

9.2.1 Status

The status screen is the default screen. It shows the progress of any current processes. When the Ditto DX Forensic Field Station is "Idle", the current firmware of the unit is also listed on this screen. An example of a status screen is shown in Figure 32.

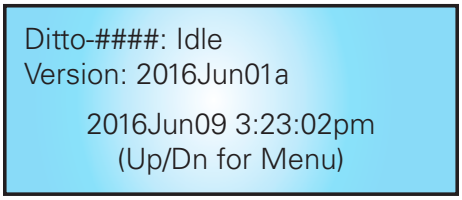


Figure 32. The "Status" screen on the Front Panel LCD.

9.2.2 Perform Action

After you adjust settings to your specifications, you are ready to put the Ditto DX Forensic FieldStation to work. The "Perform Action" screen lets you start or abort any of the Ditto DX Forensic FieldStation's actions using the current settings.

a. On the "Perform Action" screen, use the **Up** and **Down** buttons to cycle through the available actions. Press **Right** to select the one you want.

b. Cycle through the available settings for the action. Press **Right** if you wish to modify them.

c. When you are finished modifying settings, scroll down to option that asks you to start the action (ex. "Start Physical Image?". Press **Right** to begin.

The status and remaining time will be displayed on the LCD screen as the Ditto DX Forensic FieldStation performs the action. To abort an action, press the **Left**. The LCD screen will ask if you wish to abort the action. Press **Right** to confirm, or **Left** to cancel the abort request.

9.2.3 Investigation Info

The "Investigation Info" lists the current settings that can be modified in the "Investigation Info" section on the "Home" screen of the browser interface. To modify these settings from the browser interface, see Section 4.2.

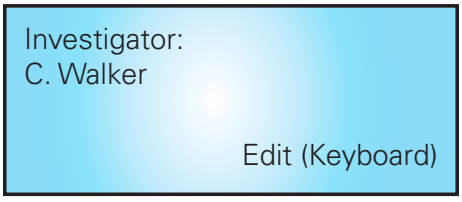


Figure 33. The "Investigator" field in the "Investigation Info" menu on the Front Panel LCD, when a USB keyboard is attached to the Ditto Forensic FieldStation.

Editing Fields With A Keyboard

On the "Investigation Info" menu, an "Edit (Keyboard)" menu item will appear when a keyboard is detected (see Figure 33). You can edit the field currently displayed on the LCD by pressing the **Right button** on the face of the Ditto DX Forensic FieldStation or by pressing **Enter or the Right Arrow keys** on the keyboard, and then using the keys to type.

STOP! Using apostrophes (') in the name fields will cause an error when the file or folder name is created. They should not be used in the Investigation Info fields.

NOTE Strings longer than 20 characters are displayed with an ellipses character (...) at the right side of the string.

NOTE The Ditto DX Forensic FieldStation can handle multiple USB devices through a USB hub attached to the USB port on the "Source Inputs" side of the Forensic FieldStation. However, if multiple keyboards are connected, keystrokes from all keyboards are processed.

Here is a table of the most common keyboard commands:

KEY	COMMAND
Escape	Cancels an edit.
Enter	Begins an edit on a user-editable string or selects the currently-visible menu option. When pressed while editing a string, it confirms the edit.
Home/End	When editing a string, these keys move the cursor to the beginning/end of the string, respectively.
Up/Down	Moves through the menu options. When editing a string, they move the cursor to the beginning/end of the string, respectively.
Delete	Deletes the character currently highlighted by the cursor.
Backspace	Deletes the character immediately behind the cursor.
NumLock	Forces the numbered arrow keys to type numbers when pressed.
CapsLock	Forces all letter keys to type capital letters.
Tab/Shift+Tab/Page Up/ Page Down/Function/Alt/ Windows/Control/Insert	Not handled.

9.2.4 Settings

The "Settings" screen allows you to view and customize the following settings, which are grouped into three subsections. These settings will be the default settings used in any actions performed.

NOTE The System Settings below cannot be modified if the Front Panel user account does not have full access to the "Config" permission, and the Src, Dst, and Ctl Network Settings cannot be modified if the Front Panel user account does not have access to the "NetSettings" permission. See Section 6 for information on how to customize the Front Panel user account.

System Settings

- **Physical Image Type:** Sets the default physical image type for all actions that create a physical image. The image types available are E01 or DD.
- **Logical Image Type:** Sets the default logical image type for all actions that create a logical image. The logical image types available are L01, TAR, ZIP, and LIST.
- **Logical Image Mode:** Sets the default logical image mode. The logical image modes available are All Files and Dirs, All Except Windows, All Except Windows Programs (abbreviated as "All Except W...nd Programs"), All Users - Windows, All Temporary - Windows, All Except Swap and Hibernate (abbreviated as "All Except S..d and Hibernate"), All Media Files, All Office Files, and All Financial Files. See Section 4.1.3 under "Logical Image Modes" for a description of each mode.
- **Hash Type:** Sets the default hash algorithm that will be used for disk verification and the "Hash Disk" action. The available options are None, MD5, SHA-1, SHA-256, MD5 & SHA-1, or MD5 & SHA-256.
- **Erase Mode:** Sets the default erase mode that will be used for all actions that require erasing disks. The available modes are Clear Partition Table, Quick Erase, LBA/Offset Pattern, Custom Erase, Secure Erase Normal, Secure Erase Enhanced, DOD Clear, DOD Sanitize, NIST800-88 Clear, and NIST800-88 Purge.

More settings are available on the next page.

System Settings, continued...

- **Default Format:** This is the default file system that will be used to format destination disks when they are used in actions that the Ditto DX Forensic FieldStation performs. The available formats are HFS+, FAT32, NTFS, EXT2, EXT3, EXT4, and XFS.
- **HTML Logging:** Logs are always saved in .XML format. This option causes the Ditto DX Forensic FieldStation to save logs in HTML format as well. The available options are Off and On.
- **DiskView Logging:** Logs any action to preview a disk or actions performed while previewing a disk (i.e. starting or finishing a preview of a disk, starting or finishing a HexView action). The available options are Off and On.
- **LCD/LED Brightness:** Sets the relative brightness of the LCDs and LEDs on the face of the Ditto DX Forensic FieldStation on a scale of 0 to 6.
- **Buzzer:** This is a planned feature that is not currently implemented. The audible buzzer will alert the user to various actions that occur when using the Ditto DX Forensic FieldStation.
- **Performance:** Sets the speed of the Ditto DX Forensic FieldStation's CPU. The available settings from fastest to slowest are Turbo, Default, Economy, and Power Saver.
- **Lightbar Mode:** Enables or disables the lightbar on the face of the Ditto DX Forensic FieldStation. The available settings are Off and Color.
- **Dual Destinations:** Enables software mirroring mode to write the same data to two destination disks at the same time.
- **Prompt Case:** Five options may be chosen to modify the case number specified in the "Investigation Info" section of the "Home" screen in the browser interface. The case number is included in the log for the requested action. "Disabled" leaves the case number as it is. "Inc/Dec" allows you to manually increment the case number up or down using the navigation buttons on the face of the Ditto DX Forensic FieldStation. "AutoInc" automatically increments the case number, and "AutoInc/Pause" automatically increments the case number, but displays a confirmation prompt the LCD screen before beginning the requested action. These options require a number to be present on the end of the Case Number specified in the "Investigation Info" section of the "Home" screen in the browser interface.
- **Prompt Evidence:** Five options may be chosen to modify the evidence number specified in the "Investigation Info" section of the "Home" screen. The evidence number is included in the log for the requested action. "Disabled" leaves the evidence number as it is. "Inc/Dec" allows you to manually increment the evidence number up or down using the navigation buttons on the face of the Ditto DX Forensic FieldStation. "AutoInc" automatically increments the evidence number, and "AutoInc/Pause" automatically increments the evidence number, but displays a confirmation prompt the LCD screen before beginning the requested action. These options require a number to be present on the end of the Evidence Number specified in the "Investigation Info" section of the "Home" screen in the browser interface.

More settings are available on the next page.

System Settings, continued...

- **Quick Start:** Enables the "Quick Start" screen on the LCD that appears after you boot or reboot the Ditto DX Forensic FieldStation. The settings for this mode may be modified in the "Quick Start" tab of the "Configure" screen on the browser interface. See Section 5.10.
- **Verify Single:** Determines whether individual destination disk are hashed and compared to the hash value of the source disk's hash value. The available options are Yes and No.
- **Verify Dual:** Requires that the "Dual Destinations" option above is enabled. Determines whether mirrored destination disks are hashed and compared to the hash value of the source disk's hash value(s). You can choose to verify Destination 1 or Destination 2 individually, both disks, or none. Destination 1 and Destination 2 are selected when setting up the action to be performed.
- **Verify Clone & Image:** Determines whether cloned and imaged disks are hashed and compared to the hash value of the source disk's hash value during a "Clone & Image Source Disk" action. You can choose to verify no disks, the clone, the image, or both.
- **Log Disk Info:** Determines whether S.M.A.R.T. and hdparm disk information is logged before running an action, after running an action, both, or not at all.

Src (Source) Network Settings

- **Src Network:** Enable or disable the source network Ethernet connection.
- **Src MAC Address:** Displays the source Ethernet port's MAC address.
- **Src IP Assignment:** Displays the source Ethernet port's IP assignment method. The available options are DHCP or Static. An IP address can be manually configuring in the browser interface (see Section 5.2.2).
- **Src Network Access:** Allows you to choose whether or not the Ditto DX Forensic FieldStation responds to any network traffic via the source Ethernet port.
- **Src IP Address:** Displays the IP address assigned to the source Ethernet port.
- **Src Subnet Mask:** Displays the subnet mask address assigned to the destination Ethernet port. It is only visible if the "Src IP Assignment" is set to "Static".

Dst (Destination) Network Settings

- **Dst Network:** Enable or disable the destination network Ethernet connection.
- **Dst MAC Address:** Displays the destination Ethernet port's MAC address.
- **Dst Network Mode:** Displays the destination Ethernet port's networking mode. The available options are Server, Client (DHCP), or Client (Static IP). "Server" allows you to connect the Ditto DX Forensic FieldStation directly to a computer without the use of an intermediary network. The network mode can be further configured in the browser interface (see Section 5.2.3).
- **Dst IP Address:** Displays the IP address assigned to the destination Ethernet port.
- **Dst Subnet Mask:** Displays the subnet mask address assigned to the destination Ethernet port. It is only visible if "Dst Network Mode" is set to "Client (Static IP)" or "Server".

Ctl (Control) Network Settings

- **Ctl Network:** Enable or disable the control network Ethernet connection.
- **Ctl MAC Address:** Displays the control Ethernet port's MAC address.
- **Ctl Network Mode:** Displays the control Ethernet port's networking mode. The available options are Server, Client (DHCP), or Client (Static IP). "Server" allows you to connect the Ditto DX Forensic FieldStation directly to a computer without the use of an intermediary network. The network mode can be further configured in the browser interface (see Section 5.2.4).
- **Ctl IP Address:** Displays the IP address assigned to the control Ethernet port.
- **Ctl Subnet Mask:** Displays the subnet mask address assigned to the control Ethernet port. It is only visible if "Dst Network Mode" is set to "Client (Static IP)" or "Server".

Date & Time

- **Date:** Displays the date.
- **Time:** Displays the time.
- **Timezone:** Displays the time zone.

9.2.5 Disk Info

The "Disk Info" screen (Figure 34) shows all available disks attached to either the source or destination ports. Ports are shown only if a disk is connected there. Press **Right** and then **Up** or **Down** to scroll through the following information about each connected disk:

- Model number
- Disk capacity
- File system

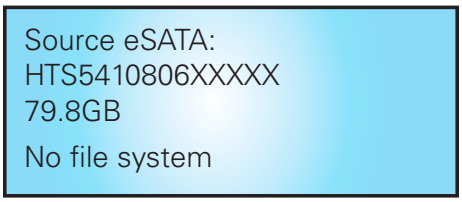


Figure 34. The "Disk Info" screen on the Front Panel LCD.

9.3 FACTORY RESET

To reset the Ditto DX Forensic FieldStation's settings back to their factory defaults, press and hold the **Up**, **Right**, and **Down** navigation buttons while powering the unit on. The Ditto DX Forensic FieldStation will start up and then display the text, "Preparing Factory Reset" (see Figure 35).

You will then be prompted to confirm your choice to reset the Ditto DX. Press **Right** to continue or **Left** to cancel.

You can also use the browser interface to perform a factory reset. See Section 8.1.3.

Figure 35. The "Preparing Factory Reset" screen on the Front Panel LCD.

10 STEALTH MODE

Stealth Mode turns off all LEDs and LCDs on the Ditto DX Forensic FieldStation. You can enable Stealth Mode by flipping the physical "Stealth Mode" switch on the Control Interface side of the Ditto DX Forensic FieldStation (see Section 1.2).

You can also enable it from the browser interface. Click on the **Configure tab**, and then under the "System" tab change the "Stealth Mode" drop-down box to "Enabled." Then click **Commit Changes**.

NOTE If Stealth Mode is enabled from the browser interface, the physical switch cannot override it.

11 ADVANCED FEATURES AND FUNCTIONS

11.1 NETVIEW SCAN

This type of network probing is very noisy and may trigger any IT related Intrusion Detection Devices (IDSs) on the network. Please be sure to run this action in a very controlled and isolated environment.

a. Select **Netview Scan** from the "Action to Perform" drop-down box.

b. Configure the available options, which are detailed below in Section 11.1.1.

c. When you are finished, press the **Start** button. You should see updates every few seconds that describe the current scan being executed, the number of hosts discovered, and the progress of the current scan. Please note that progress estimates are crude and are still being developed. A "Completed" message box will pop up when the action has finished. Click on the message to continue.

You can view the results of the Netview Scan action by scrolling down to the "System Log" panel on the "Home" screen. Find and click on the latest link, which will be denoted by a filename with a date/timestamp format: "S_yyyymmddhhmmss". Alternatively, you can click on the **Logs button** from the top menu bar.

The "Netview Report" section contains summaries of the discovered hosts, including the IP address, MAC address, and the manufacturer associated with the MAC address if that information can be determined. The "Hostname" will be blank if a DNS lookup could not associate the host's IP address to a name.

11.1.1 Netview Scan Configuration Options

The following options can be configured before running a Netview Scan:

Interface Selection

The "Interface" drop-down box allows you to tell the Ditto DX Forensic FieldStation which Ethernet connection to use during the Netview Scan. You can choose either the **Source**, **Destination**, or **Control** Ethernet ports.

STOP! The selected interface will be used when the scan is started. This may create a heavy network traffic load and depending on the "Timing" setting in the "Discovery Options" subsection, may alert your IT department that the network is under some sort of threat. Ensure that the selected interface is attached to a controlled and isolated network.

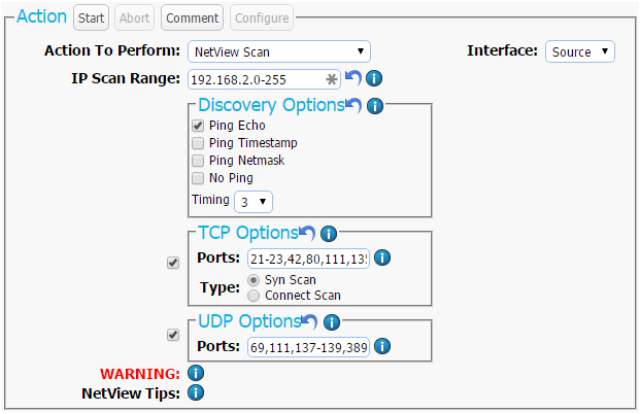


Figure 36. The "Action" section on the "Home" screen, showing the options available for the "Netview Scan" action.

IP Scan Range

By default the last octet of the IP address of the selected interface will be scanned. You may change this value and enter a list of IP address, a range of IP addresses, or a combination of both. Click the "Reset" icon to reset the IP Scan Range back to its default value.

Examples:

1. Range: 10.10.10.0-255
   - Scans the addresses 10.10.10.0 through 10.10.10.255.
2. Range 2: 10.10.10-12.0-255
   - Scans addresses 10.10.10.0-255, 10.10.11.0-255, and 10.10.12.0-255.
3. List: 10.10.10.1
   - Will only scan IP address 10.10.10.1
4. List 2: 10.10.10.2,10.10.10.3
   - Will scan only hosts 10.10.10.2 and 10.10.10.3
5. Combo: 10.10.10.1,10.10.10.2,10.10.10.50-100
   - Will scan hosts 10.10.10.1, 10.10.10.2 and hosts 10.10.10.50 through 10.10.10.100.

Discovery Options

There are three optional host (machine) discovery options and one "No Ping" port scan option available. By default, the "Ping Echo" option is enabled and will suffice for most use cases. Some machines may be configured to ignore pings and not respond, so there are two other specialized Ping options which may be useful. Click the "Reset" icon to reload the default settings.

- **Ping Echo:** Sends a standard ICMP echo request to each IP address.
- **Ping Timestamp:** Sends a request for a timestamped ICMP packet.
- **Ping Netmask:** Sends a request for the destination's subnet mask using an ICMP packet.
- **No Ping:** Skips host discovery and forces a port scan, which is useful when the hosts appear to be down.
- **Timing:** Selects a timing interval for scanning a network. "3" is the default setting. Lower numbers are slower and will help you avoid triggering an intrusion detection alert, and higher numbers are faster but may be less accurate, and may cause intrusion detection alerts.

TCP Options

NetView can optionally scan the specified hosts for open TCP ports. By default, this feature is not enabled. Check the box next to "TCP Options" to enable this feature and expand more options. Click the "Reset" icon to reset all TCP Options back to their default values.

- **Ports:** By default, TCP ports for commonly used services as well as services to which the Ditto DX Forensic FieldStation may be able to connect are entered into this text box, including ports for NFS, iSCSI, and Samba. Only ports entered into this text box will be scanned. NetView IP port ranges may be specified as any combination of lists and ranges. Valid port numbers are

between 1 and 65535 (inclusive). A list is in the form: 80,22,23. A range is in the form: 1-40. Both may be combined to form: 22,23,40-50,80,90-91.

- **Syn Scan:** Syn Scan is selected by default and is appropriate for most use cases. The Ditto DX Forensic FieldStation generates raw IP packets and monitors for responses. This type of scan is also known as "half-open scanning" since it does not open a full TCP connection.
- **Connect Scan:** The Ditto DX Forensic FieldStation uses a full system-level TCP connection in order to determine what ports are available on the host network. This scan should only be performed by advanced users.

NOTE The more ports being scanned, the longer the scan will take.

UDP Options

NetView can optionally scan the specified hosts for open UDP ports. By default, this feature is not enabled. Check the box next to "UDP Options" to enable this feature. Click the "Reset" icon to reset the UDP option back to its default values.

Ports: By default, UDP ports for commonly used services as well as services to which the Ditto DX Forensic FieldStation may be able to connect are entered into this text box, including NFS, iSCSI, and Samba. Only ports entered into this text box will be scanned. NetView IP port ranges may be specified as any combination of lists and ranges. Valid port numbers are between 1 and 65535 (inclusive). A list is in the form: 80,22,23. A range is in the form: 1-40. Both may be combined to form: 22,23,40-50,80,90-91.

NOTE UDP port scanning takes much longer than TCP port scanning due to the fact that open and filtered ports do not typically respond to queries. Therefore, any UDP port scanner will spend time retransmitting its query in case the query or response was lost. Furthermore, while closed ports do usually respond with ICMP port unreachable messages, hosts tend to limit the number of those messages sent per second, resulting in further delay.

Netview Tips

1. See Nmap.org for general information about network scanning.
2. Keep your IP address lists/ranges short. This will mean faster scans and less network traffic.
3. Keep your port lists/ranges short. This will also mean faster scans and less network traffic.
4. Start by deselecting the TCP and UDP scans. Just scanning for the presence of hosts is much quicker than running TCP and UDP scans on a network with an unknown number of machines. Once you have a list of discovered machines, then you can decide whether to TCP and/or UDP scan them all or scan only a subset at a time.
5. TCP scanning must be enabled in order to detect the target's operating system.

11.2 TARGET MODE: REMOTELY ACCESS DISKS ATTACHED TO THE DITTO DX FORENSIC FIELDSTATION WITH THIRD PARTY SOFTWARE

Disks attached to Ditto DX Forensic FieldStation may be mounted on your computer as iSCSI devices for use with third party data acquisition tools. The machine this software is installed on does not have to be physically connected to the Ditto DX Forensic FieldStation, but rather the software may be run remotely from a separate

location within the same network. To do so, you will need to put the Ditto DX Forensic FieldStation into Target Mode.

a. On the "Home" Screen, navigate down to the bottom of the "Disks" panel and select the **Target Mode button**.

b. Check the boxes in the iSCSI column next to the disk(s) that you wish to mount on your computer as iSCSI device(s).

c. Check **Enable iSCSI and SMB authentication** if you wish to require authentication in order for iSCSI initiator software to connect to the selected disk(s). Then input your desired credentials.

d. Press the **OK button**.

You can now mount the disk(s) you selected in the steps above to your computer. Use the Ditto DX Forensic FieldStation's IP address in your iSCSI initiator software in order to attach to it. Initiators can vary, but typically you'll add the IP address to the "Discovery" section of your initiator.

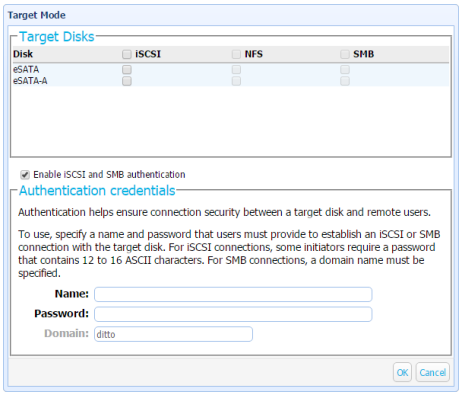


Figure 37. The "Target Mode" window is used to allow computers and third party software to remotely connect via iSCSI to disks connected to Ditto.

11.3 USING ISCSI DEVICES

11.3.1 Remotely Access an iSCSI Device

To connect to an iSCSI device that exists on your network, follow these directions.

a. Ensure that the Ethernet port through which the Ditto DX Forensic FieldStation is connected to your network is properly configured for use with your network (see Section 5.2). Unless you have manually configured the Ditto DX Forensic FieldStation's network settings before, you most likely do not have to change anything. If you are directly connecting the iSCSI device to the Ditto DX Forensic FieldStation, then see Section 11.3.2.

b. On the "Home" Screen, navigate down to the bottom of the "Disks" panel.

c. Click the **Source Network** button if you want to attach the iSCSI device to the Ditto DX Forensic FieldStation as a write-blocked source device, or click the **Destination Network** button if you want to attach the iSCSI device as a read/write-enabled destination.

d. Click on the **iSCSI tab** if it is not already selected.

e. Type the iSCSI device's IP address into the "Target Host" text field.

f. Type in the port number of the target iSCSI volume into the "Port" text field if the number is different than the default value of '3260'. If you don't know the port number, leave it as the default value.

g. Click the **Discover button**. The Ditto DX Forensic FieldStation will detect any IQNs (iSCSI Qualified Names) attached to the IP address.

h. Select the IQN you wish to attach to the Ditto DX Forensic FieldStation from the drop-down box.

i. If authentication is required to connect to the IQN, click the **Advanced... button** and input the appropriate credentials, including the user name, password, and domain. Otherwise, continue to Step J.

j. Click the **Add button**. The IQN will now appear in the list below.

k. Repeat steps **E** through **J** to add more IQNs. When you are finished, click **Close**.

The iSCSI disk(s) have now been added to the list of Disks, allowing you to perform actions on them like you would any other disk.

11.3.2 Directly Connect an iSCSI Device to the Ditto DX Forensic FieldStation

If you do not wish to connect an iSCSI device to your network (for example, it may be a suspect device with unknown properties), you can directly connect the device to the Ditto DX Forensic FieldStation and isolate it from the rest of your network. There are two methods for doing so. Once you have connected the device, continue down to the third subsection, "Adding an iSCSI Disk to the 'Disks' Panel".

Connect via the Source Ethernet Port

Follow these instructions if the iSCSI device you are attaching to the Ditto DX Forensic FieldStation is a suspect device. You'll need to connect the iSCSI device to the source Ethernet port and manually configure the IP address of both the Ditto DX Forensic FieldStation and the iSCSI device.

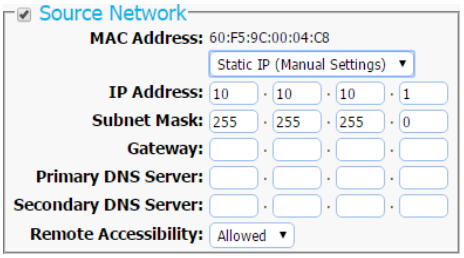


Figure 38. The "Source Network" section on the "Configure" screen's "Network" tab.

Manually set the Ditto DX Forensic FieldStation's IP address.

a. Click on the **Configure tab** at the top of the page, and then select the **Network tab**.

b. In the "Source Network" section, select **Static IP** from the drop-down box underneath the MAC address (see Figure 38).

c. Type in the desired IP address and subnet mask into the appropriate fields. Do not fill in the Gateway, Primary DNS Server, or Secondary DNS Server unless directed to do so by your network administrator.

d. Click **Commit Changes**.

Manually set the iSCSI device's IP address, subnet mask, and gateway. The first three octets of the IP address must be identical to the first three octets of the Ditto DX Forensic FieldStation's IP address. The fourth octet must be different, and must be any other number between 1 and 255. The subnet mask must be identical to the Ditto DX Forensic FieldStation's subnet mask. The gateway must also be set as the Ditto DX Forensic FieldStation's IP address.

Based on the IP address configuration of a Ditto DX Forensic FieldStation that's displayed in Figure 38, a valid configuration for an iSCSI device would be as follows:

IP address: 10.10.10.100
Subnet mask: 255.255.255.0
Gateway: 10.10.10.1

After these settings are configured for the Ditto DX Forensic FieldStation and the iSCSI device, ensure that the iSCSI device is connected to the source Ethernet Port. Then continue to the "Adding an iSCSI Volume to the 'Disks' Panel" subsection below.

Connect via the Destination Ethernet Port

Follow these instructions if you will be transferring evidence or other data to the iSCSI device. First, ensure that the destination Ethernet port is configured to act as a server.

a. Click on the **Configure tab** at the top of the page, and then select the **Network tab**.

b. In the "Destination Network" section, select **Server** from the drop-down box underneath the MAC address. Do not customize the default server configuration unless directed to do so by your network administrator.

c. Click **Commit Changes**.

Now connect the iSCSI Device to the destination Ethernet port. The iSCSI device will be assigned a new IP address if the iSCSI device is configured to obtain a new IP address from DHCP, which will the case for most devices. If no IP address is assigned, you will need to configure the iSCSI device to use DHCP. If that is not possible, contact your network administrator.

Once the iSCSI device is assigned an IP address, continue to the "Adding an iSCSI Volume to the 'Disks' Panel" subsection below.

Adding an iSCSI Disk to the "Disks" Panel

On the "Home" Screen, navigate down to the bottom of the "Disks" panel.

a. Click the **Source Network** button if you want to attach the iSCSI device to the Ditto DX Forensic FieldStation as a write-blocked source device, or click the **Destination Network** button if you want to attach the iSCSI device as a read/write-enabled destination.

b. Click on the **iSCSI tab** if it is not already selected.

c. Type the iSCSI device's IP address into the "Target Host" text field.

d. Type in the port number of the target iSCSI volume into the "Port" text field if the number is different than the default value of '3260'. If you don't know the port number, leave it as the default value.

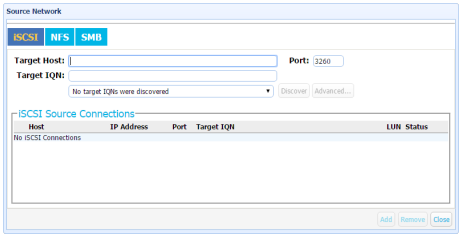


Figure 39. The "Source Network" window's iSCSI tab allows you to connect iSCSI devices to the Ditto via the source Ethernet port. The "Destination Network" tab looks similar and does the same via the destination Ethernet port.

e. Click the **Discover button**. The Ditto DX Forensic FieldStation will detect any IQNs (iSCSI Qualified Names) attached to the IP address.

f. Select the IQN you wish to attach to the Ditto DX Forensic FieldStation from the drop-down box.

g. If authentication is required to connect to the IQN, click the **Advanced... button** and input the appropriate credentials, including the user name, password, and domain. Otherwise, continue to the next step.

h. Click the **Add button**. The IQN will now appear in the list below.

i. Repeat steps C through H to add more IQNs. When you are finished, click **Close**.

The iSCSI disk(s) have now been added to the list of Disks, allowing you to use the Ditto DX Forensic Fieldstation to perform actions on them like you would any other disk.

11.3.3 Properly Remove an iSCSI Device

This process prevents timeout issues where the Ditto DX Forensic FieldStation will attempt to connect to iSCSI volumes that no longer are connected to it. On the "Home" Screen, navigate down to the bottom of the "Disks" panel.

a. Click the **Source Network** button if your iSCSI device is connected via the source Ethernet Port, or click the **Destination Network** button if your iSCSI device is connected via the destination Ethernet Port.

b. Click on the **iSCSI tab** if it is not already selected.

c. Under the "iSCSI Source Connections" or the "iSCSI Destination Connections" section, check the boxes next to the IQN(s) you want to remove and click the **Remove button**.

d. Physically disconnect the iSCSI device from the Ditto DX Forensic FieldStation.

11.4 USING NFS AND SMB (SAMBA) SHARES

11.4.1 Connect to NFS and SMB Shares

a. On the "Home" Screen, navigate down to the bottom of the "Disks" panel.

b. Click the **Source Network button** if the Ditto DX Forensic FieldStation is connected to your network via the source Ethernet Port, or click the **Destination Network button** if it is connected via the destination Ethernet Port.

c. Click on the **NFS tab** or the **SMB tab**, depending on which type of share you are connecting to.

d. Type the server name into the Server text field.

e. If you are connecting to an SMB share, select the appropriate protocol from the "Protocol" drop-down box. If you don't know the correct protocol, leave it as the default value of 'SMBv1'.

f. Click the **Show Shares button**. The Ditto DX Forensic FieldStation will detect any shares attached to the server.

g. Select the share you wish to attach to the Ditto DX Forensic FieldStation from the drop-down box.

h. If you are connecting to an SMB share and authentication is required, click the **Advanced... button** and input the appropriate credentials, including the user name, password, and domain. If the SMB share does not require authentication or you are connecting to an NFS share, continue to the next step.

i. Click the **Add button**. The share will now appear in the list below.

j. Repeat steps C through I to add more shares. When you are finished, click **Close**.

The share(s) have now been added to the list of Disks, allowing you to perform actions on them like you would any other disk.

11.4.2 Remove an NFS or SMB (Samba) Share

a. On the "Home" Screen, navigate down to the bottom of the "Disks" panel.

b. Click the **Source Network button** if the Ditto DX Forensic FieldStation is connected to your network via the source Ethernet Port, or click the **Destination Network button** if it is connected via the destination Ethernet Port.

c. Click on the **NFS tab** or **SMB tab**, depending on the which type of share you are removing.

d. Under the "iSCSI Source Connections" or the "iSCSI Destination Connections" section, check the boxes next to the share(s) you want to remove and then click the **Remove button**.

11.5 ADDING A NEW AUTOSELECT LOGICAL IMAGE PROFILE

AutoSelect is a feature that allows you to search during a logical image action only for those file types of interest to you. If you want to add your own AutoSelect Logical Image profile, you must create a **DittoAutoSelect** directory on your SDCard first. Then you can add one or more auto select XML files to that directory. You may also add subdirectories that contain one or more auto select XML files to the Ditto DXAutoSelect directory. Insert the SD Card into the Ditto DX Forensic FieldStation and your custom AutoSelect profiles will then be available in the "Logical Image Mode" drop-down box when configuring a "Logical Image Source Disk" action.

11.5.1 Ditto DX AutoSelect XML File Structure

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- All attributes must be in single quotes if they contain double quotes.
-->
<DittoAutoSelect
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:noNamespaceSchemaLocation="autoSelect.xsd"
>
    <select title="Example Title">
        <include path="*">
            <name>*.jpeg</name>
            <name>*.jpg</name>
            <name>*.m4*</name>    <!-- .m4a, .m4v, etc -->
        </include>
        <exclude path="Windows"/>
    </select>
</DittoAutoSelect>
```

The name of the auto select XML file can be any legal file name with a .xml file extension. Each AutoSelect XML file may contain one or more <select title="..."> blocks. The select block's title will appear at the bottom of the "Logical Image Mode" selection list prepended with "SDCard/" followed by the subdirectory's name, if any.

Each select block may contain one or more <include path="..."> and/or <exclude path="..."> blocks. The include/exclude block's path (case-insensitive) may contain wildcard characters and will be included in or excluded from the auto selection, respectively.

Each include block may contain zero or more <name>...</name> blocks, which specify a file name to be included in the auto selection. File names are case-insensitive and may contain wildcard characters to specify a set of file names. Exclude blocks cannot contain name blocks.

NOTE You cannot remove existing selections from the Logical Image Mode list.

To download an XML Schema that can be used to validate your auto select XML file, type the following into the address bar of an Internet browser, where <IP Address> is the IP address of your Ditto DX Forensic FieldStation: http://<IP Address>/data/DittoAutoSelect/autoSelect.xsd

12 UPGRADING FIRMWARE

Firmware upgrades are made available on CRU's website at www.cru-inc.com/support/software-downloads/Ditto-DX-firmware-updates/. There are three methods to upgrade your Ditto DX Forensic FieldStation's firmware.

METHOD 1: COPY AND PASTE A LINK

a. Ensure that the Ditto DX Forensic FieldStation is connected to a network with Internet access.

b. Go to the firmware updates webpage and scroll down to the "Ditto DX Firmware Links" section. Copy the URL of the firmware you wish to use to upgrade.

c. Log into your Ditto DX Forensic FieldStation's browser interface and navigate to the "Utilities" screen.

d. Paste the link into the top text field and click the **Firmware Upgrade button**.

e. When it asks you to confirm the retrieval of the upgrade file, click **Continue**.

f. The Ditto DX Forensic FieldStation will download the file to itself. Once downloaded, it will ask you to confirm the upgrade. Click **Continue**. After the upgrade is finished, click **OK**.

g. The LCD panel of the Ditto DX Forensic FieldStation will ask you to reboot. Press the **Right button** on the face of the unit to reboot, or click on the **Reboot button** on the "Utilities" screen.

METHOD 2: DOWNLOAD TO YOUR COMPUTER

a. Go to the firmware updates webpage and scroll down to the "Ditto DX Firmware Links" section.

b. Click on the firmware you wish to use to upgrade to download the file. Save the file in a convenient location.

c. Log into your Ditto DX Forensic FieldStation's browser interface, navigate to the "Utilities" screen, and click on the top **Upload... button**.

d. Locate the firmware file you just downloaded, select it, and click **Open**.

e. Click on the **Firmware Upgrade button**.

f. The Ditto DX Forensic FieldStation will upload the file to itself. Once uploaded, it will ask you to confirm the upgrade. Click **Continue**. After the upgrade is finished, cick **OK**.

g. The LCD panel of the Ditto DX Forensic FieldStation will ask you to reboot. Press the **Right button** on the face of the unit to reboot, or click on the **Reboot button** on the "Utilities" screen.

METHOD 3: UPLOAD VIA A USB THUMB DRIVE

a. Go to the firmware updates webspage and scroll down to the "Ditto DX Firmware Links" section.

b. Click on the firmware you wish to use to upgrade to download the file. Save the file to a USB thumb drive.

c. Insert the thumb drive into the source side USB port of the Ditto DX Forensic FieldStation.

d. The Ditto DX Forensic FieldStation will immediately scan the thumb drive and display a list on the LCD screen of all firmware files found on the drive. Use the navigation buttons on the face of the unit to move the blinking cursor to the firmware that you wish to use to upgrade, and then press **Right**.

e. The Ditto DX Forensic FieldStation's firmware will be upgraded. The LCD panel of the Ditto DX Forensic FieldStation will ask you to reboot. Press **Right** to reboot.

13 TECHNICAL SPECIFICATIONS

Product Name	Ditto DX Forensic FieldStation
Data Interface Types & Speeds	• eSATA: up to 6 Gbps • 1000BASE-T EtherNet: up to 1 Gbps • PATA/IDE: up to 133 MB/s • USB 3.0: up to 5 Gbps • PCIe x4: up to 4 GB/s
Supported Disk Types	2.5" and 3.5" rotational or solid state hard disks
SD Card Slot Support	SD, SDHC (MMC, mini-SD, and microSD are compatible with adapters)
Wifi USB Adapter Support	Wifi adapters with Atheros chipsets, and some Realtek chipsets
Data Connectors	• Three (3) eSATA ports • Three (3) 1000BASE-T Ethernet connectors • One (1) PATA/IDE connector • Three (3) USB 3.0 connectors • One (1) SD Card slot • Two (2) PCIe x4 Ditto Expansion Module connectors
Write-Blocked Data Inputs	eSATA, PATA/IDE, USB 3.0, Source-side Ethernet port. Other input types supported with Ditto Expansion Modules or drive adapters.
Data Outputs	Two (2) eSATA ports operable as single, dual, or mirrored. Two (2) USB 3.0 ports operable as single, dual, or mirrored. Both source-side and destination-side 1000BASE-T Ethernet ports.
Supported File Systems	ext2, ext3, ext4, FAT32, HFS+, NTFS, XFS
User Interface	• Four-line LCD controlled with four soft-touch menu navigation buttons or USB keyboard • Browser-based Ditto interface allows for direct operation, remote operation, and administration
LED Indicators	Lightbar status indicator, power in 5V/12V, USB 3, Source Network, IDE, eSATA, Source Expansion, HPA/DCO, Destination Network, eSATA A, eSATA B, USB 3 A, USB 3 B, Destination Expansion.
Stealth Mode	Turns off all lights (LEDs/LCD)
Browser Compatibility	Internet Explorer, Firefox, Safari, Chrome, Opera
Physical Image Types	DD, E01
Logical Image Types	L01, LIST, TAR, ZIP
Image/Clone Output Modes	Single disk image, single disk clone, image and clone, image to mirrored disks, clone to mirrored disks, restore physical image, logical image to single disk, logical image to mirrored disks
Hash Modes	None, MD5, SHA-1, SHA-256, MD5 & SHA-1, and MD5 & SHA-256, enabled during imaging and cloning operations.
Erase Modes	Clear Partition Table, Quick Erase, Custom Erase, Secure Erase Normal, Secure Erase Enhanced, DoD Clear, DoD Sanitize, NIST800-88 Clear, NIST800-88 Purge
External material	All-aluminum construction
Operating Humidity	5% to 95%, non-condensing
Power Switch	2 position: On / Off
Power Inputs	40W 12V 3.33A DC barrel connector (center pin positive), 15-pin standard SATA power

Compliance	• EMI Standard: FCC Part 15 Class A • CE • EMC Standard: EN55022, EN55024 • RCM
Shipping Weight	5 lbs (2.3 kg)
Product Dimensions	4.92in x 6.77in x 1.72in (125mm x 172mm x 43.7mm)
Technical Support	Your investment in CRU products is backed up by our free technical support for the lifetime of the product. Contact us through our website, www.cru-inc.com/support or call us at 1-800-260-9800 or +1-360-816-1800.

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Product Warranty
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Limitation of Liability
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FCC Compliance Statement: "This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation."

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference in which the user will be required to correct the interference at their own expense.

In the event that you experience Radio Frequency Interference, you should take the following steps to resolve the problem:
1) Ensure that the case of your attached disk is grounded.
2) Use a data cable with RFI reducing ferrites on each end.
3) Use a power supply with an RFI reducing ferrite approximately 5 inches from the DC plug.
4) Reorient or relocate the receiving antenna.

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