



Protecting Your Digital Assets™



Ditto Forensic FieldStation

User Manual

Features

- Source inputs (write-blocked) – eSATA (SATA), PATA, USB 2.0, PCIe x 1 expansion port, and gigabit network (NFS, iSCSI, SMB)
- Destination outputs – Dual eSATA (SATA) ports to store acquired data on one or two disks, SD card, or gigabit network (iSCSI, NFS, SMB)
- Data acquisition modes – physical image DD, physical image E01 with empty block compression, logical image L01, clone, and simultaneous clone & image.
- Hash types - MD5, SHA-1, MD5 + SHA-1
- Remote usage – Perform operations using the web browser interface from any remote networked location in the world
- System configuration management via front panel LCD or web browser interface
- User profiles can be password protected and assigned specific permission levels
- Data log captures a complete history of data acquisitions and can be managed and printed from web browser or extracted to a user-specific document
- Stealth Mode available for use with night vision goggles (not included)





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1 PRE-INSTALLATION STEPS

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 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 |
| 2.5" IDE-to-3.5" IDE and Mini-Fit cable | 1 |
| Power adapter, legacy-to-SATA | 1 |
| Velcro cable wrap | 6 |
| eSATA cable | 2 |
| SD card (pre-installed) | 1 |
| Quick Start Guide | 1 |

1.2 IDENTIFYING PARTS

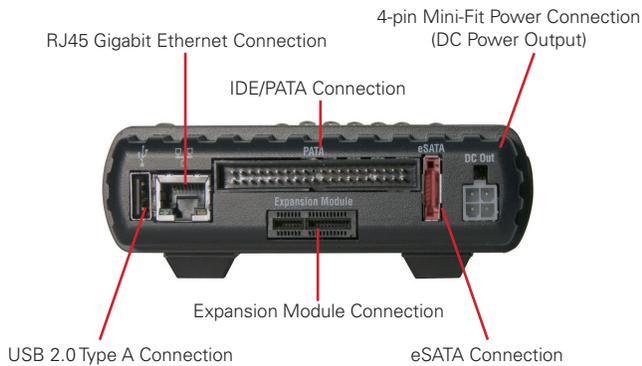
Take a moment to familiarize yourself with the parts of the Ditto Forensic FieldStation. This will help you to better understand the following instructions.



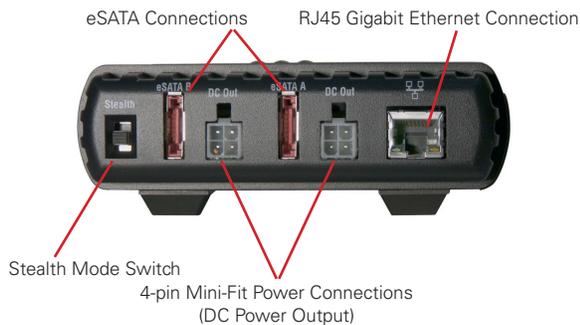


SOURCE INPUTS

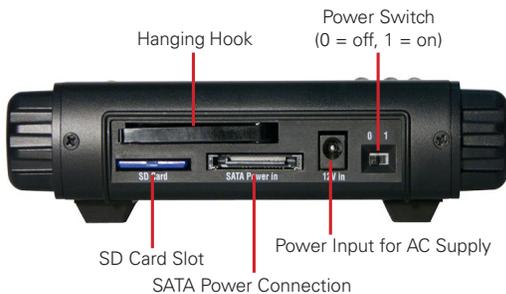
(all inputs are write-blocked)



DESTINATION OUTPUTS



REAR OF THE UNIT



2 SETUP

Plug the “suspect” disks or devices into the **Source Inputs** side of the Ditto Forensic FieldStation. All source inputs are write-blocked to prevent alteration. The source inputs include a USB 2.0 connection for USB devices, an RJ45 gigabit Ethernet connection, an IDE/PATA disk connection, and an eSATA connection for SATA disks or an eSATA device. The expansion module connection is used with the SAS, USB 3.0, and other Ditto Forensic FieldStation expansion modules.

Use the **Destination Outputs** side of the Ditto Forensic FieldStation to store acquired data. The destination output connections include two eSATA connections for SATA disks or eSATA devices and an RJ45 gigabit Ethernet connection.

The rear of the Ditto Forensic FieldStation has an SD card slot and two powering options: a 12V input for the power supply, and a SATA power connection. The rear also has a hook for hanging the unit inside the computer case or workstation.

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

3 BROWSER INTERFACE

The Ditto 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 A Network

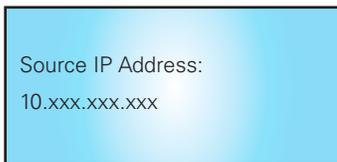
- Plug an Ethernet cable into the Ethernet port on the “Source Inputs” side of the Ditto Forensic FieldStation.
- Connect the other end of the Ethernet cable to your network. This usually means plugging it into a router or hub. In an office environment, you may have a network jack built into your office wall.
- Connect the power cable to the rear of the Ditto Forensic FieldStation and to the provided AC adapter or to SATA power.
- Turn on the Ditto Forensic FieldStation’s power using the switch on the rear panel. (0 = off, 1 = on)



- e. Type the Ditto Forensic FieldStation's source IP address into your web browser. If you know the address, go down to the last step of this section. If you do not know the address, continue to the next step.
- f. Press the **Down** navigation button on the Ditto Forensic FieldStation until you reach the "Settings" menu. Then press **Enter**.



- g. Press the **Up** or **Down** navigation buttons until you reach the "Source IP Address" screen.
- h. Type the IP address shown into your web browser.



NOTE The Ditto Forensic FieldStation is configured by default to use DHCP for IP assignment. If you need to change to a static IP address, check with your network administrator and see Section 3.3.2 of this manual.

- i. 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 "Destination Outputs" side of the Ditto Forensic FieldStation.
- b. Connect the other end of the Ethernet cable to your computer's Ethernet port.

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

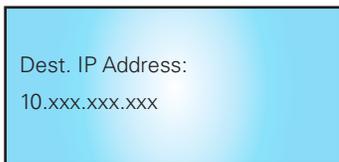
- c. Connect the power cable to the rear of the Ditto Forensic FieldStation and to the provided AC adapter or to SATA power.
- d. Turn on the Ditto Forensic FieldStation's power using the switch on the rear panel. (0 = off, 1 = on)



- e. Type the Ditto Forensic FieldStation's destination IP address into your web browser. The default IP address for the destination Ethernet port is **10.10.10.1**. If you have changed the address and do not remember it, continue to the next step. Otherwise, go down to the last step of this section.
- f. Press the **Down** navigation button on the Ditto Forensic FieldStation until you reach the "Settings" menu. Then press **Enter**.



- g. Press the **Up** or **Down** navigation buttons until you reach the "Dest. IP Address" screen.
- h. Type the IP address shown into your web browser.



- i. 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. |
|  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 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 Forensic FieldStation, and is the default screen to load upon logging into the browser interface. Click on the **Home tab** to access the “Home” screen from any other area of the browser interface.

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).

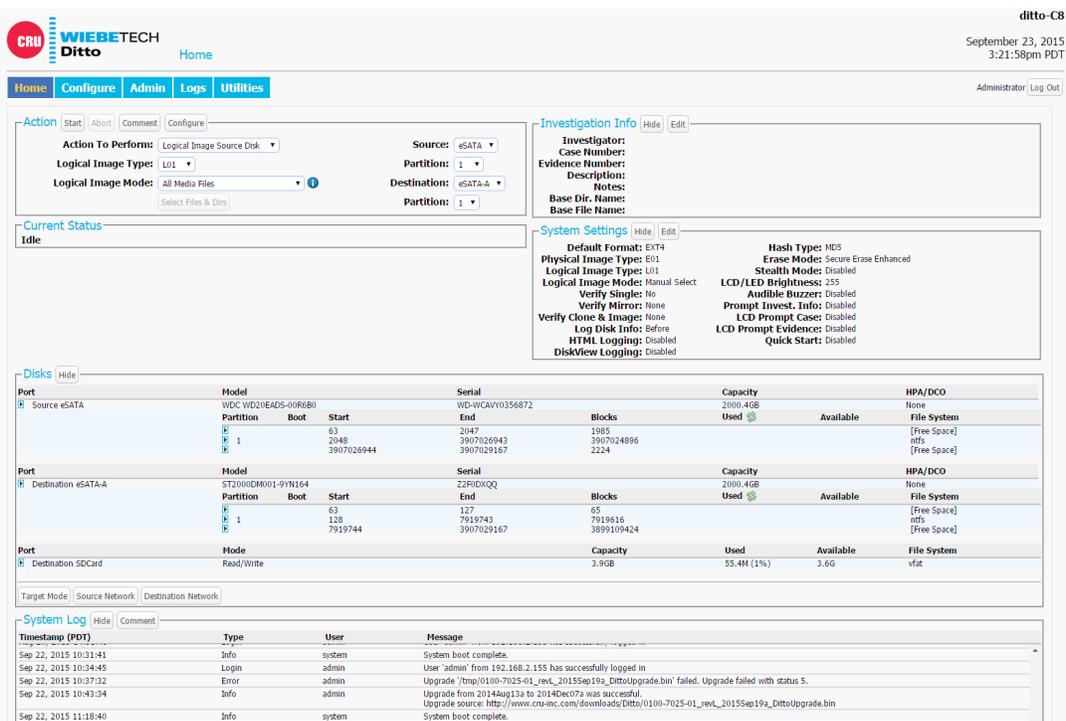


Figure 1. The “Home” screen.



4.1.1 Clone Source Disk

The Ditto Forensic FieldStation makes an exact duplicate of the source disk and can clone to a single or mirrored destination disk.

NOTE While cloning the source disk, the Ditto Forensic FieldStation can also hash the source disk using the MD5, SHA-1, or MD5 + SHA-1 algorithms. Select the hash type under the “System Settings” panel on the “Home” screen. See Section 4.3. Hashing while using both MD5 + SHA-1 significantly reduces performance.

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. To clone to two destination disks at the same time, select the **Mirror** option. Destination disks do not have to be the same physical media as the source disk, but each must be larger than the source disk.

NOTE For the Mirror feature to be shown, two destination disks must be attached.

- 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_yyyyymmddhhmmss”. Alternatively, you can click on the **Logs button** from the top menu bar.

4.1.2 Physical Image Source Disk

The Ditto 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 Forensic FieldStation can also hash the source disk using the MD5, SHA-1, or MD5 + SHA-1 algorithms. Select the hash type under the “System Settings” panel on the “Home” screen. See Section 4.3. Hashing while using both MD5 + SHA-1 significantly reduces performance.

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 the steps on the next page:



Figure 2. The “Action” section on the “Home” screen, showing the options available for the “Clone Source Disk” action.

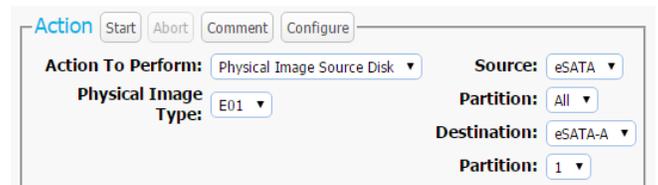


Figure 3. The “Action” section on the “Home” screen, showing the options available for the “Physical Image Source Disk” action.



- a. Using the browser interface, select **Physical Image Source Disk** from the “Action to Perform” drop-down box.
- b. Select the source disk to image from the “Source” drop-down box.
- c. Select which partition(s) to image from the “Partition” drop-down box. Choose **All** to image the entire source disk.
- d. Select the destination disk for the image from the “Destination” drop-down box. To image to two destination disks at the same time, select the **Mirror** option. Destinations do not have to be the same physical media as the source disk, but each must be larger than the source disk.

NOTE

For the Mirror feature to be shown, both destination disks must be empty. A quick way to accomplish this is to use the Ditto Forensic FieldStation to erase each disk by selecting **Erase Destination Disk** from the “Action to Perform” drop-down box and using the “Clear Partition Table” erase mode (see Section 4.1.5). You must also go to the **Erase tab** on the “Configure” Screen and make sure that “Format After Erase” is unchecked (see Section 5.6), because if a destination disk has a partition on it, the “Mirror” option will not appear.

- 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 “Home” screen’s “System Settings” section (see Section 4.3), or 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.

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_yyyyymmddhhmmss”. 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.
- b. 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.

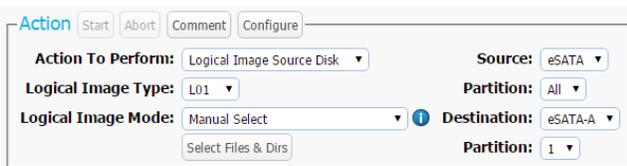


Figure 4. The “Action” section on the “Home” screen, showing the options available for the “Logical Image Source Disk” action.



- c. 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. To image to two destination disks at the same time, select the **Mirror** option. Destination disks do not have to be the same physical media as the source disk, but each must be larger than the source disk.

NOTE

For the Mirror feature to be shown, both destination disks must be empty. A quick way to accomplish this is to use the Ditto Forensic FieldStation to erase each disk by selecting **Erase Destination Disk** from the “Action to Perform” drop-down box and using the “Clear Partition Table” erase mode (see Section 4.1.5). You must also go to the **Erase tab** on the “Configure” Screen and make sure that “Format After Erase” is unchecked (see Section 5.6), because if a destination disk has a partition on it, the “Mirror” option will not appear.

- d. 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.

- e. 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.
- f. If you chose any other Logical Image Mode, 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 5).
- 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.

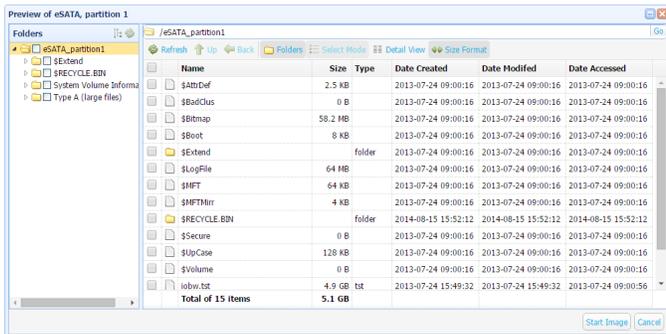


Figure 5. The file navigation tree.



Logical Image Modes

Beginning with the September 19, 2015 firmware update, 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. See the next page for information on specific file types.

Logical Image Modes, continued...

- **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 modes 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 Forensic FieldStation can also hash the source disk using the MD5, SHA-1, or MD5 + SHA-1 algorithms. Select the hash type under the “System Settings” panel on the “Home” screen. See Section 4.3. Hashing while using both MD5 + SHA-1 significantly reduces performance.

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.
- 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. 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 Erase Destination Disk

The Ditto 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 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.



Figure 6. The "Action" section on the "Home" screen, showing the options available for the "Clone & Image Source Disk" action.

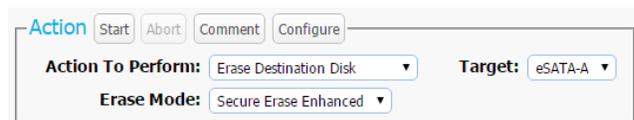


Figure 7. The "Action" section on the "Home" screen, showing the options available for the "Erase Destination Disk" action.



4.1.6 Hash Disk

The Ditto 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,” or “MD5 + SHA-1.”

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.
- 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.

4.1.7 Snapshot Disk

The Ditto 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.

4.1.8 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



Figure 8. The “Action” section on the “Home” screen, showing the options available for the “Hash Disk” action.



Figure 9. The “Action” section on the “Home” screen, showing the options available for the “Snapshot Disk” action.



computers or quickly determine whether a machine is acting as a data storage device that the Ditto Forensic FieldStation can image.

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

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 5.8). 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.

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 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.

4.2.1 User Defined Fields

Click on the **green plus sign icon** to open the “Add User Defined Field” window (see Figure 12). 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 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**.

4.3 SYSTEM SETTINGS

Displays the current configuration settings of the Ditto 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. See Section 5.1 for details on each option.

4.4 CURRENT STATUS

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

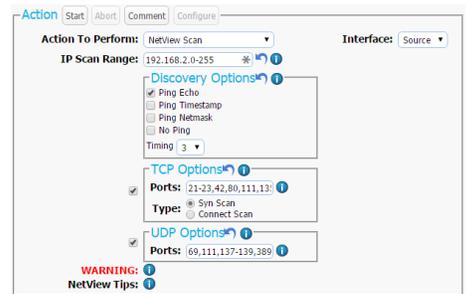


Figure 10. The “Action” section on the “Home” screen, showing the options available for the “Netview Scan” action.

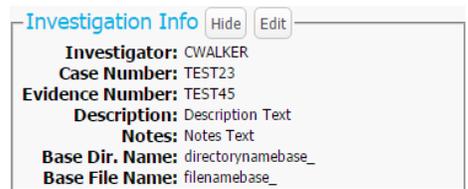


Figure 11. The “Investigation Info” section.

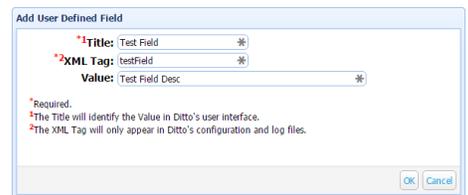


Figure 12. The “Add User Defined Field” window.

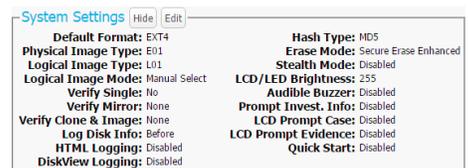


Figure 13. The “System Settings” section.



Figure 14. The “Current Status” section, displaying the status of a Physical Image action.



| Port | Model | Serial | Capacity | HPA/DCO |
|---------------------|---------------------|-----------------|--------------|--------------|
| Source eSATA | WDC WD20EADS-00R6B0 | WD-WCAVY0356872 | 2000.4GB | None |
| | Partition | Boot | Start | End |
| | 1 | 63 | 2048 | 2047 |
| | | | 3907026944 | 3907026943 |
| | | | | 3907029167 |
| | | | | 1985 |
| | | | | 3907024896 |
| | | | | 2224 |
| | | | | [Free Space] |
| | | | | ntfs |
| | | | | [Free Space] |
| Destination eSATA-A | ST2000DM001-9YN164 | Z2F0DXQQ | 2000.4GB | None |
| | Partition | Boot | Start | End |
| | 1 | 63 | 2048 | 2047 |
| | | | 3907026944 | 3907026943 |
| | | | | 3907029167 |
| | | | | 1985 |
| | | | | 3907024896 |
| | | | | 2224 |
| | | | | [Free Space] |
| | | | | ntfs |
| | | | | [Free Space] |
| Destination SDCard | Read/Write | | 3.9GB | 55.5M (1%) |
| | | | | 3.6G |
| | | | | vfat |

Figure 15. The “Disks” section on the “Home” screen.

4.5 DISKS

Displays information about the attached disks that are currently connected to the Ditto 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 16). The disk usage will refresh and give an updated amount.

The “Target Mode” button allows you to present the disks attached to the Ditto 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 Forensic FieldStation. For more information, see Section 11.

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 17). This opens up a file explorer window where you can navigate through the files and folders on the disk.

| Used | Available |
|-----------|-----------|
| 6.3G (0%) | 1.8T |

Figure 16. Clicking the green double arrow displays and updates amount of space currently used and available.



Figure 17. Drop-down menu for a disk (left) and a disk’s partition (right).

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. |



Directory Toolbar and Right-Click Context Menu Items, continued...

| ICON | ACTION |
|---|--|
|  Detail View/List View | Toggles whether the Size, Type, Date Created, Date Modified, 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 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 **Hex-View**. 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 17).

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 Forensic FieldStation has performed (see Figure 18). The "Hide" button allows you to minimize the panel. The "Comment" button allows you to write a note that is appended to the 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 Forensic FieldStation's last power cycle. These logs are deleted when the Ditto 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_yyyyymmddhhmmss". Alternatively, you can click on the **Logs button** from the top menu bar.



| 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 18. The “System Logs” section on the “Home” screen.

5 CONFIGURE SCREEN

The “Configure” screen allows you to modify the way the Ditto 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.

- **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 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.
- **Logical Image Mode:** Sets the default Logical Image Mode for the “Logical Image Source Disk” action.
- **Verify Single:** Determines whether individual destination disk are hashed and compared to the hash value of the source disk’s hash value.

The screenshot shows the 'Configure System' page with the following settings:

- Default Format: EXT4
- Physical Image Type: E01
- Logical Image Type: L01
- Logical Image Mode: Manual Select
- Verify Single: No
- Verify Mirror: None
- Verify Clone & Image: None
- Log Disk Info: Before
- HTML Logging: Disabled
- DiskView Logging: Disabled
- Hash Type: MD5
- Erase Mode: Secure Erase Enhanced
- Stealth Mode: Disabled
- LCD/LED Brightness: 255
- Audible Buzzer: Disabled
- Prompt Invest. Info: Disabled
- LCD Prompt Case: Disabled
- LCD Prompt Evidence: Disabled
- Quick Start: Disabled

Figure 18. The “Configure” screen, showing the “System” tab.



- **Verify Mirror:** 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 eSATA-A or eSATA-B individually, both disks, or none.
- **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.
- **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 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).
- **Hash Type:** Sets the default hash algorithm that will be used for disk verification and the "Hash Disk" action. The available algorithms are MD5, SHA-1, or MD5 + SHA-1. Note that hashing while using both MD5 + SHA-1 significantly reduces performance.
- **Erase Mode:** Sets the default erase mode that will be used for all actions that require erasing disks.
- **Stealth Mode:** Turns off all LEDs and LCDs on the Ditto 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 Forensic FieldStation on a scale of 1 to 255.
- **Audible 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 Forensic FieldStation.
- **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 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 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.

- **Quick Start:** Enables the “Quick Start” screen on the LCD that appears after you boot or reboot the Ditto Forensic FieldStation. The settings for this mode may be modified in the “Quick Start” tab. See Section 5.9.

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

Host Name: ditto-C8

Source Network

MAC Address: 60:F5:9C:00:04:C8
DHCP (Auto Config)

IP Address: 192.168.2.61
Subnet Mask: 255.255.255.0
Gateway: 192.168.2.1
Primary DNS Server: 192.168.2.205
Secondary DNS Server: 192.168.2.202
Remote Accessibility: Allowed

Destination Network

MAC Address: 60:F5:9C:00:04:C9
Server

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

Wifi Network

Wifi Mode: Hot Spot Mode
Status: Auto Start:
SSID: ditto-C8-wifi
Regulatory Domain: Global
Band: G - 2.4 GHz
Channel: Auto
Broadcast:
Security: WPA2 Personal
Key: *****
Show Key
WPA: 8 to 63 characters ascii or 64 characters hex

MAC Address: 00:26:F2:98:AA:19
Hotspot (Server)

IP Address: 10 · 10 · 20 · 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

Commit Changes

Figure 20. The “Network” tab on the “Configure” screen, showing the “Source”, “Destination”, and “Wifi” network settings. The “Wifi Network” section only appears when a USB wireless network adapter has been plugged in.



5.2.2 Source Network

The “Source Network” section displays the source Ethernet port’s MAC Address as well as its IP assignment method. You can 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 Forensic Field-Station responds to any network traffic via the source Ethernet port.

5.2.3 Destination Network

The “Destination Network” section displays the source Ethernet port’s MAC Address as well as its networking mode. You can choose either “Server,” “Client (DHCP),” or “Client (Static IP)” from the drop-down box.

Server

“Server” allows you to configure the Ditto 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 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



Do not connect the Ditto 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 Wifi Network

The “Wifi Network” section allows you to configure a third party USB wifi network adapter that’s been plugged into the “Souce Inputs” USB port. It also displays that port’s MAC Address. Adapters with an Atheros chipset and some adapters with Realtek chipsets are compatible.



The Ditto 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.



“Wifi Mode” allows you to determine whether the Ditto 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 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 Forensic FieldStation into a wifi hot spot.

Client Mode

Check “Status: Auto Start” if you want the Ditto 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 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 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 Forensic FieldStation will limit the frequencies it may broadcast on to only those in the permitted range(s).

STOP!

Do not connect the Ditto 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

More settings are available on the next page.



Hot Spot Mode, continued...

- 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 HPA After Fill:** Sets the HPA on the destination disk so that the capacity of the destination disk is 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 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 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 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 Forensic FieldStation will write out zeroes to fill the sector.
- **Read Error Retries:** Specifies the number of tries the Ditto 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 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 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 and 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 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 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 ERASE

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

5.6.1 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. |
| 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 'DDDDDDDDDD' 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 zeroes to the drive. |
| DOD Sanitize | Performs the U.S. Department of Defense "Sanitize" standard by using a 0xA 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. |

Typical Settings

| Mode Name | HPA/DCO Handling | Passes | Overwrite Method | Verify | Format After Erase |
|-----------------------|----------------------------|--------|--|--------|-------------------------------------|
| Clear Partition Table | Indicate Only | 1 | Write zeros to the first 16KB of the disk. | None | <input checked="" type="checkbox"/> |
| Quick Erase | Indicate Only | 1 | All Zeroes | None | <input type="checkbox"/> |
| LBA/Offset Pattern | Indicate Only | 1 | Write Byte/LBA info to each sector. | None | <input type="checkbox"/> |
| Custom Erase | Indicate Only | 1 * | Pattern: <input type="text"/> hex | None | <input type="checkbox"/> |
| Secure Erase Normal | Indicate Only | 1 | Initiate drive's built-in Secure Erase (Normal) command. | None | <input type="checkbox"/> |
| Secure Erase Enhanced | Indicate Only | 1 | Initiate drive's built-in Secure Erase (Enhanced) command. | None | <input type="checkbox"/> |
| DOD Clear | Permanently Unhide HPA/DCO | 1 | All Zeroes | None | <input type="checkbox"/> |
| DOD Sanitize | Permanently Unhide HPA/DCO | 3 | Overwrite using 0xA pattern, then its complement, then another unclassified pattern. | None | <input type="checkbox"/> |
| NIST800-88 Clear | Permanently Unhide HPA/DCO | 1 | All Zeroes | None | <input type="checkbox"/> |
| NIST800-88 Purge | Permanently Unhide HPA/DCO | 1 | Initiate drive's built-in Secure Erase (Normal) command. | None | <input type="checkbox"/> |

Commit Changes

Figure 21. The "Erase" tab on the "Configure" screen, showing all available erase modes and their customizable settings.



5.6.2 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 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).

5.7 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.

- **Buffer Size:** Sets the the buffer size used by the Ditto 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 Forensic FieldStation encounters a bad sector on the target disk.

5.8 NAMING

The “Naming” tab allows you to customize how the Ditto 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 22 on the next page, 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.



5.8.1 Variables

To modify 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.

5.9 QUICK START

The “Quick Start” tab allows you to customize the quick start mode that appears on the LCD of the Ditto Forensic FieldStation when the “Quick Start” option is enabled in the “System” tab. Many of the settings below are visible only when certain types of actions are selected in the “Action to perform” drop-down box.

- **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 Forensic FieldStation to search for a connected source.
- **Allowed Targets**: Place a check mark next to each target where you want the Ditto 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.

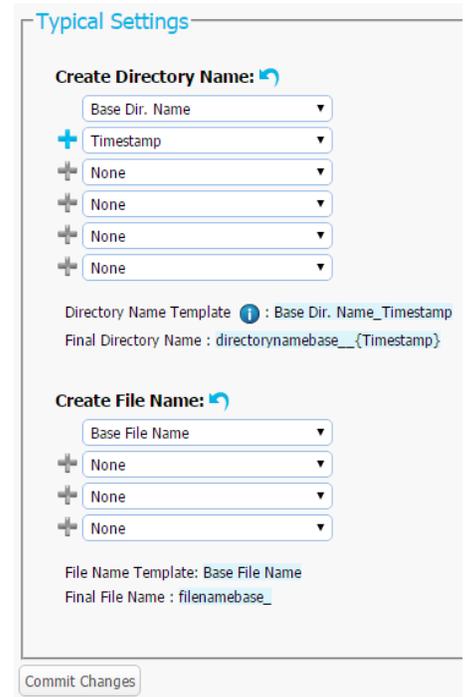


Figure 22. The “Naming” tab on the “Configure” screen.

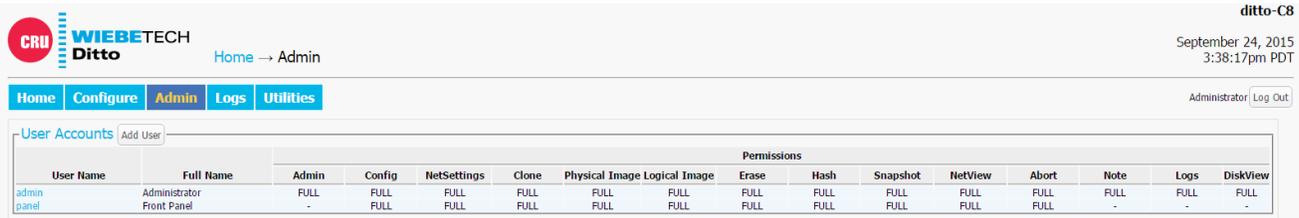


Figure 23. The "Admin" screen.

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.

6.1 USER ACCOUNTS

The Ditto 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 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.
- **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.

7 LOGS SCREEN

The “Logs” screen provides information about the Ditto 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 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.

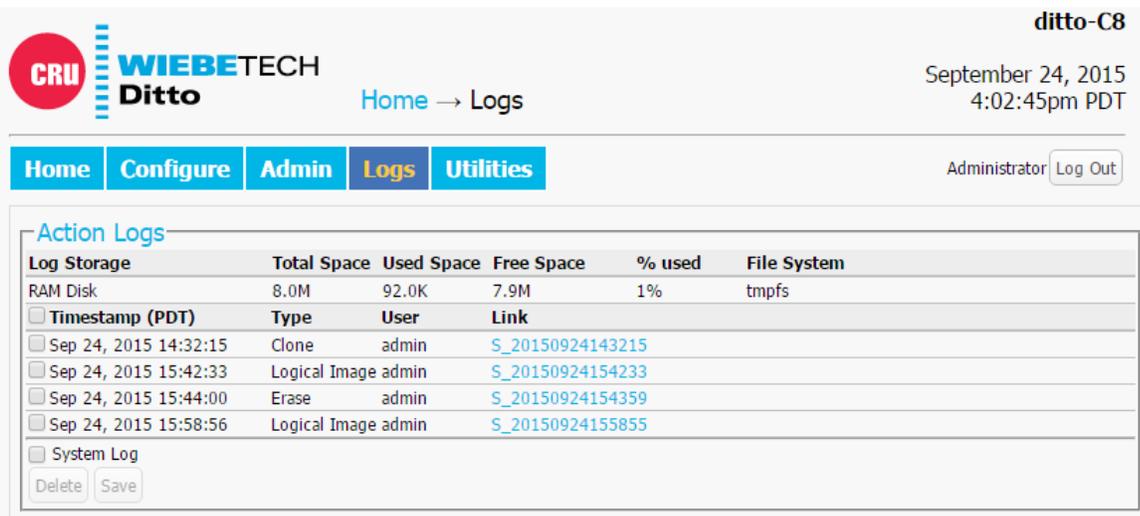


Figure 24. The “Logs” screen.

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 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.

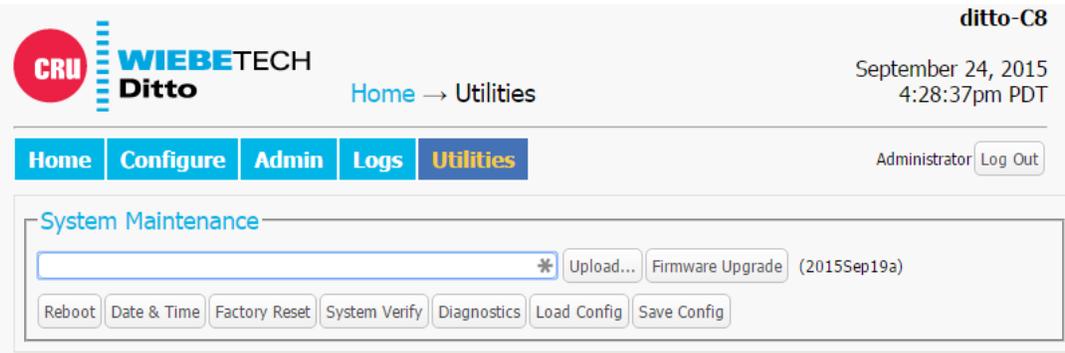


Figure 25. The “Utilities” screen.

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 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

- Click on the **Load Config button**, browse to the .xml configuration file you want to load, highlight it, and click **Open**.
- 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.
- The Ditto Forensic FieldStation will import the configuration settings. Click **OK** when it’s finished.

8.1.3 Other Buttons

- Reboot:** Opens a confirmation to reboot the Ditto 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 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 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 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 or saved.

9 USING THE FRONT PANEL INTERFACE IN STANDALONE MODE

The Ditto 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 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 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 **Enter** selects the option and **Back** goes back to the previous screen. If Quick Start Mode is enabled, press **Back** to exit it.

9.1.2 Using a Keyboard

Plug a PC USB keyboard into the USB port on the "Source Inputs" side of the Ditto 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.

NOTE The Ditto 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.

9.2 MENU SCREENS

The Ditto 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 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 26.

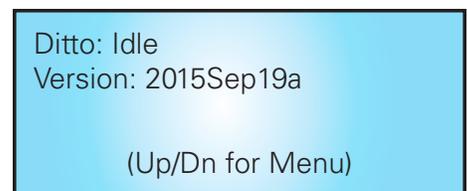


Figure 26. The "Status" screen on the Front Panel LCD.



9.2.2 Perform Action

After you adjust settings to your specifications, you are ready to put the Ditto Forensic FieldStation to work. The “Perform Action” screen lets you start or abort any of the Ditto 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 **Enter** to select the one you want.
- b. Cycle through the available settings for the action. Press **Enter** 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 **Enter** to begin.

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

Editing Fields With A Keyboard

On the “Investigation Info” menu, an “Edit (Keyboard)” menu item will appear when a keyboard is detected (see Figure 27). You can edit the field currently displayed on the LCD by pressing the **Enter** button on the face of the Ditto Forensic FieldStation or by pressing **Enter or the Right Arrow keys** on the keyboard, and then using the keys to type.

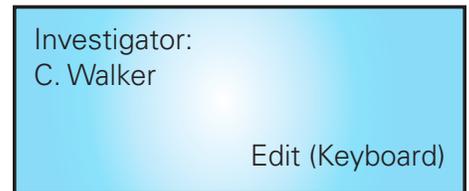


Figure 27. The “Investigator” field in the “Investigation Info” menu on the Front Panel LCD, when a USB keyboard is attached to the Ditto Forensic FieldStation.

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 24 characters are displayed with an ellipses character (...) at the right side of the string.

NOTE

The Ditto 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. |



Most Common Keyboard Commands, continued...

| KEY | COMMAND |
|---|--|
| 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.



The System Settings below cannot be modified if the Front Panel user account does not have full access to the “Config” permission, and the Source and Destination 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 Windows Programs”), All Users - Windows, All Temporary - Windows, All Except Swap and Hibernate (abbreviated as “All Except Swap 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, or MD5 + SHA-1.
- **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.
- **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 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 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 Forensic FieldStation on a scale of 1 to 255.
- **LCD 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 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.
- **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 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.
- **Quick Start:** Enables the “Quick Start” screen on the LCD that appears after you boot or reboot the Ditto 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 5.9.
- **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 Mirror:** 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 no disks, eSATA-A or eSATA-B individually, or to verify both disks.
- **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

- **Source Network:** Enable or disable the source network Ethernet connection.
- **Source MAC Address:** Displays the source Ethernet port’s MAC address.
- **Source 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).



- **Source Network Access:** Allows you to choose whether or not the Ditto Forensic FieldStation responds to any network traffic via the source Ethernet port.
- **Source IP Address:** Displays the IP address assigned to the source Ethernet port.

Dst (Destination) Network Settings

- **Destination Network:** Enable or disable the destination network Ethernet connection.
- **Dest. MAC Address:** Displays the destination Ethernet port's MAC address.
- **Dest. 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 use enable the Ditto Forensic FieldStation for use as a server. The network mode can be further configured in the browser interface (see Section 5.2.3).
- **Dest. IP Address:** Displays the IP address assigned to the destination Ethernet port.
- **Dest. Subnet Mask:** Displays the subnet mask address assigned to the destination Ethernet port.

9.2.5 Disk Info

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

- Model number
- Disk capacity
- File system

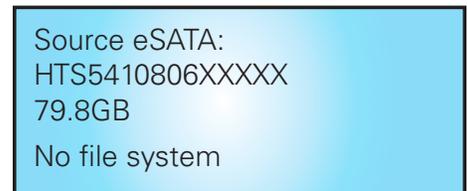


Figure 28. The "Disk Info" screen on the Front Panel LCD.

9.3 FACTORY RESET

To reset the Ditto Forensic FieldStation's settings back to their factory defaults, press and hold the **Up**, **Enter**, and **Down** navigation buttons while powering the unit on. The Ditto Forensic FieldStation will start up and then display the text, "Preparing Factory Reset" (see Figure 31).

You will then be prompted to confirm your choice to reset the Ditto. Press **Enter** to continue or **Back** to cancel.

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



Figure 29. The "Preparing Factory Reset" screen on the Front Panel LCD.

10 STEALTH MODE

Stealth Mode turns off all LEDs and LCDs on the Ditto Forensic FieldStation. You can enable Stealth Mode by flipping the physical "Stealth Mode" switch on the Destination Outputs side of the Ditto 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.

- Select **Netview Scan** from the “Action to Perform” drop-down box.
- Configure the available options, which are detailed below in Section 11.1.1.
- 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 Forensic FieldStation which Ethernet connection to use during the Netview Scan. You can choose either the **Source** or **Destination** Ethernet ports.



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.

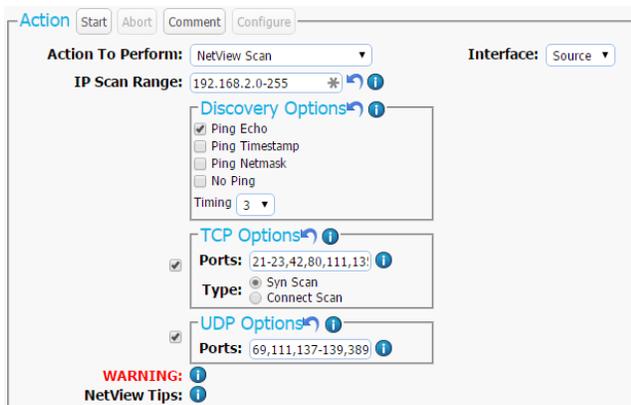


Figure 30. The “Action” section on the “Home” screen, showing the options available for the “Netview Scan” action.



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 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 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 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 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 FORENSIC FIELDSTATION WITH THIRD PARTY SOFTWARE

Disks attached to Ditto 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 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 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 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.

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 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 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 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 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 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 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.

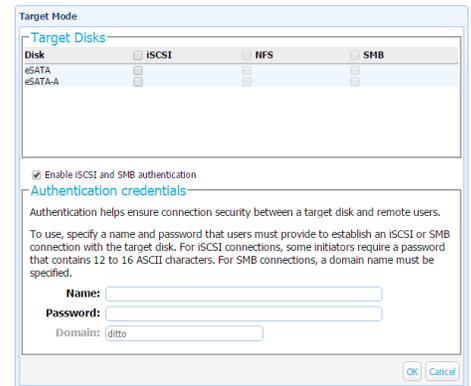


Figure 31. The "Target Mode" window is used to allow computers and third party software to remotely connect via iSCSI to disks connected to Ditto.



11.3.2 Directly Connect an iSCSI Device to the Ditto 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 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 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 Forensic FieldStation and the iSCSI device.

Manually set the Ditto 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.
- 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**.

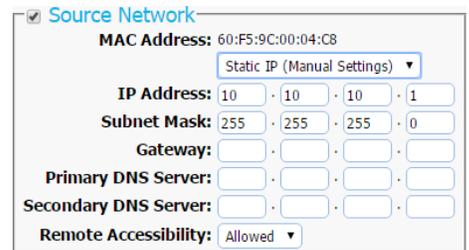


Figure 32. The “Source Network” section on the “Configure” screen’s “Network” tab.

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 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 Forensic FieldStation’s subnet mask. The gateway must also be set as the Ditto Forensic FieldStation’s IP address.

Based on the IP address configuration of a Ditto Forensic FieldStation that’s displayed in Figure 32, 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 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 be 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 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.
- e. Click the **Discover** button. The Ditto 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 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 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 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 Forensic FieldStation.

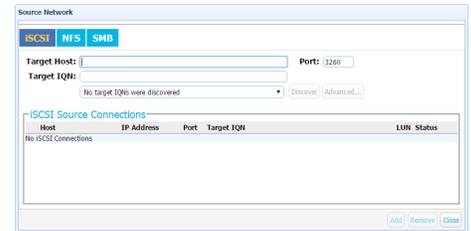


Figure 33. The “Source Network” window’s iSCSI tab allows you to connect iSCSI devices to the Ditto via the source Ethernet port. The “Destination Network” tab looks similar and does the same via the destination Ethernet port.



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 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 Forensic FieldStation will detect any shares attached to the server.
- g. Select the share you wish to attach to the Ditto 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 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 LOGICAL IMAGE MODE

If you want to add your own Logical Image Mode selection, 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 DittoAutoSelect directory. Insert the SD Card into the Ditto Forensic FieldStation and your custom Logical Image Modes will then be selectable when configuring a “Logical Image Source Disk” action.



11.5.1 DittoAutoSelect 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 auto select 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 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-firmware-updates/. There are three methods to upgrade your Ditto Forensic FieldStation's firmware.

METHOD 1: COPY AND PASTE A LINK

- a. Ensure that the Ditto Forensic FieldStation is connected to a network with Internet access.
- b. Go to the firmware updates webpage and scroll down to the "Ditto Firmware Links" section. Copy the URL of the firmware you wish to use to upgrade.
- c. Log into your Ditto 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 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 Forensic FieldStation will ask you to reboot. Press the Enter 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 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 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 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, click **OK**.
- g. The LCD panel of the Ditto Forensic FieldStation will ask you to reboot. Press the **Enter 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 webpage and scroll down to the “Ditto 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 Forensic FieldStation.
- d. The Ditto 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 **Enter**.
- e. The Ditto Forensic FieldStation’s firmware will be upgraded. The LCD panel of the Ditto Forensic FieldStation will ask you to reboot. Press **Enter** to reboot.

13 TECHNICAL SPECIFICATIONS

| | |
|-------------------------------|--|
| Product Name | Ditto Forensic FieldStation |
| Data Interface Types & Speeds | <ul style="list-style-type: none"> eSATA: up to 3 Gbps 1000BASE-T EtherNet: up to 1 Gbps PATA/IDE: up to 133 MB/s USB 2.0: up to 480 Mbps |
| 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 | <ul style="list-style-type: none"> Wifi adapters with Atheros chipsets, and some Realtek chipsets |
| Data Connectors | <ul style="list-style-type: none"> Three (3) eSATA ports Two (2) 1000BASE-T Ethernet connectors One (1) PATA/IDE connector One (1) USB 2.0 connector One (1) SD Card slot One (1) Ditto Expansion Module connector |
| Write-Blocked Data Inputs | eSATA, PATA/IDE, USB 2.0. Source-side Ethernet port. Other input types supported with Ditto Expansion Modules or drive adapters. |
| Data Outputs | Two (2) eSATA operable as single, dual, or mirrored. Both 1000BASE-T Ethernet ports. |
| Supported File Systems | ext2, ext3, ext4, FAT32, HFS+, NTFS, XFS |
| User Interface | <ul style="list-style-type: none"> 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 | Power in 5V/12V, USB, Source Network, IDE, eSATA, Expansion, HPA/DCO, Destination Network, eSATA A, eSATA B |
| 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, logical image to single disk, logical image to mirrored disks |
| Hash Modes | None, MD5, SHA-1, MD5 + SHA-1, enabled during imaging and cloning operations. Hashing while using both MD5 + SHA-1 significantly reduces performance. |
| 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 | <ul style="list-style-type: none"> • EMI Standard: FCC Part 15 Class A • CE • EMC Standard: EN55022, EN55024 • C-Tick |
| 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

CRU warrants this product to be free of significant defects in material and workmanship for a period of three years from the original date of purchase. CRU's warranty is nontransferable and is limited to the original purchaser.

Limitation of Liability

The warranties set forth in this agreement replace all other warranties. CRU expressly disclaims all other warranties, including but not limited to, the implied warranties of merchantability and fitness for a particular purpose and non-infringement of third-party rights with respect to the documentation and hardware. No CRU dealer, agent, or employee is authorized to make any modification, extension, or addition to this warranty. In no event will CRU or its suppliers be liable for any costs of procurement of substitute products or services, lost profits, loss of information or data, computer malfunction, or any other special, indirect, consequential, or incidental damages arising in any way out of the sale of, use of, or inability to use any CRU product or service, even if CRU has been advised of the possibility of such damages. In no case shall CRU's liability exceed the actual money paid for the products at issue. CRU reserves the right to make modifications and additions to this product without notice or taking on additional liability.

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.



Protecting Your Digital Assets™



For more information, visit the CRU web site.

www.cru-inc.com