



Protecting  
Your Digital  
Assets.

# CRU RTX<sup>®</sup> 800-TR User Manual



## Features

- Supports JBOD and RAID levels 0, 1, 4, 5, 6, and 10 in hardware, with easy configuration using ATTO Technology's RAID management software.
- CRU TrayFree™ bays make adding drives effortless: simply open a drive bay door, slide the drive in, and close the door. No screws, no trays, no tools. The rugged TrayFree bays are rated for over tens of thousands of insertions.
- Provides up to 32TB of storage for video editing, visualization, simulation, high-capacity storage, or backups of large amounts of data.
- Dual Thunderbolt interfaces allow the fastest connection to your Mac or PC host, at rates up to 10 Gbps in both directions and at the same time. This kind of performance can transfer or back up 1TB of content in approximately 20 minutes.

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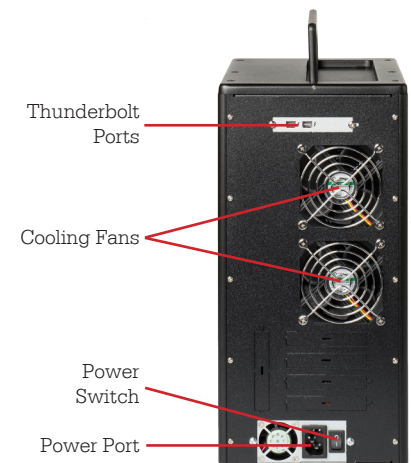
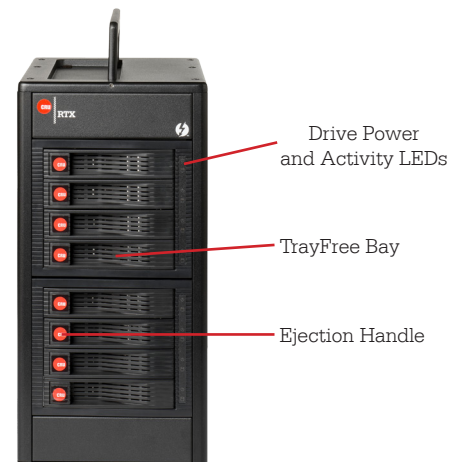
## 1. Pre-Installation Steps

### 1.1 Box 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:

Accessories	Quantity
RTX800-TR Enclosure	1
Thunderbolt Cable	1
Power Cord	1
Quick Start Guide	1

### 1.2 Identifying Parts of your RTX800-TR



### 1.3 Warnings and Notices

Please read the following before beginning installation.

#### General Care

- Proper grounding is strongly recommended to prevent electrical damage to the enclosure or other connected devices, including the computer

host. Avoid all dramatic movement, tapping on the unit, and vibration.

- Before starting any type of hardware installation, please ensure that all power switches have been turned off and all power cords have been disconnected to prevent personal injury and damage to the hardware.
- To avoid overheating, the RTX enclosure should be operated in a well-ventilated area.
- Remove the drives before transporting the RTX enclosure to prevent damage to the drive interfaces.

## RAID

- Use only hard drives that are in perfect condition. Avoid using drives that have ever developed bad sectors during previous use. This could lead to possible device failure or loss of data.
- The RTX enclosure supports SATA hard drives of various specifications and different capacities. However, we recommend using drives of the same brand and type across all bays for optimal performance. If drives of different capacities are used in a RAID, the capacity of the smallest drive will determine how much of each drive is used. The additional capacity on the larger drives will not be used by the RAID.
- RAID level 0 will allow you to use the full combined capacity of the drives and offers the best data transfer speeds. However, RAID 0 offers no protection for the data. If one drive fails in a RAID 0, the data on all of the drives is irretrievably lost. Before creating a RAID, investigate the various RAID types and choose the one that is best for your needs.
- Always back up data before switching RAID types. **Switching RAID types will destroy current data.** You must reformat your drives afterwards.

## 2 Introduction to RAID

A RAID (Redundant Array of Independent Disks) is an array of multiple hard drives that are combined in a way that provides faster performance and/or data safety. Your RTX enclosure is capable of creating and managing several different varieties of RAID. You may choose your preferred RAID level based on factors such as disk capacity, desired data safety, and desired performance.

### 2.1 Summary of RAID Levels

The RTX enclosure supports RAID Levels JBOD, 0, 1, 4, 5, 6, 10, and a custom RAID mode called ATTO DVRAID™. RAID Level 5 is most commonly used by those seeking an optimal balance of speed and data safety, however ATTO DVRAID is optimized for applications such as video production that require a high data transfer rate.

RAID Level	Description	Required No. of Drives*	Fault Tolerance
JBOD	Known as "Just a Bunch Of Disks". This is not a type of RAID as each disk is created with its own independent volume. There is no data protection.	1	No data protection
0	Also known as striping. Data distributed across all drives in the array. There is no data protection.	2 or 4	No data protection
1	Also known as mirroring. All data replicated on two separate disks. Due to the 100% duplication, only half the total disk capacity is available for data storage.	2	1 drive
4	Parity information is dedicated to a single disk while data information is subdivided across the remaining disks. Can withstand the failure of one drive.	3	1 drive
5	Data and parity information is subdivided and distributed across all disks. Can withstand the failure of one drive. The total capacity of all but one of the drives is available for data storage.	3	1 drive
6	Extends RAID 5 by adding an additional block of parity information that is subdivided across all disks, and provides protection against data loss during a RAID rebuild.	4	2 drives
10	Also known as Block-Interleaved Parity. Data is striped across two separate disks and mirrored to another disk pair.	4	1 drive**
ATTO DVRAID	Parity redundancy optimized for high data transfer rates.	6	1 drive

\* The RAID level becomes available as a menu option when exactly these numbers of hard drives are installed inside of the RTX enclosure.

\*\*If both drives in either the RAID 0 or RAID 1 set fail, then the entire RAID will fail. If only one drive in each of the RAID 0 and RAID 1 sets fail, then the RAID is preserved.

## 3 Installation Steps

### 3.1 Hard Drive Installation

- Pull the ejection handle on the TrayFree bay to open the bay door.
- Insert a bare SATA hard drive into the bay. Make sure it is label-side up with the SATA connection on the drive inserted first.
- Shut the bay door.

### Sticker Card

Use the stickers on the provided sticker card to label each drive. This will prevent the drives from getting mixed up when they are removed from the bays.

### 3.2 Operating Your RTX Enclosure

- Install your hard drives into the RTX enclosure (see Section 1.1).

- b. Connect the RTX enclosure to a power outlet with the included power cord.
- c. Connect the RTX enclosure to your computer using the included Thunderbolt cable.
- d. Flip the power switch on the rear of the unit to turn on the RTX enclosure.

### 3.2.1 Installing Thunderbolt Drivers

- a. Download the appropriate Thunderstream SC 3808E driver for your operating system from the RTX800-TR product page: [www.cru-inc.com/products/RTX800-TR.php](http://www.cru-inc.com/products/RTX800-TR.php).
- b. On Windows machines, open the ZIP file and run the included .EXE file. Press the **Unzip** button and then follow the prompts to install the driver.

On Mac machines, the folder will automatically unzip. Open the folder and double click on the .dmg file. A new folder will open. Double click on the .pkg file and follow the prompts to install the driver. A computer restart will be required.

### 3.2.2 Install ATTO ConfigTool

- a. Download the version of ATTO ConfigTool appropriate for your operating system from the RTX800-TR product page: [www.cru-inc.com/products/RTX800-TR.php](http://www.cru-inc.com/products/RTX800-TR.php).
- b. On Windows machines, open the .exe file and click the **Unzip** button. The setup files will unzip. Press **OK**. Navigate to the folder you unzipped it to (the default path is "C:\ATTO\ConfigTool") and open the ConfigTool\_411.exe file there.

For Mac, open the ConfigTool\_4xx file inside of the .dmg file you downloaded.

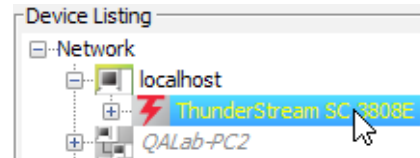
- c. Follow the onscreen instructions. On the "Choose Install Set" screen, select **Full Installation** and then click the **Next** button. Continue to follow the onscreen instructions.

### 3.2.3 Configuring RAID

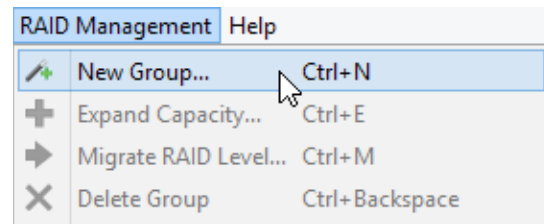
- a. Open ATTO ConfigTool.
- b. From the Device Listing panel on the left, expand the list and select the computer that your RTX is

plugged into. If the RTX enclosure is plugged into the computer you are currently using, select **localhost**.

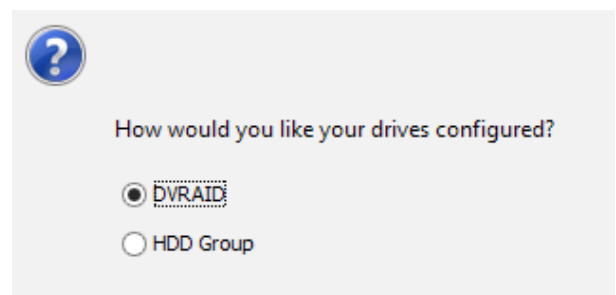
- c. A login window will pop up. Provide the username and password for the computer the RTX is connected to and press **OK**. The device listing for that computer will appear.
- d. Click on **ThunderStream SC 3808E**.



- e. A new set of tabs will appear in the right panel. Click on the **RAID** tab. If this is the first time setting up a RAID on these hard drives, the RAID wizard will automatically open. If it does not start automatically, select the **RAID Management** menu item at the top of the screen and select **New Group...** from the menu.



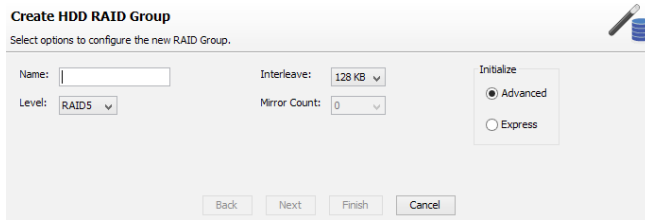
- f. Select **Setup DVRAID** to automatically set up a RAID. To customize your RAID setup with a standard RAID mode, see Section 4 . DVRAID provides parity redundancy for your data and is optimized for the high data transfer rates that are required in digital video editing. The wizard will automatically set up DVRAID using all the storage inside of the RTX enclosure.



Your RTX enclosure is almost ready to use! Now that you have created a RAID, the volume(s) will need to be formatted before being used.

## 4 Customizing a RAID Setup

- a. After following the steps in Section 3.2.3, select **HDD Group** and click **OK**.

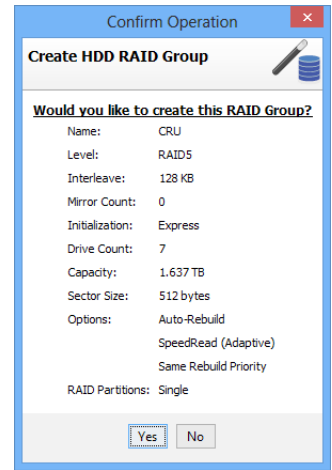


- b. Enter the name for the new RAID group in the **Name** field. The name must be unique and no more than 14 characters.
- c. Select the RAID level from the **Level** drop-down box. See Section 2.1 for a list and description of the available RAID levels.
- d. Select the interleave value under **Interleave**. The default value is 128KB and will be fine for most applications.
- e. Under **Mirror Count**, choose how many mirrors that will be in the RAID group. This option will be greyed out for most RAID configurations.
- f. Under **Initialize**, select the initialization for the RAID group. The default setting is Advanced, which erases and verifies the drive media. During this procedure the RAID group is unavailable for use. Express initialization performs the RAID group setup in the background and allows the RAID group to be used during initialization.
- g. Once the settings are complete, select **Next**.
- h. Add the disks you would like to include as part of the RAID by dragging the drives from the top window to the bottom. Then click **Finish**. The RAID group setup is complete.

If you want to change other parameters from the default values, click **Next** and select the desired property.

- i. After you selected Next in the step above, customize the following properties: **SpeedRead**, **Auto-Rebuild**, and **Rebuild Priority**. Refer to Section 6 for specific information on each of these options.
- j. Set the **Sector Size** that the RAID group virtual disk(s) will use. This parameter can only be configured during RAID group creation. Click **Next**.

- k. Finally, choose your partition options by choosing one of the following: **single**, **split by capacity**, or **split by count**. When you have made all your selections, click **Finish**.



- l. A confirmation dialog box asks you to confirm the configuration you have chosen. Select **Yes**.

The RAID group setup is complete.

## 5 Configuring Drive Redundancy

If a drive in a RAID group fails, the RAID group's status becomes degraded. In order to maintain RAID integrity, you should plan ahead and use one of these methods to ensure that should a drive fail, your data will not remain at increased risk for long. Use the method below that best fits your needs.

### 5.1 Create a Hot Spare Pool

Name	Assigned To	Vendor	SES Slot	Capacity
ST33006575S		SEAGATE	7	279.40 GB
ST33006575S		SEAGATE	8	279.40 GB

A faulted drive is automatically replaced if a suitable disk is available in the Hot Spare Pool. You set up a Hot Spare Pool with drives reserved until a RAID group member fails; they are not available when creating a RAID group.

- a. Use the ATTO ConfigTool to log in to the **ThunderStream SC 3808E** properties as detailed in Section 3.2.3, Steps A through E. and click on the **RAID** tab.
- b. Select the **Hot Spare** tab in the bottom panel to show existing members of the Hot Spare Pool.
- c. To add drives to the Hot Spare Pool, select unallocated drives from the top panel and drag them to the Hot Spare Pool.

#### 5.1.1 Remove Drives from Hot Spare Pool

To remove a drive from the Hot Spare Pool, select the drive, right click on it and click on **Delete Hot Spares**.

## 5.2 Enable Auto-Rebuild

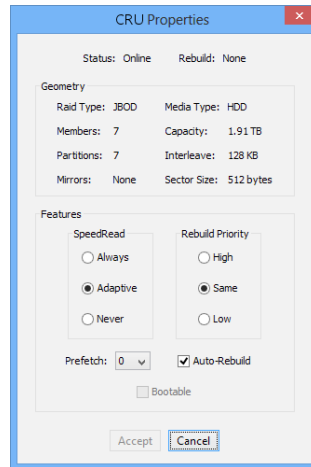
When Auto-Rebuild is enabled, the RTX enclosure will automatically use any suitable unallocated drive it finds as a replacement for a faulted drive. Suitable drives must be large enough to replace the degraded drive and cannot contain any RAID group information. If a Hot Spare Pool exists, the RTX enclosure will default to using an available Hot Spare drive from the pool before searching for an unallocated drive.

Refer to Section 6 for instructions on how to enable Auto-Rebuild.

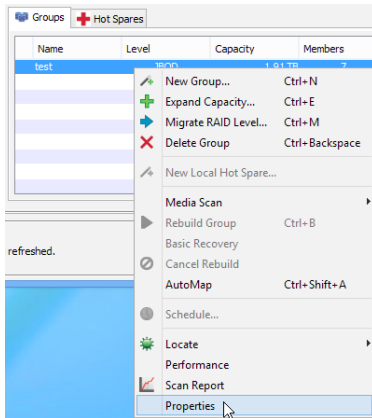
## 6 Change RAID Group Properties

Some of these properties can only be specified during the creation of the RAID group while others may be changed at any time during the life of the RAID group.

- Use the ATTO ConfigTool to log in to the **ThunderStream SC 3808E** properties as detailed in Section 3.2.3, Steps A through E.



- Right click on the RAID Group in the **Groups** panel listing and click on **Properties**.



- Modify the current properties according to your needs:

### SpeedRead

Specifies the cache policy used during read operations.

Setting	Description
Never	Read caching is disabled
Always	Read caching is always enabled
Adaptive (default)	Read caching is adaptively enabled so read performance remains high

### Auto-Rebuild

Controls the replacement of a faulted drive with any available unallocated drive. When you click on the **Auto-Rebuild** check box and the **Accept** button, Auto-Rebuild is enabled. If a drive becomes faulted, the SAS/SATA RAID storage controller replaces the drive with an unallocated drive.

### Rebuild Priority

Specifies the ratio of rebuild I/O activity to host I/O activity.

Setting	Description
Same (default)	Both rebuild and host I/O's are treated equally
Low	Host I/O is given higher priority
High	Rebuild I/O is given higher priority

### Prefetch

Specifies the number of stripes that are read when SpeedRead is enabled or adaptive. This property can only be changed after the RAID group is created. To access this property, select the RAID group and view its properties.

- Click Accept.

## 7 Recovering From a Failed Hard Drive or RAID Group

Use the chart below to diagnose the issue you are experiencing and the recovery method you should use to restore the RAID or recover your data.

Failure Scenario Table		
RAID Level	Reason(s) for Being Marked Offline	Recovery Method
JBOD/RAID 1	Any drive failure	Section 7.2: Data Recovery
RAID 1/RAID 10	Error on one drive	Section 7.1.1: Automatic Replacement or Section 7.1.2: Manual Replacement
	Mistaken replacement of good drive when its mirror has failed	Section 7.1.3: Recovery from Replacement of a Wrong Drive
	Error during rebuild	Section 7.2: Data Recovery
RAID 4/RAID 5	Error on one drive	Section 7.1.1: Automatic Replacement or Section 7.1.2: Manual Replacement
	Mistaken replacement of a good drive when another member of its RAID group has failed	Section 7.1.3: Recovering from Replacement of a Wrong Drive
	Error during rebuild	Section 7.2: Data Recovery
	Errors on two or more drives	Section 7.2: Data Recovery

RAID 6	Errors on one or two drives	Section 7.1.1: Automatic Replacement or Section 7.1.2: Manual Replacement
	Mistaken replacement of good drive(s) when other members of the RAID group have failed	Section 7.1.3: Recovering from Replacement of a Wrong Drive
	Error during rebuild	Section 7.2: Data Recovery
	Errors on three or more drives	Section 7.2: Data Recovery

### 7.1 Rebuilding the RAID Group

The recovery methods listed in this subsection can be used to recover from failures that are non-destructive to your data. Although the RAID group remains intact, its data is at an increased risk of becoming corrupted and the failed hard drive should be replaced as soon as possible. The data will only be corrupted if the RAID group fails and goes offline. If enough drives fail, the RAID group will be forced offline. See Section 2.1 for information on how many drives can fail in a given RAID mode.

#### 7.1.1 Automatic Replacement

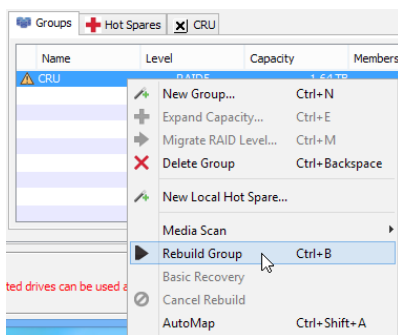
If a Hot Spare pool has been created, the RTX enclosure will automatically rebuild data to a hard drive that is inside the pool. If no drive is available in the Hot Spare pool but Auto-Rebuild is enabled, the RTX enclosure will use any available hard drive in the RTX enclosure that is not currently part of the RAID group to rebuild the RAID group.

If neither of these options is enabled, you will have to manually replace the failed drive.

See Section 5.1 for information on how to create a Hot Spare pool or Section 6 for information on how to enable Auto-Rebuild.

#### 7.1.2 Manual Replacement

- Use the ATTO ConfigTool to log in to the **ThunderStream SC 3808E** properties as detailed in Section 3.2.3, Steps A through E.
- Right click on the degraded RAID group in the **Groups** panel and select **Rebuild Group**.



- A RAID group members tab displays in the bottom panel. Select an unallocated drive from the drive inventory in the above panel and drag it over the degraded RAID drive in the members tab.

If the selected drive is appropriate, the faulted drive is replaced and the RAID will rebuild.

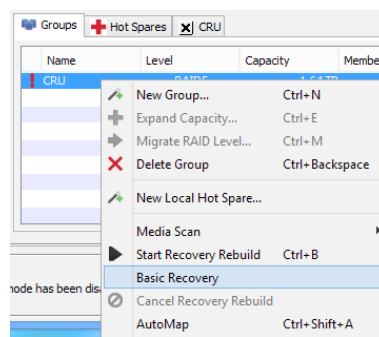
#### 7.1.3 Recovery from Replacement of a Wrong Drive

When a drive fails but the wrong drive is replaced, the RAID group will go offline instead of being rebuilt. Replace the wrongly-replaced drive with the original, then identify and replace the real failed hard drive. A rebuild should begin automatically. But if it does not, right click on the offline RAID group in the **Groups** panel and select the option **Rebuild Group**.

### 7.2 Data Recovery

Basic Recovery Mode allows you to back up your data from an offline or failed RAID group and restore it to a new RAID Group. This method is not guaranteed to recover data however. Any time a RAID group goes offline it means that the integrity of the data has been compromised and some or all of the data may have been corrupted. You should run file system repair tools to validate all of the data on the RAID after recovery before attempting to use it again.

- Use the ATTO ConfigTool to log in to the **ThunderStream SC 3808E** properties as detailed in Section 3.2.3, Steps A through E.
- Right click on the offline RAID Group and select the option **Basic Recovery**.

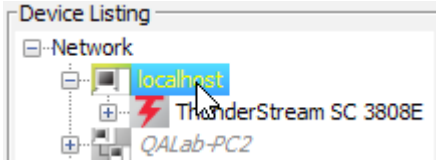


The RAID Group status will change from Offline to Recovery (Basic). Now you may use a host application to read the remaining intact data off of the drives and back it up to another location. The RAID group will remain in recovery mode and there is no way to put this RAID group back online. Once the data is backed up, use only good drives to create a new RAID group and then restore the data to it.

## 8 RAID Notifications

RAID event notifications can be configured using the Notifications tab in the host system properties panel within the ATTO ConfigTool:

- a. From the Device Listing panel on the left, expand the list and select the computer that your RTX is plugged into. If the RTX enclosure is plugged into the computer you are currently using, select **localhost**.



- b. Select the **Notifications** tab that appears on the right.

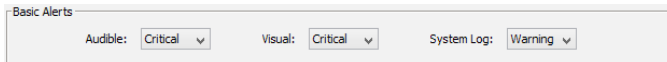
RAID events are divided into 3 categories:

- **Critical events** indicate a serious problem has occurred and the administrator of the RAID group should perform corrective action.
- **Warning events** are less serious but still warrant notification.
- **Information alerts** provide additional useful information about warnings or critical events.

Each type of notification can be configured to notify only on specific levels of RAID events. There are four options available:

- **Critical:** Only Critical events are reported.
- **Warning:** Only Warning and Critical events are reported.
- **All:** All RAID events (Information, Warning, Critical) are reported.
- **None:** No RAID events are reported and RAID notification is disabled.

### 8.1 Configuring Visual, Audible, and System Log Alerts



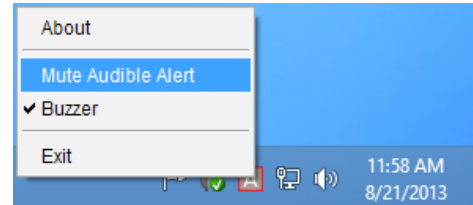
The Basic Alerts section on the Notifications tab lets you configure which levels of RAID events will trigger Audible and Visual alerts and which ones will be recorded in the system event log.

Notifications are specified at the host system level and apply to all enclosures and storage controllers with ATTO chipsets (such as the RTX enclosure) installed on the host system.

### Audible

When triggered, a buzzer will continuously sound through the host computer's speakers until stopped by the user.

To silence the alarm, right click on the Notification Agent's **red "A" icon** in the Desktop task bar (Windows) or Menu Bar (Mac OS) and select **Mute audible alert** from the pop-up menu. You may have to click on the **Show Hidden Icons** arrow on the task bar to find the correct icon.



### Visual

Visual alerts are pop-up message boxes that appear on the host computer's screen when a RAID event occurs.

### System Log

The events you specify here will be recorded directly to the system event log.

## 8.2 Configuring E-Mail Notifications

To configure e-mail notifications, navigate to the **Notifications** tab using the instructions found at the beginning of Section 8, and then enter each of the following settings in the Email section:

- **Server Address:** The address to your provider's SMTP email server
- **Sender Address:** This is the text that will appear in the "From" field of the sent email. This typically contains the email address that the email is being sent from, but may contain other text instead.
- **Username:** The username to the email account that will send the notification email
- **Password:** The password for the account that will send the notification email
- **Enable SSL:** Check if the email account being used



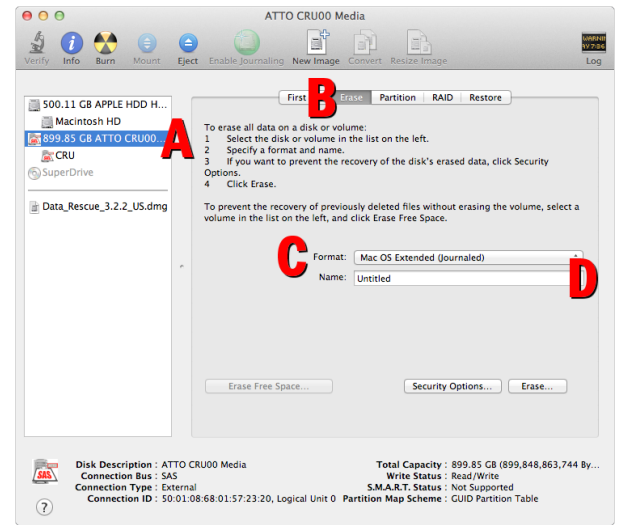
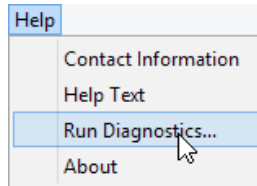
requires SSL. when checked, the ATTO ConfigTool Service will attempt to connect to the email server using the SSL protocol. When unchecked, all notification emails will be unencrypted when sent.

- **Port:** The port number of the email server.
- **Notification Addresses:** Input the email addresses that the notification emails will be sent into these three text fields. Each field may contain more than one address, each separated by a comma. Each text field can be configured to receive a specific level of RAID event using the drop-down boxes to the right.

Email notifications are sent every 15 minutes. If a critical RAID event is detected, the ATTO ConfigTool will wait 10 seconds to collect data on supporting RAID events that may be useful in identifying the cause, and then send the notification.

### 8.3 Retrieving System Logs

Open the ATTO ConfigTool and choose the **Help** → **Run Diagnostics...** Then choose a place to save the log file. It may take several moments for the process to complete. The log includes the system event log for each enclosure and storage controller with an ATTO chipset (such as the RTX enclosure) as well as logs for SNMP functionality and the ATTO ConfigTool background process itself.



### 9.1.2 Mounting and Unmounting Volumes

If the RAID group for the RTX enclosure is already formatted, an icon representing the RAID group's volume will appear (mount) on the desktop. You can begin using the volume right away. If the RAID group is unformatted, a message will appear on the desktop saying that the volume is unreadable. Use OS X's Disk Utility to easily format the drive (see section above).

Unmount the volume before powering down the unit by dragging the volume's icon to the **Trash**, or by selecting the volume then pressing **Command-E**. Disconnecting the unit without first unmounting the volume can result in data loss.



## 9 Usage with Mac and Windows Operating Systems

### 9.1 Usage with Mac OS X

#### 9.1.1 Formatting the RAID Group

To format, use Disk Utility (pictured below), which can be found in the Applications folder.

- Click on the drive in the window to the left.
- Click the **Erase** tab in the window to the right.
- Select the format type. Most users prefer **Mac OS Extended with Journaling (HFS+)**, which is required for compatibility with Time Machine (OS 10.5 or newer). If you need to use your RTX enclosure with both Mac and Windows computers, select **MS-DOS File System** instead.
- Enter a name for the new volume and then click **Erase** to start the process.

### 9.2 Usage with Windows Operating Systems

#### 9.2.1 Formatting the RAID Group

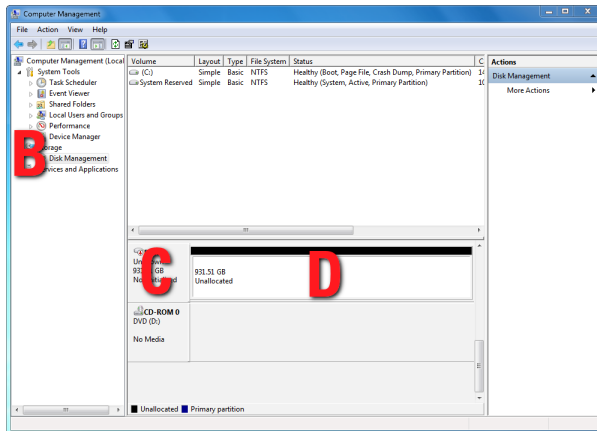
When you first mount the RAID group to a Windows operating system, a pop-up window will ask you if you would like to format it. Click **Format Disk** and skip to Step E. If the prompt does not pop up, use the Disk Management utility by following these steps:

- Right click on the **Computer** button in the Start Menu (Windows 7, Server 2008 R2, Server 2012), then select **Manage**. In the left pane of the Computer Management window that opens, left-click on **Disk Management** (labeled 'B' in the picture below). For Windows 8, press **WINKEY + X**, then select **Disk Management** from the menu that pops up.
- The volume should appear in the list of Disks in the lower pane. You may need to scroll down to see it. If the volume is already formatted, you can identify it easily by its volume name. If the Device Properties

Box (labeled 'C' in the picture below) says "Not Initialized", you'll need to initialize the volume before formatting it.

Right click on the **Device Properties Box** and select **Initialize Disk**. If you are prompted to select a partition type, select GPT.

- c. To format the volume, right click the **Drive Properties Box** (labeled 'D' in the picture below) and select **New Simple Volume...**



- d. Unless you wish to customize the settings in these dialog prompts, click **Next** on the Specify Volume/Partition Size, and Assign Drive Letter or Path dialog prompts, leaving the default settings.
- e. You will now see a window that allows selection of a file system. Choose **NTFS** and enter a name for the new volume. Be sure to check the box labeled **Quick Format**, which will ensure that the formatting process takes less than a minute.
- f. Click **Next** and then **Finish** to start the format process. When the format is complete, the Drive Properties Box will update to show the new volume name. The new volume can now be found by clicking on the **Computer** button in the Start Menu (Windows 7, Server 2008 R2) or by clicking on **Computer** in the navigation pane of a File Explorer window (Windows 8, Server 2012).

### 9.2.2 Mounting and Unmounting Volumes

If the RAID group for the RTX enclosure is already formatted, you can begin using the volume right away. When the RTX enclosure is properly connected and turned on, a window may open to allow you access to the volume. If no window appears, find the volume clicking the **Computer** button in the Start Menu (7, Server 2008

R2) or by clicking on **Computer** in the navigation pane of a File Explorer window (Windows 8, Server 2012).

Unmount the RTX enclosure before powering it down by left-clicking the **USB plug icon** with the green checkmark on the Desktop task bar and then selecting **Eject ATTO cru00 SCSI Disk Device** from the menu that pops up. You may have to click on the **Show Hidden Icons** arrow on the task bar to find the correct icon. Windows will indicate when it is safe to disconnect the RTX enclosure. Disconnecting the enclosure without first ejecting its RAID group volume can result in data loss.



## 10 RAID Is Not A Backup

Because your RTX enclosure features redundant RAID modes which protect against a hard drive mechanical failure, it is an excellent part of any backup strategy. However, a RAID is not in itself a complete backup strategy. Many things besides hard drive failure can damage or erase your data:

- Corruption caused by unexpected disconnection during data access (e.g. a cable is unplugged during a data transfer, or the computer crashes or loses power while writing to the drives)
- Corruption or destruction caused by viruses or other malware
- Sabotage by a disgruntled employee or acquaintance
- Theft of your RTX enclosure
- Natural disasters such as fire, flooding, etc.

Considering these possibilities, any single copy of your important data must always be considered at risk. That's why backing up is so important. Follow the 3-2-1 backup rule. Data should exist in three different places on two different storage media and at least one of those copies should be maintained offsite.

Without an effective backup strategy, recovering data may be impossible, or the cost of data recovery may be quite expensive. The CRU warranty does not cover costs associated with data loss (nor do the warranties of other data storage manufacturers).

Plan accordingly and backup data to minimize downtime!

# 11 Technical Specifications

Product Name	RTX800-TR
Interface Types & Speeds	Thunderbolt: up to 10 Gbps bi-directional
Drive Types Supported	3.5" SAS and SATA Drives
Data Connectors	Two (2) Thunderbolt connectors
RAID Levels	JBOD, 0, 1, 4, 5, 6, 10, and ATTO DVRAID
Operating System Requirements	<ul style="list-style-type: none"> <li>Windows 7 or 8</li> <li>Windows Server 2012 or 2008 R2 (x64 only)</li> <li>Mac OS X 10.6.8 or later</li> <li>Linux distributions that support the connection type used</li> </ul>
Insertion Rating	50,000 insertions
Compliance	EMI Standard: FCC Part 15 Class A, CE EMC Standard: EN55022, EN55024
Shipping Weight	<ul style="list-style-type: none"> <li>25 pounds (without drives)</li> <li>37 pounds (with drives)</li> </ul>
Product Dimensions	6.97" x 10.63" x 14.57" (177mm x 270mm x 370mm)
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, <a href="http://www.cru-inc.com/support">www.cru-inc.com/support</a> or call us at 1-800-260-9800 or +1-360-816-1800.

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### Product Warranty and Limitation of Liability:

#### 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 to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at this 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 drive 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.

