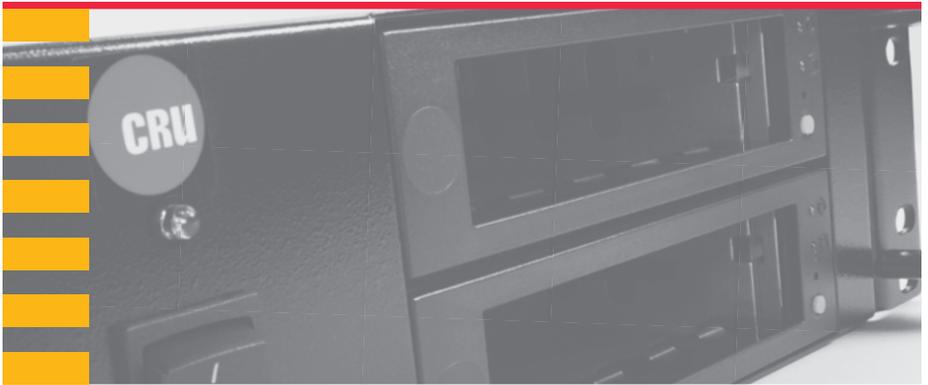




Protecting
Your Data™



RAX425DC-XJ

User Manual

Features

- Quick ingestion or duplication of DCP
- Accepts up to four CRU® DX115DC carriers
- Rugged and reliable all-metal construction
- Auto Start feature powers up the drive carrier seconds after insertion without having to push the power button



Table of Contents

Section	Page Number
1 General Information	3
1.1 Package Contents	3
1.2 Identifying Parts	3
1.3 LED Behavior	4
1.4 Warnings and Notices	4
2 Installation Steps	5
2.1 RAX425DC-XJ Setup	5
2.2 Drive Installation	5
3 Operating Your RAX425DC-XJ	5
4 Usage with Windows and macOS Operating Systems	6
4.1 Usage with Windows Operating Systems	6
4.1.1 Format a Drive	6
4.1.2 Mount and Unmount Volumes	8
4.2 Usage with macOS	9
4.2.1 Format a Drive	9
4.2.2 Mount and Unmount Volumes	10
5 Frequently Asked Questions	10
Technical Specifications	12



1 General Information

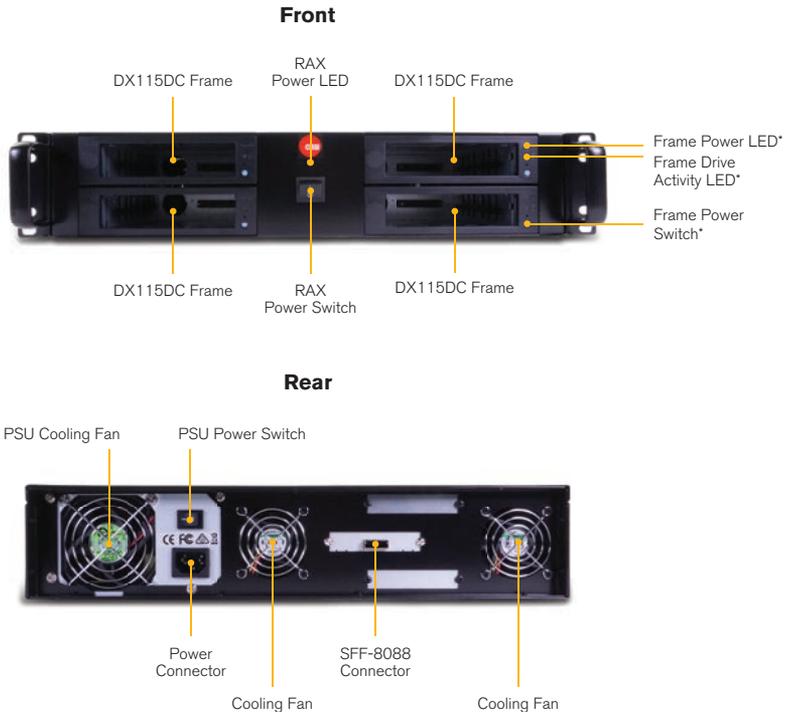
1.1 Package Contents

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

Item	Quantity
RAX425DC-XJ Enclosure	1
Power Cord	1
Key Set	1
Screw Kit	1
Quick Start Guide	1

1.2 Identifying Parts

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



*Each DX115DC frame has one (1) Frame Power LED, one (1) Frame Drive Activity LED, and one (1) Frame Power Switch located to the right of each respective drive bay.



1.3 LED Behavior

LED Name	Color	State	Description
RAX Power	Green	Solid Green	The RAX unit is powered on.
Frame Power*	Blue/Red	Flashing Blue	Carrier is inserted and the drive inside is powering up.
		Solid Blue	Drive is powered on and ready for access.
		Flashing Red and Blue	Fan failure. Please contact Technical Support.
		Solid Red	Frame power failure. Please contact Technical Support.
Frame Drive Activity*	Amber	Flashing**	Indicates when the host computer is accessing data on the drive.

1.4 Warnings and Notices

Please read the following before using the product.

General Care

- The main circuit board of the RAX425DC-XJ enclosure is susceptible to static electricity. 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.
- Avoid placing drive carriers close to magnetic devices, high voltage devices, or near a heat source. This includes any place where the product will be subject to direct sunlight. Do **not** allow water to make contact with the carrier or the RAX® enclosure.
- Before starting any type of hardware installation, 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 RAX enclosure should be operated in a well-ventilated area.
- Remove the drives before transporting the RAX enclosure to prevent damage to the drive interfaces.

Rack Mounting Warnings

- **Elevated Operating Ambient Temperature:** The operating ambient temperature of the rack environment may be greater than the room ambient temperature if the enclosure is installed in a closed or multi-unit rack assembly. Install the equipment in an environment compatible with the maximum ambient temperature of 40° C.
- **Reduced Air Flow:** Do not block or inhibit the air flow required for safe operation of the enclosure.

*Each DX115DC frame has one (1) Frame Power LED, one (1) Frame Drive Activity LED, and one (1) Frame Power Switch located to the right of each respective drive bay.

**Some SATA PC systems/host controllers do not provide support for the Drive Activity LED feature, in which case the Drive Activity LED may light up as a solid amber color or not at all.



- **Mechanical Loading:** Use care when mounting the rack in order to prevent injury.
- **Circuit Overloading:** Do not overload the circuits. Refer to the name plate ratings on the equipment.
- **Reliable Grounding:** Maintain reliable grounding of rack-mounted equipment by using indirect connections to the branch circuit (i.e. UPS battery backups, power strips).
- **Removing the Cover:** Turn off and unplug the enclosure before removing the cover.

2 Installation Steps

2.1 RAX425DC-XJ Setup

- a. Attach the included SFF-8088 data cable to the rear of the RAX unit and to your server or ingestion system.
- b. Plug in the power cord.
- c. Turn on the power by flipping the power switch on the front of the RAX unit.

2.2 Drive Installation

- a. If carriers are bundled with the RAX unit, push in on the ejection handle of the carrier to pop it out. Use the handle to remove the carrier from the frame.
- b. Use a Phillips screwdriver to remove the two screws securing the carrier cover. The screws are located on either side of the front of the carrier.
- c. Remove the cover and attach a 3.5-inch or 2.5-inch drive to the unified power and data connector inside of the carrier.
- d. With one hand on the top of the drive, turn the carrier over. Then secure the drive to the carrier using the mounting screws provided.
- e. Reattach the carrier cover and secure it using the two screws you removed in Step B.

3 Operating Your RAX425DC-XJ

Slide up to four DX1 15DC drive carriers into the RAX unit, then push each carrier handle in until it clicks into place. After a few seconds, the carrier(s) will automatically start up. Your RAX is now ready to use!

To eject a carrier, ensure there are no file transfers in progress and the amber Frame Drive Activity LED is off. Then press the Frame Power Switch to turn off the frame.

To remove the carrier, press in on the carrier handle to pop it out, then pull the carrier out by the handle.



4 Usage with Windows and macOS Operating Systems

4.1 Usage with Windows Operating Systems

4.1.1 Format a Drive

When you first mount a drive 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 in the instructions for your operating system below. If the prompt does not pop up, use the Disk Management utility by following the steps below for your specific Windows operating system:

Windows 10

- Right-click on the **Start Button** and then select **Disk Management**.
- The drive should appear in the list of Disks in the lower pane. You may need to scroll down to see it. If the drive is already formatted, you can identify it easily by its volume name. If the drive is not initialized or is brand new, a window will pop up asking you to select a partition type. Select **GPT** and press **OK**.
- To format the volume, right-click the **Drive Properties Box** of the drive (highlighted yellow in Figure 1) and select **New Simple Volume...**
- Unless you wish to customize the settings in these dialog prompts, click **Next** on the Select Partition, Specify Volume/Partition Size, and Assign Drive Letter or Path dialog prompts, leaving the default settings.
- Choose **NTFS** from the file system selection window that appears and enter a name for the new volume. Then check the box labeled **Quick Format**, which ensures that the formatting process will take less than a minute.

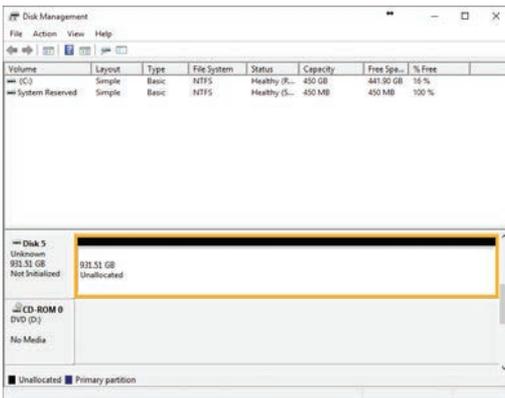


Figure 1. The Disk Management window in Windows 10 is very similar to the one found in Windows 8.1. The Drive Properties Box is highlighted in yellow.



- 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 opening a File Explorer window and clicking on **This PC** in the navigation pane to the left.

Windows 8.1

- a. Press **WINKEY + X** and then select **Disk Management**.
- b. The drive should appear in the list of Disks in the lower pane. You may need to scroll down to see it. If the drive is already formatted, you can identify it easily by its volume name. If the drive is not initialized or is brand new, a window will pop up asking you to select a partition type. Select **GPT** and press **OK**.
- c. To format the volume, right-click the **Drive Properties Box** (highlighted in yellow in Figure 1) and select **New Simple Volume...**
- d. Unless you wish to customize the settings in these dialog prompts, click **Next** on the Select Partition, Specify Volume/Partition Size, and Assign Drive Letter or Path dialog prompts, leaving the default settings.
- e. Choose **NTFS** from the file system selection window that appears and enter a name for the new volume. Then check the box labeled **Quick Format**, which ensures that the formatting process will take less than a minute.
- f. Click **Next** and then **Finish** to start the format process. The new volume can now be found by opening a File Explorer window.

Windows 7

- a. Click on the **Start Button**, right-click the **Computer** button in the Start Menu, and then select **Manage**. In the left pane of the Computer Management window that opens, left-click on **Disk Management** (labeled 'A' in Figure 2).
- b. The drive should appear in the list of Disks in the lower pane. You may need to scroll down to see it. If the drive is already formatted, you can identify it easily by its volume name. If the Device Properties Box (labeled 'B' in Figure 2) says "Not Initialized", you'll need to initialize the disk before formatting it.

Right-click where it says "Not Initialized" 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 'C' in Figure 2) and select **New Simple Volume...**



- d. Unless you wish to customize the settings in these dialog prompts, click **Next** on the Select Partition, Specify Volume/Partition Size, and Assign Drive Letter or Path dialog prompts, leaving the default settings.
- e. Choose **NTFS** from the file system selection window that appears and enter a name for the new volume. Then check the box labeled **Quick Format**, which ensures that the formatting process will take 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.

4.1.2 Mount and Unmount Volumes

Mount a Volume

If the drives inside of each drive carrier are already formatted, you can begin using them right away. When the RAX enclosure is properly connected and turned on, and each carrier is properly installed, a window may open to allow you access to each carrier's data volume. If no window appears, find the volume by opening a File Explorer window (Windows 10, 8.1, and Server 2012 R2) and then clicking on **This PC** in the navigation pane of a File Explorer Window (Windows 10) or clicking on **Computer** in the navigation pane of a File Explorer Window (Windows 8.1 and Server 2012). Otherwise, click on the **Computer** button in the Start Menu (Windows 7 or the Windows Server 2008 product family).

Unmount a Volume

Many SAS hosts do not support hotswapping, but third-party software utilities are available that will provide the functionality.

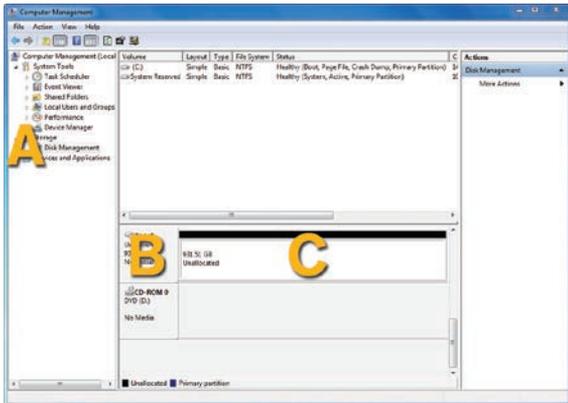


Figure 2. The Computer Management window in Windows 7. 'A' denotes the Disk Management section, 'B' denotes the Device Properties Box, and 'C' denotes the Drive Properties Box.



If your host does not support hotswapping, you may download a third-party utility or follow these instructions: Ensure no file transfers are taking place and make sure the carrier's Drive Activity LED is not blinking, as ejecting the drive carrier while a file transfer is in progress can result in data loss. Then turn off the drive bay frame the carrier is installed in by pressing its Frame Power button. You may need to restart your computer to remount the carrier.

If your host does support hot-swapping, you should unmount the volume before ejecting the carrier. To do so, left click the **USB plug icon** with the checkmark on the Desktop task bar and select the proper volume(s) 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 eject each carrier. Then turn off the drive bay frame the carrier is installed in by pressing its Frame Power button. Finally, eject the carrier.

NOTE

Disconnecting or powering off the RAX enclosure or ejecting a carrier while Windows is actively reading or writing to one of its volumes can result in data loss.

4.2 Usage with macOS

4.2.1 Format a Drive

To format a hard drive or SSD, use Disk Utility (see Figure 3), which can be found in **Applications** → **Utilities**, or by selecting **Spotlight Search** and typing in "Disk Utility" and hitting **Return** on your keyboard.

- Click on the drive in the window to the left.
- Click on the **Erase** button at the top.

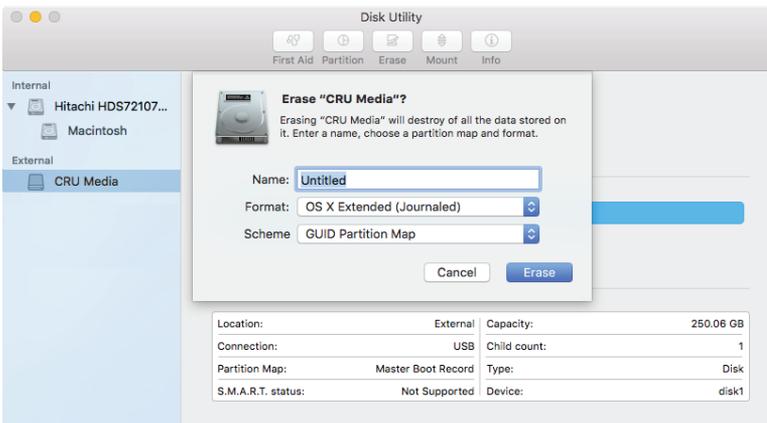


Figure 3. macOS Disk Utility, showing the "Erase" submenu.



- c. Enter a name for the new volume.
- d. Select the format type. Select **APFS** if it is an available option. Otherwise, select **OS X Extended (Journaled)**. If you need to use your RAX enclosure with both macOS and Windows 10 computers, select **ExFAT** instead.
- e. For the scheme, select **GUID Partition Map**.
- f. Click **Erase** to start the process.
- g. Once the format is complete, click **Done**.

4.2.2 Mount and Unmount Volumes

If the drives inside of each drive carrier are already formatted, you can begin using them right away. When the RAX enclosure is properly connected and turned on, and each carrier is properly installed, an icon representing the available data volume(s) will appear on the desktop. If any drive inside of a carrier is unformatted, a message will appear on the desktop saying that that disk is unreadable. Use Disk Utility to easily format it (see Section 4.2.1).

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** on your keyboard.

NOTE

Disconnecting or powering off the RAX enclosure or ejecting a carrier while macOS is actively reading or writing to the volume can result in data loss.

5 Frequently Asked Questions

Q: Does my 4-bay RAX unit support RAID?

A: The RAX425DC-XJ only supports JBOD functionality. However, the drives can be RAIDed in software, or the RAX enclosure can be attached to a RAID host bus adapter (HBA) for hardware RAID functionality.

Q: Will this product work with hard drives larger than 2.2TB?

A: Yes, assuming the rest of your configuration (e.g. OS, BIOS, host drivers) supports large volumes. All modern secure operating systems and hardware support drives larger than 2.2 TB.

Q: Why is my hard drive experiencing data corruption?

A: Many things can cause data corruption on hard drives, whether they are inside your computer or inside an external storage product. Malicious software, operating system bugs, failure to properly disconnect external devices, or no obvious reason at all. Data corruption or loss is therefore not covered by warranty.



The first thing to try is restarting both the computer and the external device. If the data is still corrupted, try running built-in operating system utilities (such as macOS's Disk Utility First Aid) on the drive volume. For best results, boot your computer with a macOS Installation CD and launch Disk Utility from the CD. When you reach the macOS installation program you can run Disk Utility from one of the menus at the top of the screen. From Disk Utility, you can run "Verify Disk" and "Repair Disk" to find and fix any errors that may be present in your macOS installation.

If an operating system utility doesn't help, you may need Data Rescue. This is a great solution for recovering lost data from a hard drive which has suffered data loss or corruption. If there is a true hardware failure of your hard drive that prevents it from communicating with your computer, there is no software solution in existence that can fix this problem. However, since we cannot tell you with any certainty whether or not you are experiencing hardware failure in your particular hard drive, we would encourage you to download a free demo version of the drive recovery software of your choice. Free software may limit how much data you can recover, but they will tell you if they even see any files.

Product Models	RAX425DC-XJ
Interface Types & Speeds	Multi-lane SAS/SATA (SFF-8088): up to 6 Gbps
Supported Drive Types	2.5-inch and 3.5-inch SATA hard drives and SSDs 2.5-inch and 3.5-inch SAS hard drives and SSDs
Data Connectors	One (1) SFF-8088 connector
Insertion Rating	Up to 30,000 carrier insertions per DX115DC frame
Torque	2.5-inch drives, M3 screws: 4 inch-pounds max. 3.5-inch drives, #6-32 screws: 6 inch-pounds max.
Supported Operating Systems	Windows 10, 8.1, and 7 Windows Server 2016, 2012 and 2008 product families macOS 10.12 "Sierra" or newer Linux distributions that support the connection type used
Compliance	EMI Standard: FCC Part 15 Class A EMC Standard: EN55022, EN55024 CE, RoHS, RCM
Product Weight	Unpopulated: 15 pounds (6.81 kg) Populated: 23 pounds (10.44 kg)
Product Dimensions	16.89in W x 16.26in L x 1.74in H (429mm W x 413mm L x 44mm H)
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, 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 two 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 B 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 home or 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.

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.

