

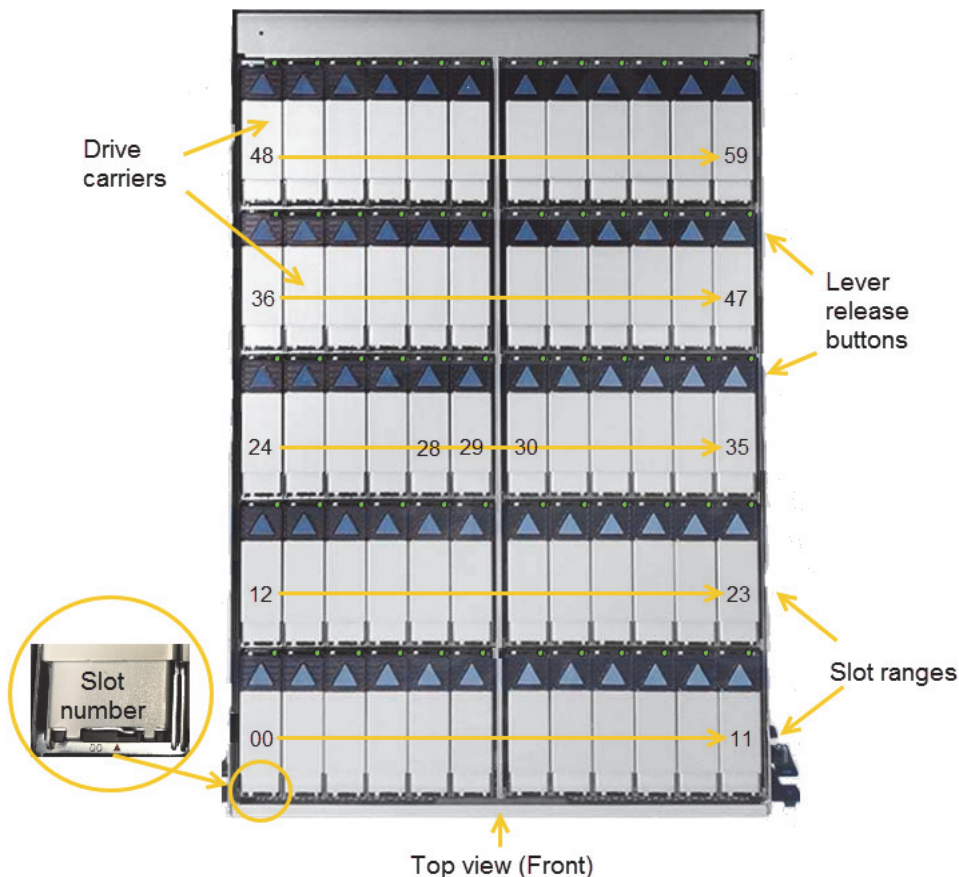
This document provides installation steps for racking and cabling the US460 Storage Expansion, and for connecting to a Unity Storage System. Instructions are also provided for powering on and monitoring. For the latest updates and documentation please visit <https://www.nexsan.com/support/support-unity/>

### Taking delivery

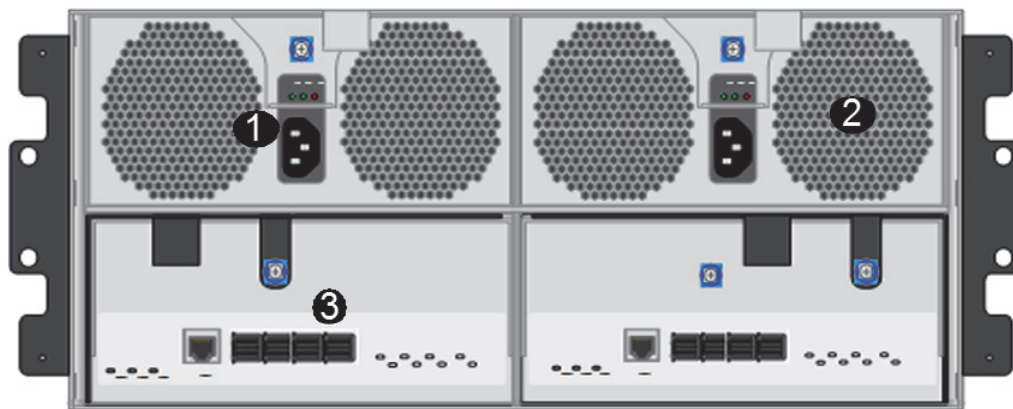
Check to ensure that no damage has been sustained to the packaging in transit. If any of the Unity storage components appear damaged, you should file a damage claim with your reseller.

### Hardware overview

The main components of the US460 Storage Expansion are shown in these diagrams:



Top view (Front)



Backplane

- ❶ Power supply units
- ❷ Fan assemblies

- ❸ Storage connectivity: SAS Quad port PCIe to Serial Attached SCSI (HD Mini-SAS) host bus adapter

# 1 Prepare for installation

- A Carefully read safety notices on [page 8](#).
- B Ensure ahead of time that you have a suitable rack; see [Rack and enclosure specifications on page 8](#).
- C Ensure that you have a Phillips screwdriver.
- D Arrange for assistance to unpack and move the US460 Storage Expansion into position. The unit weighs 99.6 lbs without drives and 200.7 lbs fully populated (see [page 8](#)).

**CAUTION:** Acclimate new disk drives to room temperature for two hours before you install them.

- on the back for both the left and right rail assemblies)
- 2 long screws to secure the chassis to the rack from the front (attached to the chassis)
- FASTier, SSD, and HDD drives. Drive packs consist of 1 SSD and 19 DATA HDDs. Up to 3 drive packs can be used in a US 460. Check that the drives included in your shipment correspond to your order and packing slip.
- Drive blanks to fill empty slots, if applicable
- SAS cables (HD Mini SAS to HD Mini SAS)
- Two power cables

**CAUTION:** To avoid possible data issues, disconnects, or damage, use cables that can extend the length of the US 460 when the drawer is pulled open.

# 2 Unpack the US460

- A Remove all the components from the packaging. Use the black lifting straps to remove the US460 chassis from its packaging.
- B Place the components on an anti-static surface until you are ready to use them.

## US460 package contents

Shipments typically include the following items:

- One US460 expansion (with front bezel)
- 4 mounting screws with 4 washers to attach outer-rack rails to the rack (1 on the front and 1

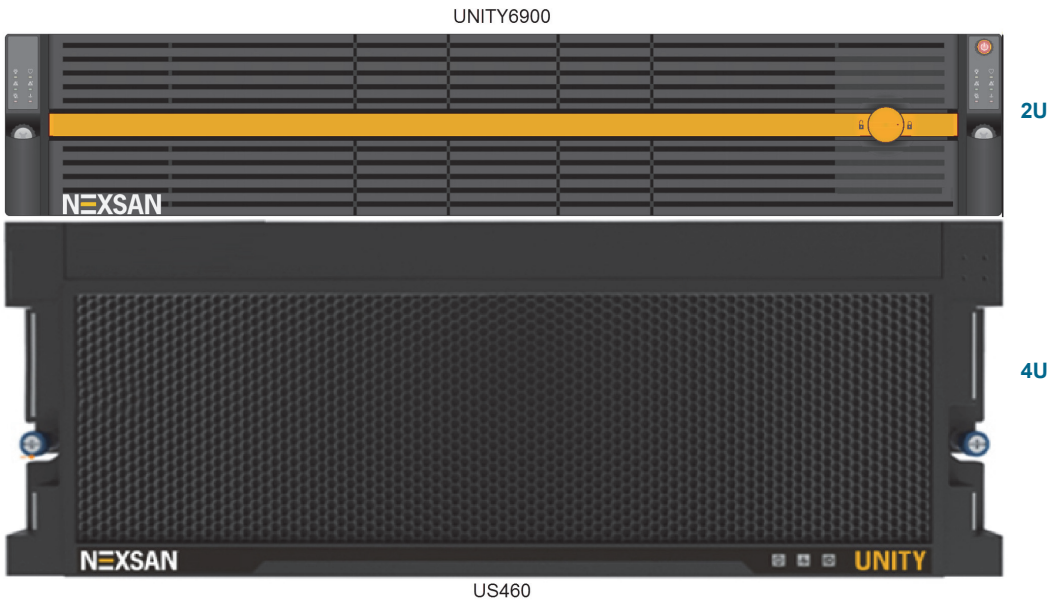
- 1 Cable Management Arm (CMA)
- 1 electrostatic discharge (ESD) wrist strap

# 3 Rack the US460

**CAUTION:** Physical installation requires two people.

Example rack positions for components:

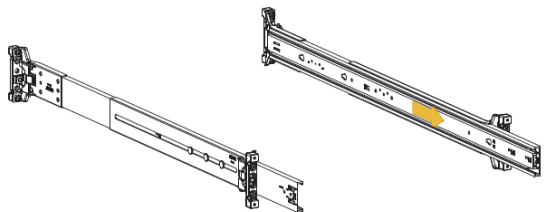
- UNTY4400 or UNTY6900 Storage System
- US460 below the storage system



## Step 1: Install the outer-rack rails on the rack

- A From the inside of the rail kit, press the release latch to unlock the inner rails from the rack mount rails. Pull the inner rail out of the rack mount rail,

and repeat for the remaining rail.

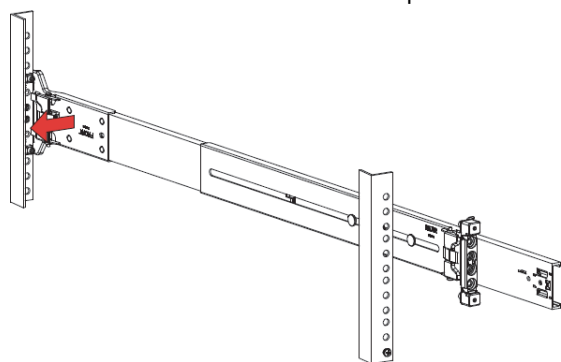


**B** Install the inner rails onto the enclosure (if necessary):

- a** Attach the inner rail by aligning the holes in the inner rail with the pegs on the side of the chassis and sliding them forward to lock them in place.
- b** From the side of the chassis, using the #2 Phillips-head screwdriver, attach the inner rails to the chassis using the screws provided with the rail kit.
- c** Repeat the previous steps to attach the other inner rail to the chassis.

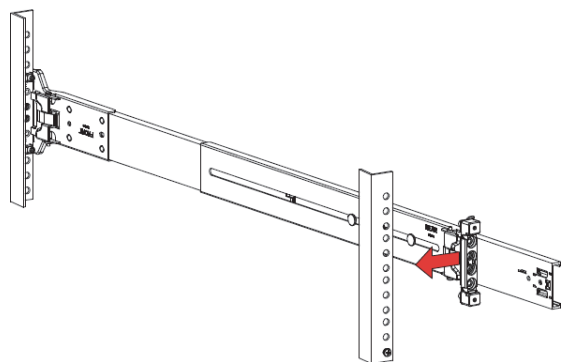
**C** Install the rack mount rails:

- a** On the first rack location, from the rear of the rack, latch the rear rack mount clip. Repeat to connect the other rear mount clip.



**D** From the front of the rack, latch the front rack mount clip. Repeat to connect the other front rack mount clip.

**NOTE:** Ensure that the front and rear of the rails are attached to the same U location.

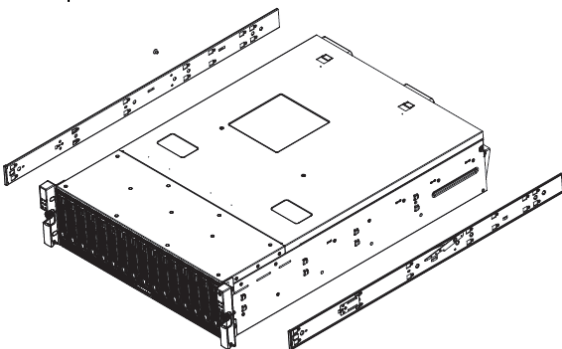


**E** Grasping the inside rail on the rack mount rails, slide the rails until locked in the extended position.

**▶ Step 2: Install the inner rails on the chassis (if necessary)**

- A** Extend the inner rail toward the front of the rail assembly as far as possible, then depress the locking tab to pull it completely out.
- B** Place the inner rail on the side of the chassis aligning the hooks of the chassis with the rail extension holes.
- C** Slide the extension toward the front of the chassis.
- D** If desired, secure the chassis with screws.

**E** Repeat for the other inner rail.

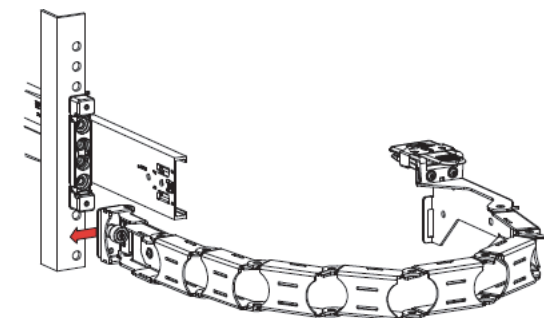


**▶ Step 3: Install the Cable Management Arm (CMA, Optional)**

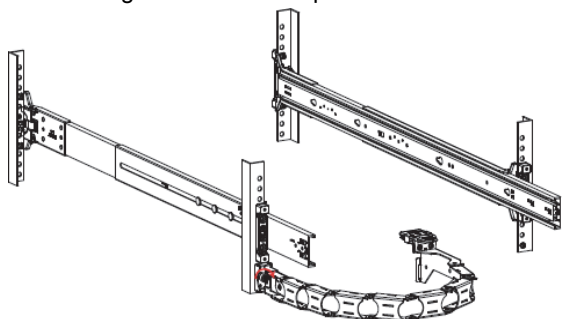
**NOTE:** If you are using a storage enclosure with a shorter depth you may not be able to use the CMA. Ensure that the CMA does not bind or bend. Improper installations could result in damage to cabling and components.

**Install the CMA arms onto the rack**

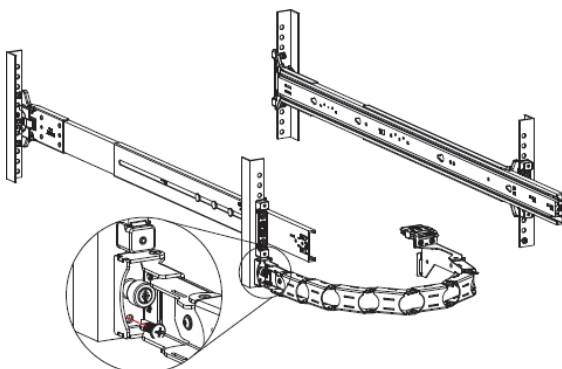
**A** From the inside of the rack, slide the bracket over the 1U location below the rail kit.



**B** Tighten the captive screw while pressing the CMA mounting bracket to the top of the U location.



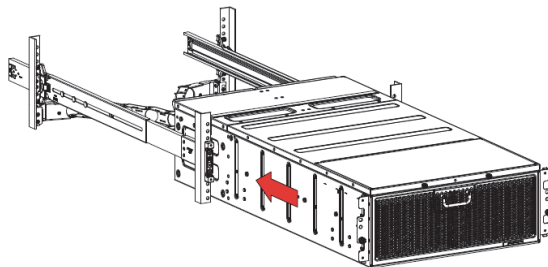
**C** Install the M4 screw in the lower hole in the bracket.



**D** Repeat the previous steps on the other CMA arm.

#### ► Step 4: Install the US460 on the rack

- A Lift the US460 chassis from each side—not from the front and back.
- B Line up the inner-chassis rails with the extended rack rails, until the rail locks engage.
- C Locate the blue tabs located on each of the inner rails, and slide them towards the front of the chassis. Push on the chassis.
- D Push the US460 completely into the rack; you should hear the locking tabs click into position.



- E Tighten the thumbscrews that hold the front of the US460 to the rack.

#### ► Step 5: Install the disk drives and FASTier read cache SSDs



**CAUTION:** Put on the ESD wrist strap before starting:

- A Slip the wrist loop over your hand (left or right), then tighten the loop against your wrist.
- B Attach the clip end of the anti-static wrist strap to a properly grounded metal surface.

#### Drive installation order:

- A To ensure proper air flow, install the drives as follows:
  - a **If you are installing one drive pack:** Install the SSD in slot 30, as shown on page 1. Go to step B.
  - b **If you are installing two drive packs:** Install the SSDs in slots 29 and 30, as shown on page 1. Go to step B.
  - c **If you are installing three drive packs:** Install the SSDs in slots 28 to 30, as shown on page 1.
- B Install the hard disk drives in the remaining slots, starting with the ones closest to the power supplies at the rear of the enclosure, and then moving toward the front.



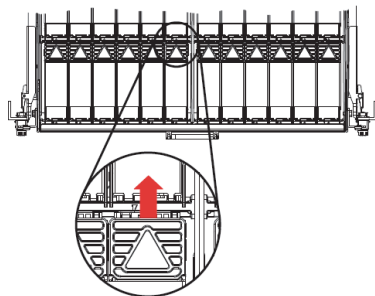
**CAUTION:** If the US 460 is not fully populated, to maintain proper air flow you **MUST** perform the following steps.

- C Install drive blanks to complete the last incomplete row of drives.
- D Install drive blanks in the row immediately following the last populated row.

#### To install the drives:

- A Slide the expansion out of the rack, by pulling on the expansion handle until the drive bay is accessible.

- B From the front of the expansion cover, turn the thumbscrews counterclockwise and slide the drive bay cover towards the front, and up.



- C Open the first drive carrier by sliding the arrow tab in the direction of the arrow.
- D Insert the hard-drive carrier into the drive bay until the drive is fully seated.
- E Repeat these steps for each drive.

**NOTE:** If you have empty drive bays in a row of 12, you must include blank drive spacers to ensure proper airflow to the working drives.

If you add drives of a different size to an existing system, you must reconfigure RAID for the new disks. Refer to the [Nexsan Unity Online Help](#).

## 4 Install the Unity Storage System

Unpack and install any Unity Storage System included in your Unity shipment. The US460 can be used with either a UNTY4400, or a UNTY6900.

For detailed instructions, refer to the appropriate *Nexsan Unity Quick Start Guide* and the *Nexsan Unity Storage Expansion Reference Guide* at [www.nexsan.com](http://www.nexsan.com) (see Support > Unity > Documents & Online Help).

## 5 Connect to a Unity Storage System

This section describes the steps for connecting US460 expansions to a Unity Storage System.

### ► Step 1: Cross-connect the storage expansion to the storage system

- A Cross-connect from the Add-on HBA SAS OUT ports on the Unity Storage System to the HBA SAS IN ports on the first US460, as shown in *UNTY4400 connected to US460 Expansions* on page 5.
- B Connect any additional storage expansions using the daisy chain method, also as shown.

You can cascade other types of Nexsan storage expansions with the US460, but the US460 units must be connected last in the series.

For details about connections and about cascading to more Unity Storage Expansions, please see the



## ► Step 2: Connect the power cables



**CAUTION:** Do not connect to the Unity Storage Expansion from the lower, on-board SAS ports on the UNTY4400 or the UNTY6900.

Use SAS cables that can extend the length of the US460 when the drawer is pulled open.

Use two-meter cables or longer to direct connect from the Unity Storage System to a second US460 Storage Expansion.



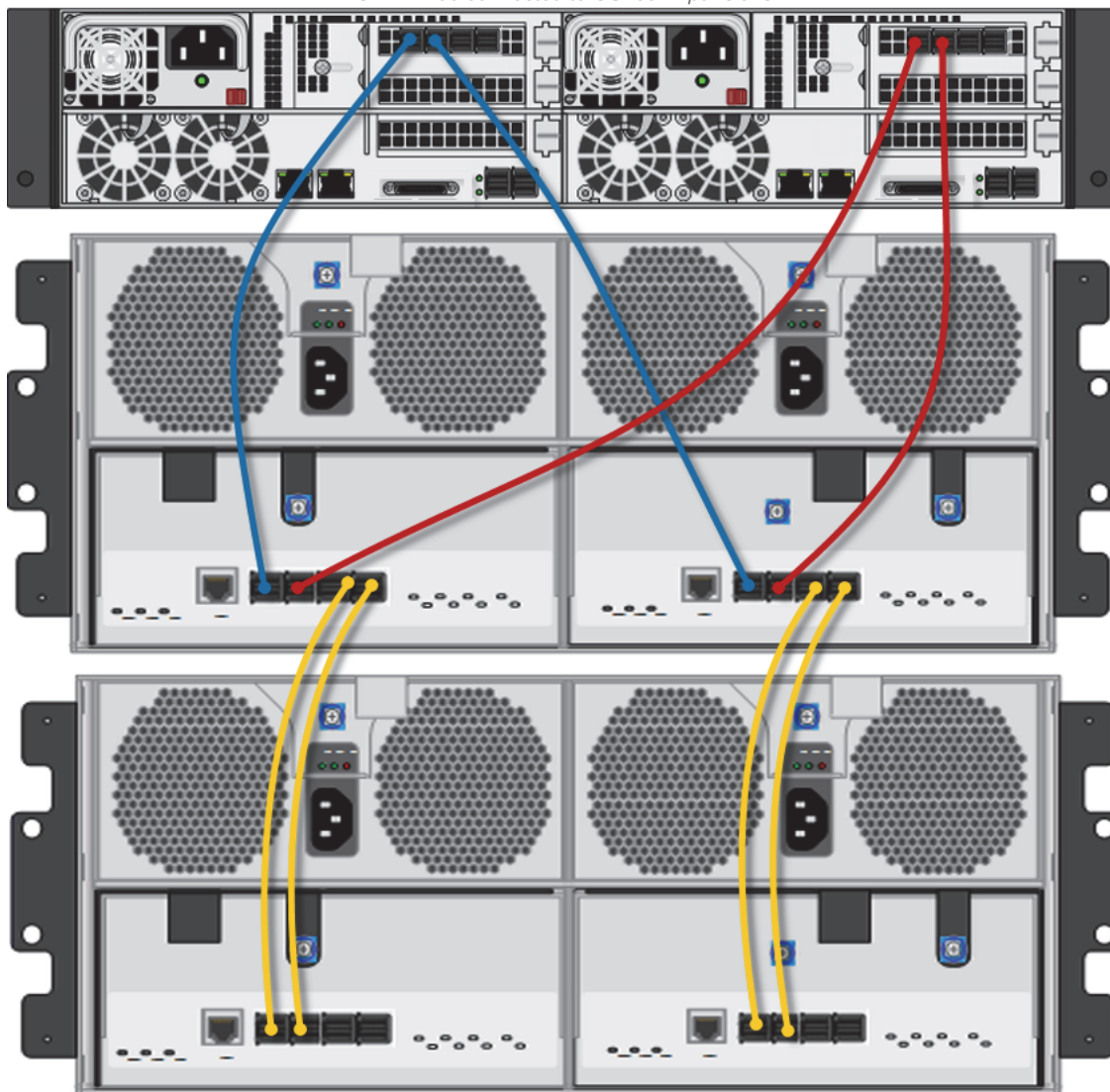
**CAUTION:** Use only the power cords supplied with the US460. Do not use another type of cord or extension cords. If you require additional power cords, please contact your Nexsan sales representative or reseller.

- A Plug the power cords into their respective power supplies on the rear of the US460.
- B Plug the power cords connected to the power supply units into a high-quality strip that offers protection from electrical noise and power surges.

**NOTE:** We strongly recommend that you use an uninterruptible power supply (UPS).

The Unity Storage System is hot pluggable: Once in service, powering down is not normally required to add a Unity Storage Expansion.

UNTY4400 connected to US460 Expansions



## 6 Power on Unity components



Power on the Unity components for the first time in the sequence described in this section.

### Step 1: Power on your US460


A Plug in the power cables. The US460 will power on automatically.


**NOTE:** If you are adding multiple Unity Storage Expansions, power them on from last to first.

### Step 2: Power on the Unity Storage System

Power on the Unity Storage System; either the Nexsan UNITY4400 or the Nexsan UNITY6900. If a drive carrier activity LED does not light up, check to make sure the corresponding drive is properly seated in the chassis.

A Press and hold the power button located on the right front panel of the chassis until the power led lights up.

B Verify that the power LEDs  on the left and right front control panels are illuminated to ensure that the controller nodes are receiving power and the power modules are functioning properly.

C Verify that the heartbeat  is blinking yellow in 2-3 second intervals.

D Verify that the drive carrier LEDs are illuminated in green.

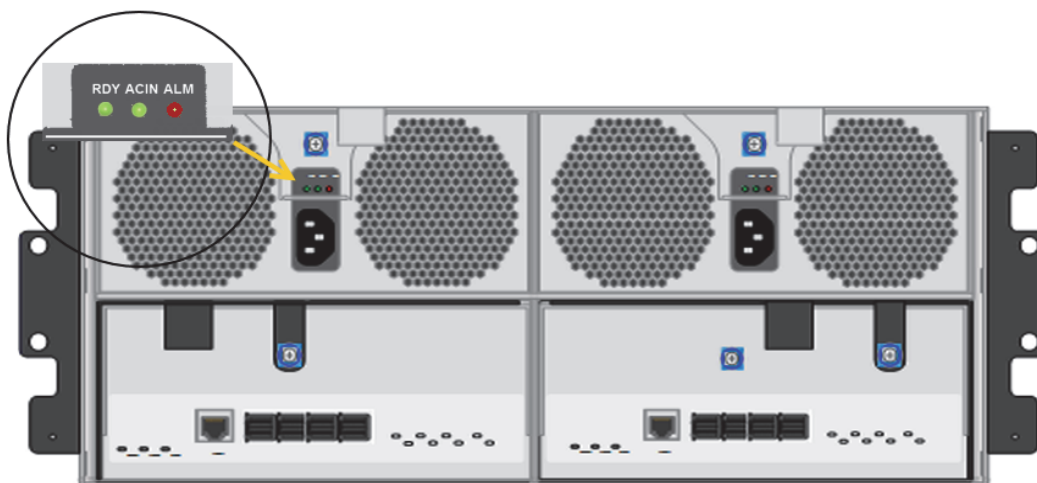
E If all LEDs indicate normal operation status, reattach the front bezel to the Unity Storage System:
 

- Remove the bezel from its packaging.
- Hook the left end of the bezel onto the chassis.
- Fit the free end of the bezel onto the chassis.
- Turn the key lock at the right end of the bezel to the lock position to secure the bezel to the chassis.

## 7 Monitor the Unity Storage Expansion

This section describes the rear panel LEDs that help you monitor the Nexsan Unity Storage Expansion.

### Power supply LEDs






Name	Description	LED status
RDY	Ready LED: Indicates whether the PSU is providing power to the enclosure.	<ul style="list-style-type: none"> <li><b>Green:</b> DC input is functioning normally.</li> <li><b>Off:</b> No DC output</li> </ul>
ACIN	AC Input LED: Indicates whether the controller has input power.	<ul style="list-style-type: none"> <li><b>Green:</b> AC input is functioning normally.</li> <li><b>Off:</b> No AC input</li> </ul>
ALM	Alarm LED: Indicates if there are faults on the PSU for each controller.	<ul style="list-style-type: none"> <li><b>Red:</b> PSU contains one or more faults</li> <li><b>Red (flashing):</b> PSU alarm status is being identified.</li> <li><b>Off:</b> PSU is functioning normally.</li> </ul>

The US460 storage expansion has the following enclosure LEDs on the front of the enclosure:

Name	Description	LED status
Power	Indicates whether the enclosure has power	<ul style="list-style-type: none"> <li><b>Green:</b> Enclosure is powered on</li> <li><b>Off:</b> Enclosure is powered off</li> </ul>

Name	Description	LED status
Ready	Indicates whether the enclosure is ready to receive data	<ul style="list-style-type: none"> <li>● <b>Green:</b> Enclosure is ready to receive data</li> <li>● <b>Green (blinking 2 Hz):</b> Enclosure contains faults</li> <li>● <b>Green (blinking 0.5 Hz):</b> Enclosure is being identified</li> <li>● <b>Off:</b> Enclosure is not ready to receive data</li> </ul>
Locate	Identifies the location of the enclosure, and enables users to turn on the LED from the Unity firmware.	<ul style="list-style-type: none"> <li>● <b>Amber (flashing):</b> Enclosure is being identified</li> <li>● <b>Off:</b> Enclosure is not being identified</li> </ul>

The US460 storage expansion has the following enclosure LEDs on the rear of the unit:

Name	Description	LED status
<b>Status LEDs</b>		
Power	 Indicates whether the enclosure has power	<ul style="list-style-type: none"> <li>● <b>Green:</b> Powered on</li> <li>● <b>Off:</b> Powered off</li> </ul>
Identify	 Identifies the location of the enclosure, and enables users to turn on the LED from the Unity firmware.	<ul style="list-style-type: none"> <li>● <b>Amber (flashing):</b> Enclosure is being identified</li> <li>● <b>Off:</b> Enclosure is not being identified</li> </ul>
Fault	 Indicates whether the enclosure has faults	<ul style="list-style-type: none"> <li>● <b>Red:</b> Enclosure has fault conditions</li> <li>● <b>Off:</b> No fault conditions</li> </ul>

#### Host Storage System LEDs (Link/Fault)

Host 1	The Host Storage System LEDs, positioned to the right of the host ports, indicate links and faults on the host Unity Storage System. In the image above, only one storage system is connected.	<b>Link:</b> (Green)
Host 2		<ul style="list-style-type: none"> <li>● On: SAS cable connected</li> <li>● Off: SAS cable not connected</li> </ul>
Host 3		<b>Fault:</b> (Red)
Host 4		Flashing: One or more of the SAS connections is not connected Off: SAS connection contains no faults

#### Drive LEDs

Each drive carrier has two LEDs. If a drive fails, verify that it is properly seated. If necessary, replace the drive as described in the *Nexsan Unity Storage Expansion Reference Guide* (click [www.nexsan.com/](http://www.nexsan.com/)).

LED	Indication
Ready (Green)	<ul style="list-style-type: none"> <li>● A steady green LED indicates the drive is ready.</li> <li>● If this LED is not lit, the drive is not getting power.</li> <li>● If this LED is flashing, the drive is being accessed (read or write).</li> </ul>
Status (Red)	<ul style="list-style-type: none"> <li>● A steady red LED indicates a drive failure.</li> <li>● If this LED is not lit, the drive has no faults.</li> </ul>



## Safety notices

- This equipment must be installed and operated in compliance with local laws and regulations.
- Ensure that the ambient temperature at the installation site is between 5°C (41°F) and 30°C (86°F). If the temperature at the site is not actively regulated, ensure that daily and seasonal temperature changes will not result in the ambient temperature going outside these limits.
- Always fully stabilize racks with wall anchors or stabilizing legs, or both, before mounting the Nexsan storage enclosure or any other components on the rack.
- Situate the rack so that full air flow at both the front and the rear of the Nexsan storage system is possible.
- Ensure that the floor beneath the mounting rack has enough load-bearing capacity to support the rack and all mounted components.
- Always fully secure all rack-mounting hardware when installing the Nexsan storage system in a rack. Insufficient rack-mount support may allow the enclosure to fall onto other rack-mounted hardware or onto the floor, potentially damaging equipment or causing injury to nearby personnel.

## Rack and enclosure specifications

### Rail kit mounting

- 4U enclosure height
- The rack must have square roles
- Maximum distances: 30" (800 mm)

### Enclosure weight and dimensions

- Height: 6.88" 174 mm
- Width: 16.69" 424 mm
- Depth: 40.30" 1033.78 mm  
43.70" 1110 mm (with CMA)
- Weight: 99.6 lbs 45 kg (no drives installed)  
207.6 lbs 93.7 kg (all drives installed)

### Power requirements

- Power supply: 1650W
- Input voltage: 200-240V
- Amperage: 5V @ 45A, 3.3V @ 24A, -12V @ 0.6A
- Power consumption: Varies, depending on the number and size of drives, running fans, and room temperature

# NEXSAN

**Part number:** P0450176 **Rev:** F **Release Date:** August 2019

**Related Documentation:** Nexsan Unity Hardware Maintenance Guide, Nexsan Unity Software User Guide, Nexsan Unity Online Help, Nexsan Unity nxadmin CLI Reference Guide

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### Technical Support

**By Email:** [support@nexsan.com](mailto:support@nexsan.com)

**By Web:** <https://www.nexsan.com/support/support-unity/>