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Chapter 1 System Overview and Introduction

This chapter provides a quick overview of the features and components of the JETSTOR SAS 760J/JD.

1.1 SYSTEM OVERVIEW

The JETSTOR SAS 760J/JD system is an enterprise class, fully redundant, SAS/SATA bulk storage enclosure. The enclosure system contains sixty disk drives of any density and spindle speed available and has the following features:

- Mechanical
  - Standard 19" Rack Mount with cable management
  - 4U High
  - 34" Enclosure Depth
  - Rail kit supports 20" - 28.5" rack depth
  - Hot-swappable FRUs (power supplies, IO assemblies and drives)
  - Conforms to EIA-310-D Specifications
  - Drive carrier supports both 3.5" and 2.5" SAS and SATA disk drives
  - Drive carrier supports 2.5" SAS and SATA Solid State Drives (SSDs)

- Electrical
  - Conforms to SAS 2.1 T10/1760-D Specification
  - 6Gb/s SAS/SATA capable
  - Supports up to 60 3.5" and/or 2.5" drives (hot-swappable)
  - Four 4-Wide Host/Expansion Ports per IO module
  - Supports both single and dual port operation
  - Supports daisy chaining (host adapter and/or zoning configuration dependent)
  - 10/100 Ethernet Port for enclosure management
  - 100 – 240 VAC Input Range with 1200w power supply (hot-swappable)
  - Optional 1865w power supply also available
  - SATA Interposer supports dual port operation
  - Power control of drives (with Interposer)

- Behavioral
  - Conforms to SES 2.0 T10/1559-D Specifications
  - Inband (SES) or Out of band (IPMI) enclosure management
  - Drive Zoning support (4 configurations)
  - Support for in-band SAS drive firmware updates

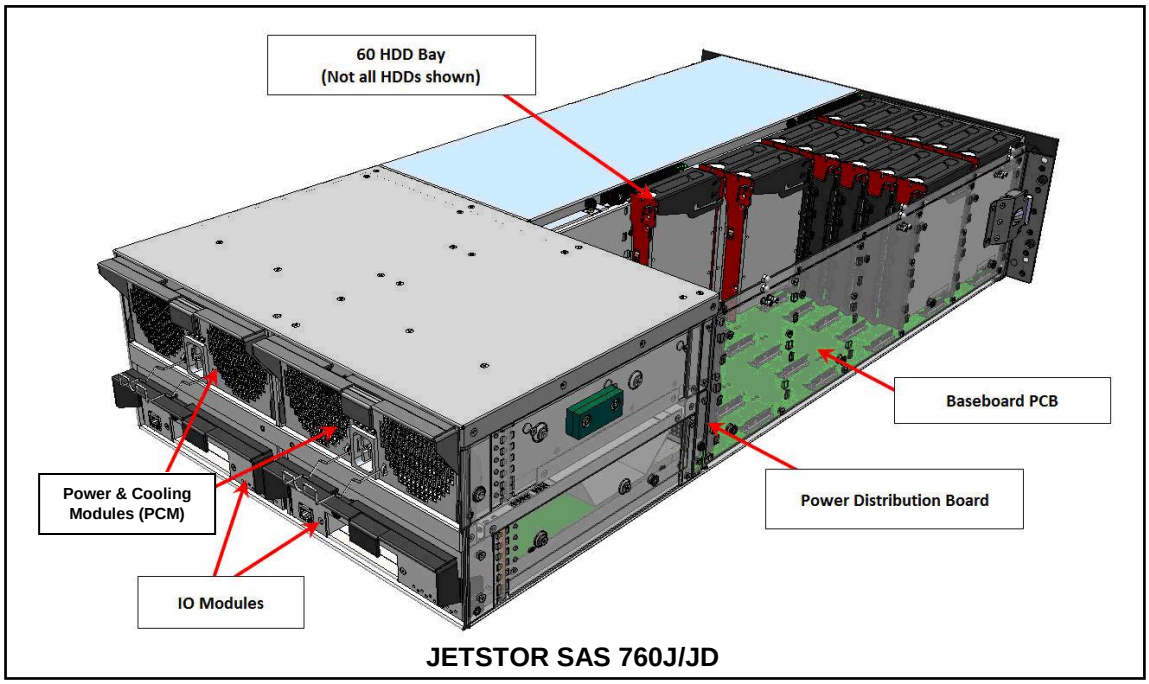
JETSTOR SAS 760J/JD 60-Drive SAS/SATA Bulk Storage

1.2 INTRODUCTION

The JETSTOR SAS 760J/JD family of external storage subsystems is based on 3.5" and 2.5" SAS or SATA drives. The JETSTOR SAS 760J/JD enclosure supports 60 hot-swappable drives. Each drive is mounted in a carrier that provides for direct-mounting the drive and has features for mounting an optional interposer card. The interposer card provides dual-porting functionality for SATA drives and power control functionality for both SAS and SATA drives.

The front cavity of the enclosure contains 60 top-loadable drives. The back cavity of the enclosure supports two IO Option slots as well as the power supplies (PCMs). Each IO Option Slot is designed to accept SAS JBOD modules or RAID controller modules. The IO modules are hot-swappable and provide a redundant path to the drives when two controllers are installed in the enclosure. The IO modules each provide four 4-wide SAS data links configured as four host or three host and one expansion port. In certain zoning modes the controller can support two host and two expansion ports. The IO modules support enclosure expansion based on the number of devices the host adapter can support and the zoning configuration used. The IO modules communicate inter-IO information using Ethernet.

The JETSTOR SAS 760J/JD enclosure houses two hot-swappable, fully redundant PCMs (Power & Cooling Modules) located in the rear of the chassis. Each PCM has integrated fans for cooling the chassis. A single PCM can power the JETSTOR SAS 760J/JD enclosure indefinitely; however, both modules are required for proper cooling of the enclosure. Each PCM will cool the JETSTOR SAS 760J/JD enclosure for a period of time while the other PCM is not present during a remove-and-replace operation. All fans are driven from the shared power bus to ensure operation in the event of a PCM failure.

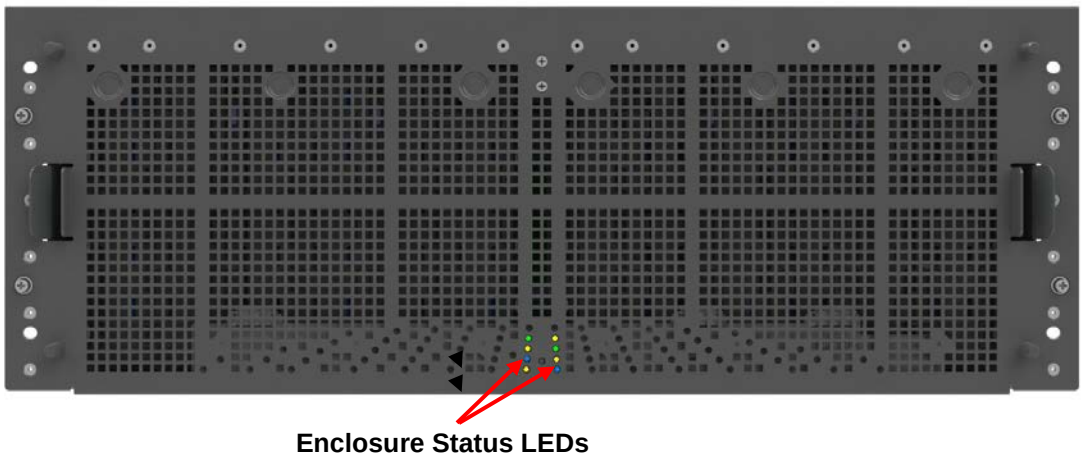


JETSTOR SAS 760J/JD

The JETSTOR SAS 760J/JD enclosure supports all available capacities and spindle speeds of SAS and SATA drives. A drive carrier-mounted SATA MUX interposer is supported to allow dual-ported access to SATA drives. The SAS MUX interposer provides a remote power control function for the drives. Disk drive firmware download is supported in-band for SAS drives.

The enclosure supports various configurations for drive zoning. Please refer to Appendix E for available zoning configurations.

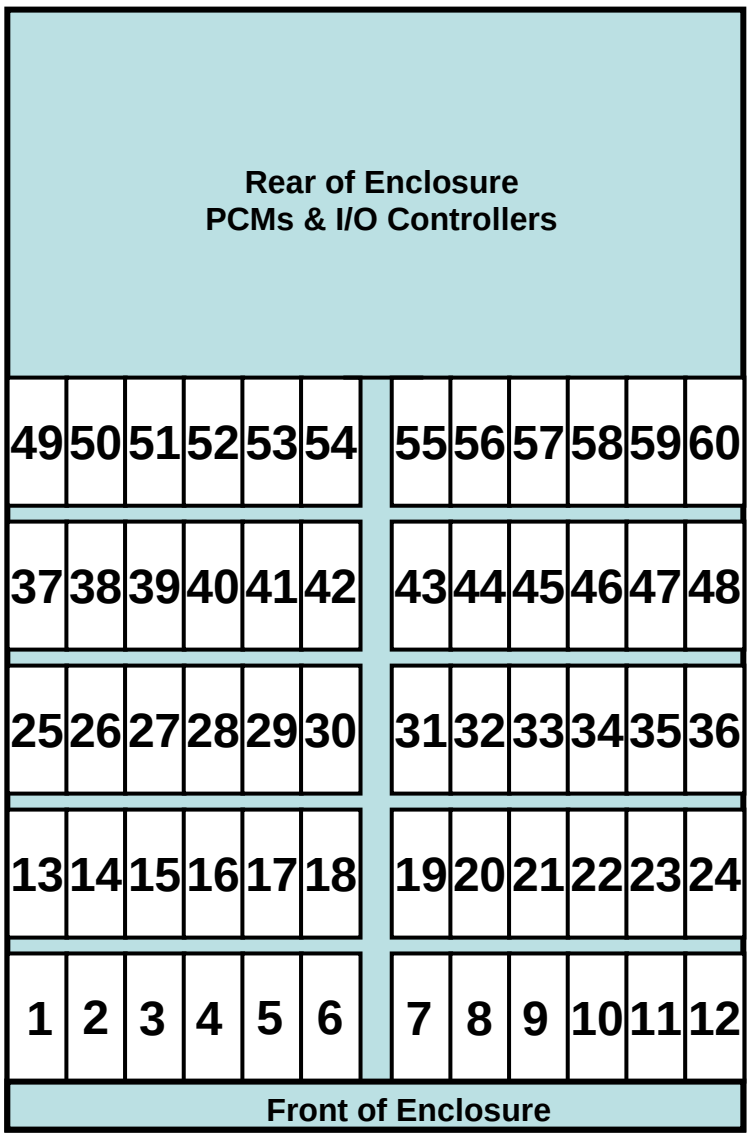
The front of the enclosure has enclosure status LEDs, features for an LCD panel and custom bezels. The enclosure status LEDs are visible through the enclosure bezel. Drive activity LEDs are physically mounted on an optional LED PCB assembly.



JETSTOR SAS 760J/JD

1.3 FEATURE SUMMARY

- 4U – 19" rack mountable.
- Support for 60 3.5" and 2.5" SAS or SATA drives.
    - Dual port support for SATA drives with an active MUX interposer
    - Power control for SAS and SATA drives
    - In-band firmware download of Enterprise drives
    - Support for 7.2K, 10K and 15K rpm drives
    - Support for Solid State Drives (SSD) and Enterprise Flash Drives(EFD)
    - Drives are numbered from 1 through 60 starting in the bottom left corner and counting left to right, bottom to top as in the following illustration:



JETSTOR SAS 760J/JD

1.4 CABLING REQUIREMENTS

- **Power Cords:** Two power cords are supplied with the JetStor SAS 760J/JD. To order additional power cords, please contact your JetStor sales representative. Do not use extension cords or other third-party power cords with this enclosure. JetStor recommends the use of an Uninterruptable Power Supply (UPS).

- **Ethernet Cables:** Only high quality Cat5-rated cables are recommended that support 10/100Mbs operation.

- **SAS Cables:** High quality 6G SAS cable are recommended that meet the following requirements:
    - Minimum Length: 0.5 meters
    - Maximum Length: 6.0 meters

Chapter 2 Unpacking and Rail Kit installation

⚠ Caution: Please read all safety precautions listed in Appendix A of this manual prior to unpacking the JETSTOR SAS 760J/JD enclosure.

⚠ Caution: The JETSTOR SAS 760J/JD enclosure is very heavy and requires assistance when lifting or installing the unit in a rack. A JETSTOR SAS 760J/JD can weigh up to 215 lbs (80 kg) with drives installed. (It is recommended that no drives are inserted prior to installing the enclosure in a rack.) A forklift or lift table is recommended when unpacking and installing the JETSTOR SAS 760J/JD to prevent possible injury.

2.1 INSTALLATION CHECKLIST

- □ **Plan and prepare for installation**
- □ ***Optional* – Install the enclosure into an equipment rack**
- □ **Install the disk drives**
- □ **Connect the cabling / configure system**
- □ **Power on**

2.2 PACKAGE CONTENTS

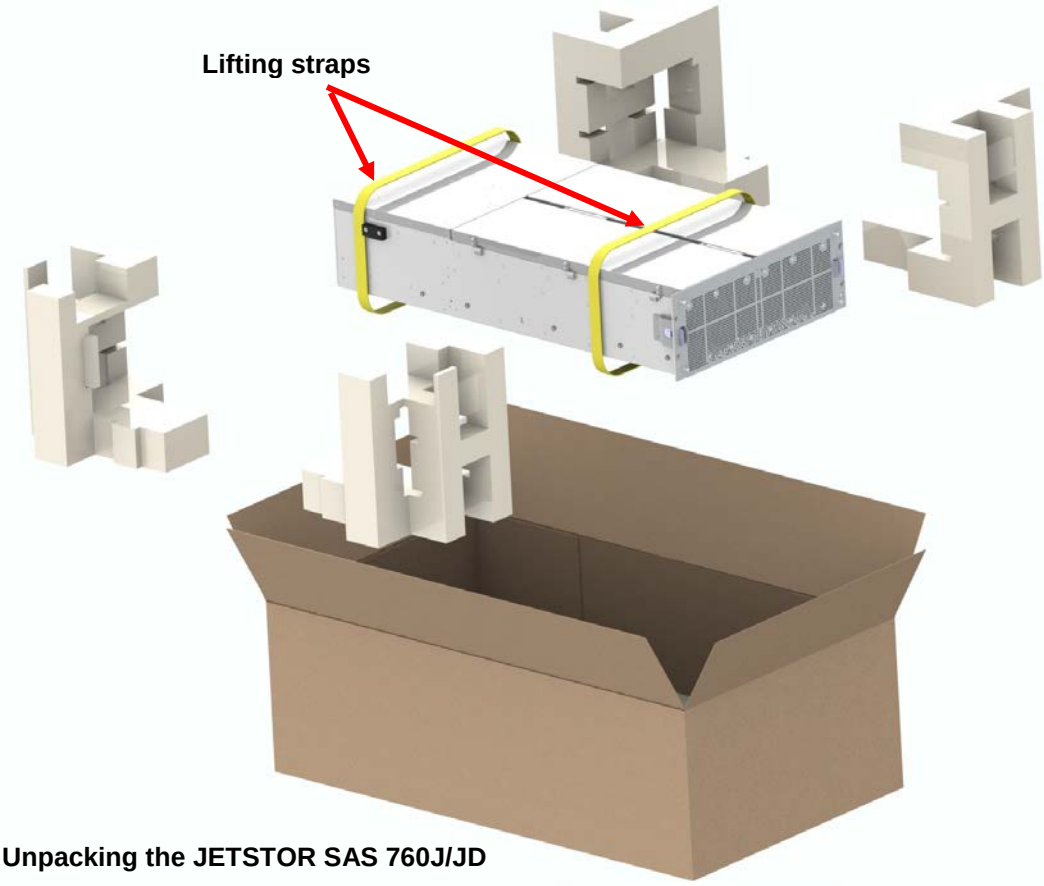
The JETSTOR SAS 760J/JD ships with the following:

- **JETSTOR SAS 760J/JD 60-Drive Enclosure**
- **Two (2) Power Cords**
- **Rail Kit**
- **Cable Management Hardware**
- **JetStor SAS 760J/JD CD**

2.3 PREPARING FOR INSTALLATION

1. Carefully read the *Safety Notices* in Appendix A before proceeding.
2. Open the top of the box; inspect for damage.
3. Remove all of the components from the packaging, inspect for shipping damage, and place them on an antistatic surface until you are ready to use them.
4. As shown in the following picture, there are two yellow nylon lifting straps that are used to remove the enclosure assembly from the box. A forklift or other mechanical lifting device is highly recommended to remove the unit.

⚠ Caution: The JETSTOR SAS 760J/JD enclosure is heavy and requires assistance when lifting or installing the unit in a rack. A JETSTOR SAS 760J/JD can weigh up to 215 lbs (80 kg) with drives installed. It is recommended that no drives are inserted prior to installing the enclosure in a rack. A forklift or lift table is recommended when installing the JETSTOR SAS 760J/JD to prevent possible injury.



Unpacking the JETSTOR SAS 760J/JD

5. If you are installing the enclosure in a rack:
    - Ensure that you have these tools available:
        1. Phillips screwdriver
        2. Bubble level
    - Arrange for assistance during installation.
    - Ensure ahead of time that you have chosen a suitable location for the enclosure or rack assembly.
6. Ensure that the appropriate power is available. AC&NC recommends an uninterruptable power supply (UPS) for all data storage configurations. Please refer to the specifications in Appendix B for JETSTOR SAS 760J/JD power ratings.
7. Ensure that the area around the enclosure or rack assembly has sufficient cooling and room around the unit to access cabling.
8. When installing disk drives, allow them to acclimate to room temperature prior to installation. Drives should be stored at room temperature for at least two hours prior to use.

2.4 INSTALLING THE JETSTOR SAS 760J/JD IN A RACK

If you are ***not*** installing your enclosure into a rack, please skip to Chapter 3: *Installing the Disk Drives*.

To install the JETSTOR SAS 760J/JD enclosure into a rack, please follow the instructions below:

1. Ensure that you have these rackmount components:
   - Rack rails (one left, one right)
   - Rail installation hardware (screws, guides/bars)
   - Enclosure rails (one left, one right)

2. Loosen the screws on the left and right rack rails and adjust the lengths accordingly to match the depth of the rack. The rails support rack depths between 20" and 28.5". Re-tighten the screws.

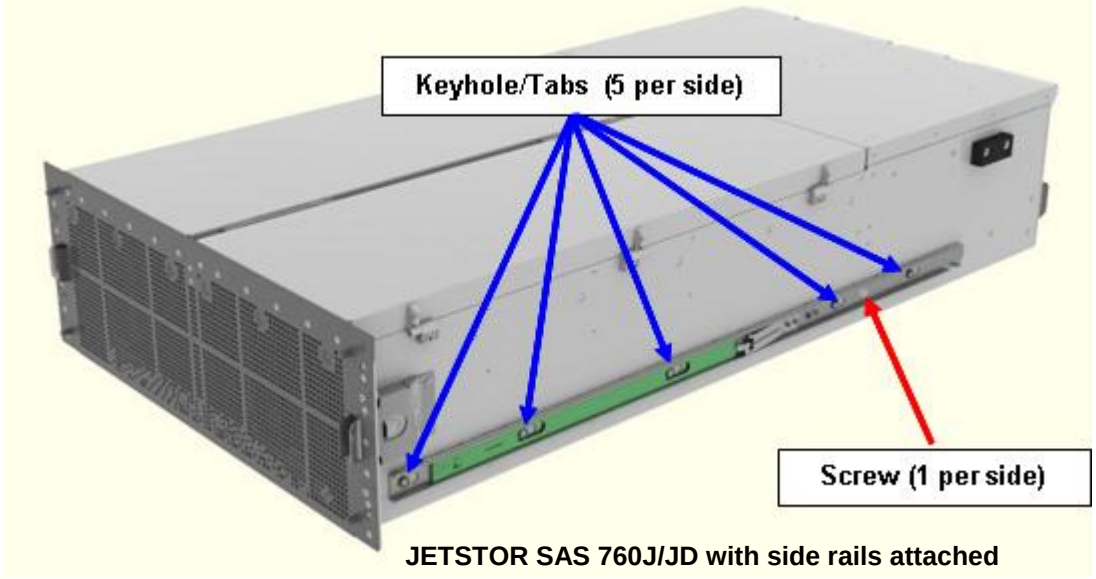
3. Secure the rack rails to the front and rear supports of the rack, using the screws and hardware as shown below. The rails are marked 'R' (right) and 'L' (left) viewing from the front of the enclosure.

Front close-up of rack showing rail kit properly installed.

Rear close-up of rack showing rail kit properly installed.

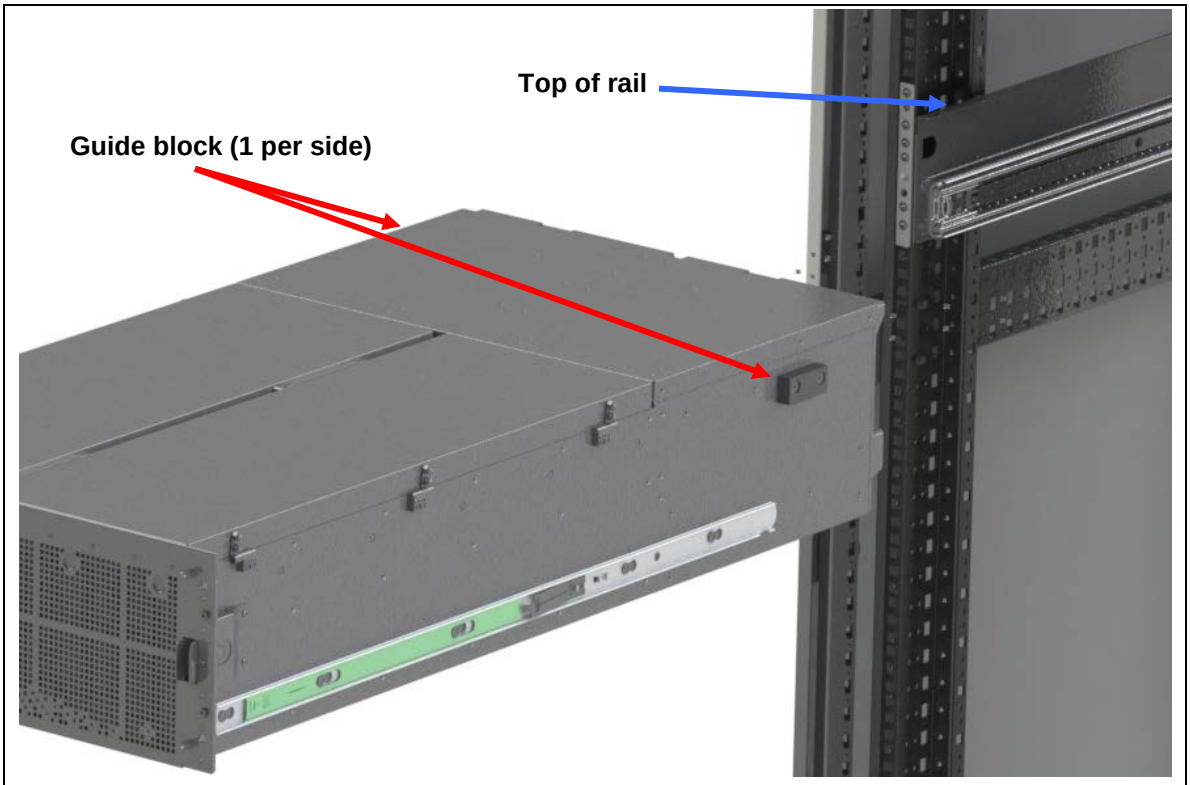
4. Tighten all screws securing the rack rails into the rack.

5. Attach the enclosure rails to each side of the enclosure by positioning the rails over the keyhole tabs, and slide the enclosure rails into place. Anchor the rail to each side of the enclosure as shown below using a single screw.



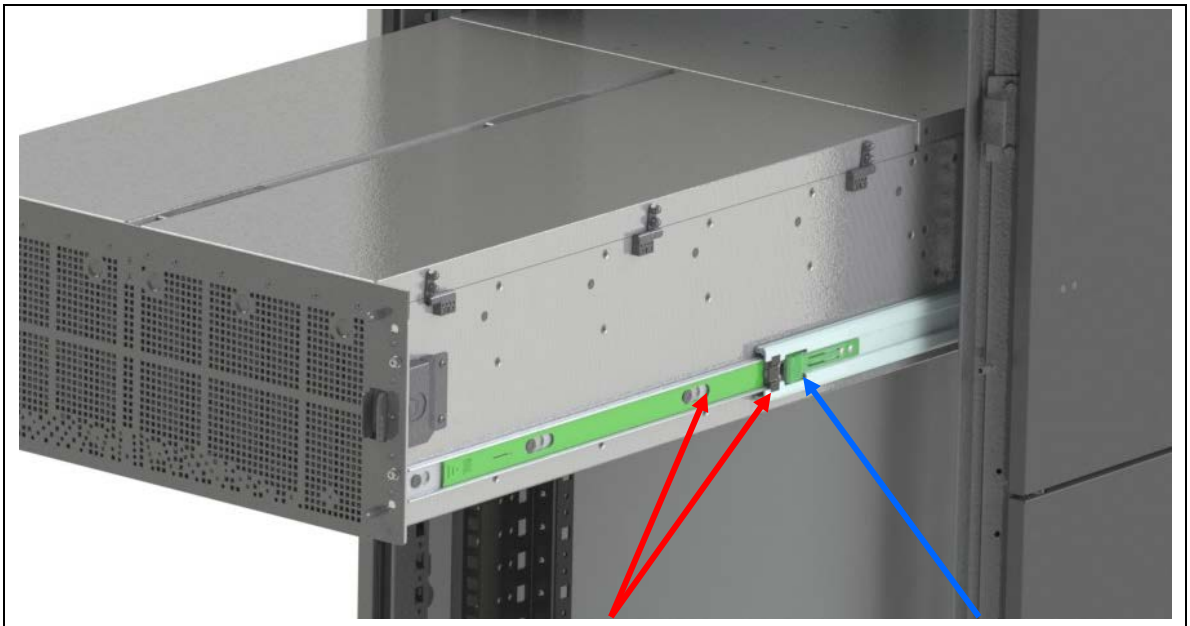
JETSTOR SAS 760J/JD with side rails attached

6. There are guide blocks on both sides of the enclosure that aid in aligning the enclosure with the rail kit when installing in the rack. When lifting the enclosure, allow the guide blocks to rest on top of the rails. This will remove a good portion of the weight while connecting the rails from the rack to the enclosure.



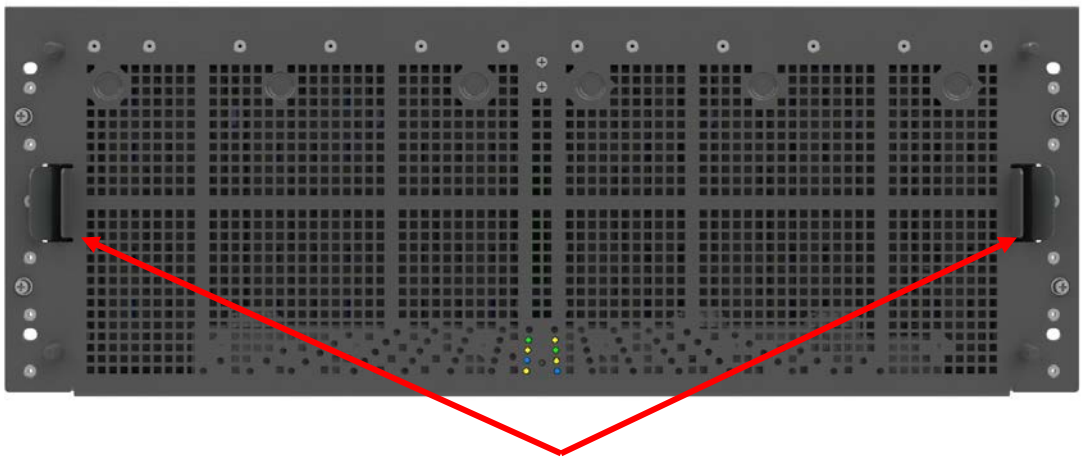
Enclosure guide blocks

7. Carefully engage the enclosure rails into the rack rails and slide the enclosure in until the green enclosure rail tabs 'click' into place. Your enclosure is now mounted in the rack.



Enclosure / Rack rails engaged **Rail tab**

8. The enclosure has an automatic locking feature when pushed all the way into the rack. No screws are needed to secure the enclosure. To slide the enclosure out, squeeze the two release tabs on the front of the enclosure to release the unit and carefully pull the unit out of the rack until the green rail tabs engage. To push the enclosure back into the rack, press the green rail tabs on either side of the enclosure and push back into the rack until the front tabs re-engage.



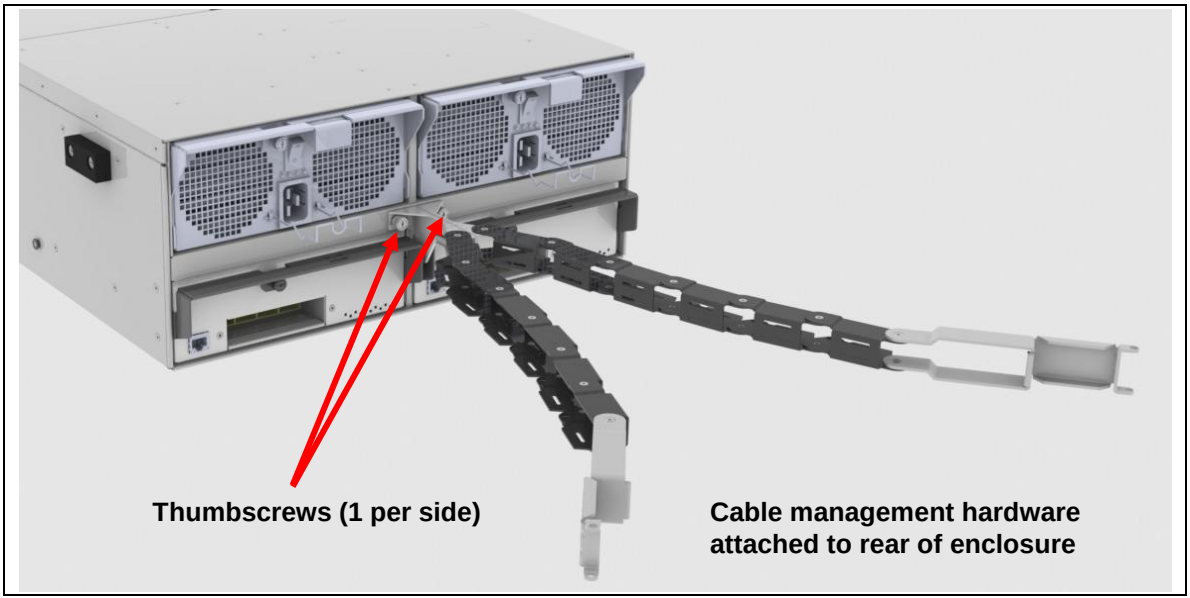
JETSTOR SAS 760J/JD Release Tabs

2.5 INSTALLING THE CABLE MANAGEMENT HARDWARE

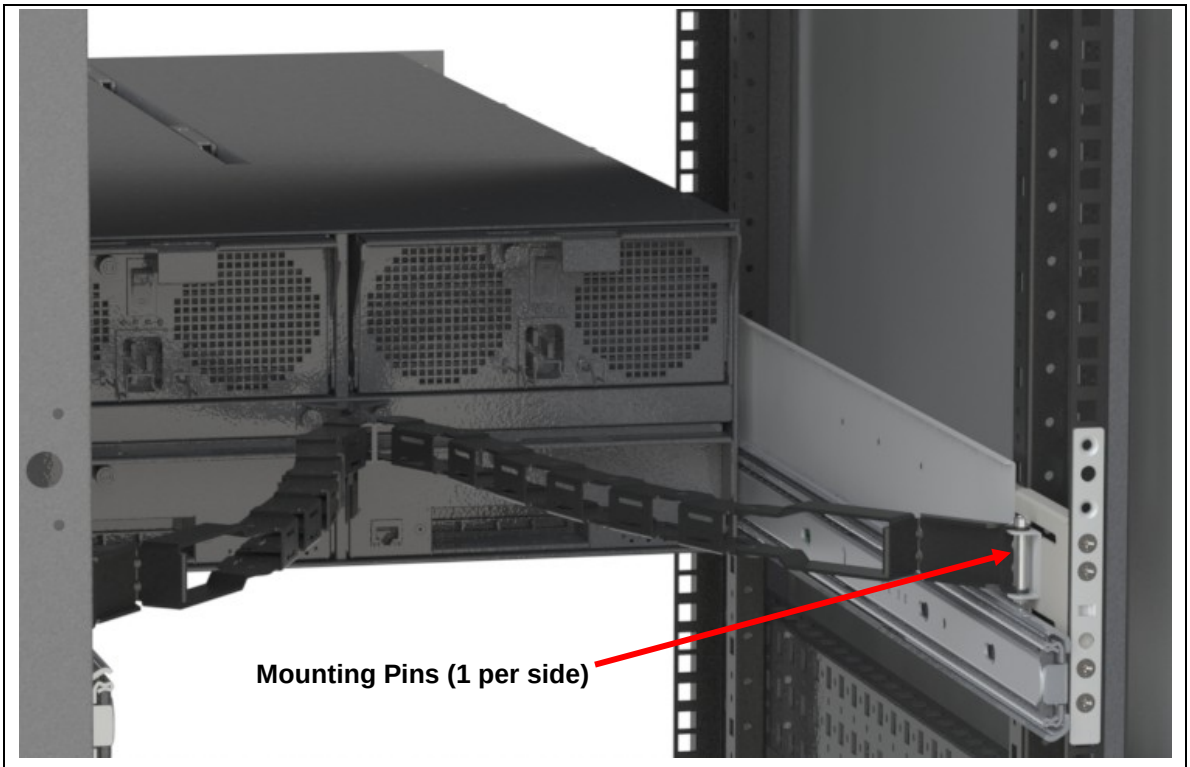
The JETSTOR SAS 760J/JD has cable management hardware that makes it easy to organize your cabling in a racked configuration. It also allows for the JETSTOR SAS 760J/JD to be easily slid out of the rack for drive installation or replacement without having to worry about cables being disconnected, tangling or interfering with other components in the rack.

After installing your enclosure in the rack, follow the steps below to install the cable management hardware for your JETSTOR SAS 760J/JD. If you will not be installing the cable management hardware, please skip to step 4 of this section.

1. Attach one end of each cable rail as shown below to the rear of the enclosure using the attached thumbscrews.



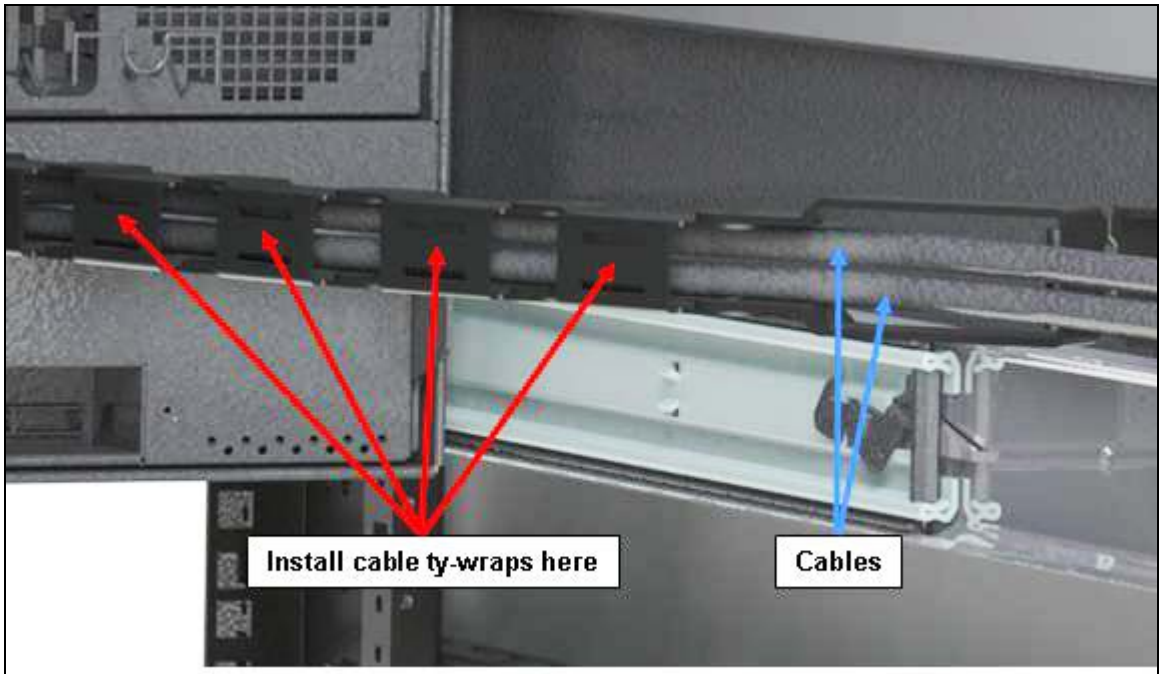
2. Attach the other end of each rail using the rack rail kit hardware (pins).



Cable management hardware attached to rear of rack.

3. SAS and Power cables can be routed through the cable management rails as shown below. The cable management rails have slots that enable the use of plastic ty-wraps or Velcro cable wraps (customer-supplied) to hold the cabling in place. Do not plug the power cords into the power supplies at this time.

⚠ Caution: Use only the power cords supplied with the enclosure. Do not use another type of cord or extension cords. If you require additional power cords, please contact your JetStor sales representative.



Cable management rail with power & SAS cable installed

4. When the rail kit and cable management installation are complete, ensure all screws are tightened and test the cable management system by sliding the unit all the way out on the rails. Ensure that the unit moves smoothly and that there are no cables loose or binding when the system is slid back into the rack.

5. Rail kit and cable management system installation is now complete.

Chapter 3 Installing the disk drives

This chapter covers the installation of disk drives into the JETSTOR SAS 760J/JD enclosure.

⚠ Caution: Ensure that disk drives are at room temperature before installing and powering up the JETSTOR SAS 760J/JD. It is recommended that drives are allowed at least two hours to acclimate to room temperature before using them.

⚠ Caution: When handling disk drives, be sure to take static precautions (wrist straps, grounded ESD mat, etc.).

3.1 INSTALLING DISK DRIVES INTO CARRIERS

Drive carriers are utilized in the installation and removal of drives in the enclosure.

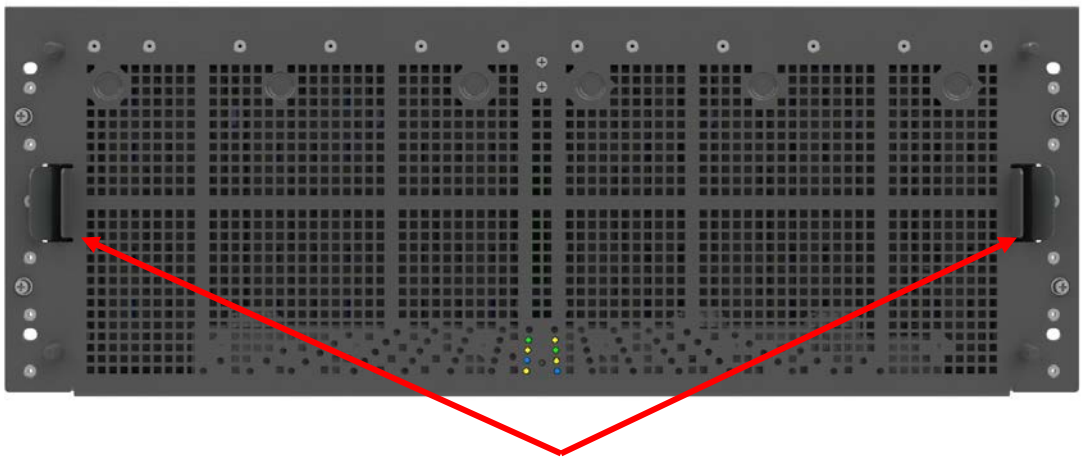
The drive carrier provides controlled installation and removal of the drive into and out of the JETSTOR SAS 760J/JD enclosure. The drive carrier has an integrated spring actuated by the handle when closed. This ensures complete seating of the connectors through operational shock and vibration. This spring functions to initiate the opening of the handle when unlatched.

The drive carrier incorporates two mounting positions to accommodate a direct drive connect and a second location allowing an interposer card to be installed in the carrier. This is illustrated in Appendix C: Installing Disk Drives in Carriers.

JETSTOR SAS 760J/JD Drive Carrier (front and rear view)

3.2 INSTALLING DISK DRIVE CARRIERS INTO THE ENCLOSURE

1. Ensure the disk drives are at room temperature.
2. The disk drives need to be installed in the drive carriers. If they are not, please refer to Appendix C to install the drives in the carriers. If Interposer MUX cards are to be installed, they should also be installed during this step.
3. Drives are now ready for installation.
4. Squeeze the release tabs together on the front of the JETSTOR SAS 760J/JD enclosure and carefully pull it forward out of the rack.

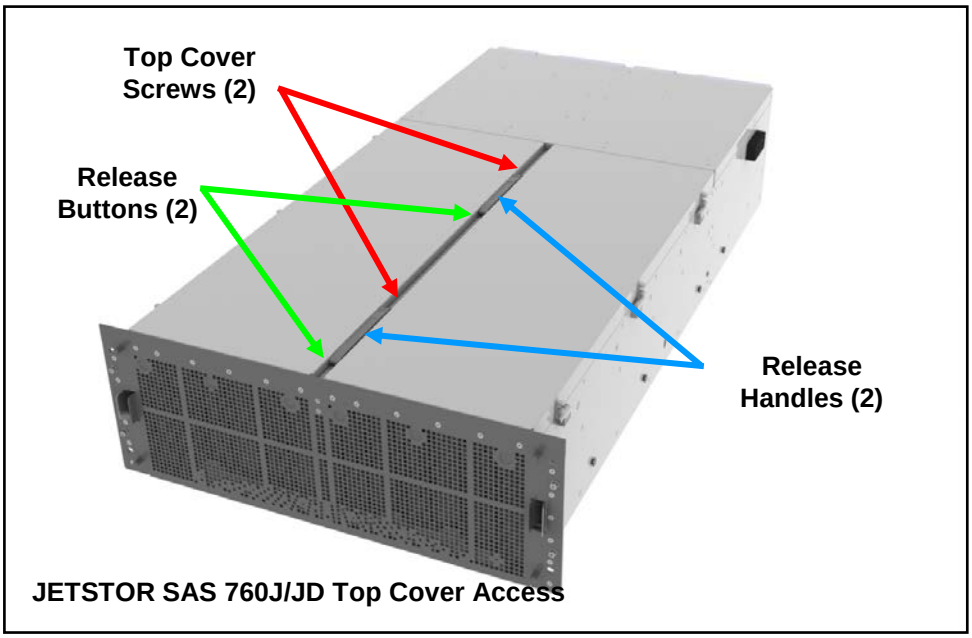


JETSTOR SAS 760J/JD Release Tabs

5. Pull the enclosure out far enough to allow the top access panels to be opened. The rails will 'lock' into a service position.

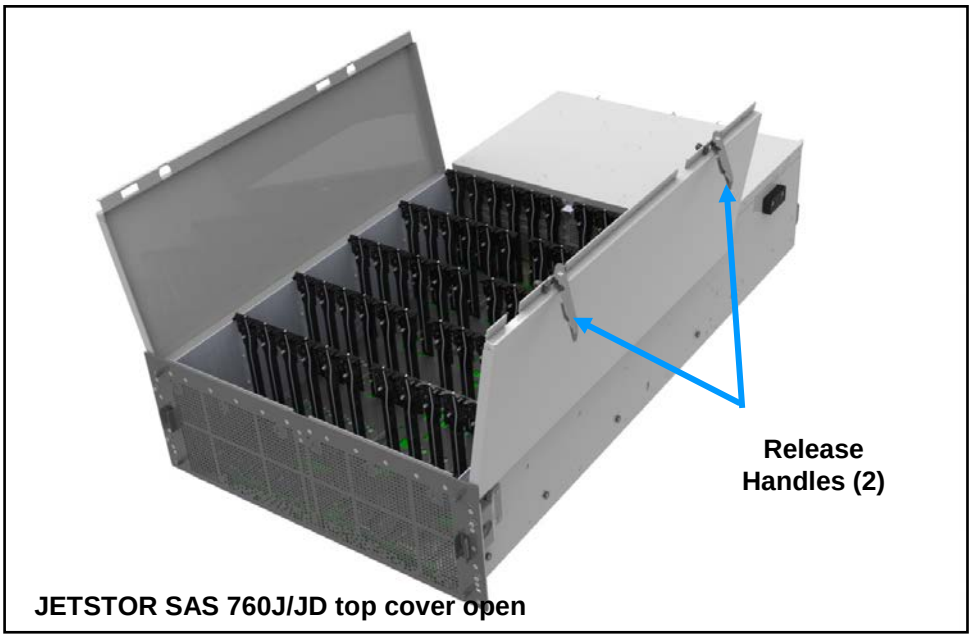
Pull enclosure out until green rail tabs click into place

6. Open the top covers by loosening the two Phillips screws on the top cover.
7. Press the release buttons on the top cover release handles.



JETSTOR SAS 760J/JD Top Cover Access

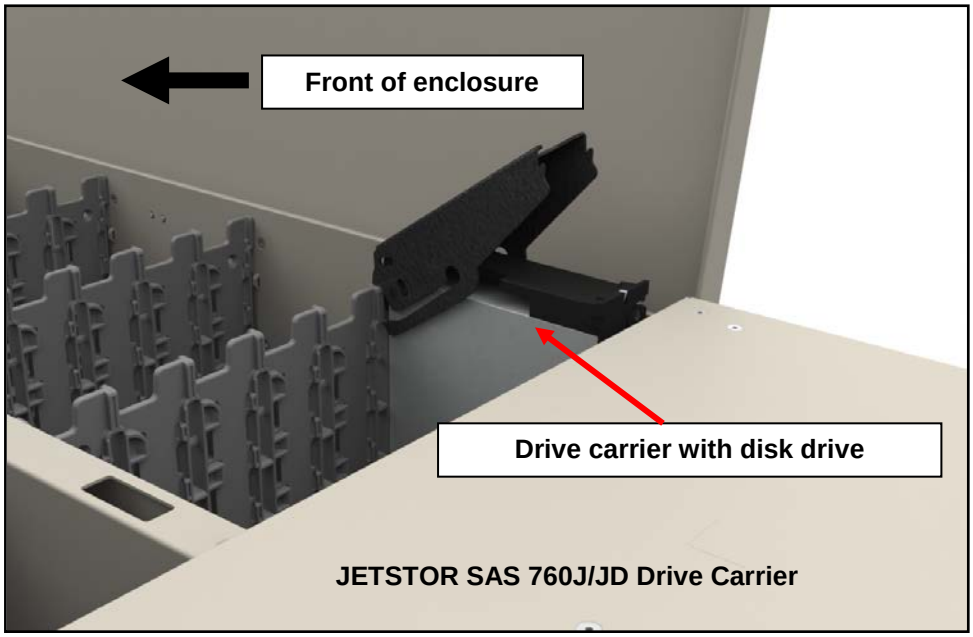
8. Pull up on the release handles to open the top covers.



JETSTOR SAS 760J/JD top cover open

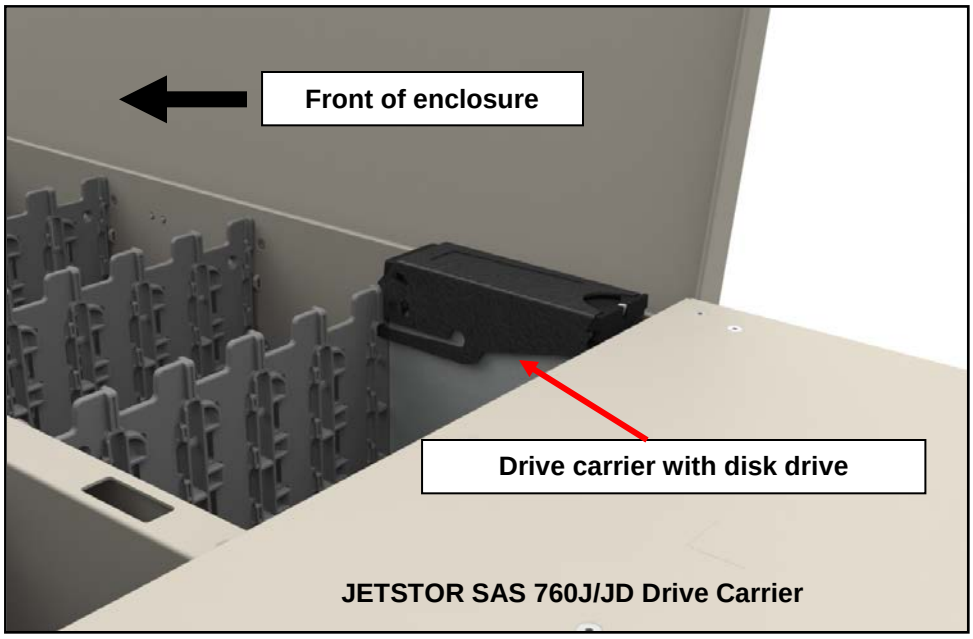
NOTE: The JETSTOR SAS 760J/JD enclosure is designed to remain operational during a service action such as replacing a drive, I/O module, or power supply. During a drive replacement the enclosure management firmware will detect a cover-open condition, will sound an alarm and turn on an amber status LED on the front of the enclosure. It is recommended that the drives be replaced as soon as possible when the cover is open during operation. Leaving the top covers open for an extended period will cause an overtemp condition which will sound a continuous alarm. It is recommended that when hot-swapping any device in the JETSTOR SAS 760J/JD, this action be completed within **five minutes** to maintain proper cooling. Please refer to Appendix D for additional information on servicing the JETSTOR SAS 760J/JD enclosure components during operation.

6. To install a drive, press the release catch on the drive carrier to release the handle and carefully slide the carrier/drive assembly into the slot as shown.



JETSTOR SAS 760J/JD Drive Carrier

7. Continue to slide the drive carrier into the selected slot until it contacts the baseboard and begins to engage the handle. Carefully press down on the handle until it latches which will cam the drive carrier into place.



JETSTOR SAS 760J/JD Drive Carrier

8. Repeat step 8 for all remaining drives.

JETSTOR SAS 760J/JD with all drives installed

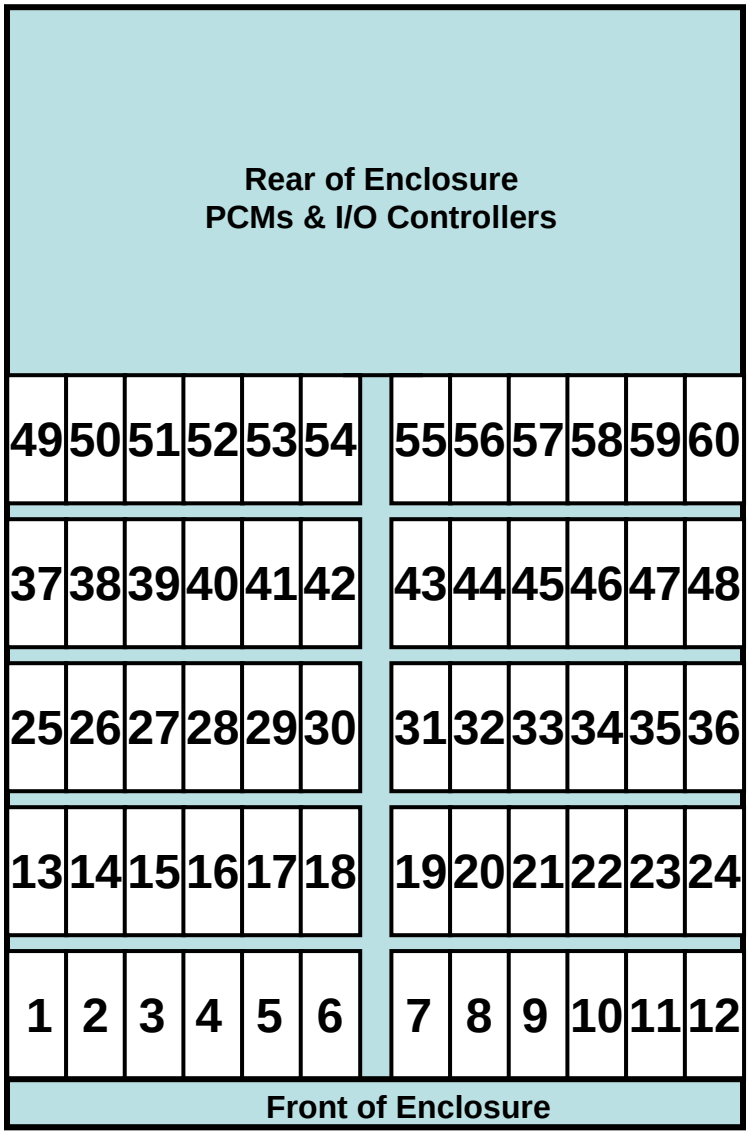
9. Once the drives are installed close the top covers. Press the top cover release handles into place and tighten the two Phillips screws.

10. Depress the green ‘press and hold’ latches on each of the two rail assemblies and carefully push the unit back into place until the front latches engage.

11. The disk drives are now installed and ready to use.

3.3 JETSTOR SAS 760J/JD ENCLOSURE DRIVE MAP

The drive mapping for the JETSTOR SAS 760J/JD enclosure is shown below.



JETSTOR SAS 760J/JD

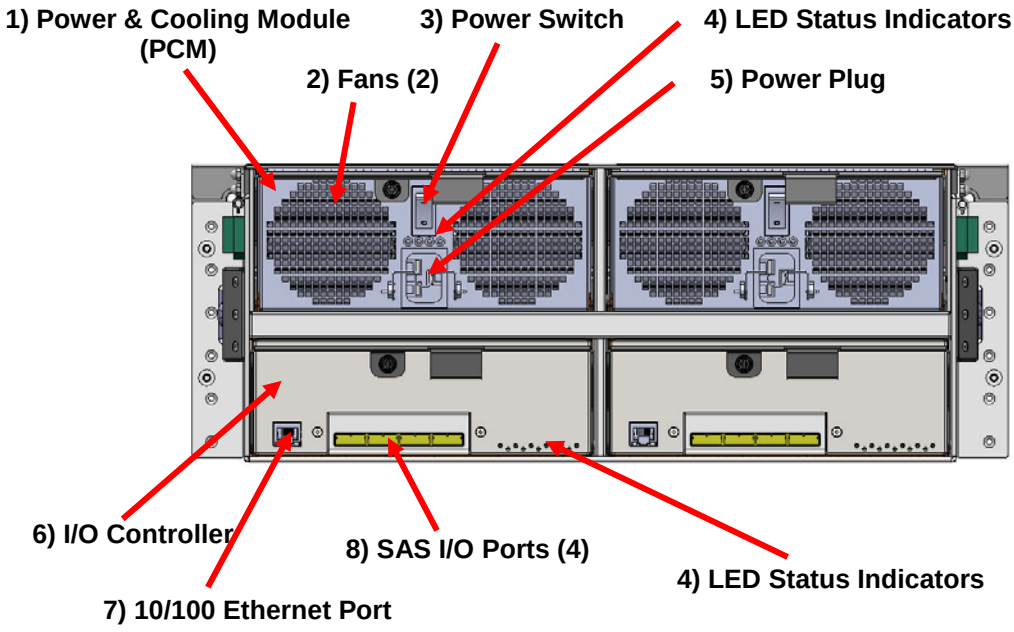
Chapter 4 Configuring the JETSTOR SAS 760J/JD

This chapter describes how to cable the JETSTOR SAS 760J/JD and any expansion enclosures.

4.1 KEY COMPONENTS

Shown below is a rear view illustration of the JETSTOR SAS 760J/JD with key components highlighted.

1. **Power & Cooling Module (2 per enclosure)**
2. **Fans (2 per PCM)**
3. **Power Switch (1 per PCM)**
4. **LED / Status Indicators (PCM & I/O Controller)**
5. **Power Plug (1 per PCM)**
6. **I/O Controller Module (1 or 2 per enclosure)**
7. **10/100 Ethernet Port (1 per I/O Controller)**
8. **SAS I/O Ports (4 per I/O Controller**



JETSTOR SAS 760J/JD Rear View

4.2 I/O MODULES & SAS PORTS

There are four multi-use SAS ports on each of the I/O Controller modules. These ports can be used as input ports (can be configured for zoning, reference Appendix E) or as expansion ports to additional JETSTOR SAS 760J/JD enclosures. The hot-swappable I/O modules each provide four (4-wide) SAS data links that can be configured as four host or three host and one expansion port. In certain zoning modes (Appendix E), the IO controller can be support two hosts and two expansion ports. Although there are many configurations that can be implemented, the following illustrations depict typical configurations for single host, dual host, and expansion enclosures.

- Single host / Single I/O configuration
- Dual host / Dual I/O configuration
- Dual host / Dual I/O configuration with up to three expansion enclosures
- Example zoning configurations

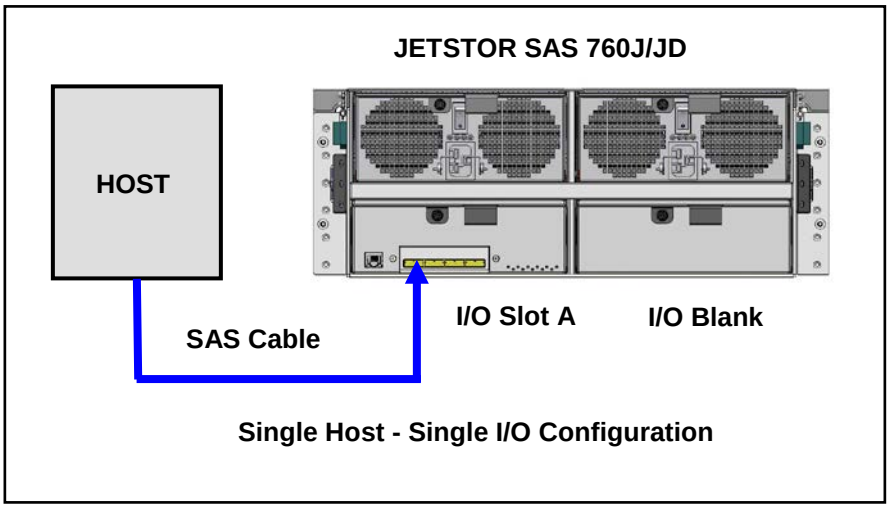
The following are typical configurations for the JETSTOR SAS 760J/JD Bulk Storage Enclosure.

SAS Cables: High quality 6G SAS cable are recommended that meet the following requirements:

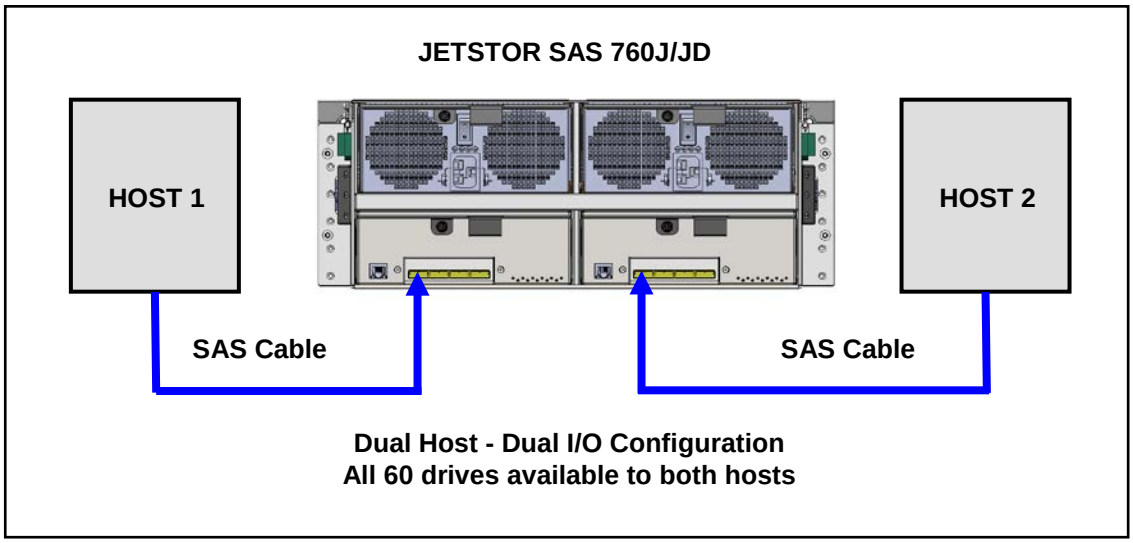
- Minimum Length: 0.5 meters
- Maximum Length: 6.0 meters

4.3 SINGLE HOST, SINGLE I/O CONFIGURATION

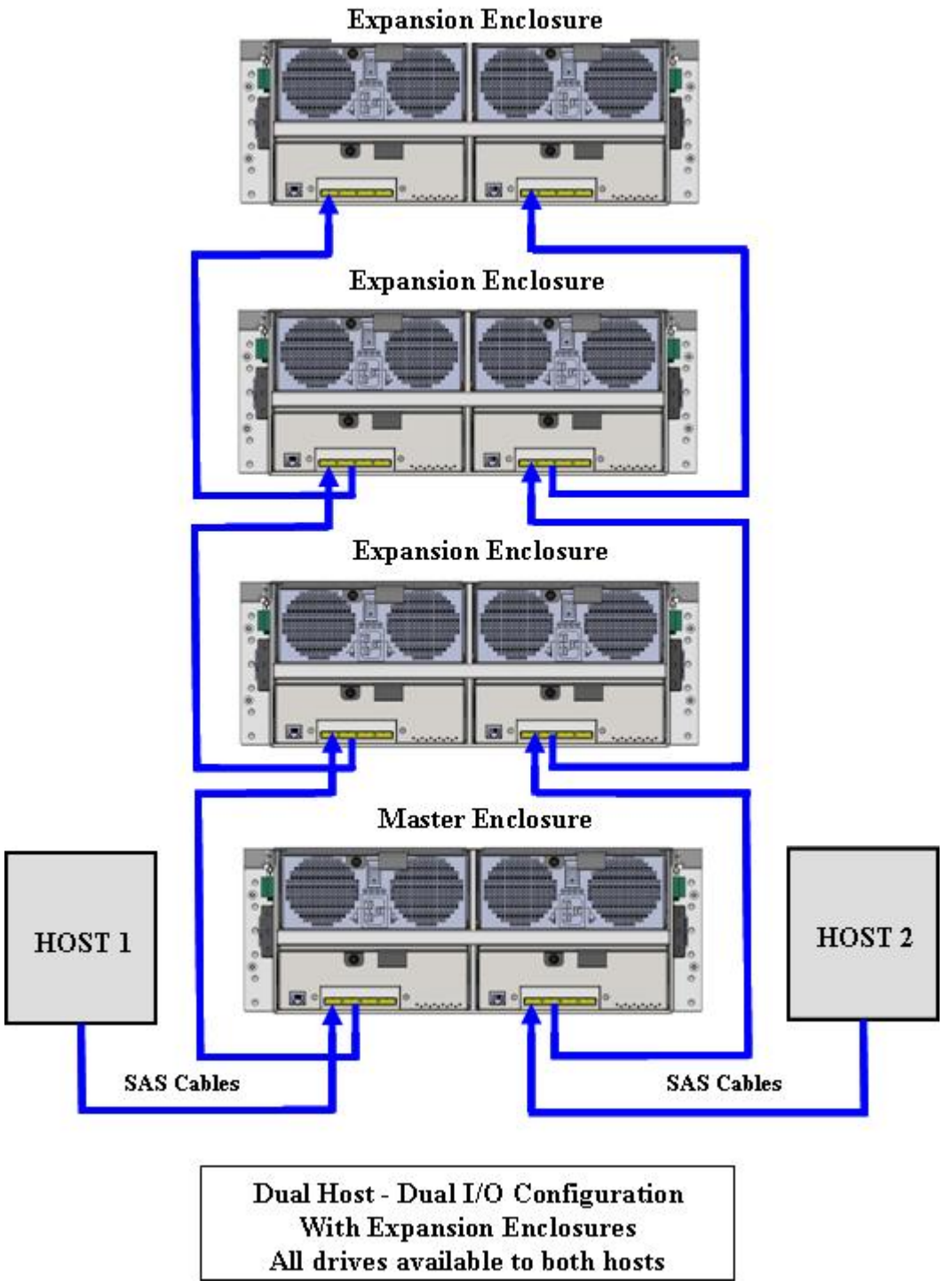
NOTE: When using a single I/O configuration the I/O controller must be in I/O Slot 'A' (left side when facing the rear of the enclosure) and an I/O 'blank' needs to be installed in the I/O Slot 'B' position. This is required to maintain proper cooling and airflow.



4.4 DUAL HOST, DUAL I/O CONFIGURATION



4.5 DUAL HOST, DUAL I/O WITH EXPANSION

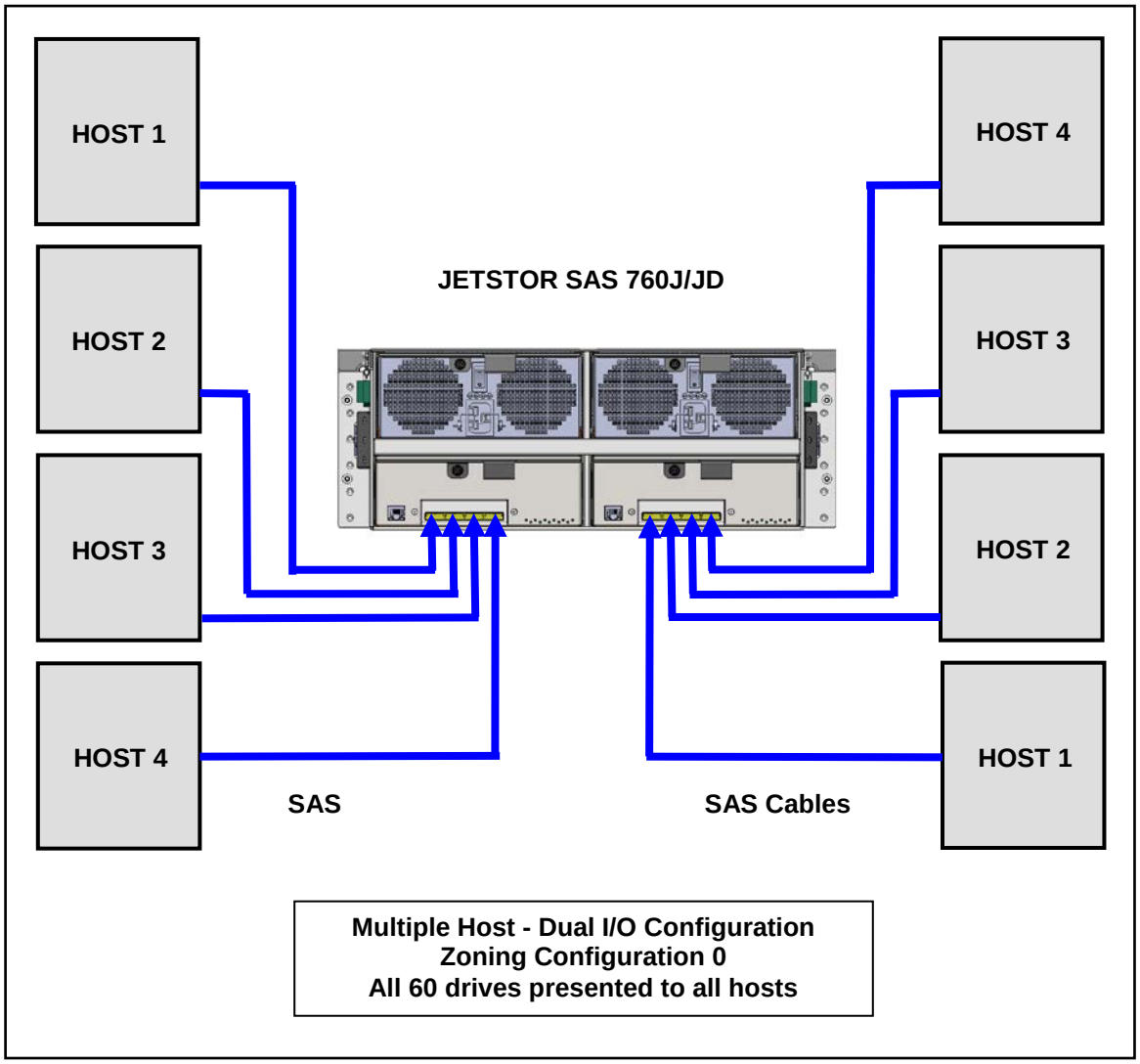


4.6 ZONED CONFIGURATIONS

There are multiple zoning configurations available. Please reference Appendix E for supported configurations. Shown below are just a couple of examples that can be implemented with the JETSTOR SAS 760J/JD enclosures.

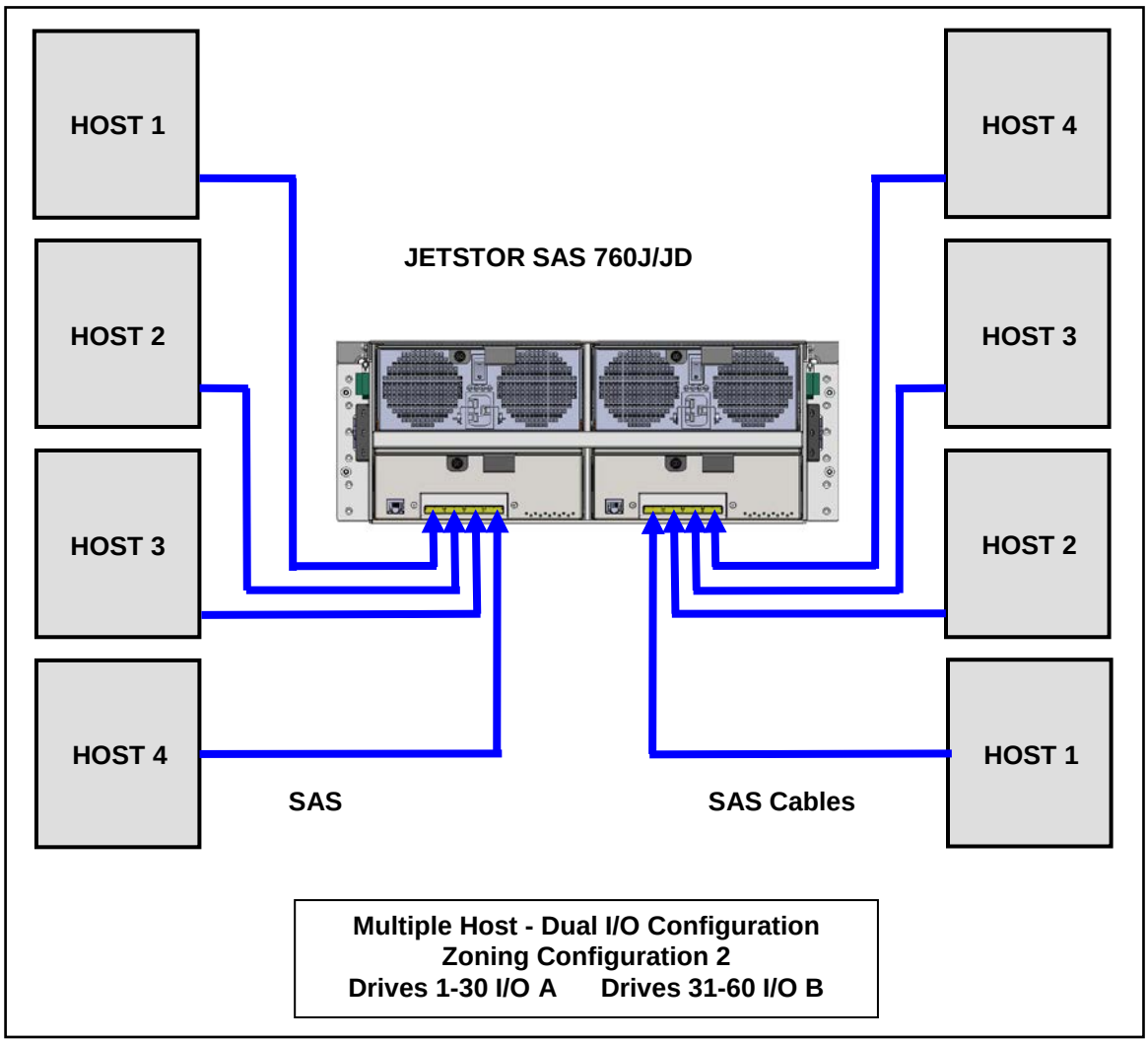
4.6.1 ZONING CONFIGURATION EXAMPLE 1

In the following configuration, all drives are presented to hosts 1-4 via I/O controller A, and all drives are presented to hosts 1-4 via I/O controller B (dual port).



4.6.2 ZONING CONFIGURATION EXAMPLE 2

In the following configuration drives 1-30 are presented to hosts 1-4 on I/O controller A and drives 31-60 are presented to hosts 1-4 on I/O controller B.



Please refer to Appendix E for a list of all the zoning configurations available.

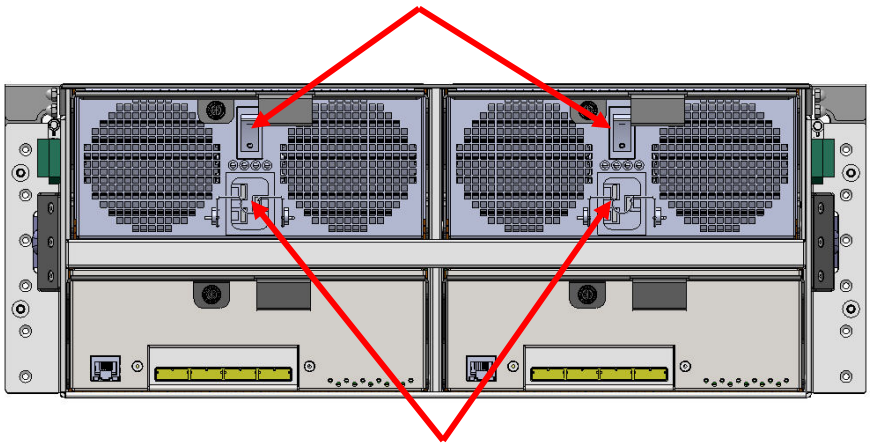
Chapter 5 Powering Up the JETSTOR SAS 760J/JD

This chapter describes how to power up and power down your JETSTOR SAS 760J/JD system configurations.

⚠ Caution: Use only the power cords supplied with the enclosure. Do not use another type of cord or extension cords. If you require additional power cords, please contact your JetStor sales representative.

NOTE: The JETSTOR SAS 760J/JD 'sequences' the power supplied to the disk drives on start-up to prevent an overcurrent condition. Different manufacturers, types and capacities of the disk drives used will vary in the amount of time that the drives become 'ready'. In most cases, waiting approximately one minute from power-on will ensure that all drives are ready and available to the host operating system.

Prior to powering up the first time, plug the power cords into their respective power supplies on the rear of the enclosure(s).



JETSTOR SAS 760J/JD Rear View

5.1 POWER-UP PROCEDURE FOR A SINGLE JETSTOR SAS 760J/JD SYSTEM

1. Turn on both PCMs (Power and Cooling Modules) using the power switches on the back of the enclosure.

2. Wait approximately 1 minute for the drives to all become ready.

3. Power on and boot the host computer.

5.2 POWER-UP PROCEDURE FOR A MULTIPLE JETSTOR SAS 760J/JD SYSTEM

1. For systems with expansion enclosures attached, the enclosure last in the chain should be powered up first, followed by the other enclosures with the master unit being turned on last. The power up order is critical for each of the expansion boxes to properly be seen by the previous unit in the chain.

2. Power up the JETSTOR SAS 760J/JD systems by pressing the power switches on the rear of the enclosures located on the PCMs (Power and Cooling Modules).

3. Wait approximately 1 minute for the drives to all become ready.

4. Power on and boot the host computers.

5.3 POWER-DOWN PROCEDURE FOR A SINGLE JETSTOR SAS 760J/JD SYSTEM.

1. Power down the host computer.

2. Power down the JETSTOR SAS 760J/JD by turning off the switches on the PCMs (Power and Cooling Modules)

5.4 POWER-DOWN PROCEDURE FOR A MULTIPLE JETSTOR SAS 760J/JD SYSTEM.

1. Power down the host computer(s).

2. Power down the master JETSTOR SAS 760J/JD by turning off the switches on the PCMs.

3. Power down the remaining expansion enclosures by turning off their switches on the PCMs.

Chapter 6 Monitoring the JETSTOR SAS 760J/JD

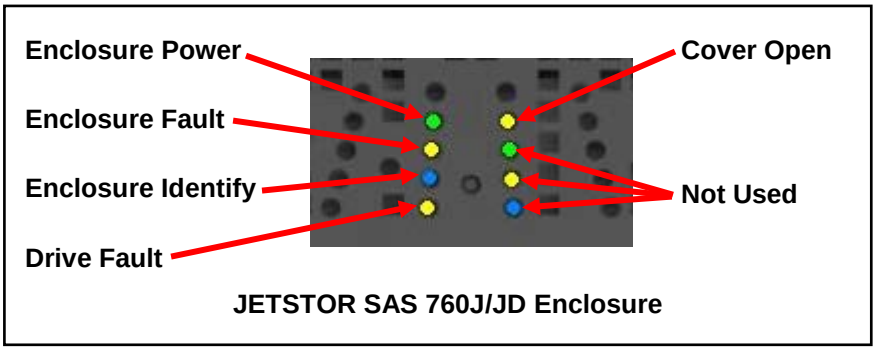
This chapter describes the status LEDs on the JETSTOR SAS 760J/JD and their meanings.

The JETSTOR SAS 760J/JD provides visual indications (LEDs) for operational status. There is also an audible alarm (piezoelectric buzzer) used to indicate that the top covers are open or that a power supply has been removed.

6.1 ENCLOSURE LEDs

The following illustrations and table show the JETSTOR SAS 760J/JD Enclosure LEDs and their functions.

Description	*LED Color*	*Normal Behavior*
Drive Activity With optional LED Module	Green	• OFF indicates no drive activity. • ON indicates drive activity.
Enclosure Power	Green	• ON indicates that the DC power is present in the enclosure. • OFF indicates that DC power is not present in the enclosure.
Enclosure Fault	Amber	• ON indicates that one or more components within the enclosure have failed and that a service action is required. • OFF indicates that no detectable faults are present in the enclosure.
Cover Open	Amber	• ON indicates that either of the top covers is not properly closed and latched in place. • OFF indicates that both top covers are securely closed and latched in place.
Drive Fault	Amber	• ON indicates that one or more drives in the enclosure are faulted. • OFF indicates that no detectable drive faults exist in the enclosure.
Enclosure Identify	Blue	• ON indicates that this enclosure is being sent an identify command through SES. • OFF indicates that this enclosure is not being sent an identify command through SES.



6.2 ENCLOSURE DRIVE IDENTIFY LED

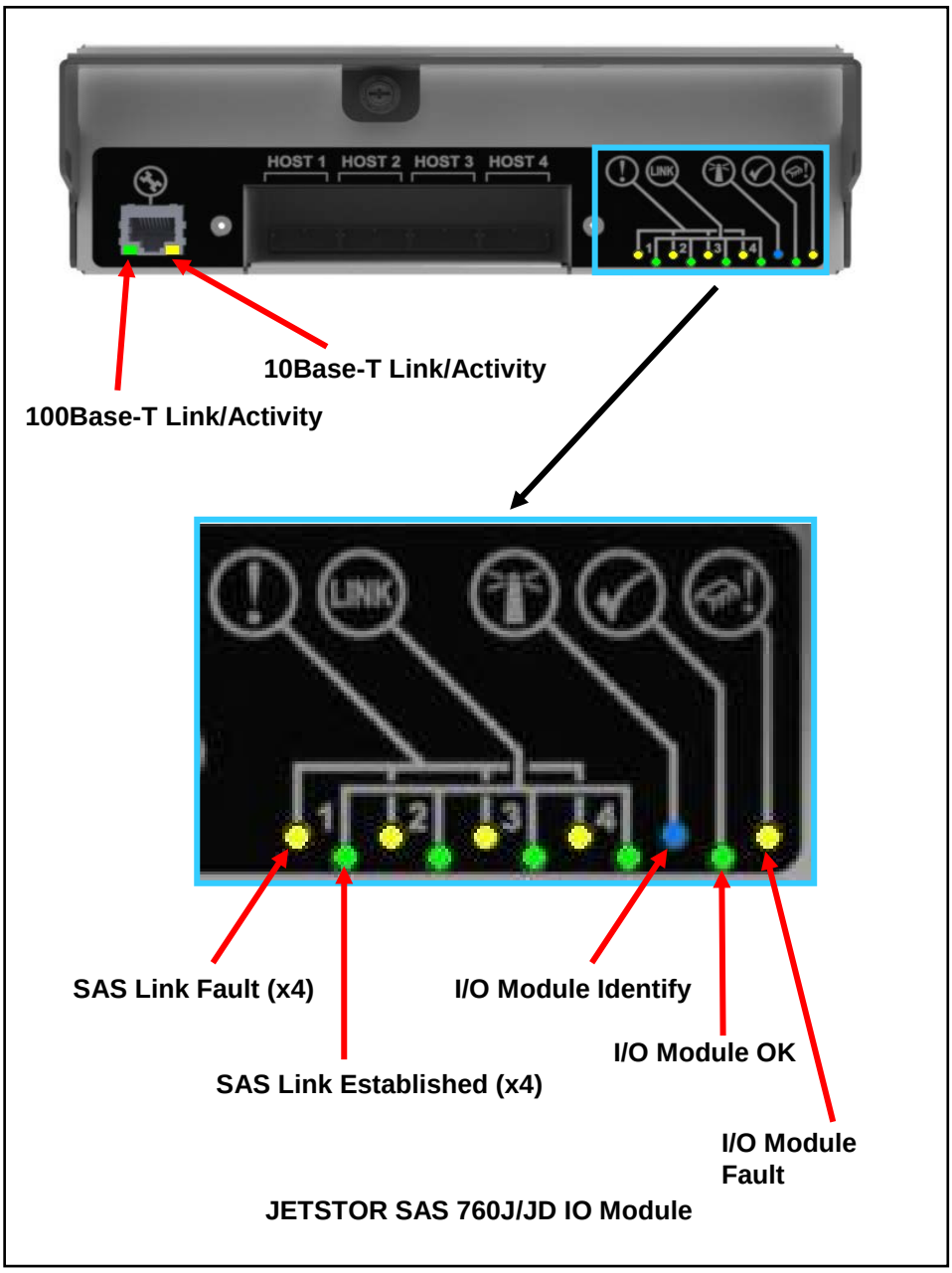
The JETSTOR SAS 760J/JD enclosure has an internal drive identify LED associated with each drive. These LEDs are located inside the drive bays. Behavior of this LED is described in the table below.

Description	*LED Color*	*Normal Behavior*
Drive Identify	Blue	• ON indicates that this drive is being sent an identify command through SES. • OFF indicates that this drive is not being sent an identify command through SES.

6.3 I/O CONTROLLER LEDs

The following table and illustration show the JETSTOR SAS 760J/JD I/O Controller LEDs and their function. There are a total of 13 status LEDs on the JETSTOR SAS 760J/JD I/O Controller.

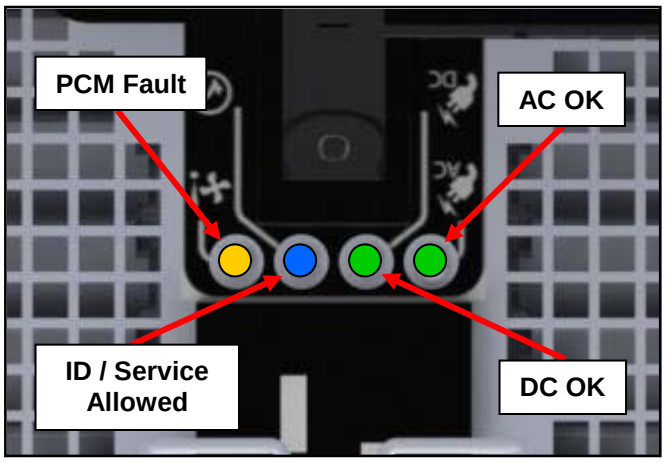
Description	*LED Color*	*Normal Behavior*
IO Module OK	Green	• ON indicates that the IO module is properly booted and is functioning correctly. • OFF indicates that the IO module has detected an internal fault.
IO Fault	Amber	• ON indicates that an IO module fault has been detected. • OFF indicates that no detectable IO module faults are present.
SAS Link Established (x4)	Green	• ON Indicates that a valid SAS link is established on the corresponding 4-wide SAS port. • OFF indicates that a valid SAS link is not established on the corresponding 4-wide SAS port.
SAS Link Fault (x4)	Amber	ON Indicates that a detectable fault is present on the corresponding 4-wide SAS port. • OFF Indicates that a detectable fault is not present on the corresponding 4-wide SAS port.
IO Module Identify	Blue	• ON indicates that this IO module is being sent an identify command through SES. • OFF indicates that this IO module is not being sent an identify command through SES.
10BASE-T Link/Activity	Yellow	• Yellow blinking indicates 10BASE-T link activity. • Yellow ON indicates 10BASE-T link.
100BASE-T Link/Activity	Green	• Green blinking indicates 100BASE-T link activity. • Green ON indicates 100BASE-T link.


HOST 1
HOST 2
HOST 3
HOST 4
LINK
10Base-T Link/Activity
100Base-T Link/Activity
SAS Link Fault (x4)
SAS Link Established (x4)
I/O Module Identify
I/O Module OK
I/O Module Fault
JETSTOR SAS 760J/JD IO Module

6.4 POWER SUPPLY LEDs (PCM – POWER & COOLING MODULE)

The following table and illustration show the JETSTOR SAS 760J/JD PCM LEDs and their functions.

Description	*LED Color*	*Normal Behavior*
AC Power Good	Green	• ON indicates that the power supply is on and that AC power is good. • OFF indicates that the power supply is either not turned on or that the AC input power is not good.
DC Power Good	Green	• ON indicates that the power supply DC output voltages are good. • OFF indicates that the power supply DC output is not good.
Fault / Service Required	Amber	• ON indicates there is a fault with the power supply and a service action is required. • OFF indicates there are no faults with the power supply.
Identify / Service Allowed	Blue	• ON identifies and indicates that the power supply may be serviced (replaced). • OFF indicates that ID and Service Allowed are not enabled.



JETSTOR SAS 760J/JD Power & Cooling

Chapter 7 Appendix A: Safety Notices and Cautions

7.1 SAFETY NOTICES

⚠ **Caution:** Before touching any of the enclosure components, ground yourself and take antistatic precautions. Use an antistatic wrist strap and a grounding wire as a minimum precaution.

⚠ **Caution:** Each storage subsystem must have a good electrical ground connection through each power cord, through the building power grid to the point of origin for the building power source entry.

⚠ **Caution:** Circuit overloading – Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing power concerns.

NOTE: The maximum current draw is printed on a label on each of the JETSTOR SAS 760J/JD PCMs (Power & Cooling Modules).

200-240V 12.4A per PCM, 2 PCMs per JETSTOR SAS 760J/JD.

INSTALLATION CAUTIONS AND NOTES

⚠ **Caution:** to prevent personal injury and equipment damage, have someone assist you during the equipment installation. If necessary, reduce the weight of the enclosure by removing the disk drives and PCMs during installation.

NOTE: Ensure that your equipment rack is placed in a dust-free, well ventilated area close to a UPS. Leave enough room behind and around the rack for services and to allow for sufficient airflow.

NOTE: For equipment racks with single or multiple storage subsystems installed, the TMRA (Manufacturer's maximum recommended ambient temperature) is 35° C.

NOTE: Elevated Operating Ambient Temperature – When installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum recommended ambient temperature.

NOTE: Mechanical Loading – Prevent instability by installing heavier items into the bottom of the equipment rack. Mounting of the equipment in a rack should be such that a hazardous condition is not achieved due to uneven loading.

Chapter 8 Appendix B: JetStor SAS 760J/JD Specifications

8.1 GENERAL SPECIFICATIONS

8.1.1 SYSTEM

- 4U Enclosure height (rack configuration)
- Up to 60 SAS/SATA drives per enclosure (3Gb or 6Gb)

8.1.2 REDUNDANT COMPONENTS

- PCMs (Power & Cooling Modules)
- Up to 60 drives per enclosure

8.1.3 FIELD REPLACEABLE UNITS (ALSO HOT-SWAPPABLE)

- Power & Cooling Modules (PCMs)
- I/O Controller modules
- Disk Drives

8.1.4 ENCLOSURE DIMENSIONS

The dimensions of the JETSTOR SAS 760J/JD comply with the EIA-310-D standard for rack-mountable equipment.

- Height : 6.97" (177 mm)
- Width : 16.56" (420.6 mm) w/Rack ears: 19" (482.6 mm)
- Depth : 34" (863.6 mm)
- Weight : Approximately 215 lbs with drives installed (105 lbs without drives)

8.1.5 POWER & COOLING MODULES (PCMS) / INPUT POWER

NOTE: The default PCM for the JETSTOR SAS 760J/JD is a 1200 watt power supply. An optional power supply with 1865 watts is also available. Please contact your JetStor representative to obtain these higher power PCMs.

Input Parameter	*Value*
Input Voltage	90 – 264 VAC
Input Frequency	47 – 63 Hz and 400 hz
Maximum Input Current	12.9A RMS @ 110 VAC
Peak Inrush Current	50A @ 230VAC, 25^{O}C, 5 msec max
Minimum Efficiency Measured at 30% and 50% load and nominal line (208 VAC)	90%
Maximum Average Output Power	1200 W
Maximum Peak Output Power, 1 second	1285 W

8.1.6 POWER & COOLING MODULES (PCMS) / DC POWER OUT

Output Parameter	*3.3 Standby VDC Output*	*5 VDC Output*	*12 VDC Output*
Nominal Voltage	3.3 VDC	5.1 VDC	12.1 VDC
Full Load	2 A	70.0 A	71.0 A
Peak Load for 1 second	4 A	80.0 A	80.0 A
Minimum Load (A)	0.0 A	0.0 A	2.0. A

NOTE: PCMs are hot-swappable. A failed PCM should be replaced as soon as possible. Once a PCM has been removed for replacement, **it should be replaced within 5 minutes** to prevent overheating of the enclosure and possible shut-down. Reference Appendix D for instructions on replacing a PCM.

NOTE: JetStor does not support single PCM configurations due to thermal considerations.

NOTE: In the event of a PCM failure, the blowers in the failed unit will continue to operate on power provided by the redundant PCM.

8.1.7 TEMPERATURE, HUMIDITY, ALTITUDE

Parameter	*Operating*	*Non-Operating*	*Transit*	*Storage*
Temperature Range	5°C to 35°C* (41°F to 95°F)	5°C to 45°C (41°F to 113°F)	-40°C to 60°C (-40°F to 140°F)	1°C to 60°C (34°F to 140°F)
Relative Humidity	20% to 80% non-condensing	10% to 90% non-condensing	10% to 90% non-condensing	10% to 80% non-condensing
Altitude	-200 ft to 10,000 ft (-61 m to 3048 m)	-200 ft to 10,000 ft (-61 m to 3048 m)	-200 ft to 40,000 ft (-61 m to 12,192 m)	-200 ft to 10,000 ft (-61 m to 3048 m)

[1] The Maximum Operating Temperature value is specified at Sea Level and is derated 2.0% per 1000 feet of increased altitude.

8.1.8 SHOCK & VIBRATION

Test Parameter	*Level*	*Frequency Range*	*Duration / Sweep Rate / # Shocks*
Operating Vibration	0.10 G, 0 – peak swept sine	5 – 500 Hz	1 complete sweep ½ octave / min
Operating Random Vibration	0.15 Grms	5 – 500 Hz	10 minutes
Operating Shock	5 G, 0 – peak 11 mS half sine		3 positive shocks 3 negative shocks
Non-operational Vibration	0.75 G, 0 – peak swept sine	5 – 500 Hz	1 complete sweep ½ octave / min
Non-operation Random Vibration	0.5 Grms	5 – 500 Hz	10 minutes
Non-operational Shock	10 G, 0 – peak 11 mS half sine		3 positive shocks 3 negative shocks

8.1.9 ROTATIONAL VIBRATION

Drives will not exceed the manufacturers' rotational vibration guidelines during typical enclosure operation.

8.1.10 PACKAGING & TRANSPORTATION

The packaging meets the requirement and test levels defined in ISTA 1E.

8.1.11 ACOUSTICS

Acoustic level does not exceed an A- weighted sound power of 7.9 Bels at normal operation tested to ISO 7779. Normal operation is defined as ambient temperature of 23°C, 60 I/Os/sec/drive, all fans / fans operational, and no fault conditions. The acoustic sound level increases under fault conditions as fan speeds increase.

8.2 AGENCY APPROVALS

Country	*Regulatory Marks/Certification*
Americas	
US	UL, FCC Class A
Canada	ICES-003, cUL
Europe	
U.K., Ireland	CE
France	CE
Switzerland	CE
Spain	CE
Austria	CE
Italy	CE
Belgium	CE
Luxembourg	CE
Netherlands	CE
Portugal	CE
Norway	CE
Finland	CE
Sweden	CE
Germany	TÜV-GS, CB CE
Asia	
Saudi Arabia	FCO (Pending)
India	Voluntary Safety / No EMC
Japan	VCCI Class A, UL (Pending)
China	CCC (Pending)

- Australian resident customer or agent uses EN55022 for EMC compliance, registers with ACA.
- Customer must have agent in Korea, Argentina, and Australia/ New Zealand for submittal.
- Test Requirements for Mexico, Argentina, Poland, Slovenia, Slovakia, Hungary, Czech Republic, Saudi Arabia, and Singapore are all met by safety and EMC tests performed. However, to obtain National Marks/Certifications, test reports must be submitted to each country. This is an additional cost and not part of the Safety/EMC plan unless requested. Russia requires additional testing (at GOST accredited site) and test report submittal.
- Certain country certifications may require this manual to be translated into the local language.

Chapter 9 Appendix C : Installing Disk Drives in Carriers

This appendix covers the installation of disk drives (or SSDs) into the JETSTOR SAS 760J/JD drive carriers. The JETSTOR SAS 760J/JD drive carriers can be assembled in a number of configurations:

- 3.5" SAS or SATA drive without an interposer.
- 3.5" SAS or SATA drive with an interposer
- 2.5" SAS or SATA drive without an interposer (includes SSDs)
- 2.5" SAS or SATA drive with an interposer (includes SSDs)

All of the above configurations utilize the same drive carrier assembly.

9.1 INTERPOSER (MUX) CARDS

Interposer (mux) cards are an available option to install with the disk drives. They are integral to the carrier assembly and are available for both the SAS and SATA disk drives.

- The SATA interposer provides dual port capability and power control for the drive.
- The SAS interposer provides for power control of the drive (SAS drives are already dual-ported).

Interposer cards are not required if the above features are not needed. SAS drives are dual port by default and SATA drives are single port by default.

9.1.1 GENERAL CAUTIONS

⚠ Caution: Ensure that disk drives are at room temperature before installing and powering up the JETSTOR SAS 760J/JD. It is recommended that drives are allowed at least two hours to acclimate to room temperature before using them.

⚠ Caution: When handling disk drives, be sure to take static precautions (wrist straps, grounded ESD mat, etc.).

9.1.2 TOOLS REQUIRED

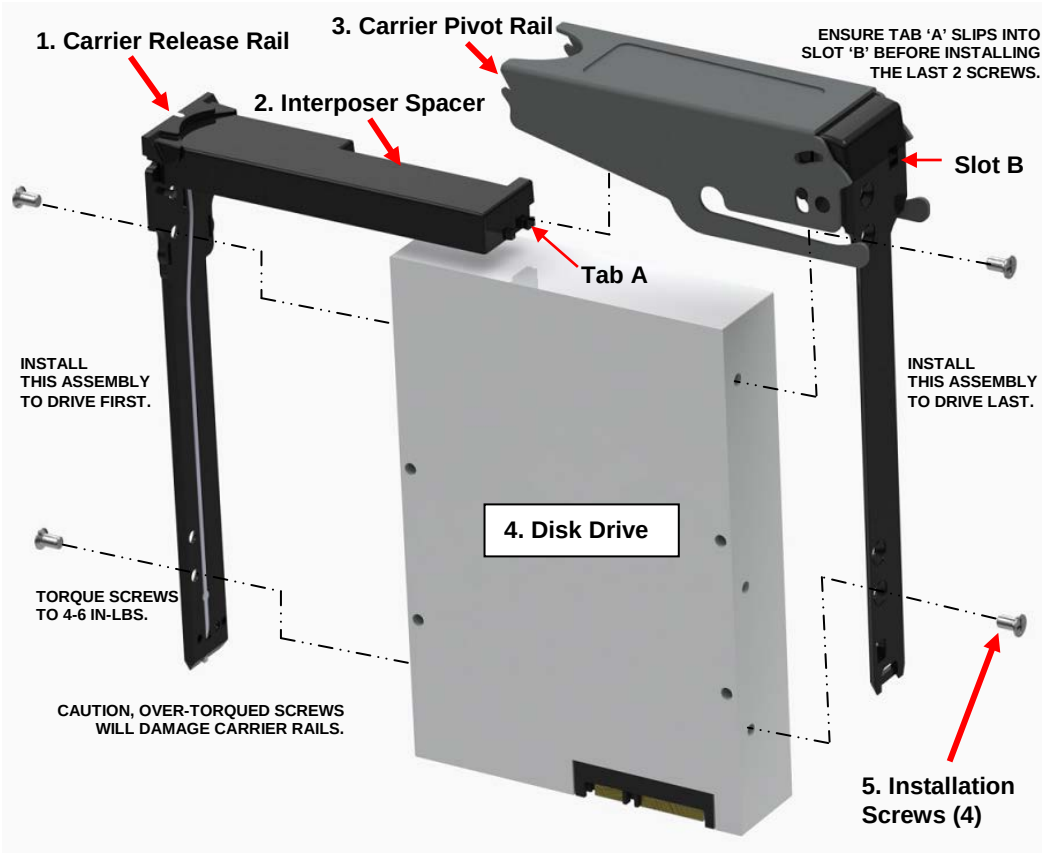
- Phillips screwdriver

9.2 INSTALLATION OF 3.5" DISK DRIVES INTO THE DRIVE CARRIER (WITHOUT INTERPOSER)

This following installation procedure covers both SAS and SATA 3.5" drive installation without the interposer card installed.

Referring to the following illustration, identify the parts required to install the disk drive:

1. Carrier release rail
2. Interposer Spacer
3. Carrier pivot rail
4. Disk drive
5. Installation screws (4)



JETSTOR SAS 760J/JD Drive Carrier Assembly (3.5" Drive / No Interposer)

1. Install the Carrier Release Rail as shown with two of the installation screws. Ensure alignment of the drive is such that the drive connector is at the bottom front as shown.

2. Align the Carrier Pivot Rail with the release rail so that Tab 'A' of the drive spacer aligns and mates with Slot 'B' of the pivot rail as shown. Install the other two installation screws to mate the Carrier Pivot Rail with the disk drive.

3. Torque the drive installation screws to 4-6 in-lbs. **Do not over-torque as damage to the carrier or drive may result.**

4. Drive carrier assembly is complete.

9.3 INSTALLATION OF 3.5" DISK DRIVES INTO THE DRIVE CARRIER WITH INTERPOSER

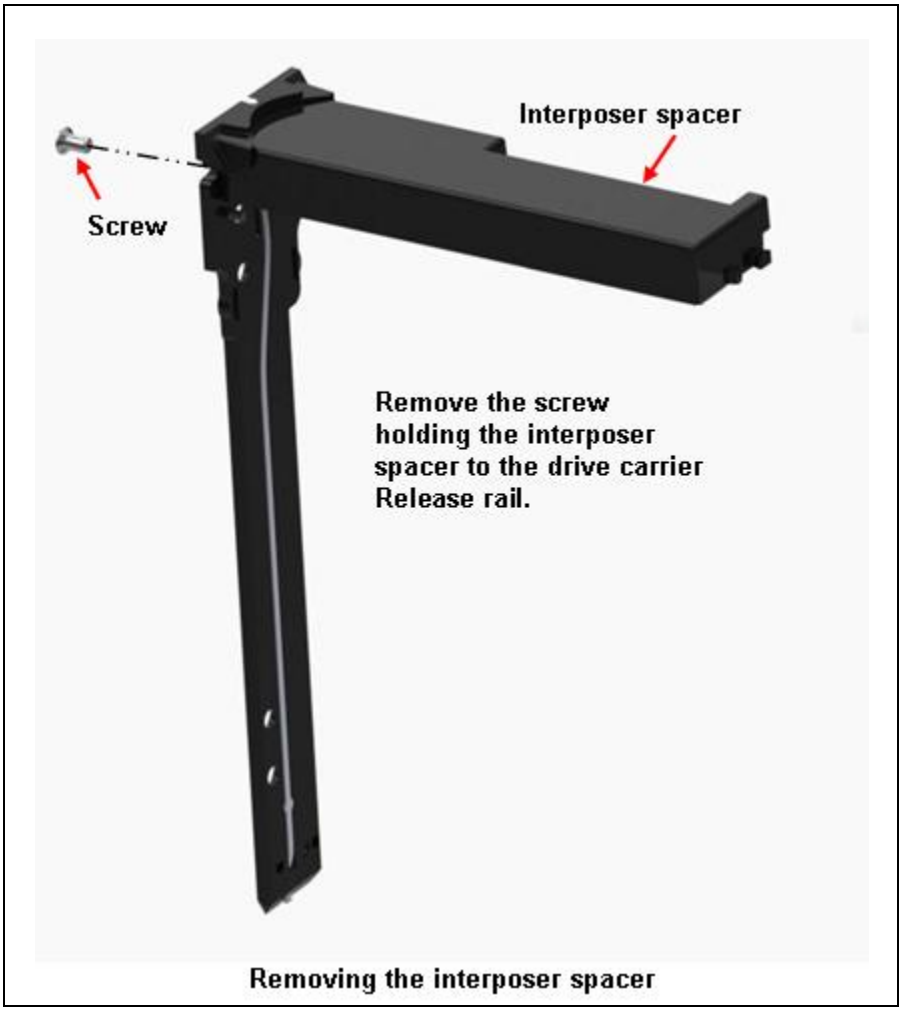
This following installation procedure covers both SAS and SATA 3.5" drive installation with an interposer card installed.

NOTE: The interposer cards are different depending on whether you are installing a SAS or SATA drive. Ensure that you have the proper interposer card for your drive type.

- The SATA interposer provides dual port capability and power control for the drive.
- The SAS interposer provides for power control of the drive (SAS drives are already dual ported).

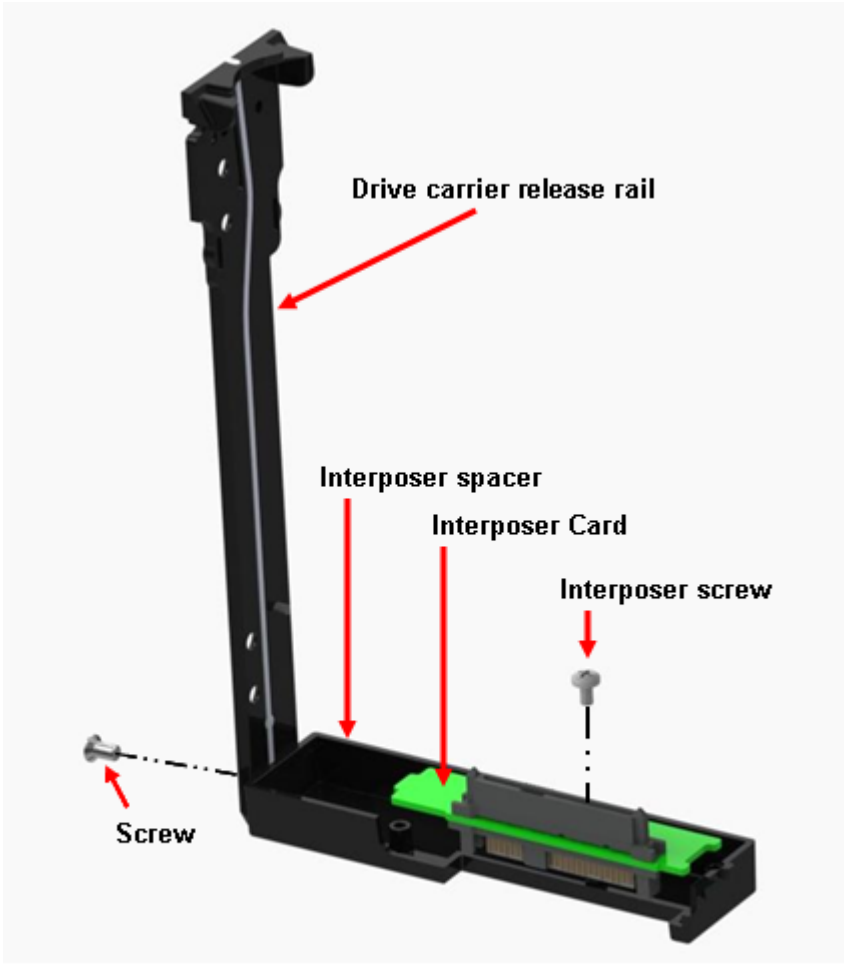
Referring to the following illustrations, follow the numbered instructions to move the interposer spacer and install the interposer and disk drive into the carrier assembly.

1. Remove the interposer spacer from the drive carrier release by removing the small screw holding it onto the carrier release rail.



Removing the interposer spacer

2. Flip and reinstall the interposer spacer as shown at the other end of the carrier release rail. Install the interposer card into the spacer with one screw (supplied with the interposer) as shown below. Torque screws to 2-3 in-lbs. max. Do not over-torque the screws.

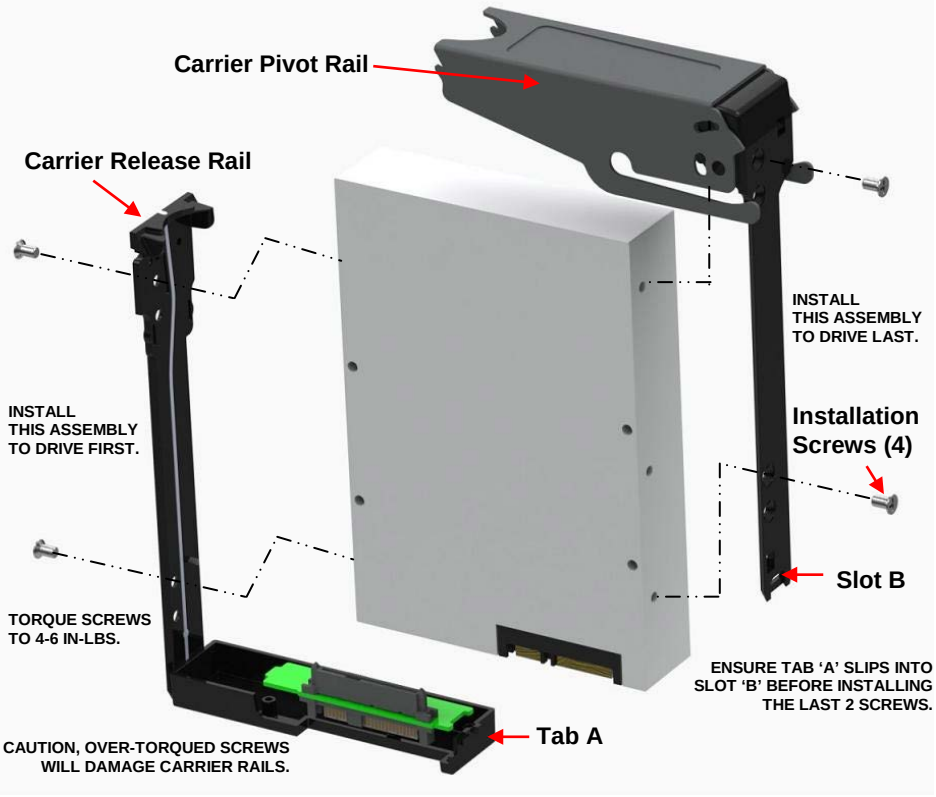


Installing the interposer card

3. Plug the disk drive into the interposer card and mount the Carrier Release Rail to the disk drive as shown using two of the drive installation screws.

NOTE: There are two sets of mounting holes on the carrier rails. Use the mounting holes as shown below to ensure the connector of the interposer is at the proper location.

4. Align the Carrier Pivot Rail with the release rail so that Tab 'A' of the interposer spacer aligns and mates with Slot 'B' of the pivot rail as shown. Install the other two installation screws to mate the Carrier Pivot Rail with the disk drive.



JETSTOR SAS 760J/JD Drive Carrier Assembly (3.5" Drive with Interposer)

5. Torque the drive installation screws to 4-6 in-lbs. Do not over-torque as damage to the carrier or drive may result.

6. Drive carrier assembly is complete.

The following illustration shows the completed drive carrier assembly with a 3.5” disk drive and the interposer card properly installed.

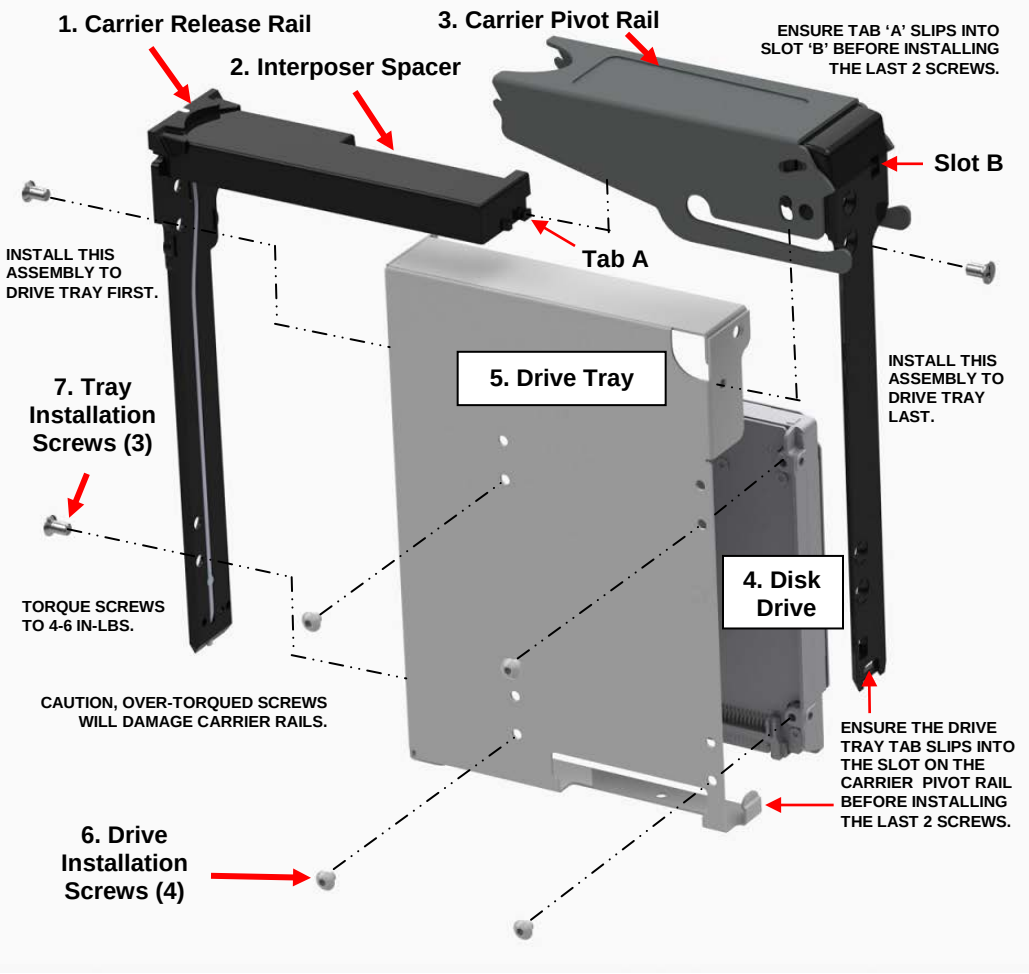
JETSTOR SAS 760J/JD Drive Carrier Assembly (3.5” Drive with interposer)

9.4 INSTALLATION OF 2.5" DISK DRIVES INTO THE DRIVE CARRIER (WITHOUT INTERPOSER)

This following installation procedure covers both SAS and SATA 2.5" drive installation without the interposer card installed. This also applies to Solid State Drive (SSD) installation.

Referring to the following illustration, identify the parts required to install the disk drive:

1. Carrier release rail
2. Interposer spacer
3. Carrier pivot rail
4. Disk drive
5. 2.5" drive tray
6. 2.5" drive installation screws (4)
7. 2.5" tray installation screws (3)



JETSTOR SAS 760J/JD Drive Carrier Assembly (2.5" Drive / No Interposer)

1. Install the Carrier Release Rail to the 2.5” tray assembly as shown with two of the tray installation screws. Ensure alignment of the tray is such that the drive connector opening is at the bottom as shown.

2. Align the Carrier Pivot Rail with the release rail so that Tab ‘A’ of the interposer spacer aligns and mates with Slot ‘B’ of the pivot rail as shown. Also align the tray tab with the Carrier Pivot Rail slot as shown. Install the third tray installation screw to mate the Carrier Pivot Rail with the 2.5” tray.

3. Torque the tray installation screws to 4-6 in-lbs. Do not over-torque as damage to the carrier or drive may result.

4. Install the disk drive as shown below using the 4 drive installation screws. Torque the drive installation screws to 4-6 in-lbs. Do not over-torque. Assembly is complete.

NOTE: There are two sets of mounting holes in the 2.5” tray (one set of holes off-sets the drive for installation of the interposer card.). Use the mounting holes as shown to ensure the connector of the disk drive (or SSD) is at its lowest point in the carrier.

The following illustration shows the completed drive carrier assembly with a 2.5” disk drive properly installed (without the interposer card)

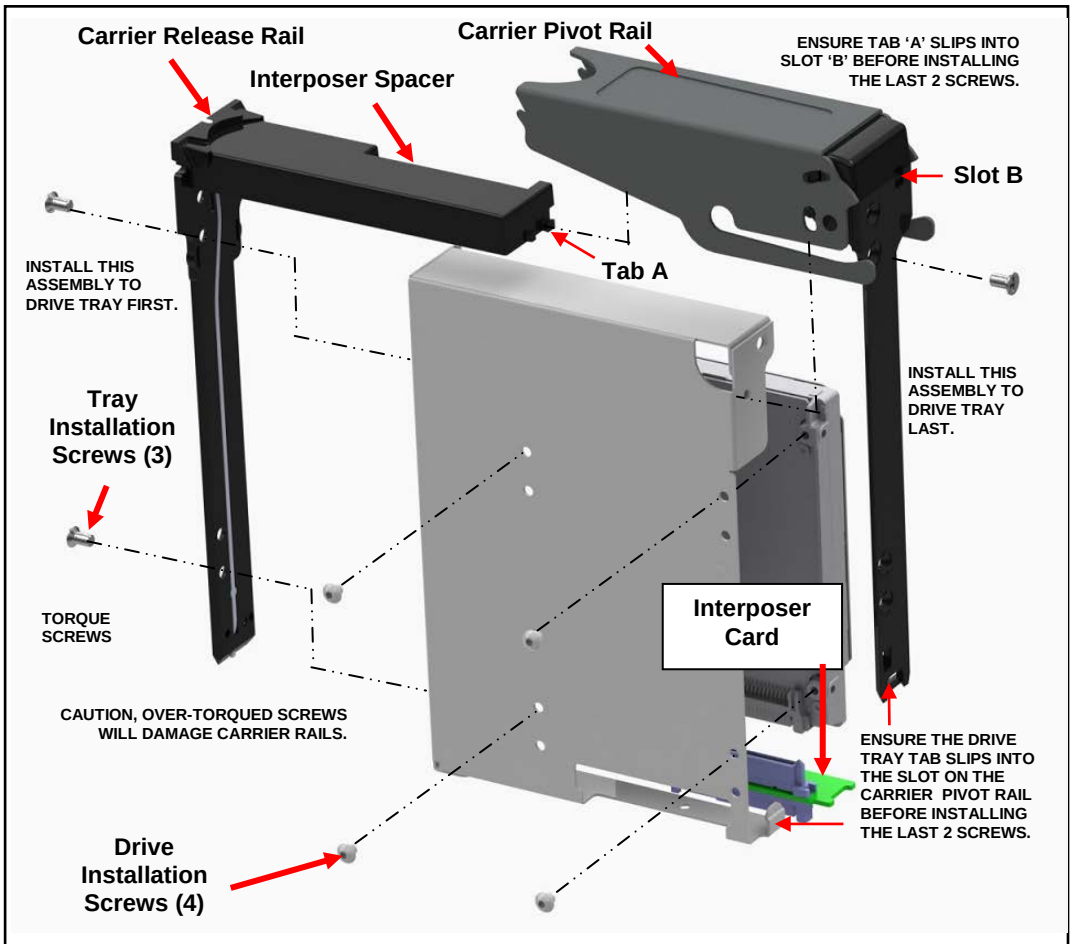
JETSTOR SAS 760J/JD Drive Carrier Assembly (2.5” Drive without interposer)

9.5 INSTALLATION OF 2.5" DISK DRIVES INTO THE DRIVE CARRIER WITH INTERPOSER

This following installation procedure covers both SAS and SATA 2.5" drive installation with an interposer card installed. This also applies to Solid State Drive (SSD) installation.

NOTE: The interposer cards are different depending on whether you are installing a SAS or SATA drive. Ensure that you have the proper interposer card for your drive type.

- The SATA interposer provides dual port capability and power control for the drive.
- The SAS interposer provides for power control of the drive (SAS drives are already dual ported).



JETSTOR SAS 760J/JD Drive Carrier Assembly (2.5" Drive with Interposer)

1. Install the Carrier Release Rail to the 2.5" tray assembly as shown with two of the tray installation screws. Ensure alignment of the tray is such that the drive connector opening is at the bottom as shown.

2. Align the Carrier Pivot Rail with the release rail so that Tab 'A' of the interposer spacer aligns and mates with Slot 'B' of the pivot rail as shown. Also align the tray tab with the Carrier Pivot Rail slot as shown. Install the third tray installation screw to mate the Carrier Pivot Rail with the 2.5" tray.

3. Torque the tray installation screws to 4-6 in-lbs. Do not over-torque as damage to the carrier or drive may result.

4. Install the interposer card onto the disk drive and seat securely.

5. Install the disk drive and interposer into the 2.5" tray as shown using the 4 drive installation screws.

6. Torque the drive installation screws to 4-6 in-lbs. Do not over-torque as damage to the carrier or drive may result.

7. Drive carrier assembly is complete.

The following illustration shows the completed drive carrier assembly with a 2.5" disk drive and interposer card properly installed.

JETSTOR SAS 760J/JD Drive Carrier Assembly (2.5" Drive with Interposer)

Chapter 10 Appendix D: Replacing Enclosure Components

This section covers the replacement of components in the JETSTOR SAS 760J/JD storage enclosure.

10.1 INTRODUCTION / GENERAL CAUTIONS

There are 3 major components of the JETSTOR SAS 760J/JD enclosure that are customer replaceable. All three of the components are hot-swappable, meaning that they can be pulled and replaced while the unit is in operation.

- **Disk Drives**
- **Power & Cooling Modules (PCM)**
- **I/O Controller Modules**

⚠ **Caution:** Before touching any of the enclosure components, ground yourself and take antistatic precautions. Use an antistatic wrist strap and a grounding wire as a minimum precaution.

⚠ **Caution:** The JETSTOR SAS 760J/JD is intended to run with two PCMs and at least one I/O controller (maximum two I/O controllers) installed. If only one I/O controller is being used, an I/O 'blank' must be installed in the other slot to maintain proper temperatures within the box.

⚠ **Caution:** When replacing any component in the JETSTOR SAS 760J/JD, it is recommended that the replacement be installed within **five minutes** to maintain proper cooling. The JETSTOR SAS 760J/JD will sound an alarm if an overtemp condition is reached. If this is not addressed, the potential exists for the unit to perform an auto-shutdown to protect the internal components from thermal damage.

10.2 REPLACING / INSTALLING DISK DRIVES

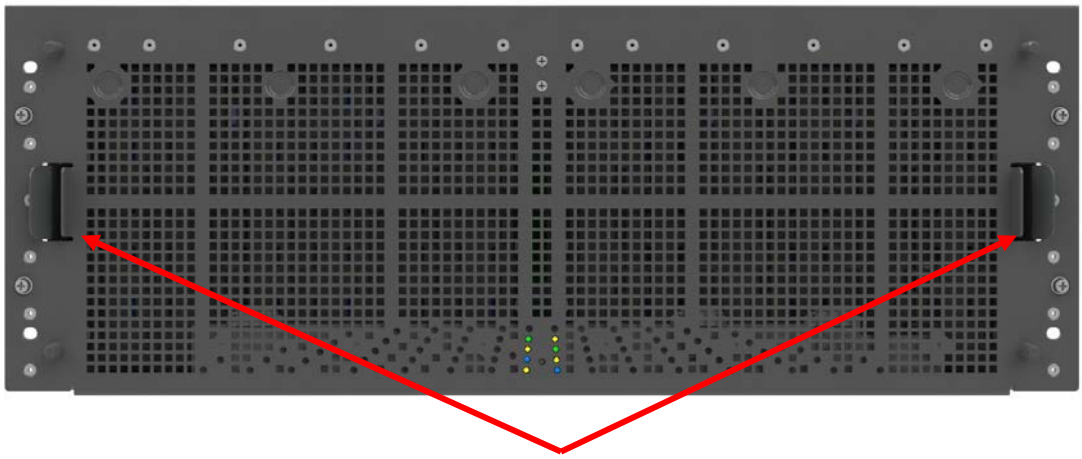
This section covers the replacement or installation of the disk drive carrier assembly for the JETSTOR SAS 760J/JD.

If the drives are new and not installed into carriers, please refer to Appendix C of this manual prior to installing the drives into the JETSTOR SAS 760J/JD enclosure. Drive carriers are required for each disk drive. If interposer cards will be used, this is also the time to install them in the drive/carrier assembly.

⚠ Caution: Ensure that disk drives are at room temperature before installing in the JETSTOR SAS 760J/JD. It is recommended that drives are allowed at least two hours to acclimate to room temperature before using them.

⚠ Caution: When handling disk drives, be sure to take static precautions (wrist straps, grounded ESD mat, etc.).

1. Follow the steps below to install or replace a drive in the JETSTOR SAS 760J/JD.
2. Ensure the drive(s) to be installed have acclimated to room temperature and have been installed into the drive carrier.
3. If the JETSTOR SAS 760J/JD is running (power on) and being used, ensure that the drive(s) to be replaced has no I/O activity.
4. Squeeze the release tabs together on the front of the JETSTOR SAS 760J/JD enclosure and carefully pull it forward out of the rack.



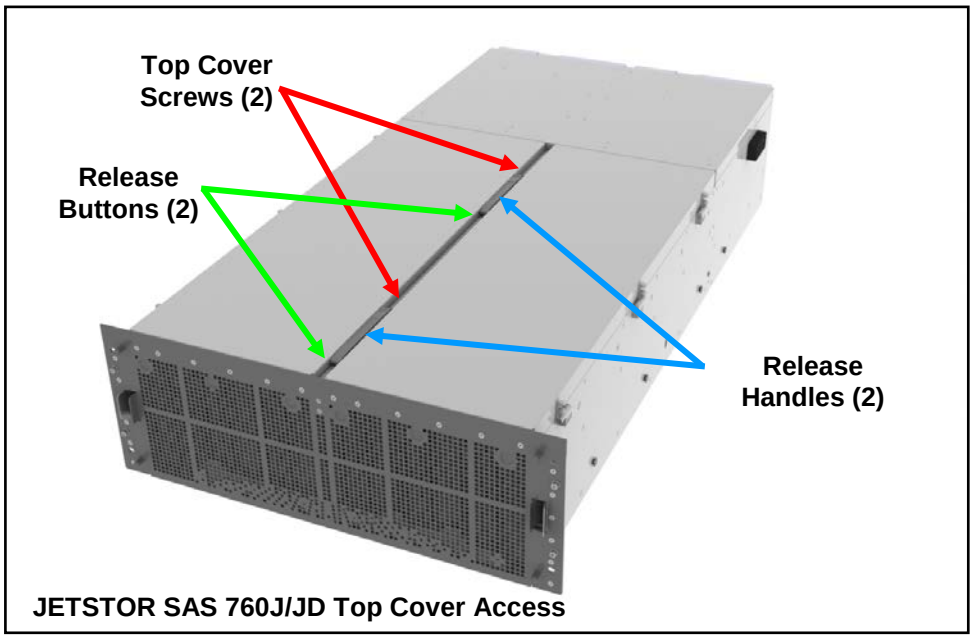
JETSTOR SAS 760J/JD Release Tabs

5. Pull the enclosure out far enough to allow the top access panels to be opened. The rails will ‘lock’ into a service position.

Pull enclosure out until green rail tabs click into place

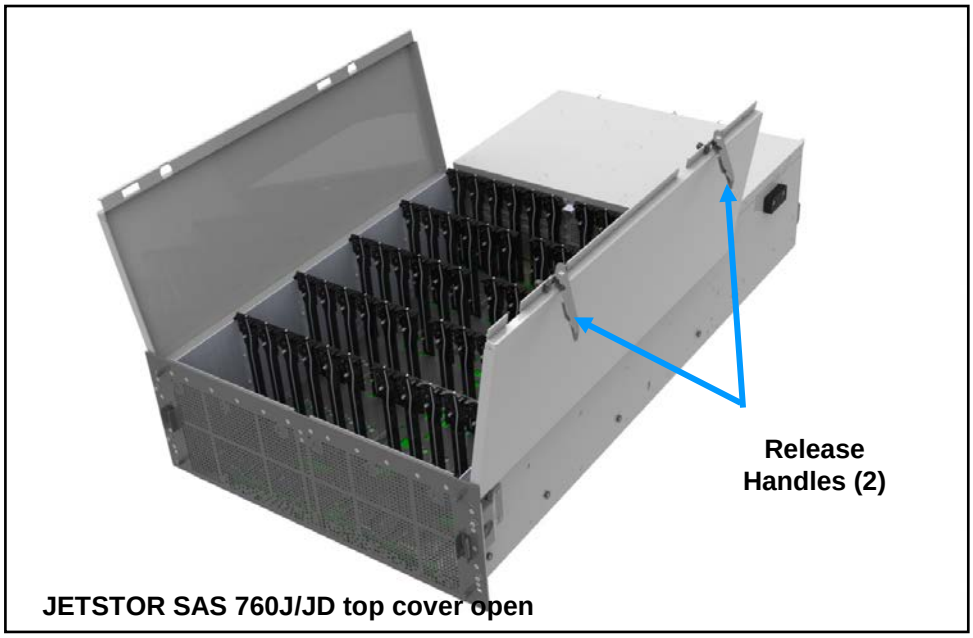
6. Loosen the two top cover screws.

7. Press the release buttons on the top cover release handles.



JETSTOR SAS 760J/JD Top Cover Access

9. Pull up on the release handles to open the top covers.



JETSTOR SAS 760J/JD top cover open

NOTE: The JETSTOR SAS 760J/JD enclosure is designed to remain operational during a service action such as replacing a drive, I/O module or power supply. When replacing a disk drive the enclosure management firmware will detect a cover-open condition, will sound an intermittent alarm and cause the fans to go to high speed. It is recommended that the drives be replaced as soon as possible when the cover is open during operation. Leaving the top covers open for an extended period will cause an overtemp condition which will sound a continuous alarm. It is recommended that when hot-swapping any device in the JETSTOR SAS 760J/JD, this action be completed within **five minutes** to maintain proper cooling.

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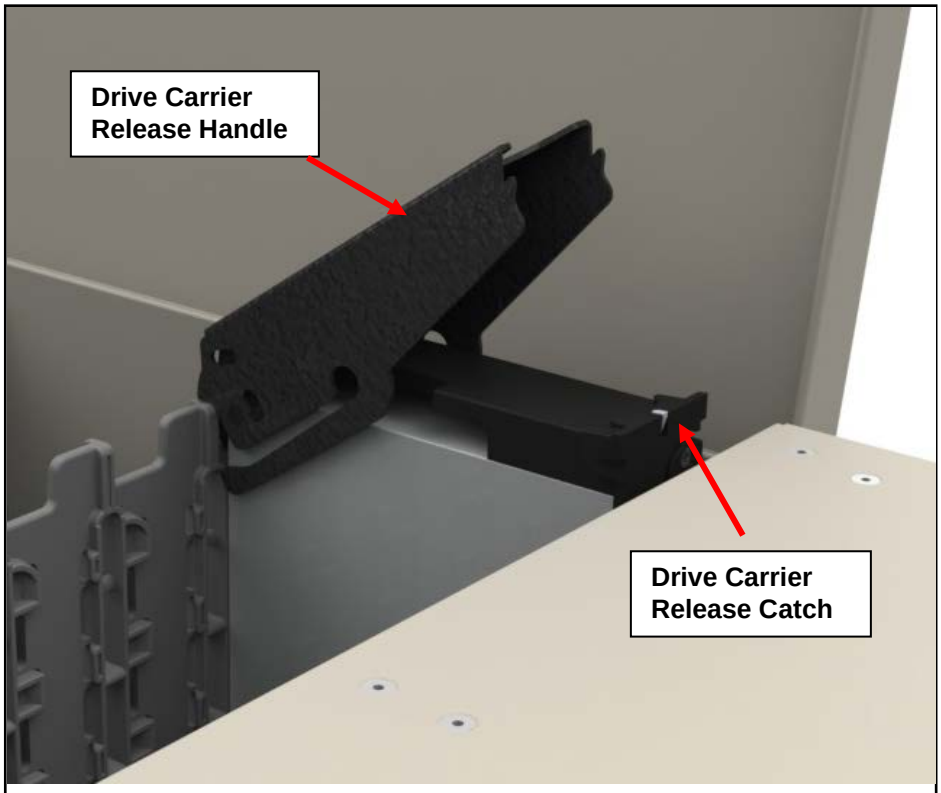
10. To remove a drive, press the release catch on the drive carrier to release the handle as shown in the following illustration.



Removing a drive from the JETSTOR SAS 760J/JD enclosure

11. Carefully slide the drive carrier (with drive installed) out of the selected slot.

12. To install the replacement drive, depress the release button the drive carrier to release the handle and carefully insert the drive until it contacts the baseboard and begins to engage the handle. Carefully press down on the handle until it latches which will cam the drive carrier into place.

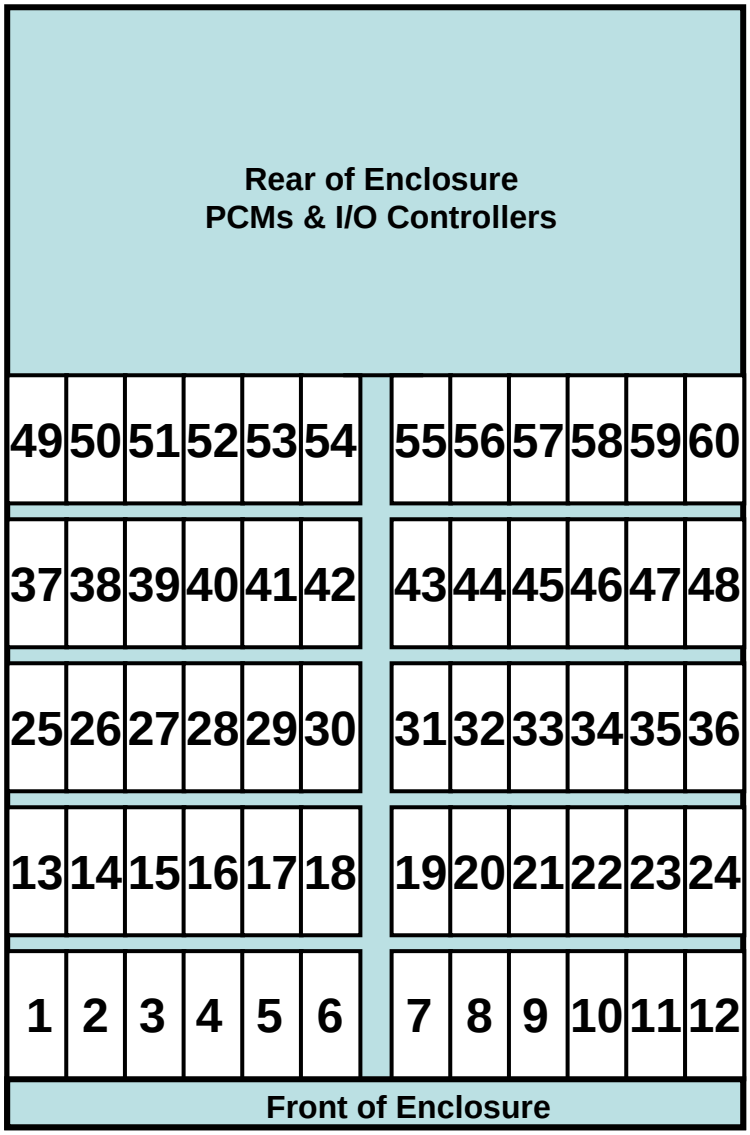
13. Repeat for any other drives to be installed or replaced.

14. Once the drives are installed close the top covers. Press latches into place and tighten the two Phillips screws.

15. Depress the green ‘press and hold’ latches on each of the two rail assemblies and carefully push the unit back into place until the front latches engage.

16. The disk drives are now installed and ready to use.

17. The drive mapping for the JETSTOR SAS 760J/JD enclosure is shown below.



JETSTOR SAS 760J/JD

10.3 REPLACING A POWER & COOLING MODULE (PCM)

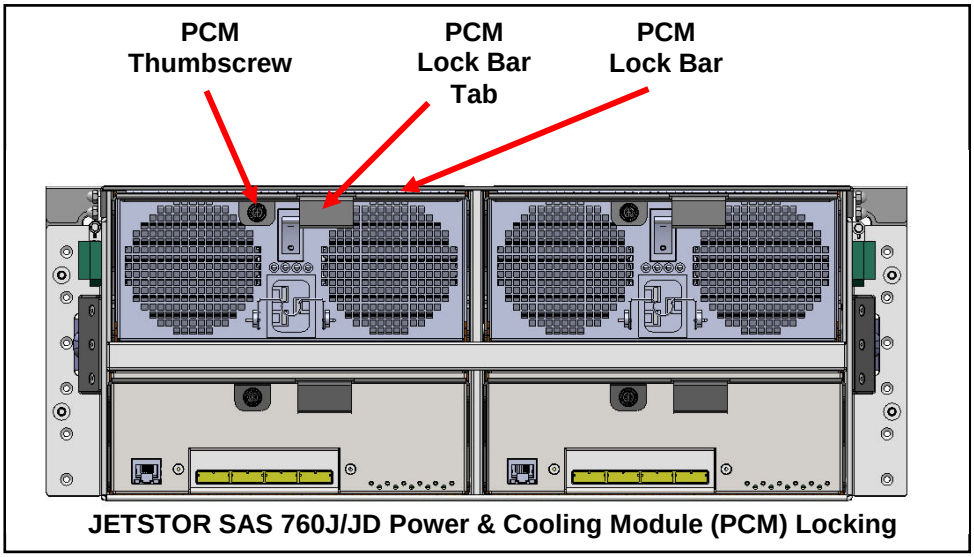
This section describes the replacement of a PCM in the JETSTOR SAS 760J/JD.

⚠ **Caution:** If replacement of a PCM is required, the fans will increase to maximum speed when the PCM is removed. This is to maintain proper cooling. Fans will return to normal operation when the replacement unit is installed and powered on.

⚠ Caution: When handling PCMs, be sure to take static precautions (wrist straps, grounded ESD mat, etc.).

Follow the steps below to replace a PCM in the JETSTOR SAS 760J/JD.

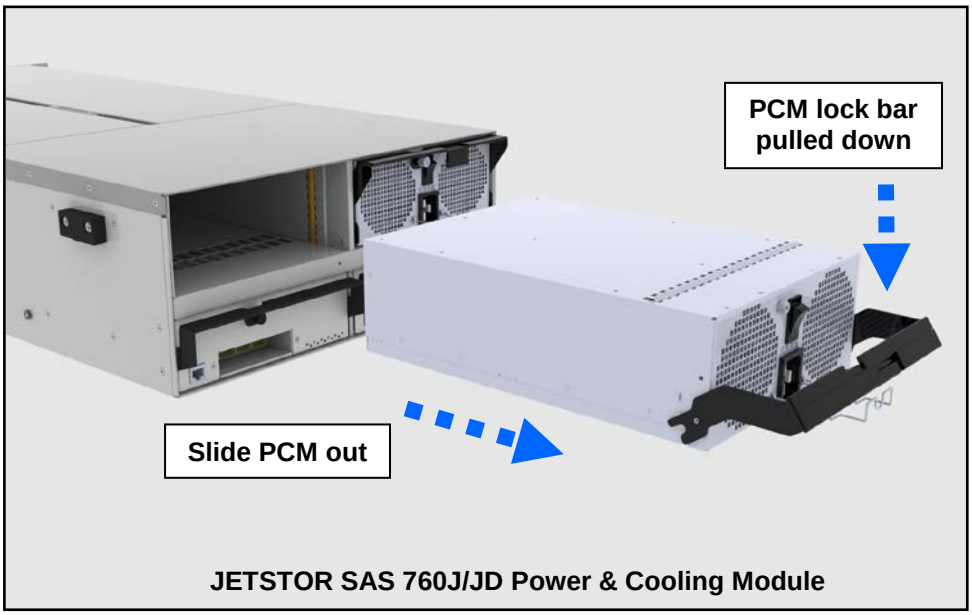
1. Power off the selected PCM by pressing its power switch. (Skip this step if the JETSTOR SAS 760J/JD is already powered off).
2. Remove the power cord from the PCM to be replaced.
3. Loosen the thumbscrew on the PCM to be replaced.



JETSTOR SAS 760J/JD Power & Cooling Module (PCM) Locking

4. Grasp the tab on the lock bar of the PCM and carefully pull towards you and down. This will release the cam assembly and the PCM will begin to slide out of the enclosure.

5. Continue pulling the PCM assembly completely out of the enclosure. If the cable management assembly (part of the rail kit) is installed, you may need to hold one or more cables out of the way as you remove the PCM.



JETSTOR SAS 760J/JD Power & Cooling Module

NOTE: The JETSTOR SAS 760J/JD enclosure is designed to remain operational during a service action such as replacing a drive, I/O module or power supply. During this time, the enclosure firmware will detect the removal of a key component and will sound an intermittent alarm and cause the fans to go to high speed. Leaving the PCM out will eventually cause an overtemp condition which will sound a continuous alarm. It is recommended that when hot-swapping any device in the JETSTOR SAS 760J/JD, this action be completed within **five minutes** to maintain proper cooling.

6. Slide in the replacement PCM and engage the locking bar to cam the unit into place.

7. Tighten the PCM thumbscrew.

8. Replace the PCM power cord.

9. Press the power-on switch.

10. After a few moments, the JETSTOR SAS 760J/JD will detect the replacement PCM. At this time, the alarm will go off (along with any failure LEDs), and the cooling fans will return to normal speed.

11. This completes the PCM replacement steps.

10.4 REPLACING AN I/O CONTROLLER MODULE

This section describes how to remove and replace a JETSTOR SAS 760J/JD I/O Controller Module.

⚠ **Caution:** If replacement of an I/O controller module is required, the fans (in the PCMs) will increase to maximum speed when the I/O controller is removed. This is to maintain proper cooling. Fans will return to normal operation when the replacement I/O controller module is inserted and powers up.

⚠ **Caution:** When handling I/O controller modules, be sure to take static precautions (wrist straps, grounded ESD mat, etc.).

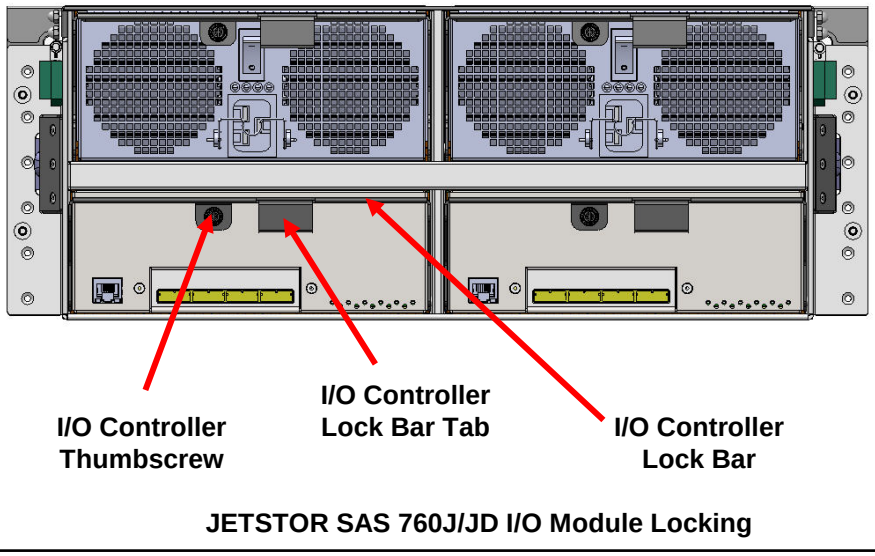
Follow the steps below to replace an I/O Controller in the JETSTOR SAS 760J/JD.

1. If the JETSTOR SAS 760J/JD is powered on (hot-swapping the I/O Controller), ensure that there are no data transactions taking place on the I/O Controller to be replaced.

2. Remove the I/O cables from the controller to be replaced (up to four may be installed). Label the cables as they will need to be installed in the same ports of the replacement unit. This is particularly important if your JETSTOR SAS 760J/JD is in a zoned configuration.

3. Loosen the thumbscrew on the controller to be replaced.

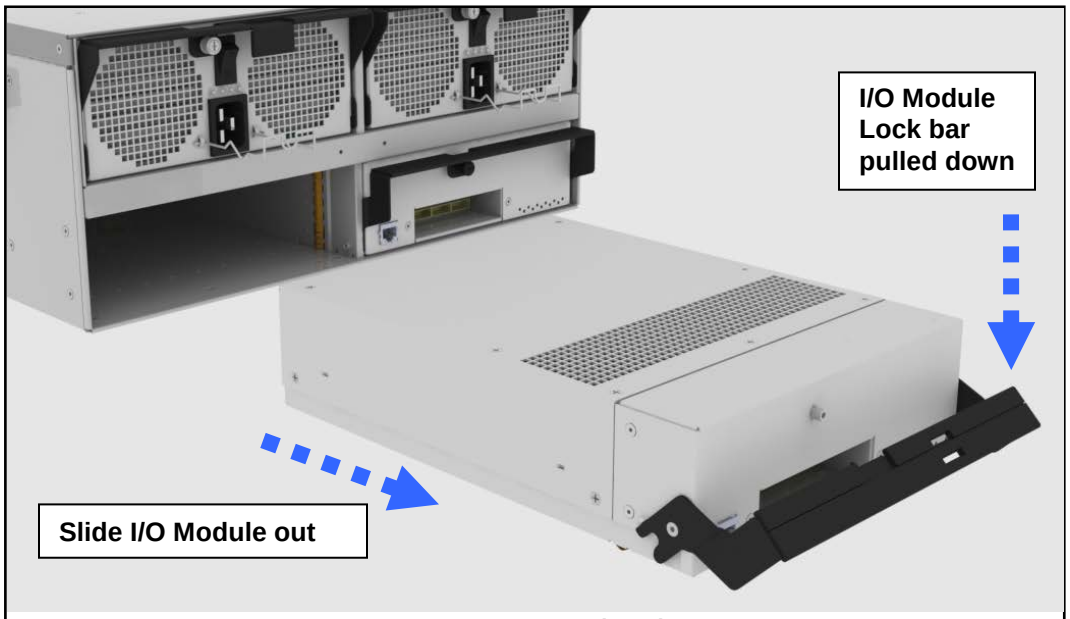
4. Grasp the tab on the lock bar of the I/O Controller and carefully pull towards you and down. This will release the cam assembly and the I/O Controller module will begin to slide out of the enclosure.



JETSTOR SAS 760J/JD I/O Module Locking

5. Grasp the tab on the lock bar of the I/O Controller and carefully pull towards you and down. This will release the cam assembly and the I/O Controller module will begin to slide out of the enclosure.

6. Continue pulling the I/O Controller assembly completely out of the enclosure. If the cable management assembly (part of the rail kit) is installed, you may need to hold one or more cables out of the way as you remove the I/O Controller Module.



JETSTOR SAS 760J/JD I/O

NOTE: The JETSTOR SAS 760J/JD enclosure is designed to remain operational during a service action such as replacing a drive, I/O module or power supply. During this time, the enclosure firmware will detect the removal of a key component and will cause the fans in the PCMs to go to high speed. It is recommended that when hot-swapping any device in the JETSTOR SAS 760J/JD, this action be completed within **five minutes** to maintain proper cooling.

7. Slide in the replacement I/O Controller Module and engage the locking bar to cam the unit into place.

8. Tighten the I/O Controller thumbscrew.

9. Replace the I/O Controller cables to their original port connectors.

After a few moments, the JETSTOR SAS 760J/JD will detect the replacement I/O Controller Module. At this time the cooling fans will return to normal operation.

10. This completes the I/O Controller Module replacement steps.

Chapter 11 Appendix E: JETSTOR SAS 760J/JD Zoning Configurations

This appendix covers the zoning configurations available for the JETSTOR SAS 760J/JD.

11.1 OVERVIEW / DRIVE GROUPINGS

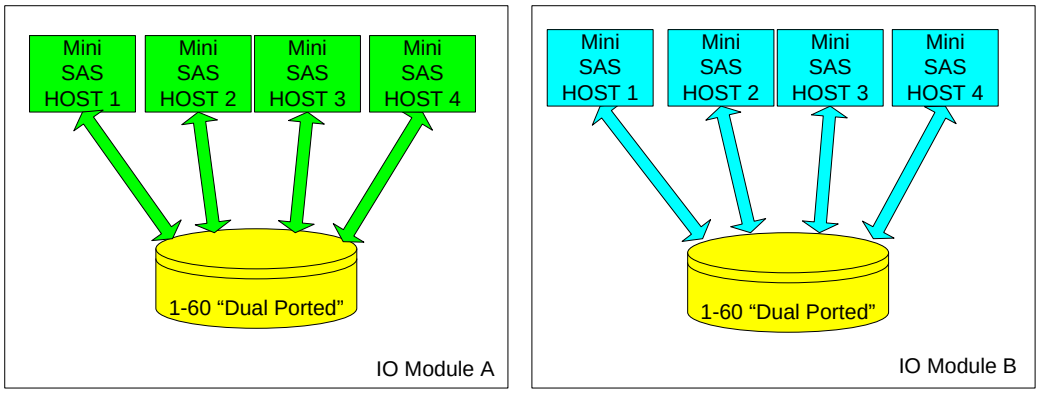
The JETSTOR SAS 760J/JD enclosure features provide for zoning on the I/O modules. This allows the input ports on the I/O modules to be assigned specifically to particular drives in the system.

The JETSTOR SAS 760J/JD supports four different zoning configurations as defined in the following tables and illustrations.

Drive Group 1		**Drive Group 2**		***Drive Group 3***	***Drive Group 4***	***Drive Group 5***	***Drive Group 6***
7	10	1	4	10	7	4	1
19	22	13	16	22	19	16	13
31	34	25	28	34	31	28	25
43	46	37	40	46	43	40	37
55	58	49	52	58	55	52	49
8	11	2	5	11	8	5	2
20	23	14	17	23	20	17	14
32	35	26	29	35	32	29	26
44	47	38	41	47	44	41	38
56	59	50	53	59	56	53	50
9	12	3	6	12	9	6	3
21	24	15	18	24	21	18	15
33	36	27	30	36	33	30	27
45	48	39	42	48	45	42	39
57	60	51	54	60	57	54	51

11.2 ZONING CONFIGURATION 0: DEFAULT SINGLE ZONE

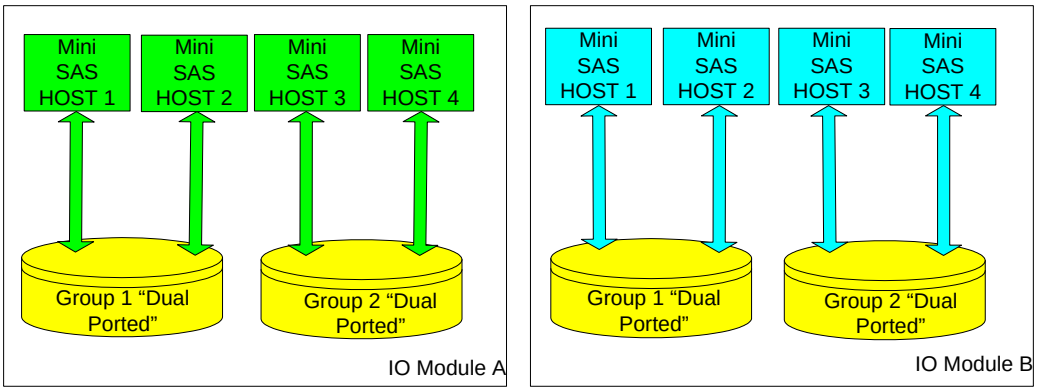
In this configuration, all installed drives are available to all of the host ports on both I/O controllers.



Zone 0 Configuration

11.3 ZONING CONFIGURATION 1

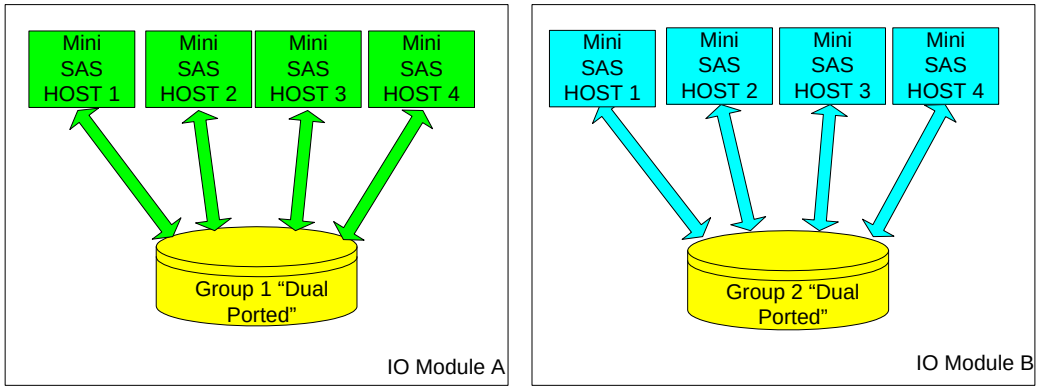
In this configuration, drives 1-30 are available to host ports 1 and 2 on both controllers and drives 31-60 are available to host ports 3 and 4 on both controllers. The Array Device elements represent either the devices in the enclosure's Drive Group 1 or devices in Drive Group 2.



Zone 1 Configuration

11.4 ZONING CONFIGURATION 2

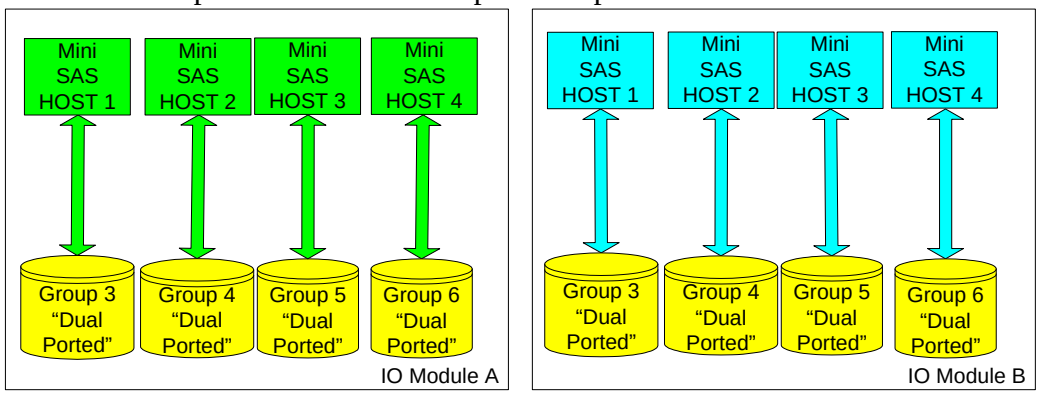
When zoning configuration 2 is active, 30 drives are presented to each host port on IO module A and 30 to each host port on IO module B. These represent either the drives in the enclosure's Drive Group 1 (IO slot A); or the drives in the enclosure's Drive Group 2 (IO slot B). If the drives are accessed through enclosure IO slot A then the drives present in Drive Group 1 are reported. If the drives are accessed through enclosure IO slot B then the drives present in Drive Group 2 are reported.



Zone 2 Configuration

11.5 ZONING CONFIGURATION 3

When zoning configuration 3 is active, there are 15 drives presented to each host port. If the drives are accessed through enclosure Host Port 1 on either I/O then the drives present in Drive Group 1 are reported. If the drives are accessed through enclosure Host Port 2 on either I/O then the drives present in Drive Group 2 are reported. If the drives are accessed through enclosure Host Port 3 on either I/O then the drives present in Drive Group 3 are reported. If the drives are accessed through enclosure Host Port 4 on either I/O then the drives present in Drive Group 4 are reported.



Zone 3 Configuration