VTrak J5000 Series

12G SAS JBOD enclosure

Product Manual

Version 1.2

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Warning

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Warning

The electronic components within the enclosure are sensitive to damage from Electro-Static Discharge (ESD). Observe appropriate precautions at all times when handling the enclosure or its subassemblies.

Warning

Turn off the power and disconnect the power cord before servicing this device.

Also included are four levels of notices:

Warning

A Warning notifies you of probable equipment damage or loss of data, or the possibility of physical injury, and how to avoid them.

Caution

A Caution informs you of possible equipment damage or loss of data and how to avoid them.

Important

An Important message calls attention to an essential step or point required to complete a task, including things often missed.

Note

A Note provides helpful information such as hints or alternative ways of doing a task.

About This Manual

This Product Manual describes how to setup, use, and maintain the VTrak J5000 Series JBOD storage enclosure. The manual is organized into chapters as follows:

- “Introduction” on page 1
- “Hardware Installation” on page 10
- “Managing the J5000 Series” on page 41
- “Maintenance” on page 56
- “Zone Configuration” on page 67
- “Contact PROMISE” on page 86

About This Manual iv

Introduction 1

Features 2

VTrak J5000 Series Models 2

Specifications 3

Front Panel Hardware 5

Rear Panel Hardware 7

SAS port identification 7

Hardware Installation 10

Unpacking 11

Packing List 11

Mounting the VTrak enclosure in a rack 12

Mounting the VTrak J5600/VTrak J5800 13

Mounting the VTrak J5300/J5320 16

Installing Physical Drives 19

Drive Slot Numbering 20

Installing Your Drives 22

3.5-inch Hard Disk Drives 22

2.5-inch Hard Disk Drives 24

Management and Data Connections 26

Serial Cable Connections 27

Serial Connection Settings 27

Pinout references 28

RJ-11 Serial Port pinout 28

Management port RJ-45 pinout 28

DB-9 pinout for RJ-11 to DB-9 serial cable 29

DAS Connection 30

Basic DAS Connection 30

Cascading DAS Connection 31

Redundant Cascading DAS Connection 32

Connect the Power 33

Power on system 34

Power on VTrak J5300 34

Front LED behavior after booting up 36

Drive Status LED Behavior After Boot Up 38

Controller LED behavior 40

Managing the J5000 Series 41

Making a Serial Connection 42

Logging Into the CLI 42

JBOD Utility CLI 43

Telnet Service 43

CLI Conventions 43

CLI Commands 44

enclosure 45

event 48

link 49

cable 50

net 51

route 52

factorydefaults 52

uptime 52

ptiflash 53

vpdr 54

version 55

help/? 55

Maintenance 56

Replacing a power supply 57

VTrak J5300 and VTrak J5320 PSU 57

Removing the power supply 57

Installing the new power supply 58

VTrak J5600 and VTrak J5800 PSU 59

Removing the old power supply 59

Installing the new power supply 59

Replacing a controller module 60

Removing the old I/O module 60

Installing a new controller 60

Remove controller 61

System Firmware Update 62

Updating Firmware through Serial Port (RS232) 62

Updating Firmware over IP Network (TFTP) 65

Zone Configuration 67

Zone Configuration Options 68

Zoning Configuration 0: No Zoning 70

Zoning Configuration 1 73

Zoning Configuration 2 77

Zoning Configuration 3 81

Contact PROMISE 86

INTRODUCTION

VTrak J5000 Series 12G SAS JBOD enclosures are designed for high performance computing application of mass capacity storage. Each dual-controller VTrak J5000 enclosure is equipped with eight 12G SAS (four per controller) connections. The VTrak J5000 controller enables high-speed data rates via mini-SAS SFF-8644 cable connections for direct attached servers or for mass storage expansion.

The main sections in this chapter include the following:

- “Features” on page 2
- “VTrak J5000 Series Models” on page 2
- “Specifications” on page 3
- “Front Panel Hardware” on page 5
- “Rear Panel Hardware” on page 7

Features

- High performance SAS
- 12, 16, or 24 hot-swappable drive bays in a 2U, 3U or 4U chassis
- Supports Serial Attached SCSI (SAS) and SATA drives simultaneously
- Dual active/active SAS JBOD I/O modules provide redundant data paths to ensure data availability
- Up to four wide SAS (x4) ports, two x8 wide ports or one x16 wide port per I/O module
- Redundant hot-swappable Field Replaceable Units (FRUs), including controller and Power Supply Units (PSU)
- SES-2 compliant enclosure management
- Compatible with leading SAS & SATA drives, HBAs and RAID controllers

VTrak J5000 Series Models

Model	Controller Units	Interface	Number of Drives	Power Supplies
J5800	2	SFF-8644 SAS	24	2
J5600	2	SFF-8644 SAS	16	2
J5300	2	SFF-8644 SAS	12	2
J5320	2	SFF-8644 SAS	24	2

SPECIFICATIONS

VTrak J5000	2U/12 Bay	2U/24 Bay	3U/16 Bay	4U/24 Bay
Model	**J5300**	**J5320**	**J5600**	**J5800**
Drive Support	Up to 12 3.5” drives	Up to 24 2.5” drives	Up to 16 3.5” drives	Up to 24 3.5” drives
12G, 6 G, 3G, SAS, 6G, 3G SATA HDD and SSD*				
External I/O Ports	Each controller module has 4 SAS (SFF--8644) I/O ports for cascading JBODs and Direct Attached Storage.			
SAS Features	*ANSI T10 SAS 3.0 Compliant*			
Expander Management Features	Self--configuring expander supports full SAS domain topology management SMP – SAS Management Protocol In--band access to Expander and PHY information Statistic counters SES EM – SES Enclosure Management (ANSI T10 SES 2 Compliant) SCSI SES command set over virtual SSP device			
System Management				
Management Interfaces	LED status indicator support for drives, FRU and enclosure environmentals In--band SES enclosure management alerts user to out of spec operation: thermal condition, voltage condition or component failures, protecting data and hardware Full subsystem management CLI through out--of--band RS232 serial port			
Enclosure Management Protocols	SES over in--band SAS			

* *A mix of SAS and SATA drives simultaneously in the same enclosure might be supported, depending on the model of HBA used, and the model and firmware of drives used. Please consult PROMISE before mixing drive types in a single enclosure.*

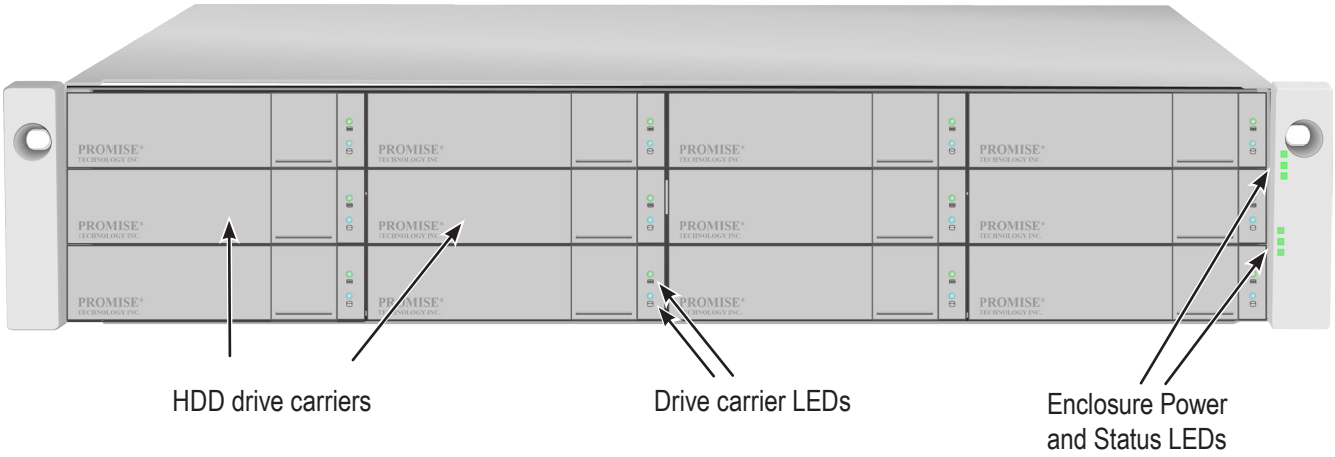
Model	J5300	J5320	J5600	J5800
Mechanical Specifications				
Drive Support	Up to 12 3.5" drives	Up to 24 2.5" drives	Up to 16 3.5" drives	Up to 24 3.5" drives
Dimensions (H x W x D)	88 mm (3.5 in), 447 mm (17.6 in), 507 mm (19.9 in)	88 mm (3.5 in) 447 mm (17.6 in) 427 mm (16.8 in)	131 mm (5.2 in) 447 mm (17.6 in) 507 mm (19.9 in)	174 mm (3.5 in) 447 mm (17.6 in) 507 mm (19.9 in)
Weight	20 (44 lbs) w/o drives 29 (64 lbs) w/drives	23 (51 lbs) w/o drives 28 (62 lbs) w/drives	29 (64 lbs) w/o drives 40 (88 lbs) w/drives	30 (66 lbs) w/o drives 47(104 lbs) w/drives
Voltage	100--240 Vac Auto--Ranging			
Current (Maximum)	15 A @ 110 VAC; 6 A @ 240 VAC			
Power Conversion Efficiency	>80% @ 110V (>20% load), >80% @ 240V (>20% load)			
Temperature Range	Operational: 5° to 35°C, Non--Operational: --40° to 70°C			
Humidity	Operational: 20% to 80% (Non--Condensing) Non--Operational: 5% to 95% (Non--Condensing)			
Acoustic Noise Levels	Less than 60 dB when ambient temperatures is below 25° C with HDD installed			
Shock	Operating: Half sine wave, 5 gn, 11 ms, X, Y, Z axes, 6 surfaces, 3 times /each surface Half sine wave, 30 gn, 11 ms. X, Y, Z axes, 6 surfaces, 3 times/each surface (with HDD installed)			
Vibration	Operating Condition 1: Sine wave 0.5 oct/min, 5 to 500 Hz, 0.2 G, 30 min for X, Y, Z axis Condition 2: Random, 3-10-200-500 Hz, 0.41 grams,30 min for X, Y, Z axes Non-Operating Condition 1: Sine wave 0.5 oct/min, 5 to 500 Hz, 1G, 30 min for X, Y, Z axes Condition 2: Random, 5-80-350-500 Hz, 2.256 grams, 30 min for X, Y, Z axes			
Regulatory Certificate	EMC Class A: CE, FCC, VCCI, BSMI, RCM and KC **Safety**: IEEE CB, UL/cUL and TUV			
Environmental Standards	RoHS, GreenPC, WEEE			
Power Supply	Efficient 80 PLUS GOLD certified redundant PSU			

Front Panel Hardware

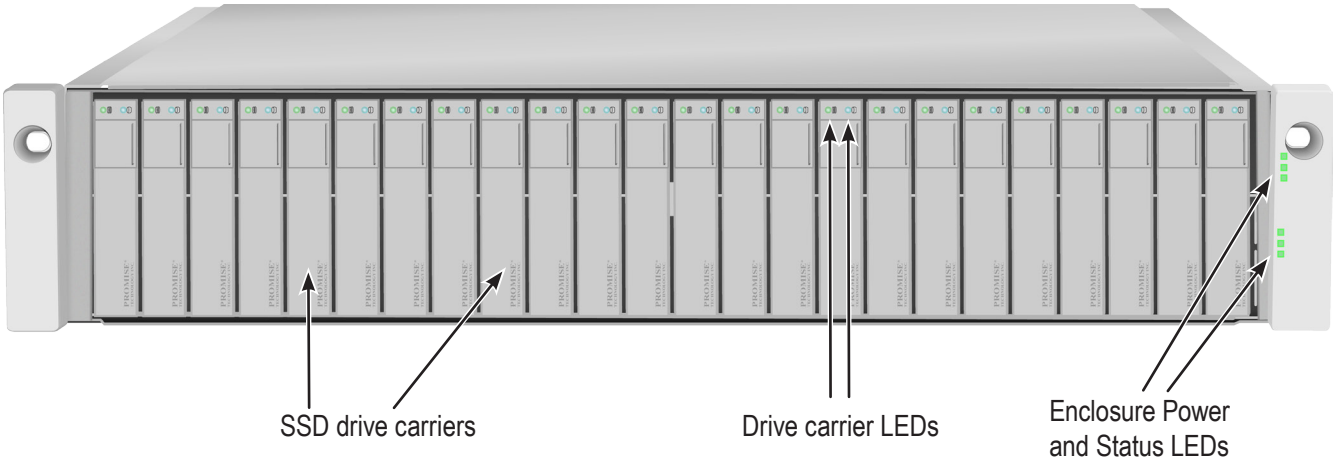
The front panel of VTrak J5000 enclosures provide access to storage disk drive carriers, a view of drive status LED indicators located on the front of each drive carrier, the LED indicators for system monitoring.

See the illustrations of the front view of each model below.

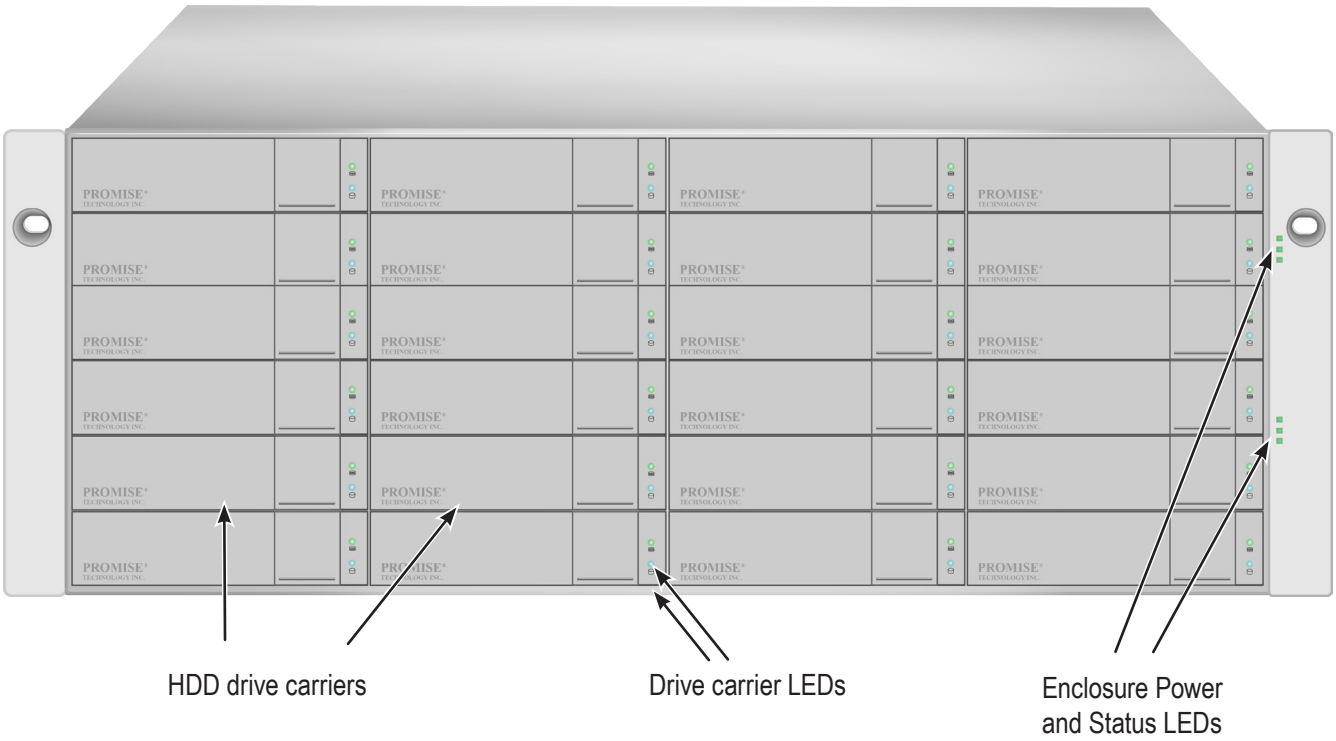
VTrak J5300 front view



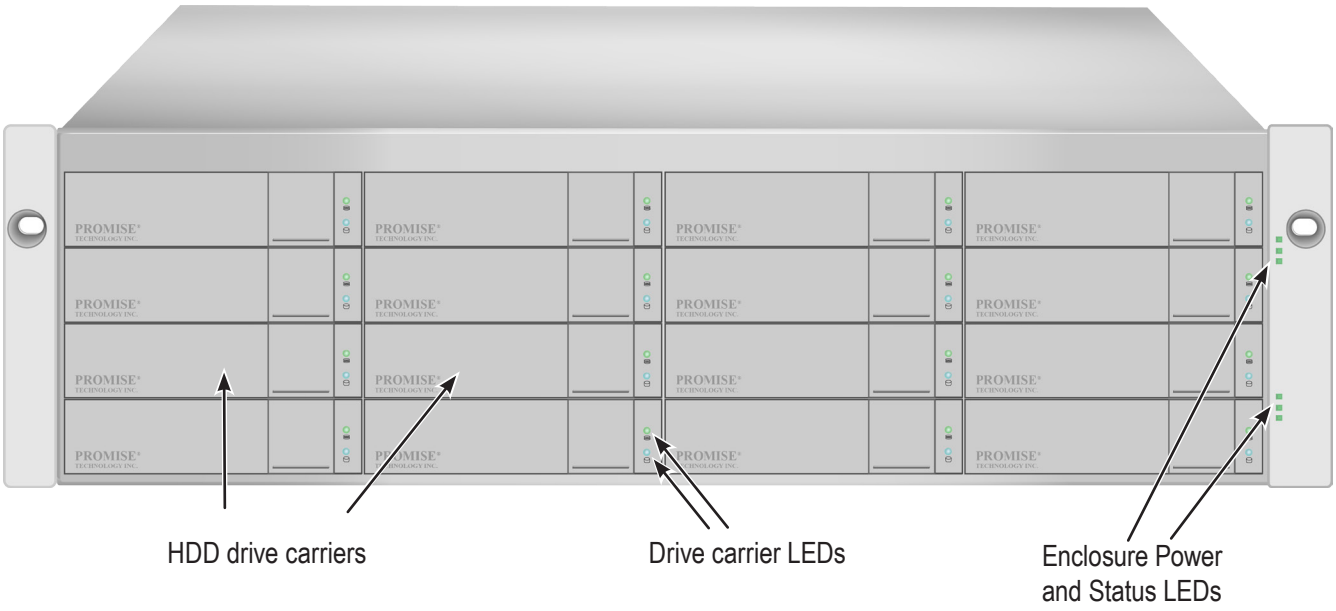
VTrak J5320 front view



VTrak J5800 front view



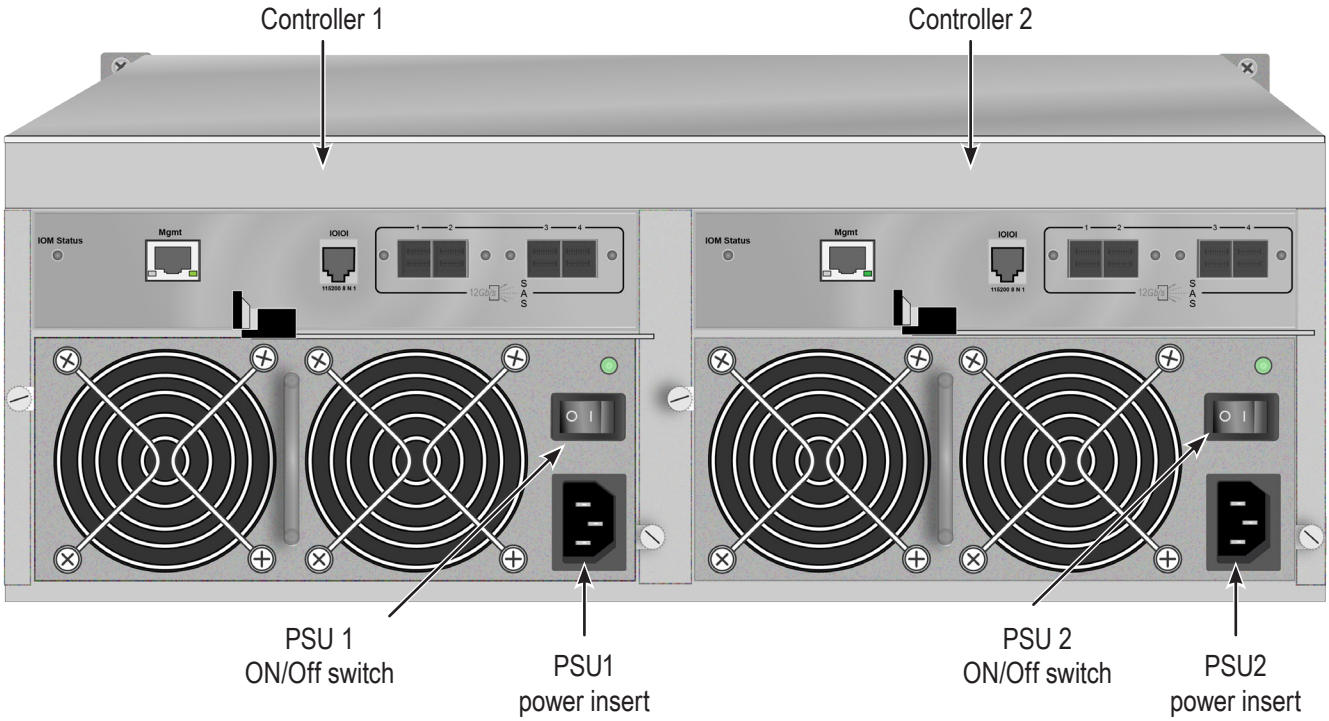
VTrak J5600 front view



Rear Panel Hardware

The rear panel of the VTrak J5000 features dual controllers for SFF-8644 SAS uplink connection (4 I/O ports per controller), 1G network ports used for system monitoring, serial port management connection, two hot-swappable power supplies, system cooling units, and power supply ON/OFF switches. For details about ports, LEDs, connection types and other hardware setup information, please see “Hardware Installation” on page 10.

VTrak J5800 rear view



SAS PORT IDENTIFICATION

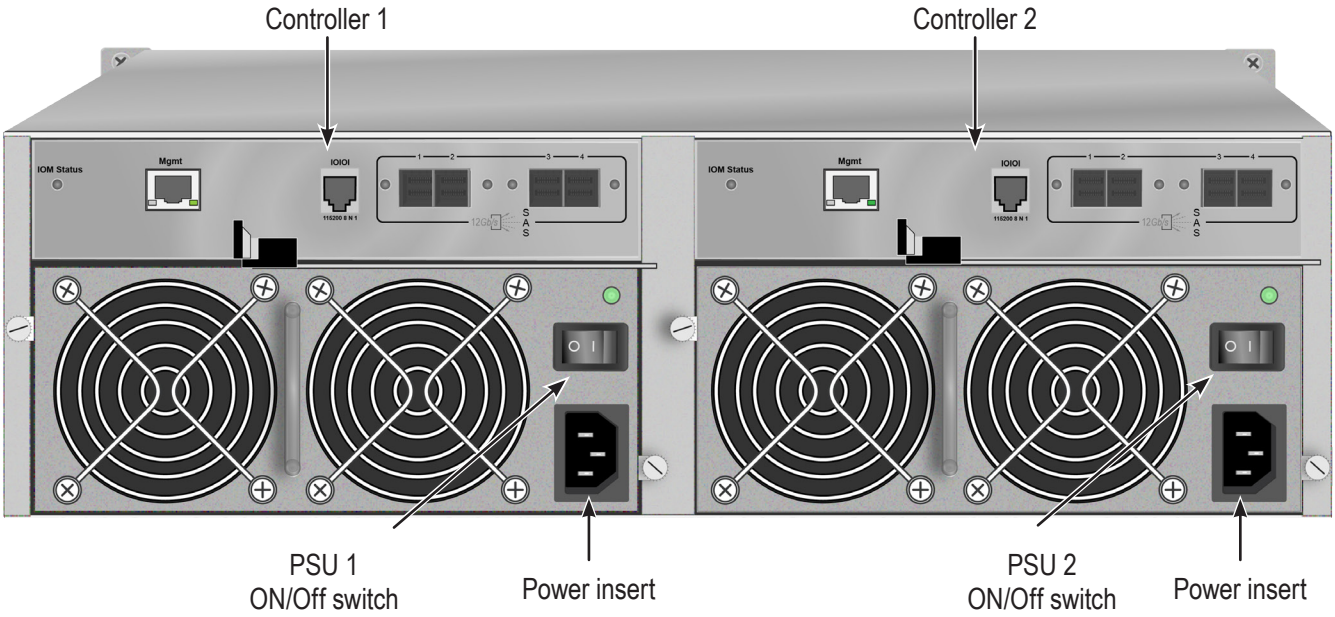
Please take a moment to note how the eight SAS ports are identified in the connection instructions that follow. SAS ports are numbered 1 to 4, left to right, for each controller module, the controller modules are also numbered left to right.

The SAS port furthest left is identified as Controller 1: Port 1.

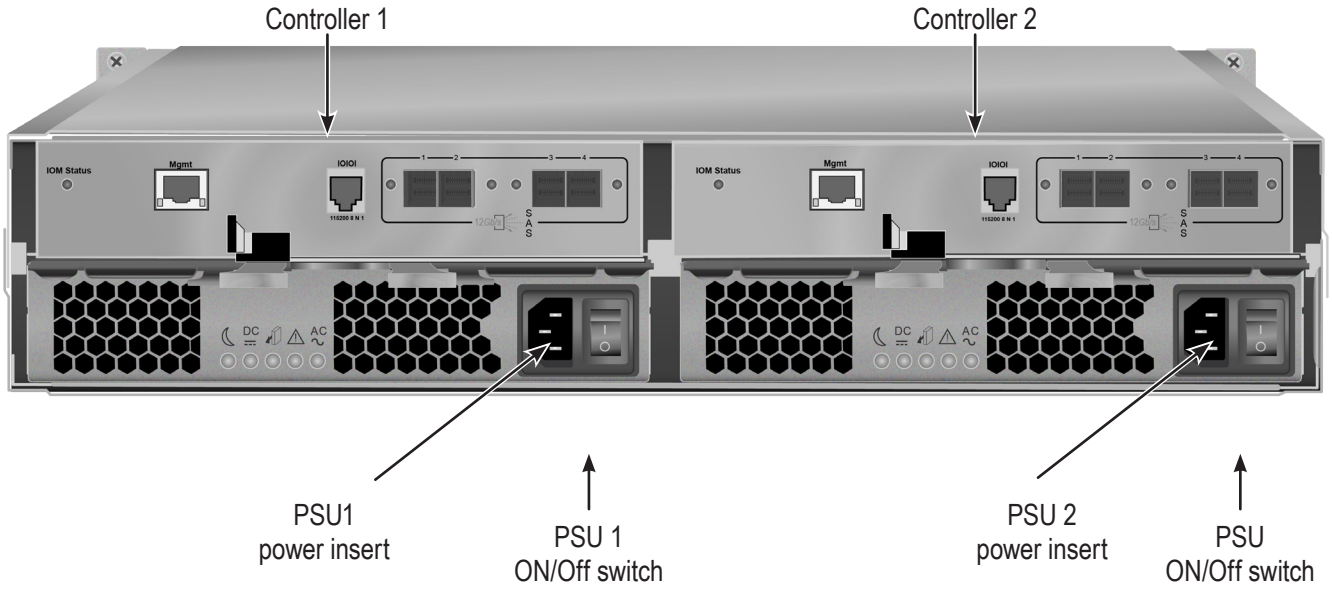
The SAS port furthest right is identified as Controller 2: Port 4.

See “Ports for in-band and out-of-band management connection on VTrak J5000 controller” on page 26 for a closer look at the controller front panel.

VTrak J5600 rear view



VTrak J5300 and VTrak J5320 rear view



Warranty and Support

Warranty

- Three year complete system limited warranty
- Optional 2-year extended warranty
- Optional onsite parts replacement program

Promise Technology, Inc. ("Promise") warrants that for three (3) years from the time of the delivery of the product to the original end user

a) the product will conform to Promise's specifications;

b) the product will be free from defects in material and workmanship under normal use and service.

This warranty:

a) applies only to products which are new and in cartons on the date of purchase;

b) is not transferable;

c) is valid only when accompanied by a copy of the original purchase invoice;

d) is not valid on spare parts.

This warranty shall not apply to defects resulting from:

a) improper or inadequate maintenance, or unauthorized modification(s), performed by the end user;

b) operation outside the environmental specifications for the product;

c) accident, misuse, negligence, misapplication, abuse, natural or personal disaster, or maintenance by anyone other than a Promise or a Promise authorized service center.

Hardware Installation

This chapter presents the basics on unpacking the VTrak J5000 Series enclosure and mounting it in an equipment rack, making the connections for data and management paths and connecting the power. It also describes how to power on the system and what to look for while it is powering up.

The main sections in Hardware Setup include the following:

- “Unpacking” on page 11
- “Mounting the VTrak enclosure in a rack” on page 12
- “Installing Physical Drives” on page 19
- “Management and Data Connections” on page 26
- “Connect the Power” on page 33
- “Power on system” on page 34

Depending on the details of your order, the VTrak J5000 enclosure might be shipped with hard drives installed, or it might require that you install hard drives. The section “Installing Physical Drives” on page 19 provides instruction for installing hard disks.

Unpacking

Packing List

The VTrak J5000 Series box contains the following items:

- One VTrak J5000 Series Unit

  VTrak J5800, VTrak J5600,

  VTrak J5300, or VTrak J5320
- One printed Quick Start Guide
- Two 1.5m (4.9 ft) Power cords
- Adjustable rack mounting rail assembly
- Two SFF-8644 SAS cables
- Two RJ11 to DB9 adapter cables

Warning

The electronic components within the VTrak enclosure are sensitive to damage from Electro-Static Discharge (ESD). Observe appropriate precautions at all times when handling the VTrak or its subassemblies.

Mounting the VTrak enclosure in a rack

This section provides instructions for installing the VTrak J5000 enclosure into a rack

Caution

To lighten the enclosure, remove the power supplies, and remove all hard drive carriers. Replace the power supplies and drive carriers after the unit is mounted in your rack.

Cautions

- **Do not populate any unit with hard drives until it has been securely installed in the rack.**
- **At least two persons are required to safely lift, place, and attach the unit into a rack system.**
- **Do not lift or move the unit by the handles, power supplies or the controller units. Hold the system itself.**
- **Do not install the unit into a rack without rails to support the system.**
- **Only a qualified technician who is familiar with the installation procedure should mount and install the unit.**
- **Mount the rails to the rack using the appropriate screws and flange nuts, fully tightened, at each end of the rail.**
- **Do not load the rails unless they are installed with screws as instructed.**
- **The rails available for the PROMISE VTrak unit are designed to safely support that PROMISE VTrak unit when properly installed. Additional loading on the rails is at the customer's risk.**
- **PROMISE Technology, Inc. cannot guarantee that the mounting rails will support your PROMISE VTrak unit unless you install them as instructed.**

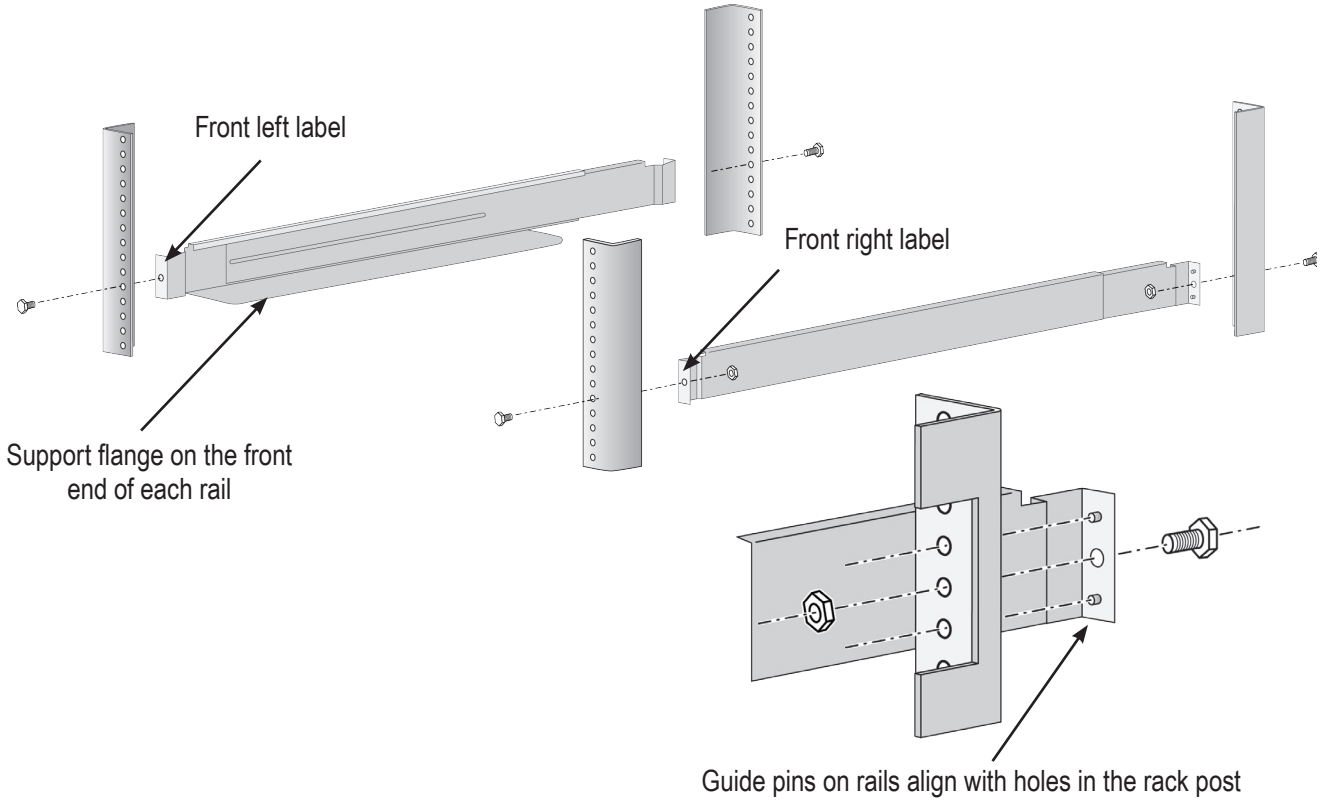
Mounting the VTrak J5600/VTrak J5800

To install the 3U/4U VTrak enclosure into a rack with the supplied mounting rails:

1. Check the fit of the mounting rails in your rack system.
2. Adjust the length of the mounting rails as needed.

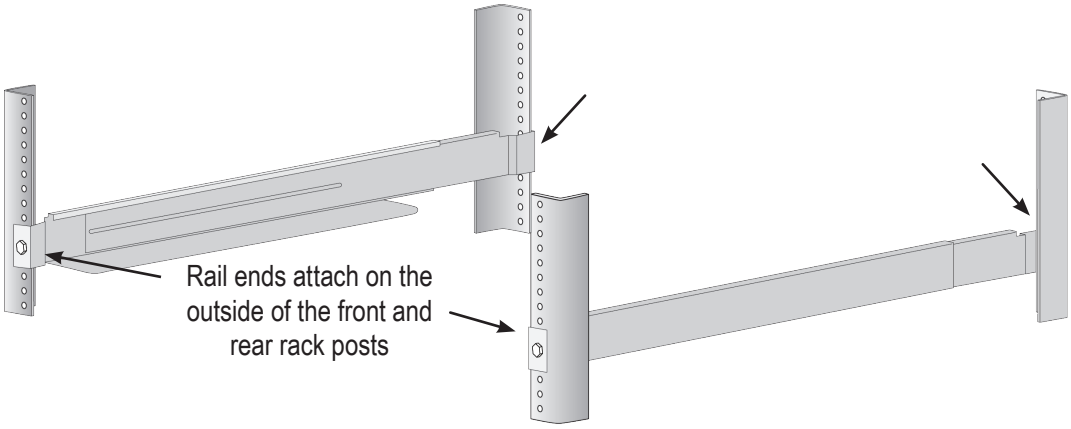
- The rear rail slides inside the front rail. The rails are composed of two sliding sections and do not require adjusting screws.
- The front-left and front-right mounting rail ends are labeled.
- Be sure the front rail support is on the bottom facing inward.

Installing the rails onto the rack



- All rail ends, front and rear, attach at the outside of the rack posts.
- The guide pins at the rail ends align with the holes in the rack posts.
- Use the attaching screws and flange nuts from your rack system. Tighten the screws and nuts according to instructions for your rack system.

Rail ends attach to the outside of each post



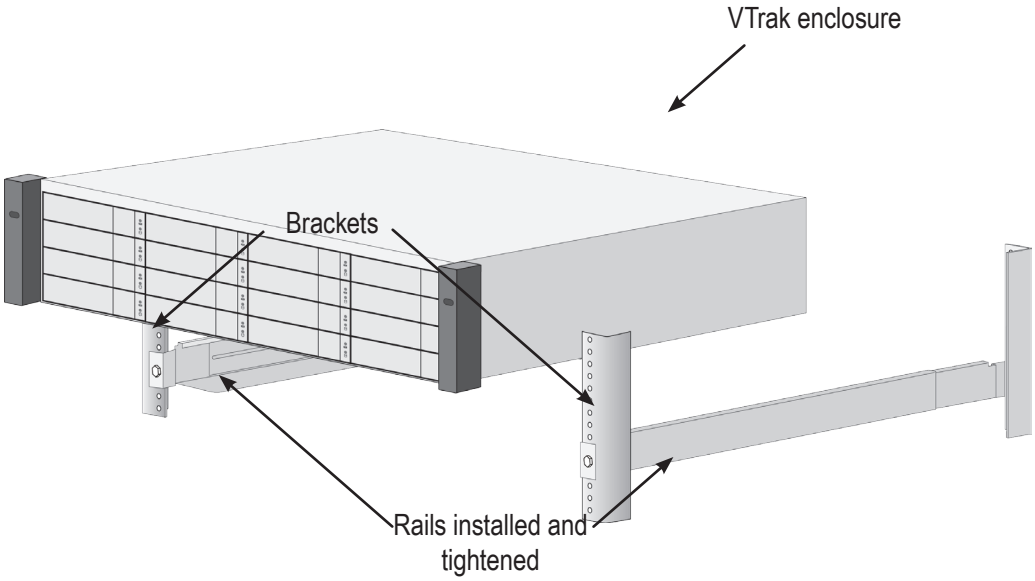
Cautions

Two persons are needed to safely place the unit onto the rails.
DO NOT lift the unit by the handles`

3. Place the VTrak onto the rails.

- At least two persons are required to safely lift the system.
- Lift the VTrak itself. Do not lift the system by its brackets.

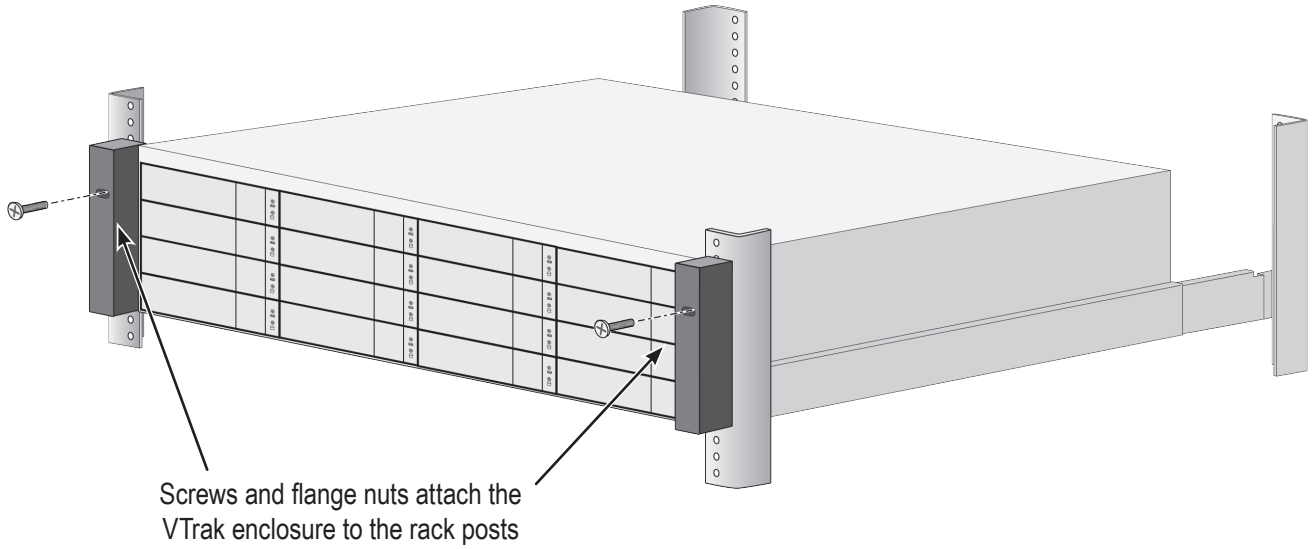
Placing the VTrak enclosure onto the rack rails



4. Secure the enclosure to the rack.

- Use the included screws and flange nuts to lock the unit in to place in the rack.
- Use the attaching screws and flange nuts that came with the VTrak enclosure.

Secure to rack

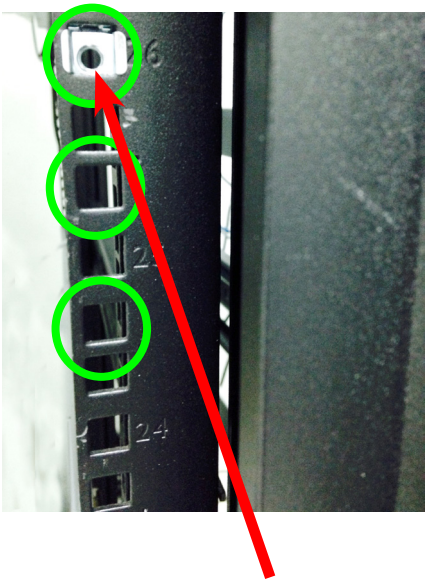


Mounting the VTrak J5300/J5320

To install the 2U VTrak enclosure into a rack with the supplied mounting rails:

1. Determine what height to place the 2U enclosure in the rack, then place the right and left rack rails at the same height on in the right and left rack position. Choose the mounting holes accordingly for your rack system. Consult the documentation for your rack if you are unsure which holes to use. Note that three holes are required on each front post, the uppermost of the three to be used for the flange nuts to anchor the enclosure to the rack posts.

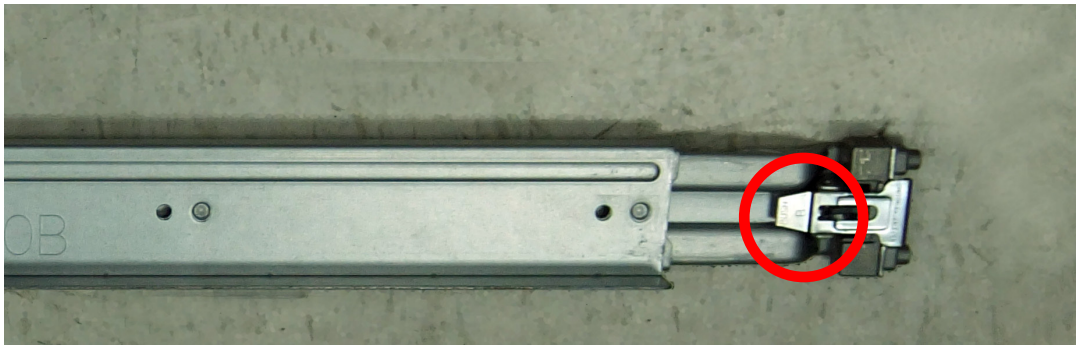
Determine position for rack rails



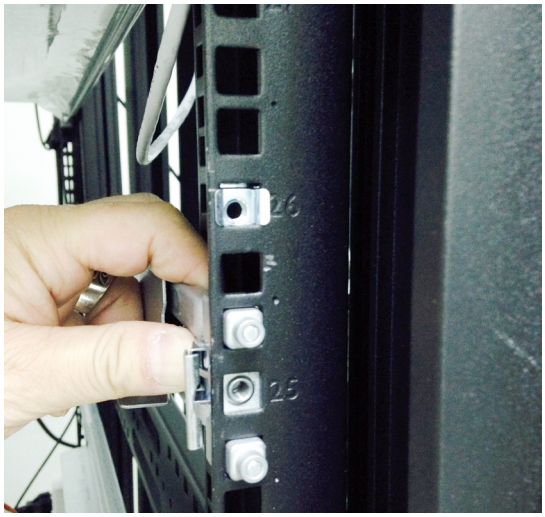
Insert flange nut in each front post

Notice that each end of the sliding rails have a lever to operate the lock mechanism that grips the rack post.

Lock release lever (back left)



Press lever to release lock (front right)



2. Secure the rails to the rack posts. Make sure the rack rails are properly oriented in the rack.

   To set the rails into the rack posts and secure the rails, follow these steps:

   a. Press the spring lock then insert the studs into the selected square holes on the rack post.

   b. Press the spring lock on the other end of the rail and insert the studs into the selected mounting hole on the rack post. If necessary, extend the rail to reach the post.

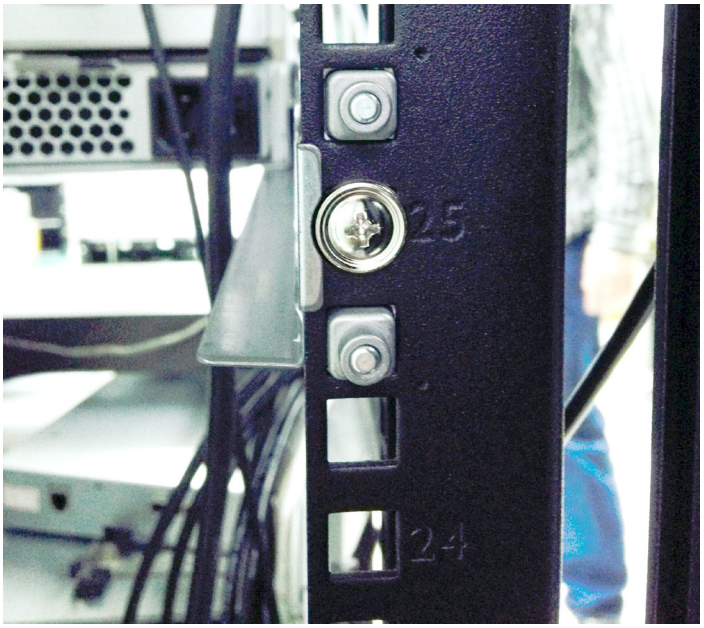
   c. Use the rail screws to anchor the rack rail to the post.

   d. Make sure the rack rail is aligned, secure, stable and in the correct place.

   e. Perform steps a through c above for the other rail.

   f. Make sure the rack rails are aligned, secure, stable and in place. See figure below.

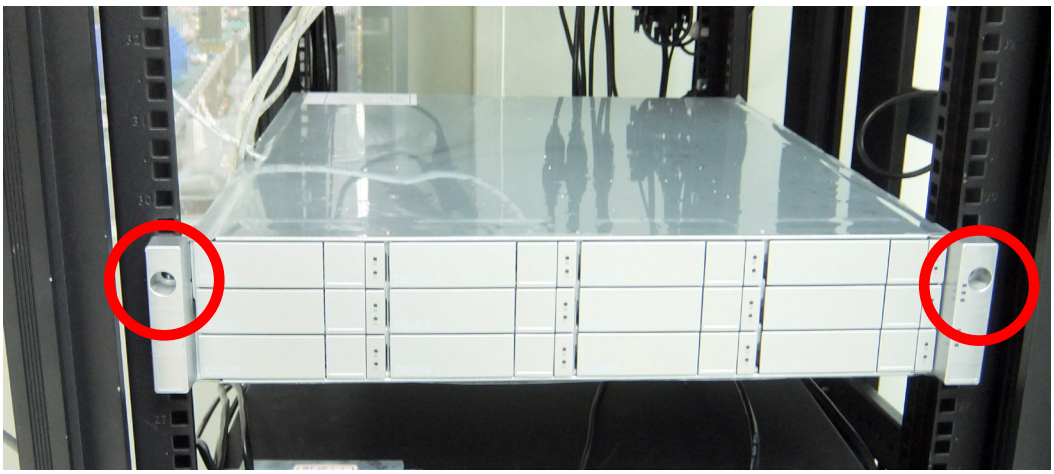
Back left rail secured to post



3. Secure the enclosure to the rack.

- Use the included screws and flange nuts to lock the unit in to place in the rack.
- Use the attaching screws and flange nuts that came with the mounting hardware.

Insert screws on each side of the front of the enclosure to secure it to the rack posts



Installing Physical Drives

The VTrak J5000 Series subsystems support:

- SAS hard disks
- 3.5-inch hard disk drives for VTrak J5800, VTrak J5600, and VTrak J5300.
- 2.5-inch disk drives for VTrak J5320

For a list of supported physical drives, download the latest compatibility list from the PROMISE support website.

Cautions

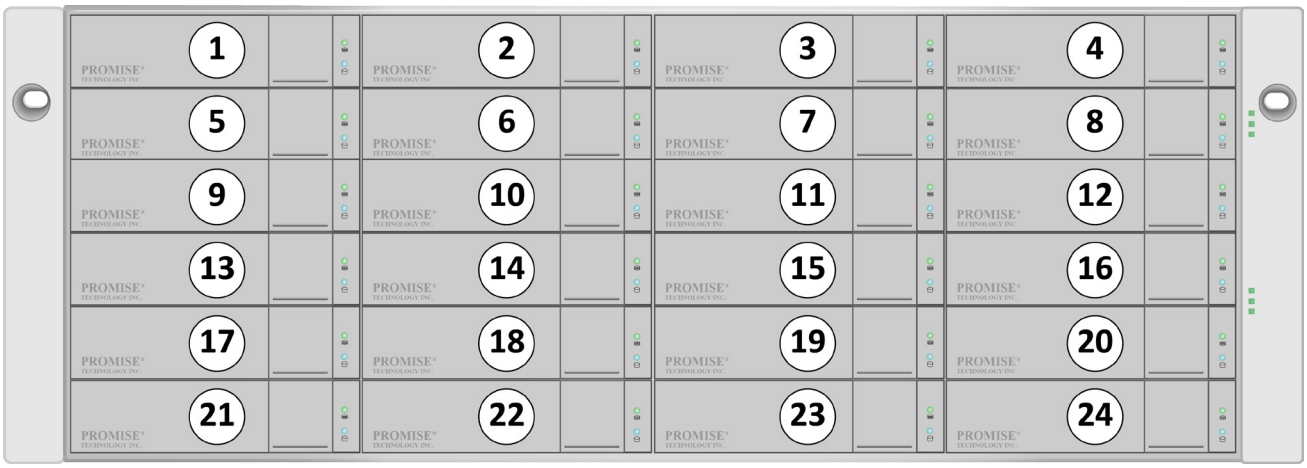
The VTrak J5000 supports disk drive hot-swapping. To avoid hand contact with an electrical hazard, do not remove more than one drive carrier a time.

Drive Slot Numbering

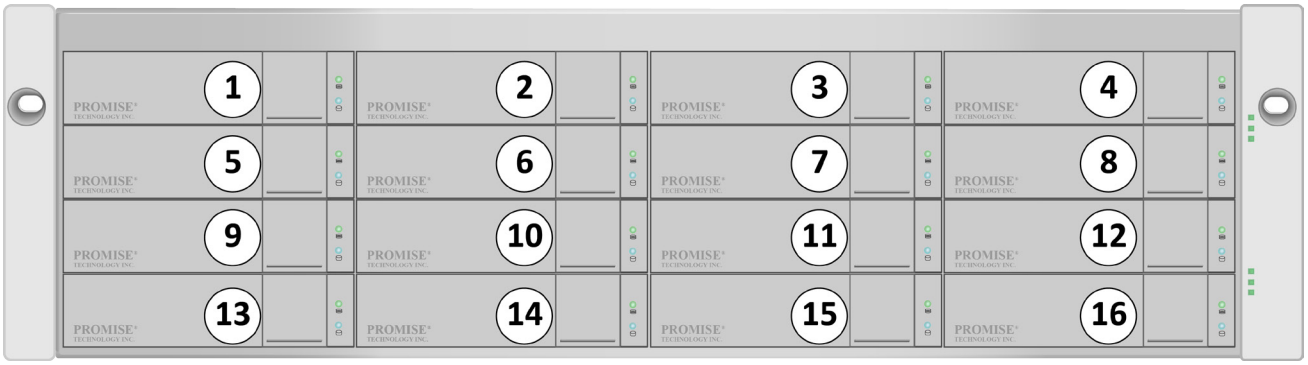
You can install any suitable disk drive into any slot in the enclosure.

Install all of the drive carriers into the VTrak J5000 enclosure to ensure proper airflow, even if you do not populate all the carriers with physical drives.

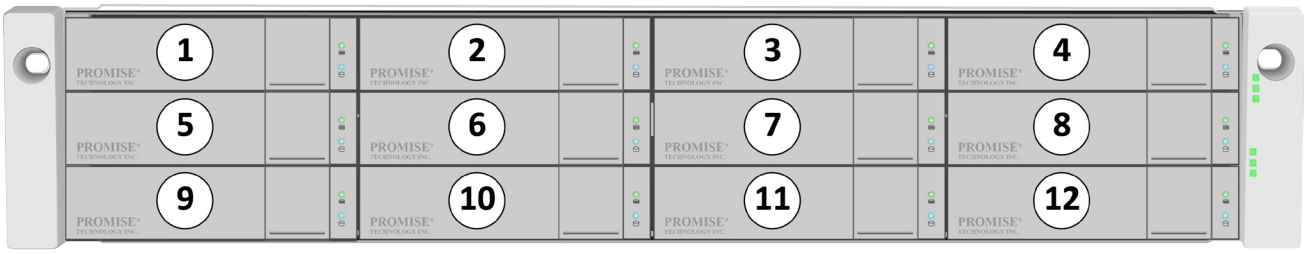
Drive slot numbering on VTrak J5800



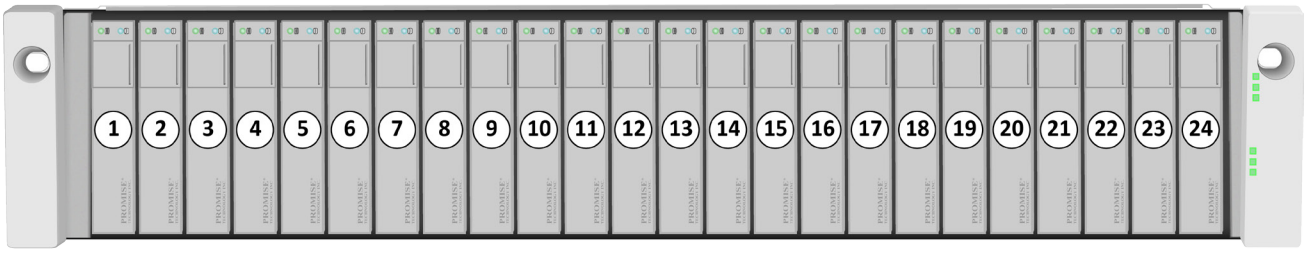
Drive slot numbering on VTrak J5600



Drive slot numbering on VTrak J5300



Drive slot numbering on VTrak J5320



Installing Your Drives

Follow the instructions below according to the size of drive being installed.

3.5-inch Hard Disk Drives

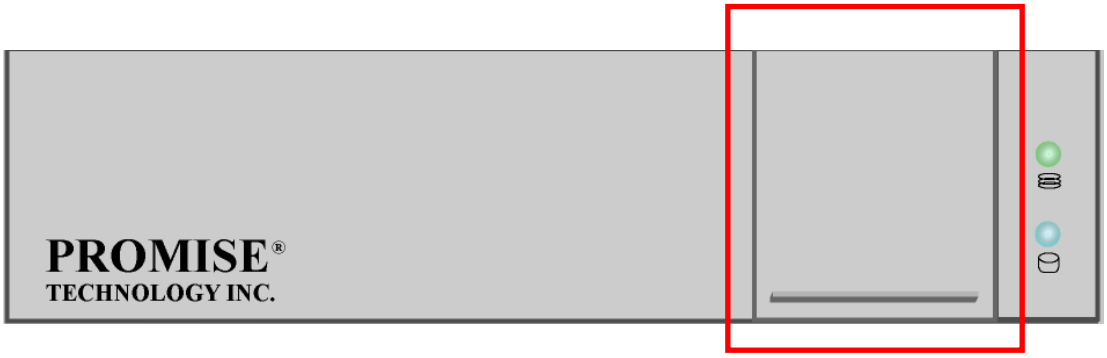
Cautions

Swing open the drive carrier handle before you insert the drive carrier into the enclosure.

To avoid hand contact with an electrical hazard, remove only one drive carrier a time.

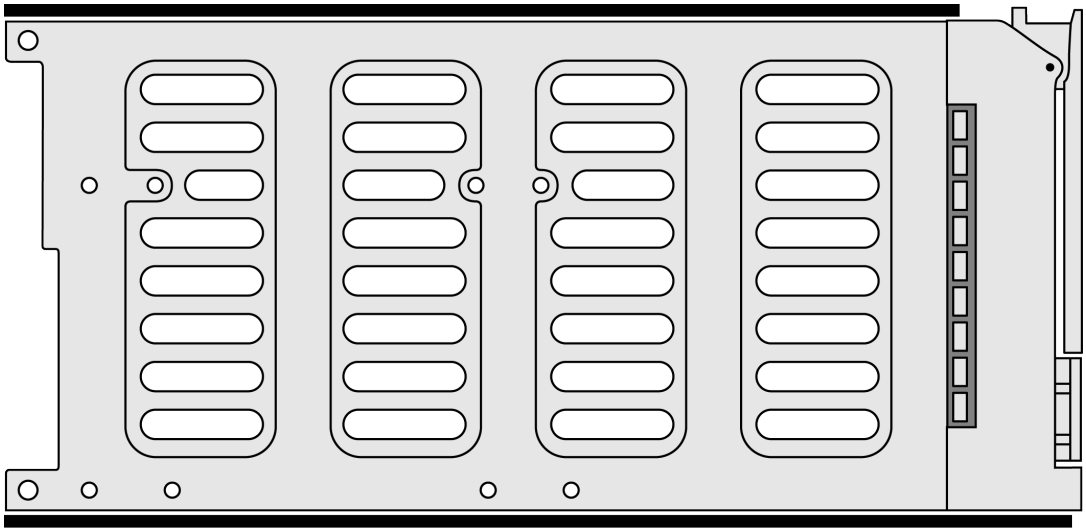
1. Press the drive carrier release button. The handle springs open.
2. Grasp the handle and gently pull the empty drive carrier out of the enclosure.

3.5" drive carrier front view

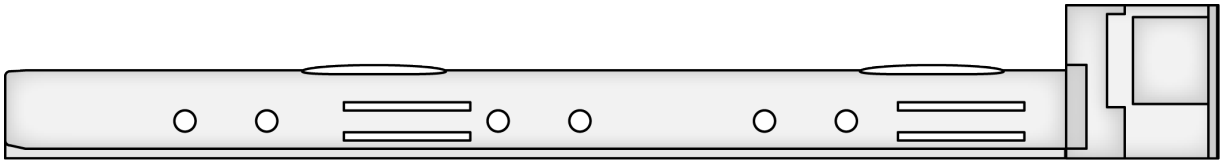


3. Carefully lay the drive into the carrier with the power and data connectors facing away from the carrier handle.

Drive carrier bottom view



Drive carrier side view



4. Position the drive in the carrier so the mounting holes line up.
5. Insert the screws through the proper holes in the carrier and into the drive or adapter.
   - Install four screws per drive.
   - Snug each screw. Be careful not to over tighten.
6. With the drive carrier handle in open position, gently slide the drive carrier into the enclosure.

Important

Press the release button to push the drive carrier into position.

Proper drive installation ensures adequate grounding and minimizes vibration. Always attach the drive to the carrier with four screws.

2.5-inch Hard Disk Drives

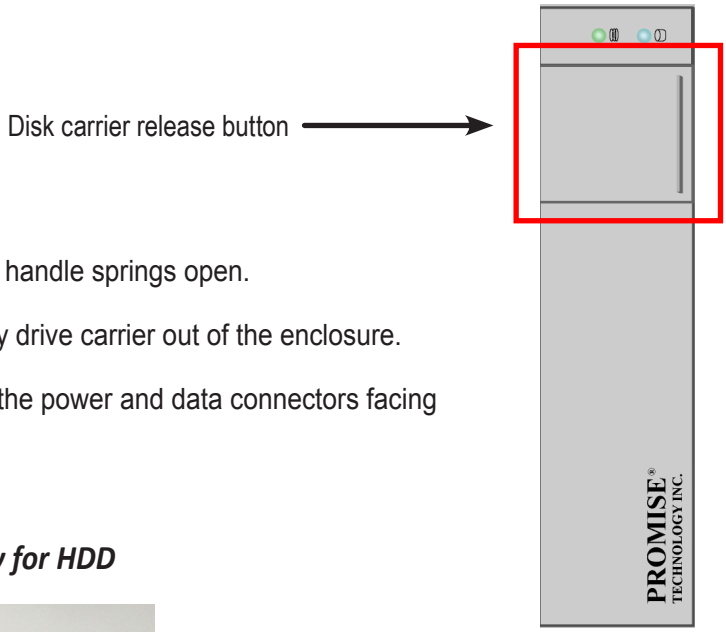
The VTrak J5320 features 24 drive carriers designed to fit 2.5” drives. Notice that the carriers are oriented vertically, with the carrier release button at the top. The lever mechanism to remove the carrier from the drive bay works exactly the same as the 3.5” carriers, except they are positioned vertically rather than horizontally.

Cautions

Swing open the drive carrier handle before you insert the drive carrier into the enclosure.

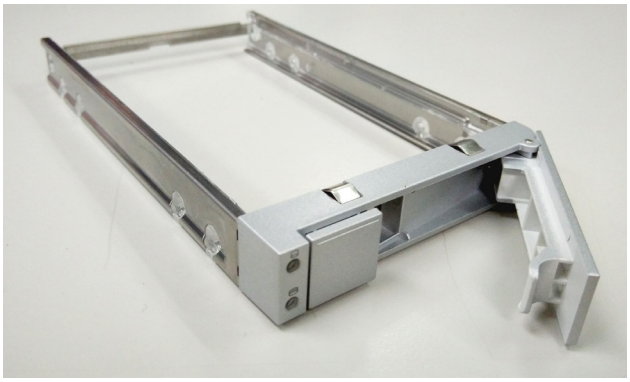
To avoid hand contact with an electrical hazard, remove only one drive carrier a time.

2.5” drive carrier front view



1. Press the drive carrier release button. The handle springs open.
2. Grasp the handle and gently pull the empty drive carrier out of the enclosure.
3. Carefully lay the drive into the carrier with the power and data connectors facing away from the carrier handle.

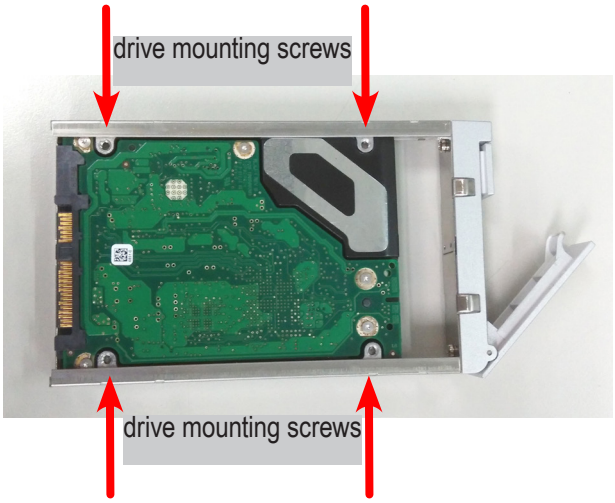
Empty 2.5” drive carrier front ready for HDD



4. Position the drive in the carrier so the mounting holes line up.
5. Insert the screws through the proper holes in the carrier and into the drive or adapter.
   - Install four screws per drive.
   - Snug each screw. Be careful not to over tighten.

2.5" drive carrier with HDD installed, front view

2.5" drive carrier with HDD, 'left' side with HDD undercarriage exposed



6. With the drive carrier handle in open position, gently slide the drive carrier into the enclosure. The drive carrier should be oriented so the the "top" of the 2.5" HDD is on the right, and the "bottom" of the HDD is on the left. The LED indicators will be at the top.

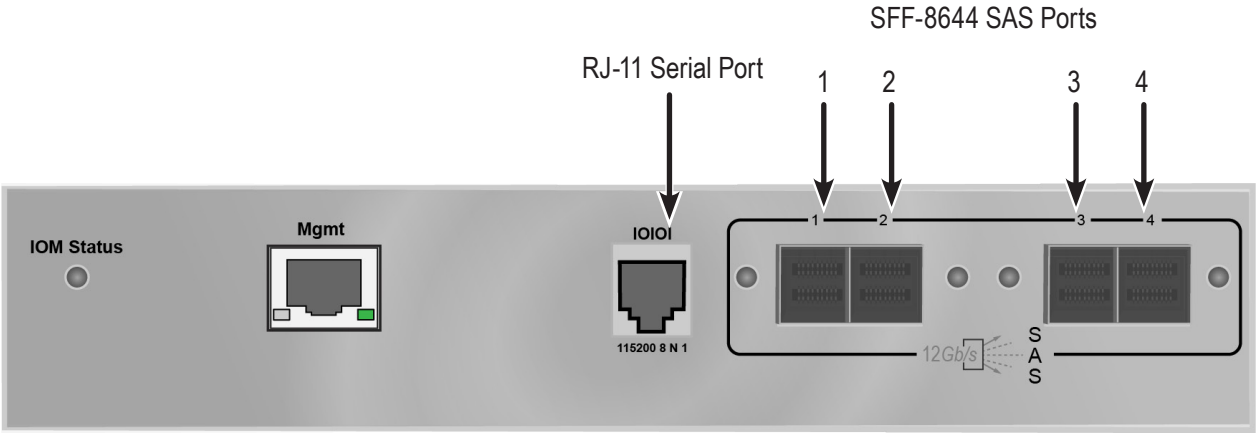
Management and Data Connections

The VTrak J5000 Series features in-band management using a software utility developed for this purpose. To use the in-band utility it is necessary to first install the software on a PC or server equipped with an SFF-8644 SAS HBA card, then connect that system to the JBOD (see “Basic DAS Connection” on page 30). The JBOD software utility is available for Linux and Windows operating systems. For more information on how to use the software, please read the *VTrak J5000 Software Utility User Guide*, available for download from PROMISE.

Management can also be done through the Serial connection using terminal emulation software.

This section describes the different cable connections for Direct Attached Storage (DAS) to a single server, as well as cascading DAS, and redundant cascading DAS. Also setup information for using the Serial connection, including connection settings are included here.

Ports for in-band and out-of-band management connection on VTrak J5000 controller



In the connection instructions that follow, SAS ports are numbered 1 to 4, left to right, for each controller module, the controller modules are also numbered left to right.

The SAS port furthest left is identified as Controller 1: Port 1.

The SAS port furthest right is identified as Controller 2: Port 4.

Serial Cable Connections

Serial communication enables the Command Line Interface (CLI) on your PC to monitor and control the VTrak J5000. The VTrak J5000 package includes a RJ11-to-DB9 serial data cable.

To set up a serial cable connection:

1. Attach the RJ11 end of the serial data cable to the RJ11 serial connector on the controller.
2. Attach the DB9 end of the serial data cable to a serial port on the Host PC or Server.

Serial Connection Settings

Use a terminal emulation program, such as Microsoft HyperTerminal, to manage the system using the CLI.

You must use the serial connection to run the CLI for direct management of the VTrak J5000 unit.

To set up a serial connection:

1. Change your terminal emulation program settings to match the following specifications:
    - Bits per second: 115200
    - Data bits: 8
    - Parity: None
    - Stop bits: 1
    - Flow control: none
2. Start your PC's terminal VT100 or ANSI emulation program.
3. Press Enter once to launch the CLI.

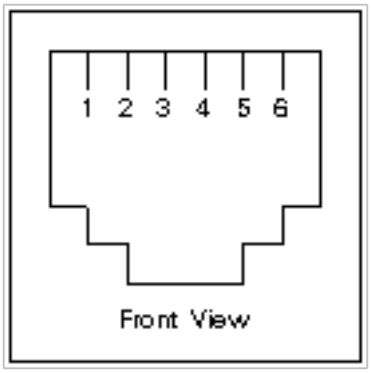
When connected and ready, the CLI screen displays:

```
**********************************************
   Promise xU-SAS-xx-SBB-BP v1.00.0000.xx
**********************************************
cli>
```

The `cli>` prompt on your screen indicates that you have a connection and the CLI is ready to accept commands.

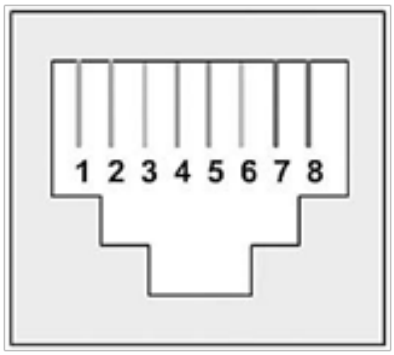
Pinout references

RJ-11 Serial Port pinout



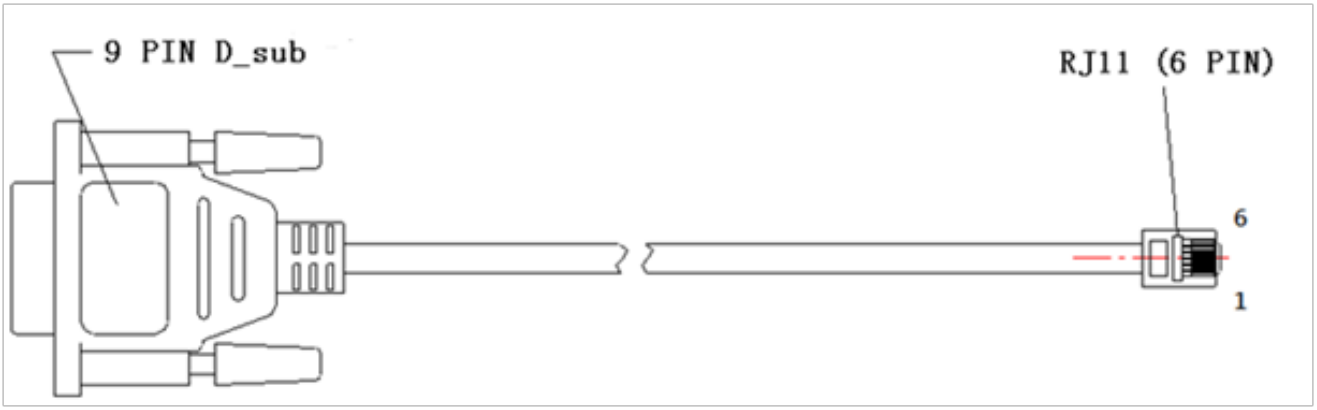
1: RX0
2: TX0
3: GND
4: NC
5: NC
6: NC

Management port RJ-45 pinout

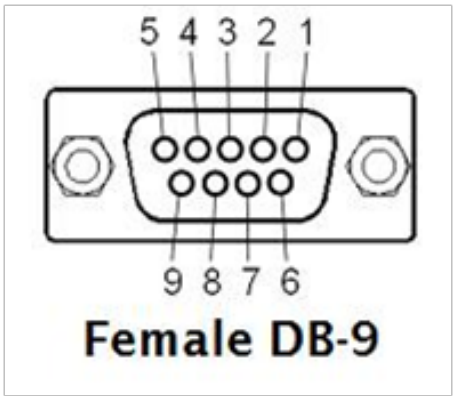


1	TP0+
2	TP0-
3	TP1+
4	TP2+
5	TP2-
6	TP1-
7	TP3+
8	TP3-

DB-9 PINOUT FOR RJ-11 TO DB-9 SERIAL CABLE



A:DB9		B:RJ11
2 (RXD0)	----------	2 (TX0)
3 (TXD0)	----------	1 (RX0)
5 (GND0)	----------	3 (GND)

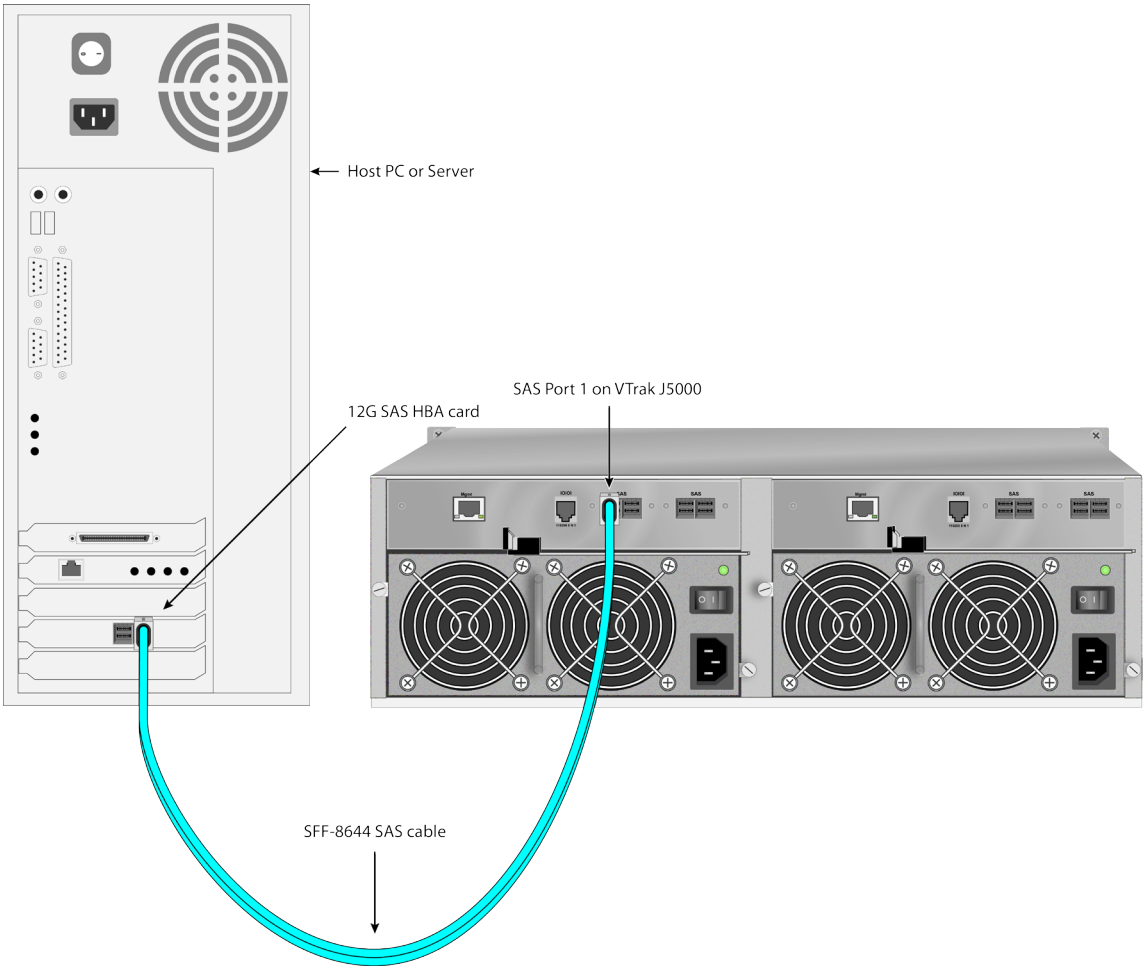


DAS Connection

Note that Direct Attached Storage (DAS) hardware setup requires that the host system (PC or server) have an SFF-8644 SAS HBA card installed.

Basic DAS Connection

For a basic DAS connection, use the SFF-8644 external SAS cable supplied with the VTrak to connect the SAS HBA card in the Host PC to **SAS Port 1** in **Controller 1**.



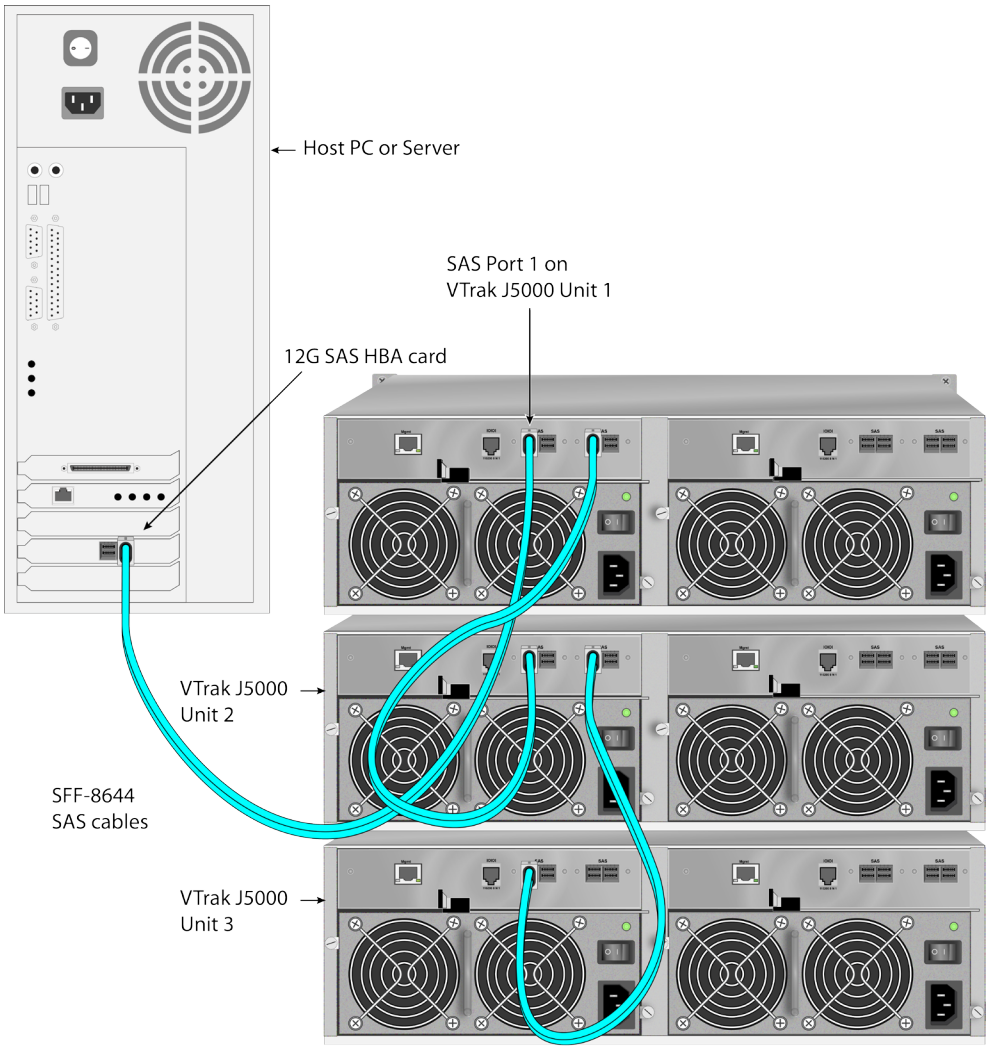
Cascading DAS Connection

For a cascading VTrak J5000 DAS connection, use SFF-8644 external SAS cables to perform these tasks:

1. Connect the SFF-8644 SAS HBA card in the host system to **SAS Port 1** on **Controller 1** of the uppermost Vtrak unit in the rack (**Unit 1**).
2. Connect **SAS Port 3** port on **Controller 1** of VTrak **Unit 1** to **SAS Port 1** on **Controller 1** of VTrak **Unit 2**.
3. Connect the remaining VTrak J5000 enclosures in the same manner.

Note

SFF-8644 ports are full-duplex (*IN* and *OUT*) SAS. So you do not need to follow this cabling description exactly, it is only used as an example.



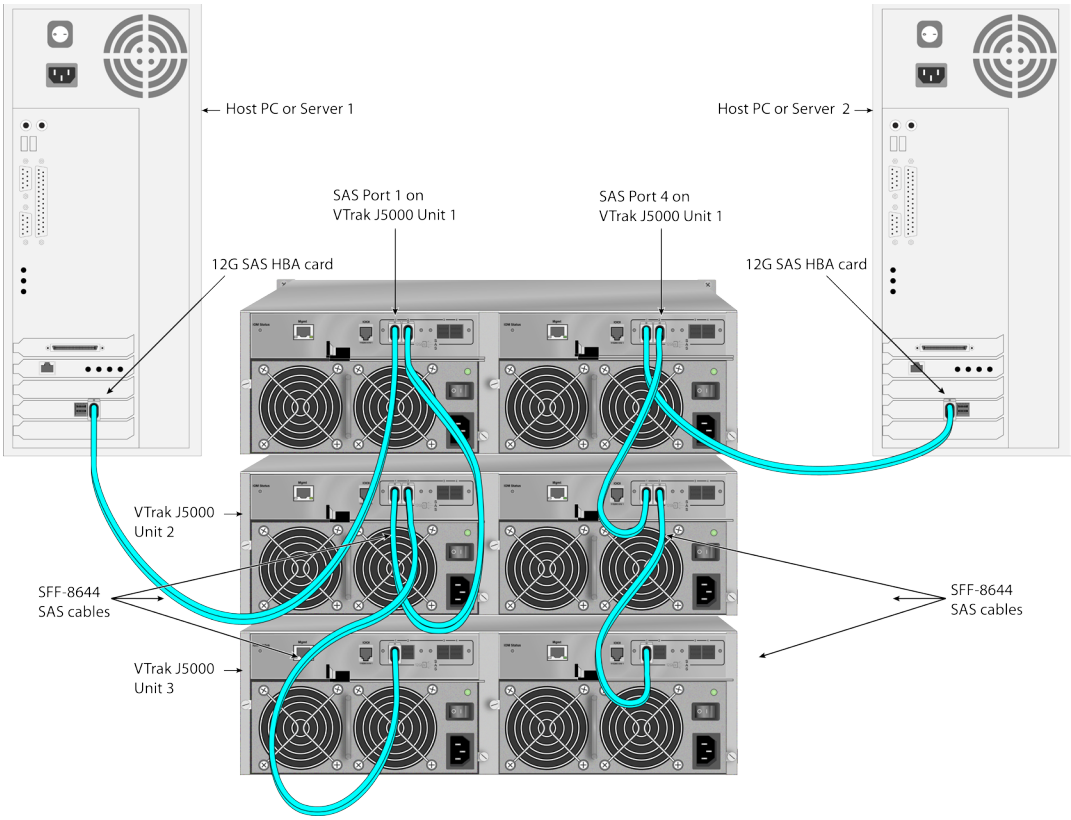
Redundant Cascading DAS Connection

To setup a redundant cascading DAS connection use SFF-8644 external SAS cables to perform these tasks:

1. Connect the SFF-8644 SAS HBA card in **Server 1** to **SAS Port 1** on **Controller 1** of the uppermost Vtrak unit in the rack (**Unit 1**).
2. Connect **SAS Port 2** port on **Controller 1** of VTrak **Unit 1** to **SAS Port 1** on **Controller 1** of VTrak **Unit 2**.
3. Continue to make cascading connections to Controller 1 in the same manner for any remaining VTrak units.
4. Connect the HBA card in **Server 2** to **SAS Port 1** on **Controller 2** of Vtrak **Unit 1**.
5. Connect **SAS Port 2** port on **Controller 2** of VTrak **Unit 1** to **SAS Port 1** on **Controller 2** of VTrak **Unit 2**.
6. Continue to make cascading connections to Controller 2 in the same manner for any remaining VTrak units.

Note

SFF-8644 ports are full-duplex (*IN* and *OUT*) SAS. So you do not need to follow this cabling description exactly, it is only used as an example.



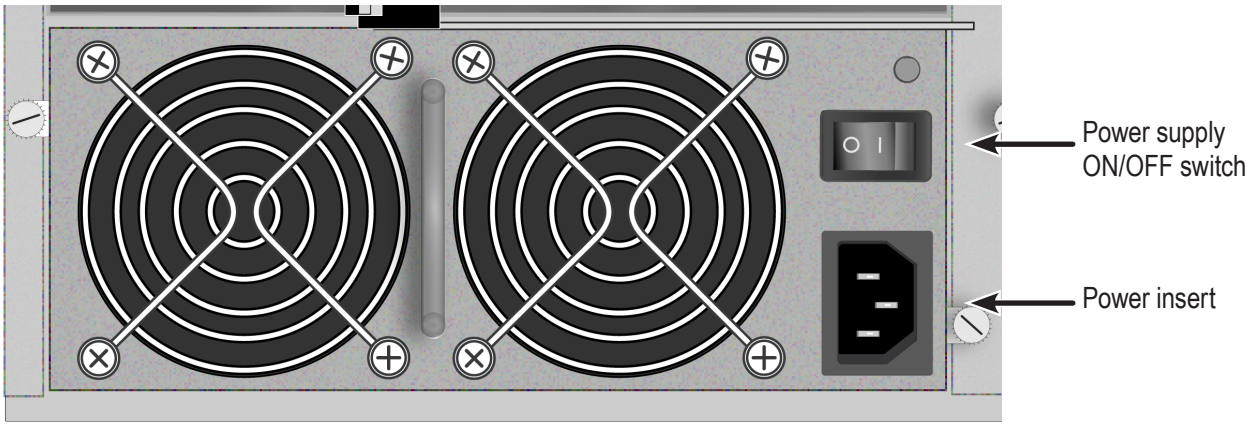
Connect the Power

To power on the VTrak J5000, follow these steps for each JBOD enclosure:

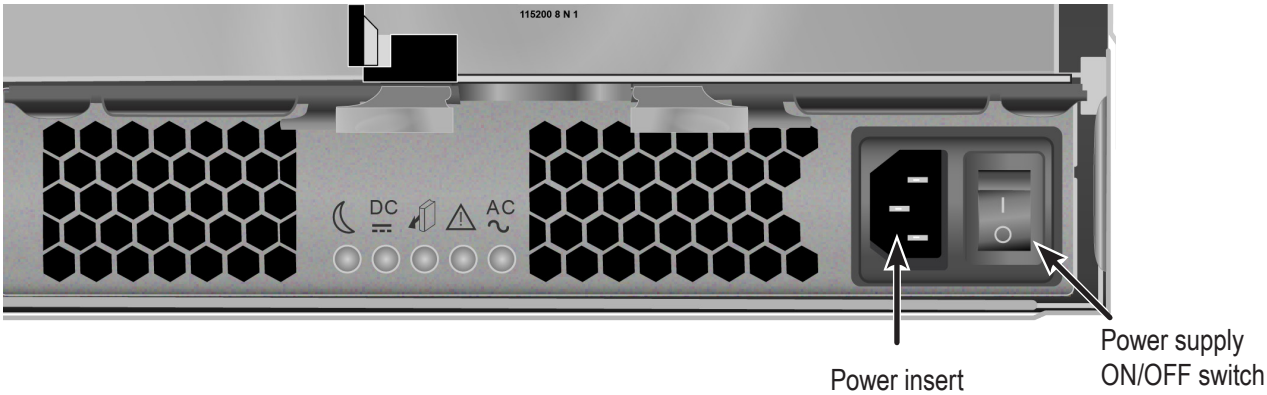
1. Use the power cords included with the shipment to connect the power insert for all power supplies on all units.
2. Plug in the power cables on all power cords to a suitable grounded power source.

   The JBODs are ready to power on.

Power supply on VTrak J5600 and VTrak J5800



Power supply on VTrak J5300 and VTrak J5320



Power on system

Follow the instructions according to the VTrak J5000 model being powered on.

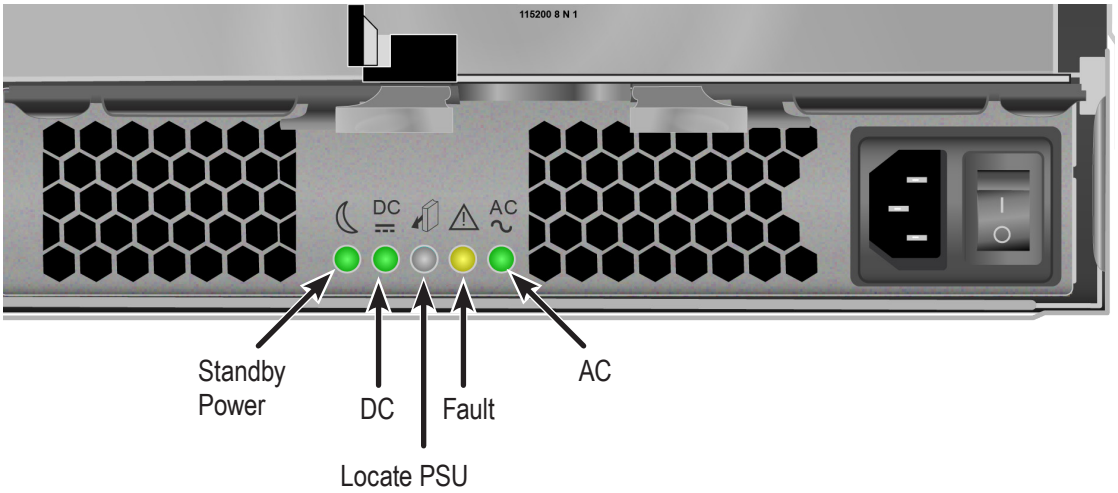
Power on VTrak J5300

The power supplies used for the VTrak J5300 include a power switch on each power supply. To power on the VTrak J5300:

1. Toggle the power switch to the *ON* position for each power supply.
2. Check the AC and DC LED indicators on each power supply to make sure they light green.

   Note that the center LED on the power supply is for locating the PSU, PROMISE RAID head only.

   Power supply LED indicators on VTrak J5300



VTrak J5300 Power Supply LEDs

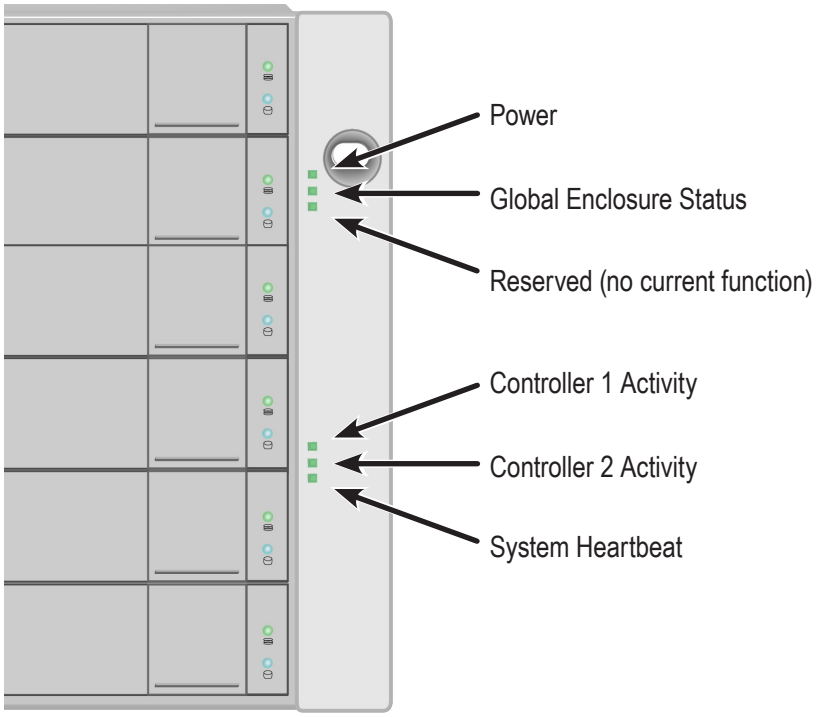
LED	Description
Standby Power	This indicates the standby power status. If the standby power is on and the power switch is off, the LED lights green. If the standby power is on and the power switch is on, then the LED will be off.
DC	This indicates if the power supply is properly inserted into the enclosure. The LED lights green when the power supply is properly inserted and the power supply is switch on. It is off if the power supply is not properly inserted, or when the power supply is switched off.
Fault	This indicates the overall health status of the power supply. When the power supply is functioning normally and no problems are detected, it will be off. If a problem with the power supply is detected, it light amber. Note that this LED blinks once when the power supply is switched on, then remains off unless there is a problem.
AC	This indicates that input power is present. When the power supply is switched on, it lights green if input power is available. It is off if power is not present and when the power supply is switched off.
Locate PSU	This flashes blue when using the *Locate PSU* function (*PROMISE RAID head only*).

Front LED behavior after booting up

When the power is switched on, the LEDs on the right handle light up.

- Power and Global Enclosure Status LEDs display green continuously.
- I/O Module Activity LED flashes green when there is controller activity.
- System Heartbeat LED blinks green at two second intervals for dual I/O Module systems; or at four second intervals for single I/O Module systems.

Front Panel LEDs (VTrak J5800)



In the table below:

- *Steady* means the LED is on continuously.
- *Blinking* means a regular on/off pattern.

Front LED Behavior

LED State	Power	Global Enclosure Status	Controller Activity	System Heartbeat
Off	System power off	System power off	No controller present or system OFF / No SAS cables are connected	System power off
Steady Green	System power on	System heathy	One or more SAS cable is connected	—
Blinking Green	—	—	Activity	Blink every 4 seconds if a single controller is installed. Blink every 2 seconds if two controllers are installed
Amber	—	Fan, power supply, temperature, or voltage over warning threshold / Only one power supply detected	—	—
Red	—	Fan, power supply, temperature, or voltage over critical threshold	—	—

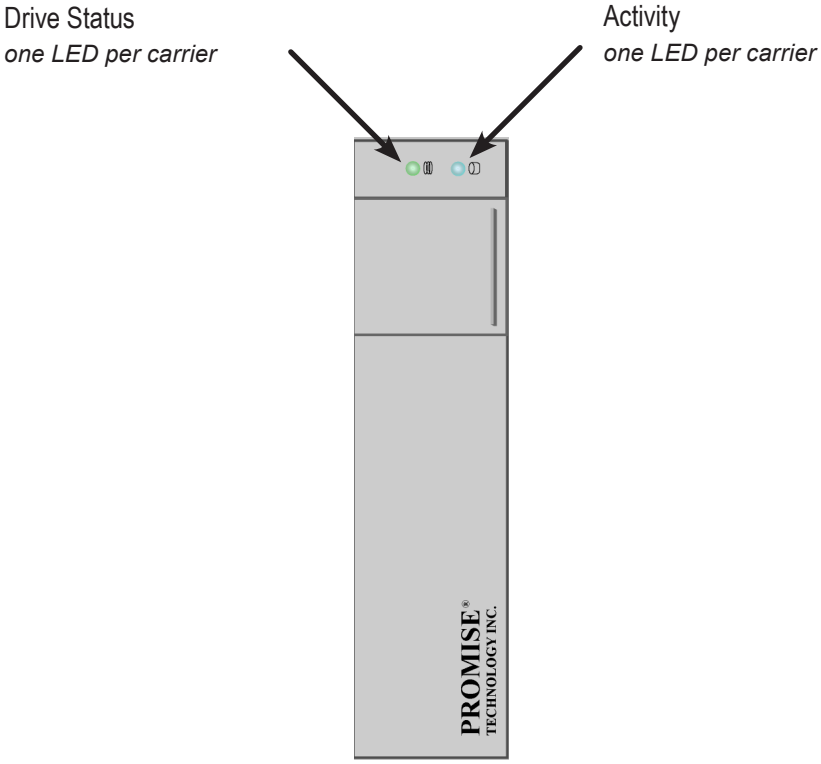
Drive Status LED Behavior After Boot Up

Note

Drive carrier LED behavior is controlled by the host HBA / RAID head; the behavior is same for all VTrak J5000 models.

Disk Carrier LEDs - front of every carrier

2.5" drive carrier front LEDs on VTrak J5320



The VTrak J5000 spins up the disk drives sequentially to equalize power draw during start-up. After a few moments:

- The Power/Activity LED displays blue when a physical drive is present.
- The Drive Status LED displays green when the physical drive is configured as a member of a disk array or as a spare. When the physical drive is not configured, the LED is off.

In the table below:

- *Steady* means the LED is on.
- *Blinking* means a regular on/off pattern.
- *Flashing* means intermittent and irregular on/off pattern.

Drive Status and Activity LED behavior*

State	Power/Activity	Drive Status
Off	No drive in carrier / Drive ready for removal	No drive in carrier
Steady Blue	Drive in carrier	—
Flashing Blue	Activity on drive	—
Steady Green	—	Drive in carrier
Blinking	—	Locator feature
Amber	—	Drive is rebuilding / drive is off line
Red	—	Drive error of failure

****LED behavior is controlled by the host HBA or RAID head. Please reference the relevant vendor documentation. The LED behavior in this table is the behavior displayed when using LSI 9380 as the HBA.***

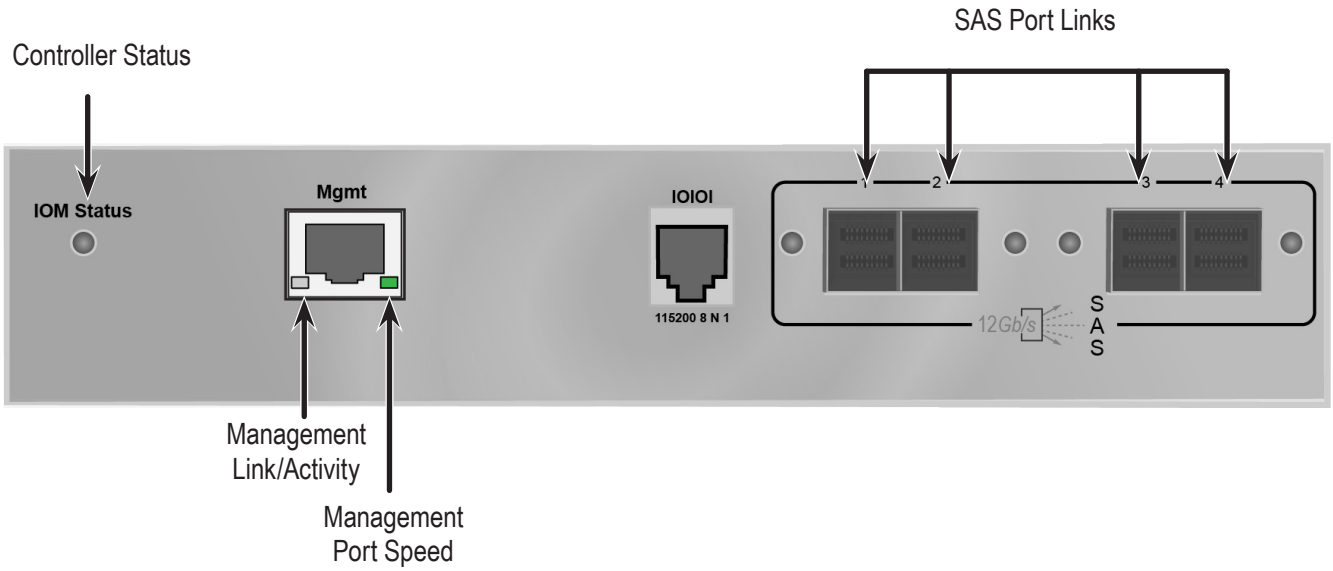
Controller LED behavior

When boot-up is finished and the VTrak J5000 subsystem is functioning normally:

- Controller status LEDs display green continuously. If this indicator lights red, there is a problem with the controller.
- Management port LEDs display green or flash depending on your network connection.

  LEDs are located below the port, the left LED lights green when connected, flashes green when active, remains off if not connected. The right LED indicates connection speed, green is 100 Mbps, amber is 1000 Mbps.
- SAS port link LEDs light green when connected, flash green when active, and remain off if not connected.

VTrak J5000 controller LEDs



Managing the J5000 Series

The main sections in this chapter include the following:

- “Making a Serial Connection” on page 42
- “Telnet Service” on page 43
- “CLI Conventions” on page 43
- “Logging Into the CLI” on page 42
- “JBOD Utility CLI” on page 43
- “System Firmware Update” on page 62

Making a Serial Connection

Before you begin, be sure the RJ11-to-DB9 serial data cable is connected between the Host PC and the VTrak enclosure, and that both machines are booted and running.

Serial ports on the controllers

Then do the following actions:

1. Change your terminal emulation program settings to match the following specifications:
   - Bits per second: 115200
   - Data bits: 8
   - Parity: None
   - Stop bits: 1
   - Flow control: none
2. Start your PC's terminal VT100 or ANSI emulation program.
3. Press Enter once to launch the CLI.

Logging Into the CLI

To login, just press the Enter key. The CLI screen appears. There is no user name or password.

JBOD Utility CLI

The JBOD Utility features a CLI and GUI for administration and monitoring of JBOD enclosures. This document provides instructions for administrators on using the JBOD Utility and descriptions of the CLI commands available.

The JBOD Utility is used to perform the following functions:

- Scan JBOD enclosures and display status information
- Update firmware on JBOD enclosures
- Enter Inband mode and to check internal hardware status
- Set zone configuration

To read information about using the JBOD Utility, including the graphical user interface (GUI), please read the VTrak JBOD Utility Manual which contains instructions specific to using Windows and Linux operating systems.

Telnet Service

Use Telnet to manage the VTrak J5000 remotely, access is provided through the Management port. Telnet service is enabled by default, use port 23 for Telnet access. The same CLI commands listed here are used once the connection is established.

The default IP settings for the Management port use DHCP, so you first will need to get the IP address via direct serial connection. Use the **net** command to learn the IP settings, then use any Telnet client to connect to the management interface. There is no user name or password to access the VTrak J5000 via Telnet.

See “net” on page 51 for syntax details about the CLI command, **net**.

CLI Conventions

Commands and options are case sensitive.

Not all extended keys are supported. However, you can use the BACKSPACE and the left and right arrow keys for command line editing. In addition, the up and down arrow keys allow scrolling through the command history buffer.

CLI Commands

VTrak JBOD Utility CLI commands follow the Linux shell scripting format of:

```
command option argument
```

This section gives detail explanation of each command and accompanying options.

If you need context-sensitive help, type one of the following commands:

- <command> -h
- <command> -?
- help <command>

Commands	Description
enclosure	Displays full information on the VTrak J5000 enclosure and its components.
event	Displays system event details.
uptime	Displays the number of days, hours, minutes and seconds since the firmware was loaded (since the VTrak J5000 was started or restarted).
link	Displays the current status of the PHYs (links), error counter, expander and attached SAS addresses.
route	Displays addresses of components through a downstream (expansion) connection.
cable	Specifies the length of cable for optimal signal quality.
net	Get and Set IP network
factorydefaults	Restores factory default settings.
ptiflash	System firmware update command
vpdr	Displays vital product data on field replaceable units.
version	System version information
help/?	Use alone to see the list of commands. Use with a command to see a list of options. Examples: enclosure -help or enclosure -h

enclosure

Syntax

enclosure [option] [sub-option] <argument>

Summary

Used to list enclosure related information. This is also used to reboot a controller or the VTrak J5000 enclosure and to make enclosure settings including physical drive zone configuration. *See "Zone Configuration" on page 67 for a description of the zone configuration options for physical drives.*

Options

-l	Display enclosure information (default)
-m	Modify enclosure settings

Sub-options

-r <option>	Restart a controller, shutdown or restart the system. <option> = 1: Restart the current controller. <option> = 2: Restart the system. <option> = 3: Restart the primary controller. <option> = 4: Shutdown the system.
-t <enable>	Enable or disable thermal management. <enable> = 0: Disable thermal management. <enable> = 1: Enable thermal management.
-z <zoning config>	Set zoning configuration for physical drives. <zoning config> = 0: No zoning. <zoning config> = 1: Zone configuration 1. <zoning config> = 2: Zone configuration 2. <zoning config> = 3: Zone configuration 3.
-a <allow>	Allow system shutdown on critical temperature. <allow> = 0: System shutdown is not allowed. <allow> = 1: Allow system shutdown.
-c <sensor_id><threshold_value>	Update the critical threshold value for different enclosure sensors. IOM critical threshold value = 68 ~ 72 ENC critical threshold value = 57 ~ 61 PSU critical threshold value = 57 ~ 61

-w <sensor_id><threshold_value> Update sensor's warning threshold.

IOM warning threshold value = 61 ~ 65

ENC warning threshold value = 47 ~ 51

PSU warning threshold value = 47 ~ 51

-f <min_fan_lvl> Set the minimum fan speed when the system is normal.

<value> = 1~10 (1 = lowest speed)

VTrak J5600/J5800 allow values 1~10

VTrak J5300/J5320 allow values 1~ 6

-b <shutdown period> Shutdown the PSU and reboot after N minutes.

<shutdown period> = 1~4320

-wol <enable> Enable or disable wake on lan function.

<enable> = 0 : Disable wake on lan function.

<enable> = 1 : Enable wake on lan function.

-i <action> Allow the user to locate a component by flashing LEDs.

<action> = e: Locate an enclosure by flashing LEDs.

<action> = c: Locate an IOM by flashing LED.

Detailed usage

```
cli> enclosure -l
```

- Display enclosure information

```
cli> enclosure -m -r <option>
```

<option> = 1

- Restart this controller

<option> = 2

- Restart the system

<option> = 3

- Restart the primary controller

<option> = 4

- Shutdown the system

```
cli> enclosure -m -t <enable>
      <enable> = 0
```

- Disable thermal manager function

```
      <enable> = 1
```

- Enable thermal manager function

```
cli> enclosure -m -c <sensor id> <threshold>
      <sensor id> = 1~10
```

- Any one thermal sensor ID between 1 to 10

```
      <threshold> = 68 ~ 72
```

- Critical thermal threshold; between 68 to 72 degree C, if the sensor is located on IO Module.

```
      <threshold> = 57 ~ 61
```

- Critical thermal threshold; between 57 to 61 degree C, if the sensor is located outside the IO Module.

```
cli> enclosure -m -w <sensor id> <threshold>
      <sensor id> = 1~10
```

- Any one thermal sensor ID between 1 to 10

```
      <threshold> = 61 ~ 65
```

- Warning thermal threshold; between 61 to 65 degree C if the sensor is located on IO Module.

```
      <threshold> = 47 ~ 51
```

- Warning thermal threshold; between 47 to 51 degree C if the sensor is located outside the IO Module.

```
cli> enclosure -m -f <min_fan_lvl>
      - f <min_fan_lvl>
```

- Minimum fan speed when system is normal

```
      <value> = 1 ~ 10
      J5600/J5800 allow to set 1 ~ 10
      J5300/J5320 allow to set 1 ~ 6
```

event

Syntax

event [option]

Summary

Used to list details of system event related information.

Options

-l ram	Display event information in RAM (RAM is the default, no need to specify).
-l nvram	Display event information in NVRAM.
-c	Clear event log in RAM.
-c nvram	Clear event log in NVRAM.

Detailed Usage

```
cli> event -l nvram
```

Display NVRAM event details.

```
cli> event -c nvram
```

Clear NVRAM event information.

link

Syntax

link [option] <sub-option> <argument>

Summary

The link command is used to clear PHY statistics counters or display information about VTrak J5000 links, including:

- Link Status
- Link Statistics
- Clearing Statistics
- Expander SAS Addresses
- Attached SAS Addresses

Options

-a	Link related action

Sub-option

list	Display PHY statistics (default)
clear	Clear all PHY statistics.

Detailed Usage

```
cli> link –a list
```

- Display PHY/Port link status

```
cli> link –a clear
```

- Clear all PHY error count

cable

Syntax

cable [option] [sub-option] <argument>

Summary

The cable command is used to modify cable settings and display the current cable information.

Options

-a	Cable related action
-m	Modify cable related function.

Sub-options

data <CN#>	Display cable EEPROM data
list	Display cable information (default)
-c <enable>	Enable or disable cable management function. <enable> = 0 : Disable cable management function. <enable> = 1 : Enable cable management function.

Detailed Usage

```
cli> cable –a list
```

- Display PHY/Port link status

```
cli> cable –a data <CN ID>
```

- Display EEPROM data in SFF-8644 Cable

```
<CN ID> = 1~4
```

- SFF-8644 connector number of the controller

```
cli> cable –m -c <enable>
```

- Enable/Disable cable management function

```
<enable> = 0/1
```

net

Syntax

net [option] <sub option> <argument>

Summary

The net command is used to change the static IP settings and display IP settings information.

Options

-l	List network related information (default)
-m	Modify network port settings

Sub-options

-d 1	Enable DHCP client.
-i <IP address>	IP Address.
-s <subnet mask>	Subnet mask
-g <gateway IP address>	Default Gateway

Detailed Usage

```
cli> net –l
```

- Display IP status

```
cli> net –m -d 1
```

- Enable DHCP client on system management port

```
cli> net –m -i <IP Address> -s <Subnet Mask> -g <Gateway>
```

- Set static IP address of system management port.

<IP Address>

- IP address in dotted-decimal notation format. e.g. 192.168.1.1

<Subnet Mask>

- Subnet mask in dotted-decimal notation format e.g. 255.255.255.0

<Gateway>

- Default gateway in dotted-decimal notation format e.g. 192.168.1.254

route

Syntax

```
route
```

Summary

The route command displays routing table information.

Detailed Usage

```
cli> route
```

- Display expander's routing table

factorydefaults

Syntax

```
factorydefaults
```

Summary

The factory default command is used to restore factory default settings in the VTrak J5000 enclosure.

Detailed Usage

```
cli> factorydefaults
```

- Restore system settings to factory default

uptime

Syntax

```
uptime
```

Summary

The uptime command informs you of the elapsed period of time since the the system firmware was loaded.

Detailed Usage

```
cli> uptime
```

- Display system uptime in day, hour, minute, and second

ptiflash

Syntax

```
ptiflash [option] <sub option> <argument>
```

Options

-x	Firmware update through XModem
-t	Firmware update through TFTP Server

Sub-options

-f	Assign the file name of the firmware image.

Detailed Usage

```
cli> ptiflash –x
```

- Update firmware through XModem

Note: User has to initiate firmware update via XModem. See "Updating Firmware through Serial Port (RS232)" on page 62.

```
cli> ptiflash –t <TFTP Server IP> -f <file_name>
```

- Update firmware through TFTP Server.

```
<TFTP Server IP>
```

- TFTP Server IP address in dotted-decimal notation format.

```
e.g. 192.168.1.1
```

```
<file_name>
```

- Name of the firmware image file located in TFTP Server.

See "Updating Firmware over IP Network (TFTP)" on page 65 for instructions on how to update firmware using TFTP.

Important

Do not restart the VTrak J5000 during a firmware upgrade procedure. Wait until you see the Flash image completed message.

vpdr

Syntax

```
vpdr <option> <sub option>
```

Summary

The vpdr command displays vital product data on the major components of the VTrak J5000 enclosure.

Options

<id>	Dump specific VPD page.

Sub-options

<dump>	Translate raw data or not.
<dump> = 0 :	Translate raw data to human readable format.
<dump> = 1 :	Display raw data (default)

Detailed Usage

```
cli> vpdr <id>
```

- Display Vital Product Data of given FRU

```
<id> = 1
- IOM VPD
<id> = 2
- PSU 1 VPD
<id> = 3
- Fan Module 1 VPD
<id> = 4
- PSU 2 VPD
<id> = 5
- Fan Module 2 VPD
<id> = 6
- Back plane VPD
```

```
cli> vpdr 1 1
```

- Display Vital Product Data of IOM with raw data.

```
cli> vpdr 1 0
```

- Display Vital Product Data of IOM with human readable format.

version

Syntax

```
version
```

Detailed Usage

```
cli> version
```

- Display system firmware and PSU versions

help/?

Syntax

```
help
?
```

Detailed Usage

```
cli> help
cli> ?
```

- Display CLI help

MAINTENANCE

This chapter covers the following topics:

- “Replacing a power supply” on page 57
- “Replacing a controller module” on page 60

Replacing a power supply

The power supplies for the VTrak J5000 models are hot-swappable. Note that the VTrak J5300/J5320 uses a different PSU than the VTrak J5600/J5800.

VTrak J5300 and VTrak J5320 PSU

Before removing a bad power supply, first verify there is a problem. See “VTrak J5300/J5320 Power Supply LEDs” on page 35 for a description of power supply LED behavior.

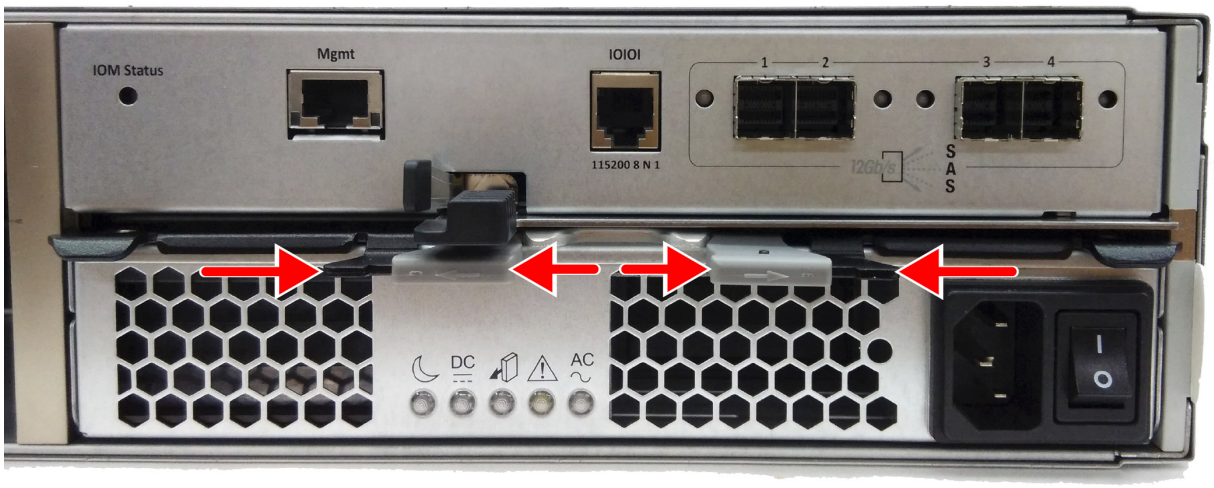
Removing the power supply

To remove the power supply:

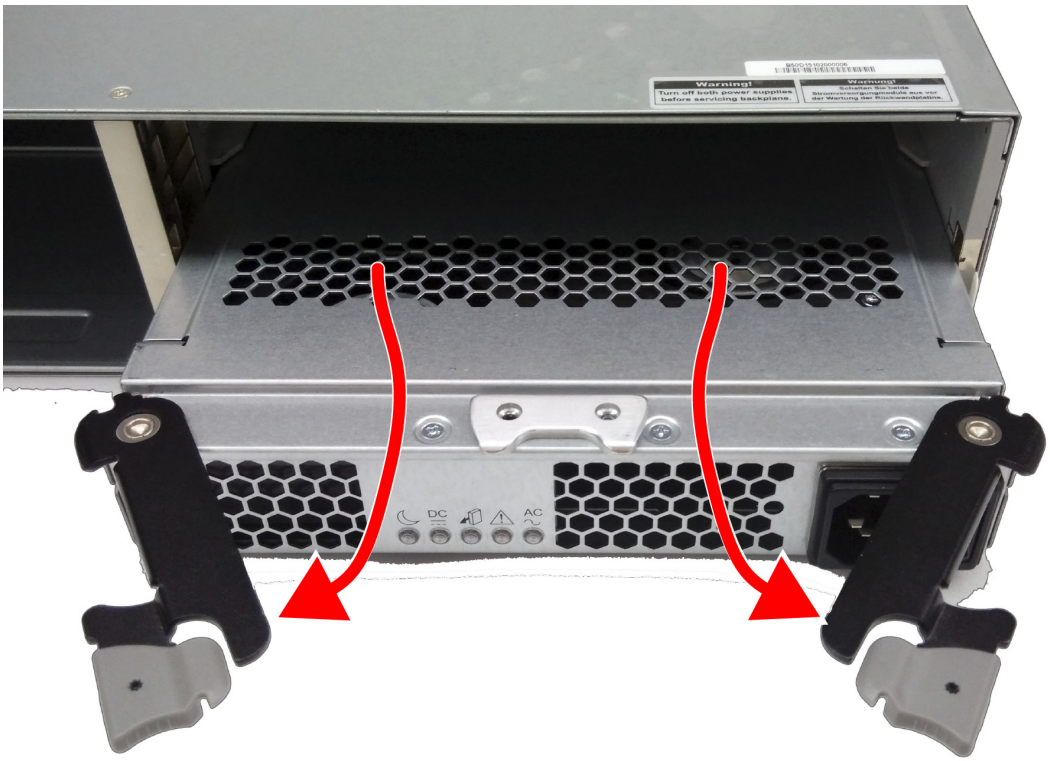
Verify that the power supply *AC* LED is amber or red. Proceed with the following steps if the power supply needs replacement:

1. Switch off the power to the power supply you plan to replace.
2. Unplug the power cord.
3. Use thumbs and forefingers to squeeze the latch release tabs on the two levers used to remove the power supply. Do not grab the controller lever by mistake.
4. Pull the levers toward you and out to each side, then slide power supply module out of the enclosure.

Push both gray colored lever release tabs outward



Pull both levers backward and outward, the module should slide out easily



Installing the new power supply

To install the power supply:

1. Carefully slide the power supply into the enclosure until the levers on each side catch on each side of the power supply.
2. Push both levers in to firmly seat the power supply into the enclosure. Both levers will latch to the enclosure so that the levers cannot be pulled out unless you release the latch.
3. Plug in the power cord.
4. Switch on the power supply.

   Verify that the *DC* and *AC* LEDs are green.

This completes the power supply replacement procedure.

VTrak J5600 and VTrak J5800 PSU

Removing the old power supply

To remove the power supply:

Verify that the power supply LED is amber or red.

1. Switch off the power to the power supply you plan to replace.
2. Unplug the power cord.
3. Loosen and remove the retaining screw on the left side of the power supply.
4. Pull the power supply out of the enclosure.

Installing the new power supply

To install the power supply:

Carefully slide the power supply into the enclosure.

1. Install and tighten the retaining screw on the left side of the power supply.
2. Plug in the power cord.
3. Switch on the power supply.

   Verify that the new power supply LED is green.

This completes the power supply replacement procedure.

Replacing a controller module

The controller module monitors and manages the logical drives. When the controller is replaced, all of your logical drive data and configurations remain intact because this logical drive information is stored on the disk drives.

The procedure is the same for all VTrak J5000 models since they all use the same controller module.

Caution

Do not replace the controller module based on LED colors alone. Only replace the controller module when directed to do so by Promise Technical Support.

Only a qualified technician should perform this procedure.

You must shut down the VTrak J5000 enclosure before you can perform this procedure.

Removing the old I/O module

To replace the I/O module:

Shut down the VTrak J5000 enclosure. Turn OFF the power supply switch (switches).

1. Disconnect the SAS, serial, and power cables.
2. Follow the steps in “Remove controller” on page 61 to remove the old module.

Installing a new controller

To install the new controller:

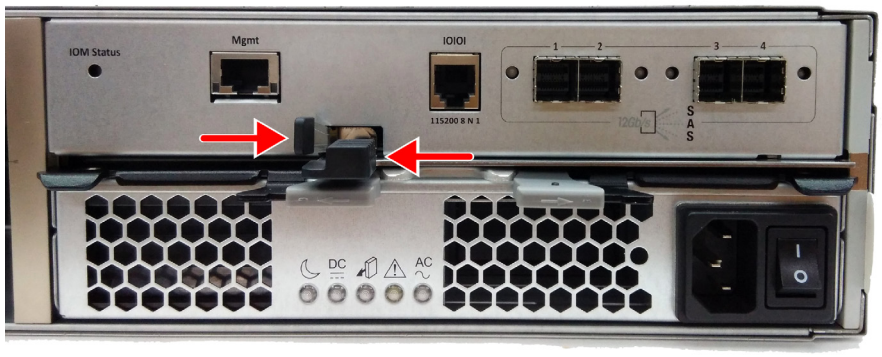
1. Carefully slide the controller into the enclosure.
2. Gently swing the handle in and press the handle until it locks.
3. Reconnect the SAS, serial to the new controller and power cables that were attached to the power supplies.

REMOVE CONTROLLER

Follow the steps below to remove the old controller module:

1. Squeeze controller handle release between thumb and finger.

Release lever on controller



2. Pull handle out, then slide controller unit straight out of the controller.

Pull out lever on controller

System Firmware Update

Note

Another option and easy way to update system firmware is the VTrak J5000 JBOD Software Utility.

See the ***PROMISE J5000 Software Utility User Guide*** for instructions.

Keeping with the latest updates and improvement, while fixing existing issues, PROMISE Technology periodic releases firmware updates. Firmware updates itself is non-disruptive, but it requires system reboot for new firmware to take effect.

In addition to updating with the JBOD Utility, new firmware can be uploaded via serial port and via IP network.

Updating Firmware through Serial Port (RS232)

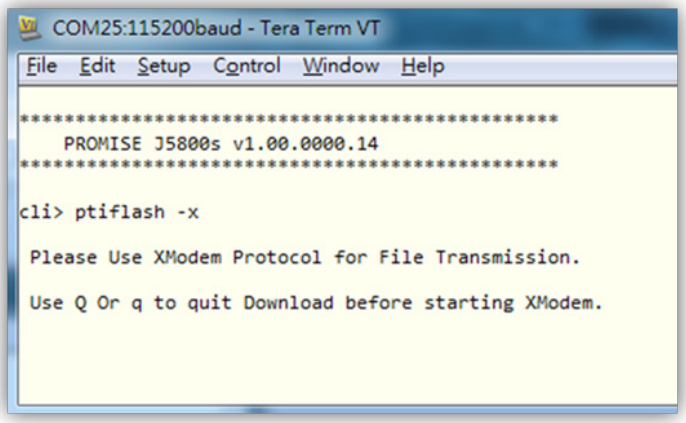
In direct connection mode, the firmware is updated using XModem protocol over Serial port. XModem tool/utility is available with TeraTerm and HyperTerminal.

Follow these steps to update firmware via XModem:

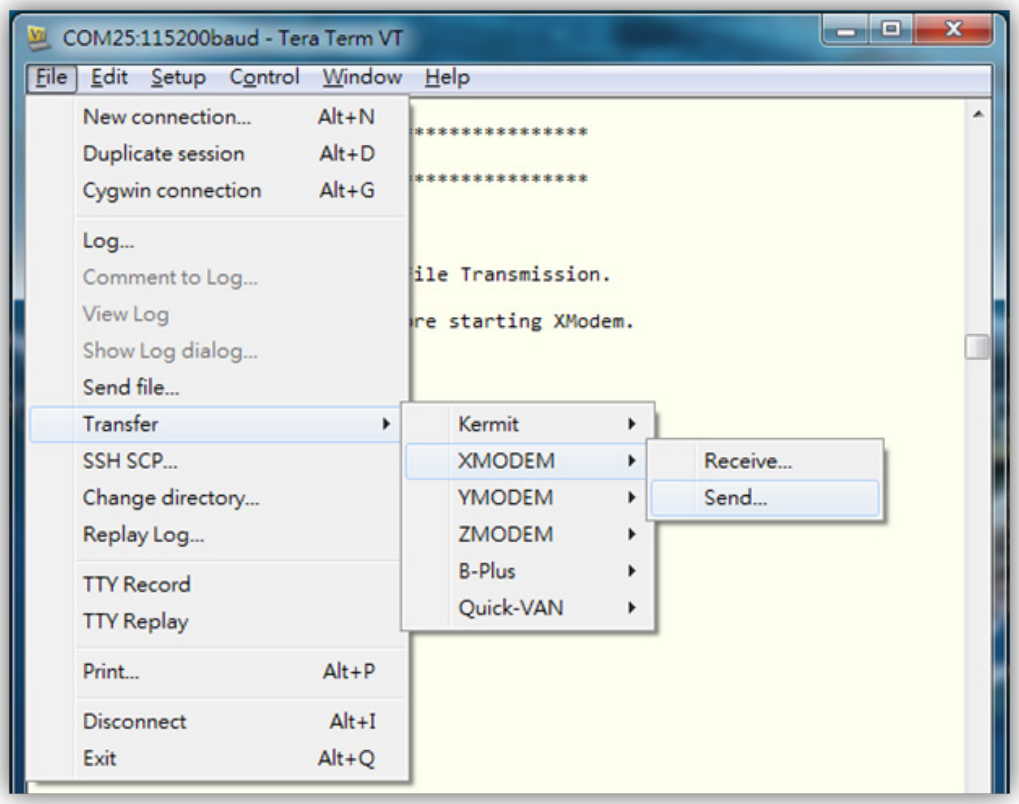
1. Connect the Insert the RJ11 end of the cable into the appropriate socket of J5000 subsystem. Connect the BD9 end of the cable into your management host computer.
2. Open the Terminal simulator software (HyperTerminal or TeraTerm).

   Note: All reference screenshots of this document are taken using TeraTerm.
3. Open **Serial Port Setup** and set **Baud rate** to **115200**. Click **OK** and close the setting.

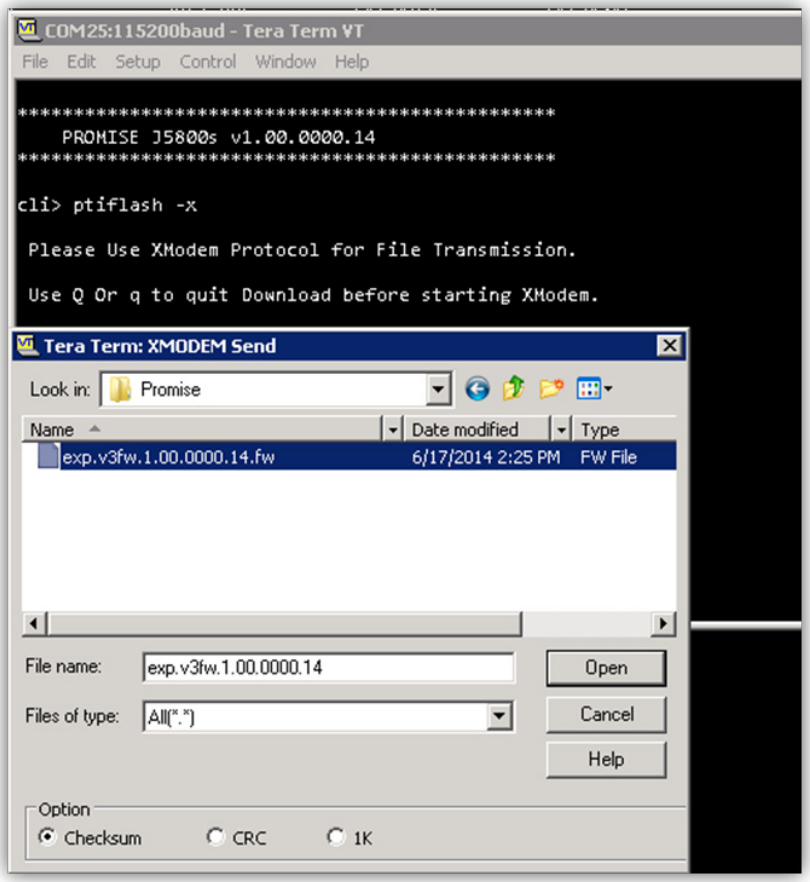
4. Upon pressing the **Enter** key, you will see `cli>` is prompted. Enter the command `ptiflash -x` in console. *CLI will enter into firmware update mode.*



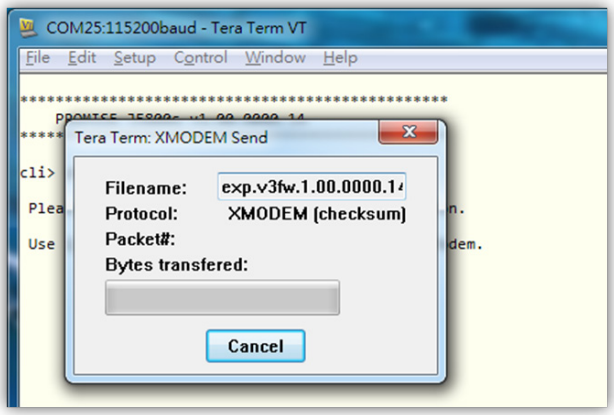
5. Open **XModem Send** by navigating - File -> Transfer -> XMODEM -> Send (or equivalent in other software):



6. Chose firmware image file in opened window and click **Open**.



7. Firmware update begins. Wait until the download is completed.



8. Once download is completed, reboot the system for new firmware to take effect.

Updating Firmware over IP Network (TFTP)

Firmware update of PROMISE J5000 series of products can also be done over IP network through TFTP protocol. To update system firmware via TFTP protocol, system management Ethernet port must be connected to network and must have IP address.

To update the firmware over IP via TFTP, follow these steps:

1. Install TFTP server software on the host system to provide TFTP service. Use an open source utility like TFTPD32 in Windows platform to provide TFTP service.
2. Make sure the TFTP server is connected to the same Ethernet switch or switching fabric as the JBOD.
3. Make sure that IP address of the TFTP server and the J5000 are in the same subnet.

```
cli>
cli> net

=================================================================
    Physical Address. . . . . . . . . : 00-01-55-55-01-01
    DHCP Enabled. . . . . . . . . . . : Yes
    IP Address. . . . . . . . . . . . : 192.168.206.64
    Subnet Mask . . . . . . . . . . . : 255.255.255.0
    Default Gateway . . . . . . . . . : 192.168.206.254
    Ethernet Link Status . . . . . . .: Up
    Ethernet Link Speed . . . . . . . : 100 Mbps
    Ethernet Link Duplex Mode . . . . : Full

=================================================================
```

4. Save the firmware file at the base directory of TFTP server.
5. Open the CLI management interface, either via serial port or Telnet over IP.

6. Enter CLI command

```
ptiflash -t <TFTP server IP> -f <Firmware Filename>
```

to start firmware update process.

***Note**: Please replace <TFTP server IP> and <Firmware Filename> with appropriate value*

```
cli> ptiflash -t 192.168.206.115 -f exp.v3fw.1.00.0000.14.fw

 Firmware Downloading ....
```

7. After firmware download is completed, please reboot the system for new firmware to take effect.

```
 Received 497768Bytes
 Firmware Download Complete


cli>
cli>
```

Zone Configuration

Improvements in the SAS standard has greatly increased the number of devices that can be accommodated in a single domain. The concept of zones for grouping disks drives has been developed and implemented in the SAS 2 standard as a means to better manage this increase. Zone Configuration enables you to configure data hosts to access a specified group of hard disk drives via Serial attached SCSI (SAS). Zone configuration hard disk drive access control is used for the traffic segregation, resource flexibility, improved security, and topology control functionality.

By default, SAS access configuration is disabled, which means all hosts can access all disks.

Note

End users can change the Zone Configuration using the **zone** CLI command.

Example:

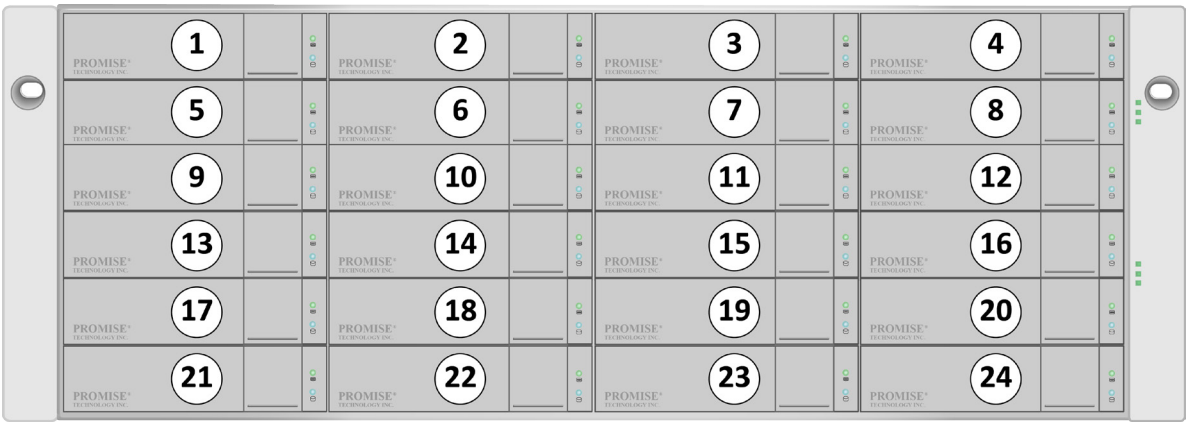
Linux: `jbodCLI]# jbodutility -d 0 -z 1`

Windows: `JBOD Utility> jbodutility.exe -d 0 -z 1`

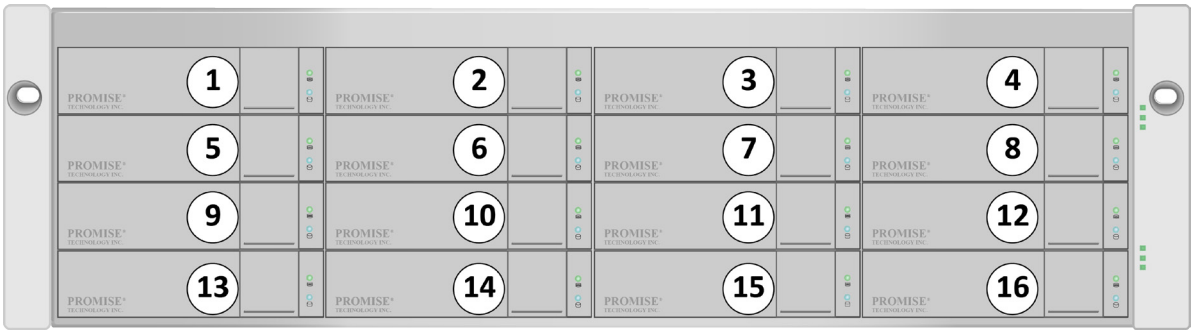
Zone Configuration Options

The VTrak J5000 offers four zone configuration options, including no zoning. These options are described in the sections that follow. Please take note of the drive slot numbering for the different hardware versions (2U, 3U, and 4U) of the VTrak J5000 series.

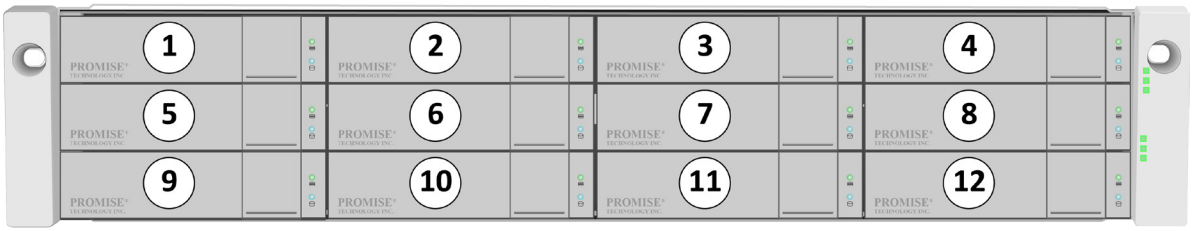
VTrak J5800 (4U, 24 drive) drive slot numbering



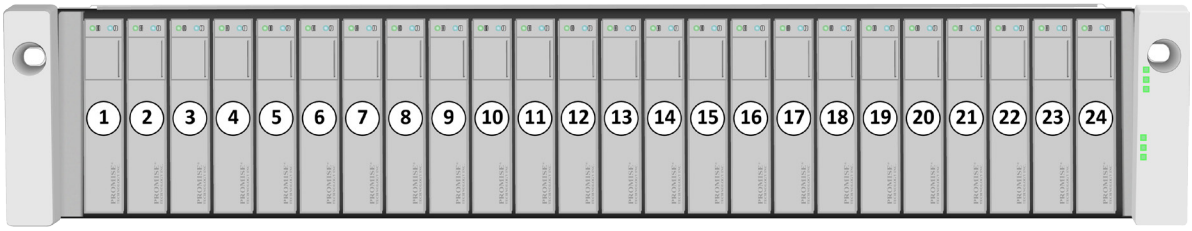
VTrak J5600 (3U, 16 drive) drive slot numbering



VTrak J5300 (2U, 12 drive) drive slot numbering



VTrak J5320 (2U, 24 drive) drive slot numbering



Zoning Configuration 0: No Zoning

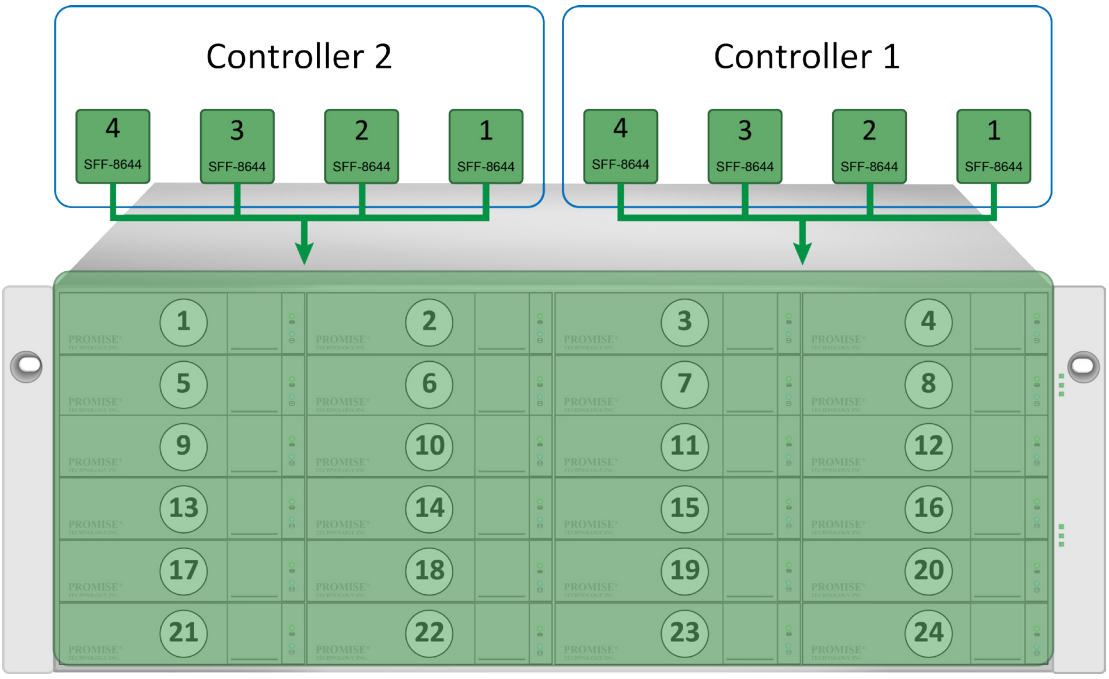
As the name itself implies, in “No Zoning” configuration each Hard Disk Drive can be accessed from any uplink connector. There is no restriction or access control from the Expander. As depicted in diagram below:

VTrak J5800 Zoning Configuration 0

The VTrak J5800 uses two controllers. There are four SFF-8644 uplinks per controller for a total of eight uplinks.

Up to 24 hard disk drives populate the enclosure. The drive identification number is depicted in the illustration below:

VTrak J5800 Zoning Configuration 0: No Zoning

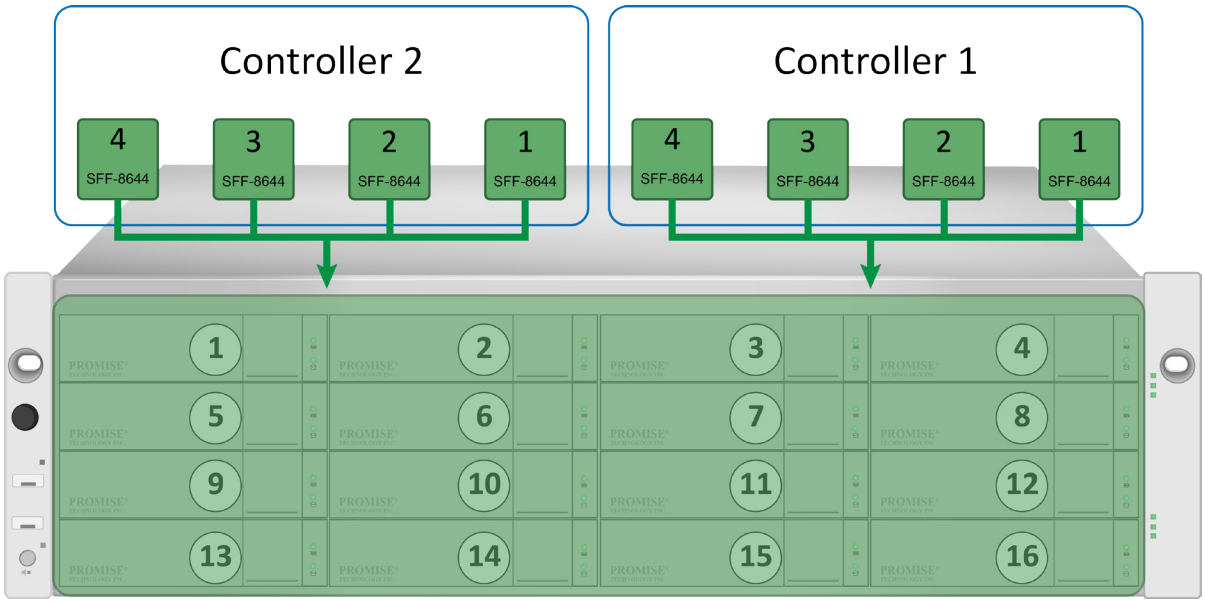


VTrak J5600 Zoning Configuration 0

The VTrak J5600 uses two controllers. There are four SFF-8644 uplinks per controller for a total of eight uplinks.

Up to 16 hard disk drives populate the enclosure. The drive identification number is depicted in the illustration below:

VTrak J5600 Zoning Configuration 0: No Zoning

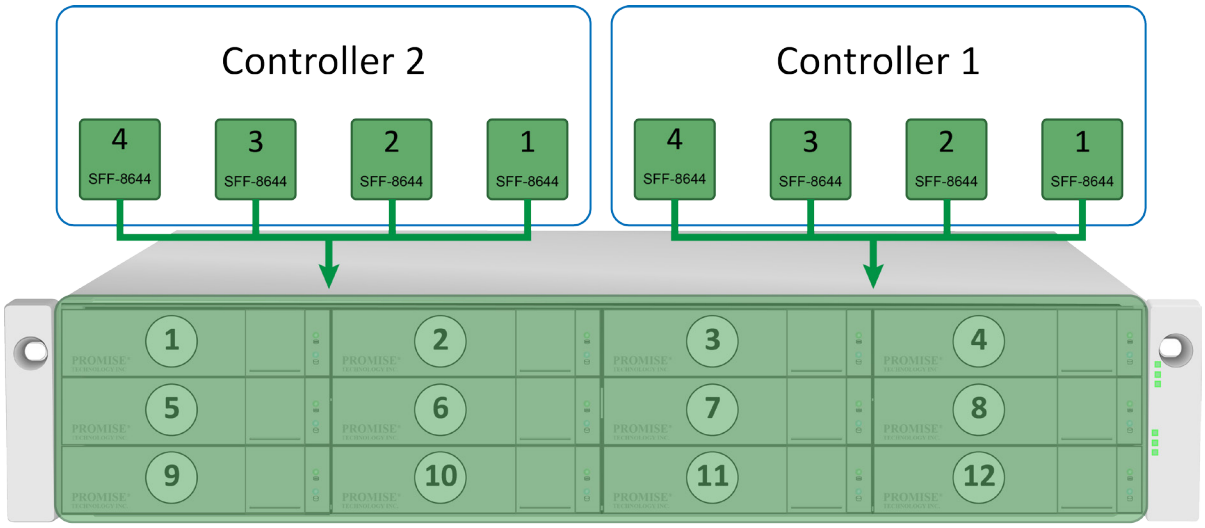


VTrak J5300 Zoning Configuration 0

The VTrak J5300 uses two controllers. There are four SFF-8644 uplinks per controller for a total of eight uplinks.

Up to 12 hard disk drives populate the enclosure. The drive identification number is depicted in the illustration below:

VTrak J5300 Zoning Configuration 0: No Zoning

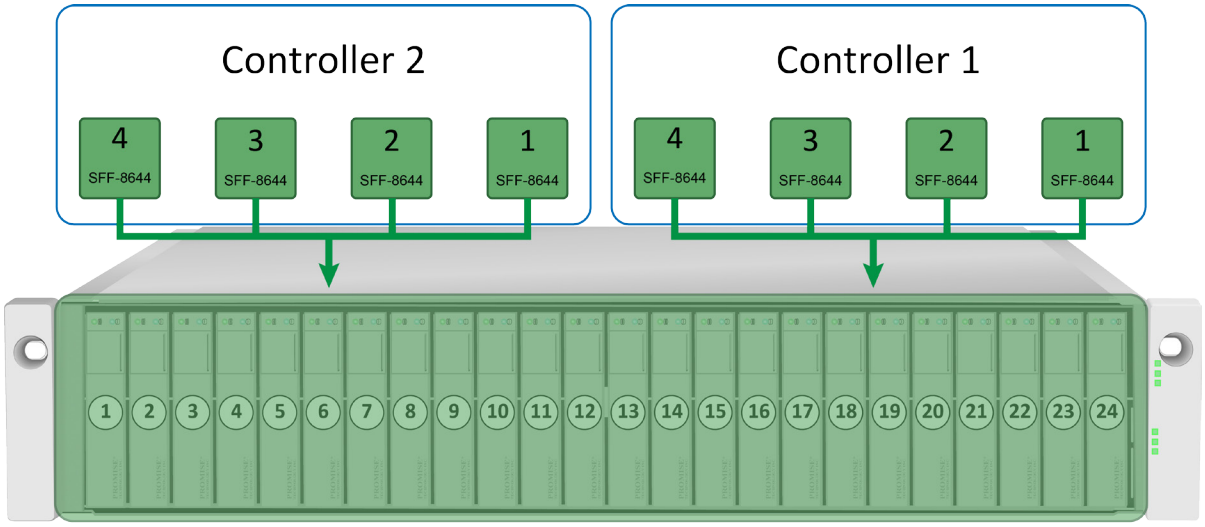


VTrak J5320 Zoning Configuration 0

The VTrak J5320 uses two controllers. There are four SFF-8644 uplinks per controller for a total of eight uplinks.

Up to 24 SSD drives populate the enclosure. The drive identification number is depicted in the illustration below:

VTrak J5320 Zoning Configuration 0: No Zoning



Zoning Configuration 1

In Zoning Configuration 1, the Hard Disk Drive pool is divided evenly into two groups.

To make the allocation user friendly and easy to identify; drive slots are divided right at the middle of the enclosure.

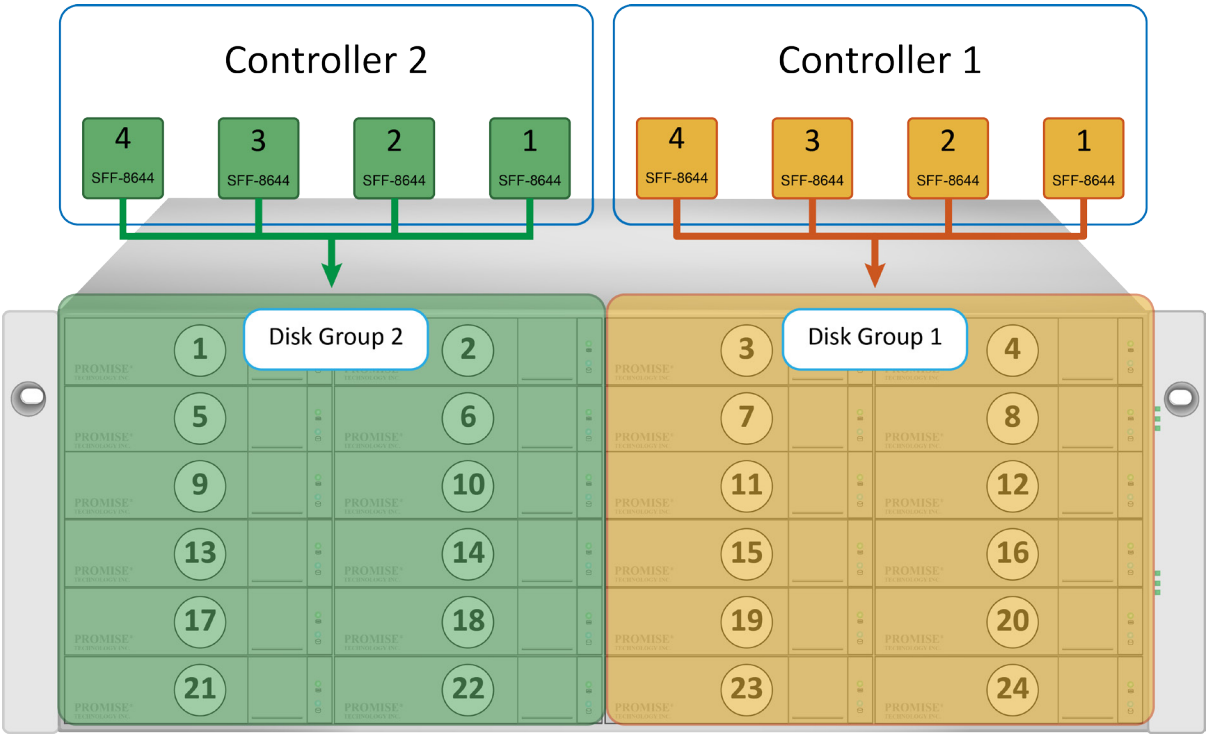
VTrak J5800 Zoning Configuration 1

Zoning configuration allocates Disk Group 1 to Controller 1 and Disk Group 2 to Controller 2.

Controller 1 cannot access any disk drive within Disk Group 2 and vise-versa.

Disk Groups	Disk Drive Slots
Disk Group 1	3, 4, 7, 8, 11, 12, 15, 16, 19, 20, 23 and 24
Disk Group 2	1, 2, 5, 6, 9, 10, 13, 14, 17, 18, 21 and 22

VTrak J5800 Zoning Configuration 1: Two zones



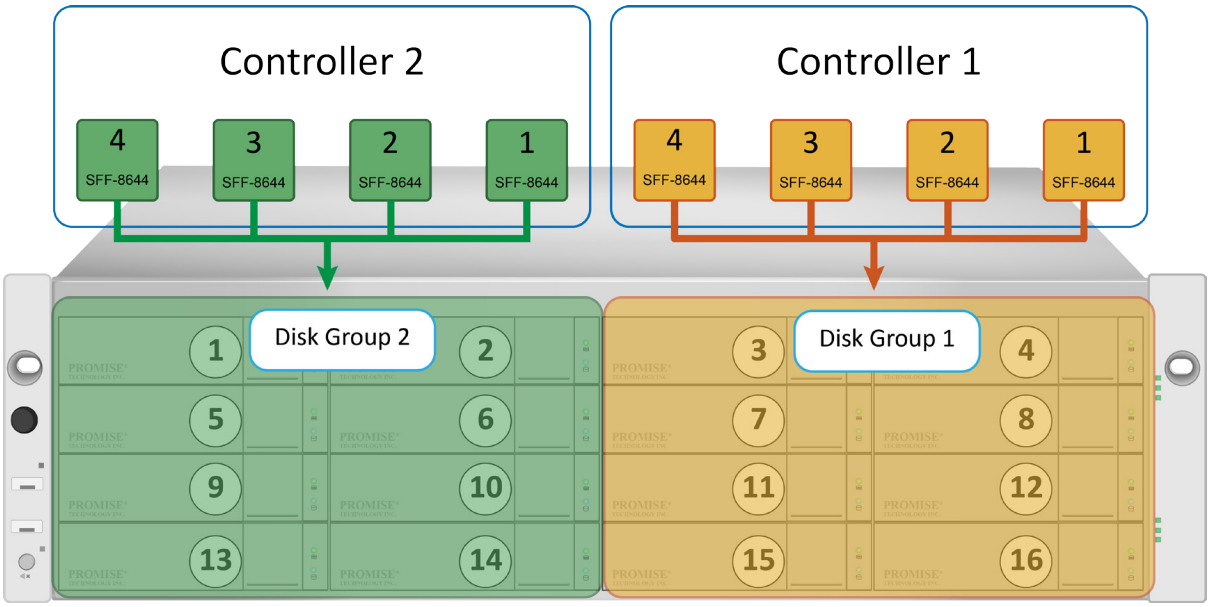
VTrak J5600 Zoning Configuration 1

Zoning configuration allocates Disk Group 1 to Controller 1 and Disk Group 2 to Controller 2.

Controller 1 cannot access any disk drive within Disk Group 2 and vise-versa.

Disk Groups	Disk Drive Slots
Disk Group 1	3, 4, 7, 8, 11, 12, 15 and 16
Disk Group 2	1, 2, 5, 6, 9, 10, 13 and 14

VTrak J5600 Zoning Configuration 1: Two zones



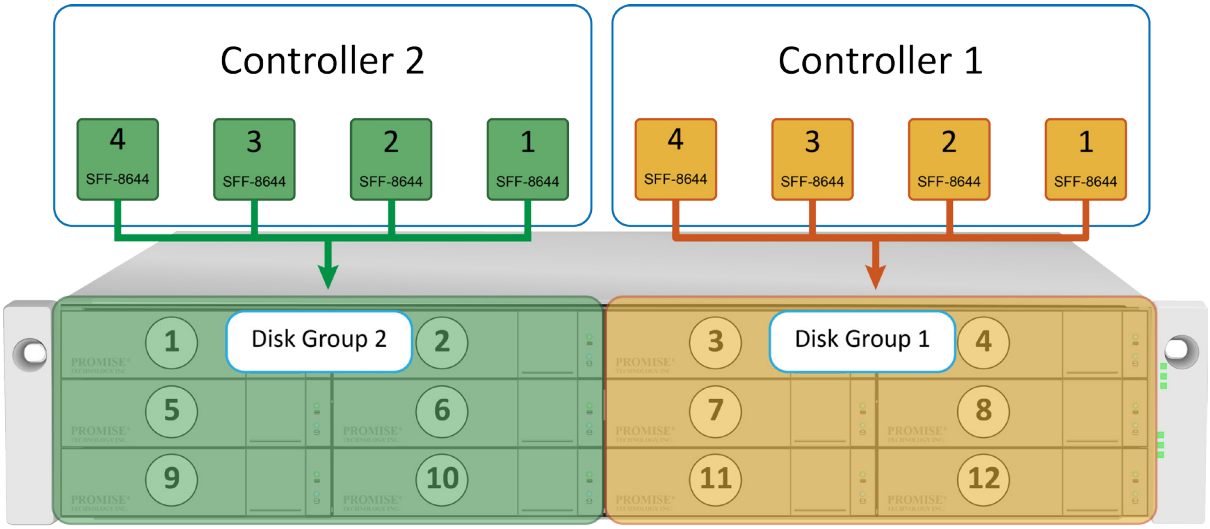
VTrak J5300 Zoning Configuration 1

Zoning configuration allocates Disk Group 1 to Controller 1 and Disk Group 2 to Controller 2.

Controller 1 cannot access any disk drive within Disk Group 2 and vise-versa.

Disk Groups	Disk Drive Slots
Disk Group 1	3, 4, 7, 8, 11 and 12
Disk Group 2	1, 2, 5, 6, 9 and 10

VTrak J5300 Zoning Configuration 1: Two zones



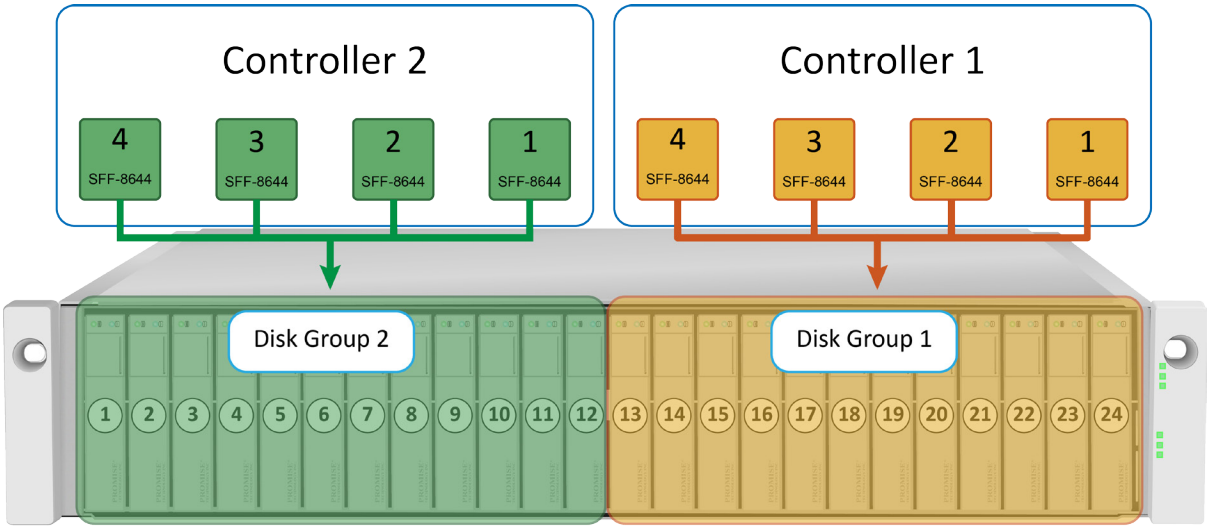
VTrak J5320 Zoning Configuration 1

Zoning configuration allocates Disk Group 1 to Controller 1 and Disk Group 2 to Controller 2.

Controller 1 cannot access any disk drive within Disk Group 2 and vise-versa.

Disk Groups	Disk Drive Slots
Disk Group 1	13,14,15,16,17,18,19, 20, 21, 22, 23 and 24
Disk Group 2	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12

VTrak J5320 Zoning Configuration 1: Two zones



Zoning Configuration 2

In Zoning Configuration 2, the Hard Disk Drive pool is divided evenly into two groups. However the access permission for the uplinks are different. See the examples for the different hardware models below.

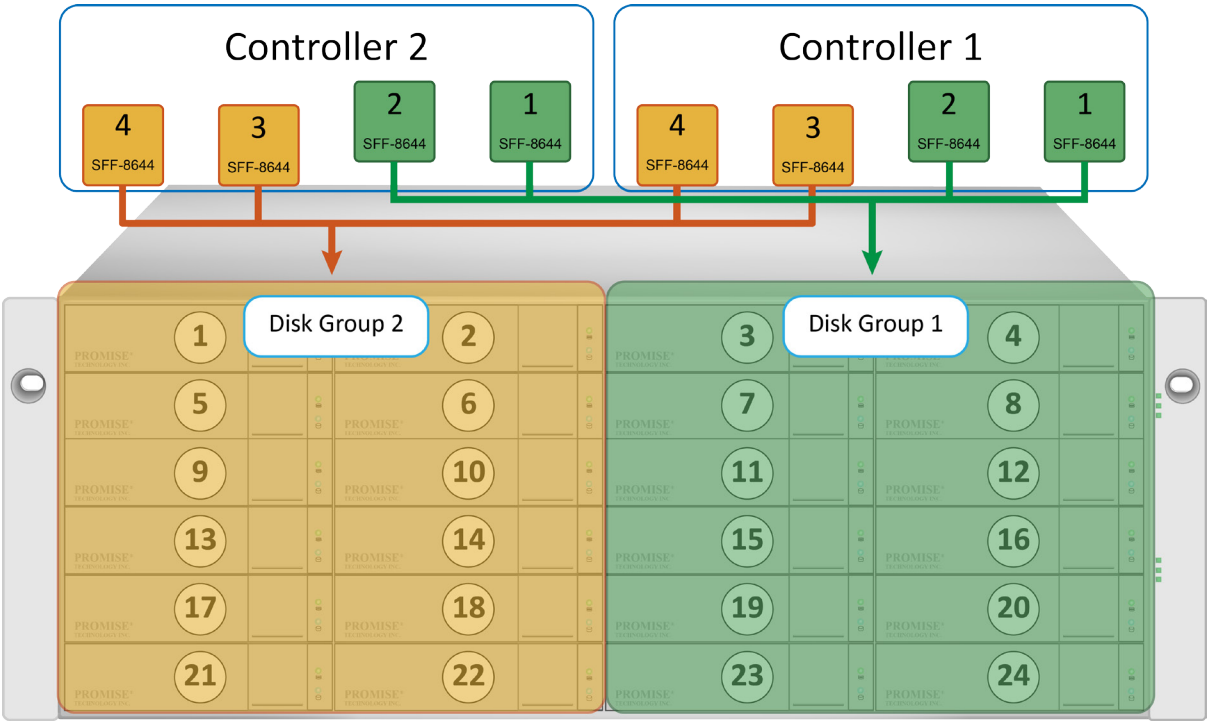
VTrak J5800 Zoning Configuration 2

Zoning Configuration 2 on VTrak J5800 features two disk groups of 12 drives. Access is divided between uplinks on both controllers.

Disk Groups	Disk Drive Slots
Disk Group 1	3, 4, 7, 8, 11, 12, 15, 16, 19, 20, 23 and 24
Disk Group 2	1, 2, 5, 6, 9, 10, 13, 14, 17, 18, 21 and 22

- **SAS ports 1 and 2 of both Controllers, can access Disk Group 1**
- **SAS ports 3 and 4 of both Controllers, can access Disk Group 2**

VTrak J5800 Zoning Configuration 2: Two zones, divided access



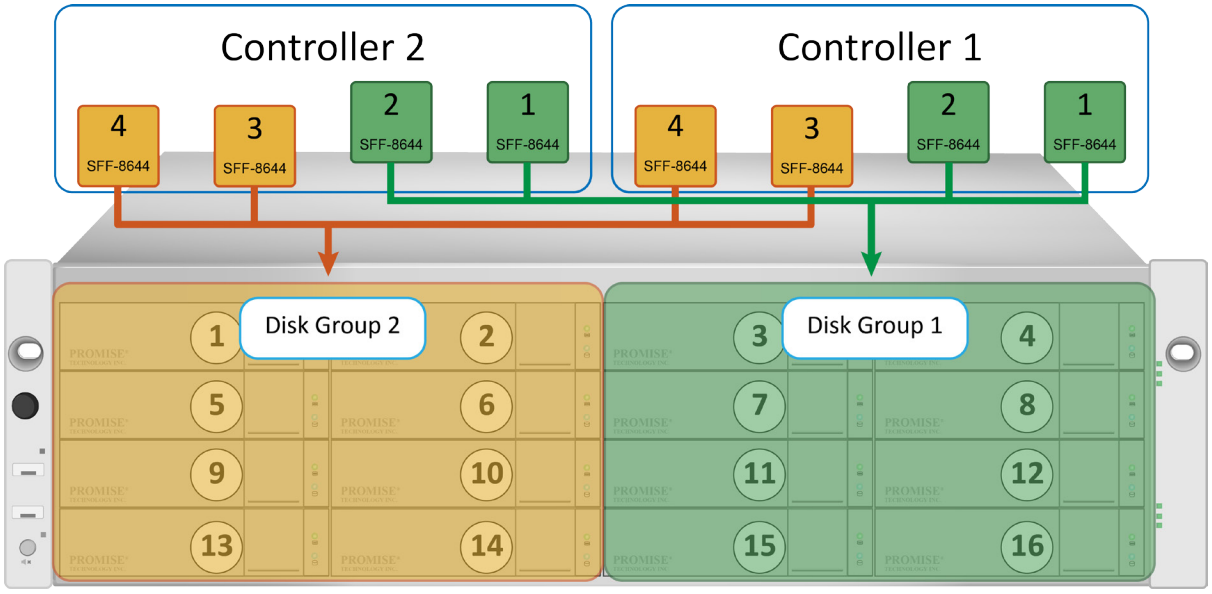
VTrak J5600 Zoning Configuration 2

Zoning Configuration 2 on VTrak 5600 features two disk groups of 8 drives. Access is divided between uplinks on both controllers.

Disk Groups	Disk Drive Slots
Disk Group 1	3, 4, 7, 8, 11, 12, 15 and 16
Disk Group 2	1, 2, 5, 6, 9, 10, 13 and 14

- **SAS ports 1 and 2 of both Controllers, can access Disk Group 1**
- **SAS ports 3 and 4 of both Controllers, can access Disk Group 2**

VTrak J5600 Zoning Configuration 2: Two zones, divided access



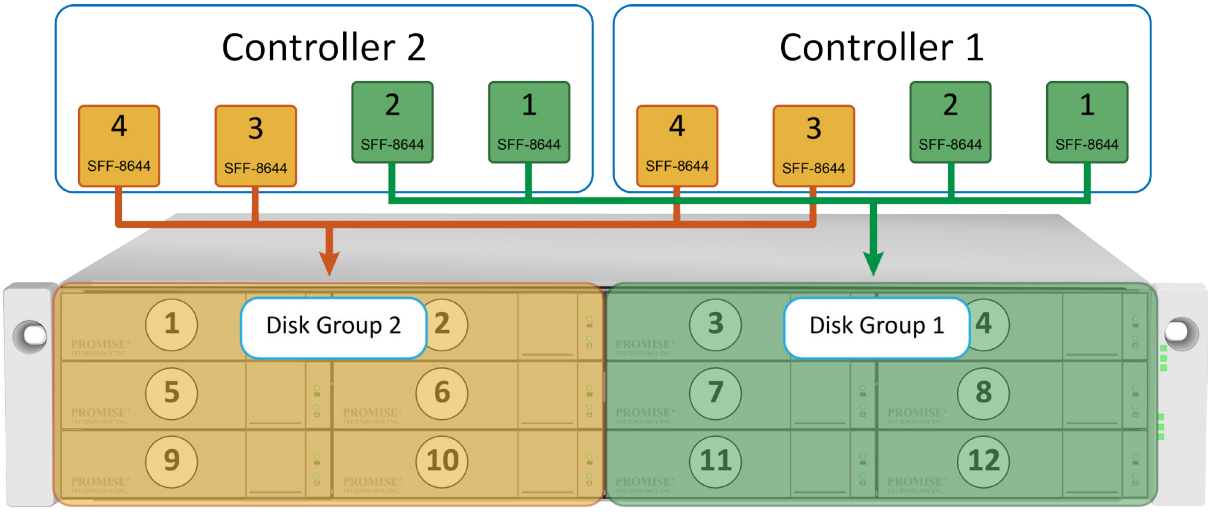
VTrak J5300 Zoning Configuration 2

Zoning Configuration 2 on VTrak 5300 features two disk groups of 6 drives. Access is divided between uplinks on both controllers.

Disk Groups	Disk Drive Slots
Disk Group 1	3, 4, 7, 8, 11 and 12
Disk Group 2	1, 2, 5, 6, 9 and 10

- **SAS ports 1 and 2 of both Controllers, can access Disk Group 1**
- **SAS ports 3 and 4 of both Controllers, can access Disk Group 2**

VTrak J5300 Zoning Configuration 2: Two zones, access divided between controllers



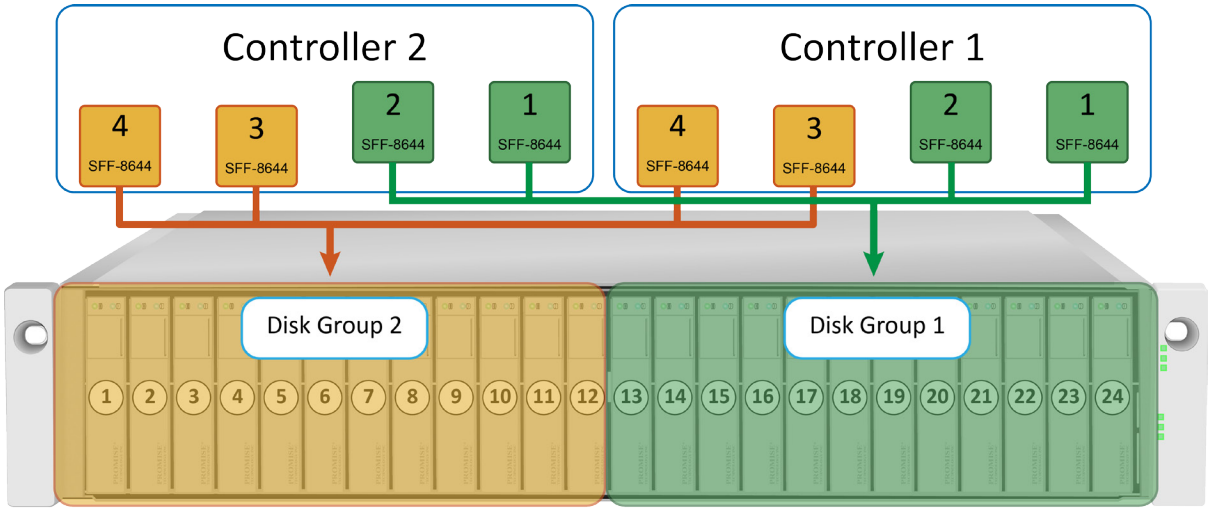
VTrak J5320 Zoning Configuration 2

Zoning Configuration 2 on VTrak 5320 features two disk groups of 12 drives. Access is divided between uplinks on both controllers.

Disk Groups	Disk Drive Slots
Disk Group 1	13,14,15,16,17,18,19, 20, 21, 22, 23 and 24
Disk Group 2	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12

- **SAS ports 1 and 2 of both Controllers, can access Disk Group 1**
- **SAS ports 3 and 4 of both Controllers, can access Disk Group 2**

VTrak J5320 Zoning Configuration 2: Two zones, access divided between controllers



Zoning Configuration 3

In Zoning Configuration 3, drive pools are divided into 4 groups.

To make the allocation user friendly and easy to identify, drive slots are divided across the column of disk physical location for the three HDD models (J5300, J5600, J5800) while on the VTrak 5320 the SSD drives are divided into four groups of 6 drives.

VTrak J5800 Zoning Configuration 3

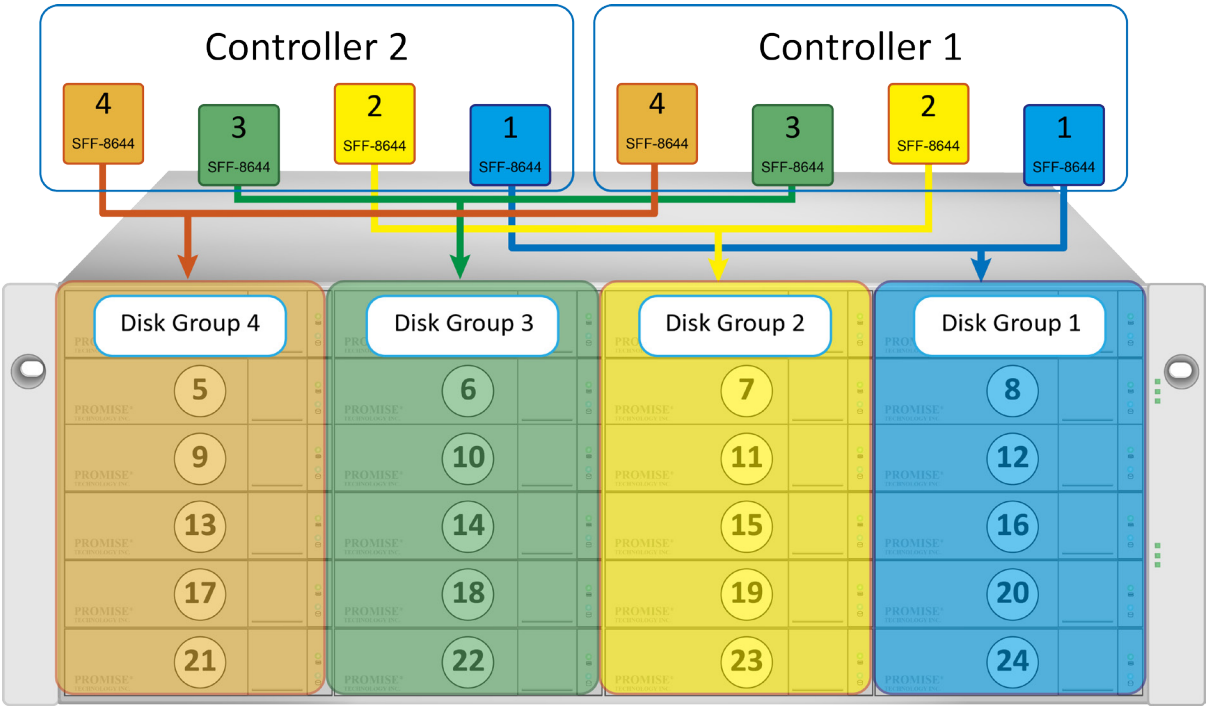
Zoning Configuration 3 on VTrak 5800 features four disk groups of 6 drives. Access is divided between uplinks on both controllers.

Disk Groups	Disk Drive Slots
Disk Group 1	4, 8, 12, 16, 20 and 24
Disk Group 2	3, 7, 11, 15, 19 and 23
Disk Group 3	2, 6, 10, 14, 18 and 22
Disk Group 4	1, 5, 9, 13, 17 and 21

- **SAS ports 1 of both Controllers, can access Disk Group 1**
- **SAS ports 2 of both Controllers, can access Disk Group 2**
- **SAS ports 3 both Controllers, can access Disk Group 3**
- **SAS ports 4 of both Controllers, can access Disk Group 4**

Access to the drives outside the given combination is restricted.

VTrak J5800 Zoning Configuration 3: Four zones, divided access



VTrak J5600 Zoning Configuration 3

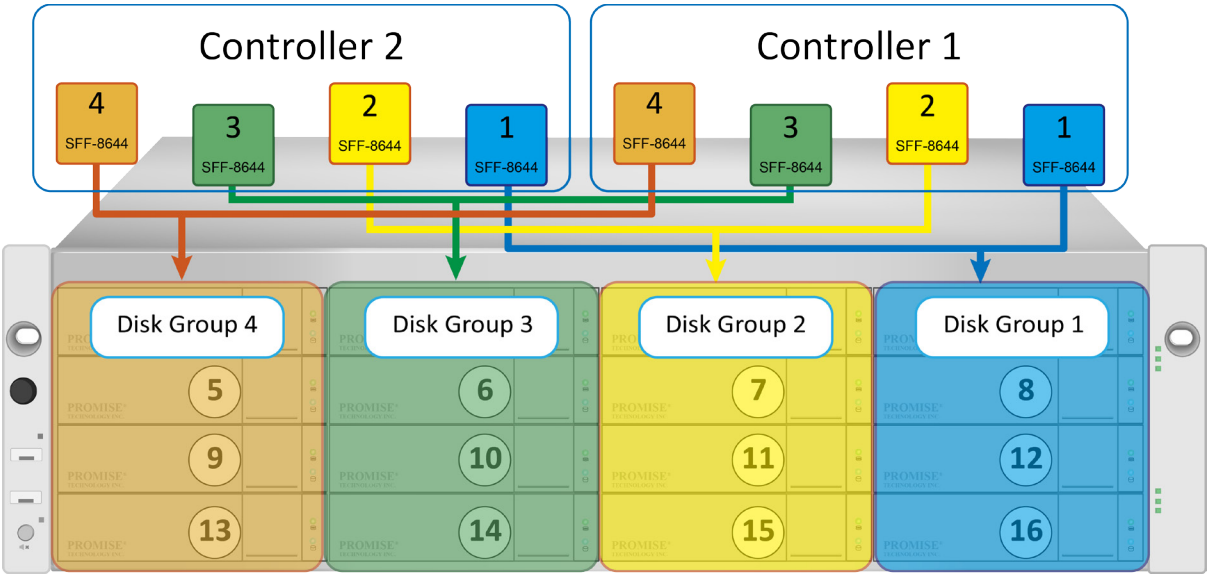
Zoning Configuration 3 on VTrak 5600 features four disk groups of 4 drives. Access is divided between uplinks on both controllers.

Disk Groups	Disk Drive Slots
Disk Group 1	4, 8, 12 and 16
Disk Group 2	3, 7, 11 and 15
Disk Group 3	2, 6, 10 and 14
Disk Group 4	1, 5, 9 and 13

- **SAS ports 1 of both Controllers, can access Disk Group 1**
- **SAS ports 2 of both Controllers, can access Disk Group 2**
- **SAS ports 3 both Controllers, can access Disk Group 3**
- **SAS ports 4 of both Controllers, can access Disk Group 4**

Access to the drives outside the given combination is restricted.

VTrak J5600 Zoning Configuration 3: Four zones, divided access



VTrak J5300 Zoning Configuration 3

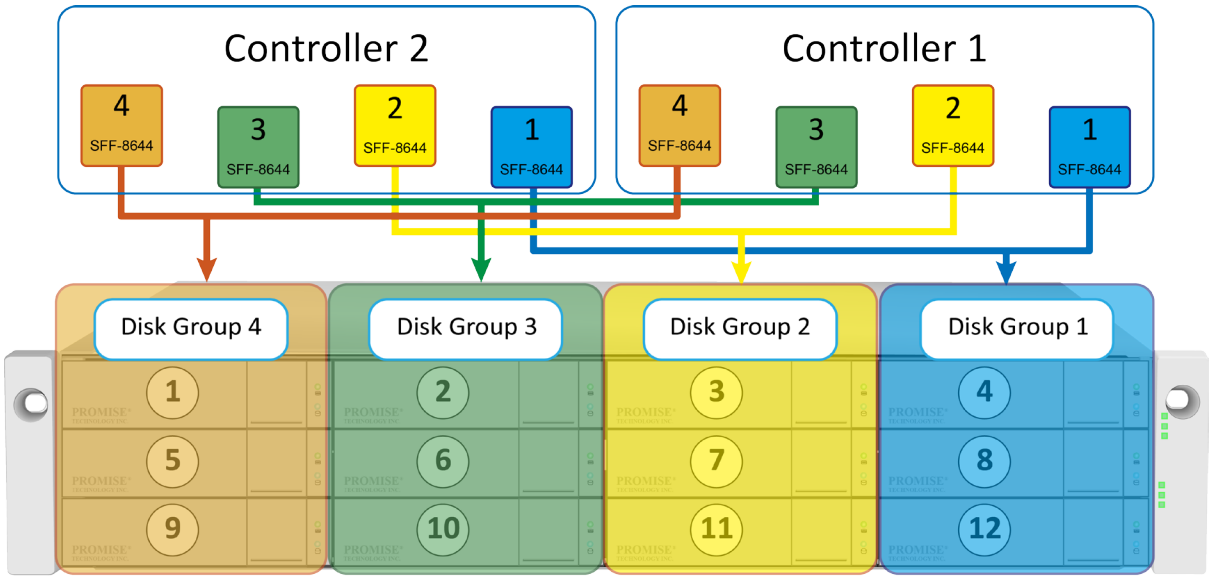
Zoning Configuration 3 on VTrak 5300 features four disk groups of 3 drives. Access is divided between uplinks on both controllers.

Disk Groups	Disk Drive Slots
Disk Group 1	4, 8 and 12
Disk Group 2	3, 7 and 11
Disk Group 3	2, 6 and 10
Disk Group 4	1, 5 and 9

- **SAS ports 1 of both Controllers, can access Disk Group 1**
- **SAS ports 2 of both Controllers, can access Disk Group 2**
- **SAS ports 3 both Controllers, can access Disk Group 3**
- **SAS ports 4 of both Controllers, can access Disk Group 4**

Access to the drives outside the given combination is restricted.

VTrak J5300 Zoning Configuration 3: Four zones, divided access



VTrak J5320 Zoning Configuration 3

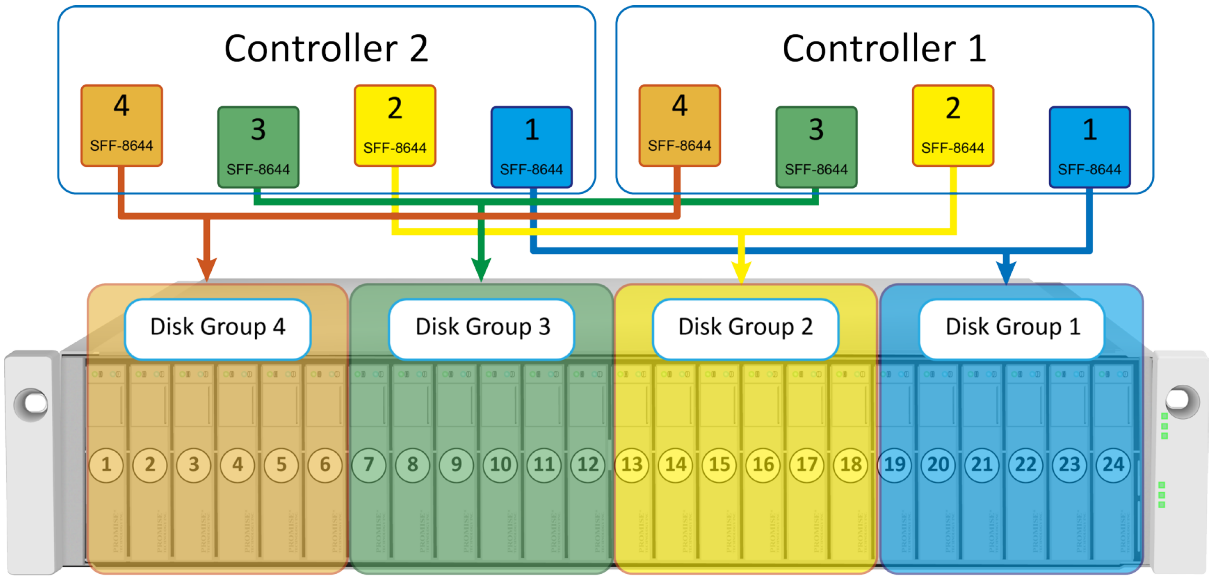
Zoning Configuration 3 on VTrak 5320 features four disk groups of 6 drives. Access is divided between uplinks on both controllers.

Disk Groups	Disk Drive Slots
Disk Group 1	19, 20, 21, 22, 23 and 24
Disk Group 2	13, 14, 15, 16, 17 and 18
Disk Group 3	7, 8, 9, 10, 11 and 12
Disk Group 4	1, 2, 3, 4, 5 and 6

- **SAS port 1 of both Controllers, can access Disk Group 1**
- **SAS ports 2 of both Controllers, can access Disk Group 2**
- **SAS ports 3 both Controllers, can access Disk Group 3**
- **SAS ports 4 of both Controllers, can access Disk Group 4**

Access to the drives outside the given combination is restricted.

VTrak J5320 Zoning Configuration 3: Four zones, divided access



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