



# EMC<sup>®</sup> VNXe<sup>™</sup> Series

## VNXe3300<sup>™</sup>

### Hardware Information Guide

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REV 04

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# PREFACE

*As part of an effort to improve and enhance the performance and capabilities of its product lines, EMC periodically releases revisions of its hardware and software. Therefore, some functions described in this document might not be supported by all versions of the software or hardware currently in use. For the most up-to-date information about product features, refer to your product release notes.*

*If a product does not function properly or does not function as described in this document, please contact your EMC representative.*

## About this book

This guide describes the EMC® VNXe3300™. The VNXe3300 platform supports a disk processor enclosure (DPE) with one to two storage processors (SPs).

In the VNXe3300 platform, the DPE uses either a 15 drive, 3.5-inch disk drive 3U enclosure (DPE7) or a 25 drive, 2.5-inch disk drive 3U enclosure (DPE8). The DAE used in the VNXe3300 platform is either a 15 drive, 3.5-inch disk drive 3U enclosure (DAE6S) or a 25 drive, 2.5-inch disk drive 2U enclosure (DAE5S). As a result, in the VNXe3300 platform, the DPE and DAE are available in several DPE/DAE configurations (for more information, see and [“Disk-array enclosure” on page 38](#))

### IMPORTANT

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When calculating the number of drives for your VNXe3300 platform, the DPE is included in the total drive slot quantity of from 120 to 150 drives. If the total drive slot quantity exceeds from 120 to 150, you will not be able to add another DAE. The [“Disk-array enclosure”](#) section on [page 38](#) provides more information about the available DAEs for the VNXe3300 platform as well as a configuration table.

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This guide is available online at [www.emc.com/vnxesupport](http://www.emc.com/vnxesupport). On this page, click **Documentation**. On the page that appears, under VNXe Series, click **VNXe3300**. On the next page that appears, under Content type, click **Manuals and Guides**. On the right side of the page that appears, a list of all the VNXe3300 product guides will appear. Select the *VNXe3300 Hardware Information Guide* from this list. The guide and other related VNX Series guides can be downloaded from here.

## Revision history

The following table presents the revision history of this document:

Revision	Date	Description
A04	March, 2016	Updated the following section: <ul style="list-style-type: none"> <li>• <a href="#">“Specifications” on page 55</a></li> </ul>
A03	June 2012	Following items were changed in this release: <ul style="list-style-type: none"> <li>• First release of the <i>VNXe3300 Hardware Information Guide</i> in the new EMC look and feel format</li> <li>• Added information about the:               <ol style="list-style-type: none"> <li>a.) 3U, 25 (2.5-inch) disk drive DPE (<a href="#">“3U, 25 (2.5-inch) disk drive DPE” on page 18</a>)</li> <li>b.) RAM memory 12 GB per SP (<a href="#">“Hardware features” on page 13</a>)</li> <li>c.) Two-port 10 Gb/s copper Ethernet I/O module (<a href="#">“Two-port 10-Gb/s RJ-45 Base-T I/O module” on page 37</a>)</li> <li>d.) 2U, 25 (2.5-inch) disk drive DAE (<a href="#">“2U, 25 (2.5-inch) DAE” on page 48</a>)</li> </ol> </li> </ul>
A02	July, 2011	Added information for the following items: <ul style="list-style-type: none"> <li>• DC power supply module (<a href="#">“DC power supply module (optional)” on page 22</a>)</li> <li>• SP LEDs (<a href="#">Table 4 on page 23</a>)</li> </ul>
A01	February, 2011	First release of the <i>VNXe3300 Hardware Information Guide</i>

## How this document is organized

The major sections of this guide are listed in the following table.

Title	Description
<a href="#">“Overview” on page 11</a>	Describes the software and hardware features of a typical VNXe3300.
<a href="#">“VNXe3300 platform” on page 11</a>	Describes and shows the front and rear views of a typical VNXe3300.
<a href="#">“System component description” on page 14</a>	Provides a description of the components that comprise a VNXe3300. Along with a description, illustrations of each component are also shown.
<a href="#">“Disk processor enclosure” on page 14</a>	Describes and illustrates the two types of DPEs available for the VNXe3300.
<a href="#">“Disk-array enclosure” on page 38</a>	Describes and illustrates the two types of DAEs available for the VNXe3300.

## Audience

This document is designed for personnel who install, configure, and maintain the VNXe3300. To use this hardware publication, you should be familiar with digital storage and networking equipment. Within the document an overview of the architecture,

features, and components of the VNXe3300 platform are presented. The specific aspects of the VNXe3300 platform and its major components include the front and rear LED indicators and the connectors on the DPE and the DAE.

## Related documentation

The following EMC publication provides additional information:

- ◆ *EMC VNXe3300 System Installation Guide*
- ◆ *DC-Powered VNXe Series Enclosures Installation and Operation Guide*

This guide is available online at [www.emc.com/vnxesupport](http://www.emc.com/vnxesupport). On this page, click **Documentation**. On the page that appears, under VNXe Series, click **VNXe3300**. On the next page that appears, under Content type, click **Manuals and Guides**. On the right side of the page that appears, a list of all the VNXe3300 product guides will appear. Select the *VNXe3300 Hardware Information Guide* from this list. The guide and other related VNX Series guides can be downloaded from here.

## Conventions used in this document

EMC uses the following conventions for special notices:



**DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.

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**WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.

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**CAUTION**, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

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**NOTICE** is used to address practices not related to personal injury.

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**Note:** A note presents information that is important, but not hazard-related.

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### **IMPORTANT**

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An important notice contains information essential to software or hardware operation.

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## Typographical conventions

EMC uses the following type style conventions in this document:

<b>Normal</b>	Used in running (nonprocedural) text for: <ul style="list-style-type: none"> <li>Names of interface elements (such as names of windows, dialog boxes, buttons, fields, and menus)</li> <li>Names of resources, attributes, pools, Boolean expressions, buttons, DQL statements, keywords, clauses, environment variables, functions, utilities</li> <li>URLs, pathnames, filenames, directory names, computer names, filenames, links, groups, service keys, file systems, notifications</li> </ul>
<b>Bold</b>	Used in running (nonprocedural) text for: <ul style="list-style-type: none"> <li>Names of commands, daemons, options, programs, processes, services, applications, utilities, kernels, notifications, system calls, man pages</li> </ul> <p>Used in procedures for:</p> <ul style="list-style-type: none"> <li>Names of interface elements (such as names of windows, dialog boxes, buttons, fields, and menus)</li> <li>What user specifically selects, clicks, presses, or types</li> </ul>
<i>Italic</i>	Used in all text (including procedures) for: <ul style="list-style-type: none"> <li>Full titles of publications referenced in text</li> <li>Emphasis (for example a new term)</li> <li>Variables</li> </ul>
<code>Courier</code>	Used for: <ul style="list-style-type: none"> <li>System output, such as an error message or script</li> <li>URLs, complete paths, filenames, prompts, and syntax when shown outside of running text</li> </ul>
<b><code>Courier bold</code></b>	Used for: <ul style="list-style-type: none"> <li>Specific user input (such as commands)</li> </ul>
<i><code>Courier italic</code></i>	Used in procedures for: <ul style="list-style-type: none"> <li>Variables on command line</li> <li>User input variables</li> </ul>
< >	Angle brackets enclose parameter or variable values supplied by the user
[ ]	Square brackets enclose optional values
	Vertical bar indicates alternate selections - the bar means “or”
{ }	Braces indicate content that you must specify (that is, x or y or z)
...	Ellipses indicate nonessential information omitted from the example

## Where to get help

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# Overview

The VNXe Series provides an integrated storage platform for small/medium businesses (SMB) and lower mid-market organizations. Providing significant advancements in efficiency and simplicity, the VNXe Series facilitates complete storage consolidation with advanced file and block functionality as well as a simple, application-driven approach to managing shared storage.

Supporting high availability through the use of redundant components—power supplies, fans, storage processors—as well as dynamic failover and failback, the VNXe Series also supports the ability to upgrade system software or hardware while the VNXe platform is running.

The VNXe3300 platform is one of three models that make up the VNXe Series. This platform is ideal for businesses with physical server infrastructures, as well as those making the move to server virtualization to drive consolidation and greater efficiency. The VNXe3300 platform also shares a comprehensive set of features including exceptional capacity utilization, data protection and availability solutions, and advanced support capabilities. [Figure 1](#) shows an example of the VNXe3300 platform with a front bezel.



VNX-000113

**Figure 1** Example of a VNXe3300 platform with front bezel

## VNXe3300 platform

This section shows examples of the front and rear views of a VNXe3300 platform.

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**Note:** A fully configured VNXe3300 platform includes up to seven DAEs supporting a maximum of from 120 to 150 disk drives depending on the type and mix of the DPE and DAEs used (for configuration information, see the [“DPE and DAE configuration rules”](#) section on [page 39](#)).

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## Front view

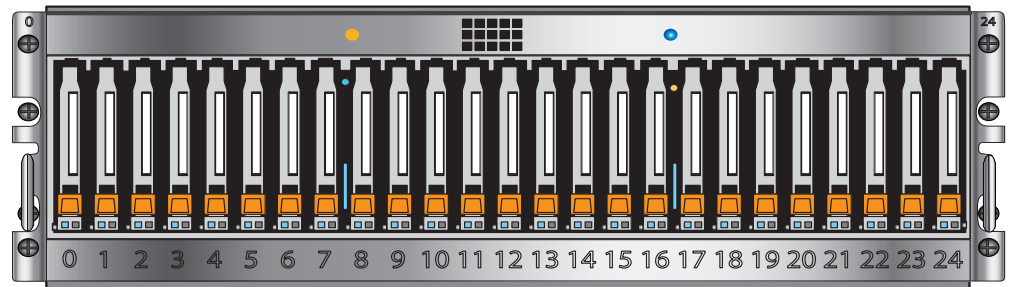
**Figure 2** shows an example of the front view of the VNxe3300 platform having a 3U, 15 (3.5-inch) disk drive DPE (DPE7).



VNxe-000109

**Figure 2** Example of a VNxe3300 platform with a 3U, 15 (3.5-inch) disk drive DPE (front view)

**Figure 3** shows an example of the front view of the VNxe3300 platform having a 3U, 25 (2.5-inch) disk drive DPE (DPE8).

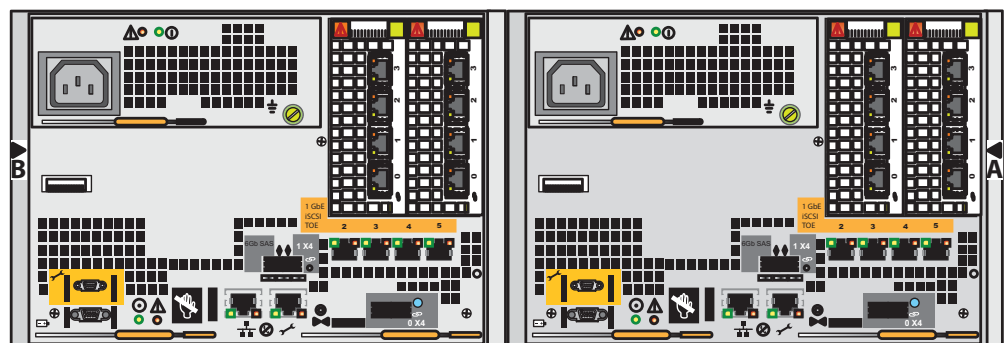


VNxe-000754

**Figure 3** Example of a VNxe3300 platform with a 3U, 25 (2.5-inch) disk drive DPE (front view)

## Rear view

Looking from left to right, **Figure 4** shows an example of the rear view of the VNxe3300 platform having a DPE with two storage processors (SP B and A), respectively.



VNxe-000750

**Figure 4** Example of a VNxe3300 DPE with two SPs (rear view)

## Hardware features

Contained in a 3U platform architecture, the VNXe3300 platform weighs approximately 96.4 lb (43.8 kg). It measures 5.25 inches high x 17.5 inches wide x 24.25 inches deep (13.3 cm to 44.5 cm x 61.5 cm). Between the front and rear of the enclosure, a midplane distributes power and signals to all the enclosure components. The VNXe3300 platform DPE CPU modules and power supplies plug directly into the midplane connections.

The “[Specifications](#)” section on [page 55](#) provides the physical, environmental, and power details that make up the VNXe3300 platform.

Configured for AC-input power, the VNXe3300 platform includes the following hardware features:

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**Note:** An optional DC power supply for the SP is also available (see the “[DC power supply module \(optional\)](#)” section on [page 22](#) for more information).

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- ◆ One 3U DPE:
  - On the front of the 3U DPE, three types of disk drives are supported in two types of disk drive carriers; a 3U, 15 (3.5-inch) disk drive carrier (DPE7) and a 3U, 25 (2.5-inch) disk drive carrier (DPE8). The disk drives supported are Serial attached-SCSI (SAS), near-line SAS (NL-SAS), Flash, and Self-Encrypting Drives (SEDs) for SAS and NL-SAS). For more information about the disk drives supported in the VNXe3300, refer to the *EMC® VNXe™ Series Storage Systems Disk and OE Matrix* document.

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**Note:** You cannot mix non-SED and SED drives. Either all non-SED or all SED.

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- On the rear of the 3U DPE, a dual SP (A and B) is supported; each SP consists of:
  - A CPU module with an Intel Xeon Quad Core 2.13-GHz processor with three Double Data Rate Three (DDR3) synchronous dynamic RAM (SDRAM) slots supporting 12 GB of memory per SP
  - Four integrated 1-Gb/s iSCSI LAN ports (labeled **1 GbE iSCSI TOE 2, 3, 4, and 5**)
  - Two integrated 6-Gb/s SAS x4 ports (labeled **6Gb SAS 0 x4** and **1 x4**); supporting speeds are 1.5, 3, and 6 Gb/s

**Note:** 6Gb SAS port 1 x4 is not supported at this time.

- Two PCI Gen 2 x4 I/O module slots supporting the following UltraFlex™ I/O modules:
 

**Note:** Support for the second I/O module slot is available only in VNXe OE version 2.3.x and later.

  - a.) Four-port 1-Gb/s (1000Base-T) copper iSCSI Ethernet (labeled **1 GbE** on the latch handle)
  - b.) Two-port 10-Gb/s optical iSCSI (labeled **10 GbE iSCSI** on the latch handle)
  - c.) Two-port 10-Gb/s RJ-45 Base-T (labeled **10 GbE Base-T** on the latch handle)

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**Note:** Any combination of the above I/O modules is supported. However, both SPs must have the same I/O module configuration.

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- One RS-232/EIA 232 serial (up to 115 K baud) service laptop (micro DB-9) port
- One RS-232/EIA 232 serial network management (micro DB-9) port
- One 10/100/1000 LAN management (RJ-45) port
- One 10/100/1000 LAN service (RJ-45) port
- One power supply module; either AC (see the [“AC power supply module”](#) section on [page 22](#) for more information) or the optional DC (see the [“DC power supply module \(optional\)”](#) section on [page 22](#) for more information)
- ◆ Either a 2U, 15 (3.5-inch) disk drive DAE (DAE6S) or a 2U, 25 (2.5-inch) disk drive DAE (DAE5S) is supported in several configurations (for more DPE/DAE configuration information, see [Table 17 on page 39](#))

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#### IMPORTANT

When calculating the number of drives for your VNXe3300 platform, the 3U DPE is included in the total drive slot quantity of from 120 to 150 drives. If the total drive slot quantity exceeds from 120 to 150, you will not be able to add another DAE. The [“Disk-array enclosure”](#) section on [page 38](#) provides more information about the available DAEs for the VNXe3300 platform as well as a configuration table.

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- ◆ Any required cables including LAN cables, modem cables, and serial DB-9 cable.
- ◆ Mounting rails with hardware
- ◆ Front bezel with VNXe3300 badge

## System component description

This section describes the VNXe3300 platform components. These details include illustrations and descriptions of the front and rear connectors and the LED indicators.

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**Note:** In the following sections, the illustrations and corresponding tables describe these individual components. These descriptions are for illustrative purposes only.

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### Disk processor enclosure

As previously described, the VNXe3300 platform consists of a 3U disk processor enclosure (DPE).

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#### IMPORTANT

When calculating the number of drives for your VNXe3300 platform, the 3U DPE is included in the total drive slot quantity of from 120 to 150 drives. If the total drive slot quantity exceeds from 120 to 150, you will not be able to add another DAE. The [“Disk-array enclosure”](#) section on [page 38](#) provides more information about the available DAEs for the VNXe3300 platform as well as a configuration table.

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Each VNXe3300 platform 3U DPE consists of the following components:

- ◆ Drive carrier
- ◆ Disk drives
- ◆ Midplane
- ◆ Storage processor (SP)
- ◆ Power supply module
- ◆ EMI shielding

## Drive carrier

The disk drive carriers are metal and plastic assemblies that provide smooth, reliable contact with the enclosure slot guides and midplane connectors. Each carrier has a handle with a latch and spring clips. The latch holds the disk drive in place to ensure proper connection with the midplane. Disk drive activity/fault LEDs are integrated into the carrier. The “[Front view](#)” section on [page 16](#) provides more information about the drive carrier.

## Disk drives

You can visually distinguish between the disk drive types by their different latch and handle mechanisms and by the type, capacity, and speed labels on each disk drive. You can add or remove a disk drive while the DPE is powered up, but you should exercise special care when removing a disk drive while in use. Disk drives are extremely sensitive electronic components. For more information about the disk drives supported in the VNXe3300, refer to the *EMC® VNXe™ Series Storage Systems Disk and OE Matrix* document.

## Midplane

A midplane separates the front-facing disk drives from the rear-facing SPs. It distributes power and signals to all the components in the enclosure. SPs and disk drives plug directly into the midplane.

## Storage processor

The storage processor (SP) is the intelligent component of the disk processor enclosure (DPE). Basically, it acts as the control center. Each SP includes status LEDs, PCI Gen 2 x4 I/O module slots, LAN ports, and so on. The “[SP](#)” section on [page 19](#) provides more information about the location and description of the connectors and LEDs.

## Power supply module

When viewed from the rear of the SP, the power supply module is located on the top, left of the SP. This module is an auto-ranging, power-factor-corrected, multi-output, off-line converter with its own line cord. Each power supply includes status LEDs. A latch on the power supply module locks it into place to ensure proper connection. The “[AC power supply module](#)” section on [page 22](#) provides more information about the location and description of the connectors and LEDs.

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**Note:** An optional DC power supply is available for the VNXe3300 (The “[DC power supply module \(optional\)](#)” section on [page 22](#) provides more information).

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EMI shielding

EMI compliance requires a properly installed electromagnetic interference (EMI) shield in front of the DPE disk drives. The VNXe3300 platform requires a front bezel that has a locking latch and integrated EMI shield. You must remove the bezel/shield to remove and install disk drives.

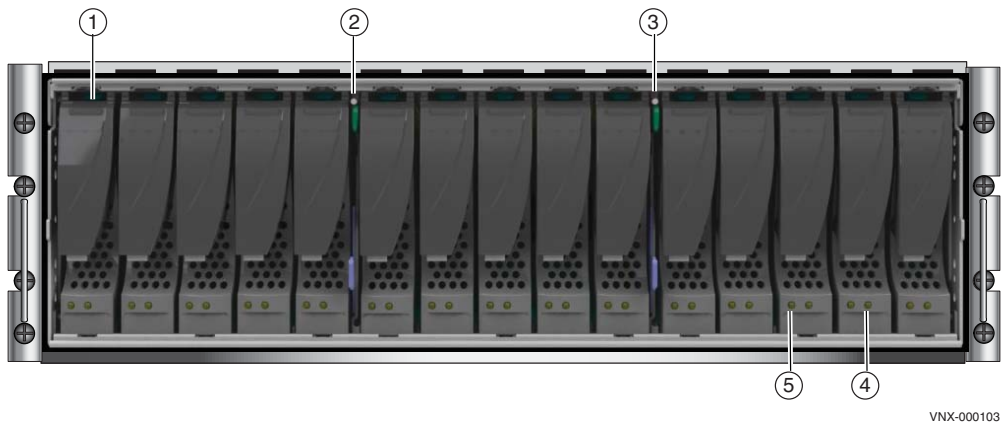
Front view

On the front of the VNXe3300 platform, two types of disk drive DPEs are supported:

- ◆ 3U, 15 (3.5-inch) disk drive DPE carrier which includes either the 3.5-inch 6-Gb/s SAS, 6-Gb/s NL-SAS, or Flash disk drives (hot-swappable)<sup>1</sup>
- ◆ 3U, 25 (2.5-inch) disk drive DPE carrier which includes either the 2.5-inch 6-Gb/s SAS, 6-Gb/s NL-SAS, or Flash disk drives (hot-swappable)<sup>1</sup>
- ◆ Status LEDs

3U, 15 (3.5-inch) disk drive DPE

Figure 5 shows the location of these disk drives and status LEDs in a 3U, 15 (3.5-inch) disk drive DPE.



1	Example of 3.5-inch 6-Gb/s SAS disk drives <sup>1</sup>	4	Disk drive fault LED (amber)
2	DPE fault LED (amber)	5	Disk drive on/activity LED (green)
3	DPE power on LED (blue)		

1. The VNXe3300 platform also supports 6-Gb/s NL-SAS, Flash, or SED (NL-SAS and SAS) drives. For more information about the disk drives supported in the VNXe3300, refer to the EMC® VNXe™ Series Storage Systems Disk and OE Matrix document.

Figure 5 VNXe3300 platform DPE with 3U disk carrier (front view)

1. You can add or remove a disk drive while the DPE is powered up, but you should exercise special care when removing modules while they are in use. Disk drives are extremely sensitive electronic components.



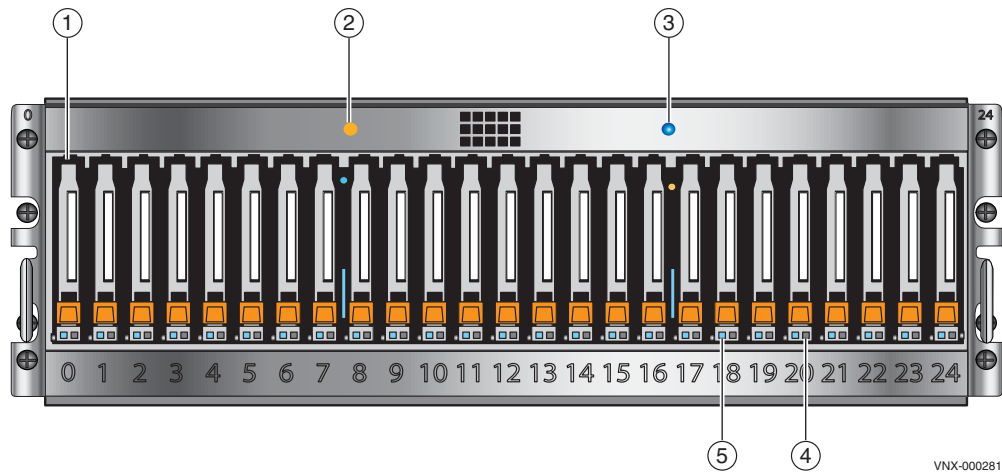
Table 1 describes the VNXe3300 platform DPE and the disk drive status LEDs.

**Table 1** VNXe3300 platform 3U, 15 (3.5-inch) DPE and disk drive LEDs

LED	Color	State	Description
DPE fault (location 2)	Amber	On	Fault has occurred <b>Note:</b> LED is always on at powerup, until it is initialized.
DPE power (location 3)	Blue	On	Powering and powered up
	—	Off	Powered down
Disk drive fault (location 4)	Amber	On	Fault has occurred
	—	Off	No fault has occurred
Disk drive on/activity (location 5)	Green	On	Powering and powered up
		Blinking, mostly on	Disk drive is on with I/O activity
		Blinking at constant rate	Disk drive is spinning up or down normally
		Blinking, mostly off	Disk drive is powered up but not spinning <b>Note:</b> This is a normal part of the spin-up sequence, occurring during the spin-up delay of a slot.
	—	Off	Disk drive is powered down

3U, 25 (2.5-inch) disk drive DPE

Figure 6 shows the location of these components.



1	Example of 2.5-inch 6-Gb/s SAS disk drives <sup>1</sup>	4	Disk drive fault LED (amber)
2	DPE fault LED (amber)	5	Disk drive status/activity (blue)
3	DPE power status LED (blue)		

1. The VNXe3300 platform also supports 6-Gb/s NL-SAS or Flash drives. For more information about the disk drives supported in the VNXe3300, refer to the *EMC® VNXe™ Series Storage Systems Disk and OE Matrix* document.

Figure 6 VNXe3300 platform 3U, 25 DPE carrier (front view)

Table 2 describes the VNXe3300 platform disk processor and 2.5-inch disk drive status LEDs.

Table 2 VNXe3300 platform 2.5-inch DPE and disk drive status LEDs

LED	Color	State	Description
DPE fault (location 2)	Amber	On	Fault has occurred
DPE power (location 3)	Blue	On	Powering and powered up
	—	Off	Powered down
Disk drive fault (location 4)	Amber	On	Fault has occurred
	—	Off	No fault has occurred
Disk drive on/activity (location 5)	Blue	On	Powering and powered up
		Blinking	Disk drive activity

## Rear view

On the rear, a VNXe3300 platform 3U DPE with two storage processors (SP A and B) includes the following hardware components:

- ◆ One power supply module
- ◆ One I/O module slot
- ◆ One SP (A or B)

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**Note:** In the following sections, the illustrations and corresponding tables describe these individual components. These descriptions are for illustrative purposes only.

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## SP

On the rear of the DPE, each SP (B and A), respectively, consists of the following connectors, status LEDs, latch handles, and so on:

- ◆ AC power supply module (for a closer view, see the [“AC power supply module”](#) section on [page 22](#)):
  - Power in (recessed) connector (plug)
  - Power supply status LEDs (power on and fault)
  - Power supply latch handle
- ◆ Optional DC power supply module (for a closer view, see the [“DC power supply module \(optional\)”](#) section on [page 22](#)):
  - Power in (recessed) connector (plug)
  - Power supply status LEDs (power on and fault)
  - Power supply latch handle
- ◆ SP B and A:
  - One PCI Gen 2 x4 I/O module slot (supporting three Ultraflex I/O module types, see [page 13](#) and the [“SP I/O module types”](#) section on [page 33](#))
  - Two 6-Gb/s SAS x4 ports (labeled **6Gb SAS 0 x4** and **1 x4**); supported speeds are 1.5, 3, and 6 Gb/s

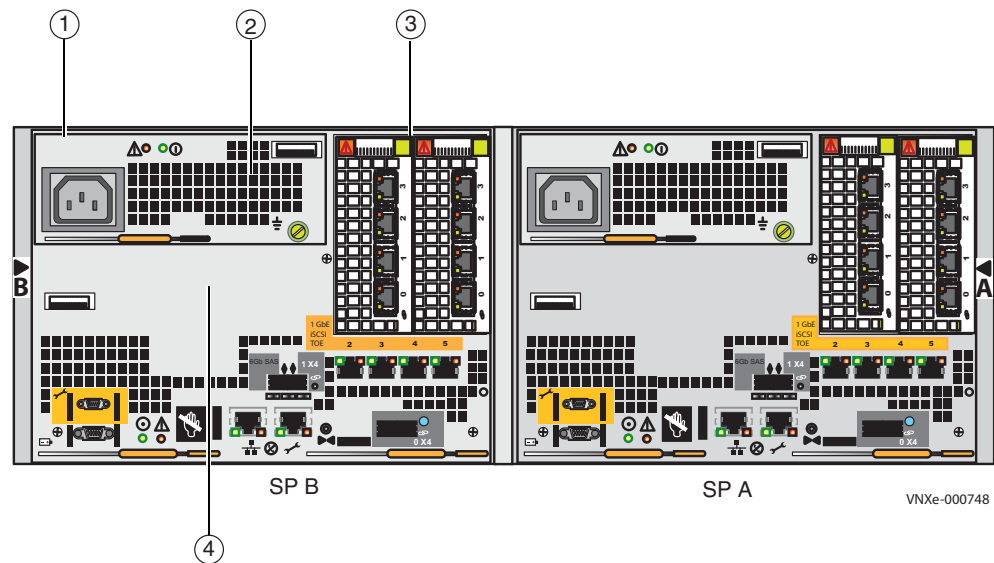
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**Note:** 6Gb SAS port 1 x4 is not supported at this time.

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- Four 1-Gb/s iSCSI LAN ports (labeled **1 GBE iSCSI TOE 2, 3, 4, and 5**)
- Two (RJ-45) LAN connectors (labeled with a network management symbol and a wrench symbol)
- Two (micro DB-9) RS-232/EIA connectors (labeled with a battery symbol and a wrench symbol)
- SP latch handles (bottom, left and right)

Looking from left to right, [Figure 7](#) shows the rear view of an example of a 3U DPE with two storage processors (SP B and SP A), respectively.

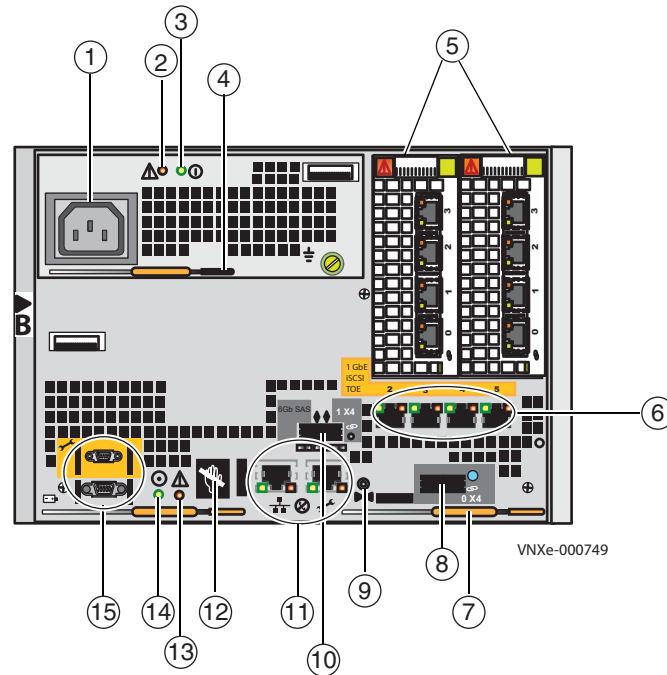


1	DPE	3	Two I/O module slots <sup>1</sup> showing two four-port copper 10/100/1000 Base-T 1Gb/s I/O modules
2	Power supply module (for a closer view, see <a href="#">Figure 9 on page 22</a> )	4	SP B (for a closer view, see <a href="#">Figure 8 on page 21</a> )

1. The I/O module slots support three types of UltraFlex I/O modules: the four-port copper 10/100/1000 Base-T 1-Gb/s I/O module, the two-port optical 10-Gb/s I/O module, and the two-port copper Ethernet 10-Gb/s I/O module (for more information, see the [“I/O modules”](#) section on [page 33](#)).

**Figure 7** Example of VNxe3300 platform 3U DPE with two SPs, respectively (rear view)

Figure 8 shows the location of the SP components.



1	AC power in connector (recessed plug)	9	NMI (password reset) push button
2	Power supply fault LED (amber)	10	6-Gb/s SAS port (labeled 1 x4); not supported at this time
3	Power supply power on LED (green)	11	Two RJ-45 (management and service laptop) connectors (labeled with a network management symbol and a wrench symbol, respectively)
4	Power supply latch handle (bottom, left)	12	SP unsafe to remove LED (white)
5	Two I/O module slots showing two four-port copper 10/100/1000 Base-T 1Gb/s Module I/O modules (for SP I/O module types, see the <a href="#">“SP I/O module types”</a> on page 33)  <b>Note:</b> Support for the second I/O module slot is available only in VNxe OE version 2.3.x and later.	13	SP status/fault LED (amber/blue)
6	Four 1-Gb/s iSCSI LAN ports (labeled 1 GBE iSCSI TOE 2, 3, 4, and 5)	14	SP power on LED (green)
7	Two SP latch handles (bottom, left and right)	15	Two RS-232/EIA (micro DB-9) connectors (labeled with a battery symbol (not used) and a wrench symbol, respectively); typically covered
8	6-Gb/s SAS port (labeled 0 x4)		

Figure 8 Example of SP components (rear view)

AC power supply module

Figure 9 shows an example of the AC power supply module with a power in (recessed) connector (plug) and status LEDs. This power supply module has a separate latch handle located on the bottom, middle portion of the module.

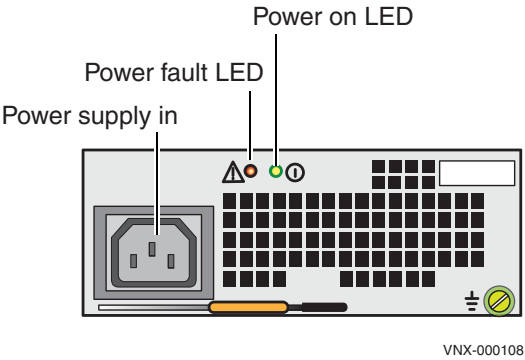


Figure 9 AC power supply module power in (recessed) connector (plug) and status LEDs

Table 3 describes the power supply module (fault and power on) LEDs.

Table 3 SP AC power supply module LEDs

Led	Color	State	Description
Power fault	Amber	On	Power supply or backup (BBU) <sup>1</sup> fault, check cable connection
		Blinking	Power is off due to environmental condition like no SP insert or SP fan failure
	—	Off	No fault or power off
Power on	Green	On	Power on
	—	Off	Power off

1. BBU = battery backup unit located on the SP power supply module. To replace the BBU, The *Replacing a VNXe3300 Buttery Backup Unit* document provides more information.

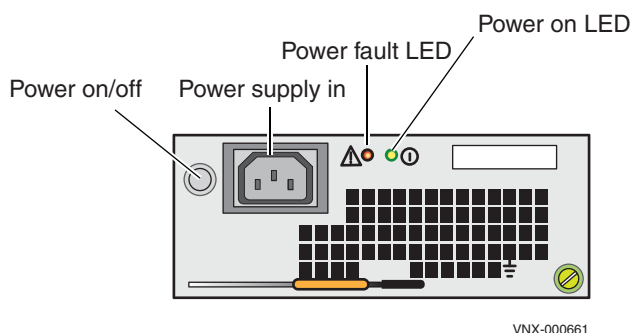
DC power supply module (optional)

Figure 10 on page 23 shows an example of the DC power supply module with a power in (recessed) connector (plug), power on/off push button, and status LEDs. This power supply module has a separate latch handle located on the bottom, middle portion of the module.

For more information about the DC power supply used in the VNXe3300 platform, refer to the *DC-Powered VNXe Series Enclosures Installation and Operation Guide* (“[Related documentation](#)” on page 7).

**IMPORTANT**

To prevent any loss of data, it is recommended that you turn off the power supply by pressing the power on/off push button. This will power down the DC power supply gracefully (Table 4 on page 23 provides more information about the DC power supply push button and LEDs).



**Figure 10** DC power supply module power in (recessed) connector (plug) and status LEDs

Table 4 describes the power supply module (fault and power on) LEDs and the power on/off push button

**Table 4** SP DC power supply module LEDs and power on/off push button

Led	Color	State	Description
Power fault	Amber	On	Power supply or backup (BBU) <sup>1</sup> fault, check cable connection
		Blinking	Power is off due to environmental condition like no SP insert, SP fan failure, or power off process has completed
	—	Off	No fault or power off
Power on	Green	On	Power on
		Blinking	<ul style="list-style-type: none"> <li>Power off process has started after pushing the power on/off push button for four seconds. The power on LED will blink for two minutes.</li> <li>Power on process has started after pushing the power on/off push button for four seconds.</li> </ul>
	—	Off	Power off
Power on/off push button	—	Push in	<ul style="list-style-type: none"> <li>Hold push button in for four seconds to start the DC power supply power off process.</li> <li>Hold push button in for four seconds to start the DC power supply power on process.</li> </ul> <p><b>Note:</b> See the power on LED and Power fault LED for more information.</p>

1. BBU = battery backup unit located on the SP power supply module. To replace the BBU, the *Replacing a VNXe3300 Battery Backup Unit* document provides more information.

## SP

The SP has an Intel Xeon 4-core 2.13-GHz processor with three Double Data Rate Three (DDR3) synchronous dynamic RAM (SDRAM) slots supporting 12 GB of memory per SP processor. This 4-core processor architecture provides the power for enhanced performance, stability, and reliability in the VNXe3300 platform.

[Table 5](#) describes the SP LEDs. The locations of the SP LEDs in [Table 5](#) are shown in [Figure 8 on page 21](#).

**Table 5** SP LEDs

LED	Color	State	Description
CRU fault (location 7)	Amber	On	Fault, lights amber when an internal customer replaceable unit (CRU) has faulted.
	—	Off	No fault or power off
Unsafe to remove (location 8)	White	On	<i>Do not</i> remove SP, data could be lost
	—	Off	Safe to remove SP
Power (location 9)	Green	On	Power on
	—	Off	Power off, verify connection
Status/fault (location 10)	Amber	Blinks once every four seconds	BIOS running
		Blinks once every second	POST running
		Blinks four times a second	Operating system boot started
		Blinks twice a second	Dump in progress
		On	SP or Solid State Disk (SSD) fault
	—	Off	No fault detected
	Blue	Blinks once every four seconds	Operating system booted
		Blinks once every second	Operating system driver starting
		Blinks four times a second	1. Operating system driver started 2. Fault, a system error has occurred, causing some storage resources to become unavailable. The SP is not operating and the status LED is blinking (see Note)
		On	System not initialized. A management IP address (static or dynamic) is assigned.



**Table 5 SP LEDs (continued)**

LED	Color	State	Description
Status/fault (location 10)	—	Off	Ready for I/O
	Blue with blinking amber once every three seconds		System not initialized. No management IP address is assigned.
<p><b>Note:</b> When the SP Fault/status LED starts blinking four times a second and the SP does not appear to be functioning, a cache-dirty condition has occurred. The LED indicates that the SP is waiting for the peer SP to boot to resolve the cache-dirty automatically.</p> <p>An SP in this state can wait up to one hour for its peer SP to resolve the cache-dirty condition. When the condition is resolved, the SP continues its boot normally. If the condition is not resolved automatically, the SP will reboot into service mode. In most circumstances, no manual intervention is required, and the wait is much less than 1 hour.</p> <p>When the SP performs a reboot or shutdown sequence, it <i>might</i> have system cache stored in memory, which can lead to the cache-dirty condition.</p> <p>For more information about this condition, go to EMC Online Support at <a href="http://emc.com/vnxesupport">http://emc.com/vnxesupport</a>. In the <b>Search</b> text box, type in emc263713.</p>			

### SP Input/output ports and connectors

The VNXe3300 platform SP supports the following I/O ports on the rear:

- ◆ Two 6-Gb/s SAS x4 ports (labeled **6Gb SAS 0 x4** and **6GB SAS 1 x4**); supported speeds 1.5, 3, and 6 Gb/s

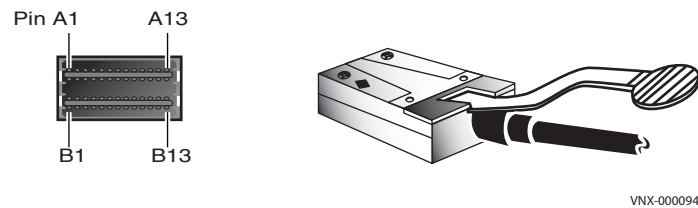
**Note:** 6Gb SAS port 1 x4 is not supported at this time.

- ◆ Built-in four 1-Gb/s iSCSI LAN ports (for front-end connectivity)
- ◆ One Ethernet (RJ-45) 10/100/1000 LAN (management) port
- ◆ One Ethernet (RJ-45) 10/100/1000 LAN (service laptop) port
- ◆ One RS-232/EIA 232 (micro DB-9) SPS connector (not used at this time)
- ◆ One RS-232/EIA 232 (micro DB-9) service laptop connector

**6-Gb/s SAS ports** — The VNXe3300 platform SP supports one 6-Gb/s SAS ports (labeled **6GB SAS 0 x4**) on the rear of each SP (A and B). This port provides an interface for SAS and NL-SAS drives on the DAE. This port is a 26-circuit SAS small form-factor 8088 (SFF-8088) specification internal (socket or receptacle) using an SFF-8088 specification mini-SAS 26-circuit cable (plug) with a pull tab.

**Note:** 6Gb SAS port 1 x4 is not supported at this time.

Figure 11 shows an example of the port connector (socket) and cable connector (plug) with pull tab.



**Figure 11** SP 6-Gb/s SAS port and cable connector

**Note:** Each SAS cable is keyed with an *in* (or one black circle, ●) and *out* (or one black diamond, ◆) connection to prevent incorrect cabling.

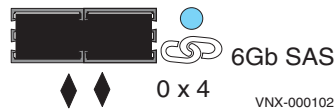
Table 6 lists the SP 6-Gb/s SAS port pin signals used on the connector.

**Table 6** SP 6-Gb/s SAS port connector pinout

Pin	Signal	Pin	Signal
A1	GND	B1	GND
A2	Rx 0+	B2	Tx 0+
A3	Rx 0-	B3	Tx 0-
A4	GND	B4	GND
A5	Rx 1+	B5	Tx 1+
A6	Rx 1-	B6	Tx 1-
A7	GND	B7	GND
A8	Rx 2+	B8	Tx 2+
A9	Rx 2-	B9	Tx 2-
A10	GND	B10	GND
A11	Rx 3+	B11	Tx 3+
A12	Rx 3-	B12	Tx 3-
A13	GND	B13	GND

**SP 6-Gb/s SAS port LEDs** — Figure 12 on page 27 shows an example of the 0 x4 SP 6-Gb/s SAS port LED—a bi-color (blue/green) LED to the right of the connector—that indicates the link/activity of the SAS port.

**Note:** Each SAS port is keyed with an *out* (or two black diamonds, ◆◆) connection to prevent incorrect cabling. For information about the SAS cable, see the note under “6-Gb/s SAS ports” on page 25 and Figure 11.



**Figure 12** 6-Gb/s SAS port LED

[Table 7](#) describes the SP 6-Gb/s SAS port LEDs.

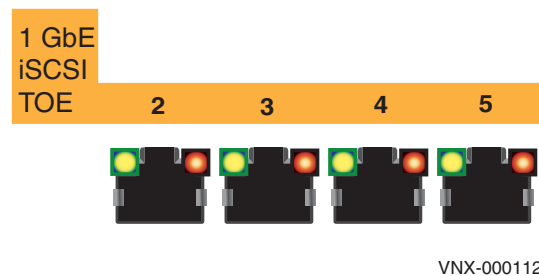
**Table 7** 6-Gb/s SAS port LEDs

Led	Color	State	Description
Link/activity	Blue	On	Port linked at 6 Gb/s with all four lanes
	Green	On	Port linked but at 1.5 Gb/s, 3 Gb/s, or 6 Gb/s without all four lanes
	—	Off	No link activity

### 1-Gb/s iSCSI Ethernet LAN ports

The VNXe3300 platform SP comes with four 1-Gb/s iSCSI Ethernet LAN ports (labeled **1 GbE iSCSI TOE 2, 3, 4, and 5**)<sup>2</sup> on the rear of each SP (A and B). These ports provide 1-Gb/s Ethernet connections which are standard for NAS and iSCSI.

[Figure 13](#) shows an example of the SP 1-Gb/s iSCSI Ethernet connector.



**Figure 13** 1-Gb/s iSCSI Ethernet ports

- TOE = TCP offload engine is a technology used in network interface cards (NIC) to offload processing of the entire TCP/IP stack to the network controller. It is primarily used with high-speed network interfaces, such as gigabit Ethernet and 10 Gigabit Ethernet, where processing overhead of the network stack becomes significant.

Table 8 describes the SP 1-Gb/s iSCSI Ethernet port LEDs.

**Table 8** 1-Gb/s Ethernet port LEDs

Led	Color	State	Description
Link (each port has one)	Green	On	Network connection
	—	Off	No network connection
Activity (each port has one)	Amber	Blinking	Transmit/receive activity
	—	Off	No activity

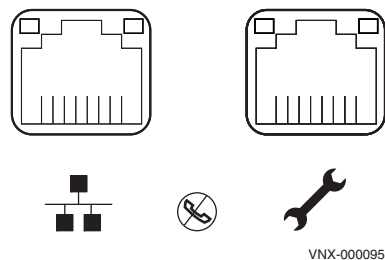
## Network management and service laptop Ethernet (RJ-45) ports

### **⚠ WARNING**

The SP Ethernet (RJ-45) ports are LAN ports not WAN ports. LAN ports contain safety extra-low voltage (SELV) circuits, and WAN ports contain telephone-network voltage (TNV) circuits. Some LAN and WAN ports both use RJ-45 connectors. Use caution when connecting cables. To avoid electric shock, do not connect TNV circuits to SELV circuits.

The VNXe3300 platform SP comes with two integrated dual-port Ethernet ports (labeled with a network management symbol and a wrench symbol, respectively). These ports provide an interface for connecting to the public LAN and a service laptop computer, respectively. The ports are 8-pin MDI RJ-45 type ports for either IEEE 802.3 10Base-T (10 Mb/s), IEEE 802.3u 100Base-TX (100 Mb/s), or 1000Base-T (1000 Mb/s) Ethernet connections.

Figure 14 shows an example of the SP network management and service laptop Ethernet (RJ-45) ports.



**Figure 14** Network management and service laptop Ethernet (RJ-45) ports

### **IMPORTANT**

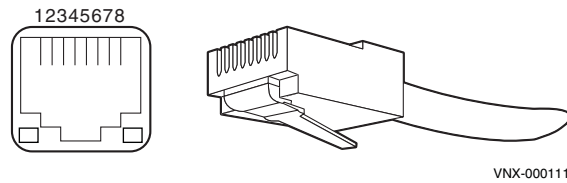
The ports shown in Figure 14 are LAN ports. A symbol depicting a telephone handset with a line through it indicates that you should not connect WAN type RJ-45 telephone connectors to these ports.

To access the Ethernet ports, connect a Category 3, 4, 5, 5E, or 6 unshielded twisted-pair (UTP) cable to the RJ-45 connectors on the back of the SP, as described in [Table 9](#).

**Table 9** Ethernet cabling guidelines

Type	Description
10Base-T	EIA Categories 3, 4, or 5 UTP (2 or 4 pairs) up to 328 ft (100 m)
100Base-TX	EIA Category 5 UTP (2 pairs) up to 328 ft (100 m)
1000Base-T	EIA Category 6 (recommended), Category 5E or 5 UTP (2 pairs) up to 328 ft (100 m)

**Network management and service laptop Ethernet (RJ-45) port and connector (adapter)** — [Figure 15](#) shows an example of the Ethernet (RJ-45) port and cable connector.



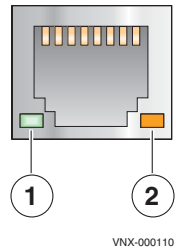
**Figure 15** Network management and service laptop Ethernet (RJ-45) port and connector (adapter)

[Table 10](#) lists the SP network management and service laptop Ethernet (RJ-45) pin signals used on the connector.

**Table 10** Network management and service laptop Ethernet (RJ-45) port and connector pinout

RJ-45 pin	Signal	Description
1	BI_DA+	Bi-directional pair A +
2	BI_DA-	Bi-directional pair A -
3	BI_DB+	Bi-directional pair B +
4	BI_DC+	Bi-directional pair C +
5	BI_DC-	Bi-directional pair C -
6	BI_DB-	Bi-directional pair B -
7	BI_DD+	Bi-directional pair D +
8	BI_DD-	Bi-directional pair D -

**Network management and service laptop Ethernet (RJ-45) port LEDs** — [Figure 16 on page 30](#) shows the network management and service laptop Ethernet (RJ-45) port LEDs—a green LED to the left of the connector and a bi-color (green/amber) LED to the right of the connector—that indicate the link/activity and speed of the Ethernet ports, respectively.



**Figure 16** Network management and service laptop Ethernet (RJ-45) port LEDs

[Table 11](#) describes the link/activity associated with the SP network management and service laptop Ethernet (RJ-45) port LEDs.

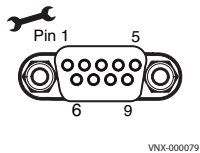
**Table 11** Network management and service laptop Ethernet (RJ-45) port LEDs

Led	Color	State	Description
Link (location 1)	Green	On	Network connection
	—	Off	No network connection
Activity (location 2)	Amber	Blinking	Transmit/receive activity
	—	Off	No activity

**Serial RS-232/EIA 232 (micro DB-9) socket connector for service laptop**

The back of the VNXe3300 platform SP includes a standard serial Electronics Industries Association (EIA) RS-232 interface (micro DB-9) connector (labeled with a symbol depicting a wrench on the upper left) to connect to a PC or service laptop computer. This serial connector (port) allows you to access the SP locally by connecting a terminal—either a PC running terminal-emulation software or an ASCII terminal—to the port.

Notice the orientation of the pins shown in [Figure 17](#).



**Figure 17** Serial RS-232/EIA 232 (micro DB-9) connector (socket) for service laptop

[Table 12](#) lists the SP serial RS-232/EIA 232 (micro DB-9) pin signals used on the connector.

**Table 12** Serial RS-232/EIA 232 (micro DB-9) connector (socket) pinout

DB-9 Pin	Signal	Description
1	CD	Carrier detect
2	RXD	Received data
3	TXD	Transmitted data

**Table 12** Serial RS-232/EIA 232 (micro DB-9) connector (socket) pinout (continued)

DB-9 Pin	Signal	Description
4	DTR	Data terminal ready
5	GND	Ground
6	DSR	Data set ready
7	RTS	Request to send
8	CTS	Clear to send
9	RI	Ring indicator

**Null modem RS-232/EIA 232 (micro DB-9 to DB-9 serial) cable**

The cable connecting the SP to the PC or service laptop is a micro DB-9 cable (plug) to serial DB-9 (socket). It has a micro DB-9 plug (SP side) on one end and a serial DB-9 socket (PC or service laptop side) on the other end. [Figure 18](#) shows an example of an SP to PC (service laptop) cable.

**Figure 18** Example of null modem RS-232/EIA 232 (micro DB-9) to serial (DB-9) cable**Serial RS-232/EIA 232 (micro DB-9) connector (socket) for SPS management**

The back of the VNxe3300 platform SP includes a second standard serial RS-232/EIA 232 interface (micro DB-9) socket connector (labeled with a symbol depicting a battery to the left) to connect to the SPS management port (RJ-12).

Notice the orientation of the pins shown in [Figure 19](#).

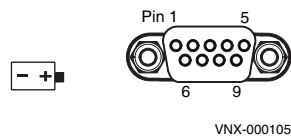
**Figure 19** Serial RS-232/EIA 232 (micro DB-9) connector (socket)

Table 13 lists the SP serial RS-232/EIA 232 (micro DB-9) pin signals used on the connector.

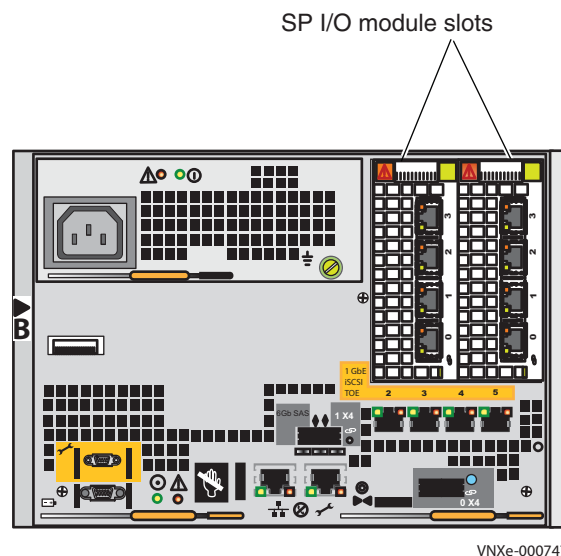
**Table 13** Serial RS-232/EIA 232 (micro DB-9) connector (socket) pinout

DB-9 Pin	Signal	Description
1	CD	Carrier detect
2	RXD	Received data
3	TXD	Transmitted data
4	DTR	Data terminal ready
5	GND	Ground
6	DSR	Data set ready
7	RTS	Clear to send
8	CTS	Request to send
9	RI	Ring indicator

## SP I/O module slots

There are two PCI Gen 2 x4 I/O module slots on the SP. The following I/O modules are supported; four-port 1-Gb/s Base-T copper iSCSI I/O module, the two-port 10-Gb/s optical I/O module, and the two-port 10-Gb/s copper Ethernet I/O module. Figure 20 shows an example of two four-port 1-Gb/s Base-T copper iSCSI I/O modules in the SP I/O module slots.

**Note:** Support for the second I/O module slot is available only in VNxe OE version 2.3.x and later.



**Figure 20** Example of SP with two four-port 1-Gb/s Base-T copper I/O modules



# I/O modules

In this section, the I/O module description includes the type of port (copper or optical) as well as a description of the LEDs.

## SP I/O module types

Three SP I/O modules are supported in the VNXe3300:

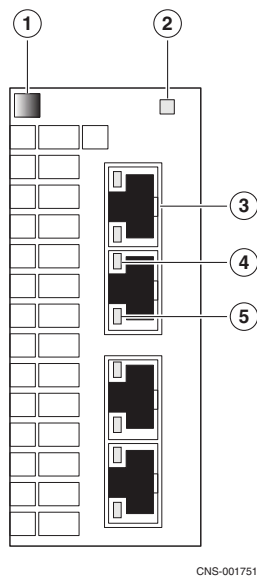
- ◆ [“Four-port 1-Gb/s copper Base-T iSCSI I/O module” on this page](#)
- ◆ [“Two-port 10-Gb/s optical iSCSI I/O module” on page 35](#)
- ◆ [“Two-port 10-Gb/s RJ-45 Base-T I/O module” on page 37](#)

These modules can be configured in the following combinations:

- ◆ Four-port 10-Gb/s copper Base-T iSCSI and Two-port 10-Gb/s optical iSCSI
- ◆ Four-port 10-Gb/s copper Base-T iSCSI and Two-port 10-Gb/s RJ-45 Base-T
- ◆ Two-port 10-Gb/s RJ-45 Base-T and Two-port 10-Gb/s optical iSCSI

### Four-port 1-Gb/s copper Base-T iSCSI I/O module

The four-port 1-Gb/s copper Base-T iSCSI I/O module (labeled **1 GbE** on the latch handle) comes with four copper ports, one power/fault LED, and a link and activity LED for each copper port ([Figure 21 on page 33](#)). This I/O module can interface at speeds of 1 Gb/s.



1	Push button latch handle	4	RJ-45 link LED
2	Power/fault LED	5	RJ-45 activity LED
3	RJ-45 (copper) port (four)		

**Figure 21** Four-port 1-Gb/s copper Base-T iSCSI I/O module

Four-port 1-Gb/s copper Base-T iSCSI I/O module LEDs

The four-port 1-Gb/s copper Base-T iSCSI I/O module has three status LEDs. [Figure 22](#) shows the LEDs and [Table 14](#) describes them.

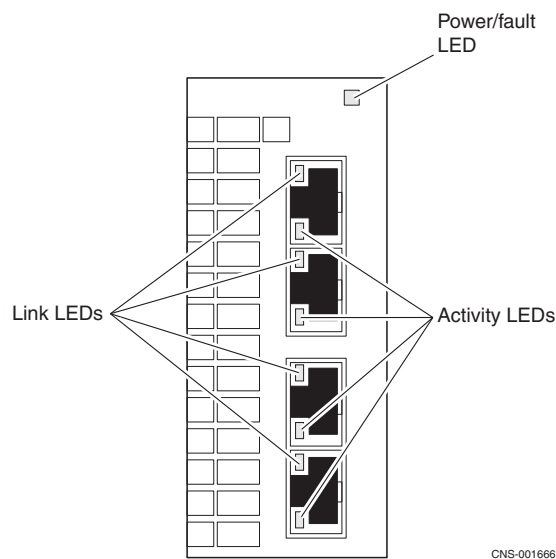


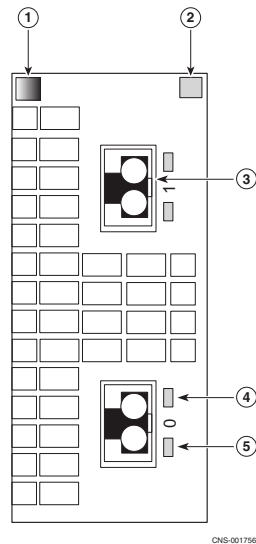
Figure 22 Four-port 1-Gb/s copper Base-T iSCSI I/O module LEDs

Table 14 Four-port 1-Gb/s copper Base-T iSCSI I/O module LEDs

LED	Color	State	Description
Power/Fault	Green	On	I/O module is powered up
	—	Off	I/O module is powered down
	Amber	On	I/O module has faulted
Link (each port has one)	Green	On	Network connection
	—	Off	No network connection
Activity (each port has one)	Amber	Blinking	Transmit/receive activity
	—	Off	No activity

Two-port 10-Gb/s optical iSCSI I/O module

The two-port 10-Gb/s optical iSCSI I/O module (labeled **10 GbE iSCSI** on the latch handle) comes with two optical ports, one power/fault LED, and a link and activity LED for each port (Figure 23). The optical ports on this I/O module can interface at speeds of 10 Gb/s for iSCSI (Internet Small Computer System Interface) networks<sup>3</sup>. The two-port 10-Gb/s optical I/O module uses the SFP+ transceiver module.



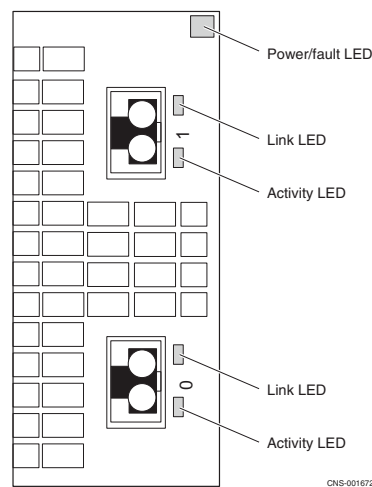
1	Push button latch handle	4	SFP+ link LED (right)
2	Power/fault LED	5	SFP+ activity LED (left)
3	SFP+ (optical) port (two)		

Figure 23 Two-port 10-Gb/s optical I/O module

3. iSCSI is a protocol for sending SCSI packets over TCP/IP networks.

### Two-port 10-Gb/s optical I/O module LEDs

The two-port 10-Gb/s optical I/O module has three types of status LEDs. [Figure 24](#) shows the LEDs and [Table 15](#) describes them.



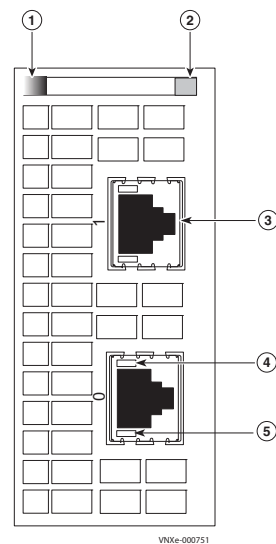
**Figure 24** Two-port 10-Gb/s optical I/O module LEDs

**Table 15** Two-port 10-Gb/s optical I/O module LEDs

LED	Color	State	Description
Power/Fault	Green	On	I/O module is powered up
	Amber	On	I/O module has faulted
	—	Off	I/O module is powered down
Link	Green	On	Network connection
	—	Off	No network connection
Activity	Amber	Blinking	Transmit/receive activity
	—	Off	No activity

Two-port 10-Gb/s RJ-45 Base-T I/O module

The two-port 10-Gb/s RJ-45 Base-T I/O module (labeled **10 GbE Base-T** on the latch handle) comes with two 10-Gb/s Base-T copper ports, one power/fault LED, and a link and activity LED for each port (Figure 25). The two Base-T ports on this I/O module can interface at speeds of 10 Gb/s. The two-port 10-Gb/s copper Ethernet I/O module uses EIA Category 6 or 6a Unshielded Twisted Pair (UTP) or EIA Category 7 fully Shielded Twisted Pair (STP) copper cabling (see Table 9, “Ethernet cabling guidelines,” on page 29).

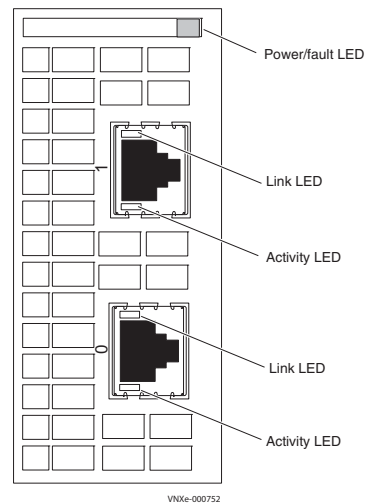


1	Push button latch handle	4	Link LED (right)
2	Power/fault LED	5	Activity LED (left)
3	RJ-45 Base-T port (two)		

Figure 25 Two-port 10-Gb/s Ethernet RJ-45 Base-T I/O module

## Two-port 10-Gb/s Ethernet RJ-45 Base-T I/O module LEDs

The two-port 10-Gb/s Ethernet RJ-45 Base-T I/O module has three types of status LEDs. [Figure 24](#) shows the LEDs and [Table 15](#) describes them.



**Figure 26** Two-port 10-Gb/s Ethernet RJ-45 Base-T I/O module LEDs

**Table 16** Two-port 10-Gb/s Ethernet RJ-45 Base-T I/O module LEDs

LED	Color	State	Description
Power/Fault	Green	On	I/O module is powered up
	Amber	On	I/O module has faulted
	—	Off	I/O module is powered down
Link	Green	On	Network connection
	—	Off	No network connection
Activity	Amber	Blinking	Transmit/receive activity
	—	Off	No activity

## Disk-array enclosure

The VNXe3300 platform supports two types of disk-array enclosures (DAEs) across a 6-Gb/s SAS bus. The DAEs used in the VNXe3300 platform are the:

- ◆ 3U, 15 (3.5-inch) disk drive DAE (DAE6S)
- ◆ 2U, 25 (2.5-inch) disk drive DAE (DAE5S)

### IMPORTANT

When calculating the number of drives for your VNXe3300 platform, the DPE is included in the total drive slot quantity of from 120 to 150 drives. If the total drive slot quantity exceeds from 120 to 150, you will not be able to add another DAE.

## DPE and DAE configuration rules

[Table 17](#) provides a matrix describing how many DAEs can be used in a VNXe3300 platform.

As shown in the table, the first column shows either the number 15 or 25 ([Table 17](#)), which refers to either the 3U, 15 (3.5-inch) disk drive DPE or to the 3U, 25 (2.5-inch) disk drive DPE, respectively. Across the top of the matrix, the number of DAEs (DAE1, DAE2, and so on up to DAE7) are listed. Within the body of the matrix ([Table 17](#)), the number 15 or 25 refers to the 3U, 15 (3.5-inch) disk drive DAE or the 2U, 25 (2.5-inch) disk drive DAE, respectively. The letter X in the matrix indicates that there is no DAE available beyond that point. Note that the **Total** column in [Table 17](#) shows the total number of disks available using a combination of the DPEs and DAEs for that particular configuration.

**Table 17** DPE and DAE configuration rules for the VNXe3300 platform

DPE	DAE1	DAE2	DAE3	DAE4	DAE5	DAE6	DAE7	Total
15	15	15	15	15	15	15	15	120
15	15	15	15	15	15	15	25	130
15	15	15	15	15	15	25	25	140
15	15	15	15	15	25	25	25	150
15	15	15	15	25	25	25	15	150
15	15	15	25	25	25	25	X	145
15	15	25	25	25	25	15	X	145
15	25	25	25	25	25	X	X	140
25	25	25	25	25	25	X	X	150
25	25	25	25	25	15	X	X	140
25	25	25	25	15	15	15	X	145
25	25	25	15	15	15	15	15	150

## DAE description

Each DAE consists of the following components:

- ◆ Drive carrier
- ◆ Disk drives
- ◆ Midplane
- ◆ Link control cards (LCCs)
- ◆ Power supply/cooling modules
- ◆ EMI shielding

## Drive carrier

Disk drive carriers are metal and plastic assemblies that provide smooth, reliable contact with the enclosure slot guides and midplane connectors. Each carrier has a handle with a latch and spring clips. The latch holds the disk drive in place to ensure proper connection with the midplane. [Figure 27 on page 41](#) shows the disk drive activity/fault LEDs that are integrated into the carrier.

## Disk drives

Each disk drive consists of one disk drive in a carrier. You can visually distinguish between disk drive types by their different latch and handle mechanisms and by type, capacity, and speed labels on each disk drive. You can add or remove a disk drive while the DAE is powered up, but you should exercise special care when removing disk drives while they are in use. Disk drives are extremely sensitive electronic components. For more information about the disk drives supported in the VNXe3300, refer to the *EMC® VNXe™ Series Storage Systems Disk and OE Matrix* document.

## Midplane

A midplane separates the front-facing disk drives from the rear-facing LCCs and power supply/cooling modules. It distributes power and signals to all components in the enclosure. LCCs, power supply/cooling modules, and disk drives plug directly into the midplane.

## LCCs

An LCC supports, controls, and monitors the DAE, and is the primary interconnect management element. Each LCC includes connectors for input and expansion to downstream devices. [Figure 33 on page 47](#) shows the enclosure address (EA<sup>4</sup>) indicator that is located on each LCC. [Figure 33 on page 47](#) shows the a bus (loop) identification indicator.

## Power supply

The power supply/cooling module integrates independent power supply and blower cooling assemblies into a single module.

Each power supply is an auto-ranging power-factor-corrected, multi-output, off-line converter with its own line cord. The drives and LCC have individual soft-start switches that protect the disk drives and LCC if you install them while the disk enclosure is powered up. A disk or blower with power-related faults will not affect the operation of any other device.

[Figure 29 on page 44](#) shows three status LEDs on the power/cooling module.

The enclosure cooling system consists of dual-blower modules in each power supply/cooling module.

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4. The EA is sometimes referred to as an enclosure ID.



EMI shielding

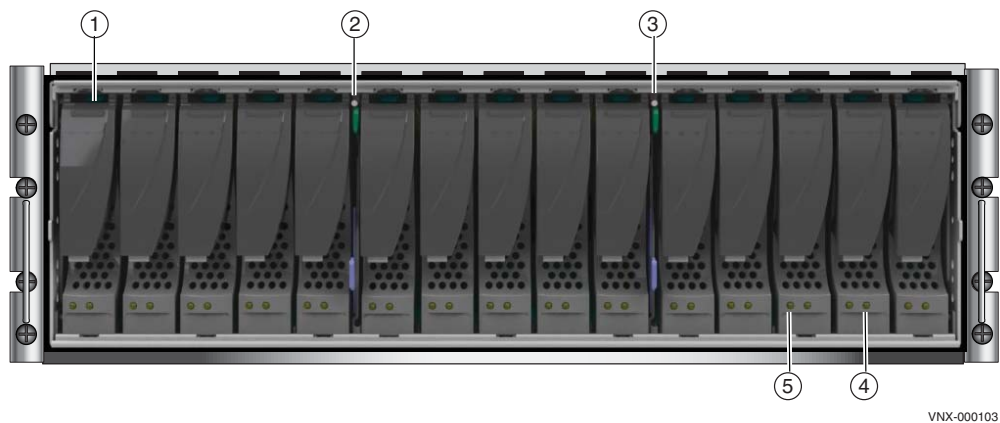
EMI compliance requires a properly installed electromagnetic interference (EMI) shield in front of the DAE disk drives. The VNXe3300 platform requires a front bezel that has a locking latch and integrated EMI shield. You must remove the bezel/shield to remove and install disk drive modules.

3U, 15 (3.5-inch) DAE

On the front, viewing from left to right, the 3U, 15 (3.5-inch) disk drive DAE (DAE6S) carrier includes the following hardware components:

- ◆ 3.5-inch 6-Gb/s SAS, 6-Gb/s NL-SAS, or Flash disk drives (hot-swappable)<sup>5</sup>
- ◆ Status LEDs

Figure 27 shows the location of these components.



1	Example of 3.5-inch 6-Gb/s SAS disk drives <sup>1</sup>	4	Disk drive fault LED (amber)
2	DAE fault LED (amber)	5	Disk drive on/activity LED (green)
3	DAE power on LED (blue)		

1. The VNXe3300 platform also supports 6-Gb/s NL-SAS, Flash, or SED (NL-SAS and SAS) drives. For more information about the disk drives supported in the VNXe3300, refer to the EMC® VNXe™ Series Storage Systems Disk and OE Matrix document.

Figure 27 DAE (front view)

5. You can add or remove a disk drive while the DAE is powered up, but you should exercise special care when removing modules while they are in use. Drive modules are extremely sensitive electronic components.

Table 18 describes the DAE and the 3.5-inch disk drive status LEDs

**Table 18** 3U, 15 (3.5-inch) DAE and disk drive LEDs

LED	Color	State	Description
DAE fault (location 2)	Blue	On	No fault has occurred
	Amber	On	Fault has occurred
DAE power (location 3)	Blue	On	Powering and powered up
	—	Off	Powered down
Disk drive fault (location 4)	Amber	On	Fault has occurred
	—	Off	No fault has occurred
Disk drive on/activity (location 5)	Green	On	Powering and powered up
		Blinking, mostly on	Disk drive is on with I/O activity
		Blinking at constant rate	Disk drive is spinning up or down normally
		Blinking, mostly off	Disk drive is powered up but not spinning  <b>Note:</b> This is a normal part of the spin-up sequence, occurring during the spin-up delay of a slot.
	—	Off	Disk is powered down

## Rear view

Figure 28 on page 43, on the rear, viewing from top to bottom, shows a 3U, 15 (3.5-inch) DAE (DAE6S) and includes the following hardware components:

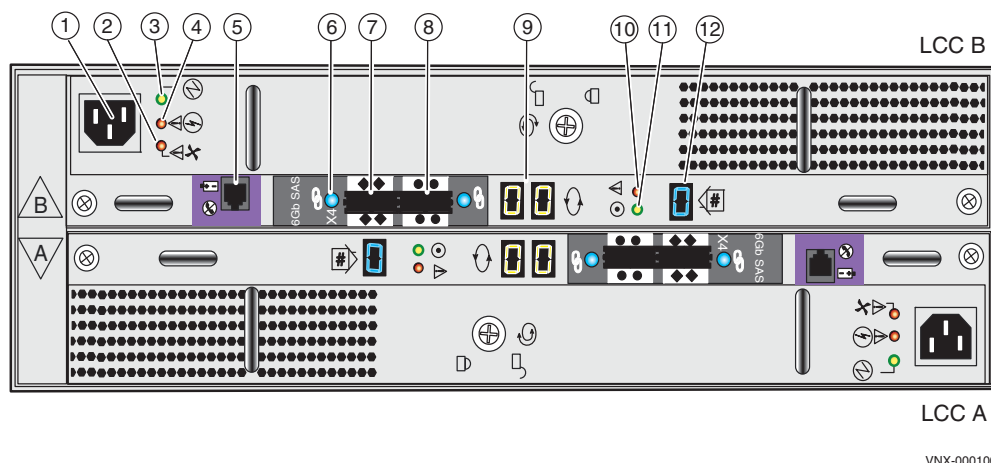
- ◆ Two 6-Gb/s SAS LCCs (A and B)
- ◆ Two power supply/cooling modules

## 6-Gb/s SAS LCC

The LCC supports and controls one 6-Gb/s SAS bus and monitors the DAE. A blue link active LED indicates a DAE operating at 6 Gb/s.

The LCCs in a DAE connect to the DPE and other DAEs with 6-Gb/s SAS cables. The cables connect the LCCs in the system in a daisy-chain topology.

Figure 28 on page 43 shows an example of the rear view of a 3U, 15 (3.5-inch) disk drive DAE.



1	LCC B AC power supply power in (recessed plug)	7	LCC B SAS connector (output); labeled with a double black diamond symbol ◆◆
2	LCC B power supply fan fault LED (on, amber)	8	LCC B SAS connector (input); labeled with a double black circle (or dot) symbol ●●
3	LCC B power supply LED (on, green)	9	LCC B loop bus ID
4	LCC B power supply fault LED (on, amber)	10	LCC B loop bus LED (fault, amber)
5	LCC B management (RJ-12) connector to SPS (not used)	11	LCC B loop bus LED (on, green)
6	LCC B SAS connector link LED	12	DAE enclosure ID <sup>1</sup>

1. The DAE enclosure ID is sometimes referred to as the enclosure address (EA).

**Figure 28** DAE with two LCCs and two power supply/cooling modules (rear view)

Internally, each DAE LCC connects to the drives in its enclosure in a point-to-point fashion through a switch. The LCC independently receives and electrically terminates incoming signals. For traffic from the system's storage processors, the LCC switch passes the signal from the input port to the drive being accessed; the switch then forwards the drive output signal to the port.

**Note:** If the target drive is not in the LCC's enclosure, the switch passes the input signal directly to the output port.

Each LCC independently monitors the environmental status of the entire enclosure, using a microcomputer-controlled monitor program. The monitor communicates the status to the storage processor, which polls disk enclosure status. LCC firmware also controls the SAS PHYs (physical links) and the disk-module status LEDs.

As shown in [Figure 28](#), an enclosure ID<sup>6</sup> indicator is located on each LCC. Each LCC also includes a bus (back-end port) identification indicator. The SP initializes the bus ID when the operating system is loaded.

6. The enclosure ID is sometimes referred to as the enclosure address (EA).

DAE AC power supply/cooling module

Figure 29 shows an example of the 3U, 15 (3.5-inch) disk drive DAE AC power supply/cooling module with a power in (recessed) connector (plug) and status LEDs.

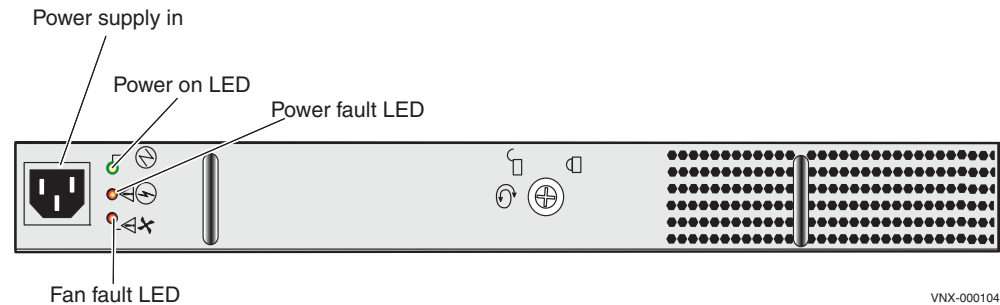


Figure 29 Example of a DAE AC power supply/cooling module (power in) recessed connector (plug) and status LEDs

Table 19 describes the DAE power supply/cooling module LEDs.

Table 19 DAE AC power supply/cooling module LEDs

Led	Color	State	Description
Power on	Green	On	Power on
	—	Off	Power off
Power fault	Amber	On	Fault
		Blinking	During power shutdown and during overvoltage and undervoltage protection (OVP/UVF) fault
Fan fault	—	Off	No fault or power off
	Amber	On	Fault, one or both not operating normally
	—	Off	No fault, fans operating normally

The power supply/cooling modules are located above and below the LCCs. The units integrate independent power supply and dual-blower cooling assemblies into a single module.

Each power supply is an auto-ranging, power-factor-corrected, multi-output, offline converter with its own line cord. Each supply supports a fully configured DAE and shares load currents with the other supply. The drives and LCCs have individual soft-start switches that protect the disk drives and LCCs if they are installed while the disk enclosure is powered up.

The enclosure cooling system includes two dual-blower modules.

**Note:** Access to the disks in the enclosure will time out and the disks will spin down two minutes after a power supply/cooling module is removed from the enclosure. While the DAE can continue operating on a single power supply, the loss of a module’s two blowers will cause a time-out unless you replace the module within two minutes. The *Replacing a DAE6S Power Supply/System Cooling module* procedure provides more information.

## DAE LCC input/output ports and connectors

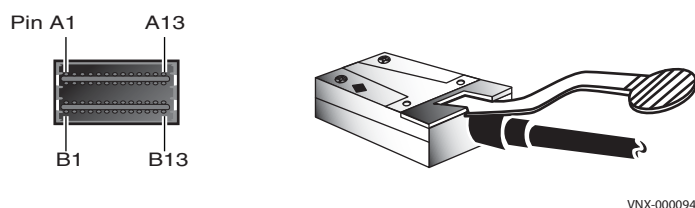
The 3U, 15 (3.5-inch) DAE LCC supports the following I/O ports on the rear:

- ◆ Two 6-Gb/s SAS x4 ports
- ◆ One management (RJ-45) connector

### 6-Gb/s SAS x4 ports

The 3U, DAE LCC supports two 6-Gb/s SAS x4 ports (labeled **6GB SAS x4**) on the rear of each SP (A and B). This port provides an interface for SAS and NL-SAS drives on the DAE. This port is a 26-circuit SAS small form-factor 8088 (SFF-8088 specification) connector (socket or receptacle) using an SFF-8088 specification mini-SAS 26-circuit cable (plug) with a pull tab.

Figure 30 shows an example of the port connector (socket) and cable connector (plug) with pull tab.



**Figure 30** 6-Gb/s SAS port and cable connector

**Note:** Each SAS cable is keyed with an *in* (or one black circle, ●) and *out* (or one black diamond, ◆) connection to prevent incorrect cabling.

Table 20 lists the DAE LCC 6-Gb/s SAS port pin signals used on the connector.

**Table 20** 6-Gb/s SAS port connector pinout

Pin	Signal	Pin	Signal
A1	GND	B1	GND
A2	Rx 0+	B2	Tx 0+
A3	Rx 0-	B3	Tx 0-
A4	GND	B4	GND
A5	Rx 1+	B5	Tx 1+
A6	Rx 1-	B6	Tx 1-
A7	GND	B7	GND
A8	Rx 2+	B8	Tx 2+
A9	Rx 2-	B9	Tx 2-
A10	GND	B10	GND

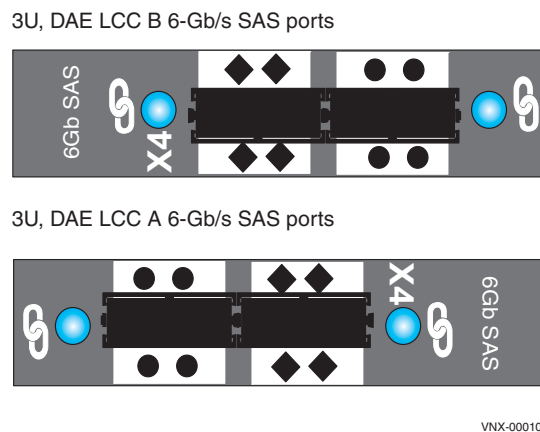
**Table 20** 6-Gb/s SAS port connector pinout (continued)

Pin	Signal	Pin	Signal
A11	Rx 3+	B11	Tx 3+
A12	Rx 3-	B12	Tx 3-
A13	GND	B13	GND

**6-Gb/s SAS port LEDs and port direction (input or output)**

Figure 31 shows the LCC 6-Gb/s SAS port LED—a bi-color (blue/green) LED next to the connector, either left or right—that indicates the link/activity of the SAS port. Figure 31 also shows a double black circle (or dot) ●● symbol (for input) or a double black diamond ◆◆ symbol (for output).

**Note:** For information about the SAS cable, see the note under “6-Gb/s SAS x4 ports” on page 45 and Figure 30 on page 45.

**Figure 31** DAE LCC B and A 6-Gb/s SAS port LEDs

**Note:** Figure 31, looking from the rear of the DAE, LCC B is located on the top and LCC A is located on the bottom.

Table 21 describes the DAE LCC B and A 6-Gb/s SAS port LEDs.

**Table 21** 3U, DAE LCC 6-Gb/s SAS port LEDs

LED	Color	State	Description
Link/activity	Blue	On	All lanes are running at 6 GB/s
	Green	On	One or more lanes is not running at full speed or disconnected
	Alternating Blue/Green	Blinking	Port is being marked by the host
	—	Off	Not connected

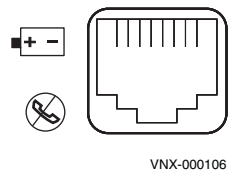
## Management (RJ-12) connector

**Note:** The management Ethernet (RJ-12) LCC to SPS connector is not used at this time.

Figure 32 shows the management port connector (labeled with two symbols; one depicting a telephone handset with a line through it and the other depicting a battery). The telephone handset with a line through it symbol means that you cannot connect telephone type circuits to this connector (see the following **WARNING**). This port connects the LCC (A and B) ports to the SPS (A and B) ports, respectively.

### **WARNING**

The LCC SPS (RJ-12) port is a LAN port not a WAN port. LAN ports contain safety extra-low voltage (SELV) circuits, and WAN ports contain telephone-network voltage (TNV) circuits. An RJ-45 (or TNV-type) looks the same as the RJ-12 except for two very important differences. An RJ-45 is an 8-wire modular jack. The RJ-12 is a six-wire modular jack. The RJ-45 plugs and jacks are wider than their RJ-12 counterparts - 7/16" vs 3/8". An RJ-45 plug won't fit into an RJ-12 jack. But an RJ-12 plug will fit into an RJ-45 jack. Use caution when connecting cables. To avoid electric shock, do not attempt to connect TNV circuits to SELV circuits.



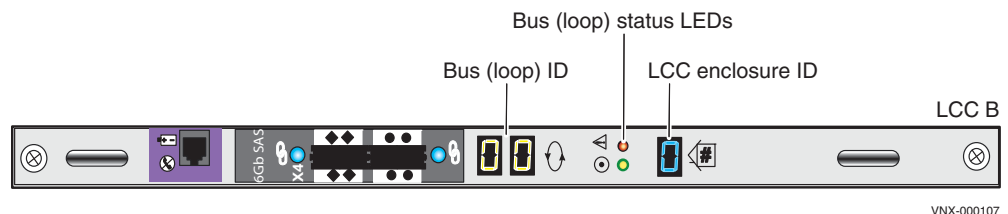
**Figure 32** LCC SPS RJ-12 port

The cable connecting the LCC to the SPS is an RJ-12 to RJ-12. It has an RJ-45 adapter (LCC side) on one end and a RJ-12 (SPS side) adapter on the other end.

## LCC enclosure ID (enclosure address) and bus (loop) ID

On the rear of the LCC (A and B), an LCC enclosure ID indicator is provided. This ID indicator is a seven-segment LED display for showing decimal numbers. The LCC enclosure ID appears on both LCCs (A and B) which is the same ID number. Figure 33 shows the location of the enclosure ID set at installation.

Each LCC includes a bus (loop) identification indicator. This indicator includes two seven-segment LED displays for showing decimal numbers. The SP initializes the bus ID when the operating system is loaded. Figure 33 shows the location of the bus ID.



**Figure 33** Example of LCC B enclosure ID and bus ID

Table 22 describes the bus (loop) indicator status LEDs.

Table 22 LCC bus (loop) status LEDs

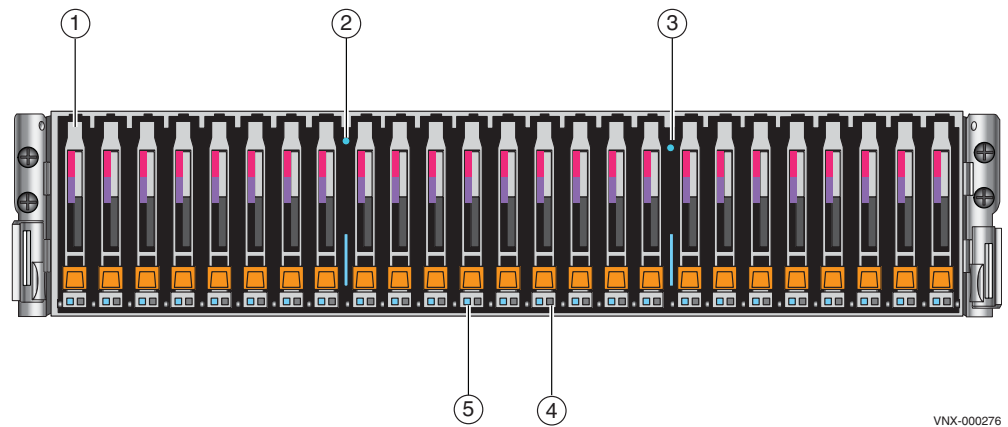
Led	Color	State	Description
Power fault	Amber	On	Fault
	—	Off	No fault or power off
Power on	Green	On	Power on
	—	Off	Power off

2U, 25 (2.5-inch) DAE

On the front, viewing from left to right, the 2U, 25 (2.5-inch) disk drive DAE (DAE5S) carrier includes the following hardware components:

- ◆ 2.5-inch 6-Gb/s SAS, 6-Gb/s NL-SAS, or Flash disk drives (hot-swappable)<sup>7</sup>
- ◆ Status LEDs

Figure 27 shows the location of these components.



1	Example of 2.5-inch SAS disk drive <sup>1</sup>	4	Disk drive fault LED (amber)
2	DPE fault LED (blue), amber if faulted	5	Disk drive ready/activity LED (blue)
3	DPE power status LED (blue)		

1. The VNXe3300 platform also supports 6-Gb/s NL-SAS or Flash drives.

Figure 34 2U, 25 (2.5-inch) DAE (front view)

7. You can add or remove a disk drive while the DAE is powered up, but you should exercise special care when removing drives while they are in use. Disk drives are extremely sensitive electronic components.



[Table 23](#) describes the DAE and the 2.5-inch disk drive status LEDs

**Table 23** Example of a VNXe3300 platform with a 2U, 25 (2.5-inch) DAE and the disk drive LEDs

LED	Color	State	Description
DPE fault (location 2)	Blue	On	No fault has occurred
	Amber	On	Fault has occurred
DPE power (location 3)	Blue	On	Powering and powered up
	—	Off	Powered down
Disk drive fault (location 4)	Amber	On	Fault has occurred
	—	Off	No fault has occurred
Disk drive on/activity (location 5)	Blue	On	Powering and powered up
		Blinking	Disk drive activity

## Rear view

On the rear, viewing from top to bottom, a 2U, 25 (2.5-inch) DAE includes the following hardware components:

- ◆ Two 6-Gb/s SAS LCCs (A and B)
- ◆ Two power supply/cooling modules

### 6-Gb/s SAS LCC

The 6-Gb/s SAS LCC supports, controls, and monitors the DAE, and is the primary interconnect management element. Each LCC includes connectors for input and output to downstream devices.

As described previously, the LCCs in a DAE connects to the SPE and other DAEs with 6-Gb/s SAS cables. The cables connect the LCCs in a system in a daisy-chain topology.

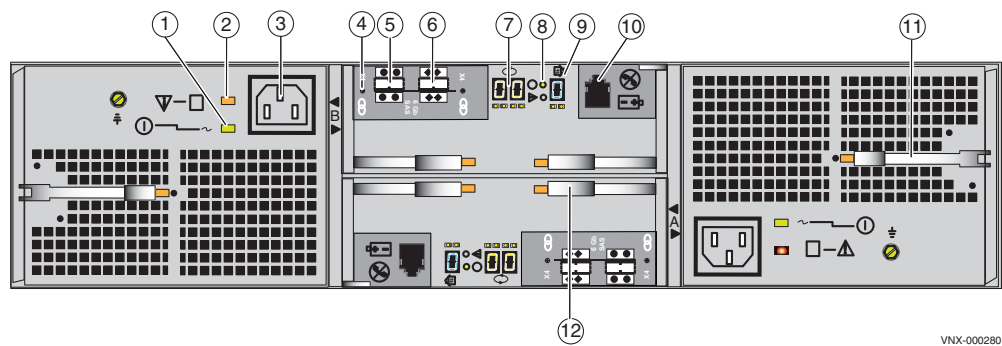
Internally, each DAE LCC connects to the drives in its enclosure in a point-to-point fashion through a switch. The LCC independently receives and electrically terminates incoming signals. For traffic from the system's storage processors, the LCC switch passes the signal from the input port to the drive being accessed; the switch then forwards the drive output signal to the port.

**Note:** If the target drive is not in the LCC enclosure, the switch passes the input signal directly to the output port.

Each LCC independently monitors the environmental status of the entire enclosure, using a microcomputer-controlled monitor program. The monitor communicates the status to the storage processor, which polls disk enclosure status. LCC firmware also controls the SAS PHYs and the disk-module status LEDs.

As shown in [Figure 35 on page 50](#), an enclosure ID<sup>8</sup> indicator is located on each LCC. Each LCC also includes a bus (back-end port) identification indicator. The SP initializes the bus ID when the operating system is loaded.

Figure 35 shows an example of the rear view of a 2U, 25 (2.5-inch) disk drive DAE.



1	LLC B power supply LED (on, green)	7	LCC B bus ID
2	LCC B power supply fault LED (on, amber)	8	LCC B power and fault LEDs
3	LCC B AC power supply power in (recessed plug)	9	DAE enclosure ID or address
4	LCC B SAS connector link LED (on, blue)	10	LCC B management (RJ-12) connector to SPS (not used)
5	LCC B SAS connector (output); labeled with a double black circle (or dot) symbol ● ● .	11	LCC A power supply latch handle
6	LCC B SAS connector (input); labeled with a double black diamond symbol ◆ ◆ .	12	LCC A right latch handle

Figure 35 DAE with two LCCs and two power supply/cooling modules (rear view)

**Note:** Figure 35, looking from the rear of the DAE, shows LCC B that is located on the left and LCC A that is located on the right.

### DAE AC power supply/cooling module

Figure 36 shows an example of the 2U, 25 (2.5-inch) DAE AC power supply/cooling module with a power in (recessed) connector (plug) and status LEDs.

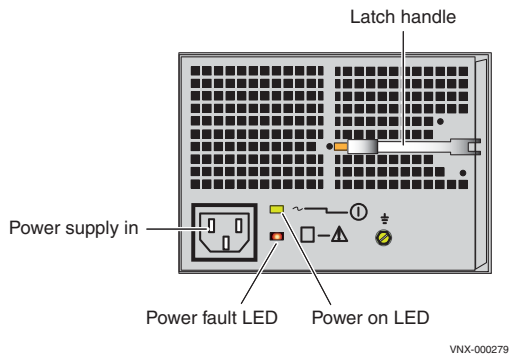


Figure 36 Example of 2U, 25 (2.5-inch) DAE AC power supply/cooling module power in (recessed) connector (plug) and status LEDs

- 8. The enclosure ID is sometimes referred to as the enclosure address (EA).

Table 24 describes the 2U, 25 (2.5-inch) DAE power supply/cooling module LEDs.

**Table 24** 2U, 25 (2.5-inch) DAE AC power supply/cooling module LEDs

Led	Color	State	Description
Power fault	Amber	On	Fault
		Blinking	During power shutdown and during overvoltage (OVP) and undervoltage protection (UVP) fault
	—	Off	No fault or power off
Power on	Green	On	Power on
	—	Off	Power off

The power supply/cooling modules are located to the left and right of the LCCs. The units integrate independent power supply and dual-blower cooling assemblies into a single module.

Each power supply is an auto-ranging, power-factor-corrected, multi-output, offline converter with its own line cord. Each supply supports a fully configured DAE and shares load currents with the other supply. The drives and LCCs have individual soft-start switches that protect the disk drives and LCCs if they are installed while the disk enclosure is powered up. The enclosure cooling system includes two dual-blower modules.

## 2U, 25 (2.5-inch) DAE LCC input/output ports and connectors

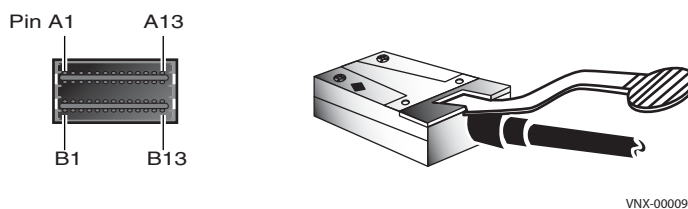
The 2U, 25 (2.5-inch) DAE LCC supports the following I/O ports on the rear:

- ◆ Two 6-Gb/s PCI Gen 2 SAS ports
- ◆ One management (RJ-12) connector to the SPS (not used)

### 6-Gb/s SAS x4 ports

The DAE LCC supports two (one input and one output) 6-Gb/s SAS x4 ports (labeled **6Gb SAS x4**) on the rear of each LCC (A and B). This port provides an interface for SAS and NL-SAS drives on the DAE. This port is a 26-circuit SAS small form-factor 8088 (SFF-8088) specification (socket or receptacle) using an SFF-8088 specification mini-SAS 26-circuit cable (plug) with a pull tab.

Figure 37 shows an example of the port connector (socket) and cable connector (plug) with pull tab.



VNX-000094

**Figure 37** 6-Gb/s SAS port and cable connector

**Note:** Each SAS cable is keyed with an *in* (or one black circle, ●) and *out* (or one black diamond, ◆) connection to prevent incorrect cabling.

Table 25 lists the 2U, DAE 6-Gb/s SAS port pin signals used on the connector.

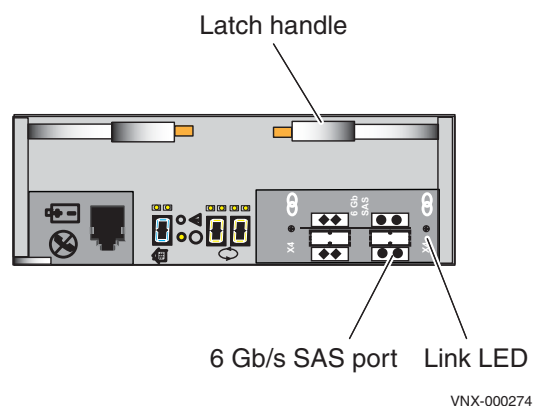
**Table 25** 6-Gb/s SAS port connector pinout

Pin	Signal	Pin	Signal
A1	GND	B1	GND
A2	Rx 0+	B2	Tx 0+
A3	Rx 0-	B3	Tx 0-
A4	GND	B4	GND
A5	Rx 1+	B5	Tx 1+
A6	Rx 1-	B6	Tx 1-
A7	GND	B7	GND
A8	Rx 2+	B8	Tx 2+
A9	Rx 2-	B9	Tx 2-
A10	GND	B10	GND
A11	Rx 3+	B11	Tx 3+
A12	Rx 3-	B12	Tx 3-
A13	GND	B13	GND

#### 6-Gb/s SAS port LEDs and port direction (input or output)

Figure 38 shows the 6-Gb/s SAS port LED—a bi-color (blue/green) LED next to the connector, either left or right—that indicates the link/activity of the SAS port.

**Note:** For information about the SAS cable, see the note under “6-Gb/s SAS x4 ports” on page 51 and Figure 37 on page 51.



**Figure 38** 6-Gb/s SAS port LED

**Note:** Looking from the rear of the 2U DAE, LCC B is located on the left and LCC A is located on the right (Figure 38 on page 52).

Table 26 describes the 2U DAE LCC 6-Gb/s port LEDs.

**Table 26** 6-Gb/s SAS port LEDs

LED	Color	State	Description
Link/activity	Blue	On	All lanes are running at 6 GB/s
	Green	On	One or more lanes is not running at full speed or disconnected
	Alternating Blue/Green	Blinking	Port is being marked by the host
	—	Off	Not connected

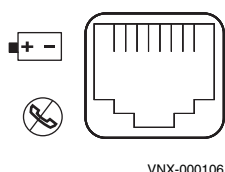
### Management (RJ-12) port connector (not used)

**Note:** The management Ethernet (RJ-12) LCC to SPS port connector is not used in the VNXe3300 platform.

Figure 39 shows the management port (labeled with two symbols; one depicting a telephone handset with a line through it and the other depicting a battery). The telephone handset with a line through it symbol means that you cannot connect telephone type circuits to this connector (see the following **WARNING**). This port connects the LCC (A and B) ports to the SPS (A and B) ports, respectively.

#### **WARNING**

The SPS (RJ-12) port is a LAN port not a WAN port. LAN ports contain safety extra-low voltage (SELV) circuits, and WAN ports contain telephone-network voltage (TNV) circuits. An RJ-45 (or TNV-type) looks the same as the RJ-12 except for two very important differences. An RJ-45 is an 8-wire modular jack. The RJ-12 is a six-wire modular jack. The RJ-45 plugs and jacks are wider than their RJ-12 counterparts - 7/16" vs 3/8". An RJ-45 plug won't fit into an RJ-12 jack. But an RJ-12 plug will fit into an RJ-45 jack. Use caution when connecting cables. To avoid electric shock, do not attempt to connect TNV circuits to SELV circuits.



**Figure 39** LCC RJ-12 port

The cable connecting the LCC to the SPS is an RJ-12 to RJ-12. It has an RJ-12 adapter (LCC side) on one end and a RJ-12 (SPS side) adapter on the other end.

LCC enclosure ID (enclosure address) and bus ID

On the rear of the LCC (A and B), an LCC enclosure ID indicator is provided. This ID indicator is a seven-segment LED display for displaying decimal numbers. The LCC enclosure ID appears on both LCCs (A and B) which is the same ID number. The enclosure ID is set at installation (Figure 40).

Each LCC includes a bus (loop) identification indicator. This indicator includes two seven-segment LED displays for displaying decimal numbers. The SP initializes the bus ID when the operating system is loaded (Figure 40).

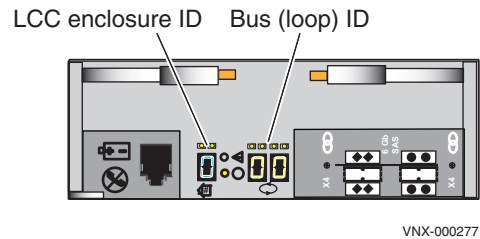


Figure 40 Example of LCC B enclosure ID and bus ID

Table 27 describes the bus (loop) status LEDs.

Table 27 LCC bus (loop) status LEDs

Led	Color	State	Description
Power on	Green	On	Power on
	—	Off	Power off
Power fault	Amber	On	Fault detected
	—	Off	No fault or power off

# Specifications

Table 28 lists the VNXe3300 platform physical specifications, operating environment, and power requirements.

**Table 28 VNXe3300 platform specifications**

Parameter	Characteristics
<b>Dimensions (approximate)</b>	
Height	42 in. (35.56 cm) or 24 NEMA units (U) total; one disk processor enclosure (DPE, 3U) and seven disk-array enclosures (DAE, 3U)
Width	17.5 in. (44.5 cm); mounting bars fit standard 19-inch NEMA cabinets
Depth	Chassis to rear: 24.25 in. (61.5 cm)
Weight	600.4 lb (272.34 kg); one DPE and seven DAEs
<b>Operating environment</b>	
Temperature	50-104° F (10-40° C)
Temperature gradient	18° F/hr (10° C/hr)
Relative humidity	20% to 80% (non-condensing)
Altitude	8,000 ft (2,438 m) @ 104° F (40° C) max. 10,000 ft (3,048 m) @ 98.6° F (37° C) max.
<b>Shipping and storage environment</b>	
Ambient temperature	-40° F to 149°F (-40°C to 65°C)
Temperature gradient	45°F/hr (25°C/hr)
Relative humidity	10% to 90% noncondensing
Elevation	-50 to 35,000 ft (-16 to 10,600 m)
Storage time (unpowered) Recommendation	Do not exceed 6 consecutive months of unpowered storage.
<b>AC power and dissipation</b>	
AC line voltage	100 to 240 VAC (47-63 Hz), single phase
AC line current	4.8 A max at 100 VAC, 2.4 A max at 200 VAC <sup>1</sup> 2.8 A max at 100 VAC, 1.4 A max at 200 VAC <sup>2</sup>
Power consumption	480 VA (455 W) max <sup>a</sup> 280 VA (235 W) max <sup>b</sup>
Power factor	0.98 min at full load, low voltage
Heat dissipation	1.64 x 10 <sup>6</sup> J/hr, (1,560 Btu/hr) max <sup>a</sup> 8.46 x 10 <sup>5</sup> J/hr, (800 Btu/hr) max <sup>b</sup>
In-rush current	15 A max for ½ line cycle, per line cord at 240 VAC 15 A max for ½ line cycle, per line cord at 120 VAC

**Table 28** VNXe3300 platform specifications

Parameter	Characteristics
AC protection	12.5 A fuse on each power supply, both phases <sup>a</sup> 10 A fuse on each power supply, both phases <sup>b</sup>
AC inlet type (receptacle)	IEC320-C14 appliance coupler (per power supply)
Ride-through	30 ms minimum at full load
Current sharing	± 10% of full load, between power supplies

1. DPE

2. DAE