



Spectra BlackPearl Deep Storage Gateway Site Preparation Guide



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Revision History

Revision	Date	Description
A	October 2014	Initial release.
B	January 2015	Second release.
C	May 2015	Added information about the 2U chassis.
D	August 2015	Updated for new BlackPearl 2.0 chassis.
E	February 2016	Updated for the BlackPearl 3.0 release.
F	October 2016	Updated for the BlackPearl 3.3 release.

Note: To make sure you have the most current version of this guide check the Spectra Logic Technical Support portal at support.spectralogic.com/documentation/user-guides/.

To make sure you have the release notes for the most current version of the BlackPearl Release Notes, check the Spectra Logic Technical Support portal at support.spectralogic.com/documentation/release-notes/. You must sign into the portal before viewing Release Notes. The release notes contain updates to the User Guide since the last time it was revised.

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CHAPTER 1

About This Guide

This guide describes site preparation for the Spectra® BlackPearl™ Deep Storage Gateway. Use the information in this guide to prepare your site for the installation of the gateway.

This guide also describes the site preparation requirements for the Spectra BlackPearl expansion node and the ArcticBlue expansion node. The expansion nodes are used in conjunction with the BlackPearl gateway and cannot be used as stand-alone products. When instructions in this guide apply to both the BlackPearl gateway and expansion nodes, *BlackPearl gateway*, or *the gateway* are used to refer to both.

INTENDED AUDIENCE

This guide is intended for data center administrators and operators who maintain and operate file storage systems. The information in this guide assumes a familiarity with computing terminology, SAS or Fibre Channel connectivity, and Ethernet networking. You also need to be familiar with installing, configuring, and using data file storage and archival software.

OVERVIEW

The BlackPearl gateway allows data to move seamlessly into mass tape storage in a way not previously possible. It enables users to deploy a tier of deep storage that is cost effective, easy to manage, and scalable to exabytes of data.

ADDITIONAL PUBLICATIONS

The following documents related to the Spectra BlackPearl gateway are available on the Support Portal website at support.spectrallogic.com, and from the Documentation screen on the BlackPearl user interface.

- The *Spectra BlackPearl User Guide* provides detailed information about configuring, using, and maintaining your BlackPearl gateway.

- The *BlackPearl Network Setup Tips* document provides helpful instructions for troubleshooting common connectivity problems.
- The *Spectra BlackPearl RackMount Instructions* provides detailed instructions for installing the BlackPearl gateway in a standard 19-inch rack.
- The *Spectra BlackPearl Spectra S3 API Reference* provides information on understanding and using the Spectra S3 API.

The following documents are available after logging into your Support portal account at: support.spectralogic.com.

- The *Spectra BlackPearl Release Notes and Documentation Updates* provide the most up-to-date information about the BlackPearl gateway, including information about the latest software releases and documentation updates.
- The *Spectra 12- & 36-Drive Chassis Boot Drive Replacement Guide* provides instructions for replacing a failed boot drive in the gateway.
- The *Spectra 12-, 36- & 45-Drive Chassis Drive Replacement Guide* provides instructions for replacing a failed data drive after the gateway is installed.
- The *Spectra 12-, 36- & 45-Drive Chassis Fan Replacement Guide* provides instructions for replacing a failed fan in the gateway.
- The *Spectra 12-, 36- & 45-Drive Chassis Power Supply Replacement Guide* provides instructions for replacing a failed power supply after the gateway is installed.
- The *Spectra 12-Drive Chassis HBA Replacement Guide* and *Spectra 36-Drive Chassis HBA Replacement Guide* provide instructions for replacing a failed HBA in the gateway.
- The *Spectra 96-Drive Chassis Drive Replacement Guide* provides instructions for replacing a failed data drive in the ArcticBlue expansion node.
- The *Spectra 96-Drive Chassis Fan Replacement Guide* provides instructions for replacing a failed fan in the ArcticBlue expansion node.
- The *Spectra 96-Drive Chassis Power Supply Replacement Guide* provides instructions for replacing a failed power supply in the ArcticBlue expansion node.
- The *Spectra 96-Drive Chassis I/O Module Replacement Guide* provides instructions for replacing a failed I/O module in the ArcticBlue expansion node.

CONVENTIONS USED IN THIS GUIDE

This manual uses the following conventions to highlight important information:

Note: Read text marked by “Note” for additional information or suggestions about the current topic.



Important

Read text marked by the “Important” icon for information that helps you complete a procedure or avoid extra steps.



Caution

Read text marked by the “Caution” icon for information you must know to avoid damaging the gateway, the installed drives, or losing data.



WARNING

Read text marked by the “Warning” icon for information you must know to avoid personal injury.

WARNUNG Lesen Sie markierten Text durch die “Warnung”-Symbol für die Informationen, die Sie kennen müssen, um Personenschäden zu vermeiden.


CHAPTER 2

Site Preparation Checklist

Use the checklist to ensure that all of the site preparation requirements are met prior to delivery of your gateway and, optionally, one or more expansion nodes.

CHECKLIST

Status	Description
<input type="checkbox"/>	<p>Physical requirements are met (see Physical Requirements on page 12).</p> <ul style="list-style-type: none"> ▪ Access to the gateway is restricted to authorized personnel. ▪ There is room for unpacking and moving the gateway. ▪ The installation area has a level, hard flooring that can support the weight of the rack and gateway. <p>BlackPearl gateways and BlackPearl expansion nodes</p> <ul style="list-style-type: none"> ▪ There is at least 36 inches (91.4 cm) of clearance in front and behind the gateway. ▪ Recommended - a fire suppression system is in place. ▪ Optional - a stability kit is installed. <p>ArcticBlue expansion nodes</p> <ul style="list-style-type: none"> ▪ There is at least 48 inches (122 cm) of clearance in front and behind the gateway. ▪ Recommended - A fire suppression system is in place. ▪ Required - a bolt down kit is installed.
<input type="checkbox"/>	<p>Environmental requirements are met (see Environmental Requirements on page 17).</p> <ul style="list-style-type: none"> ▪ The temperature, humidity, and altitude are within the gateway's specifications. ▪ The location is as free of airborne particulates as possible.
<input type="checkbox"/>	<p>Power requirements are met (see Power Requirements on page 18).</p> <ul style="list-style-type: none"> ▪ A sufficient number of power outlets are installed near the back of the gateway, and are accessible when the gateway is fully inserted into the rack. ▪ Power cords meet country and local electrical codes.
<input type="checkbox"/>	<p>Network cable requirements are addressed (see Interface Specifications on page 21).</p> <ul style="list-style-type: none"> ▪ The correct number and types of network cables are available.

<input type="checkbox"/>	<p>Rack-mount requirements are met (see Rack Requirements on page 24).</p> <p>BlackPearl gateway and BlackPearl expansion nodes</p> <ul style="list-style-type: none"> ▪ The rack is of a sufficient size to hold the gateway including cable clearance in back and clearance between the front door frame and the front mounting posts of the rack to allow the door to close over the front bezel. ▪ The rack can safely handle the weight of the gateway. ▪ The rack is assembled. <p>ArcticBlue expansion nodes</p> <ul style="list-style-type: none"> ▪ The rack is of a sufficient size to hold the gateway including cable clearance in back and clearance between the front door frame and the front mounting posts of the rack to allow the door to close over the front bezel. ▪ The rack can safely handle the weight of the gateway. ▪ The rack is assembled and affixed to the floor to eliminate the risk of tipping when a fully loaded ArcticBlue expansion node is extended from the rack. <p> Warning: Failure to anchor the rack to the floor could allow the rack to tip over which could cause personal injury.</p>
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CHAPTER 3

Site Preparation

This chapter describes the site requirements for the BlackPearl gateways, and the BlackPearl and ArcticBlue expansion nodes. Make sure that the location where you will use the gateway meets these requirements before installing the gateway.

For Spectra tape library site preparation requirements, see the applicable *Site Preparation Guide* for your library type.

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PHYSICAL REQUIREMENTS

The following physical requirements apply to the operating location of the gateway. Meeting these requirements is necessary for successful operation of the gateway.

Restricted Access Ensure that only authorized personnel can access your installation location.

Shipping Size and Weight The following table provides the shipping size and weight specifications for the gateways. All weights are approximate.

Chassis	Height	Width	Depth	Weight ^{a, b}
BlackPearl 2U gateway	13.25 in. (33.7 cm)	26 in. (66 cm)	34.25 in. (87.0 cm)	With 4 HDDs & 2 SSDs: 67.7 lb (30.7 kg) With 10 HDDs: 76.9 lb (34.9 kg) With 10 HDDs & 2 SSDs: 78.5 lb (35.6 kg)
BlackPearl 4U gateway with HDDs & SSDs	17.5 in. (44.5 cm)	27 in. (68.6 cm)	39 in. (99.1 cm)	With 10 HDDs & 2 SSDs: 110.6 lb (50.2 kg) With 20 HDDs & 6 SSDs: 131.8 lb (59.8 kg)
BlackPearl 4U gateway with SSDs	17.5 in. (44.5 cm)	27 in. (68.6 cm)	39 in. (99.1 cm)	With 12 SSDs: 100.6 lb (45.6 kg) With 26 SSDs: 111.8 lb (50.7 kg)
BlackPearl expansion node	17.5 in. (44.5 cm)	27 in. (68.6 cm)	39 in. (99.0 cm)	With 44 HDDs: 170.2 lb (77.2 kg)
ArcticBlue expansion node	14 in. (35.6 cm)	24.5 in. (62.2 cm)	43.5 in. (110.5 cm)	With 25 HDDs: 153 lb (69.4 kg) With 50 HDDs: 198 lb (89.8 kg) With 75 HDDs: 243 lb (110.2 kg) With 96 HDDs: 280.8 lb (127.4 kg)

a. Includes chassis, drives, and packaging.

b. The BlackPearl expansion node and ArcticBlue expansion node ship without drives installed.



WARNING

Lifting hazard. Use lifting aids and proper lifting techniques with assistance when handling heavy equipment.

WARNUNG Gefahren beim Heben. Verwenden Sie Hebehilfen und richtige Hebetchnik mit Unterstützung beim Umgang mit schwerem Gerät.

Unpacked Size and Weight The following table provides the unpacked size and weight specifications for the gateways.

Chassis	Height	Width	Depth ^a	Weight
BlackPearl 2U gateway	2U—3.5 in. (8.9 cm)	19 in. (48.3 cm)	27.5 in. (69.9 cm)	Empty chassis: 37.9 lb (17.2 kg) With 4 HDDs & 2 SSDs: 46.7 lb (21.2 kg) With 10- HDDs: 55.9 lb (25.4 kg) With 10 HDDs & 2 SSDs: 57.5 lb (26.1 kg)
BlackPearl 4U gateway with spinning drives & SSDs	4U—7 in. (17.8 cm)	19 in. (48.3 cm)	29.5 in. (74.9 cm)	Empty chassis: 57.0 lb (25.9 kg) With 10 HDDs & 2 SSDs: 76.6 lb (34.7 kg) With 20 HDDs & 6 SSDs: 97.8 lb (44.4 kg)
BlackPearl 4U gateway with SSDs	4U—7 in. (17.8 cm)	19 in. (48.3 cm)	29.5 in. (74.9 cm)	Empty chassis: 57.0 lb (25.9 kg) With 12 SSDs: 66.6 lb (30.2 kg) With 26 SSDs: 77.8 lb (35.43 kg)
BlackPearl expansion node	4U—7 in. (17.8 cm)	19 in. (48.3 cm)	29 in. (73.7 cm)	Empty chassis: 57 lb (25.8 kg) With 44 HDDs: 136.4 lb (61.9 kg)
ArcticBlue expansion node ^b	4U—7 in. (17.8 cm)	19 in. (48.3 cm)	40 in. (101.6 cm)	Empty chassis: 76 lb (34.5 kg) With 25 HDDs: 121 lb (54.9 kg) With 50 HDDs: 166 lb (75.3kg) With 75 HDDs: 211 lb (95.7 kg) With 96 HDDs: 248.8 lb (112.9 kg)

a. Includes the front bezel.

b. ArcticBlue expansion node weights do not include the weight of the rack mount kit. Each rack kit weighs 21 lb (9.5 kg).



WARNING

Lifting hazard. Use lifting aids and proper lifting techniques with assistance when handling heavy equipment.

WARNUNG Gefahren beim Heben. Verwenden Sie Hebehilfen und richtige Hebetchnik mit Unterstützung beim Umgang mit schwerem Gerät.

Maximum Configuration Size and Weight The maximum configuration for a BlackPearl 2U gateway is one gateway and two BlackPearl or ArcticBlue expansion nodes. The maximum configuration for a BlackPearl 4U gateway is one gateway and nine BlackPearl or ArcticBlue expansion nodes.

The following table shows the size and weight of the combined units.

Configuration	Height	Width	Depth ^a	Weight ^b
One BlackPearl 2U gateway and two BlackPearl expansion nodes	17.5 in. (44.5 cm)	19 in. (48.3 cm)	29.5 in. (74.9 cm)	330.3 lb (149.8 kg)
One BlackPearl 2U gateway and two ArcticBlue expansion nodes	17.5 in. (44.5 cm)	19 in. (48.3 cm)	40 in. (101.6 cm)	597.1 lb (270.8 kg) ^c
One BlackPearl 4U gateway and nine BlackPearl expansion nodes	63 in. (160 cm)	19 in. (48.3 cm)	29.5 in. (74.9 cm)	1325.4 lb (601.2 kg)
One BlackPearl 4U gateway and nine ArcticBlue expansion nodes	63 in. (160 cm)	19 in. (48.3 cm)	40 in. (101.6 cm)	2526 lb (1145.8 kg) ^d

a. Includes the front bezel.

b. Weight is approximate.

c. Weight includes the weight of 2 rack kits used for the ArcticBlue expansion nodes. Each rack kit weighs 21 lb (9.5 kg).

d. Weight includes the weight of 9 rack kits used for the ArcticBlue expansion nodes. Each rack kit weighs 21 lb (9.5 kg).

Floor Load / Tipping Hazard The data center flooring must support the weight of a fully loaded rack with 10 units. Additionally, any rack containing an ArcticBlue expansion node must anchor to the floor to prevent the rack from tipping over, which could cause personal injury.

A fully loaded **BlackPearl 2U gateway with BlackPearl expansion nodes** weighs 330.3 lb (149.8 kg). **Serious damage and personal injury could occur if the floor collapses or if the rack tips over.**

**WARNING**

A fully loaded **BlackPearl 2U gateway with ArcticBlue expansion nodes** weighs 597.1 lb (270.8 kg). **Serious damage and personal injury could occur if the floor collapses or if the rack tips over.**

A fully loaded **BlackPearl 4U gateway with BlackPearl expansion nodes** weighs 1325.4 lb (601.2 kg). **Serious damage and personal injury could occur if the floor collapses or if the rack tips over.**

**WARNING**

A fully loaded **BlackPearl 4U gateway with ArcticBlue expansion nodes** weighs 2526 lb (1145.8 kg). **Serious damage and personal injury could occur if the floor collapses or if the rack tips over.**

WARNUNG Ein voll beladener **BlackPearl 2U Gateway mit BlackPearl Expansion Knoten** wiegt 149,8 kg. **Schwere Schäden und Verletzungen könnten auftreten, wenn der Boden zusammenbricht oder wenn die Rack umkippt.**

WARNUNG Ein voll beladener **BlackPearl 2U Gateway mit ArcticBlue Expansion Knoten** wiegt 270,8 kg. **Schwere Schäden und Verletzungen könnten auftreten, wenn der Boden zusammenbricht oder wenn die Rack umkippt.**

WARNUNG Ein voll beladener **BlackPearl 4U Gateway mit BlackPearl Expansion Knoten** 601,2 kg. **Schwere Schäden und Verletzungen könnten auftreten, wenn der Boden zusammenbricht oder wenn die Rack umkippt.**

WARNUNG Ein voll beladener **BlackPearl 4U Gateway mit ArcticBlue Expansion Knoten** 1145,8 kg. **Schwere Schäden und Verletzungen könnten auftreten, wenn der Boden zusammenbricht oder wenn die Rack umkippt.**

Working Area - BlackPearl Gateway and BlackPearl Expansion Node

Spectra Logic requires a minimum of 36 inches (92 cm) of clearance, both in front and in back of the gateway, for ventilation and access during installation, operation, and service.

Working Area - ArcticBlue Expansion Nodes Spectra Logic requires a minimum of 48 inches (122 cm) of clearance, both in front and in back of the expansion node, for ventilation and access during installation, operation, and service.

Flooring Plac the rack on a level, hard-surfaced floor such as cement or tile. Do not place the rack on a carpeted floor or anywhere else that poses risk for static discharge that could damage your gateway or its drives.

Fire Protection If possible, install the BlackPearl gateway close to your data center's fire suppression equipment.

Stability Kit - BlackPearl Gateways and BlackPearl Expansion Node In earthquake-prone areas, it is important to adequately restrain file storage systems to prevent personal injury and limit potential damage to system components.

**WARNING**

In earthquake-prone areas, the rack must have stabilizing equipment or be anchored to the floor to eliminate the risk of tipping, which could lead to personal injury.

WARNUNG In erdbebengefährdeten Gebieten muss das Rack stabilisierende Ausrüstung oder am Boden verankert, um die Kippgefahr, die zu Verletzungen führen können beseitigt werden.

Bolt Down Kit - ArcticBlue Expansion Nodes When installing one or more ArcticBlue expansion nodes, use a bolt down kit, such as the one shipped with the rack available from Spectra Logic, to prevent personal injury and limit potential damage to system components.

**WARNING**

The rack must be anchored to the floor before the ArcticBlue expansion node is installed to eliminate the risk of tipping when a fully loaded ArcticBlue expansion node is extended from the rack, which could lead to personal injury.

WARNUNG Das Rack muss am Boden verankert werden, bevor das ArcticBlue Erweiterungsknoten installiert ist, um die Kippgefahr zu beseitigen, wenn ein voll beladener ArcticBlue Erweiterungsknoten aus dem Rack, die zu Personenschäden führen könnte erweitert.

ENVIRONMENTAL REQUIREMENTS

The tables below show the temperature, humidity, and altitude requirements for the BlackPearl gateways, and BlackPearl and ArcticBlue expansion nodes.

BlackPearl Gateways and BlackPearl Expansion Nodes

Parameter	Operating Environment ^a	Non-Operating Environment (Storing and Shipping) ^b
Humidity	8% to 90% (non-condensing)	5% to 95% (non-condensing)
Temperature	50° F to 95° F (10° C to 35° C)	-40° F to 158° F (-40° C to 70° C)
Altitude	Sea level to 10,000 feet (3,048 meters)	Sea level to 39,370 feet (12,000 meters)
Maximum wet bulb temperature	84° F (29° C)	95° F (35° C)

- a. When moving the BlackPearl gateway or expansion node from a cold storage environment to a warm operating environment, it must acclimate in its packaging for at least 12 hours before opening to prevent serious condensation damage.
- b. Specifications are for the BlackPearl gateway in its original packaging. The packaging protects the BlackPearl gateway from condensation caused by extreme temperature variations (27° F per hour or 15° C per hour, or more).

ArcticBlue Expansion Node

Parameter	Operating Environment ^a	Storing and Shipping (Non-Operating) Environment ^b
Humidity	20% to 80% (non-condensing)	10% to 90% (non-condensing)
Temperature	41° F to 95° F (5° C to 35° C)	-40° F to 140° F (-40° C to 60° C)
Altitude	-200 feet to 10,000 feet (-61 meters to 3,048 meters)	-200 feet to 40,000 feet (-61 meters to 12,192 meters)

- a. When moving the ArcticBlue expansion node from a cold storage environment to a warm operating environment, it must acclimate in its packaging for at least 12 hours before opening to prevent serious condensation damage.
- b. Specifications are for the ArcticBlue expansion node is in its original packaging. The packaging is designed to protect the ArcticBlue expansion node from condensation caused by extreme temperature variations (27° F per hour or 15° C per hour, or more).

Air Quality

Keep the location as free of airborne particulates as possible. To eliminate obvious sources of particulates, do not permit anyone to smoke, eat, or drink near the installation area, and do not place the gateway near a copier or printer that may emit toner and paper dust.

POWER REQUIREMENTS

The BlackPearl gateways, BlackPearl expansion nodes, and ArcticBlue expansion nodes, have the following power requirement.



Caution

Failure to meet the cabling and power specifications could damage your gateway, result in data loss, or both.

Input Power Requirements

The following tables provide the input power requirements for each gateway or expansion node.

BlackPearl 2U Gateway

Parameter	Requirements
Input Voltage	100–240 VAC, 11–4.5 A, 920 watts maximum
Input Frequency	50–60 Hz
Current	4 A

BlackPearl 4U Gateway

Parameter	Requirements
Input Voltage	100–140 VAC, 12–8 A, 1000 watts maximum 180–240 VAC, 8–6 A, 1280 watts maximum
Input Frequency	50–60 Hz
Current	4.2 A

BlackPearl Expansion Node

Parameter	Requirements
Input Voltage	100–140 VAC, 13.5–9.5 A, 1100 watts maximum 180–240 VAC, 9.5–7 A, 1400 watts maximum
Input Frequency	50–60 Hz
Current	4.5 A

ArcticBlue Expansion Node

Parameter	Requirements
Input Voltage	90-264 VAC, 1100 watts maximum
Input Frequency	47–63 Hz
Current	14.5 A RMS @ 90 VAC

Power Outlet Quantity and Location

Each BlackPearl node requires two easily accessible power outlets near the back of the chassis.

- Notes:**
- It is helpful to have an extra outlet available for a monitor.
 - Complete adequate electrical cabling for the gateway *before* the field engineer arrives for the gateway installation.

Power Cord Specifications

The power cords included with the BlackPearl gateways are part of the unit and not intended for use with any other equipment.

Power cords must comply with local electrical codes.

Note: ArcticBlue expansion nodes ship with cables for use with the chassis. These power cables have a right-angled C14 connector, which is required for the ArcticBlue expansion node. Only use the cords provided by Spectra Logic with the ArcticBlue expansion node.



Warning

Using extension cords in conjunction with the cords provided with an ArcticBlue expansion node, may cause serious damage.

WARNUNG Die Verwendung von Verlängerungskabeln in Verbindung mit den mit einem ArcticBlue-Erweiterungsknoten versehenen Kabeln kann schwere Schäden verursachen.

North American 120 Volt-AC Power Cord The criteria for a 120-volt power cord for use in the United States and Canada are as follows:

Parameter	Specification
Power cordage	Three-conductor, 14 AWG
Power input connectors	<ul style="list-style-type: none"> ▪ Male: NEMA 5-15P or IEC-60320 C14 ▪ Female: IEC 60320 C13



North American 220 Volt-AC Power Cord The criteria for a 220-volt power cord for use in the United States and Canada are as follows:

Parameter	Specification
Power cordage	SJT type, three-conductor, 14 AWG minimum
Power input connectors	<ul style="list-style-type: none"> ▪ Male: Use a connector with the proper type, rating, and safety approval. ▪ Female: IEC 60320 C13

International 220 Volt-AC Power Cord The table below shows the criteria for an international 220-volt AC power cord:

Parameter	Specification
Power cordage	Flexible, HAR (harmonized) type H05VV-F, three conductor cord with minimum conductor size of 1.7 square millimeters (0.0026350 square inches).
Power input connectors	<ul style="list-style-type: none"> ▪ Male: Use a connector with the proper type, rating, and safety approval for the intended country. ▪ Female: IEC 60320 C13

INTERFACE SPECIFICATIONS

This section provides information about the interfaces used to connect a BlackPearl gateway to expansion nodes, tape drives, and host systems.

Interface Connectivity Types

Connection Type	Purpose
Ethernet <ul style="list-style-type: none"> ▪ 1000Base-T ▪ 10GBase-T ▪ 10 GigE ▪ 40 GigE 	<ul style="list-style-type: none"> ▪ Access to the BlackPearl user interface to configure and manage the gateway remotely requires one 1000Base-T or 10GBase-T Ethernet connection to the BlackPearl management port. ▪ A data connection using one 10 GigE or 40 GigE port is required to connect hosts to the BlackPearl gateway. Although only one data connection can be configured, the two 10 GigE or 40 GigE ports can be configured to use link aggregation. <p>Notes:</p> <ul style="list-style-type: none"> ▪ Spectra Logic recommends using the ports on the 10 GigE or 40 GigE network card with link aggregation for best performance. ▪ If the gateway does not include a 10 GigE or 40 GigE network interface card, the extra 10GBase-T port can be used for data transfer.
SAS <ul style="list-style-type: none"> ▪ 6 Gbps ▪ 12 Gbps 	<ul style="list-style-type: none"> ▪ SAS cables are required to allow communication between the BlackPearl gateway and BlackPearl or ArcticBlue expansion nodes. ▪ SAS cables are required to allow communication between the BlackPearl gateway and the associated Spectra tape library, when the tape library is using SAS drives.
Fibre Channel <ul style="list-style-type: none"> ▪ 8 Gb 	<p>Fibre Channel cables are required to allow communication between the BlackPearl gateway and the associated Spectra tape library, when the tape library is using Fibre Channel drives.</p>

Gateway Interface Connectors

Interface Type	Number of Ports and Connector Type
Ethernet (1000BaseT, or 10GBase-T)	Two RJ-45 sockets.
Ethernet (10 GigE)	Two SFP+ optical modules with a duplex LC connector per optional 10 GigE NIC.

Interface Type	Number of Ports and Connector Type
Ethernet (40 GigE)	Two QSFP+ optical modules with a duplex LC connector per optional 40 GigE NIC.
SAS (6 Gbps)	<ul style="list-style-type: none"> ▪ Four SFF-8644 sockets per optional 6 Gbps SAS card provide connections to two BlackPearl expansion nodes, using two ports for each expansion node. ▪ Four SFF-8644 sockets per optional 6 Gbps SAS card provide connections to four SAS tape drives installed in the tape library, using one port for each tape drive.
SAS (12 Gbps)	Two SFF-8644 sockets per optional 12 Gbps SAS card provide connections to two ArcticBlue expansion nodes, using one port per expansion node.
Fibre Channel (8 Gb)	Two SFP+ optical modules with LC connectors per optional 8 Gb Fibre Channel card provide connections to two Fibre Channel tape drives installed in the tape library, using one port for each tape drive.

Expansion Node and Tape Drive Interface Connectors

Interface Type	Number of Ports and Connector Type
BlackPearl Expansion Node	Two SFF-8088 ports per BlackPearl expansion node. Both ports are required to connect the expansion node to a BlackPearl gateway.
ArcticBlue Expansion Node	Two SFF-8644 ports per ArcticBlue expansion node. Only a single port is required to connect the expansion node to a BlackPearl gateway.
SAS Tape Drive	<ul style="list-style-type: none"> ▪ T50e library: Two SFF-8644 ports per tape drive. Only a single port is required to connect the tape drive to a BlackPearl gateway. Either port can be used for the connection. ▪ T120 library: One SFF-8644 port per tape drive. The single port is required to connect the tape drive to a BlackPearl gateway.
Fibre Channel Tape Drive	<ul style="list-style-type: none"> ▪ T50e and T120 libraries: One multimode optical LC port per tape drive. The single port is required to connect the tape drive to a BlackPearl gateway ▪ All other libraries: Two multimode optical LC ports per tape drive. Only a single port is required to connect the tape drive to a BlackPearl gateway. Either port can be used for the connection.

Interface Cables

The type of cables required to connect the BlackPearl gateway to an Ethernet network, a BlackPearl or ArcticBlue expansion node, a SAS tape drive, or a Fibre Channel tape drive depend on the type of interface.

Interface Type	Cable Requirements
Ethernet (10GBase-T or 10/100/1000Base-T)	<p>10GBase-T - Shielded Category 6A data-grade cable with a RJ-45 connector.</p> <p>10/100/1000Base-T - Shielded Category 5 data-grade cable with a RJ-45 connector.</p> <p>Note: Cables provided by the customer.</p>
Ethernet (10 GigE)	<p>Multimode optical cable with duplex LC connectors.</p> <p>Note: Cables provided by the customer.</p>
Ethernet (40 GigE)	<p>QSFP+ transceiver MPT optical cables with duplex LC connectors, or copper cables with duplex LC connector.</p> <p>Note: Cables provided by the customer.</p>
SAS	<p>BlackPearl expansion node: 6 Gbps 4 lane cable with SFF-8644 and SFF-8088 connectors. Two SAS cables are required for each BlackPearl expansion node.</p> <p>Note: Two SAS cables ship with each BlackPearl expansion node.</p> <p>ArcticBlue expansion node: 12 Gbps cable with SFF-8644 connectors. One SAS cable is required for each ArcticBlue expansion node.</p> <p>Note: One SAS cable ships with each ArcticBlue expansion node.</p> <p>SAS tape drive: 6 Gbps 4 lane cable with SFF-8644 and SFF-8088 connectors. One SAS cable is required for each SAS tape drive.</p> <p>Note: Cables provided by the customer.</p>
Fibre Channel	<p>50 micron—400-M5-SN-I classification optical cable with LC connectors. One fiber cable is required for each Fibre Channel tape drive.</p> <p>Note: Cables provided by the customer.</p>

RACK REQUIREMENTS

Ensure that an appropriate rack is assembled and placed near the AC power outlets and network connections.

**Caution**

You must locate the rack on a level, hard-surfaced floor, such as cement or tile. Do not place the rack on a carpeted floor or anywhere else that poses risk for static discharge that could damage your gateway or its drives.

BlackPearl Gateways and BlackPearl Expansion Node

Note: When installing a BlackPearl gateway with an ArcticBlue expansion node, you must use the rack requirements for the ArcticBlue expansion node. See [ArcticBlue Expansion Node on page 25](#) for more information. Otherwise, use the instructions below.

The BlackPearl 4U gateway and BlackPearl expansion node are 7 inches (17.8 cm) tall and occupies 4U of rack space. The BlackPearl 2U gateway is 3.5 inches (8.9 cm) tall and occupies 2U of rack space. All are designed to fit in a standard 19-inch, 4-post rack. Keep the following in mind when selecting a rack:

- Using a 4-post rack that is at least 36 inches (91 cm) deep is recommended.
- Make sure that the distance between the mounting surfaces on the front and rear posts is at least 30 inches (76 cm).

Note: If you are using the adaptors to install the rack-mount kit in a rack with circular mounting cutouts, the distance between the front and rear posts must be at least 31.5 inches (80 cm).

- Allow approximately 3 inches (8 cm) of additional depth at the back of the rack for cable clearance.
- If the rack has a door, allow at least 2 inches (5 cm) of clearance between the front door frame and the front mounting posts of the rack to allow the door to close over the front bezel.
- Check your rack's specifications to make sure it accommodates the weight and depth of the BlackPearl gateway.

- Notes:**
- Spectra Logic does not support the use of a two-post rack with a BlackPearl gateway or expansion node.
 - An enclosed 19-inch, four-post rack is available for purchase from Spectra Logic. The rack has two doors and removable side panels. Contact Spectra Logic Sales for more information (see [Contacting Spectra Logic on page 4](#)).
 - In earthquake prone areas, provide restraints as necessary. See [Stability Kit - BlackPearl Gateways and BlackPearl Expansion Node on page 16](#).

ArcticBlue Expansion Node

The ArcticBlue expansion node chassis is 6.9 inches (17.5 cm) tall and occupies 4U of rack space; it fits in a standard 19-inch, 4-post rack. Keep the following in mind when selecting a rack:

- Make sure that the distance between the mounting surfaces on the front and rear posts is between 19 inches (48.3 cm) and 30 inches (76 cm).
- Allow approximately 3 inches (8 cm) of additional depth at the back of the rack for cable clearance.
- If the rack has a door, allow at least 2 inches (5 cm) of clearance between the front door frame and the front mounting posts of the rack to allow the door to close over the front bezel.
- Check your rack's specifications to make sure it accommodates the weight and depth of the ArcticBlue expansion node. See [Physical Requirements on page 12](#) for more information.

**WARNING**

The rack must be anchored to the floor before the ArcticBlue expansion node is installed to eliminate the risk of tipping when a fully loaded ArcticBlue expansion node is extended from the rack, which could lead to personal injury.

**WARNING**

WARNUNG Das Rack muss am Boden verankert werden, bevor das ArcticBlue Erweiterungsknoten installiert ist, um die Kippgefahr zu beseitigen, wenn ein voll beladener ArcticBlue Erweiterungsknoten aus dem Rack, die zu Personenschäden führen könnte erweitert.

- Notes:**
- Using a two-post rack is not supported.
 - Spectra Logic does not support the use of a two-post rack with an ArcticBlue expansion node.
 - An enclosed 19-inch, four-post rack and suitable bolt down kit is available for purchase from Spectra Logic. The rack has two doors and removable side panels.