# IBM System Storage
# DS4300 Storage Subsystem
# Fibre Channel Cabling Guide

Table 1 summarizes the steps required to correctly install, cable, and power on your IBM® System Storage® DS4300 storage subsystem. Unless otherwise stated, all the following tasks are detailed in the *IBM System Storage DS4300 Storage Subsystem Installation, User's, and Maintenance Guide*. Review the multilingual *IBM Safety Information* document and read all safety information in the *IBM System Storage DS4300 Storage Subsystem Installation, User's, and Maintenance Guide* before you begin the installation.

**Attention:** Before powering on the DS4300, the DS4300 storage subsystem must be installed with at least two drives. In addition, each of the drive expansion enclosures that are connected to the DS4300 storage subsystem must have with at least two drives installed. If at least two drives are not installed in the DS4300 subsystem and in each attached enclosure when you power on the drive expansion enclosures and the DS4300, your standard storage partition key will be lost and must be regenerated. In addition, the resulting insufficient load to the enclosure power supplies might cause them to intermittently appear as failed, falsely indicating the power supplies are bad. All drives in the connected enclosure or enclosures must contain no prior configuration data.

*Table 1. Installation tasks*

| | Task | Section to review |
|---|---|---|
| 1 | Review the DS4300 installation recommendations and requirements. | Chapter 1 "Heat output, airflow and cooling" and Chapter 2, "Getting started" |
| 2 | Fold down and open the sides of the shipping box. Without removing the DS4300 from the box, you can remove the DS4300 rack mounting rails and hardware, which were placed beneath the DS4300 subsystem, from the box. Install the support rails in the rack cabinet. | Chapter 2, "Rack mounting template" and steps 1-3 of "Installing the storage server in a rack" |
| 3 | Before removing the DS4300 from the shipping box, remove the components to lighten the unit. | Chapter 2, steps 4-7 of "Installing the storage server in a rack" |
| 4 | Record the serial number, machine type, model number, and RAID controller MAC addresses for your DS4300. | Appendix A, "Records" |
| 5 | Install and secure the DS4300 chassis in the rack cabinet and replace the components in the installed DS4300 chassis. | Chapter 2, steps 8-9 of "Installing the storage server in a rack" |
| 6 | Install in the rack cabinet the DS4000 storage expansion enclosures you will cable to the DS4300. | Installation, User's, and Maintenance Guide for your DS4000 storage expansion enclosure. |
| 7 | Use SFP modules and FC cables to cable the DS4300 to the DS4000 storage expansion enclosure(s) if there are storage expansion enclosures to be connected to the DS4300. | Chapter 3, "Working with SFPs and fiber-optic cables" and "Connecting storage expansion enclosures to the DS4300" |
| 8 | (If applicable) After you cable the DS4000 storage expansion enclosures, set the enclosure IDs of any storage expansion enclosures (including the DS43000 subsystem) in the DS4300 configuration that require their enclosure IDs to be manually set. The storage expansion enclosure and the DS4300 subsystem Enclosure IDs must be set to a unique value, including a unique value in the singles digit (that is, 01, 02, 03, and so on).<br><br>For example, enclosure IDs for EXP710 and EXP100 storage expansion enclosures must be set manually while enclosure IDs for EXP810 storage expansion enclosures are automatically set. | Installation, User's, and Maintenance Guide for your DS4000 storage expansion enclosure. |

*Table 1. Installation tasks  (continued)*

| | Task | Section to review |
|---|---|---|
| 9 | For out-of-band management: Cable the DS4300 Ethernet ports to either the management workstation or to the hosts. Use the default IP addresses for out-of-band connection, or change the IP addresses by using Dynamic Host Configuration Protocol (DCHP) or Storage Manager client. | Chapter 3, "Connecting secondary interface cables" |
| | For in-band management: Cable the DS4300 host channels to the FC HBAs in either the hosts or the FC switch that connects to the host FC HBAs. | Chapter 3, "Connecting hosts to the RAID controllers" |
| 10 | Connect the power cables for the DS4300. | Chapter 3, "Power cabling" |
| 11 | Power on the attached storage expansion enclosures first and then the DS4300 storage subsystem. Check the DS4300 and the storage expansion enclosure status via the LEDs. | Chapter 4, "Turning the storage subsystem on and off" and "Checking the LEDs" |
| 12 | Review the controller firmware, ESM and storage manager host software requirements. Obtain the required code if needed. | Chapter 1 "Software and hardware compatibility and upgrades" |
| 13 | Install the DS4000 Storage Manager 9.19 host software on the management workstation (for out-of-band management) or on the host (for in-band management). Use the DS4000 Storage Manager software to verify the configuration. | *IBM DS4000 Storage Manager 9.19 Installation and Support Guide* for your operating system. |
| 14 | Review and perform the DS4000 Health Check process. | Chapter 4, "Performing the DS4000 Health Check process" |

The following illustrations and instructions provide a very brief overview of the cabling tasks required after you install the DS4300 in a rack cabinet. Review the following sections and then follow the instructions provided in the *IBM System Storage DS4300 Installation, User's, and Maintenance Guide.*
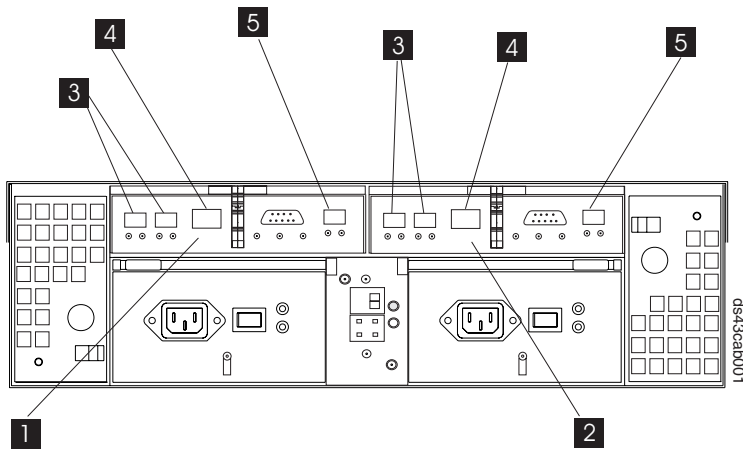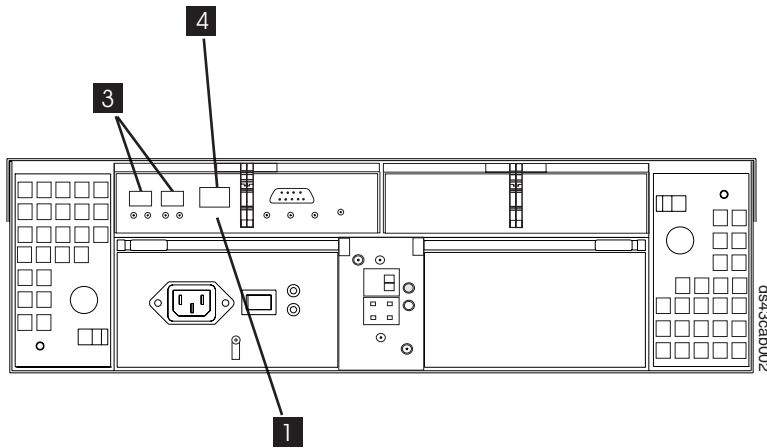


*Figure 1. DS4300 dual-controller storage subsystem*

*Figure 2. DS4300 single-controller storage subsystem*

*Table 2. DS4300 controller ports*

| Number | Description |
| --- | --- |
| 1 | Controller A |
| 2 | Controller B |
| 3 | Host ports 2 and 1 on Controller A<br><br>Host ports 1 and 2 on Controller B |
| 4 | Ethernet port on Controller A<br><br>Ethernet port on Controller B |
| 5 | Expansion port on Controller A<br><br>Expansion port on Controller B<br><br>(The Expansion port is also referred to as the drive port in the DS4300 publications.) |

# Installing an IBM Small Form-Factor Pluggable (SFP) module and fibre channel cable

The SFP module housing and fibre channel (FC) cable have integrated guide keys that prevent you from inserting these devices incorrectly. You must insert SFP modules into ports with minimal pressure so that you do not damage either the SFP module or the port. You can insert an SFP module into an active port without affecting the operational loop performance. You must connect the fibre channel cable to the SFP module after you insert the SFP module into the port.

**Attention:**  To avoid damage to your fibre-optic cables:

- Do not route the cable along a folding cable-management arm.
- Route the cable away from places where it can be damaged by other devices in the cabinet.
- For devices on slide rails, leave enough slack in the cable so that it does not bend to a diameter of less than 76 mm (3 in.) or a radius less than 38 mm (1.5 in.) when extended or become pinched when retracted.
- Do not use plastic cable ties in place of the provided cable straps.
- Do not put excess weight on the cable at the connection point. Be sure that the cable is well supported.

To install an SFP module and fibre channel cable:

1. Remove the protective caps from the SFP module and from the fibre channel cable. Do not touch the exposed fibre-optic cable.
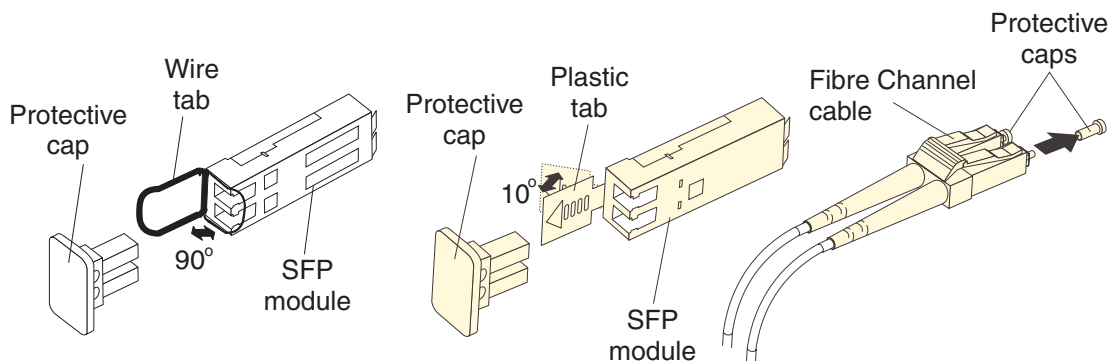


*Figure 3. Removing the protective cap from the SFP module*

2. Insert the SFP module into an SFP module port on a DS4300 FC host or expansion port.
3. Connect the fibre channel cable to the SFP module.

## Removing a fibre channel cable and SFP module

To remove a fibre channel cable and SFP module complete the following steps:

1. Remove the fibre-optic cable from the SFP module. Replace the protective caps on the cable connector.

   **Attention:**  Do not grasp the plastic tab that is part of the SFP module while disconnecting the fibre-optic cable. Pulling the SFP module plastic tab while disconnecting the fibre-optic cable might damage the SFP module.
2. For SFPs with plastic tabs, pull the SFP module plastic tab outward at a 10° angle while you remove the SFP module. The plastic tab releases the SFP module latch.
3. For SFPs with wire tabs, pull the SFP module wire tab outward at a 90° angle and remove the SFP module. The wire tab releases the SFP module latch.
4. Replace the protective cap on the SFP module.

**Statement 3:**

**CAUTION:**
**When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:**

- **Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.**

- **Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**



**DANGER**

> Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.
>
> Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

**Class 1 laser statement**

Class 1 Laser Product
Laser Klasse 1
Laser Klass 1
Luokan 1 Laserlaite
Appareil À Laser de Classe 1

IEC 825-1:1993 CENELEC EN 60 825

# Host-side fibre channel cabling (Models 60U and 60X)

1. Using a fibre channel cable, connect the first host adapter to the SFP Host port 1 on Controller A.

2. If you are cabling a second host adapter, connect the second host adapter to the SFP Host port 1 on Controller B.

3. Use the same procedure to connect up to two more host bus adapters using host port 2 on Controller A and host port 2 on Controller B.

**Note:** For more information on DS4300 host and drive side fibre channel cabling, see the *IBM®
TotalStorage™ DS4300 Installation, User's and Maintenance Guide* and the DS4000 adding capacity and migration publications.
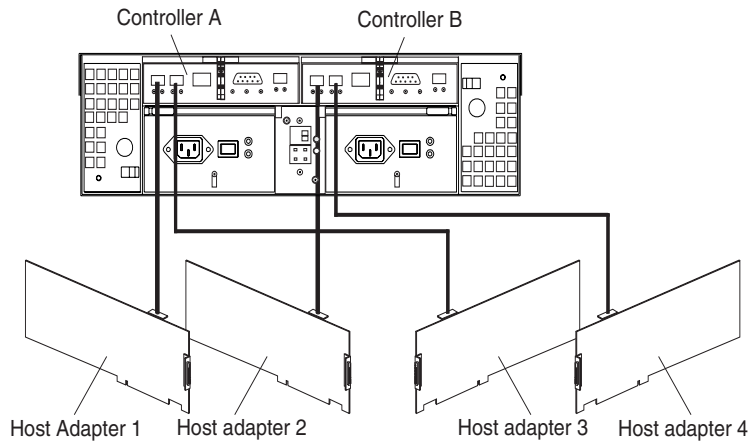


*Figure 4. Models 60U and 60X host-side fibre channel cabling*

# Host-side fibre channel cabling (Models 6LU and 6LX)

1. Using a fibre channel cable, connect the first host adapter to the SFP Host port 1 on the controller module.

2. If you are cabling a second host adapter, connect the second host adapter to the SFP Host port 2 on the controller module.
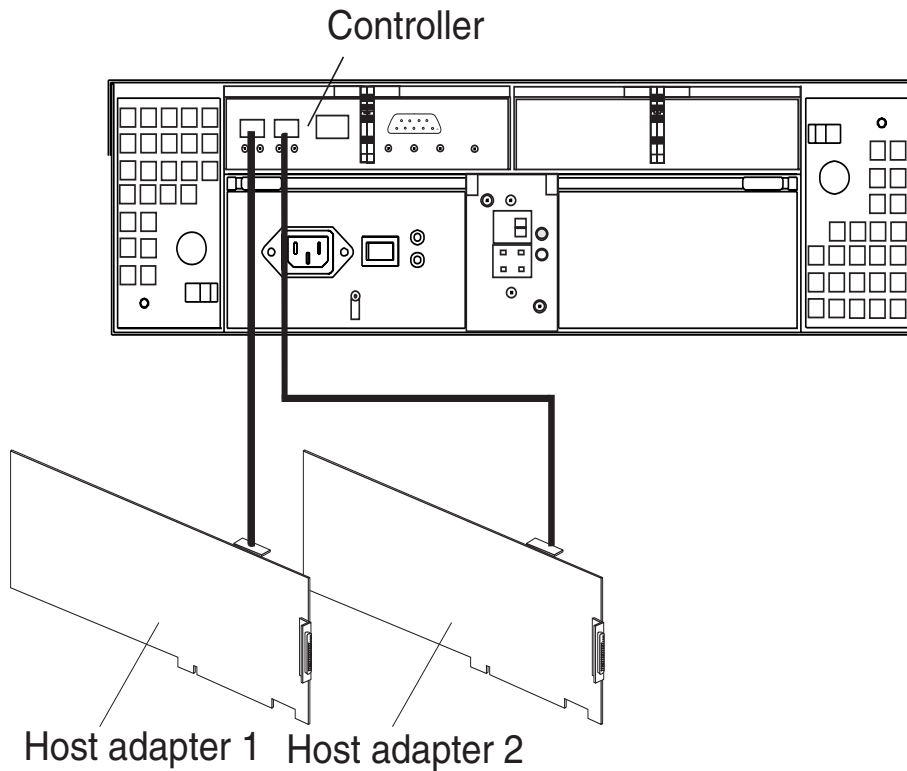
Controller



Host adapter 1  Host adapter 2

*Figure 5. Models 6LU and 6LX host-side fibre channel cabling*

## Storage expansion enclosure fibre channel cabling (Models 60U and 60X only)

The DS4300 supports a redundant drive loop pair for storage capacity expansion. If you are attaching the EXP100/700/710, follow the instructions in "Connecting to EXP100/700/710 storage expansion enclosures" to cable your enclosures to the DS4300 controllers. If you are attaching the EXP810, follow the instructions in "Connecting to EXP810 storage expansion enclosures" on page 8 to cable your EXP810 enclosures to the DS4300 controllers. If you need more information about storage expansion enclosure cabling, including the latest updates and how to cable the DS4300 to a mix of different storage expansion enclosure models, see the *IBM TotalStorage DS4300 Installation, User's and Maintenance Guide* and the *IBM TotalStorage DS4000 Hard Drive and Storage Expansion Enclosure Installation and Migration Guide*.

**Important:** Ensure that the single digit (x1) of the enclosure ID for every enclosure including the DS4300 subsystem in a redundant drive loop pair is unique. Refer to the *IBM TotalStorage DS4300 Installation, User's, and Maintenance Guide* for more information on the storage expansion enclosure IDs settings.

## Connecting to EXP100/700/710 storage expansion enclosures

1.  If you are cabling two EXP100/EXP700/EXP710 type storage expansion enclosures to the storage subsystem, use a fibre channel cable to connect the In port on the left ESM board of the first enclosure to the Out port on the left ESM board of the second enclosure. Connect the In port on the right ESM board of the first enclosure to the Out port on the right ESM board of the second enclosure. Repeat this step if you have additional EXP710 enclosures to attach, treating the second enclosure as the starting enclosure.

2. Connect the SFP Expansion port on Controller A to the In port on the left ESM board of the second (or the last enclosure that you attached to) storage expansion enclosure. Connect the SFP Expansion unit port on Controller B to the Out port on the right ESM board of the first storage expansion enclosure.

3. Ensure that each storage expansion enclosure and the DS43000 storage subsystem has a unique enclosure ID (switch setting), including a unique value in the singles digit.
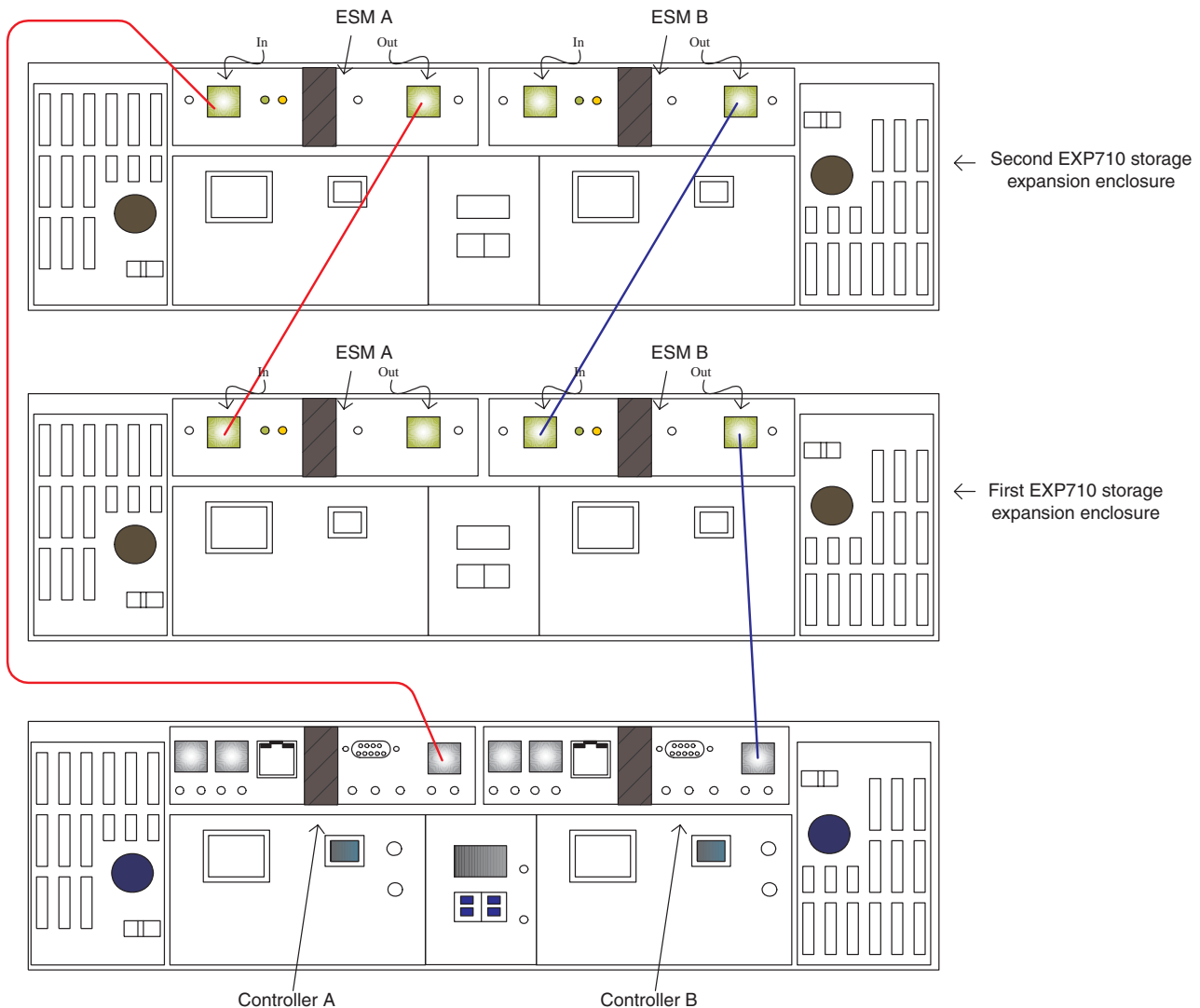


*Figure 6. EXP100/700/710 storage expansion enclosure*

## Connecting to EXP810 storage expansion enclosures

1. Ensure that each EXP810 storage expansion enclosure has the enclosure speed set to 2 Gbps fibre channel speed.

2. If you are cabling two EXP810 storage expansion enclosures to the storage subsystem, use a fibre channel cable to connect port 1B on the ESM A board of the first enclosure to port 1A on the ESM A board of the second enclosure. Connect port 1A on the ESM B board of the first enclosure to port 1B on the ESM B board of the second enclosure. Repeat this step if you have additional EXP810 enclosures to attach, treating the second enclosure as the starting enclosure.

3. Connect the SFP Expansion port on Controller A to port 1B on the ESM A board of the second (or the last enclosure that you attached to) storage expansion enclosure. Connect the SFP expansion unit port on Controller B to port 1B on the ESM B board of the first storage expansion enclosure.

   **Attention:** The controller drive port must always be connected to port 1B of the EXP810 ESM board.

4. The EXP810 enclosure IDs will automatically set to give each enclosure in the drive loop a unique enclosure ID. Ensure that each storage expansion enclosure and the DS4300 storage subsystem has a unique enclosure ID, including a unique value in the singles digit.
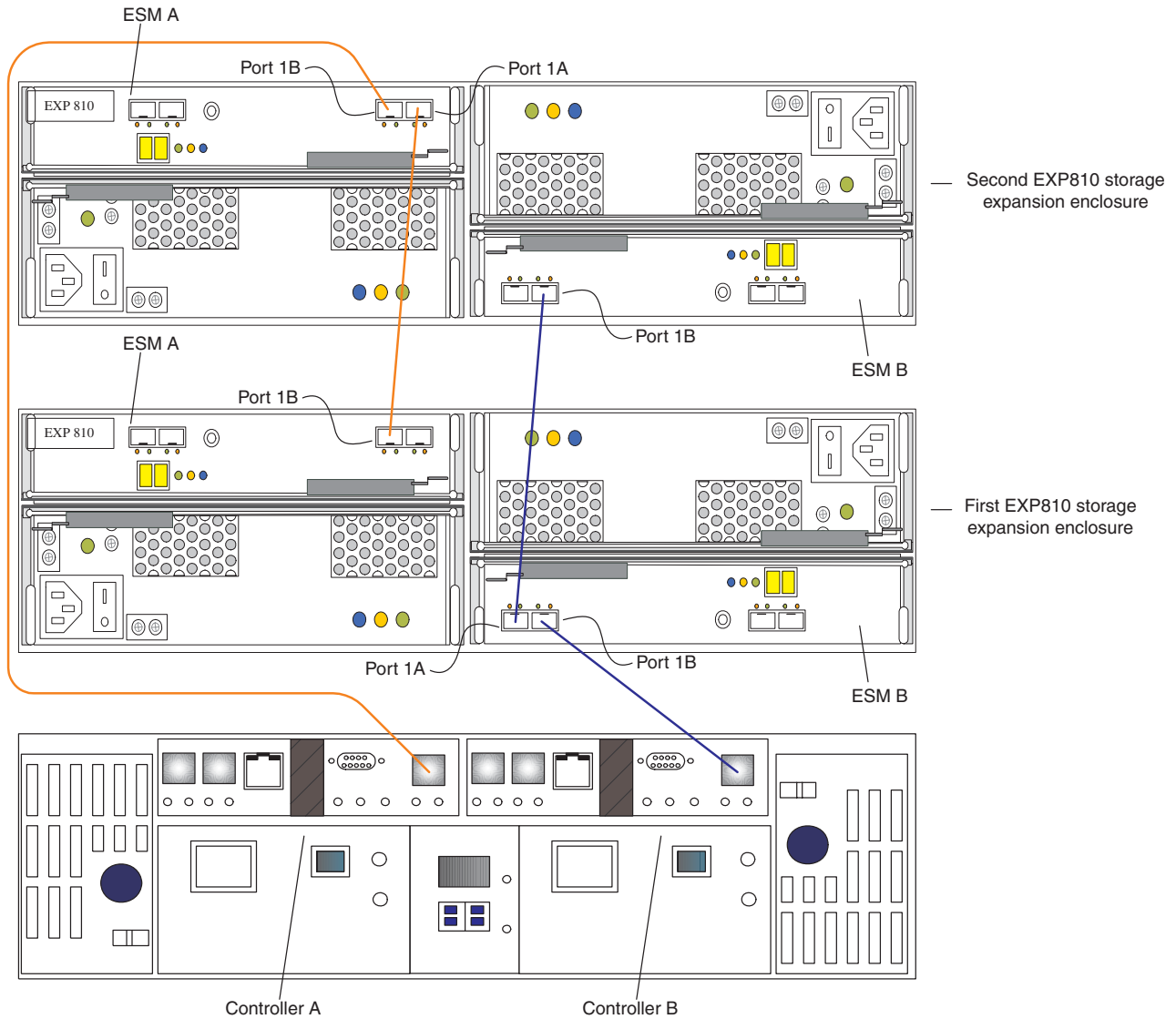


*Figure 7. EXP810 storage expansion enclosure*

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