

Dell Storage Center SC180 Expansion Enclosure Getting Started Guide

Regulatory Model: E11J
Regulatory Type: E11J001



Notes, Cautions, and Warnings

 **NOTE:** A NOTE indicates important information that helps you make better use of your computer.

 **CAUTION:** A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

 **WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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Before You Begin

Consider the following best practices before setting up your SC180 expansion enclosure.

- Before connecting any cables between the storage system and expansion enclosure, physically label each port and connector.
- Always follow proper power-up and power-down procedures when cycling power across the network. Verify that critical network components are on separate power circuits.

 **NOTE:** This product is intended for restricted access locations, such as a dedicated equipment room or equipment closet.

 **WARNING:** If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.

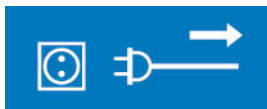
Safety Warnings



A fully configured SC180 expansion enclosure weighs up to 130 kg (287 lb). An unpopulated expansion enclosure weighs 62 kg (137 lb). Use appropriate lifting methods when installing the expansion enclosure.




The operating temperature inside the drawers of a expansion enclosure can reach up to 60°C (140°F). Take care when opening drawers and removing disk carriers.



Disconnect all electrical supply connections to the expansion enclosure before proceeding.

Other Information You May Need

Additional information you may need to install the expansion enclosure.

 **NOTE:** See the safety and regulatory information that shipped with your Storage Center components. Warranty information is included as a separate document.

- The *Dell Storage Center SCv2080 Storage System Deployment Guide* provides information about cabling Storage Center hardware components and configuring a new Storage Center using the Dell Storage Client.
- The *Dell Storage Center Dell Storage Client Administrator's Guide* describes how to use the Dell Storage Client to manage a Storage Center.


Installation and Configuration

Before you begin the installation, make sure that the site where you plan to install the expansion enclosure has standard power from an independent source or a rack power distribution unit with a UPS.

Safety Precautions

Always follow these safety precautions to avoid injury and damage to Storage Center equipment.

If equipment described in the document is used in a manner not specified by Dell, the protection provided by the equipment may be impaired. For your safety and protection, observe the rules described in the following sections.

 **NOTE:** See the safety and regulatory information that shipped with each Storage Center component. Warranty information may be included within this document or as a separate document.

Installation Safety Precautions

Follow these safety precautions:

- Dell recommends that only individuals with rack-mounting experience install an SC180 expansion enclosure in a rack.
- You need at least two people to lift the expansion enclosure chassis from the shipping box and three people to install it in the rack. The empty chassis weighs approximately 62kg (137 lbs).
- Make sure the expansion enclosure is fully grounded at all times to prevent damage from electrostatic discharge.
- When handling the expansion enclosure hardware, you should use an electrostatic wrist guard (not included) or a similar form of protection.

The expansion enclosure chassis **MUST** be mounted in a rack; the following safety requirements must be considered when doing so:

- The rack construction must be capable of supporting the total weight of the installed chassis and the design should incorporate stabilizing features suitable to prevent the rack tipping or being pushed over during installation or in normal use.
- When loading a rack with chassis, fill from the bottom up; empty from the top down.
- To avoid danger of the rack toppling over, do not slide more than one chassis out of the rack at a time.
- The expansion enclosure must be operated with low-pressure rear exhaust installation [back pressure created by rack doors and obstacles not to exceed 5 Pascals (0.5 mm water gauge)].
- The rack design should take into consideration the maximum operating ambient temperature for the unit, which is 35°C.

Unpacking Storage Center Equipment

Unpack the expansion enclosure and identify the items in your shipment.

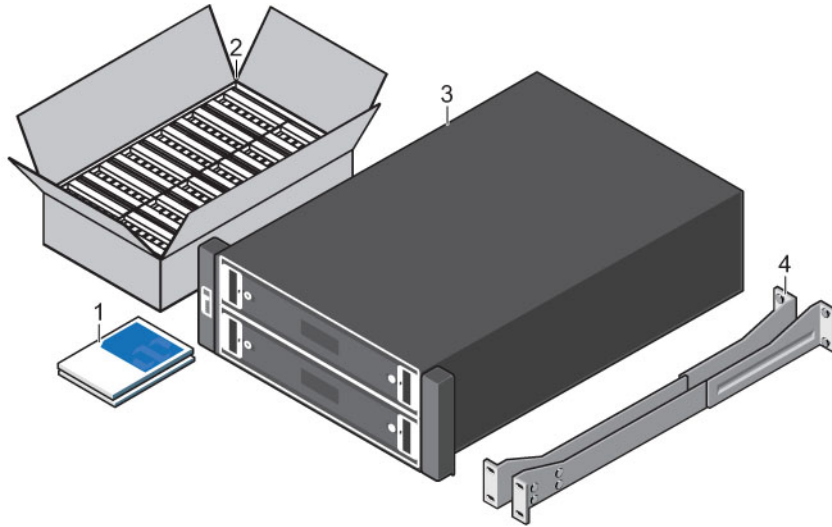


Figure 1. SC180 Expansion Enclosure Components

- | | |
|------------------------|----------------|
| 1. Documentation | 2. Hard Drives |
| 3. Expansion enclosure | 4. Rack rails |

⚠ WARNING: Two people using lift straps are required to lift the expansion enclosure to avoid injury.

Installing the Expansion Enclosure in a Rack

Install the SC180 expansion enclosure in a rack.

✍ NOTE: Mount the expansion enclosure in a manner that allows for expansion in the rack and prevents the rack from becoming top-heavy.

⚠ WARNING: If you plan to install the expansion enclosure above the lower 20U of a rack, a customer-provided mechanical lift must be used to avoid injury.

1. Assemble the rails following the safety instructions and the rack installation instructions provided with your expansion enclosure.
2. Determine where to mount the expansion enclosure in the rack and mark the location.
3. Install the rack rails at the marked location.
4. Mount the expansion enclosure chassis on the rails.

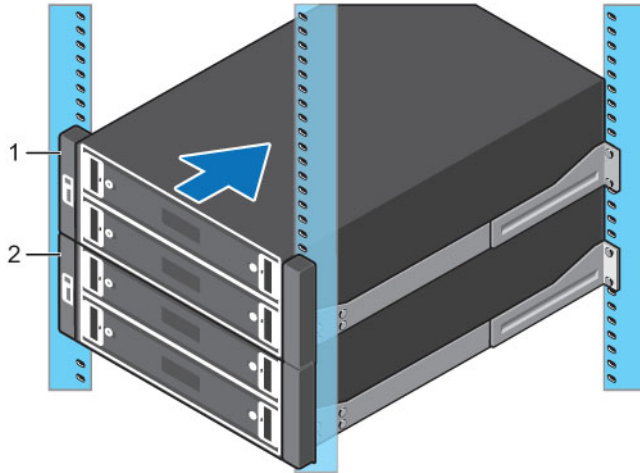


Figure 2. Mount the Expansion Enclosure Chassis in the Rack

1. SC180 expansion enclosure
 2. Storage system
5. Secure the storage system chassis to the rack using hold-down brackets.
For more information about installing the expansion enclosure, see the *Dell Storage Center SCv2080 Storage System Deployment Guide*

Installing the Hard Drives

Hard drives are connected to the backplane of the drawers using Disk Drive in Carrier (DDIC) hard drive carriers.

The minimum number of drives in an SC180 expansion enclosure is 28 (one full, front row in the top drawer and one full, front row in the bottom drawer).

1. Open the bottom drawer.

⚠ CAUTION: If the expansion enclosure operates for too long (depending on altitude) with a drawer open, the expansion enclosure may overheat, causing a power failure and data loss. Such use may invalidate the warranty.

- a. Push and hold both drawer latches toward the center of the drawer.
- b. Pull the drawer all the way out until it stops.

2. Insert each disk drive in carrier (DDIC) into the drawer, one at a time.

⚠ CAUTION: To maintain proper airflow, the drawers must be populated with drives in whole rows (there are three rows of 14 drives per drawer). The number of populated rows between drawers must not differ by more than one. Populate the rows from the front to the rear of the drawer.

- a. Hold the DDIC vertically and slide it most of the way into the slot.
- b. Using both hands, apply downward pressure firmly and equally across the DDIC.
- c. While maintaining downward pressure on the DDIC, slide the top plate toward the back of the drawer until it clicks in place.

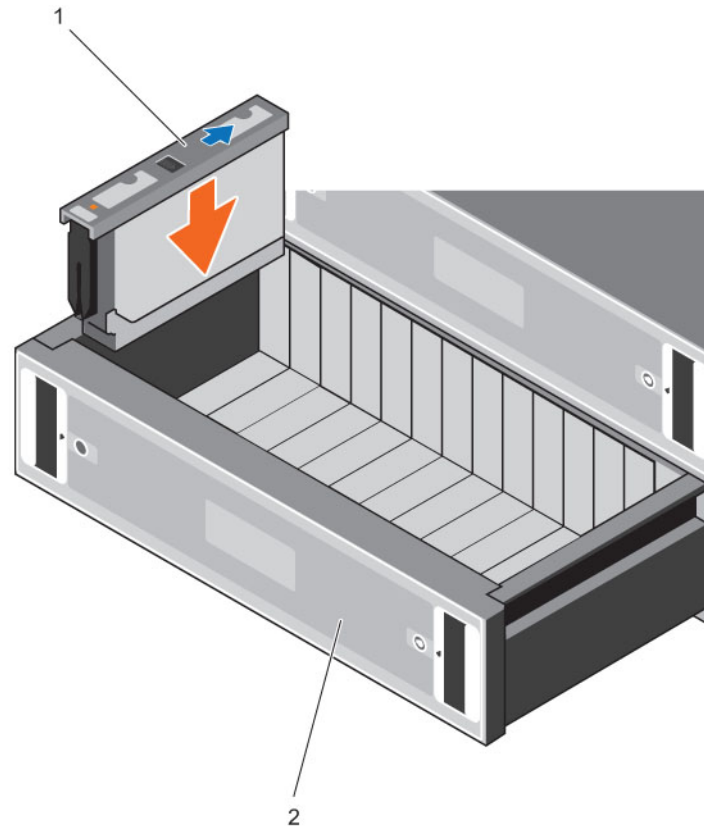


Figure 3. Installing DDIC in Drawer

1. DDIC

2. Bottom drawer

⚠ CAUTION: If the DDIC fails to latch, do not use it and request a replacement from Dell Technical Support Services. If a faulty DDIC unlatches within a closed drawer, it can make the drawer unable to be opened.

3. Close the drawer after inserting the DDICs.
 - a. Locate the two lock-release buttons situated midway along the runners on each side of the drawer.
 - b. Press the lock-release buttons inward and use your body to push the drawer toward the chassis until the locks disengage.
 - c. Place your hands on the front bezel and continue to push the drawer inward until the bezel is flush with the chassis and the front drawer locks engage.

⚠ WARNING: Keep fingers clear of the chassis as the drawer is closed.

4. Repeat the previous steps for the top drawer.

Cabling the Expansion Enclosure to a Storage System

Connect an SC180 expansion enclosure to the back-end SAS ports on an SCv2080 storage controller.

NOTE: In an SC180 expansion enclosure, the left storage controller is storage controller 1 and the right storage controller is storage controller 2.

1. Connect a SAS cable from storage controller 1: port A to the expansion enclosure: left EMM, port C.
2. Connect a SAS cable from storage controller 2: port B to the expansion enclosure: left EMM, port B.
3. Connect a SAS cable from storage controller 2: port A to the expansion enclosure: right EMM, port C.
4. Connect a SAS cable from storage controller 1: port B to the expansion enclosure: right EMM, port B.

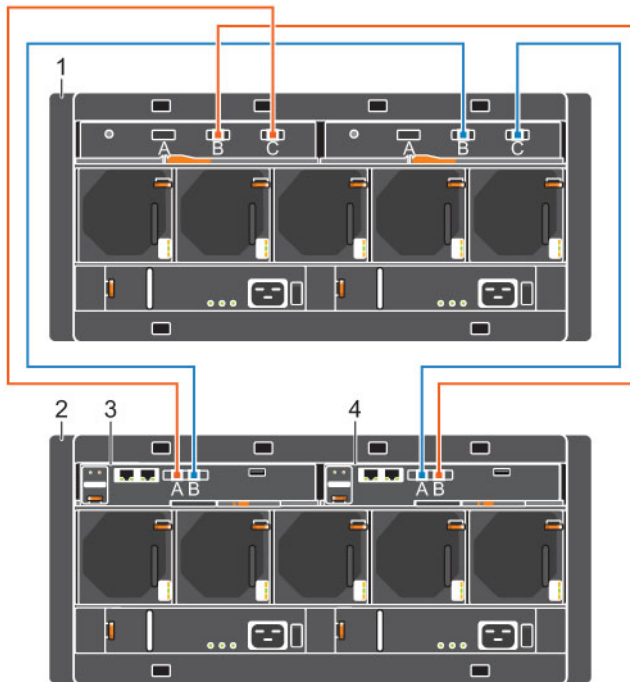


Figure 4. Cabling an SC180 Expansion Enclosure to an SCv2080 Storage Controller

- | | |
|------------------------------|-------------------------|
| 1. SC180 expansion enclosure | 2. Storage system |
| 3. Storage controller 1 | 4. Storage controller 2 |

Connecting the Power Cables

Connect power cables to the expansion enclosure.

1. Make sure that the power switches on the expansion enclosure are in the OFF position before connecting the power cables.
2. Connect the power cables to the power supplies in the expansion enclosure chassis.

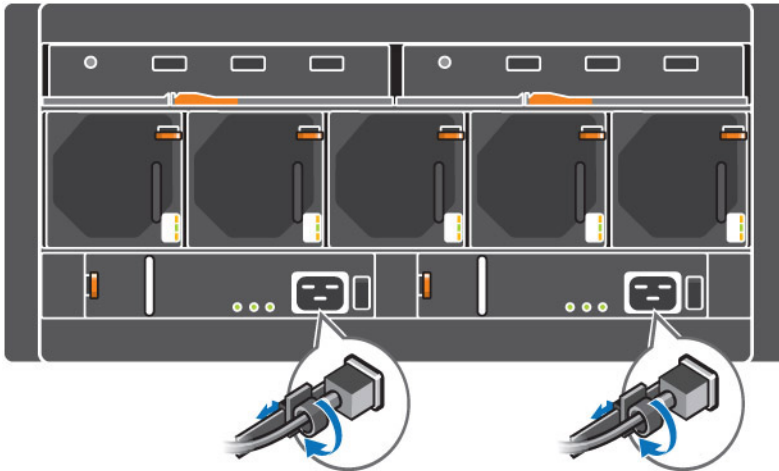


Figure 5. Power Cables

3. Secure each power cable to the expansion enclosure chassis using the strain relief fasteners.
4. Plug the other end of the power cables into a grounded electrical outlet or a separate power source such as an uninterruptible power supply (UPS) or a power distribution unit (PDU).

⚠ CAUTION: Be careful when closing the rear rack door to ensure that power cords have adequate space as some racks might not be sufficiently deep.

Turning on the Expansion Enclosure

Turn on the SC180 expansion enclosure after racking and cabling all of the Storage Center components. Turn on the expansion enclosure by pressing both power switches at the same time.

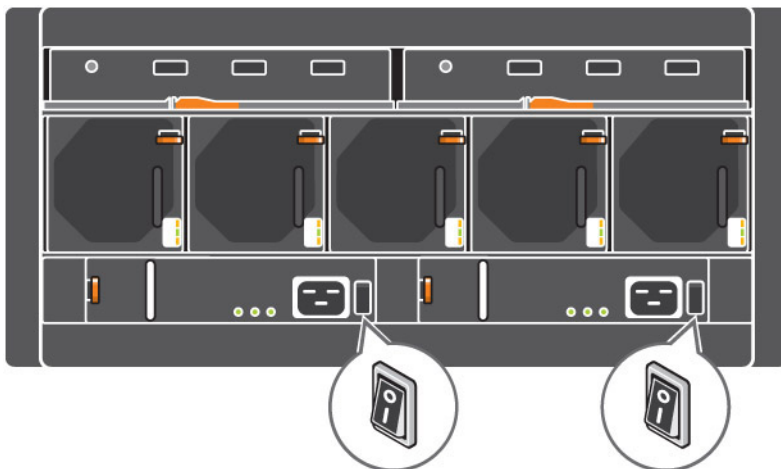


Figure 6. Location of the SC180 Expansion Enclosure Power Switches

The status indicator on the front of the expansion enclosure turns green when the expansion enclosure is powered up and operational.

NOM Information (Mexico Only)

The following information is provided on the device described in this document in compliance with the requirements of the official Mexican standards (NOM):

| | |
|----------------------|--|
| Importer: | Dell Inc. de México, S.A. de C.V Paseo de la Reforma 2620-11 ° Piso Col. Lomas Atlas 11950 México, D.F. |
| Model number: | E11J |
| Supply voltage: | 200–240 VAC |
| Frequency: | 50/60 Hz |
| Current consumption: | 16 A |

Technical Specifications

The technical specifications of the SC180 expansion enclosure are displayed in the following tables.

| | |
|--|--|
| Drives | |
| SAS hard drives | Up to 84 3.5-inch SAS hot-swappable hard drives (6.0 Gbps) |
| Enclosure Management Modules (EMMs) | |
| EMMs | Two hot-swappable IO modules |
| Connectivity | |
| Configurations | Storage Center supports up to 168 drives on a single redundant-path SAS chain An SCv2080 storage system supports one SC180 expansion enclosure |
| Redundant Array of Independent Disks (RAID) | |
| Storage System | SCv2080 |
| Management | RAID management using Dell Storage Client version 2015 R1 |
| Back-Plane Board | |
| Connectors | <ul style="list-style-type: none">• 84 SAS hard-drive connectors• Two sets of SBB connectors• Five cooling fan module connectors• Two power supply connectors |
| Back-Panel Connectors (per EMM) | |
| SAS connectors | <ul style="list-style-type: none">• Asymmetric SAS cabling for connecting an expansion enclosure to a storage system. |

Back-Panel Connectors (per EMM)

- Supports Mini-SAS HD to Mini-SAS cable universally keyed. The following lengths are currently supported:

SCv2080 to SC180:

- 0.5 m
- 2 m
- 3 m
- 5 m



NOTE: SAS connectors are SFF-8086/SFF-8088 compliant.

LED Indicators

| | |
|------------------------------|---|
| Front panel | <ul style="list-style-type: none">• One two-digit LCD indicator for Unit ID, error code, and unit location identifier• One two-color LED indicator for power status• One single-color LED indicator for module fault status (expansion enclosure as a whole)• One single-color LED indicator for logical fault status (drive, HBA, RAID controller, and so on)• One single-color LED indicator for drawer 1 fault status• One single-color LED indicator for drawer 2 fault status |
| Drawer | <ul style="list-style-type: none">• One single-color LED indicator for sideplane card and power status• One single-color LED indicator for drawer fault status• One single-color LED indicator for logical fault status• One single-color LED indicator for cable fault status• Six single-color LED indicators for data transfer status |
| Disk Drive In Carrier (DDIC) | <ul style="list-style-type: none">• One single-color LED for drive fault status |
| 6 Gb SAS IO module | 14 one-color LED status indicators, four each for the three SAS ports and two for the module status |
| Cooling module | <ul style="list-style-type: none">• One single-color LED indicator for module status• One single-color LED indicator for battery fault status (not currently used)• One single-color LED indicator for fan fault status |
| Power Supply Unit (PSU) | <ul style="list-style-type: none">• One single-color LED indicator for PSU fault status• One single-color LED indicator for AC power fault status• One single-color LED indicator for power status |

Power Supplies

AC power supply (per power supply)

| | |
|------------------|--------------------|
| Wattage | 2.8 kW |
| Voltage | 200–240 VAC (16 A) |
| Heat dissipation | 191-147 W |

Power Supplies

| | |
|------------------------|--|
| Input frequency | 50/60 Hz |
| Max input power | 1791 VA |
| Input current | 7.4 A@241 VAC |
| Maximum inrush current | Under typical line conditions and over the entire system ambient operating range, the inrush current may reach 55 A per power supply for 10 ms or less |

Available Hard Drive Power (per Slot)

| | |
|---|--|
| Supported hard drive power consumption (continuous) | Up to 1.16 A at +5 V Up to 1.6 A at +12 V |
|---|--|


IO Card Power (per Slot)

| | |
|-----------------------------------|-----------------------|
| Maximum power consumed by IO Card | 11 W at +12 V |
| Maximum available power | 100 W at +12 V |
| Minimum available power | 1 W at +5 V (standby) |

Physical


| | |
|--|------------------------|
| Height | 22.23 cm (8.75 inches) |
| Width | 48.26 cm (19 inches) |
| Depth (front mounting bracket to rear surface) | 91.5 cm (36 inches) |
| Depth (front surface to rear surface) | 96 cm (38 inches) |
| Full Weight (maximum configuration) | 130 kg (287 lb) |
| Weight without drives | 62 kg (137 lb) |

Environmental

 **NOTE:** For additional information about environmental measurements for specific configurations, see dell.com/environmental_datasheets.

Temperature

Operating 5° to 35°C (41° to 95°F) with a maximum temperature gradation of 10°C per hour

 **NOTE:** Maximum 35°C up to 2134 m (7000 ft), derate to 30°C for 2134 m to 3000 m (7000 ft to 10,000 ft).

Environmental

Storage -40° to 70°C (-40° to 158°F) with a maximum temperature gradation of 20°C per hour

Relative humidity

Operating 20% to 80% (noncondensing) with a maximum humidity gradation of 10% per hour

Storage 5% to 100% (noncondensing)

Maximum vibration

Operating 0.21 G at 5–500 Hz for 15 min

Storage 1.04 G at 2–200 Hz for 15 min

Maximum shock

Operating Half-sine shock 5 G +/- 5% with a pulse duration of 10 ms +/- 10% in operational orientations only

Storage

- Z-axis: 30 g 10 ms half sine
- X- and Y-axes: 20 g 10 ms half sine

Altitude

Operating -30.5 to 3000 m (-100 to 10,000 ft)



NOTE: Maximum 35°C up to 2134 m (7000 ft), derate to 30°C for 2134 m to 3000 m (7000 ft to 10,000 ft).

Storage -300 m to 12,192 m (-1000 ft to 40,000 ft)

Airborne Contaminant Level

Class G2 or lower as defined by ISA-S71.04-1985