IBM Cloud Object Storage System™
Version 3.13.1

Slicestor® 2584 Installation Guide

Note

Before using this information and the product it supports, read the following information:

- The general information in *Notices*
- The information in *Safety and environmental notices*
- The information in the *IBM Environmental Notices and User Guide* (provided on a DVD)

This edition applies to IBM Cloud Object Storage System™ Slicestor® 2584 and is valid until replaced by new editions.

Contents

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Safety and environmental notices

Review the safety notices, environmental notices, and electronic emission notices for IBM® Cloud Object Storage System before you install and use the product.

Suitability for telecommunication environment - This product is not intended to connect directly or indirectly by any means whatsoever to interfaces of public telecommunications networks.

Examples of a caution and a danger notice. Numbers in parentheses refer to message numbers in the *IBM Safety Notices* publication G229-9054, which is included with your product.

CAUTION:
A caution notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury. (C001)

DANGER

A danger notice indicates the presence of a hazard that has the potential of causing death or serious personal injury. (D002)

Safety notices

Safety notices for this product.

Familiarize yourself with the *IBM Safety Notices* publication G229-9054, which is included with your product.

DANGER: When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- **If IBM supplied a power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.**
- **Do not open or service any power supply assembly.**
- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.**
- **Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.**
- **Connect any equipment that will be attached to this product to properly wired outlets.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.**
- **Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.**
- **Do not continue with the inspection if any unsafe conditions are present.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.**

  To disconnect:

  1. **Turn off everything (unless instructed otherwise).**
  2. **Remove the power cords from the outlets.**
  3. **Remove the signal cables from the connectors.**
  4. **Remove all cables from the devices.**

  To connect:

  1. **Turn off everything (unless instructed otherwise).**
  2. **Attach all cables to the devices.**
  3. **Attach the signal cables to the connectors.**
  4. **Attach the power cords to the outlets.**
  5. **Turn on the devices.**
- **Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)**

DANGER: Heavy equipment — personal injury or equipment damage might result if mishandled. (D006)

DANGER: Professional movers are to be used for all relocation activities. Serious injury or death may occur if systems are handled and moved incorrectly. (D008)

DANGER: Serious injury or death can occur if loaded lift tool falls over or if a heavy load falls off the lift tool. Always completely lower the lift tool load plate and properly secure the load on the lift tool before moving or using the lift tool to lift or move an object. (D010)

CAUTION: The battery contains lithium. To avoid possible explosion, do not burn or charge the battery.
Do not: Throw or immerse into water, heat to more than 100°C (212°F), repair or disassemble. (C003)

Use the following general safety information for all rack mounted devices:

DANGER: Observe the following precautions when working on or around your IT rack system:

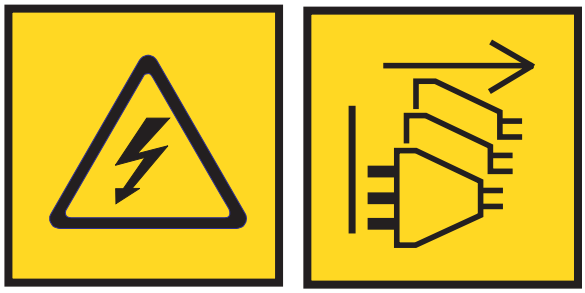
- **Heavy equipment—personal injury or equipment damage might result if mishandled.**
- **Always lower the leveling pads on the rack cabinet.**
- **Always install stabilizer brackets on the rack cabinet.**
- **To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.**
- **Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices.**

- **Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.**
- **Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.**
- **An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (R001 part 1 of 2)**

CAUTION:

- **Do not install a unit in a rack where the internal rack ambient temperatures will exceed the manufacturer's recommended ambient temperature for all your rack-mounted devices.**
- **Do not install a unit in a rack where the air flow is compromised. Ensure that air flow is not blocked or reduced on any side, front or back of a unit used for air flow through the unit.**
- **Consideration should be given to the connection of the equipment to the supply circuit so that overloading of the circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to a rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement of the supply circuit.**
- **(For sliding drawers): Do not pull out or install any drawer or feature if the rack stabilizer brackets are not attached to the rack. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.**
- **(For fixed drawers): This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.**

(R001 part 2 of 2)



DANGER: Multiple power cords. The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords. (L003)

The weight of this part or unit is between 18 and 32 kg (39.7 and 70.5 lb). It takes two persons to safely lift this part or unit. (C009)

Environmental notices

This information contains all of the environmental notices for IBM Systems products in English and other languages.

The IBM Systems Environmental Notices (http://ibm.co/1fBgWFI) information includes statements on limitations, product information, product recycling and disposal, battery information, flat panel display, refrigeration and water-cooling systems, external power supplies, and safety data sheets.

Declared noise emissions

Declared noise emissions in accordance with ISO 9296(1, 2, 3)

Table 1. Declared noise emissions in accordance with ISO 9296(1,2,3)

Product description	Declared A-Weighted Sound Power Level, L_{WAd} (B)		Declared A-Weighted Sound Pressure Level, L_{pAm} (dB)	
	Operating	Idling	Operating	Idling
Model S03 @ 25 deg. C room ambient	8.0	8.0	61	61
Model S03 @ 35 deg. C room ambient	9.3	9.3	75	75
Model S03 @ 25 deg. C room ambient w/Acoustical doors Feature codes FC EC07 = back FC EC08 = front	7.4	7.4	55	55
Model S03 @ 35 deg. C room ambient w/Acoustical doors Feature codes FC EC07 = back FC EC08 = front	8.7	8.7	69	69

Notes:

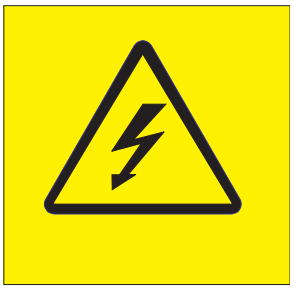
1. Declared level L_{WAd} is the upper-limit A-weighted sound power level; Declared level L_{pAm} is the mean A-weighted sound pressure level measured at the 1-meter bystander positions.
2. All measurements made in conformance with ISO 7779 and declared in conformance with ISO 9296.
3. B, dB, abbreviations for bels and decibels, respectively. 1 B = 10 dB.

Support information

For more information on the product or help with troubleshooting, contact IBM Support at IBMCloudStorageSupport@us.ibm.com or visit the Directory of worldwide contacts.

Chapter 1. Appliance safety precautions

Observe physical, electrical, and electronic component safety precautions.



DANGER: An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (D004)

DANGER: Hazardous voltage present. Voltages present constitute a shock hazard, which can cause severe injury or death. (L004)

Important: The enclosure *must* be mounted in a rack.

Safe handling

Handle the enclosure with care.

- An unpopulated enclosure can weigh up to 45kg (100lb). Use appropriate lifting methods.
- A fully populated enclosure weighs 135kg (298lb). Only lift the enclosure when the drawers are empty and latched closed. Do not attempt to lift the enclosure when populated with drives.
- Do not lift the enclosure by the handles on the rear modules. They are not designed to take the weight. Only lift from underneath the main chassis.
- When closing the drawers, do so firmly, ensuring the latches are engaged.

Safety

- This equipment is for installation in a restricted access location only.

  CAUTION:
  If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment might be impaired.
- All rear modules are part of the fire enclosure and must only be removed when a replacement can be immediately added. The system must not be run without all modules in place.
- Unplug the unit before you move it or if you think it has become damaged in any way.
- A safe electrical ground connection must be provided to the power supply cords.

  Important: The enclosure must be grounded before applying power.
- The plug on the power supply cord is used as the main disconnect device. Ensure that the socket outlets are located near the equipment and are easily accessible.

- When powered by multiple AC sources, disconnect all supply power for complete isolation.
- In order to comply with applicable safety, emission, and thermal requirements, carry out the following precautions:
  - Do not remove any covers
  - Populate all rear bays with plug-in modules
- The power connection should always be disconnected prior to insertion or removal of a power supply unit (PSU) from the enclosure.
- Do not attempt to disassemble the rear sub-chassis from the enclosure.
- Provide a suitable power source with electrical overload protection to meet the requirements laid down in the technical specification.

  CAUTION:
  Operating temperatures inside the enclosure drawers can reach up to 60°C. Take care when opening drawers and removing drive carriers.
- If any component of the product fails, consult your storage vendor.
- Do not remove Cooling Modules, PSUs or I/O Modules unless you have a replacement model of the correct type ready for insertion.
- For use in North America, each branch circuit must be rated for 20A.
- This equipment is suitable for connection to an IT power system (Norway).

  CAUTION:
  Double pole/neutral fusing in PSUs.

  Important: The optional RJ45 socket on the I/O module is for Ethernet connection only. Do not connect it to a telecommunications network.

  CAUTION: Due to product acoustics, it is recommended that users wear ear protection for any prolonged exposure.

  CAUTION: To prevent overturning, drawer interlocks stop users from opening both drawers at the same time. Do not attempt to force open a drawer when the other drawer is already open.

Rack system precautions

The enclosure must be mounted in a rack. Consider the following safety requirements when mounting the enclosure:

- The rack construction must be capable of supporting the total weight of the installed enclosure(s) 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 enclosures, fill from the bottom up; empty from the top down.
- To avoid danger of the rack toppling over, do not slide more than one enclosure out of the rack at a time.
- The system must be operated with low pressure rear exhaust installation. The back pressure created by rack doors and obstacles is not to exceed 5 Pascals (0.5mm water gauge).
- The rack design should take into consideration a maximum operating ambient temperature of 35°C.
- The rack should have a safe electrical distribution system. It must provide over-current protection for the unit and must not be overloaded by the total number of units installed in the rack. When addressing these concerns, consider the electrical power consumption rating shown on the nameplate.
- The electrical distribution system must provide a reliable ground for each unit in the rack.
- The design of the electrical distribution system must take into consideration the total ground leakage current from all the PSUs in all the units. The rack might require labeling with “HIGH LEAKAGE CURRENT. Ground connection essential before connecting supply.”

Electrostatic discharge (ESD) precautions

Fit and check a suitable anti-static wrist or ankle strap and observe all conventional ESD precautions when handling plug-in modules and components. Avoid contact with backplane components, module connectors, and other potential sources of ESD.

Product rating

Product rating information can also be found on the back of the PSUs.

The product has the following ratings:

- Voltage: 200 to 240 VAC
- Current: 16A
- Frequency: 50 to 60 Hz.

Chapter 2. Preparation

Before you install the system, verify the location and installable components.

Before you begin

Before you begin installing the product, you must meet certain requirements.

Make sure that the site where you intend to set up and use your storage system can meet the following needs:

- Standard power from an independent source or a rack power distribution unit with a UPS.
- Host computer with the correct firmware, BIOS and drivers. Contact your supplier for the correct software levels.

Before setting up your enclosure, ensure that you have the following accessories:

- Power Cord
- Rack kit (if installing within a rack)

Refer to your supplier for a list of qualified accessories for use with the enclosure. The accessory box contains the power cords and other ordered accessories

Unpacking the storage system

Read these instructions before unpacking the system.

1. Position the shipping case within 2m (6 feet) of the site where you intend to use your storage system.
2. Inspect the packaging for crushes, cuts, water damage or any other evidence of mishandling during transit. If there is any damage, photograph the packaging for future reference before opening.
3. Unpack the system, as shown in the following figure.

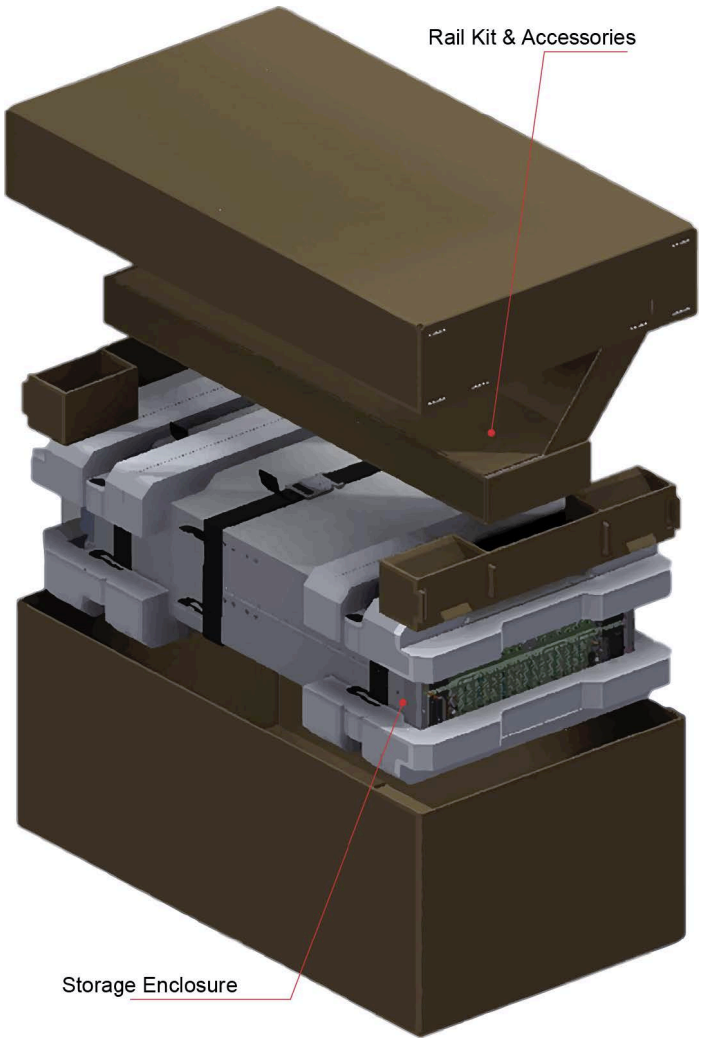


Figure 1. Unpacking the storage system

Chapter 3. Installing the appliance into a rack

There are many racks on the market, which means that the assembly procedure might differ slightly.

Mounting the system into a rack

Follow these steps to install the rails to the rack and to the enclosure.

CAUTION:
Ensure that you have fitted and checked a suitable anti-static wrist or ankle strap and observe all conventional ESD precautions when handling modules and components. Avoid contact with backplane components, module connectors, and other potential sources of ESD. ESD damage is not covered by warranty.

Note: Rail Kit Adjustment Range:

Inside of the front post to inside of the rear post: 281 in. - 348 in. (713mm - 884mm). Suits a 1-meter-deep rack (39 in.) within Rack Specification IEC 60297.

Note: A Torx T20 screwdriver is needed to lock and unlock the drawers.

CAUTION:
A populated enclosure can weigh up to 100lb (45kg). Do not try to lift it by yourself.

Note: The rail location pins are pre-assembled to suit square and round hole racks only.

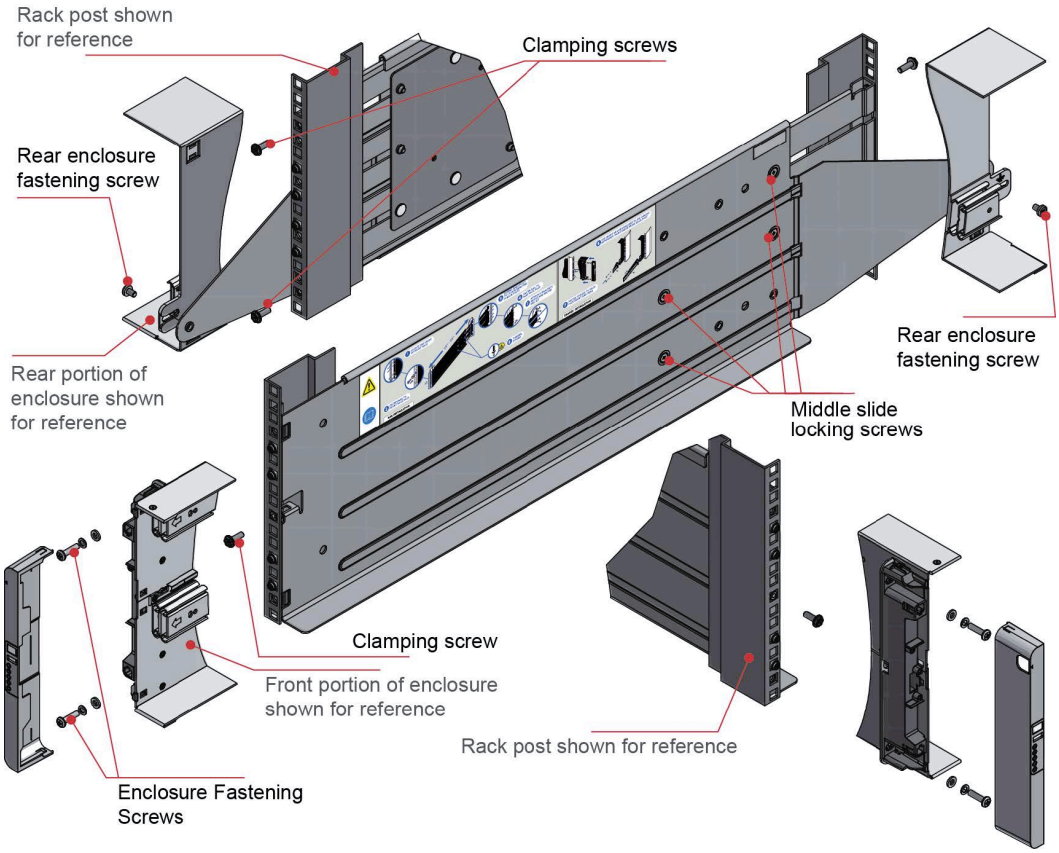


Figure 2. Mounting the system into a rack (left rail only)

1. Ensure the pre-assembled rail is at its shortest length.
2. Locate the rail location pins inside the front of the rack and extend the length of the rail assembly to enable the rear location pins to locate. Ensure the pins are fully located in the square or round holes in the rack posts (see Figure 2).
3. Fully tighten all clamping screws (left and right).
4. Slide the enclosure fully home on its rails.
5. Fasten the front of the enclosure using the enclosure fastening screws and washers (x4) as shown in Figure 2.
6. Fix the rear of the enclosure to the hold down bracket with the rear enclosure fixing screws (x2), fitted from inside the enclosure.

Enclosure layout

The enclosure contains 84 drives, a compute module, five cooling modules, and two PSUs.

Drive locations

The following figures show the locations of the drives within the enclosure.

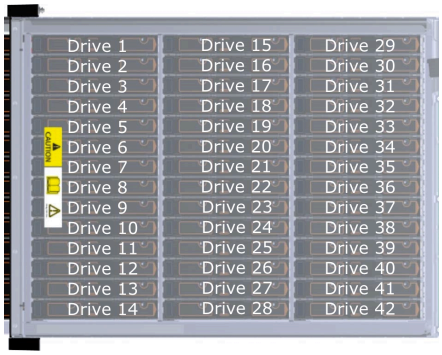


Figure 3. Drive numbering for drawer 1 (top)

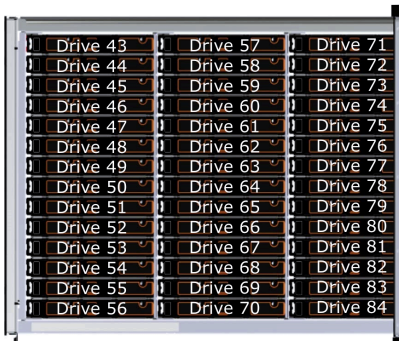


Figure 4. Drive numbering for drawer 2 (bottom)

Front and rear LEDs and modules

The following figure shows the locations of LEDs on the front of the enclosure and the modules on the back. For detailed information about the LEDs, see Chapter 4, “LED states,” on page 17.

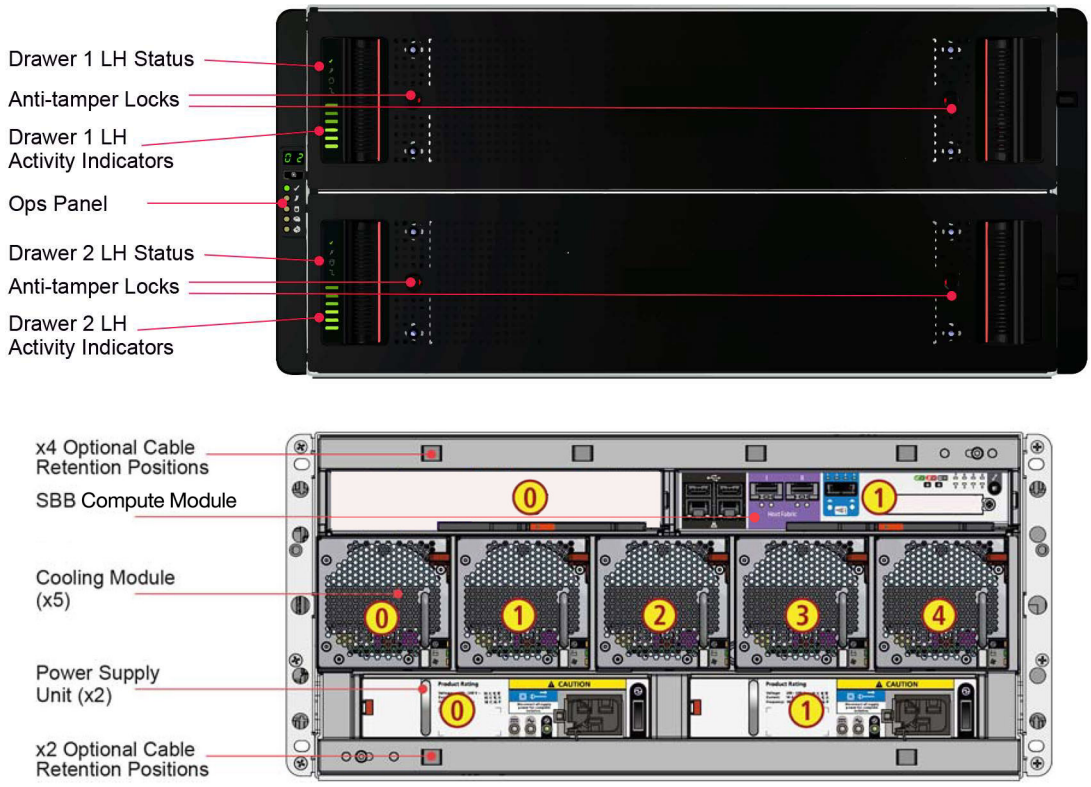


Figure 5. LED locations

Installing and removing disk drives in carriers (DDICs)

Installing a DDIC

To install a DDIC, complete the following steps:

1. Insert the DDIC into the slot, and then push it down until it stops, as shown in the following figure.

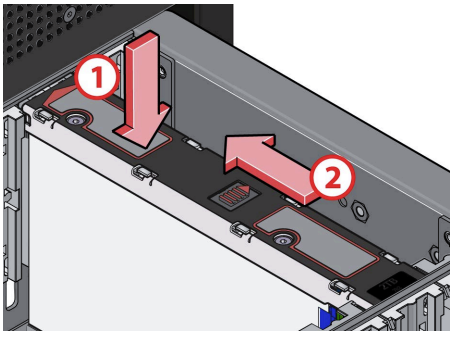


Figure 6. Installing a DDIC

2. Slide the top latch in the direction of the arrow until the latch clicks into place (see Figure 6).

Removing a DDIC

To remove a DDIC, complete the following steps:

1. Slide the release button and the DDIC will pop up slightly from the slot, as shown in the following figure.

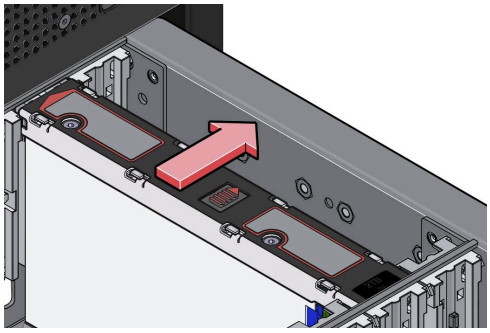


Figure 7. Removing a DDIC

2. Lift the DDIC out of the slot.

Installing and removing cooling modules, power supply units, and compute modules

Observe proper safety precautions when replacing any of these modules.

CAUTION:
Handle the modules carefully and avoid damaging the connector pins. Do not install if any pins appear to be bent.

CAUTION:
Do not remove these modules unless a replacement can be immediately added. The system must not be run without all modules in place.

Remove a cooling module

1. Depress the retaining latch, as shown in the following figure.

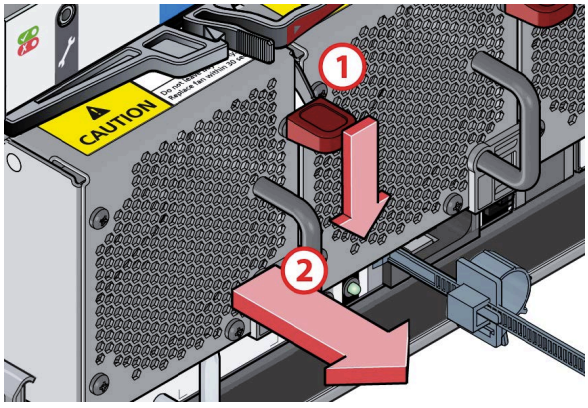


Figure 8. Removing a cooling module (1)

2. Pull the cooling module handle until the unit is completely free of the enclosure, as shown in the following figure.

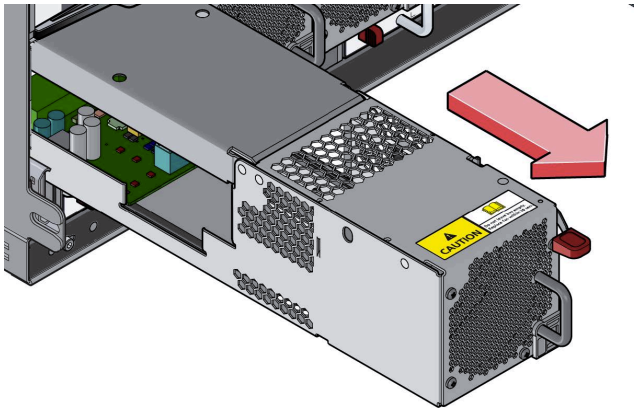


Figure 9. Removing a cooling module (2)

Install a cooling module

Installation is the reverse of the removal process. Ensure that the retaining latch clicks into place.

Remove a power supply unit (PSU)

CAUTION:
Do not remove covers from the PSU. Danger of electric shock inside. Return the PSU to your supplier for repair.

1. Squeeze the retaining latch, as shown in the following figure.

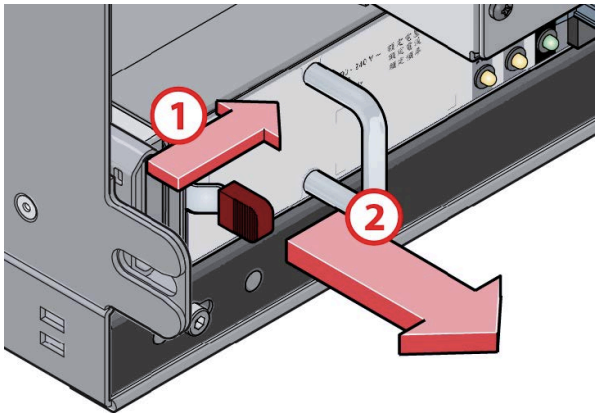


Figure 10. Removing a PSU (1)

2. Pull the PSU handle until the unit is completely free of the enclosure, as shown in the following figure.

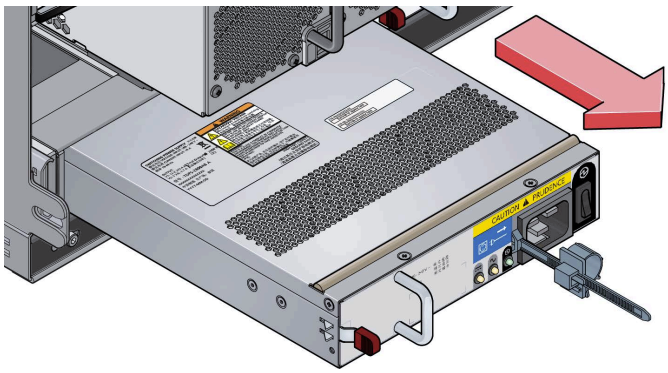


Figure 11. Removing a PSU (2)

Install a PSU

Installation is the reverse of the removal process. Ensure that the retaining latch clicks into place.

Remove an SBB compute module

Note: A variety of compute modules can be used in the enclosure. The following steps show a 6Gb/s SAS EBOD compute module but the procedure is the same for a SBB compute module.

1. Grasp the module latch between the thumb and forefinger and squeeze them together to release the latch, as shown in the following figure.

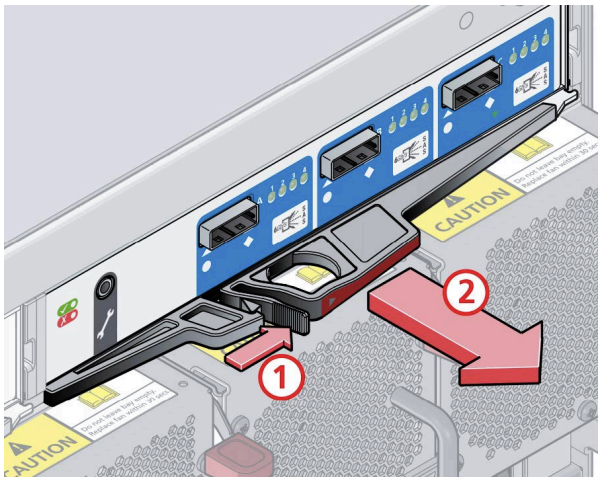


Figure 12. Removing a module (1). (6Gb/s SAS EBOD module shown)

2. Pull the latch outward to cam the module out of the enclosure.
3. Grip the latch handles and withdraw the module, as shown in the following figure.

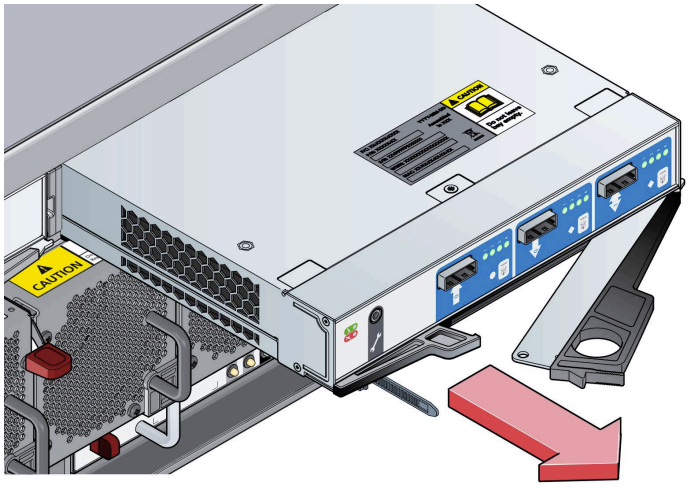


Figure 13. Removing a module (2). (6Gb/s SAS EBOD module shown)

Install an SBB compute module

1. Rotate the SBB compute module so that the release latch is at the bottom.
2. Open the release latch and rotate it to its most open position, as shown in the previous figure.
3. Slide the compute module into its slot until it will go no farther and the handle has started to close.
4. Close the latch until it clicks home. This levers the module home into its connector on the midplane. The enclosure automatically detects the new unit.
5. Connect the cables to the new module. If necessary, refer to the note you made before you removed the cables from the defective compute module.

Battery removal

Battery removal

To remove the Onboard battery, follow these steps:

1. Power off your system and unplug your power cable.
2. Remove compute module from chassis.
3. Locate the Onboard battery inside of the compute module.
4. Use one finger to tilt the battery horizontally out of its socket, pushing it away from the socket.
5. Use your thumb and index finger to lift the battery from the socket.

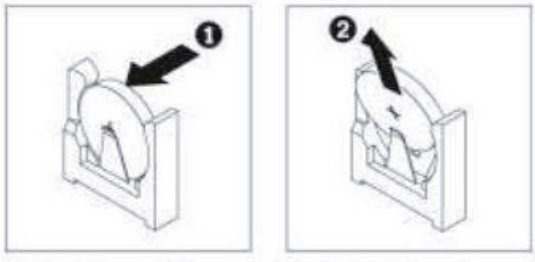


Figure 14. Remove the battery

CAUTION:
Handle used batteries carefully. Do not damage the battery in any way; a damaged battery can release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Refer to the IBM Systems Environmental Notices for battery disposal guidelines.

Chapter 4. LED states

Use the combination of LED states on the appliance to diagnose problems.

Compute module LEDs

Compute module LEDs show faults and port activity.

The following figure shows the location of the LEDs on the compute module.

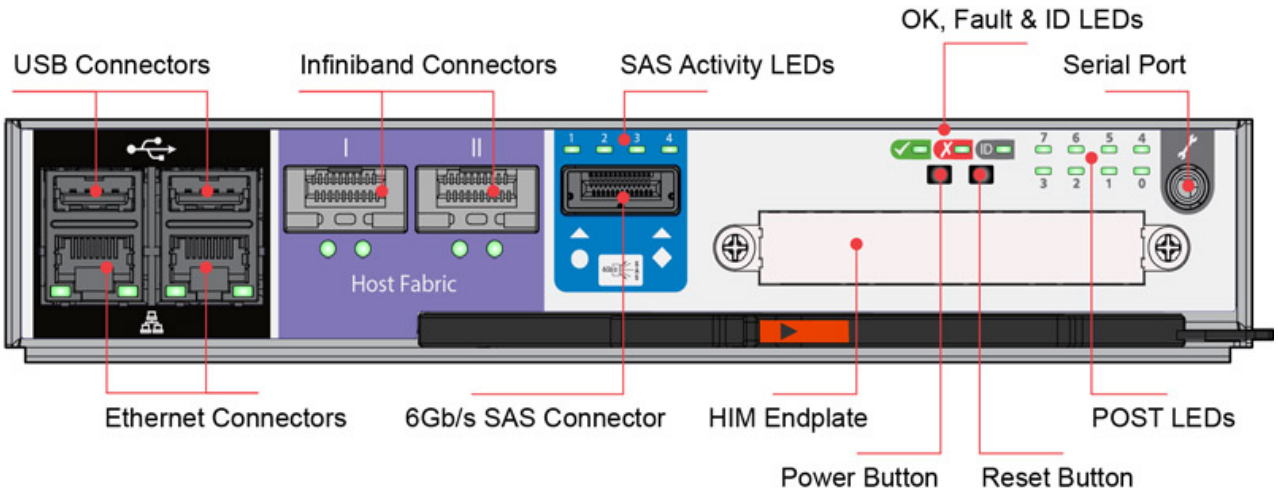


Figure 15. SBB compute module LEDs

Table 2. SBB compute module LED descriptions

LED	Description
ID LED	Blue when the module is being identified.
Fault LED	Amber when there is a fault in the controller.
OK LED	Green when the controller is operating correctly. Flashing green when there is an controller VPD error.
SAS Activity LEDs	Steady green when there is a connection but no activity. Flashing green when there is a connection and activity.
Ethernet status LEDs	Right side: • Steady green when link is active. • Flashing green when there is network activity. Left side – Network speed: • Yellow: 1000Mb/s • Green: 100Mb/s • Off: 10Mb/s
POST LEDs	Power On Self Test LEDs are used to show the boot progress of the x86 subsystem. If it fails to boot, the LEDs will show what stage of the process was being performed when the problem occurred.

Ops panel LEDs

Ops panel LEDs show logical status and faults by drawer.

The following figure shows the LEDs on the Ops panel.

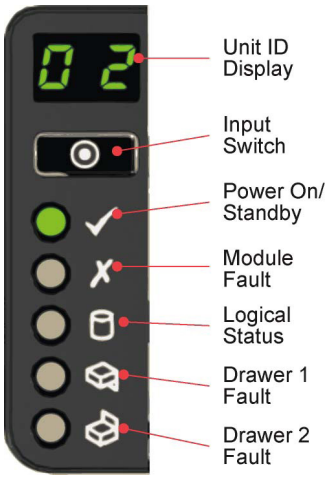


Figure 16. Ops panel LEDs

Table 3. Ops module LED states

Unit ID display	Power (green/ amber)	Module fault (amber)	Logical status (amber)	Drawer 1 fault	Drawer 2 fault	Associated LEDs or alarms	Status
X	On	Off	Off	Off	Off		Aux present, overall power failed or off
X	On	On	X	X	X	Single beep, then double	Ops panel power on (5s) test state
X	On	Off	Off	Off	Off		Power on, all functions good
X	On	On	X	Off	Off	PSU fault LEDs, fan fault LEDs	Any PSU fault, fan fault, over or under temperature
X	On	On	X	Off	Off	SBB module LEDs	Any SBB module fault
X	On	Flashing	X	Off	Off		Enclosure logical fault such as VPD configuration error
X	On	Flashing	X	Off	Off	Module status LED on SBB module	Unknown SBB module type installed, I2C Bus failure, or VPD configuration error
X	On	Flashing	X	Off	Off	PSU fault LEDs, fan fault LEDs	Unknown (invalid or mixed) PSU module type installed, or I2C Bus failure (PSU comms)

Table 3. Ops module LED states (continued)

Unit ID display	Power (green/ amber)	Module fault (amber)	Logical status (amber)	Drawer 1 fault	Drawer 2 fault	Associated LEDs or alarms	Status
X	On	On	X	Off	Off	DDIC fault LED, drawer fault LED	Drive failure has occurred causing loss of availability or redundancy
X	On	X	Flashing	Off	Off	Arrays in impacted state	Arrays operating background function
X	On	Flashing	Flashing	Off	Off	S1	Unit ID number different from "Start Of Day"
X	On	X	X	On	Off	Fault LED on Drawer 1	Fault present on drawer 1 (drive, cable or fanout card fault)
X	On	X	X	Off	On	Fault LED on Drawer 2	Fault present on drawer 2 (drive, cable or fanout card fault)
Flashing	X	X	X	X	X		SES controlled enclosure identify
X = disregard							

Drawer indicators

Each of the two drawers has its own set of status indicators.

The following figure shows the LEDs for a drive drawer.

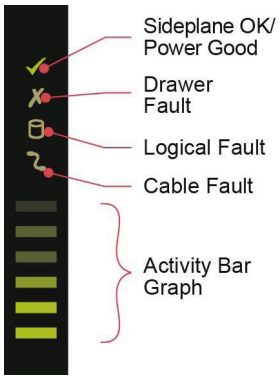


Figure 17. Drawer status indicators

Table 4. Drawer LED states

Sideplane OK / power (green)	Sideplane fault (amber)	Logical fault (amber)	Cable fault (amber)	Activity bar graph (green)	Status
On	Off	Off	Off	X	Sideplane card OK/Power good
Off	On	X	X	Off	Sideplane card fault

Table 4. Drawer LED states (continued)

Sideplane OK / power (green)	Sideplane fault (amber)	Logical fault (amber)	Cable fault (amber)	Activity bar graph (green)	Status
On	On	X	X	X	Drive failure has occured causing loss of availability or redundancy
On	X	On	X	X	Drive fault (Host indicated)
On	X	Flashing	X	X	Arrays in impacted state
Off	X	X	On	Off	Cable fault
On	Off	Off	Off	On*	Drive activity
*The Activity Bar Graph is a 6-segment drive activity meter, showing activity of the SAS interface to the sideplane. For zero activity, no segments are lit, scaling linearly until all segments are lit when the interface is transferring data at full capacity.					
X = disregard					

Power supply unit (PSU) LEDs

Each PSU has its own indicators.

The following figure shows the LEDs for the power supply.

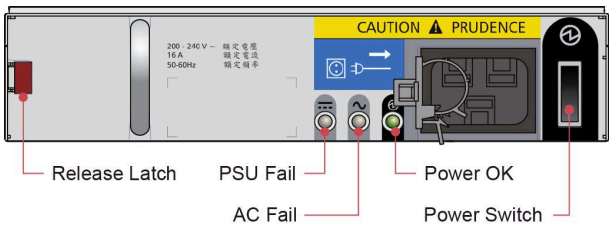


Figure 18. PSU LEDs

Table 5. PSU LED states

PSU fail (amber)	AC fail (amber	Power OK (green)	Status
Off	Off	Off	No AC power to either PSU
On	On	Off	PSU present but not supplying power
Off	Off	On	Main AC present, switch on; PSU is providing power output.
Off	Off	Flashing	AC power present, PSU in Standby mode (meaning the other PSU is currently providing power output)
Flashing	Flashing	Off	PSU firmware download
On	On	Off	PSU alert state, usually due to critical temperature
Off	On	Off	Main AC to this PSU is missing; this PSU is now on standby, and the other PSU is OK
On	On	On	GEM software lost communication with PSU
On	X	Off	PSU failed.
X = disregard			

Cooling module LEDs

Cooling modules have LEDs for the module status and fan faults.

The following figure shows the LEDs for a cooling module.

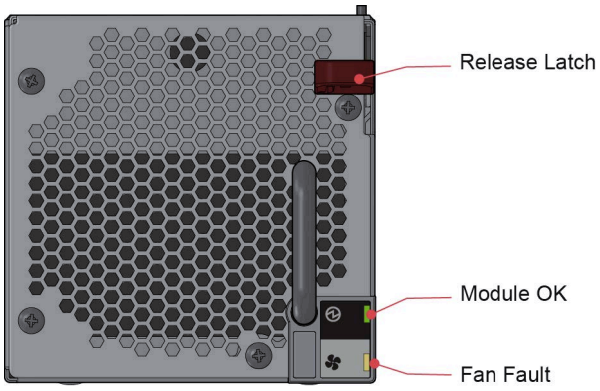


Figure 19. Cooling module LEDs

Table 6. Cooling module LED states

Module OK (green)	**Fan fault (amber)**	**Status**
X	Off	Fan OK
X	On	Communication lost with fan module controller
X	On	Reported fan speed is out of tolerance
On	X	Module good (battery and fan)
X = disregard		

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