Infortrend EonStor GS 5000 Series

Hardware Manual

Version 1.2

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Contact Infortrend

Customer Support   Contact your system vendor or visit the following support site:

EonStor GS Support

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Safety Precautions

Read these instructions carefully before you install, operate, or transport the EonStor GS storage system and expansion enclosures.

Energy Hazards Precaution

This equipment is intended to be used in Restrict Access Location, like computer room. The access can only be gained by SERVICE PERSONS or by USERS who have been instructed about the metal chassis of the equipment is have energy hazards that service persons have to pay special attention or take special protection before touching it. Further, the access is through the use of key or security identity system. Only authorized by well trained professional person can access the restrict access location.

Installation and Operation

- Install the rack cabinet and the associated equipment at a site where the ambient temperature (special room cooling equipment may be required) stays lower than:

    a. **35°C** ~ if your system have a BBU

    b. **40°C** ~ if your system does not have a BBU

- Install the power source socket outlet near the enclosure where it is easily accessible and ground the rack cabinet.

- Secure airflow clearance inside and around the rack cabinet.
    - Secure an 18 to 20cm clearance on the rear side.
    - Do not cover the enclosure openings.
    - Route the cables inside the rack cabinet.

- Secure each enclosure module using its retaining screws.

- Place power cords and other cables away from foot traffic. Do not place items on top of power cords and make sure they do not rest against data cables.

- Install all modules to the enclosure before powering on the systems.

- Ensure that the correct power range is being used before powering-on.

- DO NOT remove covers or replaceable modules if they are not faulty.

- If the system is not going to be used for a long period of time, disconnect it from the power mains to avoid transient over-voltage.

- For power source redundancy, please make sure that the PSUs are plugged into two different power sources (i.e. Different circuit breakers).

Service and Maintenance

- Keep the faulty module in place until you have a replacement unit; an empty module greatly affects the airflow efficiency within the enclosure.

- During service operation, place the enclosure on soft and clean surface to prevent exterior damage. Do not place tools or other items on top.

- When transporting the enclosure, repackage all disk drives separately in the original package foam blocks. Replaceable modules can stay in the enclosure if you are using the original package; if not, repackage them separately as well.

- Disconnect the power cords before servicing or cleaning the enclosure.

- Use a slightly moistened paper sheet or cloth for cleaning. Avoid using liquid or sprayed detergent.

- When replacing components, insert them as gently as possible while assuring full engagement. Vibration and shock can easily damage hard drives.

- Only qualified service personnel should open the enclosure.

- Contact service personnel if any of the following situations occurs:
  - The power cord or plug is damaged.
  - The enclosure has been exposed to moisture.
  - The system has not been working properly.
  - The enclosure was dropped against a hard surface.
  - The enclosure shows obvious signs of breakage.

- To move the enclosure, more than one person might be necessary due to its weight.

Important Notice

The use of Infortrend certified components is strongly recommended to ensure compatibility, quality and normal operation with your Infortrend products. Please contact your distributor for a list of Infortrend certified components (e.g. SFP, SFP+, HBA card, iSCSI cable, FC cable, memory module, etc.).

ESD Precautions

- Handle the modules by their retention screws, ejector levers, or the module's metal frame/faceplate only. Avoid touching the PCB boards or connector pins.

- Use a grounded wrist strap and an anti-static work pad to discharge static electricity when installing or operating the enclosure.

- Avoid dust, debris, carpets, plastic, vinyl, and Styrofoam in your work area.

- Do not remove any module or component from its anti-static bag before installation takes place.

About This Manual

The manual introduces hardware components of EonStor GS 5000 storage systems and expansion enclosures. It also describes how to install, monitor, and maintain them.

For non-serviceable components, please contact our support sites.

Firmware operation: Consult the Firmware User Manual on the CD-ROM.

EonOne software: Consult the EonOne User Manual on the CD-ROM.

Revision History

Version	Date	Description
1.0	Sep. 2017	Initial release
1.1	Nov. 2017	Updates
1.2	Jan. 2018	Removed mentions of 12G SAS Host board and corrected rear panel interfaces.

Table of Contents

Introduction

Product Overview

This manual introduces the EonStor GS 5000 systems. The drive capacity can be expanded by attaching expansion hard drive enclosures.

Model Variations

There are 2 (two) models for EonStor GS 5000 series. The difference between GS 5100 and 5200 is that the 5100 has 1 (one) CPU per controller and the 5200 has 2 (two).

The storage systems can connect to expansion enclosures in order to expand storage capacity.
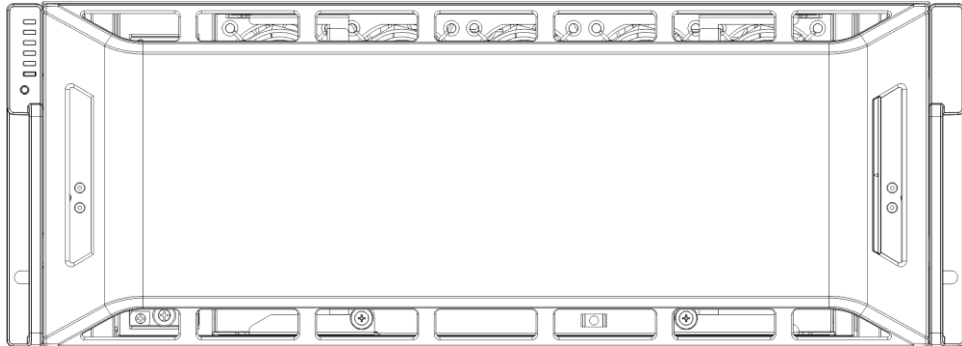
Major Components

Controller and Interface

Each controller comes with pre-installed DIMM module(s).

The traditional battery backup is replaced by an innovative Cache Backup Module methodology (CBM) which consists of a battery backup unit (BBU) and a flash backup module (FBM). Cached data is quickly distributed to a flash backup module for permanent storage with the support of the BBU in the event of a power outage.

The embedded firmware features intelligent algorithms, such as power-saving modes and variable fan speeds, making this model a greener choice.

Expansion Enclosure Controller and Interface

The enclosure is managed by expander controllers that distribute data flow to individual disk drives and report operating status through a proprietary enclosure service via in-band protocols. The enclosure, along with other expansion enclosures, connects to a storage system and serves as a building block of a scalable configuration.

In terms of supported protocols, the firmware supports communications with enclosure devices and as the storage systems featuring SAS expansion ports.

Individual Power Supply Unit and Cooling Fans

The power supply unit (PSU) and cooling fans are for protecting the system from overheating, and they locate separately. The hot-swappable PSUs are easy-accessible to all major components and easy to maintain.

The Front Panel

Dual-Controller Models

Dual-Controller systems are indicated by an "R" in their model number. Controller A is located on top and controller B at the bottom for all models. If one controller fails, the second controller module will take over in a manner that is transparent to application servers.
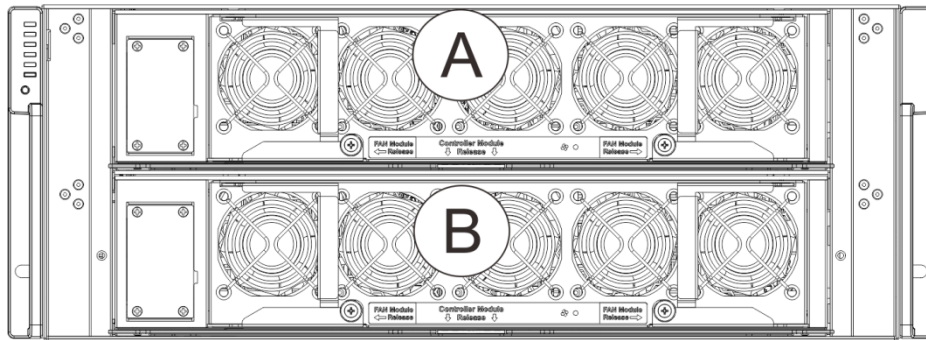
The top controller (Controller A) is the primary controller. The bottom controller (Controller B) is the secondary (= redundant) controller which is idle during normal operation and takes over the management role when Controller A cannot function properly due to hardware error, controller module removal, etc.

If the failed Controller A restarts or a replacement is installed, Controller A will temporarily assume the role of the secondary controller.

When the storage system is rebooted, all system configurations will revert back to the default state and Controller B will return the primary role back to Controller A.

Connection between the Storage System and Expansion Enclosure

The following rule applies when connecting the storage system and the expansion enclosure(s):

- Dual-Controller storage system connects to Dual-Controller expansion enclosure(s).

Chassis

The chassis is rugged constructed and divided into front and rear sections. The chassis is designed to be installed into a rack or cabinet.

Front Panel
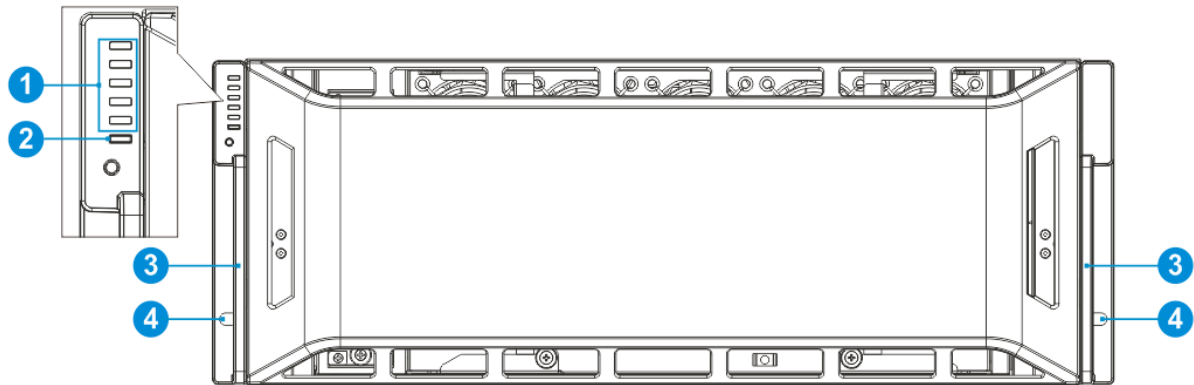
- **LED Panel ①:** The panel has Service / Power / Cooling Fan / Thermal / System LEDs.

- **Mute button / service LED ②:** The mute button is to mute an alarm when sound or to indicate to the administrator the system requires service.

- **Handles ③:** There are handles on both sides of the enclosure for users to pull / push the enclosure out and into the cabinet when the enclosure is installed on a slide rail rackmount system.

- **Rackmount holes ④:** There are two rackmount holes (one on each side of the enclosure) for users to secure the enclosure onto the cabinet.

-

Rear Panel
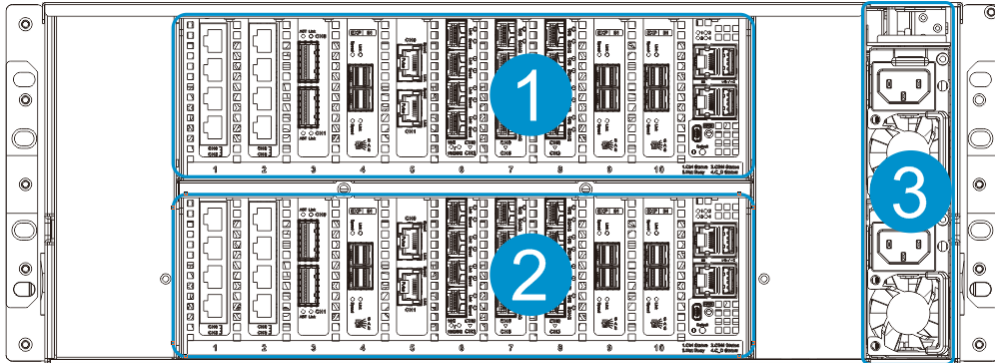
#	Description	#	Description
1	Controller 1	**3**	PSU
2	Controller 2		

- **Controllers ①/②:** Each controller module contains a main circuit board and a pre-installed DIMM module. The host port configurations will vary. For details, see Rear Panel Components.

- **PSU ③:** The hot-swappable PSUs provide power to the system.

  Please refer to your specific system for details shown in the PSUs & Fans section.

Internal Backplane

An integrated backplane separates the front and rear sections of the chassis. This circuit board provides logic level signals and low voltage power paths. Thermal sensors and I^2C devices are embedded to detect system temperatures and PSU/cooling module operating status. This board contains no user-serviceable components.

⚠ **WARNING**

Accessing the backplane board may lead to fatal damage of the system. Also, any physical contact with the backplane board may cause electrical hazards.

Front Panel Components

LED Panel
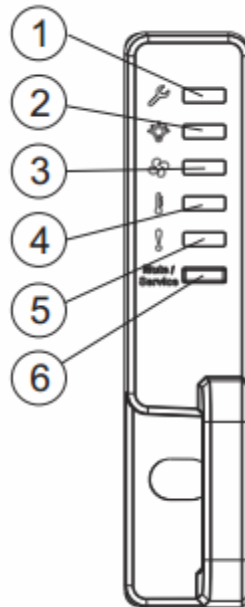
The LED panel can be located on the chassis ear. The LED panel contains Service LED ①, a power supply status LED ②, cooling module status LED ③, temperature sensor status LED ④, system fault LED ⑤, and mute service button ⑥. For details, please refer to LED Panel.

⚠ **WARNING**

If critical faults are indicated on the LED panel, verify the cause of the problem as soon as possible and contact your system vendor and arrange for a replacement module.

Rear Panel Components

Storage System Controller Module
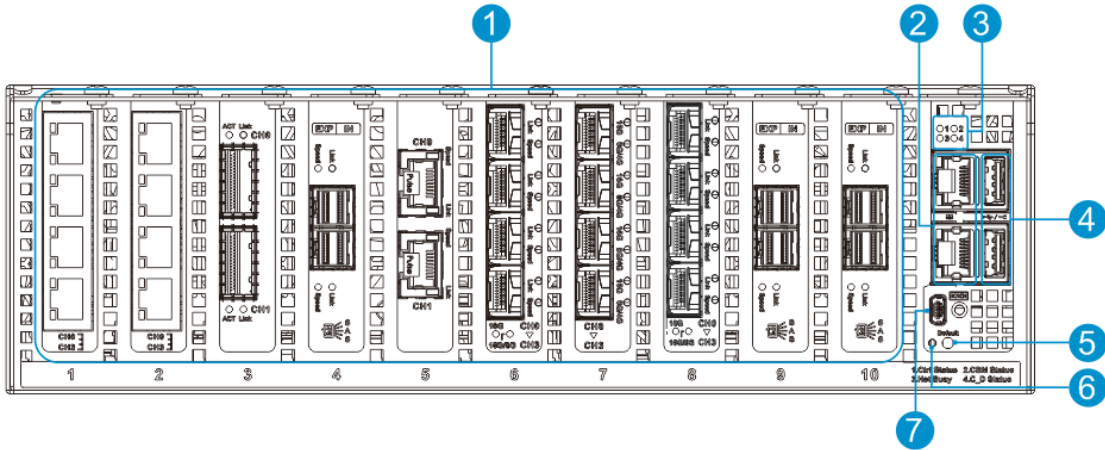
Designation	Description
1	Host ports (Host board is optional)
2	RJ-45 Management port
3	Controller status LEDs
4	USB 3.0 ports (for debug)
5	Restore Default button
6	Restore Default LED
7	Mini USB port (console port)

📝 **NOTE**

GS5000 has only one (1) RJ-45 port. The other one is covered and its function is disabled.

⚠ **WARNING**

The controller is built of sensitive components and unnecessary tampering may damage the controller.

PSUs & Fans

The two redundant, hot-swappable PSU has a power socket ①, latch ②, PSU status LED ③, and an extraction handle ④.
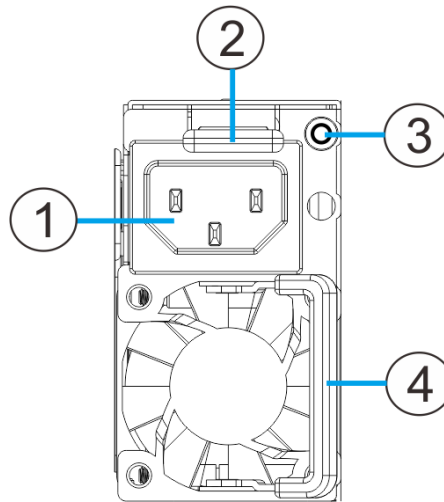
The fans are located in front of the system.
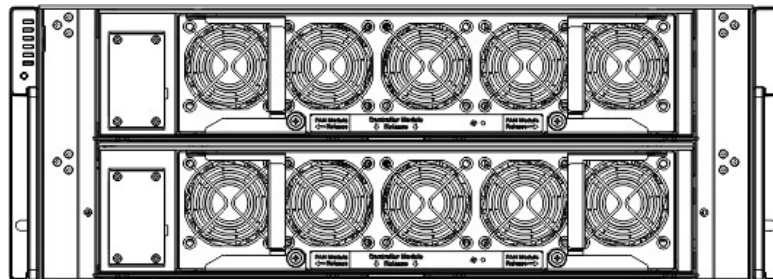
When cooling modules are running under normal condition, the cooling fans run at a low speed. Under the following conditions, the cooling fans raise their rotation speed to increase the airflow:

- Component failure: if a cooling module, PSU, or a temperature sensor fails.

- Elevated temperature: if the temperature breaches the upper threshold set for any of the interior temperature sensors.

- During the system initialization stage, the cooling fans operate at high speed and return to low speed once the initialization process has completed and no erroneous condition detected.

✎ **NOTE**

There are two upper temperature thresholds: one for event notification and the other for triggering higher fan rotation speed. The preset-value for event notification can be changed using the firmware-embedded configuration utility, while the fan speed trigger cannot be changed. Refer to the **Firmware Operation Manual** for details.

System Monitoring Features

There are a number of monitoring approaches that provide the operating status of individual components.

Expansion Enclosure Support

Monitoring:

A managing storage system is aware of the status of expansion enclosure components including those of:

- Expander controller (presence, voltage and thermal readings)
- PSU
- Cooling module
- Enclosure thermal sensor
- Service (the Service signal to specify a specific enclosure)
- Disk drives

Expansion Enclosure Identifier:

The managing storage system will sound the alarm and deliver warning messages if there is a conflict between expansion enclosure IDs.

If more than one expansion enclosure is connected to the managing storage system, each expansion enclosure needs a unique enclosure ID set using the rotary switch on the LED panel. For example, the firmware automatically disconnects the second expansion enclosure if it is connected online and comes with an ID identical to that of the first expansion enclosure.

📝 **NOTE**

The IDs for expansion enclosures are #1 to #15. For details, please refer to
Expansion Enclosure Connections.

Cooling Module Speed Adjustment:

If any of the detected temperature readings breaches the temperature threshold, the firmware running on the managing storage system automatically raises the rotation speed of all cooling fans.

Expansion Enclosure Status Monitoring:

A storage system, when connected with expansion enclosures, acquires the component status within other enclosures via a proprietary enclosure monitoring service using the in-band connectivity. No additional management connection is required.

I^{2}C bus

The detection circuitry and temperature sensors are interfaced through a non-user-serviceable I^{2}C bus. When expansion enclosures are attached to controllers, expansion enclosure component status is reported through in-band protocols over expansion links that is managed by a proprietary enclosure service.

Firmware (FW) and EonOne

The firmware (FW) is preloaded and is used to configure the system. The FW can be accessed through EonOne, a browser-based graphical user interface (GUI) software that can be installed on a local/remote computer and accessed via the network. The manager communicates with the array via the connection of the existing host links or the Ethernet link to the array's Ethernet port.

Audible Alarms

The system comes with audible alarms that are triggered when certain active components fail or when certain controller or system thresholds are exceeded. Whenever you hear an audible alarm, it is imperative that you determine the cause and rectify the problem immediately.

Event notification messages indicate the completion or status of array configuration tasks and are always accompanied by two or three successive and prolonged beeps. The alarm can be turned off using the mute button on the front panel.

⚠ **WARNING**

Failing to respond when an audible alarm is heard can lead to permanent damage(s) to the system. When an audible alarm is heard, rectify the problem as soon as possible.

Hot-swapping

The system comes with a number of hot-swappable components that can be exchanged while the system is still online without affecting the operational integrity. These components should only be removed from the system when they have to be replaced.

The following components can be user-maintained and hot-swappable:

- PSU
- BBU

✍ **NOTE**

Normalized airflow ensures sufficient cooling of the system and is only attained when all components are properly installed. Therefore, a failed component should only be removed when a replacement is available. For instructions on how to replace these hot-swappable components, please refer to System Maintenance.

Hardware Installation

Installation Prerequisites

Static-free installation environment: The system must be installed in a static-free environment to minimize the possibility of electrostatic discharge (ESD) damage.

Component check: Before installing the system, check to see that you have received all the required components using the **Unpacking List** included in the package. If there are item(s) missing or appear damaged, contact your vendor for a replacement.

Cabling: All the cables that connect the system to the hosts must be purchased separately. Please refer to System Connection for sample topologies and configuration options. Contact your vendor for the list of compatible cables.

Memory modules: If you wish to change the pre-installed DIMM module, you can find DIMM replacement procedures in Replacing the Memory Module on Storage Systems.

Rack installation: The rack slide rails are optional accessories and should you need to install it, please refer to the Slide Rail Kit Installation Guide section.

Make sure you are aware of the related positions of each plug-in module and interface connector.

Cables must be handled with care and must not be bent. To prevent emission interference within a rack system and accidental cable disconnection, the routing paths must be carefully planned.

Installation Procedures Overview

Following all the instructions provided below can minimize system installation time. Detailed, illustrated instructions for each component are given in the following sections.

1. **Unpack:** Unpack the system and confirm all components have been received against the Unpacking List.

2. **Rack/Cabinet installation:** If the system is going to be installed in a rack or cabinet, it should be installed prior to installing the hard drives. Installing the system into a rack or cabinet requires at least two people due to its weight. If you need to install the slide rails that came with the system, please refer to Slide Rail Kit Installation Guide later in this manual.

3. **Install CBM (if necessary)**: Install the CBM (BBU + Flash Backup Module) onto the controller if you purchased it as an additional item.

4. **Cable connection:** Use the supplied power cords to connect the system to main power. It is recommended to connect power cords to separate and independent power sources (different circuit breakers for redundancy).

5. **Power up:** Once the components have been properly installed and all cables are properly connected, you can power up the system and configure the storage system.

Unpacking the System

Compare the **Unpacking List** included in the shipping package against the actual package contents to confirm that all required materials have arrived.

Box contents

For detail content(s), please refer to the unpacking list that came with the system.

The accessory items include a serial port cable, screws, **Quick Installation Guide**, a CD containing the **EonOne** management software and its manual and **Firmware Operation Manual**, and a product utility CD containing the **Installation and Hardware Reference Manual** (this document).

Preinstalled Components

Shown below are the components pre-installed in the system:

- Controllers
- LED front panels
- DIMM module for storage systems
- CBM
- PSUs
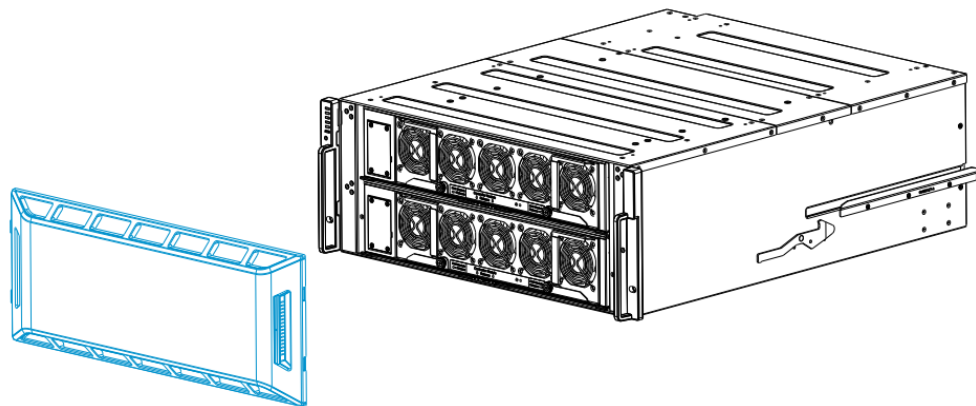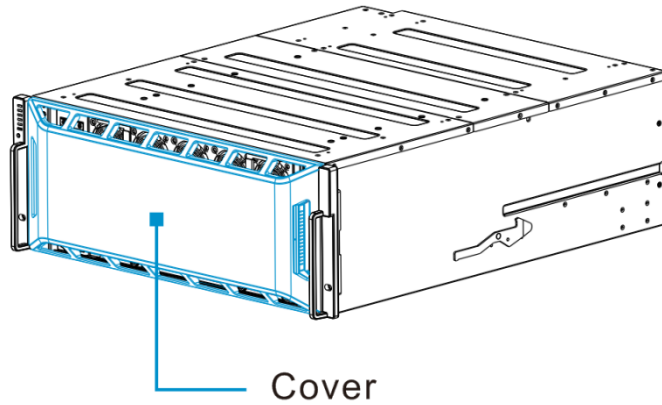- Fans
- Host board

Components to be installed

You must install the following components:

- The enclosure itself (please refer to the Slide Rail Kit Installation Guide)
- Cabling

Removing the Front Cover

If you have to remove the fans / BBUs / controllers, you will need to remove the front cover first.

Simply pull the front cover to remove it from the enclosure.
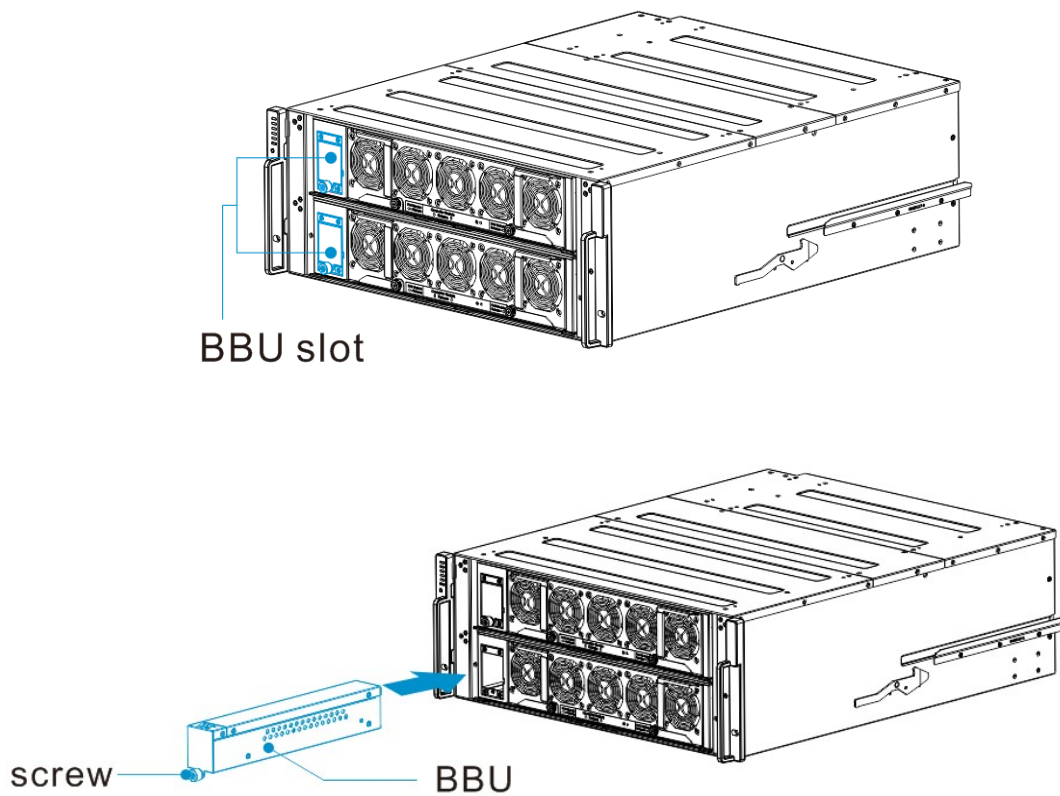

Cover

Removing / Installing the BBU(s)

The BBUs are hot-swappable.

To remove the BBU(s), loosen the screw, then pull the BBU(s) out of the chassis.

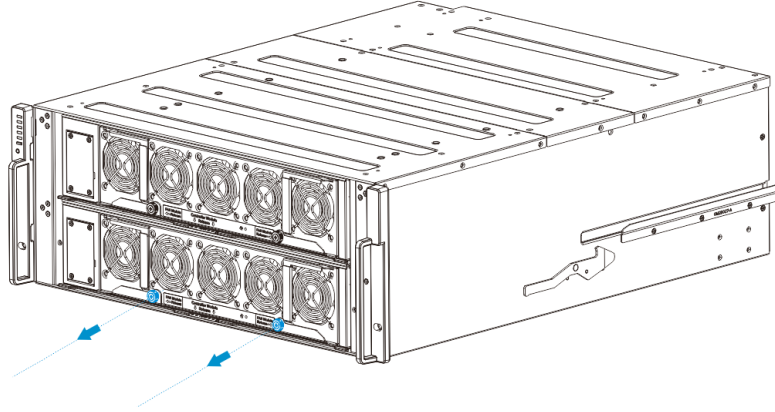To install the BBU(s), slide the BBU(s) into the chassis.

Once fully installed, secure the BBU with a screw.
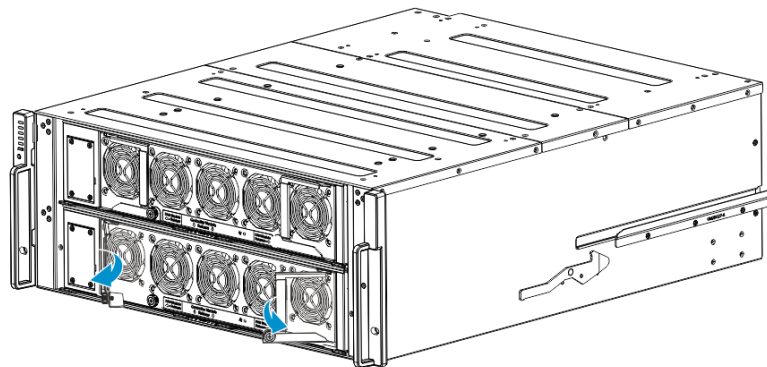

BBU slot

screw — BBU

Removing / Installing the Fan(s)

To remove the fan(s):

1. Loosen the screws that secure the fan module to the enclosure.

2. Move the left and right handles to the sides of the enclosure.

3. Pull both handles to remove the fan module from the enclosure.
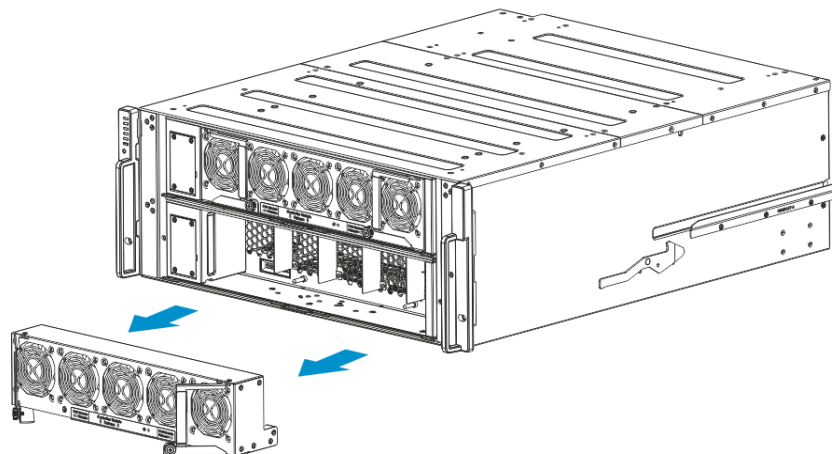
To reinstall/replace the fan(s), do opposite of the above steps.

Installing Host Boards

If you want to install any host boards, you have to remove the controller first.

Removing the Controller

1. Push the controller release button to release the ejection handles.
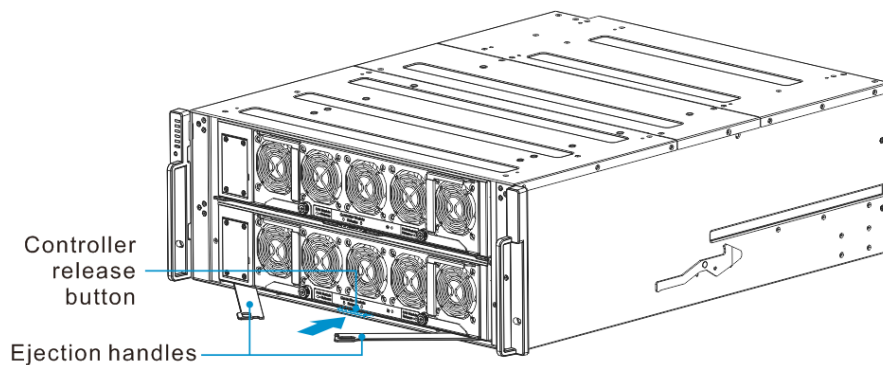
2. Pull the handles and remove the controller from the enclosure.
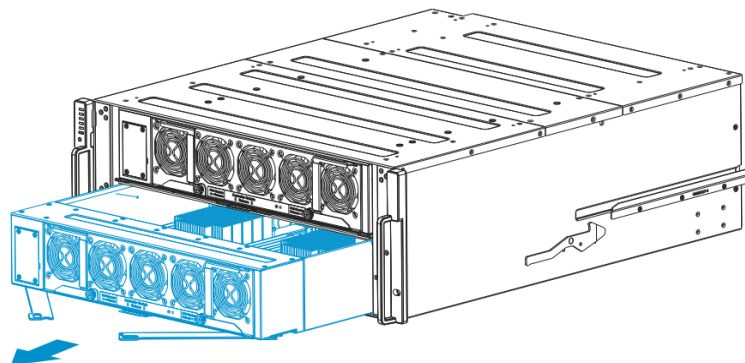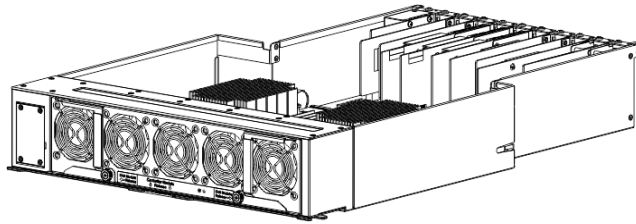
Installing the Host Board(s)

Insert the host board into the slot, and secure the screw to the controller.

Slot 8
Slot 7
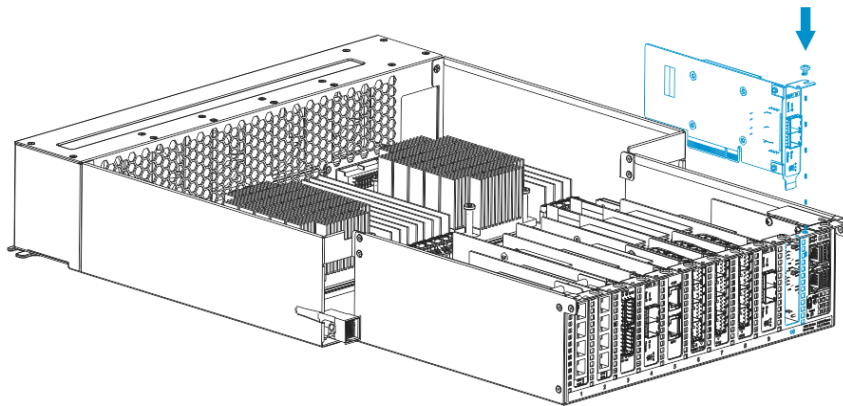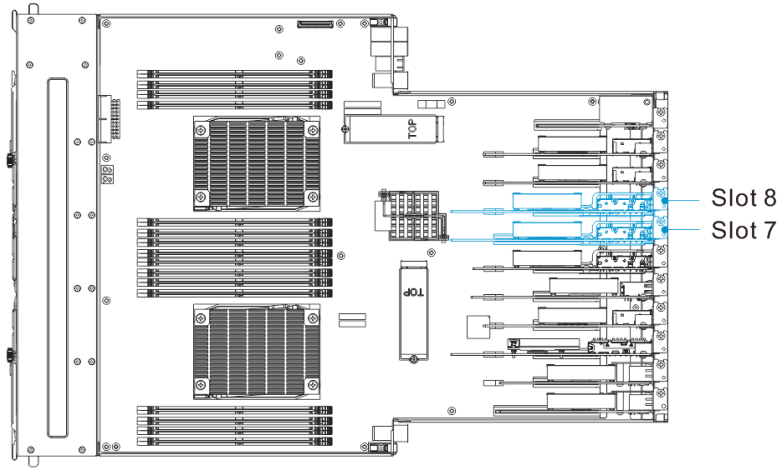
📝 **NOTE**

GS 5100 supports up to 4 host boards (2 per controller)

GS 5200 supports up to 16 host boards (8 per controller).

For more details on host boards supported memory, go to section .

Insert host boards:

You must insert host boards with <u>priority</u>, please see the below table:

|	Slot 1	Slot 2	Slot3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8
Priority	3	4	5	7	6	8	1	2

First, insert the host boards in slot 7→ 8→ 1 → 2, followed by 3→5→4→6 slot.

Below is an example of how you insert a host board properly, please insert the host boards following the above priority sequence:

① Insert the host board into the slot.

② Secure the screw to the controller.
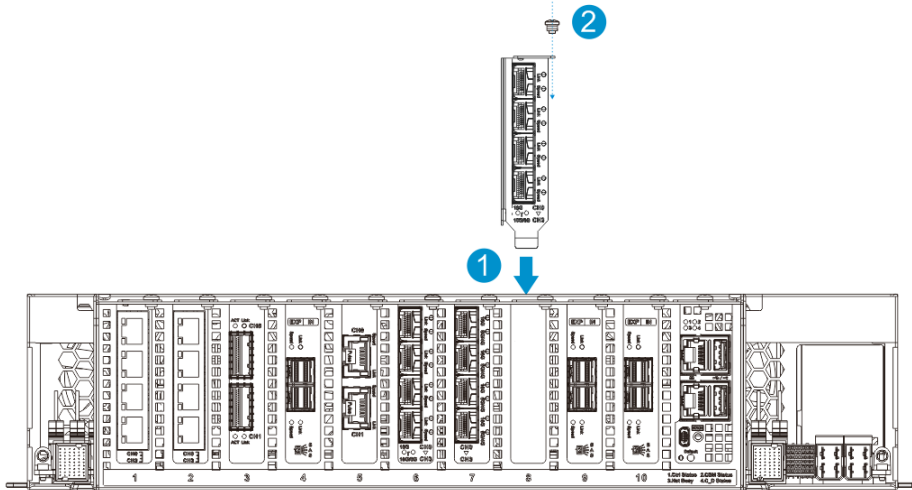
- For **GS 5100 Series** Host Board Configuration: Insert host boards only in the 7th and 8th host board slots.
- For **GS 5200 Series** Host Board Configuration: Insert host boards in the 1~8th host board slots.

Installing the Controller

1. Insert the controller slowly into the module slot. When you feel the contact resistance, use more force slightly and then push the controller into chassis.
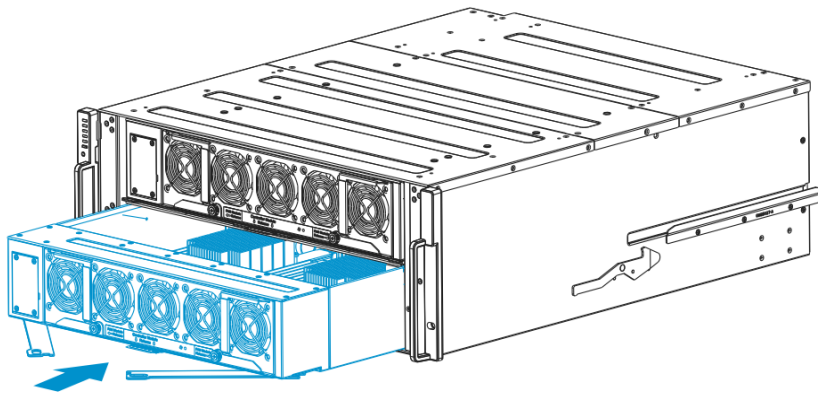
2. Gently push the ejection handles back in place.
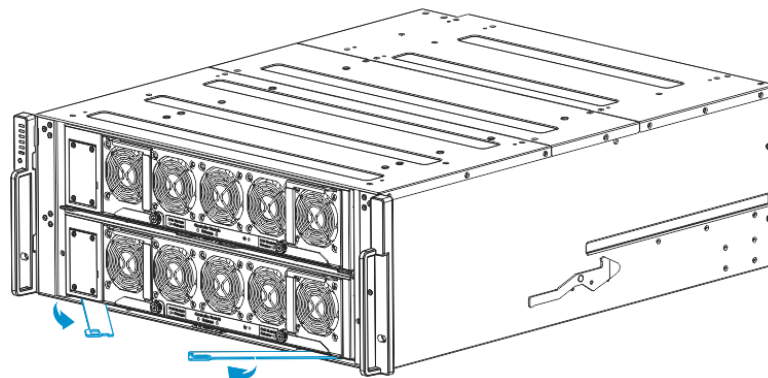
Memory

The table below shows the recommended memory combination configuration for GS 5000 Series:

Memory per Controller	GS 5100	GS 5200
16 GB	2 x 8 GB (default)	
32 GB	4 x 8 GB	4 x 8 GB (default)
64 GB	8 x 8 GB	8 x 8 GB
128 GB	8 x 16 GB	16 x 8 GB
256 GB	8 x 32 GB	16 x 16 GB
512 GB		16 x 32 GB

E.g.: 2 x 8 GB (2 = Number of memory slots, 8 = size of memory supported)

GS 5100 Series DIMM Slots: 8

GS 5200 Series DIMM Slots: 16

📝 NOTE

For GS 5200, 32 GB (default) memory is allocated for 1 to 4 host boards. If you wish to install more than 4 host boards, a minimum of 64 GB memory on a single controller is required.

To install 8 host boards (4 per controller): 64GB memory is also required.

To install 16 host boards (8 per controller): at least 128GB memory is required.

Installing Memory

Please remove the Controller first as stated above Removing the Controller section, then make sure the BBU is disconnected, refer to Replacing the BBU. To install the memory for details, please refer to Replacing Memory Modules in the later chapter.

✎ **NOTE**

For the one-CPU model (GS 5100 model), you can ONLY insert DIMMs to the 8 (eight) slots on the two sides of CPU 1.
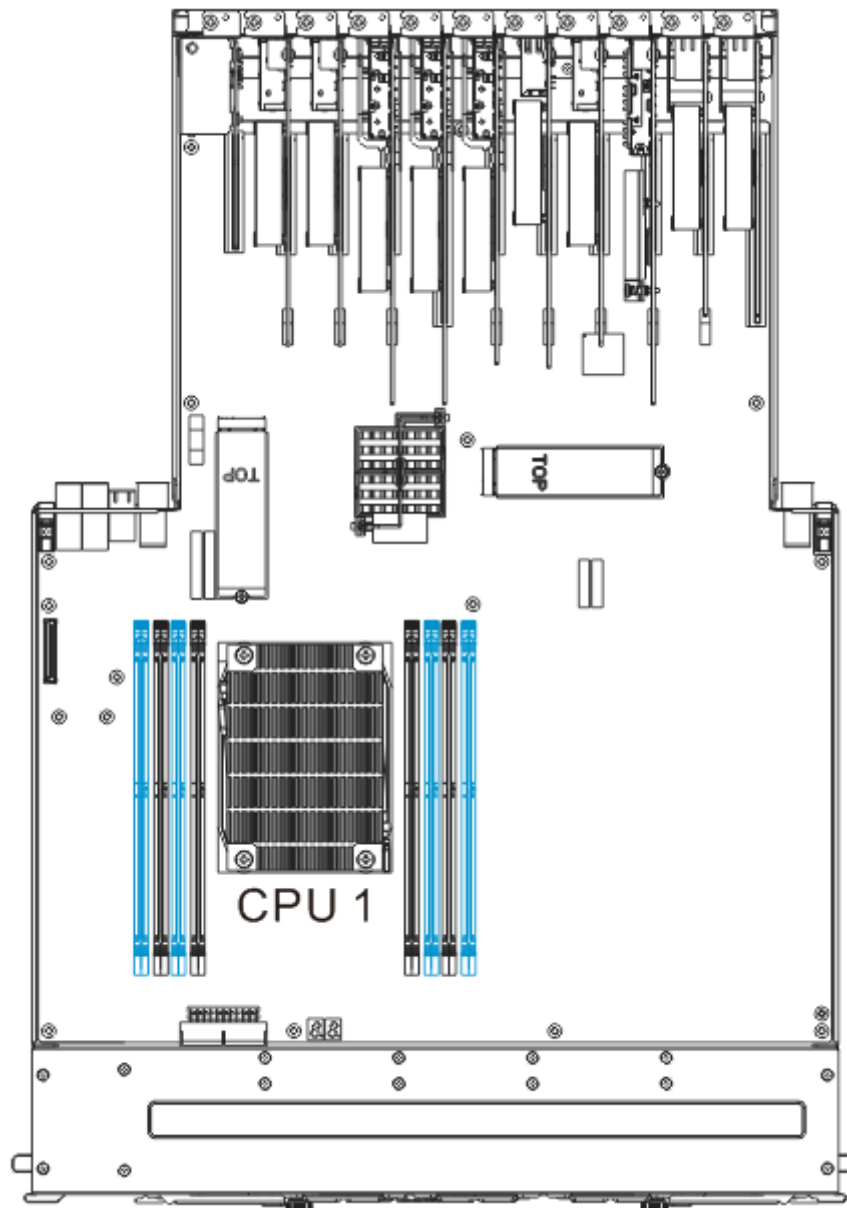
Insert the DIMMs by order from left to right. Also be sure to insert DIMMs to the specific BLUE slots first, then the black slots within the ① sector (see below picture).

After finishing inserting the DIMMS in the ① sector, proceed to the ② sector and repeat the same process.
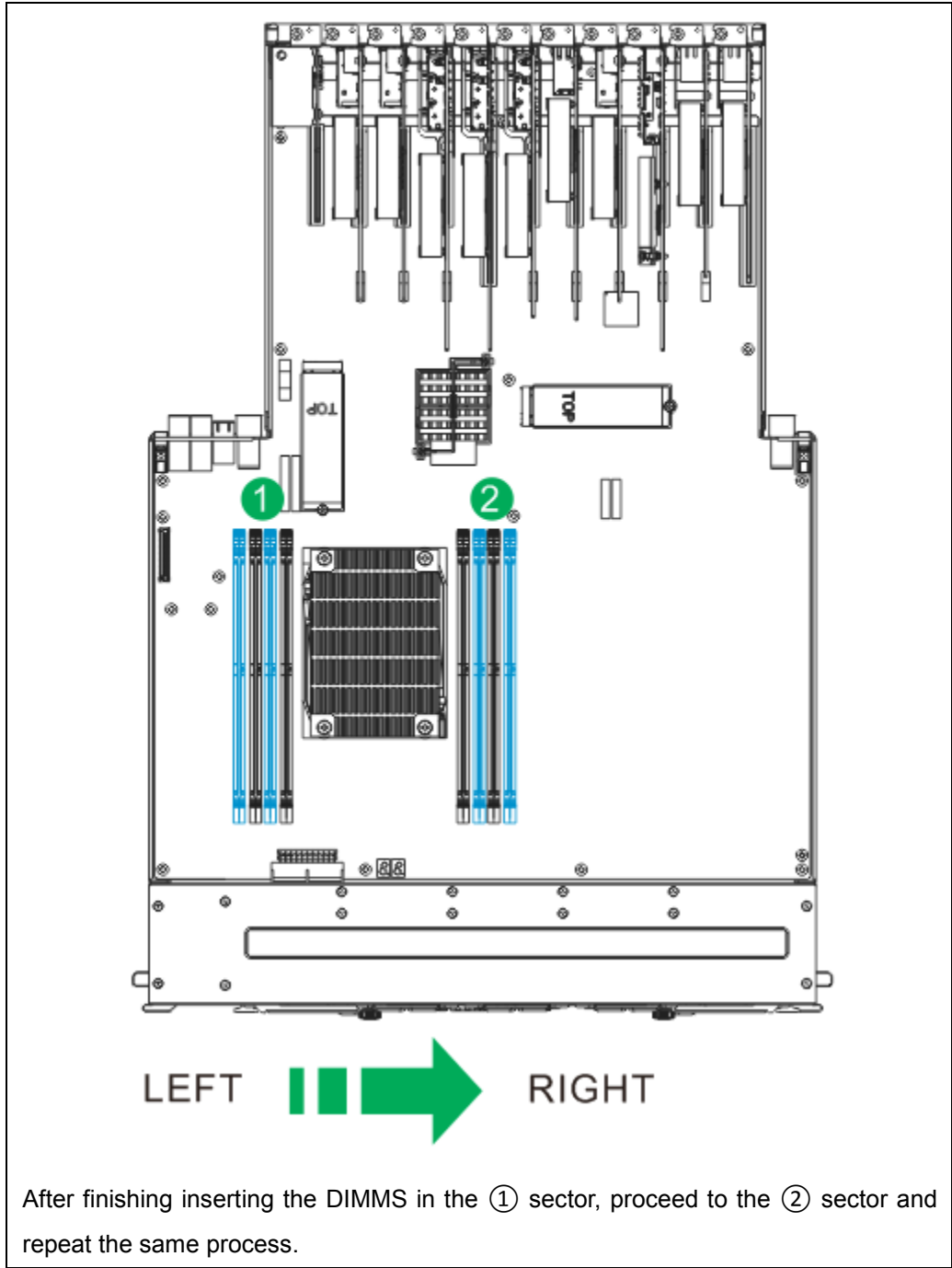
After inserted the DIMMs, replace the controller into the chassis, refer to Installing the controller.

✎ **NOTE**

For the two-CPU model (GS 5200 model), you can insert DIMMs to the 16th (sixteenth) slot on the two sides of CPU 1 and CPU 2.

Insert the DIMMs by order from <u>left to right</u>. Also be sure to insert DIMMs to the specific BLUE slots first, then the black slots within the ① sector (see below picture).

LEFT ■ ■ ➡ RIGHT
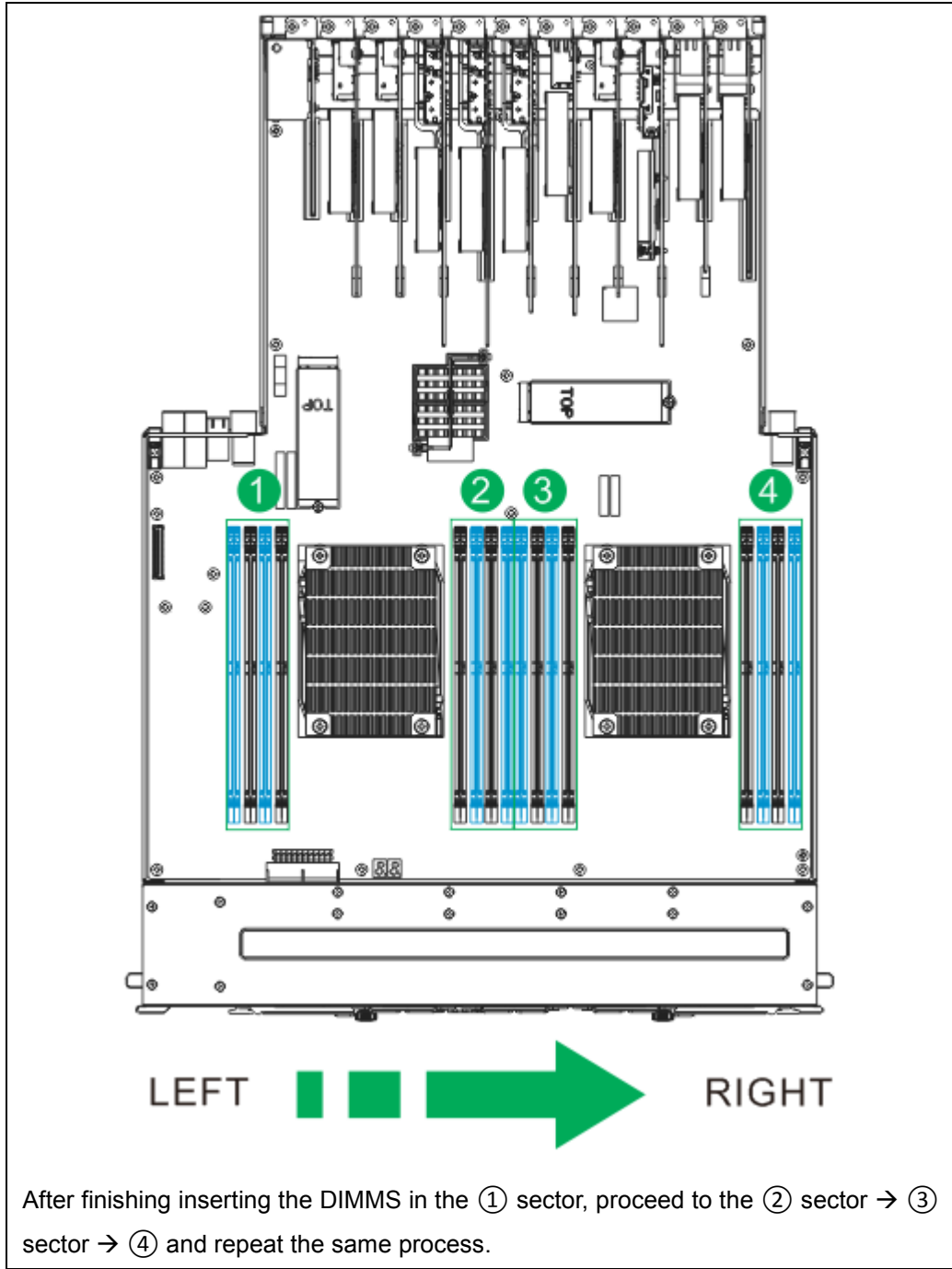
After finishing inserting the DIMMS in the ① sector, proceed to the ② sector → ③ sector → ④ and repeat the same process.

After inserted the DIMMs, replace the controller into the chassis, refer to Installing the controller.

System Connection

This chapter outlines the general configuration rules you should follow when cabling a storage system and introduces basic information about topologies. You can use these topologies or refer to them as a guide for developing your own unique topologies. A complete description of the power-on and power-off procedures is also given in this chapter.

General Considerations on Making Connections

When selecting the number of hard drives to be included in a logical drive, the host channel bandwidth and the mechanical performance of individual disk drives should be considered.

It is a good practice to calculate performance against the host port bandwidth when designing an application topology. As an example, if eig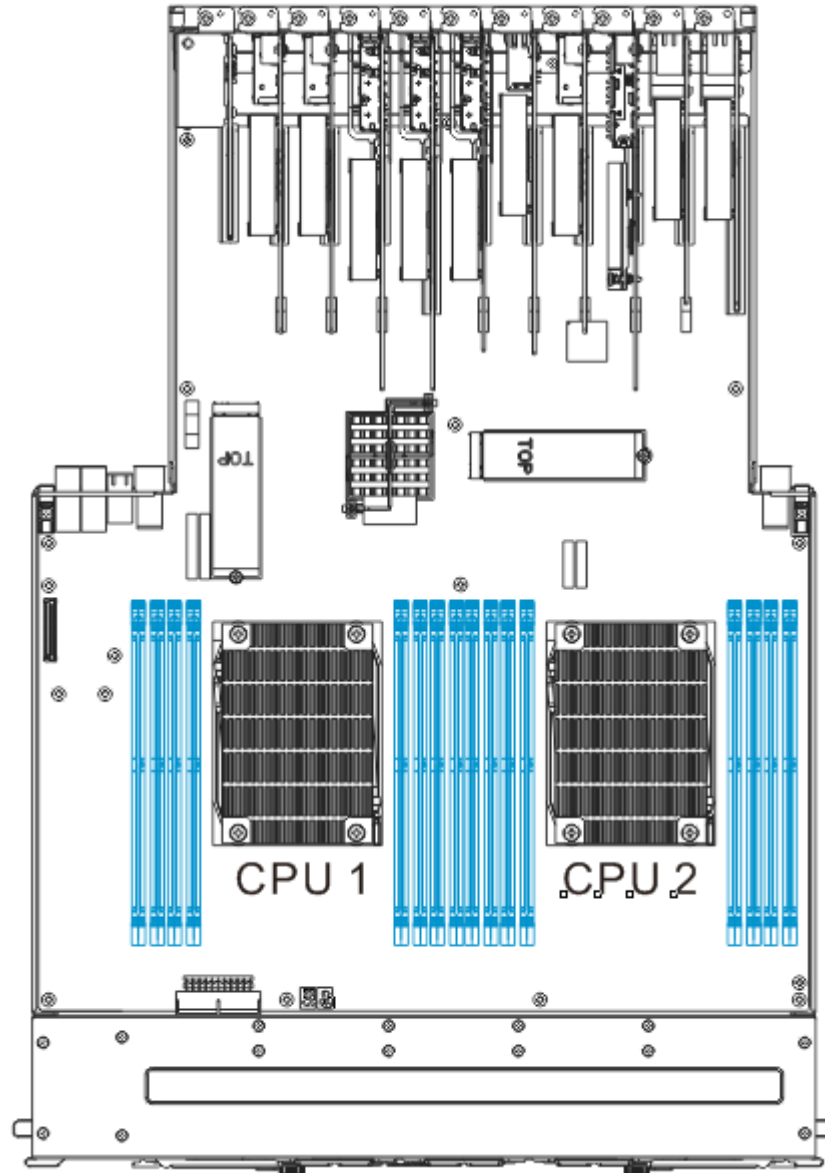ht members are included in a logical drive and this logical drive is associated with a host ID (LUN mapping), the combined performance of this logical drive should approximate the channel bandwidth. If, for example, two 6-drive logical arrays are associated with two IDs residing on a single host channel, there may be a trade-off with performance.

If your system comes with a total of 8+ host ports, it is recommended that you obtain more disk drives by attaching an expansion enclosure so that you can create host-port corresponding 6-member logical drives (RAID-5) or 8-member logical drives (RAID-6). These logical drives leverage the bandwidth of each host port.

There are other considerations:

- For example, a spare drive carries no data stripes and will not contribute to disk-level performance. Refer to the documentation for your hard drives for performance data.

- The disk drives in the same logical array should have the same capacity, but it is preferred that all the drives within a chassis have the same capacity.

- Disk drives in the same logical drive should have the same capacity, but it is preferred that all the disk drives within a chassis have the same capacity. Tiered storage configuration is supported. However, you should not include both SAS and SATA drives in a logical drive.

- A spare drive should have a minimum capacity that is equivalent to the largest drive that it is expected to replace. If the capacity of the spare is less than the capacity of the drive it is expected to replace, the controller will not proceed with the failed drive rebuild.

- When cabling, follow all the specifications. Pay attention to signal quality and avoid electronic noise from adjacent interfaces, e.g., do not lay power cords on optical cables.

- When rack-mounted, leave enough slack in the cables so that they do not bend to a diameter of less than 76mm (3 inches).

- Route the cables away from places where it can be damaged by other devices, e.g., foot traffic or fan exhaust.

- Do not over-tighten or bend the cables.

Host-Side Topologies

The primary concern for configuring host-side topologies is to avoid points of failure. It is therefore recommended that the host ports are connected to at least two HBAs.

NOTE

In order to manage the fault-tolerant data paths and to optimize data throughput on multiple data paths, it is necessary to apply multipath software or utilities such as Linux Device Mapper.

Host port channel designation may vary from system to system, please refer to the following topologies as a guide to create your own connections to suit your needs.

Host-Side Parameters

It is STRONGLY recommended that users use the default settings with their system. If you have the need of adjusting your host-side parameters, please consult on-site technical personnel or seek technical support from your vendor.

Maximum Concurrent Host LUN Connection ("Nexus" in SCSI)

The "Max Number of Concurrent Host-LUN Connection" menu option is used to set the maximum number of concurrent host-LUN connections.

Maximum concurrent host LUN connection (nexus in SCSI) is the arrangement of the controller internal resources for use with a number of the current host nexus.

For example, you can have four hosts (A, B, C, and D) and four host IDs/LUNs (IDs 0, 1, 2 and 3) in a configuration where:

- Host A accesses ID 0 (one nexus).

- Host B accesses ID 1 (one nexus).

- Host C accesses ID 2 (one nexus).

- Host D accesses ID 3 (one nexus).

These connections are all queued in the cache and are called four nexus.

If there is I/O in the cache with four different nexus, and another host I/O comes with a nexus different than the four in the cache (for example, host A accesses ID 3), the controller returns busy. This occurs with the concurrent active nexus; if the cache is cleared, it accepts four different nexus again. Many I/O operations can be accessed via the same nexus.

Maximum Queued I/O Count

The "Maximum Queued I/O Count" menu option enables you to configure the maximum number of I/O operations per host channel that can be accepted from servers. The predefined range is from 1 to 1024 I/O operations per host channel, or you can choose the "Auto" (automatically configured) setting. The default value is 256 I/O operations.

The appropriate "Maximum Queued I/O Count" setting depends on how many I/O operations the attached servers are performing. This can vary according to the amount of host memory present as well as the number of drives and their size. But usually, optimum performance results from using the "Auto" or "256" settings.

For more information, please refer to the software manual that came with your system.

Fibre-Host Connections

> ⚠ **WARNING**
>
> All Fibre cables are sensitive and must be handled with care. To avoid interference, the cable routing path must be carefully planned and the cables must not be bent.

The Fibre Channel standard allows optical connections. Optical cables can be used over longer distances and have been shown to be more reliable. Due to the demands of high transfer rates, optical cables are preferred for 16/ 8/ 4Gbps fiber connectivity. Optical cables are not susceptible to EMI.

The Fibre host ports connect to Fibre Channel host adapters (HBA) that feature SFP interface that supports full-duplex transfer and come with a preferred 64-bit/133MHz PCI-X or PCI-E interface. Please contact your vendor for the latest certified items.

> ⚠ **WARNING**
>
> Lasers can be hazardous and may cause permanent eye damage or blindness, and therefore must be treated with respect and used with caution. Never look directly at lasers while it is turned on.

Auto speed detection

Speed auto-detection is specified by the Fibre Channel standard. If a 16Gbps port is connected to an 8Gbps port, it will negotiate down and run at 8Gbps. If there are 16Gbps ports on both ends of the link, the link will run at 16Gbps.

SFP / SFP+ transceivers

An SFP transceiver converts electrical data signals into light signals and transfers them transparently via optical fiber. A transceiver provides bi-directional data links, a laser transmitter (for fiber optic cables), LC connector, and a metal enclosure to lower the EMI.

Other beneficial features of a typical SFP transceiver include a single power supply, low power dissipation, and hot-swap capability. It is also important that any transceiver you use meets the FC performance and reliability specifications.

⚠ **WARNING**

The SFP transceiver contains a laser diode featuring class 1 laser. To ensure continued safety, do not remove any covers or attempt to gain access to the inside of the product. Refer all servicing to qualified personnel.

FC port dust plugs

Each FC port comes with a dust plug. Remove these dust plugs only when you are ready to insert an SFP transceiver.

Please contact your vendor for a list of compatible components.

Fibre-Host Topologies

The Fibre Channel standard supports three (3) separate topologies. They are point-to-point, Fibre Channel Arbitrated Loop (FC-AL), and fabric switch topologies.

1. Point-to-Point: Point-to-point topology is the simplest topology. It is a direct connection between two (2) Fibre Channel devices.

2. FC-AL: This is the most common topology currently in use. Fibre Channel devices are all connected to a loop. Each device is assigned an arbitrated loop physical address (AL_PA). The FC-AL supports 124 devices in a single loop.

3. Fabric: The fabric topology supports up to 224 Fibre Channel devices. This topology allows multiple devices to communicate simultaneously. A Fibre switch is required to implement this topology.

> **NOTE**
>
> If a logical drive has to be accessed by different servers, file locking, FC switch zoning, port binding, and multipath access control will be necessary.

Fibre Cabling

Following are steps that should be completed with cabling:

1. Maintain a configuration plan. In addition to cabling topologies and list of networking components, the plan can also include firmware and software maintenance details.

2. Confirm that you have a Fibre Channel cable that loops 6-inch or longer.

3. Ensure proper airflow and keep cables away from ventilation airflow outlets.

4. Cabling steps:
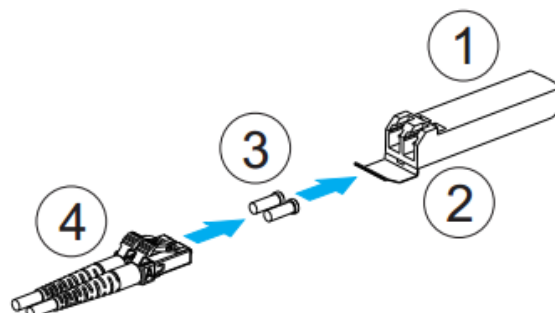
4.1 Remove the SFP+ transceiver module ① from its static-protective package.

4.2 Remove the dust cover ② from the SFP+ transceiver module.

4.3 Insert the SFP+ transceiver module into one of the system host ports. The module will snap into place.

4.4 Remove the two protective caps ③ from the LC-to-LC type cable. Save the protective caps for future use.

4.5 Connect the LC-to-LC type cable ④.

4.6 Carefully insert the cable into an SFP transceiver module that is already on the system. The cable connector is keyed and will click into place.

4.7 Remove the protective caps on the other end and connect this end to an SFP+ transceiver module on a Fibre Channel switch port or a Fibre Channel host bus adapter (HBA) port.

SAS-Host Connections

Please contact your vendor to purchase compatible host-link cables.

SAS cables are characterized by 100ohm, black colors, UL-approved, lead-free, 50, 120 or 260cm cable lengths; connectors can be secured to chassis receptacle using latching mechanism.

⚠ **WARNING**

All SAS cables are sensitive and must be handled with care. To prevent interference within a rack system, the cable routing path must be carefully planned and the cables must not been bent.

Ethernet-Host Connections

Ethernet cable requirements:

- Ethernet cables are user-supplied. Cat5e shielded STP type network cables or better performance types (important for meeting the requirements imposed by emission standards).

- Straight-through Ethernet cables with RJ-45 plugs.

- Use of cross-over cables can also be automatically detected and re-routed for a valid connection.

Connection types:

- Directly to iSCSI initiators (software or hardware) or via Gigabit Ethernet switches.

- To servers equipped with iSCSI HBA – preferably a hardware TOE (TCP/IP Offload Engine) card, and then to client stations with an Ethernet NIC or iSCSI HBA.

- The system presents its logical volumes through SCSI-like IDs and LUNs. These RAID volumes then appear as iSCSI targets through the network.

NOTE

Even though iSCSI initiator software is a cost-effective way of building an iSCSI SAN, software initiator adds additional workload to the server CPU. It is recommended to apply iSCSI HBAs that come with TCP/IP offload engines in order to reduce overhead.

Network & Host Connection Topologies

The iSCSI host ports connect to Ethernet network devices and iSCSI initiators that comply with the IETF iSCSI standard (RFC 3720). Network connection of the iSCSI ports is flexible. The use of network connecting devices, subnet, Name Servers, or iSCSI management software can vary from case to case. In the following sections, configuration diagrams will be provided to illustrate the possible uses of the EonStor GS system in an iSCSI network.

Please note the following:

- Use the Ethernet management port for management purposes only, i.e., EonOne or telnet console. This Ethernet management port is not used for I/O transactions.
- Configurations such as subnet or Virtual LAN can separate iSCSI host links, decrease overhead, and eliminate the impact of link failure.
- Multiple arrays or logical partitions can be created and made available separately through different IDs or LUN numbers on the host ports. Usually, a RAID5 logical drive of eight (8) members often brings optimal array performance.

Expansion Enclosure Connections

A SAS host link cable is included per expansion enclosure. If you need to purchase other cables or if you need other cable(s) of different length, please contact your vendor.

⚠ **WARNING**

All SAS cables are sensitive and must be handled with care. To prevent interference within a rack system, the cable routing path must be carefully planned and the cables must not be bent.
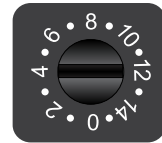

SAS Expansion Enclosure Configuration

The SAS expansion port connects to expansion enclosures. For Dual-Controller systems, each expansion port connects a controller to a corresponding expansion enclosure controller making fault-tolerant links to different SAS domains.

The following principles apply to storage systems and expansion enclosure connections:

- Dual-Controller storage systems connect to Dual-Controller expansion enclosures.

- A longer cable is available for making expansion links with a Dual-Controller configuration. A longer cable is required if connections to expansion enclosures are made from two opposite directions. Routing through two different connections can avoid loss of data links if one enclosure fails in between.

There is a rotary ID switch on every expansion enclosure that is manually configured using a flat blade screwdriver.

Configuring enclosure IDs:

- The configurable IDs for expansion enclosures are from 1 to 15. Usually the numbering starts from the one closest to the managing storage system.

- Make sure a unique ID is configured on each expansion enclosure so that the SAS WWN addresses of disk drives can be properly assigned. The firmware of the storage system automatically manages these addresses.

Configuration Rules

How to connect SAS interfaces across the storage system and the expansion enclosures:

- Fault-tolerant links in a Dual-Controller combinations: Corresponding to SAS drives' **dual-ported** interface, two physical links are available from each disk drive, routed across the backplane board, each through a SAS expander, and then interfaced through a 4x wide external SAS port.

- With data paths through separate SAS domains, access to disk drives can be continued in the event of a cable link or SAS expansion enclosure controller failure.

Designation	Description	Designation	Description
1	Controller A	5	Dual-ported SAS drives
2	Controller B	6	Expander
3	Expansion enclosure controller A	7	To another expansion enclosure
4	Expansion enclosure controller B		
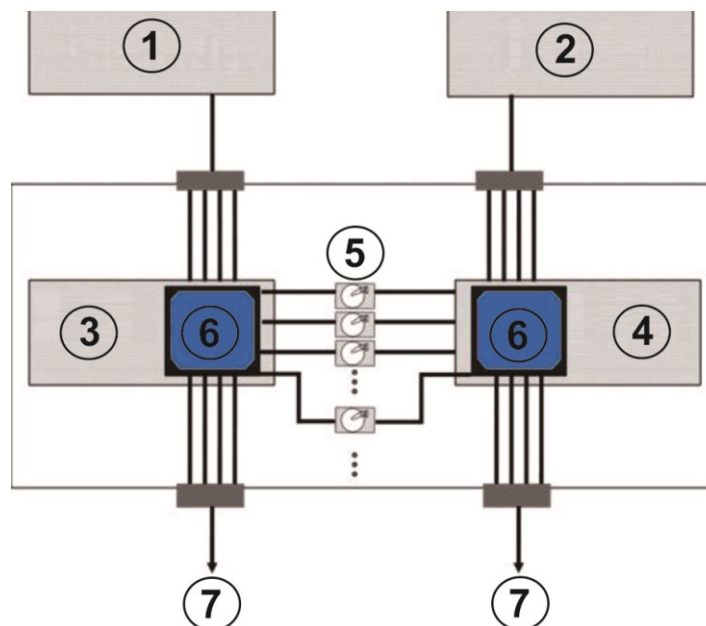
- Fault-tolerant Links to SAS disk Drives

- SAS expansion cables will be available with the expansion enclosures. Note that if many expansion enclosures are connected, a longer SAS external cable (e.g., a 120cm cable) may be necessary for connecting an expansion enclosure from the opposite direction offering high redundancy.

- One expansion link connects expansion enclosures from the storage to the nearest expansion enclosure, and then to the farthest expansion enclosure. Another expansion link connects to the farthest expansion enclosure from the opposite direction and then to the nearest expansion enclosure.

- Each expander controller on the SAS expansion enclosure controls a **SAS Domain** that connects one of the alternative interfaces on all of the disk drives in the enclosure. For example, one expander unit controls Domain A, and the other controls Domain B. In a fault-tolerant topology, the SAS external links always connect to the SAS ports on the same SAS Domain.

- The SAS Domains can be identified by the expanders' locations, i.e., upper controller slot (Controller A / Slot A) or the lower controller slot (Controller B/Slot B).

- On the storage system, each controller can be considered as managing a separate SAS Domain. With the help of the port selector mechanism on the MUX boards, the idea of SAS Domain applies even when SATA drives are used in a Dual-Controller expansion enclosure.
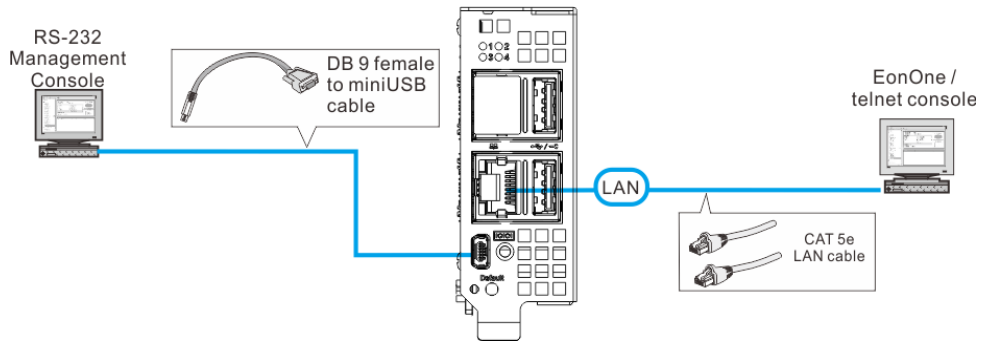
Dual-Controller Expansion Connection

Dual Controller

Expansion 1 — IN OUT — Expansion 2 — Expansion 3 — Expansion 4 — Expansion 5 — Last expansion
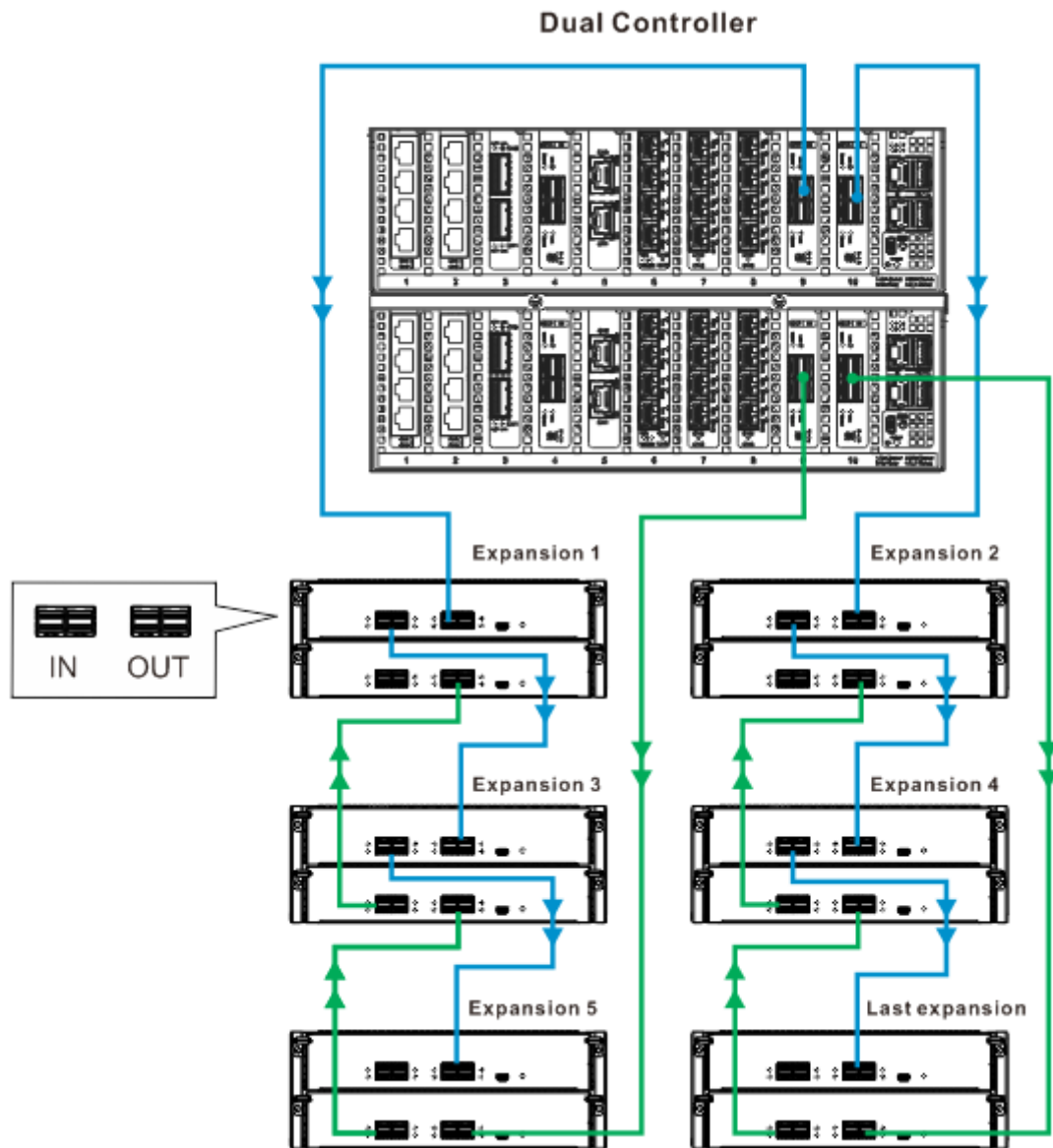
📝 **NOTE**

To ensure redundancy, Dual-Controller SAS expansion must be connected to the opposite ends of daisy-chained expansion enclosures (e.g. first expansion and last expansion).

Management Console Connections

Designation	Description	Designation	Description
1	Serial port (for Telnet access)	4	Local area network
2	DB9 to mini USB	5	CAT5e LAN cable
3	Mini USB port (**Console port**)	6	EonOne/ telnet console

Connecting the Storage System to external consoles

Serial port (mini USB): Use the cable supplied with the system to connect to mini USB port. **Ethernet port**: An Ethernet cable should be supplied by the user.

> **NOTE**
>
> ALWAYS connect to the primary controller.
>
> A null modem may be required if you are using a 3rd party cable.

The serial port's defaults are:

Baud Rate	115200
Data Bit	8
Parity	None
Stop Bit	1
Flow Control	Hardware

For TCP/IP connection and firewall configuration please refer to EonOne online help or User's Manual. If your network environment is not running DHCP server protocols, a default IP, <10.10.1.1> can be used if you are accessing for the first time.

Power Connections

Once all hard drives have been properly installed and the I/O ports or management interfaces have been connected, the system can be powered on.

Checklist

BEFORE powering on the system, please check the following:

- **Cable connections:** The system has been correctly connected to host computer(s), management computers, or external networking devices.

- **Ambient temperature:** Make sure the surrounding environment temperature is not higher 35 degrees Celsius (with CBM).

✏️ **NOTE**

Make sure you use the power cables provided that are at least 1.2 meters in length. **DO NOT** use extension cables as the power cables are designed to connect **ONLY and DIRECTLY** to relocatable power taps (RPTs) on server cabinets.


Power Cord Connections

Use the included cables. Connect them to the power sockets for all PSUs.

Power On Procedure

Before you power on the storage system, please power on the expansion enclosure first if your network configuration has multiple arrays.

To power on the system please follow the procedures below.

1. Connect the included power cord(s) to the power socket(s) of the storage system.

2. Turn on the power switch to the "on" position for the PSUs.

3. Power on the networking devices, e.g. switches.

4. Power on the host computers. They should be the last devices to be turned on.

Power switch

Power socket
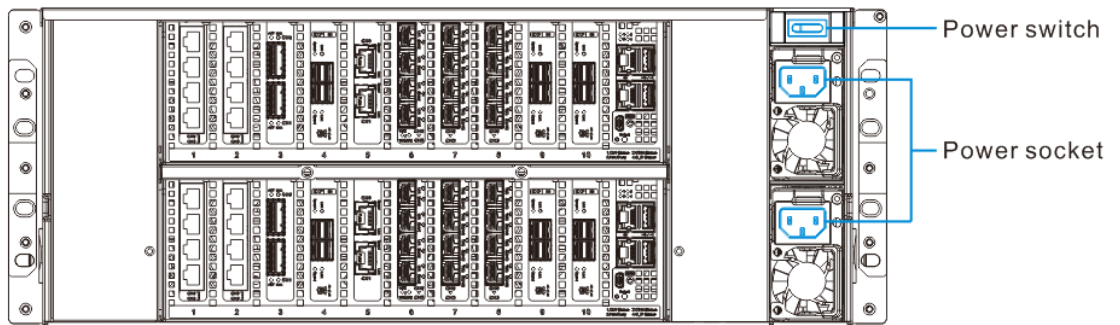
✎ **NOTE**

Make sure the switch of the power supply modules is turned on.
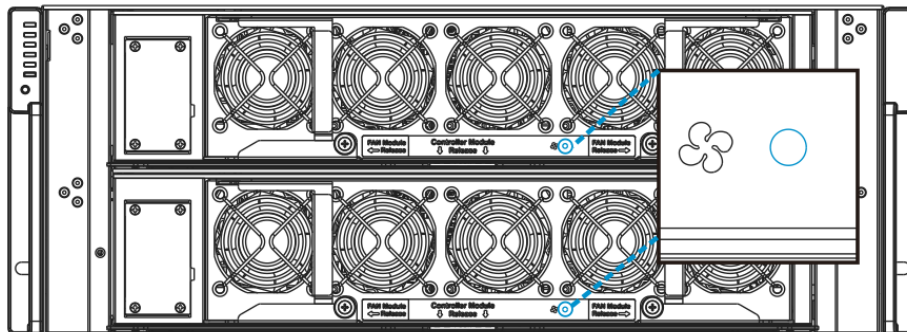

Power On Status Check

As a general rule, once the system has been powered on, there should **NOT** be LED(s) that light up in **RED** nor should you hear an audible alarm from the system. You may verify system statuses via the following monitoring interfaces: LEDs on rear chassis, including controller module, PSUs and fans (refer to System Monitoring).

PSU LED:
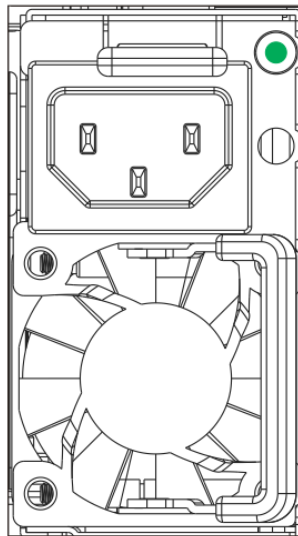
Fan Status LEDs:

Name	Color	Status
Fan Status LED	**Red**	**Off** indicates that the cooling fan is operating normally. **Red** indicates that the cooling fan has failed.

Power Off Procedure

If you wish to power down the system, please follow these steps:

📝 **NOTE**

If you wish to power down the system, please ensure that no time-consuming processes, like "Regenerate Logical Drive Parity" or a "Media Scan," are taking place.

---

1. **Stop I/O access to the system**

   Close your applications running on the host computers to stop all I/O access to the system.

2. **Flush the cache**

   Locate the Cache Dirty Status LED (refer to Storage System Controller LEDs) on the controller module to check if there is still cached data in the DRAM (if the LED is lid up in **amber**).

3. **Use the Shutdown Controller function to flush all cached data** (please refer to the EonOne manual)

4. **Once the cache has been flushed,** you may proceed to power down the system.

System Monitoring

The EonStor GS series is equipped with a variety of self-monitoring features that help keep system managers aware of system operation statuses.

Monitoring Features

You may monitor the system through the following features:

- **Firmware**: The controller in the system is managed by a pre-installed firmware, which is accessible in a terminal program via the serial port. For more details, see the software manual in the CD-ROM.

- **EonOne:** EonOne is a browser-based Graphical User Interface (GUI) that can to monitor and manage the system locally or remotely over TCP/IP network, via the Ethernet Management port. The management session is conducted using the Ethernet management port. For more details, see the EonOne manual in the CD-ROM.

- **LEDs**: LED indicators notify users of system status, events, and failures. LEDs are located on both the front and rear panel of the chassis. For details, see and subsequent sections.

- **Audible alarm:** Audible alarm will be triggered in case of system failures.
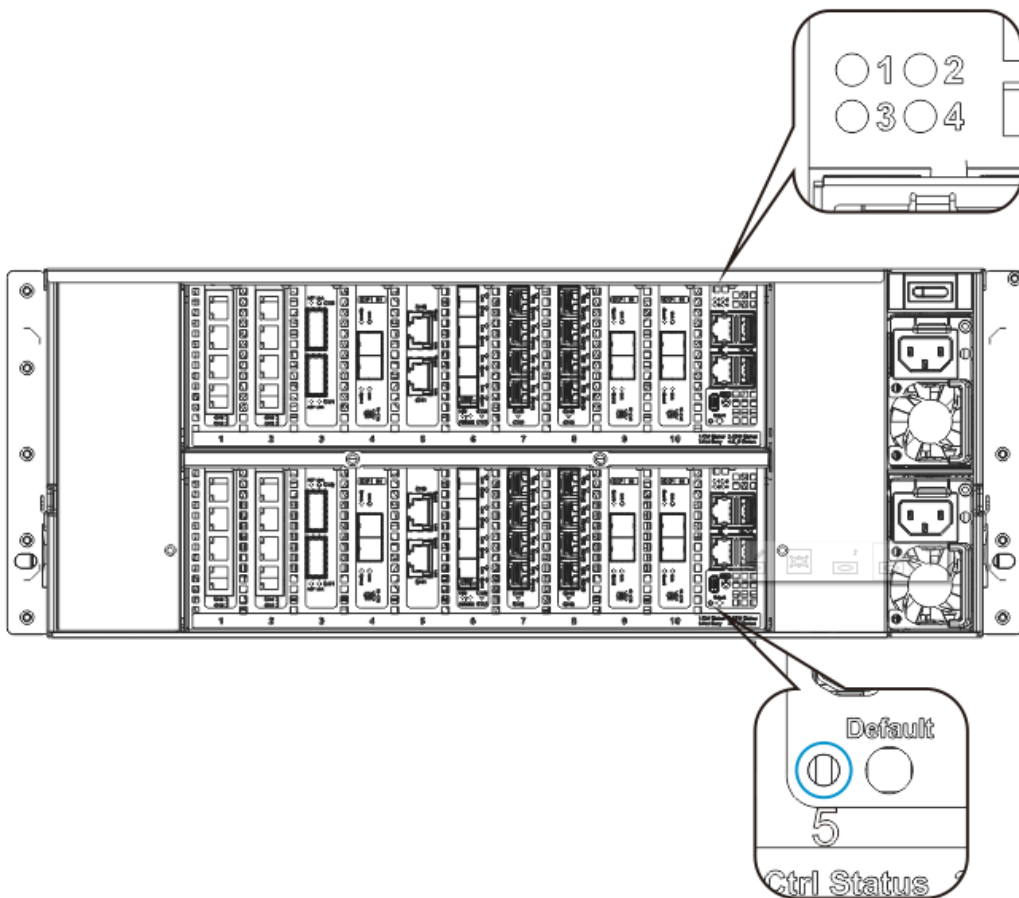
LED Panel
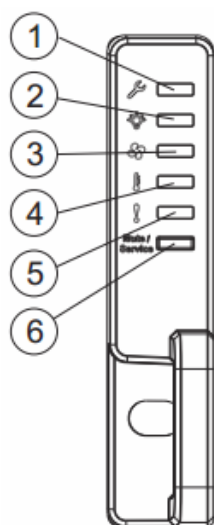
Name	Color	Status
1. Service LED	**White**	**White** indicates that the system is being serviced or is requiring services. **OFF** indicates that the system is not being serviced nor is requiring services.
2. Power LED	**Green / Amber**	**Green** indicates the power supply unit in the system is operating properly. **Amber** indicates the power supply unit in system has failed.
3. Cooling Fan LED	**Green / Amber**	**Green** indicates the cooling fan in the system is operating properly. **Amber** indicates there is a cooling fan failure in the system.
4. Thermal LED	**Green / Amber**	**Green** indicates the system's internal temperature is within the safety threshold. **Amber** indicates the system's internal temperature has exceeded the safety threshold.

5. System fault LED	**Green / Amber**	**Green** indicates the system is operating normally. **Amber** indicates anyone of nodes in the system has encountered abnormal conditions.
6. Mute / Service button	**N/A**	Press the button once to mute the audible alarm. Press and hold for more than two seconds sends a service notification to the host computer.

When lid **amber** to indicate failure, please check the corresponding module(s). For example, if the thermal LED lights up amber, please check if there are faults on the PSUs or the cooling fans.

Storage System Controller LEDs

| Name	Color	Status
1. Ctrl Status	Green / Amber	Green indicates that a controller is operating healthily. Amber indicates that a component failure has occurred, or inappropriate RAID configurations have caused system faults. It is also lit during the initialization process.
2. CBM Status	Green / Amber	Green indicates that CBM is ready which means BBU and SSD Card both are present. Flashing Green indicates that the BBU is charging. Steady Amber means BBU or SSD Card or both failed, or no BBU and/or SSD Card are found in Redundant models. Off indicates that the BBU is not installed in Generic Models.
3. Host Busy Status	Green	Flashing Green indicates that the host is busy.
4. Cache Dirty Status	Amber	Amber steady on indicates Cache Memory is dirty or it's flushing data from FBM to drive (when power back). Flashing Amber means the writing cached data from cache memory to FBM during power outage. Once writing is done, all LEDs are turned off. Off means no data is in cache memory.
5. Restore Default	Green	Green indicates that the default of NVRAM is restored.

On-Board Interface LED Overview

The controller is equipped with eight (8) SFP+ interface ports (may vary by model), two (2) SAS-IN expansion ports and one (1) Ethernet management port.

Ethernet and Management Port LEDs
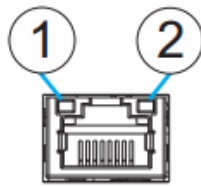
Name	Status	Description
1. Speed	**On**	Indicates 1Gb connection is established.
	Off	Indicates 10/100Mb connection is established or no connection established.
2. Link / Active	**On**	Indicates a connection has been established.
	Flashing	Indicates data I/O.
	Off	Indicates connection is not established.

*The Ethernet and Management Port needs to be connected with a RJ-45 connector.
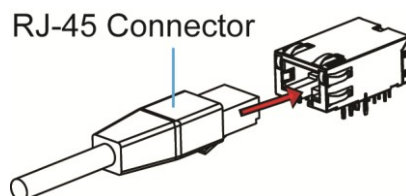
InfiniBand 56G Host Board LED
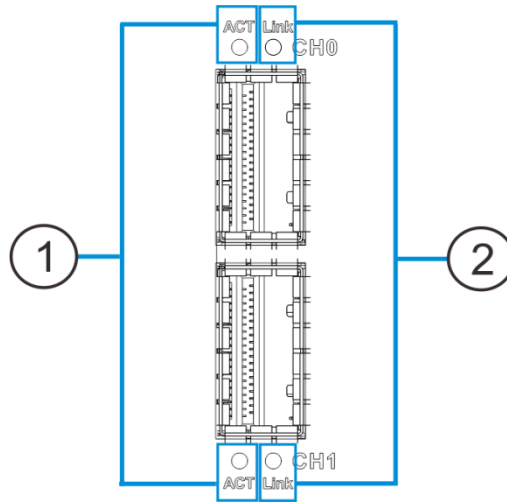
Name	Status	Status
1. Speed	**Green**	Indicates connection is established.
	Amber	Indicates connection is activating.
	Off	Indicates no connection is established.
2. Link / Active	**On**	Indicates a connection is established.
	Off	Indicates connection is not established.

*The InfiniBand Host Board port is connected through InfiniBand connector as below picture shown:
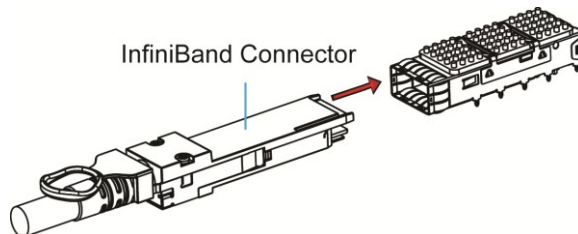
10G Ethernet Port LEDs
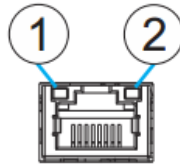
Name	Status	Status
1. Speed	**Green**	Indicates 10Gb connection is established.
	Amber	Indicates 1Gb connection is established.
	Off	Indicates 10/100Mb connection is established.
2. Link / Active	**On**	Indicates a connection is established.
	Flashing	Indicates data activity.
	Off	Indicates connection is not established.

*The 10G Ethernet Port needs to be connected with a RJ-45 connector.
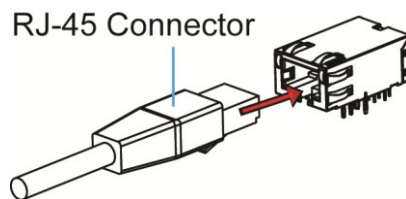
# 10G iSCSI Host Board Port LEDs (RJ-45)
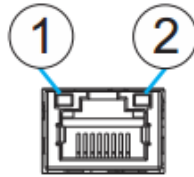
Name	Status	Status
1. Speed	**Green**	Indicates 10Gb connection is established.
	Amber	Indicates 1Gb connection is established.
	OFF	Indicates 10/100Mb connection is established.
2. Link / Active	**ON**	Indicates a connection is established.
	Flashing	Indicates data transmitting.
	OFF	Indicates connection is not established.

*The 10G iSCSI Port needs to be connected with a RJ-45 connector.
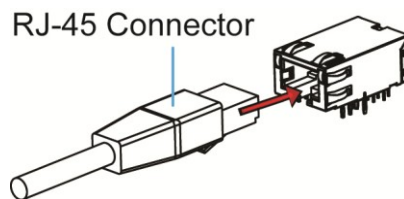
## 10G iSCSI Host Board Port LEDs (Fibre)
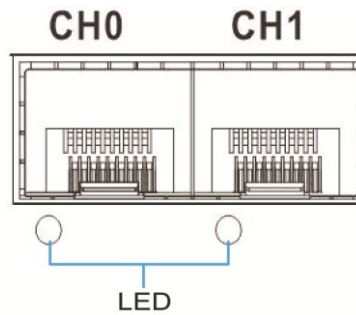
LED status	Color	Status
Steady On	Green	Indicates a link has been established.
Flashing	Green	Indicates an active link.
Off	Off	Indicates a link has not been established.

*The 10G iSCSI Fibre Channel Port is connected with a SFP+ Transceiver with FC Fibre connector attached to it. To install Fibre cable, please refer to Fibre Cabling.
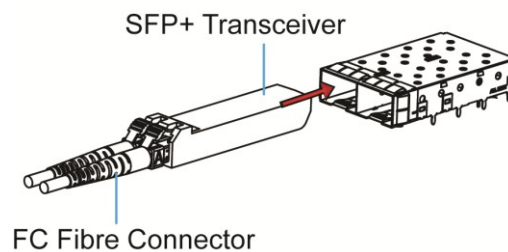
40G iSCSI Host Board Port LEDs
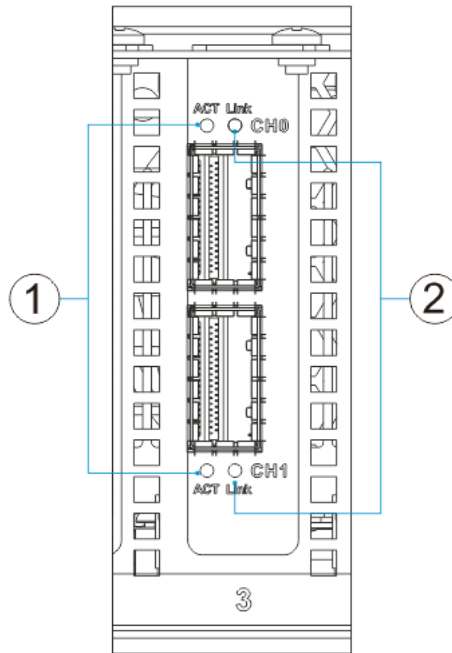
Name	Status	Description
1. Active	**Amber: ON**	Indicates that 40Gb connection is established.
	Flashing amber	Indicates data transmission.
	OFF	Indicates that a connection is not established.
2. Link	**Green**	Indicates an established connection.
	OFF	Indicates that the connection is not established.

*The 40Gb iSCSI Host Board port is connected through the QSFP connector as below picture shown:

QSFP Connector
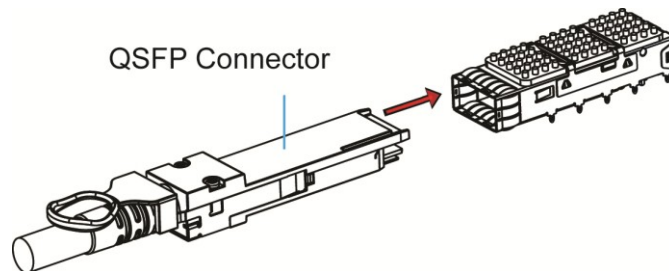
FC 16G Host Board LEDs
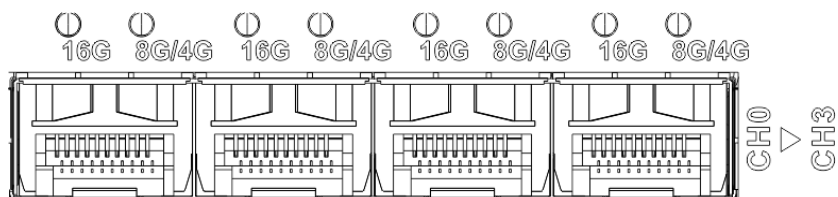
Name	Status	Status
1. Speed	**Green**	Indicates 16Gb connection is established.
	Amber	Indicates 8Gb connection is established.
	Off	Indicates 4Gb connection is established.
2. Link / Active	**On**	Indicates a connection is established.
	Flashing	Indicates data activity.
	Off	Indicates connection is not established.

* The 16G Fibre Channel Port is connected with a SFP Transceiver with FC Fibre connector attached to it. To install Fibre cable, please refer to Fibre Cabling.
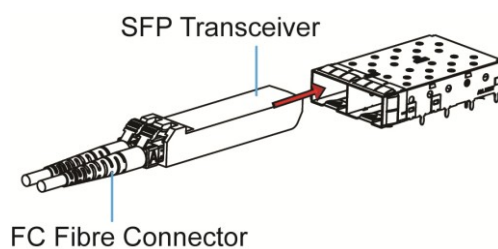
8G Fibre Channel Host Board Port LEDs
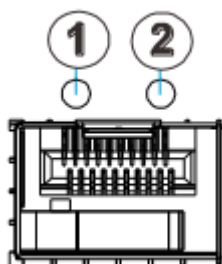
Each controller module houses Fibre channel host ports. Each of these ports has two LEDs for displaying the operating status.
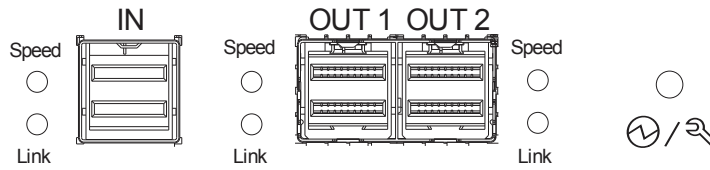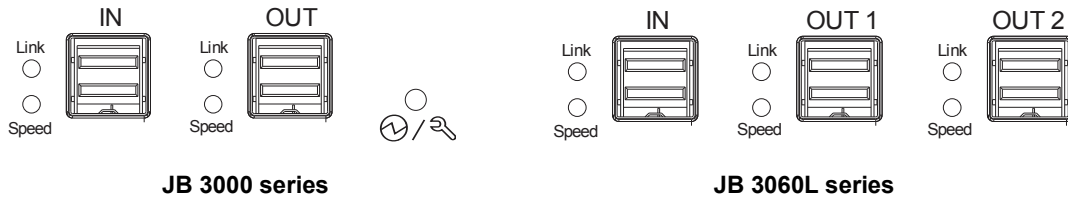
Name	Status	Description
1. Link / Active	**ON**	Indicates an established link.
	OFF	A link is broken.
2. Speed	**Green**	Indicates an 8Gb connection.
	Amber	Indicates a 4Gb connection.
	OFF	Indicates a 2 Gb or no connection.

For systems that come with 8Gb Fibre channel host ports. They deliver fast I/O performance for Storage Area Network (SAN) applications. Optical cables can be used over distances and have been shown to be more reliable. Due to the demands of high transfer rates, optical cables are preferred for 8/4Gbps fiber connectivity. Optical cables are not susceptible to EMI.

*The 8G Fibre Channel Port is connected with a SFP Transceiver with FC Fibre connector attached to it. To install Fibre cable, please refer to Fibre Cabling.
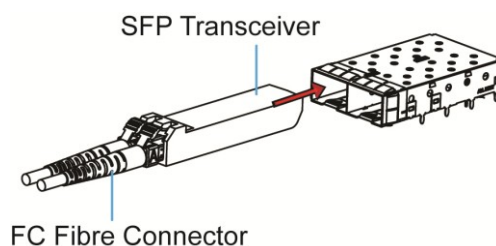
12G SAS Expansion Enclosure Models LEDs

JB 3000 series

JB 3060L series

JB 3060 series (3 drawers)

Name	Status	Description
Link / Active	**On**	Indicates all 4 PHYs are validly linked.
	Flashing	Indicates one of the 4 PHYs links has failed.
	Off	Indicates all 4 PHYs are offline.
Speed	**Green**	Indicates 12Gb link speed.
	Amber	Indicates 6 / 3Gb link speed.
	Off	Indicates no connection.
⊘ / 🔧	**Green**	Indicates the controller is operating normally.
	Amber	Indicates a component failure has occurred. It is also lit during the initialization process.

*The 12G SAS JBOD Models Port is connected through the SAS Connector.
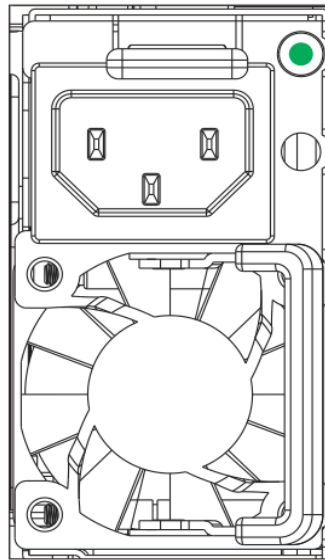

SAS Connector
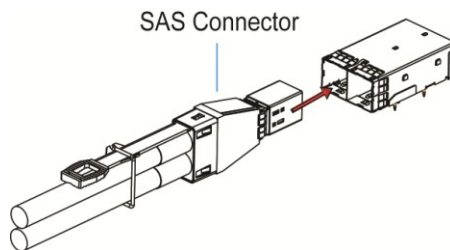
PSU & Fan LED

The PSU (Power Supply Unit) and the fans contain the LEDs for their statuses individually. When either of the PSU or the fan(s) fails, you need to replace them as soon as possible. For details, please refer to Replacing the Power Supply Module.
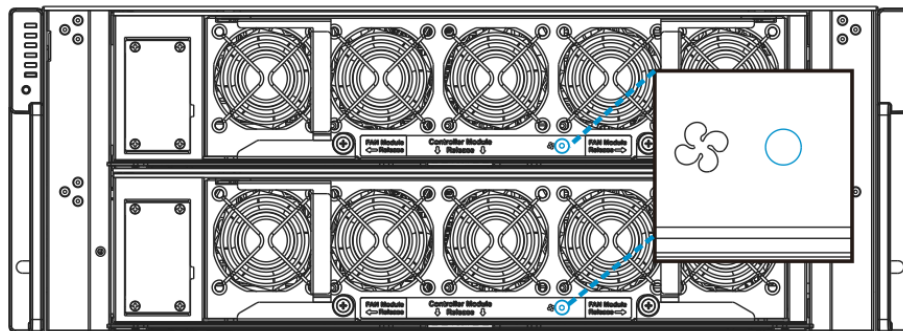
PSU LED:

PSU LED: On (green)

Fan Status LED

Fan Status LED: Off

LED	Color	Status
Fan status LED	Red	**Off** indicates that the cooling fan is operating normally. Red indicates that the cooling fan has failed.

⚠ **WARNING** 75
HAZARDOUS MOVING PARTS!
KEEP FINGERS AND OTHER BODY PARTS AWAY!

Alarms and I2C Bus

Other monitoring schemes include audible alarms and I^2C bus.

Audible Alarms

If any of the following components fails, the audible alarm will be triggered:

- Cooling fan modules

- PSU modules

- CBM module

- Sensors or presence detection circuitries

If an alarm rings out, the administrator must read the error message on the terminal or EonOne screen to determine what has triggered the alarm, and then take appropriate actions to rectify the problem. The alarm can be turned off using the mute button on the front panel and the Alarm beep pattern is described in the **Troubleshooting Guide** included in the CD-ROM.

NOTE

When temperature exceeds a preset threshold, the controller's charger circuits will stop charging. You will then receive a message that reads "Thermal Shutdown/Enter Sleep Mode." When the temperature falls back within normal range, the super capacitor will resume charging.

I^2C

The operating status of PSU and cooling fan modules are collected through an I^2C serial bus. If either of those modules fails, the failure will be detected and you will be notified through the same methods as in the audible alarms.

System Maintenance

<div>
⚠️ **WARNING**

Do not remove a failed component from the system until you have a replacement on hand. If you remove a failed component without immediate replacement, it will disrupt the internal airflow.

Qualified engineers who are familiar with the system should be the only ones who make component replacements.

When inserting a removable module, do not use excessive force. Forcing or slamming a module can damage the connector pins either on the module itself or on the backplane.
</div>

The following components can be replaced:

- Controller module (please refer to Replacing the Controller Module)

- Memory module (please refer to Replacing the Memory Module on Storage Systems)

- CBM module (please refer to Replacing the Cache Backup Module (CBM))

- Host board (please refer to Replacing the Controller Host Board)

- PSU module (please refer to Replacing the Power Supply Module)

Restoring Default System Settings

> **NOTE**
>
> Restoring default settings is a last-resort function. All configurations, such as parameters and host LUN mappings, will be erased.

You may need to restore default settings in the following cases:

• When the firmware update procedure requires it.

• When you need to reset the password to access the storage system.

Restoring Default Settings

To restore default settings, follow these steps.

1. Stop all host I/O's.

2. Save the current configuration using the **Export NVRAM** function.

3. You may also want to make a list of the existing ID/LUN mapping information because the default restoration will erase the ID/LUN mapping associations (e.g., which logical drive is associated with which host ID/LUN)

4. Remove Controller B from the chassis. Please refer to <u>Removing the Controller</u>.

5. Power off the storage system.

6. Press and hold the Restore Default button on Controller A. You may use a straightened paper clip to press the button. While pressing the Restore Default button down, power on the storage system.

7. Keep pressing the Restore Default button till the Restore Default LED lights up, then release the Restore Default button.

8. System default has been restored when the Controller Status LED changes the color from **amber** to **green**.

9. Restore previous settings using the **Import NVRAM from reserved space** or **Restore NVRAM from Files** in the firmware. ID/LUN mapping will be restored.

10. Power off the system.

11. Replace Controller A with Controller B (Controller B will be inserted into Controller A's slot) While leaving Controller B slot empty with Controller B in slot A, perform the above steps 1 to 8 to restore Controller B to default settings.

12. Put both Controller A and Controller B into their original positions and power up the system.

Replacing the Storage System Controller Module(s)

 WARNING

Controller firmware **MUST** be identical for proper functionality.

DO NOT mix controller modules from different models. Each controller has a unique ID which is applied to host port names. As the result, you may encounter SAN problems with identical port names on multiple systems.

When removing a controller from this system, ensure that your applications have been shut down beforehand.

Controller firmware **MUST** match so before you replace a controller in a dual-controller system, please check if the firmware of the operational controller matches the replacement controller sent to you. The replacement controller sent to you will state its firmware version with a label on the packaging. To find out the firmware version of your operating controller, use Storage Manager > Information > Enclosure View in EonOne (please refer to the **EonOne Manual** for details).

To update the firmware refer to the following documents:

- **EonStor GS EonOne User Manual** on Upgrading the Firmware

- **Software manual** on System Functions: Upgrading Firmware

To update the firmware, please follow these steps:

1. Prepare a clean, static-free work pad or container to place the controller.

2. **Shut the system down.** Stop all I/O access to the system and make sure all cached writes have been distributed to disk drives using firmware's Main Menu -> System Functions > Shutdown controller function. Power off the system and turn off the power switch and unplug the power cords from PSUs.

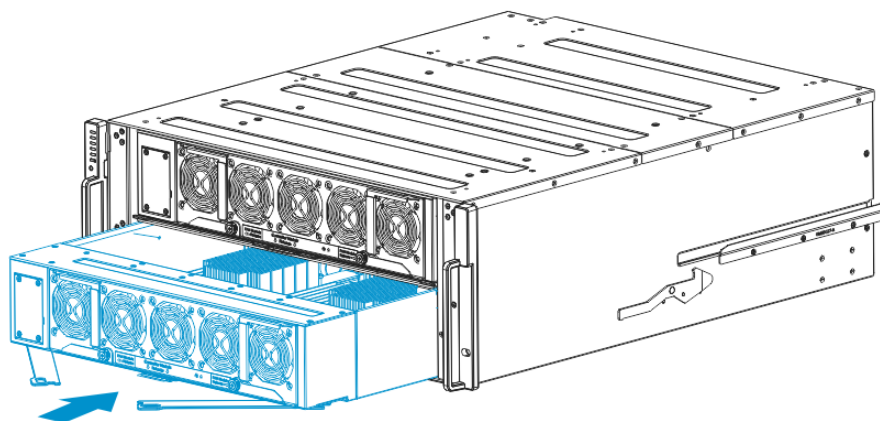3. **Disconnect all cables** that are connected to the controller module.

Push the controller release button to release the ejection handles.

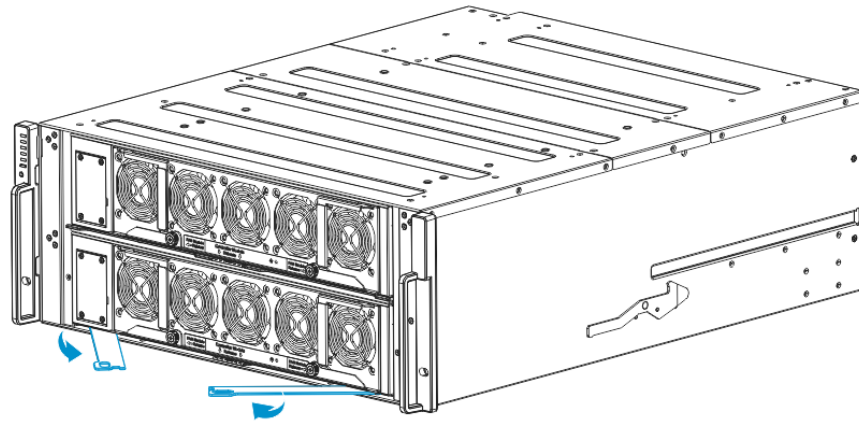Controller release button

Ejection handles
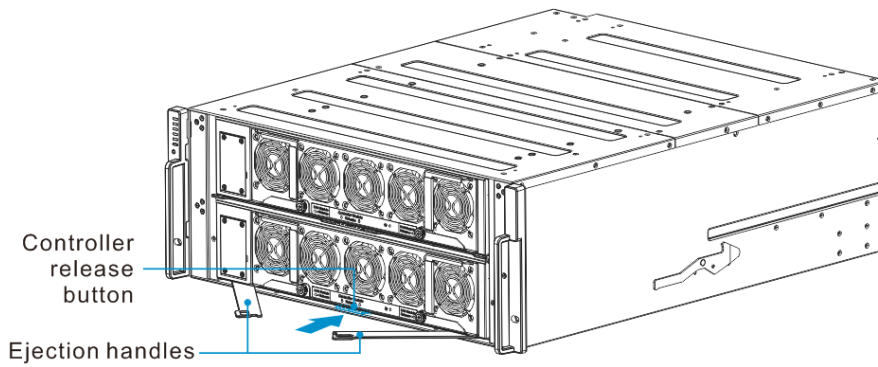
Pull the handles and remove the controller from the enclosure..
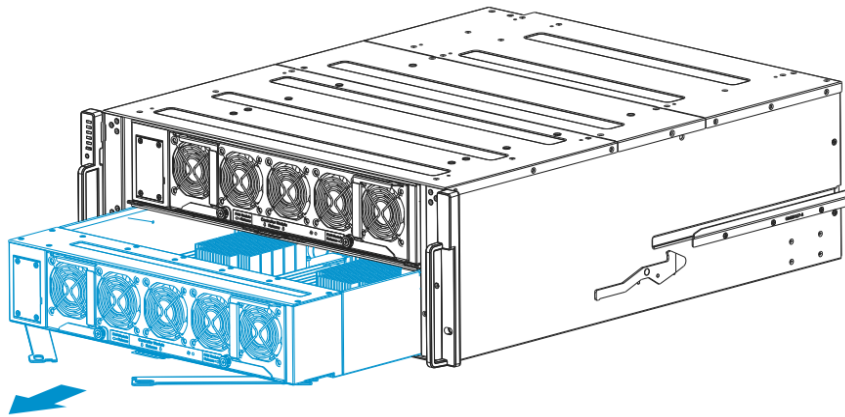
4. Insert the controller slowly into the module slot. When you feel the contact resistance, use slightly more force and then push the controller into chassis.

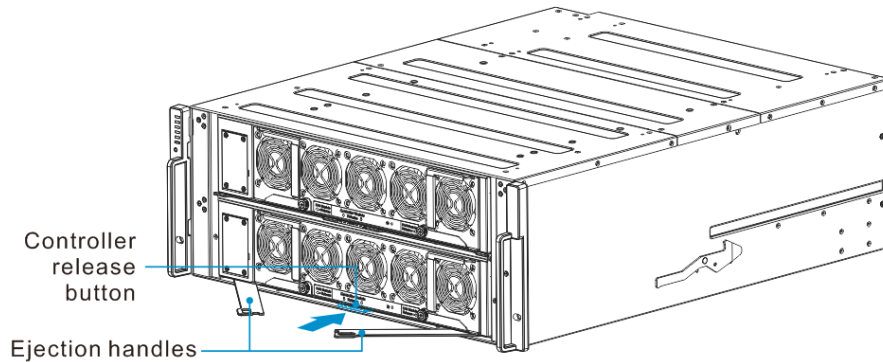5.   Gently push the ejection handles back in place.

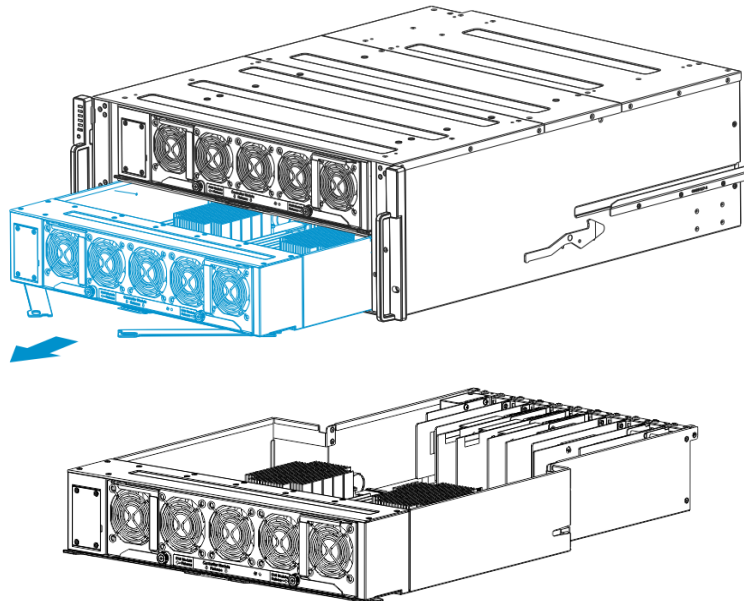6.   Reattach all the cables.

Replacing a Host Board

If you want to replace any host boards, you have to remove the controller first.

Removing the Controller

1. Push the controller release button to release the ejection handles.

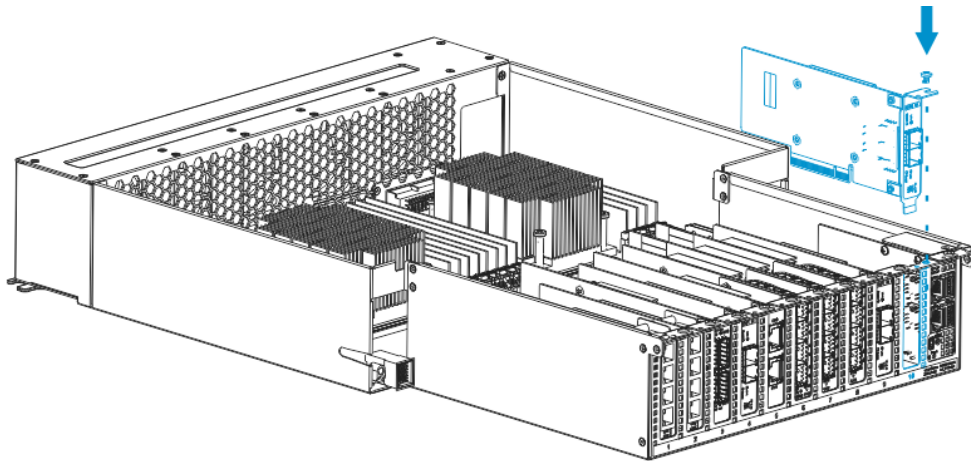2. Pull the handles and remove the controller from the enclosure.
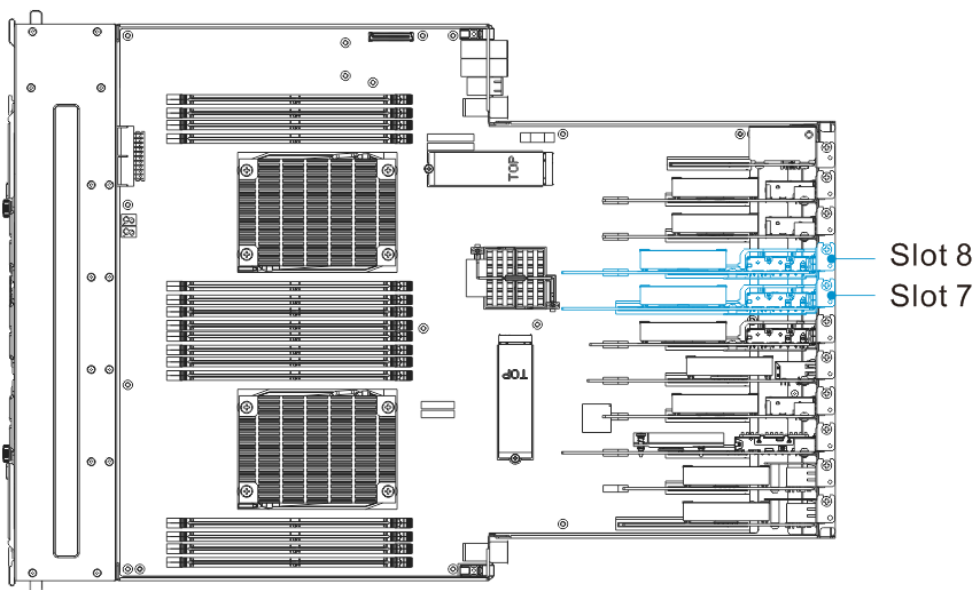
Replacing the Host Board(s)

Insert the host board into the slot, and secure the screw to the controller.

Replacing Memory Module(s)

The Controller comes with pre-installed DRAM module(s). You may upgrade it or replace it when the original module malfunctions (shown as the "NVRAM failure" event in EonOne). If you have two or more modules installed, please identify correctly which one has failed before proceeding with the replacement procedure.
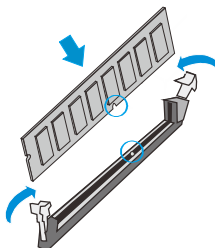

⚠ **WARNING**

If you are installing only one or replacing just one DRAM module, with the I/O ports pointing at you, always install to the DRAM slot on the right. Follow the ESD Precautions (refer to ESD Precautions). Contact your system vendor for selecting a compatible DRAM module. Reusing the DRAM module removed from a failed controller is not recommended unless you have a similar system to test its integrity.

Installing the DIMM Module

1. Remove the controller module (refer to Replacing the Controller Module).

2. **Wait for one minute** for the remaining electricity on the main board to disperse.

3. Push down the clips on the sides of the DIMM socket. The DIMM will eject automatically from the socket.
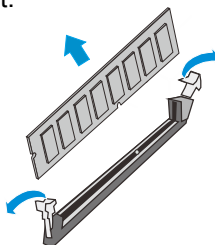
4. **Insert the replacement module**. Make sure the side clips are in the open position. Align the DIMM module with the socket and firmly push the DIMM module into the socket. The side clips will close automatically and secure the DIMM module into the socket.

5. Reinstall the controller module into the chassis (refer to Replacing the Controller Module).
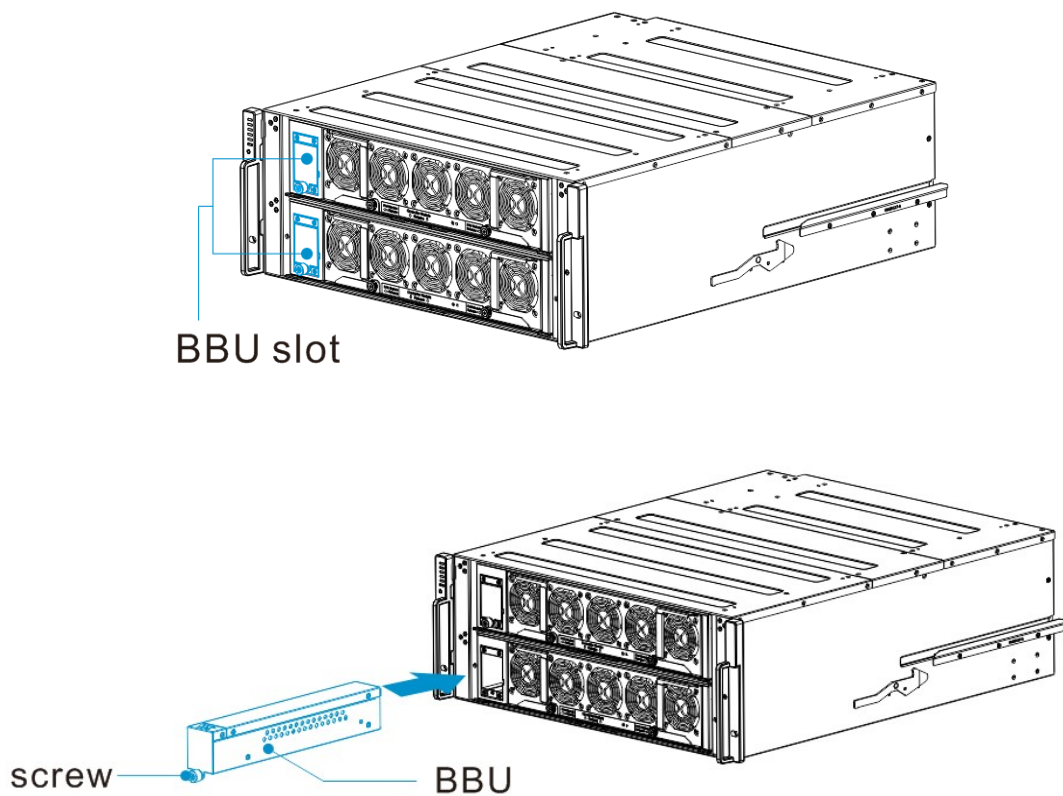
Replacing the BBU(s)

> ⚠️ **WARNING**
>
> Make sure you have the correct replacement module(s) on-hand before you attempt to replace the BBU(s).

To remove the BBU(s), loosen the screw, then pull the BBU(s) out of the chassis.

To install the BBU(s), slide the BBU(s) into the chassis.
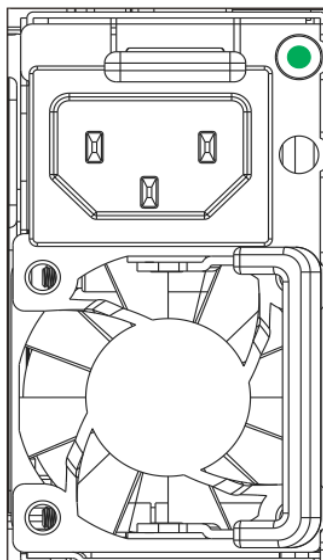Once fully installed, secure the BBU with a screw.

BBU slot

screw —— BBU

Replacing the Power Supply Unit / Fan

Detecting the Failed PSU(s)

If the PSU(s) fails, the system will notify you through the following indicators:

- PSU status LED location

- Audible alarm (refer to <u>Audible Alarms</u>)

- Firmware utility (refer to **Firmware User Manual** in the CD-ROM for details)

- EonOne manager software (refer to **EonOne User Manual** in the CD-ROM for details)

Replacing Power Supply Unit

The failed PSU(s) should be replaced as soon as possible, but only when you have a replacement in your hand. Contact your vendor for more details.
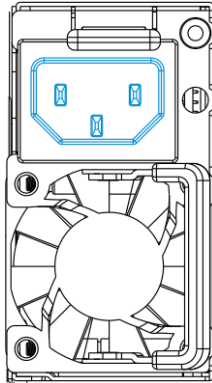
> ⚠ **WARNING**
>
> Although the system can operate with a failed PSU in a system, it is not recommended to run the system with a failed PSU for an extended period of time. The failed one should be replaced as soon as possible.

To replace a PSU, follow these steps:

1. [Power off the system](#) and unplug the power cord.

2. To remove the PSU module, flip the latch (shown in blue) and pull the extraction handle (shown in red) aside to disconnect the PSU from the backplane connectors. Once dislodged, gently pull the PSU out of the system. If the system is mounted in a rackmount rack, use another hand to support its weight while removing the module.
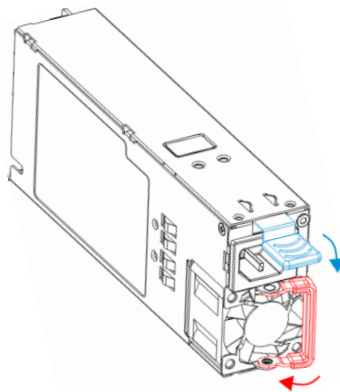

3. Insert the replacement module. Make sure the extraction handle is pointing outwards. Push the replacement PSU into the chassis, and when you feel the contact resistance, push the extraction handle towards the PSU module and it should engage the back-end connectors.

4. Reconnect the power cord.

5. Power on the PSU module.

Detecting the Failed Fan(s)

If the fan(s) fails, the system will notify you through the following indicators:

- Fan status LED location (as pointed)
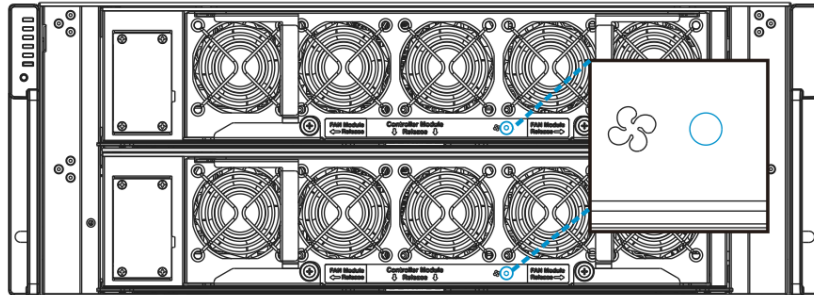
- Audible alarm (refer to Audible Alarms)

- Firmware utility (refer to **Firmware User Manual** in the CD-ROM for details)

- EonOne manager software (refer to **EonOne User Manual** in the CD-ROM for details)

Replacing the Fan(s)

The fan(s) should be replaced as soon as possible, but only when you have a replacement in your hand. Contact your vendor for more details.
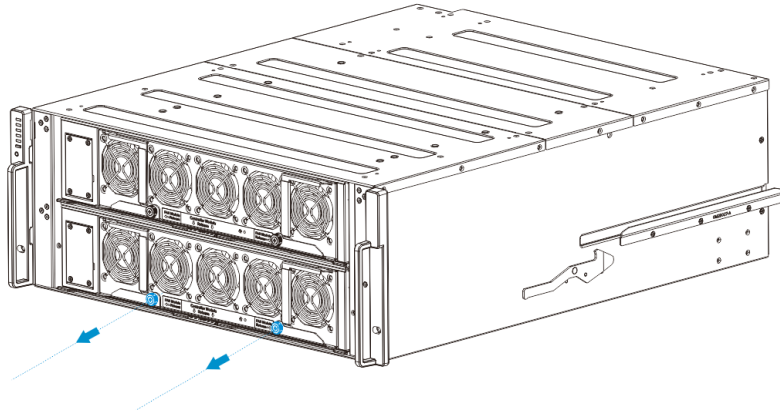

⚠️ **WARNING**

Although the system can operate with a failed fan in a system, it is not recommended to run the system with a failed fan for an extended period of time. The failed one should be replaced as soon as possible.

To replace the fan(s):

1. Loosen the screws of the fan module that needs replacement.
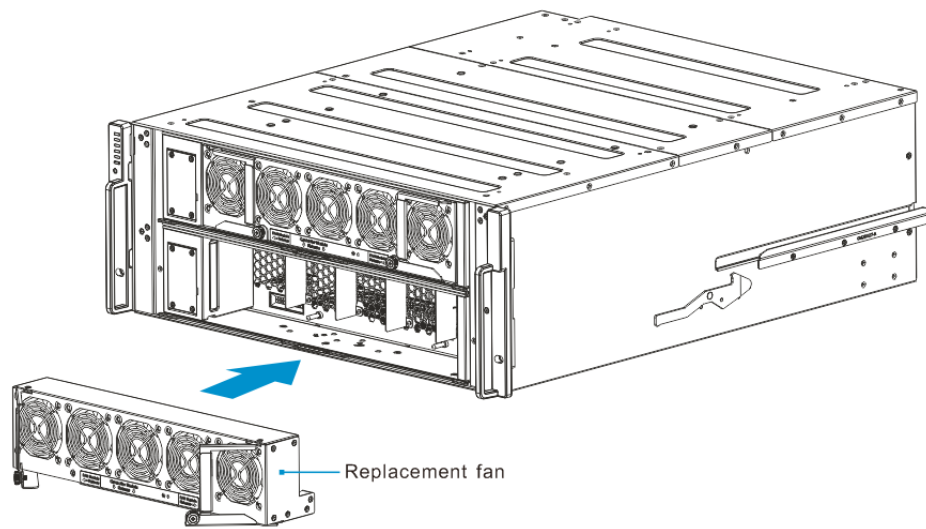

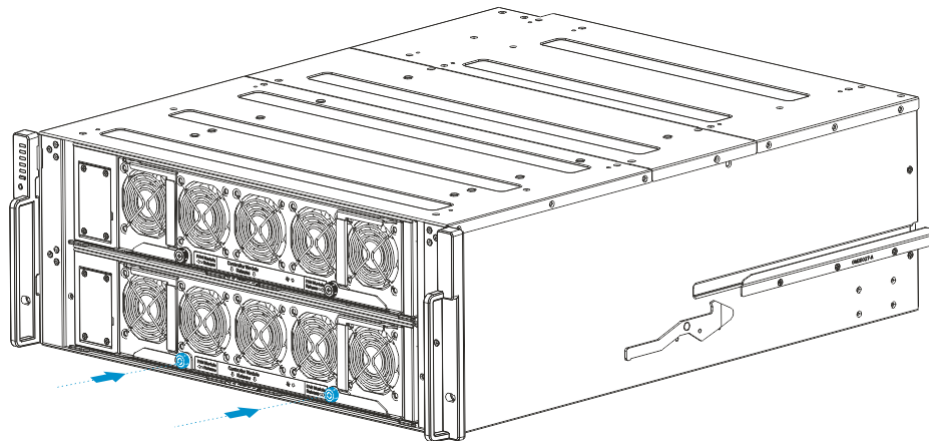2. Move the left and right handles of the fan module to the sides of the enclosure.
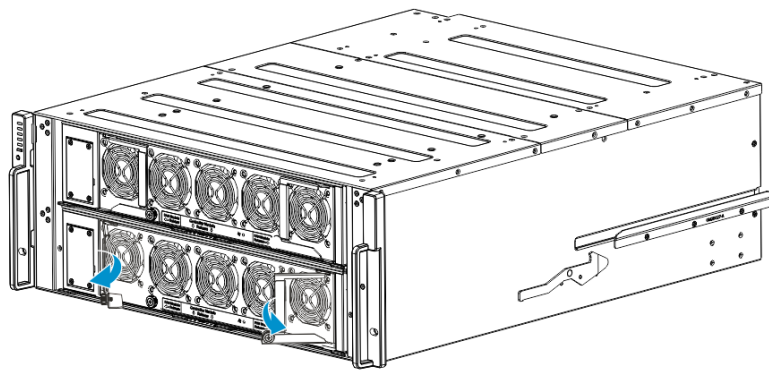
3. Pull both handles to remove the fan module from the enclosure.
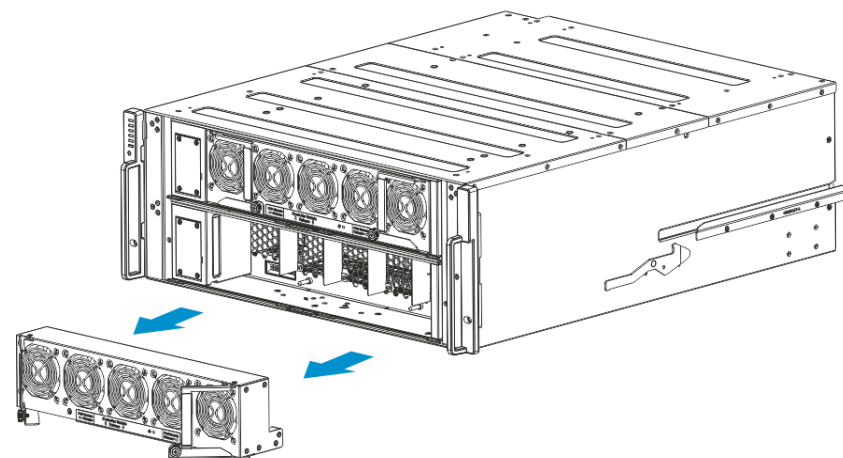
4. Orient and align the replacement fan module to the slot, then insert it to the enclosure.

Replacement fan

5. Secure the newly-replaced fan module to the enclosure with the two thumb screws that you removed in step 1.

Appendix

Technical Specifications

Host Board Interface

Fibre/iSCSI hybrid-host Storage Systems	
Host Interface	8Gbps / 16Gbps Fibre
Drive Interface / channel	Supports 12 / 16 / 24 channels of 3 / 6 / 12 Gbps SAS, SATA-II/SATA-III, Near-line SAS series
Host Interface	8Gbps / 16Gbps Fibre + 2iSCSI (onboard)
SAS/iSCSI hybrid-host Storage Systems	
Host O/S Compatibility	Host O/S independent
Host Interface	3Gbps / 6Gbps / 12Gbps Multi-lane SAS
Host Channels	Multiple SAS PHYs logically combined into 2 host channels per controller
Drive Interface / channel	Supports 12 / 16 / 24 channels of 3 / 6 / 12 Gbps SAS, SATA-II/SATA-III, Near-line SAS series
iSCSI-host Storage Systems	
Host O/S Compatibility	Host O/S independent / iSCSI offload utilities and hardware
Host Interface	RJ-45 Gigabit Ethernet / RJ-45 10Gb Ethernet / 10Gb FCOE
Drive Interface / channel	Supports 12 / 16 / 24 channels of 3 / 6 / 12 Gbps SAS, SATA-II/SATA-III, Near-line SAS series
Expansion enclosure models	
SAS Interface	Eight SMP PHYs interfaced through two / three 12Gb SAS ports
Drive Interface / channel	Supports up to 12 / 16 / 24 / 60 channels of 3 / 6 / 12 Gbps SAS, SATA-II/SATA-III, Near-line series

*Host board interface and specifications are subject to change without prior notice. For the latest specifications and information, please refer to the official EonStor GS website.

Dimensions

Dimensions	Without chassis ears & protrusions
Height	175mm
Width	447mm
Length	577mm

Environment

Humidity	5 to 95% (non condensing – operating and non-operating)

Temperature	Operating:
	   a. With Cache Backup Module 0º to 35ºC
	   b. Without Cache Backup Module 0º to 40ºC
	Non-operating: -40º to 60ºC

Altitude	Operating: Sea level to 12,000ft Packaged: Sea level to 40,000ft
Shock (Half-sine)	Operating: 5G, half-sine, 11ms pulse width Non-operating: 15G, half-sine, 11ms pulse width
Vibration	(Random) Operating: 5 to 500Hz, 0.25Grms, X/Y/Z, 30min Non-operating: 5 to 500Hz, 1.0Grms, X/Y/Z, 30min (Sine) Operating: 5 to 500Hz, 0.2Grms, X/Y/Z Sine, 1hr/sweep Non-operating: 5 to 500Hz, 1.0Grms, X/Y/Z Sine, 1hr/sweep
Acoustic Noise	65dBA boundary, 60dBA normal

Certifications

Summary

Safety	UL (60950-1 2'nd)
	BSMI CNS 14336: 2005
	CB IEC 60950-1, 2'nd Edition
	GOST-R GOST R 60950-1-2005
EMC	CE EN 55022: 2006/A1:2007 / EN 61000-3-2: 2006 / EN 61000-3-3: 1995/A1: 2001 /A2: 2005 / EN 55024: 1998/A1: 2001/A2: 2003
	IEC 61000-4-2:1995/A2:2000
	IEC 61000-4-3:1995/A2:2006
	IEC 61000-4-4:2004
	IEC 61000-4-5:2005
	IEC 61000-4-6:2003/A1:2004/A2:2006
	IEC 61000-4-8:1993/A1:2000,
	IEC 61000-4-11: 2004
	IEC 61000-3-2, IEC61000-3-3
	BSMI (CNS 13438)
	FCC (FCC Part 15,subpart B)
Environment	IEC 60068-2
	MIL-STD-810E/883E
	ISTA
	ASTM-D3332
	IPC-TM-650
Others	ISO7779/3744
	RoHS
	Microsoft WHQL-Windows Server 2003

警告使用者：

這是甲類資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當對策

사 용 자 안 내 문
이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

Slide Rail Kit Installation Guide

Slide Rail Kits

If you are unable to locate clear instructions on installing your enclosure, please contact Technical Support.

Enclosure Installation Prerequisites

To ensure proper installation and functionality of the storage system, please observe the following warnings:

- Cross check all components have been received against the "Unpacking List". Contact your vendor immediately if anything is missing
- Install the enclosure as-is out of the packaging; install optional modules (e.g. FBM) after the enclosure has been mounted
- Wear an anti-static wristband before and during the installation procedure
- It is recommended to plug the system into two different power sources (e.g. into a power outlet and another into a UPS)
- Ensure the rack which the enclosure will be mounted onto has proper grounding and over-current protection
- Do not obstruct ventilation openings; provide 20cm of free space at the front and back of the enclosure for air circulation; keep the ambient temperature below 35 degrees Celsius

Unpacking the System

Use the "Unpacking List" to cross check all components have been received. The basic contents include one GUI CD pack, Quick Installation Guide and Storage Enclosure Installation Guide. For details on each slide rail kit contents, please refer to specific kit installation details in this manual.

Component Installation Procedure

Please install components in the following order:

1. Rackmount rails onto the enclosure / rack / cabinet
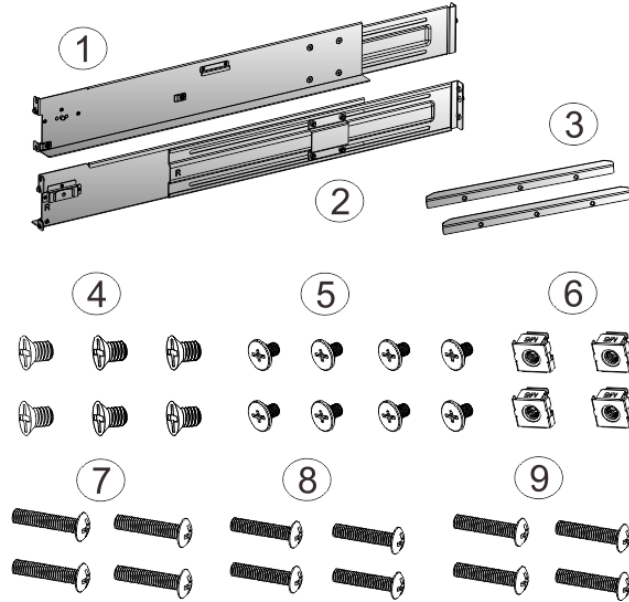2. Enclosure onto the slide rail and into the cabinet

Tools Required

For each of the slide rail installation procedures, you will need the following tools:

- One medium sized Phillips screwdriver
- One small sized Phillips screwdriver
- One medium size flat blade screwdriver

Slide Rail Kit

The following table shows all accessories that came with the slide rail kit.

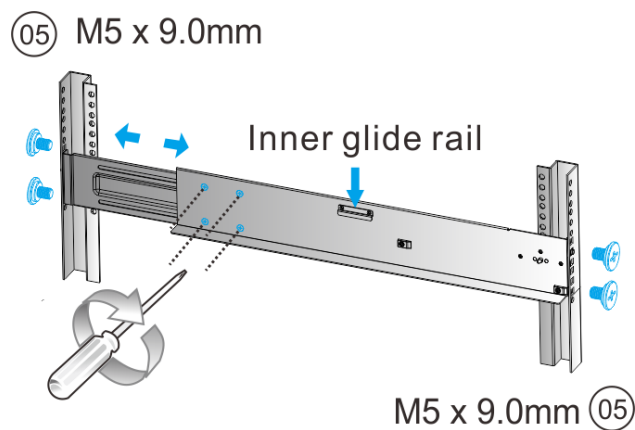| Item	Description	Quantity
01	Mounting bracket assembly, left-side	1
02	Mounting bracket assembly, right-side	1
03	Inner glides	2
04	Flathead screws #6-32 L4	6
05	Truss head screws M5 x9.0mm	8
06	M5 cage nuts	4
07	M5 x 25mm	4
08	M6 x 25mm	4
09	#10-32 x 25.4mm	4

Installation Procedure

1. Determine the exact position for enclosure installation (front and rear rack posts).

   Refer to the illustration to insert cage nuts into the front rack post and truss head screws to secure the slide rail.
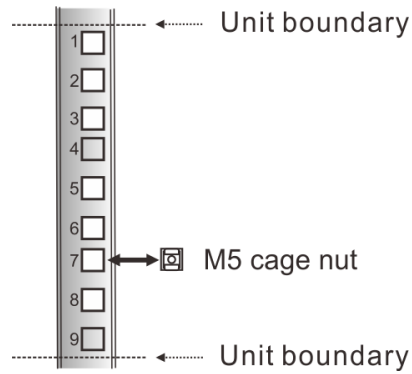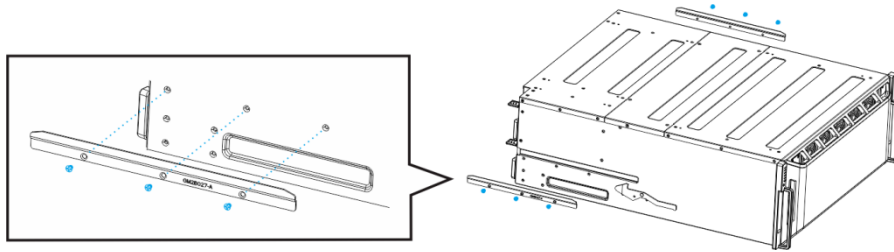

2. Adjust the length by loosening the four screws on the slide rail. Secure the slide rails to front and rear posts using truss head screws. Tighten the four screws on the slide to fix the length.
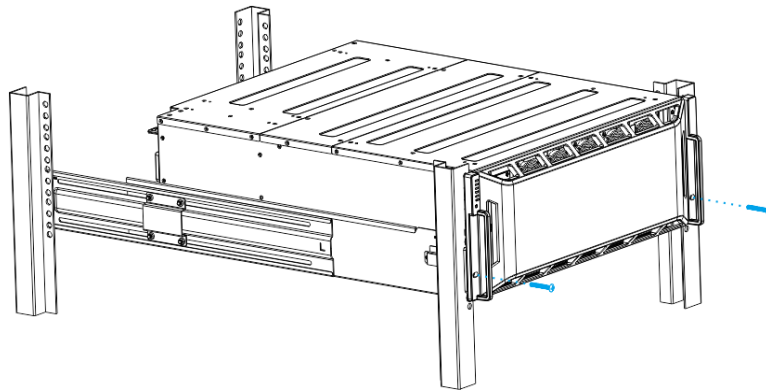

Item	Description
05	Truss head screws M5 x 9.0mm

3. Attach the inner glides to BOTH sides of the enclosure using flathead screws #6-32.

4. With the assistance of another person, lift and insert the enclosure onto the slide rail. Make sure the inner glides on both sides of the enclosure meets the inner glide rail. Secure the enclosure using M5 or M6 screws from the front.

Once Mounted

Once the enclosure has been mounted, you may refer to the User's Manual that came with your system for further instructions on completing the hardware installation process. The User's Manual will go on to explain details on installation / maintenance of hard drives, controllers, optional modules (CBM etc.), cooling modules, power supplies, cable connections, topology configurations, etc.

Safety Reminders

If you must relocate the enclosure after installation
- Cease all input / output transactions, shutdown the system, disconnect all the cables (please refer to the User Manual for details)
- Modules came installed within the enclosure need not be removed

When the system is in operation
- Module must not be empty! They must have a dummy cover / plate in place to stabilized internal airflow
- Should a module fail, leave it in its place until you have the replacement item on-hand to take its place
- Allow at least 18~20cm of clearance space at the rear of the enclosure for ventilation
- Avoid touching the PCB and gold-finger connections