

ALTOS

an Acer Group Company

Altos BrainSphere™

R380 F6

**R380 F6 , R380 F6 LFF, R380 F6
SFF, Altos R380 F6**



USER'S MANUAL

Revision 1.0

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Preface

About this Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the server. Installation and maintenance should be performed by experienced technicians only.

Please refer to the R380 F6 server specifications page on our website for updates on supported memory, processors and operating systems.

Notes

For your system to work properly, please follow the links below to download all necessary drivers/utilities and the user's manual for your server.

- Altos product manuals: <https://www.altoscomputing.com/zh-TW/download>
- Product drivers and utilities: <https://www.altoscomputing.com/zh-TW/download>

If you have any questions, please contact our support team at:

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This manual may be periodically updated without notice. Please check the Altos website for possible updates to the manual revision level.

Warnings

Special attention should be given to the following symbols used in this manual.



Warning! Indicates important information given to prevent equipment/property damage or personal injury.



Warning! Indicates high voltage may be encountered when performing a procedure.

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Chapter 1

Introduction

1.1 Overview

This chapter provides an outline of the functions and features of the Altos BrainSphere™ R380 F6. The following provides an overview of the specifications and capabilities.

System Overview	
Motherboard	SB.RTX11.002
Processor	Dual 4th Gen Intel Xeon Scalable in E (LGA-4189) sockets with four UPIs (16GT/s max.) and a thermal design power (TDP) up to 350W
Memory	Supports up to 8TB RDIMM DDR5 ECC memory with speeds up to 4800MT/s in 32 DIMM slots
Storage	Twelve 3.5" or 2.5" hot-swap NVMe/SAS/SATA front drive bays Two M.2 NVMe/SATA hybrid slots with support for M-key 2280 and 22110
Expansion Slots	Default Four PCIe 5.0 x8 slots and two PCIe 5.0 x16 slots Options Two PCIe 5.0 x8 slots and three PCIe 5.0 x16 slots
I/O Ports	One OCP 3.0 compatible slim AIOM slot (second slot optional) One RJ45 dedicated BMC LAN port Two rear USB 2.0 ports One VGA port
System Cooling	Four heavy duty fans w/optimal fan speed control Two air shrouds
Power	Two redundant power supplies Default: 1200W, 80Plus Titanium level
Form Factor	2U Rackmount 3.5 x 17.2 x 31.6in. / 89 x 437 x 803mm (HxWxD)

1.2 System Features

The following views of the system display the main features.

Front View

Control Panel



Service/Asset Tag

Logical Storage Drive Numbers	
Item	Description
0-11	Twelve 3.5-inch or 2.5-inch front drive bays, NVMe, SAS, or SATA with additional parts

Drive Carrier Indicators

Each drive carrier has two LED indicators: an activity indicator and a status indicator. For RAID configurations using a controller, the meaning of the status indicator is described in the table below. For OS RAID or non-RAID configurations, some LED indications are not supported, such as hot spare. For VROC configurations, refer to the VROC section in this manual.

Drive Carrier LED Indicators			
	Color	Blinking Pattern	Behavior for Device
Activity LED	Blue	Solid On	Idle SAS/NVMe drive installed
	Blue	Blinking	I/O activity
	Blue	Off	Idle SATA drive installed
Status LED	Red	Solid On	Failure of drive with RSTe support
	Red	Blinking at 1 Hz	Rebuild drive with RSTe support
	Red	On for five seconds, then off	Power on for drive with RSTe support
	Red	Blinking at 4 Hz	Identify drive with RSTe support
	Green	Solid Green LED	Safe to remove NVMe device
	Amber	Blinking at 1Hz	Do not remove NVMe device

Control Panel

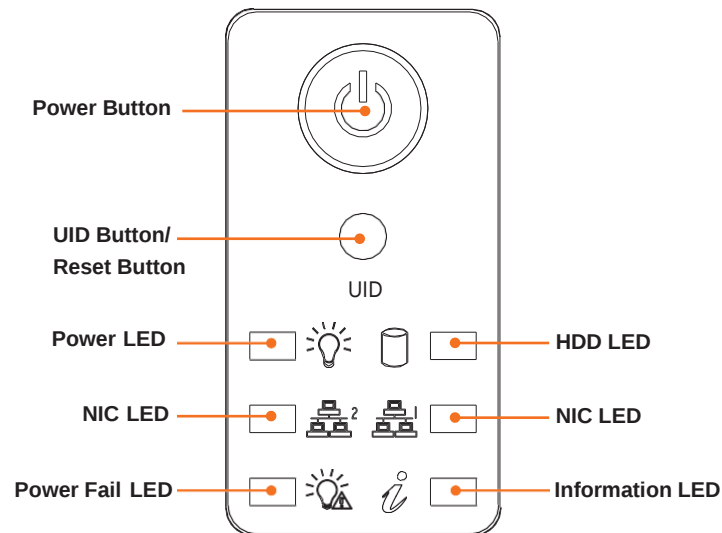


Figure 1-2. Control Panel

Control Panel Features	
Features	Description
Power Button	The main power switch applies or removes primary power from the power supply to the server but maintains standby power.
UID Button/ Reset Button	The unit identification (UID) button turns on or off the blue light function of the Information LED. This button can also be used to reset the system, depending on the JRU1 settings.
Power LED	Steady on – Power on Blinking at 4Hz – Checking BIOS/BMC integrity Blinking at 4Hz and "i" LED is blue – BIOS firmware updating. Two blinks at 4Hz, one pause 2hz and "i" LED blue – BMC firmware updating. Blinking at 1Hz and "i" LED red – Fault detected
NIC LEDs	Indicates network activity on a LAN when flashing; defaults to the first two ports of CPU1. AIOM.
Power Fail LED	Indicates a power supply module has failed.
HDD LED	Indicates activity on the hard drive when flashing.
Information LED	Alerts operator to several states (noted in the table below).

Information LED	
Color, Status	Description
Red, solid	An overheating condition has occurred
Red, blinking at 1Hz	Fan failure, check for an inoperative fan
Red, blinking at 0.25Hz	Power failure, check for a non-operational power supply
Red, blinking at 10Hz	CPLD recovery mode error

(Table continued on next page)

Information LED	
Color, Status	Description
Blue, solid	Unit ID has been activated by switch
Blue, blinking at 1Hz	Unit ID has been activated using the BMC
Blue, blinking at 2Hz, and BMC Heartbeat LED on the motherboard is green	BMC is resetting
Blue, blinking at 4Hz	BMC is setting factory defaults
Blue, blinking at 10Hz	BIOS/BMC is recovering or updating
Red, blinking at 10Hz and the rear UID LED is blue, blinking at 10Hz	CPLD recovery or update is in progress

Rear View



BMC LAN Port

Power Supplies

USB Ports

VGA Port

UID Button

Figure 1-3. System Rear View

System Features: Rear	
Feature	Description
Power Supplies	Two redundant power supply modules
VGA Port	Video port
USB Ports	Two USB 2.0 ports
BMC LAN Port	Dedicated port to access the BMC; for indicator details, see BMC LAN LEDs
UID Button	The unit identification (UID) button turns on or off the blue light function of the Information LED. This button can also be used to reset the BMC.

Expansion Slot Locations	
Item	Description
 	1~4 Two PCIe 5.0 x8 (in x16) and One PCIe 5.0 x16 full-height, full-length slots (CPU2)
 	5~8 Two PCIe 5.0 x8 (in x16) and One PCIe 5.0 x16 full-height, full-length slots (CPU1)
	x16 OCP 3.0 AIOM slot (CPU1)
	(Optional) x16 OCP 3.0 AIOM slot (CPU2)

Note: Some combinations of expansion slot options may not be available due to the limited number of PCIe lanes reserved for expansion slots.

Power Supply Indicators

Power Supply Indicator	
LED Color and State	Power Supply Condition
Solid Green	Indicates that the power supply is on
Blinking Green	Indicates that the power supply is plugged in and turned off by the system.
Blinking Amber	Indicates that the power supply has a warning condition and continues to operate.
Solid Amber	Indicates that the power supply is plugged in, and is in an abnormal state. The system might need service. Please contact Altos technical support.
Off	No AC power to modules

Top View

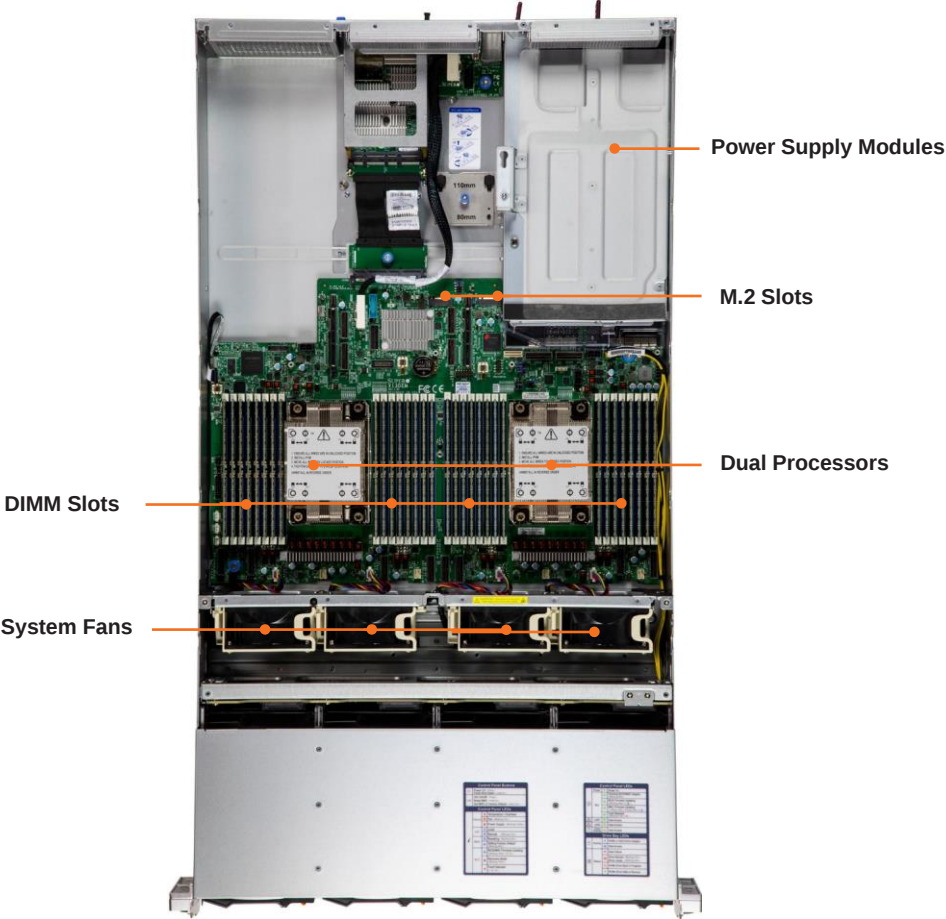


Figure 1-4. System: Top View

System Features: Top	
Feature	Description
M.2 Slots	Two slots for M.2, NVMe or SATA
Power Supplies	Dual redundant modules
DIMM Slots	Thirty-two memory slots
Processors	Dual 4th Gen Intel Xeon Scalable with heatsinks
System Fans	Four 8-cm heavy duty fans with Optimal Fan Speed Control

1.3 System Architecture

This section covers the locations of the subsystem components.

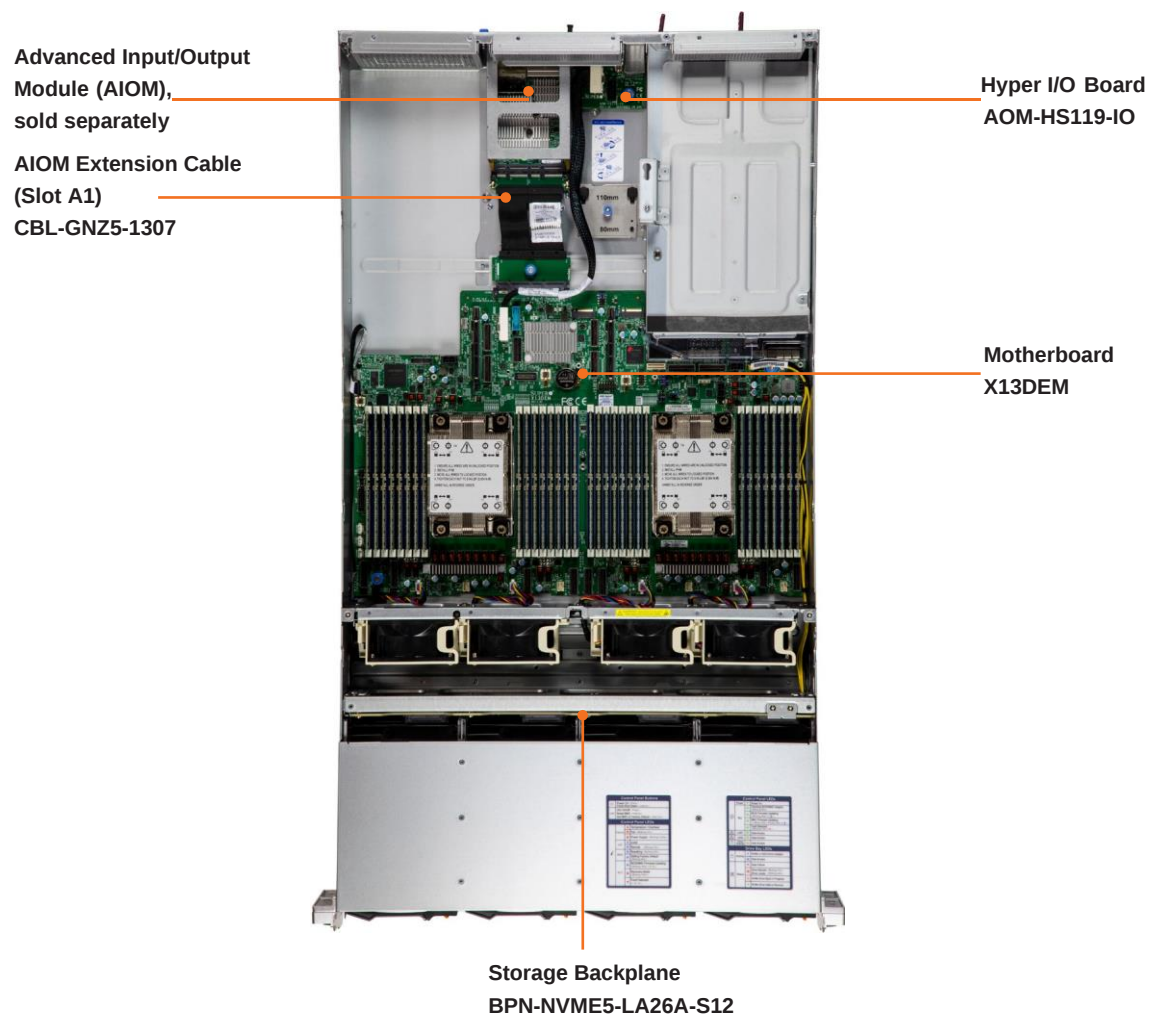


Figure 1-5. Main Component Locations

System Block Diagram

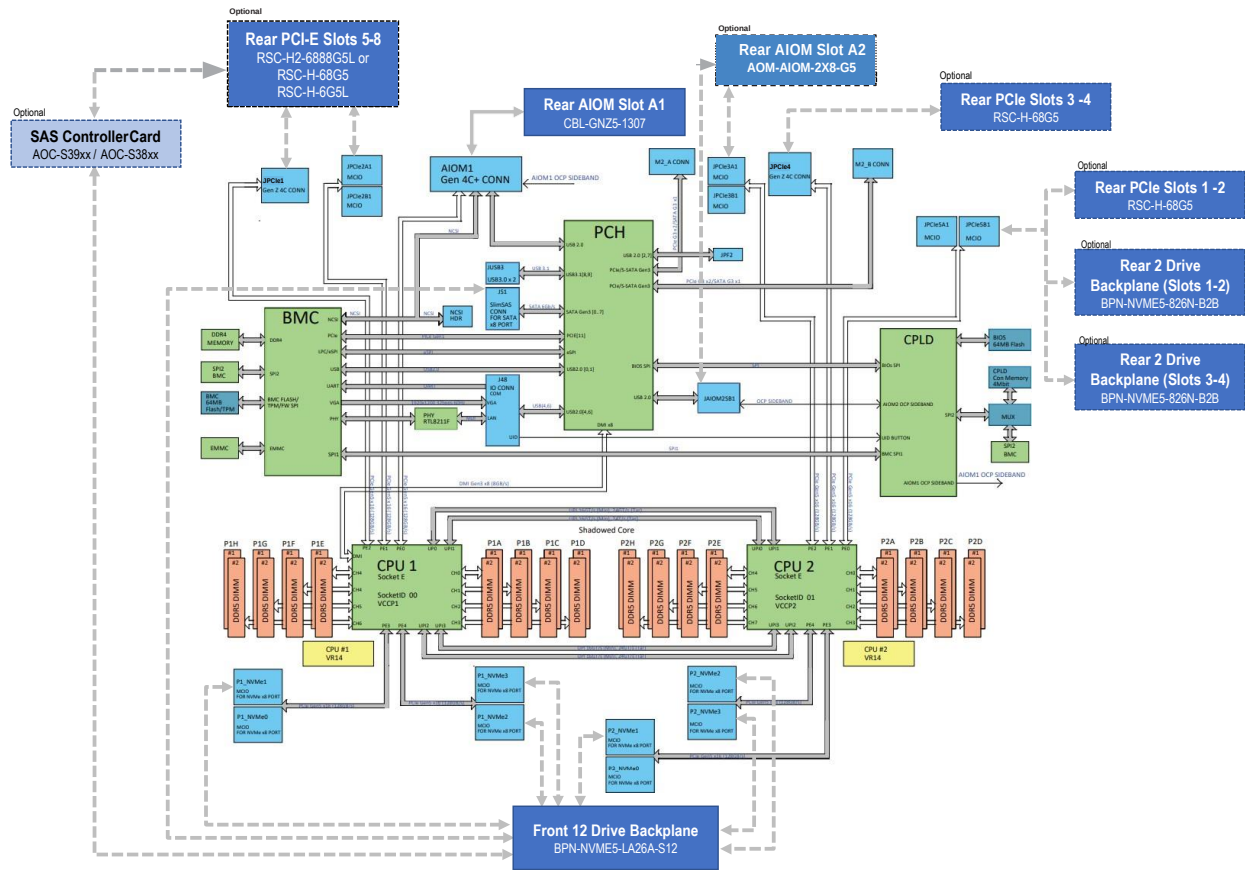


Figure 1-6. System Block Diagram

Quick Reference

Jumper	Description	Default Setting
JBT1	CMOS Clear	Open (Normal)
JRU1	UID LED/System Reset Jumper	Pins 1/2: UID LED (Default), Pins 3/4: System Reset

Connector	Description
Battery (BT1)	Onboard battery
BMCLAN/USB/VGA (JIO1)	Low-profile (LP) Slim SAS I/O connector used for dedicated BMC LAN/USB/VGA connections
FAN1-FAN8, FAN9/FAN10	Eight 6-pin cooling fan headers (FAN1–FAN 8) and two 4-pin cooling fan headers (FAN9-FAN10)
JAIOM1 (P1_PE0 15-0)	Advanced input/output Module (AIOM) PCIe 5.0 x16 connector for rear I/O support
JAIOM2SB1	Advanced Input/Output Module (AIOM2) sideband connector
JFP1	Front Control Panel header with I ² C
JPMW1 - JPMW5	8-pin power connectors 1–5
JPWR1 and JPWR4	6-pin power connectors
PS1/PS2	Power Supply Unit1/Power Supply Unit2 for system power use
JIPMB1 (JF3_JIPMB1)	6-pin BMC external I2C header
JL1	Chassis Intrusion header
JNCSI1	NC-SI (Network Controller Sideband Interface) connector (See the note below)
JNVI2C1	NVMe SMBus I2C header used for PCIe SMBus clock and data connections with hot-plug support.
JNVVPP1	NVMe VPP SMBus (System Management Bus) with hot-plug support
JRK1	Intel VROC key header for NVMe RAID support
JTPM1	Trusted Platform Module/Port 80 connector
JRSI2C1	Auxiliary I ² C header used for PCIe cards to allow the BMC/BIOS to read drive or FRU (Field Replace Unit) information effectively
M.2-H1/M.2-H2	PCIe 3.0 x2/SATA3 Hybrid M.2 slots (with support of M-Key 2280, and 22110)
MH1/MH9	Mounting holes for built-in thumbscrews used to attach the motherboard to the chassis
MH2/MH3/MH4/MH5/MH10/MH11/MH12	Mounting holes for T-pins used to help lock the motherboard to the proper location in the chassis
MH15 - MH19	Mounting holes for standoffs used for heatsink support
P1_NVME 0-3	(P1) PCIe 5.0 x8 MCIO connectors supported by CPU1 with four NVMe connections (0/1/2/3)
P2_NVME 0-3	(P2) PCIe 5.0 x8 MCIO connectors supported by CPU2 with four NVMe connections (0/1/2/3)
P1_PE0 15-0 (JAIOM1)	PCIe 5.0 x16 AIOM (OCP3.0 compliant) slot supported by CPU1
P1_PE1 7-0 (JPCIE2A1)	(P1) PCIe 5.0 x8 MCIO connector supported by CPU1
P1_PE1 15-8 (JPCIE2B1)	(P1) PCIe 5.0 x8 MCIO connector supported by CPU1
P1_PE2 15-0 (JPCIE1)	(P1-SLOT1) PCIe 5.0 x16 slot supported by CPU1

Connector	Description
P2_PE0 0-7 (JPCIE5A1)	(P2) PCIe 5.0 x8 MCIO connector supported by CPU2
P2_PE0 8-15 (JPCIE5B1)	(P2) PCIe 5.0 x8 MCIO connector supported by CPU2
P2_PE1 15-0 (JPCIE4)	(P2-SLOT2) PCIe 5.0 x16 slot supported by CPU2
P2_PE2 0-7 (JPCIE3A1)	(P2) PCIe 5.0 x8 MCIO connector supported by CPU2
P2_PE2 8-15 (JPCIE3B1)	(P2) PCIe 5.0 x8 MCIO connector supported by CPU2
SATA 0-7 (JS1)	SlimSAS LP (MCIO) connector with support of eight Intel® PCH SATA 3.0 connections (RAID 0, RAID 1, RAID 5, and RAID 10 supported)
USB2/3 (3.2) (JUSB3)	Rear USB header with support for two USB 3.2 Gen1 ports

LED	Description	State: Status
LED1 (UID-LED)	Unit Identifier (UID) LED	Solid Blue: Unit Identified
LED2 (LEDPWR)	Power LED	LED On: Onboard Power On
LEDBMC (LEDM1)	BMC Heartbeat LED	Blinking Green: BMC Normal (Active), Solid Green: (During BMC Reset or during a Cold Reboot)

Motherboard Block Diagram

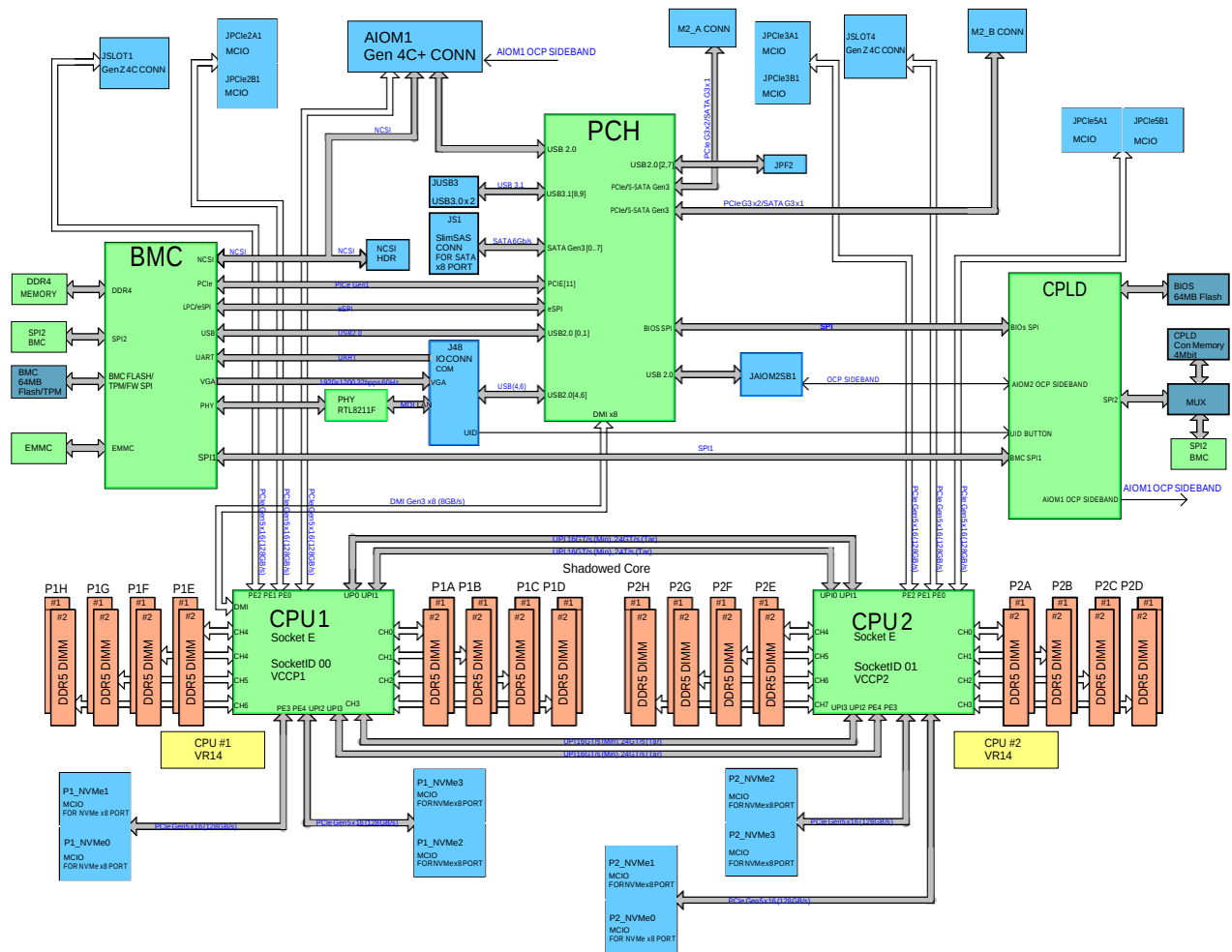


Figure 1-8. Motherboard Block Diagram

Chapter 2

Server Installation

2.1 Overview

This chapter provides advice and instructions for mounting your system in a server rack. If your system is not already fully integrated with processors, system memory, etc.,

Caution: Electrostatic Discharge (ESD) can damage electronic components. To prevent such damage to PCBs (printed circuit boards), it is important to use a grounded wrist strap, handle all PCBs by their edges and keep them in anti-static bags when not in use.

2.2 Unpacking the System

Inspect the box in which the system was shipped and note if it was damaged in any way. If any equipment appears damaged, file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the server. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise, and electromagnetic fields are generated.

2.3 Preparing for Setup

The box in which the system was shipped should include the rackmount hardware needed to install it into the rack. Please read this section in its entirety before you begin the installation.

Choosing a Setup Location

- The system should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise, and electromagnetic fields are generated.
- Leave enough clearance in front of the rack so that you can open the front door completely (~25 inches) and approximately 30 inches of clearance in the back of the rack to allow sufficient space for airflow and access when servicing.
- This product should be installed only in a Restricted Access Location (dedicated equipment rooms, service closets, etc.).

- This product is not suitable for use with visual display workplace devices according to §2 of the German Ordinance for Work with Visual Display Units.

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are extended to the floor so that the full weight of the rack rests on them.
- In single rack installations, stabilizers should be attached to the rack. In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a server or other component from the rack.
- You should extend only one server or component at a time - extending two or more simultaneously may cause the rack to become unstable.

Server Precautions

- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components at the bottom of the rack first and then work your way up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges and voltage spikes and to keep your system operating in case of a power failure.
- Allow any drives and power supply modules to cool before touching them.
- When not servicing, always keep the front door of the rack and all covers/panels on the servers closed to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the room's ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (TMRA).

Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be always maintained. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit



To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.
- Slide rail mounted equipment is not to be used as a shelf or a workspace.



Slide rail mounted equipment is not to be used as a shelf or a workspace.



Warning: Do not pick up the server with the front handles. They are designed to pull the system from a rack only.

2.4 Installing the Rails

There are a variety of rack units on the market, which may require a slightly different assembly procedure.

The following is a basic guideline for installing the system into a rack with the rack mounting hardware provided. You should also refer to the installation instructions that came with the specific rack you are using.

Identifying the Rails

The chassis package includes two rail assemblies. Each assembly consists of three sections: An inner rail that secures directly to the chassis, an outer rail that secures to the rack, and a middle rail which extends from the outer rail. These assemblies are specifically designed for the left and right side of the chassis and labeled as such.

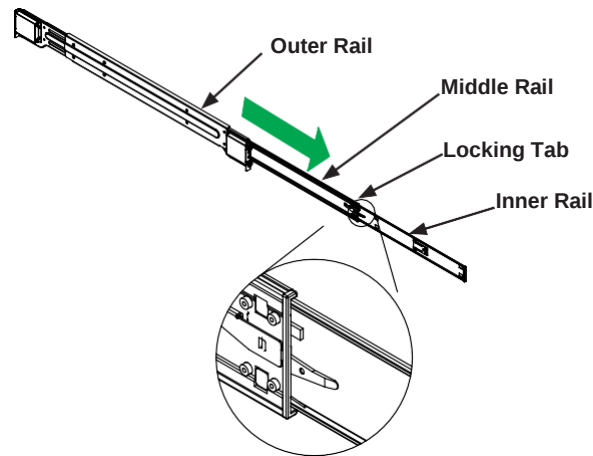


Figure 2-1. Identifying the Outer Rail, Middle Rail and Inner Rail
(Left Rail Assembly Shown)

Releasing the Inner Rail

Each inner rail has a locking latch. This latch prevents the server from coming completely out of the rack when the chassis is pulled out for servicing.

To mount the rail onto the chassis, first release the inner rail from the outer rails.

1. Pull the inner rail out of the outer rail until it is fully extended as illustrated below.
2. Press the locking tab down to release the inner rail.
3. Pull the inner rail all the way out.

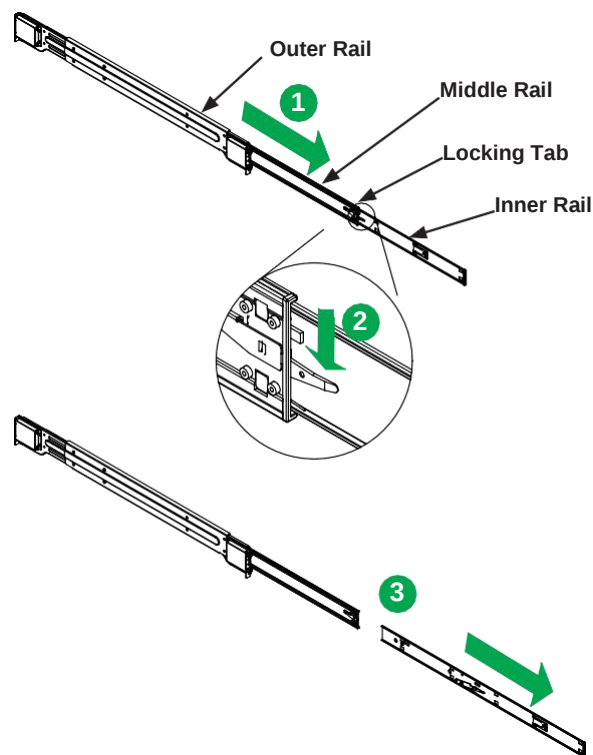


Figure 2-2. Extending and Releasing the Inner Rail

Installing the Inner Rails on the Chassis

Installing the Inner Rails

1. Identify the left and right inner rails. They are labeled.
2. Place the inner rail firmly against the side of the chassis, aligning the hooks on the side of the chassis with the holes in the inner rail.
3. Slide the inner rail forward toward the front of the chassis until the quick release bracket snaps into place, securing the rail to the chassis.
4. Optionally, you can further secure the inner rail to the chassis with screws.

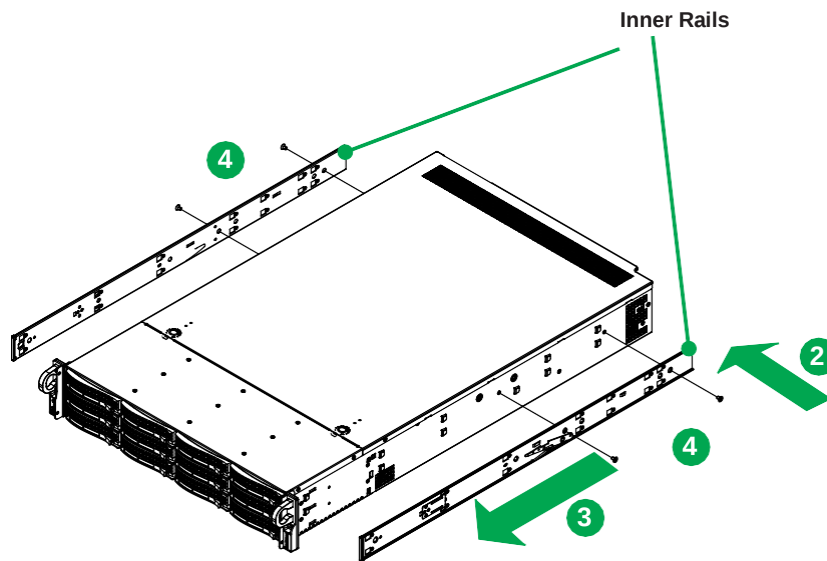


Figure 2-3. Installing the Inner Rails

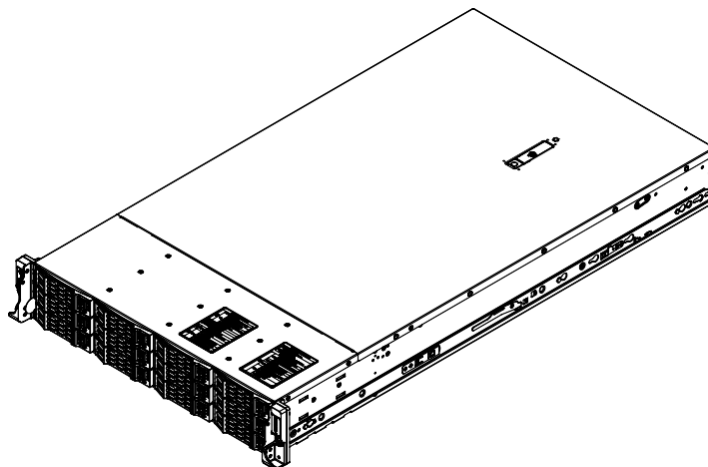


Figure 2-4. Inner Rails Installed on the Chassis

Installing the Outer Rails onto the Rack

Installing the Outer Rails

1. Press upward on the locking tab at the rear end of the middle rail.
2. Push the middle rail back into the outer rail.
3. Hang the hooks on the front of the outer rail onto the square holes on the front of the rack. If desired, use screws to secure the outer rails to the rack.
4. Pull out the rear of the outer rail, adjusting the length until it just fits within the posts of the rack.
5. Hang the hooks of the rear section of the outer rail onto the square holes on the rear of the rack. Take care that the proper holes are used so the rails are level. If desired, use screws to secure the rear of the outer rail to the rear of the rack.
6. Repeat for the other outer rail.

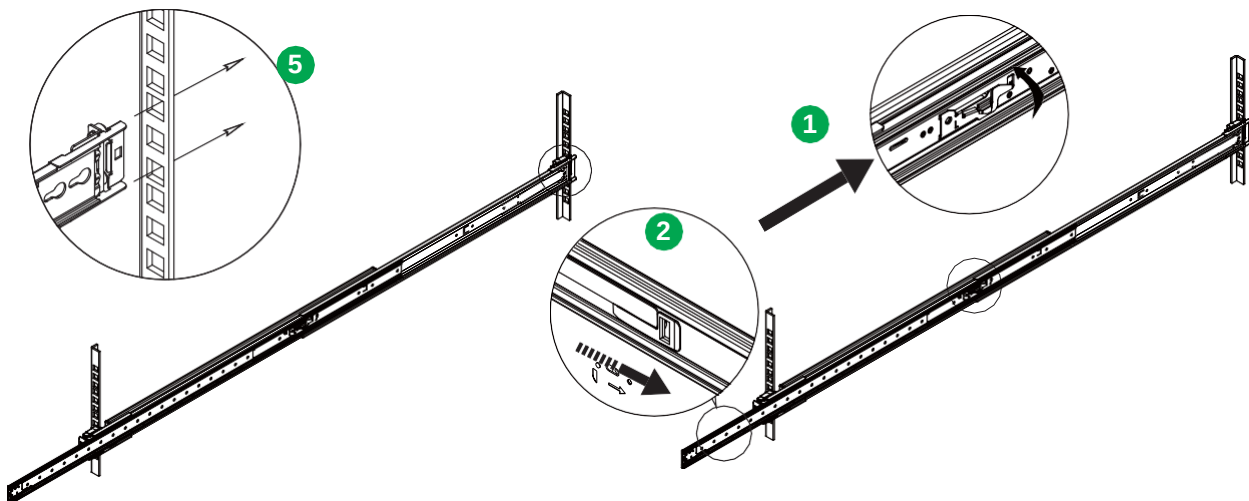


Figure 2-5. Installing the Outer Rails to the Rack

Note: The figure above is for illustrative purposes only. Always install servers at the bottom of the rack first.



Stability hazard. The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before you slide the unit out for servicing. Failure to stabilize the rack can cause the rack to tip over.



Warning: Do not pick up the server with the front handles. They are designed to pull the system from a rack only.

2.5 Installing the Chassis into a Rack

Once rails are attached to the chassis and the rack, you can install the server.



Warning: Mounting the system into the rack requires at least two people to support the chassis during installation. Please follow safety recommendations printed on the rails.

Installing the Chassis into a Rack

1. Extend the outer rails as illustrated.
2. Align the inner rails of the chassis with the outer rails on the rack.
3. Slide the inner rails into the outer rails, keeping the pressure even on both sides. When the chassis has been pushed completely into the rack, it should click into the locked position.
4. Optional screws may be used to hold the front of the chassis to the rack.

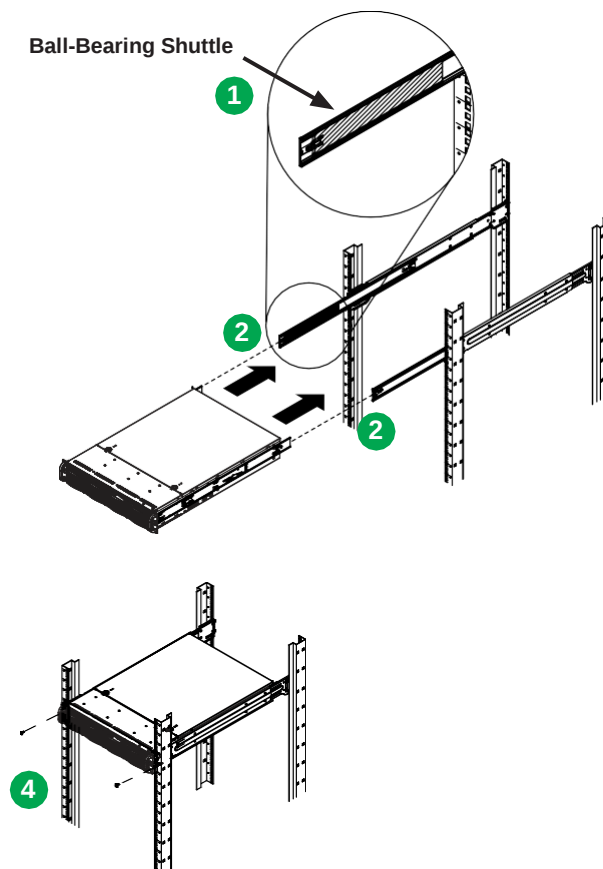


Figure 2-6. Installing the Server into the Rack

Note: Keep the ball bearing shuttle locked at the front of the middle rail during installation.

Note: Figure is for illustrative purposes only. Always install servers to the bottom of a rack first.

Removing the Chassis from the Rack

Caution! It is dangerous for a single person to off-load the heavy chassis from the rack without assistance. Be sure to have sufficient assistance supporting the chassis when removing it from the rack. Use a lift.

1. If necessary, loosen the thumb screws on the front of the chassis that hold it in the rack.
2. Pull the chassis forward out the front of the rack until it stops.
3. Press the release latches on each of the inner rails downward simultaneously and continue to pull the chassis forward and out of the rack.

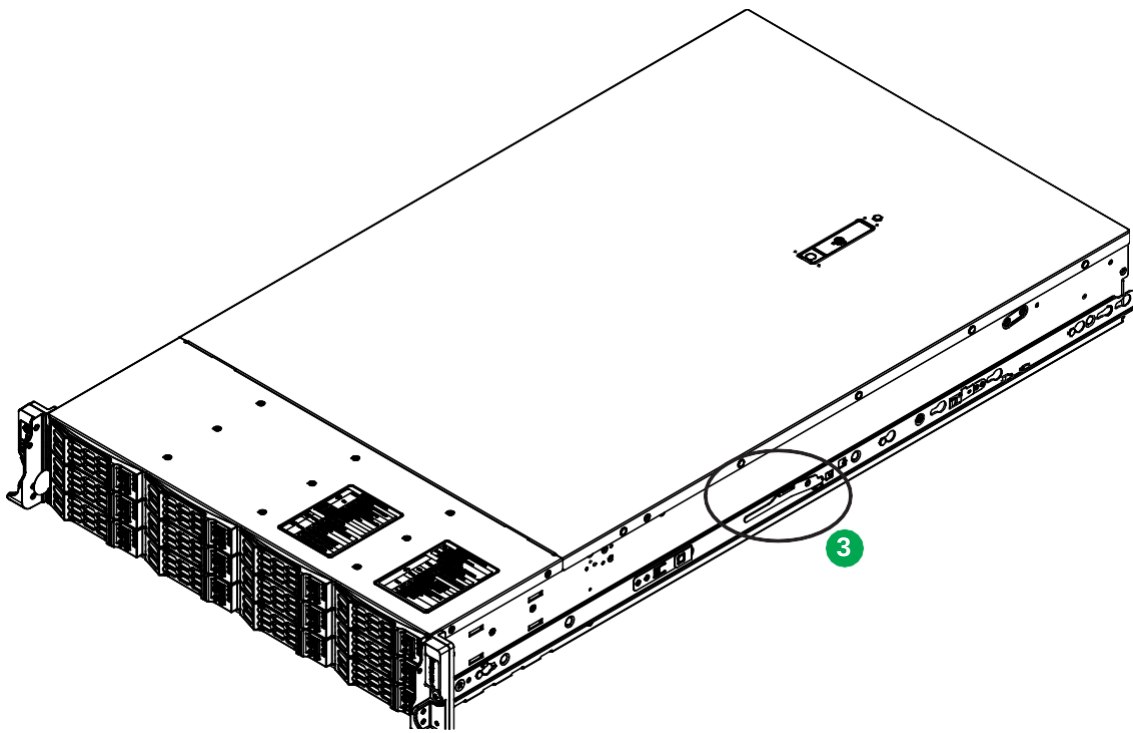


Figure 2-7. Removing the Chassis From the Rack

Chapter 3

Maintenance and Component Installation

This chapter provides instructions on installing and replacing main system components. To prevent compatibility issues, only use components that match the specifications and/or part numbers given.

Installation or replacement of most components require that power first be removed from the system. Please follow the procedures given in each section.

3.1 Removing Power

Use the following procedure to ensure that power has been removed from the system. This step is necessary when removing or installing non hot-swap components or when replacing a non-redundant power supply.

1. Use the operating system to power down the system.
2. After the system has completely shut down, disconnect the AC power cord(s) from the power strip or outlet. (If your system has more than one power supply, remove the AC power cords from all power supply modules.)
3. Disconnect the power cord(s) from the power supply module(s).

3.2 Accessing the System

A removable top cover allows access to the inside of the chassis.

Removing the Top Cover

1. Remove the two screws on each side of the cover, which secure the cover to the chassis. These two screws are optional and will not impact functionality if they are not installed.
2. Press the release button and slide the cover toward the rear.
3. Lift the top cover up.

Check that all ventilation openings on the top cover and the top of the chassis are clear and unobstructed.

Caution: Except for short periods of time, do not operate the server without the cover in place. The chassis cover must be in place to allow for proper airflow and to prevent overheating.

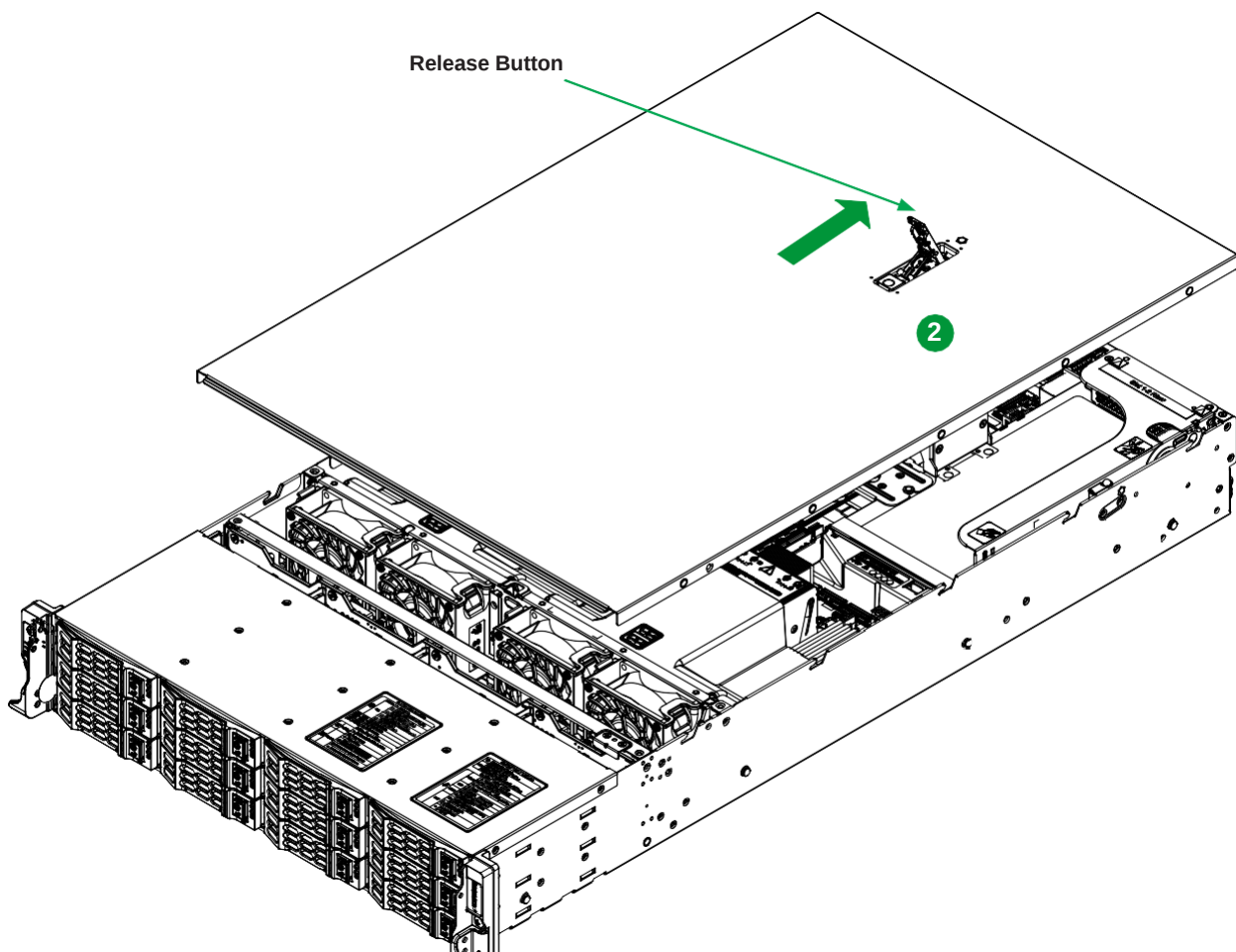
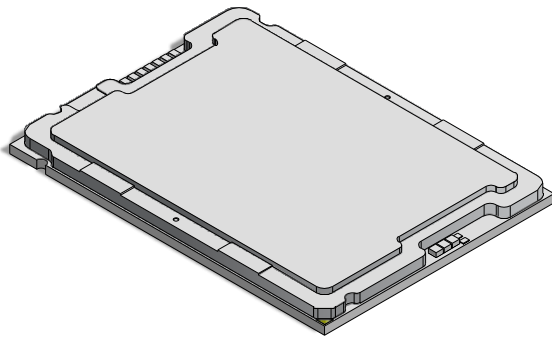


Figure 3-1. Removing the System Cover

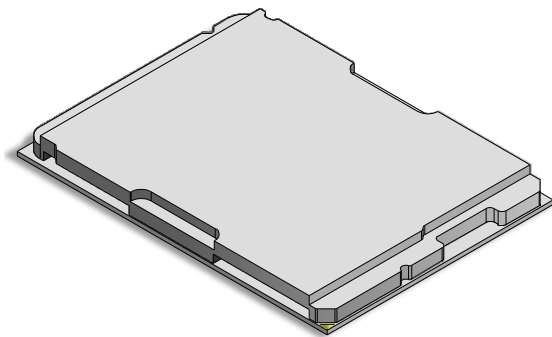
3.3 Processor and Heatsink

Processor Overview

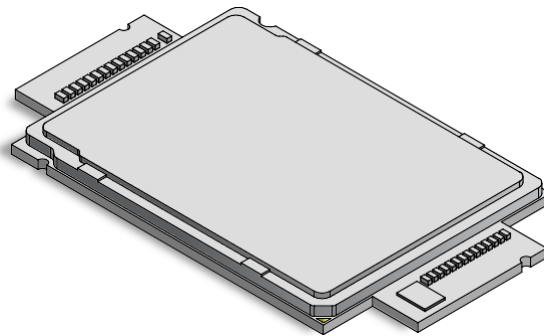
The motherboard supports three versions of the 4th Gen Intel Xeon Scalable processors. They differ in the number of cores, and each requires a different CPU carrier. The XCC version supports up to 60 cores, the MCC version supports up to 32 cores, and the HBM version supports up to 56 cores. The CPU carriers differ by the presence or absence of shims and levers.



SP XCC



SP MCC



SP HBM

CPU Type	Cores	Carrier Type	Lever	Shim
XCC	60	E1A	Yes	No
MCC	32	E1B	Yes	Yes
HBM	56	E1C	No	No

Installation Overview

The processor (CPU) and processor carrier should be assembled first to form the processor carrier assembly. This will be attached to the heatsink to form the processor heatsink module (PHM) before being installed onto the CPU socket.

Notes:

- Use ESD protection.
- The system power cords must be removed from all power supplies.
- Check that the plastic protective cover is on the CPU socket and none of the socket pins are bent. If they are, contact your retailer.
- When handling the processor, avoid touching or placing direct pressure on the LGA lands (gold contacts). Improper installation or socket misalignment can cause serious damage to the processor or socket, which may require manufacturer repairs.
-

Installation Procedure Overview

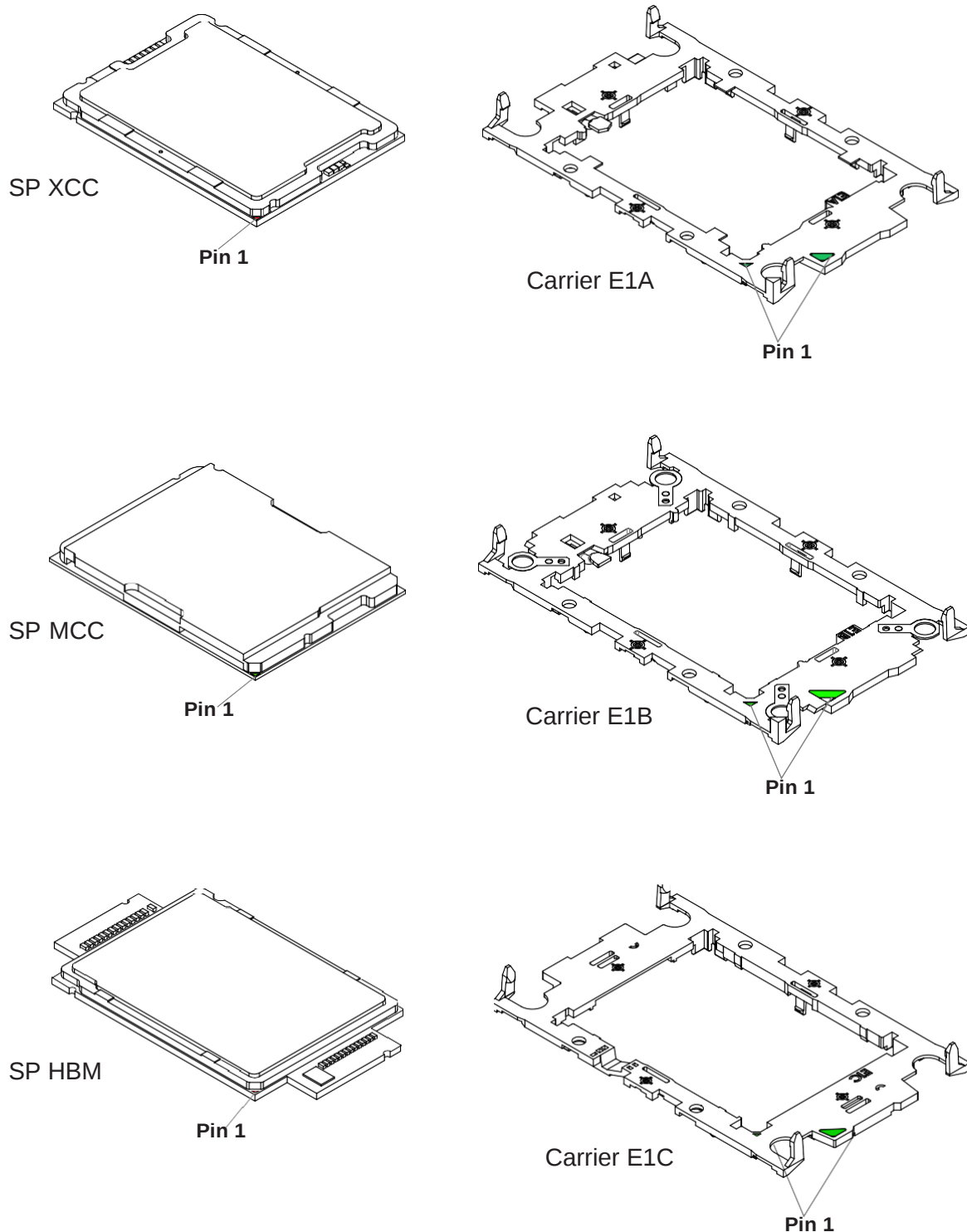
After preparing the system, and following ESD precautions, there are four steps to installing the processor and heatsink onto the motherboard.

1. Attach the processor to a plastic carrier to create the processor carrier assembly.
2. Attach the processor carrier assembly to the heatsink to create the processor heatsink module (PHM).
3. Remove the socket cover.
4. Install the PHM.

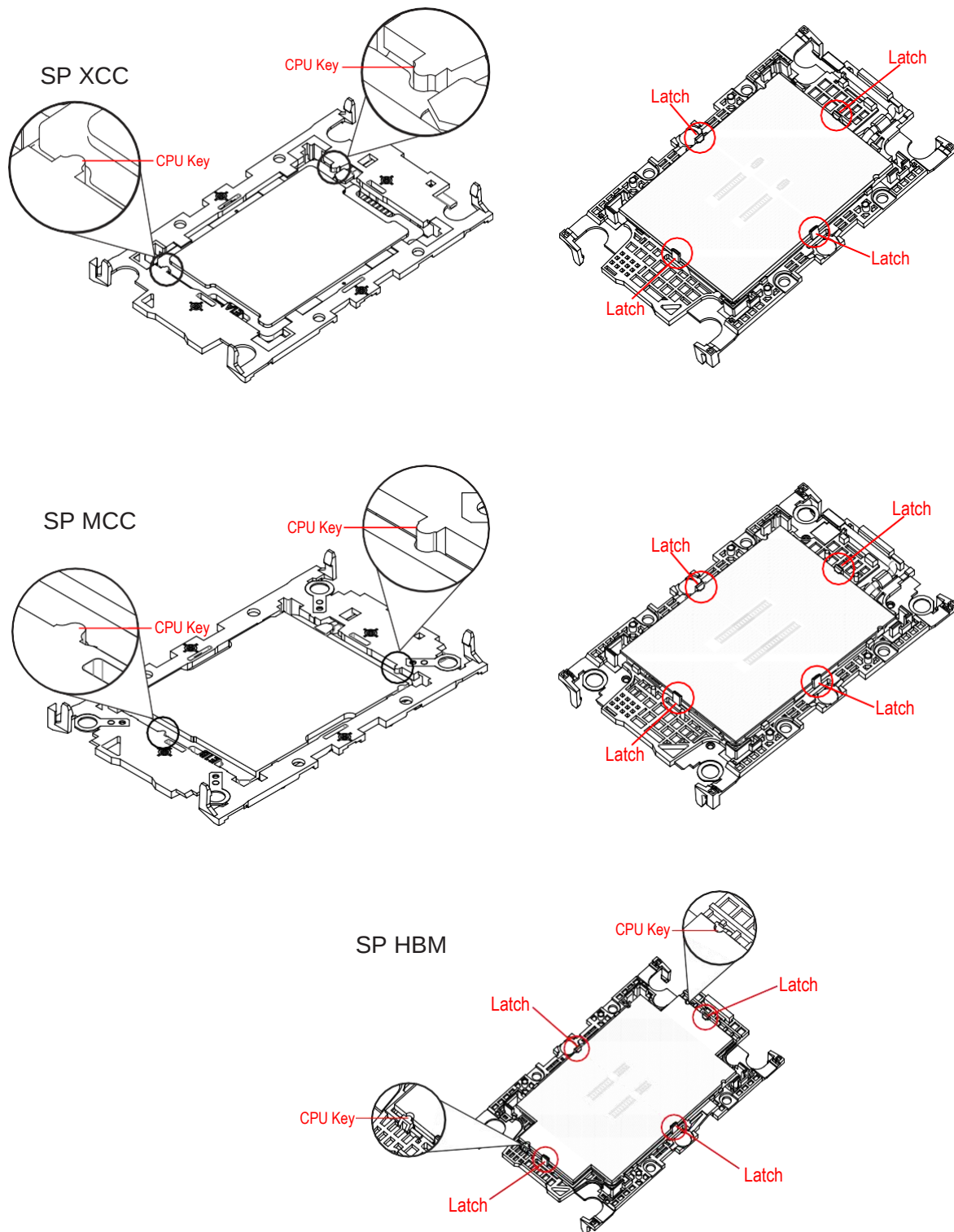
Create the Processor Carrier Assembly

Assembling the Process Carrier Assembly

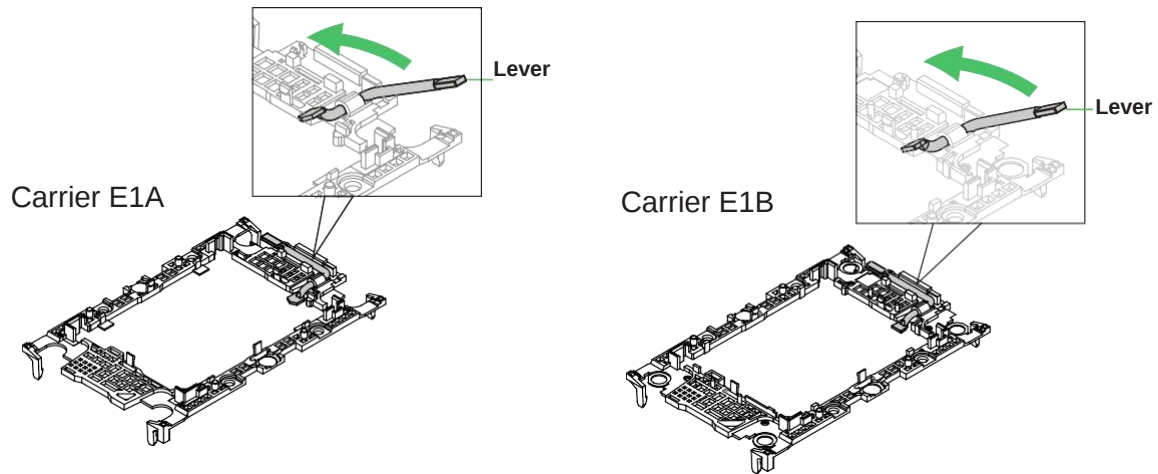
1. Hold the processor with the gold pins (LGA lands) facing down. Locate the gold triangle at the corner of the processor and the corresponding hollowed triangle on the processor carrier as shown below. These triangles indicate the location of pin 1.



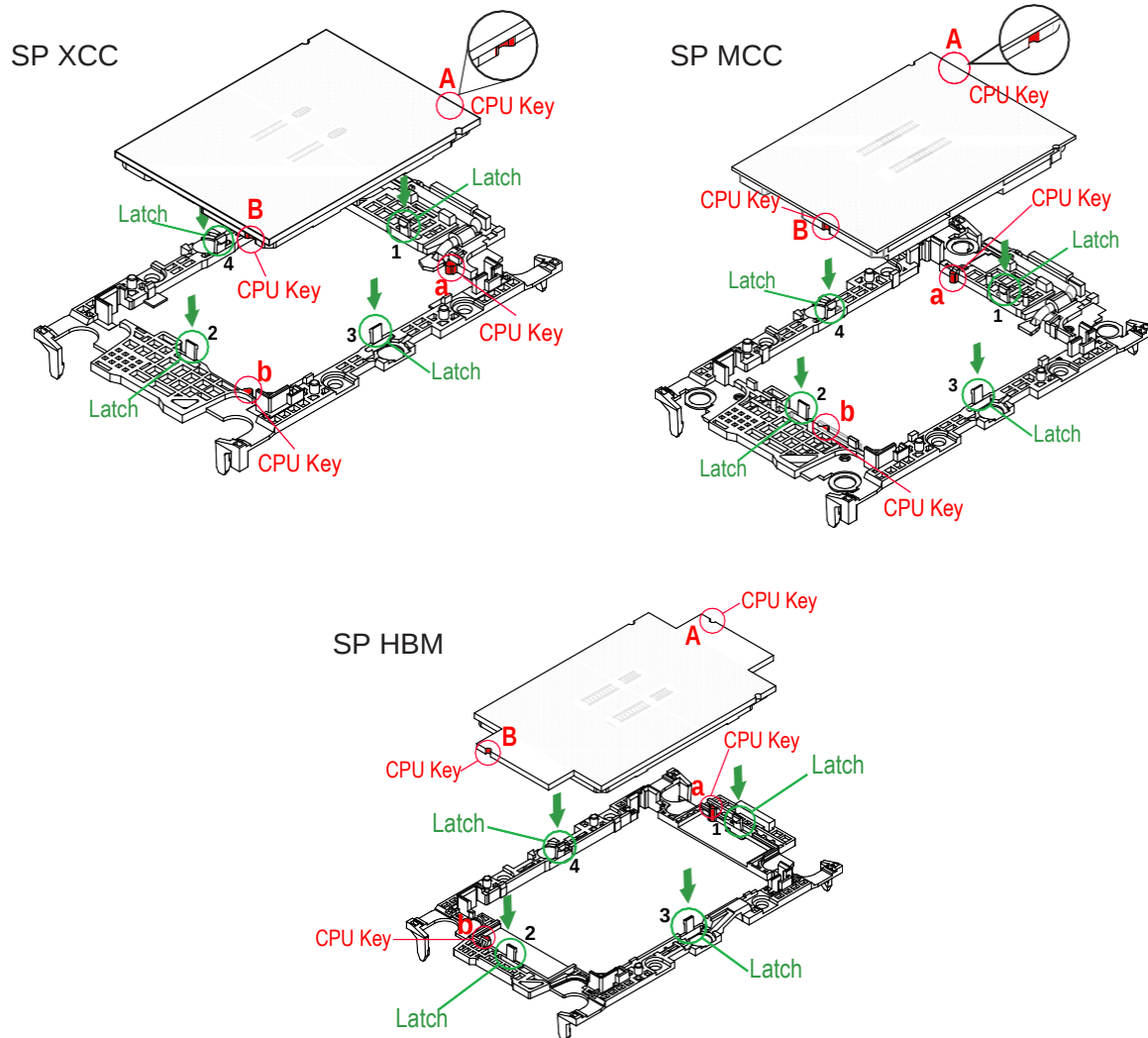
2. Turn the processor over (with the gold pins up). Locate the CPU keys on the processor and the four latches on the carrier.



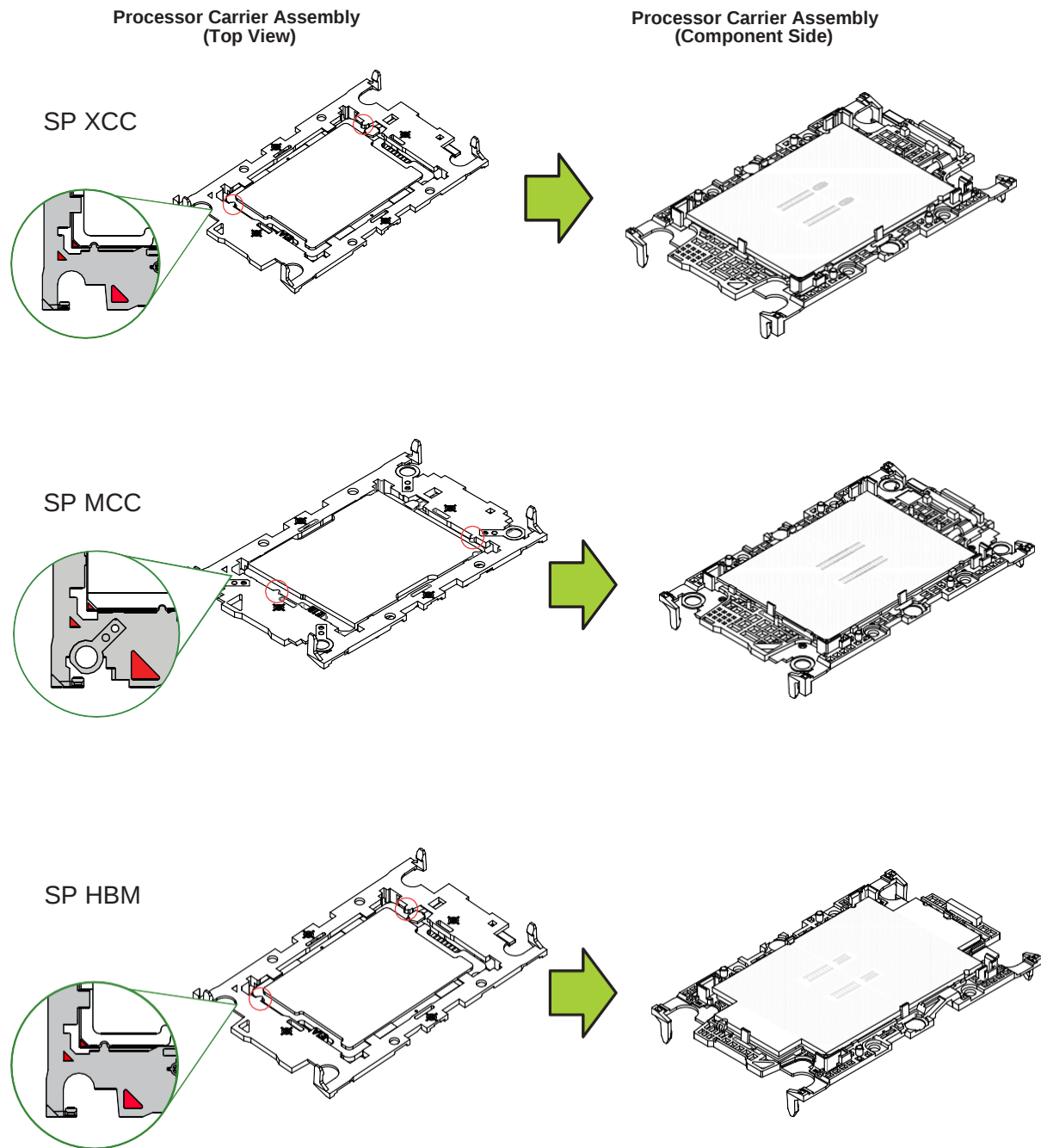
3. Locate the lever on the processor carrier and press it down (E1A and E1B only).



4. Using pin 1 as a guide, carefully align the CPU keys on the processor (A & B) with those on the carrier (a & b).



5. Once aligned, carefully insert the CPU into the carrier, making sure that the CPU is secured by latches 1, 2, 3, and 4.

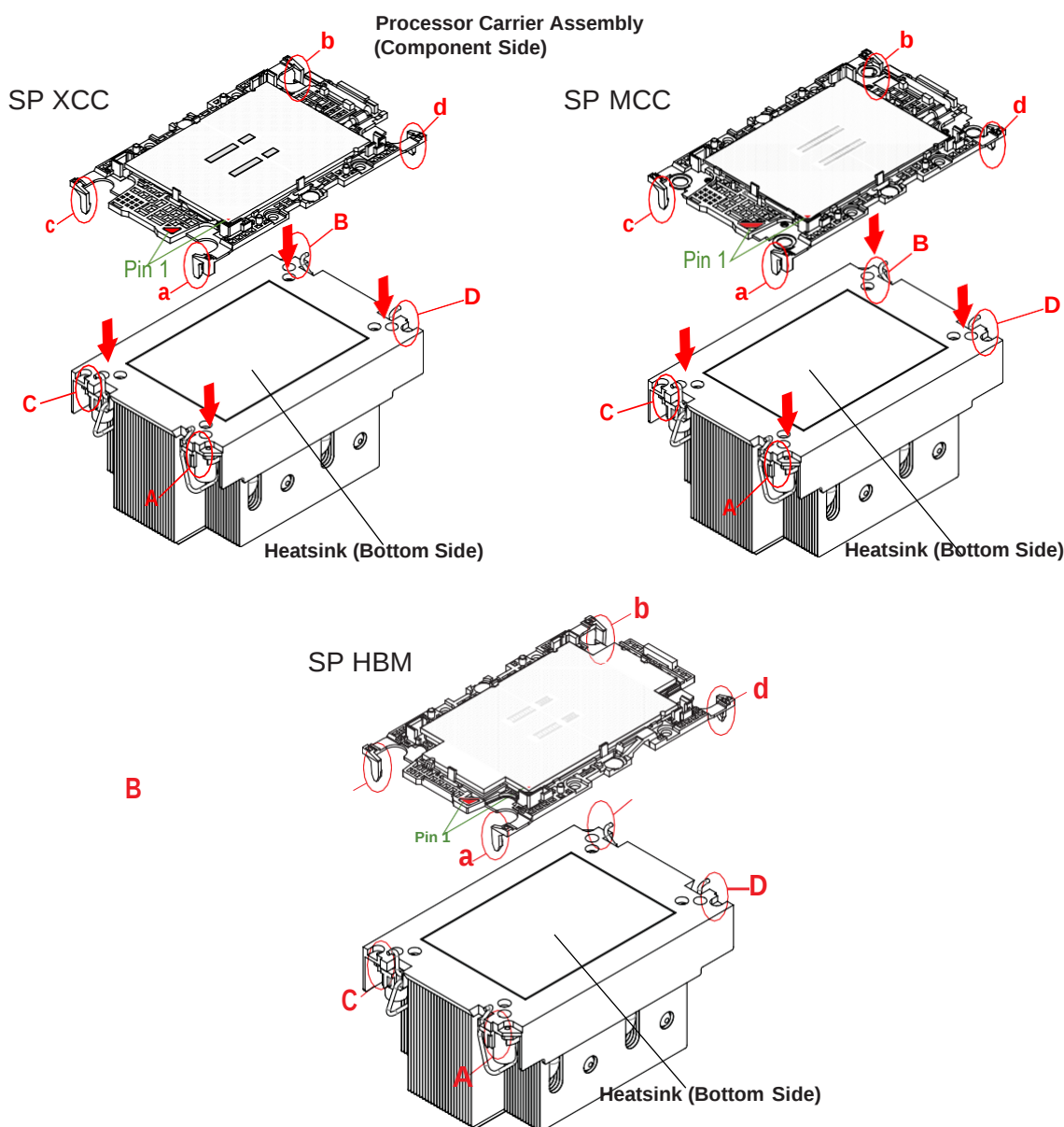


Assemble the Processor Heatsink Module

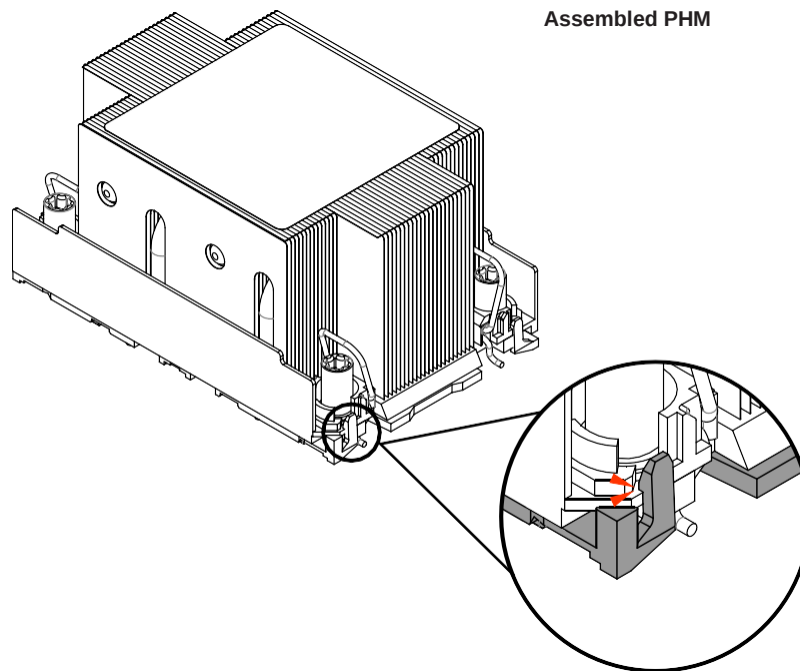
Thermal grease is pre-applied on a new heatsink. No additional thermal grease is needed. If this is a re-installation, apply the proper amount of thermal grease to the underside of the heatsink.

Assembling the Processor Heatsink Module (PHM)

1. Turn the heatsink over with the thermal grease facing up. Locate the two triangle cutouts (A, B) at the diagonal corners of the heatsink as shown in the drawing below.
2. Hold the processor carrier assembly component side up to locate the triangles on the processor and the carrier, which indicate pin 1.
3. Turn the processor carrier assembly over so that the gold pins are facing up, noting the two pin 1 locations ("A" on the processor and "a" on the processor carrier assembly).



4. Align "a" on the processor carrier assembly with the triangular cutout "A" on the heatsink along with "b", "c", "d" on the processor assembly with "B", "C", "D" on the heatsink.
5. Once properly aligned, place the heatsink on the processor carrier assembly with all corners matched up, making sure that the four clips are properly securing the heatsink.

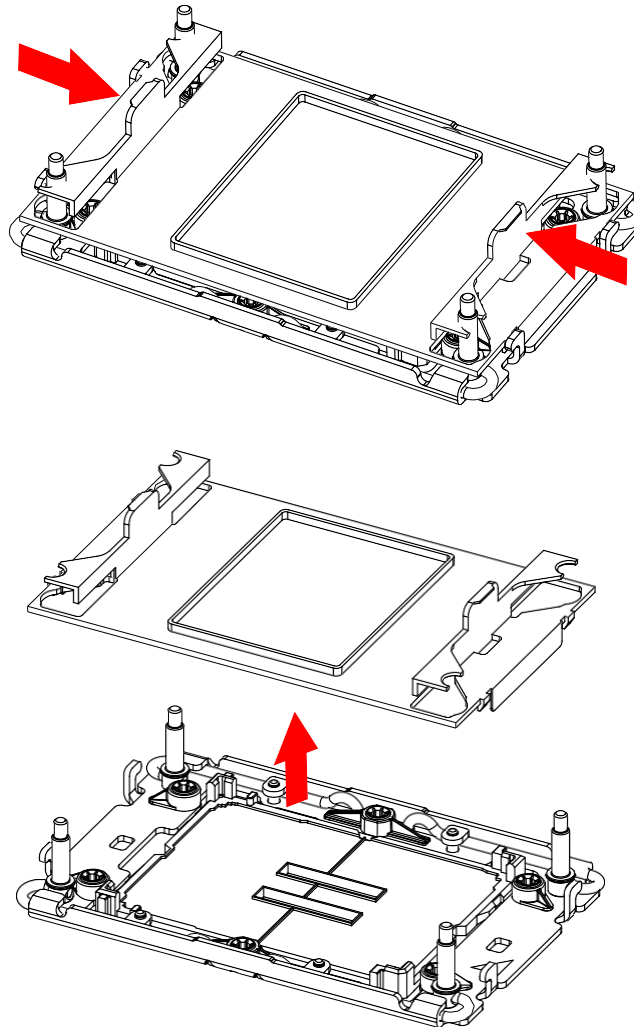


Note: The figure is for illustrative purposes. Your components may differ slightly from the components shown.

Remove the Socket Cover

Remove the plastic protective cover from the socket by gently squeezing the grip tabs and pulling the cover off.

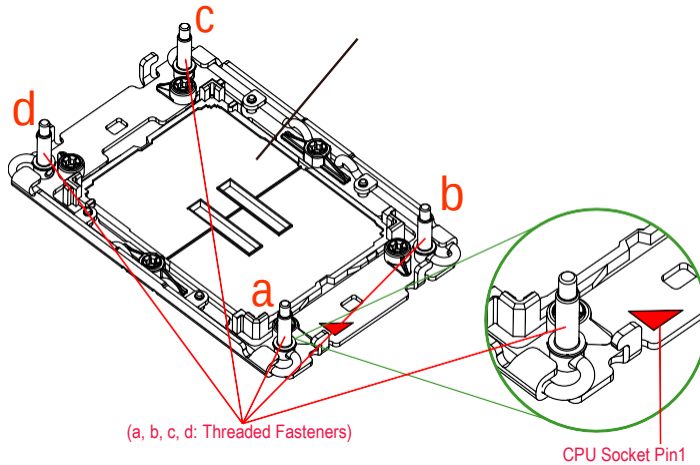
CPU Socket with Plastic Protective Cover



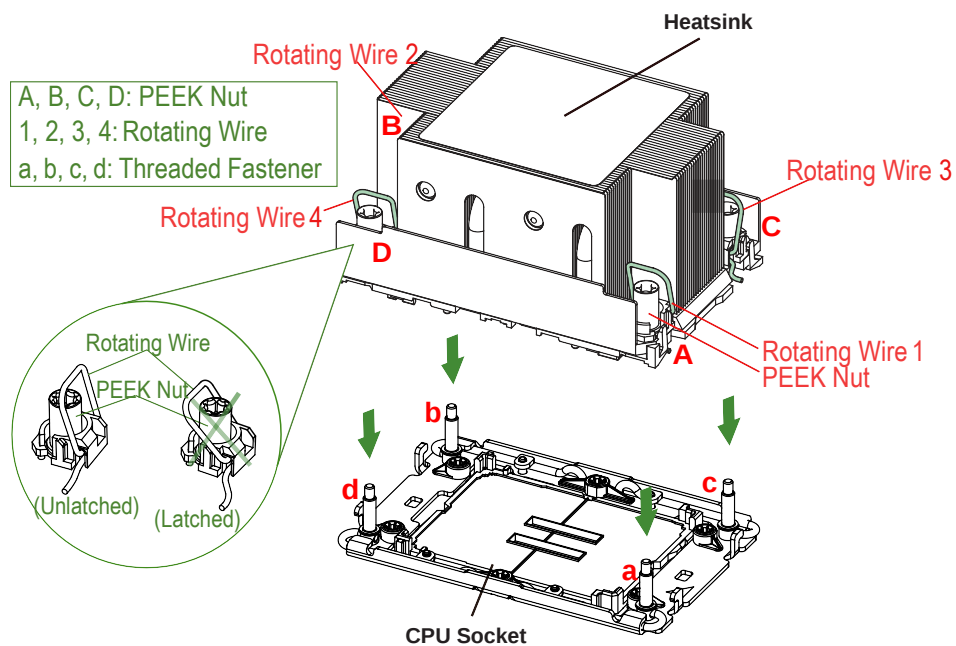
Install the PHM

To install the PHM into the CPU socket, follow these steps.

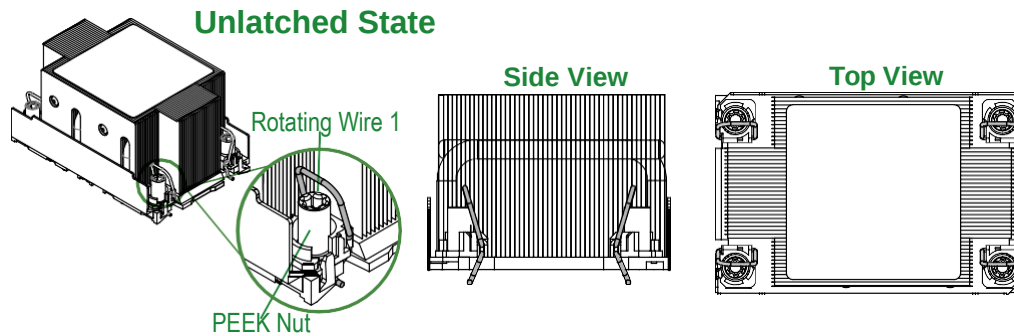
1. Locate four threaded fasteners (a, b, c, d) and Pin 1 on the CPU socket.



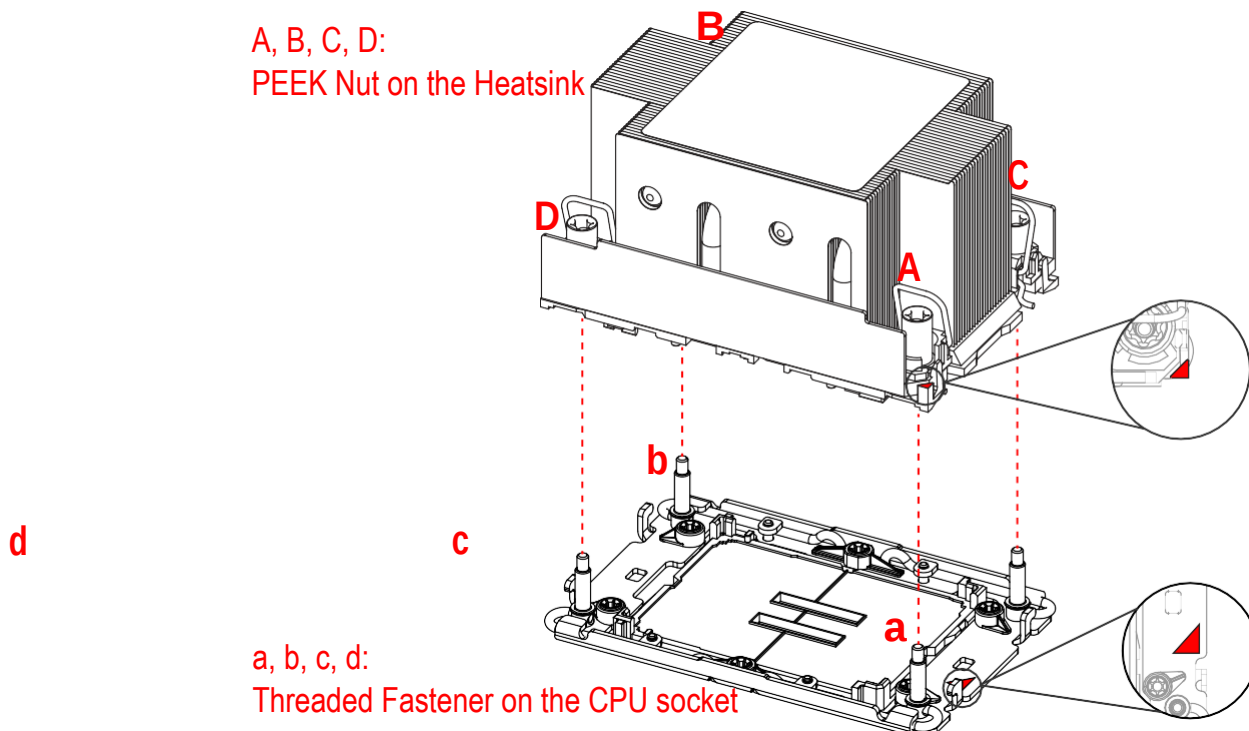
2. Locate four PEEK nuts (A, B, C, D) and four rotating wires (1, 2, 3, 4) on the heatsink.



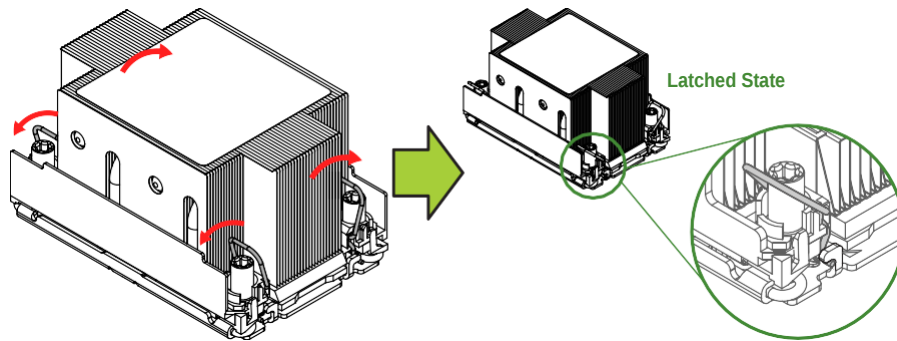
3. Check the rotating wires (1, 2, 3, 4) to make sure that they are in the unlatched position.



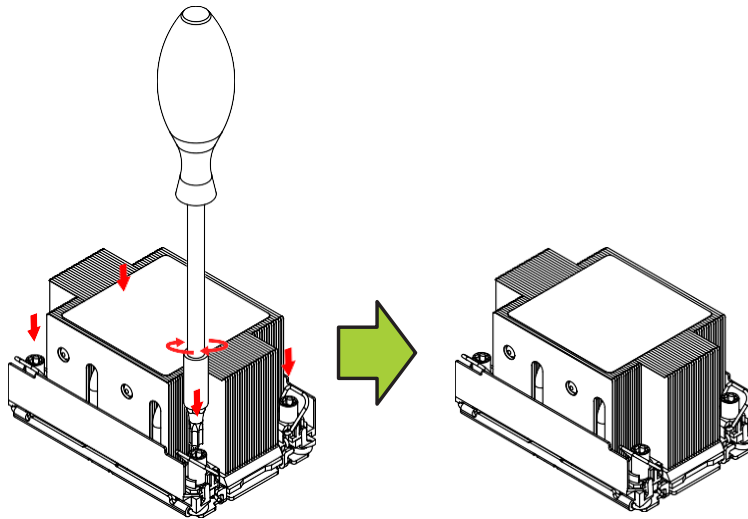
4. Align PEEK nut "A" (next to the triangular pin 1 on the heatsink) with threaded fastener "a" on the CPU socket. Then align PEEK nuts "B", "C", "D" on the heatsink with threaded fasteners "b", "c", "d" on the CPU socket.
5. Once aligned, gently place the PHM on the CPU socket, making sure that each PEEK nut is properly attached to its corresponding threaded fastener.



6. Press all four rotating wires outward and make sure that the heatsink is securely latched into the CPU socket.



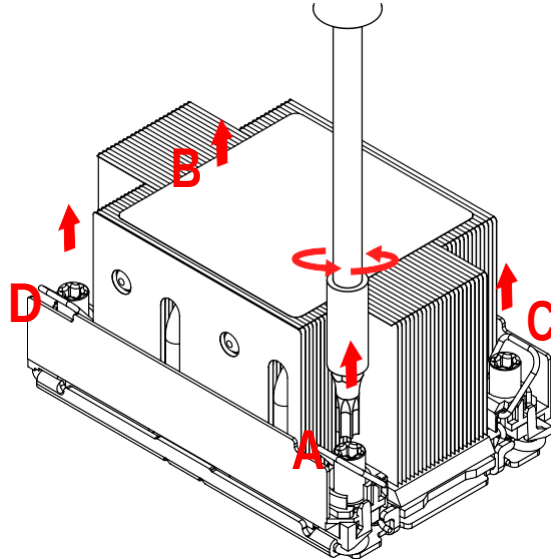
7. With a t30-bit screwdriver, tighten all PEEK nuts in the sequence of "A", "B", "C", and "D" with even pressure. Note the torque specifications written on the heatsink, and do not exceed them when tightening the screws.
8. Examine all corners of the heatsink to ensure that the PHM is firmly attached to the CPU socket.



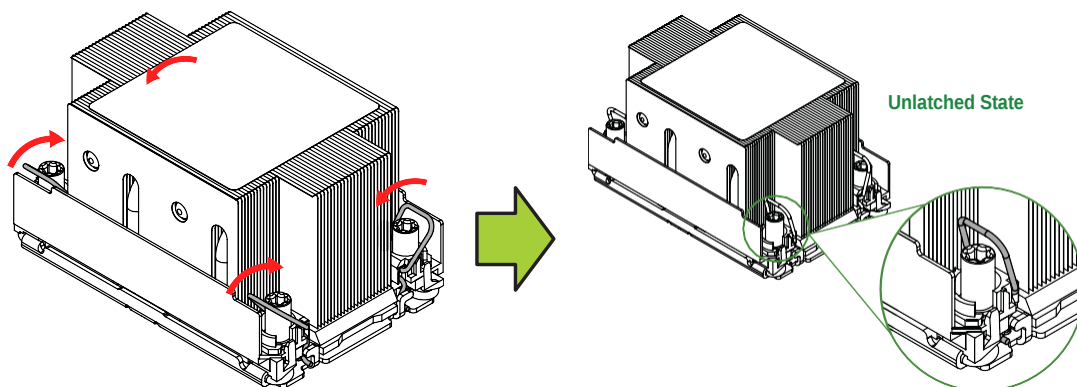
Removing the PHM

To remove the processor, heatsink module (PHM) from the motherboard, follow these steps.

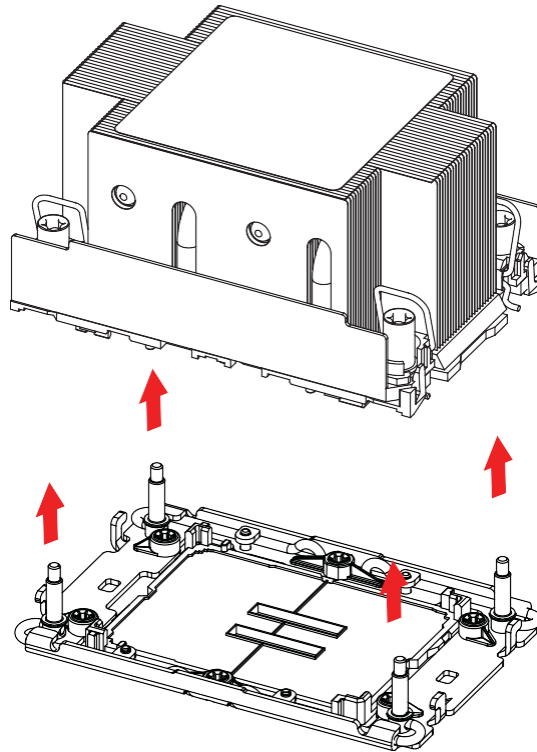
1. Shut down the system and unplug the AC power cord from all power supplies.
2. Use a T30-bit screwdriver to loosen the four PEEK nuts on the heatsink in the sequence of A, B, C, and D.



3. Press the rotating wires inward to unlatch the PHM from the socket as shown below.



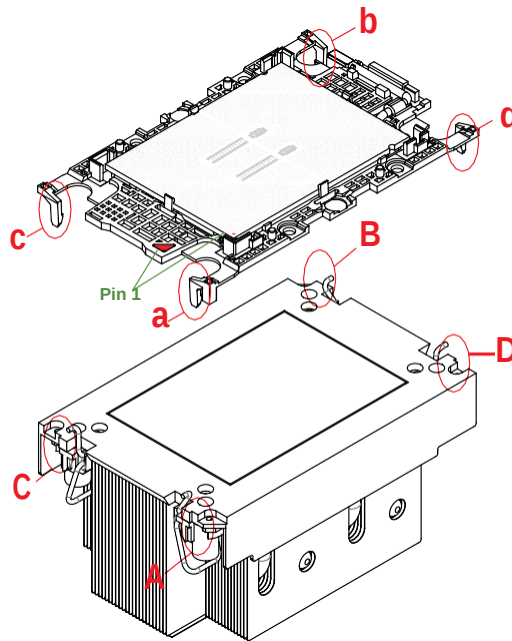
4. Gently lift the PHM upward to remove it from the CPU socket.



Removing the Carrier Assembly from the Heatsink

To remove the processor carrier assembly from the PHM, follow these steps:

1. Detach the four plastic clips (marked a, b, c, d) on the processor carrier assembly from the four corners of the heatsink (marked A, B, C, D) as shown below.

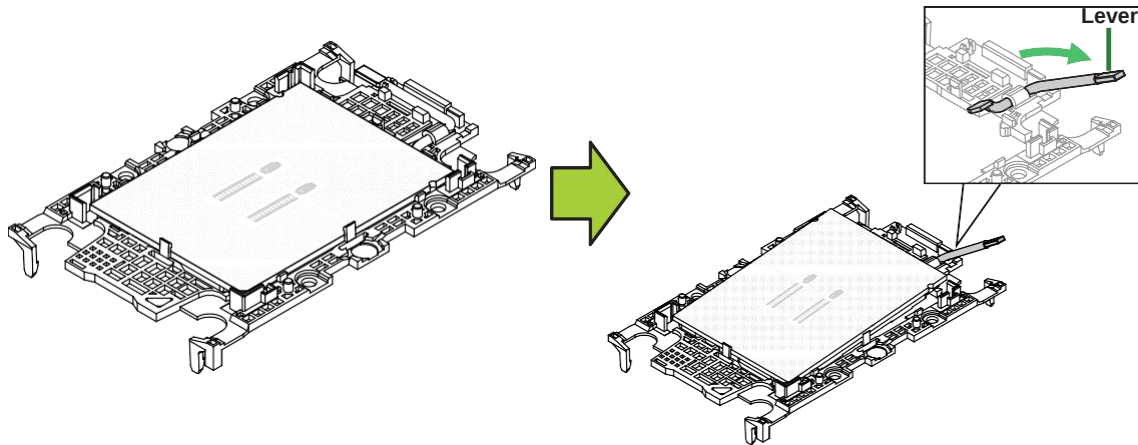


2. When all plastic clips have been detached from the heatsink, remove the processor carrier assembly from the heatsink.

Removing the Processor from the Carrier Assembly

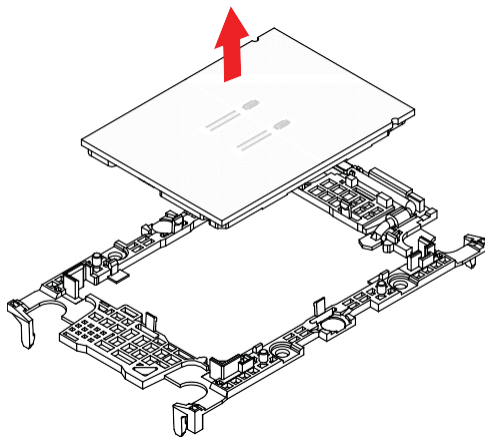
To remove the processor from the processor carrier, follow these steps.

1. Unlock the lever from its locked position and push it upwards to disengage the processor from the processor carrier as shown below right.



2. Once the processor has been loosened from the carrier, carefully remove the processor from the carrier.

Note: Handle the processor with care.



3.4 Memory

Memory Support

The X13DEM supports up to 8TB RDIMM DDR5 (288-pin) ECC memory with speeds up to 4800MHz in 32 DIMM slots.

DDR5 Memory Support 4th Gen Intel Xeon Scalable Processors				
Type	Ranks Per DIMM and Data Width (Stack)	DIMM Capacity (GB)	Speed (MT/s)	
			One DIMM per Channel	Two DIMMs per Channel
RDIMM		16 Gb	1.1 Volts	
	1Rx8 (RC D)	16GB	4800*	4400*
	1Rx4 (RC C)	32GB		
	1Rx5 (RC F) 9x4	32GB		
	2Rx8 (RC E)	32GB		
	2Rx4 (RC A))	64GB		
	2Rx4 (RC B) 9x4	64GB		

*Memory speed and capacity support depends on the processors used in the system.

Use the DIMM slots listed below for memory modules. This memory population table is based on guidelines provided by Intel to support Altos motherboards.

Memory Population for the X13 DP Motherboard, 32 DIMM Slots	
CPU/DIMMs	DIMM Slots
1 CPU & 1 DIMM	A1 or B1 or E1 or F1
1 CPU & 2 DIMMs	A1, G1 or C1, E1
1 CPU & 4 DIMMs	A1, C1, E1, G1
1 CPU & 6 DIMM	A1, C1, D1, E1, F1, G1 or A1, B1, C1, E1, G1, H1 or B1, C1, D1, E1, F1, H1 or A1, B1, D1, F1, G1, H1
1 CPU & 8 DIMMs	A1, B1, C1, D1, E1, F1, G1, H1
1 CPU & 12 DIMMs	A1, A2, B1, C1, C2, D1, E1, E2, F1, G1, G2, H1 or A1, B1, B2, C1, D1, D2, E1, F1, F2, G1, H1, H2
1 CPU & 16 DIMMs	A1, A2, B1, B2, C1, C2, D1, D2, E1, E2, F1, F2, G1, G2, H1, H2
2 CPUs & 2 DIMMs	CPU1 A1, and CPU2: A1 or CPU1 B1, and CPU2: B1 or CPU1 E1, and CPU2: E1 or CPU1 F1, and CPU2: F1
2 CPUs & 4 DIMMs	CPU1 A1, G1 and CPU2: A1, G1 or CPU1 C1, E1 and CPU2: C1, E1
2 CPUs & 8 DIMMs	CPU1: A1, C1, E1, G1, and CPU2: A1, C1, E1, G1
2 CPUs & 10 DIMMs	CPU1: A1, C1, D1, E1, F1, G1, and CPU2: A1, C1, E1, G1
2 CPUs & 12 DIMMs	CPU1: A1, C1, D1, E1, F1, G1 and CPU2: A1, C1, D1, E1, F1, G1 or CPU1: A1, B1, C1, E1, G1, H1 and CPU2: A1, B1, C1, E1, G1, H1 or CPU1: B1, C1, D1, E1, F1, H1 and CPU2: B1, C1, D1, E1, F1, H1 or CPU1: A1, B1, D1, F1, G1, H1 and CPU2: A1, B1, D1, F1, G1, H1
2 CPUs & 16 DIMMs	CPU1: A1, B1, C1, D1, E1, F1, G1, H1, and CPU2: A1, B1, C1, D1, E1, F1, G1, H1
2 CPUs & 22 DIMMs	CPU1: A1, A2, B1, B2, C1, C2, D1, D2, E1, E2, F1, F2, G1, G2, H1, H2 CPU2: A1, C1, D1, E1, F1, G1
2 CPUs & 24 DIMMs	CPU1: A1, A2, B1, B2, C1, C2, D1, D2, E1, E2, F1, F2, G1, G2, H1, H2 CPU2: A1, B1, C1, D1, E1, F1, G1, H1
2 CPUs & 32 DIMMs	CPU1: A1, A2, B1, B2, C1, C2, D1, D2, E1, E2, F1, F2, G1, G2, H1, H2 CPU2: A1, A2, B1, B2, C1, C2, D1, D2, E1, E2, F1, F2, G1, G2, H1, H2

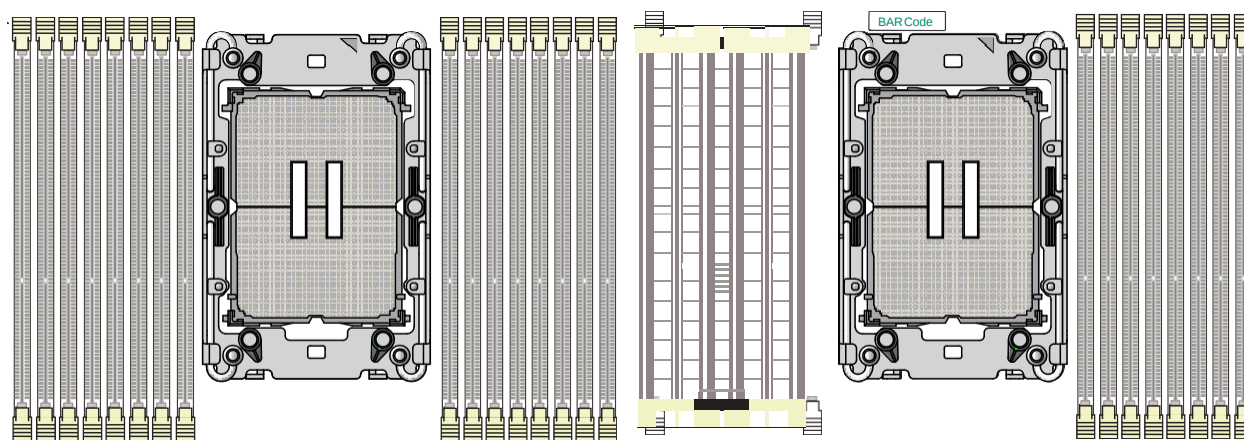


Figure 3-2. Memory Slots

HBM CPUs

Memory Population for HBM CPU, 32 DIMM Slots	
CPU/DIMMs	Slots
1 CPU & 1 DIMM	A1 or E1
1 CPU & 2 DIMMs	A1, G1 or C1, E1
1 CPU & 4 DIMMs	A1, C1, E1, G1
1 CPU & 8 DIMMs	A1, B1, C1, D1, E1, F1, G1, H1
1 CPU & 16 DIMMs	A1, A2, B1, B2, C1, C2, D1, D2, E1, E2, F1, F2, G1, G2, H1, H2
2 CPUs & 2 DIMMs	CPU1: A1; CPU2: A1 or CPU1: E1; CPU2: E1
2 CPUs & 4 DIMMs	CPU1: A1, G1; CPU2: A1, G1 or CPU1: C1, E1; CPU2: C1, E1
2 CPUs & 8 DIMMs	CPU1: A1, C1, E1, G1 CPU2: A1, C1, E1, G1
2 CPUs & 16 DIMMs	CPU1: A1, B1, C1, D1, E1, F1, G1, H1 CPU2: A1, B1, C1, D1, E1, F1, G1, H1
2 CPUs & 32 DIMMs	CPU1: A1, A2, B1, B2, C1, C2, D1, D2, E1, E2, F1, F2, G1, G2, H1, H2 CPU2: A1, A2, B1, B2, C1, C2, D1, D2, E1, E2, F1, F2, G1, G2, H1, H2

Memory Population Guidelines

- All DIMMs must be DDR5.
- Balance memory. Using unbalanced memory topology, such as populating two DIMMs in one channel while populating one DIMM in another channel, reduces performance. It is not recommended for Altos systems.
- In single-CPU configurations, memory must be installed in the DIMM slots associated with the installed CPU.

Guidelines Regarding Mixing DIMMs

- Populating slots with a pair of DIMM modules of the same type and size results in interleaved memory, which improves memory performance.
- Use memory modules of the same type and speed, as mixing is not allowed.
- x4 and x8 DIMMs can be mixed in the same channel.

DIMM Construction

- RDIMM (*non-3DS*) Raw Cards: A/B (2Rx4), C (1Rx4), D (1Rx8), E (2Rx8)

Memory Population Sequence

Blue slots versus black slots: Install the first DIMM in the blue memory slot, which is the first of a memory channel. Then, if using two DIMMs per channel, install the second DIMM in the black slot.

Installing Memory

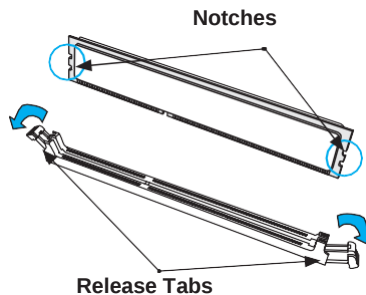
Electrostatic Discharge (ESD) can damage electronic components including memory modules. To avoid damaging DIMM modules, it is important to handle them carefully. The following measures are generally sufficient.

- Use a grounded wrist strap designed to prevent static discharge.
- Handle the memory module by its edges only.
- Put the memory modules into the antistatic bags when not in use.

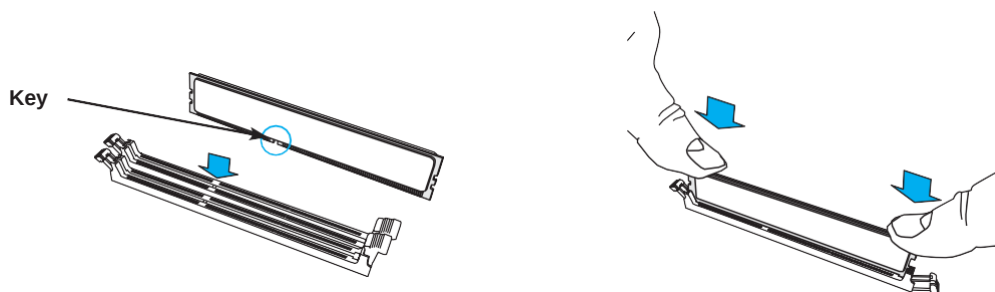
Installing Memory

Begin by removing power from the system as described in Section 3.1. Follow the memory population sequence in the table above.

1. Push the release tabs outwards on both ends of the DIMM slot to unlock it.



2. Align the key of the DIMM with the receptive point on the memory slot and with your thumbs on both ends of the module, press it straight down into the slot until the module snaps into place.



3. Press the release tabs to the locked position to secure the DIMM module into the slot.

Caution: Exercise extreme caution when installing or removing memory modules to prevent damage to the DIMMs or slots.

Removing Memory

To remove a DIMM, unlock the release tabs then pull the DIMM from the memory slot.

3.5 Motherboard Battery

The motherboard uses non-volatile memory to retain system information when system power is removed. This memory is powered by a lithium battery residing on the motherboard.

Replacing the Battery

Begin by removing power from the system.

1. Push aside the small clamp that covers the edge of the battery. When the battery is released, lift it out of the holder.
2. To insert a new battery, slide one edge under the lip of the holder with the positive (+) side facing up. Then push the other side down until the clamp snaps over it.

Note: Handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

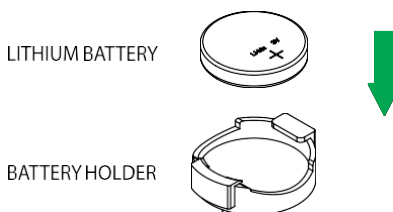


Figure 3-3. Installing the Onboard Battery



Warning: There is a danger of explosion if the onboard battery is installed upside down (which reverses its polarities). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer (BR2032).

3.6 Storage Drives

The system supports up to twelve 3.5" or 2.5" storage drives. The 3.5" storage drives are mounted in tool-less 3.5" drive carriers that simplify their removal from the chassis. These 3.5" drive carriers can also support 2.5" drives through screw mounting. These carriers also help promote proper airflow.

For VROC configurations, refer to the VROC section in this manual.

SAS, SATA, and NVMe drives are supported using optional parts that are sold separately.

Installing Drives



Figure 3-6. Logical Drive Numbers

Removing a Hot-Swap Drive Carrier from the Chassis

1. Press the release button on the drive carrier, which will extend the drive carrier handle.
2. Use the drive carrier handle to pull the drive out of the chassis.

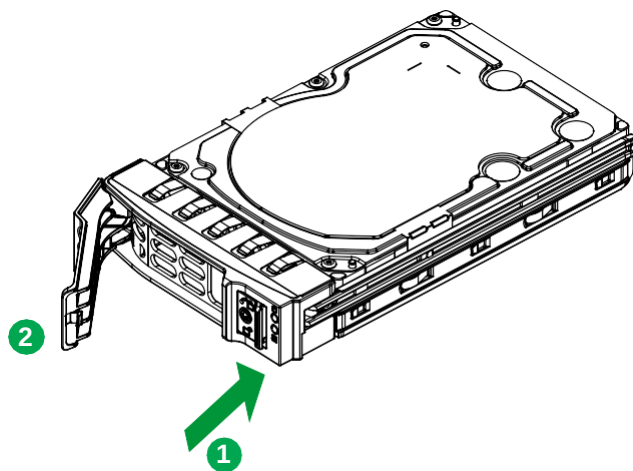


Figure 3-7. Removing a Drive Carrier

Installing a 3.5" Drive

1. Remove the dummy drive, which comes pre-installed in the drive carrier. Pull out the two locking clasps on the right outside of the carrier and lift out the dummy drive.
2. Position the drive above the carrier with the PCB side facing down and the connector end toward the rear of the carrier.

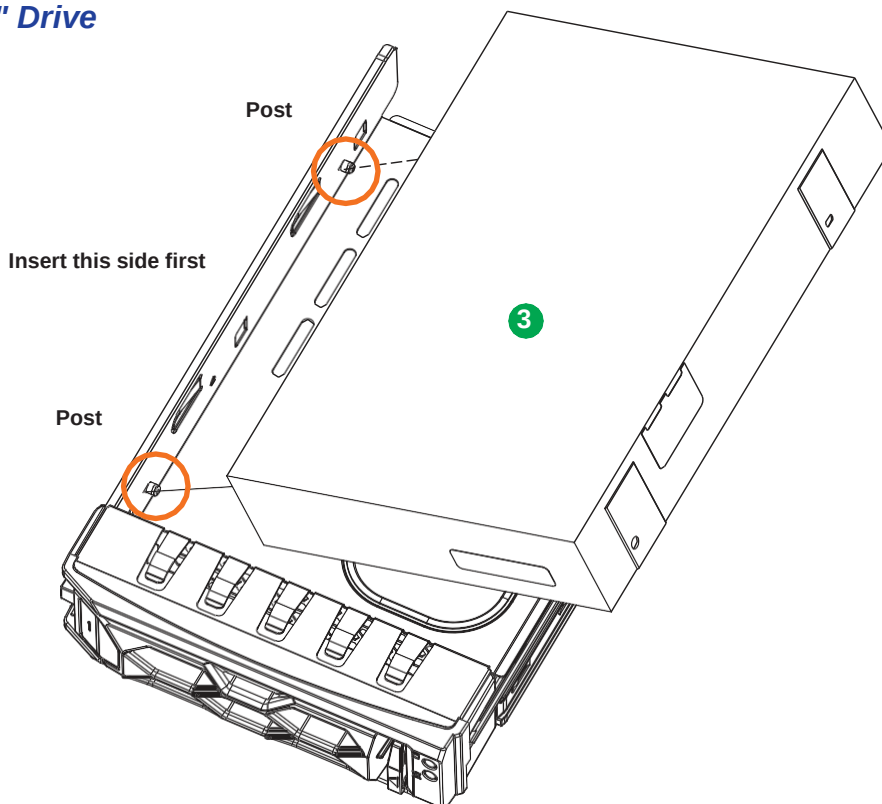
3.5" Drive

Figure 3-8. Installing a 3.5" Drive into a Carrier

3. Tilt the drive to insert it onto the two posts on the left inside of the carrier.
4. Push the right side of the drive fully into the carrier and allow the two spring locking clasps to secure the drive.
5. Insert the drive carrier into its bay, keeping the release button on the right. When the carrier reaches the rear of the bay, the release handle will retract.
6. Push the handle in until it clicks into its locked position.

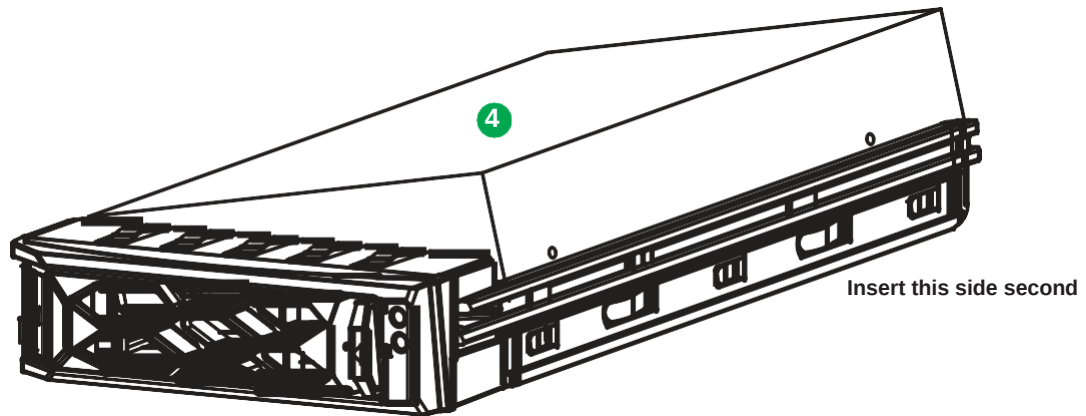


Figure 3-9. Installing a 3.5" Drive into a Carrier

Hot-Swap for NVMe Drives

Altos servers support NVMe surprise hot-swap. For even better data security, NVMe orderly hot swap is recommended. NVMe drives can be ejected and replaced remotely using the BMC Dashboard.

Ejecting a Drive

1. BMC Dashboard > Server Health > NVMe SSD

2. Select Device, Group and Slot, and click **Eject**. After ejecting, the drive Status LED indicator turns green.
3. Remove the drive.

Replacing the Drive

1. Insert the replacement drive.

2. BMC Dashboard > Server Health > NVMe SSD

3. Select Device, Group and slot and click **Insert**. The drive Status LED indicator flashes red, then turns off. The Activity LED turns blue.

Checking the Temperature of an NVMe Drive

There are two ways to check using the BMC Dashboard.

Checking a Drive

- **BMC Dashboard > Server Health > NVMe SSD** – Shows the temperatures of all NVMe drives.
- **BMC Dashboard > Server Health > Sensor Reading > NVME_SSD** – Shows the single highest temperature among all the NVMe drives.

Installing M.2 Solid State Drives

The motherboard has two M.2 slots (M.2-H1, M.2-H2) for NVMe or SATA. The M.2 slot on the motherboard supports PCIe 3.0 x2 or SATA 3.0 devices in the 2280 and 22110 form factors.

Installing M.2 Drives

1. Power down the system and then remove the top cover.
2. Locate the plastic clips that will lock the M.2 SSD in place.

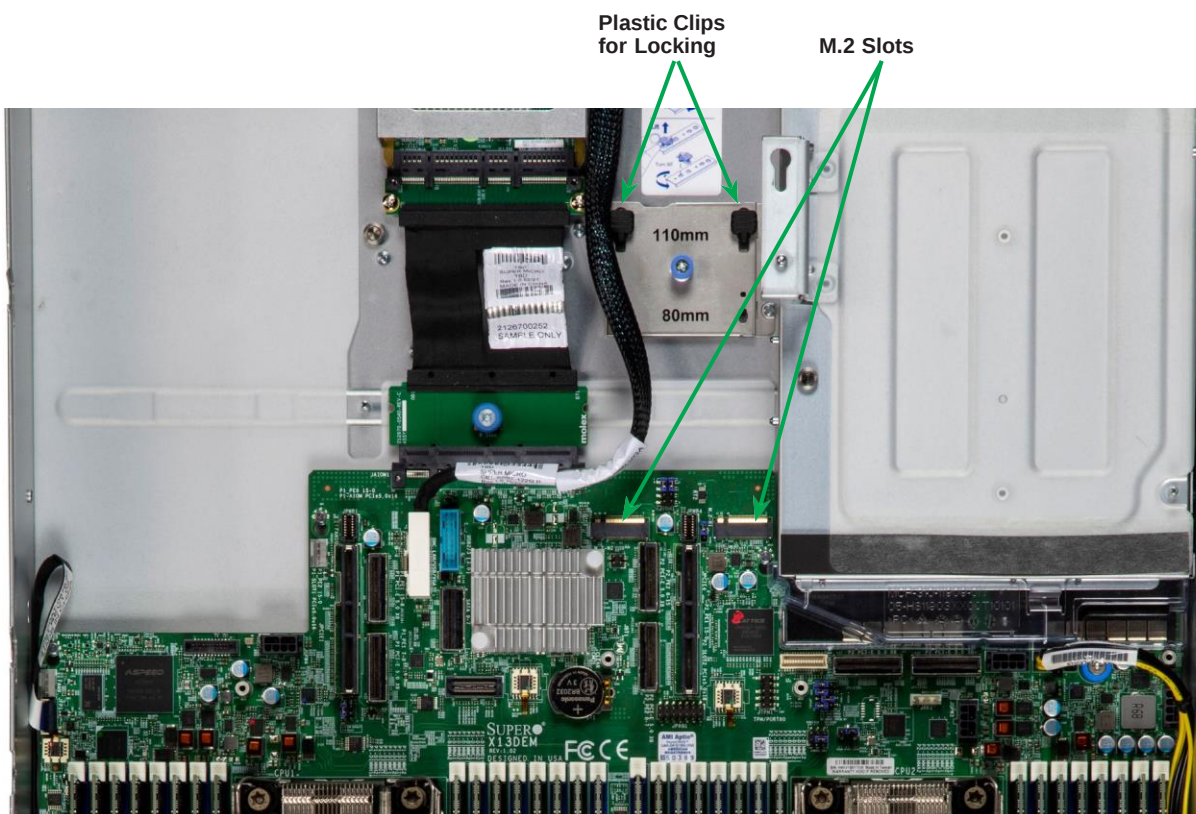


Figure 3-12. Location of the M.2 Slots and Locking Clips

3. Determine whether your M.2 SSD is 80mm or 110mm. If the plastic clip is not in the correct hole, move it.
 - a. To remove the plastic clip, twist it 90 degrees and pull up.
 - b. To insert the plastic clip, push it into the correct mounting hole and twist 90 degrees.

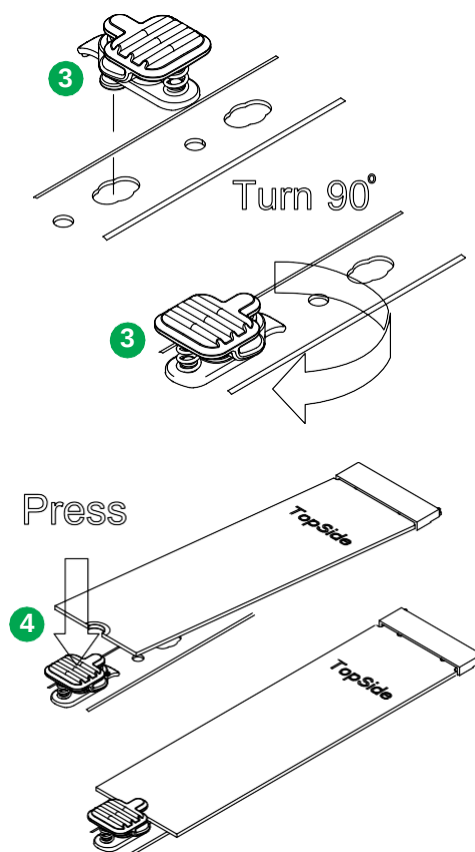


Figure 3-13. Installing a Plastic Locking Clip and M.2 SSD

4. Insert the M.2 SSD sideways into the connector on the motherboard so that it lays flat, then secure it to the motherboard with the plastic clip.
5. Replace the cover and restore the power to the system.

3.7 System Cooling

Fans

The chassis contains four 8-cm high-performance fans. Fan speed is controlled by the BMC depending on the system temperature. If a fan fails, the remaining fans will ramp up to full speed. The system will continue to run with a failed fan, although it may shut down if the heat gets too great. Replace any failed fan at your earliest convenience with the same model. Failed fans can be identified through the BMC.

Changing a System Fan

1. Replace the failed fan with an identical fan, available from Altos. Push the new fan into the housing, making sure the air flow direction is the same.
2. Power up the system and check that the fan is working properly and that the LED on the control panel has turned off. Finish by replacing the chassis cover.

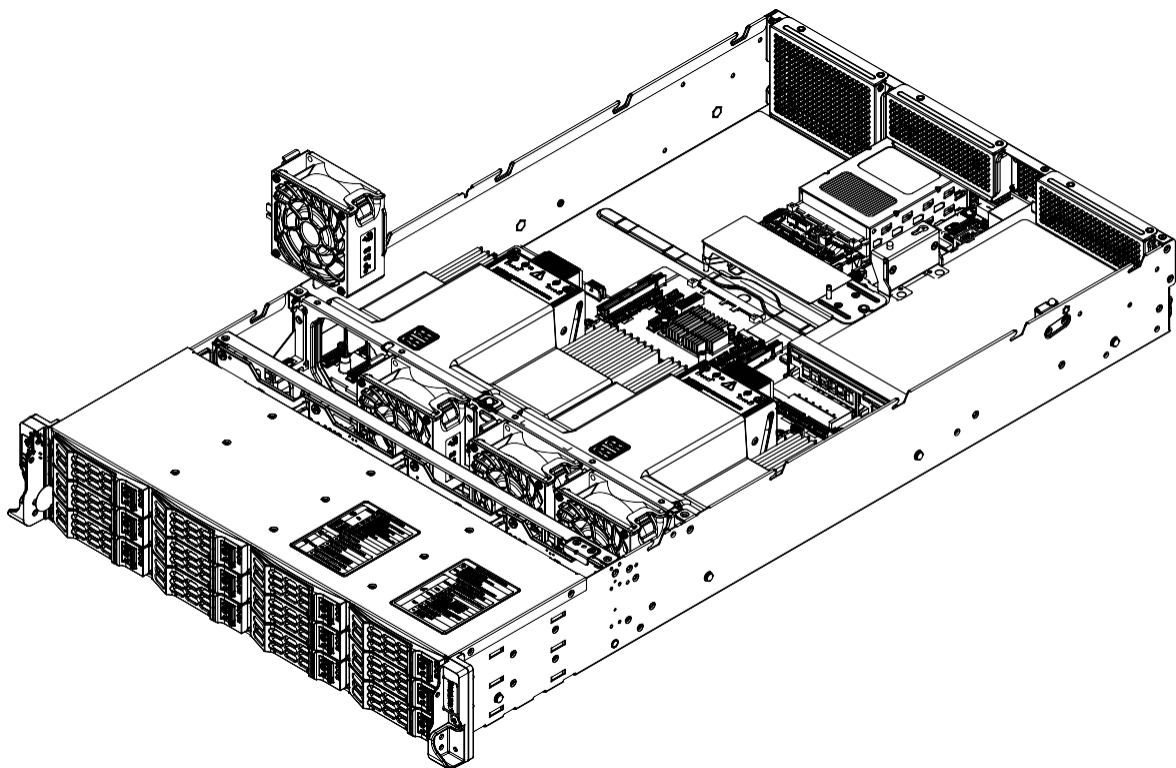


Figure 3-14. Replacing a Fan

Air Shrouds

Air shrouds concentrate airflow to maximize fan efficiency. They do not require screws to install.

Installing the Standard Air Shrouds

- Position the air shrouds as illustrated in the figure below.

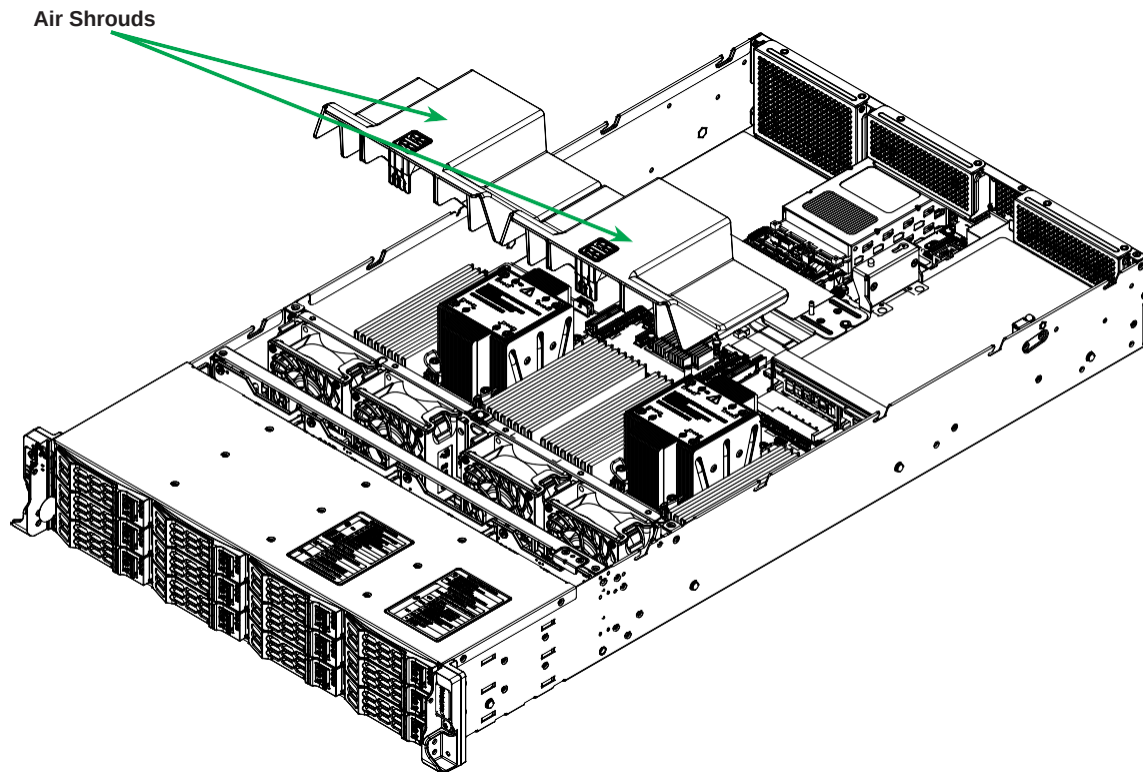


Figure 3-15. Installing the Air Shrouds

3.8 Power Supply

The chassis features redundant power supplies. The power modules can be changed without powering down the system.

These power supplies are auto-switching capable. This feature enables them to automatically sense the input voltage and operate at a 100-120v or 180-240v.

Power Supply LEDs

On the rear of the power supply module, an LED displays the status.

- **Solid Green:** When illuminated, indicates that the power supply is on.
- **Blinking Green:** When blinking, indicates that the power supply is plugged in and turned off by the system.
- **Blinking Amber:** When blinking, indicates that the power supply has a warning condition and continues to operate.
- **Solid Amber:** When illuminated, indicates that the power supply is plugged in, and is in an abnormal state. The system might need service. Please contact Altos technical support.

Replacing the Power Supply

1. Unplug the AC cord from the module to be replaced.
2. Push the release tab on the back of the power supply as illustrated.
3. Pull the power supply out using the handle.
4. Replace the failed power module with the same model.
5. Push the new power supply module into the power bay until it clicks.
6. Plug the AC power cord back into the module.

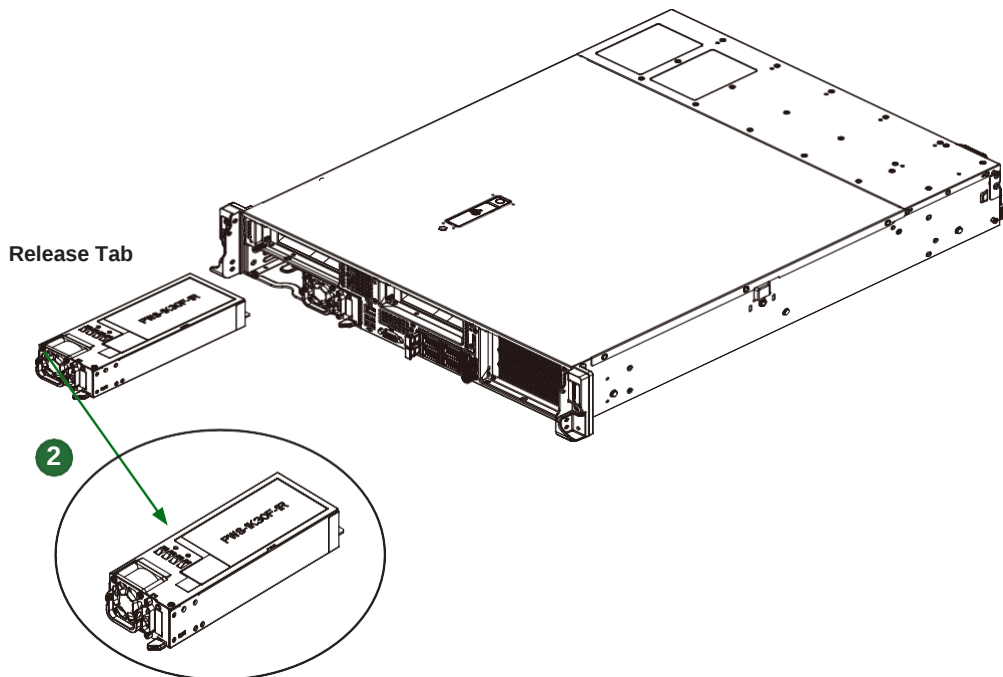


Figure 3-16. Installing a Power Supply Module

3.9 OCP 3.0 Network Cards

The system provides network connection by means of up to two advanced input/output modules (AIOMs) OCP 3.0 network port cards.



Figure 3-1

7. AIOM Chassis Slots

AIOM Slots			
Item	Mechanical	Electrical	Thermal
A1	Small Form Factor, OCP 3.0	x16 (CPU1)	Up to 15W*
A2 (Optional)	Small Form Factor, OCP 3.0	x16 (CPU2)	Up to 15W*

*

Installing AIOM Cards

1. Remove the blank cover plate (**A1** or **A2**), unscrewing the thumbscrew.
2. Slide the AIOM card in the opening until it seats in the connector slot.
3. Secure with the thumbscrew.

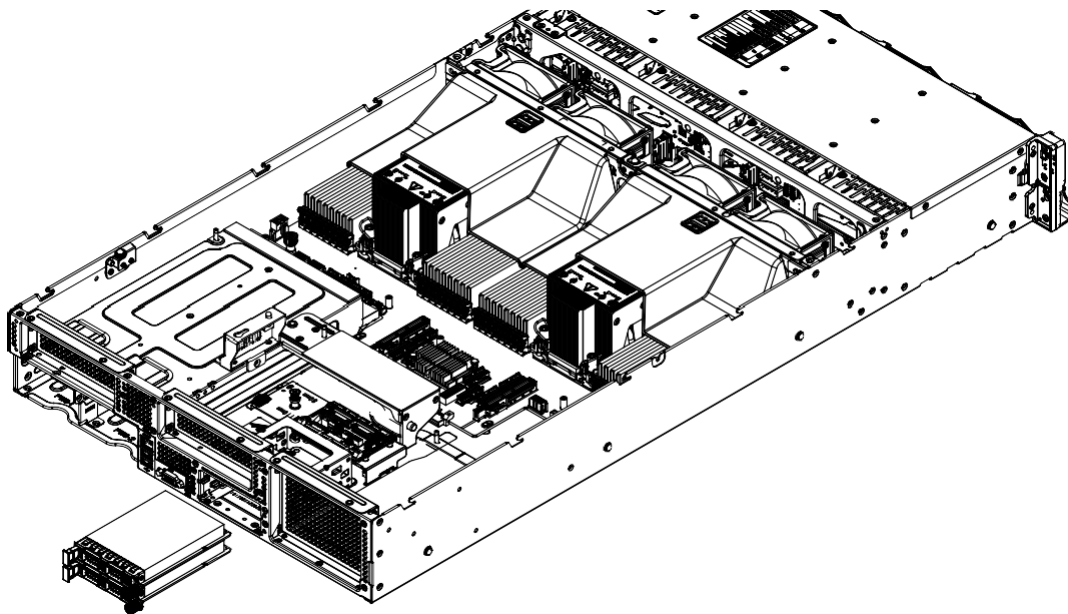


Figure 3-18. Installing AIOMs

3.10 Expansion Cards

The system can accommodate eight PCIe 5.0 cards or up to four double-width GPUs.



CPU1 ■ CPU2 ■

Figure 3-19. Expansion Card Chassis Slots

To enable any of the eight expansion card slots in this system it will require optional parts that are sold separately.

Expansion Card Slot Configurations		
Slot Configurations	Slot Width	Motherboard Connection
Default	Slot 1: PCIe x16	Cable connection from (CPU2)
	Slot 2: No Connection	Cable connection from (CPU2)
	Slot 3: PCIe x8	Cable connection from (CPU2)
	Slot 4: PCIe x8	Cable connection from (CPU2)
	Slot 5: PCIe x16	Cable connection from (CPU1)
	Slot 6: No Connection	Cable connection from (CPU1)
	Slot 7: PCIe x8	Edge connection from (CPU1)
	Slot 8: PCIe x8	Edge connection from (CPU1)
Options	Slot 1: PCIe x16	Cable connection from (CPU2)
	Slot 2: No Connection	No Connection
	Slot 3: PCIe x16	Cable connection from JPCIE4 (CPU2)
	Slot 4: No Connection	No Connection
	Slot 5: PCIe x16	Cable connection from JPCIE2A1 + JPCIE2B1 (CPU1)
	Slot 6: No Connection	No Connection

	Slot 7: PCIe x16	Edge connection from JPCIE1 (CPU1)
	Slot 8: No Connection	No Connection

3.11 Cable Routing Diagrams

The below diagrams indicate the cable routing for the storage, PCIe, IO, and power cables. When disconnecting cables to add or replace components, refer to the diagrams so you can reroute them in the same manner. If cables are not connected or routed properly it may lead to device detection or performance issues.

Storage Cables - NVMe

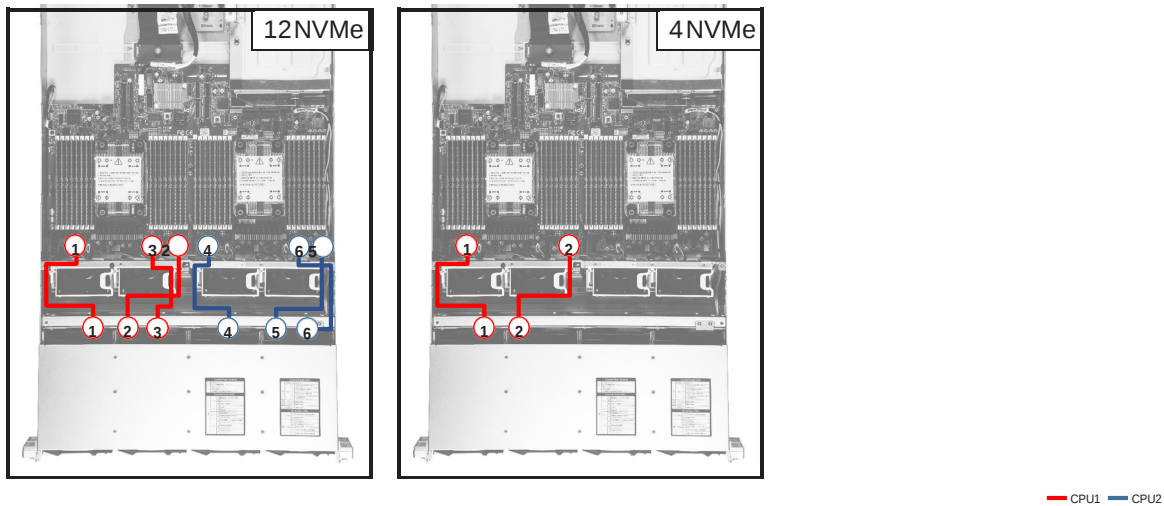


Figure 3-20. Storage Drive NVMe Cable Routing

NVMe Cable Routing			
Cable	Part Number	Connection From	Connection To
1*	SC.31411.089	Motherboard, P1_NVME1	Front Backplane, NVME1
2	SC.31411.08A	Motherboard, P1_NVME2	Front Backplane, NVME2
3	SC.31411.08B	Motherboard, P1_NVME3	Front Backplane, NVME3
4	SC.31411.08C	Motherboard, P2_NVME1	Front Backplane, NVME4
5	SC.31411.0D	Motherboard, P2_NVME2	Front Backplane, NVME5
6	SC.31411.08B	Motherboard, P2_NVME3	Front Backplane, NVME6

*This cable connection provides a NVMe SMBus& NVMe VPP bus communication links between the system and the storage backplane. NVMe devices attached to the storage backplane may have detection or hot-swap issues if this cable not connected properly.

Storage Cables - SAS/SATA (from Storage Add-on Card)

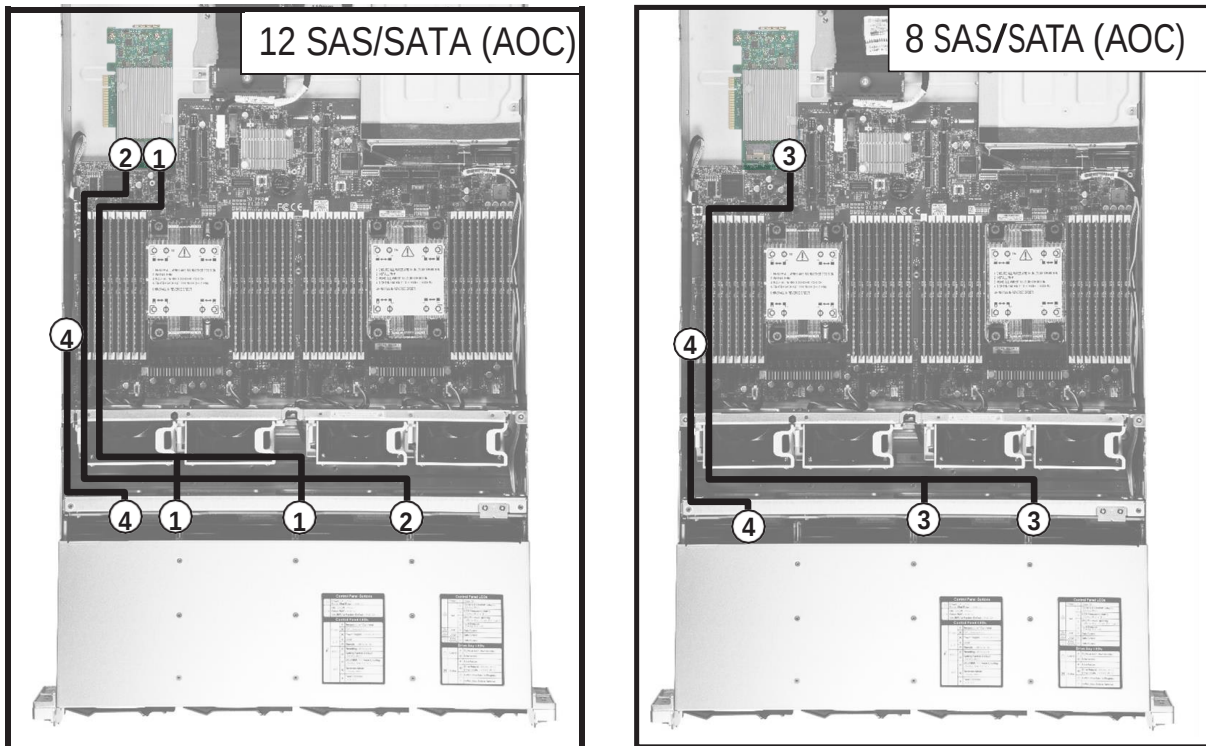


Figure 3-21. Storage Drive SAS/SATA Cable Routing

SAS/SATA Card Cable Routing			
Cable	Part Number	Connection From	Connection To
1	SC.31411.079	Storage AOC, CN0	Backplane, CN1 & CN2
2	SC.31411.086	Storage AOC, CN1	Backplane, CN3
3	SC.31411.079	Storage AOC, CN0	Backplane, CN2 & CN3

Storage Cables - PCH SATA

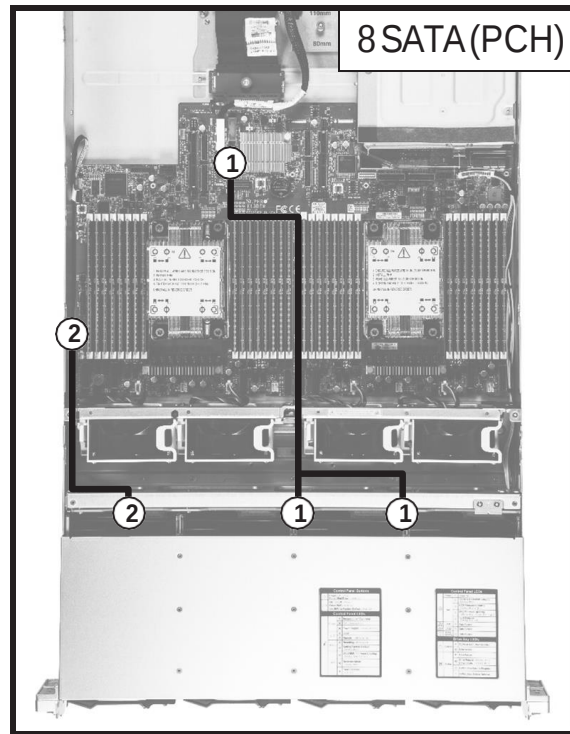


Figure 3-22. Storage Drive PCH SATA Cable Routing

PCIe Cables - Expansion Card Slots

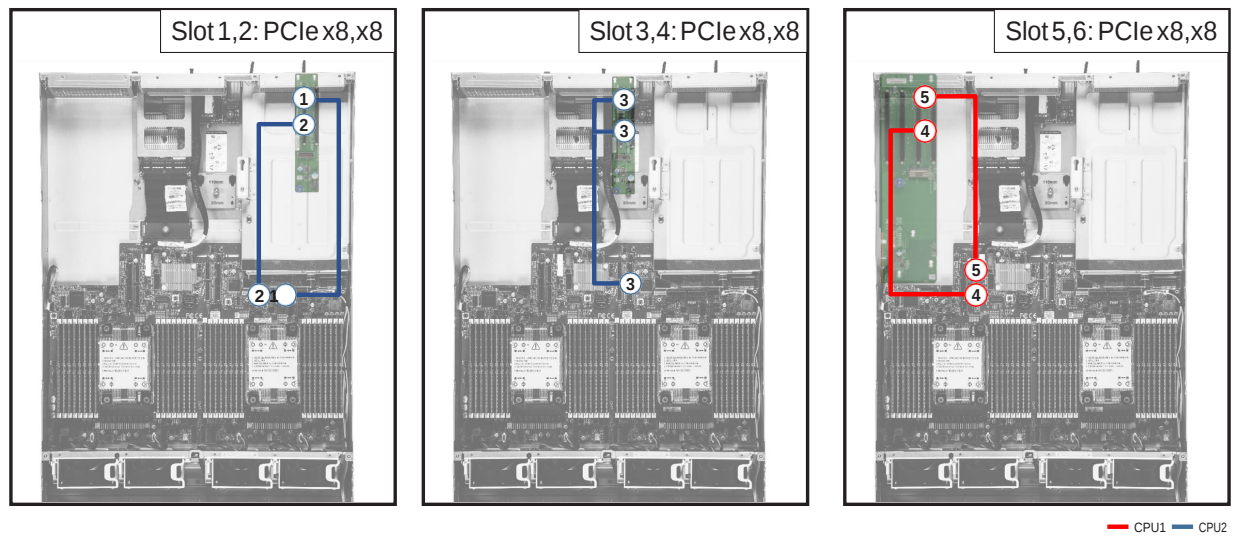


Figure 3-24. Expansion Card Cable Routing, 1 of 2

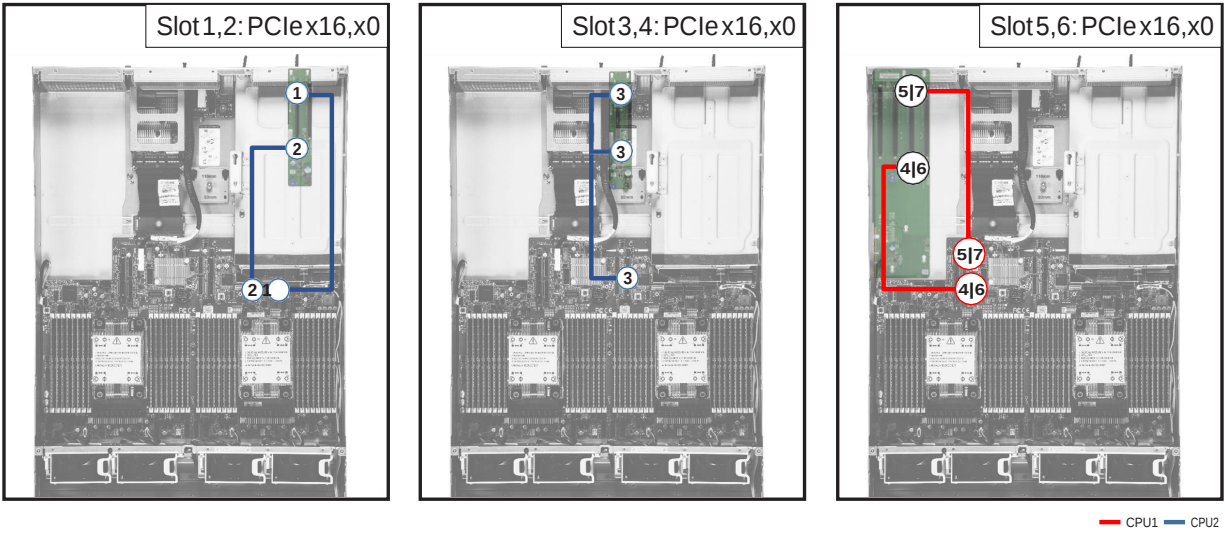


Figure 3-25. Expansion Card Cable Routing, 2 of 2

PCIe Cables - AIOM/OCP 3.0 NIC Slots

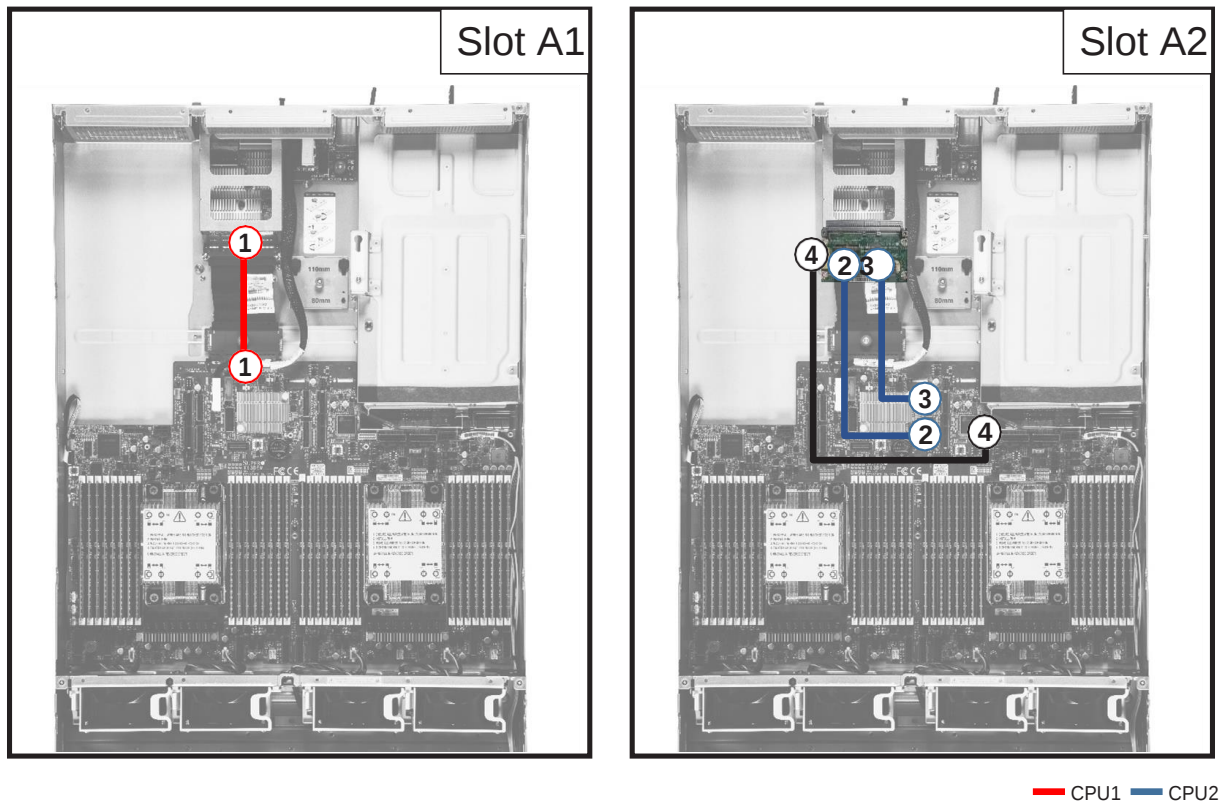


Figure 3-26. AIOM Cable Routing, 1 of 2

Input/Output Board Cable

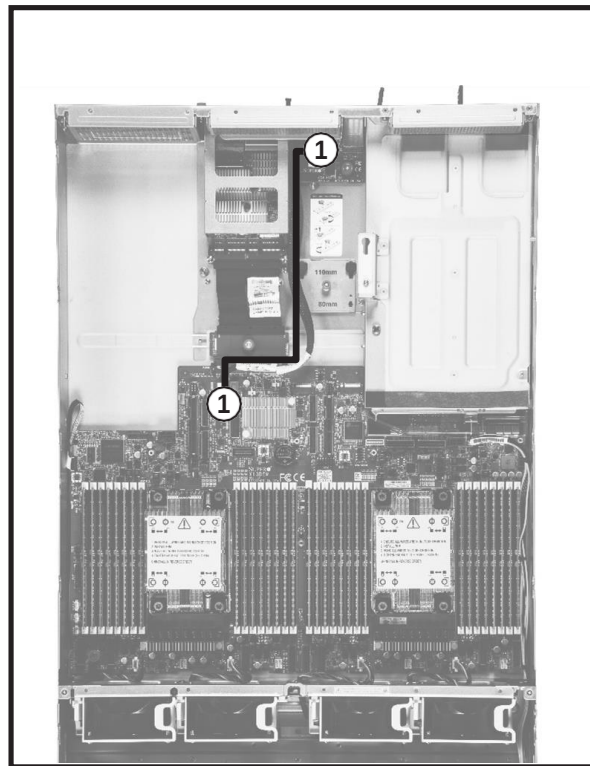


Figure 3-27. I/O Board Cable Routing

Power Cables

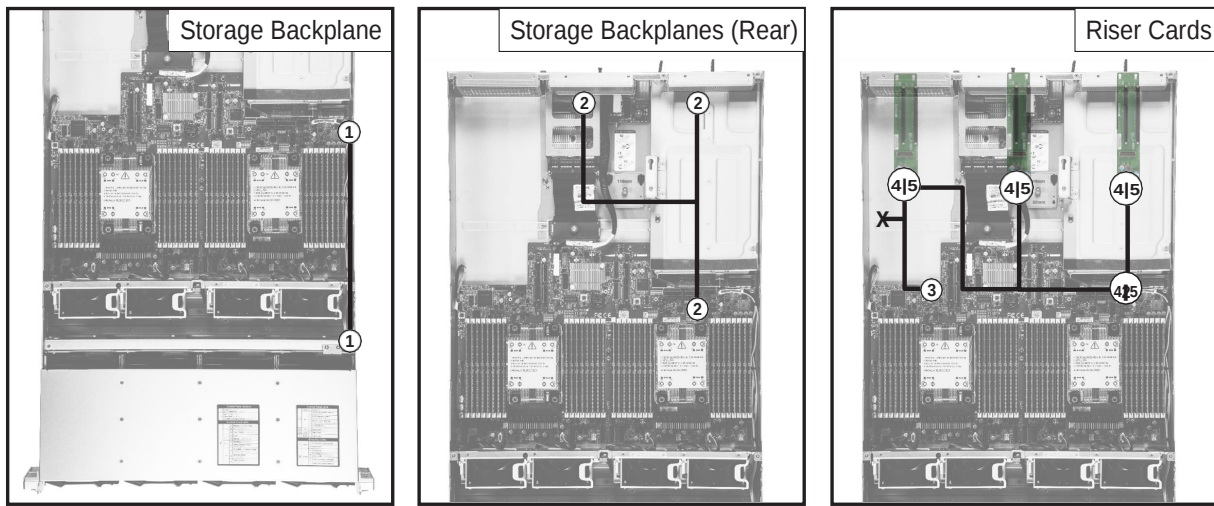


Figure 3-28. Power Cable Routing

*The riser card power cable(s) installed in the system may vary depending on the optional riser cards or GPUs installed in the system.

Chapter 4

Motherboard Connections

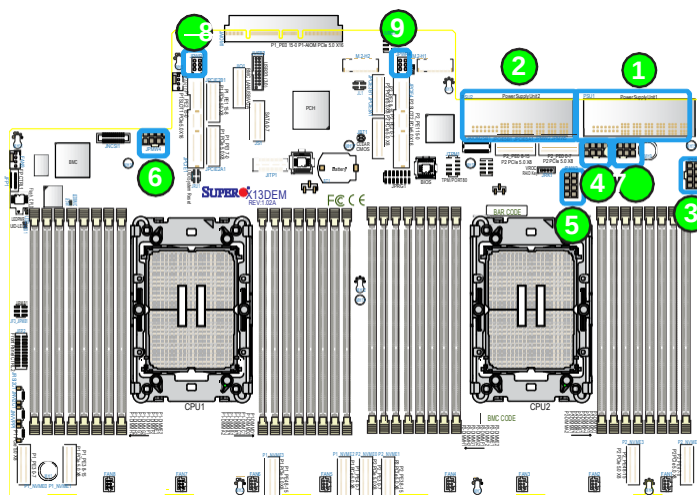
This section describes the jumpers, connections and LEDs on the motherboard and provides pinout definitions. Some connections might not be used in this system. A motherboard layout indicating component locations may be found in [Chapter 1](#). More detail can be found in the [Motherboard Manual](#).

4.1 Power Connections

Two power supply connections, located at PSU1/PSU2, provide main power to your system, and five 8-pin power connectors (JPMW1–JPMW5) are used for +12V devices. Another two 6-pin power connectors (JPWR1 and JPWR4) provide additional power for system use. All these power connectors meet the ATX SSI EPS 12V specification.

Important: To provide adequate power to the motherboard, connect all power connectors to the power supply. Failure to do so may void the manufacturer's warranty on your power supply and motherboard.

8-pin Power Pin Definitions	
Pin#	Definition
1 - 4	Ground
5 - 8	+12 V



1. PSU1: Main PWR Supply Unit 1
2. PSU2: Main PWR Supply Unit 2
3. JPMW1: 8-pin PWR Connector 1
4. JPMW2: 8-pin PWR Connector 2
5. JPMW3: 8-pin PWR Connector 3
6. JPMW4: 8-pin PWR Connector 4
7. JPMW5: 8-pin PWR Connector 5
8. JPWR1: 6-pin PWR Connector 1
9. JPWR4: 6-pin PWR Connector 2

4.2 Headers and Connectors

Fan Headers

There are eight 6-pin fan headers (FAN1–FAN8) and two 4-pin fan headers (FAN9/FAN10). Fan speed control for these fans is supported by Thermal Management using the BMC interface.

6-pin Fan Header Pin Definitions	
Pin#	Definition
1	Ground
2	3A, +12V
3	Tachometer
4	PWM_Control
5	3A/12V
6	Ground

4-pin Fan Header Pin Definitions	
Pin#	Definition
1	Ground (Black)
2	+12V (Red)
3	Tachometer
4	PWM Control

TPM Header

The JTPM1 header is used to connect a Trusted Platform Module (TPM)/Port 80, which is available from Altos A TPM/Port 80 connector is a security device that supports encryption and authentication in hard drives. It allows the motherboard to deny access if the TPM associated with the storage drive is not installed in the system.

Trusted Platform Module/Port 80 Header Pin Definitions			
Pin#	Definition	Pin#	Definition
1	P3V3	2	SPI_TPM_CS_N
3	PCIe_RESET_N#	4	SPI_PCH_MISO
5	SPI_PCH_CLK#	6	Ground
7	SPI_PCH_MOSI	8	N/A
9	JTPM1_P3V3A	10	IRQ_TPM_SPIN_N

BMC External I²C Header

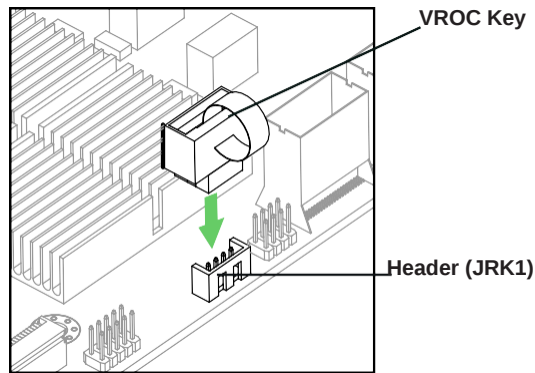
A System Management Bus 6-pin header for BMC is located at JIPMB1. Connect a cable to this header to use the IPMB I²C connection on your system.

External I ² C Header Pin Definitions	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection
5	???
6	???

RAID Key Header

An Intel VROC RAID Key header is located at JRK1. It supports VMD used in creating optional advanced NVMe RAID configurations.

RAID Key Header Pin Definitions	
Pin#	Definition
1	Ground
2	RAID_KEY_PU
3	Ground
4	PCH_RAID_KEY



Note: This drawing is for illustration only. Your motherboard may look different.

NC-SI Connector

The Network Controller Sideband Interface (NC-SI) connector is located at JNCSI1. This is used to connect a Network Interface Card (NIC) to the motherboard to allow the onboard Baseboard Controller (BMC) to communicate with a network.

NVMe SMBus Headers

NVMe SMBus (I²C) header (JNVI2C1), used for PCIe SMBus clock and data connections, provides hot-plug support via a dedicated SMBus interface. This feature is only available for a Altos complete system with an Altos proprietary NVMe add-on card and the proper cable.

NVMe SMBus Header Pin Definitions	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	VCCIO

NVMe VPP Bus Connector

A NVMe VPP Bus connector is located at JNVVPP1 on the motherboard. The NVMe VPP connector provides hot plug support for the NVMe devices, which will allow the user to replace NVMe devices without shutting down and powering off the system.

Chassis Intrusion

A Chassis Intrusion header is located at JL1. Attach the appropriate cable from the chassis to the header to alert when the chassis is opened.

Chassis Intrusion Pin Definitions	
Pins	Definition
1	Intrusion Input
2	Ground

AIOM Sideband Connector (JAIOM2SB1)

This connector provides the AIOM sideband signals for an optional second AIOM IO board.

PCIe I²C Header

A PCIe I²C (SMBus) header is located at JRSI2C1. It is used for PCIe cards to allow the BMC or the BIOS to read disk drive information or FRUs more effectively.

PCIe 3.0 M.2-H1/M.2-H2 Slots

Two PCIe 3.0/SATA3 Hybrid M.2 slots are located at M.2-H1 and M.2-H2 on the motherboard. These M.2/SATA3 Hybrid slots support PCIe 3.0 x4 M.2 NVMe/SATA3 SSDs in the 2280 and 22110 form factors. To accommodate the 2280 and 22110 form factors, two M.2 mounting holes (MH17/MH18) are provided on the motherboard. Use Mounting Hole MH17 for M.2-H2 slot support, and MH18 for M.2-H1 slot support. M.2 allows for a variety of card sizes, increased functionality, and spatial efficiency.

MCIO NVMe Connectors

MCIO NVMe connectors, located at P1_NVME 0–3 and P2_NVME 0–3, provide eight PCIe 5.0 x8 connections on the motherboard. P1_NVME 0–3 connections are supported by CPU1, and P2_NVME 0–3 connections supported by CPU2. NVMe VPP and NVMe SMBus signals are included in MCIO NVMe connectors P1_NVME 1 and P2_NVME 1. Use these MCIO connectors to support high-speed PCIe storage devices.

Note: When installing an NVMe device on a motherboard, please be sure there is a valid NVMe VPP and NVMe SMBus connection from the motherboard to the storage backplane in order for the NVMe device to work properly.

SATA 3.0 0-7 Ports

A SATA 3.0 header, located at JS1, supports eight SATA 3.0 connections (SATA0–7) on the motherboard. These SATA 3.0 ports are supported by the Intel Intel PCH C621A chipset. Connecting a proper SATA cable to JS1 to use SATA 3.0 connections.

Low-profile (LP) Slim SAS I/O Connector

A low-profile slim SAS I/O connector, located on JIO1, provides dedicated BMC LAN/USB/VGA support on the rear side of the motherboard.

Control Panel

JFP1 contains header pins for the front control panel connections. All JFP1 wires have been bundled into a single cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the motherboard. The other end connects to the control panel PCB board.

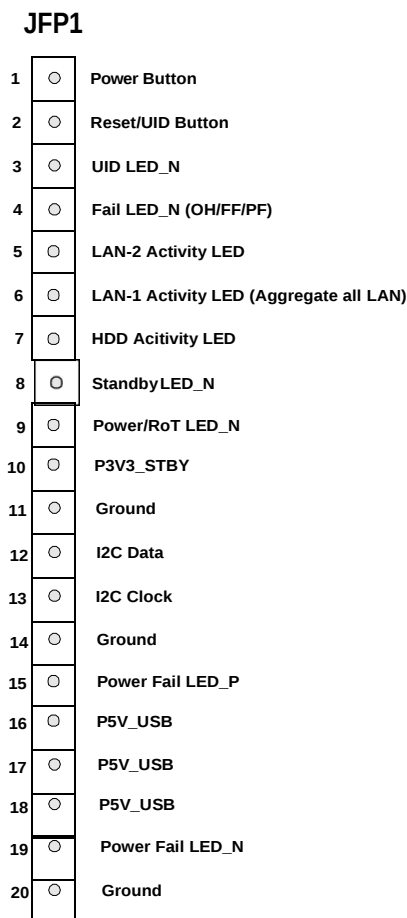


Figure 4-1. JFP1 Control Panel Pins

Power Button and BMC/BIOS Status LED Button

The Power On and BMC/BIOS Status LED button is connected to Pin 1 of the header JFP1. Momentarily contacting Pin 1 of JFP1 will power on/off the system, or display the BMC/BIOS status.

Reset Button/Front UID Switch

The Reset button/Front UID switch is configured in conjunction with the jumper, JRU1. Depending on the JRU1 settings, the button either resets the BMC or toggles the UID LED. See the JRU1 description for details. The button is connected to Pin 2 of JFP1.

UID LED

The unit identifier LED connection is located on Pin 3.

Fail LED (Information LED)

The Fail LED connection is Pin 4 of JFP1. It provides stimulus to the Information LED that indicates overheating, fan failure, and power failure. A description of the Information LED can be found in Chapter 1

LAN1/LAN2 (NIC1/NIC2)

The NIC (Network Interface Controller) LED connection for LAN Port 1 is Pin 6, and for LAN Port 2 is Pin 5. When this LED is blinking green, it indicates LAN activity.

HDD Activity LED

The HDD activity LED connection is Pin 7. When this LED is blinking green, it indicates HDD activity.

Standby Power LED

The LED indicator for standby power is Pin 8. If this LED is on, standby power is on.

RoT (Root of Trust) Power LED

The Power LED for RoT (Root of Trust) connection is Pin 9. If this LED is on, power for the RoT chip is on.

Standby Power

A Standby Power (I2C) connections are Pins 10 through Pin 14 to provide power to the system when it is in standby mode.

Power Fail LED Indicators

Power Failure LED Indicators are Pin 15 and Pin 19.

FP USB Power

Front Panel USB power connections are Pins 16 through Pin 18 to provide power to front USB devices.

4.3 Input/Output Ports

The low-profile slimSAS I/O connector, located at J101, is used to connect a Hyper I/O mezzanine board to the motherboard. This connector provides dedicated BMC LAN, VGA, USB, and a COM port header connection for rear chassis access.

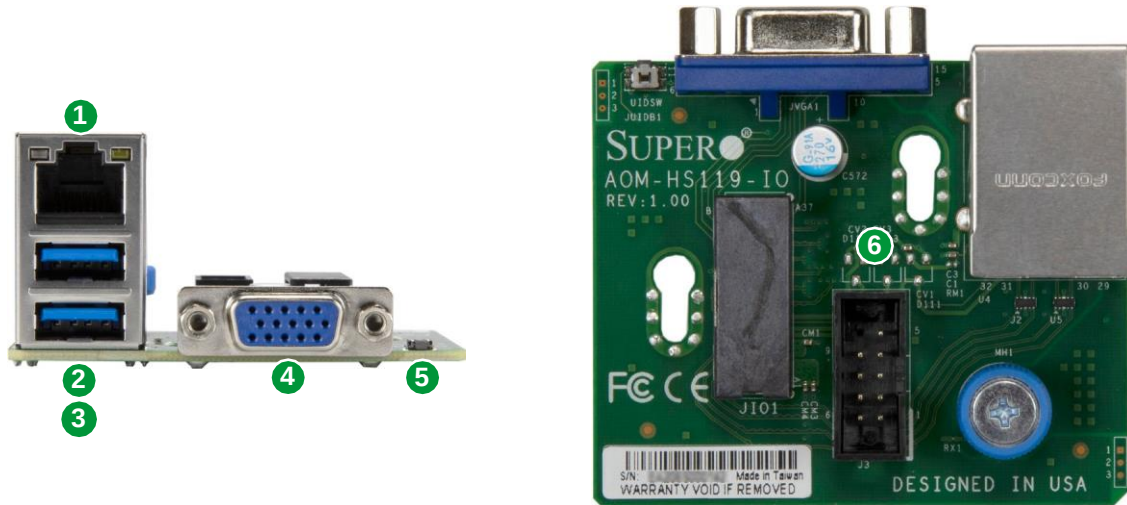


Figure 4-2. Rear System I/O Ports

Rear I/O Ports			
#	Description	#	Description
1	Dedicated BMC LAN	4	VGA
2	USB (2.0)	5	UID Switch
3	USB (2.0)	6	Com header

BMC LAN Port

There is a dedicated LAN port on the I/O back panel to provide access to the BMC.

Unit Identifier Switch/UID LED Indicator

A Unit Identifier (UID) switch and a UID LED indicator are located on the rear of the system. When you press the UID switch, both front and rear UID LED indicators are toggled on or off. The UID indicators provide easy identification of a system in a rack. The UID can also be triggered using the BMC.

Advanced I/O Module (AIOM) for Rear I/O Support (JAIOM1)

This AIOM connector (P1_PE0 15-0), supported by CPU1, provides input/output connections on the rear side of your system. (An AIOM extension cable is required.)

AIOM Sideband Connector (JAIOM2SB1)

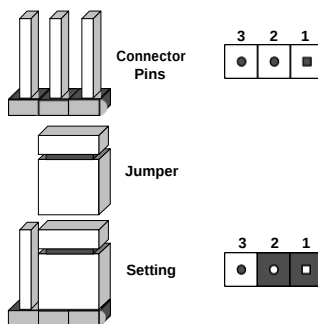
This AIOM slot provides support for AIOM sideband connections.

4.4 Jumpers

Explanation of Jumpers

To modify the operation of the motherboard, jumpers are used to choose between optional settings. Jumpers create shorts between two pins to change the function associated with it. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout page for jumper locations.

Note: On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" indicates the jumper is either on only one pin or has been completely removed.



CMOS Clear

JBT1 is used to clear CMOS.

UID and System Reset Button Select Jumper

Jumper JRU1 is used to configure the function of the Control Panel Reset or UID LED button (Pin 2 of JFP1). To set the button to toggle the UID LEDs (in a chassis that supports front UID), close Pins 1 and 2 of jumper JRU1.

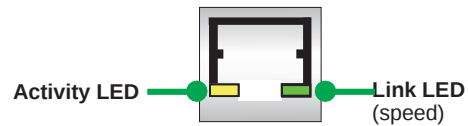
Front UID Switch/Reset Button Select Jumper (JRU1) Jumper Settings	
State	Description
Close Pin 1 and Pin 2 of JRU1	Button UID support (Default)
Close Pin 3 and Pin 4 of JRU1	Button system reset support

4.5 LED Indicators

BMC-Dedicated LAN LEDs

A dedicated BMC LAN port provided a connection to the BMC. The Link LED indicates the speed of the connection. The other LED indicates activity.

BMC Link LED	
Color	Definition
Off	No Connection
Green	100 Mb/s
Amber	1 Gb/s



Unit ID LED

A rear unit identifier (UID) indicator at LE6 is located near the UID switch on the I/O back panel. It provides easy identification of a unit that may need service.

Onboard Power LED

The Onboard Power LED is LE3. When this LED is on, the system power is connected.

BMC Heartbeat LED

LED1 is the BMC heartbeat LED. When the LED is blinking green, BMC is functioning normally.

Chapter 5

Software

After the hardware has been installed, you can install the Operating System (OS), configure RAID settings and install the drivers.

5.1 Microsoft Windows OS Installation

If you will be using RAID, you must configure RAID settings before installing the Windows OS and the RAID driver

Installing the OS

1. Create a method to access the MS Windows installation ISO file. That can be a USB flash or media drive.
2. Retrieve the proper RST/RSTe driver. Go to the Altos web page for your motherboard and click on "Download the Latest Drivers and Utilities", select the proper driver, and copy it to a USB flash drive.
3. Boot from a bootable device with Windows OS installation. You can see a bootable device list by pressing **F11** during the system startup.

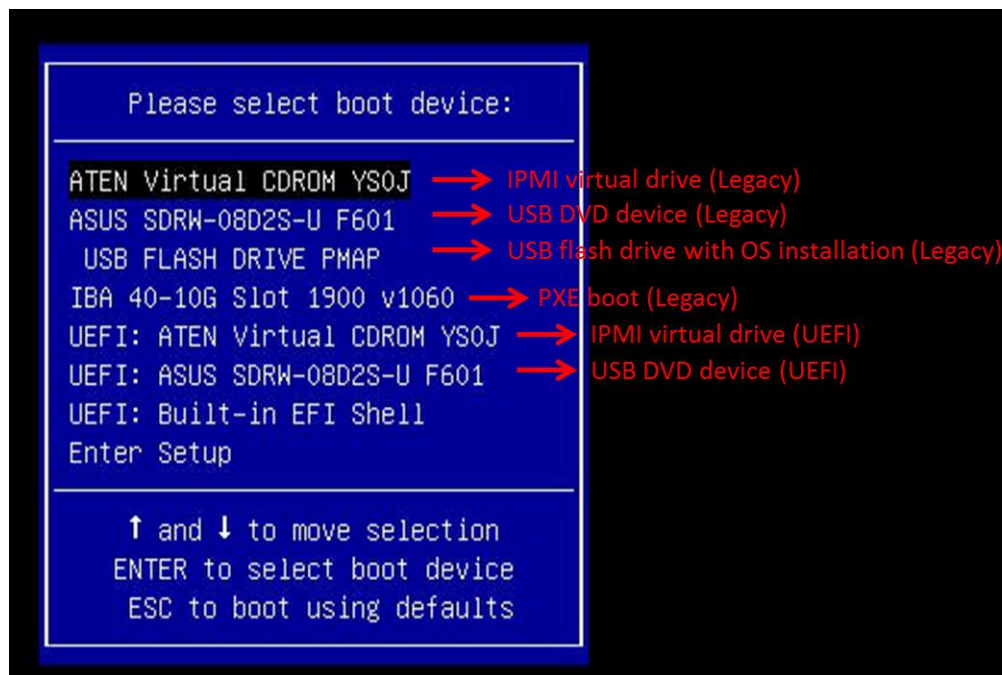


Figure 5-1. Select Boot Device

4. During Windows Setup, continue to the dialog where you select the drives on which to install Windows. If the disk you want to use is not listed, click on “Load driver” link at the bottom left corner.

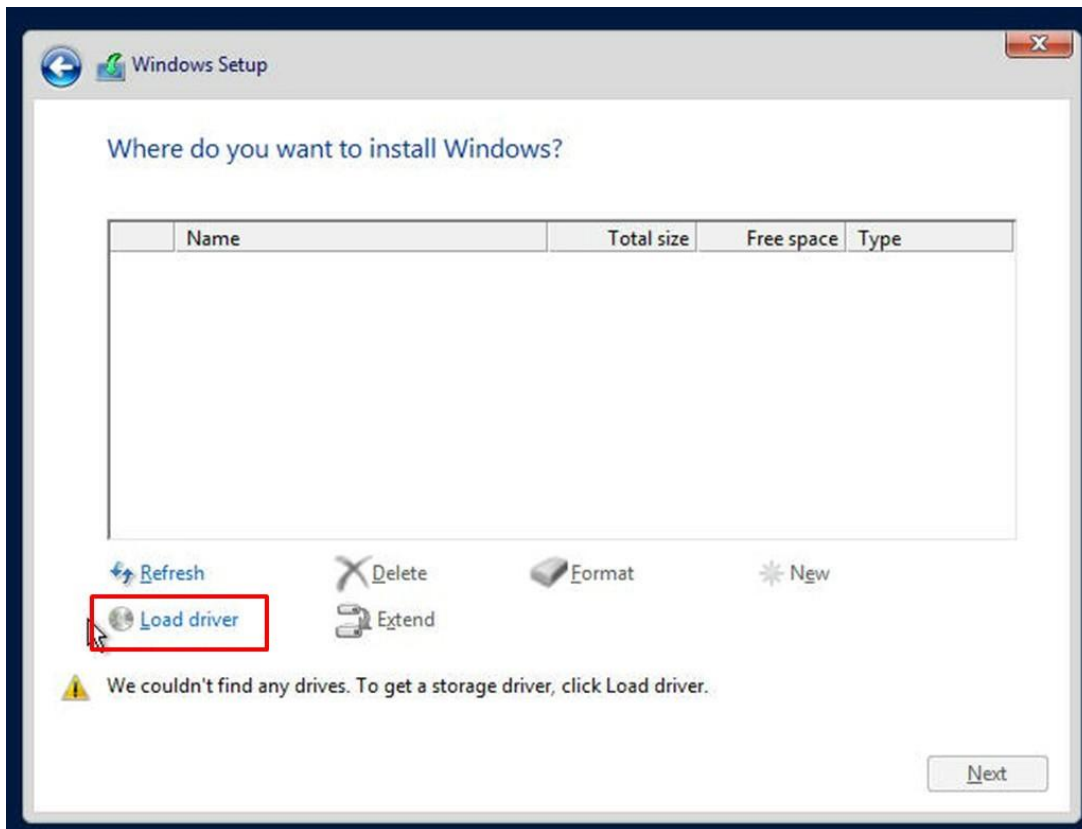


Figure 5-2. Load Driver Link

To load the driver, browse the USB flash drive for the proper driver files.

- For non-RAID, choose the SATA/sATA AHCI driver indicated then choose the storage drive on which you want to install it.
5. Once all devices are specified, continue with the installation.
 6. After the Windows OS installation has completed, the system will automatically reboot multiple times.

5.2 Driver Installation

The Altos website contains drivers and utilities for your system at <https://www.altoscomputing.com/en-US/download> . Some of these must be installed, such as the chipset driver.

After accessing the website, go into the CDR_Images (in the parent directory of the above link) and locate the ISO file for your motherboard. Download this file to to a USB flash or media drive. (You may also use a utility to extract the ISO file if preferred.)

Another option is to go to the Altos website at <https://www.altoscomputing.com/en-US/download> Find the product page for your motherboard, and "Download the Latest Drivers and Utilities".

Insert the flash drive or disk and the screenshot shown below should appear.

Figure 5-3. Driver & Tool Installation Screen

Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** The bottom icon with a CD on it allows you to view the entire content

5.3 BMC

The motherboard provides remote access, monitoring and management through the baseboard management controller (BMC) and other management controllers distributed among different system modules. There are several BIOS settings that are related to BMC.

Chapter 6

Optional Components

This chapter describes alternate configurations and optional system components.

Optional Parts
Storage Protocols
Power Options

6.1 Storage Protocols Supported

The storage drive bays can be configured to support either SATA, SAS, or NVMe drives by adding optional parts to the system.

SATA – The system supports up to 12 SATA drive bays by adding an additional storage add-on cards and cables. Alternatively, the system can support up to 8 SATA drive bays using the motherboard's onboard SATA controller. Additional cables are still required.

SAS – The system supports up to 12 SAS drive bays. Additional storage add-on cards and cables are required.

NVMe – The system supports up to 12 NVMe drives. Additional cables are required.

See the following section for the supported storage drive bay configurations and the optional parts required.

Power Supply Configurations

Power Supply Module Options		
Watts	Part Number	80Plus Level
1200	SC.12M1S.004	Titanium

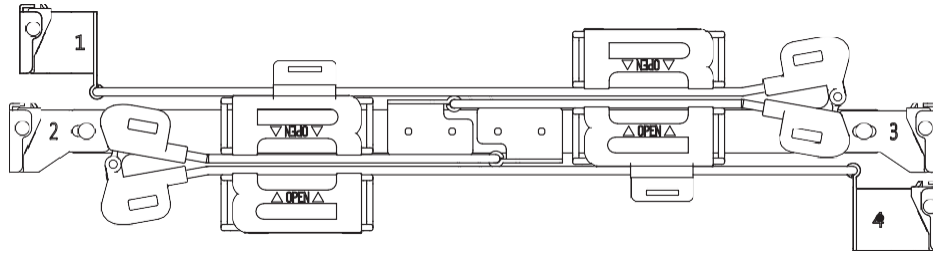


Figure 6-3. Cable Management Arm

Cable Arm Details		
Optional Part	Part Number	Description
Cable Arm	MCP-290-00168-0N	7.5" deep cable arm
Rail Set	MCP-290-11901-0N	41.2" rails (optimized for 1200 mm deep racks)

Installing the Cable Management Arm

1. Slide CMA connector #1 forward onto the two posts on the rear of the right *inner* rail (right side when viewed from the front). It snaps into place.
2. Slide CMA connector #2 forward onto the two posts on the rear of the right *middle* rail. It snaps into place.

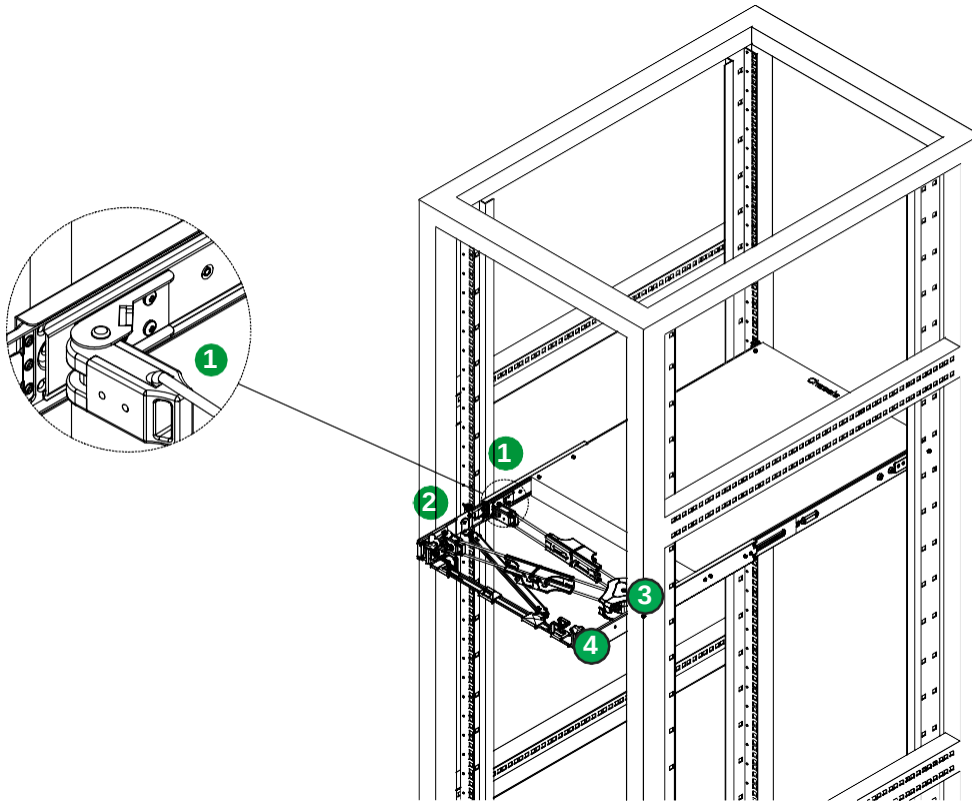


Figure 6-4. Installing the Connectors

3. Slide CMA connector #3 forward onto the two posts on the rear of the left middle rail. It snaps into place.
4. For CMA connector #4, align the metal tabs with the slots on the rear of the left outer rail and push it forward. It snaps into place.
5. Route the cables through the holding brackets, leaving enough slack.

Removing the Cable Management Arm

1. Remove cables from the CMA,
2. For CMA connector #4, pull the metal release tab toward the center of the rack and slide the connector toward the rear to release it.
3. For CMA connectors #3, #2, and #1, depress the front edge of the yellow plastic rocker lock and slide the connector toward the rear to release it.

6.2 TPM Security Module

SPI capable TPM 2.0 (or 1.2) with Infineon 9670 controller, horizontal form factor

The JTPM1 header is used to connect a Trusted Platform Module (TPM). A TPM is a security device that supports encryption and authentication in hard drives. It enables the motherboard to deny access if the TPM associated with the hard drive is not installed in the system.

- SC.35211.00L

Warning Definition



Warning! This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.

警告の定義

この警告サインは危険を意味します。

人身事故につながる可能性がありますので、いずれの機器でも動作させる前に、電気回路に含まれる危険性に注意して、標準的な事故防止策に精通して下さい。

此警告符号代表危險。

您正处于可能受到严重伤害的工作环境中。在您使用设备开始工作之前，必须充分意识到触电的危险，并熟练掌握防止事故发生的标准工作程序。请根据每项警告结尾的声明号码找到此设备的安全性警告说明的翻译文本。

此警告符號代表危險。

您正處於可能身體可能會受損傷的工作環境中。在您使用任何設備之前，請注意觸電的危險，並且要熟悉預防事故發生的標準工作程序。請依照每一注意事項後的號碼找到相關的翻譯說明內容。

Warnung

WICHTIGE SICHERHEITSHINWEISE

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu Verletzungen führen kann. Machen Sie sich vor der Arbeit mit Geräten mit den Gefahren elektrischer Schaltungen und den üblichen Verfahren zur Vorbeugung vor Unfällen vertraut. Suchen Sie mit der am Ende jeder Warnung angegebenen Anweisungsnummer nach der jeweiligen Übersetzung in den übersetzten Sicherheitshinweisen, die zusammen mit diesem Gerät ausgeliefert wurden.

BEWAHREN SIE DIESE HINWEISE GUT AUF.

INSTRUCCIONES IMPORTANTES DE SEGURIDAD

Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.

GUARDE ESTAS INSTRUCCIONES.

IMPORTANTES INFORMATIONS DE SÉCURITÉ

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

CONSERVEZ CES INFORMATIONS.

תקנון הזהרות אזהרה

הזהרות הבאות הן אזהרות על פי תקני התעשייה, על מנת להזהיר את המשתמש מפני חבלה פיזית אפשרית. במידה ויש שאלות או היתקלות בבעיה כלשהי, יש ליצור קשר עם מחלקת תמיכה טכנית של סופרמיקרו. טכנאים מוסמכים בלבד רשאים להתקין או להגדיר את הרכיבים. יש לקרוא את הנספח במלואו לפני התקנת או הגדרת הרכיבים במארזי סופרמיקרו.

اك ف حالة وئك أى نَسبب ف اصابة جسدة هذا الزرع ع خطر إنحد ز .
 قبل أى دعول عل أى معدات، يك عل علن بالوخاطر ال أُجوة عي الذولوز
 الكهزبائ ة

وئك عل دراة بالوورسات الهوائ قلو ع وئوع أى حوادث
 استخدم رقن الب إى الوصى ةكل تحذر للعشرترجوتها

ح ص

안전을 위한 주의사항

경고!

이 경고 기호는 위험이 있음을 알려 줍니다. 작업자의 신체에 부상을 야기 할 수 있는
 상태에 있게 됩니다. 모든 장비에 대한 작업을 수행하기 전에 전기회로와 관련된
 위험요소들을 확인하시고 사전에 사고를 방지할 수 있도록 표준 작업절차를 준수해 주시기
 바랍니다.

해당 번역문을 찾기 위해 각 경고의 마지막 부분에 제공된 경고문 번호를 참조하십시오

BELANGRIJKE VEILIGHEIDSINSTRUCTIES

Dit waarschuwings symbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel
 kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn
 van de bij een elektrische installatie betrokken risico's en dient u op de hoogte te zijn van de
 standaard procedures om ongelukken te voorkomen. Gebruik de nummers aan het eind van
 elke waarschuwing om deze te herleiden naar de desbetreffende locatie.

BEWAAR DEZE INSTRUCTIES

Installation Instructions



Warning! Read the installation instructions before connecting the system to the power
 source.

設置手順書

システムを電源に接続する前に、設置手順書をお読み下さい。

警告

将此系统连接电源前,请先阅读安装说明。

警告

將系統與電源連接前，請先閱讀安裝說明。

Warnung

Vor dem Anschließen des Systems an die Stromquelle die Installationsanweisungen lesen.

¡Advertencia!

Lea las instrucciones de instalación antes de conectar el sistema a la red de alimentación.

Attention

Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.

יש לקרוא את הוראות התקנה לפני חיבור המערכת למקור מתח.

أقر إرشادات الربط قبل توصيل النظام إلى مصدر للطاقة

시스템을 전원에 연결하기 전에 설치 안내를 읽어주십시오.

Waarschuwing

Raadpleeg de installatie-instructies voordat u het systeem op de voedingsbron aansluit.

Circuit Breaker

Warning! This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 250 V, 20 A.

サーキット・ブレーカー

この製品は、短絡（過電流）保護装置がある建物での設置を前提としています。保護装置の定格が**250 V**、**20 A**を超えないことを確認下さい。

警告

此产品的短路(过载电流)保护由建筑物的供电系统提供,确保短路保护设备的额定电流不大于250V,20A。

警告

此產品的短路(過載電流)保護由建築物的供電系統提供,確保短路保護設備的額定電流不大於250V,20A。

Warnung

Dieses Produkt ist darauf angewiesen, dass im Gebäude ein Kurzschluss- bzw. Überstromschutz installiert ist. Stellen Sie sicher, dass der Nennwert der Schutzvorrichtung nicht mehr als: 250 V, 20 A beträgt.

¡Advertencia!

Este equipo utiliza el sistema de protección contra cortocircuitos (o sobrecorrientes) del edificio. Asegúrese de que el dispositivo de protección no sea superior a: 250 V, 20 A.

Attention

Pour ce qui est de la protection contre les courts-circuits (surtension), ce produit dépend de l'installation électrique du local. Vérifiez que le courant nominal du dispositif de protection n'est pas supérieur à :250 V, 20 A.

מוצר זה מסתמך על הגנה המותקנת במבנים למניעת קצר חשמלי. יש לוודא כי המכשיר המגן מפני הקצר החשמלי הוא לא יותר מ-250VDC, 20A

هذا المنتج يعتمد على معدات الحماية من الدوائر القصيرة التي تم تثبيتها في المبنى

تأكد من أن تقييم الجهاز الوقائي ليس أكثر من : 20A, 250V

경고!

이 제품은 전원의 단락(과전류)방지에 대해서 전적으로 건물의 관련 설비에 의존합니다. 보호장치의 정격이 반드시 250V(볼트), 20A(암페어)를 초과하지 않도록 해야 합니다.

Waarschuwing

Dit product is afhankelijk van de kortsluitbeveiliging (overspanning) van uw elektrische installatie. Controleer of het beveiligde apparaat niet groter gedimensioneerd is dan 250V, 20A.

Power Disconnection Warning



Warning! The system must be disconnected from all sources of power and the power cord removed from the power supply module(s) before accessing the chassis interior to install or remove system components.



電源切断の警告

システムコンポーネントの取り付けまたは取り外しのために、シャーシ内部にアクセスするには、システムの電源はすべてのソースから切断され、電源コードは電源モジュールから取り外す必要があります。

警告

在你打开机箱并安装或移除内部器件前,必须将系统完全断电,并移除电源线。

警告

在您打開機殼安裝或移除內部元件前，必須將系統完全斷電，並移除電源線。

Warnung

Das System muss von allen Quellen der Energie und vom Netzanschlusskabel getrennt sein, das von den Spg.Versorgungsteilmodulen entfernt wird, bevor es auf den Chassisinnenraum zurückgreift, um Systemsbestandteile anzubringen oder zu entfernen.

¡Advertencia!

El sistema debe ser disconnected de todas las fuentes de energía y del cable eléctrico quitado de los módulos de fuente de alimentación antes de tener acceso el interior del chasis para instalar o para quitar componentes de sistema.

Attention

Le système doit être débranché de toutes les sources de puissance ainsi que de son cordon d'alimentation secteur avant d'accéder à l'intérieur du chassis pour installer ou enlever des composants de système.

אזהרה מפני ניתוק חשמלי

אזהרה יש לנתק את המערכת

מכל מקורות החשמל ויש להסיר את כבל החשמל מהספק. לפני גישה לחלק הפנימי של המארז לצורך התקנת או הסרת רכיבים

يجب فصل المنظومة من جميع مصادر الطاقة وإزالة سلك الكهرباء من وحدة امداد الطاقة قبل

التصل إلى مناطق انداخت نهيككم زئيج أو إزالت مكناث الجهاز

경고!

시스템에 부품들을 장착하거나 제거하기 위해서는 새시 내부에 접근하기 전에 반드시 전원 공급장치로부터 연결되어있는 모든 전원과 전기코드를 분리해주어야 합니다.

Waarschuwing

Voordat u toegang neemt tot het binnenwerk van de behuizing voor het installeren of verwijderen van systeem onderdelen, dient u alle spanningsbronnen en alle stroomkabels aangesloten op de voeding(en) van de behuizing te verwijderen

Equipment Installation



Warning! Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

機器の設置

トレーニングを受け認定された人だけがこの装置の設置、交換、またはサービスを許可されています。

警告

只有经过培训且具有资格的人员才能进行此设备的安装、更换和维修。

警告

只有經過受訓且具資格人員才可安裝、更換與維修此設備。

Warnung

Das Installieren, Ersetzen oder Bedienen dieser Ausrüstung sollte nur geschultem, qualifiziertem Personal gestattet werden.

¡Advertencia!

Solamente el personal calificado debe instalar, reemplazar o utilizar este equipo.

Attention

Il est vivement recommandé de confier l'installation, le remplacement et la maintenance de ces équipements à des personnels qualifiés et expérimentés.

אזהרה!

צוות מוסמך בלבד רשאי להתקין, להחליף את הציוד או לתת שירות עבודת הציוד.

والمدربيه لتزكيب واستبدال أو خدمة هذا الجهاز يجب أن يسمح فقط للمظفيه املؤ هليه

경고!

훈련을 받고 공인된 기술자만이 이 장비의 설치, 교체 또는 서비스를 수행할 수 있습니다.

Waarschuwing

Deze apparatuur mag alleen worden geïnstalleerd, vervangen of hersteld door geschoold en gekwalificeerd personeel.

Restricted Area



Warning! This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. (This warning does not apply to workstations).

アクセス制限区域

このユニットは、アクセス制限区域に設置されることを想定しています。

アクセス制限区域は、特別なツール、鍵と錠前、その他のセキュリティの手段を用いてのみ出入りが可能です。

警告

此部件应安装在限制进出的场所，限制进出的场所指只能通过使用特殊工具、锁和钥匙或其它安全手段进出的场所。

警告

此裝置僅限安裝於進出管制區域，進出管制區域係指僅能以特殊工具、鎖頭及鑰匙或其他安全方式才能進入的區域。

Warnung

Diese Einheit ist zur Installation in Bereichen mit beschränktem Zutritt vorgesehen. Der Zutritt zu derartigen Bereichen ist nur mit einem Spezialwerkzeug, Schloss und Schlüssel oder einer sonstigen Sicherheitsvorkehrung möglich.

¡Advertencia!

Esta unidad ha sido diseñada para instalación en áreas de acceso restringido. Sólo puede obtenerse acceso a una de estas áreas mediante la utilización de una herramienta especial, cerradura con llave u otro medio de seguridad.

Attention

Cet appareil doit être installée dans des zones d'accès réservés. L'accès à une zone d'accès réservé n'est possible qu'en utilisant un outil spécial, un mécanisme de verrouillage et une clé, ou tout autre moyen de sécurité.

אזור עם גישה מוגבלת

אזהרה!

יש להתקין את היחידה באזורים שיש בהם הגבלת גישה. הגישה ניתנת בעזרת 'כלי אבטחה בלבד' (מפתח, מנעול וכד.).

تخصيص هذه الوحدة لتترك بـها ف مناطق محظورة . ،
للمن ان يصل إن منطقت محظورة نوط من خالل اسنخذاو أداة خاصت
أو أ وس مت أخري زالألمأ نيم ومنناح

경고!

이 장치는 접근이 제한된 구역에 설치하도록 되어있습니다. 특수도구, 잠금 장치 및 키, 또는 기타 보안 수단을 통해서만 접근 제한 구역에 들어갈 수 있습니다.

Waarschuwing

Dit apparaat is bedoeld voor installatie in gebieden met een beperkte toegang. Toegang tot dergelijke gebieden kunnen alleen verkregen worden door gebruik te maken van speciaal gereedschap, slot en sleutel of andere veiligheidsmaatregelen.

Battery Handling



Warning! There is the danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions

電池の取り扱い

電池交換が正しく行われなかった場合、破裂の危険性があります。交換する電池はメーカーが推奨する型、または同等のものを使用下さい。使用済電池は製造元の指示に従って処分して下さい。

警告

電池更換不當會有爆炸危險。請只使用同類電池或制造商推薦的功能相當的電池更換原有電池。請按製造商的說明處理廢舊電池。

警告

電池更換不當會有爆炸危險。請使用製造商建議之相同或功能相當的電池更換原有電池。請按照製造商的說明指示處理廢棄舊電池。

Warnung

Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr. Ersetzen Sie die Batterie nur durch den gleichen oder vom Hersteller empfohlenen Batterietyp. Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.

Attention

Danger d'explosion si la pile n'est pas remplacée correctement. Ne la remplacer que par une pile de type semblable ou équivalent, recommandée par le fabricant. Jeter les piles usagées conformément aux instructions du fabricant.

¡Advertencia!

Existe peligro de explosión si la batería se reemplaza de manera incorrecta. Reemplazar la batería exclusivamente con el mismo tipo o el equivalente recomendado por el fabricante. Desechar las baterías gastadas según las instrucciones del fabricante.

אזהרה!

קיימת סכנת פיצוץ של הסוללה במידה והוחלפה בדרך לא תקינה. יש להחליף את הסוללה בסוג התואם מחברת יצרן מומלצת. סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

هناك خطر من انفجار يف حالة اسحبذال البطارية بطريقة غري صحيحة فعليل
 اسحبذال البطارية فقط
 بنفس النبع أو ما يعادلها مام أو صرث به الرشمة المصنعة جخلص من
 البطاريات املمسعملة ونفا لعليلامت الرشمة الصانعة

경고!

배터리가 올바르게 교체되지 않으면 폭발의 위험이 있습니다. 기존 배터리와 동일하거나 제조사에서 권장하는 동등한 종류의 배터리로만 교체해야 합니다. 제조사의 안내에 따라 사용된 배터리를 처리하여 주십시오.

Waarschuwing

Er is ontplofingsgevaar indien de batterij verkeerd vervangen wordt. Vervang de batterij slechts met hetzelfde of een equivalent type die door de fabrikant aanbevolen wordt. Gebruikte batterijen dienen overeenkomstig fabrieksvoorschriften afgevoerd te worden.

Redundant Power Supplies



Warning! This unit might have more than one power supply connection. All connections must be removed to de-energize the unit.

冗長電源装置

このユニットは複数の電源装置が接続されている場合があります。

ユニットの電源を切るためには、すべての接続を取り外さなければなりません。

警告

此部件连接的电源可能不止一个，必须将所有电源断开才能停止给该部件供电。

警告

此裝置連接的電源可能不只一個，必須切斷所有電源才能停止對該裝置的供電。

Warnung

Dieses Gerät kann mehr als eine Stromzufuhr haben. Um sicherzustellen, dass der Einheit kein Strom zugeführt wird, müssen alle Verbindungen entfernt werden.

¡Advertencia!

Puede que esta unidad tenga más de una conexión para fuentes de alimentación. Para cortar por completo el suministro de energía, deben desconectarse todas las conexiones.

Attention

Cette unité peut avoir plus d'une connexion d'alimentation. Pour supprimer toute tension et tout courant électrique de l'unité, toutes les connexions d'alimentation doivent être débranchées.

אם קיים יותר מספק אחד

אזהרה!

ליחידה יש יותר מחיבור אחד של ספק. יש להסיר את כל החיבורים על מנת לרוקן את היחידה.

وإذا كان لهذا الجهاز عدة اتصالات بوحدة إمداد الطاقة .
يجب إزالة كافة الاتصالات لعزل الوحدة عن الكهرباء

경고!

이 장치에는 한 개 이상의 전원 공급 단자가 연결되어 있을 수 있습니다. 이 장치에 전원을 차단하기 위해서는 모든 연결 단자를 제거해야만 합니다.

Waarschuwing

Deze eenheid kan meer dan één stroomtoevoeraansluiting bevatten. Alle aansluitingen dienen verwijderd te worden om het apparaat stroomloos te maken.

Backplane Voltage



Warning! Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.

バックプレーンの電圧

システムの稼働中は危険な電圧または電力が、バックプレーン上にかかっています。修理する際には注意ください。

警告

当システム正在进行時，背板上有很危险的电压或能量，进行维修时务必小心。

警告

當系統正在進行時，背板上有很危險的電壓或能量，進行維修時務必小心。

Warnung

Wenn das System in Betrieb ist, treten auf der Rückwandplatine gefährliche Spannungen oder Energien auf. Vorsicht bei der Wartung.

¡Advertencia!

Cuando el sistema está en funcionamiento, el voltaje del plano trasero es peligroso. Tenga cuidado cuando lo revise.

Attention

Lorsque le système est en fonctionnement, des tensions électriques circulent sur le fond de panier. Prendre des précautions lors de la maintenance.

מתח בפנל האחורי

אזהרה!

קיימת סכנת מתח בפנל האחורי בזמן תפעול המערכת. יש להיזהר במהלך העבודה.

هناك خطر من التيار الكهربائي أو الطاقة الملتصقة قبل اللمسة عندما
يكن النظام يعمل كه حذرا عند خدمة هذا الجهاز

경고!

시스템이 동작 중일 때 후면판 (Backplane)에는 위험한 전압이나 에너지가 발생 합니다.
서비스 작업 시 주의하십시오.

Waarschuwing

Een gevaarlijke spanning of energie is aanwezig op de backplane wanneer het systeem in gebruik is. Voorzichtigheid is geboden tijdens het onderhoud.

Comply with Local and National Electrical Codes



Warning! Installation of the equipment must comply with local and national electrical codes.

地方および国の電気規格に準拠

機器の取り付けはその地方および国の電気規格に準拠する必要があります。

警告

设备安装必须符合本地与本国电气法规。

警告

設備安裝必須符合本地與本國電氣法規。

Warnung

Die Installation der Geräte muss den Sicherheitsstandards entsprechen.

¡Advertencia!

La instalación del equipo debe cumplir con las normas de electricidad locales y nacionales.

Attention

L'équipement doit être installé conformément aux normes électriques nationales et locales.

תיאום חוקי החשמל הארצי

אזהרה!

התקנת הציוד חייבת להיות תואמת לחוקי החשמל המקומיים והארציים.

تركيب المعدات الكهربائية يجب أن يمثل للقوانين المحلية والوطنية المتعلقة
بالكهرباء

경고!

현 지역 및 국가의 전기 규정에 따라 장비를 설치해야 합니다.

Waarschuwing

Bij installatie van de apparatuur moet worden voldaan aan de lokale en nationale elektriciteitsvoorschriften.

Product Disposal



Warning! Ultimate disposal of this product should be handled according to all national laws and regulations.

製品の廃棄

この製品を廃棄処分する場合、国の関係する全ての法律・条例に従い処理する必要があります。

警告

本产品的废弃处理应根据所有国家的法律和规章进行。

警告

本產品的廢棄處理應根據所有國家的法律和規章進行。

Warnung

Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.

¡Advertencia!

Al deshacerse por completo de este producto debe seguir todas las leyes y reglamentos nacionales.

Attention

La mise au rebut ou le recyclage de ce produit sont généralement soumis à des lois et/ou directives de respect de l'environnement. Renseignez-vous auprès de l'organisme compétent.

סילוק המוצר

אזהרה!

סילוק סופי של מוצר זה חייב להיות בהתאם להנחיות וחוקי המדינה.

التخلص النهائي من هذا المنتج ينبغي التعامل معه وفقا لجميع القوانين واللوائح الوطنية عند

경고!

이 제품은 해당 국가의 관련 법규 및 규정에 따라 폐기되어야 합니다.

Waarschuwing

De uiteindelijke verwijdering van dit product dient te geschieden in overeenstemming met alle nationale wetten en reglementen.

Hot Swap Fan Warning



Warning! Hazardous moving parts. Keep away from moving fan blades. The fans might still be turning when you remove the fan assembly from the chassis. Keep fingers, screwdrivers, and other objects away from the openings in the fan assembly's housing.

ファン・ホットスワップの警告

警告！回転部品に注意。運転中は回転部(羽根)に触れないでください。シャーシから冷却ファン装置を取り外した際、ファンがまだ回転している可能性があります。ファンの開口部に、指、ドライバー、およびその他のものを近づけないで下さい。

警告!

警告！危险的可移动性零件。请务必与转动的风扇叶片保持距离。当您从机架移除风扇装置，风扇可能仍在转动。小心不要将手指、螺丝起子和其他物品太靠近风扇

警告

危险的可移动性零件。请务必与转动的风扇叶片保持距离。当您从机架移除风扇装置，风扇可能仍在转动。小心不要将手指、螺丝起子和其他物品太靠近风扇。

Warnung

Gefährlich Bewegende Teile. Von den bewegenden Lüfterblätter fern halten. Die Lüfter drehen sich u. U. noch, wenn die Lüfterbaugruppe aus dem Chassis genommen wird. Halten Sie Finger, Schraubendreher und andere Gegenstände von den Öffnungen des Lüftergehäuses entfernt.

¡Advertencia!

Riesgo de piezas móviles. Mantener alejado de las aspas del ventilador. Los ventiladores podran dar vuelta cuando usted quite el montaje del ventilador del chasis. Mantenga los dedos, los destornilladores y todos los objetos lejos de las aberturas del ventilador

Attention

Pieces mobiles dangereuses. Se tenir a l'écart des lames du ventilateur Il est possible que les ventilateurs soient toujours en rotation lorsque vous retirerez le bloc ventilateur du châssis. Prenez garde à ce que doigts, tournevis et autres objets soient éloignés du logement du bloc ventilateur.

אזהרה!

חלקים נעים מסוכנים. התרחק מלהבי המאוורר בפעולה כאשר מסירים את חלקי המאוורר מהמארז, יתכן והמאווררים עדיין עובדים. יש להרחיק למרחק בטוח את

האצבעות וכלי עבודה שונים מהפתחים בתוך המאוורר

تحذير! أجزاء منحلقة خطيرة. ابتعد عن شفرات المروحة المنحلقة. من الممكن أن المراوح ال تزال تدور عند إزالة كتلة المروحة من الهيكل يجب إبقاء الأصابع وفخات الرباعي وغيرها من الأشياء بعيدا عن الفتحات بكتلة المروحة

경고!

움직이는 위험한 부품. 회전하는 송풍 날개에 접근하지 마세요. 새시로부터 팬 조립품을 제거할 때 팬은 여전히 회전하고 있을 수 있습니다. 팬 조립품 외관의 열려있는 부분들로부터 손가락 및 스크류드라이버, 다른 물체들이 가까이 하지 않도록 배치해 주십시오.

Waarschuwing

Gevaarlijk bewegende onderdelen. Houd voldoende afstand tot de bewegende ventilatorbladen. Het is mogelijk dat de ventilator nog draait tijdens het verwijderen van het ventilatorsamenstel uit het chassis. Houd uw vingers, schroevendraaiers en eventuele andere voorwerpen uit de buurt van de openingen in de ventilatorbehuizing.

Power Cable and AC Adapter



Warning! When installing the product, use the provided or designated connection cables, power cables and AC adapters. Using any other cables and adapters could cause a malfunction or a fire. Electrical Appliance and Material Safety Law prohibits the use of UL or CSA -certified cables (that have UL/CSA shown on the cord)

電源コードとACアダプター

製品を設置する場合、提供または指定および購入された接続ケーブル、電源コードとACアダプターを該当する地域の条例や安全基準に適合するコードサイズやプラグと共に使用下さい。他のケーブルやアダプタを使用すると故障や火災の原因になることがあります。

電気用品安全法は、ULまたはCSA認定のケーブル(UL/CSAマークがコードに表記)を

警告

安装此产品时,请使用本身提供的或指定的或采购的连接线,电源线和电源适配器。包含遵照当地法规和安全要求的合规的电源线尺寸和插头.使用其它线材或适配器可能会引起故障或火灾。

警告

安裝此產品時,請使用本身提供的或指定的或採購的連接線,電源線和電源適配器。包含遵照當地法規和安全要求的合規的電源線尺寸和插頭.使用其它線材或適配器可能會引起故障或火災。除

Warnung

Nutzen Sie beim Installieren des Produkts ausschließlich die von uns zur Verfügung gestellten Verbindungskabeln, Stromkabeln und/oder Adapter, die Ihre örtlichen Sicherheitsstandards einhalten. Der Gebrauch von anderen Kabeln und Adapter können Fehlfunktionen oder Feuer verursachen. Die Richtlinien untersagen das Nutzen von UL oder CAS zertifizierten Kabeln (mit UL/CSA gekennzeichnet),

¡Advertencia!

Cuando instale el producto, utilice la conexión provista o designada o procure cables, Cables de alimentación y adaptadores de CA que cumplan con los códigos locales y los requisitos de seguridad, incluyendo el tamaño adecuado del cable y el enchufe. El uso de otros cables y adaptadores podría causar un mal funcionamiento o un incendio. La Ley de Seguridad de Aparatos Eléctricos y de Materiales prohíbe El uso de cables certificados por UL o CSA (que tienen el certificado UL / CSA en el código) o.

Attention

Lors de l'installation du produit, utilisez les cables de connection fournis ou désigné ou achetez des cables, cables de puissance et adaptateurs respectant les normes locales et les conditions de securite y compris les tailles de cables et les prises electriques appropries. L'utilisation d'autres cables et adaptateurs peut provoquer un dysfonctionnement ou un incendie. Appareils électroménagers et la Loi sur la Sécurité Matériel interdit l'utilisation de câbles certifies- UL ou CSA (qui ont UL ou CSA indiqué sur le code).

전원 케이블 및 AC 어댑터

경고! 제품을 설치할 때 현지 코드 및 적절한 굵기의 코드와 플러그를 포함한 안전 요구 사항을 준수하여 제공되거나 지정된 연결 혹은 구매 케이블, 전원 케이블 및 AC 어댑터를 사용하십시오.

다른 케이블이나 어댑터를 사용하면 오작동이나 화재가 발생할 수 있습니다. 전기 용품 안전법은 UL 또는 CSA 인증 케이블 (코드에 UL / CSA가 표시된 케이블)

Stroomkabel en AC-Adapter

Waarschuwing! Bij het aansluiten van het Product uitsluitend gebruik maken van de geleverde Kabels of een andere geschikte aan te schaffen Aansluitmethode, deze moet altijd voldoen aan de lokale voorschriften en veiligheidsnormen, inclusief de juiste kabeldikte en stekker. Het gebruik van niet geschikte Kabels en/of Adapters kan een storing of brand veroorzaken. Wetgeving voor Elektrische apparatuur en Materiaalveiligheid verbied het gebruik van UL of CSA -gecertificeerde Kabels (met UL/CSA in de code)

Appendix B

System Specifications

Processors

Dual 4th Gen Intel Xeon Scalable processors in a E (LGA-4189) socket with four UPIs (16GT/s max.) and a thermal design power (TDP) of up to 350W. Supports SP XCC, SP MCC, and HBM processor SKUs

Chipset

Intel C741 PCH

BIOS

AMI SPI BIOS

Memory

Supports up to 8TB of 3DS RDIMM/RDIMM DDR5 (288-pin) ECC memory with speeds up to 4800MT/s in 32 DIMM slots
DIMM size up to 512GB at P12V.

Storage Drives

Twelve 3.5" or 2.5" hot-swap NVMe/SAS/SATA front drive bays
Two M.2 NVMe/SATA hybrid slots with support for M-key 2280 and 22110

PCI Expansion Slots

Optional eight PCIe 5.0 x8 slots or four PCIe 5.0 x16 slots

Input/Output

Network: One or two AIOM modules (OCP 3.0 NIC)
BMC: Dedicated LAN port
USB: Two rear USB 2.0 ports
Video : One VGA port

Motherboard

X13DEM; 17.0" (W) x 11.5" (L) E-ATX (431.80 mm x 292.1 mm)

Chassis

HS829-R1K24P; 2U Rackmount, 3.5 x 17.2 x 31.6in. / 89 x 437 x 803mm (HxWxD)

System Cooling

Four 80x80x38 mm, 13.5K RPM, hot-swap middle cooling fans, two CPU heatsinks, two air shrouds to direct air flow

Power Supply

Model: PWS-1K24A-1R, 1200W redundant modules, 80Plus Titanium level
AC Input
800W: 100-127 Vac, 50-60 Hz
1200W: 200-240 Vac, 50-60 Hz
+12V
Max: 83A, Min: 0 A (100 Vac–127 Vac)
Max: 166A, Min: 0 A (200 Vac–240 Vac)
+12V standby: Max: 2.1 A, Min: 0 A

Operating Environment

Operating Temperature: 10° to 35° C (50° to 95° F)
Non-operating Temperature: -40° to 60° C (-40° to 140° F)
Operating Relative Humidity: 8% to 90% (non-condensing) Non-
operating Relative Humidity: 5% to 95% (non-condensing)

Regulatory Compliance

FCC, ICES, CE, VCCI, RCM, UKCA, NRTL, CB

Certified Safety Models

Compliant with UL and CSA: HS829-R12X12, HS829-12, HS829-R26X12, HS829-26, HS829-R16X12, HS829-16, HS829-16DX12, HS829-16D, HS829-R13DX12, and HS829-13D

Applied Directives, Standards

EMC/EMI: 2014/30/EU (EMC Directive)
 Electromagnetic Compatibility Regulations 2016
 FCC Part 15
 ICES-003
 VCCI-CISPR 32
 AS/NZS CISPR 32
 BS/EN55032
 BS/EN55035
 CISPR 32
 CISPR 35
 BS/EN 61000-3-2
 BS/EN 61000-3-3
 BS/EN 61000-4-2
 BS/EN 61000-4-3
 BS/EN 61000-4-4
 BS/EN 61000-4-5
 BS/EN 61000-4-6
 BS/EN 61000-4-8
 BS/EN 61000-4-11

Environment:

2011/65/EU (RoHS Directive)
 EC 1907/2006 (REACH)
 2012/19/EU (WEEE Directive)
 California Proposition 65

Product Safety: 2014/35/EU (LVD Directive)

UL/CSA 62368-1 (USA and Canada)
 Electrical Equipment (Safety) Regulations 2016
 IEC/BS/EN 62368-1

Perchlorate Warning

California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. "Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate"

この装置は、クラスA機器です。この装置を住宅環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

VCCI — A

BSMI RoHS Statement

限用物質含有情況標示聲明書

Declaration of the Presence Condition of the Restricted Substances Marking

設備名稱: 伺服器/Server Equipment name						
型號 (型式) : HS119-R12X13 (系列型號: HS119-R16X13, HS119-R26X13, SYS-121H-TNR) Type designation (Type)						
單元Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛Lead (Pb)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr ⁺⁶)	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
機殼 (Chassis)	○	○	○	○	○	○
機殼風扇 (Chassis Fan)	—	○	○	○	○	○
線材 (Cable)	○	○	○	○	○	○
主機板 (Motherboard)	—	○	○	○	○	○
電源供應器 (Power Supply)	—	○	○	○	○	○
電源背板 (PDB)	—	○	○	○	○	○
硬碟 (SSD)	—	○	○	○	○	○
附加卡 (Add-on Card)	—	○	○	○	○	○
備考1. “超出0.1wt %” 及 “超出0.01wt %” 係指限用物質之百分比含量超出百分比含量基準值。 Note 1 : “Exceeding 0.1 wt %” and “exceeding 0.01 wt %” indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition. 備考2. “○” 係指該項限用物質之百分比含量未超出百分比含量基準值。 Note 2 : “○” indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence. 備考3. “—” 係指該項限用物質為排除項目。 Note 3 : The “—” indicates that the restricted substance corresponds to the exemption.						

警告: 為避免電磁干擾, 本產品不應安裝或使用於住宅環境。

輸入額定:

PWS-1K24A-1R

100-127V ~, 60-50Hz, 9.8-7A (x2)

200-240V ~, 60-50Hz, 7.5-6A (x2)

PWS-1K63A-1R

100-127V ~, 60-50Hz, 12-9A (x2)

200-240V ~, 60-50Hz, 9-7.5A (x2)

PWS-2K63A-1R

200-240V ~, 60-50Hz, 15-12.5A (x2)

*使用者不能任意拆除或替換內部配備

*報驗義務人之姓名或名稱：美超微電腦股份有限公司

限用物質含有情況標示聲明書

Declaration of the Presence Condition of the Restricted Substances Marking

設備名稱: 伺服器/Server Equipment name						
型號 (型式) : HS119-R13DX13 (系列型號: HS119-R16DX13, SYS-121H-TNR(DC)) Type designation (Type)						
單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛Lead (Pb)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr ⁶⁺)	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
機殼 (Chassis)	○	○	○	○	○	○
機殼風扇 (Chassis Fan)	—	○	○	○	○	○
線材 (Cable)	○	○	○	○	○	○
主機板 (Motherboard)	—	○	○	○	○	○
電源供應器 (Power Supply)	—	○	○	○	○	○
電源背板 (PDB)	—	○	○	○	○	○
硬碟 (SSD)	—	○	○	○	○	○
附加卡 (Add-on Card)	—	○	○	○	○	○
備考1. “超出0.1 wt %” 及 “超出0.01 wt %” 係指限用物質之百分比含量超出百分比含量基準值。 Note 1 : “Exceeding 0.1 wt %” and “exceeding 0.01 wt %” indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition. 備考2. “○” 係指該項限用物質之百分比含量未超出百分比含量基準值。 Note 2 : “○” indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence. 備考3. “—” 係指該項限用物質為排除項目。 Note 3 : The “—” indicates that the restricted substance corresponds to the exemption.						

警告: 為避免電磁干擾, 本產品不應安裝或使用於住宅環境。

HEVC

