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Hitachi Advanced Server DS120 G2

Hardware Guide

MK-97HAS017-00
September 2021

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1.1 Introduction

This document provides an overview of the hardware features of the chassis, troubleshooting information, and instructions on how to add and replace components of the server.

For the latest version of this manual, see support.HitachiVantara.com.

System Features

The system comprises a 1U/30.7" long chassis. Major features include:

- **Processors (x2):** Intel® Xeon® processor scalable family
- **Expansion:**

CAUTION!

SOME ADD-ON CARDS MIGHT BE HOT AFTER SYSTEM POWER IS OFF. CONTACT SHOULD BE MADE WITH CARE.

  - Option 1

    [CPU0]

    - (1) OCP 3.0 Mezz x8
    - (1) Internal SAS Mezz (Riser Slot5A)
    - (1) PCIe HHHL x16 (Riser Slot1A)

    [CPU1]

    - (1) PCIe HHHL x16 (Riser Slot2A)
  - Option 2

    [CPU0]

    - (1) OCP 3.0 Mezz x8
    - (1) Internal Slimline Riser (Riser Slot5B)
    - (1) PCIe HHHL x16 (Riser Slot1A)

    [CPU1]

    - (2) PCIe HHHL x16 (Riser Slot2A)
- **Memory:** Up to 32 DIMM slots; ECC DDR4 3200 MHz LRDIMM/RDIMM memory
  - Up to 8TB (256Gx32) of memory for LRDIMM/RDIMM
- **Network*:** Dedicated GbE management NIC port from PHY RTL8211E to BMC

*Visit support.HitachiVantara.com for the latest Network support listings.

Note:

The system supports:

- (2) 800W/1200W/1600W 86mm Titanium/Platinum redundant PSU, 100-240VAC 50/60Hz, AC/ HVDC
- (2) 1200/1600W 86mm Titanium/Platinum redundant PSU, 48V DC

Specifications

Table 1: System Specifications

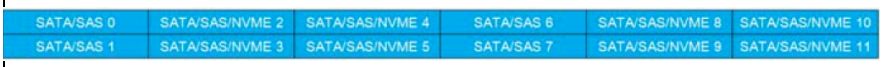
SPECIFICATIONS	DESCRIPTION
Form factor	1U rack mount
Chassis dimensions (W x H x D)	440mm x 43.2 mm x 780 mm 17.3" x 1.7" x 30.7"
Processor	Processor type: Intel® Xeon® processor scalable family Max. TDP support: 270W **Number of processors:** 2
Memory	**Total slots:** 32 **Memory type:** DDR4 3200 MHz LRDIMM/RDIMM **Memory size:** 8GB, 16GB, 32 GB* *More options refer to the AVL
Storage	1U Chassis - Option1 [2.5" Tiered] (4) 2.5" SAS/ SATA (SFF-8680) (8) 2.5" SAS/ SATA/ PCIe x4 (SFF-8639)  1U Chassis - Option2- [2.5" All Flash] (12) 2.5" SAS/ SATA/ PCIe x4 (SFF-8639) 
Internal storage	(2) M.2 2230
Networking	Dedicated GbE management NIC port from PHY RTL8211E to BMC

Table 1: System Specifications (Continued)

SPECIFICATIONS	DESCRIPTION
Expansion slots	**EXPANSION: OPTION1** [CPU0] (1) OCP 3.0 Mezz x8 (1) Internal SAS Mezz (Riser Slot5A) (1) PCIe HHHL x16 (Riser Slot1A) [CPU1] (1) PCIe HHHL x16 (Riser Slot2A) **EXPANSION: OPTION2** [CPU0] (1) OCP 3.0 Mezz x8 (1) Internal Slimline Riser (Riser Slot5B) (1) PCIe HHHL x16 (Riser Slot1A) [CPU1] (2) PCIe HHHL x16 (Riser Slot2A)  **CAUTION!** SOME ADD-ON CARDS MIGHT BE HOT AFTER SYSTEM POWER IS OFF. CONTACT SHOULD BE MADE WITH CARE.
Video	Integrated Aspeed AST2500 with 8MB video memory
Network options	More options refer to the CCL at support.HitachiVantara.com
Front I/O	• Power button/ LED • Reset button • ID button/ LED • System status LED • HDD LED on HDD tray • (2) USB 3.0
Rear I/O	• (2) USB 3.0 ports • (1) VGA port • (1) Micro USB for BMC console • (1) ID LED • (1) PFR LED • (1) LAN (BMC dedicated) • (1) microSD port
TPM	Yes (optional, SPI mode)
ACPI	ACPI compliance, S0, S5 support
Power supply	• (2) 800W/1200W/1600W 86mm Titanium/Platinum redundant PSU, 100-240VAC 50/60Hz, AC/ HVDC support • (2) 1200/1600W 86mm Titanium/Platinum redundant PSU, 48V DC

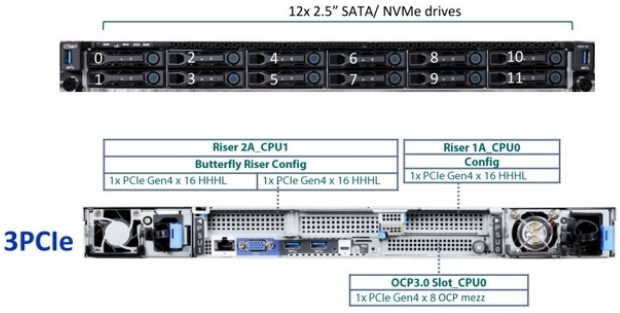
Table 1: System Specifications (Continued)

SPECIFICATIONS	DESCRIPTION
System rating	• 800W AC PSU: 100-115V/120V/200-240Vac, 50/60Hz, 7.4A/7.4A/4.5A, or 240Vdc, 3.5A (per PSU inlet) • 1200W AC PSU: 100-120/200-240Vac, 50/60Hz, 8/6A or 240Vdc, 5A (per PSU inlet) • 1600W PSU Full range: 100-120/200-240Vac, 50/60Hz, 10/8A or 240Vdc, 7A (per PSU inlet) • 1600W PSU High Line only: 200-240Vac, 50/60Hz, 8A or 240Vdc, 8A (per PSU inlet) • 1200W DC PSU: - 48Vdc, 25A or +48Vdc, 25A (per PSU inlet) - 39V --72V, 30A or +39V - +72V , 30A (per PSU inlet) • 1600W DC PSU: - 48Vdc, 40A or +48Vdc, 40A (per PSU inlet) - 39V - -72V, 40A or +39V - +72V , 40A (per PSU inlet)
Fan	(8) dual rotor fans (15+1 redundant)* *Hot-swap feature will be available only while the optional Cable Management Arm (CMA) is installed.
System management	IPMI v2.0 Compliant, on board "KVM over IP" support
Operating environment	• Operating temperature: 5°C to 40°C (41°F to 104°F) • Non-operating temperature: -40°C to 70°C (-40°F to 158°F) • Operating relative humidity: 50% to 85%RH • Non-operating relative humidity: 20% to 95%RH

SKU information

2.5" All Flash SKU

Dimensions (WxHxD): 440mm x 43.2mm x 780mm
CPU: 2x Intel Ice Lake-SP processors (up to 270W TDP)
PCH: LBG-R
DIMM slot: 32x DDR4 RDIMM/LRDIMM (including 16x BPS-enabled[1])
Storage: 12x SFF SATA/ NVMe drives
(Optional HW RAID with Intel VROC key)
2x 2230 M.2 SSD for OS
Expansion:
3PCIe
1x PCIe Gen4 x8 OCP 3.0 SFF mezzanine (CPU0)
1x PCIe Gen4 x16 , HHHL (CPU0)
2x PCIe Gen4 x16 , HHHL (CPU1)



1. Specific ICX CPU SKU support Barlow Pass. Please check CPU spec for BPS support.
2. CPU limitation please refer to PLN
3. Target workload - All NVMe flash storage, CDN as Edge Caching Server, etc.

2.5" Tiered SKU

Dimensions (WxHxD): 440mm x 43.2mm x 780mm

CPU: 2x Intel Ice Lake-SP processors (up to 270W TDP)

PCH: LBG-R

DIMM slot: 32x DDR4 RDIMM/LRDIMM (including 16x BPS-enabled[1])

Storage: 12x SFF SAS/SATA drives (including 8x NVMe SSD)

(Optional HW RAID with Intel VROC key)

2x 2230 M.2 SSD for OS

Expansion:

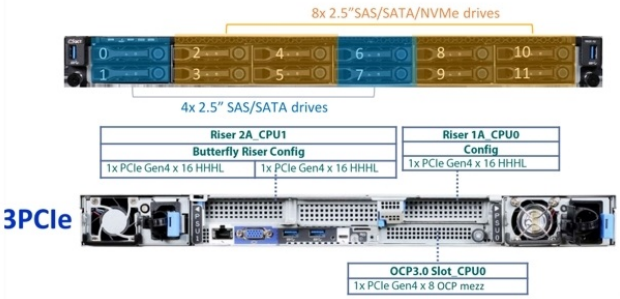
3PCIe

1x PCIe Gen4 x8 OCP 3.0 SFF mezzanine (CPU0)

1x PCIe Gen4 x8 SAS mezzanine for internal HBA/RAID (CPU0)

1x PCIe Gen4 x16 , HHHL (CPU0)

2x PCIe Gen4 x16 , HHHL (CPU1)



1. Specific ICX CPU SKU support Barlow Pass. Please check CPU spec for BPS support.
2. CPU limitation please refer to PLN
3. Target workload - Login/Admin/Service nodes used in HPC & SDS, Spark HDFS, NFVi (OpenStack or Kubernetes), etc.

1.2 Package Contents

- (1) Hitachi Advanced Server DS120 G2 system
- (2) processor heat sinks
- (1) power supply unit
- (1) power cord (optional)

Note:
For exact shipping contents, contact your Hitachi sales representative.

1.3 A Tour of the System

System Overview

The server is available as a 2.5” storage drive configuration.

System Front View

The 2.5" storage drive system is displayed in the following image:

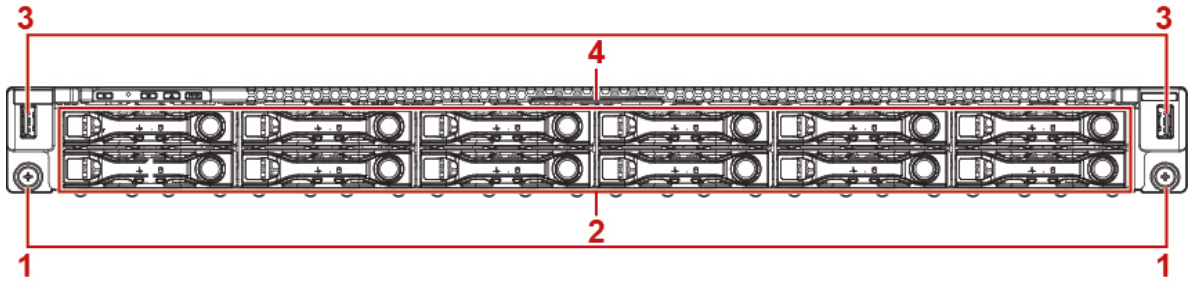


Figure 1-1. 2.5" Storage Drive System Front View

Table 2: Front View

NO.	NAME	DESCRIPTION
1.	Thumb screw	Secure the system to rack frame.
2.	2.5" storage drive tray	House up to twelve 2.5" storage drive (15mm).
3.	USB port	Connect to USB device.
4.	Asset tag	Record serial number or other important information.

Front Control Panel (FCP)

For purposes of this procedure, the FCP is used for the numbering indicators.

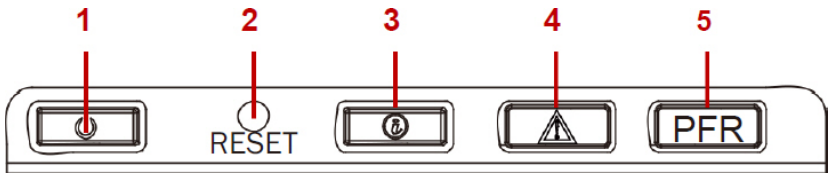


Figure 1-2. Front Control Panel

Table 3: Front Control Panel Definition

NO.	ICON	NAME	DESCRIPTION
1.		Power button with LED	Power on / off Blue on – S0 system power on; off – S5 system power off
2.		Reset button	Soft reset system function

Table 3: Front Control Panel Definition (Continued)

NO.	ICON	NAME	DESCRIPTION
3.		Identification button with LED	Toggles ID LED, activate ID LED to identify system Blue blinking – Identifier on front and rear chassis; off – Normal.
4.		System Status LED	Provides critical and non-critical failure notification Amber blinking – failed; Off – SEL cleared / good
5.	PFR	PFR Status LED (Only for certain models)	Provides notification of PFR operation status Off: Power Off/PFR Module is not installed Green On: Authenticated Amber On: Failed Amber Blinking: Authentication/Recovery is executing in T-1

System Rear View

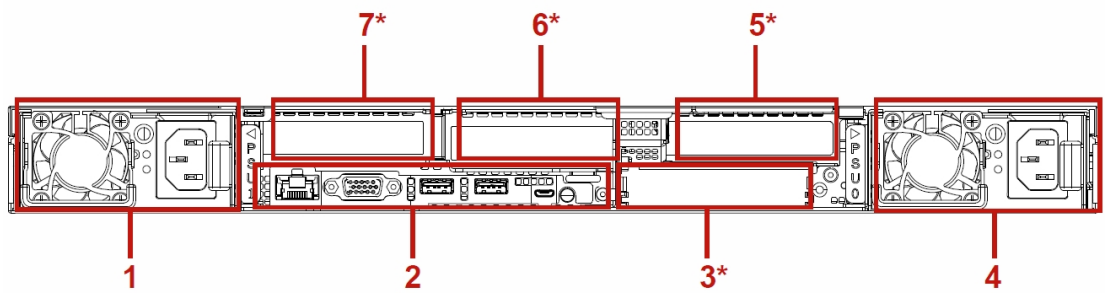


Figure 1-3. System Rear View

Table 4: System Rear View

NO.	FEATURE	DESCRIPTION
1.	Power sub-system	Main power supply unit (PSU1). See *Power Sub-System* on page 1-9
2.	System I/O ports	See *System Rear I/O* on page 1-9
3.	Expansion slot*	Support OCP 3.0 mezzanine card with adapter installation (PCIe Gen4 x 8, CPU0)PCIe HHHL
4.	Power sub-system	Main power supply unit (PSU0). See *Power Sub-System* on page 1-9
5.	Expansion slot*	PCIe expansion slot with PCIe HHHL x 16 (CPU0)
6.		PCIe expansion slot with PCIe HHHL x 16 (CPU1)
7.		

CAUTION!

*SOME ADD-ON CARDS MIGHT BE HOT AFTER SYSTEM POWER IS OFF. CONTACT SHOULD BE MADE WITH CARE.

System Rear I/O

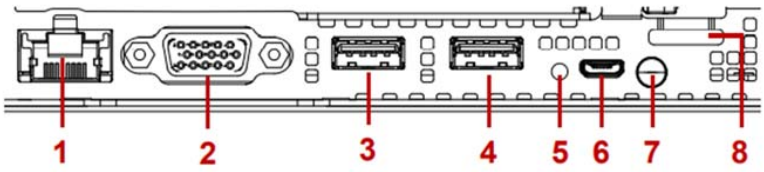


Figure 1-4. System Rear I/O

Table 5: System Rear I/O Definition

NO.	ICON	NAME	DESCRIPTION
1.		Dedicated NIC	Dedicated RJ45 connector
2.		VGA connector	Maximum display resolution: 1920x1200 32bpp@60Hz (reduced blanking)
3.		USB 3.0 port	USB 1 port; connect to USB device
4.			USB 0 port; connect to USB device
5.		Identification LED	Blue blinking - Identifier; Off - Normal
6.		Micro USB port	Transmit in serial signal for debug or terminal concentrator
7.		PFR Status LED (Only for certain models)	Off: Power Off/PFR Module is not installed Green On: Authenticated Amber On: Failed Amber Blinking: Authentication /Recovery is executing in T-1
8.		MicroSD slot	Backup BMC SEL.

Power Sub-System

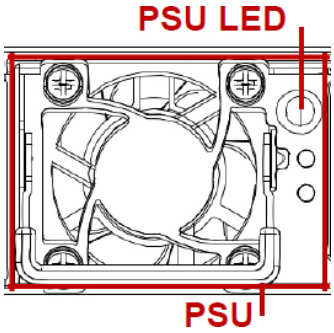


Figure 1-5. PSU to Mainboard Module Description

A single power supply unit (default) is supplied in the system. A secondary PSU is available for redundancy functionality.

Table 6: AC Power Supply Units by Model

PSU	AC INPUT
(2) 800W/1200W/1600W 86mm Titanium/Platinum redundant PSU	100-240VAC 50/60Hz, AC/HVDC support

Table 7: DC Power Supply Units by Model

PSU	DC INPUT
(2) 1200/1600W 86mm Titanium/Platinum redundant PSU	48V DC

Table 8: Power Supply Unit LED

PSU LED COLOR	DESCRIPTION
Amber On	PSU failure
Green On	PSU good
Green Blinking at 0.5Hz	PSU standby
Green Blinking at 2Hz	PSU cold redundancy standby

System Top View

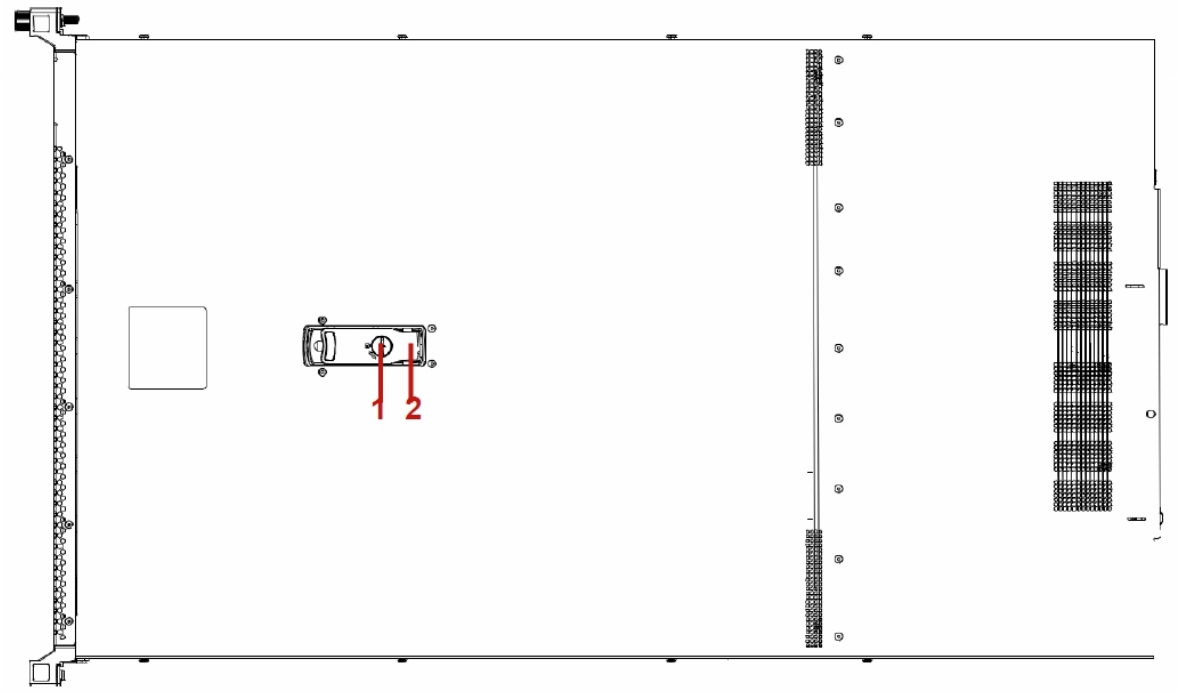
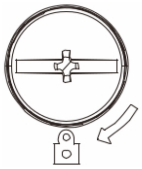
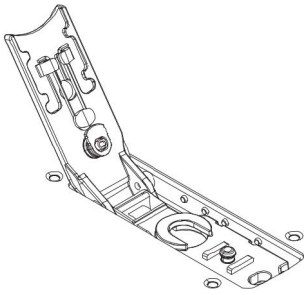


Figure 1-6. System Top View

Table 9: System Top View

NO.	NAME	DESCRIPTION
1.	Latch	Rotate to the unlock position to unsecure the handle 
2.	Handle	Open toward to rear chassis to eject and lift up the top cover to remove 

HDD Configuration

The systems are available as a full 2.5" HDD SKU. Within the HDD array, the HDD enumeration is as follows:

Full 2.5" HDD Configuration

ALL SATA/SAS/NVME SKU

- HDD0~HDD11 support SATA, SAS or NVMe SSD
- HDD0~HDD5 (CPU0) / HDD6~HDD11 (CPU1)

TIERED SKU

- HDD0,1, 6, 7 support SATA/SAS HDD/SSD;
- HDD2~HDD5, HDD8~HDD11 support SATA/SAS HDD/SSD or NVMe SSD

Figure 1-7. Full 2.5" HDD Configuration

LED Status Descriptions

Front Control Panel LEDs

For location of the FCP, see *System Front View* on page 1-7.

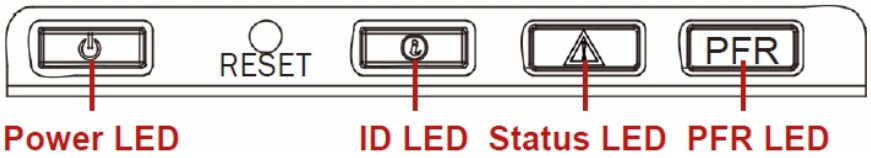


Figure 1-8. Front Control Panel LEDs

Table 10: Front Control Panel LEDs Behavior

NAME	COLOR	CONDITION	DESCRIPTION
Power LED	Blue	On	System S0 power on
		Off	System S5 power off
Identification	Blue	Blinking	Unit selected for identification
		Off	No identification request
Status LED	Amber	Blinking	Critical Failure: critical fan, voltage, temperature state
			Non-Critical Failure: non-critical fan, voltage, temperature state, CPU thermal trip, DC off
		Off	SEL cleared
			Last pending warning or error has been de-asserted.
PFR Status LED (Only for certain models)	Off		Power Off/PFR Module is not installed
	Green	On	Authenticated
	Amber	On	Failed
		Blinking	Authentication /Recovery is executing in T-1

BMC Management Port LEDs

The system mainboard includes one dedicated RJ45 GbE management port. The RJ45 connector has two built-in LEDs. See the following illustration and table for details.

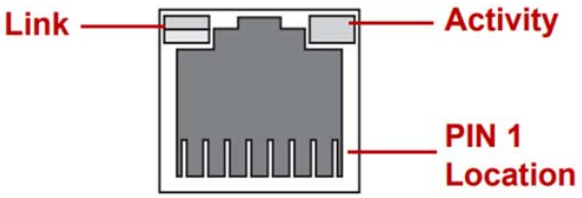


Figure 1-9. GbE RJ45 Management

Table 11: RJ45 LED Descriptions

CONDITION	LINK	ACTIVITY
Unplugged	Off	Off
1G active link	On amber	Blinking green
100M active link	On green	Blinking green
10M active link	Off	Blinking green

Storage Drive LED

Front 2.5" Storage Drive LED Status Behavior

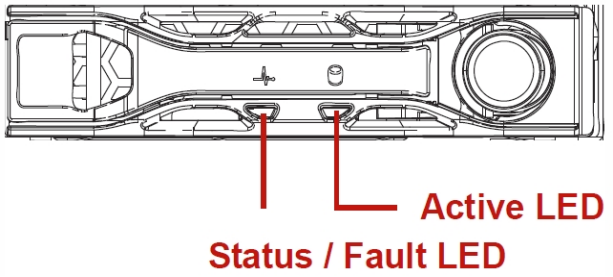


Figure 1-10. 2.5" Storage Drive LED Identification

The following LED behavior table represents LED conditions

Table 12: 2.5" Storage Drive LED Status Behavior

NAME	COLOR	CONDITION	DESCRIPTION
Drive Status / Fault	Blue	On	Drive is online
		Blinking	Twice per second: Identification Once per second: Rebuilding
	Amber	On	HDD failure
	Off		Slot is empty
Drive Active	Blue	Blinking	HDD access is active

Hitachi Vantara

Corporate Headquarters
2535 Augustine Drive
Santa Clara, CA 95054 USA
HitachiVantara.com | community.HitachiVantara.com

Contact Information
USA: 1-800-446-0744
Global: 1-858-547-4526
HitachiVantara.com/contact