

Hitachi Virtual Storage Platform G130 88-03-2x

Hardware Reference Guide

This document provides information about the system hardware components and the mechanical and environmental specifications for the Hitachi Virtual Storage Platform G130 storage system.

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Preface

This guide describes the hardware features and specifications of the VSP G130 storage system.

Intended audience

This document is intended for Hitachi Vantara representatives, system administrators, authorized service providers, or customers who install, configure, and operate the VSP G130 storage system.

Readers of this document should be familiar with the following:

- Data processing and RAID storage systems and their basic functions
- RAID storage system hardware components and operational specifications

UEFI Development Kit 2010

This product includes UEFI Development Kit 2010 written by the UEFI Open Source Community. For more information, see the UEFI Development Kit website:

http://sourceforge.net/apps/mediawiki/tianocore/index.php?title=UDK2010

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Product version

This document revision applies to VSP G130 firmware 88-03-2x or later.

Release notes

Read the release notes before installing and using this product. They may contain requirements or restrictions that are not fully described in this document or updates or corrections to this document. Release notes are available on Hitachi Vantara Support Connect: <u>https://knowledge.hitachivantara.com/Documents</u>.

Changes in this revision

- Added support for 480 GB SSD, 3.8 TB SAS, 1.9 TB SSD, and 14 TB HDD drives.
- Add support for 10-Gbps iSCSI controller board (copper) and 10-Gbps iSCSI controller board (BASE-T)

Document conventions

This document uses the following typographic conventions:

| Convention | Description | | | |
|------------|---|--|--|--|
| Bold | Indicates text in a window, including window titles, menus, menu options, buttons, fields, and labels. Example: | | | |
| | Click OK . | | | |
| | Indicates emphasized words in list items. | | | |

| Convention | Description | | | |
|------------------------|---|--|--|--|
| Italic | Indicates a document title or emphasized words in text. | | | |
| | Indicates a variable, which is a placeholder for actual text provided by the user or for output by the system. Example: | | | |
| | pairdisplay -g <i>group</i> | | | |
| | (For exceptions to this convention for variables, see the entry for angle brackets.) | | | |
| Monospace | Indicates text that is displayed on screen or entered by the user. Example: pairdisplay -g oradb | | | |
| < > angle | Indicates variables in the following scenarios: | | | |
| brackets | Variables are not clearly separated from the surrounding text or from other variables. Example: | | | |
| | Status- <report-name><file-version>.csv</file-version></report-name> | | | |
| | Variables in headings. | | | |
| [] square brackets | Indicates optional values. Example: [a b] indicates that you can choose a, b, or nothing. | | | |
| { } braces | Indicates required or expected values. Example: { a b } indicates that you must choose either a or b. | | | |
| vertical bar | Indicates that you have a choice between two or more options or arguments. Examples: | | | |
| | [a b] indicates that you can choose a, b, or nothing. | | | |
| | { a b } indicates that you must choose either a or b. | | | |

This document uses the following icons to draw attention to information:

| lcon | Label | Description |
|------|---------|--|
| | Note | Calls attention to important or additional information. |
| 0 | Тір | Provides helpful information, guidelines, or suggestions for performing tasks more effectively. |
| | Caution | Warns the user of adverse conditions and/or consequences (for example, disruptive operations, data loss, or a system crash). |

| lcon | Label | Description |
|------|---------|---|
| | WARNING | Warns the user of a hazardous situation which, if not avoided, could result in death or serious injury. |

Conventions for storage capacity values

Physical storage capacity values (for example, disk drive capacity) are calculated based on the following values:

| Physical capacity unit | Value |
|------------------------|--------------------------------------|
| 1 kilobyte (KB) | 1,000 (10 ³) bytes |
| 1 megabyte (MB) | 1,000 KB or 1,000 ² bytes |
| 1 gigabyte (GB) | 1,000 MB or 1,000 ³ bytes |
| 1 terabyte (TB) | 1,000 GB or 1,000 ⁴ bytes |
| 1 petabyte (PB) | 1,000 TB or 1,000 ⁵ bytes |
| 1 exabyte (EB) | 1,000 PB or 1,000 ⁶ bytes |

Logical capacity values (for example, logical device capacity, cache memory capacity) are calculated based on the following values:

| Logical capacity unit | Value |
|-----------------------|--------------------------------------|
| 1 block | 512 bytes |
| 1 cylinder | Mainframe: 870 KB |
| | Open-systems: |
| | • OPEN-V: 960 KB |
| | Others: 720 KB |
| 1 KB | 1,024 (2 ¹⁰) bytes |
| 1 MB | 1,024 KB or 1,024 ² bytes |
| 1 GB | 1,024 MB or 1,024 ³ bytes |
| 1 TB | 1,024 GB or 1,024 ⁴ bytes |
| 1 PB | 1,024 TB or 1,024 ⁵ bytes |

| Logical capacity unit | Value |
|-----------------------|--------------------------------------|
| 1 EB | 1,024 PB or 1,024 ⁶ bytes |

Accessing product documentation

Product user documentation is available on Hitachi Vantara Support Connect: <u>https://knowledge.hitachivantara.com/Documents</u>. Check this site for the most current documentation, including important updates that may have been made after the release of the product.

Getting help

<u>Hitachi Vantara Support Connect</u> is the destination for technical support of products and solutions sold by Hitachi Vantara. To contact technical support, log on to Hitachi Vantara Support Connect for contact information: <u>https://support.hitachivantara.com/en_us/contact-us.html</u>.

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<u>doc.comments@hitachivantara.com</u>. Include the document title and number, including the revision level (for example, -07), and refer to specific sections and paragraphs whenever possible. All comments become the property of Hitachi Vantara Corporation.

Thank you!

Chapter 1: Overview

The following describes hardware components, features, and configurations of the Hitachi Virtual Storage Platform G130.

About Hitachi Virtual Storage Platform G130

The VSP G130 is comprised of a controller chassis and drive trays. The controller chassis is equipped with a controller board, fans, dual power supply units, and drive bay for small form-factor (SFF) or large form-factor (LFF) SAS disk drives. The controller board is embedded with Fibre Channel interface, cache flash memory (CFM), and battery backup modules.

The storage system supports small form-factor (DBS) and large form-factor (DBL) drive trays. Both drive trays are equipped with an I/O module (ENC) and redundant power supplies with integrated cooling fans. The DBS tray supports SFF SAS disk drives. The DBL tray supports LFF SAS disk drives.

Features

- Modular and versatile system configurations
- High reliability and strong performance
- Simple management of array
- Easily expandable storage capacity

Scalability and versatility

- One dual controller chassis with on-board SFF or LFF SAS disk drives
- Host interfaces: 16-Gbps FC
- One or more optional drive trays (up to three DBS drive trays or seven DBL drive trays)
- Optional service processor (SVP)

System configurations

The following table lists the supported system configurations with maximum mountable drive tray and data drives for the VSP G130 storage system.

Chapter 1: Overview

| Controller | Number of mountable drive trays | | Maximum number of mountable SAS |
|------------|------------------------------------|---------|---------------------------------|
| chassis | Drive tray | Maximum | drives |
| CBSS | DBS | 3 | 96 |
| | DBL | 6 | 96 |
| CBSL | DBS | 3 | 84 |
| | DBL | 7 | 96 |

Chapter 1: Overview

The following section describes the technical specifications and associated hardware components of the VSP G130 storage system.

Technical specifications

The following table provides some key technical specifications for VSP G130.

| Item | | | Specification |
|--------------------------------|--|--------------------|---|
| System | Number of disk drives | Minimum | 4 (disk-in model)/0 (diskless model) |
| | (HDD) | Maximum | 96 |
| | RAID level | | RAID 6/RAID 5/RAID 1 |
| | RAID group | RAID 6 | 6D+2P, 14D+2P |
| | configuration | RAID 5 | 3D+1P, 7D+1P |
| | | RAID 1 | 2D+2D, 4D+4D |
| Maximum number of spare drives | | 16 ¹ | |
| | Maximum number of volumes | | 2,048 |
| | Maximum stora | ge system capacity | 201 TiB (using 2.4 TB, SFF HDD) |
| (physical capacity) | | ty) | 1,196 TiB (using 14 TB, LFF HDD) |
| Memory | Cache memory capacity | | 32 GiB |
| | Cache flash memory capacity | | BM05 |
| Storage interface | Controller/drive chassis interface | | SAS/Dual Port |
| | Data transfer rate | | Maximum 12 Gb/s |
| | Maximum number of drives per SAS interface | | 144 |

Table 1 System specifications

| Item | | | Specification |
|----------------|---------------------------------------|---------------|---|
| Channel | Support channel type | Open systems | Fibre Channel Shortwave |
| Interface | | Fibre Channel | 400/800/1600 MB/s |
| | Data transfer rate | | |
| | Maximum number of channel adapters | | 4 |
| Power | AC Input | Single-phase | 50Hz/60Hz : 100V to 120V, 200V to 240V |
| Acoustic Level | Operating | CBSS/CBSL | 60dB (32°C) |
| 2, 5 | | DBSC/DBLC | 60dB (32°C) ^{4, 5} |
| | Standby | CBSS/CBSL | 55dB |
| | | DBSC/DBLC | 55dB ^{4, 5} |
| Non-stop | Control PCB | · | Supported |
| maintenance | Cache memory module | | Supported |
| | Cache flash memory | | Supported |
| | Power supply, fan | | Supported |
| | Microcode | | Supported |
| | Drive (2.5-inch/3.5-inch HDD) | | Supported |

Notes:

- **1.** Available as spare drive or data disks.
- 2. The acoustic level is measured under the following conditions in accordance with ISO7779 and the value is declared based on ISO9296. In a normal installation area (data center/general office), the storage system is surrounded by different elements from the following measuring conditions according to ISO, such as noise sources other than the storage system (other devices), the walls and ceilings that reflect the sound. Therefore, the values described in the table do not guarantee the acoustic level in the actual installation area.
 - Measurement environment: In a semi-anechoic room whose ambient temperature is 23°C ± 2°C
 - Device installation position: The Controller Chassis is at the bottom of the rack and the Drive Box is at a height of 1.5m in the rack.

| | Item | Specification |
|----|--|--|
| | | |
| | Measurement position: 1m away from the fron storage system and 1.5m high (at four points). | t, rear, left or right side of the |
| | Measurement value: Energy average value of th and right). | ne four points (front, rear, left |
| 3. | It is recommended to install the Hitachi Vantara st However, you can install the storage system into a should be equipped with proper cooling systems a are installing a storage system into a regular office The cooling fans in the storage system are compare of the cooling fan blades causes high-frequency ne | orage system into a data center. n office space but the space and noise insulation. When you e space, observe the following: ct and the high rotational speed pise. |
| 4. | Sound pressure level (LA) changes from 66dB to 7 temperature, drive configuration and operating st 79dB during maintenance procedure for failed EN | 5dB according to the ambient atus. The maximum could be C or Power Supply. |
| 5. | Acoustic power level (LwA) measured by ISO7779 of from 7.2B to 8.1B according to the ambient tempe | condition is 7.2B. And it changes trature, drive configuration and |

Electrical specifications

operating status.

The following table describes the electrical specifications for the VSP G130.

| Input power specifications | CBSS/CBSL controller chassis | DBS/DBL drive tray | |
|--|---------------------------------|------------------------|--|
| Input voltage | AC | AC | |
| (Operable voltage range) | 100-120/200-240 | 100-120 / 200-240 | |
| (V) | +6%/-11% | +6%/-11% | |
| Frequency (Hz) | 50/60 ± 1 | | |
| Number of phases, cabling | Single-phase with protective | grounding | |
| Steady-state current | 4.0×2/2.0×2 | DBS: 2.4×2/1.2×2 | |
| 100V/200V (A) ^{1, 2} | | DBL: 1.9×2/1.0×2 | |
| Current rating of breaker/ fuse (A) | 16.0 (each electrical) | 16.0 (each electrical) | |
| Heat value (normal) | 1770 or less | DBS: 1120 or less | |
| (kJ/h) | | DBL: 940 or less | |
| Steady-state power | 800/760 or less | DBS: 480/460 or less | |
| (VA/W) ³ | | DBL: 380/350 or less | |
| Power consumption | 490/490 or less | DBS: 320/310 or less | |

| Input power specifications | CBSS/CBSL controller chassis | DBS/DBL drive tray |
|----------------------------|---------------------------------|----------------------|
| (VA/W) | | DBL: 280/260 or less |

Note:

- **1.** The power current of N2 described in this table is required for operation by a single power supply unit.
- **2.** If one power supply unit fails, another power supply unit requires electric current for the two power supply units. Therefore, plan the power supply facility so the current carrying capacity of one power supply unit can provide a total capacity of the two power supply units.
- **3.** Power requirement for the maximum configuration is shown. Value at 100 V/200 V is shown. The actual required power may exceed the value shown in the table when the tolerance is included.

Environmental specifications

The following table describes the environmental specifications for the VSP G130.

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Note: The VSP G130 storage system components are not supported in high-temperature environments. Do not operate the Hitachi Vantara-provided service processor (SVP) at temperatures of 40°C or higher.

| | Item | CBSS/CBSL controller chassis | DBS/DBL drive tray | Notes |
|--|---|--|--|---|
| Temperat | Operating (°C) | 10 to 40 | 10 to 40 | - |
| ure | Non-operating (°C) | -10 to 50 | -10 to 50 | |
| | Transport/storage (°C) | -30 to 60 | -30 to 60 | |
| | Temperature change rate (°C) | 10 or less | 10 or less | |
| Humidity | Operating (°C) | 8 to 80 | 8 to 80 | - |
| | Non-operating (°C) | 8 to 90 | 8 to 90 | |
| | Transport/storage (°C) | 5 to 95 | 5 to 95 | |
| | Max. wet bulb temperature (°C) | 29 (non- condensing) | 29 (non- condensing) | |
| Vibration | Operating (m/s ²) | 2.5 or less (5 to 300Hz) | 2.5 or less (5 to 300Hz) | Within 5 seconds |
| | Non-operating (m/s ²) | 5.0 or less (5 to 300Hz): No critical damage for product. | 5.0 or less (5 to 300Hz): No critical damage for product. | (Resonance point: 10Hz or less) |
| | | 9.8 (1.0G): Ensure own safety with fall prevention. | 9.8 (1.0G): Ensure own safety with fall prevention. | |
| | Transport (packed) (m/s ²) | 5.0 or less | 5.0 or less | - |
| Impact | Operating (m/s ²) | 20 or less | 20 or less | 10ms, |
| | Non-operating (m/s ²) | 50 or less | 50 or less | half sine wave |
| | Transport (packed) (m/s ²) | 80 or less | 80 or less | |
| Storage system tips over at specific angle (°) | | 15° or less | 15° or less | To be measured when installed on leveling bolts. |

| | Item | CBSS/CBSL controller chassis | DBS/DBL drive tray | Notes |
|--|----------------------------|--|--------------------------------|-------|
| Altitude | Operating (m) | (⁵) to 3,050 | | - |
| | | (Environmental ter to 28°C) | nperature: 10°C | |
| | | to 950 (Environme temperature: 10°C | ntal to 40°C) | |
| | Non-operating (m) | -60 to 12,000 | -60 to 12,000 | |
| Gaseous contamin ants ⁴ | Operating | G1 classification levels | G1 classification levels | - |
| | Non-operating | G1 classification levels | G1 classification levels | |
| | Transport/storage | - | - | |
| Acoustic noise | Operating | 60 (Environmental temperature: 32°C or less) ¹ | | - |
| (dB) | Standby | 55 | | |
| Noise level (dB) | Operating (Recommended) | 90 or less ³ | | - |

Notes:

- 1. The system internal temperature controls the rotating speed of the fan. This value might be exceeded if the maximum load continues under high temperature environment or if a failure occurs in the system.
- **2.** Sound pressure level [LA] changes from 66dB to 75dB according to the ambient temperature, drive configuration, and operating status. The maximum value can reach 79dB during maintenance procedure for failed ENC or power supply unit.
- **3.** Fire-suppression systems and pneumatic sirens can generate high levels of acoustic noise and affect system performance. It can also cause vibrations to the hard disk drives (HDD) in the storage systems resulting in I/O errors, performance degradation in and to some extent damage to the HDDs. The noise level tolerance of HDDs may vary among different models, designs, capacities and manufacturers. The recommended acoustic noise level for an operating environment is 90dB or less in order to ensure reliable operations when placing a Hitachi Vantara storage system two meters from the source of the noise.

| | Item | CBSS/CBSL controller chassis | DBS/DBL drive tray | Notes |
|----|--|--|--|--|
| | Hitachi Vantara does not te suppression systems and p recommendations or claim pneumatic sirens. The custo regulations. | st storage systems a neumatic sirens. Hit compatibility with a omer is responsible | and HDDs for com achi Vantara also ny fire suppressic to follow their loc | patibility with fire does not provide on systems and al or national |
| | To prevent I/O error or dam recommends the following: | nages to HDDs in the | e storage systems | , Hitachi Vantara |
| | Install noise-reducing ba systems. | ffles to mitigate the | noise to the HDD | s in the storage |
| | • Consult the fire suppress to reduce the acoustic net | sion system manufa oise to protect the H | cturers on noise i IDDs in the storag | reduction nozzles ge systems. |
| | Locate the storage syste emergency sirens. | m as far as possible | from noise sourc | es such as |
| | If it can be safely done without risk of personal injury, shut down the storage systems to avoid data loss and damages to the HDDs in the storage systems. | | | |
| | Damage to HDDs from fire suppression systems or pneumatic sirens voids the HDD warranty. | | | |
| 4. | See ANSI/ISA-71.04-2013 Er Control Systems: Airborne (| nvironmental Condit Contaminants. | ions for Process N | leasurement and |
| 5. | Meets the highest allowable (American Society of Heatin Thermal Guidelines Class A and the altitude is from 40° altitude of 3050 meters (100 decreased by 1°C for every | e temperature condi ng, Refrigerating and 3. The maximum val C at an altitude of 9 000 feet). The allowa 175-meter increase | tions and complie Air-Conditioning lue of the ambien 50 meters (3000 f able ambient tem in altitude above | es with ASHRAE Engineers) 2011 t temperature eet) to 28°C at an perature is 950 meters. |
| 6. | The acoustic level is measured ISO7779 and the value is de | red under the follow eclared based on ISC | ving conditions in 09296. | accordance with |

| | Item | CBSS/CBSL controller chassis | DBS/DBL drive tray | Notes | |
|----|---|---|--|---|--|
| | In a normal installation (data center/office), the storage system is surrounded by different elements from the following measuring conditions according to ISO, such as noise sources other than the storage system (other devices), the walls and ceilings that reflect the sound. Therefore, the values described in the table do not guarantee the acoustic level in the actual installation area. | | | | |
| | Measurement environment: In a semi-anechoic room whose ambient temperature is 23°C ±2°C | | | | |
| | Device installation position: The controller chassis is at the bottom of the rack and the drive tray is at a height of 1.5 meters in the rack. | | | | |
| | Measurement position: 1 meter away from the front, rear, left, or right side of the storage system and 1.5 meters high (at four points) | | | t, or right side of | |
| | Measurement value: Energy average value of the four points (front, rear, left, and right) | | | front, rear, left, | |
| 7. | It is recommended to instal However, you can install the should be equipped with pr are installing a storage syste The cooling fans in the stora of the cooling fan blades ca | l the Hitachi Vantara e storage system int oper cooling system em into a regular of age system are com uses high-frequency | a storage system i o an office space ns and noise insul fice space, observ pact and the high y noise. | nto a data center. but the space ation. When you re the following: rotational speed | |

VSP G130 controller chassis

Each controller chassis includes dual controllers equipped with internal components such as a processor, single cache memory module (DIMMs), cache flash memory (CFM), battery, fans. The front of the controller chassis provides a drive bay for loading 2.5-inch or 3.5-inch SAS disk drives.

The controller has an Ethernet connection for out-of-band management using Device Manager - Storage Navigator. If the data path through one controller fails, all drives remain available to data hosts using a redundant data path through the other controller. The controller is equipped with LED indicators for monitoring its operating conditions and notifying possible component replacement.

Controller chassis with small form-factor drive bays (CBSS)

The following describes the CBSS controller board specifications and associated physical features of the controller.

CBSS mechanical specifications

The following table provides a description and specifications of the CBSS controller chassis.

| Item | Description | | |
|---|---|-----------------|-----------------|
| Chassis (2U) | DW800-CBSS | | |
| Controller board | DW-F850-CTLXSFA | DW-F850-CTLXSCA | DW-F850-CTLXSSA |
| Number of DIMM slot | 1 | | |
| Cache memory DIMM capacity per controller | 16 GiB | | |
| Total cache memory capacity per system | 32 GiB | | |
| Control memory | Flash memory: 32 ME | 3 | |
| | L3 cache memory: 4 l | MB | |
| | SDRAM: 1 GB | | |
| Data assurance | Data bus: Parity | | |
| method | Cache memory: ECC (1-bit correction, 2-bit detection) | | |
| Drive: Data assurance code | | | |
| Available drive slots | 24 | | |
| Physical dimension | 483 × 813 × 88 mm | | |
| (W x D x H) (mm) | (W x D x H) (mm) | | |
| Weight/Mass (kg) | 16.1 kg | | |
| (Approximate) | | | |
| Start-up time (min) ¹ | 5 to 8 (min) | | |
| Height | 2U | | |
| (EIA unit) ² | | | |
| Heat output (W) | 218 W | | |
| Power consumption (VA) | on 226 W | | |
| Insulation withstand voltage | AC 1,500 V (100mA, 1min) | | |
| Insulation resistance | DC 500 V, 10 MΩ or more | | |
| Air flow (m ³ /min) ³ | 4.0 (m ³ /min) | | |
| Notes: | | | |

| Item Description | | | | | |
|------------------|---|--|--|--|--|
| 1. | Start-up times m connected. With start-up time is a | t-up times might be longer depending on the number of drive trays nected. With a maximum configuration 1 controller chassis and 3 drive trays, t-up time is approximately 8 minutes. | | | |
| 2. | Can be mounted on the Hitachi Universal V2 rack. | | | | |
| 3. | Value shown is t | he maximum value. | | | |

Host interface specifications

The following table lists the specifications of the host interfaces available for the VSP G130 controllers.

| Item | Specification |
|-----------------------------------|-------------------------|
| Interface type | 16 Gbps FC (Optical) |
| Data transfer speed | 400 Mbps (FC) |
| (Max. speed for transfer to host) | 800 Mbps (FC) |
| | 1600 Mbps (FC) |
| Number of ports per controller | 16 Gbps FC (Optical): 2 |
| Number of ports per system | 4 |

Battery life specifications

| Storage system intake temperature | CBSS |
|-----------------------------------|---------|
| Up to 75.2° F (24° C) | 5 years |
| Up to 86° F (30° C) | 5 years |
| Up to 93.2º (34º C) | 4 years |
| Up to 104° (40° C) | 3 years |

CBSS component LEDs

The following table lists the definitions of the CBSS controller chassis front panel bezel LEDs.



| Number | Item | Color | Pattern | Description |
|--------|-------------------------------------|-------|---------|--|
| 1 | POWER | Green | ON | Storage system is powered on. |
| | LED | Amber | ON | Storage system is receiving power. |
| 2 | READY LED | Green | ON | Storage system is ready for normal operation. |
| 3 | WARNING | Amber | ON | Component requires maintenance. |
| | LED | | Blink | Failure occurred. Requires maintenance. |
| | | | | When the SIM is confirmed, the LED pattern indicates the failure and requires attention. |
| | | | | Note : When System Option Mode 1097 is set to ON, the WARNING LED does not blink, even if the following failure service information messages (SIM) are issued: 452xxx, 462xxx, 3077xx, 4100xx, and 410100. |
| | | | | LED might turn off during user maintenance. |
| 4 | ALARM LED | Red | ON | Processor failure (system might be down). For assistance, contact customer support: <u>https://support.hitachivantara.com/en_us/</u> <u>contact-us.html</u> . |
| 5 | POWER ON/OFF (main switch) | - | - | Turns on power to the storage system. |
| 6 | Lock | - | - | Locks and unlocks the front panel bezel by using the supplied key. |

Note: Removing a controller can cause the POWER, READY, WARNING, and ALARM LEDs on the front panel to turn off. These LEDs return to their on state after the storage system recovers from the controller replacement.

Chapter 2: Hardware components and specifications

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The following table describes the definitions of the CBSS controller front panel LEDs without an attached front bezel.



| Number | Item | Color | Pattern | Description |
|--------|--|-------|---------|--|
| 1 | ACT LED | Green | ON | Normal operation. |
| | | | Blink | Drive is being accessed. |
| 2 | ALM LED | Red | ON | Drive stopped due to a failure and can be replaced. |
| 3 | POWER, | - | - | Refer to the previous table. |
| | READY, WARNING, and ALARM LEDs | | | Note : When System Option Mode 1097 is set to ON, the WARNING LED does not blink, even if the following failure service information messages (SIM) are issued: 452xxx, 462xxx, 3077xx, 4100xx, and 410100. |
| 4 | POWER ON/OFF (main switch) | - | - | Turns on power to the storage system. |
| 5 | Small form- factor drive slots | - | - | Twenty-four 2.5-inch small form-factor drives are positioned vertically in the slots. The slots are arranged from left to right and organized as 0 to 23. |

The following table describes the definitions of the CBSS controller real panel LEDs.



| Number | Item | Color | Pattern | Description |
|--------|----------------------|------------|--|---|
| 1 | Port LED | Red | ON | A failure occurred in the small form-factor pluggable (SFP). |
| | | Blue | ON Normal link status at 16-Gbps (16-Gb SFP) | |
| | | Green | ON | Normal link status at 4-Gbps or 8-Gbps (16-Gbps SFP) |
| 2 | LAN LED | Amber | ON | LAN-RST is pressed. |
| 3 | Battery | Green | ON | Battery charge is complete. |
| | status LED | | Blink | Battery is charging or discharging. |
| | | - | OFF | Battery indicates the following status: |
| | | | | • The battery is not installed. |
| | | | | A failure occurred. |
| 4 | Backup status LED | Green | ON Restoration in progress following loss o power. | |
| | | | Fast blink | Restoring. Blinking five time per second. |
| | | | Slow blink | Restoring or sequential shutdown in progress. Blinking once per second. |
| 5 | SAS port LED | Blue | ON | Link to port is established. |
| 6 | Controller | roller Red | ON | Controller can be removed. |
| | (CLT) ALM LED | | Blink | Failure occurred to controller power supply. |
| | | Amber | ON | LAN switched is pressed. |
| 7 | SAS port | | | SAS cable port. |

The following table describes the definitions of the CBSS controller AC power supply unit LEDs and connectors.



| Number | ltem | Description |
|--------|-------------|---|
| 1 | Receptacle | Connects to the power cable provided with the storage system. |
| 2 | AC IN LED | Blue: AC input is normal. |
| 3 | ALM/RDY LED | Red: Power supply unit can be replaced. |
| | | Green: Normal operation. |

Controller chassis with large form-factor drive bays (CBSL)

The following describes the CBSL controller chassis technical specifications and associated physical features of the controller.

CBSL mechanical specifications

The following table provides a description and specifications of the CBSL controller chassis.

| Item | Description | | | | | |
|---|---|-----------------|-----------------|--|--|--|
| Chassis (2U) | DW800-CBSL | | | | | |
| Controller board | DW-F850-CTLXSFA | DW-F850-CTLXSCA | DW-F850-CTLXSSA | | | |
| Number of DIMM slot | 1 | | | | | |
| Cache memory DIMM capacity per controller | 16 GiB | | | | | |
| Total cache memory capacity per system | 32 GiB | | | | | |
| Control memory | Flash memory: 32 MI | 3 | | | | |
| | L3 cache memory: 4 | MB | | | | |
| | SDRAM: 1 GB | | | | | |
| Data assurance | Data bus: Parity | | | | | |
| method | Cache memory: ECC (1-bit correction, 2-bit detection) | | | | | |
| | Drive: Data assurance code | | | | | |
| Available drive slots | 12 | | | | | |
| Physical dimension | 483 × 813 × 88 mm | | | | | |
| (W x D x H) (mm) | | | | | | |
| Weight/Mass (kg) | 15.9 kg | | | | | |
| (Approximate) | | | | | | |
| Start-up time (min) ¹ |) ¹ 5 to 8 (min) | | | | | |
| Required height | 2U | | | | | |
| (EIA unit) ² | | | | | | |
| Heat output (W) | 192 W | | | | | |
| Power consumption (VA) | 200 W | 200 W | | | | |
| Insulation withstand voltage | AC 1,500 V (100mA, 1 | min) | | | | |
| Insulation resistance | DC 500 V, 10 MΩ or n | nore | | | | |
| Air flow (m ³ /min) ³ | 3.5 (m ³ /min) | | | | | |
| Notes: | , | | | | | |

| | Item Description | | | | |
|---|------------------------------------|--|--|--|--|
| Start-up times might be longer depending on the number of drive trays connected. With a maximum configuration 1 controller chassis and 7 drive trays, start-up time is approximately 8 minutes. | | | | | |
| 2. 3. | Can be mounted Value shown is t | l on the Hitachi Universal V2 rack. he maximum value. | | | |

Host interface specifications

The following table lists the specifications of the host interfaces available for the VSP G130 controllers.

| Item | Specification | |
|-----------------------------------|-------------------------|--|
| Interface type | 16 Gbps FC (Optical) | |
| Data transfer speed | 400 Mbps (FC) | |
| (Max. speed for transfer to host) | 800 Mbps (FC) | |
| | 1600 Mbps (FC) | |
| Number of ports per controller | 16 Gbps FC (Optical): 2 | |
| Number of ports per system | 4 | |

Battery life specifications

| Storage system intake temperature | CBSL |
|-----------------------------------|---------|
| Up to 75.2° F (24° C) | 5 years |
| Up to 86° F (30° C) | 4 years |
| Up to 93.2º (34º C) | 3 years |
| Up to 104° (40° C) | 2 years |

CBSL component LEDs

The following table describes the definitions of the CBSL controller front panel bezel LEDs.



| Number | Item | Color | Pattern | Description |
|--------|-------------------------------------|-------|---------|--|
| 1 | POWER | Green | ON | Storage system is powered on. |
| | | Amber | ON | Storage system is receiving power. |
| 2 | READY LED | Green | ON | Storage system is ready for normal operation. |
| 3 | WARNING | Amber | ON | Component requires maintenance. |
| | LED | | Blink | Failure occurred. Requires maintenance. |
| | | | | When the SIM is confirmed, the LED pattern indicates the failure and requires attention. |
| | | | | Note : When System Option Mode 1097 is set to ON, the WARNING LED does not blink, even if the following failure service information messages (SIM) are issued: 452xxx, 462xxx, 3077xx, 4100xx, and 410100. |
| | | | | LED might turn off during user maintenance. |
| 4 | ALARM LED | Red | ON | Processor failure (system might be down). For assistance, contact customer support: <u>https://support.hitachivantara.com/en_us/</u> <u>contact-us.html</u> . |
| 5 | POWER ON/OFF (main switch) | - | - | Turns on power to the storage system. |
| 6 | Lock | - | - | Locks and unlocks the front panel bezel by using the supplied key. |

Note: Removing a controller can cause the POWER, READY, WARNING, and ALARM LEDs on the front panel to turn off. These LEDs return to their on state after the storage system recovers from the controller replacement.

Chapter 2: Hardware components and specifications

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The following table describes the definitions of the CBSL controller front panel LEDs without an attached front bezel.



| Number | Item | Color | Pattern | Description | |
|--------|--|-------|---------|--|--|
| 1 | ACT LED | Green | ON | Normal operation. | |
| | | | Blink | Drive is being accessed. | |
| 2 | ALM LED | Red | ON | Drive stopped due to a failure and can be replaced. | |
| 3 | POWER, READY, WARNING, and ALARM LEDs | - | - | Refer to the previous table. Note : When System Option Mode 1097 is set to ON, the WARNING LED does not blink, even if the following failure service information messages (SIM) are issued: 452xxx, 462xxx, 3077xx, 4100xx, and 410100. | |
| 4 | POWER ON/OFF (main switch) | - | - | Turns on power to the storage system. | |
| 5 | Large form- factor drive slots | - | - | Twelve 3.5-inch large form-factor drives are positioned horizontally in the slots. The slots are organized from 0 to 11 in the following order:89101145670123 | |

The following table describes the definitions of the CBSL controller real panel LEDs.



| Number | Item | Color | Pattern | Description |
|--------|----------------------|---------------|---------------|---|
| 1 | Port LED | Red | ON | A failure occurred in the small form-factor pluggable (SFP). |
| | | Blue | ON | Normal link status at 16-Gbps (16-Gbps SFP) |
| | | Green | ON | Normal link status at 4-Gbps or 8-Gbps (16-Gbps SFP) |
| 2 | LAN LED | Amber | ON | LAN-RST is pressed. |
| 3 | Battery | Green | ON | Battery charge is complete. |
| | status LED | | Blink | Battery is charging or discharging. |
| | | - | OFF | Battery indicates the following status: |
| | | | | The battery is not installed. |
| | | | | A failure occurred. |
| 4 | Backup status LED | Green | ON | Restoration in progress following loss of power. |
| | | | Fast blink | Restoring. Blinking five time per second. |
| | | | Slow blink | Restoring or sequential shutdown in progress. Blinking once per second. |
| 5 | SAS port LED | Blue | ON | Link to port is established. |
| 6 | Controller | ontroller Red | ON | Controller can be removed. |
| | (CLT) ALM LED | | Blink | Failure occurred to controller power supply. |
| | | Amber | ON | LAN switched is pressed. |
| 7 | SAS port | | | SAS cable port. |

The following table describes the definitions of the CBSL controller AC power supply unit LEDs and connectors.



| Number | Item | Description |
|--------|-------------|---|
| 1 | Receptacle | Connects to the power cable provided with the storage system. |
| 2 | AC IN LED | Blue: AC input is normal. |
| 3 | ALM/RDY LED | Red: Power supply unit can be replaced. |
| | | Green: Normal operation. |

Drive trays

The SFF and LFF drive trays contain disk drives, power supplies, fans, and status LEDs. Each drive tray provides interfaces for connecting to controllers and other drive trays.

Small form-factor drive tray (DBS)

The following tables provide information about the DBS drive tray specifications and supported configurations for VSP G130 storage system.

| Name | Model number | Height | Number of drive slots | Supported drive type |
|------|--------------|--------------|-----------------------|-------------------------|
| DBS | DW-F800-DBSC | 2U (88.2 mm) | 24 | 2.5 inch (SFF) |

Physical specifications

| Item | Specification | |
|---|---------------------------|--|
| Physical dimension | 482 × 565 × 88.2 mm | |
| (W x D x H) (mm) | | |
| Weight/Mass (kg) | 17 kg | |
| (Approximate) | | |
| Start-up time (min) ¹ | 5 to 8 (min) | |
| Height | 2U | |
| (EIA unit) ² | | |
| Heat output (W) | 116 W | |
| Power consumption (VA) | 126 VA | |
| Air flow (m ³ /min) ³ | 2.2 (m ³ /min) | |

Notes:

1. Start-up times might be longer depending on the number of drive trays connected. With a maximum configuration 1 controller chassis and 3 drive trays, start-up time is approximately 8 minutes.

- **2.** Can be mounted on the Hitachi Universal V2 rack. For the mounting, special rails for the rack and decoration panels are required separately depending on the number of the mounted storage systems.
- **3.** Value shown is the maximum value.

Supported drive type

| Item | Specification | | |
|---|-----------------------------|-------------------------|--|
| Drive form-factor | 2.5-inch HDD | | |
| Supported data capacity | 576.39, 1152.79, 2305.58 GB | | |
| Maximum mountable quantity (unit) ¹ | 24 (total per chassis) | 96 (maximum per system) | |
| Maximum number of spare drives ² | 16 | | |
| Note: | | | |

- **1.** When mounting storage system and DBS drive trays, the maximum mountable quantity may vary.
- **2.** Available as spare or data disks.

DBS component LEDs

The following table lists the definitions of the DBS drive tray front bezel LEDs.



| Number | Item | Color | Pattern | Description |
|--------|---------------|-------|---------|---|
| 1 | POWER LED | Green | ON | Drive tray is powered on. |
| 2 | READY LED | Green | ON | Drive tray is ready for normal operation. |
| 3 | Locate LED | Amber | Blink | Indicates the location of the chassis. Can be turned on or turned off by the maintenance utility. |
| 4 | Lock | - | - | Locks or unlocks the front panel bezel by using the supplied key. |

The following table lists the definitions of the DBS drive tray front LEDs without an attached bezel.



| Number | Item | Color | Pattern | Description |
|--------|--------------------|-------|---------|--|
| 1 | POWER, | Green | ON | Drive tray is powered on. |
| | READY, | | | Drive tray is under normal operation. |
| | and, | Amber | Blink | Indicates the location of the chassis. |
| | LOCATE LEDs | | | Can be turned on or turned off by the maintenance utility. |
| 2 | ALM LED | Red | ON | Drive stopped due to a failure and can be replaced. |
| 3 | ACT LED | Green | ON | Drive tray is under normal operation. |
| | | | Blink | Drive is being accessed. |
| 4 | SFF drive slots | - | - | Twenty-four 2.5-inch small form-factor drives are positioned vertically. |
| | | | | Twenty-four 2.5-inch small form-factor drives are positioned vertically in the slots. The slots are arranged from left to right and organized as 0 to 23. |

The following table lists the definitions of the DBS drive tray rear panel components and LEDs.

Small form-factor drive tray (DBS)



| Number | Item | Color | Pattern | Description |
|--------|--------------------------------|-------|---------|---|
| 1 | ENC | - | - | Controller board |
| 2 | POWER LED | Green | ON | ENC is powered on. |
| 3 | LOCATE | Amber | Blink | Indicates the location of the chassis. |
| | LED | | | Can turn on or off by the maintenance utility. |
| 4 | ALARM LED | Red | ON | ENC stopped due to a failure and can be replaced. |
| 5 | PATH (IN) LED | Blue | ON | IN side port is linked up. |
| 6 | PATH (IN) connect or | - | - | Port connects to a controller or drive tray. |
| 7 | PATH (OUT) LED | Blue | ON | OUT side port is linked up. |
| 8 | PATH (OUT) connect or | - | - | Connects to a drive tray. |
| 9 | Console | - | - | This port is reserved. |
| 10 | Power supply unit | - | - | Power supply unit |
| 11 | Recepta cle | - | - | Connects to the power cable provided with the storage system. |
| 12 | AC IN LED | Green | ON | Drive tray is under normal operation. |
| 13 | ALM LED | Red | ON | Power supply unit stopped due to a failure and can be replaced. |
| 14 | RDY LED | Green | ON | Power supply unit is under normal operation. |

Large form-factor drive tray (DBL)

The following tables provide information about the DBL drive tray specifications and supported configurations for VSP G130 storage system.

| Name | Model number | Height | Number of drive slots | Supported drive type |
|------|--------------|--------------|-----------------------|-------------------------|
| DBL | DW-F800-DBLC | 2U (88.2 mm) | 12 | 3.5 inch (LFF) |

Physical specifications

| Item | Specification | |
|---|---------------------------|--|
| Physical dimension | 482 × 565 × 88.2 mm | |
| (W x D x H) (mm) | | |
| Weight/Mass (kg) | 17.4 kg | |
| (Approximate) | | |
| Start-up time (min) ¹ | 5 to 8 (min) | |
| Height | 2U | |
| (EIA unit) ² | | |
| Heat output (W) | 124 W | |
| Power consumption (VA) | 144 VA | |
| Air flow (m ³ /min) ³ | 2.2 (m ³ /min) | |

Notes:

- 1. Start-up times might be longer depending on the number of drive trays connected. With a maximum configuration 1 controller chassis and 7 drive trays, start-up time is approximately 8 minutes.
- **2.** Can be mounted on the Hitachi Universal V2 rack. For the mounting, special rails for the rack and decoration panels are required separately depending on the number of the mounted storage systems.
- **3.** Value shown is the maximum value.

Supported drive type

| Item | | Specification |
|---|------------------------|-------------------------|
| Drive form-factor | 3.5-inch HDD | |
| Supported data capacity | 5874.22, 9790.36 GB | |
| Maximum mountable quantity (unit) ¹ | 12 (total per chassis) | 96 (maximum per system) |
| Maximum number of spare drives ² | 16 | |
| Note: | | |

- **1.** When mounting storage system and DBL drive trays, the maximum mountable quantity may vary.
- **2.** Available as spare or data disks.

DBL component LEDs

The following table lists the definitions of the DBL drive tray front bezel LEDs.



| Number | Item | Color | Pattern | Description |
|--------|---------------|-------|---------|---|
| 1 | POWER LED | Green | ON | Drive tray is powered on. |
| 2 | READY LED | Green | ON | Drive tray is ready for normal operation. |
| 3 | Locate LED | Amber | Blink | Indicates the location of the chassis. Can be turned on or turned off by the maintenance utility. |
| 4 | Lock | - | - | Locks or unlocks the front panel bezel by using the supplied key. |

The following table lists the definitions of the DBL drive tray front LEDs without an attached bezel.



| Number | Item | Color | Pattern | Description | |
|--------|--------------------|-------|---------|---|--|
| 1 | POWER, | Green | ON | Drive tray is powered on. | |
| | READY, | | | Drive tray is under normal operation. | |
| | and, | Amber | Blink | Indicates the location of the chassis. | |
| | LOCATE LEDs | | | Can be turned on or turned off by the maintenance utility. | |
| 2 | ACT LED | Green | ON | Drive tray is under normal operation. | |
| | | | Blink | Drive is being accessed. | |
| 3 | ALM LED | Red | ON | Drive stopped due to a failure and can be replaced. | |
| 4 | LFF drive slots | - | - | Twelve 3.5-inch large form factor drives are positioned horizontally. | |
| | | | | The slots are organized in the following order: | |
| | | | | 8 9 10 11 4 5 6 7 0 1 2 3 | |

The following table lists the definitions of the DBL drive tray rear panel components and LEDs.

Large form-factor drive tray (DBL)



| Number | Item | Color | Pattern | Description |
|--------|--------------------------------|-------|---------|---|
| 1 | ENC | - | - | Controller board |
| 2 | POWER LED | Green | ON | ENC is powered on. |
| 3 | LOCATE | Amber | Blink | Indicates the location of the chassis. |
| | LED | | | Can turn on or off by the maintenance utility. |
| 4 | ALARM LED | Red | ON | ENC stopped due to a failure and can be replaced. |
| 5 | PATH (IN) LED | Blue | ON | IN side port is linked up. |
| 6 | PATH (IN) connect or | - | - | Port connects to a controller or drive tray. |
| 7 | PATH (OUT) LED | Blue | ON | OUT side port is linked up. |
| 8 | PATH (OUT) connect or | - | - | Connects to a drive tray. |
| 9 | Console | - | - | This port is reserved. |
| 10 | Power supply unit | - | - | Power supply unit |
| 11 | Recepta cle | - | - | Connects to the power cable provided with the storage system. |
| 12 | AC IN LED | Green | ON | Drive tray is under normal operation. |
| 13 | ALM LED | Red | ON | Power supply unit stopped due to a failure and can be replaced. |
| 14 | RDY LED | Green | ON | Power supply unit is under normal operation. |

Service Processor

The VSP G130 include an optional, separate 1U service processor (SVP) dedicated to host an element manager (Storage Navigator). The SVP operates independently from the CPU of the storage system and operating system, and provides out-of-band configuration and management of the storage system. The SVP also monitors and collects performance data for key components of the storage system to enable diagnostic testing and analysis for customer support.

The SVP provides four RJ-45 ports:

- Two ports connect to the storage system controllers (one port for each controller).
- One port connects to the IP network of the user.
- One port connects to a user-supplied management console PC.

Note: This product is also designed for IT power distribution systems with phase-to-phase voltage.

Three of the four RJ-45 ports (which connect to the controllers and the IP network) are configured as a bridge. The SVP can be addressed using the default IP address 192.168.0.15.

In the unlikely event you cannot connect to the SVP using the default IP address, use the
following emergency login: http://<default SVP IP address>/dev/storage/
<model number><system serial number>/emergency.do. For example:

| Storage system model number | Storage system serial number | URL |
|--------------------------------|---------------------------------|--|
| 8320004 | 456789 | http://192.168.0.15/dev/ storage/8320004456789/ emergency.do |
| 8340004 | 456789 | http://192.168.0.15/dev/ storage/8340004456789/ emergency.do |
| 8360004 | 456789 | http://192.168.0.15/dev/ storage/8360004456789/ emergency.do |

Users are responsible for adopting the appropriate security procedures with the SVP:

- Applying Windows security patches.
- Turning on automatic Windows updates or using the manual Windows update method.
- Installing antivirus software that has been tested and approved by Hitachi.

SVP specifications

The following table lists the hardware specifications for the service processor (Windows 10 IoT Enterprise) provided by Hitachi Vantara.

| Item | Specification |
|----------------------------|--|
| Dimensions | Height: 1.7 inches (43 mm) |
| | Width: 17.2 inches (437 mm) |
| | Depth: 9.8 inches (249 mm) |
| | Weight: 10 lbs (4.5 kg) |
| Processor | Intel N3710 Pentium processor 4C/4 threads 1.6 GHz 2M cache, 6W |
| Memory | 2 x 4 GB DDR3 1600MHz |
| Storage media | 1 TB 5400 RPM SATA HDD |
| LAN/Network interface card | 1-GbE x 4 ports (on-board NIC) |
| | x1 IPMI (BMC) port |
| Fans | 2 x 4028 mm 13KPRM 4-pin PWM fans |
| Operating system | Windows 10 Enterprise |
| Maximum temperature | Up to 40° C (104° Fahrenheit) |
| | The SVP is supported in high-temperature environments. Do not operate in any location with temperatures above 40°C (104° Fahrenheit). |

SVP (Windows 10 Enterprise) front panel

The front panel of the physical SVP with Windows 10 Enterprise operating system is equipped with LEDs, a reset button, and a power button.



| Item | Description |
|------|--|
| 1 | LED (left to right): |
| | • N/A |
| | LAN card 2 |
| | LAN card 1 |
| | Hard drive |
| | System standby power |
| 2 | Reset button |
| 3 | Power button |

Table 2 SVP (Windows 10 Enterprise) front panel

SVP (Windows 10 Enterprise) rear panel

The only ports used at the rear panel of the physical SVP are the power socket and the four LAN ports. The following ports connect to your IP network, the management console PC, and the user LAN port on each storage system controller.



Table 3 SVP (Windows 10 Enterprise) rear panel

| Item | Description | |
|------|-----------------------------------|--|
| 1 | Management (DKC CTL1) - LAN3 port | |
| 2 | Management (DKC CTL2) - LAN4 port | |
| 3 | Maintenance - LAN2 port | |
| 4 | Management (User) - LAN1 port | |

The SVP running Windows 10 operating system does not provide an option to disable Spanning Tree Protocol (STP). If your network has BPDU enabled to prevent loops, connect the user LAN port on controllers 1 and 2 to an Ethernet switch that is also connected to the LAN1 port on the SVP.

After the Initial Startup Wizard is complete, the SVP can be used in non-bridge mode. In this mode, the cables can be removed from SVP ports LAN3 and LAN4 and attached to switches. For more information, contact customer support.

Chapter 3: Parts list

The VSP G130 storage system includes the following base and optional components.

Components list

The following tables list the base and optional components available to the storage system.

| Model number | Part description | Quantity |
|--------------|----------------------|----------|
| DW800-CBSS | 2U chassis | 1 |
| | AC power supply unit | 2 |
| | Front bezel (2U) | 1 |
| | Binder (two types) | 4 |
| | SAS cable label | 2 |
| | Кеу | 2 |
| DW-F800-RRCB | Rail kit | 1 |

Table 4 CBSS controller components

Chapter 3: Parts list

| Model number | Part description | Quantity |
|-------------------|--|----------|
| DW-F850-CTLXSFA | Controller board (FC 16- Gbps) | 2 |
| DW-F850-CTLXSCA | Controller board (iSCSI 10- Gbps copper) | 2 |
| DW-F850-CTLXSSA | Controller board (iSCSI 10- Gbps BASE-T) | 2 |
| DKC-F810I-600JCMC | 600 GB, 2.5-inch, 10kmin, 12 Gbps, SAS drive | 0-24 |
| DKC-F810I-1R2JCMC | 1.2 TB, 2.5-inch, 10kmin, 12 Gbps, SAS drive | 0-24 |
| DKC-F810I-2R4JGM | 2.4 TB, 2.5-inch, 10kmin, 12 Gbps, SAS, drive | 0-24 |

Table 5 CBSS optional controller components

Table 6 CBSL controller components

| Model number | Part description | Quantity |
|--------------|----------------------|----------|
| DW800-CBSL | 2U chassis | 1 |
| | AC power supply unit | 2 |
| | Front bezel (2U) | 1 |
| | Binder (two types) | 4 |
| | SAS cable label | 2 |
| | Кеу | 2 |
| DW-F800-RRCB | Rail kit | 1 |

Chapter 3: Parts list

| Model number | Part description | Quantity |
|------------------|--|----------|
| DW-F850-CTLXSFA | Controller board (FC 16- Gbps) | 2 |
| DW-F850-CTLXSCA | Controller board (iSCSI 10- Gbps copper) | 2 |
| DW-F850-CTLXSSA | Controller board (iSCSI 10- Gbps BASE-T) | 2 |
| DKC-F810I-6R0H9M | 6 TB, 3.5-inch, 7.2kmin, 12 Gbps SAS drive | 0-12 |
| DKC-F810I-10RH9M | 10 TB, 3.5-inch, 7.2kmin, 12 Gbps SAS drive | 0-12 |
| DKC-F810I-14RH9M | 14 TB, 3.5-inch, 7.2kmin, 12 Gbps, SAS, drive | 0-12 |

Table 7 CBSL optional controller components

Table 8 DBS drive tray components

| Model number | Part description | Quantity |
|--------------|---------------------------|----------|
| DW-F800-DBSC | 2U chassis | 1 |
| | ENC | 2 |
| | AC power supply unit | 2 |
| | Front bezel (2U) | 1 |
| | Repeat binder (two types) | 4 |
| | Omega clip | 4 |
| | Bracket (L) | 1 |
| | Bracket (R) | 1 |
| | Side bezel (L) | 1 |
| | Side bezel (R) | 1 |
| | Кеу | 2 |
| DW-F800-RRDB | Rail kit | 1 |

| Model number | Part description | Quantity |
|-------------------|--|----------|
| DKC-F810I-600JCMC | 600 GB, 2.5-inch, 10kmin, 12 Gbps, SAS drive | 0-24 |
| DKC-F810I-1R2JCMC | 1.2 TB, 2.5-inch, 10kmin, 12 Gbps, SAS drive | 0-24 |
| DKC-F810I-2R4JGM | 2.4 TB, 2.5-inch, 10kmin, 12 Gbps, SAS, drive | 0-24 |
| DKC-F810I-480MGM | 480 GB, MLC, 12 Gbps, SFF, flash drive | 0-24 |
| DKC-F810I-1T9MGM | 1.9 TB, TLC, 12 Gbps, SFF, flash drive | 0-24 |
| DKC-F810I-3R8MGM | 3.8 TB, MLC/TLC, 12 Gbps, SFF, flash drive | 0-24 |

Table 9 DBS optional drive tray components

Table 10 DBL drive tray components

| Model number | Part description | Quantity |
|--------------|---------------------------|----------|
| DW-F800-DBLC | 2U chassis | 1 |
| | ENC | 2 |
| | AC Power supply unit | 2 |
| | Front bezel (2U) | 1 |
| | Repeat binder (two types) | 4 |
| | Omega clip | 4 |
| | Bracket (L) | 1 |
| | Bracket (R) | 1 |
| | Side bezel (L) | 1 |
| | Side bezel (R) | 1 |
| | Кеу | 2 |
| DW-F800-RRDB | Rail kit | 1 |

| Model number | Part description | Quantity |
|------------------|--|----------|
| DKC-F810I-6R0H9M | 6 TB, 3.5-inch, 7.2kmin, 12 Gbps SAS drive | 0-12 |
| DKC-F810I-10RH9M | 10 TB, 3.5-inch, 7.2kmin, 12 Gbps SAS drive | 0-12 |
| DKC-F810I-14RH9M | 14 TB, 3.5-inch, 7.2kmin, 12 Gbps, SAS, drive | 0-12 |

Table 11 DBL optional drive tray components

Table 12 Optional service processor

| Model number | Part description | Quantity |
|-----------------|---|----------|
| HDW2-F850-SVP.P | Service processor (Windows 10 loT Enterprise) | 1 |

Data and power cable model list

The following tables list the data and power cables available to the storage system.

Table 13 Power cables

| Model number | Specification |
|---------------|---|
| DW-F800-J1K | 2.5 m, 2-pole power cable with grounding terminal (AC 125 V, 13 A or 15 A) |
| DW-F800-J2H | 2.5 m, 2-pole power cable with grounding terminal (AC 250 V, 13 A or 15 A) |
| DW-F800-J2H5 | 5.0 m, 2-pole power cable with grounding terminal (AC 250 V, 13 A or 15 A) |
| DW-F800-J2H10 | 10.0 m, 2-pole power cable with grounding terminal (AC 250 V, 13 A or 15 A) |
| A-F6516-P620 | Power cable for PDU (1) |
| A-F6516-P630 | Power cable for PDU (1) |

| Model number | Specification |
|----------------|--|
| DW-F800-SCQ1 | 1 m SAS cable, including omega clip (2) |
| DW-F800-SCQ1F | 1.5 m SAS cable, including omega clips (2) |
| DW-F800-SCQ3 | 3 m SAS cable, including omega clips (2) |
| DW-F800-SCQ5 | 5 m SAS cable, including omega clips (2) |
| DW-F800-SCQ10A | 10 m SAS optical cable |
| DW-F800-SCQ30A | 30 m SAS optical cable |
| DW-F800-SCQ1HA | 100 m SAS optical cable |

Table 14 SAS cables

Chapter 3: Parts list

| Model number | Specification | |
|---------------|---------------------------------------|--|
| A-6515-GM5L | 5 m LC-LC optical cable for optical | |
| A-6515-GM10L | 10 m LC-LC optical cable for optical | |
| A-6515-GM20L | 20 m LC-LC optical cable for optical | |
| A-6515-GM30L | 30 m LC-LC optical cable for optical | |
| A-6515-GM40L | 40 m LC-LC optical cable for optical | |
| A-6515-GM50L | 50 m LC-LC optical cable for optical | |
| A-6515-GM1JL | 100 m LC-LC optical cable for optical | |
| A-6515-GS10L | 10 m LC-LC optical cable for optical | |
| A-6515-GS20L | 20 m LC-LC optical cable for optical | |
| A-6515-GS30L | 30 m LC-LC optical cable for optical | |
| A-6515-GS50L | 50 m LC-LC optical cable for optical | |
| A-6515-GS1JL | 100 m LC-LC optical cable for optical | |
| A-6515-HM5L | 5 m LC-LC optical cable for optical | |
| A-6515-HM10L | 10 m LC-LC optical cable for optical | |
| A-6515-HM20L | 20 m LC-LC optical cable for optical | |
| A-6515-HM30L | 30 m LC-LC optical cable for optical | |
| A-6515-HM50L | 50 m LC-LC optical cable for optical | |
| A-6515-HM100L | 100 m LC-LC optical cable for optical | |
| A-6515-HM200L | 200 m LC-LC optical cable for optical | |
| A-6515-HM300L | 300 m LC-LC optical cable for optical | |
| A-6515-JM5L | 5 m LC-LC optical cable for optical | |
| A-6515-JM10L | 10 m LC-LC optical cable for optical | |
| A-6515-JM20L | 20 m LC-LC optical cable for optical | |
| A-6515-JM30L | 30 m LC-LC optical cable for optical | |
| A-6515-JM50L | 50 m LC-LC optical cable for optical | |
| A-6515-JM100L | 100 m LC-LC optical cable for optical | |
| A-6515-JM200L | 200 m LC-LC optical cable for optical | |

Table 15 Optical cables

| Model number | Specification |
|---------------|---------------------------------------|
| A-6515-JM300L | 300 m LC-LC optical cable for optical |

Chapter 3: Parts list

Chapter 4: Operational and maintenance considerations

Proper operation and ongoing required maintenance continues the reliability of the storage system and its constant availability to all connecting hosts.

Network access

External Fibre Channel or Ethernet cable connections are completed at the time of installation.

These connections are required to:

- Establish connections from the controllers to the host computers.
- Connect the storage system to the network, enabling storage system management through Hitachi Command Suite or Hitachi Storage Advisor.
- Allow communication to the storage system from the SVP.

TCP/IP port assignments

When you install your storage system, default ports must be opened to allow for incoming and outgoing requests.

Review the following ports before you install the storage system to avoid conflicts between the TCP/IP port assignments used by the storage system and those used by other devices and applications.

| Port number | Usage description |
|-------------|---|
| 80 | Used by the SVP, Hitachi Storage Advisor, and Device Manager - Storage Navigatorto communicate through the HTTP protocol. |
| 161 | UDP (SNMP uses this port to send traps from the storage system) . |
| 427 | Used by SMI-S. |
| 1099 | Used by Hitachi Command Suite products JAVA RMI Registry server. |
| 2000 | TCP (Device Manager - Storage Navigator: Nonsecure) |
| | Cisco Skinny Client Control Protocol (SCCP) uses port 2000 for TCP. If you use Device Manager - Storage Navigator in a network with SCCP, change the TCP port that Device Manager - Storage Navigator uses (refer to the Device Manager - Storage Navigator online help). |
| 5989 | Used by SMI-S. |
| 10995 | TCP Device Manager - Storage Navigator and Hitachi suite components) |
| 23015 | Used for Web browser communications. |
| 23016 | Used for Web browser communications via SSL. |
| 28355 | TCP (Device Manager - Storage Navigator: Secure) |
| 31001 | Used for communication by Hitachi Command Control Interface (CCI) data collection procedures. |
| 34001 | Used by RAID Manager. |
| 51099 | Used by Device Manager - Storage Navigator for communication. |
| 51100 | Used by Device Manager - Storage Navigator for communication. |

The following table shows the port number key name for outbound communication between the client PC and SVP.

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Note: Refer to the following table for port number assignments if the storage system is using a physical service processor.

| Port number key name (Windows Firewall Inbound name) | Protocol | Initial value of port number | Can the port be closed? | SVP software version |
|--|-----------|------------------------------|-------------------------------------|-----------------------------|
| MAPPWebServ er | HTTP | 80 | Yes | 88-02-0x -xx/00 or later |
| MAPPWebServ erHttps | HTTPS | 443 | No | |
| RMIClassLoade r | RMI | 51099 | No | |
| RMIClassLoade rHttps | RMI (SSL) | 5443 | No | |
| RMIIFRegist | RMI | 1099 | No | |
| PreRMIServer | RMI | 51100-51355 ¹ | No | |
| | | Automatic allocation | | 88-02-0x -xx/00 or later |
| DKCManPrivate | RMI | 11099 | N/A | 88-02-0x -xx/00 |
| SMI-S (SLP) | SLP | 427 | Yes, only if SMI- S is not used. | or later |
| SMIS_CIMOM | SMI-S | 5989-6244 ¹ | Yes, only if SMI- S is not used. | 88-02-0x -xx/00 or later |
| | | Automatic allocation | | 88-02-0x -xx/00 or later |
| CommonJettySt art | НТТР | 8080 | N/A | 88-02-0x -xx/00 or later |
| CommonJettySt op | НТТР | 8210 | N/A | |
| RestAPIServerS top | НТТР | 9210 | N/A | |
| DeviceJettyStart | HTTP | 8081 | N/A | |

| Port number key name (Windows Firewall Inbound name) | Protocol | Initial value of port number | Can the port be closed? | SVP software version |
|--|---------------------|------------------------------|---|-----------------------------|
| | | Automatic allocation | | 88-02-0x -xx/00 or later |
| DeviceJettyStop | НТТР | 8211 | N/A | 88-02-0x -xx/00 or later |
| | | Automatic allocation | | 88-02-0x -xx/00 or later |
| Hi-Track | HTTPS, FTP (SSL) | 4431 | Yes, only if Hi- Track is not used. | 88-02-0x -xx/00 or later |

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Note: Hitachi Command Suite has additional port considerations. For more information, refer to the *Hitachi Command Suite Administrator Guide*.

Controller connections

The controllers provide the ports that are required to connect to an optional SVP, external drive trays, systems, and other devices.

A controller contains Fibre Channel ports. The number and type of ports available for host connections vary based on the controller model.

• Fibre Channel SFP adapters are used to connect to your Fibre Channel switch and hosts.

Each controller also has:

- A SAS port for connection to an external drive tray.
- An RJ-45 10/100/1000 bps user LAN port for performing management activities.
- An RJ-45 10/100/1000 bps maintenance LAN port for diagnostics.

Physical service processor connections

The SVP is available as an optional, physical device provided by Hitachi Vantara or as a virtual guest host running on customer-provided ESX servers and VM/OS licenses and media. The SVP provides error detection and reporting and supports diagnostic and maintenance activities involving the storage system.

In a VSP G130 configuration, both the storage system and the SVP reside on the same private network segment of your local-area network (LAN). The management console PC used to administer the system must also reside on the same private network segment.

Physical SVP connectivity requires all of the following:

- A static IP address for the SVP that is on the same network segment as the storage system.
- One Ethernet connection from each controller to separate LAN ports on the SVP.
- One Ethernet connection to your network switch.
- At least one management console PC on the same network segment as the SVP and storage system.
 - **Note:** The SVP running Windows 10 operating system does not provide a way to disable Spanning Tree Protocol (STP). If your network has BPDU enabled to prevent loops, connect the user LAN port on controllers 1 and 2 to an Ethernet switch instead of connecting them to SVP LAN 3 and LAN 4 ports.

Virtual SVP connectivity requires all of the following:

ESX Server

- VMware ESXi server 6.x
- 2 quad core processors, Intel Xeon 2.29 GHz
- 1-port NIC
- SVP guest OS (2 DKCs)
- 32 GB RAM

SVP Guest OS (1 DKC)

- Windows 10 IoT Enterprise
- 2 x vCPU
- 1 virtual network adapter
- 4 GB RAM
- 120 GB disk space

Powering off the storage system

Procedure

- 1. Press the main switch on the controller chassis for approximately three seconds until the POWER LED on the front of the chassis changes from solid green to a blinking status.
- Release the main switch and the POWER LED returns to solid green after blinking for approximately three seconds. The power-off process begins. The process takes approximately 18 minutes or

longer depending on the amount of data that needs to be written. The POWER LED is solid green during the powering off process. The POWER LED changes from green to amber when the process is completed.

- **3.** Verify the POWER LED on the front of the storage system changes from green to amber.
- **4.** To stop the power supply, remove the power cables from the power supply units on the controller chassis and drive box.

If the storage system is connected to a PDU, you can stop the power supply by turning off the PDU breaker.

Note: If the storage system does not receive power for more than six months, the battery can become discharged and possibly damaged. To avoid this situation, charge the battery for more than three hours at least once every six months.

Storing the storage system

If the storage system does not receive power for more than six months, the battery can become discharged and possibly damaged. To avoid this situation, charge the battery for more than three hours at least once every six months.



Note: Do not store the equipment in an environment with temperatures of $104^{\circ}F$ (40°C) or higher because battery life will be shortened.

Appendix A: Environmental notices

Disposal



This symbol on the product or on its packaging means that your electrical and electronic equipment should be disposed at the end of life separately from your household wastes.

There are separate collection systems for recycling in the European Union. For more information, contact the local authority or the dealer where you purchased the product.

Recycling

A nickel-metal hydride battery is used in the Cache Backup Battery.

A nickel-metal hydride battery is a resource that can be recycled. When you want to replace the Cache Backup Battery, call the service personnel. They will dispose of it for you. This nickel-metal hydride battery, which is designated as recycling product by a recycling promotion low, must be recycled.

The mark posted on the Cache Backup Battery is a three-arrow mark that indicates a recyclable part.



Appendix A: Environmental notices

Appendix B: Regulatory compliance

This equipment has been tested and certified for compliance with the following standards.

Appendix B: Regulatory compliance

Country Specifications and Certifications

| Standard | Specification | Product marking or logo | Country regulation | |
|---|----------------------------------|----------------------------|---|--|
| Electronic emission controls | FCC part 15 Sub B: 2016 | FCC | USA and Canada | |
| | ICES-003 Issue 6: 2016 | ICES-003 | USA and Canada | |
| | AS/NZS CISPR 22: 2009+A1 | RCM | Australia and New Zealand | |
| | TP TC 020/2011 | EAC | Russia, Belarus, and Kazakhstan | |
| | CNS 13438 | BSMI | Taiwan | |
| | KN32 | КС | Korea | |
| | KN35 | | | |
| Electronic emission | EN55022: 2010 | CE marking | EU | |
| certifications | EN55024: 2010 | | | |
| | EN61000-3-2:2006+ A1+A2 | | | |
| | EN61000-3-3:2013 | | | |
| Safety certifications | UL and CSA 60950-1:2007 | cTuVus | United States of America and Canada | |
| | EN60950-1:2006+A1 1+A1+A12+A2 | TUV | Germany | |
| | IEC60950-1:2005+A 1+A2 | N/A | All CB countries | |
| | IEC60950-1:2005+A 1+A2 | S_Mark | Argentina | |
| | TP TC 004/2011 | EAC | Russia | |
| | CNS 14336-1 | BSMI | Taiwan | |
| | EN60950-1:2006+A1 1+A1+A12+A2 | CE marking | EU | |
| Radio interference voluntary control | VCCI V-3/2015.4 | VCCI | Japan | |

Appendix B: Regulatory compliance

FDA radiation regulation

The array complies with FDA radiation performance standard 21 CFR subchapter J.

EMI regulation

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference in which case the user will be required to correct the interference at his own expense. Testing was done with shielded cables. Therefore, in order to comply with the FCC regulations, you must use shielded cables with your installation.

This product must not be used in residential areas.

This is a class A product. In a domestic environment this product can cause radio interference in which case the user can be required to take adequate measures.

Appendix B: Regulatory compliance