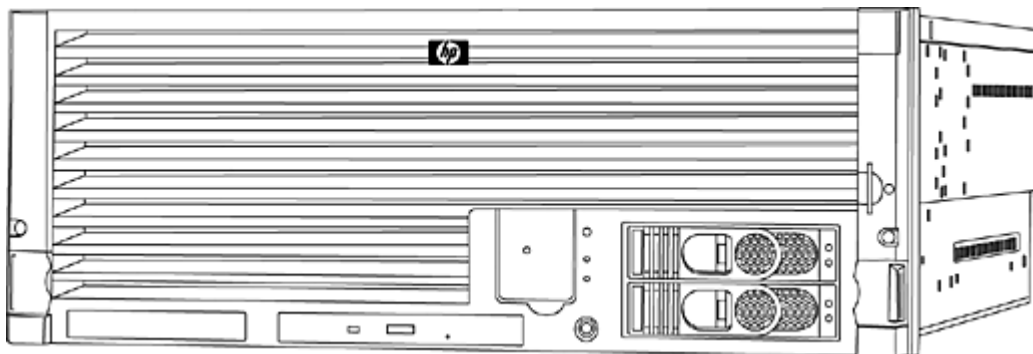


Overview



At A Glance

Standard System Features

- Operating System support: HP UX 11i v1, HP UX 11i v2 and HP UX 11i v3 for HP 9000
- Dual channel Ultra320 LVD SCSI controller
- Two external Ultra320 LVD SCSI ports
- Two 10/100/1000Base T LAN ports (with auto speed sensing; RJ 45 connector)
- iLO Manageability Processor for remote management and HA monitoring
- Telnet and web console via 10/100Base TX management LAN (RJ 45 connector)
- Three RS 232 serial ports linked to the management processor
- Factory integration of processors, memory, disk drives, removable media, and I/O cards
- Rackmountable into 19 inch cabinets - HP Rack System/E and HP Universal G2 1000 series as well as many third party racks
- Optional stand alone pedestal mount
- Three year warranty with next business day on site

Standard Features

Minimum System

- One two core PA 8900 processor module either 800 MHz/3 MB level 1 cache or 1 GHz/3 MB level 1 cache One 16 DIMM slot memory carrier board
- One hot swap power supply

Maximum Server Capacities

- Four two core PA 8900 processor modules: Either 800 MHz/3 MB level 1 cache or 1 GHz/3 MB level 1 cache
- 128 GB PC2100 ECC Registered DDR266A/B SDRAM (32×2GB DIMMs)
- One 32 DIMM slot memory carrier board
- Two hot swap power supplies, providing N+1 protection for power supplies and power input
- 6 PCI X IO adapter cards
- One internal DVD-R (Read Only) or DVD+RW (Read/Write) optical drive
- Two internal hot plug LVD SCSI disks

Standard System Features

- Operating System support: HP UX 11i v1, HP UX 11i v2 and HP UX 11i v3 for HP 9000
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High Availability

- N+1 Hotswap cooling
- One Hotswap power supply-optional second power supply for N+1 protection
- Hot Plug PCI-X I/O slots
- On-line memory page deallocation
- ECC protected DDR memory
- Memory chip spare to overcome single DRAM chip failures
- Dynamic Processor resilience and deallocation
- UPS power management
- Hot Plug internal disks
- Optional two channel Ultra320 SCSI RAID controller for mirroring across internal disks
- Journal file system with HP UX
- Auto reboot
- HP Serviceguard for HP-UX
- HP Serviceguard Extension for RAC for HP-UX
- HP Serviceguard Extension for SAP for HP-UX
- Serviceguard Manager for HP-UX Clusters
- HP Event Monitoring Service
- HA Monitors for HP-UX
- HA Toolkits for HP-UX Linux
- HP Mirrordisk/UX
- Extended Campus Cluster, HP Metrocluster, and HP Continentalclusters for HP-UX

Standard Features

Security

- Separate LAN for system management
 - Password protection on console port
 - Disabling of remote console ports
 - SSL encryption on web console
-

Manageability - Deploy

- HP Ignite-UX for installation and deployment of the operating system
 - HP Software Distributor UX for software and patch management
 - HP Integrity Essentials Foundation Pack for Windows including Smart Setup DVD
-

Manageability - Monitor

- Built in iLO Manageability Processor for comprehensive remote server management of HP UX,
 - HP Servicecontrol suite for HP UX servers including tools for system administration, asset management, and fault management
 - HP-UX kernel configuration for easy, dynamic kernel parameter changes
-

Manageability - Optimize

- Process Resource Manager for HP-UX resource management
- HP-UX Workload Manager for HP-UX workload management based upon service level objectives
- HP OpenView Glanceplus Pack

Configuration

Processor Configuration The HP 9000 rp4440 is a symmetrical multiprocessing (SMP) server supporting up to four high performance two core PA 8900 processors

- Processor Details**
- Two core PA 8900 processor modules at 800 MHz or 1.0 GHz frequencies:
 - Level 2 Cache: 64 MB (shared between cores)
 - Level 1 Cache: 1.5 MB per core (3 MB per processor module)
 - Single bit cache error correction
 - 44 bit physical addressing
 - 64 bit virtual addressing
 - 4 GB maximum page size
-

- Processor Configuration Rules**
- Two core processor modules can be installed one at a time
 - Processors must be installed in the following sequence: 0, 1, 2, 3
 - 800 MHz and 1.0 GHz processors cannot be mixed in the same system
-

Memory Configuration The HP 9000 rp4440 supports double data rate (DDR) synchronous dynamic random access memory (SDRAM) DIMMs with ECC and chip spare protection. The HP 9000 rp4440 can be ordered with one of the following two memory carrier boards:

- A9738B-Supports from 4 to 16 DIMMs (1 to 64 GB); 12.8 GB/s memory bandwidth
- A9739B-Supports from 4 to 32 DIMMs (1 to 128 GB); 12.8 GB/s memory bandwidth

Both memory carrier boards provide the same bandwidth to the processors. The primary difference between the two boards is in total memory capacity.

- Memory Loading Rules**
- Memory must be installed in groups of four DIMMs, also known as quads
 - Each quad must consist of equal density DIMMs
 - Memory can be ordered in quads of 1 GB (4×256MB), 2 GB (4×512MB), 4 GB (4×1GB), 8 GB (4×2GB), or 16 GB (4×4GB)
 - Minimum memory is 1 GB (4×256 MB)
 - Maximum memory is 128 GB, using eight 16 GB memory quads in memory carrier board A9739B
 - Memory must be loaded in the order depicted on the memory carrier board
 - Arrange DIMMs so that the quads with the largest capacity are in the lowest numbered slots

Memory Options	
Description	Part Number
1GB DDR memory quad (4x256MB DIMMs)	A7128A
2GB DDR memory quad (4x512MB DIMMs)	A7129A
4GB DDR memory quad (4x1GB DIMMs)	A7130A
8GB DDR memory quad (4x2GB DIMMs)	A7131A
16-GB DDR memory quad (4x4 GB DIMMs)	AB560A

Configuration

Server Form Factor and Rack Configuration

The HP 9000 rp4440 is a 4U rack optimized server. It is supported in HP Standard Rack System/E series cabinets and HP Universal 10000 G2 series racks. For factory integration order A6977AZ. Sliding mounts and a cable management arm will be installed with the server in a factory integrated rack.

The HP 9000 rp4440 can be installed in the field with the Field Rack Kit (A6977A). This field kit contains the slide mounts, cable management arm, and all other hardware needed to mount an rp4440 into a 19 inch cabinet.

Refer to the 10000 G2 Series Rack Best Practices Guide for information on rack deployment, stabilization and transportation. Go to HP.com/go/rackandpower for more information.

For stand alone, non raked deployments, the HP 9000 rp4440 can be placed into a freestanding tubular frame that wraps around the server (A6979A). This product is not available with factory installation. However, the tubular frame is easily installed in the field.

I/O Architecture

The HP 9000 rp4440 I/O architecture utilizes industry standard PCI X buses in a unique design for maximum performance, scalability and reliability.

The HP 9000 rp4440 architecture uses eight high speed I/O channels. Each channel provides 0.5 GB/s of sustained I/O throughput. The diagram above shows how these channels are used to provide bandwidth to the six available PCI X slots, two reserved PCI X slots, and to multifunction core I/O. The reserved slots, #1 and #2 (counting from the bottom) will always be filled with core I/O. Slot #2 will come factory loaded with a dual channel Ultra320 SCSI card. Slot #1 will come factory loaded with a two port 10/100/1000Base TX LAN adapter.

Each channel of the Ultra320 or Ultra160 SCSI card may be used for either internal or external connection but not both internal and external connections. The factory default configuration is one channel connected to the internal hard disk drive backplane. The second channel is free for use with an external tape drive or disk shelf (JBOD). The internal disk drives can be set up in a duplex configuration such that each disk has a dedicated SCSI channel. This is called a duplex configuration and is done to enhance server availability. It is often combined with disk mirroring software. The second internal SCSI cable is already in place to support a duplex configuration. Order A9740B for additional components needed on the SCSI backplane of the internal disks for duplex mode. Factory installation is recommended for the A9740B duplex kit.

The factory loaded dual channel Ultra320 SCSI card may be upgraded to a Smart Array 6402 Ultra320 RAID controller (A9890A) with support for internal hardware RAID1. When upgrading to Smart Array 6402, you must order all of the following:

1. Option 001 of base server
2. Two identical hard disk drives
3. Factory Express services

The two slots at the outside edge of the backplane (slots #7 & #8) each have their own dedicated 64 bit 133 MHz PCI X bus and their own independent 1.0 GB/s I/O channel. These slots should be used for high performance PCI and PCI X cards, such as clustering interconnects or multi port storage adapters. The independent buses and I/O channels provide improved performance and error containment. Independence protects each I/O card from bus hangs or extended latencies due to the failure or high bandwidth demands of other I/O cards. Independence also ensures that each I/O card can achieve maximum throughput. Both of these slots support hot plug operations in HP UX. Hot plug is not supported with the Linux operating system.

The remaining four slots (#3 through #6) share two 64 bit 66 MHz PCI X buses, with two slots allocated to each bus. Each pair of slots shares a 0.5 GB/s I/O channel. If a 33 MHz card shares a bus with a 66 MHz card, the faster card will downgrade to 33 MHz. All four of these slots support hot plug operations in HP UX. Hot plug is not supported with the Linux operating system.

All I/O slots are keyed for I/O cards with 3.3V signaling. Cards that use 5V signaling are not supported in the HP 900 rp4440.

Configuration

	Number of Slots	Bandwidth Per Slot	Bus Width	Bus Speed	Hot-Plug	Slot Keying
Dedicated	2	1.0 GB/s	64 bits	133 MHz, 66 MHz or 33 MHz	Yes	3.3 Volts
Shared	4	0.5 GB/s per pair of slots (two pairs)	64 bits	66 MHz or 33 MHz	Yes	3.3 Volts
Dual channel SCSI Core I/O	1	0.5 GB/s shared with LAN Core I/O	64 bits	66 MHz	No	3.3 Volts
1000Base-T LAN Core I/O	1	0.5 GB/s shared with SCSI Core I/O	64 bits	66 MHz	No	3.3 Volts

HP 9000 rp4440 Supported I/O Cards

I/O Card	Product Number	Connector Type(s)	HP UX / Boot Support	Max Cards / Max Ports
Mass Storage Host Bus Adapters				
PCI 2 Gb/s Fibre Channel	A6795A	LC	Yes / Yes	6 / 6
PCI 1 channel U160 SCSI	A6828A ³	VHDCI	Yes / Yes	6 / 6
PCI 2 channel U160 SCSI	A6829A ³	VHDCI	Yes / Yes	6 / 12
PCI-X 2 channel Ultra320 SCSI ¹	A7173A	VHDCI	Yes / Yes	6 / 12
PCI-X 2 channel Smart Array 6402 U320	A9890A	VHDCI	Yes / Yes	3 / 6
PCI 2 channel PCI 2-Gb/s Fibre Channel	A6826A	LC	Yes / Yes	6 / 12
PCI X 266 MHz 1 channel 4 Gb/s Fiber Channel	AB378B	LC	Yes / Yes	6 / 6
PCI X 266 MHz 2 channel 4 Gb/s Fiber Channel	AB379B	LC	Yes / Yes	6 / 12
Local Area Network (LAN) Adapters				
PCI 1 port 1000Base-T (gigabit copper) ²	A6825A	RJ-45	Yes / No	6 / 6
PCI-X 1 port 1000Base T (gigabit copper) ²	AD331A	RJ-45	Yes / No	6 / 6
PCI 1 port 1000Base-SX (gigabit fiber)	A6847A	Duplex SC	Yes / No	6 / 6
PCI-X 1 port 1000Base SX (gigabit fiber)	AD332A	Duplex SC	Yes / No	6 / 6
PCI 1 port 10/100Base-TX	A5230A ³	RJ-45	Yes / No	6 / 6
PCI-X 2-port 1000Base-T	A7012A	RJ-45	Yes / No	6 / 12
PCI-X 2-port 1000Base-SX	A7011A	Duplex SC	Yes / No	6 / 12
PCI 4 port 100Base-T	A5506B ³	RJ-45	Yes / No	6 / 24
PCI 1 port Universal FDDI LAN	A3739B	FDDI SC	Yes / No	6 / 6
PCI 1 port 802.5 Token Ring 4/16/100	A5783A	RJ-45 and DB 9	Yes / No	6 / 6
PCI -X 24 port 4x Fabric Copper Switch	AB399A	4x Infiniband Copper	Yes / No	6 / 144
PCI-X 4-port 1000Base-T 1-GbE Adapter	AB545A	RJ-45	Yes / Yes	6/24
PCI-X 2-port 4x Fabric Adapter	AB345A	4x Infiniband Copper	Yes / No	2 / 4
Multi-Function Cards (Mass Storage/LAN)				
PCI 2 port 100Base-T/ 2 port Ultra2 SCSI	A5838A	VHDCI/RJ 45	Yes / Yes (SCSI Only)	6 / 24

Configuration

PCI-X 2Gb Fibre Channel / 1000BaseT	A9782A	2 LC	Yes / Yes	6 / 12
PCI-X 2Gb Fibre Channel / 1000BaseSX	A9784A	1 LC, 1 RJ-45	Yes / Yes	6 / 12
PCI-X 2-port 2-Gb Fibre Channel/2-port 1-Gb Ethernet Adapter	AB465A	2 LC, 2 RJ-45	Yes / No	6/24
PCI-X 2-port 1000BT/2-port U320 Multifunction adapter	AB290A	SCSI - LVD/SE LAN - RJ-45	Yes/Yes	1 / 4
HP PCI-X 1-port 4Gb Fibre Channel & 1-port 1000Base-T Adapter	AD193A	1 LC, 1 RJ-45	Yes/Yes	6/12
HP PCI-X 2-port 4Gb Fibre Channel & 2-port 1000Base-T Adapter	AD194A	2 LC, 2 RJ-45	Yes/Yes	6/24
Wide Area Network (WAN) Adapters				
PCI 1 port ATM 155 Mbps Multi Mode Fiber (MMF)	A5513A	Duplex SC	Yes / No	6 / 6
2 port Programmable Serial Interface (PSI) X.25 / Frame Relay / SDLC	J3525A	RS 530, RS 232, V.35, RS 449 or X.21	Yes / No	6/24
4-port Programmable Serial Interface (PSI) X.25/Frame Relay	J3526A	RS-530, RS-232, V.35, RS-449 or X.21	Yes/No	6/24
Additional Interface Cards				
PCI 8 port Serial MUX Adapter	AD278A		Yes / No	6/48
PCI 64 port Serial MUX Adapter	AD279A		Yes / No	6/384
16-port RS-232 RJ45 Port Module	AD280A ⁵		Yes / No	4 per AD279A
16-port RS-232 DB25 Port Module	AD281A ⁶		Yes / No	4 per AD279A
PCI HyperFabric 2 Fibre	A6386A	LC Duplex	Yes / No	6 / 6
PCI 64-port Terminal Multiplexer	A6749A	RS 232 or RS-422	Yes / No	6 / 384
PCI 8-port Terminal Multiplexer	A6748A	RS-232	Yes / No	6 / 48
PCI AMD Radeon 7000 Graphic Adapter	AH391A	VGA and DVI-I	Yes/No	1/14

¹ The A7143A can only be installed in slot 8 and is therefore limited to one per system.

² Only supports LAN boot when installed in a core I/O slot; not in an add in slot.

³ I/O card is supported but no longer orderable.

⁴ Supported in slots 7 or 8 only.

⁵ AD280A #001 Port Module Power Supply, required on Port Module (3) and Port Module (4) connected to an AD279A 64P Mux adapter.

⁶ AD281A #001 Port Module Power Supply, required on Port Module (3) and Port Module (4) connected to an AD279A 64P Mux adapter.

Internal Storage Devices

Configuration

Device	Part Number
Internal Hard Disk Drives (Optional - Maximum 2)	
36-GB 15K RPM Ultra320 SCSI Low Profile Hot Plug drive ¹	AD186A
73-GB 15K RPM Ultra320 SCSI Low Profile Hot Plug drive ¹	AD187A
146 GB 10K RPM Ultra320 SCSI Low Profile Hot Plug drive ¹	AD206A
300 GB 10K RPM Ultra320 SCSI Low Profile Hot Plug drive ¹	AD263A
Removable Media (Optional - Maximum 1)	
DVD Read Only drive	A7163B
DVD+RW Optical drive	AB349B

¹ Disks run at the speed of the controller they are connected to. If they are connected to the integrated U320 controller, they will operate at U320 speeds.

Integrated Multi-function Core I/O The integrated multifunction I/O provides core I/O functionality and includes the management processor, which provides remote management and high availability monitoring capabilities.

- 10/100/1000Base-T LAN with two RJ 45 connectors -Supports LAN boot for operating system installation
- Two external LVD Ultra320 SCSI (320 MB/s) ports; Ultra320 is backward compatible with Ultra160, LVD Ultra2 and with SE SCSI-Order the appropriate cable to connect to external peripherals, example: VH to HD cable
- Two internal Ultra320 SCSI channels -One channel is routed to the external SCSI port and one channel is routed to the two internal hot plug disk bays
- An optional conversion kit is available to split the internal disks between two separate SCSI channels (HP product number A9740B). This option provides additional high availability through fault isolation on the internal disks.

iLO Managability Processor Functionality

- Dedicated 10/100Base-T LAN port for LAN console and embedded web console access
- DB-25 serial port-Multiplexed (using W cable) into three RS-232 ports: local ASCII console, remote/modem console, and general purpose
- Password protected console ports
- Console mirroring between all local, modem, LAN, and web consoles
- Remote power up and power down control
- Configurable remote access control
- Event notification to system console-Provides connectivity, information, and support for HP-UX tools (such as STM and EMS) to notify by email, pager and/or HP response centers.
- Interface to system monitoring and diagnostic hardware via an internal IC bus
- Secure Sockets Layer security on web console

Configuration

System Console Configurations

The HP 9000 rp4440's integrated Management Processor provides four methods for console connections.

- SSL-secured Web console accessible through the 10/100Base-T management LAN
- Standard telnet connections accessible through the 10/100Base-T management LAN
- Local VT100 or hpterm terminal, or VT100 or hpterm emulator via local RS-232 serial connection
- Remote VT100 or hpterm terminal, or VT100 or hpterm emulator via external modem
- Keyboard and mouse connections are provided by USB.

HP 9000 rp4440 Power Subsystem

The HP 9000 rp4440 provides a high level of integrated power protection:

- N+1 redundant hotswap power supplies
- N+1 redundant AC power input protection with electrical phase isolation
- Power monitoring and control

The HP 9000 rp4440 supports a second hot swap power supply for N+1 protection. One supply is shipped as a standard part of every system and is required for correct operation. The hot swap design allows for the online replacement of a power supply when N+1=2 supplies are configured in the server.

The HP 9000 rp4440 provides an independent power input receptacle for each power supply. The independent design provides protection against losing the connection from a power cord or breaker. The HP 9000 rp4440 power cords should always be plugged into separate breakers when possible.

The following table displays the AC power needs of the HP 9000 rp4440 at various configurations. The server is has two power supplies; two internal hard disk drives and a DVD drive in each configuration. These power figures are based on actual measurements under typical server workloads, and are appropriate for power budgeting at customer installations.

HP 9000 rp4440 AC Power Requirements at Various Configurations

Processors	DIMMs	I/O Cards	Watts, AC	Volt Amps	Amps @ 200V
1	4	2	464	484	2.4
1	16	4	540	562	2.8
1	32	6	633	657	3.3
2	4	2	595	618	3.1
2	16	4	668	693	3.5
2	32	6	755	781	3.9
4	4	2	836	864	4.3
4	16	4	907	936	4.7
4	32	6	999	1028	5.1

Technical Specifications

Server model number rp4440

Server product numbers **PA 8900 Two core, 4 processor Capable Base System:** A9950A
 Base system with one two core PA 8900 800 MHz processor. Standard core I/O includes a dual-port GigE LAN card and one dual-channel Ultra320 SCSI controller card. (Ultra320 SCSI controller card can be upgraded to Smart Array 6402 Ultra320 RAID controller.) Must select one memory carrier board, at least one quad of memory, and either rack or stand-alone form factor. System comes with one power supply; a second power supply may be ordered for redundancy. Must select either rackmount option or rack-less form factor.

PA 8900 Two core, 4 processor Capable Base System: A9951A
 Base system with one two core PA 8900 1 GHz processor. Standard core I/O includes a dual-port GigE LAN card and one dual-channel Ultra320 SCSI controller card. (Ultra320 SCSI controller card can be upgraded to Smart Array 6402 Ultra320 RAID controller.) Must select one memory carrier board, at least one quad of memory, and either rack or stand-alone form factor. System comes with one power supply; a second power supply may be ordered for redundancy. Must select either rackmount option or rack-less form factor.

Number of cores 2-8

NOTE: Two power cords are shipped with each system; one cord connects system to the rack PDU and one cord enables a direct connection to a wall socket. Localized cord is included at the Distribution site.

Supported Processors	Two core 800 MHz Proc. Module	PA 8900	Cache Level 1	3 MB (1.5 MB per core)
			Cache Level 2	64 MB (shared between cores)
			Floating-point coprocessor included	Yes
	Two core 1 GHz Processor Module	PA 8900	Cache Level 1	3 MB (1.5 MB per core)
Cache Level 2			64 MB (shared between cores)	
		Floating-point coprocessor included	Yes	

System Memory	Minimum memory	1 GB
	(HP-UX 11i v3 requires min 2GB)	
	Maximum memory capacity	128 GB

Internal Disks	Maximum disk mechanisms	2
	Maximum disk capacity	600 GB

Technical Specifications

Standard Integrated I/O	Dual port Ultra320 SCSI LVD	2 channel
	10/100/1000Base-T (RJ-45 connector)	2 port NOTE: Supports LAN boot.
	RS-232 serial ports	3
	10/100Base-T management port (RJ-45 connector)	1 port
	USB 2.0	Yes

I/O Buses and Slots	Available PCI-X slots	6
	2 133-MHz, 64-bit slots on dedicated PCI-X buses	
	4 66-MHz, 64-bit slots distributed on 2 PCI-X buses; 2 slots per bus	

Maximum I/O Cards (See supported I/O table for specific products)	Mass Storage	1-6
	LAN	6
	WAN	6
	Multi-Function (Mass Storage/LAN)	6
	Additional Interface Cards	1-6

Electrical Characteristics	AC Input power	200-240V 50-60Hz
	Hot swap Power supplies	1 included, 2nd for N+1
	Redundant AC power inputs	1 included, 2nd for N+1
	Typical current requirements at 230V	5.58 A (shared across inputs)
	Typical maximum power dissipation	1065 Watts
	Conservative maximum power dissipation	1368 Watts
	Power factor at full load	0.95 or higher
	Typical heat dissipation (BTUs/hour)	3600
	Maximum heat dissipation (BTUs/hour)	5500

Technical Specifications

Site Preparation	Site planning and installation included	No
	NOTE: System is customer installable.	
	Rack depth (in/mm)	25.2 in (639 mm)
	Rack width (in/mm)	17.32 in (440 mm)
	Rack height (in/mm/EIA)	6.9 in (175 mm)/4 U
	Rack Weight (lbs/kg) Max.	100 lbs (45 kg)
	Stand-mounted depth (in/mm)	27.4 in (95 mm)
	Stand-mounted width (in/mm)	10.3 in (261 mm)
	Stand-mounted height (in/mm)	20.9 in (530 mm)
	Stand-mounted weight (lbs/kg) Max.	115 lbs (522 kg)

Environmental Characteristics	Acoustics (operator/bystander) at 25°C	<7.2 Bels LwA
	Operating Temperature (up to 5000 ft) *	41° to 95° F (5° to 35° C)
	Non-operating Temperature	-40° to 158° F (-40° to 70° C)
	Maximum rate of temperature change	10° C/hour
	Operating relative humidity	15% to 80% RH non-condensing
	Non-operating/storage humidity	5% to 90% non-condensing
	Operating altitude above sea level	10,000 ft (3000 m) max
	Non-operating altitude above sea level	15,000 ft (4600 m) max

*Maximum operating temperature range up to 5000 feet (1524 m). For higher altitudes, de-rate the maximum temperature by 2°C/1000 feet above 5000 feet.

Regulatory Compliance	RMN	RSVLA-0201
	Electromagnetic interference	Complies with FCC Rules and Regulations, Part 15 as a Class A digital device. Manufacturer's Declaration to EN55022 Level A, VCCI Registered, Class A, Korea RLL
	Safety	UL Listed, CSA Certified, TUV GS Mark compliant with EN 60950 and EN 41003

Technical Specifications

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