NVIDIA UFM 4.0 Cyber-AI Appliance Hardware User Manual

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About This Document

This manual describes the installation and basic use of NVIDIA® UFM® Cyber-AI appliance.

Ordering Part Numbers

The table below provides the ordering part number (OPN) for the available UFM Cyber-AI appliance.

NVIDIA SKU	Legacy OPN	Marketing Description
920-9B020-00FH-0D0	MUA9652H-2SF	NVIDIA® UFM® 4.0 appliance for UFM Cyber-AI, UFM Enterprise, UFM Telemetry, 2U server with 2 ConnectX®-6 HDR 200Gb/s InfiniBand adapters

Intended Audience

This manual is intended for IT managers and system administrators.

Technical Support

Customers who purchased NVIDIA products directly from NVIDIA are invited to contact us through the following methods:
- E-mail: enterprisesupport@nvidia.com
- Enterprise Support page: https://www.nvidia.com/en-us/support/enterprise

Customers who purchased NVIDIA M-1 Global Support Services, please see your contract for details regarding Technical Support.

Customers who purchased NVIDIA products through an NVIDIA-approved reseller should first seek assistance through their reseller.

Related Documentation

Document	Description
UFM Cyber-AI User Manual	NVIDIA® UFM® Cyber-AI platform determines a data center's unique vital signs and uses them to identify performance degradation, component failures, and abnormal usage patterns

Overview

Data centers host many users and applications and have become the competitive advantage for research organizations and manufacturing companies. Keeping the data center intact and healthy is critical as a data center shutdown means the loss of millions of dollars. Moreover, malicious users often exploit data center access to misuse compute resources by running prohibited applications, for example, resulting in higher operating costs.

The NVIDIA® UFM® Cyber-AI Appliance (Gen 4.0) solution enhances the benefits of UFM Telemetry and UFM Enterprise, providing scale-out of preventive maintenance for lowering supercomputing OPEX. UFM Cyber-AI Appliance comes with NVIDIA GPU-accelerated deep learning frameworks to significantly speed up deep learning training, which could otherwise take days and weeks, to just hours and days.

UFM Cyber-AI Appliance Highlights

Part Number	MUA9652H-2SF
Form factor	2U rackmount - 19"
GPU	NVIDIA® A30 24GB - accelerated deep learning frameworks
PCIe cards	2x NVIDIA® ConnectX®-6 VPI dual-port network interface cards
Port speed	InfiniBand: SDR/QDR/HDR100/HDR Ethernet: 25/50/100/200 Gb/s
Bandwidth	Up to 100Gb/s bi-directional per port
Power supplies	2x AC power supply units (PSUs)

List of Hardware Features

Component	Description	Qty
SKY-6200	SKY-6200MLX-02UFM4 Up to 24'' depth / 2U height and 19''(typical rack) width	1
GPU	NVIDIA® A30 24GB	1
CPU	Silver 4214R Processor (16.5M Cache, 2.40 GHz)	2
TPM	TPM 2.0 module by LPC	1
Secure boot	Secure boot based on Intel boot guard technology with RSA-2K secured key	
RAM	8GB 2666MHz DDR4 ECC 8 per CPU	16
Disk HDD	2.5" 2.0TB SATA 7200RPM Enterprise	6
Disk SSD	2.5" 3.84TB, SATA 6Gb/s, 3D2, TLC	2

RAID	The server must support, via BIOS, three RAID configuration simultaneals • RAID 1 for 2 Disk HDD • RAID 10 for 4 Disk HDD • RAID 1 for 2 Disk SSD	
OOB Networking	2x1GbE management ports IPv4/6 & 2x10GbE3	4
Serial Port	DB9 RS232 port male	1
PCIe	PCI Express 3.0 x16	2
BMC	Baseboard management controller for device health monitoring	1
PSU	Hot-swappable power supply units for reliability (1+1 redundancy) • 1000 W @ 100 ~ 127 V • 2000 W @ 200 ~ 240 V	2
Fans	1x fan per power supply	2
	6x internal cooling fans for CPU, GPU, and expansion card	6
USB ports	On front panel: 2 X USB 2.0	6
	On back panel: 4 X USB 3.0	
Lights-out management	For remote shutdown and serial access	

Main System Components

UFM Cyber-AI Appliance system populates one GPU, two ConnectX-6 InfiniBand/VPI adapter cards, fans, and two PSUs in the system's rear panel.

Network Interface Cards

UFM Cyber-AI Appliance is populated with two ConnectX-6 dual-port network interface cards (NICs) which enable the hardware-based forwarding of IP packets from InfiniBand to Ethernet, and vice versa.

Power Supply Units

UFM Cyber-AI Appliance is equipped with two redundant, load-sharing PSUs at the rear side of the system. The PSUs are housed in a 2U container. Each PSU has an extraction handle, status LED, and a power socket.

For power supply unit LED operation, please refer to "System Monitoring".

The system enables hot swapping which enables components to be exchanged while the system is online without affecting operational integrity.

> ⚠ Only removed these PSUs from the system if they are being replaced.

> ⚠ If one of the two PSUs is extracted from the UFM Cyber-AI Appliance, the Tensor Reading screen of the GUI will still show OK under the Healthy column and "Not presence" under the Status column. This behavior is normal.

Fans

Power Supply Fans

UFM Cyber-AI Appliance is equipped with one fan per PSU on the rear panel of the appliance.

Internal Fans

UFM Cyber-AI Appliance is equipped with six internal cooling fans for the CPU, GPU, and expansion cards. When the system is operating normally, the fans operate at a constant speed. If the system module fails, or one of the temperature thresholds is exceeded, the fans automatically raise their rotation speeds to draw in more air.

UFM Cyber-AI Appliance Requirements

Hardware Requirements

Unless otherwise specified, NVIDIA Networking products are designed to work in an environmentally controlled data center with low levels of gaseous and dust (particulate) contamination.

The operating environment should meet severity level G1 as per ISA 71.04 for gaseous contamination and ISO 14644-1 class 8 for cleanliness level.

Airflow Requirements

NVIDIA UFM Cyber-AI appliance is offered with one airflow pattern: From the front panel to the rear panel. Please refer to the Technical Specifications section for airflow numbers.

Software Requirements

The UFM Cyber-AI software offers enhanced and real-time network telemetry, combined with AI-powered intelligence and advanced analytics. It enables IT managers to discover operational anomalies and even predict network failures. This improves both security and data center uptime while decreasing overall operating expenses.

System Features

- UFM Telemetry and UFM Enterprise inside

- Detects performance degradations
- Detects usage profile changes over time
- Detects abnormal cluster behavior
- Correlates between seemingly unrelated phenomena powered by artificial intelligence
- Alerts when preventive maintenance is needed
- Continuous system data collection to optimize predictability

Regulatory Certifications

Country	Certification
EU/Morocco	CE
USA	FCC
Canada	ICES
Japan	VCCI
Australia/New Zealand	RCM
Brazil	ANATEL
Taiwan	BSMI
China	CCC
Korea	KCC
Worldwide	CB
USA/Canada	cTUVus
Argentina	S-mark
Russia/Belarus/Kazakhstan	CU
Taiwan	BSMI

Environmental Certifications

Type	Details
Acoustic Noise	ISO-7779:1999 ETS 300 753
Shock & Vibration	According to industrial spec
WEEE	ROHS 2011/65/EU
RoHS 6	ROHS 2011/65/EU
MTBF/ MTBCF	According to Telcordia SR-332

System Layout and Interfaces

The following figures show the front and rear sides of NVIDIA® UFM® Cyber-AI Appliance. Each numbered interface referenced in the following figures is described in the table that follows.

Appliance Front and Rear Panel Interfaces
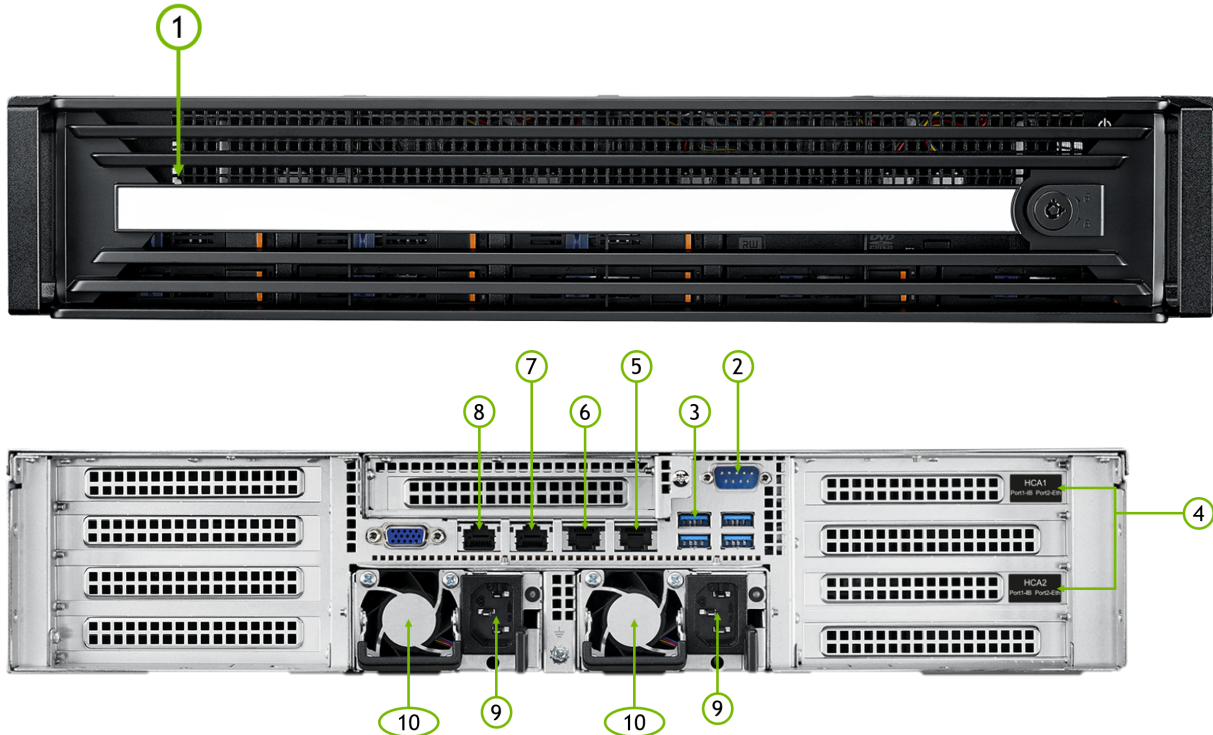
#	Interface	Description
1	Power-on LED	Bezel LED - lights when the system is powered on
2	COM port	Serial DB9 to RJ45 RS232 port - not active
3	USB interfaces	4 x USB 3.0 ports at the rear panel
4	PCIe Gen 3.0 x16 slots	2x ConnectX-6 VPI adapter cards at slots 1 and 3 on the left side
5	LAN1	RJ-45 LAN port – 10G IPMI-LAN2
6	LAN2	RJ-45 LAN port – 10G
7	LAN3	RJ-45 LAN port – 1G
8	LAN4	RJ-45 LAN port – 1G IPMI-LAN1
9	Redundant power module	Two redundant 80 PLUS PLATINUM PSUs at the rear of the appliance
10	Power supply fans	One fan per power supply unit

Power-on LED

There is one I/O LED (green) on the front panel to indicate if the system is powered. For power-on LED definitions, please refer to section "Power-on LED".

USB 3.0 Interfaces

UFM Cyber-AI Appliance offers 4x USB 3.0 ports on the system's rear panel. These interfaces can be used to provide up to 500MB/s in bandwidth.

> ❗ Do not use excessive force when inserting or extracting the USB disk into and from the port.

PCIe Gen 3.0 x16 Slots

UFM Cyber-AI Appliance is shipped preassembled with two ConnectX-6 VPI cards that enable the hardware-based forwarding of IP packets from InfiniBand-to-Ethernet, and vice versa.

LAN Interfaces

UFM Cyber-AI Appliance features two 10G Base-T Ethernet LAN 1/2 connections (Intel X557 PHY (2* 10GbE)) and two GbE LAN 3/4 (Intel I210 (2* 10/100/1000 Base-T GbE)) to eliminate bottlenecks in network data flow. The ports are accessible from the appliance's rear panel.

In addition, the appliance is equipped with a ASPEED 2500 BMC chip that supports IPMI 2.0 via LAN1 and LAN4 interfaces.

The recommended cabling when connecting LAN4 and LAN1 (for 10G LAN) is Cat. 6 (< 55m) or Cat. 6A (<100m), both cross and straight cables are supported.

LAN3 (X557-AT2 controller) has an internal signal connected to BMC LAN2.

- For LAN1 and LAN2 LED definitions, please refer to section "LAN1/LAN2 Rear I/O LED Interface".
- For LAN3 and LAN4 LEDs definitions, please refer to section "LAN3/LAN4 Rear I/O LED Interface".

> ⚠ If any of the LAN ports do not come up automatically, then please bring them up manually.

Redundant Power Modules

UFM Cyber-AI Appliance is equipped with two redundant power supply units at the rear of the appliance. The PSUs are housed in a 2U canister containing the power supplies. Each PSU has an extraction handle, PSU status LED, and a power socket.

80 PLUS Platinum 1+1 redundant power supply:
- 1000W @ 100 ~127V
- 2000W @ 200 ~240V

For the redundant power module LEDs definitions, please refer to Power Module LED Specifications.

Fan Modules

Power Supply Fans

UFM Cyber-AI Appliance is equipped with one fan per power supply unit on the rear panel of the appliance.

PSU Fans

Internal Fans

UFM Cyber-AI Appliance is equipped with six internal cooling fans for the CPU, GPU, and expansion cards. When the system is operating normally, the cooling fans operate at a constant speed. If the system module fails, or one of the temperature thresholds have been exceeded, the cooling fans automatically raise their rotation speeds to draw more airflow.

All fans are equipped with tachometer status monitoring.

Hardware Installation

Installation of the NVIDIA UFM Cyber-AI appliance requires attention to the mechanical and power elements of the appliance and precautions must be taken for the rack-mounted equipment.

The system platform can be rack-mounted and is designed for installation in a standard 19" rack. The power side of the system includes a hot-swap power supply unit (PSU), space for an optional second PSU (purchased separately) for redundancy, and replaceable fan trays. There is one possible airflow direction. It is necessary to validate that the system airflow direction is compatible with the system, rack, and PSUs. The rear panel of the system has the QSFP28 ports, system LEDs, and management connection ports.
Use a rack capable of supporting the mechanical and environmental characteristics of a fully-populated platform.

> ❗ The rack mounting holes conform to the EIA-310 standard for 19-inch racks. Take precautions to guarantee proper ventilation in order to maintain good airflow at ambient temperature.

System Package Contents

Check against the package contents list that all the parts have been sent. Check the parts for visible damage that may have occurred during shipping. Please note that the product must be placed on an antistatic surface.

Item Type	Qty	Item Description
System	1	UFM Cyber-AI Appliance Gen 4.0
Slide Rail Kit	1	1U/2U 36" slide kit pair for UFM Cyber-AI Appliance
Power Cables	2	250V 10A 1830MM C14 TO C13 power cable
	2	Cable retainers
Harness	1	Harness RS232 2m cable – DB9-to-RJ45 ❗ Do not connect to the COM port.
	1	Ethernet CAT6A 2m cable – RJ45-to-RJ45
Documentation	1	Quick installation guide

Item Type	Qty	Item Description
System	1	UFM Cyber-AI Appliance Gen 4.0
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		⚠ Do not connect to the COM port.
Ethernet Cable	1	Ethernet CAT6A 2m cable – RJ45-to-RJ45
Documentation	1	Quick installation guide

Rail Kit Package Contents

Item type	Qty	Item description
Slides	2	Set of rack slides
Screw M5* 15L	2	M5* 15L – 8pcs
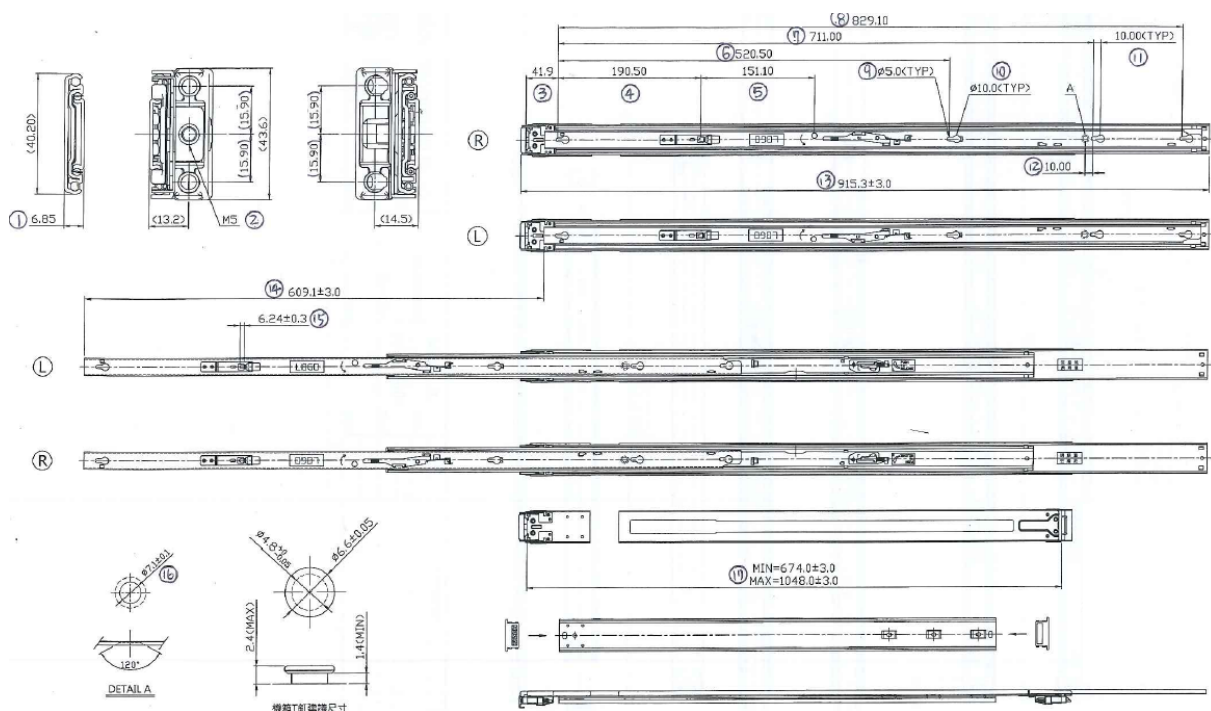
Rack Mounting

UFM Cyber-AI Appliance can be mounted in a rack using the optional rack mounting kit.

> ⚠ The minimum post-to-post dimension is 890mm.

> ⚠ It is strongly recommended that the minimum depth of cabinet be 1100mm.

Safety Warnings

Prior to the installation, make sure to review the safety warnings. Note that not all warnings may apply to the UFM Cyber-AI Appliance.

> ⓘ Safety warnings are provided here in the English language. For safety warnings in other languages, refer to the 1U Switch Installation Safety Instructions document.

⚠	**Installation Instructions** Read all installation instructions before connecting the equipment to the power source.
⚠	**Bodily Injury Due to Weight** Use enough people to lift this product safely. <40 lbs / <18 kgs 40 – 70 lbs / 18 – 32 kgs 70 – 121 lbs / 32 – 55 kgs >121 lbs / >55 kgs
⚠	**Heavy Equipment** This heavy equipment should be moved using a mechanical lift to avoid injuries.
⚡	**Risk of Electric Shock!** • With the fan module removed power pins are accessible within the module cavity. Do not insert tools or body parts into the fan module cavity. • For AC powered switch systems: Disconnecting one power supply only disconnects one module. To isolate the unit completely, all connected power supplies must be disconnected. (L003) In QM97X0/HGX H100 switch systems: for 200-240Vac use only
⚠	**Over-temperature** This equipment should not be operated in an area with an ambient temperature exceeding the maximum value listed in the product specifications. Moreover, to guarantee proper ventilation, allow at least 8 cm (3 inches) of clearance around the ventilation openings.
⚠	**Stacking the Chassis** The chassis should not be stacked on any other equipment. If the chassis falls, it can cause bodily injury and equipment damage.
⚡	**Redundant Power Supply Connection (OPTIONAL)—Electrical Hazard** This product includes a redundant power or a blank in its place. In case of a blank power supply, do not operate the product with the blank cover removed or not securely fastened.
⚠	**Double Pole/Neutral Fusing** This system has double pole/neutral fusing. Remove all power cords before opening the cover of this product or touching any internal parts.

	Multiple Power Inlets Risk of electric shock and energy hazard. The PSUs are all independent. Disconnect all power supplies to ensure a powered down state inside of the switch platform.
	During Lightning—Electrical Hazard During periods of lightning activity, do not work on the equipment or connect or disconnect cables.
	Copper Cable Connecting/Disconnecting Copper cables are heavy and not flexible, as such they should be carefully attached to or detached from the connectors. Refer to the cable manufacturer for special warnings/instructions.
	Rack Mounting and Servicing When this product is mounted or serviced in a rack, special precautions must be taken to ensure that the system remains stable. In general, the rack should be filled with equipment starting from the bottom to the top.
	Equipment Installation This equipment should be installed, replaced, and/or serviced only by trained and qualified personnel.
	Equipment Disposal Disposal of this equipment should be in accordance to all national laws and regulations.
	Local and National Electrical Codes This equipment should be installed in compliance with local and national electrical codes.
	Installation Codes This device must be installed according to the latest version of the country national electrical codes. For North America, equipment must be installed in accordance to the applicable requirements in the US National Electrical Code and the Canadian Electrical Code.
	Battery Replacement Warning: Replace only with UL Recognized battery, certified for maximum abnormal charging current not less than 4mA. There is a risk of explosion should the battery be replaced with a battery of an incorrect type. Dispose of used batteries according to the instructions.
	UL Listed and CSA Certified Power Supply Cord For North American power connection, select a power supply cord that is UL Listed and CSA Certified, 3 - conductor, [16 AWG], terminated with a molded plug rated at 125 V, [13 A], with a minimum length of 1.5m [six feet] but no longer than 4.5m. For European connection, select a power supply cord that is internationally harmonized and marked "<HAR>", 3 - conductor, minimum 1.0 mm2 wire, rated at 300 V, with a PVC insulated jacket. The cord must have a molded plug rated at 250 V, 10 A.
	Installation Codes This device must be installed according to the latest version of the country's national electrical codes. For North America, equipment must be installed in accordance to the applicable requirements in the US National Electrical Code and the Canadian Electrical Code.
	Interconnection of Units Cables for connecting to the unit RS232 and Ethernet Interfaces must be UL certified type DP-1 or DP-2. (Note: when residing in non LPS circuit.)

⚠	**Overcurrent Protection** A readily accessible Listed branch circuit overcurrent protective device rated 20 A must be incorporated in the building wiring. **Acoustic Level Warning** The acoustic level listed in Specifications section represents product noise measured in accordance with ISO 7779 under nominal conditions. The actual noise level can vary depending on the installation conditions, including but not limited to the number of racks in the installation, the overall installation size, rack and other equipment material and noise levels, fan faults, room temperature, room configuration, and employee location in relation to the equipment. The data-center owner should manage effective hearing conservation as per the OSHA standard to protect employees against over and extended exposure to noise.
🚫	**Do Not Use the Switch as a Shelf or Work Space** Caution: Slide/rail mounted equipment is not to be used as a shelf or a work space. The rails are not intended for sliding the unit away from the rack. It is for permanent installation at final resting place only, not used for service and maintenance.
♺	**WEEE Directive** According to the WEEE Directive 2002/96/EC, all waste electrical and electronic equipment (EEE) should be collected separately and not disposed of with regular household waste. Dispose of this product and all of its parts in a responsible and environmentally-friendly way.
⚠	**Country of Norway Power Restrictions** This unit is intended for connection to a TN power system and an IT power system of Norway only.

Taiwan RoHS Declaration - Switch Systems

設備名稱：伺服器

單元Unit	限用物質及其化學符號					
	鉛Lead (Pb)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr⁺⁶)	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
印刷電路板	—	○	○	○	○	○
金屬外殼	○	○	○	○	○	○
塑膠件	○	○	○	○	○	○
PCB 板電子零件	—	○	○	○	○	○

備考1. 〝超出0.1 wt %〞及〝超出0.01 wt %〞係指限用物質之百分比含量超出百分比含量基準值。

備考2. 〝○〞係指該項限用物質之百分比含量未超出百分比含量基準值。

備考3. 〝—〞係指該項限用物質為排除項目。

# Taiwan RoHS Declaration - Gateway Systems

單元Unit	限用物質及其化學符號					
設備名稱： 閘道器	鉛Lead (Pb)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr⁺⁶)	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
印刷電路板	—	○	○	○	○	○
金屬外殼	○	○	○	○	○	○
塑膠件	○	○	○	○	○	○
PCB 板電子零件	—	○	○	○	○	○

備考1. 〝超出0.1 wt %〞及〝超出0.01 wt %〞係指限用物質之百分比含量超出百分比含量基準值。

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備考3. 〝—〞係指該項限用物質為排除項目。

Taiwan BSMI Class A Statement - Warning to the User!

警告：為避免電磁干擾，本產品不應安裝或使用於住宅環境。

Installing Appliance in Rack

Before mounting UFM Cyber-AI Appliance in a rack, ensure that all internal components are installed, and that the unit has been fully tested. Both sides of the chassis ear must be assembled with screws (PN:1930005209) after you assemble the slide rail kit.
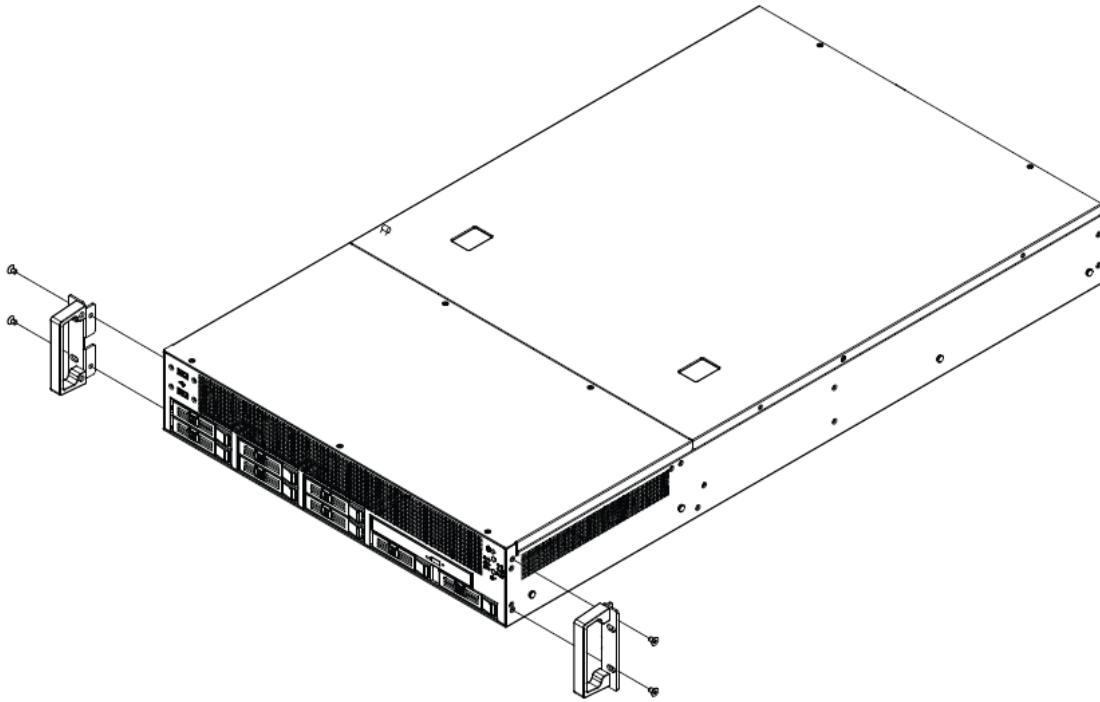
Slide Rail Installation

The UFM Cyber-AI Appliance slides are developed for 1U or 2U applications whose system load does not exceed 34 kgs. The slide length is 1041±3.0 mm. The rear bracket is extendable to a max/min post-to-post distance of 670-1042 mm. The slide extension is 610.0±3.0 mm.

Max : 1042±3 mm
Min : 670±3 mm

Ext : 610±3 mm
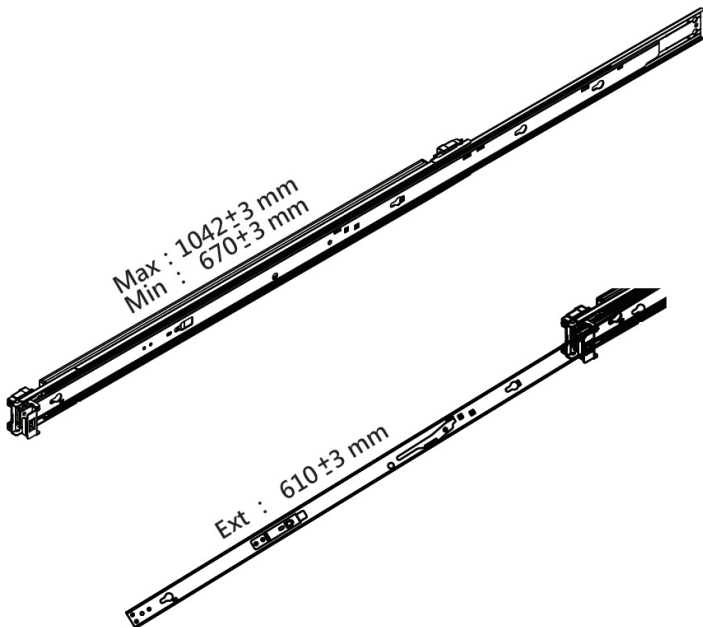
1. Remove the inner member. Pull inner member out as shown in the following figure.
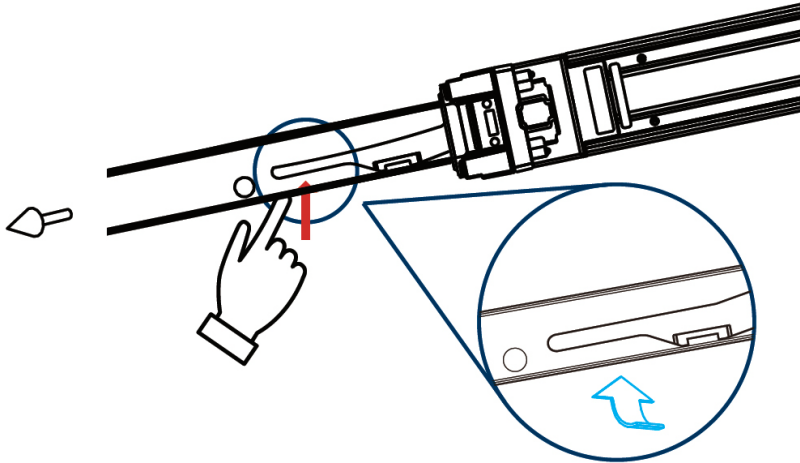
2. Mount the inner member onto the chassis. Place the key slot on T stud and push the inner member toward the back.

Place bigger portion of key slot on T stud

Stand-off sptring snaps the T stud
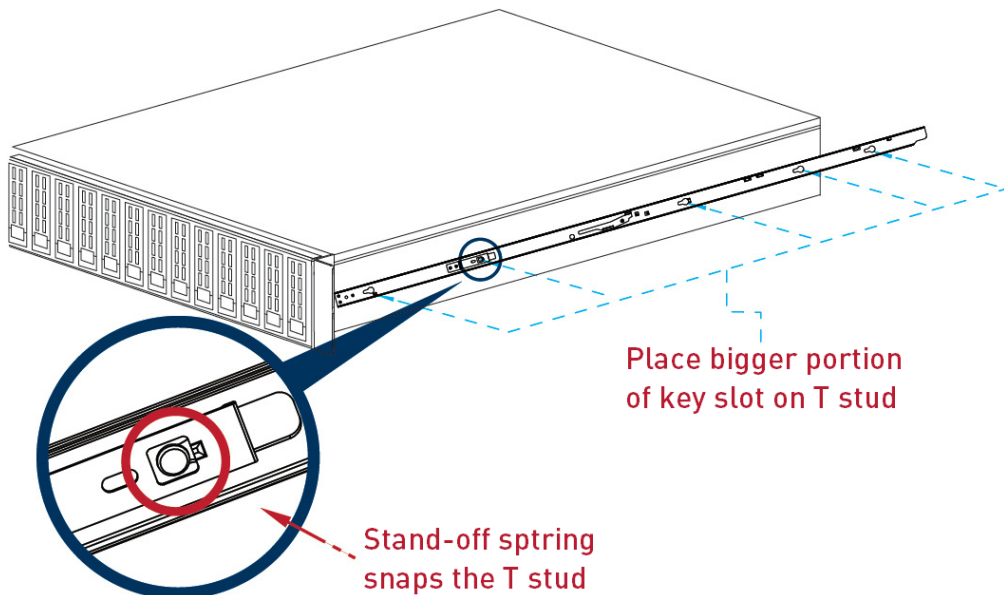
3. Mount the cabinet member to the posts. Align the positioning pin to the desired complete U location, and pull the bracket forwards to lock it to the post. The bracket is locked to the

post after you hear a "click" sound.

Rear
bracket

click

Rear bracket is extendable.
Front bracket is in the open position.
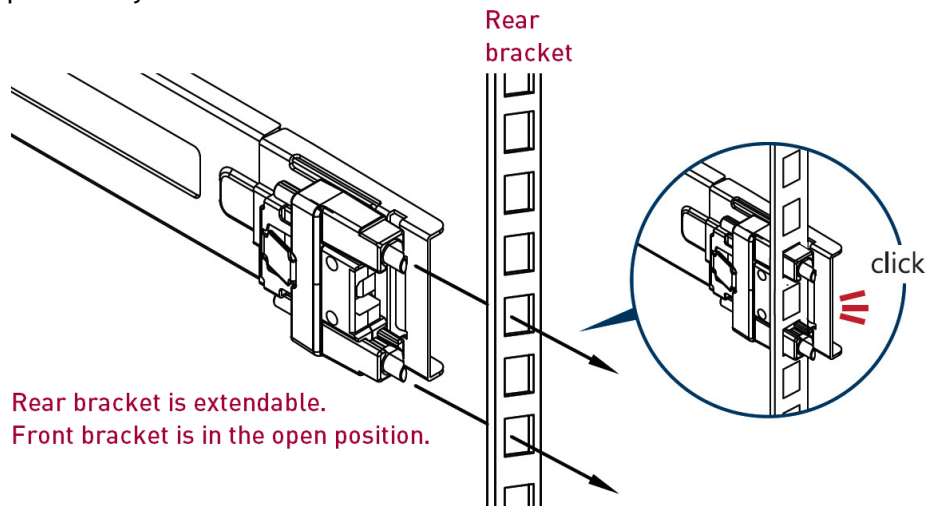
4. Release the locking latch upward.
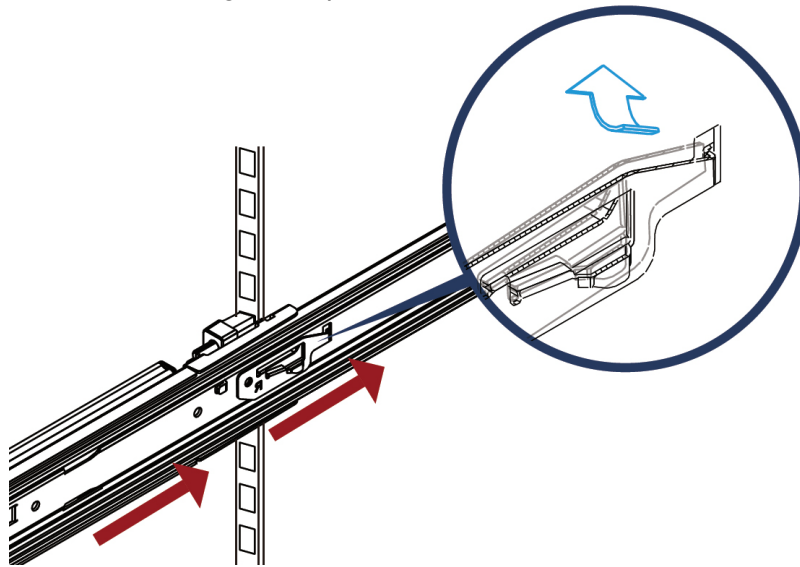
5. Push the middle member forward to the rear of the slide.
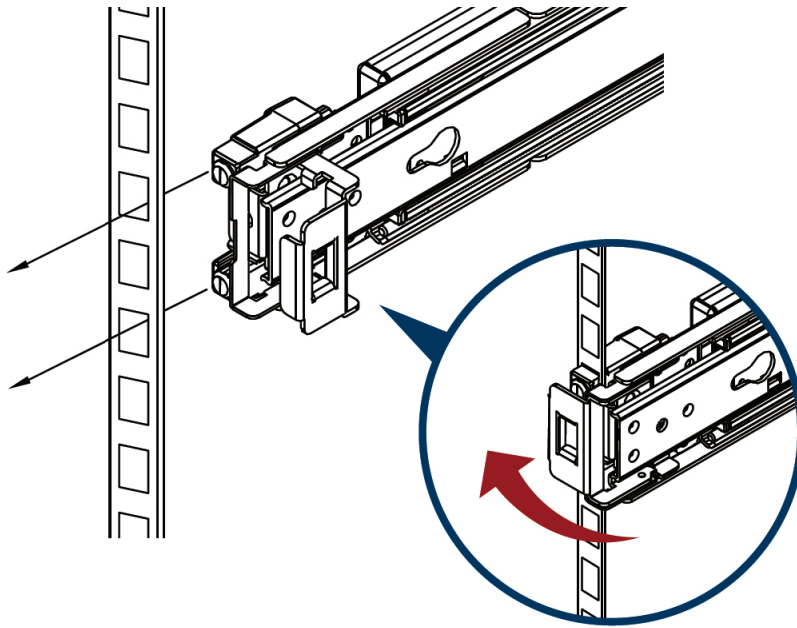
6. Install the chassis. As shown, insert the inner member to the cabinet member. Make sure the ball retainer is in the open position. It might cause damage to the slides if the ball retainer is not on the front position. After the inner member goes in, push up/down the disconnect lever to unlock the slides and keep pushing the chassis to the fully closed position.

Attention: Ball retainer must be in the open position.

Push up/down the lever
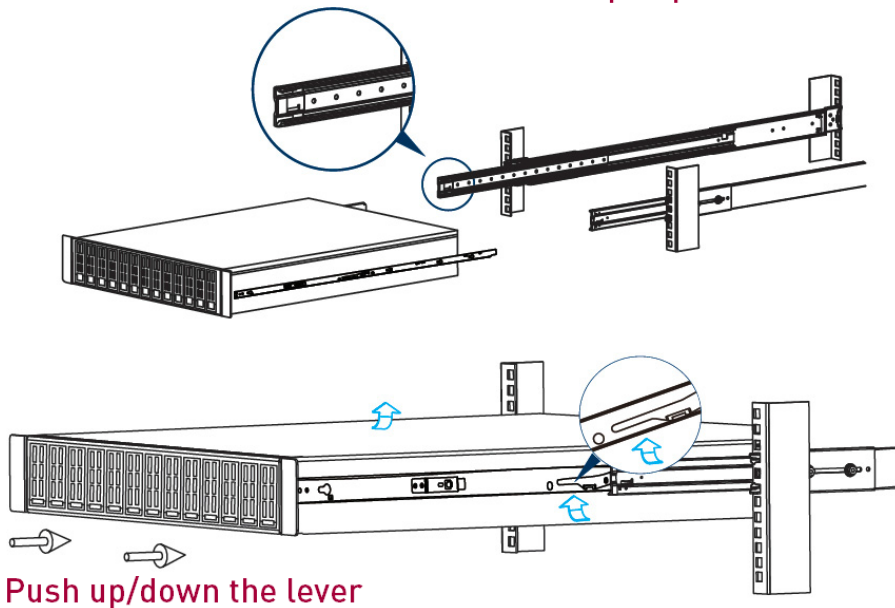
7. Screw the system in the cabinet.
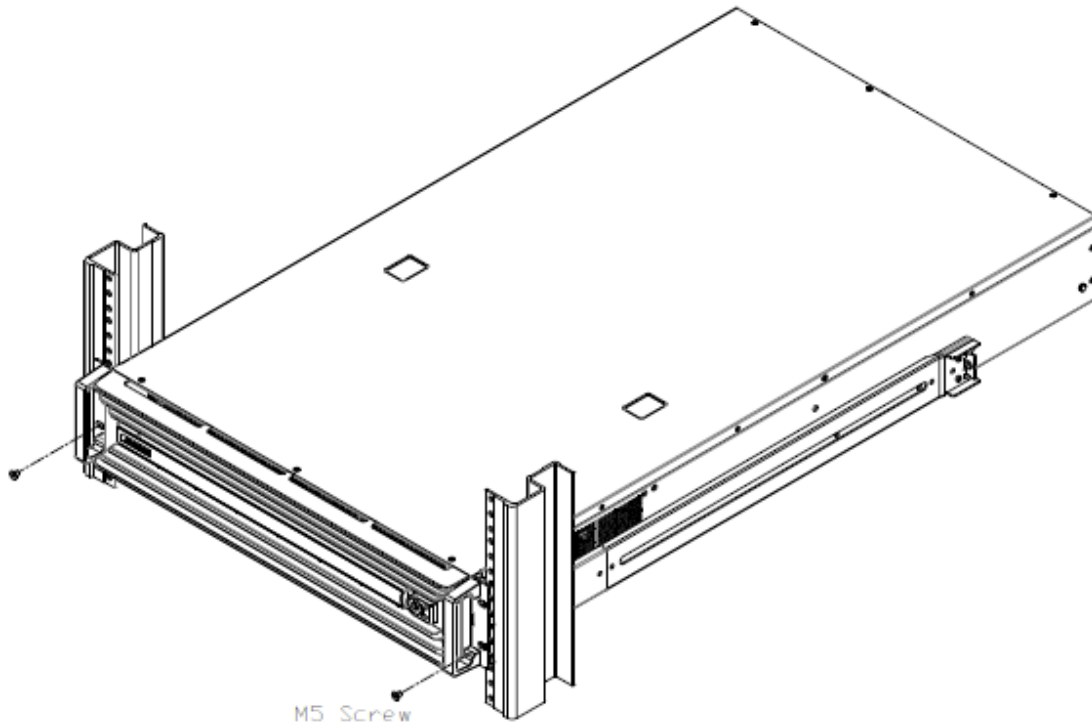
> ⚠ **Rack Mount Instructions**
>
> The following or similar rack-mount instructions are included with the installation procedure:
> - Elevated Operating Ambient – if installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
> - Reduced Air Flow – installation of the equipment in a rack should be such that the amount of airflow required for the safe operation of the equipment is not compromised.
> - Mechanical Loading – mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
> - Circuit Overloading – consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
> - Reliable Earthing – reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).
>
> Please note that you must install the handlebar and mounting ear after the slide rail kit has been installed completely.

System Monitoring

This section lists the monitoring LEDs available on the NVIDIA® UFM® Cyber-AI Appliance.

Power-on LED

There is one I/O LED (green) on the front panel to indicate if the system is powered.

LED state	Color	Description
On	Green	System is turned on
Blinking	Green	System is under S4 state
Off	N/A	Power off

Rear Panel LEDs

LAN Interface LEDs

There are two I/O LEDs (Green and Amber) per LAN port to indicate LAN link and activity.
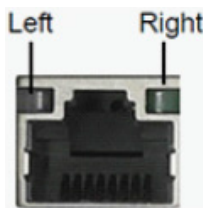
LAN1/LAN2 Rear I/O LED Interface

Left LED	Right LED	Description
Amber	Green	Linked – 1Gbps
Amber	Blinking green	Active – 1Gbps
Green	Green	Linked – 10Gbps
Green	Blinking green	Active – 10Gbps
Off	Off	No link

LAN3/LAN4 Rear I/O LED Interface

Left LED	Right LED	Description
Off	Green	Active – 10Mbps
Off	Blinking green	Active – 10Mbps
Amber	Green	Active – 100Mbps
Amber	Blinking green	Active – 100Mbps
Green	Green	Linked – 1Gbps
Green	Blinking green	Active – 1Gbps
Off	Off	No link

Power Module LED

There are two I/O LEDs (Green and Amber) to indicate the power module state.

LED state	Color	Description
Blinking	Amber	Power supply warning event
Blinking	Green	AC present standby output on
On	Amber	AC unplug to this module or power supply critical event
On	Green	Power supply DC output ON and OK
Off	N/A	No AC power to both power modules

Network Interface Card LEDs

The network card features two I/O LEDs per port:

- LED 1 and 2 are bi-color I/O LED which indicate link status. LED behavior is described below for Ethernet and InfiniBand port configurations.
- LED 3 and 4 are reserved for future use
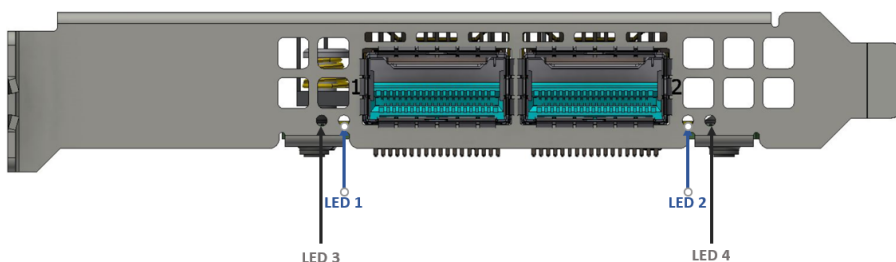
Ethernet Network Port LED Behavior

LED Color and State	Description
Off	No link is established

LED Color and State	Description
Blinking amber	1Hz blinking amber occurs due to running a beacon command to locate the adapter card 4Hz blinking amber indicates a problem with the physical link
Solid green	Indicates a valid link with no active traffic
Blinking green	Indicates a valid logical link with active traffic

InfiniBand Network Port LED Behavior

LED Color and State	Description
Off	No link is established
Solid amber	Indicates an active physical link
Blinking amber	1Hz blinking amber occurs due to running a beacon command to locate the adapter card 4Hz blinking amber indicates a problem with the physical link
Solid green	Indicates a valid link with no active traffic
Blinking green	Indicates a valid logical link with active traffic

Technical Specifications

UFM Cyber-AI Appliance Specifications

Physical	Dimensions (W x H x D): 438 x 88 x 760 (17.24" x 3.46" x 29.92")		
	Weight: 35kg		
	Mounting: 19" Rack mount		
Supported Protocols	InfiniBand: IBTA v1.3a Auto-Negotiation: 1X/2X/4X SDR (2.5Gb/s per lane), DDR (5Gb/s per lane), QDR (10Gb/s per lane), EDR (25Gb/s per lane) port, HDR100 (2 lane x 50Gb/s per lane), HDR (50Gb/s per lane) port		
	Ethernet: 200GBASE-CR4, 200GBASE-KR4, 200GBASE-SR4, 100GBASE-CR4, 100GBASE-KR4, 100GBASE-SR4, 50GBASE-R2, 50GBASE-R4, 25GBASE-R, 20GBASE-KR2, SGMII, 1000BASE-CX, 1000BASE-KX, 10GBASE-SR		
	Data rate	InfiniBand	SDR/DDR/QDR/EDR/HDR100/HDR
		Ethernet	1/25/50/100/200 Gb/s
	Gen4: SERDES @ 16.0GT/s, x16 lanes		
Power	Voltage: Monitors for CPU Cores, +3.3 V, +5 V, +12 V, +5 V Standby, VBAT		
	80 PLUS Platinum 1+1 redundant power supply 1000W @ 100 ~127V 2000W @ 200 ~240V		

Power consumption per interface	Interface	Power consumption per interface	Total power consumption per interface
	2x CPU	2x100W	200W
	1x GPU	1x165W	165W
	8x DDR4 16G	16x0.5W	8W
	2x SSD SATA 2.5 4TB	2x3.9W	7.8W
	6x HDD SATA 2TB	6x6W	36W
	6x fans	6x52.8W	316.8W
	2x ConnectX-6 network cards	2x37W	74W
	1x BMC	1x2W	2W
	6x USB 4x RJ45	15W 2W	17W
	Other server components		3W
	Maximum power consumption of the entire server		**~826.6W**

Environmental	Temperature	Operating	0-35°C
		Non-operating	-20-60°C
	Humidity	Operating relative humidity	10~85% @ 40°C (non-condensing)
		Non-operating relative humidity	10~95% @ 40°C (non-condensing)

	Vibration (5 ~ 500 Hz)	0.25 GRMs
	Shock	10G (with 11ms duration, half sine wave)
Thermal	Airflow/heat dissipation: • 1045 LFM when all 6 fans are working at full speed • 688 LFM when only 4 fans are working at full speed	

System Dimensions

⚠ All dimensions are in millimeters. All the mechanical tolerances are ±0.1mm.

Top View
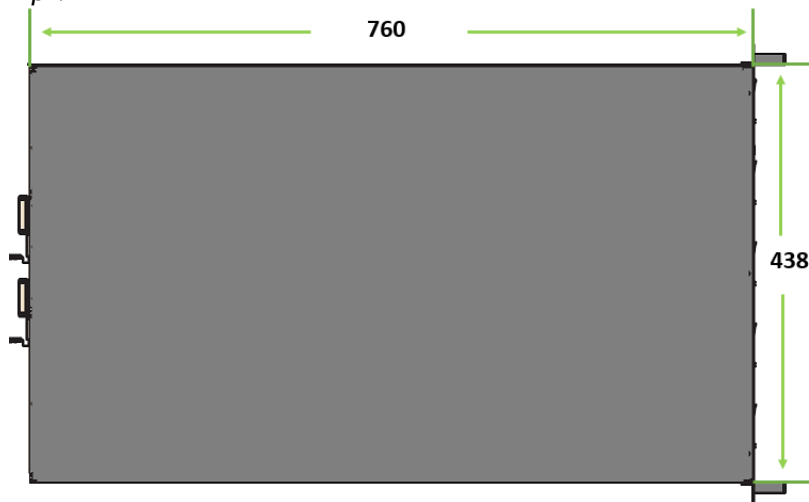
Side View
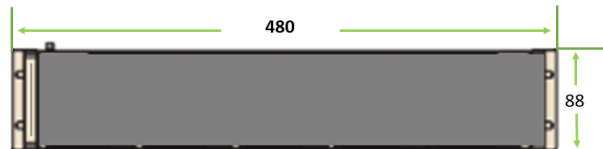
Thermal Threshold Definitions

There are two thermal threshold definitions for Skyway which impact the overall system operation state:

- Critical – When the device crosses this temperature, the firmware will automatically shut down the device. This temperature threshold is set from the BIOS (Advanced > IT8528 HW Monitor > CPU ACPI Shutdown Temperature). The temperature threshold can be configured from 50-110°C.
- Emergency – The temperature threshold is set by the CPU's internal thermal trip. It is impossible to change the temperature value through a software interface.

Inventory Information

The system's inventory parameters (i.e. serial number, part number) can be extracted from labels on the system's bottom side.

Field Replaceable Units

OPN	Description
MUA96-PF	Power supply w/ PSU-side to connector-side airflow for NVIDIA® UFM® 4.0 2U server
MUA96-SKIT	Rack installation kit for NVIDIA® UFM® 4.0 2U server standard depth racks
MUA96-HD	NVIDIA® UFM® 4.0 – hard drive FRU
MUA96-SD	NVIDIA® UFM® 4.0 – solid-state drive FRU
MUA96-GPU	NVIDIA® UFM® 4.0 – GPU FRU

System Configuration

IP Address Configuration

The system comes with a default system root user: `root/UFMcyberAI`.

Whether the user wants to configure static or dynamic IP addresses, they may use standard Linux tools to configure it while logged in as root user.

> ⚠️ Avoid using IP addresses from the subnet 172.17.0.0/16 as it is used as the subnet of docker containers by default.

IPMI Configuration

The power of the UFM Cyber-AI Appliance may be managed remotely using any IPMI-based power management system.

Document Revision History

Rev	Date	Description of Changes
Rev 1.0	Mar 31, 2022	First release