



# Telecom Datacenter Appliances

Innovative Platforms for Next Generation Network Infrastructure

## HMB-6130 User Manual

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## About this Document

This manual describes the overview of the various functionalities of this product, and the information you need to get it ready for operation. It is intended for those who are:



- responsible for installing, administering and troubleshooting this system or Information Technology professionals.
- assumed to be qualified in the servicing of computer equipment, such as professional system integrators, or service personnel and technicians.

The latest version of this document can be found on Lanner's official website, available either through the product page or through the [Lanner Download Center](#) page with a login account and password.

## Conventions & Icons

This document utilizes different icons in order to make selected text more transparent and explicable to users. Please note that this document contains the following conventions:

### Icon Descriptions

Icon	Usage
 <b>Note or Information</b>	This mark indicates that there is something you should pay special attention to while using the product.
 <b>Warning or Important</b>	This mark indicates that there is a caution or warning and it is something that could damage your property or product.

## Online Resources

To obtain additional documentation resources and software updates for your system, please visit the [Lanner Download Center](#). As certain categories of documents are only available to users who are logged in, please be registered for a Lanner Account at <http://www.lannerinc.com/> to access published documents and downloadable resources.

For troubleshooting the issues with your system, please check the [Lanner Q&A](#) page for a diagnostic procedure and troubleshooting steps.

## Technical Support

In addition to contacting your distributor or sales representative, you could submit a request to our [Lanner Technical Support](#), where you can fill in a support ticket to our technical support department.

## Documentation Feedback

Your feedback is valuable to us, as it will help us continue to provide you with more accurate and relevant documentation. To provide any feedback, comments or to report an error, please email to [contact@lannerinc.com](mailto:contact@lannerinc.com). Thank you for your time.

## Contact Information

### Taiwan Corporate Headquarters

**Lanner Electronics Inc.**

7F, No.173, Sec.2, Datong Rd.  
Xizhi District, New Taipei City 22184,  
Taiwan

**立端科技股份有限公司**

221 新北市汐止區  
大同路二段 173 號 7 樓  
T: +886-2-8692-6060  
F: +886-2-8692-6101  
E: [contact@lannerinc.com](mailto:contact@lannerinc.com)

### USA

**Lanner Electronics Inc.**

47790 Westinghouse Drive  
Fremont, CA 94539  
T: +1-855-852-6637  
F: +1-510-979-0689  
E: [sales\\_us@lannerinc.com](mailto:sales_us@lannerinc.com)

### Europe

**Lanner Europe B.V.**

Wilhelmina van Pruysenweg 104  
2595 AN The Hague  
The Netherlands  
T: +31 70 701 3256  
E: [sales\\_eu@lannerinc.com](mailto:sales_eu@lannerinc.com)

### China

**Beijing L&S Lancom Platform Tech. Co., Ltd.**

Guodong LOFT 9 Layer No. 9 Huinan Road,  
Huilongguan Town, Changping District, Beijing  
102208 China  
T: +86 010-82795600  
F: +86 010-62963250  
E: [service@ls-china.com.cn](mailto:service@ls-china.com.cn)

### Canada

**Lanner Electronics Canada Ltd**

3160A Orlando Drive  
Mississauga, ON  
L4V 1R5 Canada  
T: +1 877-813-2132  
F: +1 905-362-2369  
E: [sales\\_ca@lannerinc.com](mailto:sales_ca@lannerinc.com)

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## Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ▶ Reorient or relocate the receiving antenna.
- ▶ Increase the separation between the equipment and receiver.
- ▶ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ▶ Consult the dealer or an experienced radio/TV technician for help.

### FCC Caution

- ▶ Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
- ▶ This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.



#### Note

1. An unshielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.
2. Use only shielded cables to connect I/O devices to this equipment.
3. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



#### Important

1. Operations in the 5.15-5.25GHz band are restricted to indoor usage only.
2. This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

## Safety Guidelines

Follow these guidelines to ensure general safety:

- ▶ Keep the chassis area clear and dust-free during and after installation.
- ▶ Do not wear loose clothing or jewelry that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- ▶ Wear safety glasses if you are working under any conditions that might be hazardous to your eyes.
- ▶ Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- ▶ Disconnect all power by turning off the power and unplugging the power cord before installing or removing a chassis or working near power supplies
- ▶ Do not work alone if potentially hazardous conditions exist.
- ▶ Never assume that power is disconnected from a circuit; always check the circuit.

## Consignes de sécurité

Suivez ces consignes pour assurer la sécurité générale :

- ▶ Laissez la zone du châssis propre et sans poussière pendant et après l'installation.
- ▶ Ne portez pas de vêtements amples ou de bijoux qui pourraient être pris dans le châssis. Attachez votre cravate ou écharpe et remontez vos manches.
- ▶ Portez des lunettes de sécurité pour protéger vos yeux.
- ▶ N'effectuez aucune action qui pourrait créer un danger pour d'autres ou rendre l'équipement dangereux.
- ▶ Coupez complètement l'alimentation en éteignant l'alimentation et en débranchant le cordon d'alimentation avant d'installer ou de retirer un châssis ou de travailler à proximité de sources d'alimentation.
- ▶ Ne travaillez pas seul si des conditions dangereuses sont présentes.
- ▶ Ne considérez jamais que l'alimentation est coupée d'un circuit, vérifiez toujours le circuit. Cet appareil génère, utilise et émet une énergie radiofréquence et, s'il n'est pas installé et utilisé conformément aux instructions des fournisseurs de composants sans fil, il risque de provoquer des interférences dans les communications radio.

## Lithium Battery Caution

- ▶ There is risk of explosion if the battery is replaced by an incorrect type.
- ▶ Dispose of used batteries according to the instructions.
- ▶ Installation should be conducted only by a trained electrician or only by an electrically trained person who knows all installation procedures and device specifications which are to be applied.
- ▶ Do not carry the handle of power supplies when moving to another place.
- ▶ Please conform to your local laws and regulations regarding safe disposal of lithium battery.
- ▶ Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery can result in an explosion.
- ▶ Leaving a battery in an extremely high temperature environment can result in an explosion or the leakage of flammable liquid or gas.
- ▶ A battery subjected to extremely low air pressure may result in an explosion or the leakage of flammable liquid or gas.

## Avertissement concernant la pile au lithium

- ▶ Risque d'explosion si la pile est remplacée par une autre d'un mauvais type.
- ▶ Jetez les piles usagées conformément aux instructions.
- ▶ L'installation doit être effectuée par un électricien formé ou une personne formée à l'électricité connaissant toutes les spécifications d'installation et d'appareil du produit.
- ▶ Ne transportez pas l'unité en la tenant par le câble d'alimentation lorsque vous déplacez l'appareil.

## Operating Safety

- ▶ Electrical equipment generates heat. Ambient air temperature may not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Be sure that the room in which you choose to operate your system has adequate air circulation.
- ▶ Ensure that the chassis cover is secure. The chassis design allows cooling air to circulate effectively. An open chassis permits air leaks, which may interrupt and redirect the flow of cooling air from internal components.
- ▶ Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures. Be sure to follow ESD-prevention procedures when removing and replacing components to avoid these problems.
- ▶ Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. If no wrist strap is available, ground yourself by touching the metal part of the chassis.
- ▶ Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).

## Sécurité de fonctionnement

- ▶ L'équipement électrique génère de la chaleur. La température ambiante peut ne pas être adéquate pour refroidir l'équipement à une température de fonctionnement acceptable sans circulation adaptée. Vérifiez que votre site propose une circulation d'air adéquate.
- ▶ Vérifiez que le couvercle du châssis est bien fixé. La conception du châssis permet à l'air de refroidissement de bien circuler. Un châssis ouvert laisse l'air s'échapper, ce qui peut interrompre et rediriger le flux d'air frais destiné aux composants internes.
- ▶ Les décharges électrostatiques (ESD) peuvent endommager l'équipement et gêner les circuits électriques. Des dégâts d'ESD surviennent lorsque des composants électroniques sont mal manipulés et peuvent causer des pannes totales ou intermittentes. Suivez les procédures de prévention d'ESD lors du retrait et du remplacement de composants.
- ▶ Portez un bracelet anti-ESD et veillez à ce qu'il soit bien au contact de la peau. Si aucun bracelet n'est disponible, reliez votre corps à la terre en touchant la partie métallique du châssis.
- ▶ Vérifiez régulièrement la valeur de résistance du bracelet antistatique, qui doit être comprise entre 1 et 10 mégohms (Mohms).

## Mounting Installation Precautions

The following should be put into consideration for rack-mount or similar mounting installations:

- ▶ Do not install and/or operate this unit in any place that flammable objects are stored or used in.
- ▶ The installation of this product must be performed by trained specialists; otherwise, a non-specialist might create the risk of the system's falling to the ground or other damages.
- ▶ Lanner Electronics Inc. shall not be held liable for any losses resulting from insufficient strength for supporting the system or use of inappropriate installation components.
- ▶ 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 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 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 Grounding - Reliable grounding 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).

## Electrical Safety Instructions

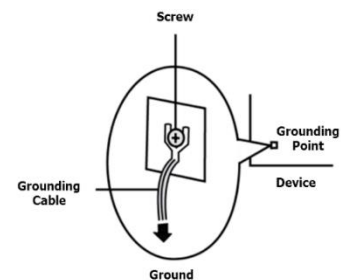
Before turning on the device, ground the grounding cable of the equipment. Proper grounding (grounding) is very important to protect the equipment against the harmful effects of external noise and to reduce the risk of electrocution in the event of a lightning strike. To uninstall the equipment, disconnect the ground wire after turning off the power. A ground wire is required and the part connecting the conductor must be greater than 4 mm<sup>2</sup> or 12 AWG.

## Consignes de sécurité électrique

- ▶ Avant d'allumer l'appareil, reliez le câble de mise à la terre de l'équipement à la terre.
- ▶ Une bonne mise à la terre (connexion à la terre) est très importante pour protéger l'équipement contre les effets néfastes du bruit externe et réduire les risques d'électrocution en cas de foudre.
- ▶ Pour désinstaller l'équipement, débranchez le câble de mise à la terre après avoir éteint l'appareil.
- ▶ Un câble de mise à la terre est requis et la zone reliant les sections du conducteur doit faire plus de 4 mm<sup>2</sup> ou 12 AWG.

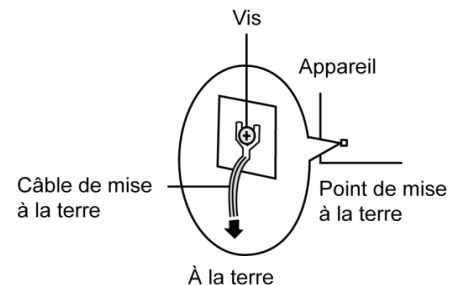
## Grounding Procedure for DC Power Source

- ▶ Loosen the screw of the earthing point.
- ▶ Connect the grounding cable to the ground.
- ▶ The protection device for the DC power source must provide 30 A current.
- ▶ This protection device must be connected to the power source before DC power.



## Procédure de mise à la terre pour source d'alimentation CC

- ▶ Desserrez la vis du terminal de mise à la terre.
- ▶ Branchez le câble de mise à la terre à la terre.
- ▶ L'appareil de protection pour la source d'alimentation CC doit fournir 30 A de courant.
- ▶ Cet appareil de protection doit être branché à la source d'alimentation avant l'alimentation CC.



**CAUTION:** TO DISCONNECT POWER, REMOVE ALL POWER CORDS FROM UNIT.

注意：要断开电源，请将所有电源线从本机上拔下。

**WARNUNG:** Wenn Sie das Gerät zwecks Wartungsarbeiten vom Netz trennen müssen, müssen Sie beide Netzteile abnehmen.

**ATTENTION:** DÉBRANCHER LES TOUT CORDONS D'ALIMENTATION POUR DÉCONNECTER L'UNITÉ DU SECTEUR.

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# CHAPTER 1: PRODUCT OVERVIEW

HMB-6130 is a high-performance CPU blade designed for Lanner HTCA (HybridTCA) product line and powered by Intel 4th Generation Intel® Xeon® Scalable Processors (codenamed Sapphire Rapids) and Emmitsburg PCH. HMB-6130 compute blade is built to be hot swappable, and thus the smart fans are hot swappable as well. This compute blade is built to optimize functionality, scalability and performance for our HTCA-6000 modular network appliance series.

## Main Features

- ▶ Hot swappable x86 compute blade
- ▶ Support dual 4<sup>th</sup> Generation Intel® Xeon® Scalable Processors (codenamed Sapphire Rapids) and Emmitsburg PCH
- ▶ DDR5 4800MHz REG DIMM, 16x 288pin DIMM Socket, Up to 1024GB (16x 64GB) per M/B tray
- ▶ 4x KR4 supporting 4x 100G to front Switch blades
- ▶ 5x Hot swappable smart fans

## Package Content

Your package contains the following items:

- ▶ 1x HMB-6130 Computing Blade
- ▶ 2x CPU Heat Sink
- ▶ 2x CPU Carriers
- ▶ 1x VGA to Mini-DP Cable

## Ordering Information

SKU No.	Main Features
HMB-6130A	Compute Blade for HTCA-6000 Series based on 4th Generation Intel® Xeon® Scalable Processors (Sapphire Rapids), Up to 185W
HMB-6130B	Compute Blade for HTCA-6000 Series based on 4th Generation Intel® Xeon® Scalable Processors (Sapphire Rapids), Up to 205W

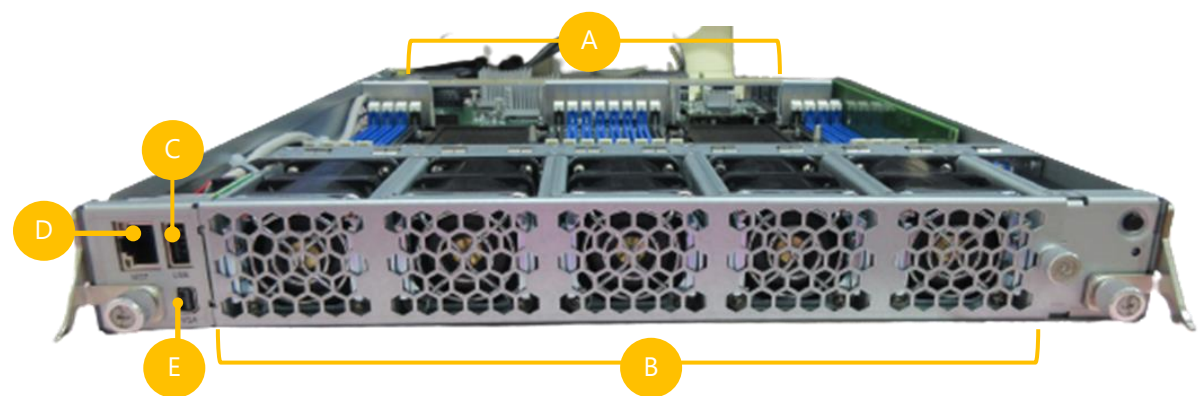
## Optional Accessories

Model	Description
IAC-TPM04A	TPM 2.0 Module

## System Specification

<b>System</b>	<b>CPU</b>	Dual Intel® 4 <sup>th</sup> Generation Intel® Xeon® Scalable Processors (codename Sapphire Rapids) with Emmitsburg PCH
	<b>Memory</b>	DDR5 4800MHz REG DIMM, 16x 288-pin DIMM Socket, Up to 1024GB (16x 64GB) per M/B tray
<b>BIOS</b>	AMI SPI Flash BIOS	
<b>Networking</b>	<ul style="list-style-type: none"> <li>● 2x Intel® Columbiaville E810-CAM2 support 4x 100G KR4 Total</li> <li>● 2x 100G (KR4) to top 1<sup>st</sup> layer switch blade from 2x E810-CAM2</li> <li>● 2x 100G (KR4) to top 2<sup>nd</sup> layer switch blade from 2x E810-CAM2</li> <li>● 1x Intel® i210 1GbE (for NC-SI share NIC)</li> <li>● 1x Intel® i226 2.5GbE (for Rear IO)</li> </ul>	
<b>Rear IO</b>	<ul style="list-style-type: none"> <li>● USB: 1x USB 3.0 Type A</li> <li>● VGA: 1x VGA port</li> <li>● LAN: 1x RJ45 Mgt Port</li> <li>● FAN: 5x Cooling Smart Fans, Hot-swappable</li> </ul>	
<b>Storage</b>	2x M.2 2280 M-Key Slots	
<b>Expansion</b>	<b>PCIe</b>	<ul style="list-style-type: none"> <li>● 6x PCI-Express Gen3 by 8 (to Front-side Module)</li> <li>● 1x PCI-Express Gen3 by 2 (to Front-side Module)</li> </ul>
	<b>IPMI</b>	Onboard, IAC-AST2600 IPMI module (NCSI via i210)
	<b>TPM</b>	TPM 2.0 (Optional)
<b>System Compatibility</b>	HTCA-6200, HTCA-6400, HTCA-6600	
<b>Temperature</b>	<b>Operating</b>	0°C ~40°C
	<b>Storage</b>	-40°C~70°C
<b>Humidity</b>	5%~90% Non-condensing (Operating); 5%~95% Non-condensing (Storage)	
<b>Mechanical</b>	<b>Dimension (WxHxD)</b>	327.4mm x 41mm x 471.2mm
	<b>Weight</b>	TBD
<b>Certification</b>	CE/FCC Class A, RoHS, UL	

Product I/O

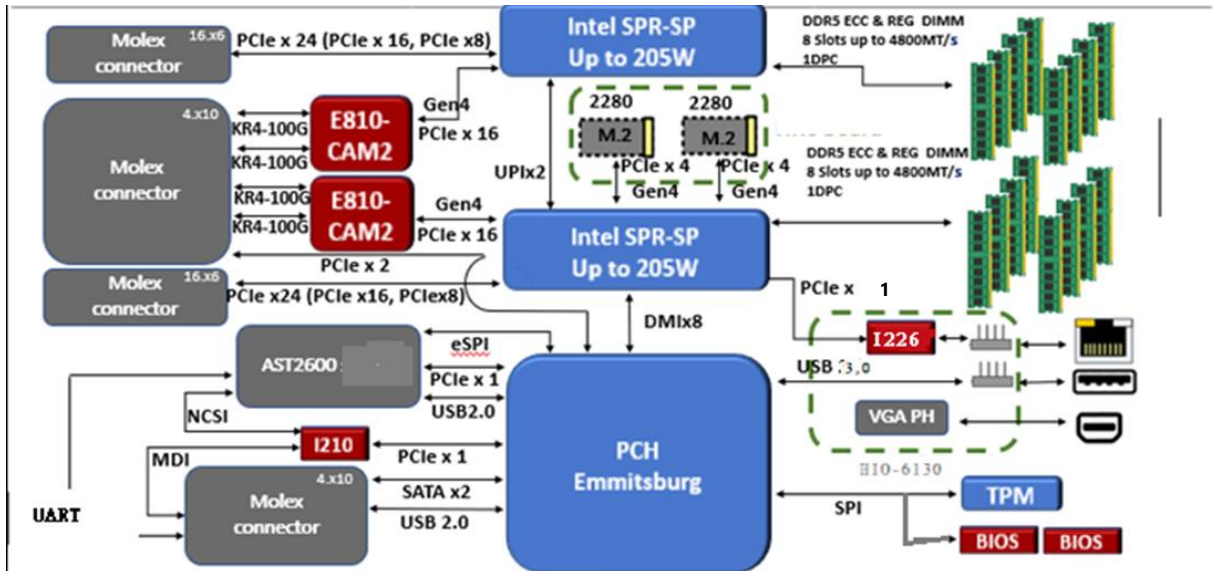


No.	Description	
A	High Speed Connectors	2x Molex 288 PIN, 2x Molex 120 PIN, 3x Molex Power Connector
B	Cooling Fans	5x Smart Fan
C	USB Port	1x USB 3.0 Port
D	MGN Port	1x RJ45 Management port
E	VGA Port	1x VGA Port

## Motherboard Information

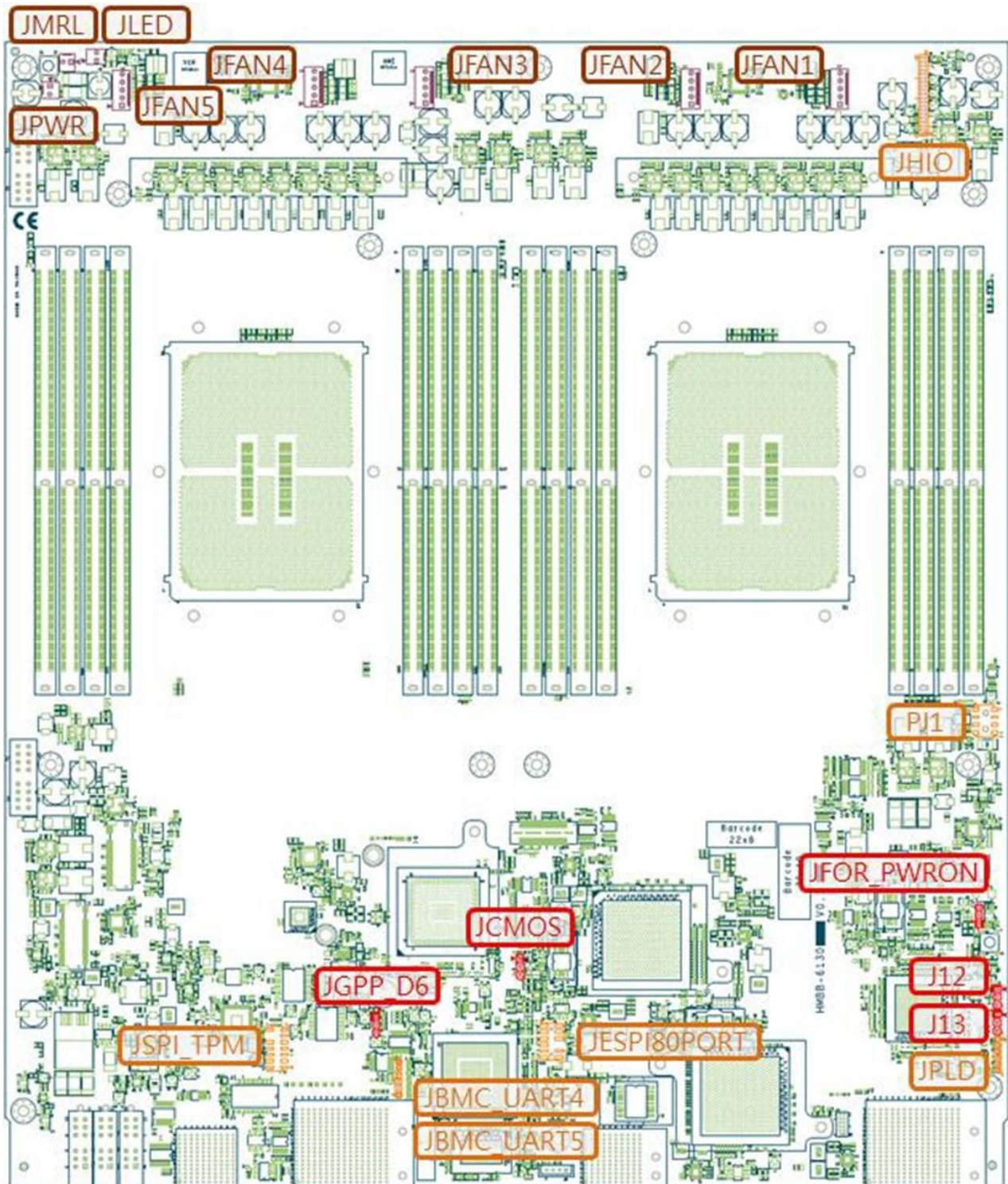
### Block Diagram

The block diagram indicates how data flows among components on the motherboard. Please refer to the following figure for your motherboard's layout design.



## Motherboard Layout

The motherboard layout shows the connectors and jumpers on the board. Refer to the following picture as a reference of the pin assignments and the internal connectors.

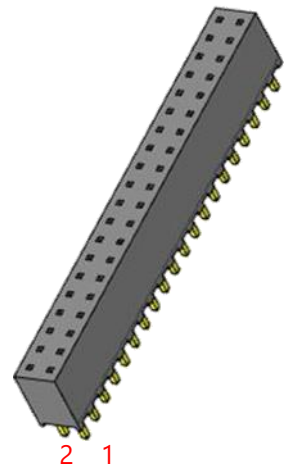




## Connector Pin Assignment

### JHIO: For Lanner I/O Card (HIO-6130) Implementation

Pin	Description	Pin	Description
1,2,3	+P5V_AUX	6,11,12, 16,17,22, 23,28, 29, 34,35,40	GND
4,5	NC		
7	VSYNC	8	DDC_CLK
9	HSYNC	10	DDC_DATA
13	DAC_B	14	DAC_R
15	DAC_G	18	PCIE_PRX_DP9
19	PCIE_WAKE#	20	PCIE_PRX_DN9
21	PERST_N	24	USB3_P8_RXP
25	CLK_PCIE_DN	26	USB3_P8_RXN
27	CLK_PCIE_DP	30	PCIE_PTX_DP9
31	USB20_P13_DN	32	PCIE_PTX_DN9
33	USB20_P13_DP	36	USB3_P8_TXP
37	USB20_P11_DN	38	USB3_P8_TXN
39	USB20_P11_DP		



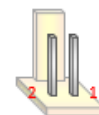
### JFAN1 ~ JFAN5: For Fan Module Connection

Pin	Description
1	PWM control
2	RPM sense
3	RPM sense
4	+12V
5	GND



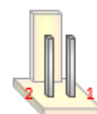
### JLED: For Power LED Indication

Pin	Description
1	Anode
2	Cathode



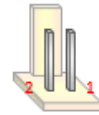
### JMRL: For thumb Screw Detection

Pin	Description
1	Detect
2	GND

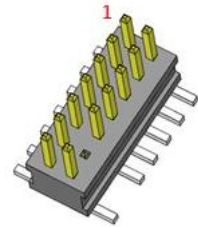


**JPWR: For Power Button Detection**

Pin	Description
1	GND
2	Power on

**JSPITPM: For Lanner TPM Module (IAC-TPM04) or SPI Fixture Debug Purpose**

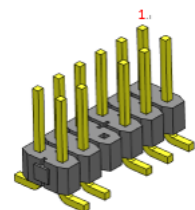
Pin	Description	Pin	Description
1	SPI_HOLD#	2	SPI_CS1#
3	SPI_CS0#	4	SPI_3V3
5	SPI_MISO	6	SPI_IO3
7	NC	8	SPI_CLK
9	GND	10	SPI_MOSI
11	TPM_PIRQ#	12	Key
13	TPM_CS0#	14	TPM_PLTRST#

**JBMC\_UART4 & JBMC\_UART5: For System or BMC Console Debug Purpose**

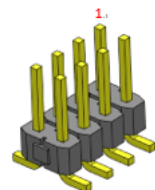
Pin	Description
1	RX
2	TX
3	GND

**JJESPI80PORT: For Lanner eSPI Fixture Debug Purpose**

Pin	Description	Pin	Description
1	ESPI_CLK	2	ESPI_IO1
3	ESPI_RST#	4	ESPI_IO0
5	ESPI_CS#	6	+P3V3
7	ESPI_IO3	8	Key
9	ESPI_IO2	10	GND
11	+P3V3_AUX	12	NC

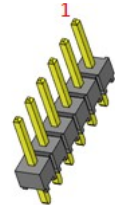
**JP1: For Lanner Power Debug Purpose**

Pin	Description	Pin	Description
1	PMBUS_SDA0	2	PMBUS_SDA1
3	PMBUS_SCL0	4	PMBUS_SCL1
5	GND	6	GND
7	PMBUS_EN0	8	PMBUS_EN1



**JPLD: For Lanner CPLD Debug Purpose**

Pin	Description
1	CPLD_3V3
2	JTAG_TDO
3	JTAG_TDI
4	JTAG_TMS
5	GND
6	JTAG_TCK

**JFOR\_PWRON: For Power Debug Purpose**

Pin	Description
1-2	Normal
2-3	FORCE POWER ON

**JCMOS: For Clear CMOS**

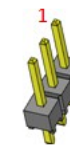
Pin	Description
1-2	Normal
2-3	Clear CMOS

**J12: For Dual BIOS Enable**

Pin	Description
1-2	Enable
2-3	Disable

**J13: For Boot Up BIOS Selection**

Pin	Description
1-2	First BIOS
2-3	Second BIOS

**JGPP\_D6: For Flash Descriptor Security Override**

Pin	Description
1-2	Normal
2-3	Override

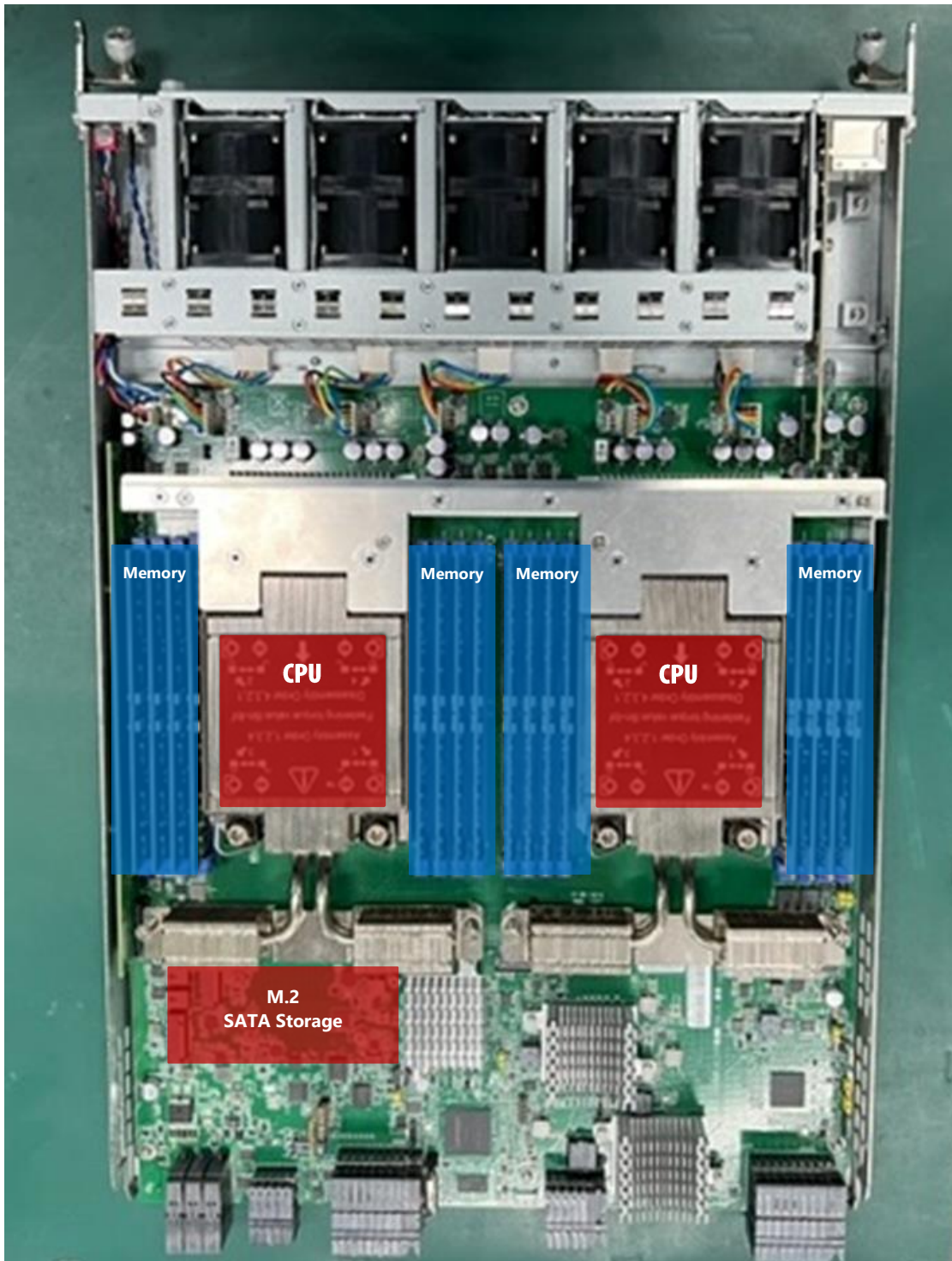




## CHAPTER 2: HARDWARE SETUP

To reduce the risk of personal injury, electric shock, or damage to the system, please remove all power connections to shut down the device completely. Also, please wear ESD protection gloves when conducting the steps in this chapter.

Based on your application and modules used, install modules in the corresponding slots.



## Accessing the Compute Blade(s)

You have to access the compute blade(s) in order to install or replace CPUs, heatsinks, and DDR memory DIMMs. Please follow the steps below to access the compute blades.

1. Select a compute blade you wish to access the internal components.



2. Rotate and loosen the captive screws circled in the image below. You may apply a screwdriver to conduct this task.
3. Hold onto both captive screws and handles and lift them upwards at the same time.



4. Then, pull the compute blade out.





## Installing the CPU(s)

Please note that the system delivered to you includes the heatsink and processor. This processor comes with a rather sophisticated design, therefore, the assembly of which must be handled with exclusive tools and extreme care by professionals.

Installing the processor onto the motherboard involves three stages:

1. Processor carrier assembly
2. Processor carrier assembly to heatsink.
3. System assembly PHM (Processor + Heat Sink Module) to motherboard

### Tools Required




Tool	Description	
T-30 Torx Bit®	Set to 0.904 N.m. (or 8 in/lbf $\pm$ 10%) for tightening the nuts which fasten the PHM on the bolster plate.	
ESD Protection (ESD gloves, ESD-safe work surface, ESD-safe shoes, grounded wrist strap etc.)	During the entire assembly process, at least wear a pair of ESD gloves to avoid damaging or contaminating the electronic parts while enhancing your own safety.	

**Note:** The images of tools shown in this document are for reference only; the actual tools you use might be different

### Parts Explanation:

Item	Description	
<b>Processor</b>	Please avoid touching the gold fingers or package lands of the processor even if you are wearing ESD gloves.	 



<b>Heatsink (1U &amp; 2U)</b>	<p>When handling heatsink, always grip it along the axis of the fins of the heatsink to avoid fin damage. Fins or soldering of fins might be damaged by handling heatsink holding along the long side of the heatsink.</p>	
<b>Processor Carrier</b>		
<b>Processor Tray</b>		

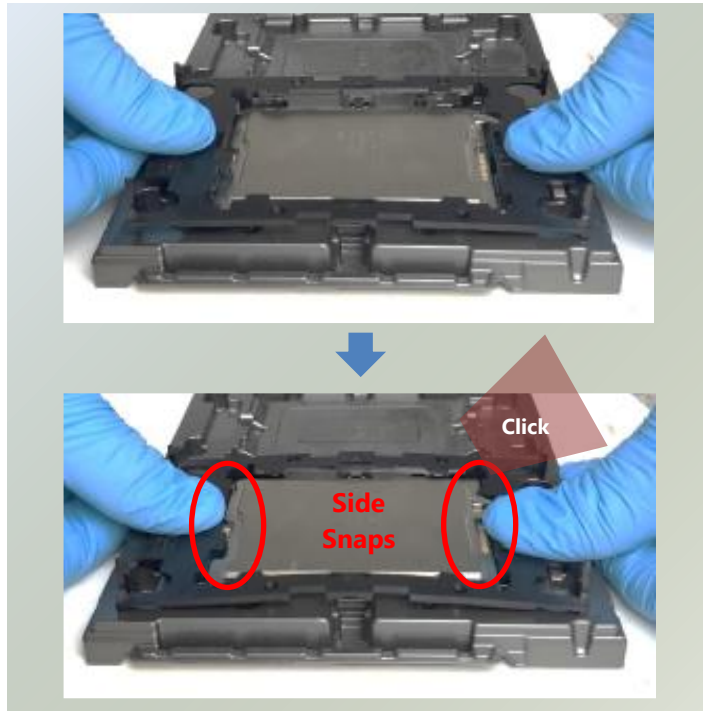
## Processor Carrier Assembly

1. Place the processor carrier on top of the processor that is in the package tray aligning **Pin 1** marks on the processor carrier to **Pin 1** of the processor.

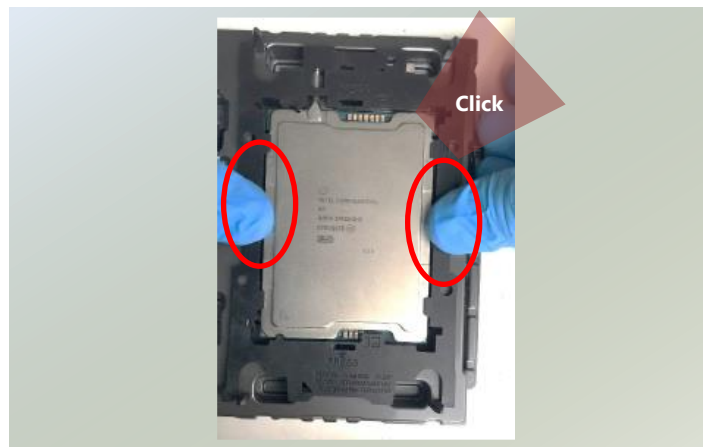
Note: Make sure that the keying feature tabs of the processor carrier are aligned to the slots in the processor properly. If not check that the correct processor carrier is being used.



2. Using both hands place the thumbs on the side of the carrier at the opposite end of the TIM brake lever. Push down on one side at a time slightly pressing in the outward motion until a snap sound is heard.

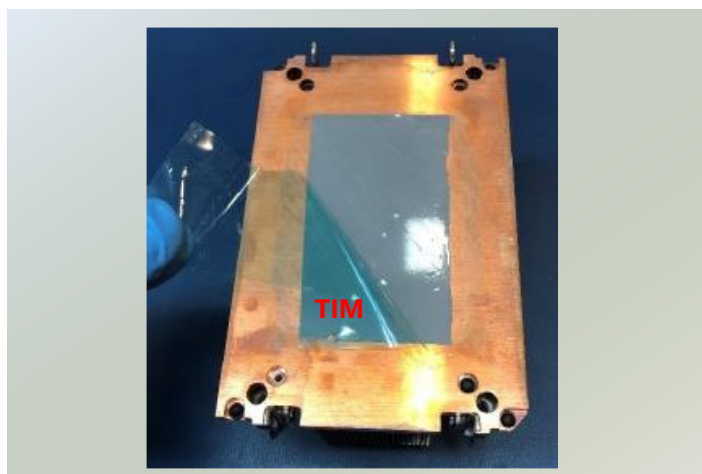


3. Check the two side snap latches on the carrier and verify that they have latched to the package. If not then press down on top of the side snap latches until they snap into place.

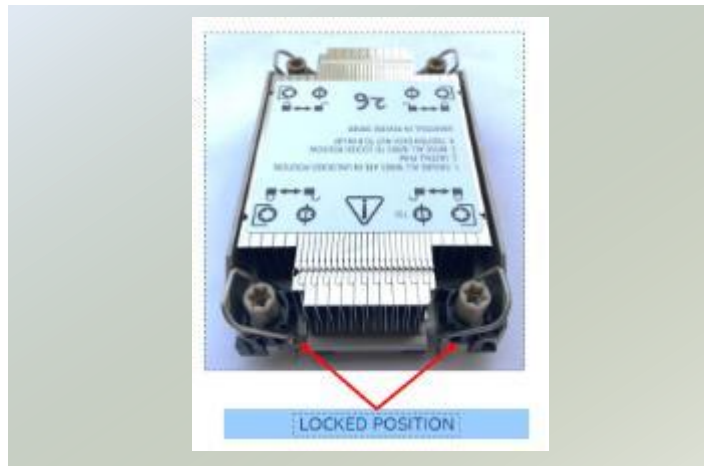


## Processor Carrier Assembly to Heatsink

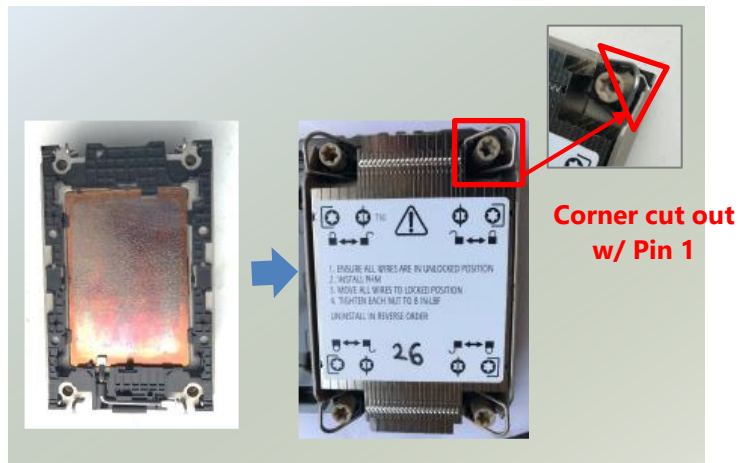
1. If there is TIM (Thermal Interface Material) protective film on the base of heatsink, remove it.



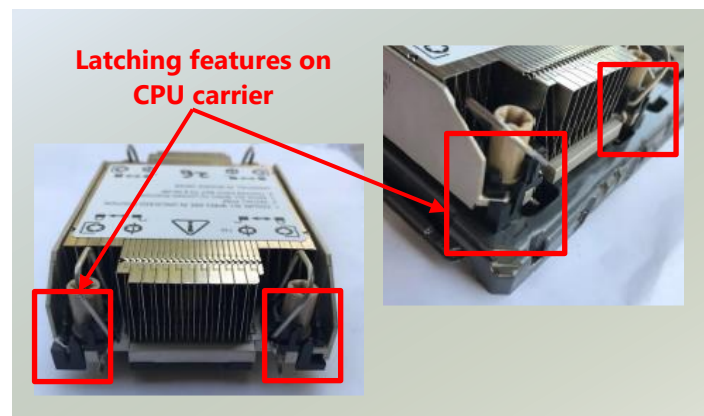
2. Turn the heatsink over and set the Anti-Tilt wires to the locked position (outward position).



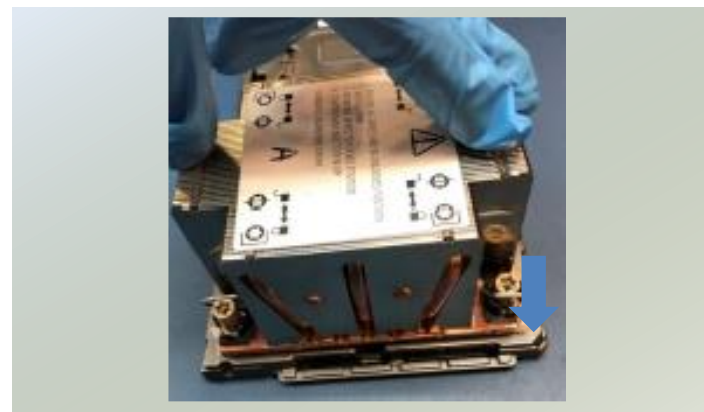
3. Align Pin 1 indicator of Processor carrier and corner cut out of Heatsink. If there are two corners cut out, either orientation is fine.



4. Place the heatsink ensure latching features on Processor carrier and heatsink are aligned during assembly.

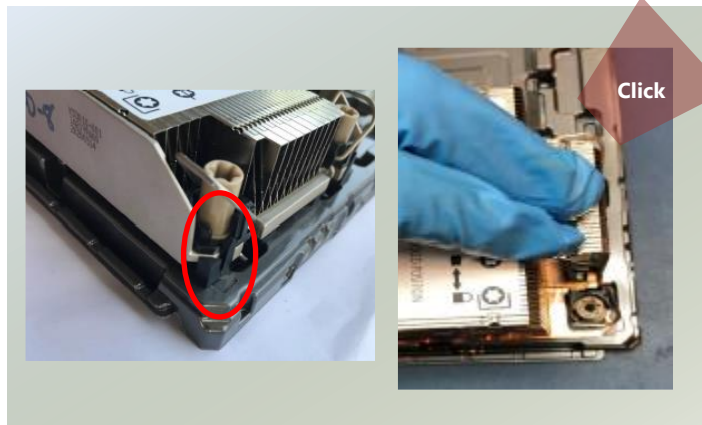


5. Press heatsink down firmly to engage carrier latching features to the heatsink at four corners.



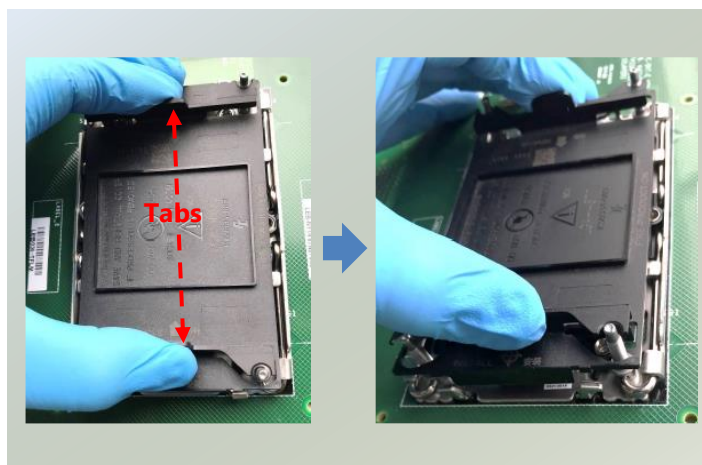


6. If carrier latching features do not latch the heatsink properly, engage each latching features by pressing the heatsink at the unlatched corner. You may hear a clicking sound when latched.

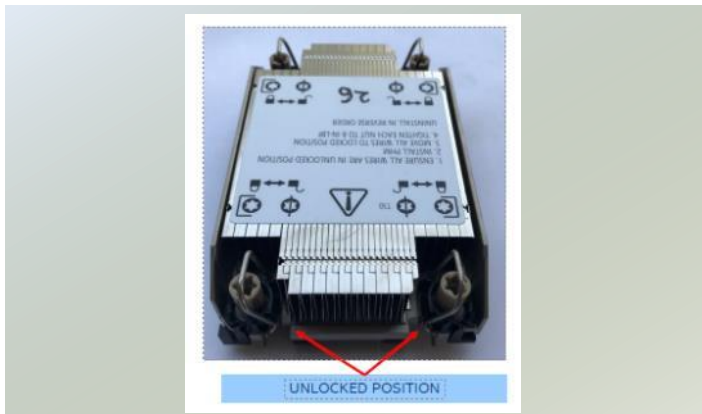


## System Assembly PHM to Motherboard

1. Locate the processor placement on the motherboard. Hold finger grips on socket cover and squeeze in on the grip tabs. Then pull the cover up and off vertically to remove.



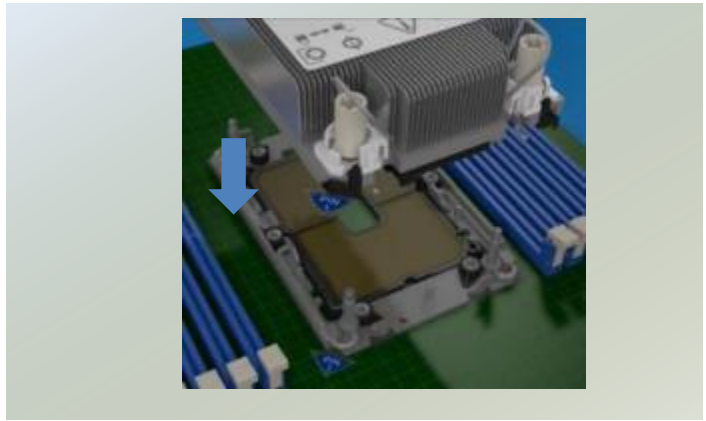
2. Set each anti-tilt wire to inward or unlocked position on the heatsink.



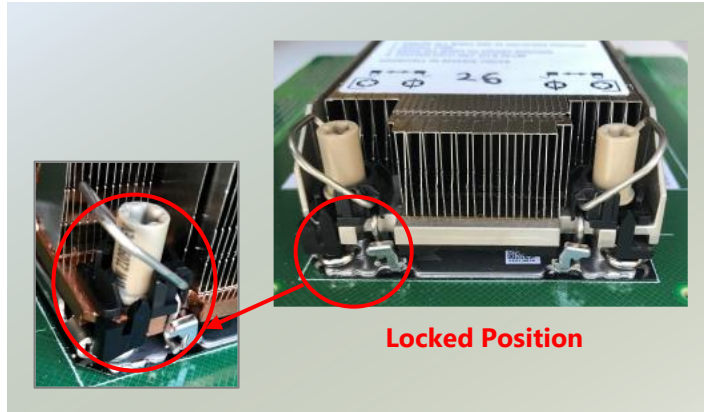
3. Lift up the PHM. Turn the PHM over to locate the **PIN1** corner on processor carrier and processor.



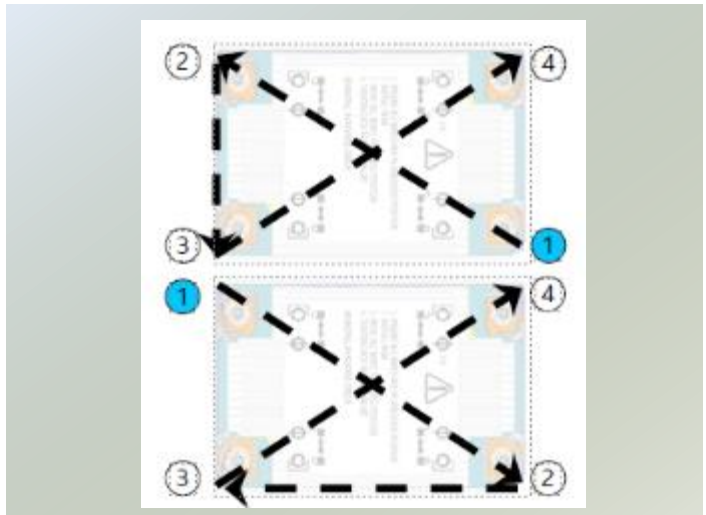
4. Then turn the PHM right side up. Line up the **PIN1** corner of the PHM to the bolster plate **PIN1** corner. Lower the PHM vertically down over the bolster plate studs.



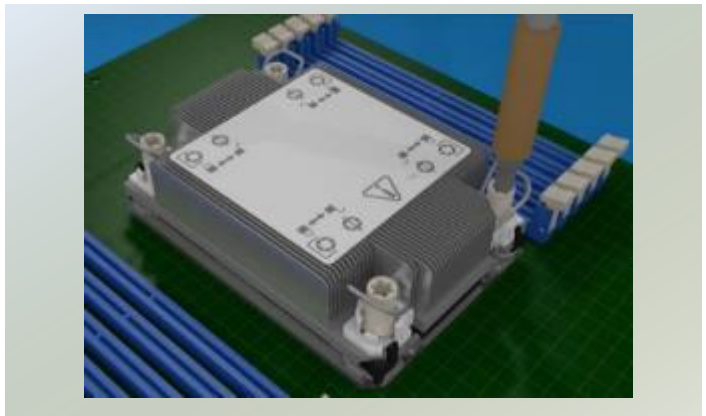
5. Set all four Anti-Tilt wires into the locked position (outward position.)



6. Next is to tighten the nuts on the heatsink using a diagonal pattern tightening sequence. Diagonal sequence is regardless of starting point. Primary step is Second nut driven is in diagonally opposite corner to the First nut.



7. Tighten all nuts on heatsink using a torque driver with a T30 bit to 8 in-lbf  $\pm$  10%.





## Installing System Memory

The motherboard supports 16 memory slots for DDR5 registered DIMM.

### Supported System Memory Summary

Total Slots	16 (8 slots per processor)
Number of Channels	8 channels per each processor
Memory Size	Maximum 1024GB RDIMM (64GB*16)
Memory Type	DDR5 REG DIMM
Minimum DIMM Installed	Each processor requires at least 1 memory modules to boot and run from.

### DIMM Population per CPU Requirements

1-DIMM : Either DIMM1/2/5/6 is workable

2-DIMMs : DIMM1 + DIMM7

or DIMM3 + DIMM5

4-DIMMs : DIMM1 + DIMM3 + DIMM5 + DIMM7

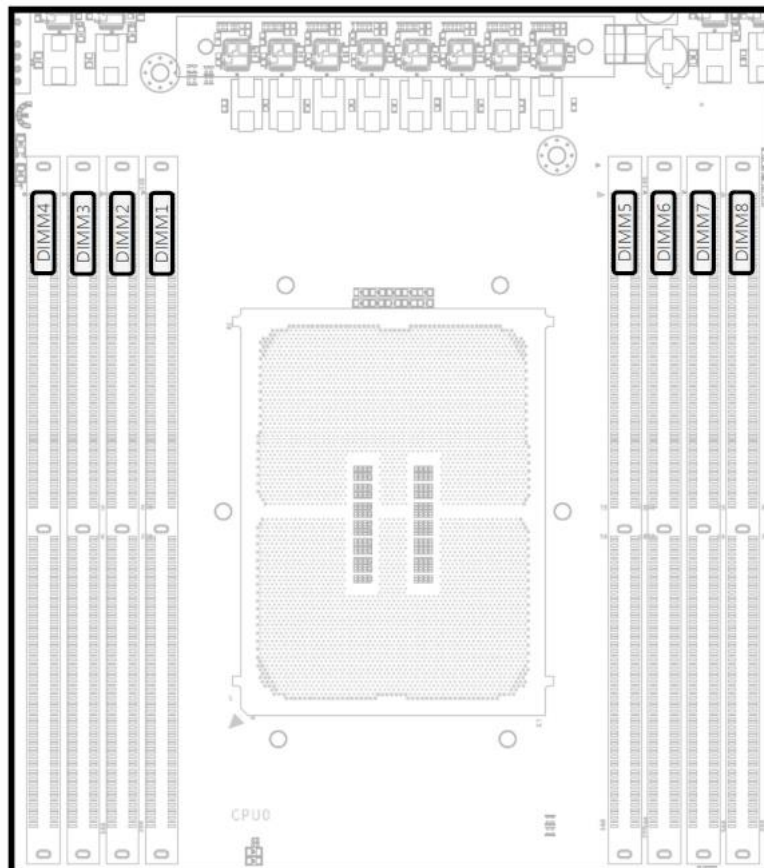
6-DIMMs : DIMM1 + DIMM3 + DIMM4 + DIMM5 + DIMM6 + DIMM7

or DIMM1 + DIMM2 + DIMM3 + DIMM5 + DIMM7 + DIMM8

or DIMM2 + DIMM3 + DIMM4 + DIMM5 + DIMM6 + DIMM8

or DIMM1 + DIMM2 + DIMM4 + DIMM6 + DIMM7 + DIMM8

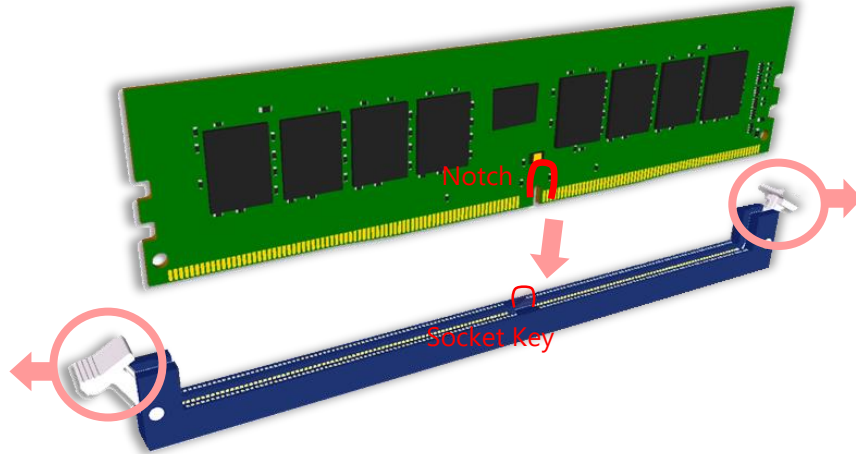
8-DIMMs : Full populated



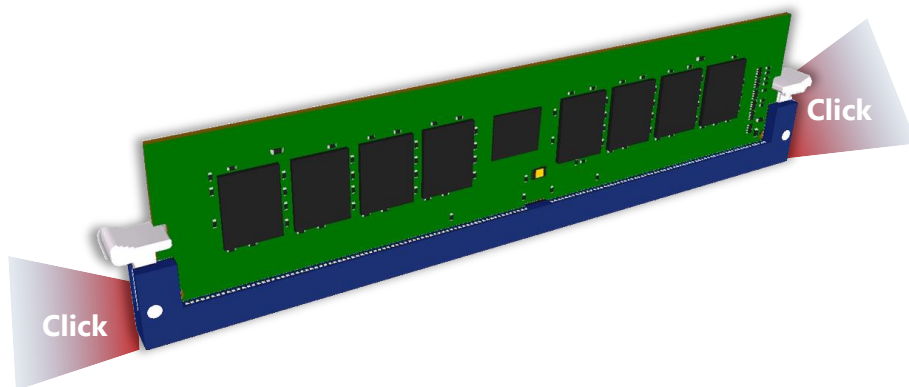
## Memory Module Installation Instructions

Please follow the steps below to install the DIMM memory modules.

1. Power off the system.
2. Pull open the DIMM slot latches.
3. Align the notch of the module with the socket key in the slot and carefully insert the card into the slot.



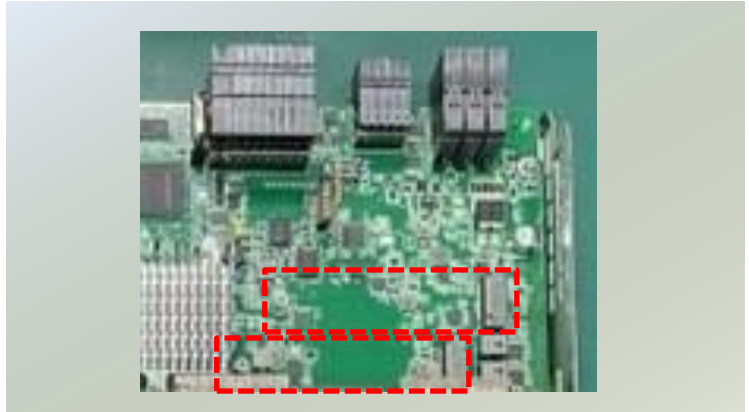
4. Push the module down into the slot until it is firmly seated. Press vertically on both corners of the card until it clicks into place.



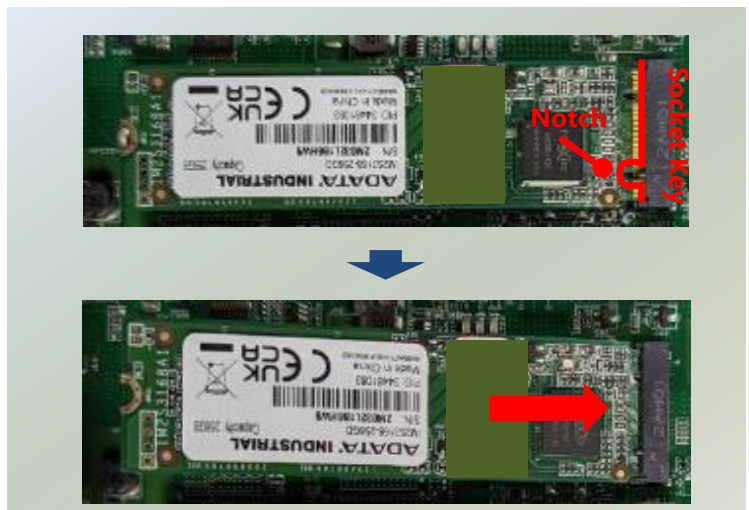
## Installing M.2 NVMe Storage Card (Optional)

The compute blade provides one M.2 socket for storage card expansion. Please follow the steps for installation.

1. Locate the M.2 socket on the compute blade.



2. Align the notch of the M.2 storage card with the socket key in the pin slot.
3. Insert the storage card at 30 degrees into the socket until it is fully seated.



4. Push down on the module and secure with one screw. Repeat steps if installing a second NVMe storage module.



## Replacing Cooling Fans

Cooling fans are wearable components and may have to be replaced eventually. Please follow the steps below to replace cooling fans.

1. Locate the cooling fans at the rear of CPU blades. The fans are covered by a bezel.
2. Rotate and loosen the captive screw that locks the bezel for the cooling fans.



3. Hold onto the loosened captive screw and remove the bezel.



4. Take the worn-out fan out of its original place, and insert a new fan into the system. Repeat same steps for additional worn-out fan.



## CHAPTER 3: SOFTWARE SETUP

### Remote Server Management

#### Overview

This document specifies the BMC firmware features of Lanner. The BMC firmware implements IPMI 2.0 based on ASPEED service processor. It performs all the BMC management tasks defined by IPMI 2.0.

In addition, Lanner's BMC firmware runs an embedded web-server for full configuration using Web UI, which has a low learning curve.

#### BMC Main Features

	Feature	Description
<b>IPMI 2.0 Standard Features</b>	System Interface Support	<ul style="list-style-type: none"> <li>• KCS (System Interface Support)</li> <li>• LAN (RMCP+)</li> </ul>
	IPMI 2.0 based Management	<ul style="list-style-type: none"> <li>• BMC stack with an IPMI 2.0 implementation</li> </ul>
	System Management	<ul style="list-style-type: none"> <li>• Sensor monitoring</li> <li>• System power management</li> <li>• Watchdog timer</li> <li>• Fan speed monitor and control</li> <li>• FRU information</li> </ul>
	Event Log	<ul style="list-style-type: none"> <li>• System Event Log (SEL)</li> </ul>
	Text Console Redirection: SOL	<ul style="list-style-type: none"> <li>• Support in IPMI stack for SOL to remotely access BIOS and text console before OS booting</li> </ul>
	User Management	<ul style="list-style-type: none"> <li>• IPMI based user management</li> <li>• Multiple user permission level</li> </ul>
<b>Non-IPMI Functions</b>	Web User Interfaces	<ul style="list-style-type: none"> <li>• BMC management via web user interface</li> </ul>
	User Authorization	<ul style="list-style-type: none"> <li>• Integrated KVM and Virtual Media</li> </ul>
	Security	<ul style="list-style-type: none"> <li>• RADIUS support</li> <li>• LDAP support</li> <li>• SSL and HTTPS support</li> </ul>
	Maintenance	<ul style="list-style-type: none"> <li>• Auto-sync time with NTP server</li> <li>• Remote firmware update by Web UI or Linux tool</li> </ul>



## **BMC Firmware Functional Description**

### **System health monitoring**

The BMC implements system sensor monitoring feature. It could monitor voltage, temperature, and current of critical components.

### **System Power Management**

The BMC implements chassis power and resets functions for system administrators to control and manage the system power behavior. These functions can be activated by sending the IPMI 2.0 compatible chassis commands to the BMC over messaging interfaces. The following list summarizes the supported functions.

- Chassis power on
- Chassis power off
- Chassis power cycle
- Chassis power reset
- Chassis power soft
- Server's power status report

### **Watchdog Timer**

The BMC provides an IPMI 2.0 compatible watchdog timer which can prevent the system from system hanging.

### **Fan Speed Control**

BMC is in charge of fan speed control. The fan speed can be modified by varying the duty cycle of PWM signal. The fan speed control algorithm mainly refers to the readings of on-board temperature sensors.

### **Field Replaceable Unit (FRU)**

The BMC implements an interface for logical FRU inventory devices as specified in IPMI 2.0 specification. This functionality provides commands for system administrators to access and management the FRU inventory information.

### **System Event Log (SEL)**

A non-volatile storage space is allocated to store system events for system status tracking.

## Serial over LAN (SOL)

IPMI 2.0 SOL is implemented to redirect the system serial controller traffic over an IPMI session. System administrators are able to establish a SOL connection with a standard IPMI client, like IPMITOOL, to remotely interact with serial text-based interfaces such as OS command-line and serial redirected BIOS interfaces.

## User Management

The BMC supports 9 IDs for IPMI user accounts. The maximum length of the username and password are 16 and 20 respectively, and the possible privilege levels are Callback, User, Operator, and Administrator. Moreover, the account creator is allowed to enable/disable the user account at any time. If not specified, the default user accounts are listed follows:

User Name	Password	User Access	Characteristics
admin	admin	Enabled	Password can be changed

## Keyboard, Video, Mouse (KVM) Redirection

- The BMC provides keyboard, video, and mouse (KVM) redirection over LAN. This application is available remotely from the embedded web server.
- Support video recording, recorded videos to be downloaded & playable.

## Virtual Media Redirection

- The BMC provides remote virtual CD, HD and FD redirection. CD image could be mounted directly in KVM window. HD, FD could be mounted by NFS and SAMBA.
- Efficient USB 2.0 based CD/DVD redirection with a typical speed of 20XCD.
- Completely secured transmission.

## IPMI Commands Support List

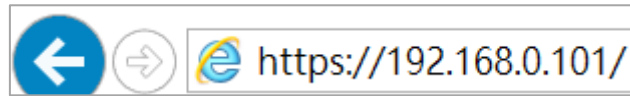
COMMANDS	NETFN	CMD
<b>IPM Device “Global” Commands</b>		
Get Device ID	APP (06h)	01h
Cold Reset	APP (06h)	02h
Warm Reset	APP (06h)	03h
Get Device GUID	APP (06h)	08h
<b>BMC Watchdog Timer Commands</b>		
Reset Watchdog Timer	APP (06h)	22h
Set Watchdog Timer	APP (06h)	24h
Get Watchdog Timer	APP (06h)	25h
<b>BMC Device and Messaging Commands</b>		
Get System GUID	APP (06h)	37h
Get Channel Info	APP (06h)	42h
Set User Access	APP (06h)	43h
Get User Access	APP (06h)	44h
Set User Name	APP (06h)	45h
Get User Name	APP (06h)	46h
Set User Password	APP (06h)	47h
<b>Chassis Device Commands</b>		
Get Chassis Capabilities	Chassis (00h)	00h
Get Chassis Status	Chassis (00h)	01h
Chassis Control	Chassis (00h)	02h
Chassis Reset	Chassis (00h)	03h
<b>Sensor Device Commands</b>		
Get Sensor Reading Factors	S/E (04h)	23h
Get Sensor Hysteresis	S/E (04h)	25h
Get Sensor Threshold	S/E (04h)	27h
Get Sensor Event Enable	S/E (04h)	29h
Get Sensor Event Status	S/E (04h)	2Bh
Get Sensor Reading	S/E (04h)	2Dh
Get Sensor Type	S/E (04h)	2Fh
<b>FRU Device Commands</b>		
Get FRU Inventory Area Info	Storage (0Ah)	10h
Read FRU Data	Storage (0Ah)	11h
Write FRU Data	Storage (0Ah)	12h
<b>SDR Device Commands</b>		
Get SDR Repository Info	Storage (0Ah)	20h
Get SDR Repository Allocation Info	Storage (0Ah)	21h
Get SDR	Storage (0Ah)	23h
Get SDR Repository Time	Storage (0Ah)	28h
<b>SEL Device Commands</b>		
Get SEL Info	Storage (0Ah)	40h
Get SEL Allocation Info	Storage (0Ah)	41h
Get SEL Entry	Storage (0Ah)	43h



Delete SEL Entry	Storage (0Ah)	46h
Clear SEL	Storage (0Ah)	47h
Get SEL Time	Storage (0Ah)	48h
Set SEL Time	Storage (0Ah)	49h
Get SEL Time UTC Offset	Storage (0Ah)	5Ch
Set SEL Time UTC Offset	Storage (0Ah)	5Dh
<b>LAN Device Commands</b>		
Set LAN Configuration Parameters	Transport (0Ch)	01h
Get LAN Configuration Parameters	Transport (0Ch)	02h
<b>Serial/Modem Device Commands</b>		
Set User Callback Options	Transport (0Ch)	1Ah
Get User Callback Options	Transport (0Ch)	1Bh
SOL Activating	Transport (0Ch)	20h
Set SOL Configuration Parameters	Transport (0Ch)	21h
Get SOL Configuration Parameters	Transport (0Ch)	22h

## Using BMC Web UI

In the address bar of your Internet browser, input the IP address of the remote server to access the BMC interface of that server.



Initial access of BMC prompts you to enter username and password. A screenshot of the login screen is given below:

A screenshot of a login page. At the top is a green header bar with the text 'Engineering Sample' in white. Below the header is a light gray rectangular area containing two white input fields. The first field is labeled 'Username' and the second is labeled 'Password'. Below these fields is a green rectangular button with the text 'Sign in' in white.

*Login Page*

- ▶ **Username:** Enter your username in this field.
- ▶ **Password:** Enter your password in this field.
- ▶ **Sign me in:** After entering the required credentials, click the **Sign me in** to log in to Web UI.



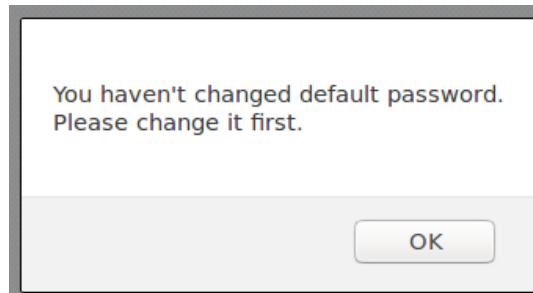
**Note:**

- (1) If not specified, the default IP to access BMC is **https://192.168.0.101/**
- (2) Please use **https** to access Web UI.

## Default User Name and Password

- **Username:** admin
- **Password:** admin

The default username and password are in lower-case characters. When you log in using the default username and password, you will get full administrative rights, and it will ask you to change the default password once you log in. The dialog is shown below:



*Change the default password - Dialog*

Clicking **OK** will take you to the User Management Configuration page to set a password.

*Change the default password – Set password*



### Note

Duplicate usernames shouldn't exist across various authentication methods like LDAP, RADIUS or IPMI since the privilege of one Authentication method is overwritten by another authentication method during logging in, and hence the correct privilege cannot be returned properly.

## Web UI Layout

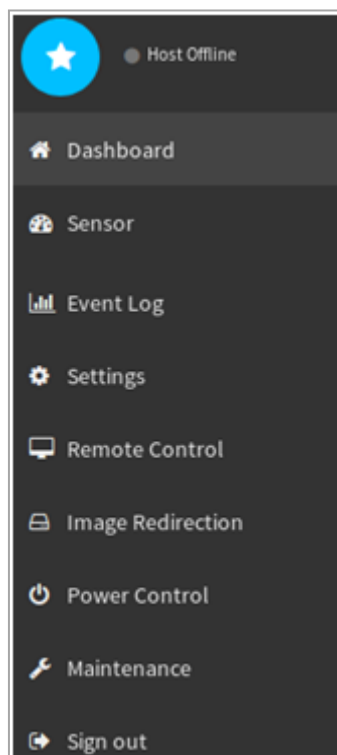
The BMC Web UI consists of various menu items:

### Menu Bar

The menu bar displays the following:

- ▶ Dashboard
- ▶ Sensor
- ▶ Event Log
- ▶ Settings
- ▶ Remote Control
- ▶ Image Redirection
- ▶ Power Control
- ▶ Maintenance
- ▶ Sign out

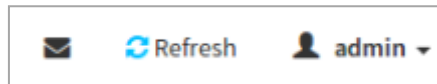
A screenshot of the menu bar is shown below:



*Menu Bar*

## Quick Button and Logged-in User

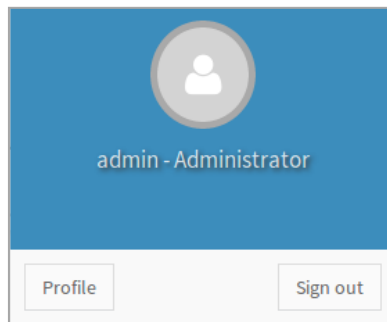
The user information and quick buttons are located at the top right of the Web UI.



*User Information*




**Logged-in user information:** Click the icon  **admin** ▾ to view the logged-in user information.

A screenshot of the logged-in user information is shown below:



*Logged-in User Information*

The logged-in user information shows the logged-in user's username, privilege, with the quick buttons allowing you to perform the following functions:


- ▶ **Notification:** Click the icon  to view the notification messages.
- ▶ **Refresh:** Click the icon  **Refresh** to reload the current page.
- ▶ **Sign out:** Click the icon  to log out of the Web UI.

## Logged-in user and its privilege level

This option shows the logged-in username and privilege. There are four kinds of privileges:

- ▶ **User:** Only valid commands are allowed.
- ▶ **Operator:** All BMC commands are allowed except for the configuration commands that can change the behavior of the out-of-hand interfaces.
- ▶ **Administrator:** All BMC commands are allowed.
- ▶ **No Access:** Login access denied.

## Help

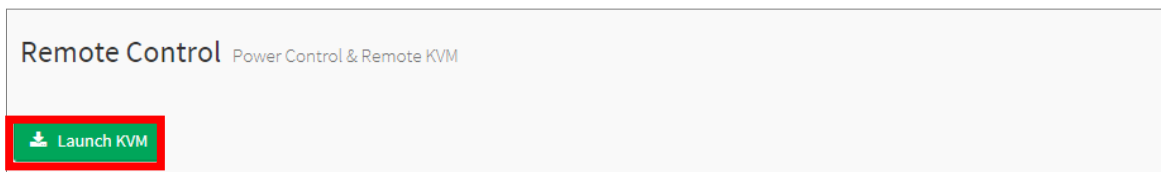
**Help:** The **Help** icon  is located at the top right of each page in Web UI. Click this help icon to view more detailed field descriptions.

## Installing Operating System

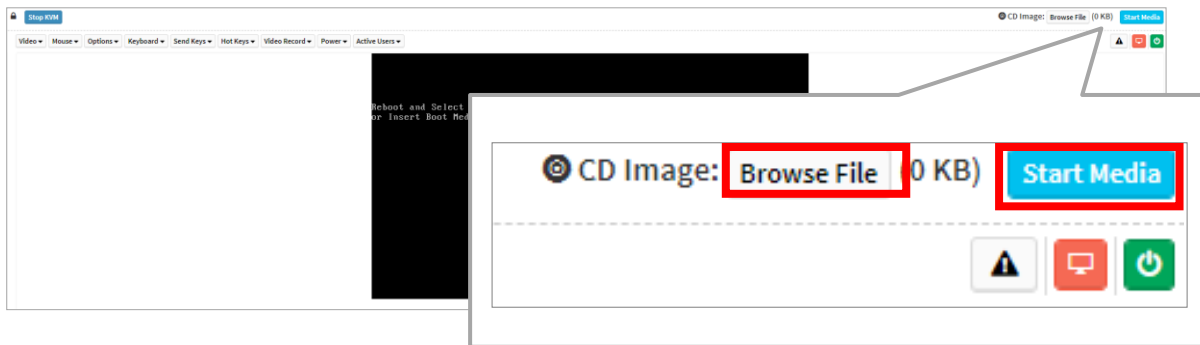
If your system is shipped without an operating system, install the supported operating system using the following resources.

### Via IPMI Interface

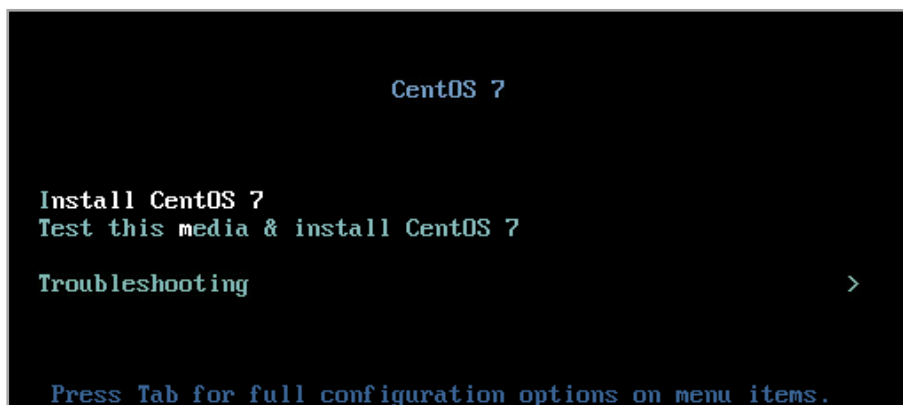
1. Download the ISO image and make a bootable DVD from it.
2. Connect a DVD player or other type of readers (floppy disk, or a drive) to a computer.
3. Connect to your target system from this computer. (Refer to Remote Server Management for instructions on how to access the target system through Web UI).
4. After entering the main screen, click "**Launch KVM**" to open the Remote Control KVM page:



5. Click "**Browse File**" to select **CD Image**.



6. Click "**Start Media**" to redirect the selected CD image file to the Host.
7. The installation process will automatically start. Please follow the onscreen instruction to complete the rest of the steps and restart the target system manually.



## Via Display Port Using USB Keyboard/Mouse Interface

1. Download the ISO image and save in a USB flash drive.
2. Connect USB flash drive to the compute blade USB port.



3. Take the VGA cable, included in the accessory box, and connect to the VGA port on the compute blade.



4. Connect the other end of the VGA cable to your monitor.
5. Power up and turn on the compute blade.



6. Now, you can start installing the Operating System.

## Via SOL

1. Download the ISO image and save in a USB flash drive.
2. Connect USB flash drive to the compute blade USB port.



3. Connect to SOL via ipmitool command.
  - SOL usage:  
`ipmitool -I lanplus -U [Username] -P [password] -H [compute blade BMC IP] sol [activate/deactivate]`
  - Sample command to access compute blade 1 SOL:  
`ipmitool -I lanplus -U admin -P admin -H 192.168.0.101 sol activate`
  - SOL Command details can be found under "man ipmitool."
4. Power up and turn on the compute blade.



5. Start installation with console serial setup. Refer to HTCA QSG for console serial setup installation.



# APPENDIX A: TERMS AND CONDITIONS

## Warranty Policy

1. All products are under warranty against defects in materials and workmanship for a period of one year from the date of purchase.
2. The buyer will bear the return freight charges for goods returned for repair within the warranty period; whereas the manufacturer will bear the after service freight charges for goods returned to the user.
3. The buyer will pay for the repair (for replaced components plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on "RMA Service," RMA goods will be returned at customer's expense.
5. The following conditions are excluded from this warranty:
  - ▶ Improper or inadequate maintenance by the customer
  - ▶ Unauthorized modification, misuse, or reversed engineering of the product
  - ▶ Operation outside of the environmental specifications for the product.

## RMA Service

### Requesting an RMA#

1. To obtain an RMA number, simply fill out and fax the "RMA Request Form" to your supplier.
2. The customer is required to fill out the problem code as listed. If your problem is not among the codes listed, please write the symptom description in the remarks box.
3. Ship the defective unit(s) on freight prepaid terms. Use the original packing materials when possible.
4. Mark the RMA# clearly on the box.



#### Note

Customer is responsible for shipping damage(s) resulting from inadequate/loose packing of the defective unit(s). All RMA# are valid for 30 days only; RMA goods received after the effective RMA# period will be rejected. Your computer will reboot during restart in order to change State of the Device.

## RMA Service Request Form

When requesting RMA service, please fill out the following form. Without this form enclosed, your RMA cannot be processed.

<b>RMA No:</b>		Reasons to Return: <input type="checkbox"/> Repair(Please include failure details)	
		<input type="checkbox"/> Testing Purpose	
Company:		Contact Person:	
Phone No.		Purchased Date:	
Fax No.:		Applied Date:	
Return Shipping Address: _____			
Shipping by: <input type="checkbox"/> Air Freight <input type="checkbox"/> Sea <input type="checkbox"/> Express _____			
<input type="checkbox"/> Others: _____			
Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

**\*Problem Code:**

01: D.O.A.	07: BIOS Problem	13: SCSI	19: DIO
02: Second Time R.M.A.	08: Keyboard Controller Fail	14: LPT Port	20: Buzzer
03: CMOS Data Lost	09: Cache RMA Problem	15: PS2	21: Shut Down
04: FDC Fail	10: Memory Socket Bad	16: LAN	22: Panel Fail
05: HDC Fail	11: Hang Up Software	17: COM Port	23: CRT Fail
06: Bad Slot	12: Out Look Damage	18: Watchdog Timer	24: Others (Pls specify)

***Request Party***

***Confirmed By Supplier***

\_\_\_\_\_  
Authorized Signature / Date

\_\_\_\_\_  
Authorized Signature / Date