

Pro ET900A X9

WORKSTATION SYSTEM

USER GUIDE

Copyright © 2024 ASUSTeK COMPUTER INC. All Rights Reserved.

No part of this manual, including the products and software described in it, may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language in any form or by any means, except documentation kept by the purchaser for backup purposes, without the express written permission of ASUSTeK COMPUTER INC. ("ASUS").

ASUS provides this manual "as is" without warranty of any kind, either express or implied, including but not limited to the implied warranties or conditions of merchantability or fitness for a particular purpose. In no event shall ASUS, its directors, officers, employees, or agents be liable for any indirect, special, incidental, or consequential damages (including damages for loss of profits, loss of business, loss of use or data, interruption of business and the like), even if ASUS has been advised of the possibility of such damages arising from any defect or error in this manual or product.

Specifications and information contained in this manual are furnished for informational use only, and are subject to change at any time without notice, and should not be construed as a commitment by ASUS. ASUS assumes no responsibility or liability for any errors or inaccuracies that may appear in this manual, including the products and software described in it.

Product warranty or service will not be extended if: (1) the product is repaired, modified or altered, unless such repair, modification or alteration is authorized in writing by ASUS; or (2) the serial number of the product is defaced or missing.

Products and corporate names appearing in this manual may or may not be registered trademarks or copyrights of their respective companies, and are used only for identification or explanation and to the owners' benefit, without intent to infringe.

Contents

- Safety information..... vi
 - Electrical Safetyvi
 - Operation Safetyvi
- About this guide ix

Chapter 1: Product Introduction

- 1.1 System package contents 1-2
- 1.2 Serial number label..... 1-2
- 1.3 Specifications summary..... 1-3
- 1.4 Front panel features..... 1-6
- 1.5 Rear panel features..... 1-7
- 1.6 Internal features 1-8
- 1.7 LED information 1-9
 - 1.7.1 Front panel LEDs 1-9
 - 1.7.2 LAN LEDs 1-9
- 1.8 USB4® monitor connection 1-10

Chapter 2: Hardware Setup

- 2.1 Repair tools 2-2
- 2.2 Side covers 2-2
 - 2.2.1 Removing the side cover..... 2-2
 - 2.2.2 Installing the side cover..... 2-2
- 2.3 GPU support bracket..... 2-3
 - 2.3.1 Removing the GPU support bracket 2-3
 - 2.3.2 Installing the GPU support bracket 2-4
- 2.4 GPU fan 2-5
 - 2.4.1 Removing the GPU fan 2-5
 - 2.4.2 Installing the GPU fan 2-5
- 2.5 GPU fan bar 2-6
 - 2.5.1 Removing the GPU fan bar 2-6
 - 2.5.2 Installing the GPU fan bar 2-7

Contents

2.6	Central processing unit (CPU)	2-8
2.6.1	Installing the CPU and heatsink.....	2-9
2.7	Air duct	2-10
2.7.1	Removing the air duct.....	2-10
2.7.2	Installing the air duct.....	2-10
2.8	System memory	2-11
2.8.1	Recommended memory configurations.....	2-11
2.8.2	Installing a DIMM.....	2-12
2.8.3	Removing a DIMM.....	2-12
2.9	Storage bays	2-13
2.10	Expansion slots	2-15
2.10.1	Installing an expansion card or GPU.....	2-16
2.11	M.2 SSD modules	2-18
2.12	Motherboard	2-24
2.12.1	Removing the motherboard.....	2-24
2.12.2	Installing the motherboard.....	2-25
2.13	CMOS battery	2-26
2.14	Motherboard rear and audio connections	2-27
2.14.1	Rear panel connectors.....	2-27
2.14.2	Audio connectors.....	2-28

Chapter 3: Motherboard Information

3.1	Motherboard layout	3-2
3.2	Onboard buttons and switches	3-4
3.3	Jumpers	3-6
3.4	Onboard LEDs	3-8
3.5	Internal connectors	3-10

Contents

Chapter 4: Software Configuration

4.1	System recovery and removing personal files.....	4-2
4.2	Putting your device into the lowest power mode	4-2

Chapter 5: BIOS Setup

5.1	About the BIOS.....	5-2
5.2	BIOS setup program	5-3
5.3	USB BIOS FlashBack™	5-4
5.4	ASUS EzFlash Utility.....	5-5
5.5	ASUS CrashFree BIOS 3 utility	5-6

Chapter 6: RAID Configuration

6.1	RAID configurations	6-2
-----	---------------------------	-----

Appendix

Block diagram	A-2
Exploded view	A-3
Q-Code table.....	A-4
Notices	A-8
Warranty.....	A-17
Service and Support	A-19

Safety information

Electrical Safety

- Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.
- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing any additional devices to or from the system, contact a qualified service technician or your dealer. Ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you service.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your dealer.

Operation Safety

- Servicing of this product or units is to be performed by trained service personnel only.
- Before operating the server, carefully read all the manuals included with the product.
- Before using this product, make sure all cables are correctly connected and the power cables are not damaged. If any damage is detected, contact your dealer as soon as possible.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Place this product on a stable surface.
- This product is only suitable for use on concrete or other non-combustible surfaces.



This product is equipped with a three-wire power cable and plug for the user's safety. Use the power cable with a properly grounded electrical outlet to avoid electrical shock.

Button/Coin Batteries Safety Information

1. Remove and immediately recycle or dispose of used batteries according to local regulations and keep out of reach of children. Do not incinerate or dispose of batteries in household trash.
2. If ingested or inserted inside any part of the body, call a local poison control center for treatment information. Even used batteries may cause serious injury or death.
3. This product uses CR2032 type batteries with a nominal voltage of 3V.
4. Do not attempt to recharge non-rechargeable batteries.
5. Do not forcibly discharge, recharge, disassemble, heat above the battery manufacturer's specified temperature rating, or incinerate. Doing so may result in injury or chemical burns caused by venting, leakage, or explosion.
6. When installing batteries, ensure that the polarity (+ and -) is correct.
7. Do not mix old and new batteries, or batteries of different brands or types (such as alkaline, carbon-zinc, or rechargeable batteries).
8. Remove and immediately recycle or dispose of batteries from equipment not used for an extended period of time according to local regulations.
9. Always completely secure the battery compartment. If the battery compartment cannot be securely closed, stop using the product, remove the batteries, and keep the batteries out of reach of children.

 WARNING	
• INGESTION HAZARD: This product contains a button cell or coin battery. • DEATH or serious injury can occur if ingested. • A swallowed button cell or coin battery can cause Internal Chemical Burns in as little as 2 hours. • KEEP new and used batteries OUT OF REACH of CHILDREN. • Seek immediate medical attention if a battery is suspected to be swallowed or inserted inside any part of the body.	

Restricted Access Area

This equipment should only be installed in a Restricted Access Area where both these conditions apply:

- Access can only be gained by skilled or instructed persons who have been instructed about the reasons for the restrictions applied to the area and about any precautions that shall be taken; and
- Access is through the use of a TOOL or lock and key, or other means of security, and is controlled by the authority responsible for the area.

Heavy System

CAUTION! This system is heavy. Ask for assistance when moving or carrying the system.

Lithium-Ion Battery Warning

CAUTION! Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.



About this guide

Audience

This user guide is intended for system integrators, and experienced users with at least basic knowledge of configuring a server.

Contents

This guide contains the following parts:

1. Chapter 1: Product Introduction

This chapter describes the general features of the server, including sections on front panel and rear panel specifications.

2. Chapter 2: Hardware Setup

This chapter lists the hardware setup procedures that you have to perform when installing or removing system components.

3. Chapter 3: Motherboard Information

This chapter includes the motherboard layout and brief descriptions of the jumpers and internal connectors.

4. Chapter 4: Software Configuration

This chapter provides instructions for changing software configuration settings.

5. Chapter 5: BIOS Setup

This chapter provides information on the BIOS Setup menus and describes the BIOS parameters.

6. Chapter 6: RAID Configuration

This chapter provides instructions for setting up, creating, and configuring RAID sets using the available utilities.

Where to find more information

Refer to the following sources for additional information and for product and software updates.

1. ASUS website

The ASUS website (www.asus.com) provides updated information on ASUS hardware and software products.

2. Optional documentation

Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

3. Driver and Utilities FAQ

Please visit <https://www.asus.com/support> for more information on downloading and installing drivers and utilities for your workstation.



4. RAID Configuration Guide

Please visit <https://www.asus.com/support> for more information on the RAID Configuration Guide.



5. BIOS FlashBack™ Feature

Please visit <https://www.asus.com/support> for more information on the BIOS FlashBack™ Feature.



Conventions used in this guide

To ensure that you perform certain tasks properly, take note of the following symbols used throughout this manual.



DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task.



CAUTION: Information to prevent damage to the components when trying to complete a task.



IMPORTANT: Instructions that you **MUST** follow to complete a task.



NOTE: Tips and additional information to help you complete a task.

Typography

Bold text

Indicates a menu or an item to select.

Italics

Used to emphasize a word or a phrase.

<Key>

Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key.

Example: <Enter> means that you must press the Enter or Return key.

<Key1> + <Key2> + <Key3>

If you must press two or more keys simultaneously, the key names are linked with a plus sign (+).

Example: <Ctrl> + <Alt> +

Command

Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets.

Example: At the command prompt, type the command line:

format A: /S

References

Refer to the following sources for additional information, and for product and software updates.

ASUS websites

The ASUS websites provide updated information for all ASUS hardware and software products. Visit <https://www.asus.com> for more information.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Product Introduction

1

This chapter describes the general features of the server, including sections on front panel and rear panel specifications.

1.1 System package contents

Check your system package for the following items.

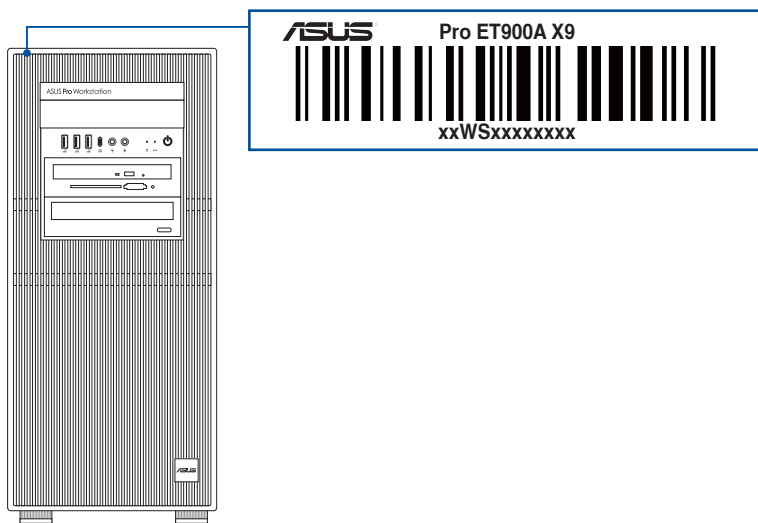
Model name	Pro ET900A X9
Accessories	1 x Support DVD 1 x AC power cable
Optional items	Smart card reader Operating system Antivirus CD pack DVD-RW



If any of the above items is damaged or missing, contact your retailer.

1.2 Serial number label

Before requesting support from the ASUS Technical Support team, you must take note of the product's serial number containing 12 characters such as xxWSxxxxxxx shown as the figure below. With the correct serial number of the product, ASUS Technical Support team members can then offer a quicker and satisfying solution to your problems.



1.3 Specifications summary

Processor / System bus		1 x sTR5 socket AMD RYZEN™ Threadripper™ PRO 7000 WX-series processors
Core logic		AMD WRX90 chipset
Memory	Total slots	8 (8-channel)
	Memory type	DDR5 5600/4800 MHz ECC RDIMM * Memory frequency support depends on the CPU installed
	Memory size	64GB, 48GB, 32GB, 24GB, 16GB, 8GB ECC RDIMM * Refer to product QVL for more information ** Actual memory frequency may vary depending on CPU and memory module. Refer to AMD documentation for more details on the memory types supported by each CPU.
Expansion slots	Total PCIe slots	7
	Slot type	Slot 1: PCIe x16 (Gen5 x16 link) Slot 2: PCIe x16 (Gen5 x16 link) Slot 3: PCIe x16 (Gen5 x16 link) Slot 4: PCIe x16 (Gen5 x16 link) Slot 5: PCIe x16 (Gen5 x16 link) Slot 6: PCIe x16 (Gen5 x8 link) Slot 7: PCIe x16 (Gen5 x16 link)
Storage	Storage controllers	AMD RYZEN™ Threadripper PRO 7000 WX-Series Processors: M.2_1 slot (Key M, type 2242/2260/2280/22110, supports PCIe 5.0 x4 mode) M.2_2 slot (Key M, type 2242/2260/2280/22110, supports PCIe 5.0 x4 mode) M.2_3 slot (Key M, type 2242/2260/2280, supports PCIe 5.0 x4 mode) M.2_4 slot (Key M, type 2242/2260/2280, supports PCIe 5.0 x4 mode) AMD WRX90 chipset: SlimSAS_1 slot (supports PCIe 4.0 x4 mode NVMe devices) SlimSAS_2 slot (supports PCIe 4.0 x4 mode NVMe devices) * AMD RAIDxpert2 technology supports both PCIe RAID 0/1/5/10 and SATA RAID 0/1/5/10
	Storage bays	4 x Internal 3.5"/2.5" storage bays
	Auxiliary storage	1 x 5.25" media bay for optional DVD-RW Slim optical drive and card reader

(continued on the next page)

Networking		1x Intel® Dual 10Gb Ethernet
Graphics	Ports	2 x USB4® 40Gbps Type-C® ports on the rear panel with support for USB Type-C® display output¹ ¹ Supports max. 8K@60Hz as specified in DisplayPort 1.4. Output from USB4® Type-C® ports each require a Mini DisplayPort IN to DisplayPort adapter cable. For more information, refer to the USB4® monitor connection section. ² This workstation does not include integrated graphics capability. A discrete graphics card is required for display output. ³ To ensure optimal stability, an ambient temperature of under 25°C is recommended during heavy workloads.
	Supported graphics cards	Up to four 2-slot NVIDIA® graphics cards including, but not limited to: NVIDIA® RTX 2000 ADA 16GB NVIDIA® RTX 6000 ADA 48GB NVIDIA® RTX A2000 12GB NVIDIA® RTX A4000 16GB
Front I/O		1 x USB 20Gbps Type-C® port (15W, 5Vdc/3A) 2 x USB 5Gbps ports 1 x USB 2.0 port 1 x Headphone port 1 x Microphone port
Rear I/O		2 x USB4® 40Gbps Type-C® ports (15W, 5Vdc/3A) 6 x USB 10Gbps ports 1 x USB 2.0 port 2 x Mini DisplayPort (input) 2 x RJ-45 LAN port 1 x Headphone port 1 x Microphone port
Internal I/O connectors		1 x COM port header 1 x USB 2.0 header for optional card reader or IPMI expansion card 1 x Thermal sensor header 1 x TPM-SPI header (14-1 pin)

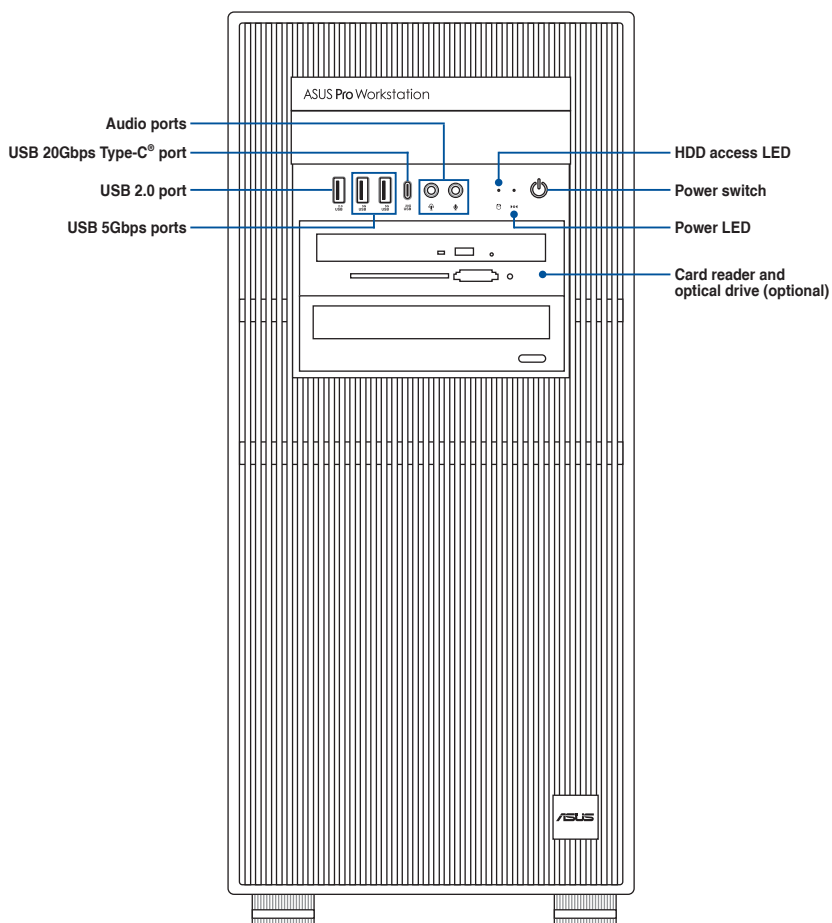
(continued on the next page)

Switch/LEDs	Front: 1 x Power switch/LED 1 x HDD access LED Rear: 1 x BIOS FlashBack™ button 1 x Clear CMOS button Internal: 1 x Q-Code LED 4 x Q-LEDs (CPU; DRAM; VGA; BOOT) 1 x FlexKey button 1 x LN2 mode button 1 x ReTry button 1 x Safe boot button 1 x Start button
Management solution	ASUS Control Center Express
OS support	Windows 11 Pro, Windows 11 Pro for Workstations
BIOS CAP filename	A5554.CAP
Regulatory compliance	BSMI, CE, FCC, ENERGY STAR®
Dimension (HH x WW x DD)	535mm x 243mm x 582mm
	21" x 9.5" x 22.9"
Net weight	31.490kg
Gross weight	37.570kg
Power supply and rating	1650W 80PLUS Platinum single power supply (200-240Vac, 10A, 50-60Hz)
	2000W 80PLUS Gold single power supply* (100-240Vac, 15-12A, 60-50Hz)
Environment	* 2000W@200-240Vac, 1500W@115-200Vac, 1200W@100-115Vac
	Operating temperature: 10°C ~ 35°C
	Non-operating temperature: -40°C ~ 70°C
	Non-operating humidity: 20% ~ 90% (Non-condensing)

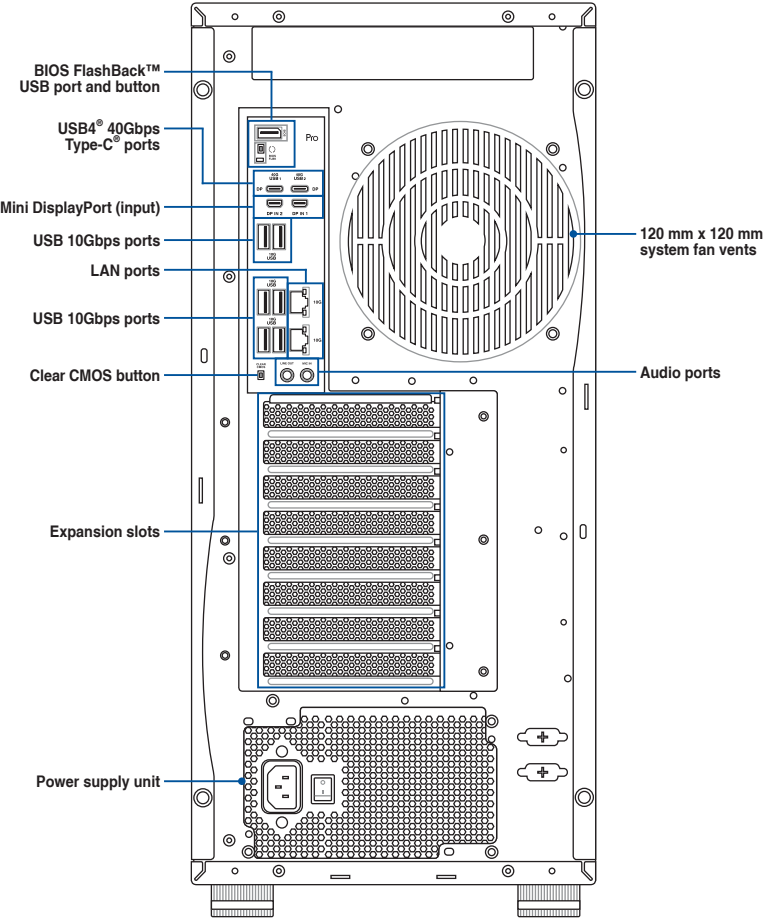


Specifications are subject to change without notice.

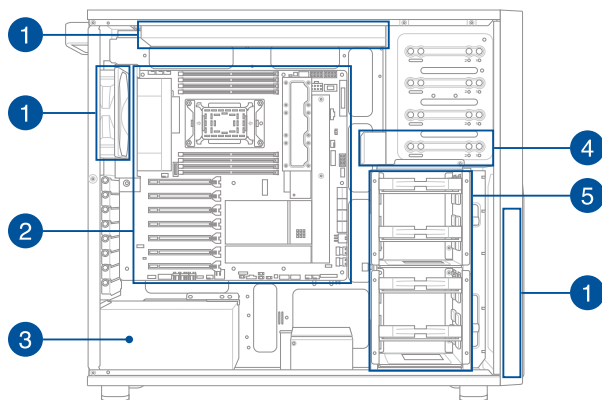
1.4 Front panel features



1.5 Rear panel features



1.6 Internal features



1. System fans
2. Motherboard
3. Power supply unit
4. Card reader or optical drive (optional)
5. 4 x 2.5"/3.5" storage bays



Turn off the system power and detach the power supply before removing or replacing any system component.

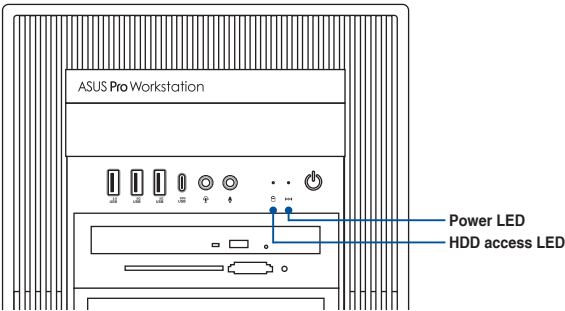


The system does not include a floppy disk drive. If you need to use a floppy disk, connect the USB floppy disk drive to any of the USB ports on the front or rear panel.

WARNING
HAZARDOUS MOVING PARTS
KEEP FINGERS AND OTHER BODY PARTS AWAY

1.7 LED information

1.7.1 Front panel LEDs

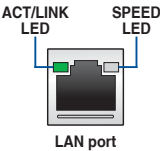


LED	Icon	Display status	Description
HDD Access LED		Off	No activity
		Blinking	Storage device reading or writing data
Power LED		Off	System is powered off
		Blinking	System is in sleep mode
		On	System is powered on

1.7.2 LAN LEDs

Intel® Dual 10Gb Ethernet ports LED indications

Activity/Link LED		Speed LED	
Status	Description	Status	Description
OFF	No link	OFF	100 Mbps
GREEN	Linked	ORANGE	5 Gbps/2.5 Gbps/1 Gbps
BLINKING	Data activity	GREEN	10 Gbps



1.8 USB4[®] monitor connection

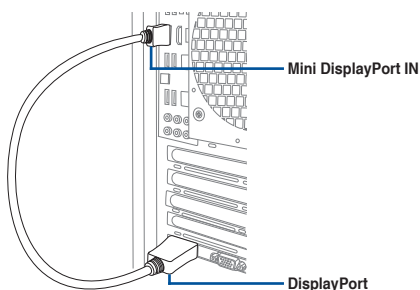


- Refer to the **USB4[®] and Mini DisplayPort configuration** section on the next page for more details on the configurations available using the Mini DisplayPort IN and USB4[®] Type-C[®] ports.
- Refer to the **Rear panel features** section for the location of the Mini DisplayPort IN port.

1. Connect a Mini DisplayPort cable* to the DisplayPort on a discrete graphics card and to the Mini DisplayPort IN port on the motherboard.



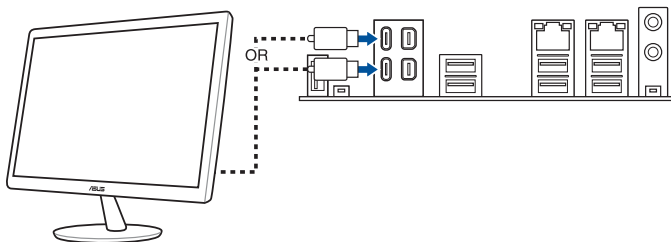
- The Mini DisplayPort should be purchased separately.



2. Connect a video capable USB Type-C[®] cable to a USB4[®] Type-C[®] port (USB4[®] Type-C[®] 40G USB 1 port or USB4[®] Type-C[®] 40G USB 2 port) on the motherboard and to a monitor featuring a USB Type-C[®] port.



- The USB4[®] port features the ASMedia ASM4242 controller and can support up to 40 Gb/s when USB4[®] devices are connected.
- Ensure to use a video capable USB Type-C[®] when connecting a monitor featuring a USB Type-C[®] port.



USB4[®] Type-C[®] port can be connected to any USB Type-C[®] compatible display or device.

USB4® and Mini DisplayPort configuration



DO NOT hot swap the **USB4® Type-C® 40G USB 1 port**, and **USB4® Type-C® 40G USB 2 port** ports when your motherboard is powered on.

The tables below will list the USB4® and DisplayPort configurations.

Mini DisplayPort IN input to USB4® Type-C® output (Using a CPU without integrated graphics)

		USB4® Type-C® 40G USB 1 port	USB4® Type-C® 40G USB 2 port	Details
A	Mini DP-IN 1 no input	-	-	Not supported.
	Mini DP-IN 2 no input			
B	Mini DP-IN 1 no input	-	V	Only USB4® Type-C® 40G USB 2 port has output. Output standard depends on the external graphics card.
	Mini DP-IN 2 with input			
C	Mini DP-IN 1 with input	V	-	Only USB4® Type-C® 40G USB 1 port has output. Output standard depends on the external graphics card.
	Mini DP-IN 2 no input			
D	Mini DP-IN 1 with input	V	V	Both USB4® Type-C® 40G USB 1 and USB4® Type-C® 40G USB 2 ports have output and output standards depend on the external graphics card.
	Mini DP-IN 2 with input			

[illegible]

Hardware Setup

2

This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the jumpers and connectors on the motherboard.

2.1 Repair tools



PH1 screwdriver



T30 screwdriver

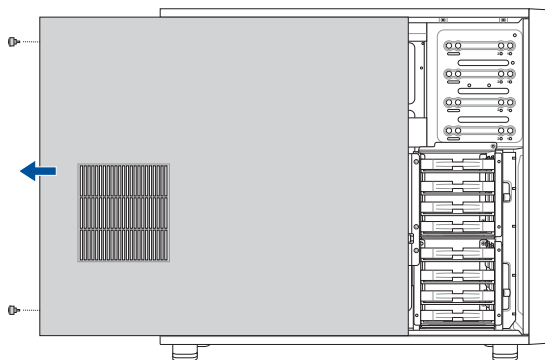
2.2 Side covers

2.2.1 Removing the side cover



- Ensure that you unplug the power cord before removing the side cover.
- Take extra care when removing the side cover. Keep your fingers from components inside the chassis that can cause injury, such as the CPU fan, rear fan, and other sharp-edged parts.
- The images of the system shown in this section are for reference purposes only and may not exactly match the model you purchase.

Remove the screws, then slide the side cover towards the rear of the chassis.



2.2.2 Installing the side cover

Align and install the side cover, then slide it towards the front of the chassis and secure it using the screws you removed earlier.

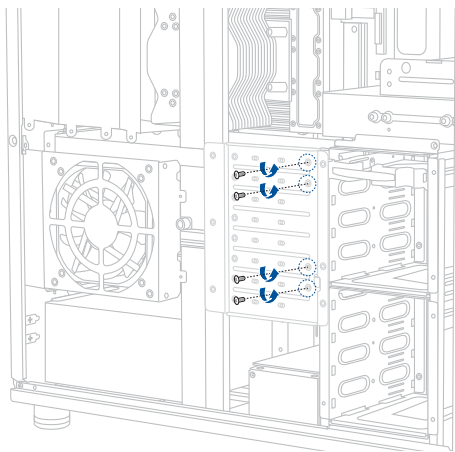
2.3 GPU support bracket

2.3.1 Removing the GPU support bracket

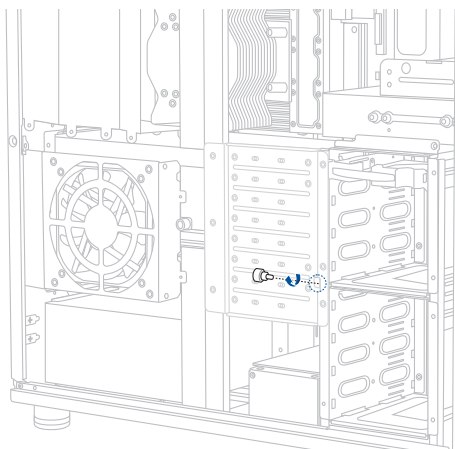
1. Remove the screws.



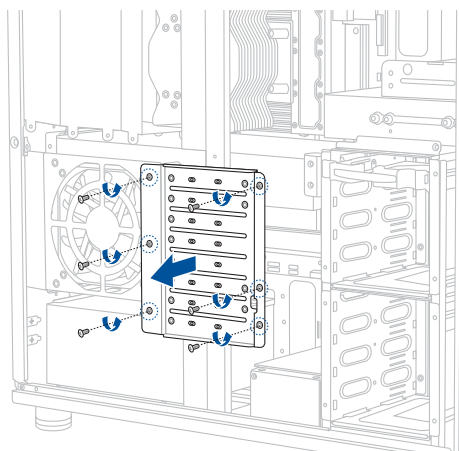
The number of screws may vary depending on how many GPUs are installed.



2. Remove the screw.



3. Remove the screws, then remove the GPU support bracket.



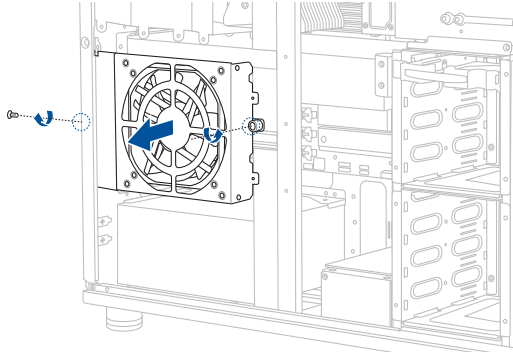
2.3.2 Installing the GPU support bracket

Install the GPU support bracket, then secure the GPU support bracket using the screws you removed earlier.

2.4 GPU fan

2.4.1 Removing the GPU fan

Remove the screws, then disconnect and remove the GPU fan.



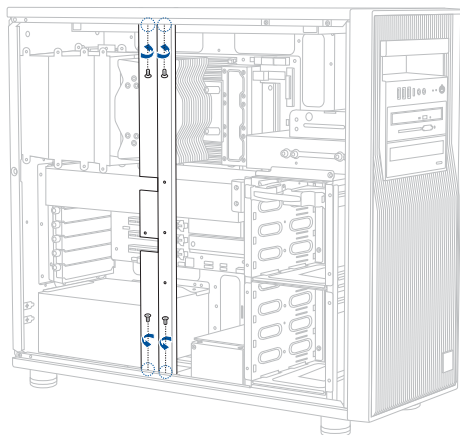
2.4.2 Installing the GPU fan

Install the GPU fan, then secure the GPU fan using the screws you removed earlier.

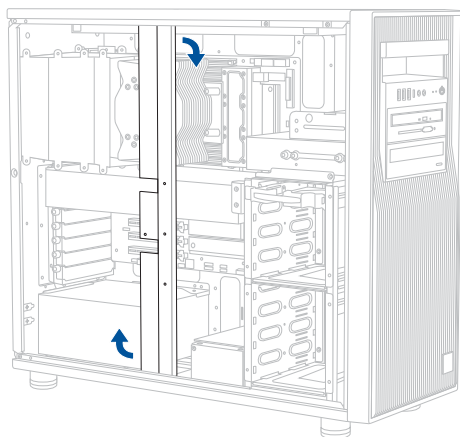
2.5 GPU fan bar

2.5.1 Removing the GPU fan bar

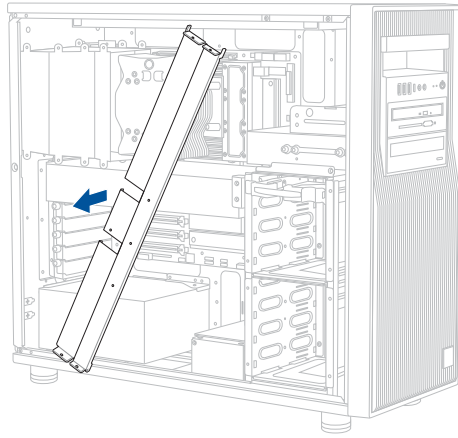
1. Remove the screws.



2. Rotate the GPU fan bar clockwise.



3. Remove the GPU fan bar from the chassis.

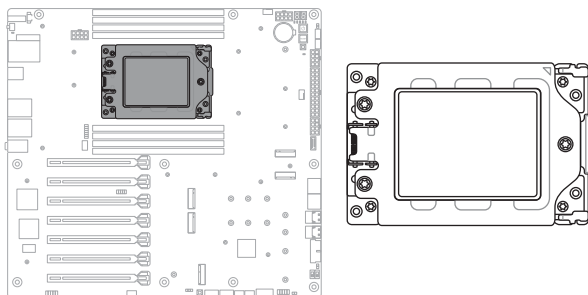


2.5.2 Installing the GPU fan bar

Install the GPU fan bar, then rotate the GPU fan bar counter-clockwise and secure the GPU fan bar using the screws you removed earlier.

2.6 Central processing unit (CPU)

The motherboard comes with an sTR5 socket designed for AMD RYZEN™ Threadripper™ PRO 7000 WX-series processors.



Ensure that you install the correct CPU designed for the socket only. **DO NOT** install a CPU designed for other sockets on the socket.



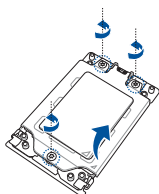
- Ensure that all power cables are unplugged before installing the CPU.
 - Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. ASUS will shoulder the cost of repair only if the damage is shipment/transit-related.
 - Keep the cap after installing the motherboard. ASUS will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the socket.
 - The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.
-

2.6.1 Installing the CPU and heatsink

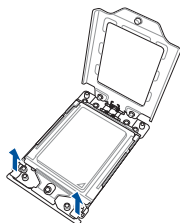


- A screwdriver with a torque value of 12.5-15.1kgf-cm is recommended.
- To remove this component, follow the instructions in reverse order.

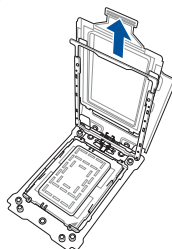
1



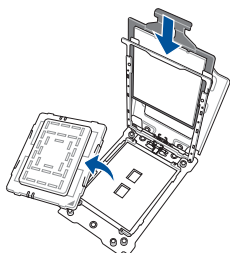
2



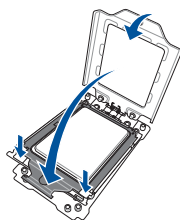
3



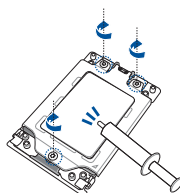
4



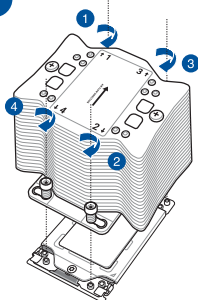
5



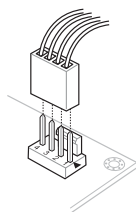
6



7



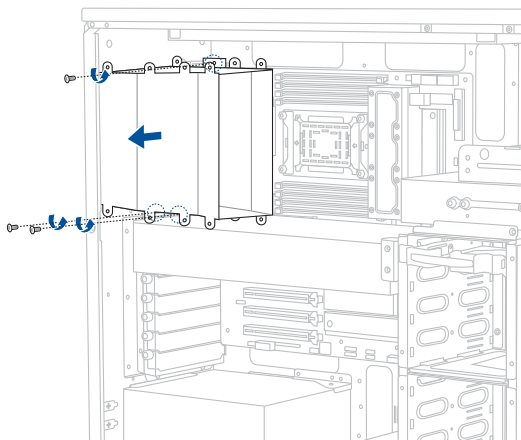
8



2.7 Air duct

2.7.1 Removing the air duct

Remove the screws, then remove the air duct from the chassis.

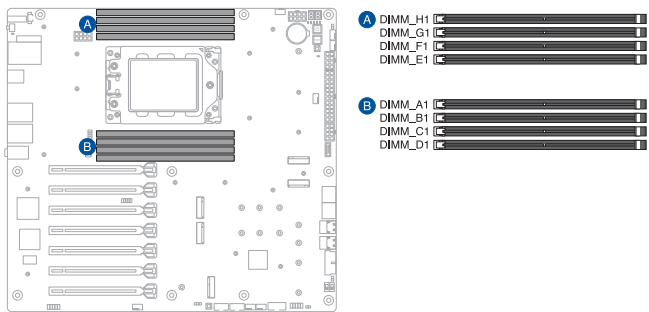


2.7.2 Installing the air duct

Install the air duct, then secure the air duct using the screws you removed earlier.

2.8 System memory

The motherboard comes with eight DDR5 (Double Data Rate 5) Dual Inline Memory Modules (DIMM) slots. You may install 128GB, 64GB, 48GB, 32GB, 24GB, 16GB, and 8GB RDIMM into the DIMM sockets.



- AMD Ryzen™ processors support ECC registered memory.
- The default memory operation frequency is dependent on its Serial Presence Detect (SPD), which is the standard way of accessing information from a memory module. Under the default state, some memory modules for overclocking may operate at a lower frequency than the vendor-marked value.
- For system stability, use a more efficient memory cooling system to support a full memory load or overclocking condition.
- Always install the DIMMS with the same CAS Latency. For an optimum compatibility, we recommend that you install memory modules of the same version or data code (D/C) from the same vendor. Check with the vendor to get the correct memory modules.
- Visit the ASUS website for the latest QVL.

2.8.1 Recommended memory configurations

Slot	A1	B1	C1	D1	E1	F1	G1	H1
1-DIMM	V							
2-DIMM	V				V			
4-DIMM	V	V			V	V		
6-DMM	V	V	V		V	V	V	
8-DIMM	V	V	V	V	V	V	V	V

2.8.2 Installing a DIMM

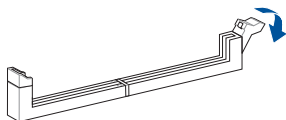


A DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket in the wrong direction to avoid damaging the DIMM.

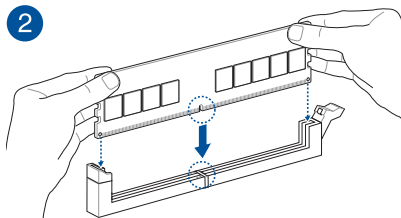


Always insert the DIMM into the socket vertically to prevent DIMM notch damage.

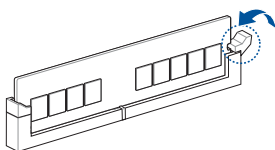
1



2



3

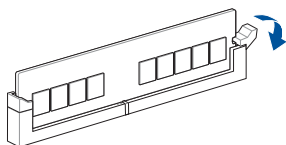


2.8.3 Removing a DIMM

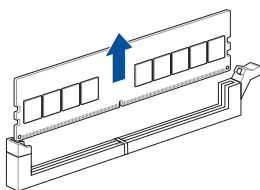


Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

1



2



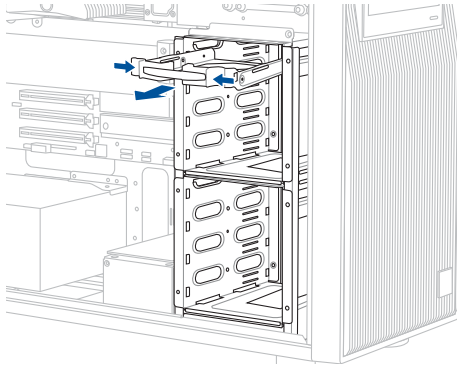
2.9 Storage bays



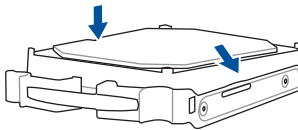
To remove this component, follow the instructions in reverse order.

Installing a 3.5" storage device

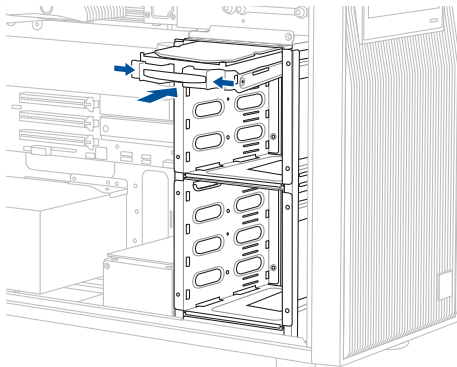
1. Press the latches inwards to release the storage device tray, then remove the storage device tray.



2. Install the 3.5" storage device onto the storage device tray.

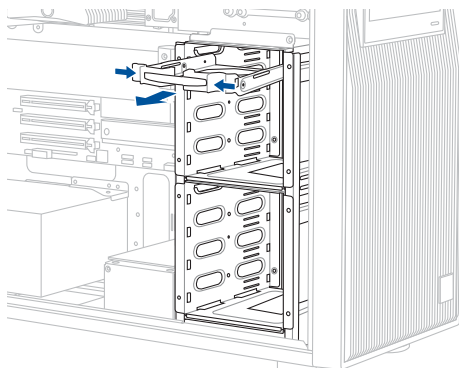


3. Insert the storage device tray into the storage bay bracket.

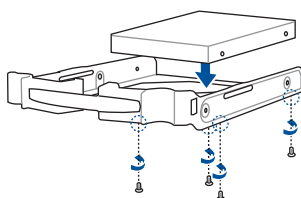


Installing a 2.5" storage device

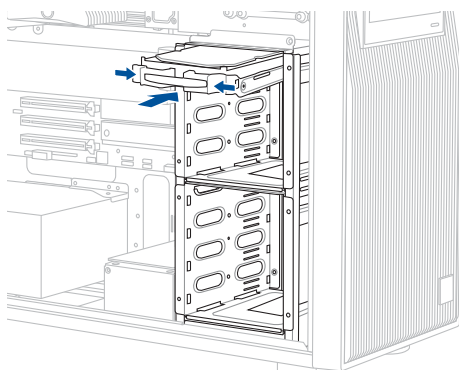
1. Press the latches inwards to release the storage device tray, then remove the storage device tray.



2. Install the 2.5" storage device onto the storage device tray, then secure it with four screws.



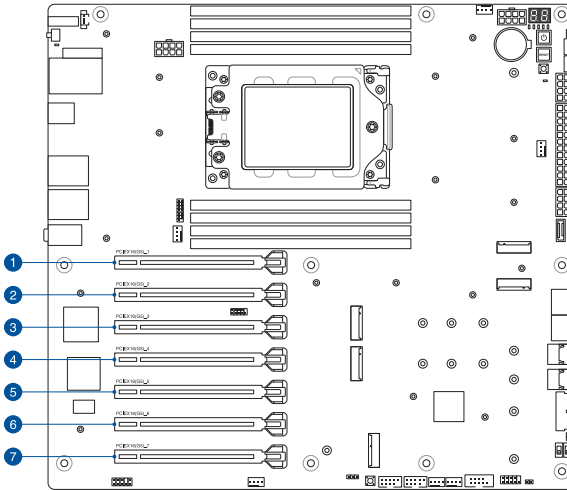
3. Insert the storage device tray into the storage bay bracket.



2.10 Expansion slots



Unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.



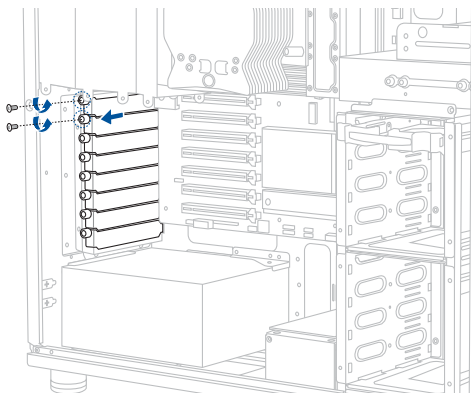
- | | |
|----------------------------------|----------------------------------|
| 1. PCIEX16(G5)_1 (Gen5 x16 link) | 5. PCIEX16(G5)_5 (Gen5 x16 link) |
| 2. PCIEX16(G5)_2 (Gen5 x16 link) | 6. PCIEX16(G5)_6 (Gen5 x8 link) |
| 3. PCIEX16(G5)_3 (Gen5 x16 link) | 7. PCIEX16(G5)_7 (Gen5 x16 link) |
| 4. PCIEX16(G5)_4 (Gen5 x16 link) | |

2.10.1 Installing an expansion card or GPU



To remove this component, follow the instructions in reverse order.

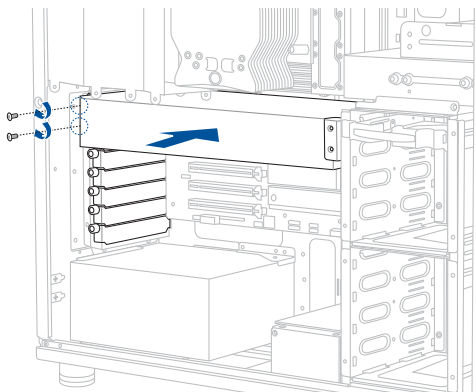
1. Remove the slot cover(s) from the chassis.



2. Secure the mounting bracket to the expansion card with two screws (optional).



3. Align and insert the expansion card into the PCIe slot until it clicks into place, then secure it using the screw(s) you removed earlier.



4. Install the GPU support bracket, GPU fan, and GPU fan bar.

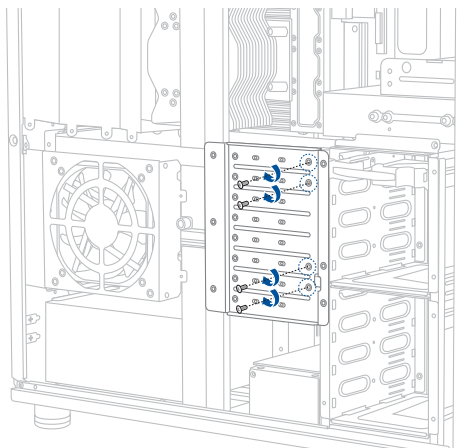


Refer to the **GPU support bracket**, **GPU fan**, and **GPU fan bar** sections for more information.

5. Secure the mounting bracket to the GPU support bracket with two screws (optional).



The number of screws may vary depending on how many GPUs are installed.

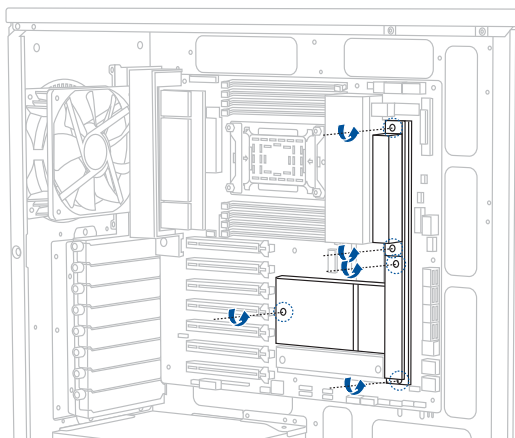


2.11 M.2 SSD modules



- The illustrations only show the installation steps for a 22110 M.2 slot, the steps are the same for the other M.2 slots.
- Use a Phillips screwdriver when removing or installing the screws or screw stands mentioned in this section.
- If the thermal pad on the M.2 heatsink becomes damaged, we recommend replacing it with the bundled thermal pad or a thermal pad with a thickness of 1.25mm.
- Supported M.2 type varies per motherboard.
- To remove this component, follow the instructions in reverse order.

1. Loosen the screws from the M.2 heatsinks, then lift and remove the heatsinks.



2. Install your M.2 to your M.2 slot. The steps may differ between the different M.2 slots, please refer to the different installation steps below:

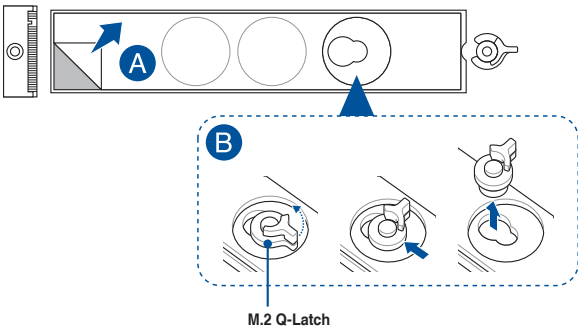
M.2 1(Socket3) slot

- A. (optional) If required, remove the pre-installed M.2 Q-Latch at the 2280 length screw hole by rotating the handle counterclockwise then pushing it towards the M.2 slot and removing it from the latch hole.



Only follow this step if a removable M.2 Q-Latch is pre-installed at the 2280 length screw hole and can be removed.

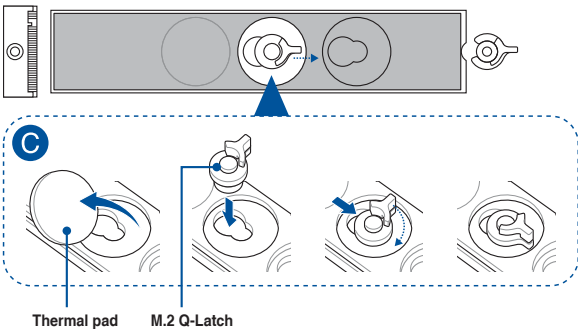
- B. Remove the plastic film from the thermal pad.



- C. (optional) Remove the thermal pad of the M.2 length screw hole you wish to install your M.2 module to, then install the M.2 Q-Latch.



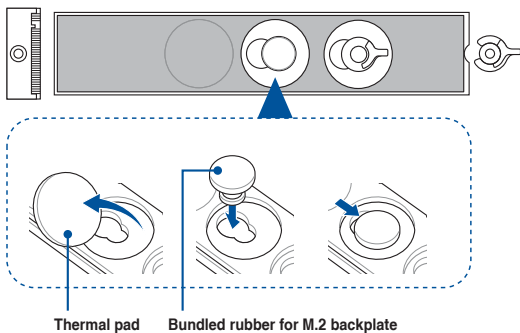
You can use a bundled M.2 Q-Latch or a pre-installed removable M.2 Q-Latch.



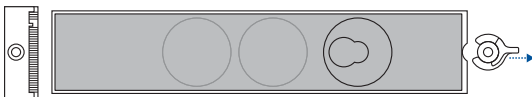
- D. (optional) Remove the thermal pad of the 2260 or 2242 M.2 length screw hole and install the bundled rubber for M.2 backplate if you are installing a single sided M.2 module. **DO NOT** install the bundled rubber for M.2 backplate when installing a double-sided M.2 module.



- Only follow this step when:
 - a. Installing a 22110, 2280, or 2260 length M.2 module and
 - b. When the rubber for M.2 backplate comes bundled with your motherboard package.
- Install the bundled rubber for M.2 backplate to the:
 - a. 2260 M.2 length screw hole when installing a 22110 or 2280 length M.2 module.
 - b. 2242 M.2 length screw hole when installing a 2260 length M.2 module.



- E. Rotate and adjust the M.2 Q-Latch so that the handle points away from the M.2 slot.

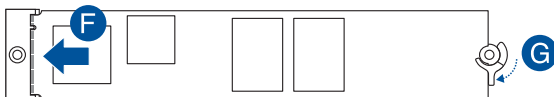


- F. Install your M.2 module to the M.2 slot.



Ensure that there is nothing obstructing your M.2 module when installing the M.2 module to the M.2 slot.

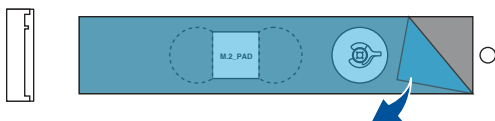
- G. Rotate the M.2 Q-Latch clockwise to secure the M.2 module in place.



If you are installing a double-sided M.2 module that comes pre-installed with a heatsink and are having difficulty securing the M.2 module in place with the M.2 Q-Latch, please remove the M.2 module, then remove the entire thermal pad from the M.2 backplate and follow steps E to G to reinstall the M.2 module.

M.2 2(Socket3), M.2 3(Socket3), and M.2 4 (Socket3)

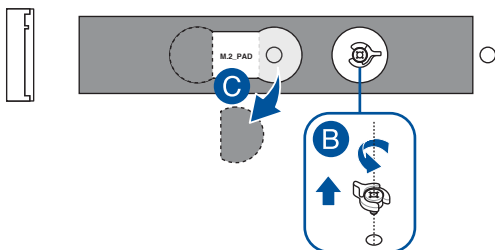
- A. Peel the plastic film off the M.2 slot you wish to install an M.2 module to.



- B. (optional) If required, remove the pre-installed removable M.2 Q-Latch screw at the 2280 length screw hole.
- C. (optional) Remove the thermal pad covering the M.2 length screw hole you wish to install an M.2 module to.



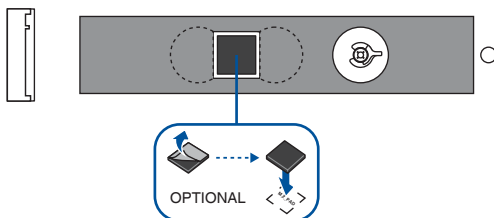
Follow this step only if you are installing a 2242 or 2260 M.2 modules.



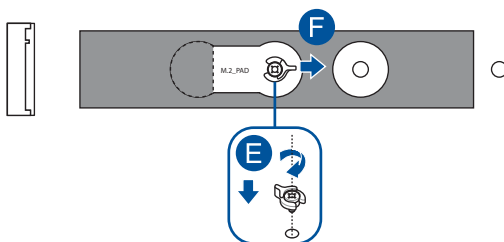
- D. (optional) If you are installing an 2280 or 22110 single sided M.2 storage device, ensure to peel off the plastic film on the bundled rubber for M.2, then stick them in the rubber for M.2 location.



DO NOT install the bundled rubber for M.2 when installing a double-sided M.2 storage device.



- E. (optional) Install the M.2 Q-Latch to the M.2 length screw hole you wish to install your M.2 module to.
- F. Rotate and adjust the M.2 Q-Latch so that the handle points away from the M.2 slot.

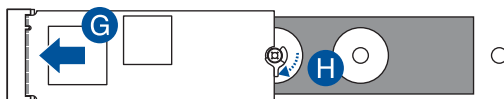


- G. Install your M.2 module to the M.2 slot.



Ensure that there is nothing obstructing your M.2 module when installing the M.2 module to the M.2 slot.

- H. Rotate the M.2 Q-Latch clockwise to secure the M.2 module in place.

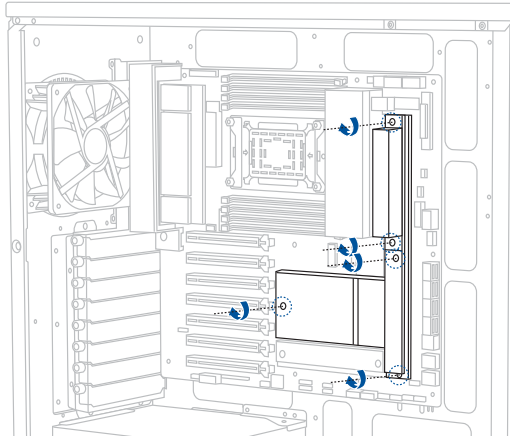


3. Remove the plastic film from the thermal pads on the bottom of the heatsinks.



If the thermal pad on the M.2 heatsink becomes damaged, we recommend replacing it with the bundled thermal pad or a thermal pad with a thickness of 1.25mm.

4. Install the heatsinks, then secure the heatsinks using the screws on the heatsinks.



2.12 Motherboard

2.12.1 Removing the motherboard

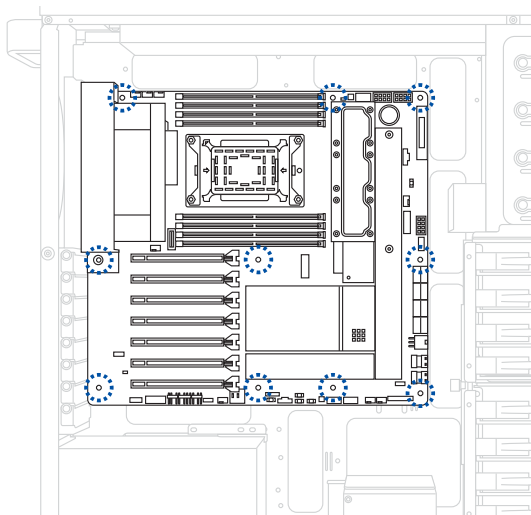
To remove the system motherboard:

1. Disconnect the cables from the motherboard and remove any installed components on the motherboard.



Take a photo or make a note of which components are removed, which cables are disconnected, and which connectors the cables were connected to.

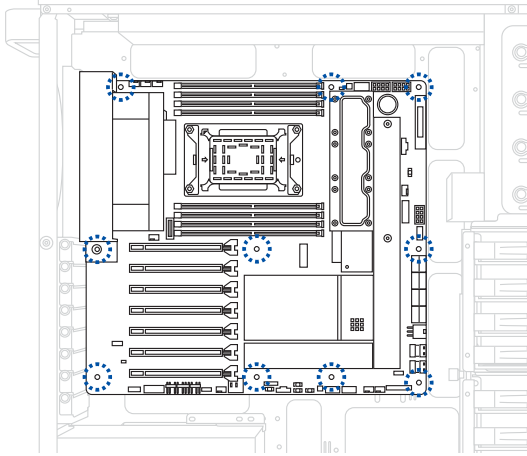
2. Remove the screws, then remove the motherboard.



2.12.2 Installing the motherboard

To install the system motherboard:

1. Place the motherboard into the chassis and ensure the screw holes on the motherboard are aligned with the screw holes in the chassis, then secure the motherboard to the chassis using the screws removed previously.

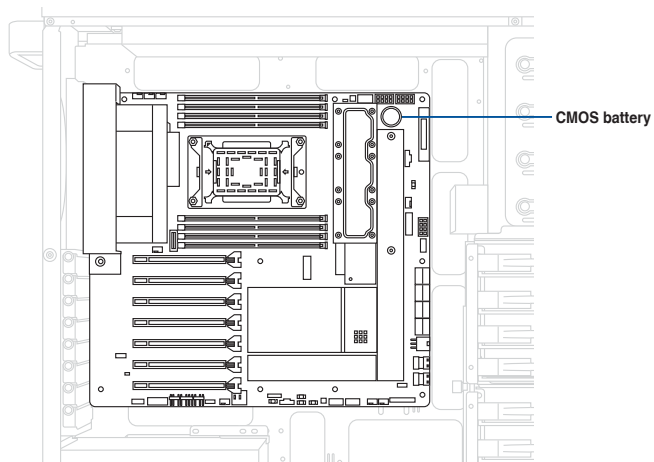


2. Reinstall any removed components and reconnect the cables to the motherboard.

2.13 CMOS battery

To replace a CMOS battery:

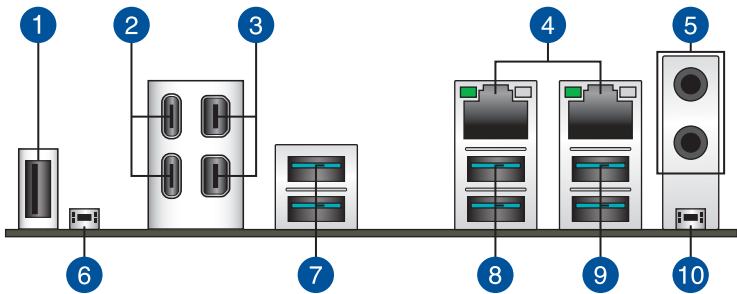
1. Locate and remove the CMOS battery.



2. Place the replacement CMOS battery into the battery compartment.

2.14 Motherboard rear and audio connections

2.14.1 Rear panel connectors



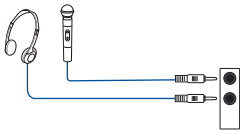
Rear panel connectors	
1. USB 2.0 port	6. BIOS FlashBack™ button
2. USB4® Type-C® ports	7. USB 10Gbps Type-A ports 1-2
3. Mini DisplayPort IN	8. USB 10Gbps Type-A ports 3-4
4. Intel® dual 10GbE LAN ports	9. USB 10Gbps Type-A ports 5-6
5. Headphone and microphone ports	10. Clear CMOS button

2.14.2 Audio connectors

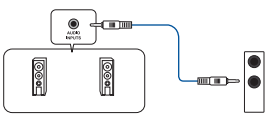
Audio port configuration

Port	2-channel	4-channel	5.1-channel	7.1-channel
Rear panel				
LINE OUT	Front speaker out	Front speaker out	Front speaker out	Front speaker out
MIC IN	-	-	Center/subwoofer	Center/subwoofer
Front panel				
HEADPHONE	-	-	-	Side speaker out
MIC IN	-	Rear speaker out	Rear speaker out	Rear speaker out

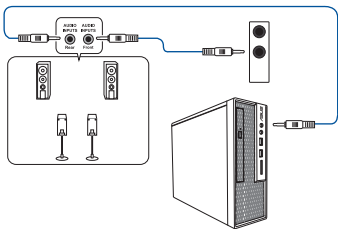
Headphones/microphone



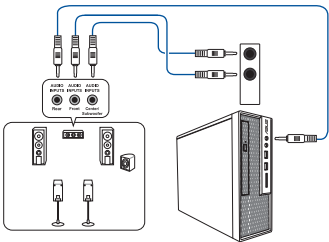
Stereo/2-channel speakers



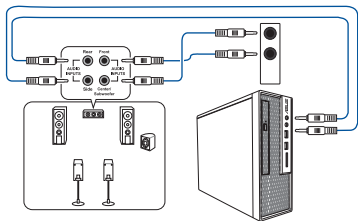
4-channel Speakers



5.1-channel Speakers



7.1-channel Speakers

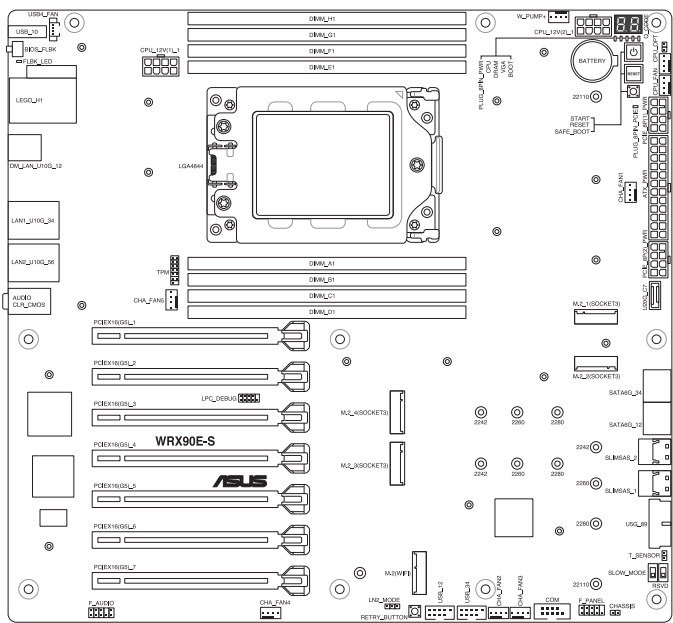


Motherboard Information

3

This chapter includes the motherboard layout and brief descriptions of the jumpers and internal connectors.

3.1 Motherboard layout



Layout contents

Central Processing Unit (CPU)	Page
1. CPU socket(s)	2-7

Dual Inline Memory Module (DIMM)	Page
1. DIMM sockets	2-10

Onboard buttons and switches	Page
1. FlexKey (reset) button (RESET)	3-4
2. ReTry button (RETRY_BUTTON)	3-4
3. Safe boot button (SAFE_BOOT)	3-5
4. Start button (START)	3-5

Jumpers	Page
1. LN2 mode setting (3-pin LN2_MODE)	3-6
2. RSVD switch (RSVD)	3-6
3. Slow mode switch (SLOW_MODE)	3-7

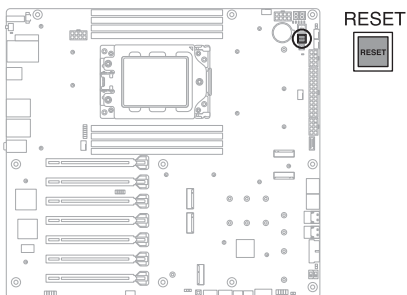
Onboard LEDs	Page
1. BIOS FlashBack™ LED (FLBK_LED)	3-8
2. 8-pin PCIe power plug LED (PLUG_8PIN_PCIE)	3-8
3. 8-pin power plug LED (PLUG_8PIN_PWR)	3-9
4. Q-Code LED (Q_CODE)	3-9
5. Q-LEDs (CPU; DRAM; VGA; BOOT)	3-10

Internal connectors	Page
1. Chassis intrusion header (2-pin CHASSIS)	3-10
2. COM port header (10-1 pin COM)	3-11
3. Front panel audio header (10-1 pin F_AUDIO)	3-11
4. System panel header (10-1 pin F_PANEL)	3-12
5. Fan connectors (CHA_FAN1-5; CPU_FAN; CPU_OPT; W_PUMP+)	3-13
6. M.2 sockets (M.2_1-4)	3-14
7. ATX power connectors (ATX_PWR; CPU_12V(1-2)_1; PCIe_8P(1-2)_PWR)	3-14
8. SATA connectors (SATA6G_12-34)	3-15
9. SLIMSAS ports (SLIMSAS_1-2)	3-15
10. TPM header (14-1 pin TPM)	3-16
11. USB 5Gbps header (20-1 pin U5G_89)	3-16
12. USB 20Gbps Type-C® front panel header (20-pin U20G_C7)	3-17
13. USB 2.0 header (10-1 pin USB_12-34)	3-17

3.2 Onboard buttons and switches

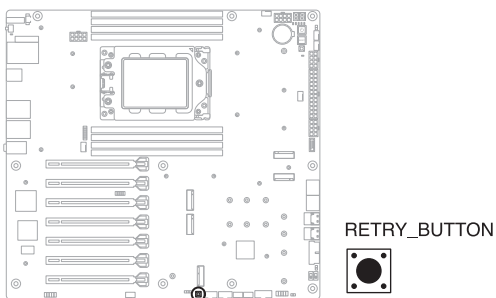
1. FlexKey (reset) button

Press the FlexKey button to reboot the system. You may also configure the button and assign a quick access feature such as activating safe boot to the button.



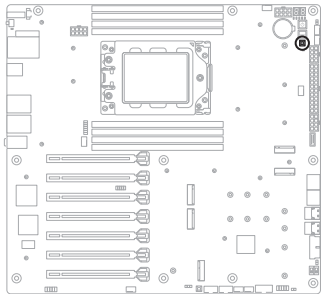
2. ReTry button

Press the ReTry button to force the system to reboot while retaining the same settings to be retried in quick succession to achieve a successful POST.



3. Safe boot button

The safe boot button temporarily applies safe settings to the BIOS while retaining the overclocked settings, allowing you to modify the settings causing a boot failure. Press this button at anytime to force the system to reboot into the BIOS safe mode.

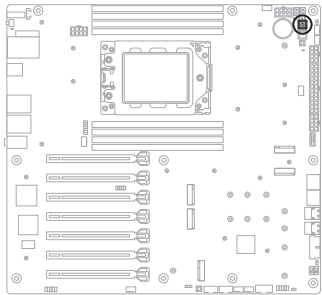


SAFE_BOOT



4. Start button

Press the start button to power up the system, or put the system into sleep or soft-off mode (depending on the operating system settings).



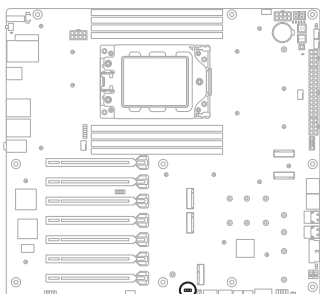
START



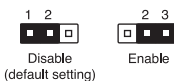
3.3 Jumpers

1. LN2 mode setting (3-pin LN2_MODE)

Set to pins 2-3 to optimize the motherboard to help the system boot successfully in case of cold-boot bug during POST.



LN2_MODE

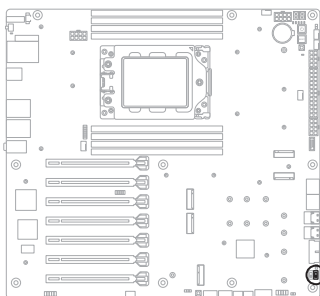


2. RSVD switch

The RSVD switch is reserved for ASUS-authorized technicians only.



Please ensure the RSVD switch is set to **On**. Setting this switch to **Off** may result in damage to your system.

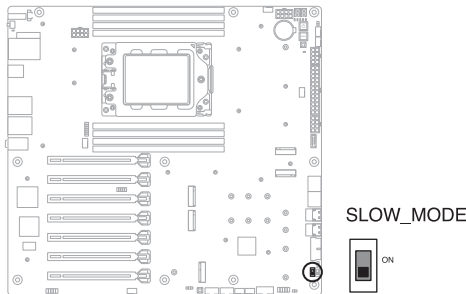


RSVD



3. Slow mode switch

The system may crash due to the CPU being unstable when using extreme overclocking settings. Enable the slow mode switch during LN2 benching to decrease the processor frequency and stabilize the system, allowing you to keep track of the overclocking data.



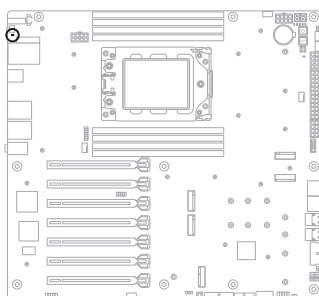
3.4 Onboard LEDs

1. BIOS FlashBack™ LED

The BIOS FlashBack™ LED lights up or blinks to indicate the status of the BIOS FlashBack™.



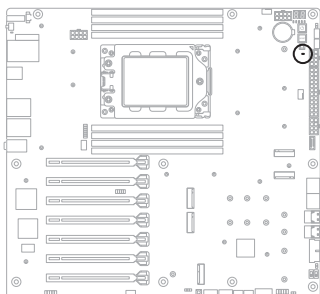
Refer to the **BIOS update utility** section for more information on using the BIOS FlashBack™ feature.



FLBK_LED

2. 8-pin PCIe power plug LED (PLUG_8PIN_PCIE)

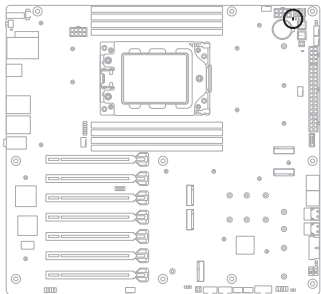
The 8-pin PCIe power plug LED lights up to indicate that the 8-pin PCIe power plug (PCIE_8P(1)_PWR) is not connected.



PLUG_8PIN_PCIE

3. **8-pin power plug LED (PLUG_8PIN_PWR)**

The 8-pin power plug LED lights up to indicate that either one of the 8-pin power plugs (CPU_12V(1)_1 or CPU_12V(2)_1) is not connected.



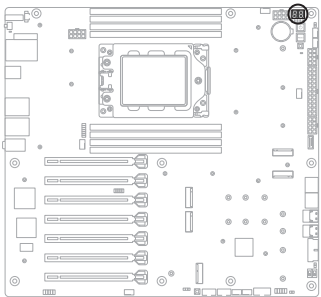
PLUG_8PIN_PWR

4. **Q-Code LED (Q_CODE)**

The Q-Code LED provides you with a 2-digit error code that displays the system status.



- The Q-Code LED provides the most probable cause of an error code as a starting point for troubleshooting. The actual cause may vary from case to case.
- Refer to the **Q-Code Table** section of the appendix for a list of Q-Code error codes.

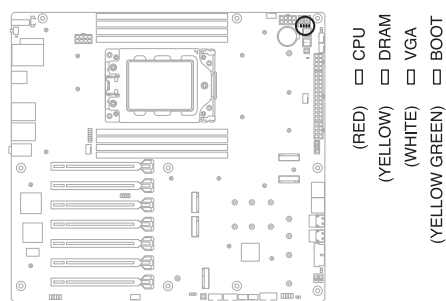


Q_CODE



5. **Q-LEDs (CPU; DRAM; VGA; BOOT)**

The Q-LEDs check key components (CPU, DRAM, VGA card, and booting devices) in sequence during the motherboard booting process. If an error is found, the corresponding LED remains lit until the problem is solved.



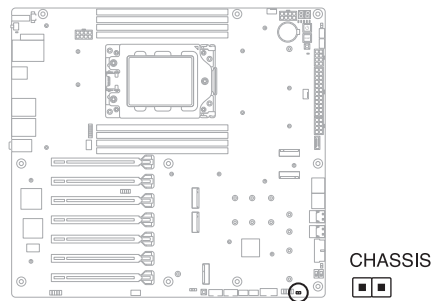
3.5 **Internal connectors**

1. **Chassis Intrusion header**

The Chassis Intrusion header allows you to connect a intrusion sensor or microswitch for the chassis intrusion detection feature. When you remove any chassis component, the sensor or microswitch triggers and sends a high level signal and records a chassis intrusion event.

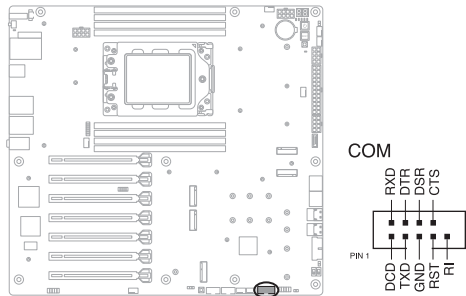


By default, a jumper cap that disables the intrusion detection feature is installed on the header to prevent accidental triggers.



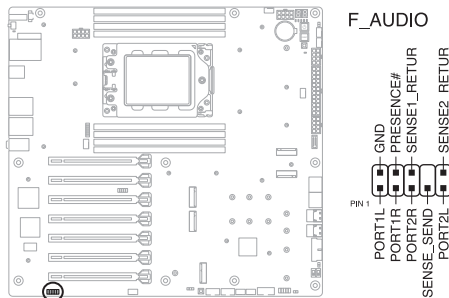
2. **COM Port header (10-1 pin COM)**

The COM (Serial) Port header allows you to connect a COM port module. Connect the COM port module cable to this header, then install the module to a slot opening on the system chassis.



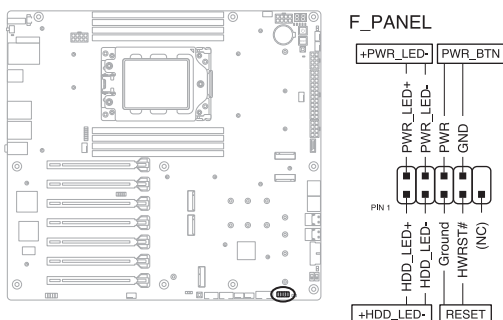
3. **Front Panel Audio header**

The Front Panel Audio header is for a chassis-mounted front panel audio I/O module that supports HD Audio. Connect one end of the front panel audio I/O module cable to this header.



4. System panel header (10-1 F_PANEL)

The System Panel header supports several chassis-mounted functions.



- **System Power LED header (+PWR_LED-)**

The 2-pin header allows you to connect the System Power LED. The System Power LED lights up when the system is connected to a power source, or when you turn on the system power, and blinks when the system is in sleep mode.

- **Storage Device Activity LED header (+HDD_LED-)**

The 2-pin header allows you to connect the Storage Device Activity LED. The Storage Device Activity LED lights up or blinks when data is read from or written to the storage device or storage device add-on card.

- **Power Button/Soft-off Button header (PWR_BTN)**

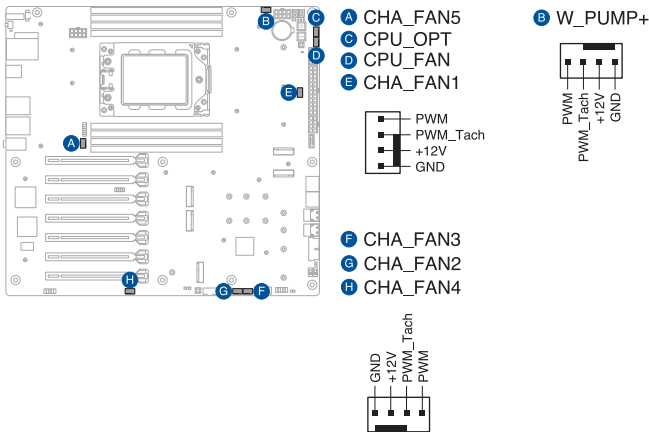
The 3-1 pin header allows you to connect the system power button. Press the power button to power up the system, or put the system into sleep or soft-off mode (depending on the operating system settings).

- **Reset button header (RESET)**

The 2-pin header allows you to connect the chassis-mounted reset button. Press the reset button to reboot the system.

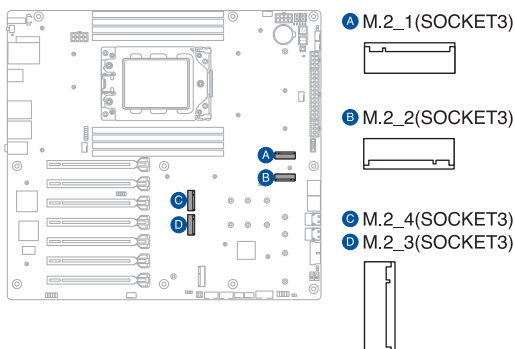
5. Fan connectors (CHA_FAN1-5; CPU_FAN; CPU_OPT; W_PUMP+)

Connect the fan cables to the fan connectors on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector.



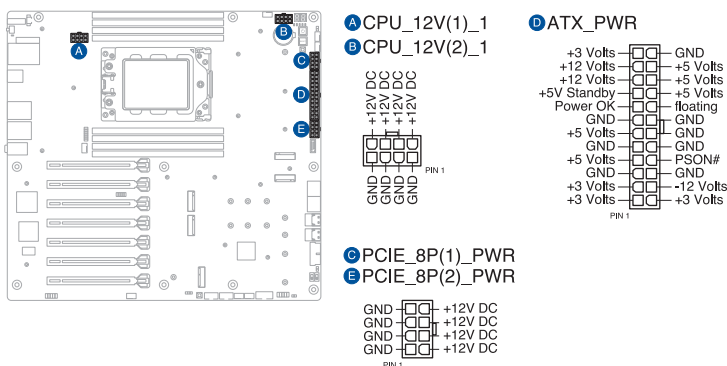
6. M.2 sockets (M.2_1-4)

These sockets allow you to install M.2 SSD modules.



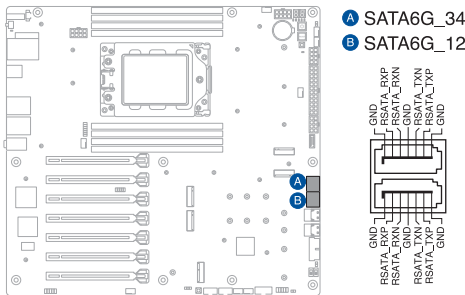
7. ATX power connectors (ATX_PWR; CPU_12V(1-2)_1; PCIE_8P(1-2)_PWR)

These connectors are for ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.



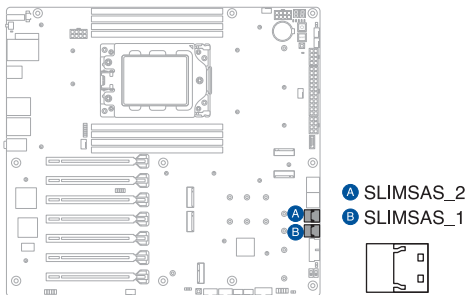
8. **SATA connectors (SATA6G_12-34)**

The SATA 6Gb/s connectors allow you to connect SATA devices such as optical disc drives and hard disk drives via a SATA cable.



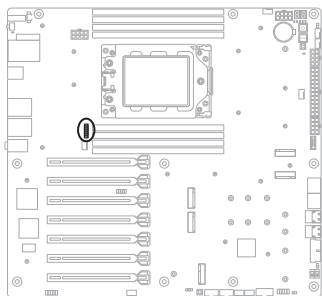
9. **SLIMSAS ports (SLIMSAS_1-2)**

The SlimSAS ports allow you to connect NVMe storage devices.

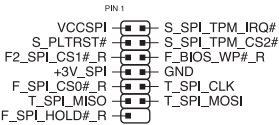


10. TPM header

The TPM header allows you to connect a TPM module, which securely stores keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protect digital identities, and ensures platform integrity.

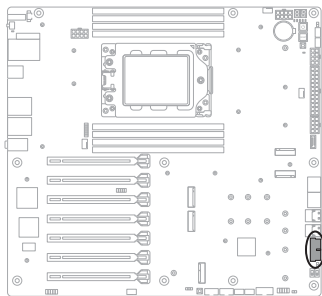


TPM

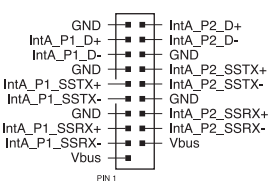


11. USB 5Gbps header

The USB 5Gbps header allows you to connect a USB 5Gbps module for additional USB 5Gbps ports. The USB 5Gbps header provides data transfer speeds of up to 5 Gb/s.

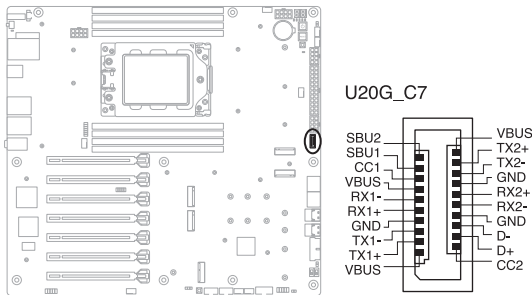


U5G_89



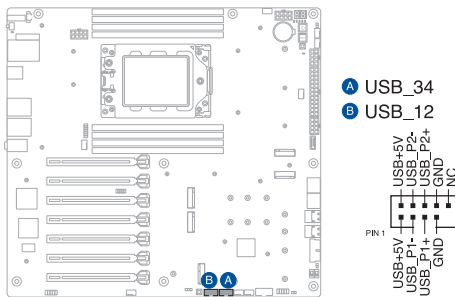
12. USB 20Gbps Type-C® front panel header

The USB 20Gbps Type-C® connector allows you to connect a USB 20Gbps Type-C® module for additional USB 20Gbps ports on the front panel.



13. USB 2.0 header

The USB 2.0 header allows you to connect a USB module for additional USB 2.0 ports. The USB 2.0 header provides data transfer speeds of up to 480 Mb/s.



This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Software Configuration

4

This chapter provides instructions for changing software configuration settings.

4.1 System recovery and removing personal files

You can restore your device to its original settings and optionally remove all personal files.



Ensure all your files are backed up before recovering your device.

1. In Windows, go to **Settings > System > Recovery**.
2. Click **Reset PC** under **Recovery Options**, then select either **Keep my files** or **Remove everything**.
 - **Keep my files** - This option restores the device's original settings, removes installed applications, while keeping personal files such as documents, photos, music, and videos.
 - **Remove everything** - This option restores the device's original settings, removes installed applications, and deletes personal files.

4.2 Putting your device into the lowest power mode

For ErP requirements, you can put your device into the lowest power mode by following the below steps:

- Enter BIOS setup by pressing or <ESC> during the boot process, then go to **Advanced > APM Configuration > ErP Ready** and select **Enabled (S5)**.



When set to enabled, all other PME options are switched off. RGB LEDs and RGB/Addressable RGB Headers will also be disabled.

- In Windows, go to **Settings > All Control Panel Items > Power Options > Choose what the power button does** and click **Change settings that are currently unavailable**, then uncheck **Turn on fast startup (recommended)** and click **Save changes**.
- Open the Start menu, select the power icon, then select **Shut down**.
- From the log-in screen, select the power icon, then select **Shut down**.
- Press <Alt>+<F4>, then select **Shut down** from the drop-down list and select **OK**.
- If your device is unresponsive, press and hold the power button for at least four seconds until your device turns off.

BIOS Setup

5

This chapter tells how to change the system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

5.1 About the BIOS



- For more details on BIOS and RAID configurations, please refer to Manual & Document under the Support tab of the product information site, or visit <https://www.asus.com/support>.
- Please visit the AMD website for the latest information on RAID configurations.

BIOS (Basic Input and Output System) stores system hardware settings such as storage device configuration, overclocking settings, advanced power management, and boot device configuration that are needed for system startup in the motherboard CMOS. In normal circumstances, the default BIOS settings apply to most conditions to ensure optimal performance. **DO NOT change the default BIOS settings** except in the following circumstances:

- An error message appears on the screen during the system bootup and requests you to run the BIOS Setup.
- You have installed a new system component that requires further BIOS settings or update.



Inappropriate BIOS settings may result to instability or boot failure. **We strongly recommend that you change the BIOS settings only with the help of a trained service personnel.**



BIOS settings and options may vary due to different BIOS release versions. Please refer to the latest BIOS version for settings and options.

5.2 BIOS setup program

Use the BIOS Setup to update the BIOS or configure its parameters. The BIOS screen include navigation keys and brief onscreen help to guide you in using the BIOS Setup program.

Entering BIOS at startup

To enter BIOS Setup at startup, press or <ESC> during the Power-On Self Test (POST). If you do not press or <ESC>, POST continues with its routines.

Entering BIOS Setup after POST

To enter BIOS Setup after POST:

- Press <Ctrl>+<Alt>+<Delete> simultaneously.
- Press the reset button on the system chassis.
- Press the power button to turn the system off then back on. Do this option only if you failed to enter BIOS Setup using the first two options.

After doing either of the three options, press <Delete> key to enter BIOS.



-
- Ensure that a USB mouse is connected to your motherboard if you want to use the mouse to control the BIOS setup program.
 - If the system becomes unstable after changing any BIOS setting, load the default settings to ensure system compatibility and stability. Select the **Load Optimized Defaults** item under the **Exit** menu or press hotkey <F5>.
 - If the system fails to boot after changing any BIOS setting, try to clear the CMOS and reset the motherboard to the default value.
 - The BIOS setup program does not support Bluetooth devices.
-

5.3 USB BIOS FlashBack™

BIOS FlashBack™

BIOS FlashBack™ allows you to easily update the BIOS without entering the existing BIOS or operating system.

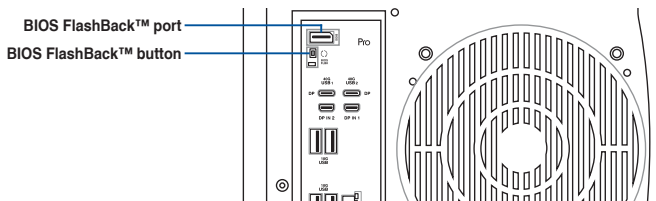
To use BIOS FlashBack™:

1. Visit <https://www.asus.com/support/> and download the latest BIOS version for this motherboard.
2. Launch the BIOSRenamer.exe application to automatically rename the file or manually rename the file to the BIOS CAP filename specified in the **Specifications** section, then copy it to your USB storage device.



The **BIOSRenamer.exe** application is zipped together with your BIOS file when you download a BIOS file for a BIOS FlashBack™ compatible motherboard.

3. Plug the 24-pin power connector into the motherboard and turn on the power supply (no need to power on the system).
4. Insert the USB storage device into the BIOS FlashBack™ port.
5. Press the BIOS FlashBack™ button for three (3) seconds until the BIOS FlashBack™ LED blinks three times, indicating that the BIOS FlashBack™ function is enabled.



6. Wait until the light goes out, indicating that the BIOS updating process is completed.



- Do not unplug portable disk, power system, or short the CLR_CMOS header while BIOS update is ongoing, otherwise the update will be interrupted. In case of interruption, please follow the steps again.
 - If the light flashes for five seconds and turns into a solid light, this means that the BIOS FlashBack™ is not operating properly. This may be caused by improper installation of the USB storage device and filename/file format error. If this scenario happens, please restart the system to turn off the light.
 - Updating BIOS may have risks. If the BIOS program is damaged during the process and results to the system's failure to boot up, please contact your local ASUS Service Center.
-

5.4 ASUS EzFlash Utility

The ASUS EZ Flash Utility feature allows you to update the BIOS without using an OS-based utility.



- Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the **Load Optimized Defaults** item under the **Exit** menu or press hotkey **<F5>**.
- Download the latest BIOS from the ASUS website at www.asus.com before using this utility.

To update the BIOS:



- This function can support devices such as a USB flash disk with FAT 32/16 format and single partition only.
- DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!

1. Insert the USB flash disk that contains the latest BIOS file to the USB port.
2. Enter the BIOS setup program. Go to the **Tool** menu to select **Start EzFlash** and press **<Enter>** to enable it.
3. Press the Left arrow key to switch to the **Drive** field.
4. Press the Up/Down arrow keys to find the USB flash disk that contains the latest BIOS then press **<Enter>**.
5. Press the Right arrow key to switch to the **Folder Info** field.
6. Press the Up/Down arrow keys to find the BIOS file then press **<Enter>**.
7. Reboot the system when the update process is done.

5.5 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can update a corrupted BIOS file using a USB flash drive that contains the updated BIOS file.



Prepare a USB flash drive containing the updated motherboard BIOS before using this utility.



When downloading or updating the BIOS file, please rename it to **ASUS.CAP** or the BIOS CAP filename specified in the **Specifications** section.

Recovering the BIOS from a USB flash drive

To recover the BIOS from a USB flash drive:

1. Insert the USB flash drive with the original or updated BIOS file to one USB port on the system.
2. The utility will automatically recover the BIOS. It resets the system when the BIOS recovery finished.



DO NOT shut down or reset the system while recovering the BIOS! Doing so would cause system boot failure!



The recovered BIOS may not be the latest BIOS version for this motherboard. Visit the ASUS website at www.asus.com to download the latest BIOS file.

6

RAID Configuration

This chapter provides instructions for setting up, creating, and configuring RAID sets using the available utilities.

6.1 RAID configurations

This workstation supports RAID configurations.



- For more information on configuring your RAID sets, please refer to the **RAID Configuration Guide** which you can find at <https://www.asus.com/support>, or by scanning the code.
- Please visit the AMD website for the latest information on RAID configurations.



RAID definitions

RAID 0 (Data striping) optimizes two identical hard disk drives to read and write data in parallel, interleaved stacks. Two hard disks perform the same work as a single drive but at a sustained data transfer rate, double that of a single disk alone, thus improving data access and storage. Use of two new identical hard disk drives is required for this setup.

RAID 1 (Data mirroring) copies and maintains an identical image of data from one drive to a second drive. If one drive fails, the disk array management software directs all applications to the surviving drive as it contains a complete copy of the data in the other drive. This RAID configuration provides data protection and increases fault tolerance to the entire system. Use two new drives or use an existing drive and a new drive for this setup. The new drive must be of the same size or larger than the existing drive.

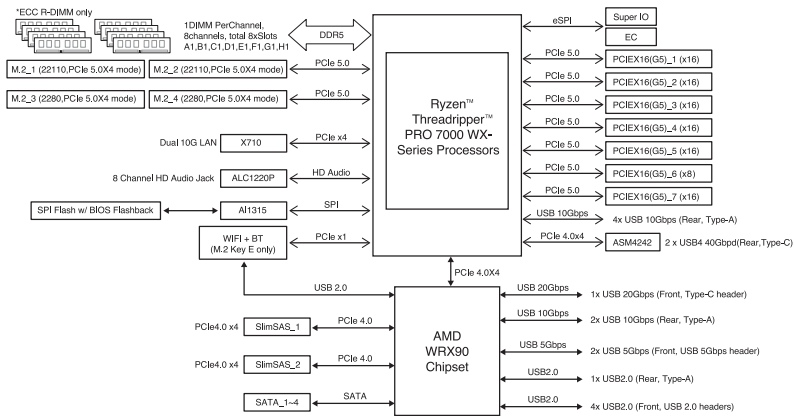
RAID 5 stripes both data and parity information across three or more hard disk drives. Among the advantages of RAID 5 configuration include better HDD performance, fault tolerance, and higher storage capacity. The RAID 5 configuration is best suited for transaction processing, relational database applications, enterprise resource planning, and other business systems. Use a minimum of three identical hard disk drives for this setup.

RAID 10 is data striping and data mirroring combined without parity (redundancy data) having to be calculated and written. With the RAID 10 configuration you get all the benefits of both RAID 0 and RAID 1 configurations. Use four new hard disk drives or use an existing drive and three new drives for this setup.

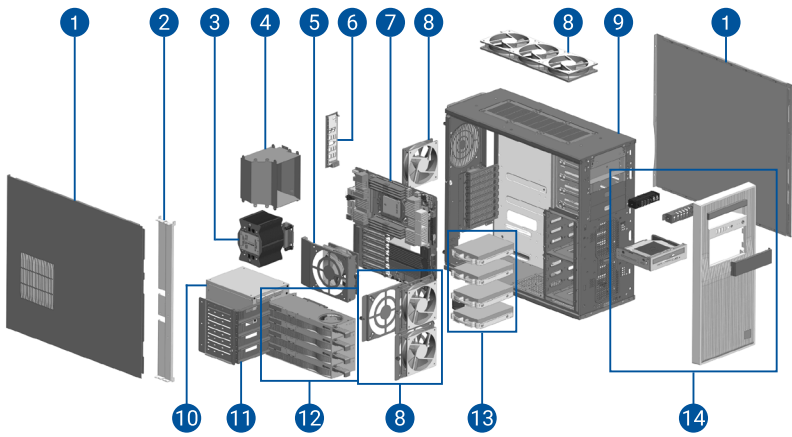
Appendix

A

Block diagram



Exploded view



- | | |
|-----------------|-------------------------|
| 1. Side covers | 8. System fans |
| 2. GPU fan bar | 9. Chassis |
| 3. CPU heatsink | 10. Power supply unit |
| 4. Air duct | 11. GPU support bracket |
| 5. GPU fan | 12. GPUs* |
| 6. I/O shield | 13. Storage device bays |
| 7. Motherboard | 14. Front cover |

* On selected models

Q-Code table

Code	Description
00	Not used
01	Power on. Reset type detection (soft/hard).
02	AP initialization before microcode loading
03	System Agent initialization before microcode loading
04	PCH initialization before microcode loading
06	Microcode loading
07	AP initialization after microcode loading
08	System Agent initialization after microcode loading
09	PCH initialization after microcode loading
0B	Cache initialization
0C – 0D	Reserved for future AMI SEC error codes
0E	Microcode not found
0F	Microcode not loaded
10	PEI Core is started
11 – 14	Pre-memory CPU initialization is started
15 – 18	Pre-memory System Agent initialization is started
19 – 1C	Pre-memory PCH initialization is started
2B – 2F	Memory initialization
30	Reserved for ASL (see ASL Status Codes section below)
31	Memory Installed
32 – 36	CPU post-memory initialization
37 – 3A	Post-Memory System Agent initialization is started
3B – 3E	Post-Memory PCH initialization is started
4F	DXE IPL is started
50 – 53	Memory initialization error. Invalid memory type or incompatible memory speed
54	Unspecified memory initialization error
55	Memory not installed
56	Invalid CPU type or Speed
57	CPU mismatch
58	CPU self test failed or possible CPU cache error
59	CPU micro-code is not found or micro-code update is failed
5A	Internal CPU error
5B	Reset PPI is not available
5C – 5F	Reserved for future AMI error codes

(continued on the next page)

Code	Description
E0	S3 Resume is started (S3 Resume PPI is called by the DXE IPL)
E1	S3 Boot Script execution
E2	Video repost
E3	OS S3 wake vector call
E4 – E7	Reserved for future AML progress codes
E8	S3 Resume Failed
E9	S3 Resume PPI not Found
EA	S3 Resume Boot Script Error
EB	S3 OS Wake Error
EC – EF	Reserved for future AML error codes
F0	Recovery condition triggered by firmware (Auto recovery)
F1	Recovery condition triggered by user (Forced recovery)
F2	Recovery process started
F3	Recovery firmware image is found
F4	Recovery firmware image is loaded
F5 – F7	Reserved for future AML progress codes
F8	Recovery PPI is not available
F9	Recovery capsule is not found
FA	Invalid recovery capsule
FB – FF	Reserved for future AML error codes
60	DXE Core is started
61	NVRAM initialization
62	Installation of the PCH Runtime Services
63 – 67	CPU DXE initialization is started
68	PCI host bridge initialization
69	System Agent DXE initialization is started
6A	System Agent DXE SMM initialization is started
6B – 6F	System Agent DXE initialization (System Agent module specific)
70	PCH DXE initialization is started
71	PCH DXE SMM initialization is started
72	PCH devices initialization
73 – 77	PCH DXE Initialization (PCH module specific)
78	ACPI module initialization
79	CSM initialization
7A – 7F	Reserved for future AML DXE codes

(continued on the next page)

Code	Description
90	Boot Device Selection (BDS) phase is started
91	Driver connecting is started
92	PCI Bus initialization is started
93	PCI Bus Hot Plug Controller Initialization
94	PCI Bus Enumeration
95	PCI Bus Request Resources
96	PCI Bus Assign Resources
97	Console Output devices connect
98	Console input devices connect
99	Super IO Initialization
9A	USB initialization is started
9B	USB Reset
9C	USB Detect
9D	USB Enable
9E – 9F	Reserved for future AMI codes
A0	IDE initialization is started
A1	IDE Reset
A2	IDE Detect
A3	IDE Enable
A4	SCSI initialization is started
A5	SCSI Reset
A6	SCSI Detect
A7	SCSI Enable
A8	Setup Verifying Password
A9	Start of Setup
AA	Reserved for ASL (see ASL Status Codes section below)
AB	Setup Input Wait
AC	Reserved for ASL (see ASL Status Codes section below)
AD	Ready To Boot event
AE	Legacy Boot event
AF	Exit Boot Services event
B0	Runtime Set Virtual Address MAP Begin
B1	Runtime Set Virtual Address MAP End
B2	Legacy Option ROM Initialization
B3	System Reset

(continued on the next page)

Code	Description
B4	USB hot plug
B5	PCI bus hot plug
B6	Clean-up of NVRAM
B7	Configuration Reset (reset of NVRAM settings)
B8– BF	Reserved for future AML codes
D0	CPU initialization error
D1	System Agent initialization error
D2	PCH initialization error
D3	Some of the Architectural Protocols are not available
D4	PCI resource allocation error. Out of Resources
D5	No Space for Legacy Option ROM
D6	No Console Output Devices are found
D7	No Console Input Devices are found
D8	Invalid password
D9	Error loading Boot Option (LoadImage returned error)
DA	Boot Option is failed (StartImage returned error)
DB	Flash update is failed
DC	Reset protocol is not available

ACPI/ASL Checkpoints (under OS)

Code	Description
03	System is entering S3 sleep state
04	System is entering S4 sleep state
05	System is entering S5 sleep state
30	System is waking up from the S3 sleep state
40	System is waking up from the S4 sleep state
AC	System has transitioned into ACPI mode. Interrupt controller is in PIC mode.
AA	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.

Notices

FCC Compliance Information

Responsible Party: Asus Computer International
Address: 48720 Kato Rd., Fremont, CA 94538, USA
Phone / Fax No: (510)739-3777 / (510)608-4555

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the 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 instructions, 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.



The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Compliance Statement of Innovation, Science and Economic Development Canada (ISED)

This device complies with Innovation, Science and Economic Development Canada licence exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

CAN ICES-003(B)/NMB-003(B)

Déclaration de conformité de Innovation, Sciences et Développement économique Canada (ISED)

Le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

La bande 5150 – 5250 MHz est réservée uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.

CAN ICES-003(B)/NMB-003(B)

VCCI: Japan Compliance Statement

Class B ITE

この装置は、クラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。

取扱説明書に従って正しい取り扱いをして下さい。

V C C I - B

インターネット回線への接続に関するご注意

本製品は電気通信事業者(移动通信会社、固定通信会社、インターネットプロバイダ等)の通信回線(公衆無線LANを含む)に直接接続することができません。本製品をインターネットに接続する場合は、必ずルータ等を経由し接続してください。

Safety Precautions

Accessories that came with this product have been designed and verified for the use in connection with this product. Never use accessories for other products to prevent the risk of electric shock or fire.

安全上のご注意

付属品は当該専用品です。他の機器には使用しないでください。機器の破損もしくは、火災や感電の原因となることがあります。

KC: Korea Warning Statement

B급 기기 (가정용 방송통신기자재)

이 기기는 가정용(B급) 전자파적합기기로서 주로 가정에서 사용하는 것을 목적으로 하며, 모든 지역에서 사용할 수 있습니다.

*당해 무선설비는 전파혼신 가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없습니다.

Précautions d'emploi de l'appareil :

- a. Soyez particulièrement vigilant quant à votre sécurité lors de l'utilisation de cet appareil dans certains lieux (les avions, les aéroports, les hôpitaux, les stations-service et les garages professionnels).
- b. Évitez d'utiliser cet appareil à proximité de dispositifs médicaux implantés. Si vous portez un implant électronique (stimulateurs cardiaques, pompes à insuline, neurostimulateurs...), veuillez impérativement respecter une distance minimale de 15 centimètres entre cet appareil et l'implant pour réduire les risques d'interférence.
- c. Utilisez cet appareil dans de bonnes conditions de réception pour minimiser le niveau de rayonnement. Ce n'est pas toujours le cas dans certaines zones ou situations, notamment dans les parkings souterrains, dans les ascenseurs, en train ou en voiture ou tout simplement dans un secteur mal couvert par le réseau.
- d. Tenez cet appareil à distance du ventre des femmes enceintes et du bas-ventre des adolescents.

Australia statement notice

From 1 January 2012 updated warranties apply to all ASUS products, consistent with the Australian Consumer Law. For the latest product warranty details please visit <https://www.asus.com/support/>. Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

If you require assistance please call ASUS Customer Service 1300 2787 88 or visit us at <https://www.asus.com/support/>.

Declaration of compliance for product environmental regulation

ASUS follows the green design concept to design and manufacture our products, and makes sure that each stage of the product life cycle of ASUS product is in line with global environmental regulations. In addition, ASUS disclose the relevant information based on regulation requirements.

Please refer to <https://esg.asus.com/Compliance.htm> for information disclosure based on regulation requirements ASUS is complied with:

EU REACH and Article 33

Complying with the REACH (Registration, Evaluation, Authorization, and Restriction of Chemicals) regulatory framework, we publish the chemical substances in our products at ASUS REACH website at <https://esg.asus.com/Compliance.htm>.

EU RoHS

This product complies with the EU RoHS Directive. For more details, see <https://esg.asus.com/Compliance.htm>

Japan JIS-C-0950 Material Declarations

Information on Japan RoHS (JIS-C-0950) chemical disclosures is available on <https://esg.asus.com/Compliance.htm>

India RoHS

This product complies with the “India E-Waste (Management) Rules, 2016” and prohibits use of lead, mercury, hexavalent chromium, polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs) in concentrations exceeding 0.1% by weight in homogenous materials and 0.01% by weight in homogenous materials for cadmium, except for the exemptions listed in Schedule II of the Rule.

Vietnam RoHS

ASUS products sold in Vietnam, on or after September 23, 2011, meet the requirements of the Vietnam Circular 30/2011/TT-BCT.

Các sản phẩm ASUS bán tại Việt Nam, vào ngày 23 tháng 9 năm 2011 trở về sau, đều phải đáp ứng các yêu cầu của Thông tư 30/2011/TT-BCT của Việt Nam.

Türkiye RoHS

AEEE Yönetmeliğine Uygundur

ASUS Recycling/Takeback Services

ASUS recycling and takeback programs come from our commitment to the highest standards for protecting our environment. We believe in providing solutions for you to be able to responsibly recycle our products, batteries, other components as well as the packaging materials. Please go to <https://esg.asus.com/en/Takeback.htm> for detailed recycling information in different regions.

Ecodesign Directive

The European Union announced a framework for the setting of ecodesign requirements for energy-related products (2009/125/EC). Specific implementing measures are aimed at improving environmental performance of specific products or across multiple product types. ASUS provides product information on the CSR website. ASUS provides product information at <https://esg.asus.com/Compliance.htm>.



DO NOT throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.



DO NOT throw the mercury-containing button cell battery in municipal waste. This symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

ENERGY STAR® Qualified Product



ENERGY STAR® is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy helping us all save money and protect the environment through energy efficient products and practices.

All ASUS products with the ENERGY STAR® logo comply with the ENERGY STAR® standard, and the power management feature is enabled by default. The monitor is automatically set to sleep within 10 minutes of user inactivity; the computer is automatically set to sleep within 30 minutes of user inactivity. To wake your computer, click the mouse, press any key on the keyboard, or press the power button.

Please visit <https://www.energystar.gov> for detailed information on the ENERGY STAR® joint program, power management, and the benefits to the environment.



ENERGY STAR® is NOT supported on FreeDOS and Linux-based products.

Simplified UKCA Declaration of Conformity

ASUSTeK Computer Inc. hereby declares that this device is in compliance with the essential requirements and other relevant provisions of related Regulations. Full text of UKCA declaration of conformity is available at: www.asus.com/support

Simplified EU Declaration of Conformity

English ASUSTeK Computer Inc. hereby declares that this device is in compliance with the essential requirements and other relevant provisions of related Directives. Full text of EU declaration of conformity is available at: www.asus.com/support

Français AsusTek Computer Inc. déclare par la présente que cet appareil est conforme aux critères essentiels et autres clauses pertinentes des directives concernées. La déclaration de conformité de l'UE peut être téléchargée à partir du site Internet suivant : www.asus.com/support

Deutsch ASUSTeK Computer Inc. erklärt hiermit, dass dieses Gerät mit den wesentlichen Anforderungen und anderen relevanten Bestimmungen der zugehörigen Richtlinien übereinstimmt. Der gesamte Text der EU-Konformitätserklärung ist verfügbar unter: www.asus.com/support

Italiano ASUSTeK Computer Inc. con la presente dichiara che questo dispositivo è conforme ai requisiti essenziali e alle altre disposizioni pertinenti con le direttive correlate. Il testo completo della dichiarazione di conformità UE è disponibile all'indirizzo: www.asus.com/support

Русский Компания ASUS заявляет, что это устройство соответствует основным требованиям и другим соответствующим условиям соответствующих директив. Подробную информацию, пожалуйста, смотрите на www.asus.com/support

Български С настоящото ASUSTeK Computer Inc. декларира, че това устройство е в съответствие със съществените изисквания и другите приложими постановления на свързаните директиви. Пълният текст на декларацията за съответствие на ЕС е достъпна на адрес: www.asus.com/support

Hrvatski ASUSTeK Computer Inc. ovim izjavljuje da je ovaj uređaj sukladan s bitnim zahtjevima i ostalim odgovarajućim odredbama vezanih direktiva. Cijeli tekst EU izjave o sukladnosti dostupan je na: www.asus.com/support

Čeština Společnost ASUSTeK Computer Inc. tímto prohlašuje, že toto zařízení splňuje základní požadavky a další příslušná ustanovení souvisejících směrnic. Plné znění prohlášení o shodě EU je k dispozici na adrese: www.asus.com/support

Dansk ASUSTeK Computer Inc. erklærer hermed, at denne enhed er i overensstemmelse med hovedkravene og andre relevante bestemmelser i de relaterede direktiver. Hele EU-overensstemmelseserklæringen kan findes på: www.asus.com/support

Nederlands ASUSTeK Computer Inc. verklaart hierbij dat dit apparaat voldoet aan de essentiële vereisten en andere relevante bepalingen van de verwante richtlijnen. De volledige tekst van de EU-verklaring van conformiteit is beschikbaar op: www.asus.com/support

Eesti Käesolevaga kinnitab ASUSTeK Computer Inc, et see seade vastab asjakohaste direktiivide oluliste nõuetele ja teistele asjassepuutuvatele sätetele. EL vastavusdeklaratsiooni täielik tekst on saadaval järgmisel aadressil: www.asus.com/support

Suomi ASUSTeK Computer Inc. ilmoittaa täten, että tämä laite on asiaankuuluvien direktiivien olennaisten vaatimusten ja muiden tätä koskevien säädösten mukainen. EU-yhdenmukaisuusilmoituksen koko teksti on luettavissa osoitteessa: www.asus.com/support

Ελληνικά Με το παρόν, η AsusTek Computer Inc. δηλώνει ότι αυτή η συσκευή συμμορφώνεται με τις θεμελιώδεις απαιτήσεις και άλλες σχετικές διατάξεις των Οδηγιών της ΕΕ. Το πλήρες κείμενο της δήλωσης συμβατότητας είναι διαθέσιμο στη διεύθυνση: www.asus.com/support

Magyar Az ASUSTeK Computer Inc. ezennel kijelenti, hogy ez az eszköz megfelel a kapcsolódó Irányelvek lényeges követelményeinek és egyéb vonatkozó rendelkezéseinek. Az EU megfeleléségi nyilatkozat teljes szövege innen letölthető: www.asus.com/support

Latviski ASUSTeK Computer Inc. ar šo paziņo, ka šī ierīce atbilst saistīto Direktīvu būtiskajām prasībām un citiem citiem saistošajiem nosacījumiem. Pilns ES atbilstības paziņojuma teksts pieejams šeit: www.asus.com/support

Lietuvių „ASUSTeK Computer Inc.“ šiuo tvirtina, kad šis įrenginys atitinka pagrindinius reikalavimus ir kitas svarbias susijusių direktyvų nuostatas. Visą ES atitikties deklaracijos tekstą galima rasti: www.asus.com/support

Norsk ASUSTeK Computer Inc. erklærer herved at denne enheten er i samsvar med hovedsaklige krav og andre relevante forskrifter i relaterte direktiver. Fullstendig tekst for EU-samsvarserklæringen finnes på: www.asus.com/support

Polski Firma ASUSTeK Computer Inc. niniejszym oświadcza, że urządzenie to jest zgodne z zasadniczymi wymogami i innymi właściwymi postanowieniami powiązanych dyrektyw. Pełny tekst deklaracji zgodności UE jest dostępny pod adresem: www.asus.com/support

Português A ASUSTeK Computer Inc. declara que este dispositivo está em conformidade com os requisitos essenciais e outras disposições relevantes das Diretivas relacionadas. Texto integral da declaração da UE disponível em: www.asus.com/support

Română ASUSTeK Computer Inc. declară că acest dispozitiv se conformează cerințelor esențiale și altor prevederi relevante ale directivelor conexe. Textul complet al declarației de conformitate a Uniunii Europene se găsește la: www.asus.com/support

Srpski ASUSTeK Computer Inc. ovim izjavljuje da je ovaj uređaj u saglasnosti sa osnovnim zahtevima i drugim relevantnim odredbama povezanih Direktiva. Pun tekst EU deklaracije o usaglašenosti je dostupan da adresi: www.asus.com/support

Slovensky Spoločnosť ASUSTeK Computer Inc. týmto vyhlasuje, že toto zariadenie vyhovuje základným požiadavkám a ostatým príslušným ustanoveniam príslušných smerníc. Celý text vyhlásenia o zhode pre štáty EÚ je dostupný na adrese: www.asus.com/support

Slovenščina ASUSTeK Computer Inc. izjavlja, da je ta naprava skladna z bistvenimi zahtevami in drugimi ustreznimi določbami povezanih direktiv. Celotno besedilo EU-izjave o skladnosti je na voljo na spletnem mestu: www.asus.com/support

Español Por la presente, ASUSTeK Computer Inc. declara que este dispositivo cumple los requisitos básicos y otras disposiciones pertinentes de las directivas relacionadas. El texto completo de la declaración de la UE de conformidad está disponible en: www.asus.com/support

Svenska ASUSTeK Computer Inc. förklarar härmed att denna enhet överensstämmer med de grundläggande kraven och andra relevanta föreskrifter i relaterade direktiv. Fulltext av EU-försäkran om överensstämmelse finns på: www.asus.com/support

Українська ASUSTeK Computer Inc. заявляє, що цей пристрій відповідає основним вимогам та іншим відповідним положенням відповідних Директив. Повний текст декларації відповідності стандартам ЄС доступний на: www.asus.com/support

Türkçe AsusTek Computer Inc., bu aygıtın temel gereksinimlerle ve ilişkili Yönergelerin diğer ilgili koşullarıyla uyumlu olduğunu beyan eder. AB uygunluk bildiriminin tam metni şu adreste bulunabilir: www.asus.com/support

Bosanski ASUSTeK Computer Inc. ovim izjavljuje da je ovaj uređaj usklađen sa bitnim zahtjevima i ostalim odgovarajućim odredbama vezanih direktiva. Cijeli tekst EU izjave o usklađenosti dostupan je na: www.asus.com/support

Warranty

EN: ASUS Guarantee Information

- ASUS offers a voluntary manufacturer's Commercial Guarantee.
- ASUS reserves the right to interpret the provisions of the ASUS Commercial Guarantee.
- This ASUS Commercial Guarantee is provided independently and in addition to the statutory Legal Guarantee and in no way affects or limits the rights under the Legal Guarantee.

For all the guarantee information, please visit <https://www.asus.com/support>.

F: Garantie ASUS

- ASUS fournit une garantie commerciale en tant que garantie volontaire du fabricant.
- ASUS se réserve le droit d'interpréter et de clarifier les informations relatives à la garantie commerciale ASUS.
- Cette garantie commerciale ASUS est fournie indépendamment et parallèlement à la garantie légale, elle n'affecte ou ne limite d'aucune façon les droits acquis par la garantie légale.

Pour plus d'informations sur la garantie, consultez le site <https://www.asus.com/fr/support/>.

G: ASUS Garantieinformationen

- ASUS bietet eine freiwillige Warengarantie des Herstellers an.
- ASUS behält sich das Recht zur Auslegung der Bestimmungen in der ASUS Warengarantie vor.
- Diese ASUS Warengarantie wird unabhängig und zusätzlich zur rechtmäßigen gesetzlichen Garantie gewährt und beeinträchtigt oder beschränkt in keiner Weise die Rechte aus der gesetzlichen Garantie.

Die vollständigen Garantieinformationen finden Sie unter <https://www.asus.com/de/support/>.

I: Informativa sulla Garanzia ASUS

- ASUS offre una Garanzia Commerciale volontaria del produttore.
- ASUS si riserva il diritto di interpretare le disposizioni della Garanzia Commerciale ASUS.
- La presente Garanzia Commerciale ASUS viene fornita in modo indipendente e in aggiunta alla Garanzia Legale prevista per legge e non pregiudica o limita in alcun modo i diritti previsti dalla Garanzia Legale.

Per tutte le informazioni sulla garanzia, visitare <https://www.asus.com/it/support>.

R: Информация о гарантии ASUS

- ASUS предлагает добровольную гарантию от производителя.
- ASUS оставляет за собой право интерпретирования положений гарантии ASUS.
- Настоящая гарантия ASUS никоим образом не ограничивает Ваши права, предусмотренные локальным законодательством.

Для получения полной информации о гарантии посетите <https://www.asus.com/ru/support/>.

DA: ASUS garantioplysninger

- ASUS tilbyder en valgfri handelsmæssig garanti.
- ASUS forbeholder sig retten til at fortolke bestemmelserne i ASUS' handelsmæssige garanti.
- Denne handelsmæssige garanti fra ASUS tilbydes uafhængigt, som en tilføjelse til den lovbestemte juridiske garanti og den påvirker eller begrænser på ingen måde rettighederne i den juridiske garanti.

Alle garantioplysningerne kan findes på <https://www.asus.com/dk/support/>.

BG: Информация за гаранцията от ASUS

- ASUS предлага доброволна търговска гаранция от производителя.
- ASUS си запазва правото да тълкува условията на търговската гаранция на ASUS.
- Тази търговска гаранция на ASUS се предлага независимо от и в допълнение на законовата гаранция. Тя по никакъв начин не оказва влияние върху правата на потребителя в законовата гаранция и по никакъв начин не ги ограничава.

За цялостна информация относно гаранцията, моля, посетете <https://www.asus.com/bg/support>.

CZ: Informace o záruce společnosti ASUS

- Společnost ASUS nabízí dobrovolnou komerční záruku výrobce.
- Společnost ASUS si vyhrazuje právo vykládat ustanovení komerční záruky společnosti ASUS.
- Tato komerční záruka společnosti ASUS je poskytována nezávisle a jako doplněk zákonné záruky a žádným způsobem neovlivňuje ani neomezuje práva vyplývající ze zákonné záruky.

Všechny informace o záruce najdete na adrese <https://www.asus.com/cz/support/>.

CR: Informacije o ASUS jamstvu

- ASUS dragovaljno nudi komercialno proizvođačko jamstvo.
- ASUS zadržava prava na tumačenje odredbi ASUS komercijalnog jamstva.
- Ovo ASUS komercialno jamstvo daje se neovisno i kao dodatak zakonskom jamstvu i ni na koji način ne ograničuje prava iz okvira zakonskog jamstva.

Sve informacije o jamstvu potražite na <https://www.asus.com/support>.

DU: ASUS-garantie-informatie

- SUS biedt een vrijwillige commerciële garantie van de fabrikant.
- ASUS behoudt zich het recht voor om de bepalingen van de commerciële garantie van ASUS uit te leggen.
- Deze commerciële garantie van ASUS wordt onafhankelijk en als aanvulling op de statutaire Wettelijke garantie geboden en beïnvloedt of beperkt in geen geval de rechten onder de wettelijke garantie.

Voor alle informatie over de garantie, gaat u naar <https://www.asus.com/nl/support/>.

EE: Teave ASUS-e garantii kohta

- ASUS pakub vabatahtlikku tasulist tootjagarantiid.
- ASUS jätab endale õiguse tõlgendada ASUS-e tasulise garantii tingimusi.
- See ASUS-e tasuline garantii on sõltumatu lisagarantii seadusega kehtestatud garantiele ega mõjuta mingil määral seadusega kehtestatud garantiid ning seadusega kehtestatud garantiid piiranguid.

Vaadake garantiiga seotud teavet veebisaidil <https://www.asus.com/ee/>.

GK: Πληροφορίες εγγύησης ASUS

- H ASUS προσφέρει μια εθελοντική Εμπορική εγγύηση κατασκευαστή.
 - H ASUS διατηρεί το δικαίωμα ερμηνείας των διατάξεων της Εμπορικής εγγύησης ASUS.
 - Αυτή η Εμπορική εγγύηση ASUS παρέχεται ανεξάρτητα και επιπροσθέτως της θεσμικής Νομικής εγγύησης και σε καμία περίπτωση δεν επηρεάζει ή περιορίζει τα δικαιώματα βάσει της Νομικής εγγύησης.
- Τα όλης τις πληροφορίες εγγύησης, επισκεφθείτε τη διεύθυνση <https://www.asus.com/gr/el/>.

HUG: ASUS garanciális információk

- Az ASUS önkéntes gyártói kereskedelmi garanciát kínál.
- Az ASUS fenntartja magának a jogot, hogy értelmezze az ASUS kereskedelmi garanciára vonatkozó rendelkezéseket.
- Ezt a kereskedelmi garanciát az ASUS függetlenül és a törvényes garancia mellett nyújtja és semmilyen módon nem befolyásolja, vagy korlátozza a jogi garancia nyújtotta jogokat.

A garanciára vonatkozó teljes körű információkért látogasson el a <https://www.asus.com/hu/support/oldalra>.

LV: ASUS garantijas informācija

- ASUS piedāvā brīvprātīgu ražotāja komerciālo garantiju.
- ASUS patur tiesības interpretēt ASUS komerciālās garantijas noteikumus.
- Šī ASUS komerciālā garantija tiek piedāvāta neatkarīgi un papildus likumā noteiktajai juridiskajai garantijai, un tā nekādā veidā neietekmē vai neierobežo juridiskajai garantijai noteiktās tiesības.

Lai iegūtu informāciju par garantiju, apmeklējiet vietni <https://www.asus.com/lv/>.

LT: Informacija apie ASUS garantiją

- ASUS siūlo savanorišką komercinę gamintojo garantiją.
- ASUS pasilieka teisę savo nuostatais aiškinti šios komercinės ASUS garantijos nuostatas.
- Ši komercinė ASUS garantija suteikiama nepriklausoma, be įstatyminės teisinės garantijos, ir jokiu būdu nepaveikia ar neapriboja teisinės garantijos suteikiamų teisių.

Norėdami gauti visą informaciją apie garantiją, apsilankykite <https://www.asus.com/lt/>.

PL: Informacje o gwarancji firmy ASUS

- Firma ASUS oferuje dobrowolną gwarancję handlową producenta.
- Firma ASUS zastrzega sobie prawo do interpretacji warunków gwarancji handlowej firmy ASUS.
- Niniejsza gwarancja handlowa firmy ASUS jest udzielana niezależnie, jako dodatek do wymaganej ustawowo gwarancji prawnej i w żaden sposób nie wpływa na prawa przysługujące na mocy gwarancji prawnej ani ich nie ogranicza.

Wszelkie informacje na temat gwarancji można znaleźć na stronie <https://www.asus.com/pl/support>.

PG: Informações de Garantia ASUS

- A ASUS oferece uma Garantia Comercial voluntária do fabricante.
- A ASUS reserva o direito de interpretar as disposições da Garantia Comercial da ASUS.
- Esta Garantia Comercial da ASUS é fornecida de forma independente além da Garantia Legal estatutária e não afeta nem limita de qualquer forma os direitos estabelecidos na Garantia Legal.

Para consultar todas as informações sobre a garantia, visite <https://www.asus.com/pt/support/>.

RO: Informații despre garanția ASUS

- ASUS oferă o garanție comercială voluntară a producătorului.
- ASUS își rezervă dreptul de a interpreta prevederile garanției comerciale ASUS.
- Această garanție comercială ASUS este oferită independent și în plus față de garanția obligatorie legală și nu afectează sau limitează în niciun fel drepturile acordate conform garanției legale.

Pentru toate informațiile legate de garanție, vizitați <https://www.asus.com/ro/support>.

SL: Informacije o garanciji ASUS

- ASUS ponuja prostovoljno tržno garancijo proizvajalca.
- ASUS si pridržuje pravico do razlage določb tržne garancije družbe ASUS.
- Ta tržna garancija družbe ASUS je na voljo neodvisno in kot dodatek zakonsko predpisani pravni garanciji ter na noben način ne vpliva na pravice, ki jih zagotavlja pravna garancija, oziroma jih omejuje.

Vse informacije o garanciji najdete na spletnem mestu <https://www.asus.com/sk/support>.

SK: Informácie o záruke ASUS

- ASUS ponúka dobrovoľnú obchodnú záruku výrobcu.
- ASUS si vyhradzuje právo interpretovať ustanovenia obchodnej záruky ASUS.
- Táto obchodná záruka ASUS je poskytnutá nezávisle a navyše k zákonnej záruke a v žiadnom prípade neovplyvňuje ani neobmedzuje tieto práva podľa tejto zákonnej záruky.

Všetky další informace o záruce najdete na <https://www.asus.com/sk/support>.

ES: Información de garantía de ASUS

- ASUS ofrece una garantía comercial voluntaria del fabricante.
- ASUS se reserva el derecho de interpretar las disposiciones de esta garantía comercial de ASUS.
- Esta garantía comercial de ASUS se proporciona de forma independiente y adicional a la garantía estatutaria y de ninguna manera afecta a los derechos bajo la garantía legal ni los limita.

Para obtener toda la información sobre la garantía, visite <https://www.asus.com/ES/support/>.

TR: ASUS Garanti Bilgileri

- ASUS, gönüllü olarak üretici Ticari Garantisini sunar.
- ASUS, ASUS Ticari Garantisinin hükümlerini yorumlama hakkını saklı tutar.
- Bu ASUS Ticari Garantisini, bağımsız olarak ve hukuki Yasal Garanti'ye ek olarak sağlamak ve hiçbir şekilde Yasal Garanti kapsamındaki hakları etkilemez veya sınırlandırmaz.

Tüm garanti bilgileri için lütfen <https://www.asus.com/tr/support> adresini ziyaret edin.

FI: ASUS-takuutiedot

- ASUS tarjoaa vapaaehtoisien valmistajan kaupallisen takuun.
- ASUS pidättää oikeuden tulkita ASUS-kaupallisen takuun ehdot.
- Tämä ASUS-kaupallinen takuu tarjotaan itsenäisesti lakisääteisen oikeudellisen takuun lisäksi eikä se vaikuta millään tavoin laillisen takuun oikeuksiin tai rajoita niitä.

Saadaksesi kaikki takuutiedot, siirry osoitteeseen <https://www.asus.com/fi/support>.

NW: Informasjon om ASUS-garanti

- ASUS tilbyr som produsent en frivillig kommersiell garanti.
- ASUS forbeholder seg retten til å tolke bestemmelsene i ASUS sin kommersielle garanti.
- ASUS sin kommersielle garanti gir uavhengig og i tillegg til den lovbestemte juridiske garantien, og verken påvirker eller begrenser rettighetene under den juridiske garantien på noen måte.

Du finner fullstendig informasjon om garanti på <https://www.asus.com/no/support/>.

SB: Informacije o ASUS garanciji

- ASUS nudi dobrovoljnu proizvođačku komercijalnu garanciju.
- ASUS zadržava pravo da tumači odredbe svoje ASUS komercijalne garancije.
- Ova ASUS komercijalna garancija daje se nezavisno, kao dodatak zakonskoj pravnoj garanciji, i ni na koji način ne utiče na i ne ograničava prava dala pravnomoćnom garancijom.

Za sve informacije o garanciji, posetite <https://www.asus.com/support/>.

SW: ASUS garantiinformation

- ASUS erbjuder en frivillig kommersiell tillverkningsgaranti.
- ASUS förbehåller sig rätten att tolka bestämmelserna i ASUS kommersiella garanti.
- Denna kommersiella garanti från ASUS tillhandahålls separat och som tillägg till den lagstadgade garantin, och påverkar eller begränsar på intet sätt rättigheterna under den lagstadgade garantin.

För all garantiinformation, besök <https://www.asus.com/se/support/>.

UA: Інформація про Гарантію ASUS

- ASUS пропонує добровільну Комерційну Гарантію виробника.
- ASUS застерігає за собою право тлумачити положення Комерційної Гарантії ASUS
- Цю Комерційну Гарантію надано незалежно і на додаток до обов'язкової Законної Гарантії; вона жодним чином не впливає на права за Законною Гарантією і не обмежує їх.

Всю інформацію про гарантію подано тут: <https://www.asus.com/ua/support>.

MX: Garantía y Soporte

Esta Garantía aplica en el país de compra. Usted acepta que en esta garantía:

- Los procedimientos de servicio pueden variar en función del país.
- Algunos servicios y/o piezas de reemplazo pudieran no estar disponibles en todos los países.
- Algunos países pueden tener tarifas y restricciones que se apliquen en el momento de realizar el servicio, visite el sitio de soporte de ASUS en <https://www.asus.com/mx/support/> para ver más detalles.
- Si tiene alguna queja o necesidad de un centro de reparación local o el periodo de garantía del producto ASUS, por favor visite el sitio de Soporte de ASUS en <https://www.asus.com/mx/support/> para mayores detalles.

Información de contacto ASUS

Esta garantía está respaldada por:
ASUSTeK Computer Inc.
Centro de Atención ASUS +52 (55) 1946-3663

BP: Informações de garantia ASUS

Esta garantia aplica-se ao período definido pela garantia legal (90 dias) mais o período de garantia comercial oferecido pela ASUS. Por exemplo: 12M significa 12 meses de garantia no total (3 meses de garantia legal mais 9 meses de garantia contratual), 24 meses significa 24 meses de garantia no total (3 meses de garantia legal mais 21 meses de garantia contratual) e 36 meses significa 36 meses de garantia no total (3 meses de garantia legal e 33 de garantia contratual) a contar da data da garantia declarada (Data de Início da Garantia).

Para todas as informações de garantia, visite <https://www.asus.com/br/support/>.

ID: Informasi Garansi ASUS

Garansi ini berlaku di negara tempat pembelian.

Periode Garansi tertera pada kemasan/kotak dari Produk dan Masa Garansi dimulai sejak tanggal pembelian Produk ASUS dengan kondisi baru.

Silahkan pinjai Kode QR di bagian bawah halaman terakhir untuk Kartu Garansi versi Web dalam format PDF untuk lebih informasi jelas mengenai jaminan garansi Produk ASUS.

- Informasi Dukungan ASUS, silakan kunjungi <https://www.asus.com/id/support>.
- Informasi Lokasi Layanan, silakan kunjungi <https://www.asus.com/id/support/Service-Center/Indonesia>.
- Layanan Call Center: 1500128

Vi: Thông tin đảm bảo của ASUS

- ASUS cung cấp Bảo hành thương mại tự nguyện của nhà sản xuất.
- ASUS bảo lưu quyền giải thích các điều khoản của Bảo hành thương mại của ASUS.
- Bảo hành thương mại này của ASUS được cung cấp độc lập và ngoài Bảo đảm pháp lý theo luật định và không có cách nào ảnh hưởng đến hoặc giới hạn các quyền theo Bảo lãnh pháp lý. Để biết tất cả các thông tin bảo hành, vui lòng truy cập

<https://www.asus.com/vn/support>



FCC COMPLIANCE INFORMATION

Per FCC Part 2 Section 2.1077



Responsible Party: Asus Computer International
Address: 48720 Kato Rd., Fremont, CA 94538
Phone/Fax No: (510)739-3777/(510)608-4555

hereby declares that the product

Product Name : Workstation
Model Number : Pro ET900A X9, WS990T

compliance statement:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Ver. 180125

Service and Support

Visit our multi-language website at <https://www.asus.com/support>.



This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.