ASUS ROG MAXIMUS XIII EXTREME GLACIAL

ASUS ROG Maximus XIII Extreme Glacial Z590 Motherboard User Manual

Model: ROG MAXIMUS XIII EXTREME GLACIAL

1. INTRODUCTION

This manual provides detailed instructions for the installation, operation, and maintenance of your ASUS ROG Maximus XIII Extreme Glacial Z590 motherboard. Designed for high-performance computing and advanced water-cooling enthusiasts, this motherboard supports 10th and 11th Generation Intel Core processors and features an integrated EK water block for optimal thermal management.

Please read this manual thoroughly before proceeding with installation to ensure correct setup and to maximize the performance and longevity of your system.

2. PRODUCT OVERVIEW

The ASUS ROG Maximus XIII Extreme Glacial motherboard is engineered for extreme performance and comprehensive cooling. Key features include:

- **Intel LGA 1200 Socket:** Compatible with 10th and 11th Gen Intel Core processors.
- **Integrated EK Water Block:** Full-coverage water block for VRM, CPU, and PCH.
- **Extreme Power Solution:** 18+2 teamed power stages, ProCool II connectors, MicroFine alloy chokes, and 10K Japanese-made black metallic capacitors.
- **Advanced Cooling:** Five M.2 heatsinks with embedded backplates and ROG Water-Cooling Zone.
- **AI Motherboard Features:** AI Overclocking, AI Cooling, AI Networking, and AI Noise Cancellation.
- **Connectivity:** PCIe 4.0, five M.2 slots, USB 3.2 Gen 2x2, dual Thunderbolt 4 USB-C, 10Gb and 2.5Gb LAN, WiFi 6E AX210.
- **Audio:** SupremeFX ALC4082 CODECESS, DTS Sound Unbound, and Sonic Studio III.
- **Personalization:** 2-inch LiveDash color OLED display and ASUS Aura Sync RGB lighting.
- **DIY-Friendly Design:** Pre-mounted I/O shield, V_Latch switch, BIOSFlashBack, Q-Code, FlexKey, Q-Connector, SafeSlot, and Graphics Card Holder.

Figure 2.1: ASUS ROG Maximus XIII Extreme Glacial Motherboard and included accessories.
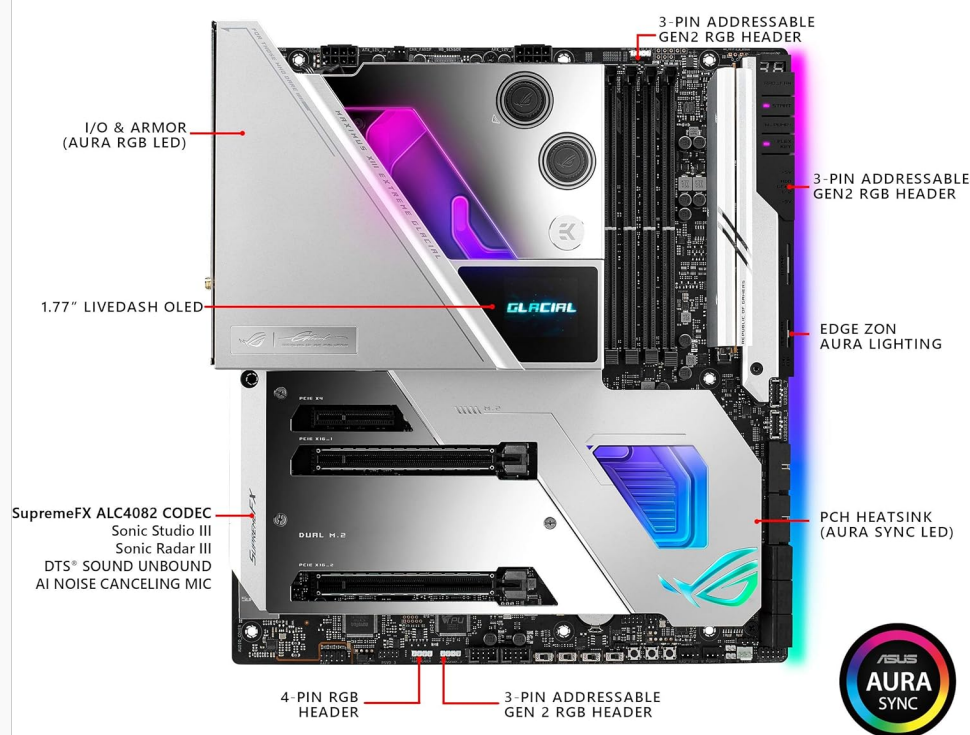

Figure 2.2: Motherboard layout showcasing the 1.77-inch LiveDash OLED, SupremeFX audio, and Aura RGB lighting zones.

Comprehensive Cooling

AI Cooling, EK® ULTRABLOCK ,
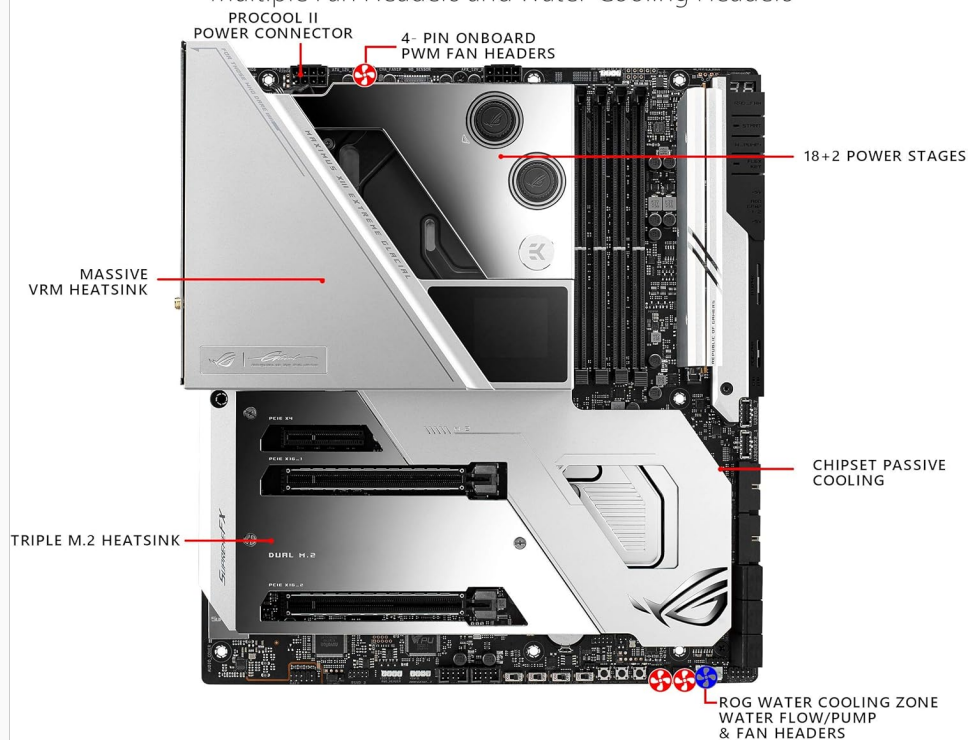## Multiple Fan Headers and Water-Cooling Headers

Figure 2.3: Comprehensive cooling design featuring the integrated EK Ultrablock, massive VRM heatsink, and chipset passive cooling.

Extreme Power & Performance

AI Overclocking, 18+2 Power Stage, 4x DIMM 128GB DDR4,
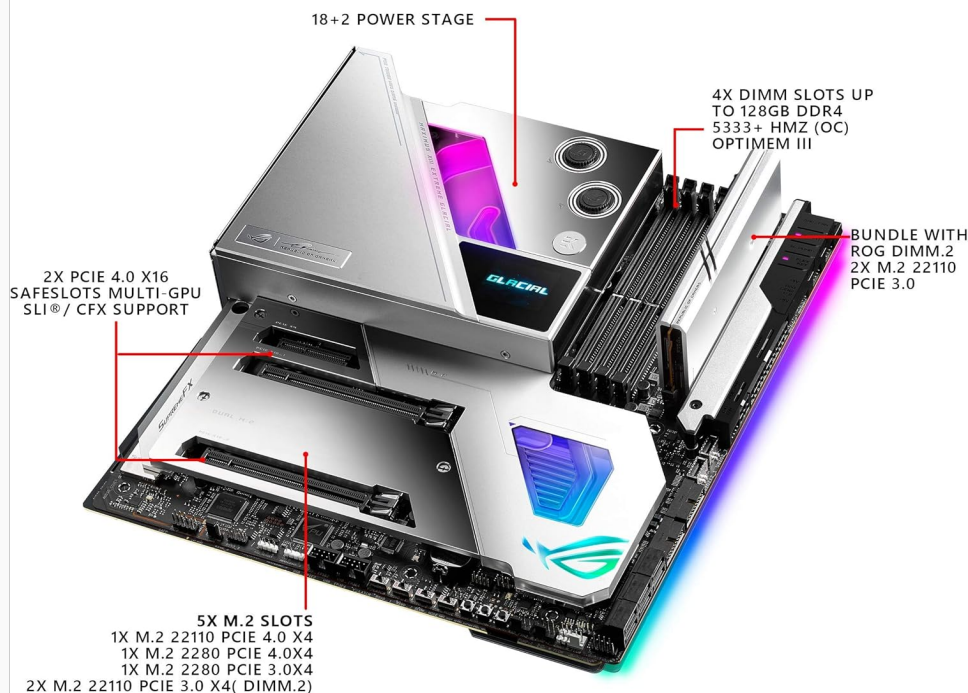## 5x M.2 NVMe SSD and 2x PCIe 4.0 x16 Slots

Figure 2.4: Extreme power and performance components, including 18+2 power stages, DIMM slots for up to 128GB DDR4, and multiple M.2 and PCIe 4.0 slots.

Full Gaming Connectivity

AI Networking, **WiFi 6E** (Gig+), 10G LAN, Intel®2.5G LAN, Bluetooth v5.2
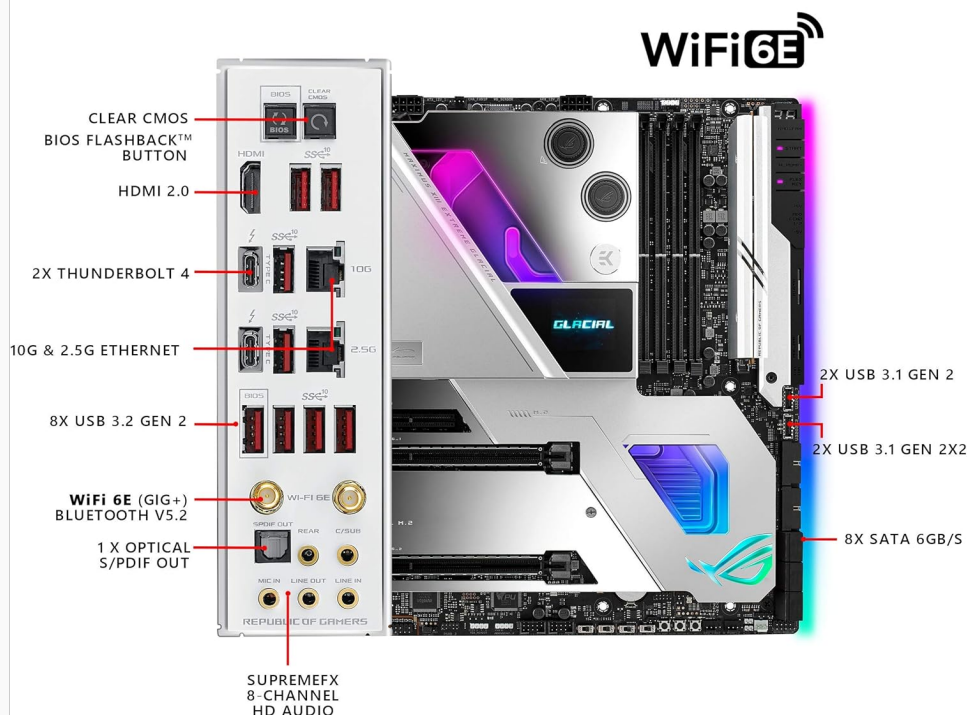Thunderbolt 4, USB 3.2 Gen 2x2 and BIOS FlashBack™

Figure 2.5: Full gaming connectivity with the rear I/O panel, highlighting Thunderbolt 4, 10G and 2.5G Ethernet, and WiFi 6E.

What's in the Box

Figure 2.6: Contents of the retail package, including the motherboard, ROG DIMM.2, WiFi 6E antenna, SATA cables, and other accessories.

3. SETUP AND INSTALLATION

Proper installation is crucial for system stability and performance. This motherboard requires a custom liquid cooling

loop due to its integrated EK water block.

3.1 Pre-Installation Checklist

- Ensure you have a compatible CPU (Intel LGA 1200, 10th or 11th Gen).
- Acquire compatible DDR4 RAM modules.
- Prepare all necessary components for your custom liquid cooling loop (pump, radiator, reservoir, fittings, tubing, coolant).
- Gather essential tools: Phillips-head screwdriver, anti-static wrist strap, thermal paste (if not pre-applied to CPU).

3.2 Component Installation

1. **CPU Installation:** Carefully open the CPU socket lever, align the CPU with the socket's notch, gently place it, and close the lever.
2. **RAM Installation:** Open the DIMM slot clips, align the RAM modules with the key notch, and press firmly until the clips snap into place.
3. **M.2 SSD Installation:** Locate the M.2 slots (under heatsinks). Remove the heatsink, insert the M.2 SSD at an angle, and secure it with the provided screw or Q-Latch mechanism. Reattach the heatsink.
4. **Graphics Card Installation:** Insert your PCIe graphics card into the primary PCIe 4.0 x16 slot until it clicks. Secure it with a case screw.
5. **Power Connections:** Connect the 24-pin ATX power connector and the 8-pin + 4-pin (or dual 8-pin) CPU power connectors from your power supply to the motherboard.

3.3 Liquid Cooling Loop Setup

The integrated EK water block cools the CPU, VRM, and PCH. Connect your custom liquid cooling loop to the inlet and outlet ports on the water block. Ensure all fittings are securely tightened to prevent leaks. Fill the loop with appropriate coolant and perform a leak test before powering on the system.

4. OPERATING INSTRUCTIONS

4.1 BIOS/UEFI Setup

Upon initial boot, press the **DEL** or **F2** key to enter the UEFI BIOS. Here you can configure boot order, system settings, and advanced features. Refer to the ASUS website for the latest UEFI BIOS manual for detailed information.

4.2 AI Features

- **AI Overclocking:** Automatically analyzes your CPU and cooling system to predict optimal voltage and frequency settings.
- **AI Cooling:** Monitors CPU temperatures and dynamically adjusts fan speeds to maintain optimal thermal performance while minimizing noise.
- **AI Networking:** Optimizes network traffic for gaming and streaming by prioritizing bandwidth.
- **AI Noise Cancellation:** Utilizes a vast deep-learning database to preserve your voice while eliminating distracting keyboard clatter, mouse clicks, and other ambient noises.

4.3 LiveDash OLED

The 2-inch LiveDash OLED display can show useful system information such as CPU temperature, frequency, fan speeds, or custom graphics. Configure its display options via the ASUS Armoury Crate software.

5. Maintenance

Regular maintenance ensures the longevity and optimal performance of your motherboard and system.

- **Liquid Cooling System:** Periodically inspect your liquid cooling loop for leaks, coolant levels, and clarity. Replace coolant according to the manufacturer's recommendations (typically every 6-12 months). Clean radiators and fans to prevent dust buildup.
- **Dust Removal:** Use compressed air to gently remove dust from PCIe slots, RAM slots, and other components. Ensure the system is powered off and unplugged before cleaning.
- **Software Updates:** Keep your motherboard's BIOS/UEFI firmware and drivers updated to the latest versions available on the ASUS support website.

6. Troubleshooting

If you encounter issues, refer to the following common troubleshooting steps:

- **No Power/No POST:**
  - Check all power connections (24-pin ATX, CPU power).
  - Ensure CPU, RAM, and GPU are correctly seated.
  - Consult the Q-Code display on the motherboard for diagnostic codes.

- **Memory Issues:**
  - Try booting with a single RAM stick in different slots.
  - Ensure RAM is compatible and listed on the motherboard's Qualified Vendor List (QVL).

- **BIOS FlashBack:** If the system does not boot after a BIOS update or if you need to update the BIOS without a CPU/RAM, use the BIOS FlashBack feature. Refer to the motherboard manual for specific instructions on using the BIOS FlashBack button and USB port.
- **Connectivity Problems:**
  - For network issues, ensure LAN cables are properly connected and drivers are installed.
  - For WiFi, ensure the antenna is securely attached and drivers are updated.

7. Specifications

Feature	Specification
CPU Socket	LGA 1200
Chipset	Intel Z590
RAM Type	DDR4
Max RAM Capacity	128 GB
Memory Speed	Up to 4400 MHz (OC)
PCIe Slots	2x PCIe 4.0 x16, 1x PCIe 3.0 x4
M.2 Slots	5x M.2 slots (PCIe 4.0 and PCIe 3.0 support)
USB Ports	USB 3.2 Gen 2x2, Thunderbolt 4, USB 3.2 Gen 2, USB 2.0

Feature	Specification
Ethernet	Marvell AQtion 10Gb, Intel 2.5Gb
Wireless	Intel WiFi 6E AX210 (802.11ax), Bluetooth v5.2
Audio	SupremeFX ALC4082 CODECESS
Form Factor	EATX
Dimensions (LxWxH)	13 x 7.63 x 16.25 inches
Item Weight	17.27 pounds

8. SAFETY INFORMATION

Observe the following safety precautions during installation and operation:

- Always disconnect the power cord from the wall outlet before touching any components.
- Use an anti-static wrist strap to prevent electrostatic discharge (ESD) damage to components.
- Handle components by their edges; avoid touching pins or circuitry.
- Ensure proper ventilation within your PC case to prevent overheating.
- For liquid cooling, ensure all connections are secure and perform a leak test before powering on.

9. WARRANTY AND SUPPORT

For warranty information, please refer to the warranty card included with your product or visit the official ASUS support website. For technical assistance, driver downloads, and further support, please visit www.asus.com/support/.