

ASUS PRIME Z890M-PLUS WIFI

ASUS Prime Z890M-PLUS WiFi Motherboard Instruction Manual

Model: PRIME Z890M-PLUS WIFI

1. INTRODUCTION

The ASUS Prime Z890M-PLUS WiFi motherboard is designed to support Intel Core Ultra Processors (Series 2) with an LGA 1851 socket. This mATX motherboard offers a robust platform for advanced AI PCs, featuring 10+1+2+1 80A DrMOS power stages, DDR5 memory support, and PCIe 5.0 connectivity. It includes three M.2 slots, with one supporting PCIe 5.0, and provides high-speed networking through Wi-Fi 7 and Realtek 2.5Gb Ethernet. Connectivity options include USB 20Gbps with DisplayPort video output, USB Type-C, and BIOS FlashBack for convenient firmware updates.

This manual provides detailed instructions for the installation, operation, and maintenance of your ASUS Prime Z890M-PLUS WiFi motherboard.

2. PACKAGE CONTENTS

Verify that all items listed below are present in your motherboard package. If any item is damaged or missing, contact your retailer.

Faster, Cooler & More

+
WiFi 7
for stable WiFi connection
and lower latency

2.5 Gb
2.5Gb Ethernet

+
PCIe 5.0
PCIe 5.0 slot
with full support for
next-gen graphics cards

20 Gbps

USB 20Gbps Type-C®
for the latest super-speed
devices and drives

+
ASUS Fan Xpert 4
for ultimate cooling
control

Image: The ASUS Prime Z890M-PLUS WiFi motherboard, its retail box, Wi-Fi antenna, SATA cables, and M.2 screw packages.

- ASUS Prime Z890M-PLUS WiFi Motherboard
- Wi-Fi Antenna
- SATA Cables
- M.2 Screw Packages
- User Manual (this document)

3. SPECIFICATIONS

Feature	Detail
Brand	ASUS
CPU Socket	LGA 1851
Compatible Devices	Personal Computer

Feature	Detail
RAM Memory Technology	DDR5
Compatible Processors	Intel Core Ultra Processors (Series 2)
Chipset Type	Intel Z890
Memory Clock Speed	160 MHz (Base, supports higher via OC)
Platform	Windows
Model Name	PRIME Z890M-PLUS WIFI
CPU Model	Intel Core Ultra 5 (and higher Series 2)
Memory Storage Capacity (Max)	192 GB
Main Power Connector Type	24-Pin
Graphics Card Interface	PCI Express 5.0
Memory Slots Available	4
Total SATA Ports	6
Total USB Ports	13 (including USB 20Gbps Type-C with DP Alt mode)
Number of Ethernet Ports	1 (2.5Gb LAN)
Total Number of HDMI Ports	1
Total PCIe Slots	4 (1x PCIe 5.0 x16 SafeSlot, 2x PCIe 4.0 x16, 1x PCIe 4.0 x4)
M.2 Slots	3 (1x PCIe 5.0, 2x PCIe 4.0)
Wi-Fi	Wi-Fi 7 (802.11be)
Item Weight	2.3 Pounds
Item Dimensions L x W x H	9.6"L x 1.9"W x 9.6"H

4. SETUP AND INSTALLATION

Before you begin, ensure your system is powered off and unplugged from the wall outlet. Wear an anti-static wrist strap to prevent electrostatic discharge (ESD) damage to components.

4.1 Motherboard Overview

PRIME Z890M-PLUS WIFI

ASUS PRIME series motherboards are expertly engineered to unleash the full potential of the latest Intel® Core™ Ultra Processors (Series 2). Boasting a robust power design, comprehensive cooling solutions and intelligent tuning options, the PRIME Z890M-PLUS WIFI motherboard provides users and PC DIY builders with a range of performance optimizations via intuitive software and firmware features. It's designed to be Advanced AI PC-ready, offering the power and connectivity needed for demanding AI applications.



Image: An overview diagram of the ASUS Prime Z890M-PLUS WiFi motherboard, highlighting the LGA 1851 socket, DDR5 DIMM slots, PCIe 5.0 x16 SafeSlot, and M.2 slots.

4.2 CPU Installation

1. Locate the LGA 1851 CPU socket on the motherboard.
2. Open the CPU socket lever and lift the load plate.
3. Carefully align your Intel Core Ultra Series 2 processor with the socket, ensuring the gold triangle on the CPU matches the triangle on the socket.
4. Gently place the CPU into the socket without forcing it.
5. Close the load plate and secure it with the lever.

4.3 Memory (RAM) Installation

This motherboard supports DDR5 memory modules. For optimal performance, install modules in matched pairs for dual-channel operation.

AEMP III for Ultimate DDR5 Performance

ASUS Enhanced Memory Profile III (AEMP III) is an advanced firmware feature that empowers users to achieve unparalleled memory performance with cutting-edge CUDIMM memory. Through a two-phase comprehensive tuning process, AEMP III first optimizes the clock driver and then the memory frequency. This results in the best balance between performance and stability, even at cutting-edge speeds of DDR5-7600 or higher.



DIMM Fit

DIMM Fit is an ASUS-exclusive BIOS feature that precisely analyzes individual memory modules to optimize performance and pinpoint potential issues. This offers peak efficiency, compatibility, and system stability. Whether you are an overclocker seeking ultimate performance, a competitor pursuing the most responsive gameplay, or a content creator prioritizing rock-solid stability, DIMM Fit provides optimizations tailored to your needs and your hardware configuration.



Three M.2 slots (up to 128Gbps)

The PRIME Z890M-PLUS WIFI offers a total of three M.2 slots, including one that supports data-transfer speeds of up to 128Gbps via PCIe 5.0, two that support 64Gbps via PCIe 4.0. This enables quicker boot-up and app load times with OS or application drives.



Image: A diagram illustrating the DDR5 DIMM slots and M.2 slots, along with features like AEMP III and DIMM Fit for enhanced memory performance.

1. Open the retention clips on both ends of the DIMM slot.
2. Align the notch on the DDR5 memory module with the key in the DIMM slot.
3. Press down firmly on both ends of the memory module until the clips snap into place.

4.4 Storage (M.2) Installation

The motherboard features three M.2 slots, with one supporting PCIe 5.0 for ultra-fast storage. Refer to the motherboard diagram for exact locations.

1. Unscrew the M.2 heatsink (if present) and remove it.
2. Insert the M.2 SSD into the slot at a 30-degree angle.
3. Push the SSD down and secure it with the provided M.2 screw or Q-Latch mechanism.
4. Reinstall the M.2 heatsink (if applicable).

4.5 Graphics Card Installation

Install your graphics card into the primary PCIe 5.0 x16 SafeSlot for maximum performance.

1. Open the retention clip on the PCIe x16 slot.
2. Align your graphics card with the slot and press down firmly until it clicks into place.
3. Secure the graphics card to your chassis with screws.
4. Connect any necessary PCIe power cables from your power supply to the graphics card.

4.6 Power Connections

Connect the 24-pin ATX power connector and the 8-pin (or 4+4-pin) CPU power connector from your power supply to the motherboard. Ensure all connections are secure.



Robust power design

Stable power is crucial for maximizing the performance of Intel® Core™ Ultra Processors (Series 2). The PRIME Z890M-PLUS WIFI is designed to meet the needs of high-core-count CPUs. It features 10(80A) + 1(80A) + 2(80A) + 1(80A) power stages that integrate high-side and low-side MOSFETs and drivers into packages rated for up to 80 amperes each. This configuration ensures optimal power delivery, efficiency, stability and performance for both current and future Intel® processors.

10 VCC CORE power (80A, DrMOS)	1 VCC GT power (80A, DrMOS)	2 VCC SA power (80A, DrMOS)	1 VNN AON power (80A, DrMOS)
---------------------------------------------	------------------------------------------	------------------------------------------	-------------------------------------------

- Eight-layer PCB design**
Enhanced stability and overclocking.
- ProCool connectors**
Proprietary 8 + 8 pin connectors improve PSU connection.
- Power Saving**
Optimize power with CPU, lighting, and fan settings.
- Digi+ VRM control**
Real-time voltage control.

Image: A visual representation of the motherboard's robust power design, including 10+1+2+1 80A DrMOS power stages and ProCool connectors.

4.7 Front Panel and I/O Connections

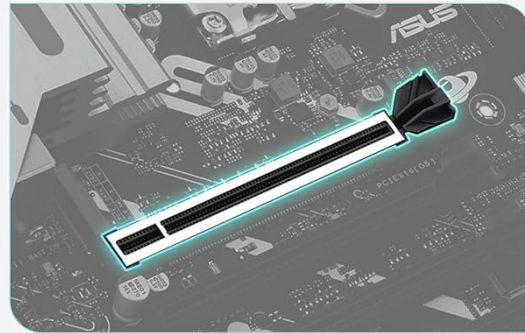
Connect your chassis' front panel headers (power button, reset button, USB ports, audio jacks) to the corresponding pins on the motherboard. The motherboard features a pre-mounted I/O shield for easy installation into your chassis.

EZ PC DIY Innovations



Q-ANTENNA

for quick, hassle-free WiFi setup and consistent performance.



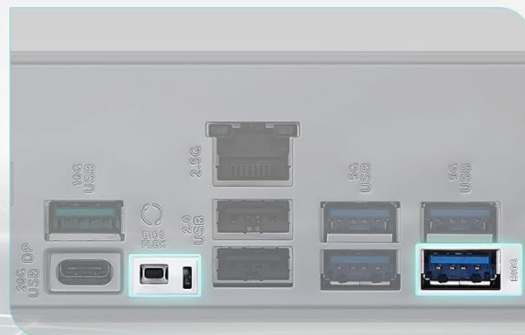
SAFESLOT

For secure card installation and faster data speeds.



PRE-MOUNTED I/O SHIELD

for protecting ports and enhancing both functionality and aesthetics.



BIOS FLASHBACK™

for simple BIOS updates with a FAT32 USB stick. No CPU or memory needed.

Image: Visuals of the Q-Antenna for Wi-Fi setup, SafeSlot for secure card installation, the pre-mounted I/O shield, and the BIOS FlashBack button.

Connect the included Wi-Fi 7 Q-Antenna to the designated ports on the rear I/O panel for optimal wireless performance.

5. OPERATING INSTRUCTIONS

5.1 First Boot and BIOS/UEFI Configuration

- After assembling your PC, connect a monitor, keyboard, and mouse.
- Power on your system. Press the **DEL** or **F2** key during startup to enter the BIOS/UEFI setup utility.
- Configure basic settings such as date, time, boot order, and enable XMP/EXPO for your DDR5 memory if desired.

5.2 Driver Installation

After installing your operating system, it is crucial to install the latest drivers for your motherboard components. Visit

the official ASUS support website for your specific model to download the most up-to-date drivers for chipset, audio, LAN, Wi-Fi, and other utilities.

5.3 Networking

The motherboard supports high-speed networking:

- **Wi-Fi 7 (802.11be):** Connect the included Q-Antenna for stable and low-latency wireless connectivity. Ensure Wi-Fi drivers are installed.
- **Realtek 2.5Gb Ethernet:** Connect an Ethernet cable to the LAN port for high-speed wired network access. Ensure LAN drivers are installed.

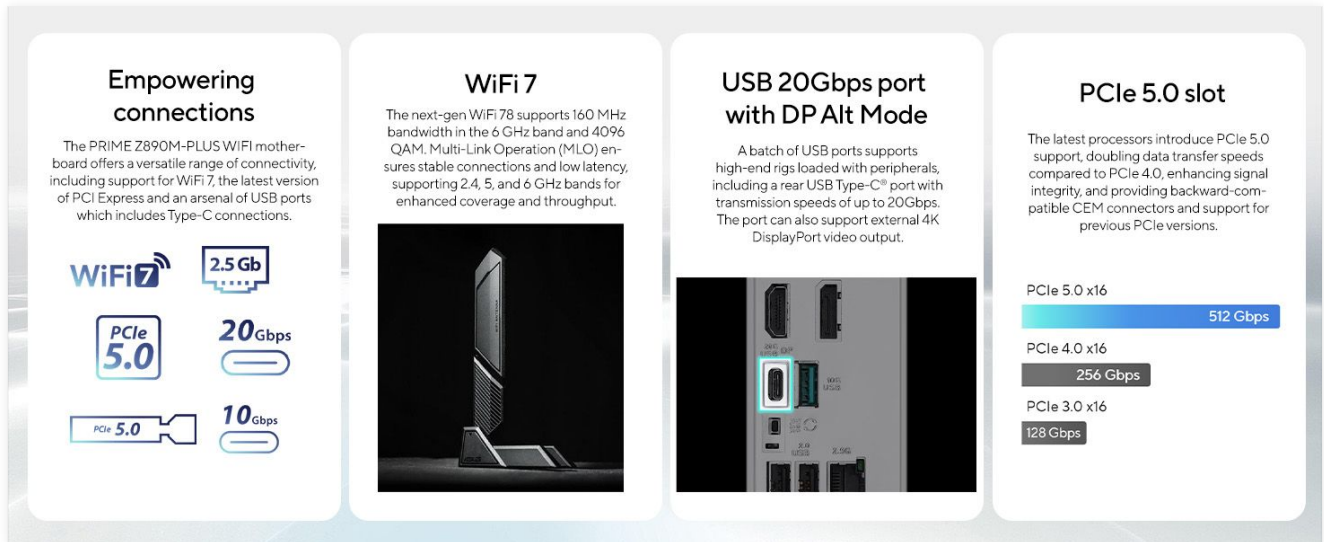


Image: A visual guide to the motherboard's empowering connections, detailing Wi-Fi 7, 2.5Gb Ethernet, USB 20Gbps Type-C with DP Alt Mode, and PCIe 5.0 slot capabilities.

5.4 AI Features

The ASUS Prime Z890M-PLUS WiFi integrates advanced AI solutions to optimize system performance and user experience.

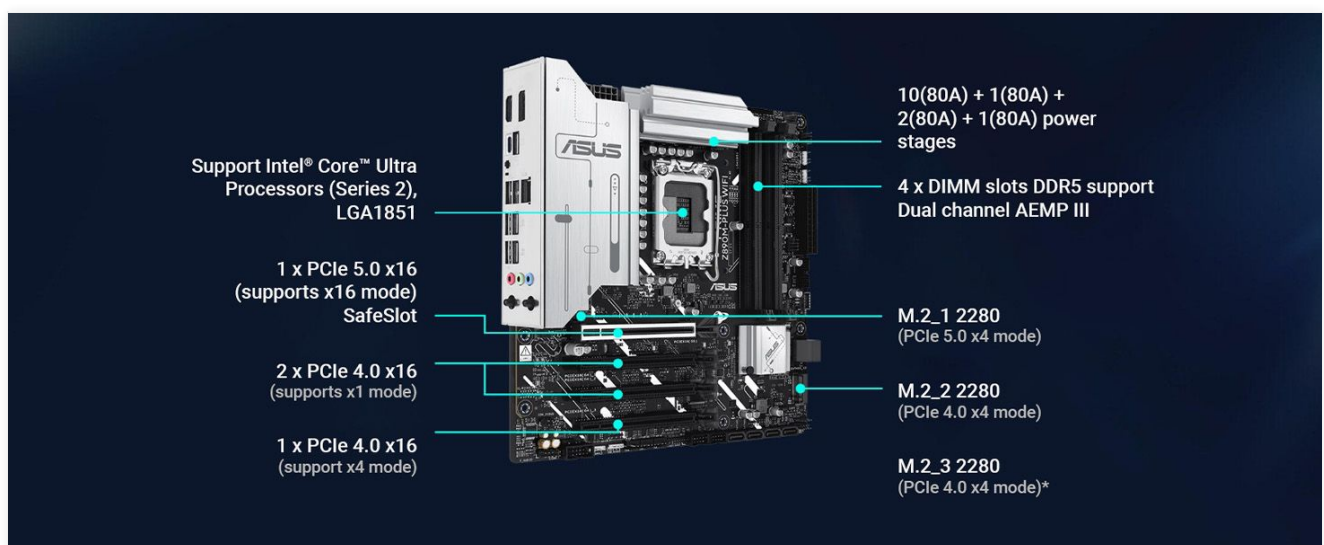


Image: A diagram illustrating the functions of ASUS AI Advisor for system functionality, AI Networking II for optimized network performance, and AI Cooling II for automated thermal control.

- **AI Cooling II:** Optimizes thermal performance and reduces noise by dynamically adjusting fan speeds based on CPU temperatures.
- **AI Networking II:** Enhances network performance, ensuring seamless connectivity and maximizing Wi-Fi 7

speeds.

- **AI Advisor:** Provides insights into motherboard functionality and features.

6. MAINTENANCE

6.1 BIOS FlashBack

The BIOS FlashBack feature allows you to update the BIOS without installing a CPU or memory. This is useful for compatibility with newer processors.

1. Download the latest BIOS file from the ASUS support website.
2. Rename the BIOS file according to the instructions on the ASUS support page (usually a specific filename like 'PZ890MPW.CAP').
3. Copy the renamed BIOS file to the root directory of a FAT32 formatted USB flash drive.
4. Insert the USB flash drive into the designated BIOS FlashBack USB port on the motherboard's rear I/O panel.
5. Press and hold the BIOS FlashBack button for three seconds until the FlashBack LED starts blinking.
6. Release the button. The LED will continue to blink and then turn off when the BIOS update is complete.

6.2 Cleaning

Regularly clean your PC components to ensure optimal performance and longevity. Use compressed air to remove dust from heatsinks, fans, and other components. Ensure the system is powered off and unplugged before cleaning.

6.3 Software and Firmware Updates

Keep your motherboard drivers and BIOS updated to the latest versions available on the ASUS support website to benefit from performance improvements, bug fixes, and enhanced compatibility.

7. TROUBLESHOOTING

7.1 Q-LED Core Diagnostics

The Q-LED Core feature provides visual indicators for key components during the Power-On Self-Test (POST) process. If your system fails to boot, observe the Q-LEDs to identify the problematic component (CPU, DRAM, VGA, BOOT).

- **CPU LED:** Indicates CPU initialization status.
- **DRAM LED:** Indicates memory detection status.
- **VGA LED:** Indicates graphics card detection status.
- **BOOT LED:** Indicates boot device detection status.

7.2 Common Issues

- **No Display/No Boot:**
 - Check all power connections (24-pin ATX, 8-pin CPU, PCIe power for GPU).
 - Reseat CPU, RAM, and graphics card.
 - Verify monitor connection and input source.
 - Observe Q-LED Core indicators for specific component failures.
- **RAM Instability (especially with XMP/EXPO enabled):**

- Ensure RAM modules are installed in the correct slots for dual-channel operation as per the motherboard manual.
 - Update BIOS to the latest version.
 - If experiencing instability with XMP/EXPO profiles above 6000MHz, try manually adjusting timings or voltage, or use a lower frequency profile.
- **Bluetooth Not Working:**
 - Ensure Wi-Fi/Bluetooth drivers are correctly installed.
 - Check if the Wi-Fi antenna is securely connected.
 - Verify Bluetooth is enabled in the BIOS and operating system.
- **Network Connectivity Issues (Wi-Fi/LAN):**
 - Install the latest Wi-Fi 7 and Realtek 2.5Gb LAN drivers from the ASUS website.
 - Ensure the Wi-Fi antenna is properly connected.
 - Check network cable connections for LAN.

8. WARRANTY AND SUPPORT

8.1 Warranty Information

The ASUS Prime Z890M-PLUS WiFi motherboard comes with a **3-year manufacturer's warranty**. Please retain your proof of purchase for warranty claims. The warranty covers defects in materials and workmanship under normal use. For specific terms and conditions, refer to the warranty card included with your product or visit the official ASUS website.

8.2 Technical Support

For technical assistance, driver downloads, or further information, please visit the official ASUS support website:

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

You may also contact ASUS customer service directly through their website for personalized support.