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ASRock X870 STEEL LEGEND WIFI

ASRock X870 Steel Legend WiFi 7 Motherboard User Manual

Model: X870 STEEL LEGEND WIFI

1. Introduction

This manual provides detailed instructions for the installation, configuration, and operation of your ASRock X870 Steel Legend WiFi 7 AMD Ryzen Socket AM5 ATX Motherboard. Please read this manual thoroughly before beginning the installation process to ensure proper setup and to maximize the performance and longevity of your system.
The ASRock X870 Steel Legend WiFi 7 motherboard is designed for AMD Ryzen Socket AM5 processors, featuring advanced power delivery, high-speed connectivity, and robust cooling solutions. It supports DDR5 memory, PCIe Gen5, and includes integrated Wi-Fi 7 and USB4 Type-C ports.



Image 1.1: The ASRock X870 Steel Legend WiFi 7 motherboard, its retail packaging, and included Wi-Fi antennas. The motherboard features a white and silver aesthetic.

2. Key Features

The ASRock X870 Steel Legend WiFi 7 motherboard incorporates several advanced features for optimal performance and user experience:

- **14+2+1 Power Phase Design:** Ensures stable power delivery to the CPU for enhanced performance and overclocking stability.
- **Exclusive 20K Cap with 1000uF Capacitance:** Provides improved power stability and durability.
- **Dual USB4 Type-C Ports:** Offers high-speed data transfer up to 40Gbps and versatile connectivity options.
- **Toolless Multi-Layer M.2 Heatsink:** Facilitates easy installation and effective cooling for M.2 SSDs.
- **Wi-Fi 7 802.11be:** Provides the latest wireless connectivity standard for faster speeds and lower latency.
- **M.2 Bottom Heatsink:** Additional cooling for M.2 storage devices located on the underside of the motherboard.

3. Motherboard Layout and Components

Understanding the layout of your motherboard is crucial for proper installation and configuration. Below are diagrams highlighting key components and connectors.

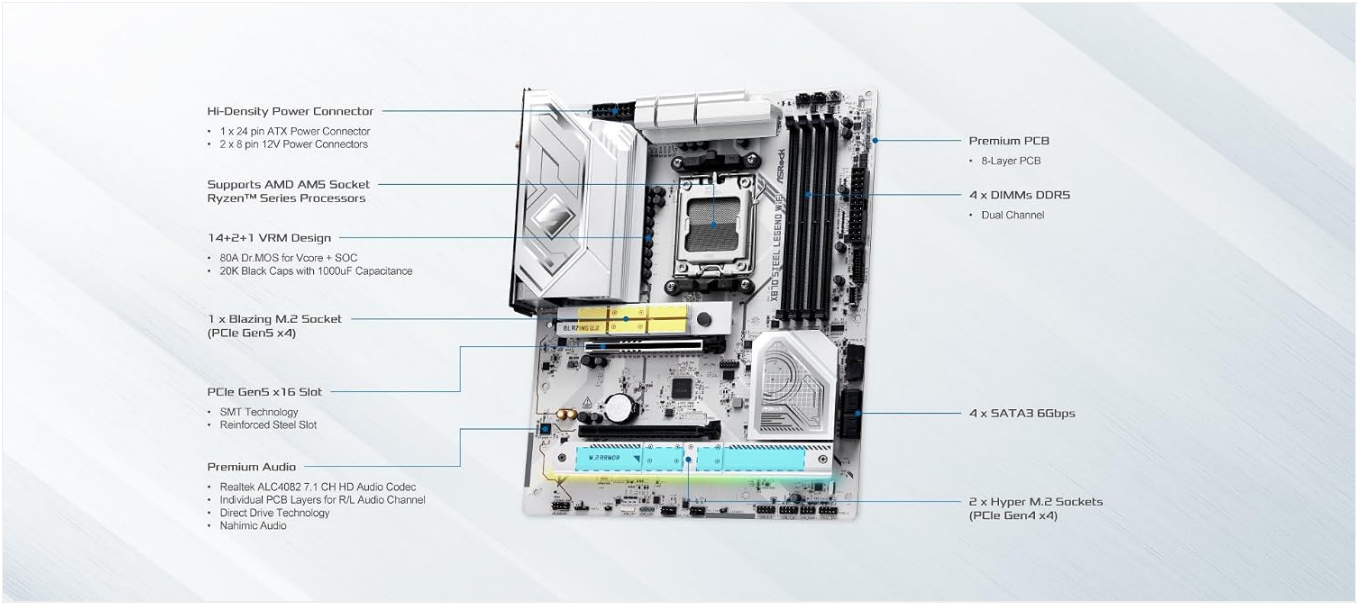


Image 3.1: Overview of the ASRock X870 Steel Legend WiFi 7 motherboard's main components, including the CPU socket, DDR5 DIMM slots, PCIe Gen5 x16 slot, M.2 sockets, SATA3 ports, and audio components.

- **CPU Socket (AM5):** Supports AMD Ryzen 7000, 8000, and 9000 Series Processors.
- **DDR5 DIMM Slots:** Four slots supporting dual-channel DDR5 memory.
- **PCIe Gen5 x16 Slot:** For high-performance graphics cards.
- **M.2 Sockets:** Multiple M.2 slots for NVMe SSDs, including Blazing M.2 (PCIe Gen5 x4) and Hyper M.2 (PCIe Gen4 x4).
- **SATA3 6Gbps Ports:** For traditional SATA storage devices.
- **Premium Audio:** Realtek ALC4082 7.1 CH HD Audio Codec with Nahimic Audio support.

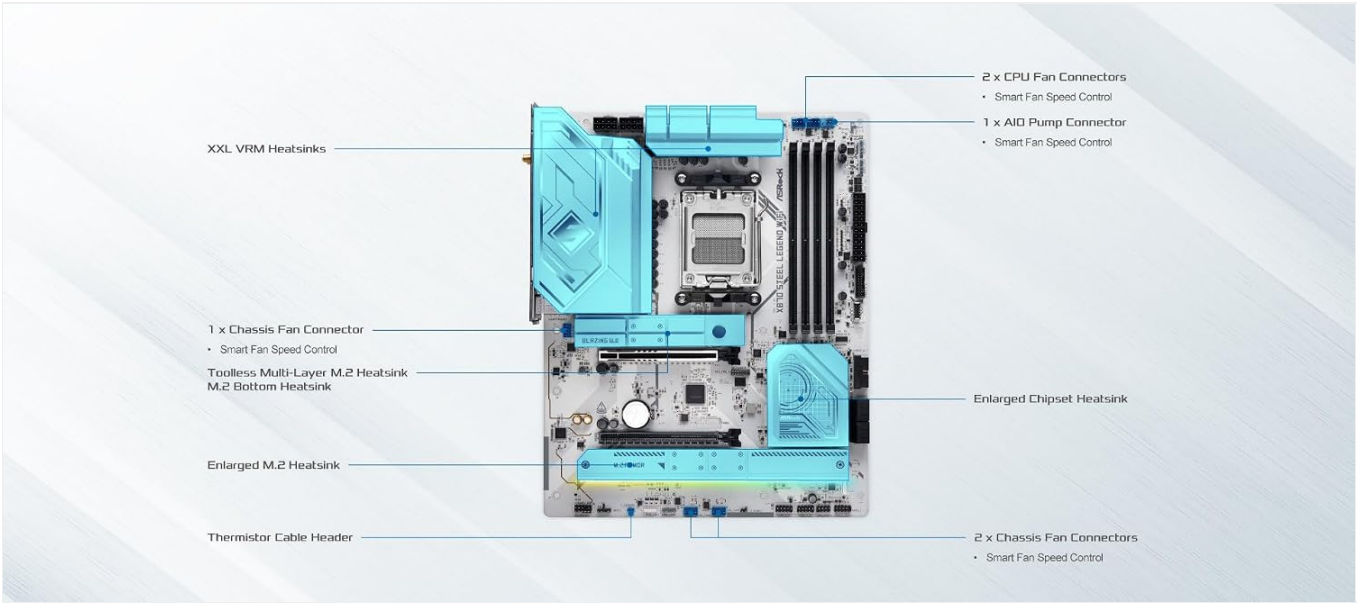


Image 3.2: Cooling solutions on the ASRock X870 Steel Legend WiFi 7 motherboard, highlighting XXL VRM Heatsinks, an enlarged chipset heatsink, and M.2 heatsinks.

- **XXL VRM Heatsinks:** Large heatsinks covering the Voltage Regulator Modules for efficient heat dissipation.
- **Enlarged Chipset Heatsink:** Provides cooling for the AMD X870 chipset.
- **M.2 Heatsinks:** Dedicated heatsinks for M.2 SSDs to prevent thermal throttling.
- **Fan Connectors:** Multiple CPU and Chassis fan connectors with Smart Fan Speed Control.

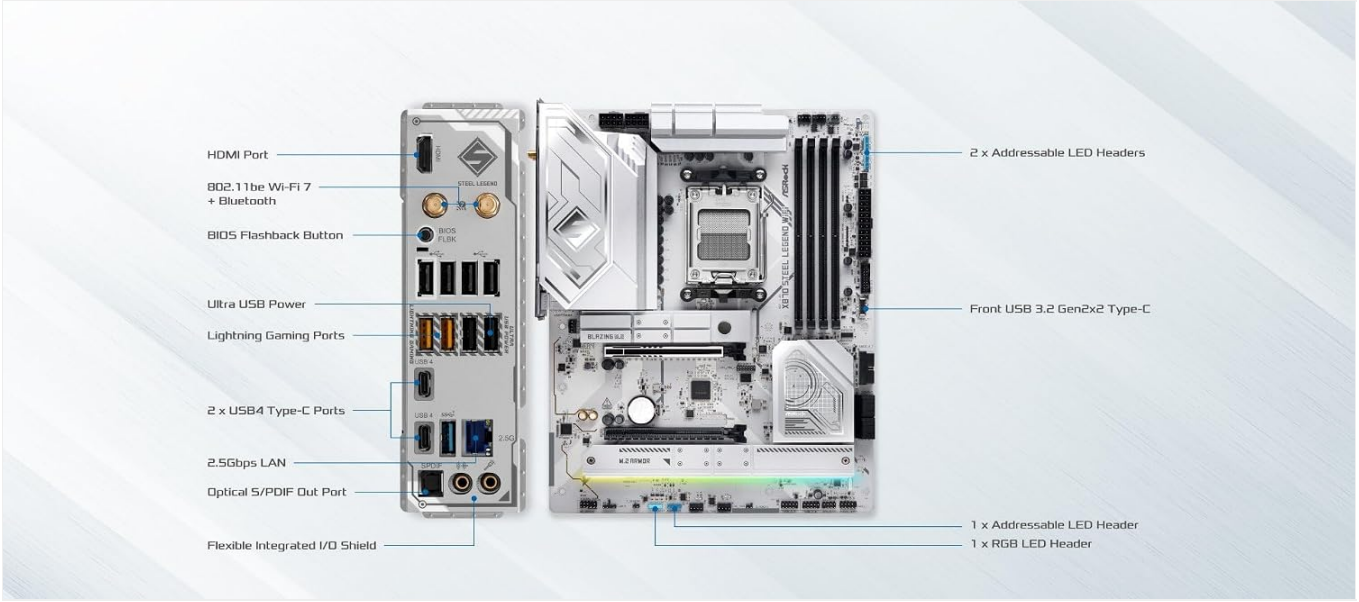


Image 3.3: Rear I/O panel and internal headers of the ASRock X870 Steel Legend WiFi 7 motherboard, showing USB ports, network ports, and LED headers.

- **Rear I/O Panel:** Includes HDMI port, Wi-Fi 7 + Bluetooth antennas, BIOS Flashback Button, Ultra USB Power ports, Lightning Gaming Ports, Dual USB4 Type-C ports, 2.5Gbps LAN, and Optical S/PDIF Out Port.
- **Internal Headers:** Addressable LED headers, RGB LED header, and Front USB 3.2 Gen2x2 Type-C header.



Image 3.4: Rear view of the ASRock X870 Steel Legend WiFi 7 motherboard, showcasing the metal backplate and PCB traces.

4. Specifications

Feature	Detail
Brand	ASRock
Model Name	X870 STEEL LEGEND WIFI
CPU Socket	Socket AM5
Compatible Processors	AMD Ryzen 7000 Series, AMD Ryzen 8000 Series, AMD Ryzen 9000 Series
Chipset Type	AMD X870
RAM Memory Technology	DDR5
Memory Clock Speed	Up to 8000 MHz (OC)
Memory Storage Capacity	256 GB (Max)

Feature	Detail
Product Dimensions	13.62 x 11.06 x 2.95 inches (ATX Form Factor)
Item Weight	4.5 pounds
Platform	Windows 10, Windows 11
Connectivity	Wi-Fi 7 802.11be, 2.5Gbps LAN, Dual USB4 Type-C

4.1. Motherboard Dimensions

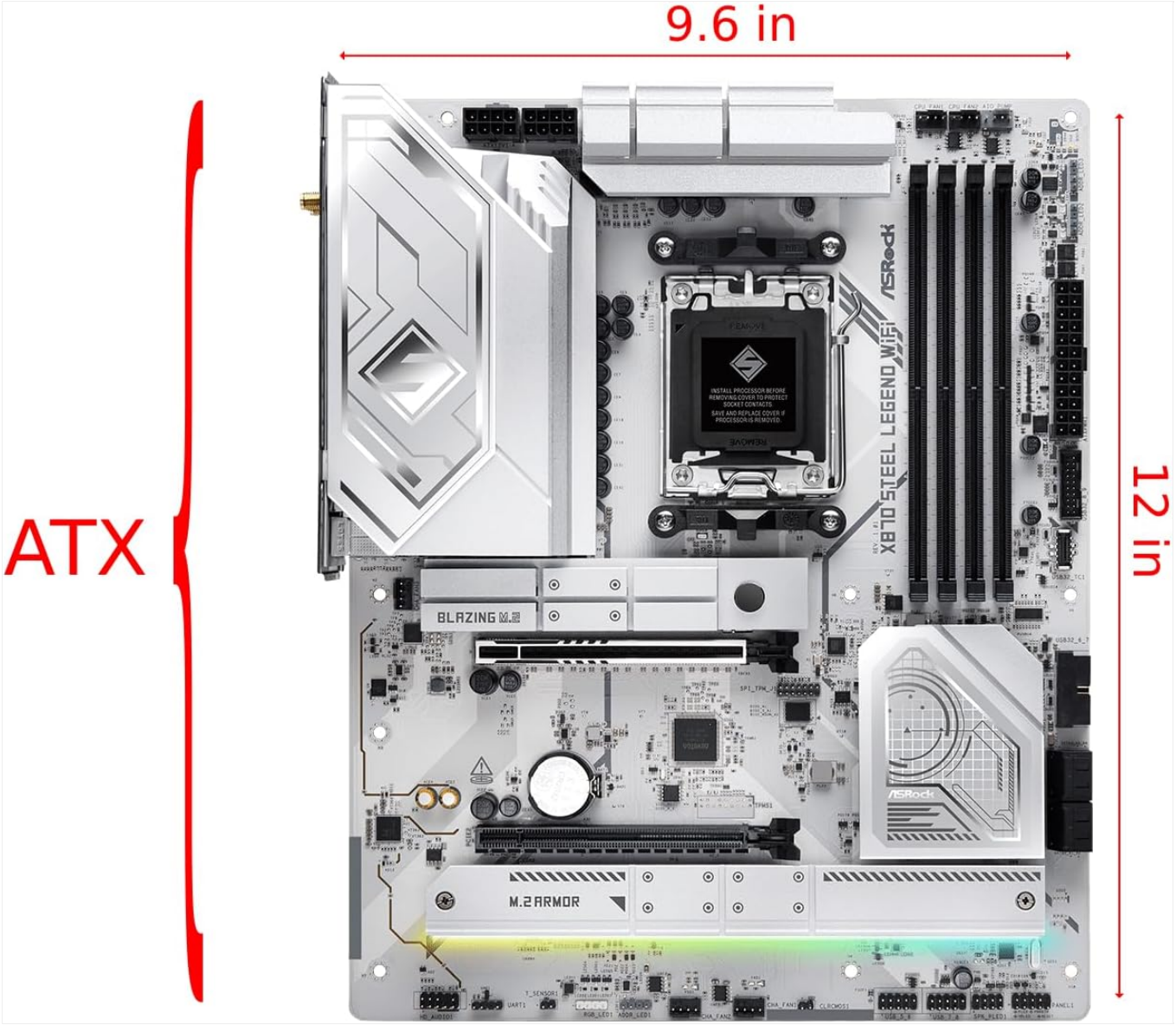


Image 4.1: The ASRock X870 Steel Legend WiFi 7 motherboard is an ATX form factor, measuring approximately 12 inches (30.5 cm) in length and 9.6 inches (24.4 cm) in width.

4.2. CPU Support List

For the most up-to-date and comprehensive CPU compatibility list, please refer to the official ASRock website. A partial list is provided below for reference.

CPU Support List

1. CPU performance may be limited due to system configuration. A top down CPU cooler is recommended.
2. Some CPUs do not have integrated graphics. A PCIe graphics card must be added for output.

Socket	Family	Model	Power	Core	Frequency	L2 Cache	L3 Cache	CPU Rev.	Validated BIOS	Bootable since BIOS
AM5	Ryzen 9	9950X(100-000001277)	170W	Granite Ridge	4.3GHZ	16MB	64MB		3.06	3.06
AM5	Ryzen 9	9950X3D(100-000000719)	170W	Granite Ridge	4.3GHz	16MB	128MB		3.16	3.06
AM5	Ryzen 9	9900X3D(100-000001368)	120W	Granite Ridge	4.4GHz	12MB	128MB		3.16	3.06
AM5	Ryzen 9	9900X(100-000000662)	120W	Granite Ridge	4.4GHz	12MB	64MB		3.06	3.06
AM5	Ryzen 7	9800X3D(100-000001084)	120W	Granite Ridge	4.7GHz	8MB	96MB		3.10	3.06
AM5	Ryzen 7	9700X(100-000001404)	65W	Granite Ridge	3.8GHz	8MB	32MB		3.06	3.06
AM5	Ryzen 5	9600X(100-000001405)	65W	Granite Ridge	3.9GHz	6MB	32MB		3.06	3.06
AM5	Ryzen 5	9600(100-000000718)	65W	Granite Ridge	3.8GHz	6MB	32MB		3.16	3.06
AM5	Ryzen 7 PRO	PRO 8700GE(100-000001240)	35W	Phoenix 1	3.65GHz	8MB	16MB		3.06	3.06
AM5	Ryzen 7 PRO	PRO 8700G(100-000001238)	65W/45W	Phoenix 1	4.2GHz	8MB	16MB		3.06	3.06
AM5	Ryzen 7	8700F(100-000001590)	65W/45W	Phoenix 1	4.1GHz	8MB	16MB		3.06	3.06
AM5	Ryzen 7	8700G(100-000001236)	65W/45W	Phoenix 1	4.2GHz	8MB	16MB		3.06	3.06
AM5	Ryzen 5 PRO	PRO 8600GE(100-000001241)	35W	Phoenix 1	3.9GHz	6MB	16MB		3.06	3.06
AM5	Ryzen 5 PRO	PRO 8600G(100-000001239)	65W/45W	Phoenix 1	4.35GHz	6MB	16MB		3.06	3.06
AM5	Ryzen 5	8400F(100-000001591)	65W/45W	Phoenix 1	4.2GHz	6MB	16MB		3.06	3.06
AM5	Ryzen 5	8600G(100-000001237)	65W/45W	Phoenix 1	4.3GHZ	6MB	16MB		3.06	3.06
AM5	Ryzen 5 PRO	PRO 8500GE(100-000001185)	35W	Phoenix 2	3.4GHz	6MB	16MB		3.06	3.06
AM5	Ryzen 5 PRO	PRO 8500G(100-000001183)	65W/45W	Phoenix 2	3.55GHz	6MB	16MB		3.06	3.06
AM5	Ryzen 5	8500GE(100-000001184)	35W	Phoenix 2	3.4GHz	6MB	16MB		3.06	3.06
AM5	Ryzen 5	8500G(100-000000931)	65W/45W	Phoenix 2	3.5GHz	6MB	16MB		3.06	3.06
AM5	Ryzen 3 PRO	PRO 8300GE(100-000001189)	35W	Phoenix 2	3.5GHz	4MB	8MB		3.06	3.06
AM5	Ryzen 3 PRO	PRO 8300G(100-000001187)	65W/45W	Phoenix 2	3.45GHz	4MB	8MB		3.06	3.06
AM5	Ryzen 3	8300GE(100-000001188)	35W	Phoenix 2	3.5GHz	4MB	8MB		3.06	3.06
AM5	Ryzen 3	8300G(100-000001186)	65W/45W	Phoenix 2	3.45GHz	4MB	8MB		3.06	3.06
AM5	Ryzen 9	7950X3D(100-000000908)	120W	Raphael	4.2GHz	16MB	128MB		3.06	3.06
AM5	Ryzen 9	7900X3D(100-000000909)	120W	Raphael	4.4GHz	12MB	128MB		3.06	3.06
AM5	Ryzen 9	7950X(100-000000514-00)	170W	Raphael	4.5GHz	16MB	64MB		3.06	3.06
AM5	Ryzen 9	7900X(100-000000589-00)	170W	Raphael	4.7GHz	12MB	64MB		3.06	3.06
AM5	Ryzen 9	7900(100-000000590)	65W	Raphael	3.7GHz	12MB	64MB		3.06	3.06
AM5	Ryzen 9	Pro 7945(100-000000598)	65W	Raphael	3.7GHz	12MB	64MB		3.06	3.06
AM5	Ryzen 7	Pro 7745(100-000000599)	65W	Raphael PRO	3.8GHz	8MB	32MB		3.06	3.06
AM5	Ryzen 7	7800X3D(100-000000910)	120W	Raphael	4.2GHz	8MB	96MB		3.06	3.06
AM5	Ryzen 7	7700X(100-000000591-00)	105W	Raphael	4.5GHz	8MB	32MB		3.06	3.06
AM5	Ryzen 7	7700(100-000000592)	65W	Raphael	3.8GHz	8MB	32MB		3.06	3.06
AM5	Ryzen 5	Pro 7645(100-000000600)	65W	Raphael	3.8GHz	6MB	32MB		3.06	3.06
AM5	Ryzen 5	7600X(100-000000593-00)	105W	Raphael	4.7GHz	8MB	32MB		3.06	3.06
AM5	Ryzen 5	7600(100-000001015)	65W	Raphael	3.8GHz	6MB	32MB		3.06	3.06
AM5	Ryzen 5	7500F(100-000000597)	65W	Raphael	3.7GHz	6MB	32MB		3.06	3.06
AM5	Ryzen 5	7600X3D(100-000001721)	65W	Raphael	4.1GHz	6MB	96MB		3.08	3.06
AM5	Ryzen 5	7400F(100-000001845)	65W	Raphael	3.7GHz	6MB	32MB		3.16	3.06
AM5	Ryzen 9 PRO	PRO 9945(100-000001407)	65W	Granite Ridge PRO	3.4GHz	12MB	64MB		3.30	3.30
AM5	Ryzen 7 PRO	PRO 9745(100-000001408)	65W	Granite Ridge PRO	3.8GHz	8MB	32MB		3.30	3.30
AM5	Ryzen 7	9700F(100-000001902)	65W	Granite Ridge	3.8GHz	8MB	32MB		3.30	3.30
AM5	Ryzen 5 PRO	PRO 9645(100-000001409)	65W	Granite Ridge PRO	3.9GHz	6MB	32MB		3.30	3.30
AM5	Ryzen 5	7400(100-000001900)	65W	Raphael	3.3GHz	6MB	16MB		3.30	3.30
AM5	Ryzen 5 PRO	PRO 7445(100-000001899)	65W	Raphael	3.3GHz	6MB	16MB		3.30	3.30
AM5	Ryzen 5	9500F(100-000001406)	65W	Granite Ridge	3.8GHz	6MB	32MB		3.30	3.30

Image 4.2: A partial list of supported CPUs for the ASRock X870 Steel Legend WiFi 7 motherboard, including their socket, family, model, core count, frequency, and compatible BIOS versions. Always check the ASRock website for the latest compatibility information.

5. Setup Guide

This section outlines the steps for installing your ASRock X870 Steel Legend WiFi 7 motherboard and its components.

5.1. Package Contents



Image 5.1: The ASRock X870 Steel Legend WiFi 7 motherboard and its included accessories, such as Wi-Fi antennas, SATA cables, and documentation.

Before installation, ensure all components listed in your product's packing list are present. Typically, this includes:

- ASRock X870 Steel Legend WiFi 7 Motherboard
- Wi-Fi Antennas
- SATA Data Cables
- M.2 Screws/Standoffs
- Quick Installation Guide and Support CD/USB (if included)

5.2. Pre-Installation Checks

- Ensure your power supply is compatible and provides sufficient wattage.
- Prepare your computer case with appropriate standoffs for an ATX motherboard.
- Ground yourself to prevent electrostatic discharge (ESD) damage to components.

5.3. CPU Installation

1. Locate the AM5 CPU socket on the motherboard.
2. Open the CPU socket retention arm.
3. Carefully align the CPU with the socket, ensuring the triangular marker on the CPU matches the marker on the socket. Do not force the CPU into the socket.
4. Close the retention arm to secure the CPU.
5. Apply thermal paste to the CPU and install your CPU cooler according to its manufacturer's instructions.

5.4. Memory (RAM) Installation

1. Open the clips on both ends of the DDR5 DIMM slots.
2. Align the memory module with the slot, ensuring the notch on the module matches the key in the slot.

3. Press down firmly on both ends of the memory module until the clips snap into place.
4. For dual-channel operation, refer to your motherboard manual for recommended slot configurations (e.g., A2 and B2).

5.5. M.2 SSD Installation

1. Locate the M.2 slots on the motherboard. Some slots may be covered by heatsinks.
2. Remove the M.2 heatsink if present.
3. Insert the M.2 SSD into the slot at an angle.
4. Gently push down the SSD and secure it with the provided M.2 screw or toolless retention mechanism.
5. Reinstall the M.2 heatsink, ensuring proper contact for cooling.

5.6. Expansion Card (GPU) Installation

1. Locate the PCIe Gen5 x16 slot (usually the top reinforced slot).
2. Remove the corresponding expansion slot cover from your PC case.
3. Align your graphics card with the PCIe slot and press down firmly until it clicks into place.
4. Secure the graphics card to the case with a screw.
5. Connect any necessary PCIe power cables from your power supply to the graphics card.

5.7. Power Supply Connections

- Connect the 24-pin ATX power connector from your power supply to the motherboard.
- Connect the 8-pin (or 4+4-pin) CPU power connector(s) to the motherboard.
- Connect SATA power cables to your SATA storage devices.

5.8. Front Panel Connections

Connect the front panel cables from your PC case (Power Button, Reset Button, HDD LED, Power LED, USB ports, Audio ports) to the corresponding headers on the motherboard. Refer to the motherboard diagram in Section 3 for header locations.

6. Operating Instructions

6.1. First Boot and BIOS/UEFI Setup

1. After assembling all components, connect your monitor, keyboard, and mouse.
2. Power on your system. The system should display the ASRock splash screen.
3. Press `DEL` or `F2` during startup to enter the BIOS/UEFI setup utility.
4. In the BIOS, configure essential settings such as boot order, date/time, and enable XMP/EXPO for your DDR5 memory if applicable.
5. Save changes and exit the BIOS. The system will restart.

6.2. Operating System and Driver Installation

1. Insert your Windows 10 or Windows 11 installation media (USB drive or DVD).
2. Follow the on-screen prompts to install your operating system.
3. After OS installation, install the necessary drivers. You can download the latest drivers from the official ASRock website for your specific motherboard model.
4. Alternatively, ASRock motherboards often feature an 'Auto Driver Installer' within the BIOS or as a post-OS installation utility that can download and install drivers if an internet connection is available.

7. Maintenance

7.1. BIOS Update Procedure

Updating your BIOS can improve system stability, add support for new CPUs, or fix bugs. Always exercise caution when updating the BIOS.

1. Download the latest BIOS file for your specific motherboard model from the ASRock website.
2. Extract the BIOS file to a FAT32 formatted USB flash drive.
3. Restart your computer and enter the BIOS/UEFI setup utility.
4. Navigate to the 'Tool' section and select 'ASRock Instant Flash' or a similar BIOS update utility.
5. Select the BIOS file from your USB drive and follow the on-screen instructions. Do not power off or restart your system during the update process.
6. Alternatively, use the BIOS Flashback button on the rear I/O panel for updating without a CPU or RAM installed. Refer to the ASRock website for detailed instructions on using this feature.

7.2. Cleaning Guidelines

- Regularly clean dust from your computer case and motherboard components using compressed air.
- Ensure the system is powered off and unplugged before cleaning.
- Avoid using liquid cleaners directly on motherboard components.
- Clean fan blades and heatsinks to maintain optimal cooling performance.

8. Troubleshooting

This section addresses common issues you might encounter during setup or operation.

8.1. No Power / No Boot

- **Check Power Connections:** Ensure the 24-pin ATX and 8-pin CPU power cables are securely connected to the motherboard and power supply.
- **Power Supply:** Verify the power supply unit (PSU) is switched on and functioning correctly.
- **Front Panel Headers:** Double-check that the power button cable is correctly connected to the motherboard's front panel header.
- **Clear CMOS:** Try clearing the CMOS by removing the CMOS battery for a few minutes or using the clear CMOS jumper/button on the motherboard.

8.2. No Display Output

- **Monitor Connection:** Ensure your monitor is connected to the graphics card (or motherboard if using integrated graphics) and is powered on.
- **Graphics Card:** Reseat the graphics card in its PCIe slot and ensure all necessary PCIe power cables are connected.
- **RAM:** Incorrectly seated or faulty RAM can prevent display output. Reseat your RAM modules. Try booting with only one RAM stick in the recommended slot.
- **Integrated Graphics:** If your CPU has integrated graphics, try removing the discrete GPU and connecting the monitor to the motherboard's video output to isolate the issue.

8.3. System Instability / Crashes

- **Overheating:** Monitor CPU and GPU temperatures. Ensure all fans are working and heatsinks are properly

seated.

- **Drivers:** Ensure all drivers (chipset, graphics, etc.) are up to date.
- **BIOS Settings:** Reset BIOS to default settings. If XMP/EXPO is enabled, try disabling it to check for memory stability issues.
- **Power Delivery:** Ensure your power supply provides sufficient and stable power to all components.

8.4. USB4 Type-C Connectivity Issues

- **Driver Installation:** Ensure the latest chipset and USB drivers are installed.
- **Cable Quality:** Use certified USB4 cables to ensure full functionality and speed.
- **Device Compatibility:** Verify that the connected device is compatible with USB4 specifications.

9. Support

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

www.asrock.com

The ASRock website provides comprehensive resources including:

- Latest BIOS updates
- Driver downloads
- Detailed product specifications
- FAQ and troubleshooting guides
- Contact information for technical support

10. Warranty Information

ASRock products are covered by a limited warranty. The specific terms and duration of the warranty may vary by region and product model. Please refer to the warranty card included with your product or visit the official ASRock website for detailed warranty information and registration procedures.
Keep your proof of purchase (receipt or invoice) as it will be required for any warranty claims.

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Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

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