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## ASRock B650M-HDV/M.2

# ASRock B650M-HDV/M.2 Motherboard User Manual

Model: B650M-HDV/M.2 | Brand: ASRock

## 1. INTRODUCTION

This user manual provides comprehensive instructions for the installation, operation, and maintenance of your ASRock B650M-HDV/M.2 motherboard. Designed to support AMD Socket AM5 Ryzen™ 7000 Series Processors, this motherboard offers robust performance and essential features for building a powerful and efficient system.

Key features include 8+2+1 Power Phase design with Dr.MOS for stable power delivery, support for high-speed DDR5 6400+ MHz (OC) memory, and advanced expansion options like PCIe 4.0 x16 slots and M.2 slots for high-speed storage. It also integrates AMD RDNA™ 2 Graphics for display output and features Dragon 2.5G LAN for fast network connectivity.



Figure 1.1: ASRock B650M-HDV/M.2 Motherboard and its retail packaging.

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Video 1.1: Product Overview Video. This video provides a general overview of the ASRock B650M-HDV/M.2 Motherboard, showcasing its design and key features.

## 2. SETUP AND INSTALLATION

### 2.1. CPU Installation

The ASRock B650M-HDV/M.2 motherboard features an AM5 CPU Socket. Carefully align your AMD Ryzen 7000 series processor with the socket, ensuring the triangular markers on the CPU and socket match. Gently lower the CPU into the socket, then secure it by closing the retention arm. Always handle the CPU by its edges to avoid damaging the pins or contacts.



Figure 2.1: Top-down view of the motherboard, highlighting the AM5 CPU socket.

## 2.2. Memory (RAM) Installation

This motherboard supports DDR5 memory modules. It features two DIMM slots. To install, open the clips on both ends of the memory slot. Align the notch on the DDR5 module with the key in the slot, then press down firmly on both ends of the module until the clips snap into place. Ensure both clips are fully closed to confirm proper installation.

For optimal performance, refer to the motherboard's QVL (Qualified Vendor List) for compatible DDR5 memory modules and configurations. The board supports DDR5 6400+ MHz (OC) for high-speed operation.

## 2.3. Storage Device Installation

The B650M-HDV/M.2 offers versatile storage options:

- **M.2 Slots:** One Blazing M.2 (PCIe Gen5x4) slot and one Hyper M.2 (PCIe Gen4x4) slot are available for high-speed NVMe SSDs. Install the M.2 SSD into the slot and secure it with the provided screw or standoff. The board includes a free M.2 heat spreader for improved thermal performance.
- **SATA Ports:** Four SATA3 (6.0 Gb/s) ports are provided for traditional SATA SSDs or HDDs. Connect your SATA devices using SATA data cables.



Figure 2.2: M.2 slots and SATA ports for storage device connections.

## 2.4. Power Connections

Connect the 24-pin ATX power connector and the 8-pin EPS 12V power connector from your power supply unit (PSU) to the corresponding ports on the motherboard. Ensure all power cables are securely seated.

## 2.5. Front Panel and Peripheral Connections

Connect your case's front panel headers (power button, reset button, USB ports, audio jacks) to the appropriate headers on the motherboard. This motherboard includes a USB 3.2 Gen2 Front Type-C header for modern case connectivity.

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Video 2.2: Product Demonstration Video. This video illustrates the installation of components such as the CPU cooler, M.2 SSD, and the motherboard into a PC case, providing a visual guide for the setup process.

# 3. OPERATING YOUR SYSTEM

## 3.1. BIOS/UEFI Configuration

The UEFI (Unified Extensible Firmware Interface) BIOS allows you to configure various system settings. Access the BIOS by pressing the designated key (usually Del or F2) during system startup. Here you can adjust settings for CPU, memory, storage, and other peripherals. The motherboard supports BIOS Flashback, enabling BIOS updates

without a CPU installed.

### 3.2. Graphics Output

For processors with integrated graphics (e.g., AMD Ryzen 7000 series with RDNA 2 Graphics), the motherboard provides HDMI and DisplayPort outputs on the rear I/O panel. Connect your monitor to these ports for display. If using a dedicated graphics card, connect your monitor to the graphics card's output ports.



Figure 3.1: Rear I/O panel with various connectivity options, including video outputs.

### 3.3. Audio and Networking

The motherboard features Realtek ALC897 7.1 CH HD Audio Codec with Nahimic Audio support for high-quality sound. Connect your speakers or headphones to the audio jacks on the rear I/O panel. For network connectivity, the Dragon 2.5G LAN port provides high-speed wired internet. An M.2 Key E slot is available for installing an optional WiFi module if wireless connectivity is desired (WiFi module not included).

## 4. MAINTENANCE

## 4.1. BIOS Updates

Regularly updating your BIOS is recommended to ensure system stability, compatibility with new hardware, and access to the latest features. Utilize the BIOS Flashback feature for convenient updates, especially when installing new generation CPUs that may require a newer BIOS version.

## 4.2. Driver Installation

After installing your operating system, install the necessary drivers for the motherboard's components. ASRock provides an Auto Driver Installer to simplify this process, ensuring all essential drivers for chipset, LAN, audio, and other peripherals are correctly installed.

## 4.3. Cleaning and Care

To maintain optimal performance and longevity, periodically clean your computer system. Use compressed air to remove dust from fans, heatsinks, and internal components. Ensure the system is powered off and unplugged before cleaning. Avoid using liquid cleaners directly on components.

# 5. TROUBLESHOOTING

## 5.1. Diagnostic Red Light

The motherboard features a diagnostic red light indicator. If your PC fails to boot, this light can help identify the problematic component (CPU, RAM, GPU, or boot device), making troubleshooting easier.

## 5.2. CMOS Reset

If you encounter issues such as an unbootable PC due to incorrect BIOS settings or driver conflicts, you can reset the CMOS (Complementary Metal-Oxide-Semiconductor) settings. Locate the 2-pin CMOS jumper on the motherboard. With the system powered off, briefly short the two pins with a metal object (like a screwdriver) for a few seconds. This will revert BIOS settings to their default values.

## 5.3. RAM Instability

If experiencing RAM instability, especially with high-frequency DDR5 modules, ensure your memory is properly seated and that the BIOS settings (e.g., EXPO/XMP profiles) are correctly configured. Updating the BIOS to the latest version can often improve memory compatibility and stability.

# 6. SPECIFICATIONS

Feature	Detail
Brand	ASRock
Model Name	B650M-HDV/M.2
CPU Socket	Socket AM5
Compatible Processors	AMD Ryzen 7000 Series Processors
RAM Memory Technology	DDR5
Memory Slots	2

Feature	Detail
Memory Clock Speed	6400 MHz (OC)
Chipset Type	AMD B650M
PCIe Slots	2 x PCIe 4.0 x16, 1 x PCIe 4.0 x1
M.2 Slots	1 x Blazing M.2 (PCIe Gen5x4), 1 x Hyper M.2 (PCIe Gen4x4), 1 x M.2 Key E for WiFi
SATA Ports	4 x SATA3
USB Ports (Rear)	2 x USB 3.2 Gen1, 1 x USB 3.2 Gen1 Type-C, 6 x USB 2.0
USB Ports (Front)	1 x USB 3.2 Gen2 Type-C, 4 x USB 3.2 Gen1
LAN	Dragon 2.5G LAN
Graphics Output	HDMI, DisplayPort (for integrated graphics)
Audio Codec	Realtek ALC897 7.1 CH HD Audio Codec, Nahimic Audio
Dimensions	12.2 x 8.27 x 1.97 inches
Item Weight	2.2 pounds

## 7. WARRANTY AND SUPPORT

For warranty information, technical support, and driver downloads, please visit the official ASRock website. You can find detailed FAQs, troubleshooting guides, and contact information for customer service there. Keep your purchase receipt as proof of purchase for warranty claims.

ASRock Official Website: [www.asrock.com](http://www.asrock.com)