

## GRAUGEAR U4-40G01

# GRAUGEAR USB4 M.2 SSD Enclosure (U4-40G01) Instruction Manual

Model: U4-40G01

## INTRODUCTION

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This manual provides detailed instructions for the installation, operation, and maintenance of your GRAUGEAR USB4 M.2 SSD Enclosure, Model U4-40G01. This device is designed to convert an M.2 NVMe SSD into a portable external storage solution with high-speed data transfer capabilities.



Image: The GRAUGEAR USB4 M.2 SSD Enclosure (U4-40G01) shown with its accompanying USB-C cables.

## PACKAGE CONTENTS

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Please verify that all items listed below are included in your package:

- GRAUGEAR USB4 M.2 NVMe SSD Enclosure (U4-40G01)
- USB Type-C to Type-C Cable (40Gbps)
- 2x SSD Fixed Rubber Stoppers
- 2x Thermal Pads (various thicknesses)
- 2x M.2 SSD Length Extend Adapters
- User Manual
- Service Card

## SETUP

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### Installing the M.2 NVMe SSD

Follow these steps to install your M.2 NVMe SSD into the enclosure:

1. **Open the bottom cover:** Gently slide the bottom cover of the enclosure in the direction indicated by the "OPEN" arrow until it detaches.
2. **Insert the M.2 SSD:** Carefully align your M.2 NVMe SSD with the M-Key slot inside the enclosure and insert it firmly. Secure the SSD in place using one of the provided fixed rubber stoppers.
3. **Apply the thermal pad:** Remove both protective films from a thermal pad. Place the thermal pad directly onto the installed M.2 SSD. This helps dissipate heat from the SSD to the aluminum enclosure.
4. **Close the bottom cover:** Realign the bottom cover and slide it back into place until it clicks securely.



Image: Step-by-step visual guide for the tool-free installation of an M.2 SSD, including opening the cover, inserting the SSD, applying the thermal pad, and closing the cover.

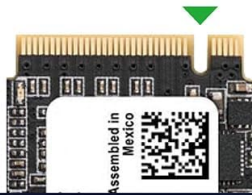
## SSD Compatibility

The GRAUGEAR U4-40G01 enclosure is designed for M.2 NVMe SSDs with an M-Key interface. It supports various lengths including 2230, 2242, 2260, and 2280. The maximum supported capacity is 8TB.

**Important:** This enclosure is not compatible with SATA B-Key or B+M Key SSDs. Additionally, SSDs with pre-installed heatsinks are not supported due to space constraints and the enclosure's integrated cooling design.

# Wide NVMe Size Support

## Compatible SSD Key



**M KEY**  
NVMe/PCIe



## SATA : B KEY & B+M KEY

SSD with heatsink or SATA SSD  
is not supported

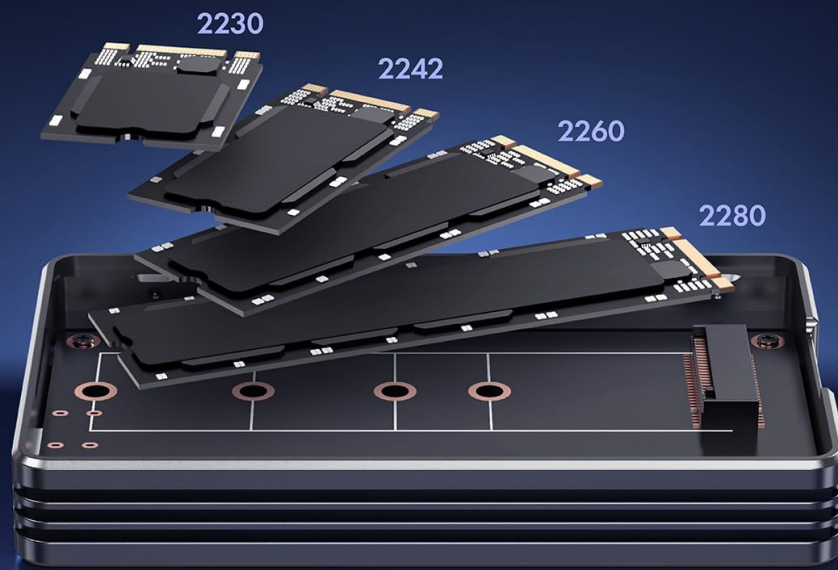


Image: Visual representation of compatible M.2 NVMe SSD form factors (2230, 2242, 2260, 2280) and the required M-Key interface. It also highlights incompatible SATA SSDs and SSDs with heatsinks.

## Installation Video Guide

For a visual guide on the installation process, please watch the official GRAUGEAR video below:

Your browser does not support the video tag.

Video: An official GRAUGEAR video demonstrating the unboxing and tool-free installation of an M.2 NVMe SSD into the enclosure, highlighting the components and steps involved.

## OPERATING THE ENCLOSURE

### Connecting to a Host Device

Connect the GRAUGEAR U4-40G01 enclosure to your computer or compatible device using the provided USB Type-C cable. For optimal performance, ensure your host device's port supports USB4 or Thunderbolt 4. The enclosure is plug-and-play, requiring no additional drivers for basic functionality.

# Next-Gen USB4 NVMe Enclosure

# 40Gbps



Image: The GRAUGEAR enclosure connected to a laptop, demonstrating its use as an external storage device with high-speed capabilities.

## System Compatibility

The enclosure offers broad compatibility across various operating systems and devices:

- **Devices:** Desktop computers, laptops, smartphones, smart TVs, tablets, gaming consoles (e.g., PlayStation).
- **Operating Systems:** Windows, macOS, Linux.
- **Interface Compatibility:** USB4, Thunderbolt 5/4/3, and backward compatible with USB 3.2/USB 3.0.

For achieving the maximum 40Gbps transfer speeds, the host device must have a Thunderbolt 3, USB4, or higher port.



# Universal Compatibility

## Devices



Computer



Laptop



Smartphone



Smart TV



Tablet



Play Station®

## Systems



Windows®



MAC OS®



Linux®

## Thunderbolt / USB



Thunderbolt 4



Thunderbolt 3



USB 4.0



USB 3.2



USB 3.1



USB 3.0



Image: A comprehensive chart detailing the wide range of devices and operating systems compatible with the GRAUGEAR USB4 M.2 SSD Enclosure, along with supported USB and Thunderbolt versions.

## Recommended System Requirements for 40Gbps

Operating System	Processor/Controller	Recommended Minimum System Version
Windows device	AMD Ryzen 6000 or higher / Intel 12th Gen or higher	Windows 11 10.0.22621
macOS device	Apple Silicon / Intel	macOS 15 or higher
iPad OS device	Apple Silicon / A-Series (USB-C port)	N/A
iOS device	A-Series (USB-C port)	iPhone 15 or later

Note: For 40Gbps, the host device requires Thunderbolt 3, USB4 or higher.

## Performance Benchmarks (Example with Samsung 9100PRO 1TB SSD)

Devices	System-Version	Write (MB/s)	Read (MB/s)
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Devices	System-Version	Write (MB/s)	Read (MB/s)
ASUS TUF Gaming F15	Windows 11 Professional 23H2 22631.4169	3117.56	3675.28
ASUS Z890 PC	Windows 11 Professional 23H2 26100.5189	3575.52	3345.17
Mac mini M4	macOS 15.5	3285.19	3574.58
MacBook Pro 2024 M4	macOS 15.5	3512.24	3951.07
MacBook Pro 2023 M4	macOS 14.4.1	3427.55	3672.5
Mac air M2 2022	macOS 14.7.1	3267.82	3511.27

Note: Performance figures are based on internal testing with a Samsung 9100PRO 1TB SSD. Actual speeds may vary depending on the specific SSD, host system configuration, and other environmental factors.

## MAINTENANCE

The GRAUGEAR U4-40G01 features a fanless all-aluminum design for efficient heat dissipation and silent operation. Minimal maintenance is required to ensure optimal performance and longevity:

- **Cleaning:** Periodically wipe the exterior of the enclosure with a soft, dry cloth to remove dust and fingerprints. Avoid using liquid cleaners or abrasive materials.
- **Thermal Management:** The aluminum casing acts as a heatsink. Ensure adequate airflow around the enclosure, especially during prolonged high-speed transfers, to facilitate heat dissipation.
- **Environmental Conditions:** Avoid exposing the enclosure to extreme temperatures, direct sunlight, high humidity, or dusty environments.
- **Handling:** While durable, avoid dropping or subjecting the enclosure to strong impacts, which could damage the internal SSD or components.

## TROUBLESHOOTING

### Low Transfer Speeds

- **Host Port Verification:** Ensure your computer's USB port supports USB4 or Thunderbolt 4. Connecting to older USB standards (e.g., USB 3.2 Gen1/Gen2, USB 3.0) will limit speeds to their respective maximums (e.g., 5Gbps, 10Gbps, 20Gbps).
- **SSD Performance:** The actual speed is limited by the installed M.2 NVMe SSD. For speeds exceeding 3000MB/s, a high-performance PCIe Gen4 NVMe SSD is recommended.
- **Cable Quality:** Use the provided high-quality USB Type-C cable. Lower quality or longer cables can degrade performance.
- **Thermal Throttling:** Although designed for efficient cooling, prolonged heavy workloads can cause the SSD to heat up. Ensure the thermal pad is correctly installed and the enclosure has adequate ventilation.

### Drive Not Detected

- **SSD Seating:** Re-open the enclosure and ensure the M.2 SSD is fully and correctly seated in its slot, secured by the rubber stopper.
- **Cable Connection:** Verify that the USB cable is securely connected to both the enclosure and the host device.

- **Disk Initialization/Formatting:** For new SSDs, the drive may need to be initialized and formatted in your operating system's Disk Management (Windows) or Disk Utility (macOS) before it appears in File Explorer/Finder.
- **Test with Another Port/Device:** Try connecting the enclosure to a different USB port on your computer or to another compatible device to determine if the issue is with the port or the enclosure itself.

## TECHNICAL SPECIFICATIONS

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- **Model:** U4-40G01
- **Brand:** GRAUGEAR
- **Interface:** USB4 / Thunderbolt 4 (backward compatible with USB 3.2/3.0)
- **SSD Compatibility:** M.2 NVMe (M-Key) 2230/2242/2260/2280
- **Max Digital Storage Capacity:** 8 TB
- **Transfer Speed:** Up to 40Gbps (theoretical), 3000-3500MB/s (actual read/write with PCIe Gen4 NVMe)
- **Material:** Aluminum Alloy
- **Cooling:** Fanless design with double heat dissipation (aluminum housing and thermal pad)
- **Special Features:** Tool-free installation, UASP support, TRIM support
- **Dimensions:** 6.34 x 4.29 x 1.46 inches
- **Item Weight:** 9 ounces
- **Installation Type:** External Hard Drive
- **Color:** Black
- **Manufacturer:** CHAB GmbH
- **Date First Available:** September 5, 2025

## WARRANTY AND SUPPORT

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GRAUGEAR products are manufactured to high-quality standards and are designed for reliable performance. For specific warranty terms and conditions, please refer to the included Service Card or the official GRAUGEAR website.

Should you encounter any issues or require technical assistance, please contact GRAUGEAR support using the information below:






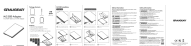
**Phone:** +49 40 700 744 928

**Email:** [support@graugear.de](mailto:support@graugear.de)

**Address:** CHAB GmbH, Oststrasse 7, 22869 Schenefeld, Germany

**Website:** [www.graugear.de](http://www.graugear.de)



	<p><a href="#"><u>GRAUGEAR G-M2DK-AC-10G M.2 NVMe/NGFF SSD Docking Station User Manual</u></a></p> <p>User manual and specifications for the GRAUGEAR G-M2DK-AC-10G M.2 NVMe/NGFF SSD Docking Station. Features USB 3.2 Gen2 10Gbps connectivity, active cooling with a 50mm fan, and support for various M.2 SSD sizes (2230-22110). Includes installation guide and safety information.</p>
	<p><a href="#"><u>GRAUGEAR G-2501-AC-10G USB Type-C 2.5" HDD/SSD Enclosure: Features, Installation, and Safety</u></a></p> <p>Comprehensive guide to the GRAUGEAR G-2501-AC-10G USB Type-C enclosure for 2.5-inch HDDs and SSDs. Details package contents, features, specifications, installation steps, and essential safety information.</p>
	<p><a href="#"><u>GrauGear USB 3.2 Gen2x2 Clone Station for 2x M.2 NVMe SSD - User Manual</u></a></p> <p>This document provides instructions and safety information for the GrauGear USB 3.2 Gen2x2 Clone Station, a device designed for cloning M.2 NVMe SSDs. It covers setup, standalone cloning, PC/Notebook mode, and important safety precautions.</p>
	<p><a href="#"><u>GRAUGEAR G-M2HS08-F Heat Pipe Cooler for M.2 2280 SSD - Installation and Safety Guide</u></a></p> <p>Comprehensive guide for the GRAUGEAR G-M2HS08-F Heat Pipe Cooler, detailing package contents, features, specifications, installation steps, and essential safety information for M.2 2280 SSDs.</p>
	<p><a href="#"><u>GRAUGEAR Type-C Enclosure for 2.5-inch SATA HDD/SSD - Model G-2502-C-10G</u></a></p> <p>Detailed overview of the GRAUGEAR Type-C enclosure for 2.5-inch SATA HDDs and SSDs. Features include IP66 waterproofing, USB 3.2 Gen2, 6Gbps transfer speeds, installation guide, and comprehensive safety information.</p>
	<p><a href="#"><u>GRAUGEAR G-CV-M2T25 M.2 NGFF SSD to 2.5" SATA Adapter: Features and Installation</u></a></p> <p>Comprehensive guide for the GRAUGEAR G-CV-M2T25 adapter, detailing its features, installation process for M.2 NGFF SSDs (2230, 2242, 2260, 2280) into a 2.5" SATA form factor, and essential safety information.</p>