

NVMe WriteBlocker

User Manual

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FCC Compliance Statement: "This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation."

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a home or commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

In the event that you experience Radio Frequency Interference, you should take the following steps to resolve the problem:

1. Ensure that the case of your attached drive is grounded.
2. Use a data cable with RFI reducing ferrites on each end.
3. Use a power supply with an RFI reducing ferrite approximately 5 inches from the DC plug.
4. Reorient or relocate the receiving antenna.

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1. INTRODUCTION

This document shows you how to set up the NVMe WriteBlocker. The NVMe WriteBlocker allows you to mount a NVMe M.2 or a U.2 solid state drive to a host computer in a write-blocked mode so that you can image and preview the files on the drive without altering the contents. This is useful if you need to preserve the drive as evidence of a crime, for example.

1.1. WHAT'S IN THE BOX

Check the package contents to verify that you have received the items below. Please contact WiebeTech if any items are missing or damaged.

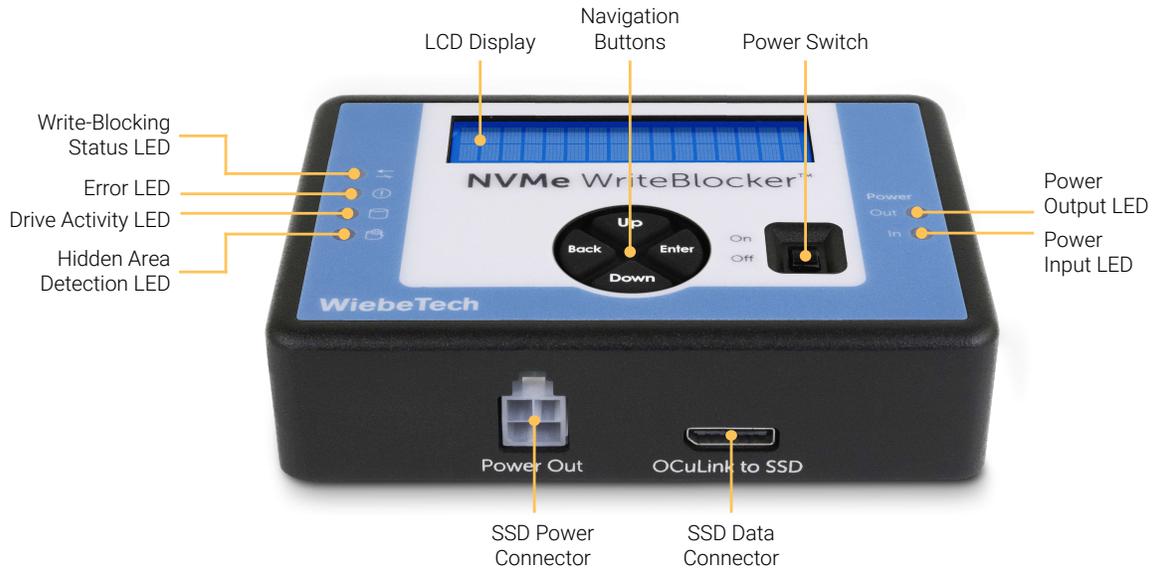
Item	Quantity
NVMe WriteBlocker	1
Power adapter and cord	1
AC adapter label	1
U.2-to-OCuLink adapter	1
M.2-to-U.2 adapter	1
USB Type-C cable	1
USB Type-A to Type-C cable	1

1.2. SAFETY INFORMATION

Please read the following before handling this product.

1. Do not drop the product, submit it to impact, or pierce it.
2. The circuit boards within this product are susceptible to static electricity. Proper grounding is strongly recommended to prevent electrical damage to the product or other connected devices, including the computer host.
3. Avoid placing this product close to magnetic devices, high voltage devices, or in an area exposed to heat, flame, direct sunlight, dampness, moisture, rain, vibration, shock, dust, or sand.
4. To avoid overheating, this product should be operated in a well-ventilated area.
5. Before starting any type of hardware installation, please ensure that all power switches have been turned off and all power cords have been disconnected to prevent personal injury and damage to the hardware.
6. A damaged cable or device may malfunction and/or overheat and become a fire hazard.
7. Use only with high quality, undamaged cables and prevent cables from being pinched or damaged. The cable supplied with your system has been optimized for performance. Longer cables may not work or only work intermittently.

1.3. IDENTIFYING PARTS



1.4. LED BEHAVIOR

LED Name	Color	State	Description
Write-Blocking Status	Green	Solid	Write-blocking mode is enabled.
	Amber	Solid	Write-blocking mode is <i>not</i> enabled! Do not attach drives to the unit. Please contact Technical Support, page 11 .
Error	Red	Solid	A drive error has been detected.
Drive Activity	Amber	Flickering	The attached SSD is being accessed by your computer.
Hidden Area Detection	Green	Solid	Lights only if a hidden area has been detected on the SSD.
Power Output	Green	Solid	Indicates the presence of 12V and 5V power for attached SSDs.
Power Input	Green	Solid	Indicates the presence of 12V DC power from the attached AC adapter.

2. SETUP

1. Ensure that the NVMe WriteBlocker power switch is in the "Off" position.
2. Attach the AC adapter to the NVMe WriteBlocker and connect the other end to a power outlet.
3. Connect the NVMe WriteBlocker to the drive.
 - **U.2 drive:** Connect the U.2-to-OCuLink adapter to the U.2 drive. Then connect the adapter's OCuLink connector and power connectors to the appropriate ports on the NVMe WriteBlocker.
 - **M.2 drive:** Attach the M.2 drive to the M.2-to-U.2 adapter. Next, connect the U.2-to-OCuLink adapter to the other side of the M.2-to-U.2 adapter. Finally, connect the adapter's OCuLink and power connectors to the appropriate ports on the NVMe WriteBlocker.
4. Connect the NVMe WriteBlocker to the host computer with one of the included USB cables.
5. Turn on the power switch. The connected drive will power up and then after a short standby message appears the NVMe WriteBlocker main menu will appear on the LCD screen.



NOTE

The screen on the NVMe WriteBlocker will only move off of the "Standby" screen when there is a host connection to the dock. Ensure that the NVMe WriteBlocker is connected to both an NVMe drive and a computer.

The NVMe drive can now be accessed via your computer. The NVMe WriteBlocker will prevent any changes to the data on the drive. If the device fails to mount, please consult the troubleshooting section in the User Manual, located on the NVMe WriteBlocker product page at www.cru-inc.com.

3. MENU STRUCTURE

- **View Dock Info**
 - **Product Name:** Display's the product's name
 - **Unique ID#:** Display's the product's unique ID number
 - **Firmware Ver.#:** Display's the product's current firmware version
- **View Drive Info**
 - **Drive Temp:** Displays the attached SSD's temperature in Celsius.
 - **Size (MB):** Displays the attached SSD's size in megabytes.
 - **Capacity (MB):** Displays the attached SSD's total capacity in megabytes.
 - **Namespaces:** Displays the number of namespace areas available on the attached SSD. A namespace is an area of non-volatile memory that's formatted into small logical blocks.
 - **Manufacturer:** Displays the attached SSD's manufacturer
 - **PCI Vendor ID:** Displays the chipset manufacturer vendor ID for the attached SSD. Also known as the SVID.
 - **PCI SS VID:** Displays the card manufacturer for the attached SSD. Also known as the SSID.
 - **Model number:** Displays the attached SSD's model number
 - **Serial number:** Displays the attached SSD's serial number.
 - **Firmware rev:** Displays the attached SSD's current firmware revision.
 - **Power cycles:** Displays the number of power cycles the attached SSD has undergone.
 - **Power on hours:** Displays the number of hours the attached SSD has been powered on.
 - **Avail. spare:** Displays the remaining spare capacity available on the attached SSD.
 - **Life span used:** Displays an estimated percentage of how much of the attached SSD's life span has been used. A value of 100 indicates the estimated endurance of the attached SSD has been consumed. It does not indicate a drive failure.
 - **Read commands:** Displays the number of read commands issued.
 - **Read data (MB):** Displays the total number of data read from the attached SSD in megabytes.
 - **Write commands:** Displays the number of write commands issued.
 - **Write data (MB):** Displays the total number of data written to the attached SSD in megabytes.
 - **Data errors:** Displays the number of occurrences when a data integrity error was detected on the attached SSD.
 - **Warning temp:** Displays the temperature threshold for the warning temperature as defined by the drive's manufacturer.
 - **Warning time:** Displays the amount of time in minutes the attached SSD has been operational while its temperature is greater than or equal to the warning temperature threshold.
 - **Critical temp:** Displays the temperature threshold for the critical temperature as defined by the drive's manufacturer.
 - **Critical time:** Displays the amount of time in minutes the attached SSD has been operational while its temperature is greater than or equal to the critical temperature threshold.

- **NVMe ver:** Displays the NVMe specification version used by the attached SSD.

4. TROUBLESHOOTING

MY NVME WRITEBLOCKER WILL NOT COME OUT OF "STANDBY" MODE.

You will need to connect both an SSD to the NVMe WriteBlocker and connect the NVMe WriteBlocker to a functional host computer in order for it to come out of "Standby" mode. Once it leaves "Standby" mode, you will be able to navigate menus.

However, some older models of Intel® U.2 drives are not compatible with the NVMe WriteBlocker. Such drives will remain on standby and not mount to the computer. There is no known workaround for these drives.

IN THE VIEW DRIVE INFO SECTION, THE MANUFACTURER AND/OR MODEL DOES NOT APPEAR CORRECTLY.

The NVMe specification states that the manufacturer name and model name occupy a contiguous area in the buffer and should be separated by a space. There are more than a hundred different manufacturers of NVMe drives, and they have implemented this in many different ways. Some manufacturers include one or more spaces in their company names, which can cause the NVMe WriteBlocker to interpret everything after the first space to be part of the model name. Some manufacturers use characters other than a space, such as an underscore. Others leave out the space entirely. Manufacturers may even implement it in different ways across different drive models or versions of firmware.

If you need to record the drive's manufacturer and model for a report, use the information on the drive's label instead of the NVMe WriteBlocker's LCD menu if the values don't match.

WHY AREN'T DRIVES FORMATTED EXT4 MOUNTING TO MY LINUX PC?

Linux appears to search for a superblock and write to it as part of the mounting process. Since the NVMe WriteBlocker is preventing writes from reaching the drive, this process cannot complete, and the drive is not able to mount. Drives formatted NTFS or FAT32 do not have this issue and are able to mount in Linux via the NVMe WriteBlocker.

WHY DOES THE ACTIVITY LED BEHAVE DIFFERENTLY FOR M.2 AND U.2 DRIVES?

For M.2 drives, the activity LED should be off by default and flicker on during activity. For some U.2 drives this is reversed, with the LED on solid by default and flickering off during activity. This is due to some U.2 drive manufacturers departing from the NVMe specification's recommendations.

IS THE NVME WRITEBLOCKER COMPATIBLE WITH YOUR SOFTWARE APPLICATIONS SUCH AS FORENSIC SOFTWARE UTILITY AND THE WRITEBLOCKING VALIDATION UTILITY?

We are working to add support for the NVMe WriteBlocker to our software apps. The product is not supported by the current release versions. The WriteBlocking Validation Utility is partially compatible since it was designed for use with any brand/type of write-blocking product, but it needs to be updated to test NVMe-specific commands, and there may be anomalies in the drive or product descriptions.

I'M USING A THIRD-PARTY SOFTWARE APP TO VIEW INFORMATION ABOUT THE DRIVE. WHY IS IT SHOWING INFORMATION ABOUT THE NVME WRITEBLOCKER IN SOME OF THE DATA FIELDS FOR DRIVE INFO?

The NVMe WriteBlocker uses a bridge chip that presents itself to the host as a "drive". It may therefore substitute some of its own descriptor values in place of the drive's native values. The original drive information is still available in the SMART log. An app that reads the drive's SMART data will be able to show the drive's native values.

5. PRODUCT SUPPORT

Your investment in CRU and WiebeTech products is backed up by our free technical support for the life-time of the product. Contact us through our website, cru-inc.com/support or call us at 1-800-260-9800 or +1-360-816-1800.

APPENDIX A. TECHNICAL SPECIFICATIONS

Product Name	NVMe WriteBlocker
Host Interface Types & Speeds	USB 3.2 Gen 2: up to 10 Gbps
Supported Storage Media	<ul style="list-style-type: none"> • M.2 NVMe SSDs • U.2 NVMe SSDs
Host Data Connectors	One (1) USB Type-C connector
Supported Operating Systems	<ul style="list-style-type: none"> • Windows 10 and 8.1 • Windows Server 2019, 2016, and 2012 product families • macOS 10.14 “Mojave” or newer • Red Hat Enterprise Linux and Ubuntu LTS¹
Weight	0.18 g
Dimensions	<ul style="list-style-type: none"> • Width: 110 mm • Length: 75 mm • Height: 27 mm
Compliance	<ul style="list-style-type: none"> • EMI Standard: FCC Part 15 Class B • EMC Standard: EN55024, EN55032 • CE, RoHS, RCM

¹The EXT4 file system is not supported when used in conjunction with Linux. See [Section 4: Troubleshooting, page 9](#) for more information.