

Apacer

Opaque User Manual

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1. Introduction

Data security for solid state drives (SSDs) remains as a hot issue because most electronic storage devices are made to store data directly into flash memory spaces and they are made to do it faster, more efficient, and even tougher against demanding environments. However, hardly any SSD device is born with resistance to external data threat. Some software utility application programs designed to prevent potential theft are available on the market for download and installation in users' computer systems, but installing software programs may possibly slow down the drive and is time consuming.

As SSDs become more popular for storing sensitive data, there is a growing need for strong data encryption to mitigate the risk of data loss. One of the most recommended methods is to implement encryption in the drive. Realizing that data security was fast becoming one of the most pressing issues facing the information technology industry, Apacer brings hardware-based full drive encryption capability in the form of Opal Security Subsystem Class, to SSDs with our self-encrypting drives (SEDs).

Developed by the Trusted Computing Group (TCG), the Opal Storage Specification is a set of security specifications used for applying hardware-based encryption to storage devices which feature higher performance, better security and easier management than software-based encryption. Apacer's efforts to protect the confidentiality of your data against unauthorized access can be divided into two levels. Firstly, Apacer offers TCG Opal-compliant SSDs in hardware level. Furthermore, in software level, a security management tool Opaque is developed, allowing you to manage Opal-supported devices, enable Opal 2.0 function and configure related settings.

1.1 System Requirements

- OS Support: Windows XP, Windows 7, Windows 8, Windows 10

Note: If any issue arises when the Opaque is run in Windows 7, 8 or 10, you may need to switch off Windows User Account Control before running this program.

- Storage Space: More than 30MB available storage space of the device.
- Device Support: Only applicable for Apacer self-encrypting drive (SED) with SATA 6.0Gbps and PCIE interface/controller.

2. Getting Started with Opaque


Being a security management tool, Opaque provides basic but essential functions of TCG Opal by simplifying TCG Opal specifications onto the easy-to-use interface. This makes it more convenient and efficient to encrypt Opal-supported storage devices based on the requirements you need. Make sure the devices attached to your computer support TCG Opal before using Opaque.

This chapter explains how to install and launch Opaque.

2.1 Installing Opaque

Before managing your drives with Opaque, you need to download it from [Apacer's website](#) and install it on your computer. Follow the steps below to install the utility.

To install Opaque:

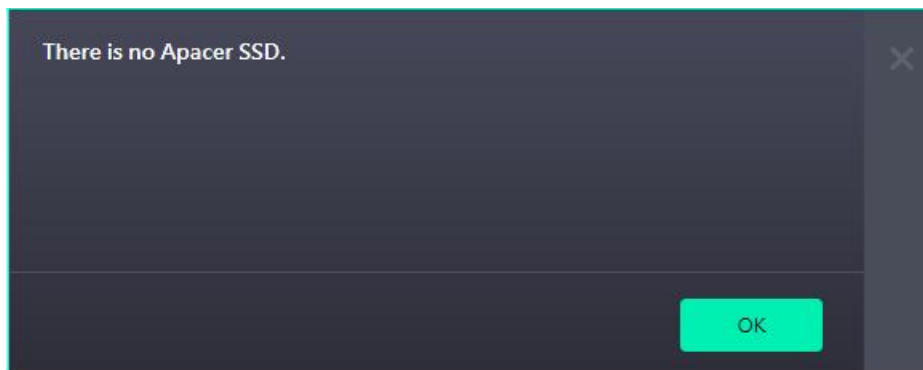
1. Go to [Apacer's website](#), and go to **Support > Downloads**.
2. In the **Software** section, find Opaque and click  to download the utility. The compressed file will be downloaded to your computer.
3. Extract the zipped file. Once the extraction is finished, Opaque folder will appear and the installation is complete.

2.2 Launching Opaque

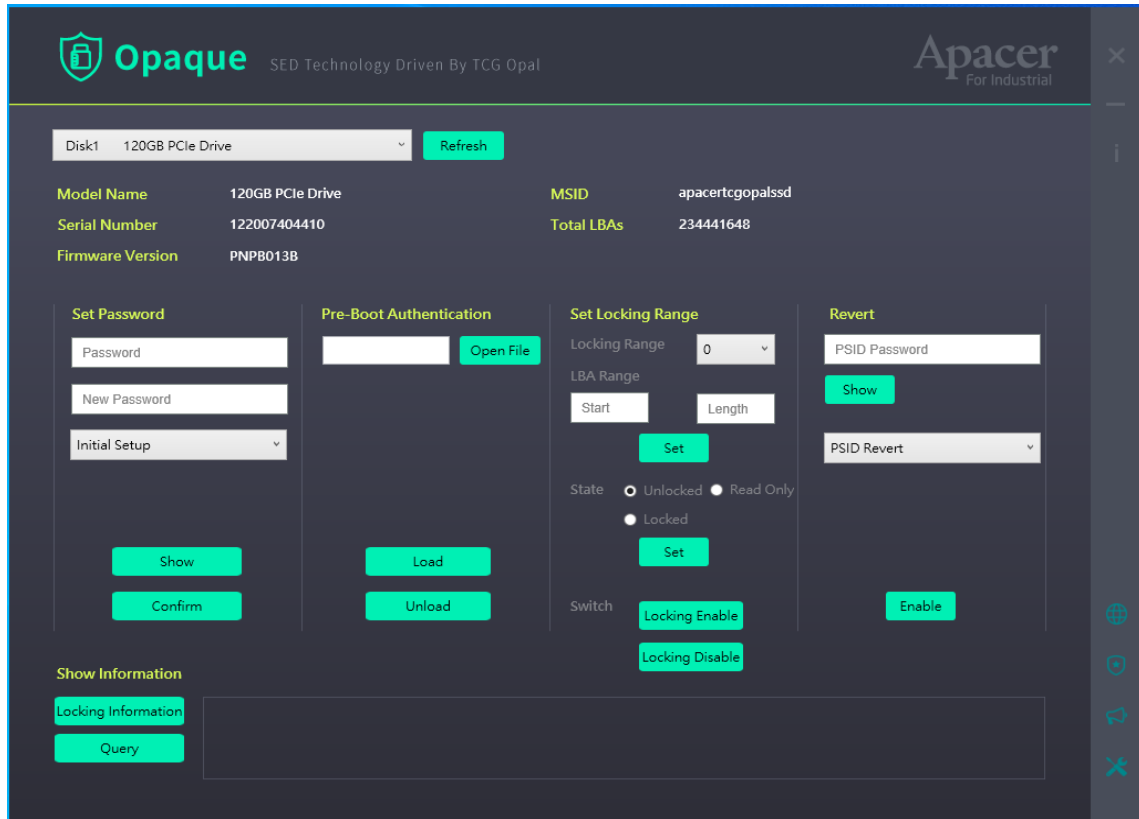
Once the installation is complete, follow the steps below to launch Opaque and you may start managing your storage devices.

To launch Opaque:

1. Go to the Opaque folder and double click the Opaque execution file to launch Opaque.
2. Depending on whether any storage device is detected, do either of the following:
 - **No device detected:** The error message below will appear. Click **OK** and check if the attached devices support TCG Opal or if they are properly attached. Once the problem is solved, launch Opaque again.



- **Device detected:** You will see the Opaque interface below. See “3. Opaque Features” for more information.



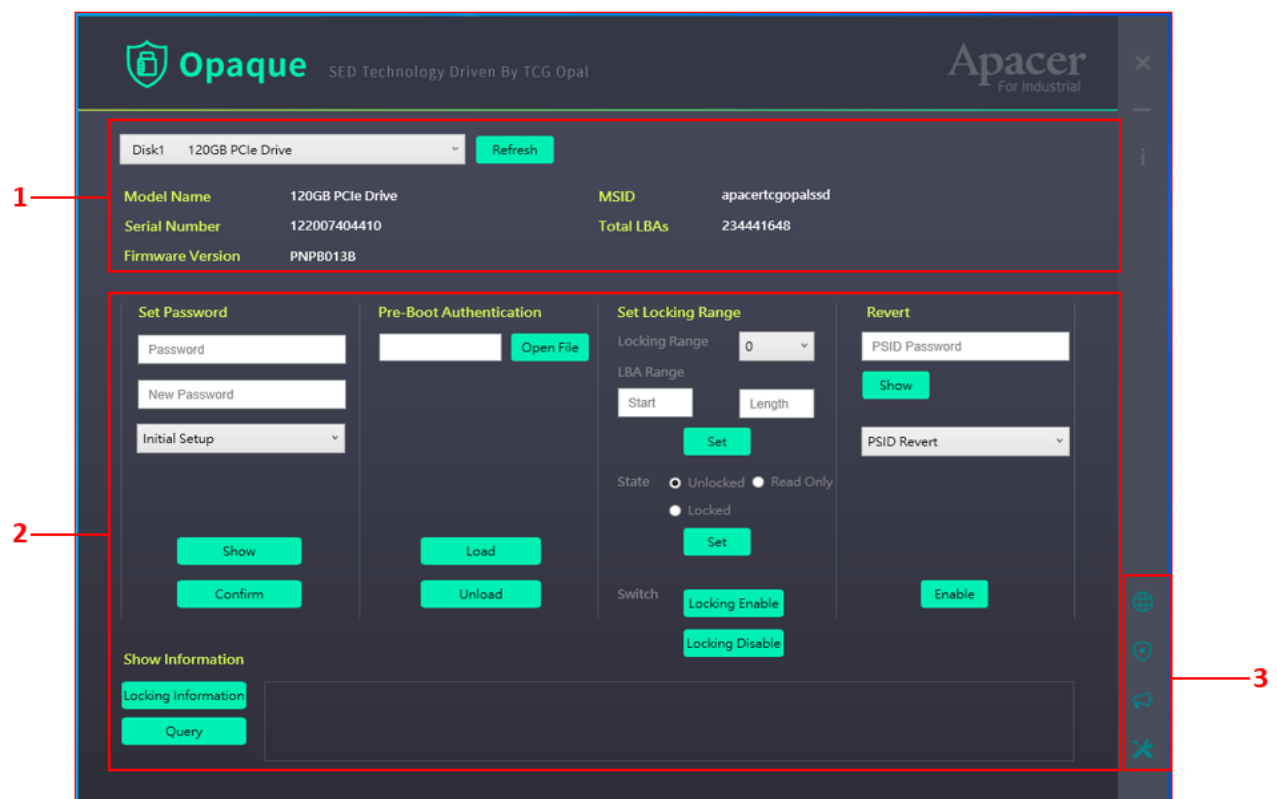
3. Opaque Features


Opaque offers several features to manage storage devices, including running initial setup to enable TCG Opal function, setting passwords to limit permissions to the devices, implementing power-on authentication to request the drive password at boot, assigning the state of divided locking ranges for different authorizations, and restoring the device to factory defaults by reverting all user data and settings.




This chapter introduces you to the interface of Opaque and guides you through the process of viewing device information and configuring above settings for the connected storage devices.

3.1 Navigating Home Screen

When Opaque is launched, you can see the Opaque interface divided into the following three sections: disk information, device settings and Apacer website shortcuts.



No.	Item	Icon	Description
1.	Disk information		Lists all attached storage devices with TCG Opal support and displays disk information of the selected device. See “3.2 Viewing Disk Information” for more information.
2.	Device settings		Perform initial setup, set SID/Admin password, manage Opal-related settings, including pre-boot authentication, locking range and revert function, and view locking setting information and programming messages. See “3.3 Managing Device Settings” for more information.
3.	Apacer website		Click to go to Apacer’s website exclusively designed for industrial products.

No.	Item	Icon	Description
			Click to open the Technology webpage which offers introduction of the technologies implemented on Apacer's storage devices.
			Click to browse news releases and check out exhibitions/events Apacer participates in.
			Click to download technical materials or software you need.

3.2 Viewing Disk Information

Multiple storage devices can be attached for industrial applications. You may view device information of any of the devices with the drop-down menu on the top of the home screen.



To view disk information of the attached storage devices:

Click the drop-down menu to select any of the installed storage devices. Once a device is selected, following information of the selected device will be shown.

Note: Only TCG Opal-supported storage device will be available for selection from the drop-down menu.

If new devices are connected to the Opaque interface while you are running Opaque, you may click **Refresh** to update the device list.

- **Model Name:** Displays the model name of the selected device installed in the system.
- **Serial Number:** Shows the serial number of the selected device, serving as product ID.
- **Firmware Version:** Displays the current firmware version of the selected device.
- **MSID:** Indicates the default Manufactured Secure ID (MSID) of the selected device.
- **Total LBAs:** Indicates total LBA's quantity of the selected device.

3.3 Managing Device Settings

This section allows you to perform initial setup, set SID (Secure ID)/Admin password, manage Opal-related settings, including pre-boot authentication, locking range and revert function and view locking setting information and programming messages.

3.3.1 Initial Setup

Running initial setup is required before configuring TCG Opal settings for your connected storage devices because the initialization procedure serves as a switch to enable the TCG Opal function. Therefore, you are required to perform initialization before making any changes to other settings. Once initialization starts, the TCG Opal function is activated on the devices until the revert function is applied.

To run initial setup:

Select **Initial Setup** from the drop-down menu and click the **Confirm** button.

Note: This action must be completed before changing other settings. Otherwise, all the other settings will not apply.

3.3.2 Set Password

The aim of developing Opaque is to provide users with an easy-to-use management tool to protect the confidentiality of data against unauthorized access. With the implementation of identity-based authentication, devices can only be accessed by users with the correct password. In light of this, it is strongly recommended that you change both SID and Admin passwords for security concerns.

To set SID/Admin password:

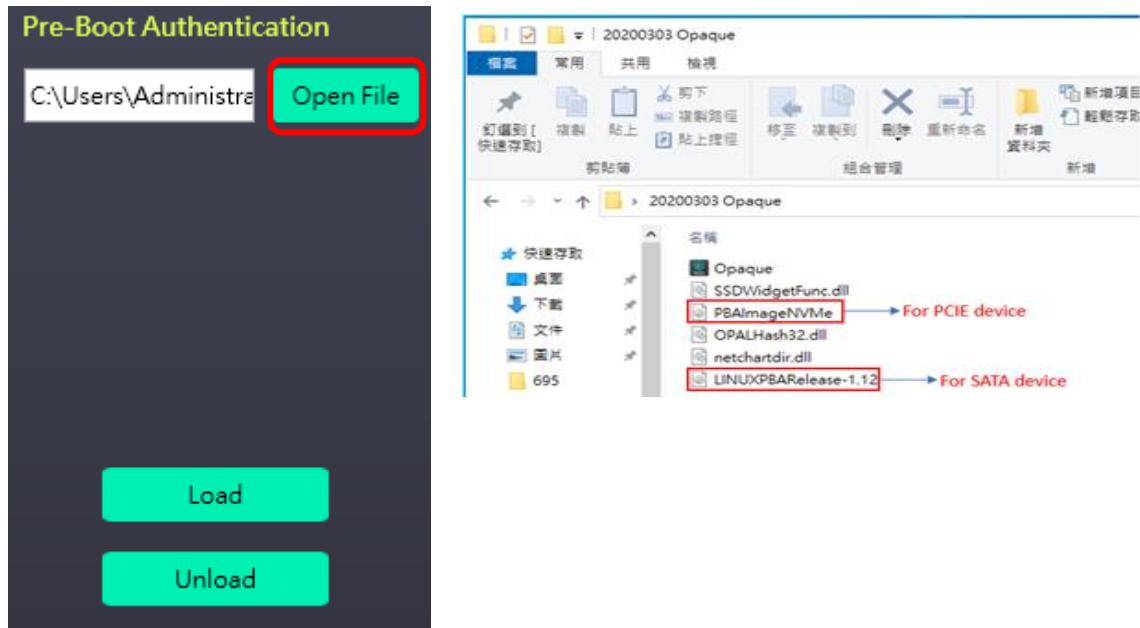
1. Select **SID/Admin Password** from the drop-down menu and then enter the current password in the **Password** field and new password in the **New Password** field. If this is your first time to set the password, use the default password “Apacer” for the current password. You can click **Show** to display the input password.
2. Once completed, click **Confirm** to save the settings.

3.3.3 Pre-Boot Authentication

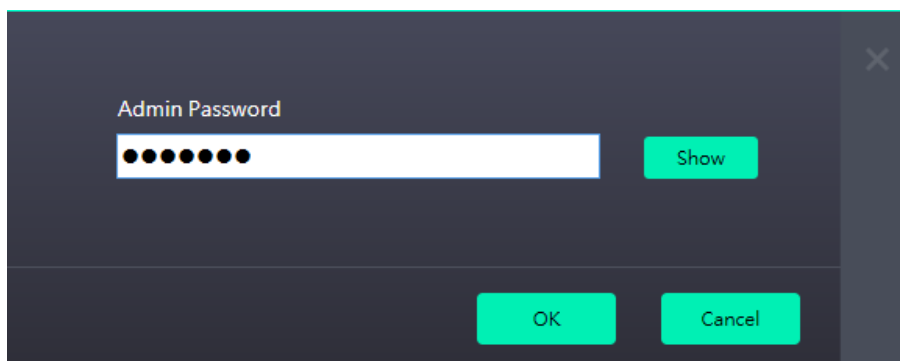
Pre-Boot Authentication (PBA) is designed to provide an additional layer of security for storage devices by creating the Master Boot Record (MBR) shadow with a correct image file and implementing the power-on authentication procedure which requires the Admin password for access.

To create the MBR shadow:

1. Click **Open File** to select an image file which is placed in the Opaque folder.



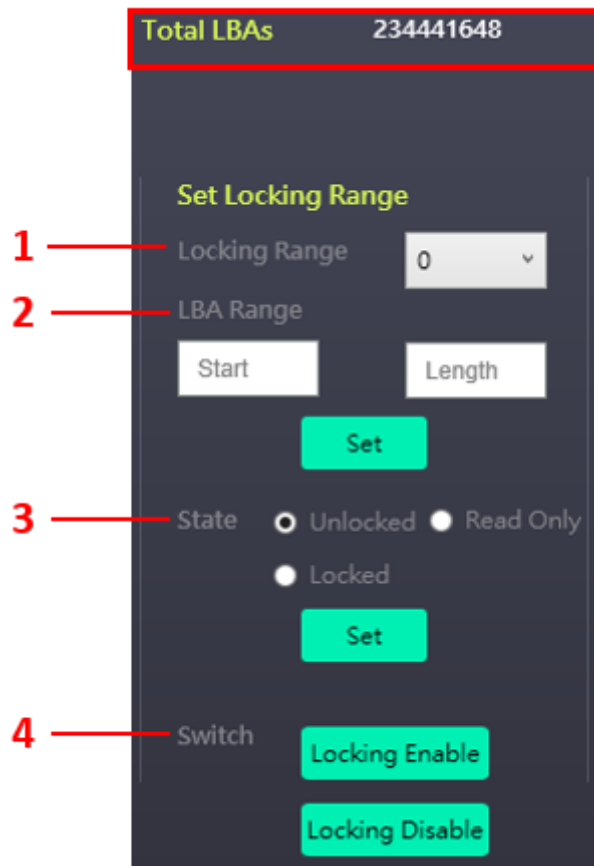
2. After selecting the image file, click **Load** to load the file to the connected device.
3. Enter the Admin password and click **OK**. You can click **Show** to display the input password.



4. If you want to remove the PBA function, click **Unload** to unload the image file. You will be required to enter the Admin password for this action.

3.3.4 Set Locking Range

This section allows you to set LBA locking ranges and assign access control of users to LBA ranges. Each LBA range is password-protected and can only be accessed with the correct Admin password.

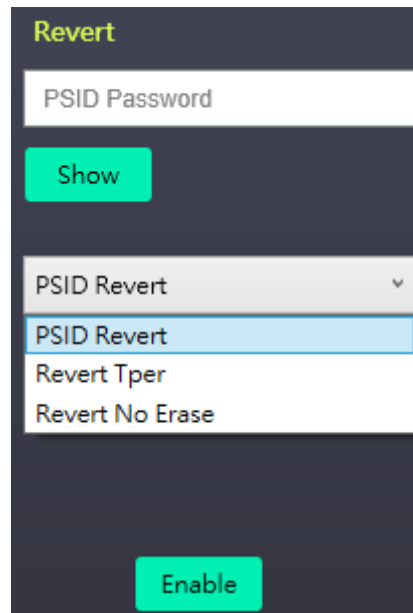


To set a locking range:

1. Select the range number from the **Locking Range** drop-down menu except for 0, which represents global range. The default setting for the global range is all LBAs.
2. Specify the start and length of the LBA range in the **Start** and **Length** fields and then click **Set**. The total LBAs of the device can be found above at **Total LBAs** in the disk information section. In the window that appears, enter the Admin password and click **OK**.
3. Assign the state of the specified LBA range from **Unlock**, **Read Only**, and **Lock** and click **Set**. In the window that appears, enter the Admin password and click **OK**.
4. Now you can apply the above locking settings to the specified locking ranges by clicking **Locking Enable**. Click **Locking Disable** if you wish to cancel the locking function. In the window that appears, enter the Admin password and click **OK** to apply the settings.
5. Once finished, you will be able to see the locking setting information at the Show Information section. See “3.3.6 Show Information” for more information.

3.3.5 Revert

The revert function allows you to remove TCG Opal settings from storage devices, restore factory defaults and erase user data, depending on the revert mode you choose. Select from three revert modes as follows to perform the action you want by clicking **Enable** and entering the password required to apply the settings.



The screenshot displays a dark-themed interface for the 'Revert' function. At the top, the word 'Revert' is written in yellow. Below it is a white input field labeled 'PSID Password'. Underneath the input field is a red 'Show' button. A dropdown menu is open, showing three options: 'PSID Revert' (highlighted in blue), 'Revert Tper', and 'Revert No Erase'. At the bottom of the screen is a red 'Enable' button.

- **PSID Revert:** Enter the 32-digit PSID (Physical Secure ID) to activate this function. Once this function is enabled, all data and settings will be erased and the TCG Opal function will be disabled. The PSID can be found on the label on 2.5-inch SSD and others form factor can use DataMatrix QR code to scan the PSID.
- **Revert Tper:** Enter SID password to revert the Tper (Trusted Peripheral) function. This action will erase all data and disable the TCG Opal function.
- **Revert No Erase:** Enter Admin password to activate this function. This action will only disable the TCG Opal function without erasing data stored on the device. However, if you want to enable TCG Opal again, you need to execute the function of **Revert Tper** first before enabling.

3.3.6 Show Information

This section allows you to check the device locking setting information which can only be accessed by entering the Admin password with the **Locking Information** button and firmware programming messages with the **Query** button.

[Locking Information]

Show Information
Locking Information
 Query
 [Locking Number 1]
 Start LBA: 10000
 Length: 11000
 Status: Lock

[Query]

Show Information
Locking Information
 Query
 [TPer Function]
 FeatureCode : 0x0001
 SyncSupported : Y
 AsyncSupported : N
 ACK NAKSupported : N

Revision History

Revision	Date	Description	Remark
1.0	1/14/2019	Official release	
1.1	3/5/2020	Add PCIE SED solution to support this feature	

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