



# LaCie RAID Manager User Manual

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12big Thunderbolt 3

6big Thunderbolt 3

8big Rack Thunderbolt 2

5big Thunderbolt 2

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Seagate Technology LLC  
47488 Kato Road  
Fremont, CA 94538  
USA

Seagate Singapore International Headquarters Pte. Ltd.  
Koolhovenlaan 1  
1119 NB Schiphol-Rijk  
The Netherlands

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# Contents

<b>1</b>	<b>Introduction</b>	<b>5</b>
	LaCie RAID Manager requirements	5
	• LaCie professional storage	5
	• Minimum operating system	6
	• Thunderbolt 3	6
	• Thunderbolt 2	6
	• USB	6
<b>2</b>	<b>Key Features and Terminology</b>	<b>7</b>
	Configuration	7
	• Array	7
	• RAID	7
	• RAID level	8
	• Initialization	8
	• Spare drive	9
	• Stripe size	10
	Maintenance	10
	• Auto rebuild	10
	• Consistency check	11
	• Disk check	11
	• Poll SMART status	11
	Performance	12
	• Cache	12
	• Disabling caching	12
<b>3</b>	<b>RAID</b>	<b>13</b>
	Standard RAID levels	13
	• RAID 0	14
	• RAID 1	14
	• RAID 5	15
	• RAID 6	15
	Nested RAID levels	16
	• RAID 10	16
	• RAID 50	17
	• RAID 60	17
	• RAID+Spare	18
	Drive failures and synchronizing a spare hard drive	18
	RAID and data security	19
<b>4</b>	<b>Getting Started</b>	<b>20</b>
	Download and Install LaCie RAID Manager	20

macOS 10.13 High Sierra .....	20
• Enabling the kernel extension .....	21
• Troubleshooting for big devices .....	21
Windows and Thunderbolt 3 .....	22
5big and 8big Thunderbolt 2 firmware update .....	22
• Installing the firmware update .....	22
<b>5 Sign into LaCie RAID Manager .....</b>	<b>25</b>
Administrators .....	25
Users .....	25
<b>6 Array Configuration and Maintenance .....</b>	<b>26</b>
Select a device .....	27
View array .....	28
• View array details .....	28
• From the Overview tab .....	28
• From the Arrays menu .....	29
Create an array .....	29
• Create a quick array .....	29
• Create a custom array .....	29
• Choose RAID level .....	30
• Configure RAID .....	30
Delete an array .....	31
Create a spare drive .....	32
• Create a dedicated spare .....	32
• New array .....	32
• Existing array .....	32
• From the Overview tab .....	32
• From the Available Disks menu .....	32
• From the Arrays menu .....	33
• Create a global spare .....	33
Remove a spare drive .....	33
• Remove a dedicated spare .....	33
• Remove a global spare .....	33
Upgrade RAID level .....	34
• Upgrade RAID level .....	34
Add an available disk to an existing array .....	34
Initialize an array .....	34
• Run or schedule a background initialization .....	35
• From the Overview tab .....	35
• From the Arrays menu .....	35
Check the array using Consistency Check .....	35
• Run or schedule a consistency check .....	36
Repair an array using Consistency Check and Fix .....	36
• Run or schedule a consistency check and fix .....	36
View disk details .....	37
• From the Arrays menu .....	37

- From the Global Spare or Available Disks menu ..... 37
- Check individual disks in an array ..... 37
- Check cache settings ..... 38

## 7 Device and App Management ..... 39

- Device settings ..... 39
  - Change device name ..... 39
  - View device details ..... 40
  - Assign processing priorities ..... 40
  - Change Poll SMART status setting ..... 40
  - Change Auto rebuild setting ..... 41
  - Change Audible alarm setting ..... 41
  - Save device settings ..... 41
  - Register your device ..... 42
- App settings ..... 42
  - Change language settings ..... 42
  - Send usage information ..... 42
  - Change auto start setting ..... 43
  - View app version ..... 43
- Notifications ..... 43
  - Download log ..... 43
  - Clear notification entries ..... 44
  - Change email settings ..... 44
    - Custom server ..... 44
- Updates ..... 44
  - Check for updates ..... 44
  - Manual updates ..... 44
  - Use system proxy settings ..... 45
- Recent notifications ..... 45

## 8 Frequently Asked Questions ..... 46

- RAID initialization and other operations ..... 46
- Thunderbolt 2 and Windows PCs ..... 46
- LaCie 6big Thunderbolt 3 / 12big Thunderbolt 3 and USB connections ..... 47
- LaCie 12big Thunderbolt 3 using consecutive disks ..... 47

# Introduction

Created specifically for LaCie professional direct-attached storage, LaCie RAID Manager helps you configure and manage arrays, set up important email alerts, measure the health of hard drives, and more.

The LaCie RAID Manager: 5big, 6big, 8big and 12big user manual provides instructions on configuring and maintaining arrays for the following LaCie professional storage devices:

- LaCie 12big Thunderbolt 3
- LaCie 6big Thunderbolt 3
- LaCie 8big Rack Thunderbolt 2
- LaCie 5big Thunderbolt 2

For common questions and answers about LaCie RAID Manager, please see [Frequently Asked Questions](#).

You can get the latest tips and updated technical information about your product at [LaCie customer support](#).

## LaCie RAID Manager for 2-Bay Devices

LaCie RAID Manager's features and options differ significantly for devices with only two hard drives. These products include:

- LaCie 2big Dock Thunderbolt 3
- LaCie Rugged RAID Pro

For details on using LaCie RAID Manager with dual-drive devices, see [LaCie RAID Manager for 2-Bay Devices](#).

## LaCie RAID Manager requirements

### LaCie professional storage

- LaCie 12big Thunderbolt 3
- LaCie 6big Thunderbolt 3
- LaCie 8big Rack Thunderbolt 2
- LaCie 5big Thunderbolt 2

# Minimum operating system

For detailed information on supported operating systems, please see the following [knowledge base article](#).

## Thunderbolt 3

- macOS Sierra 10.12 and higher
- Windows 10 and higher

## Thunderbolt 2

- Mac OS X 10.9 and higher
- Windows 7 and higher ([driver required](#))

## USB

- Mac OS X 10.9 and higher
- Windows 8 and higher

# Key Features and Terminology

Use the links below to review key features and terminology related to LaCie RAID Manager.

<b>Configuration</b>
<a href="#">Array</a> <a href="#">RAID</a> <a href="#">RAID level</a> <a href="#">Initialization</a> <a href="#">Spare drive</a> <a href="#">Stripe size</a>
<b>Maintenance</b>
<a href="#">Auto rebuild</a> <a href="#">Consistency check</a> <a href="#">Disk check</a> <a href="#">Poll SMART Status</a>
<b>Performance</b>
<a href="#">Cache</a>

## Configuration

### Array

An array is a combination of two or more physical disks that are presented to the operating system as a single volume.

<b>Go to</b>
<a href="#">Create an array</a> <a href="#">Delete an array</a>

### RAID

RAID stands for [Redundant Array of Independent Disks](#). RAID contains the word [array](#), and the two terms are often used interchangeably.



# RAID level

Disks are combined into different RAID configurations known as RAID levels. The RAID level you choose depends on which storage attributes are most important to you:

Capacity	The total amount of data you can store
Performance	The speed at which data is copied
Protection	The number of disks that can fail before data is lost

Go to

[Understanding RAID Levels](#)

## Initialization

Initializing an array can help prevent errors while handling data. The following options are available when creating a custom array:

None	The data check is skipped. This option is not recommended as you can encounter data errors and you cannot perform a consistency check on the array.
Fast	Fast initialization is a destructive process that erases all data on the array, including the Master Boot Records (MBR) on all physical disks. Use fast initialization if you wish to perform a cursory check before starting a project. However, this option does not perform a thorough check of the array. Therefore, a Fast initialization does not help to prevent data handling errors. Since it is not a full initialization, consistency checks are not available when using Fast on the array.
Background	<p>A full initialization that guarantees all mirror or parity blocks are checked and updated to ensure consistency of data on the array. A background initialization deletes data previously stored on the array. However, since the process runs in the background, you can use the array during the initialization. Any data written on the array during the background initialization is safe.</p> <p>A background initialization can take multiple hours based upon the total capacity of the array. Performance is impacted during the initialization process, especially when working on high-end video or graphic projects.</p>
Foreground	A full initialization that guarantees all mirror or parity blocks are checked and updated to ensure consistency of data on the array. A foreground initialization is faster than background initialization, but you can't write new data to the array while the initialization is underway.

**!** **Caution**—Make certain to back up your files before performing an initialization on an existing array. Files on the array that predate the initialization will be deleted, however, you can write new data during an initialization.

Go to

[Create an array](#)  
[Initialize an array](#)

## Spare drive

A hard drive designated as a spare is only used if a hard drive in an array fails.

A spare hard drive waits to be used in the event a single hard drive in an array fails. If auto rebuild is enabled, a spare hard drive automatically takes the place of a failed hard drive. As part of a rebuild, the device synchronizes data to the spare hard drive so that it can be assimilated into the array. A hard drive must be assigned as a spare in order for auto rebuild to synchronize data.

**!** A spare drive cannot be assigned to a RAID 0 array.

The greatest advantage of having a spare hard drive is the reduction of time wasted waiting to rebuild an array. That is, if all hard drives in the enclosure are being used for one or more arrays, there are no hard drives available to assign as a spare to take over for a failed disk. In such a case, you must contact LaCie support to replace a hard drive purchased through LaCie, or find a replacement if the hard drive did not ship with the device. Since a failed hard drive generally means the array is degraded, the RAID can no longer protect your data. Further, if another hard drive in the array fails, the data is lost. Therefore, a good amount of time and, potentially, data can be lost if a replacement hard drive is not available.

The clear disadvantage to having a spare is losing storage space since a spare hard drive sits on the side waiting for a hard drive to fail. While acting as a spare, the hard drive's storage space cannot be used.

LaCie RAID Manager has two spare drive options:

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Global spare drive

Global spare drives can be used by any array. This option is good if you have more than one array.

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Dedicated spare drive

Dedicated spare drives are used exclusively for rebuilding a specific array.

Go to

[Create a spare drive](#)  
[Remove a spare drive](#)

## Stripe size

A stripe represents a single data block on the array. Stripe size is the amount of data (in KB) written to one disk before moving to the next disk in the array. The range of stripe sizes includes 64K, 128K, 256K, 512K and 1024K. The choice of stripe size varies by device.

The larger the stripe size, the longer it takes for the RAID controller to read from and write to data blocks on the physical disks. Consider the following when configuring the stripe size:

- Use a larger stripe size for applications requiring large data transfers, such as audio, video, and graphics.
- Use a smaller stripe size for applications with content much smaller in size, such as emails, documents, and web resources.

A stripe size can be assigned while configuring the array.

Go to

[Create an array](#)

## Maintenance

### Auto rebuild

When auto rebuild is enabled, the device automatically rebuilds a degraded array once a spare hard drive is available. A degraded array generally means that one or more hard drives are missing or experiencing errors.

The amount of disks an array can lose depends upon the RAID level. A RAID 5 array can lose one hard drive, while a RAID 6 array can lose two hard drives. The rebuild cannot begin if there are no dedicated or global spare hard drives.

If auto rebuild is disabled, you can rebuild a degraded array by exchanging a defective hard drive with a healthy hard drive and manually initiating a rebuild.

**!** **Important info**—Data is not protected during a rebuild. The RAID array protects data once the rebuild is complete and all information has been synchronized to the spare hard drive. Therefore, if a second hard drive fails during the rebuild, the array is broken and all data is lost.

Go to

[Change Auto rebuild setting](#)

## Consistency check

A consistency check tests the integrity of parity or mirrored data on the array. Consistency checks are highly recommended as part of regular maintenance for arrays. Consider running a consistency check when an array is not performing as expected.

You can run a consistency check on an array that has had a background or foreground initialization. The consistency check option is not available for arrays with a fast initialization or no initialization. Additionally, a consistency check is not available when a background initialization or a disk check is in progress.

Go to

[Check an array using consistency check](#)  
[Repair an array using consistency check and fix](#)

## Disk check

While a consistency check scans the integrity of parity or mirrored data on the array, disk check searches for errors on a single hard drive. Run disk check on an individual disk as part of regular maintenance.

A disk check is not available when an initialization or consistency check is in progress.

Go to

[Check a disk in an array](#)

## Poll SMART status

SMART (Self-Monitoring, Analysis and Reporting Technology) is a hardware monitoring system that reports various indicators of drive reliability. You can configure LaCie RAID Manager to gather and report the SMART status for each disk in the enclosure.



Enabling SMART status can have a negative effect upon performance.

Go to

[Change Poll SMART status setting](#)

# Performance

## Cache

Caching media can improve your LaCie device's performance by keeping files in a select location rather than sending them directly to the array's storage. Transfer speeds are faster since your computer retrieves data directly from the cache rather than searching the hard drives. Caching data optimizes your LaCie product for better performance.

There are two options for caching media:

Array cache	Cache media on the array. Data is stored on a buffer before being flushed to the array at the appropriate time.
Disk cache	Cache media on disks. Data is stored temporarily on the disks' caches before it is moved to the array.

While caching data is recommended to improve performance, there is a potential drawback in regard to protecting data and data corruption. In the event of power failure, data integrity can be lost if the data has not been fully transferred from the cache to the array. Make certain to use a stable power supply that cannot be interrupted, such as an uninterruptable power supply (UPS). A UPS allows you to safely shut down the LaCie device if the electricity suddenly terminates at your facility or office.

## Disabling caching

When data caching is disabled, all data is accessed from the array. This option is recommended when data protection is critical to your workflow. While access to data is not as fast when disk caching is disabled, transfer rates remain quite high due to the use of a hardware RAID controller and your version of Thunderbolt technology.

Go to

[Change cache settings](#)

# RAID

Use LaCie RAID Manager to configure the RAID level for an array. The information below provides a basic guide to the RAID modes available to compatible LaCie devices.

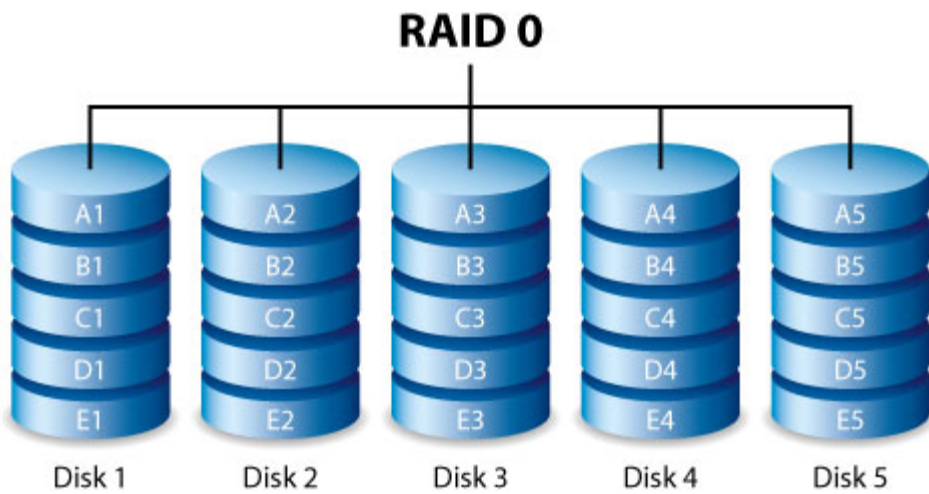
RAID level is contingent upon the amount of hard drives in the array. For example, an array with four hard drives supports all standard RAID levels except RAID 1, which is not compatible with arrays greater than two disks. When making comparisons in an array with four disks, RAID 0 appears to be the best choice since it offers 100% storage capacity and high performance. However, RAID 0's major weakness is a lack of data protection in case of hard drive failure. Further, its performance is not much greater than RAID 5, which includes data protection in case one hard drive should fail. RAID 6 and, in some cases, nested RAID levels, can provide data protection in the event that two or more hard drives fail.

RAID mode	Type	Minimum hard drives	LaCie devices
RAID 0	Standard	2	All
RAID 1	Standard	2	All
RAID 5	Standard	3	All
RAID 6	Standard	4	All
RAID 10	Nested	4	All
RAID 50	Nested	6	LaCie 6big and LaCie 12big Thunderbolt 3
RAID 60	Nested	8	LaCie 6big and LaCie 12big Thunderbolt 3

## Standard RAID levels

# RAID 0

RAID 0 is the fastest RAID mode since it writes data across all of the array's hard drives. Further, the capacities of each disk are added together for optimal data storage.

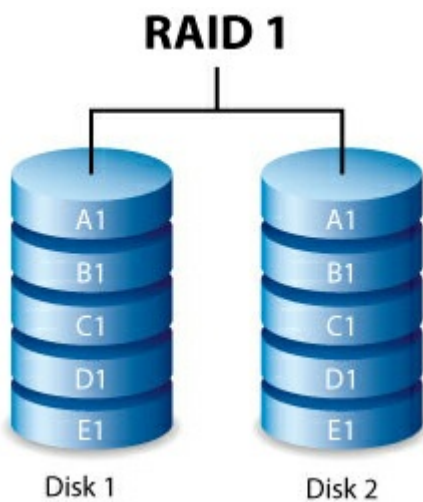


However, RAID 0 lacks a very important feature: data protection. If one hard drive fails, all data becomes inaccessible. A recommended option is RAID 5, which offers:

- Performance that can approach RAID 0.
- Approximately 75% of the storage capacity of all the hard drives in the RAID configuration.
- Data protection in case a single hard drive fails.

# RAID 1

RAID 1 provides enhanced data security since all data is written to each disk in the array. If a single disk fails, data remains available on the other disk in the array.

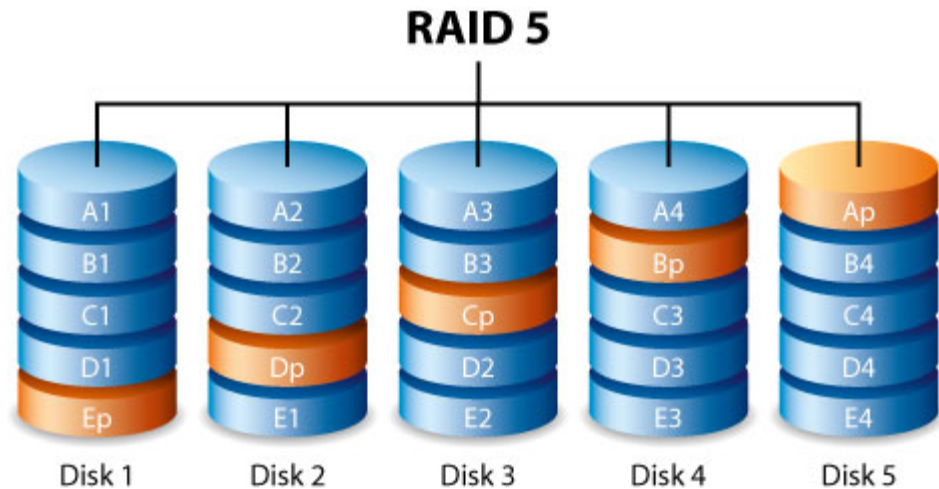


However, due to the time it takes to write data multiple times, performance is reduced. Additionally, RAID 1

reduces disk capacity by 50% since each bit of data is stored on both disks in the array.

## RAID 5

RAID 5 writes data across all hard drives in the array and a parity block for each data block. If one physical hard drive fails, the data from the failed hard drive can be rebuilt onto a replacement hard drive. A minimum of three hard drives is required to create a RAID 5 array.



While the files stored on a RAID 5 array remain intact should one hard drive fail, data can be lost if a second hard drive fails before the RAID is rebuilt with the replacement hard drive.

RAID 5 offers performance that can approach RAID 0. RAID 5's strong advantage over RAID 0 is data protection. Additionally, you still have approximately 75% of the storage capacity of a RAID 0 array (based upon total available hard drives and storage capacities). The equation for determining the storage is:

(The size of the hard drive with the smallest capacity in the array) \* (Total hard drives-1)

Example 1: An array is assigned five 3TB hard drives for a total of 15TB. The equation is:

$$3\text{TB} * 4 = 12\text{TB}$$

Example 2: An array is assigned three 2TB hard drives and one 3TB hard drive for a total of 9TB. The equation is:

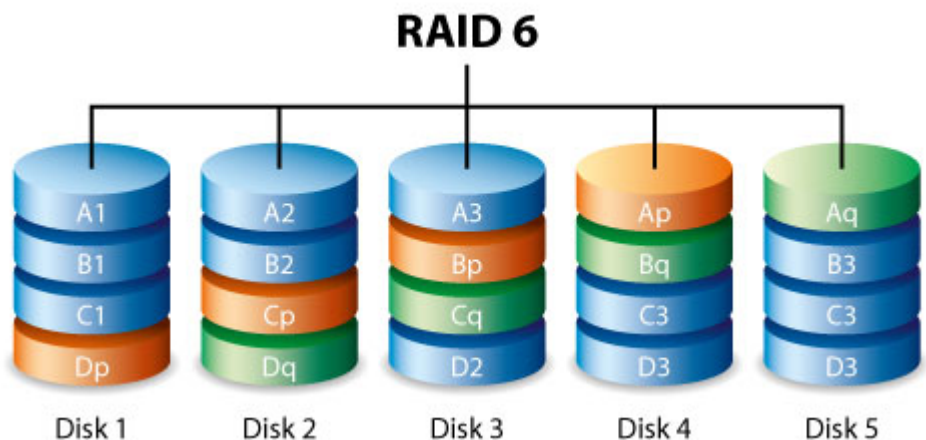
$$2\text{TB} * 3 = 6\text{TB}$$

## RAID 6

RAID 6 writes data across all disks in the array and two parity blocks for each data block. If one physical disk



fails, the data can be rebuilt onto a replacement disk. With two parity blocks per data block, RAID 6 supports up to two disk failures with no data loss. A minimum of four disks is required to create a RAID 6 array.



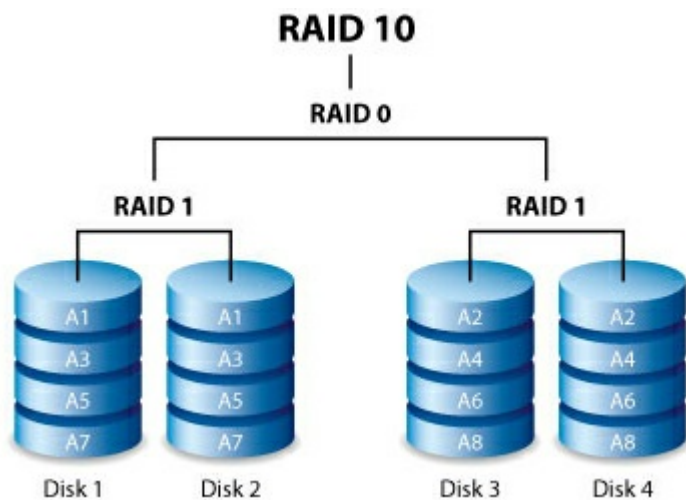
RAID 6 synchronizing from a failed disk is slower than RAID 5 due to the use of double parity. However, it is far less critical due to its double-disk security.

RAID 6 offers very good data protection with a slight loss of performance compared to RAID 5.

## Nested RAID levels

### RAID 10

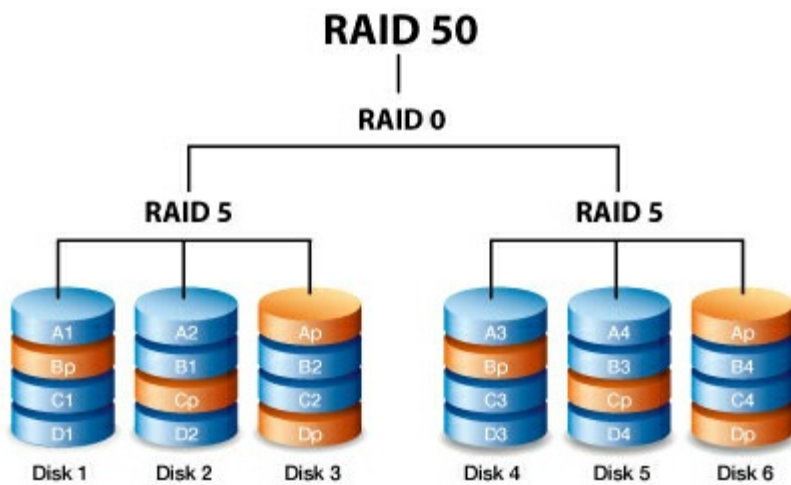
RAID 10 combines the protection of RAID 1 with the performance of RAID 0. Using four disks as an example, RAID 10 creates two RAID 1 segments, and then combines them into a RAID 0 stripe. Such configurations offer exceptional data protection, allowing for two disks to fail across two RAID 1 segments. Additionally, RAID 10 writes data at the file level and, due to the RAID 0 stripe, gives users higher performance when managing greater amounts of smaller files. This means a more generous input output per second for data, referred to as IOPS.



RAID 10 is a great choice for database managers that need to read and write a multitude of smaller files across the array's disks. The impressive IOPS and data protection offered by RAID 10 gives database managers impressive reliability both in keeping files safe and rapid access.

## RAID 50

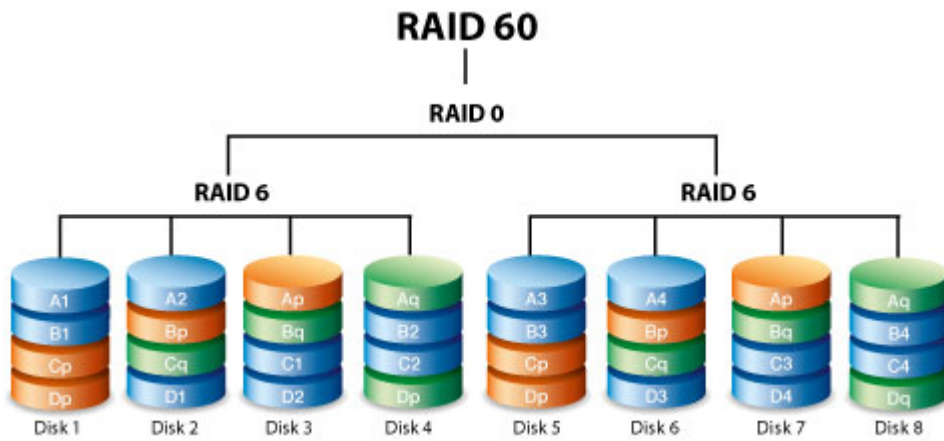
RAID 50 combines RAID 0 striping with RAID 5 parity. Due to the speed of RAID 0 striping, RAID 50 improves upon RAID 5 performance, especially during writes. It also offers more protection than a single RAID level. Use RAID 50 when you need improved fault tolerance, high capacity and impressive write speeds. A minimum of six hard drives is required for a RAID 50 array.



A RAID 50 array with a high number of hard drives increases the time to initialize and rebuild data due to the large storage capacity.

## RAID 60

RAID 60 combines RAID 0 striping with RAID 6 double parity. Due to the speed of RAID 0 striping, RAID 60 improves upon RAID 6 performance. It also offers more protection than a single RAID level. Use RAID 60 when you need improved fault tolerance, high capacity and impressive write speeds. A minimum of eight hard drives is required for a RAID 60 array.

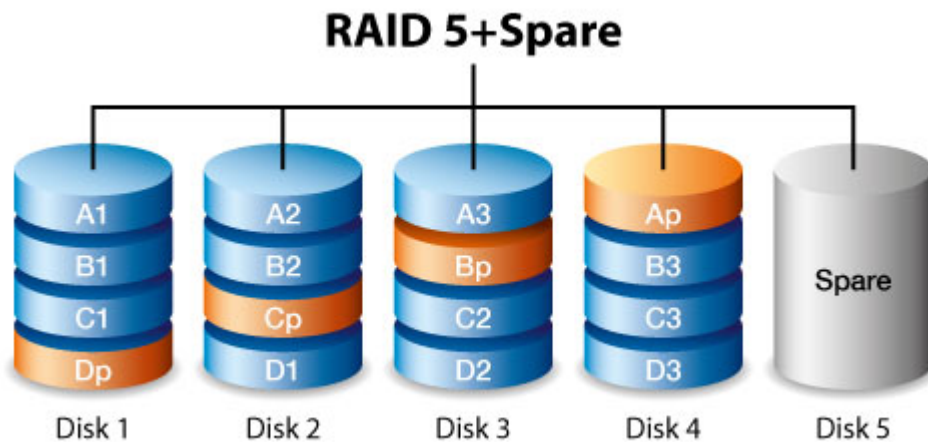


Since a RAID 60 array has a high number of hard drives, the time to initialize and rebuild data is longer than a single RAID level.

## RAID+Spare

A RAID+Spare array gives you a “hot-spare” that is ready to synchronize data immediately should a hard drive fail. If a hard drive in the array fails, the data starts to synchronize with the spare. The advantage for a RAID array with a spare is the immediacy of the replacement hard drive. However, the spare cannot be used as storage during standard operation since its sole task is to take over should a hard drive fail.

You can replace the failed hard drive immediately and, once synchronization is complete, assign it as a new spare.



## Drive failures and synchronizing a spare hard drive

For RAID+Spare arrays, data remains intact when the minimum number of redundant hard drives fail. However, if an additional hard drive fails before or during data synchronization with a spare hard drive, the data in the array is lost. See the examples below.

- RAID 1 and 5—One drive has failed and the array immediately begins to synchronize with the spare hard drive. If a second hard drive in the RAID 5 array fails before synchronization is complete, all data in the array is lost.
- RAID 6—Two hard drives have failed and the array immediately begins to synchronize the first failed hard drive with the spare. If a third hard drive in the RAID 5 array fails before synchronization is complete, all data in the array is lost.
- Nested RAID—Nested RAID levels have greater fault tolerances depending upon which of the nested RAID arrays have hard drives that fail.
- RAID 10 and 50—Each of the nested arrays can lose one hard drive. If one of the two nested arrays loses two hard drives before or during the synchronization, data is lost.
- RAID 60—Each of the nested arrays can lose two hard drives. If one of the two nested arrays loses three hard drives before or during the synchronization, data is lost.

## RAID and data security

While RAID levels higher than 0 can protect data in case of a single drive failure, they cannot guarantee complete data protection for all cases of hardware failure or data corruption. To help prevent the loss of your data in case of extreme circumstances such as hardware failure, LaCie highly recommends that you keep at least two copies of your data, one copy on your LaCie storage device and a second copy on one of the following:

- Another direct-attached storage (DAS) device
- A network attached storage (NAS) device
- Some form of removable or archival storage

Any loss, corruption or destruction of data while using a LaCie hard drive or a LaCie hard drive system is the sole responsibility of the user and under no circumstances will LaCie be held liable for the recovery or restoration of this data.

# Getting Started

Download the LaCie RAID Manager installer per the instructions provided on your LaCie storage device's quick install guide or online registration. The LaCie RAID Manager installation includes:

- The driver to mount the LaCie device via Thunderbolt 2 and Thunderbolt 3.
- LaCie RAID Manager to manage the storage.



**Important info regarding LaCie RAID Manager and LaCie Desktop Manager**—Older versions of LaCie Desktop Manager may conflict with LaCie RAID Manager. If you are using LaCie Desktop Manager, go to LaCie support to download and install the latest version. It's recommended that you install the new version before following the steps below.

## Download and Install LaCie RAID Manager

After downloading the LaCie RAID Manager installer:

1. Launch it from the computer's Download folder. If you cannot find the installer on your computer, it can be [downloaded here](#).
2. Follow the on-screen instructions to complete the installation. You may be prompted to restart your computer.

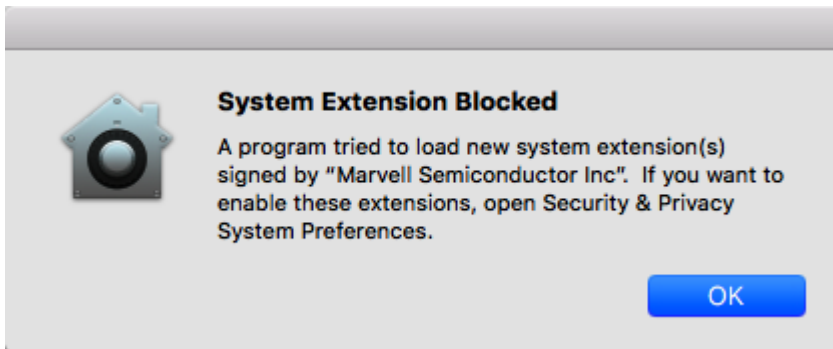
See the user manual for your LaCie product for instructions on connecting your drive and details regarding hard drive formats.

Device	Factory configuration	User manual
LaCie 12big Thunderbolt 3	RAID 5	<a href="#">Click here</a>
LaCie 8big Rack Thunderbolt 2	RAID 5	<a href="#">Click here</a>
LaCie 6big Thunderbolt 3	RAID 5	<a href="#">Click here</a>
LaCie 5big Thunderbolt 2	RAID 5	<a href="#">Click here</a>

## macOS 10.13 High Sierra

Apple introduced a new security mechanism in macOS High Sierra 10.13 that requires a user's approval before loading third-party kernel extensions (kexts). When installing LaCie RAID Manager on a Mac running

macOS 10.13 (High Sierra), you may receive a 'System Extension Blocked' alert message:



**i** The macOS alert message shows the name of the developer who signed the next certificate.

## Enabling the kernel extension

To enable the kernel extension:

1. When the alert message appears, click **OK**.



Once you press **OK**, you have 30 minutes to approve the software.

2. Click on the Apple icon and select **System Preferences...**
3. Select **Security & Privacy**.
4. Click on the **Allow** button for the blocked software.



If the Allow button is not selectable, click on the Lock icon at the bottom of the pane, and then enter your system password.



5. Click **Restart** to restart computer right away, or **OK** if you prefer to manually restart your computer.

## Troubleshooting for big devices

- It's recommended that you install the latest version of LaCie RAID Manager (LRM v2.5.704.24245 or later).
- Make sure that the "Marvell Semiconductor Inc" kernel extension is enabled in **System Preferences > Security & Privacy**.
- If the kernel extension is not listed under Security and Privacy, reinstall LRM v2.5.704.24245 or later. Before restarting the computer, go immediately to **System Preferences > Security & Privacy** to enable the "Marvell Semiconductor Inc" kernel extension.

# Windows and Thunderbolt 3

Your LaCie Thunderbolt 3 storage device is certified for use with Windows PCs that have a Thunderbolt 3 port. However, you may experience connectivity issues between the storage device and the Thunderbolt 3 port on a Windows PC. Therefore, before setting up your LaCie Thunderbolt 3 storage device, please visit your PC manufacturer's website to update your Windows PC to the latest versions of:

- BIOS
- Thunderbolt 3 firmware
- Thunderbolt 3 driver

Also, make certain that your PC has the most recent version of Windows 10.

For questions regarding your PC, please contact the PC manufacturer. You can also review the following website for additional information: <https://thunderboltechnology.net/updates>

## 5big and 8big Thunderbolt 2 firmware update

If your 5big or 8big Thunderbolt 2 is not being detected in LaCie RAID Manager (LRM) v 2.5, it's an indication that the RAID firmware is outdated. Since the device is not being detected, the firmware update cannot be initiated from LaCie RAID Manager. To resolve this issue, a standalone firmware updater is available for download.

Requirements:

- You need to be an administrator for your computer to run the updater tool.
- Only one big device can be connected to the computer during the firmware update.
- LaCie RAID Manager v2.5 must be installed on the computer.

## Installing the firmware update

1. Log in to the computer as an administrator.
2. Make sure LRM 2.5 is installed.
3. Download the updater tool for your device and extract the archive files:
  - [5big\\_RaidFw1058\\_updater v1.2 for macOS](#)
  - [8big\\_RaidFw1058\\_updater v1.2 for macOS](#)
4. Double click on 'Update\_firm.command' file.
5. Enter your admin password.
6. Note the progress of the firmware update:

```
seagatelab — Update_firm.command — testcli • Update_firm.command — 80x...
Last login: Tue Nov 21 16:29:49 on ttys000
/Users/seagatelab/Desktop/8big_RaidFw1058_Updater\ v1.1/Update_firm.command ; exit;
Seagates-MacBook-Pro:~ seagatelab$ /Users/seagatelab/Desktop/8big_RaidFw1058_Updater\ v1.1/Update_firm.command ; exit;
[Password: ]
bridge test cli version 1.0.0.10
bridge version 1.0.0.31
start to update fw : 8big_firmware_1058.bin
Percentage : 1
Percentage : 10
Percentage : 10
Percentage : 10
Percentage : 12
Percentage : 18
Percentage : 21
Percentage : 26
Percentage : 29
Percentage : 35
Percentage : 38
Percentage : 43
█
```

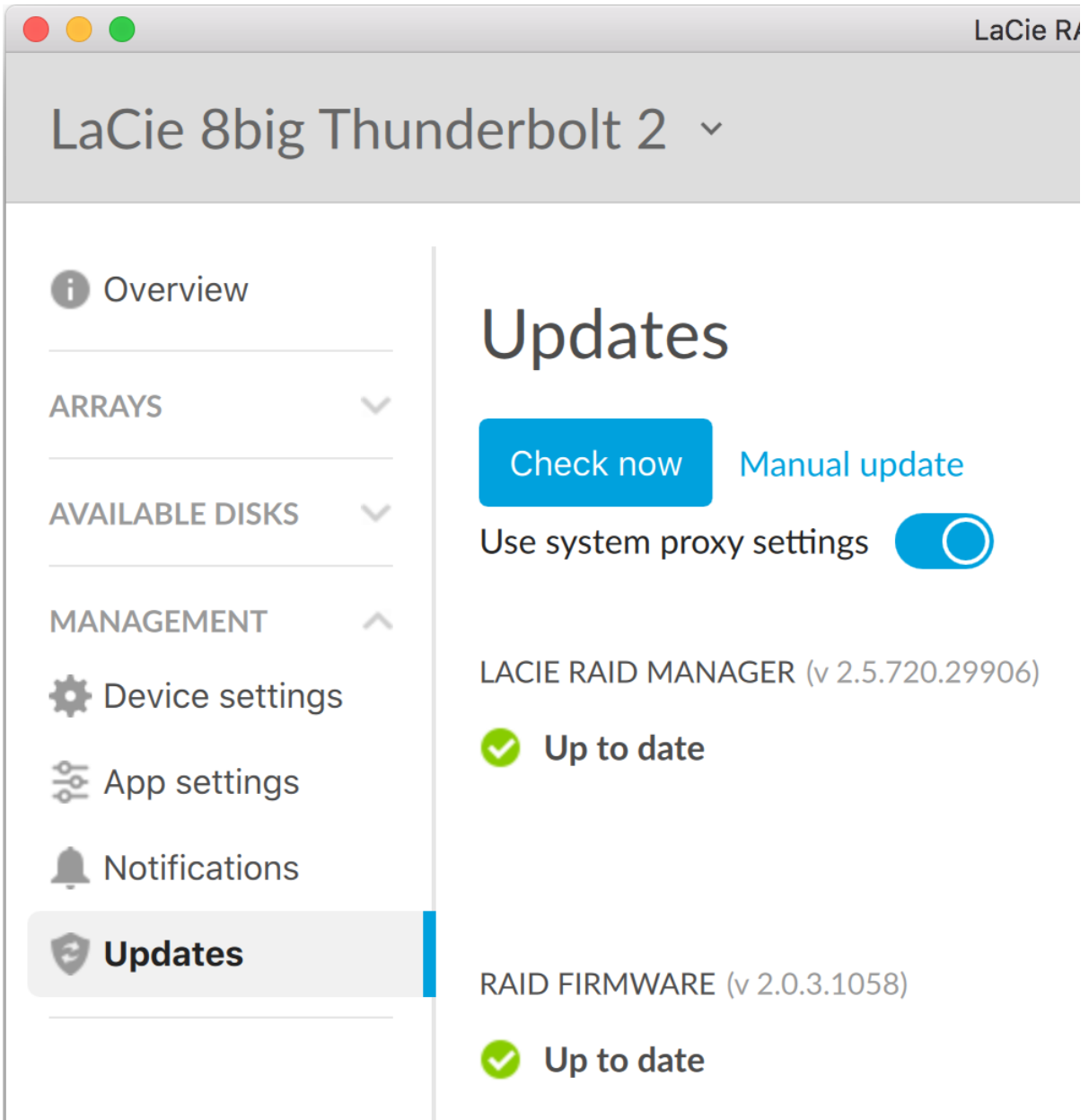
7. A message informs you when the process is completed:

```
Percentage : 100
Percentage : 0
logout
Saving session...
...copying shared history...
...saving history...truncating history files...
...completed.

[Process completed]█
```

8. Close the tool and launch LaCie RAID Manager.
9. Note that your device is now detected.
10. To verify the firmware version, click on the Updates tab in LaCie RAID Manager:





# Sign into LaCie RAID Manager

## Administrators

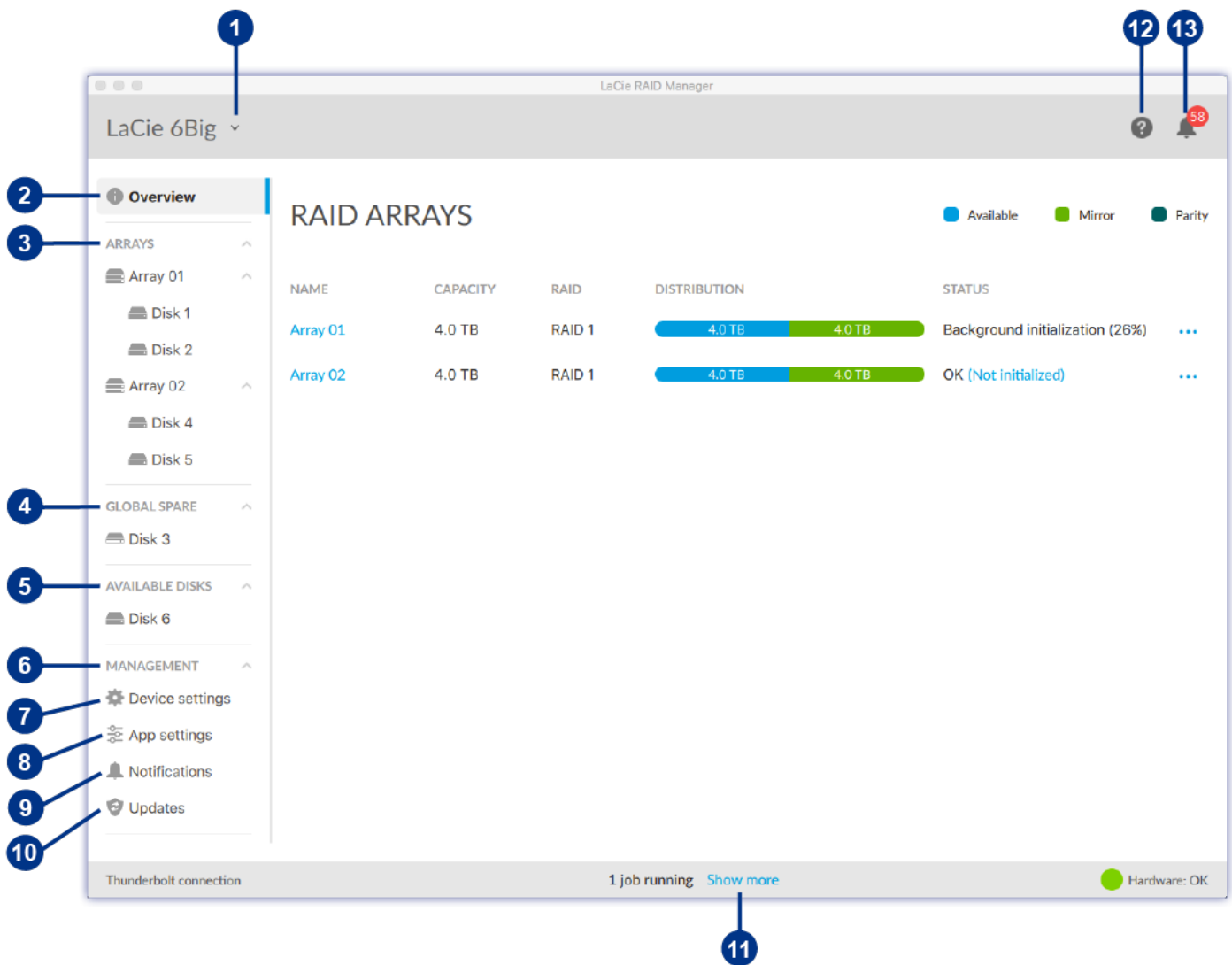
Users with administration privileges to the computer can launch LaCie RAID Manager without signing into the application.

## Users

LaCie RAID Manager requests administrator credentials when it is launch by a user with standard user privileges to the computer. The administrator for the computer should launch the application to prepare it for the user.

# Array Configuration and Maintenance

LaCie RAID Manager's intuitive interface makes it easy to configure and maintain arrays and disks for all of your LaCie multi-drive devices.



- 1 **Device** Select connected device.
- 2 **Overview** Create or delete an array, and view information on your current RAID configuration.
- 3 **Arrays** View and manage your array and disks.

4	<b>Global Spare</b>	View disks designated as global spares.
5	<b>Available Disks</b>	View disks available for RAID configuration.
6	<b>Management</b>	View management tabs.
7	<b>Device settings</b>	Register your device and change device settings.
8	<b>App settings</b>	Change LaCie RAID Manager app settings.
9	<b>Notifications</b>	View device events, download the event log, and set up email alerts.
10	<b>Updates</b>	Check for updates to LaCie RAID Manager and your device firmware (internet connection required).
11	<b>Jobs</b>	Show messages related to activities running in the background.
12	<b>Info</b>	Go to the LaCie RAID Manager support page (internet connection required).
13	<b>Recent</b>	View a list of recent device operations and events.

### LaCie RAID Manager for 2-Bay Devices

LaCie RAID Manager's features and options differ significantly for devices with only two hard drives. These products include:

- LaCie 2big Dock Thunderbolt 3
- LaCie Rugged RAID Pro

For details on using LaCie RAID Manager with dual-drive devices, see [LaCie RAID Manager for 2-Bay Devices](#).

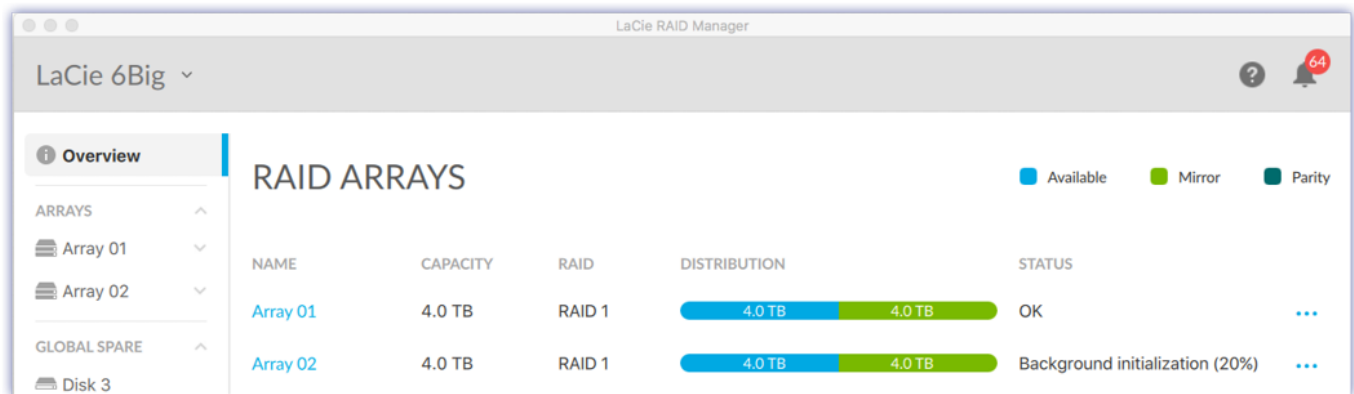
## Select a device

If your computer is connected to multiple compatible devices, click the arrow and select the device you want to manage.

If the device is not currently listed, select [Scan for new devices](#) to have LaCie RAID Manager search for new devices connected to your computer.

# View array

When a compatible device with an array is connected to your computer, the Overview tab provides a summary of information about your arrays.



## View array details

You can view details on an array:

---

ID

---

RAID level

---

Status

---

Disk block

---

Stripe size

---

Array cache status

---

Disk cache status

Use one of the following methods to view array details:

### From the Overview tab

1. Click on the Overview tab.
2. Click on the More icon **...** next to an array.
3. Select [Info](#).

### From the Arrays menu

1. In the sidebar, open the Arrays menu.

2. Click on an array to highlight it.
3. Click the [Array details](#).

## Create an array

You can create an array when two or more hard drives in the device are listed in the Available Disks menu in the sidebar. Two options are available when creating an array:

---

**Quick** LaCie RAID Manager automatically creates an array based on the number of available disks. A single RAID 1 array is created if only two disks are available. If more disks are available, a single RAID 5 array is created. In addition, LaCie RAID Manager will automatically:

- Enable disk cache for optimal performance
- Perform a fast initialization of the array

---

**Custom** You choose how the array is configured, including:

- Hard drives to include in the array
- RAID level
- Array name
- Spare drive
- Disk cache setting
- Stripe size
- Initialization type

## Create a quick array

To create a quick array:

1. Click on the Overview tab.
2. Click [Create array](#).
3. Select [Quick](#) and click the [Next](#) button.
4. Review the summary and click the [Finish](#) button.

After creating an array, your operating system prompts you to initialize and format the array. Follow the prompts to format the array.

## Create a custom array

To create a custom array:

1. Click on the Overview tab.

1. Click on the Overview tab.
2. Click [Create array](#).
3. Select [Custom](#) and click the [Next](#) button.

## Choose RAID level

1. Select the hard disks to include in the array.
2. Select a RAID level.
3. Click the [Next](#) button.

## Configure RAID

1. Enter an [Array name](#).
2. Choose an [Auto format](#) setting. When enabled, LaCie RAID Manager will automatically format the hard drives after creating the array using the format that provides the best performance for your operating system (NTFS for Windows or HFS+ for macOS).
3. Choose a [Spare drive](#) setting. When enabled, one of the disks will be a dedicated spare drive for the array. (default = disabled)
4. Choose a [Disk cache](#) setting. Enabling disk cache optimizes performance but adds risk of data loss in the event of power loss or system errors. Disabling disk cache reduces the risk of data loss, but performance may be affected. (default = enabled)
5. Select a [Stripe size](#). Large stripe sizes are often used when copying large media files such as videos, high end graphics, and audio files. Small stripe sizes are typically used for small files such as text files, documents, and web resources.
6. Choose an Initialization type:

<a href="#">None</a>	No effort to fix potential sector errors. Array is available immediately. Not recommended due to possibility of corrupt data.
<a href="#">Fast</a>	Minimum effort to fix potential sector errors. Array is available immediately. Not recommended due to possibility of corrupt data.
<a href="#">Background</a>	Fixes sector errors that can lead to corrupt data. A background initialization can run for multiple hours depending on the array's capacity—however, since the process runs in the background, you can write new data to the array while the initialization is underway.
<a href="#">Foreground</a>	Fixes sector errors that can lead to corrupt data. Faster than background initialization, but you can't write new data to the array while the initialization is underway.

### For descriptions of custom array options, go to

Spare drive  
Cache  
Stripe size  
Initialization type

After creating an array, your operating system prompts you to initialize and format the array. Follow the instructions from your operating system to complete the formatting.

**!** **Note for multiple arrays on the LaCie 12big Thunderbolt 3**—When creating multiple arrays, it's recommended that you avoid using consecutive disks in the same array. Performance for an array that has consecutive disks can be negatively affected. For example, do not create an array with disks 1, 2, 3 and 4. Instead, create an array with disks 1, 3, 5 and 7. You can use disks 2, 4, 6, 8 and 10 for the next array.

## Delete an array

Deleting an array deletes all of its data. The data cannot be recovered from the LaCie storage device once the array has been deleted.

**!** **Warning**—Always back up your data before deleting an array.

Use one of the following methods to delete an array:

From the Overview tab

1. Click on the Overview tab.
2. Click on the More icon **•••** next to an array.
3. Select **Delete**.
4. At the prompt, confirm that you want to delete the array. Follow any additional instructions specific to your device.

From the Arrays menu

1. In the sidebar, open the Arrays menu.
2. Click on an array to highlight it.
3. Click the **Manage** button.
4. Click **Delete**.
5. At the prompt, confirm that you want to delete the array. Follow any additional instructions specific to your device.



The deletion process may take up to several minutes to complete. Do not disconnect or power off the device while LaCie RAID Manager deletes the array. The **Create array** button on the Overview tab will not be enabled until the deletion process is complete.



**!** Deleting the array removes the formatting from your disks. Your operating system will prompt you to initialize the available disks. It's recommended that you cancel or ignore these prompts.

## Create a spare drive

LaCie RAID Manager has two options for assigning disks as spares:

---

<b>Dedicated spare</b>	Dedicated spare drives are used exclusively for rebuilding a specific array.
<b>Global spare</b>	Global spare drives can be used by any array. You can only create a global spare drive if you have two or more arrays.

---

## Create a dedicated spare

At least one drive must not have an array assignment in order to create a spare drive.

### New array

You can create a dedicated spare drive when creating a custom array. See [Create a custom array](#).

### Existing array

Use one of the following methods to add a dedicated spare drive to an existing array:

#### From the Overview tab

1. Click on the Overview tab.
2. Click on the More icon **...**.
3. Select [Add spare](#).
4. Select the disk you want to add as a spare. Click [Add](#).

#### From the Available Disks menu

1. In the sidebar, open the Available Disks menu.
2. Click on a disk to highlight it.
3. Select [Add spare](#).
4. Click [please choose](#) and select an array from the menu.
5. Click [Apply](#).

#### From the Arrays menu

1. In the sidebar, open the Arrays menu.
2. Click on an array to highlight it.
3. Click the [Manage](#) button.
4. Click [Add a Spare Drive](#).

5. Select the disk you want to add as a spare. Click [Add](#).

## Create a global spare

You can only create a global spare hard drive if you have two or more arrays. At least one drive must not have an array assignment in order to create a spare drive.

To add a global spare:


1. In the sidebar, open the Available Disks menu.
2. Click on a disk to highlight it.
3. Select [Add spare](#).
4. Click [please choose](#) and select [Global spare](#) from the menu.
5. Click [Apply](#).

## Remove a spare drive

You can remove a dedicated or global spare drive, making the disk available for use in an array.

### Remove a dedicated spare

To remove a dedicated spare drive:

1. In the sidebar, open the Arrays menu.
2. Click on the Expand symbol  to view the disks in the array.
3. A dedicated spare disk is marked (spare). Click on the spare disk to highlight it.
4. Select [Remove as spare](#).
5. Click [Apply](#).
6. At the prompt, click [Remove](#).

### Remove a global spare

To remove a global spare drive:

1. In the sidebar, open the Global Spare menu.
2. Click on a disk to highlight it.
3. Select [Remove as global spare](#).
4. Click [Apply](#).
5. At the prompt, click [Remove](#).

## Upgrade RAID level

RAID levels can be upgraded for greater protection and performance. For example, you can upgrade a RAID 1

array to a RAID 5 array if there are one or more available disks in the enclosure.

To upgrade an array's RAID level:

1. Click on the Overview tab.
2. Click on the More icon **...**.
3. Select [Upgrade](#).

## Upgrade RAID level

1. Select one or more disks to use in the upgraded array.
2. Select the RAID level for the upgraded array.
3. Click [Next](#).
4. Review the summary and click the [Finish](#) button.

The upgrade process begins. You can use the array during the upgrade but performance is affected.

# Add an available disk to an existing array

You can add an available disk to an array as long as it's not being initialized or upgraded.

1. In the sidebar, open the Available Disks menu.
2. Click on a disk to highlight it.
3. Select [Add to array](#).
4. Click [please choose](#) and select an array from the menu.
5. Click [Apply](#).

You can use the array during the upgrade but performance is affected.

# Initialize an array

When creating a custom array, you can choose from four initialization options: None, Fast, Background, and Foreground. See [Create a custom array](#).

You can also initialize an array as a maintenance task. Only a background initialization is available for an existing array.

**!** **Caution**—Make certain to back up your files before performing an initialization on an existing array. Files on the array that predate the background initialization will be deleted. However, you can write new data during an initialization.

# Run or schedule a background initialization

Use one of the following methods to run or schedule a background initialization:

## From the Overview tab

1. Click on the Overview tab.
2. In the Status column, click on [\(Not initialized\)](#).
3. At the prompt, click [Initialize](#).

## From the Arrays menu

1. In the sidebar, open the Arrays menu.
2. Click on an array to highlight it.
3. Click on the [Maintenance](#) tab and select [Background initialization](#).
4. Choose one of the following:
  1. Click [Run](#) to start the background initialization immediately.
  2. Click [Schedule](#) to set up a scheduled initialization. Select a date and time and click [Create](#).

# Check the array using Consistency Check

A consistency check scans the array for sector errors that could lead to corrupt data. It identifies and reports bad sectors but does not repair them, since repairing the array might require changes to the data, resulting in limited data loss.

Your data is safe during a consistency check since it's non-destructive. You can use the array during the consistency check, but other disk activities may be affected.

To run a scan that fixes bad sectors, see [Repair an array using Consistency Check and Fix](#) below.



**Important info**—You can perform a consistency check on an array that has had a full (background or foreground) initialization. You can't perform a consistency check on arrays with a fast initialization or no initialization.

A consistency check is not available when:

- The RAID level is being upgraded.
- Another disk activity is in progress.
- The array is degraded, broken, or only partially optimized.

# Run or schedule a consistency check

To initiate a consistency check:

1. In the sidebar, open the Arrays menu.
2. Click on an array to highlight it.
3. Click on the [Maintenance](#) tab and select [Consistency check](#).
4. Choose one of the following:
  1. Click [Run](#) to start the consistency check immediately.
  2. Click [Schedule](#) to set up a scheduled consistency check. Select a date and time and click [Create](#).

## Repair an array using Consistency Check and Fix

A consistency check and fix scans the array for sector errors and repairs them. While this operation is generally safe, there is a risk that some or all of your data can be lost, since repairing sector errors requires making changes to the array.



You can perform a consistency check on an array that has had a full (background or foreground) initialization. You can't perform a consistency check on arrays with no initialization or only fast initialization.

A consistency check is not available when:

- The RAID level is being upgraded.
- Another disk activity is in progress.
- The array is degraded, broken, or only partially optimized.

## Run or schedule a consistency check and fix

To initiate a consistency check and fix:

1. In the sidebar, open the Arrays menu.
2. Click on an array to highlight it.
3. Click on the [Maintenance](#) tab and select [Consistency check and fix](#).
4. Choose one of the following:
  1. Click [Run](#) to start the consistency check and fix immediately.
  2. Click [Schedule](#) to set up a scheduled consistency check and fix. Select a date and time and click [Create](#).

## View disk details

You can view details on a disk:

---


ID

---

Type
Model
Status
Current speed
Device ID
Feature support
Serial number
Firmware version

To view disk details:

## From the Arrays menu

1. In the sidebar, open the Arrays menu.
2. Click on the Expand symbol  next to an array to view the disks.
3. Click on a disk to highlight it.
4. Click [Details](#).

## From the Global Spare or Available Disks menu

1. In the sidebar, open the Global Spare or Available Disks menu.
2. Click on a disk to highlight it.
3. Click [Details](#).


# Check individual disks in an array

You can check the health of hard drives in an array.



You can only check disks that are in an array. Global spare drives and disks that are not part of an array (available disks) cannot be checked

To check a disk in an array:


1. In the sidebar, open the Arrays menu.
2. Click on the Expand icon  to view the disks in the array.
3. Click on a disk to highlight it.

4. Click [Check disk](#).

## Check cache settings

You can enable/disable array cache and disk cache settings from the Overview tab.

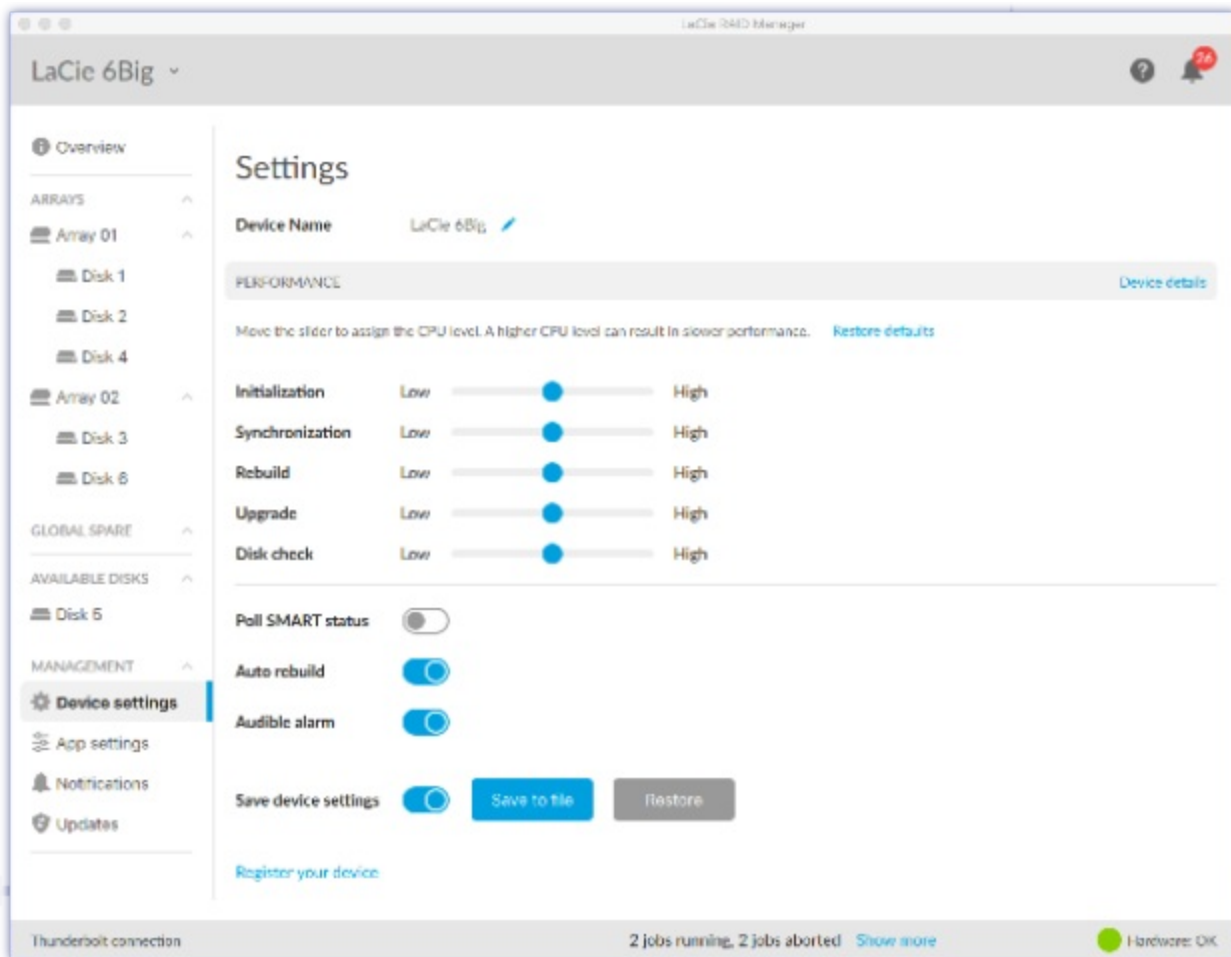
To change cache settings:

1. Click on the Overview tab.
2. Click on the More icon  next to an array.
3. Click on the [Array Cache](#) switch or [Disk Cache](#) switch.

# Device and App Management


## Device settings

Click the Device settings tab in the sidebar to view details and settings related to the currently selected device.



## Change device name

To change the name of your device:

1. Click on the Edit icon  next to the device name.
2. Enter a new name in the edit field (up to 19 characters in length).
3. Press Enter.



# View device details

Click Device details to see information related to your hardware.

---

Firmware version

---

Bootloader version

---

Driver version

---

Vendor version

---

Subvendor version

---

Device ID

---

Subdevice ID

---

Port count

---

Supported RAID

---

Supported stripe size

---

Max disks / Device

---

Serial Number

## Assign processing priorities

By default, the RAID processor for your device gives all actions equal priority. You can change the priority for specific activities—for example, you can give initialization a low priority while you are working during the day and a high priority during the night.

Use the sliders to make the preferred adjustments.



Moving multiple sliders to High affects the performance of all arrays associated with the LaCie device.

## Change Poll SMART status setting

SMART (Self-Monitoring, Analysis and Reporting Technology) is a hardware monitoring system that reports various indicators of drive reliability. When [Poll SMART Status](#) is enabled, LaCie RAID Manager gathers and reports information for each hard drive in the enclosure, including the model number, capacity and overall SMART status. SMART status should only be used for informational purposes when diagnosing hard drives.



Enabling SMART status can have a negative affect upon performance.

When the option is enabled, you can view SMART details on each array:

1. In the sidebar, open the Arrays menu.
2. Click on an array to highlight it.
3. In the SMART column, click [Details](#).

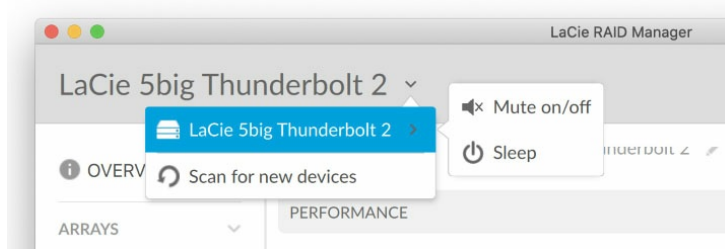
## Change Auto rebuild setting

When [Auto rebuild](#) is enabled, the device automatically rebuilds a degraded array once a spare hard drive is available. The rebuild cannot begin if there are no dedicated or global spare hard drives.

## Change Audible alarm setting

When [Audible alarm](#) is enabled, the device emits audible warnings when encountering a critical event (for example, hard drive failure or high temperatures). See your device's user manual for a list of audible warning conditions.

Audible alarm settings can also be accessed using the Device selector at the top of the page:



LaCie 5big Thunderbolt 2—You must use the Device selector to change audible alarm settings.

## Save device settings

You can save a copy of your device settings configuration to your computer or a storage device. In the event that you reset your device, you can restore your device settings from the saved file.

To save your device settings:

1. Make sure that [Save device settings](#) is enabled. Click [Save to file](#).
2. Specify a name and location for the LaCie configuration file.
3. Click [Save](#).

To restore your device settings:

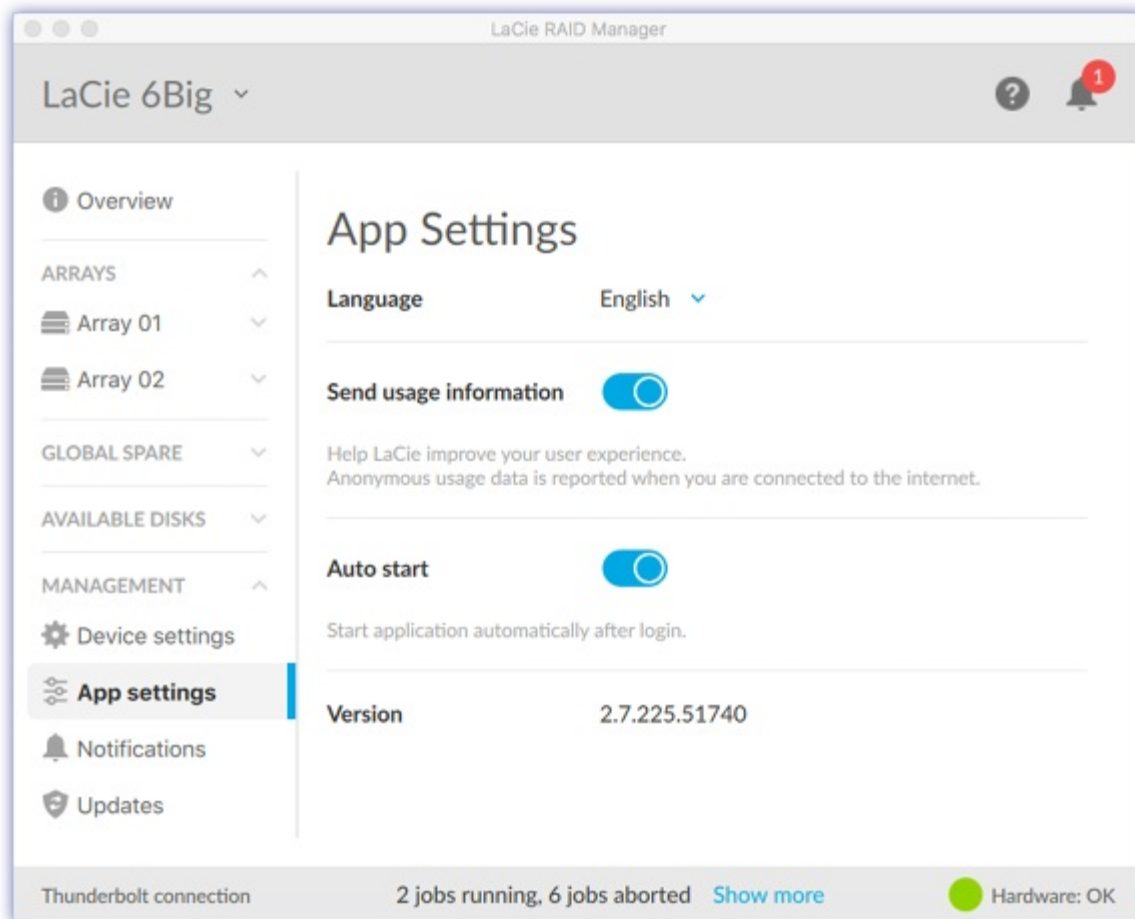
1. Make sure that [Save device settings](#) is enabled. Click [Restore](#).
2. Navigate to the location of your saved LaCie configuration file and select it.
3. Click [Open](#).

## Register your device

Click [Register your device](#) to go to the LaCie Product Registration page. An internet connection is required.

## App settings

Click the [App settings](#) tab in the sidebar to change LaCie RAID Manager settings.



## Change language settings

Use the [Language](#) drop-down menu to select a language setting.

## Send usage information

When [Send usage information](#) is enabled, LaCie RAID Manager is permitted to send anonymous usage data to help LaCie improve your user experience.

## Change auto start setting

When [Auto start](#) is enabled (default setting), LaCie RAID Manager starts automatically after you sign into your computer. When disabled, you must start LaCie RAID Manager manually.

## View app version

The installed version of LaCie RAID Manager is listed on the app page.

## Notifications

Click the [Notifications](#) tab in the sidebar to view device events, download the event log, and set up email alerts.

The screenshot displays the LaCie RAID Manager interface. The sidebar on the left contains the following menu items: Overview, ARRAYS (with sub-items Array 01 and Array 02), GLOBAL SPARE, AVAILABLE DISKS, MANAGEMENT (with sub-items Device settings, App settings, Notifications, and Updates). The main content area is titled 'Notifications' and includes a 'Download log' button and a 'Clear All' button. Below these is a table with the following data:

Filter	CATEGORY	DATE
Disk check on disk 3 is 90% done.	HDD 3	16 May 2018 at 12:28 PM
Disk check on disk 3 is 80% done.	HDD 3	16 May 2018 at 11:55 AM
Disk check on disk 3 is 70% done.	HDD 3	16 May 2018 at 11:22 AM
RAID upgrade on "Array 01" is 90% done.	"Array 01"	16 May 2018 at 11:16 AM
Disk check on disk 3 is 60% done.	HDD 3	16 May 2018 at 10:51 AM
Disk check on disk 3 is 50% done.	HDD 3	16 May 2018 at 10:16 AM

At the bottom of the notifications list, there is a pagination control: Previous 1 2 3 4 5 ... 85 Next. The status bar at the bottom of the window shows 'Thunderbolt connection', '2 jobs running, 6 jobs aborted Show more', and a green indicator for 'Hardware: OK'.

## Download log

Click [Download log](#) to save a .log file to your computer containing a list of events related to your device.

## Clear notification entries

Click [Clear All](#) to clear the list of notifications.

## Change email settings

LaCie RAID Manager can send you email updates on the health and status of your device. Your computer must have internet access and LaCie RAID Manager must be open in order to send you email notifications.

To change email settings:

1. Click [Email settings](#).
2. Enter your email address.
3. Select the types of content you want notifications for.
4. Click [Save](#).

## Custom server

By default, emails are sent from LaCie's server. You can configure email notifications to be routed through a custom server instead. A basic understanding of servers and networking is required.

1. Click [Email settings](#).
2. Click the [Email server](#) drop-down list and choose [Custom](#).
3. Complete all fields.
4. Click [Save](#).

## Updates

Click the [Updates](#) tab in the sidebar to view the installed versions of:

- System firmware
- RAID firmware
- LaCie RAID Manager

## Check for updates

To have LaCie RAID Manager check for updates, click [Check now](#). Your computer must have access to the internet to check for updates.

## Manual updates

If you've downloaded a software or firmware update and saved it to your hard drive, you can initiate a manual update from the saved file.

To initiate a manual update:

1. Click [Manual update](#).
2. Navigate to the update file and highlight it.
3. Click [Open](#).

## Use system proxy settings

LaCie RAID Manager searches for updates using your PC or Mac's internet connection. If your computer uses a proxy server for internet connection, make certain to enable [Use system proxy settings](#).

## Recent notifications

Click the Bell icon in the header bar to view a list of recent events.



Click [View all notifications](#) to go to the Notifications page.

# Frequently Asked Questions

## RAID initialization and other operations

### [Can I disconnect my computer during RAID synchronization or initialization?](#)

Yes. Synchronization and initialization continue uninterrupted when the computer disconnects from the LaCie device. Similarly, your LaCie device can be placed into low power mode or powered off during synchronization and initialization. Provided the same hard drives are in the enclosure, the operation continues once the device is powered on.

### [Initialization has been running for days. Has initialization become stuck?](#)

With higher capacity storage, initialization can take many days and, in some cases, well over a week. This is especially true of background initializations. You can check Device settings in LaCie RAID Manager to see if the processing for initialization has been moved to Low. Reducing the processing allotted to initialization can slow down initialization while helping to improve performance. To speed up initialization, move the slider to High. The device's performance can be negatively affected when the slider is set to High.

### [Can I perform more than one operation at a time, for example, run a disk check while an initialization is in progress?](#)

Only one operation can be performed at a time. Therefore, you can run an initialization and then a disk check but not at the same time. The same is true for a consistency check and an array upgrade.

## Thunderbolt 2 and Windows PCs

### [Do I need a special driver for Thunderbolt devices?](#)

You must have the most recent Thunderbolt 2 driver and firmware to use LaCie 5big Thunderbolt 2 and LaCie 8big Thunderbolt 2 with a Windows PC. LaCie RAID Manager installs a driver for Thunderbolt but we cannot update your computer's firmware.

# LaCie 6big Thunderbolt 3 / 12big Thunderbolt 3 and USB connections

[All my arrays are visible in LaCie RAID Manager. Why can't I see them on my computer?](#)

While LaCie RAID Manager sees all arrays associated with the device, USB connections to LaCie 6big/LaCie 12big allow for one array on your computer. Create a single array from all the hard drives if you connect to LaCie 6big/LaCie 12big via USB. To use multiple arrays, connect to LaCie 6big/LaCie 12big via Thunderbolt 3.

## LaCie 12big Thunderbolt 3 using consecutive disks

[Can I create multiple arrays on LaCie 12big Thunderbolt 3 using consecutive disks?](#)

When creating multiple arrays, please do not use consecutive disks in the same array. Performance for an array that has consecutive disks can be negatively affected. For example, do not create an array with disks 1, 2, 3 and 4. Instead, create an array with disks 1, 3, 5 and 7. You can use disks 2, 4, 6, 8 and 10 for the next array. This recommendation is limited to LaCie 12big Thunderbolt 3 and should not be used with other products compatible with LaCie RAID Manager.