

# External RAID Enclosure

TR-002

TR-004

**User Guide**

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# 1. Preface





## About This Guide

This guide provides information on the QNAP TR-002 and TR-004 external RAID enclosures and step-by-step instructions on installing the hardware. It also provides instructions on basic operations and troubleshooting information.

## Audience

This document is intended for consumers and storage administrators. This guide assumes that the user has a basic understanding of storage and backup concepts.

## Document Conventions

Symbol	Description
	Notes provide default configuration settings and other supplementary information.
	Important notes provide information on required configuration settings and other critical information.
	Tips provide recommendations or alternative methods of performing tasks or configuring settings.
	Warnings provide information that, when ignored, may result in potential loss, injury, or even death.

## 2. Product Overview

This chapter provides basic information about the QNAP TR-002 and TR-004 external RAID enclosures.

### About QNAP External RAID Enclosures

QNAP external RAID enclosures are designed to increase the capacity and utility of your NAS or computer. They provide RAID, JBOD, and port multiplier support for added compatibility and security across multiple platforms. The TR-002 and TR-004 feature a mode switch for easy and accessible RAID configuration, and their USB Type-C ports ensure quick and efficient data transfer.

### Hardware Specifications



**Warning**

If your QNAP product has hardware defects, return the product to QNAP or a QNAP-authorized service center for maintenance or replacement. Any attempt to repair or perform maintenance procedures on the product by you or an unauthorized third-party invalidates the warranty.

QNAP is not responsible for any damage or data loss caused by unauthorized modifications and installation of unsupported third-party applications.

For details, see the [QNAP Warranty Terms and Conditions](#).

Component	TR-002	TR-004
Ordering Information		
Ordering P/N	TR-002	TR-004
Storage		
Drive bays	2 x 3.5-inch SATA 6 Gbps	4 x 3.5-inch SATA 3 Gbps
	<b>Note</b> The TR-004 is compatible with SATA 6 Gbps drives.	
Drive compatibility	<ul style="list-style-type: none"> <li>• 3.5-inch SATA hard disk drives</li> <li>• 2.5-inch SATA hard disk drives</li> <li>• 2.5-inch SATA solid-state drives</li> </ul>	
Drive tray type	Key lock	
Hot-swapping	Yes	
External I/O Ports & Expansion Slots		
USB ports	1 x USB 3.1 Gen 2 (10 Gbps) Type-C	1 x USB 3.0 Type-C
	<b>Important</b> This port is only for connecting the RAID enclosure to a NAS or computer.	
Interface		
Buttons	<ul style="list-style-type: none"> <li>• Eject</li> <li>• Set</li> <li>• USB One Touch Copy</li> </ul>	

Component	TR-002	TR-004
Switches	<ul style="list-style-type: none"> <li>• Power</li> </ul> <div style="display: flex; align-items: center;"> <p><b>Important</b> QNAP recommends waiting at least two seconds after powering off the RAID enclosure before powering it on again.</p> </div> <ul style="list-style-type: none"> <li>• Mode</li> </ul>	
Dimensions		
Form factor	Tower	
Dimensions (H x W x D)	169 x 102 x 219 mm (6.65 x 4.02 x 8.62 in)	169 x 160.2 x 219 mm (6.65 x 6.31 x 8.62 in)
Net weight	1.37 kg (3.02 lbs)	1.85 kg (4.08 lbs)
Others		
Power supply unit	36W, 100-240V AC, 50/60 Hz	65W, 100-240V AC, 50/60 Hz
	<div style="display: flex; align-items: center;"> <p><b>Warning</b> To reduce the risk of fire or electric shock, ensure that you only connect the power cord to a properly grounded electrical outlet.</p> </div>	
Sound level	17.8 db(A)	18.1 db(A)
	<div style="display: flex; align-items: center;"> <p><b>Note</b> The sound level was tested at a bystander position, which is within one meter of the RAID enclosure. The test device operated at low speed with the maximum number of drives installed.</p> </div>	
Fans	System: 1 x 7 cm, 12V DC smart fan	System: 1 x 12 cm, 12V DC smart fan
	<div style="display: flex; align-items: center;"> <p><b>Warning</b> To avoid potential injury or damage to the components, do not touch the fans while the device is connected to a power source.</p> </div>	
Operating temperature	0°C to 40°C (32°F to 104°F)	
Relative humidity	<ul style="list-style-type: none"> <li>• Non-condensing relative humidity: 5% to 95%</li> <li>• Wet-bulb temperature: 27°C (80.6°F)</li> </ul>	
Security slot	Kensington security slot	



**Tip**

Model specifications are subject to change without prior notice. To see the latest specifications, go to <https://www.qnap.com>.

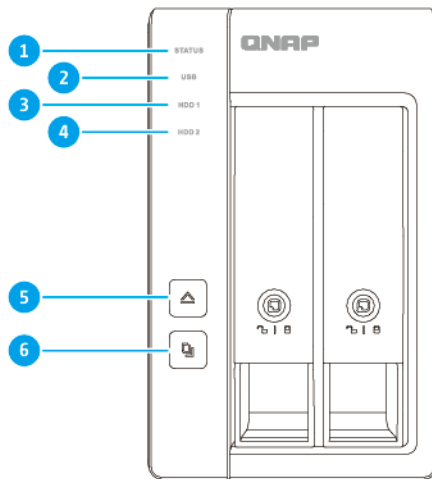
### Package Contents

Item	Quantity
External RAID enclosure	1
AC power adapter	1
Power cord	1
USB Type-C to Type-A connector cable	1

Item	Quantity
Drive tray keys	2
USB cable clip	1
Screws for 2.5-inch drives	<ul style="list-style-type: none"> <li>• TR-002: 6</li> <li>• TR-004: 12</li> </ul>
Screws for 3.5-inch drives	<ul style="list-style-type: none"> <li>• TR-002: 8</li> <li>• TR-004: 16</li> </ul>
Quick Installation Guide (QIG)	1

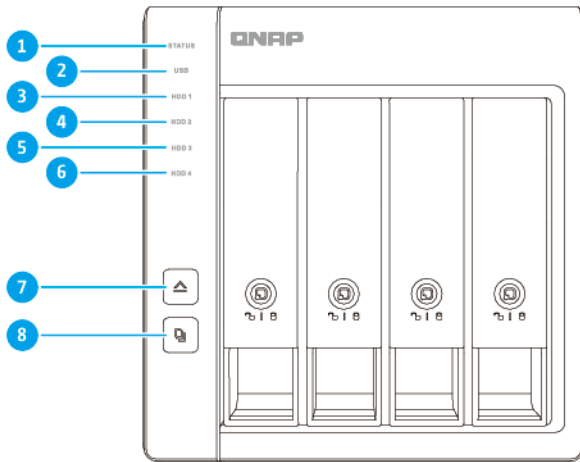
## Components

### Front Panel



### TR-002

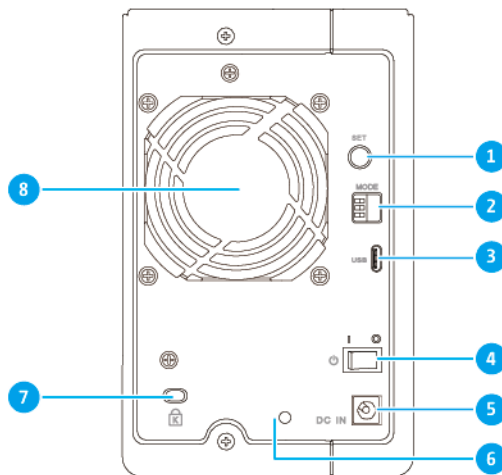
No.	Component	No.	Component
1	Status LED	4	Drive 2 LED
2	USB LED	5	Eject button
3	Drive 1 LED	6	USB One Touch Copy button



**TR-004**

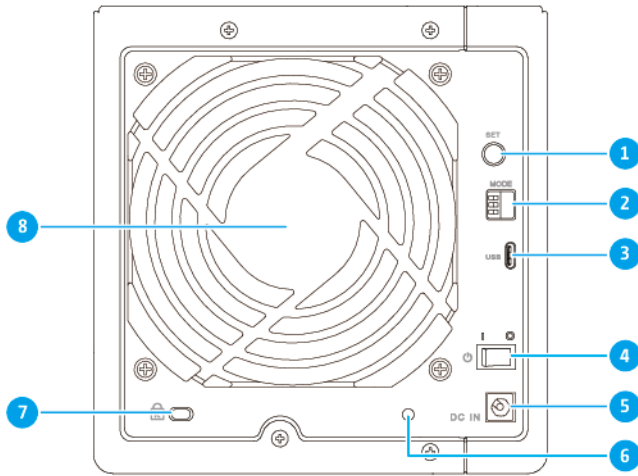
No.	Component	No.	Component
1	Status LED	5	Drive 3 LED
2	USB LED	6	Drive 4 LED
3	Drive 1 LED	7	Eject button
4	Drive 2 LED	8	USB One Touch Copy button

**Rear Panel**



**TR-002**

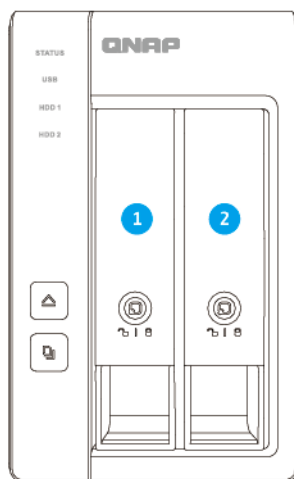




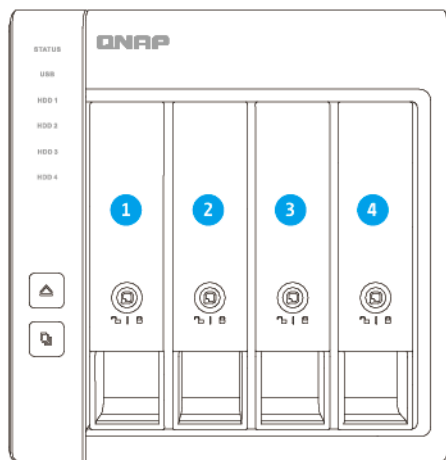
**TR-004**

No.	Component	No.	Component
1	Set button	5	Power input
2	Mode switch	6	USB cable clip slot
3	<ul style="list-style-type: none"> <li>• TR-002: USB 3.1 Gen 2 Type-C port</li> <li>• TR-004: USB 3.0 Type-C port</li> </ul>	7	Kensington security slot
4	Power switch	8	System fan

**Drive Numbering**



**TR-002**



## TR-004

### Installation Requirements

Category	Item
Environment	<ul style="list-style-type: none"> <li>Room temperature: 0°C to 40°C (32°F to 104°F)</li> <li>Non-condensing relative humidity: 5% to 95%</li> <li>Wet-bulb temperature: 27°C (80.6°F)</li> <li>Flat, anti-static surface without exposure to direct sunlight, liquids, or chemicals</li> </ul>
Hardware and peripherals	<ul style="list-style-type: none"> <li>NAS or computer</li> <li>Storage drives For details on compatible drives, go to <a href="https://www.qnap.com/compatibility/">https://www.qnap.com/compatibility/</a>.</li> <li>USB connector cable</li> </ul>
Tools	<ul style="list-style-type: none"> <li>Phillips #1 or #2 screwdriver</li> <li>Anti-static wrist strap</li> </ul>

### Setting Up the RAID Enclosure

- Place the RAID enclosure in an environment that meets the requirements.  
For details, see [Installation Requirements](#).
- Install the drives.  
For details, see the following topics:
  - [Installing 3.5-inch Drives on 3.5-inch Trays](#)
  - [Installing 2.5-inch Drives on 3.5-inch Trays](#)

3. Connect the power cord.
4. Connect the RAID enclosure to your NAS or computer.  
For details, see the following topics:
  - [Connecting the RAID Enclosure to a NAS](#)
  - [Connecting the RAID Enclosure to a Computer](#)
5. Power on the RAID enclosure.
6. Optional: Configure the RAID settings.  
For details, see [RAID Configuration](#).

### 3. Hardware Installation

This section provides information on installing drives, connecting the RAID enclosure to a NAS or computer, and attaching the USB cable clip.

#### Drive Installation

QNAP external RAID enclosures are compatible with 3.5-inch and 2.5-inch hard drives and 2.5-inch solid-state drives.

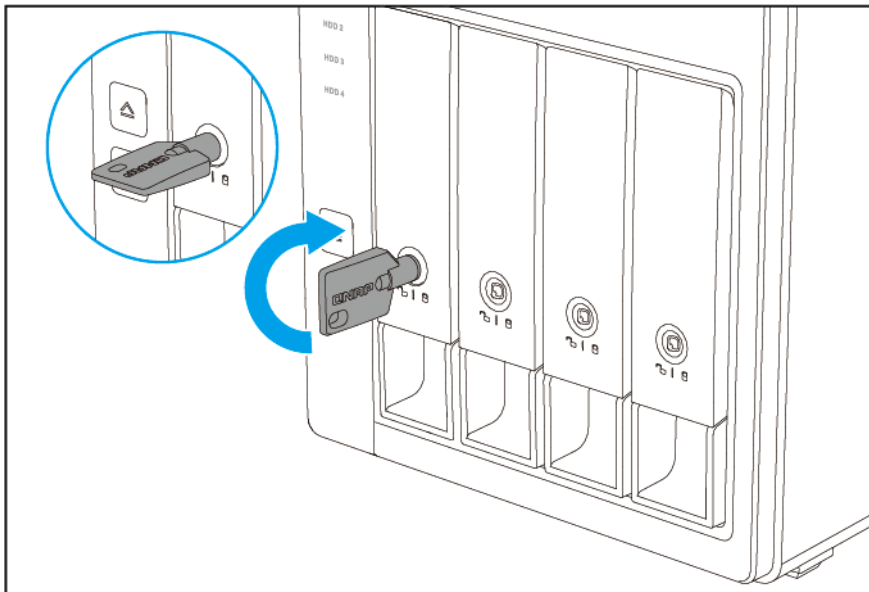
#### Installing 3.5-inch Drives on 3.5-inch Trays



#### Warning

- Installing a drive deletes all data on the drive, unless the RAID enclosure is in Individual or Software Control mode.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

1. Power off the RAID enclosure.
2. Remove a drive tray.
  - a. Optional: Unlock the tray.



#### Note

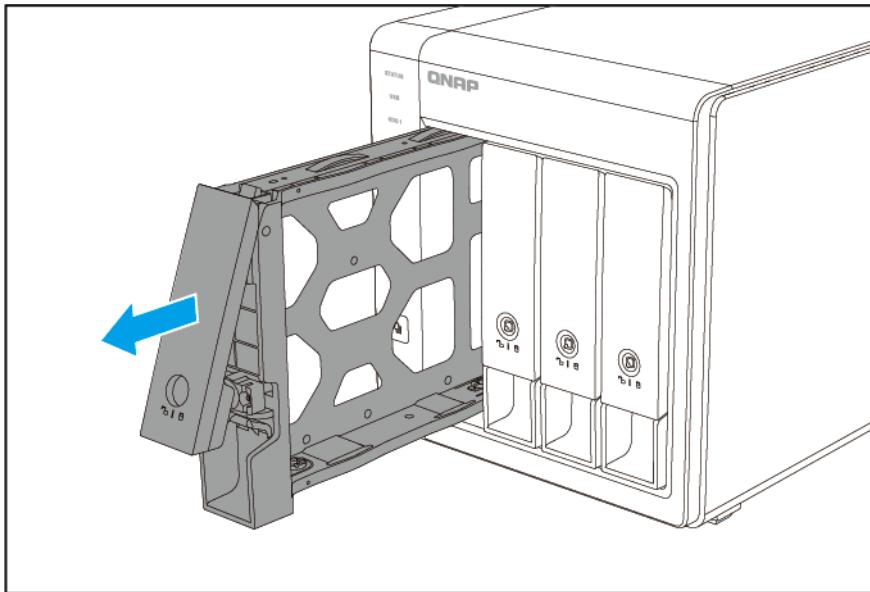
The preinstalled drive trays come unlocked.



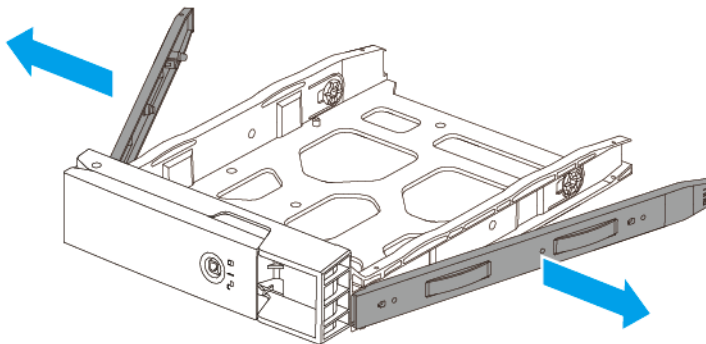
#### Important

Ensure that the drive tray keys are stored in a safe place.

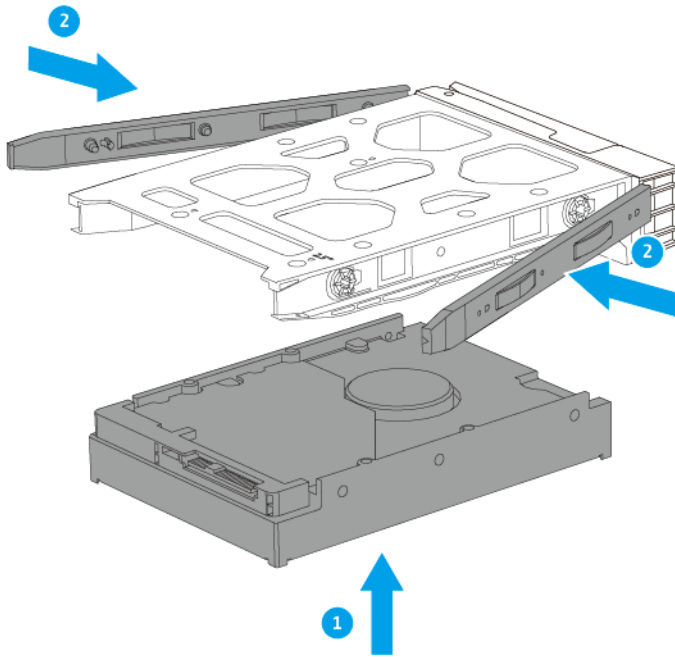
- b. Pull the handle to release the tray.
- c. Pull the tray out.



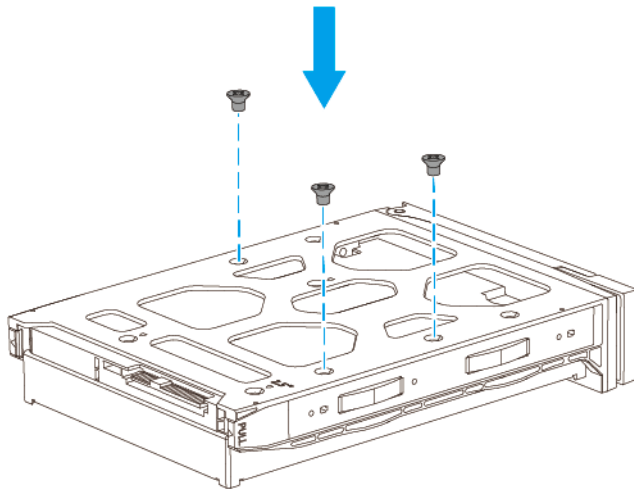
3. Install a drive on the tray.
  - a. Remove the fastening panels from the sides of the tray.



- b. Place the drive on the tray so that the holes on the sides of the drive are aligned with the holes on the sides of the tray.
    - c. Attach the fastening panels.



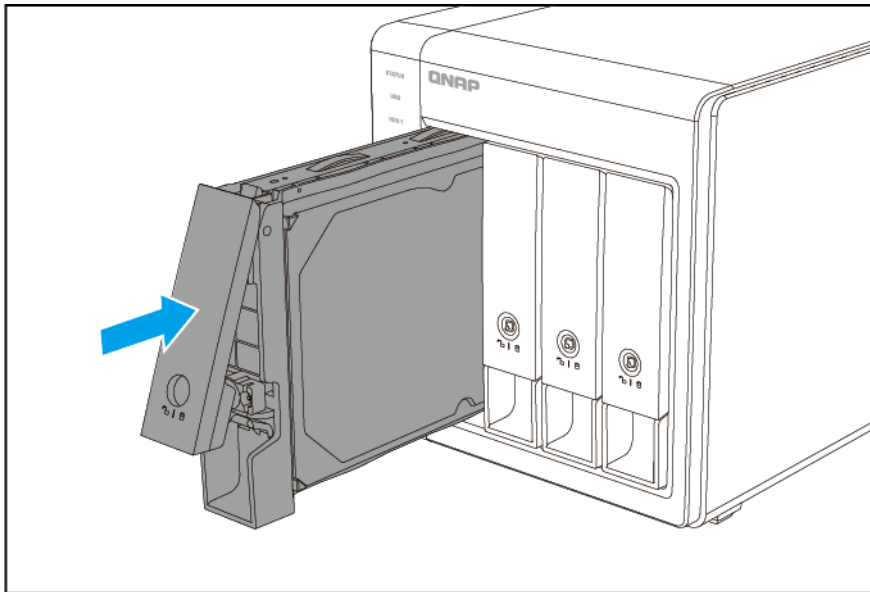
d. Optional: Attach the screws to further secure the drive.



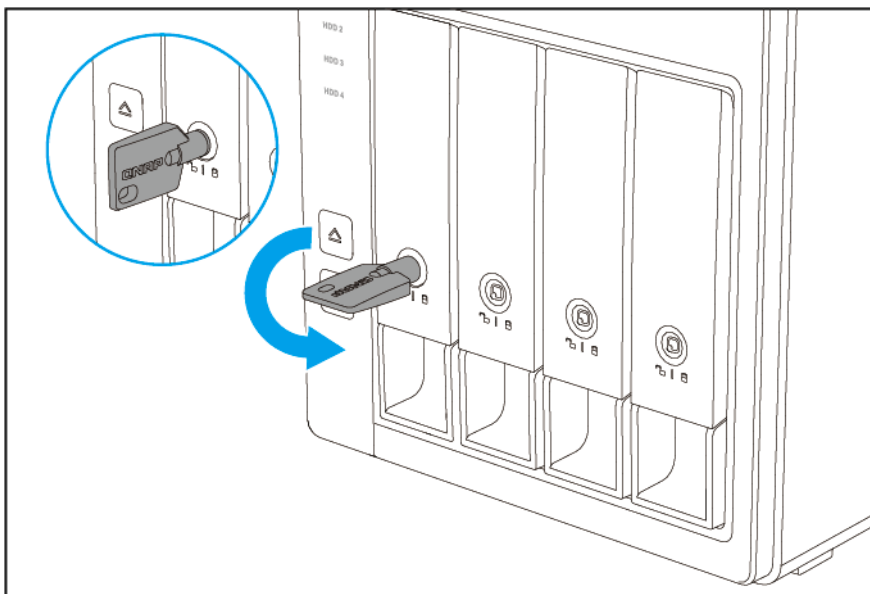
**Important**

QNAP recommends attaching the screws to the drive trays during transport.

4. Load the tray into the drive bay.
  - a. Insert the tray into the bay.
  - b. Push the handle.



c. Optional: Lock the tray.



5. Power on the RAID enclosure.



**Important**

The RAID enclosure may take up to 30 seconds to detect the installation of the new drive.

**Installing 2.5-inch Drives on 3.5-inch Trays**

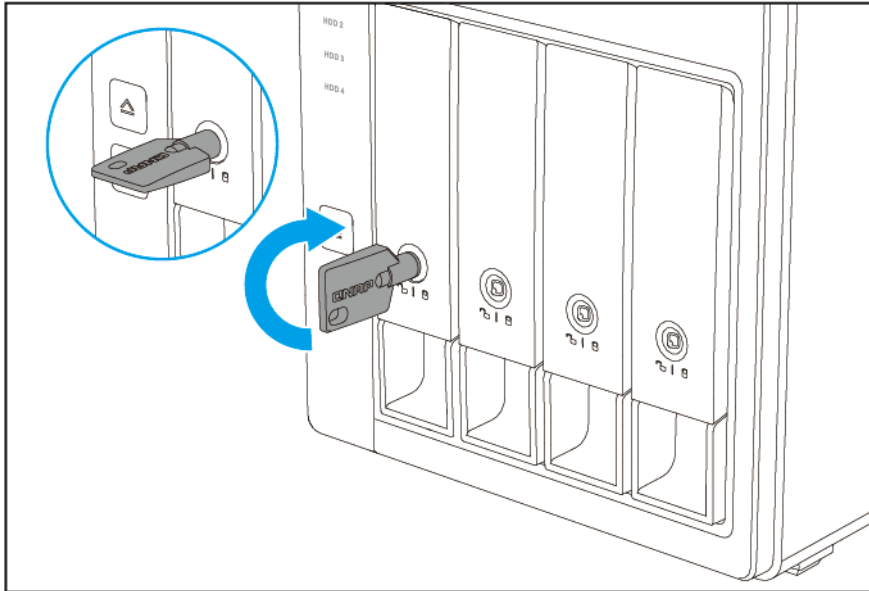


**Warning**

- Installing a drive deletes all data on the drive, unless the RAID enclosure is in Individual or Software Control mode.

- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

1. Power off the RAID enclosure.
2. Remove a drive tray.
  - a. Optional: Unlock the tray.

**Note**

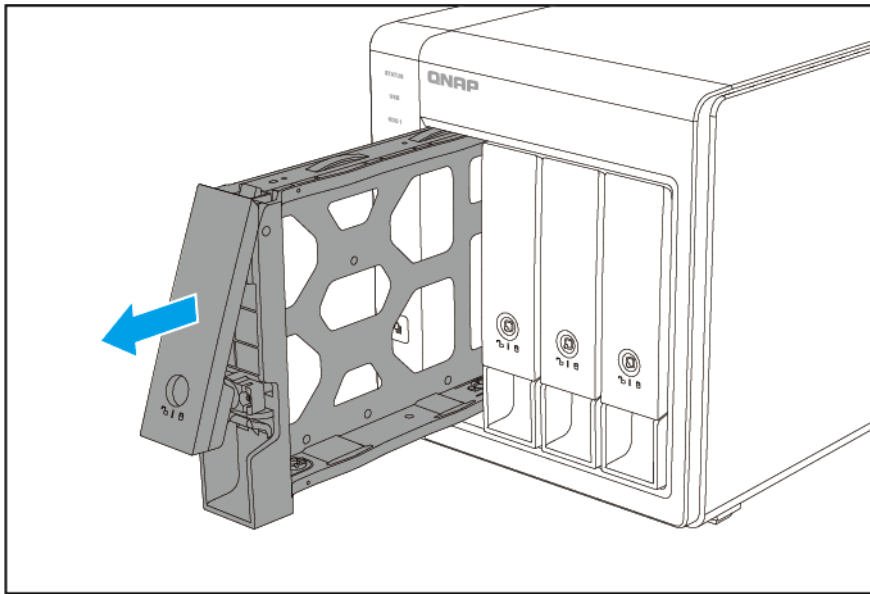
The preinstalled drive trays come unlocked.

**Important**

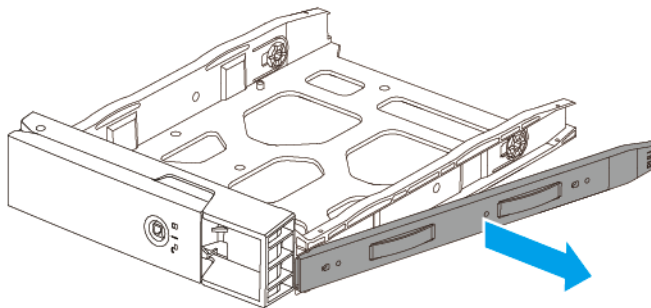
Ensure that the drive tray keys are stored in a safe place.

- b. Pull the handle to release the tray.
- c. Pull the tray out.

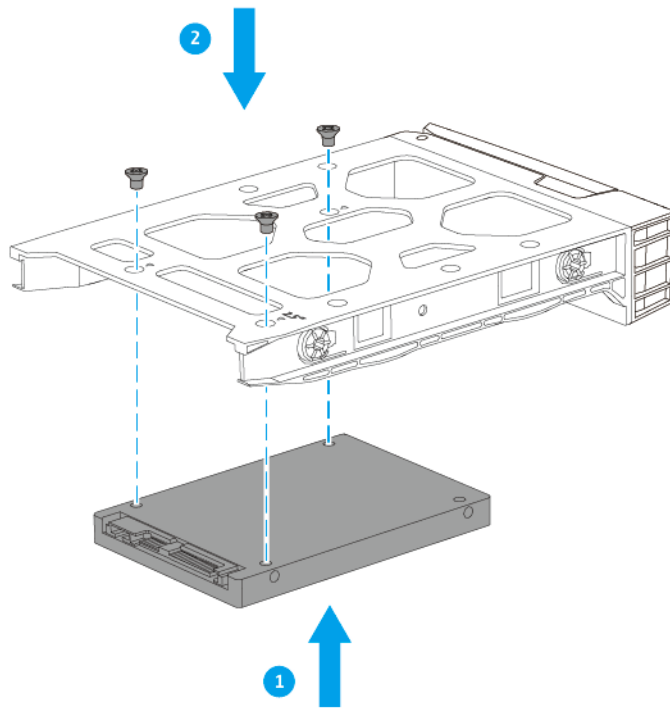




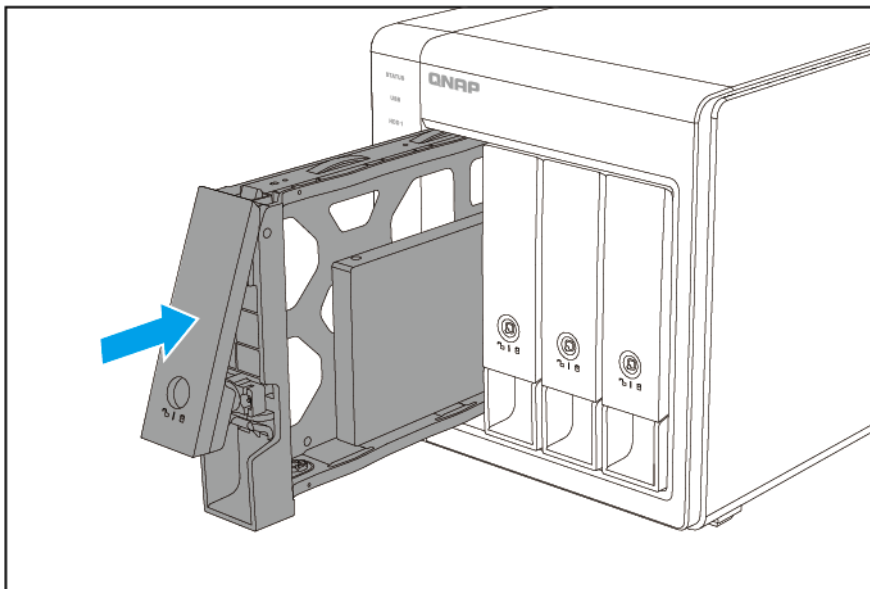
3. Install a drive on the tray.
  - a. Remove the right fastening panel from the tray.



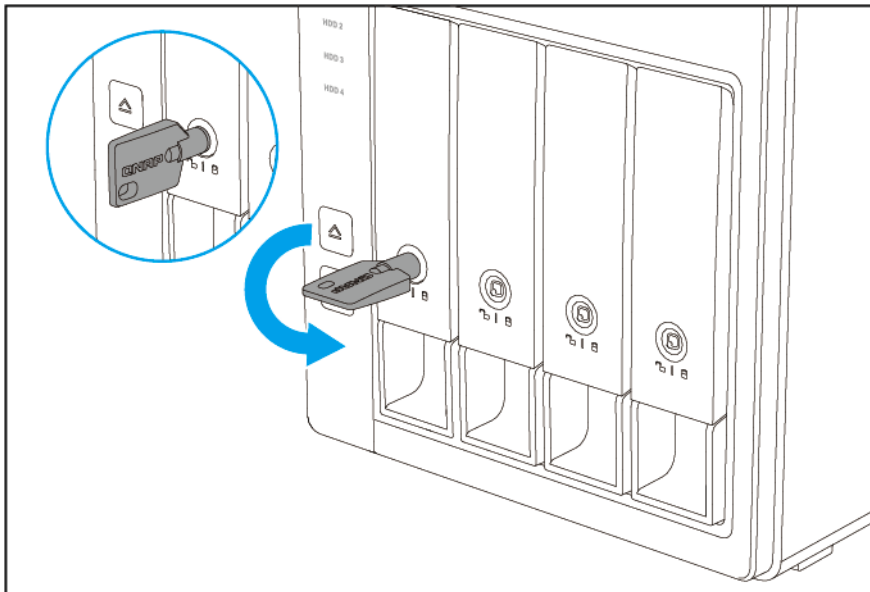
- b. Place the drive on the tray so that the holes on the bottom of the drive are aligned with the holes on the bottom of the tray.
    - c. Attach the screws.



4. Load the tray into the drive bay.
  - a. Insert the tray into the bay.
  - b. Push the handle.



- c. Optional: Lock the tray.



5. Power on the RAID enclosure.

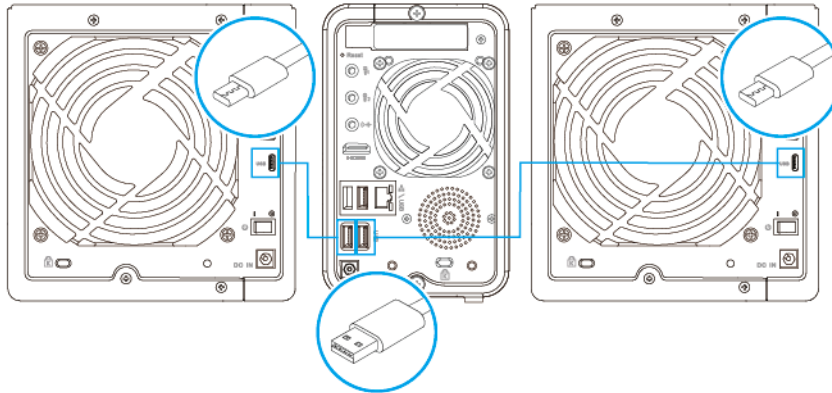
**Important**

The RAID enclosure may take up to 30 seconds to detect the installation of the new drive.

## Connecting the RAID Enclosure to a NAS

A QNAP NAS can support a maximum of two external RAID enclosures.

1. Connect the RAID enclosure to the NAS.
  - a. Connect a USB cable to the USB 3.0 Type-C port on the RAID enclosure.
  - b. Connect the USB cable to a USB port on the NAS.
  - c. Optional: Connect a second RAID enclosure to the NAS.

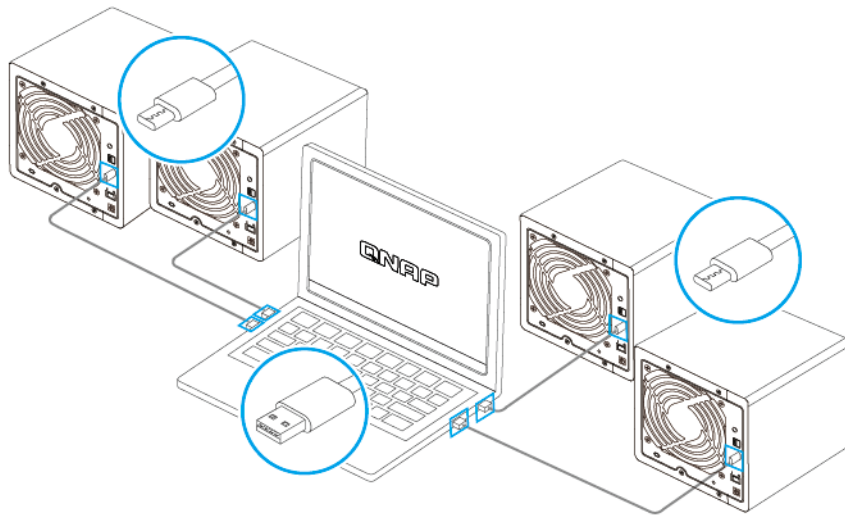


2. Power on the RAID enclosures.
3. Verify that the RAID enclosures are recognized by the NAS.
  - a. Log on to QTS as administrator.
  - b. Go to **Main Menu > Storage & Snapshots > Overview > Storage** .
  - c. Verify that the RAID enclosures are listed.

## Connecting the RAID Enclosure to a Computer

A Windows, macOS, or Linux computer does not limit the number of RAID enclosures it can support. However, QNAP recommends keeping the maximum RAID enclosure connections to four at a time.

1. Connect the RAID enclosure to a computer.
  - a. Connect a USB cable to the USB 3.0 Type-C port on the RAID enclosure.
  - b. Connect the USB cable to a USB port on the computer.
  - c. Optional: Connect additional RAID enclosures to the computer.



2. Power on the RAID enclosures.
3. Verify that the RAID enclosures are recognized by the computer.
  - a. Go to your computer's disk management utility or open QNAP External RAID Manager in Windows or macOS.
  - b. Verify that the RAID enclosures are listed.

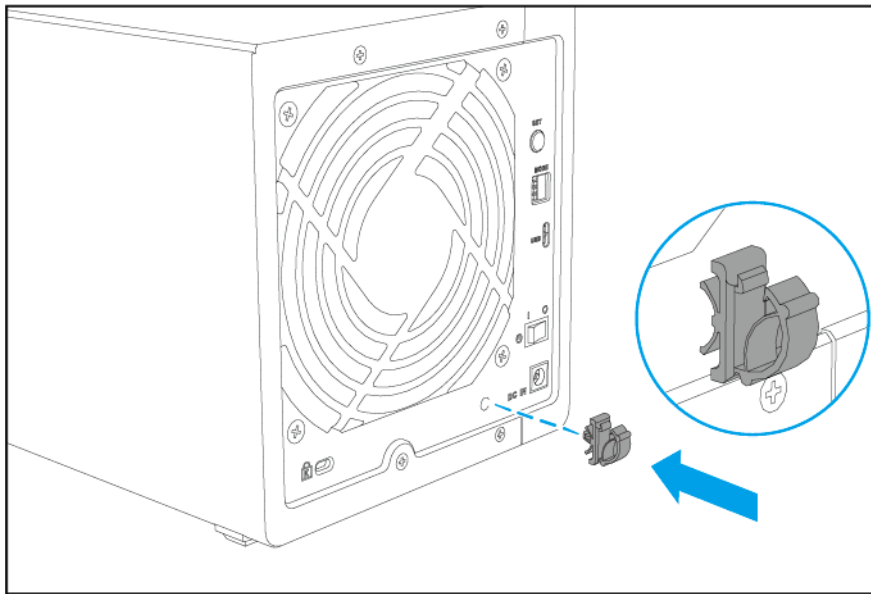
## Attaching the USB Cable Clip



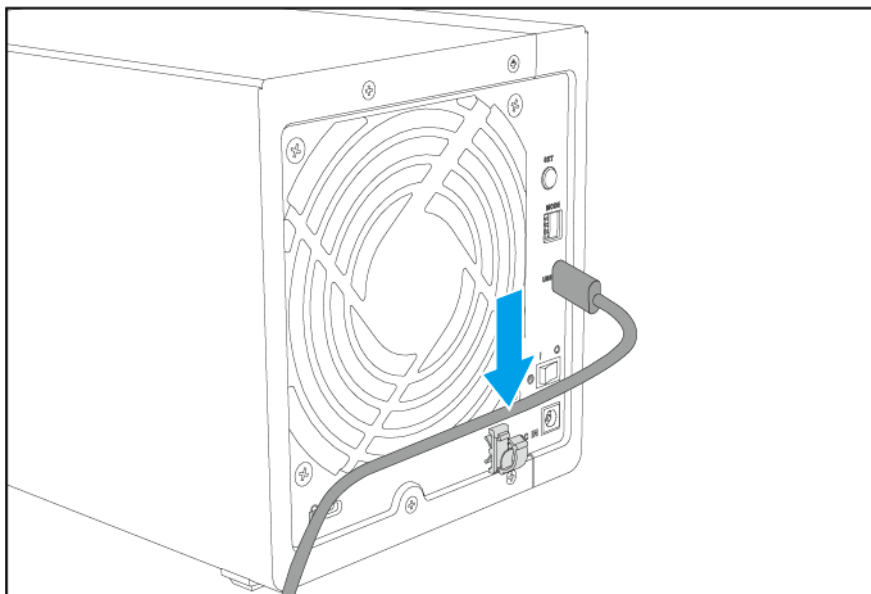
### Important

The USB cable clip keeps the cable near the enclosure to avoid potential damage to the cable or any nearby components.  
The clip is not intended to be removed after attaching it to the RAID enclosure.

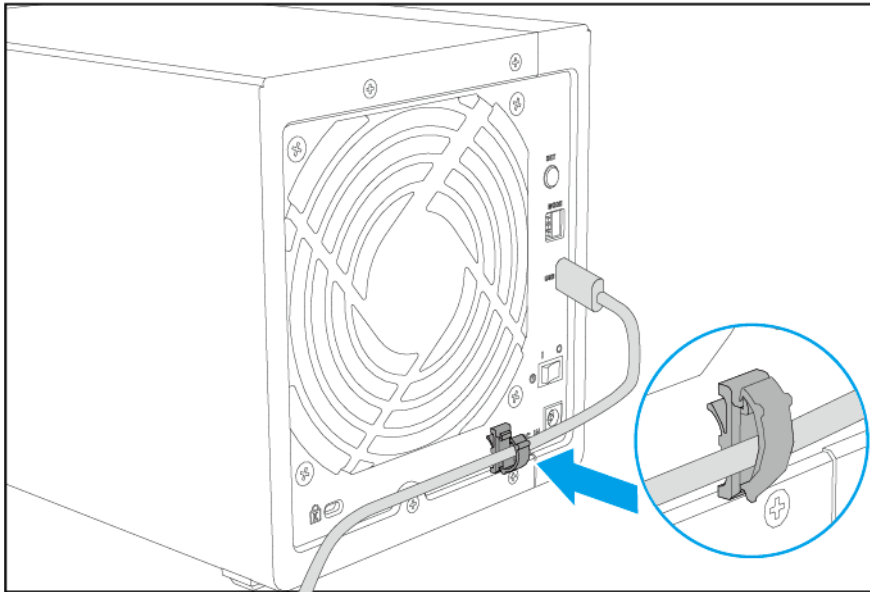
1. Insert the cable clip into the cable clip slot.



2. Insert the cable into the clip.

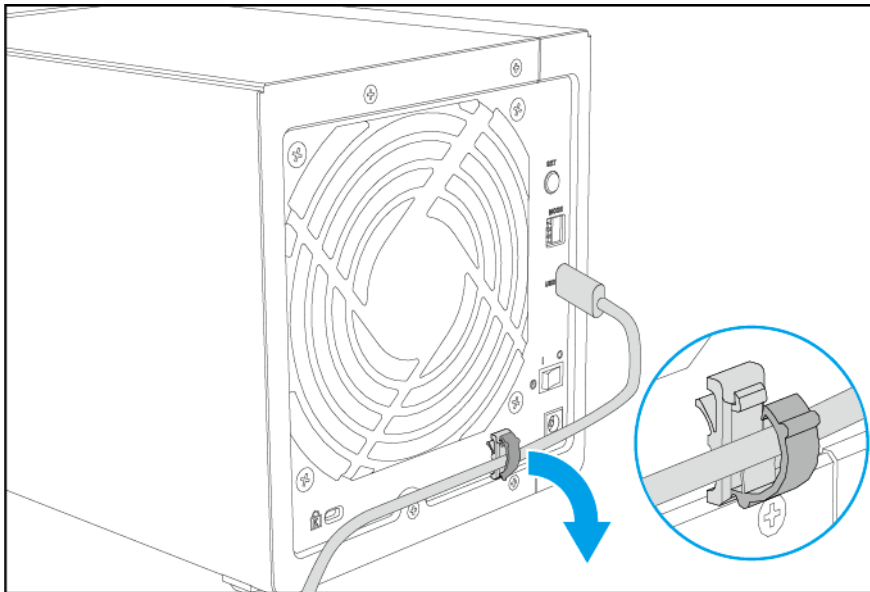


3. Fasten the clip to secure the cable.

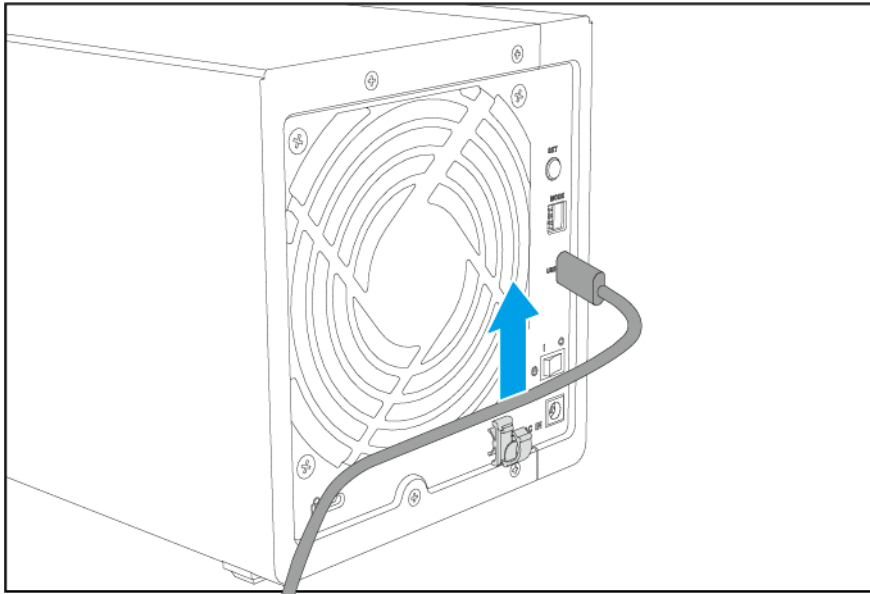


## Removing a USB Cable from the USB Cable Clip

1. Release the cable clip.



2. Remove the cable from the clip.





## 4. RAID Configuration

This section provides information on configuring RAID settings.



### Important

The following situations will interrupt the connection to the RAID enclosure, causing data being written to the drives to be lost.

- Creating or deleting a RAID group while another RAID group or disk is in use
- RAID group failure (excluding degraded mode), or adding or removing a RAID group while another RAID group is in use
- Inserting or removing a drive when the RAID enclosure is in Individual mode
- Pressing and holding the Set button for three or more seconds, until the RAID enclosure beeps

### Supported RAID Types

QNAP external RAID enclosures support several RAID types.



### Important


- When disks with different capacities are combined in one RAID group, all disks function according to the capacity of the smallest disk. For example, if a RAID group contains five 2 TB disks and one 1 TB disk, the total capacity will be 6 TB.
- You can only use one disk type (HDD or SSD) in a RAID group. Combining different types of disk in one RAID group is not supported.
- QNAP recommends creating separate RAID groups for each capacity and type of disk.



### Note

The RAID enclosure does not support capacity expansion or RAID-level migration.

RAID Type	Number of Disks	Description	Compatibility
JBOD (Just a Bunch of Disks)	2 or more	<ul style="list-style-type: none"> <li>• JBOD combines disks together in a linear fashion. The system writes data to a disk until it is full, and then writes to the next disk.</li> <li>• JBOD allows all of the disks capacity to be used, but does not provide any disk failure protection or performance benefits.</li> <li>• Unless you have a specific reason to use JBOD, use RAID 0 instead.</li> </ul>	<ul style="list-style-type: none"> <li>• TR-002</li> <li>• TR-004</li> </ul>

RAID Type	Number of Disks	Description	Compatibility
RAID 0	2 or more	<ul style="list-style-type: none"> <li>• Disks are combined together using striping.</li> <li>• RAID 0 offers the fastest read/write speeds and uses the total capacity of all the disks.</li> <li>• RAID 0 provides no disk failure protection. This RAID type must be paired with a data backup plan.</li> <li>• RAID 0 is recommended for high performance applications such as video editing.</li> </ul>	<ul style="list-style-type: none"> <li>• TR-002</li> <li>• TR-004</li> </ul>
RAID 1	2	<ul style="list-style-type: none"> <li>• An identical copy of data is stored on two disks. If either disk fails, data can still be read from the other disk.</li> <li>• Half of the total disk capacity is lost, in return for a high level of data protection.</li> <li>• RAID 1 is recommended if you have two disks.</li> </ul> <p> <b>Important</b> Deleting a RAID 1 group does not format the drives.</p>	<ul style="list-style-type: none"> <li>• TR-002</li> <li>• TR-004</li> </ul>
RAID 5	3 or more	<ul style="list-style-type: none"> <li>• Data and parity information are striped across all disks.</li> <li>• The capacity of one disk is lost for parity. This means that if any one disk fails, it can be replaced and the data on it can be restored.</li> <li>• Striping means read speeds are increased with each additional disk.</li> <li>• RAID 5 is recommended for a good balance between data protection and speed.</li> </ul>	TR-004
RAID 10	4	<ul style="list-style-type: none"> <li>• Every two disks are paired using RAID 1 for failure protection. Then the pairs are striped together using RAID 0.</li> <li>• RAID 10 provides excellent random read/write speeds and high failure protection, but half the total disk capacity is lost.</li> <li>• RAID 10 is recommended for application or database storage.</li> </ul>	TR-004

## Storage Modes

QNAP external RAID enclosures support different storage modes for NAS devices and computers.

Storage Mode	Description
NAS Storage	<p>Add storage capacity to a QNAP NAS by creating a storage pool or static volume.</p> <div style="border-left: 2px solid red; padding-left: 10px; margin-top: 10px;"> <p><b>Important</b> When using NAS expansion mode:</p> <ul style="list-style-type: none"> <li>• The RAID enclosure must be set to Software Control mode. For details, see <a href="#">Mode Switch</a>.</li> <li>• The RAID enclosure cannot be set to Individual mode.</li> <li>• The RAID enclosure cannot contain more than one RAID group.</li> <li>• The RAID enclosure cannot be used to expand an existing storage pool or static volume.</li> </ul> </div>
External Storage	Use the RAID enclosure as an external hardware RAID device with a NAS or a Windows, macOS, or Linux-based computer.

## Storage Modes and Platform Support

Configuration	NAS Storage Mode	External Storage Mode
Software Control	Required	Yes
Individual	No	Yes
JBOD	Yes	Yes
RAID 0/1/5/10	Yes	Yes
Multiple RAID Groups	No	Yes

## Mode Switch




You can configure RAID settings manually using the Mode switch on the rear panel of the RAID enclosure by moving the switches to the corresponding positions as illustrated above.



### Important

- You can only use one disk type (HDD or SSD) in a RAID group. Combining different types of disk in one RAID group is not supported.

- If disks with different capacities are combined in one RAID group, all disks function according to the capacity of the smallest disk.

Configuration	Description
Individual	The NAS or computer identifies each installed disk as a separate, external drive. The disks are not combined into a single volume or RAID group. This configuration is also known as a port multiplier.
<ul style="list-style-type: none"> <li>• JBOD</li> <li>• RAID 0</li> <li>• RAID 1/10</li> <li>• RAID 5</li> </ul>	QNAP external RAID enclosures provide hardware RAID support for these RAID types. For details, see <a href="#">Supported RAID Types</a> .
Software Control	<p>This is the default factory setting. This mode allows you to configure RAID settings using QNAP External RAID Manager on a Windows or Mac computer or using Storage &amp; Snapshots on a QNAP NAS. Go to <a href="http://www.qnap.com/download">http://www.qnap.com/download</a> to download QNAP External RAID Manager and supporting documentation.</p> <p> <b>Important</b></p> <ul style="list-style-type: none"> <li>• At least one drive must be installed in the RAID enclosure for it to be recognized by QNAP External RAID Manager.</li> <li>• Do not use QNAP External RAID Manager at the same time as any other RAID management software. Doing so may affect the response time of QNAP External RAID Manager.</li> </ul>

## Configuring RAID Settings Using the Mode Switch

### Switching From Individual Mode to a RAID Mode or Software Control Mode



#### Warning

Configuring RAID settings deletes all data on the drives, except when switching to or from Software Control mode.

1. Ensure that the Mode switch is set to Individual. For details, see [Mode Switch](#).
2. Set the Mode switch to Software Control or the desired RAID mode.
3. Press and hold the Set button for three seconds. The expansion enclosure beeps once.



#### Note

Pressing the Set button is not necessary when switching to Software Control mode.

4. Verify that the settings have been applied.
  - a. Open **QNAP External RAID Manager** on your computer or go to **Storage & Snapshots** in QTS.
  - b. Verify that the settings have changed.

Method	User Action
QNAP External RAID Manager	<ol style="list-style-type: none"> <li>1. Open <b>QNAP External RAID Manager</b> on your computer.</li> <li>2. Locate the RAID group, and verify that the status has changed to your desired setting.</li> </ol>
Storage & Snapshots	<ol style="list-style-type: none"> <li>1. Log on to QTS as administrator.</li> <li>2. Go to <b>Main Menu &gt; Storage &amp; Snapshots &gt; Storage &gt; Disks/VJBOD</b> .</li> <li>3. Locate the RAID group, and verify that the status has changed to your desired setting.</li> </ol>

### Switching From a RAID Mode or Software Control Mode to a Different Mode



**Warning**

Configuring RAID settings deletes all data on the drives, except when switching to or from Software Control mode.

1. Ensure that the Mode switch is set to Software Control or a RAID mode.
2. Set the Mode switch to Individual.
3. Press and hold the Set button for three seconds.  
The expansion enclosure beeps once.



**Tip**

Stop here if you want to keep the RAID enclosure in Individual mode.

4. Set the Mode switch to Software Control or the desired RAID setting.
5. Press and hold the Set button for three seconds.  
The expansion enclosure beeps once.



**Note**

Pressing the Set button is not necessary when switching to Software Control mode.

6. Verify that the settings have been applied.
  - a. Open **QNAP External RAID Manager** on your computer or go to **Storage & Snapshots** in QTS.
  - b. Verify that the settings have changed.

Method	User Action
QNAP External RAID Manager	<ol style="list-style-type: none"> <li>1. Open <b>QNAP External RAID Manager</b> on your computer.</li> <li>2. Locate the RAID group, and verify that the status has changed to your desired setting.</li> </ol>
Storage & Snapshots	<ol style="list-style-type: none"> <li>1. Log on to QTS as administrator.</li> <li>2. Go to <b>Main Menu &gt; Storage &amp; Snapshots &gt; Storage &gt; Disks/VJBOD</b> .</li> <li>3. Locate the RAID group, and verify that the status has changed to your desired setting.</li> </ol>

## 5. Basic Operations

This chapter describes basic operations of the external RAID enclosure.

### Eject Button

Pressing the Eject button disconnects the external RAID enclosure or its partitions from a QNAP NAS running QTS 4.3.6 (or later) or a Windows computer running the QNAP External RAID Manager utility.

For a macOS computer running the QNAP External RAID Manager utility, pressing the Eject button unmounts the volumes, but does not disconnect the RAID enclosure from the computer.

### USB One Touch Copy Button

The USB One Touch Copy button allows you to copy data between an external RAID enclosure and a NAS in external storage mode.

This feature supports incremental backups. The RAID enclosure only copies files that were modified or added after the last backup.

The USB One Touch Copy button can only be used if the RAID enclosure is connected to a NAS running QTS 4.4.1 (or later) that has a USB One Touch Copy button.

### Set Button

The Set button is used for configuring the RAID settings from the rear panel of the external RAID enclosure. For details, see [Mode Switch](#).

### LEDs

LEDs indicate system status and related information when the external RAID enclosure is powered on. The following LED information applies only when the drive is correctly installed and when the RAID enclosure is connected.

For details on the location of the LEDs, see [Components](#).

LED	Status	Description
System Status	Flashes green and red alternately every 0.5 seconds	RAID rebuilding is in progress.
	Red	<ul style="list-style-type: none"> <li>The drive is invalid.</li> <li>The system fan is not functioning.</li> <li>The RAID enclosure is in degraded mode (one member drive failed in RAID 1 or RAID 5).</li> </ul>
	Flashes red every 2 seconds	The RAID enclosure is in standby mode, but the system is abnormal.
	Green	The RAID enclosure is ready.
	Flashes green every 1.5 seconds	The RAID enclosure is in standby mode.
	Off	The RAID enclosure is powered off.

LED	Status	Description
Drive	Flashes green	<ul style="list-style-type: none"> <li>Data is being accessed.</li> <li>Data is being copied.</li> <li>An external application is monitoring the RAID enclosure.</li> </ul>
	Green	The drive can be accessed.
	Off	<ul style="list-style-type: none"> <li>The RAID enclosure is in standby mode.</li> <li>No drives are detected.</li> </ul>
USB	Blue	The RAID enclosure is connected to the host.
	Off	<ul style="list-style-type: none"> <li>The RAID enclosure is not connected to the host.</li> <li>The RAID enclosure is in standby mode.</li> </ul>

## Audio Alert

Duration	Frequency	Description
Short beep (0.5 seconds)	1	<ul style="list-style-type: none"> <li>The RAID enclosure is starting up.</li> <li>The RAID enclosure is ready.</li> <li>The RAID settings are modified.</li> </ul>
Long beep (2 seconds)	3 times (every 5 minutes)	<ul style="list-style-type: none"> <li>The system fan is not functioning.</li> <li>The system or drives are overheating.</li> <li>A RAID group is in degraded mode.</li> <li>A RAID group failed.</li> </ul>
	3 times (non-repeating)	<ul style="list-style-type: none"> <li>The RAID rebuilding process started.</li> <li>The RAID rebuilding process finished.</li> </ul>

## Standby Mode

The RAID enclosure features standby mode to help reduce noise and power consumption. When the RAID enclosure enters standby mode, the system fan and installed HDDs stop spinning, and system processes are paused. Upon waking, the RAID enclosure returns to the previous system state and any paused processes are resumed.

The RAID enclosure enters standby mode under the following conditions:

- The host enters hibernation or standby mode or is powered off.  
The RAID enclosure only enters standby mode if the USB power design of the host supports this feature.
- The USB cable is disconnected.



### Note

The TR-002 will not enter standby mode during RAID rebuilding. If prompted to enter standby mode during RAID rebuilding, the TR-002 will finish RAID rebuilding before entering standby mode.

## 6. Troubleshooting

This chapter describes basic troubleshooting information.

### Forcing Storage & Snapshots or QNAP External RAID Manager to Recognize the RAID Enclosure

If Storage & Snapshots or QNAP External RAID Manager is unable to locate the RAID enclosure, the drives or data may be faulty.

1. Power off the RAID enclosure.
2. Remove all drives.
3. Power on the RAID enclosure.
4. Locate the RAID enclosure using Storage & Snapshots or QNAP External RAID Manager.
5. Reinsert the drives.
6. Continue with RAID configuration.

### Hot-swapping Failed Drives

The RAID enclosure supports hot-swapping of drives in the following situations:

- RAID 1: One member drive fails
- RAID 5: One member drive fails
- RAID 10:
  - One member drive fails
  - Two member drives fail (one in bay 1 or 2 and one in bay 3 or 4)

1. Log on to QTS.
2. Go to **Main Menu > Storage & Snapshots > Storage > External Storage** .
3. Locate the failed drive.
4. Prepare a new hard drive with a capacity that is the same as or larger than the failed hard drive.
5. Remove the failed drive from the RAID enclosure.
6. Wait for 30 seconds or until the RAID enclosure beeps twice.
7. Remove the failed drive from the drive tray.
8. Insert the new drive into the drive tray.
9. Install the new drive.  
The RAID enclosure beeps twice.
10. Wait for 30 seconds or until the RAID enclosure beeps twice.
11. Go to **Main Menu > Storage & Snapshots > Storage > Storage/Snapshots** .



12. Locate the volume that contains the new drive and then verify that the status is `Rebuilding`.

## Support and Other Resources

QNAP provides the following resources:

Resource	URL
Documentation	<a href="http://docs.qnap.com">http://docs.qnap.com</a>
Helpdesk	<a href="http://helpdesk.qnap.com">http://helpdesk.qnap.com</a>
Downloads	<a href="http://download.qnap.com">http://download.qnap.com</a>
Community Forum	<a href="http://forum.qnap.com">http://forum.qnap.com</a>

## 7. Glossary

### **QTS**

QNAP NAS operating system

### **QNAP External RAID Manager**

Windows and macOS utility that allows you to view and configure QNAP external RAID enclosures

### **Storage & Snapshots**

QTS utility that allows you to view and configure QNAP external RAID enclosures connected to a QNAP NAS

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## END OF TERMS AND CONDITIONS

### FCC Notice

#### FCC Class B Notice



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.
2. This device must accept any interference received, including interference that may cause undesired operation.



#### Note

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 in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.



#### Important

Any modifications made to this device that are not approved by QNAP Systems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

### CE Notice



This QNAP NAS complies with CE Compliance Class B.

## SJ/T 11364-2006



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壳体	0	0	0	0	0	0
显示	0	0	0	0	0	0
印刷电路板	0	0	0	0	0	0
金属螺帽	0	0	0	0	0	0
电缆组装	0	0	0	0	0	0
风扇组装	0	0	0	0	0	0
电力供应组装	0	0	0	0	0	0
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