



QNAP

External RAID Enclosure

TR-004U

User Guide

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1. Preface





About This Guide

This guide provides information on the QNAP TR-004U external RAID enclosure 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-004U external RAID enclosure.

About the TR-004U

The TR-004U external RAID enclosure is designed to increase the capacity and utility of your NAS or server. It provides RAID, JBOD, and port multiplier support for added compatibility and security across multiple platforms. The TR-004U features a mode switch for easy and accessible RAID configuration, and its USB 3.0 Type-C port ensures 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-004U |
|--------------------------------------|--|
| Ordering Information | |
| Ordering P/N | TR-004U |
| Storage | |
| Drive bays | 4 x 3.5-inch SATA 3 Gbps <div style="display: flex; align-items: center;"> <p>Note The TR-004U is compatible with SATA 6 Gbps drives.</p> </div> |
| Drive compatibility | <ul style="list-style-type: none"> • 3.5-inch SATA hard disk drives • 2.5-inch SATA hard disk drives • 2.5-inch SATA solid-state drives |
| Hot-swapping | Yes |
| External I/O Ports & Expansion Slots | |
| USB ports | 1 x USB 3.0 Type-C <div style="display: flex; align-items: center;"> <p>Important This port is only for connecting the RAID enclosure to a NAS or server.</p> </div> |
| Interface | |
| Buttons | Set |

| Component | TR-004U |
|------------------------|--|
| Switches | <ul style="list-style-type: none"> • Power <div style="display: flex; align-items: center;">  <div> <p>Important</p> <p>QNAP recommends waiting at least two seconds after powering off the RAID enclosure before powering it on again.</p> </div> </div> <ul style="list-style-type: none"> • Mode |
| Dimensions | |
| Form factor | 1 U Rackmount |
| Dimensions (H x W x D) | 44 x 439 x 291 mm (1.7 x 17.3 x 11.4 in) |
| Net weight | 4.04 kg (8.91 lbs) |
| Other | |
| Rail compatibility | <p>RAIL-B02</p> <div style="display: flex; align-items: center;">  <div> <p>Note</p> <ul style="list-style-type: none"> • Rail kits are not included with the RAID enclosure and must be purchased separately. For details, contact an authorized reseller or go to http://shop.qnap.com. • Information on rail kit installation can be found in the installation guide included in the rail kit package. </div> </div> |
| Power supply unit | <p>100W, 100-240V AC, 50/60 Hz, open-frame</p> <div style="display: flex; align-items: center;">  <div> <p>Warning</p> <p>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> </div> |
| Sound level | <p>23.1 dB(A)</p> <div style="display: flex; align-items: center;">  <div> <p>Note</p> <p>The sound level was tested at a bystander position, which is within one meter of the test device. The test device operated at low speed with the maximum number of drives installed.</p> </div> </div> |
| Fans | <p>System: 2 x 4 cm, 12V DC smart fan</p> <div style="display: flex; align-items: center;">  <div> <p>Warning</p> <p>To avoid potential injury or damage to components, do not touch the fans while the device is connected to a power source.</p> </div> </div> |
| Operating temperature | 0°C to 40°C (32°F to 104°F) |
| Relative humidity | <ul style="list-style-type: none"> • Non-condensing relative humidity: 5% to 95% • Wet-bulb temperature: 27°C (80.6°F) |
| 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 |
|--------------------------------------|---|
| TR-004U | 1 |
| Power cord | 1 |
| USB Type-C to Type-A connector cable | 1 |
| Drive tray keys | 2 |
| USB cable clip | 1 |
| Screws for 3.5-inch drives | 16 |
| Screws for 2.5-inch drives | 12 |
| Handle kit | <ul style="list-style-type: none"> • 2 x handles • 2 x angle brackets • 8 x screws |
| Quick Installation Guide (QIG) | 1 |

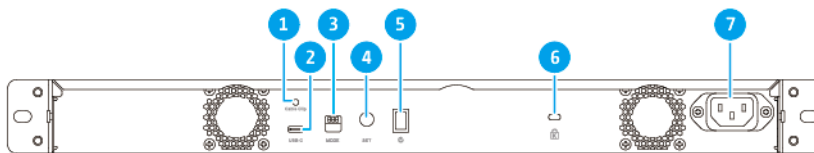
Components

Front Panel



| No. | Component | No. | Component |
|-----|------------|-----|------------|
| 1 | Drive LEDs | 3 | Status LED |
| 2 | USB LED | - | - |

Rear Panel



| No. | Component | No. | Component |
|-----|---------------------|-----|--------------------------|
| 1 | USB cable clip slot | 5 | Power switch |
| 2 | USB 3.0 Type-C port | 6 | Kensington security slot |
| 3 | Mode switch | 7 | Power input |
| 4 | Set button | - | - |

Drive Numbering



Safety Information

The following instructions help ensure personal safety and environmental safety. Read these instructions carefully before performing any operations.

General Instructions

- The device should be stored in a secure location with restricted access, controlled through the use of a tool, lock and key, or any means of security.
- Only qualified, skilled, and authorized persons with knowledge of all restrictions, safety precautions, and installation and maintenance procedures should have physical access to the device.
- To avoid potential injury or damage to components, ensure that the drives and other internal system components have cooled before touching them.
- Observe electrostatic discharge (ESD) procedures to avoid potential injury or damage to components.

Power

- To reduce the risk of fire or electric shock, ensure that you only connect the power cord to a properly grounded electrical outlet.



Devices with redundant power supply may have one or more power supply unit (PSU) cords. To avoid serious injuries, a trained service technician must disconnect all PSU cords from the device before installing or replacing system components.

System Battery

- To avoid potential battery explosion, causing injury or damage to components, ensure that you replace the existing battery with a battery of the same type.
- Dispose of used batteries properly according to local regulations or the instructions of the battery manufacturer.

Moving Parts

•



Moving fan blades: Keep your body parts away from moving fan blades while the device is connected to a power source.

•



Moving components: Keep your body parts away from other moving components.

Installation Requirements

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

Setting up the RAID Enclosure

- Place the RAID enclosure in an environment that meets the requirements.
For details, see [Installation Requirements](#).
- Install the RAID enclosure on a rack.
For details, see the following topics:
 - [Rail Kits](#)
 - [Installing Handles](#)
- 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](#)
- Connect the power cord.

5. Connect the RAID enclosure to your NAS or server.
For details, see the following topics:
 - [Connecting the RAID Enclosure to a NAS](#)
 - [Connecting the RAID Enclosure to a Server](#)
6. Power on the RAID enclosure.
7. Optional: Configure the RAID settings.
For details, see [RAID Configuration](#).

3. Hardware Installation

This section provides information on installing drives and handles and connecting the RAID enclosure to a NAS or server.

Drive Installation

The TR-004U is compatible with 3.5-inch and 2.5-inch hard drives and 2.5-inch solid-state drives.

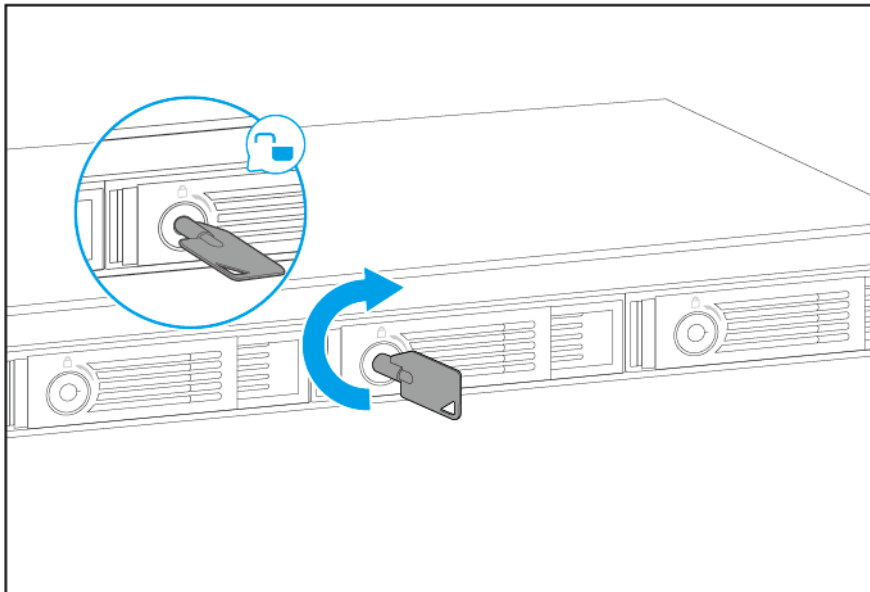
Installing 3.5-inch Drives on 3.5-inch Trays



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

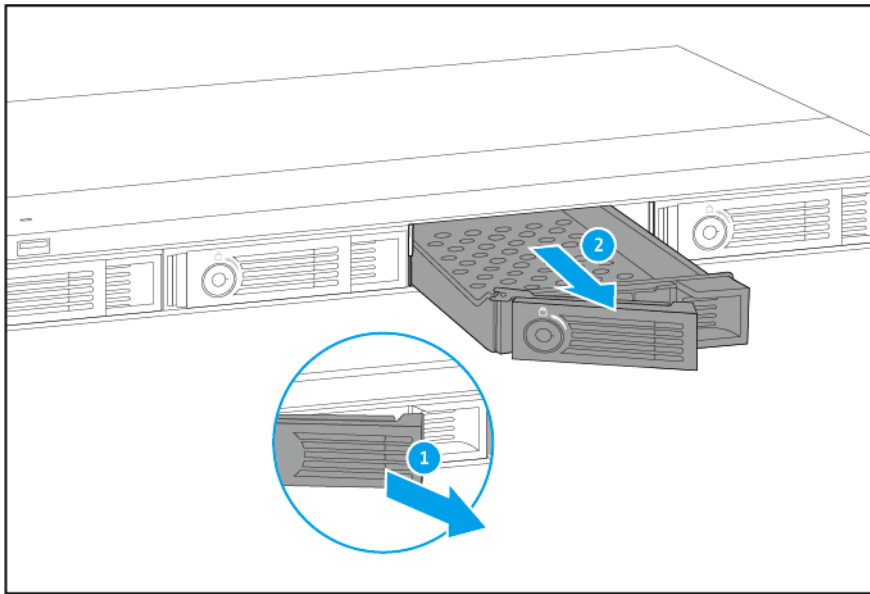
The preinstalled drive trays come unlocked.



Important

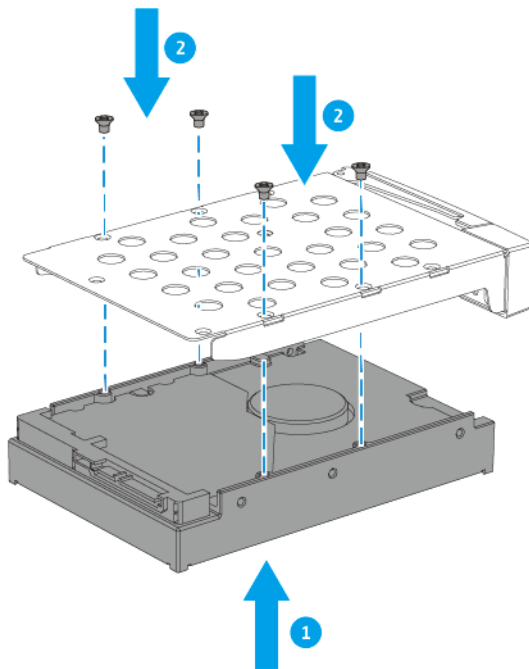
Ensure that the drive tray keys are stored in a safe place.

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



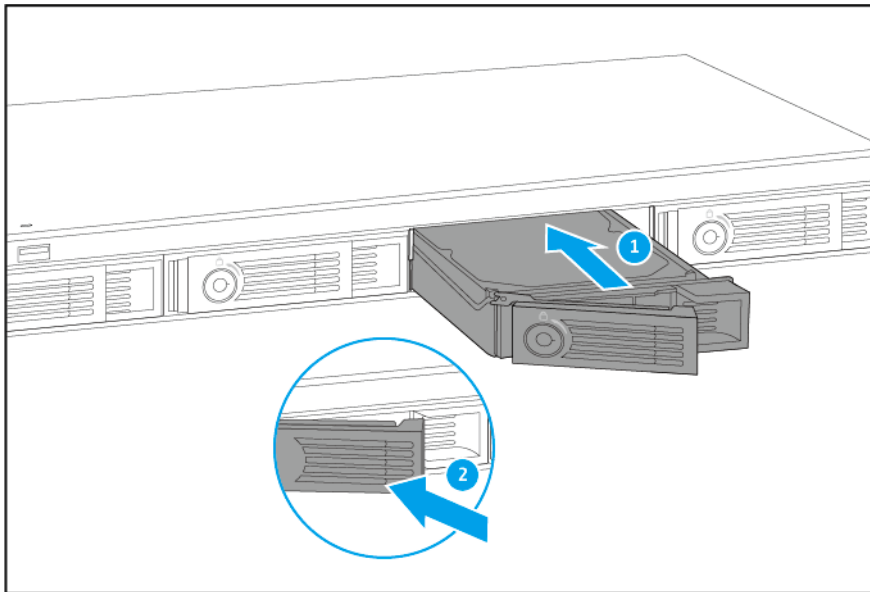
3. Install a drive on the tray.

- a. 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.
- b. Attach the screws.

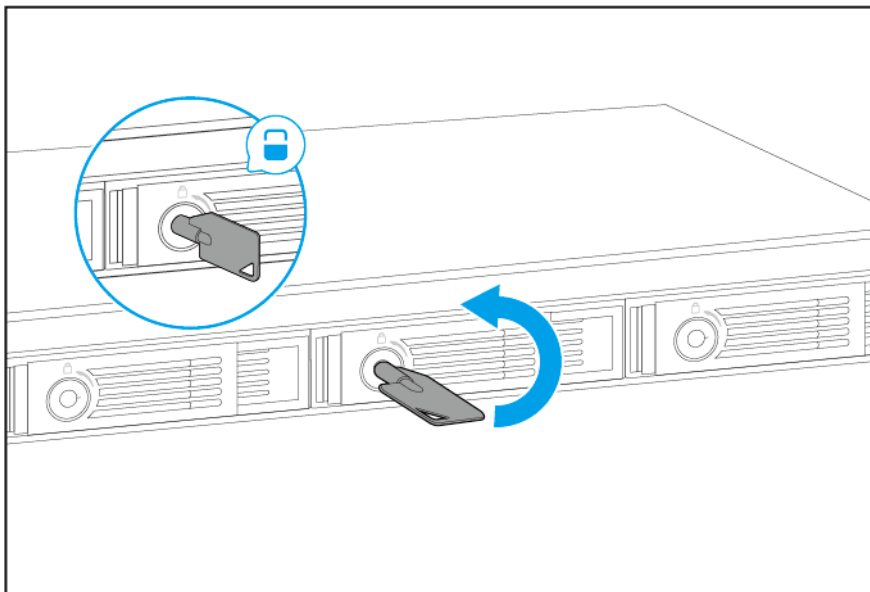


4. Load the tray into the drive bay.

- 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.

Installing 2.5-inch Drives on 3.5-inch Trays

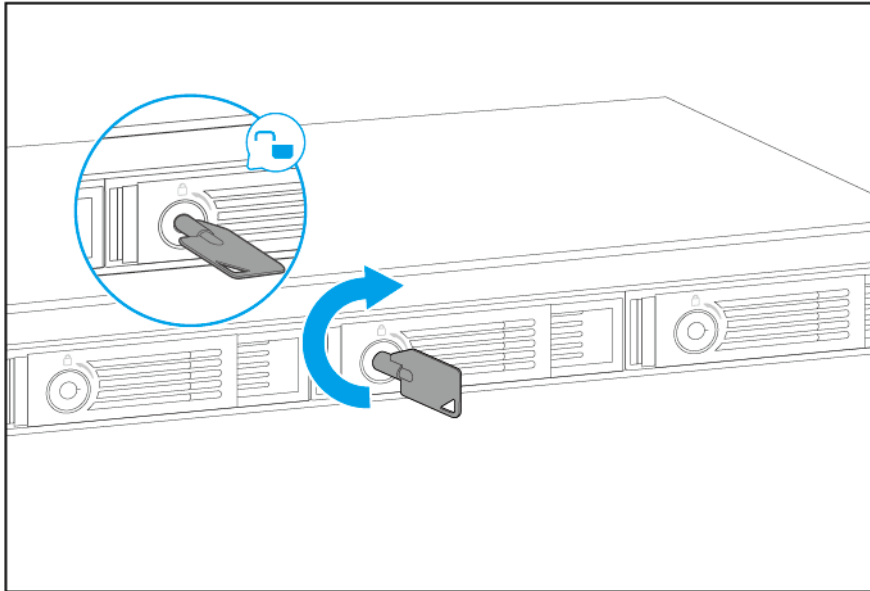


Warning

- 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.

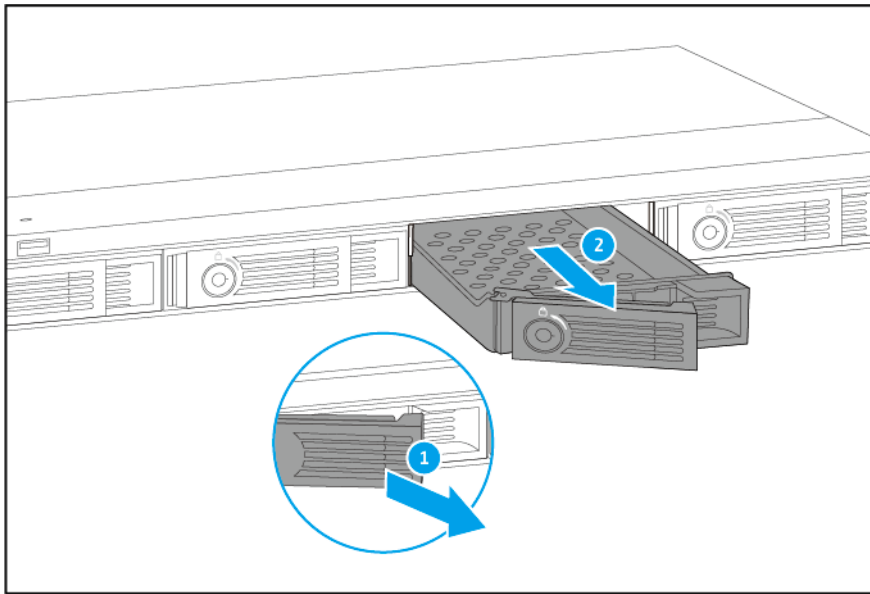
**Note**

The preinstalled drive trays come unlocked.

**Important**

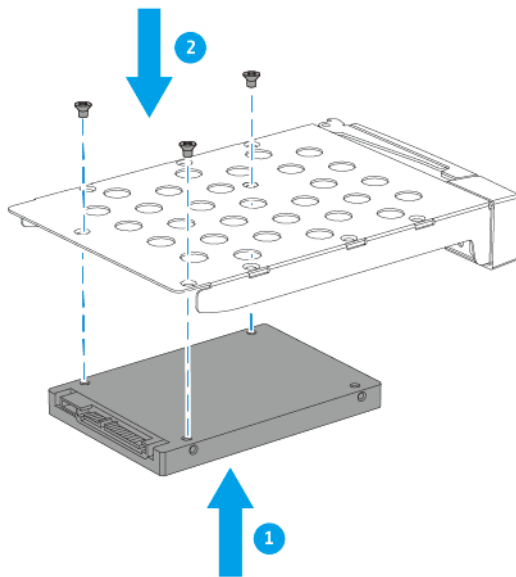
Ensure that the drive tray keys are stored in a safe place.

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



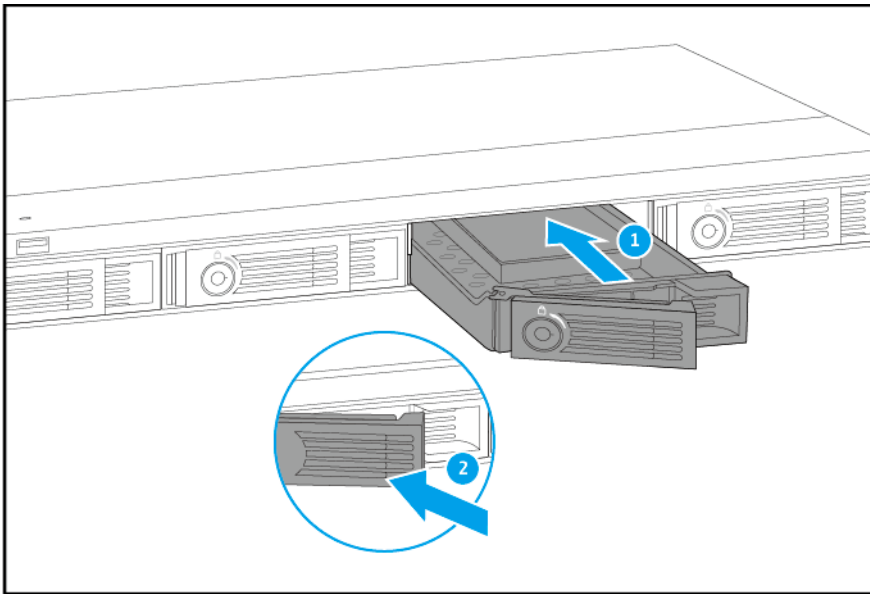
3. Install a drive on the tray.

- a. 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.
- b. Attach the screws.

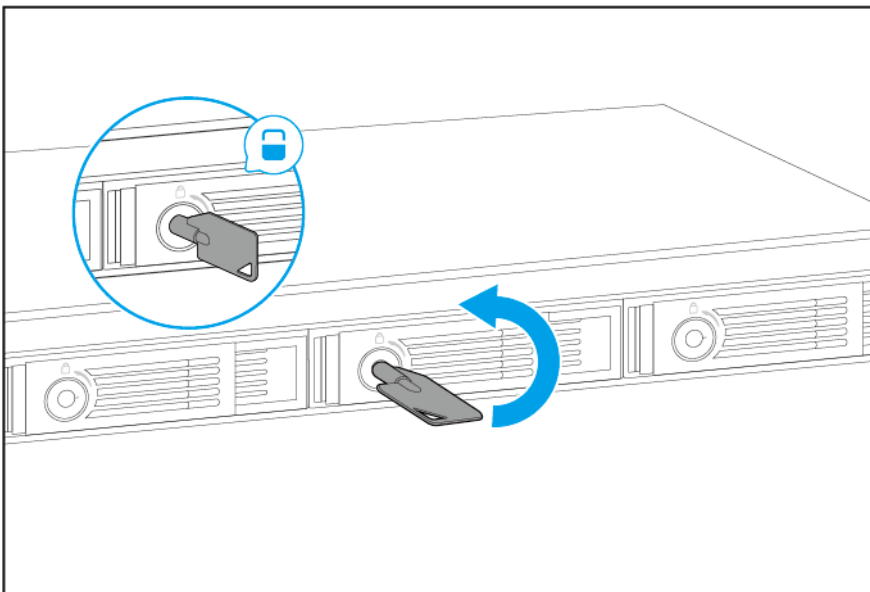


4. Load the tray into the drive bay.

- a. Insert the tray into the bay.
- b. Push the handle.



c. Optional: Lock the tray.



5. Power on the RAID enclosure.



Important

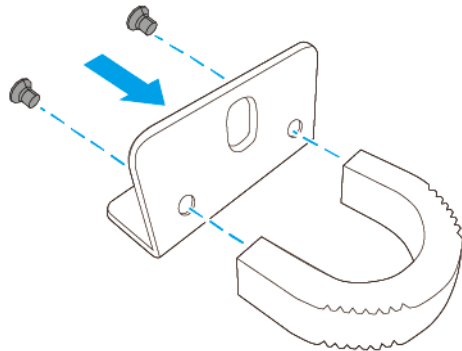
The RAID enclosure may take up to 30 seconds to detect the installation of the new drive.

Installing Handles

Installing handles enables you to better grip and secure the RAID enclosure.

1. Power off the RAID enclosure.
2. Install a handle on an angle bracket.

- a. Align the openings on the handle with the two round screw holes on the angle bracket.
- b. Attach the screws to lock the handle to the angle bracket.

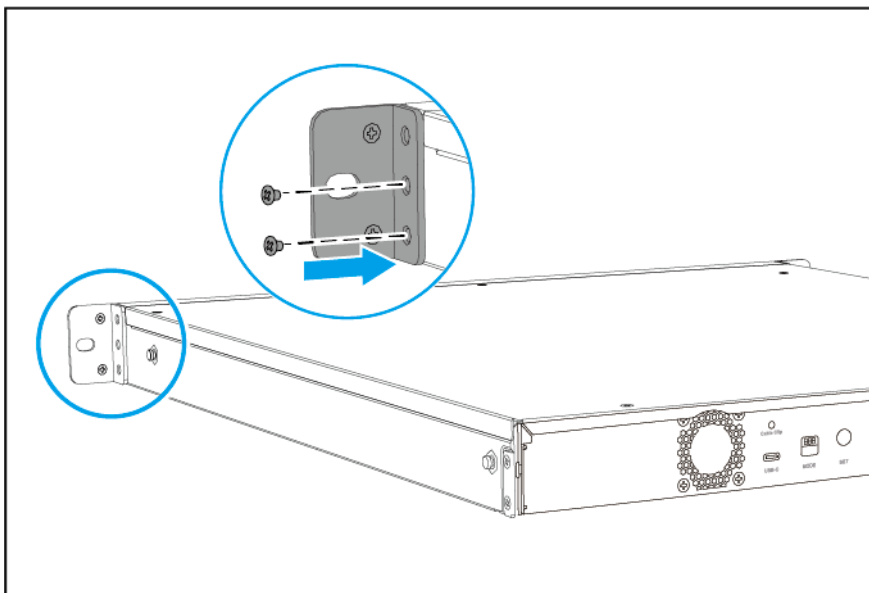


3. Install the angle bracket on the NAS.
 - a. Align the holes on the angle bracket with the holes on the chassis.



Note
Ensure that the handle faces the same direction as the front panel.

- b. Attach the screws.



4. Install a second handle on the other side of the chassis.
5. Power on the RAID enclosure.

Connecting the RAID Enclosure to a NAS

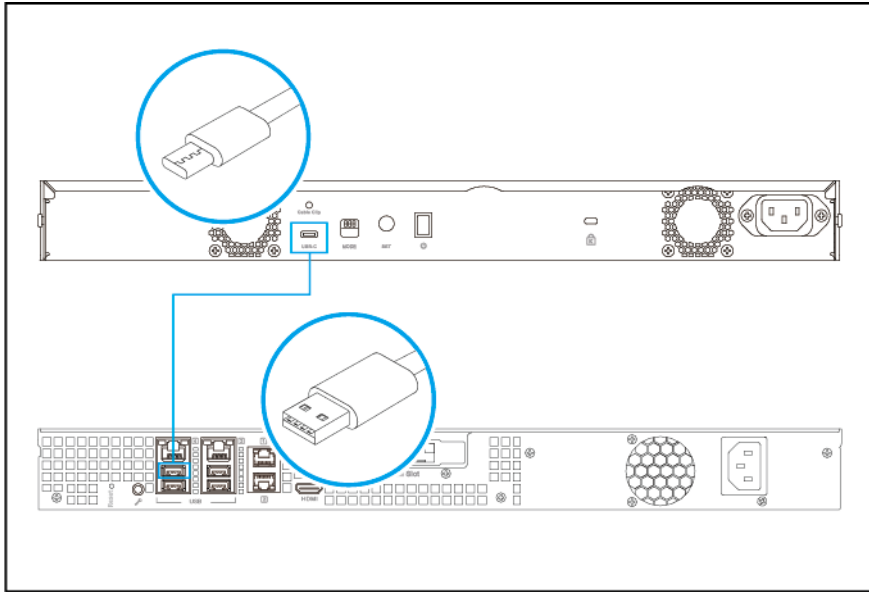
A QNAP NAS can support a maximum of two external RAID enclosures.



Warning

Boot failures may occur when disconnecting and reconnecting the external device from the host device repeatedly within a short time. QNAP recommends waiting 10 seconds before reconnecting the external device to the host device.

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 enclosure.
3. Verify that the RAID enclosure is 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 enclosure is listed.

Connecting the RAID Enclosure to a Server

A Windows, macOS, or Linux server does not limit the number of RAID enclosures it can support. However, QNAP recommends limiting the maximum number of connections to four RAID enclosures.

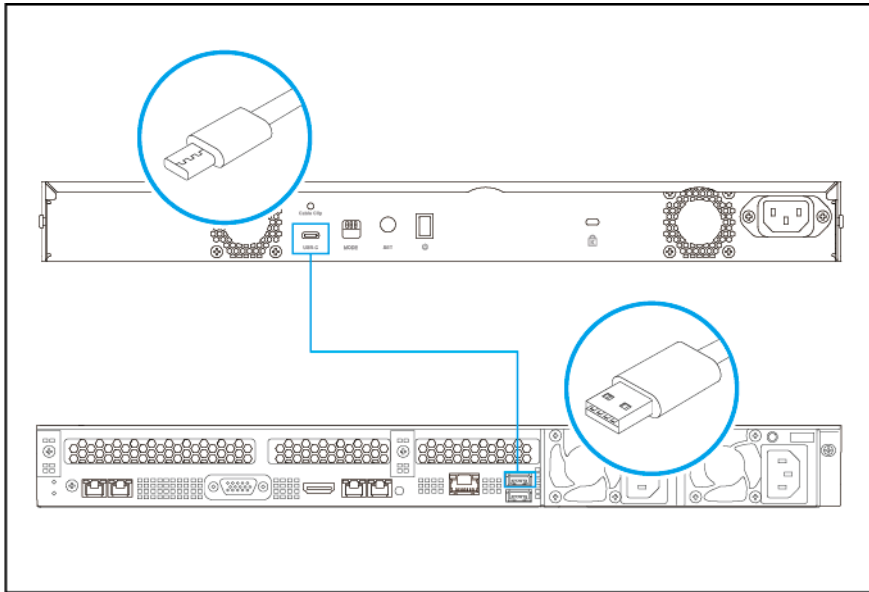


Warning

Boot failures may occur when disconnecting and reconnecting the external device from the host device repeatedly within a short time. QNAP recommends waiting 10 seconds before reconnecting the external device to the host device.

1. Connect the RAID enclosure to a server.
 - 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 server.



- c. Optional: Connect additional RAID enclosures to the server.
2. Power on the RAID enclosure.
 3. Verify that the RAID enclosure is recognized by the server.
 - a. Go to your server's disk management utility or open QNAP External RAID Manager in Windows or macOS.
 - b. Verify that the RAID enclosure is listed.

Attaching the USB Cable Clip

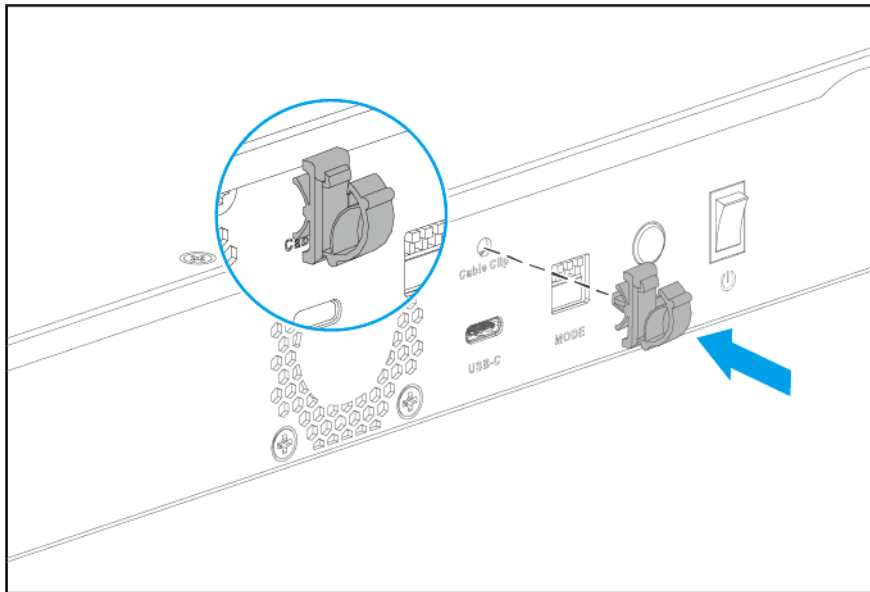


Important

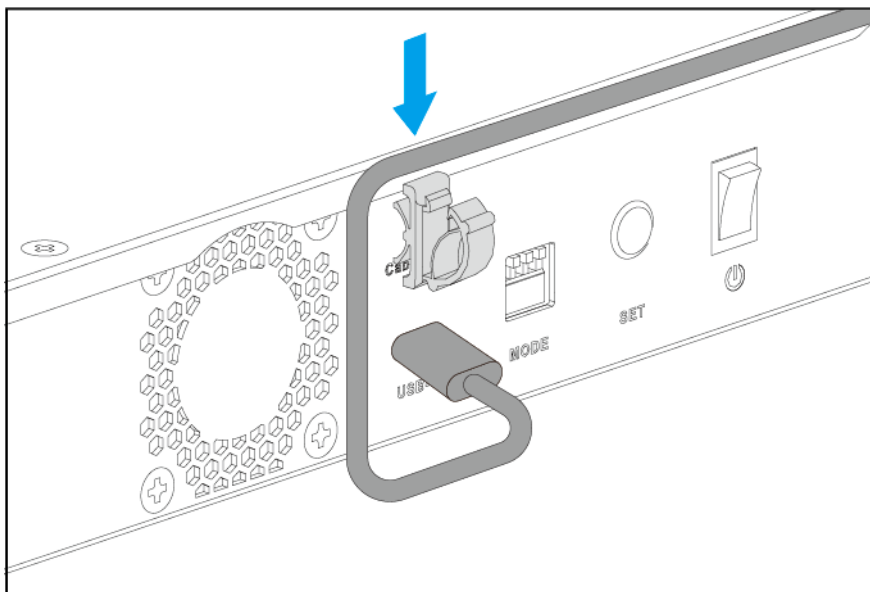
The USB cable clip keeps the cable near the enclosure to avoid potential damage to the cable or any nearby components.

The clip is not intended to be removed after attaching it to the RAID enclosure.

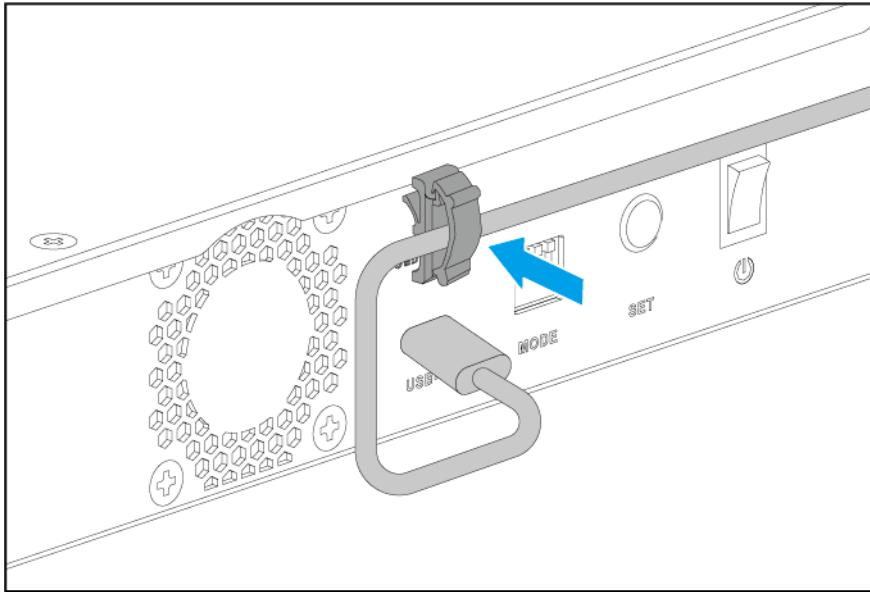
1. Insert the cable clip into the cable clip slot.



2. Insert the cable into the clip.

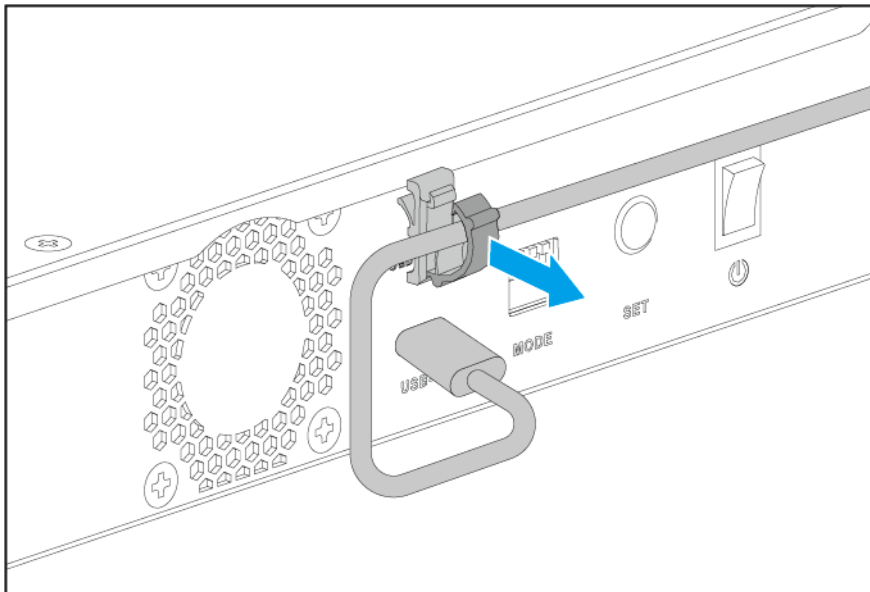


3. Fasten the clip to secure the cable.

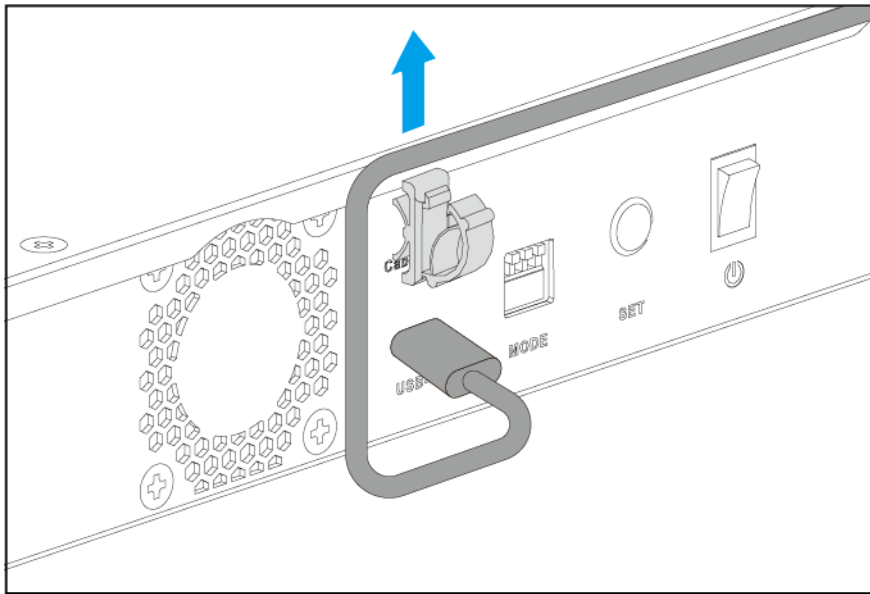


Removing a USB Cable from the USB Cable Clip

1. Release the cable clip.



2. Remove the cable from the clip.



Rail Kits

The TR-004U is compatible with the following models:

- RAIL-B02

Rail kits are not included with the RAID enclosure and must be purchased separately. For details, contact an authorized reseller or go to <http://shop.qnap.com>.

You can find installation information in the rail kit package.

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 |
|------------------------------|-----------------|---|
| JBOD (Just a Bunch of Disks) | 2 or more | <ul style="list-style-type: none"> • 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. • JBOD allows all of the disks capacity to be used, but does not provide any disk failure protection or performance benefits. • Unless you have a specific reason to use JBOD, use RAID 0 instead. |

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

Storage Modes

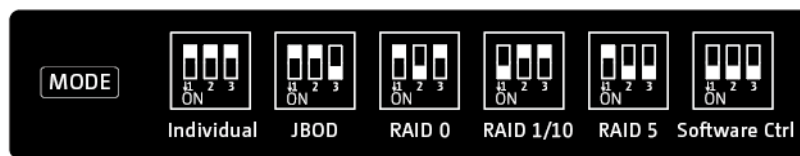
The RAID enclosure supports different storage modes for NAS devices and servers.

| Storage Mode | Description |
|------------------|---|
| NAS Storage | <p>Add storage capacity to a QNAP NAS by creating a storage pool or static volume.</p> <p>Important When using NAS expansion mode:</p> <ul style="list-style-type: none"> • The RAID enclosure must be set to Software Control mode. For details, see Mode Switch. • The RAID enclosure cannot be set to Individual mode. • The RAID enclosure cannot contain more than one RAID group. • The RAID enclosure cannot be used to expand an existing storage pool or static volume. |
| External Storage | Use the RAID enclosure as an external hardware RAID device with a NAS or a Windows, macOS, or Linux server. |

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

- QNAP recommends using only one disk type (HDD or SSD) in a RAID group. If different types of disk are combined in one RAID group, the RAID group will function according to the speed of the slowest disk.
- 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 server 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"> • JBOD • RAID 0 • RAID 1/10 • RAID 5 | QNAP external RAID enclosures provide hardware RAID support for these RAID types. For details, see Supported RAID Types . |
| Software Control | <p>This is the default factory setting. This mode allows you to configure RAID settings using QNAP External RAID Manager on Windows or macOS or using Storage & Snapshots on a QNAP NAS. Go to http://www.qnap.com/download to download QNAP External RAID Manager and supporting documentation.</p> <div style="border-left: 2px solid red; padding-left: 10px; margin-top: 10px;"> <p> Important</p> <ul style="list-style-type: none"> • At least one drive must be installed in the RAID enclosure for it to be recognized by QNAP External RAID Manager. • 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. </div> |

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

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

5. Basic Operations

This chapter describes basic operations of the external RAID enclosure.


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 | Green | The RAID enclosure is ready. |
| | Red | <ul style="list-style-type: none"> The drive is invalid. The disk volume has reached its full capacity. The disk volume is about to reach its full capacity. The system fan is not functioning. An error occurred when accessing (read/write) the data. A bad sector is detected on the hard drive. The RAID enclosure is in degraded read-only mode (two member drives failed in RAID 5 but the data can still be read). The RAID enclosure is in degraded mode (one member drive failed in RAID 1 or RAID 5). Hardware self-test error |
| | Flashes red every 2 seconds | The RAID enclosure is in standby mode, but the system is abnormal. |
| | Flashes green every 2 seconds | All drives are in standby mode. |
| | Flashes green every second | The RAID enclosure is not configured. |
| | Flashes green and red alternately every 0.5 seconds | <ul style="list-style-type: none"> The drive is being formatted. The device firmware is being updated. <div style="border-left: 2px solid red; padding-left: 10px; margin-left: 10px;">  <p>Important When updating the device firmware, do not remove the power cable, USB cable, or force-exit the application.</p> </div> <ul style="list-style-type: none"> RAID rebuilding is in progress. |
| Off | The RAID enclosure is powered off. | |
| Drive | Red | A drive read/write error occurred. |
| | Flashes red | The data is being accessed and a read/write error occurs during the process. |
| | Green | The drive can be accessed. |
| | Flashes green | <ul style="list-style-type: none"> Data is being accessed. Data is being copied. |
| | Off | All drives are in standby mode. |

| LED | Status | Description |
|-----|---------------------------|---|
| USB | Blue | <ul style="list-style-type: none"> The RAID enclosure is connected to the host. Data is finished copying. |
| | Flashes blue every second | <ul style="list-style-type: none"> Data is being copied. The device firmware is being updated. <div style="border-left: 2px solid red; padding-left: 10px; margin-top: 10px;">  <p>Important When updating the device firmware, do not remove the power cable, USB cable, or force-exit the application.</p> </div> |
| | Off | <ul style="list-style-type: none"> The RAID enclosure is not connected to the host. The RAID enclosure is ejected by the host. All drives are in standby mode. |

Audio Alert

| Duration | Frequency | Description |
|--------------------------|-----------|---|
| Short beep (0.5 seconds) | 1 | <ul style="list-style-type: none"> The RAID enclosure is starting up. The RAID enclosure is shutting down (software shutdown). The RAID settings are modified. |
| | 3 | <ul style="list-style-type: none"> The system fan is not functioning. The system or drives are overheating. The drives are in degraded mode. The user tried to copy RAID enclosure data to an external storage device, but the data cannot be copied. |
| Long beep (3 seconds) | 3 | <ul style="list-style-type: none"> The disk volume is about to reach its full capacity. The disk volume has reached its full capacity. The user started the drive rebuilding process. A drive is installed or removed. |
| | 1 | <ul style="list-style-type: none"> The RAID enclosure was powered off by forced shutdown (hardware shutdown). The RAID enclosure was powered on successfully and is ready. |

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 sleep mode if the USB power design of the host supports this feature.
- The USB cable is disconnected.

**Note**

The RAID enclosure will not enter standby mode during RAID rebuilding. If prompted to enter standby mode during RAID rebuilding, the RAID enclosure 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 External 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 | https://docs.qnap.com |
| Helpdesk | https://helpdesk.qnap.com |
| Downloads | https://download.qnap.com |
| Community Forum | https://forum.qnap.com |

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 A 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 A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.



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 A.

SJ/T 11364-2006



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