



**QNAP**

# TS-hx86

TS-h686

TS-h886

## User Guide

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# 1. Preface





## About This Guide

This guide provides information about the device 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 storage administrators. This guide assumes that the user is knowledgeable and qualified to install, maintain, and troubleshoot issues involving servers, server components, and storage systems. This guide also assumes that the user is trained to recognize hazards, including the appropriate actions the user needs to take to prevent personal injury and damage to data and property.

## 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 device.

### About the TS-hX86

The TS-hX86 series is a robust and reliable enterprise NAS powered by an Intel® Xeon® D processor, and features two PCIe slots, two M.2 SSD slots, and four Intel 2.5 GbE ports. The TS-hX86 series can help your business achieve reliable service-level agreement performances, including mission-critical file servers, virtualization servers, collaborative video editing, or efficient data backup and recovery applications.

### 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](#).




#### Tip

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

Ordering P/N	CPU	Memory	Power supply
TS-h686-D1602-8G	Intel® Xeon® D-1602	8 GB	Single
TS-h886-D1622-16G	Intel® Xeon® D-1622	16 GB	Single

Component	TS-h686-D1602-8G	TS-h886-D1622-16G
Processor		
CPU	Intel® Xeon® D-1602	Intel® Xeon® D-1622
Frequency	Dual-core/4-thread 2.5 GHz/3.2 GHz turbo	4-core/8-thread 2.6 GHz/3.2 GHz turbo
Architecture	x86 64-bit	
Encryption engine	AES-NI	
Memory		
Pre-installed memory	8 GB RAM: 2 x 4 GB ECC DDR4 UDIMM	16 GB: 2 x 8 GB ECC DDR4 UDIMM
Memory slots	4 x Long-DIMM DDR4	
	 <b>Important</b> Use only QNAP memory modules to maintain system performance and stability. For NAS devices with more than one memory slot, use QNAP modules with identical specifications. Using unsupported modules may degrade performance, cause errors, or prevent the operating system from starting.	
Maximum memory	128 GB RAM: 4 x 32 GB	

Component	TS-h686-D1602-8G	TS-h886-D1622-16G
Flash memory	5 GB (dual-boot OS protection)	
Storage		
Drive bays	<ul style="list-style-type: none"> <li>• 4 x 3.5-inch SATA 6 Gbps</li> <li>• 2 x 2.5-inch SATA 6 Gbps</li> </ul>	<ul style="list-style-type: none"> <li>• 6 x 3.5-inch SATA 6 Gbps</li> <li>• 2 x 2.5-inch SATA 6 Gbps</li> </ul>
Drive compatibility	3.5-inch bays: <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> 2.5-inch bays: <ul style="list-style-type: none"> <li>• 2.5-inch SATA hard disk drives</li> <li>• 2.5-inch SATA solid-state drives</li> </ul>	
M.2 SSD slots	2 x PCIe Gen 3 x4 NVMe	
M.2 SSD form factor	<ul style="list-style-type: none"> <li>• 2280</li> <li>• 22110</li> </ul>	
SSD cache acceleration support	Supported.	
Hot-swapping	The device supports hot-swapping for all drives.	
Network		
2.5 Gigabit Ethernet ports	4 x 2.5 GbE RJ45	
Wake-on-LAN	Yes (GbE RJ45)	
External I/O Ports & Expansion Slots		
PCIe slots	<ul style="list-style-type: none"> <li>• 2 x PCIe 3.0 x8</li> </ul>	
USB ports	3 x USB 3.2 Gen 1 Type-A <ul style="list-style-type: none"> <li>• Front:               <ul style="list-style-type: none"> <li>• 1 x USB 3.2 Gen 1 One Touch Copy Type-A</li> </ul> </li> <li>• Rear:               <ul style="list-style-type: none"> <li>• 2 x USB 3.2 Gen 1 Type-A</li> </ul> </li> </ul>	
Interface		
Display panel	-	Monochrome backlit LCD display
Buttons	<ul style="list-style-type: none"> <li>• Power</li> <li>• Reset</li> <li>• USB One Touch Copy</li> </ul>	
Dimensions		
Form factor	Tower	
Dimensions (H x W x D)	231.9 × 224.9 × 319.8 mm (9.13 x 8.85 x 12.59 in)	231.9 × 292.8 × 319.8 mm (9.13 x 11.53 x 12.59 in)
Net weight	7.27 kg (16.03 lbs)	8.5 kg (18.74 lbs)

Component	TS-h686-D1602-8G	TS-h886-D1622-16G
Others		
Power supply unit	250W, 100-240V AC, 50/60 Hz	
System battery	CR2032 lithium battery (3V, 225 mAh)	
Sound level	18.6 dB(A)	20.4 dB(A)
	 <b>Note</b> The sound level was tested at a bystander position, which is within one meter of the NAS. The test NAS operated at low speed with the maximum number of drives installed.	
Fans	<ul style="list-style-type: none"> <li>• System: 1 x 80 mm, 12V DC fan</li> <li>• CPU: 1 x 97 mm, 12V DC smart fan</li> </ul>	<ul style="list-style-type: none"> <li>• System: 2 x 80 mm, 12V DC fan</li> <li>• CPU: 1 x 97 mm, 12V DC smart fan</li> </ul>
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	

**Note**

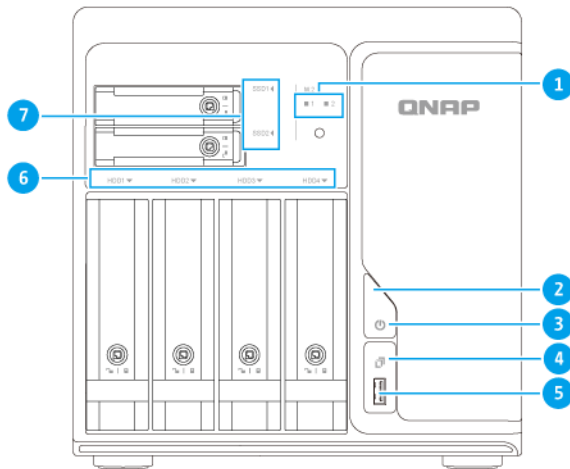
For the list of compatible drive models, go to <https://www.qnap.com/compatibility>.

## Package Contents

Item	Quantity
TS-hX86 NAS	1
Power cord	1
Ethernet cables	2 x 1GbE (Cat 5e)
Drive tray keys	2
Screws for 2.5-inch drives	TS-h686: 12 TS-h886: 18
Screws for 3.5-inch drives	TS-h686: 12 TS-h886: 18
Heatsinks	2
Quick Installation Guide (QIG)	1

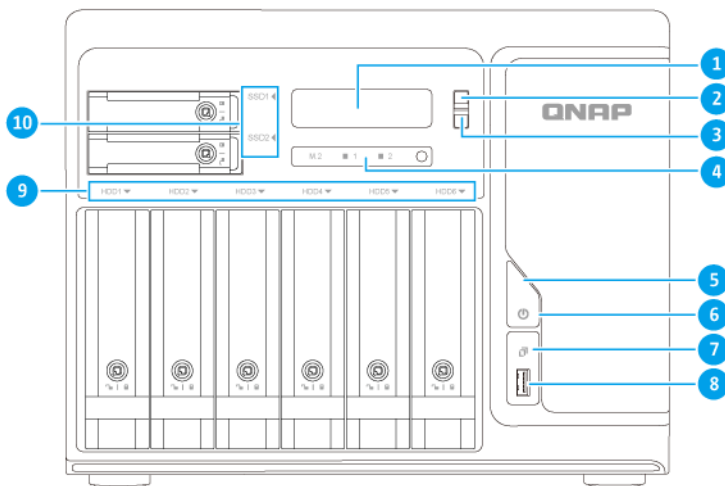
## Components

## Front Panel



### TS-h686

No.	Component	No.	Component
1	M.2 SSD LEDs	5	USB 3.2 Gen 2 One Touch Copy Type-A port
2	Power button	6	Drive LEDs
3	Power LED	7	SSD LEDs
4	USB One Touch Copy button	8	-



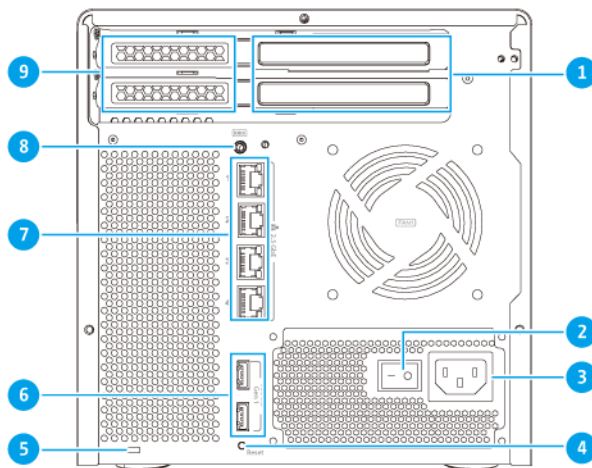
### TS-h886

No.	Component	No.	Component
1	LCD panel	6	Power LED




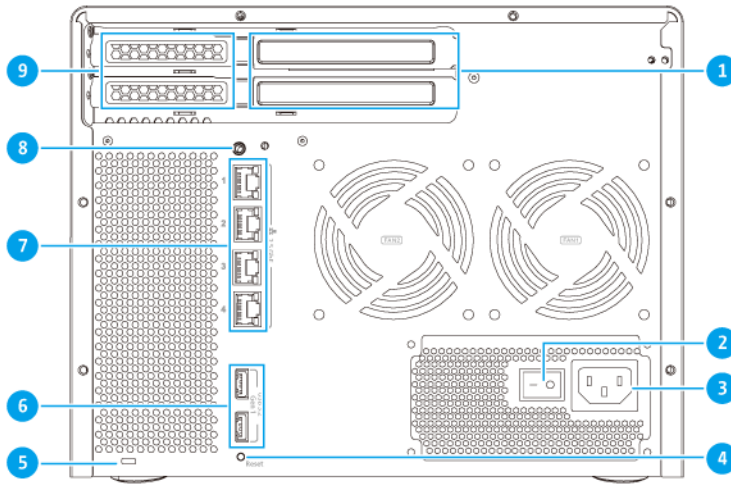
No.	Component	No.	Component
2	Enter button	7	USB One Touch Copy button
3	Select button	8	USB 3.2 Gen 2 One Touch Copy Type-A port
4	M.2 SSD LEDs	9	Drive LEDs
5	Power button	10	SSD LEDs

## Rear Panel




## TS-h686

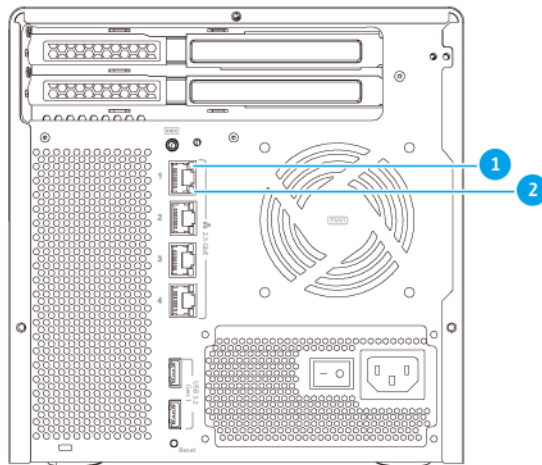
No.	Component	No.	Component
1	PCIe full-height covers	6	USB 3.2 Gen 1 Type-A ports
2	PSU power switch	7	2.5 Gigabit Ethernet ports (RJ45)
3	Power input	8	Com port
			 <b>Note</b> This port is only for engineering purposes.
4	Reset button	9	PCIe low-profile covers
5	Kensington security slot	-	-



**TS-h886**

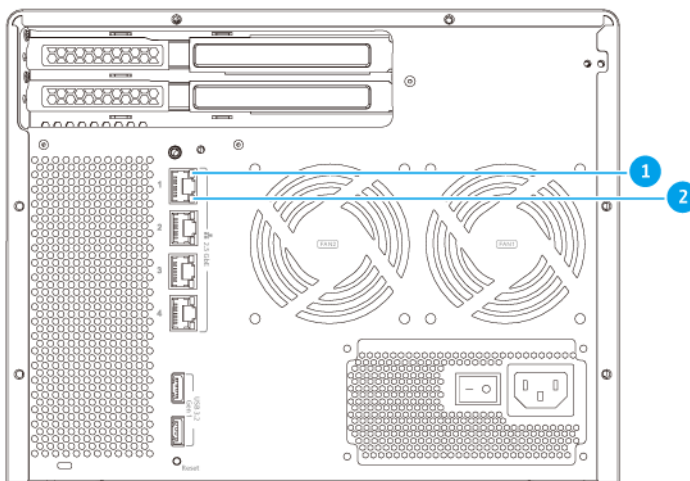
No.	Component	No.	Component
1	PCIe full-height covers	6	USB 3.2 Gen 1 Type-A ports
2	PSU power switch	7	2.5 Gigabit Ethernet ports (RJ45)
3	Power input	8	Com port
4	Reset button		 <b>Note</b> This port is only for engineering purposes.
5	Kensington security slot	9	
		-	-

## Rear Panel LEDs



### TS-h686

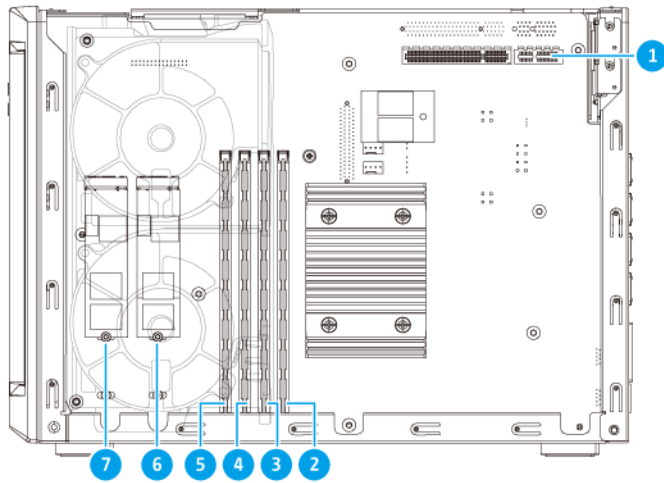
No.	Component	No.	Component
1	2.5 Gigabit Ethernet speed LED	2	2.5 Gigabit Ethernet activity LED



### TS-h886

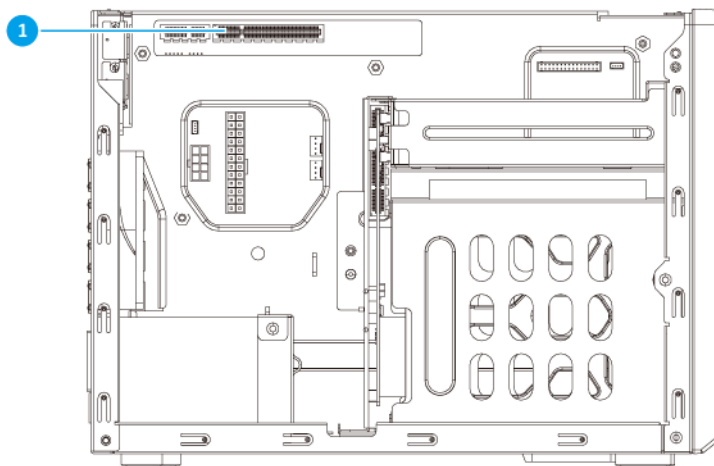
No.	Component	No.	Component
1	2.5 Gigabit Ethernet speed LED	2	2.5 Gigabit Ethernet activity LED

## Right Panel



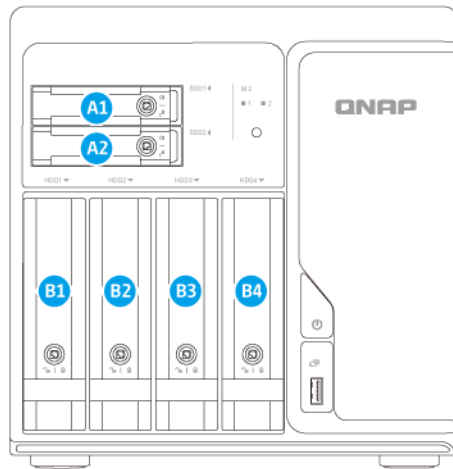
No.	Component	No.	Component
1	PCIe 3.0 x8	5	Memory slot 1
2	Memory slot 4	6	M.2 SSD slot 1
3	Memory slot 3	7	M.2 SSD slot 2
4	Memory slot 2	-	-

## Left Panel



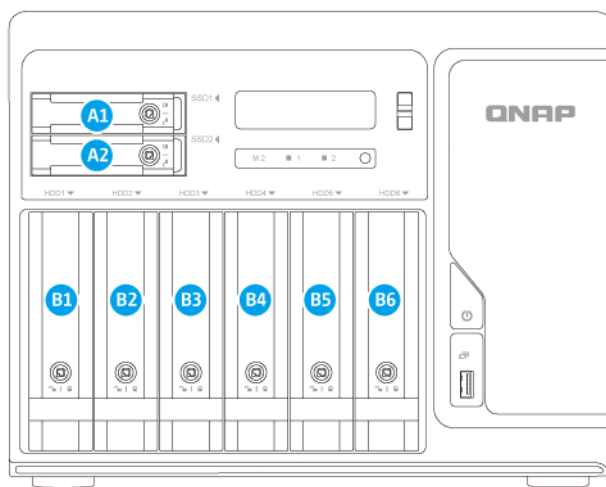
No.	Component	No.	Component
1	PCIe 3.0 x8	-	-

## Drive Numbering



### TS-h686

Drive Label	Drive Type	Compatible Drives
A1 to A2	2.5-inch SATA	<ul style="list-style-type: none"> <li>• 2.5-inch SATA 6 Gbps hard disk drives</li> <li>• 2.5-inch SATA 6 Gbps solid-state drives</li> </ul>
B1 to B4	3.5-inch SATA	<ul style="list-style-type: none"> <li>• 3.5-inch SATA 6 Gbps hard disk drives</li> <li>• 2.5-inch SATA 6 Gbps hard disk drives</li> <li>• 2.5-inch SATA 6 Gbps solid-state drives</li> </ul>



### TS-h886

Drive Label	Drive Type	Compatible Drives
A1 to A2	2.5-inch SATA	<ul style="list-style-type: none"> <li>• 2.5-inch SATA 6 Gbps hard disk drives</li> <li>• 2.5-inch SATA 6 Gbps solid-state drives</li> </ul>
B1 to B6	3.5-inch SATA	<ul style="list-style-type: none"> <li>• 3.5-inch SATA 6 Gbps hard disk drives</li> <li>• 2.5-inch SATA 6 Gbps hard disk drives</li> <li>• 2.5-inch SATA 6 Gbps solid-state drives</li> </ul>

## 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"> <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> <li>Free from objects that may obstruct NAS ventilation or apply pressure to the NAS or power cord</li> <li>Restricted access               <ul style="list-style-type: none"> <li>The NAS 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.</li> <li>Only qualified, trained, and authorized NAS administrators with knowledge of all restrictions, safety precautions, and installation and maintenance procedures should have physical access to the NAS.</li> </ul> </li> </ul>
Hardware and peripherals	<ul style="list-style-type: none"> <li>Storage drives For the list of compatible drive models, go to <a href="https://www.qnap.com/compatibility">https://www.qnap.com/compatibility</a>.</li> <li>Network 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 NAS



### Important

Read all safety requirements and information in [Safety Information](#) carefully before setting up the NAS or installing NAS components.

- Place your NAS device 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 Hard Drives on 3.5-inch Trays](#)

- [Installing 2.5-inch Hard Drives or Solid-State Drives on 3.5-inch Trays](#)
- [Installing 2.5-inch Solid-State Drives on 2.5-inch Trays](#)
- [Installing M.2 Solid-State Drives](#)

For the list of compatible drive models, go to <https://www.qnap.com/compatibility>.

3. Optional: Install expansion cards.  
For details, see [Installing Expansion Cards](#).
4. Connect the NAS to the network.
5. Optional: Connect the expansion units.  
For details, see [Connecting USB Expansion Units](#).
6. Connect the power cord and all applicable cables.
7. Power on the NAS.  
For details, see [Front Panel](#).
8. Install QuTS hero.  
For details, see [QuTS hero Installation](#).
9. Log on to QuTS hero.



## 3. Installation and Configuration

This chapter provides specific hardware and firmware installation and configuration steps.

### Hardware Installation

This section provides information on installing drives, memory modules, and expansion cards.

### Drive Installation

The TS-hX86 series is compatible with 3.5-inch and 2.5-inch hard drives, 2.5-inch solid state drives, and M.2 SSD drives.

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



#### Warning

- Installing a drive deletes all data on the drive.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.
- 



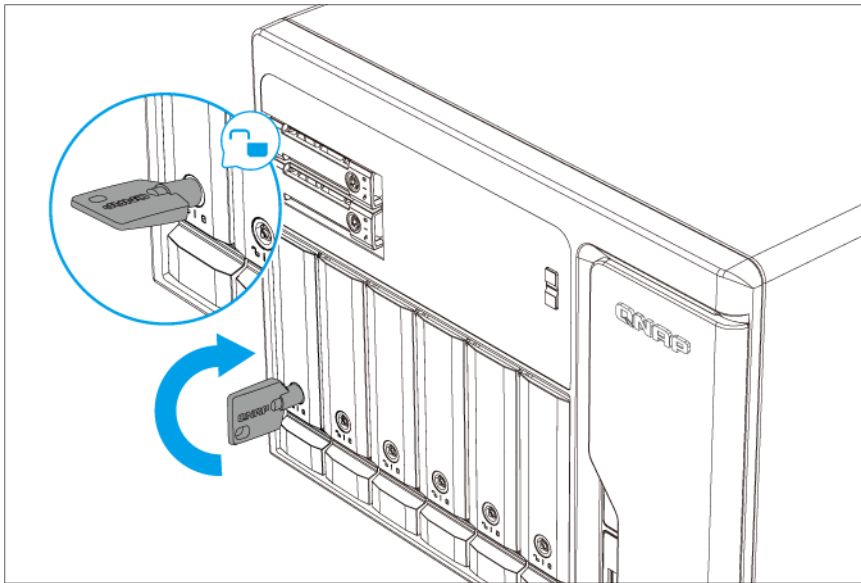
**Moving fan blades:** Keep your hands and other body parts away from moving fan blades.

- 

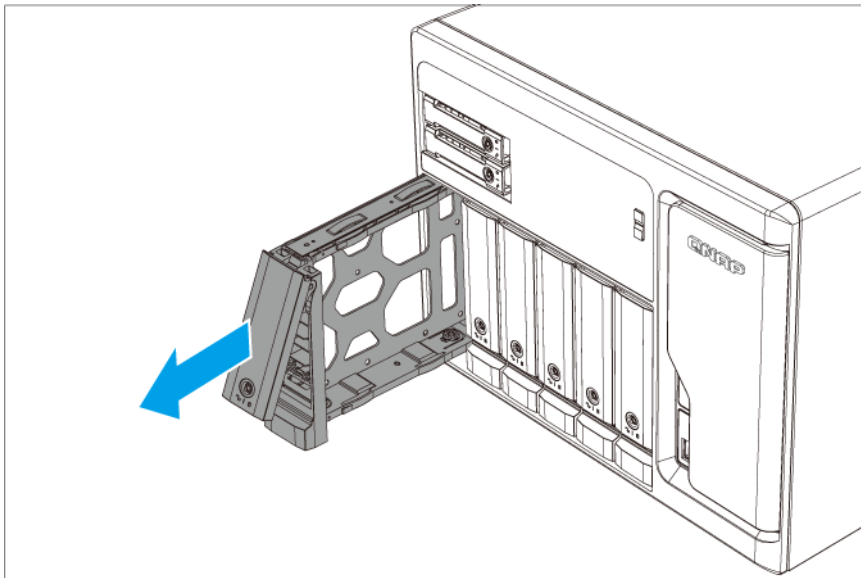


**Other moving components:** Keep your hands and other body parts away from other moving components.

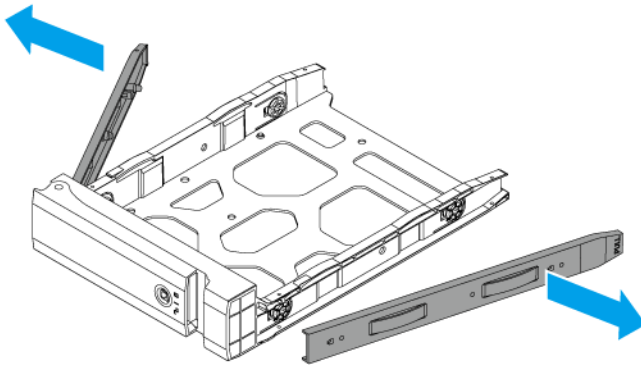
1. Power off the NAS.
2. Remove the drive tray.
  - a. Unlock the tray.



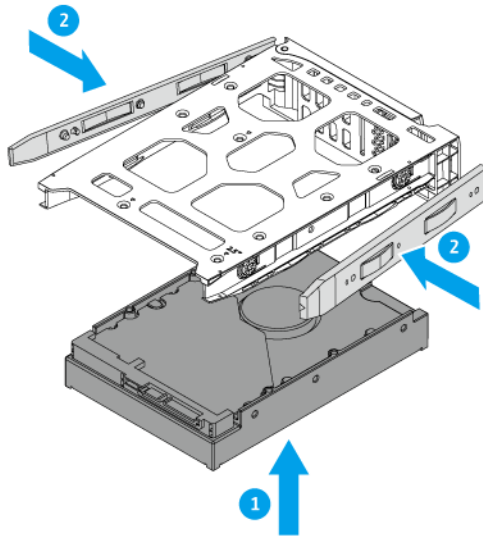
- b.** Slide the lock down.
- c.** Pull the handle to release the tray.
- d.** Pull the tray out.



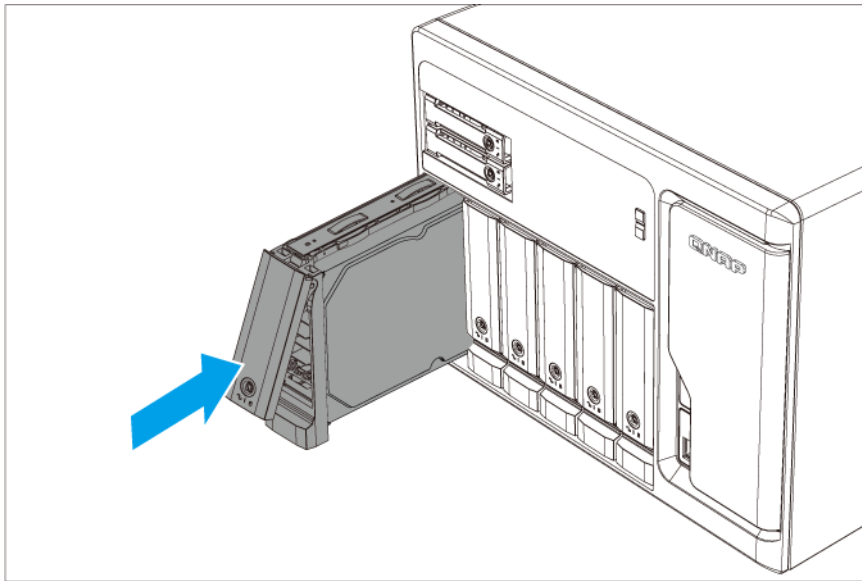
- 3.** Install a drive on the tray.
  - a.** Remove the fastening panels from the sides of the drive tray.



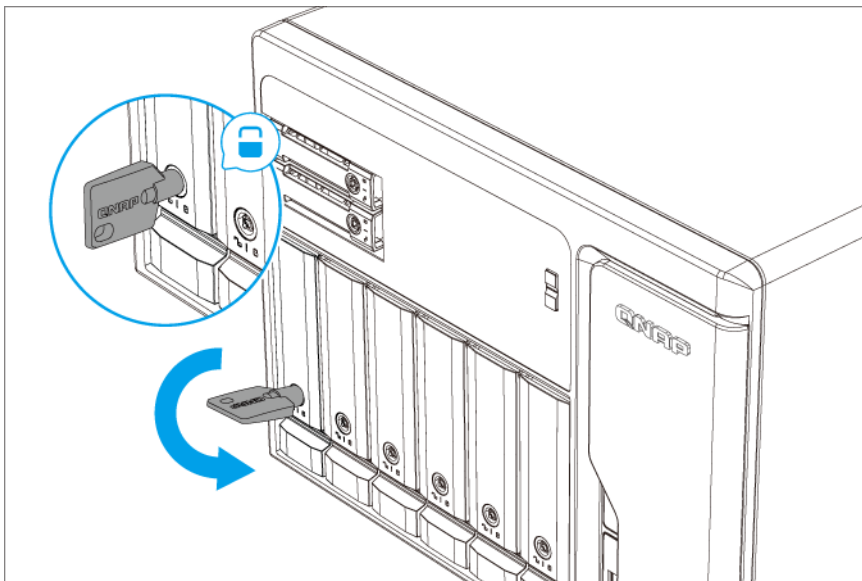
- b.** Place the drive on the tray so that the holes on the sides of the drive are aligned with the holes on the sides of the tray.
- c.** Attach the fastening panels to lock the drive to the tray.



- d.** Optional: Attach the screws to further secure the drive.
- 4.** Load the tray into the bay.
- a.** Insert the tray into the bay.



- b. Push the handle.
- c. Slide the lock up.
- d. Lock the tray.



5. Power on the NAS.

### Installing 2.5-inch Hard Drives or Solid-State Drives on 3.5-inch Trays



#### Warning

- Installing a drive deletes all data on the drive.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

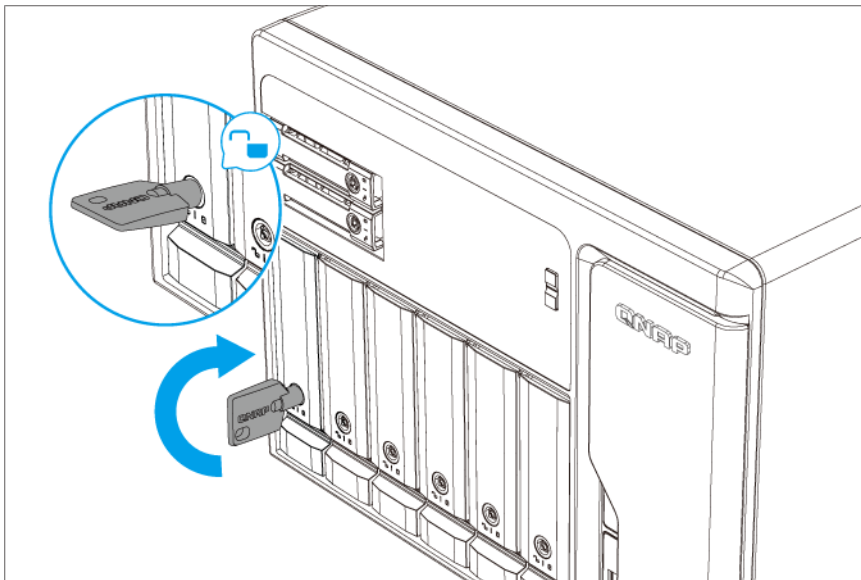


**Moving fan blades:** Keep your hands and other body parts away from moving fan blades.

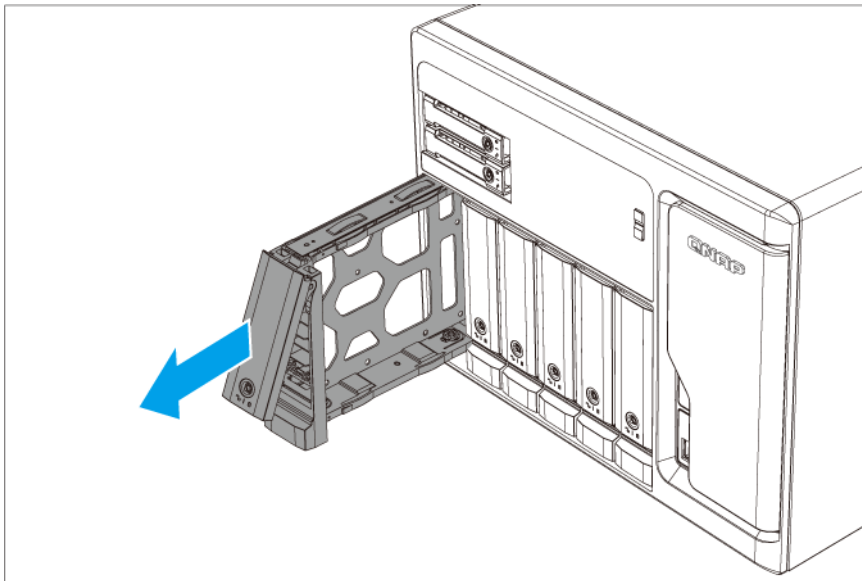


**Other moving components:** Keep your hands and other body parts away from other moving components.

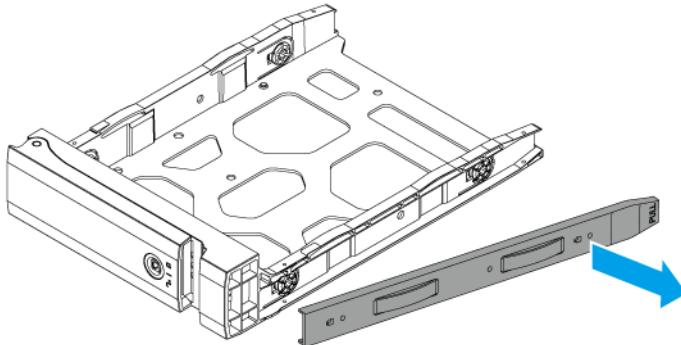
1. Power off the NAS.
2. Remove the drive tray.
  - a. Unlock the tray.



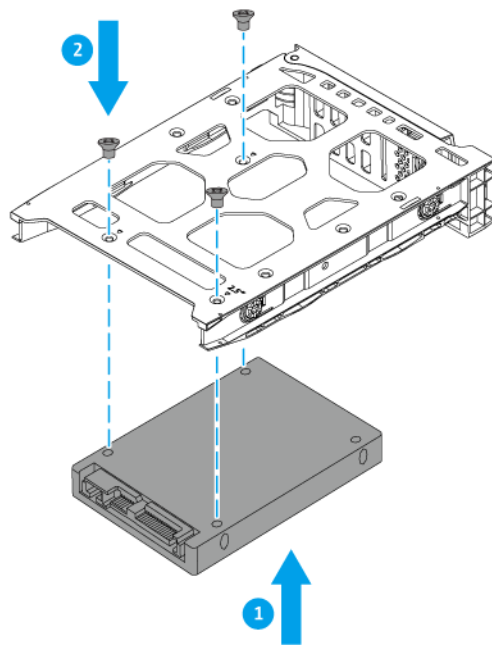
- b. Slide the lock down.
- c. Pull the handle to release the tray.
- d. Pull the tray out.



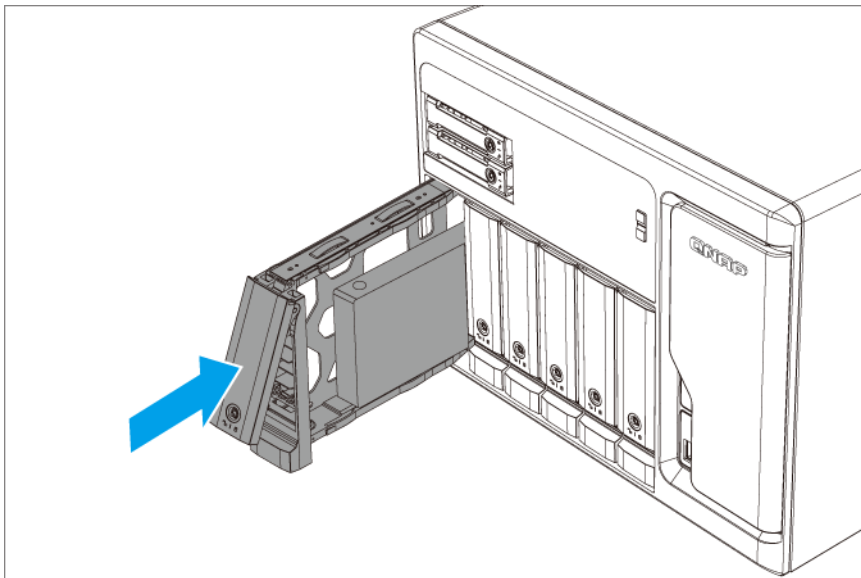
3. Install a drive on the tray.
  - a. Remove the right fastening panel from the drive tray.



- 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.

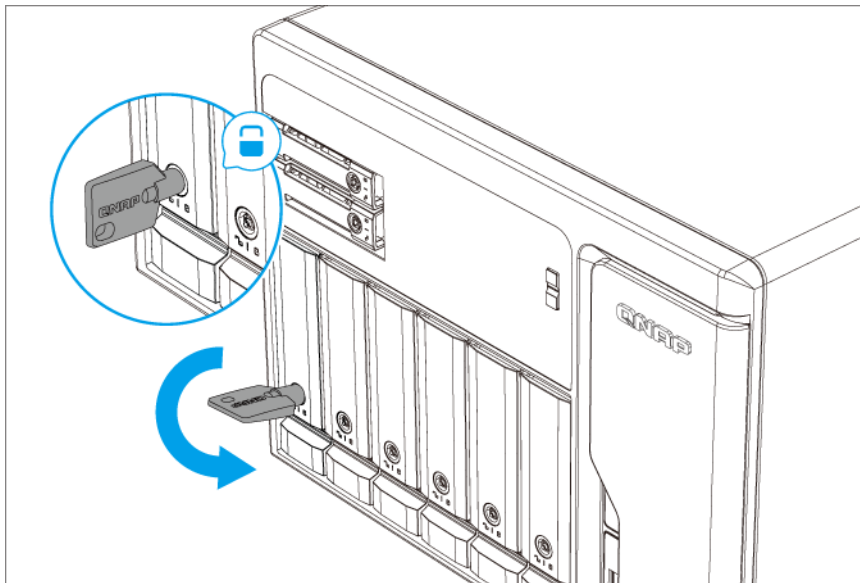


4. Load the tray into the bay.
  - a. Insert the tray into the bay.



- b. Push the handle.
    - c. Slide the lock up.

- d. Lock the tray.



5. Power on the NAS.

## Installing 2.5-inch Solid-State Drives on 2.5-inch Trays



### Warning

- Installing a drive deletes all data on the drive.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

- 



**Moving fan blades:** Keep your hands and other body parts away from moving fan blades.

- 

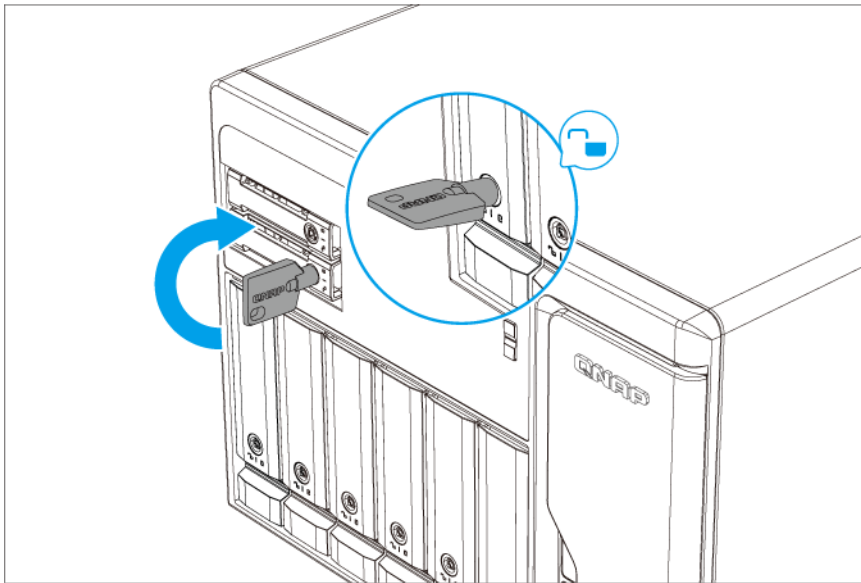


**Other moving components:** Keep your hands and other body parts away from other moving components.

1. Power off the NAS.
2. Remove the drive tray.
  - a. Unlock the tray.
  - b. Slide the lock to the right.
  - c. Pull the handle to release the tray.

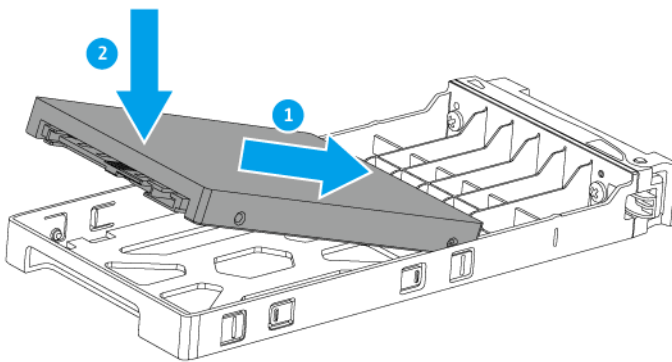


- d. Pull the tray out.



3. Install a drive on the tray.

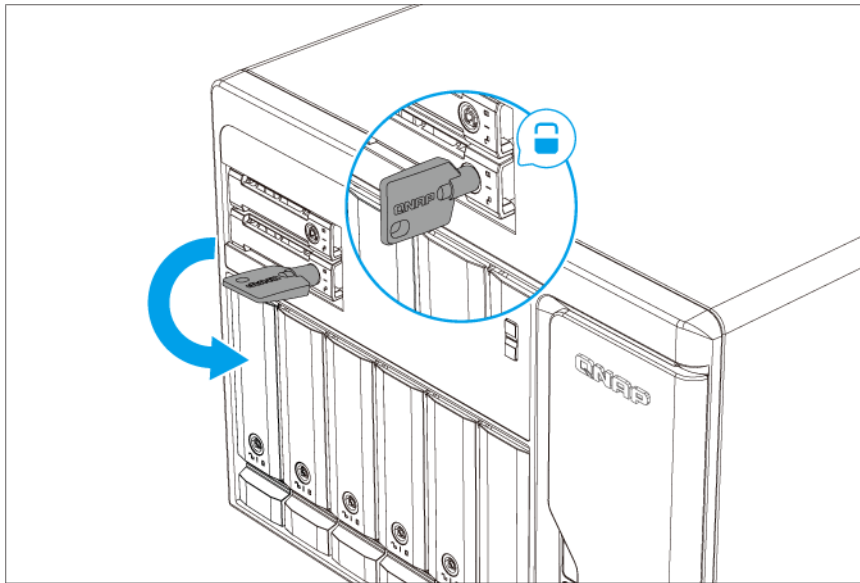
- a. Place the drive on the tray so that the holes on the bottom of the drive are aligned with the holes on the bottom of the tray.



- b. Attach the screws.

4. Load the tray into the bay.

- a. Insert the tray into the bay.



- b. Push the handle.
- c. Slide the lock up.
- d. Lock the tray.

5. Power on the NAS.

### Installing M.2 Solid-State Drives

The TS-hX86 series has two M.2 SSD slots on the **Right Panel**. For a list of compatible M.2 SSDs, go to <http://www.qnap.com/compatibility>.



#### Warning

- Installing a drive deletes all data on the drive.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

•



**Moving fan blades:** Keep your hands and other body parts away from moving fan blades.

•

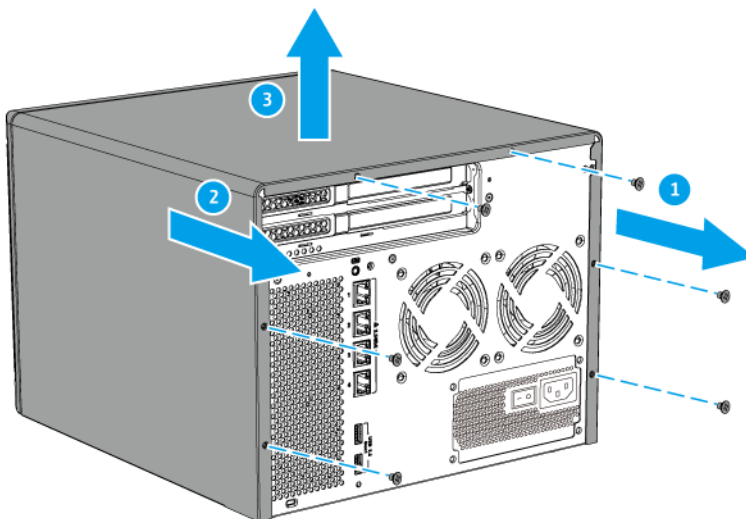


**Other moving components:** Keep your hands and other body parts away from other moving components.

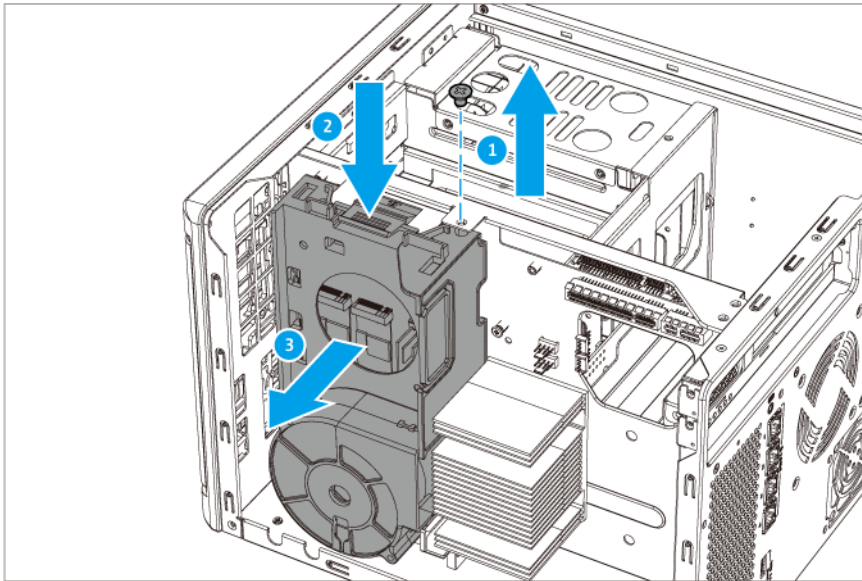
**Note**

- QNAP recommends installing heatsinks on the M.2 SSD controllers to enhance cooling efficiency and to ensure consistent performance.
- Before installing non-QNAP heatsinks, ensure that they are of the appropriate size and shape.

1. Power off the device.
2. Disconnect the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the case cover.
  - a. Loosen the screws.
  - b. Slide the cover back.
  - c. Lift the cover off the device.



5. Remove the fan module.
  - a. Disconnect the fan cable from the system board.
  - b. Remove the screw that secures the module to the chassis.
  - c. Press the clip and then pull the module away from the system board.



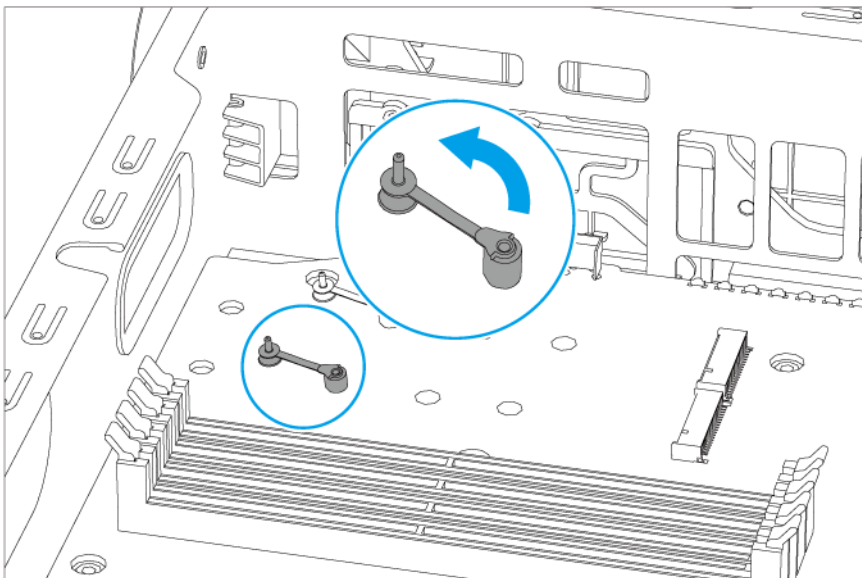
6. Install a heatsink on the M.2 SSD.
  - a. Locate the controller on the M.2 SSD.



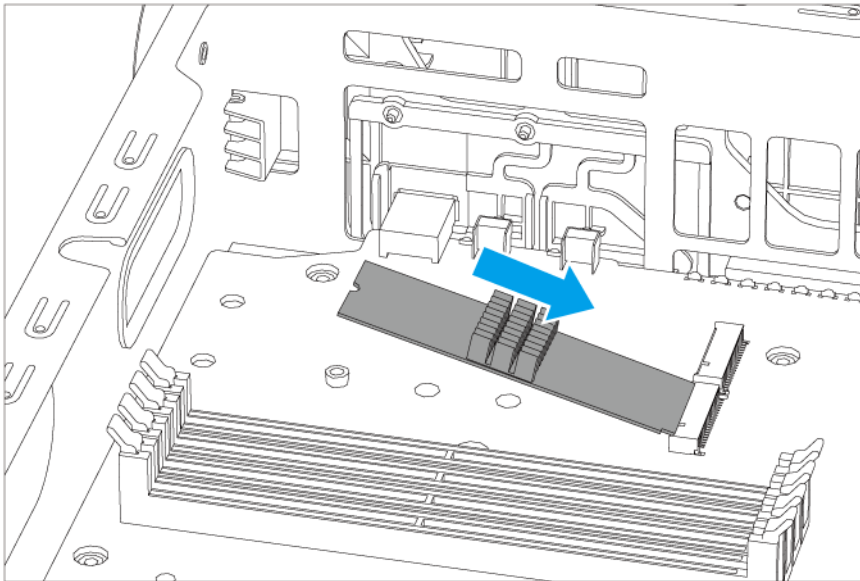
**Note**

The controller location varies depending on the model and manufacturer of the M.2 SSD. For details, refer to the documentation or contact the manufacturer.

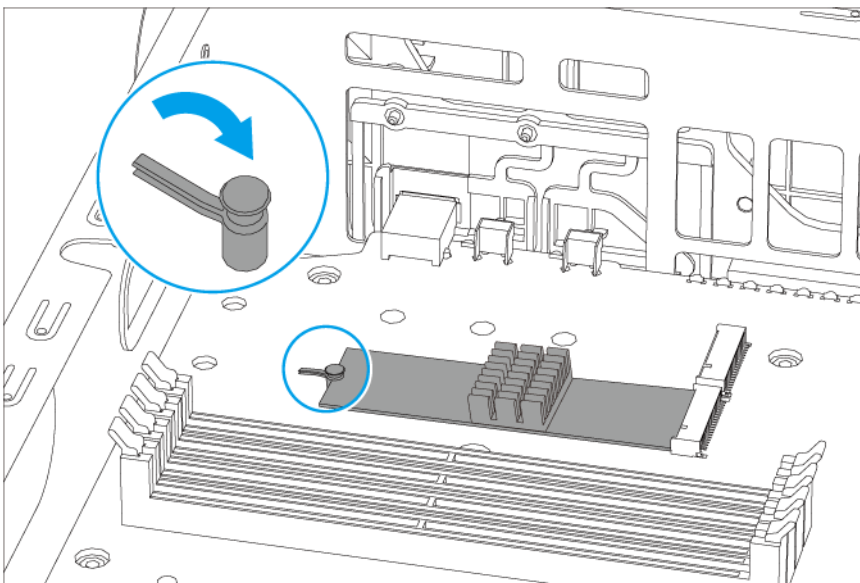
7. Install the M.2 SSD.
  - a. Pull out the pushpin.



- b. Insert the M.2 SSD into the slot.



c. Insert the pushpin to secure the drive.



**Note**

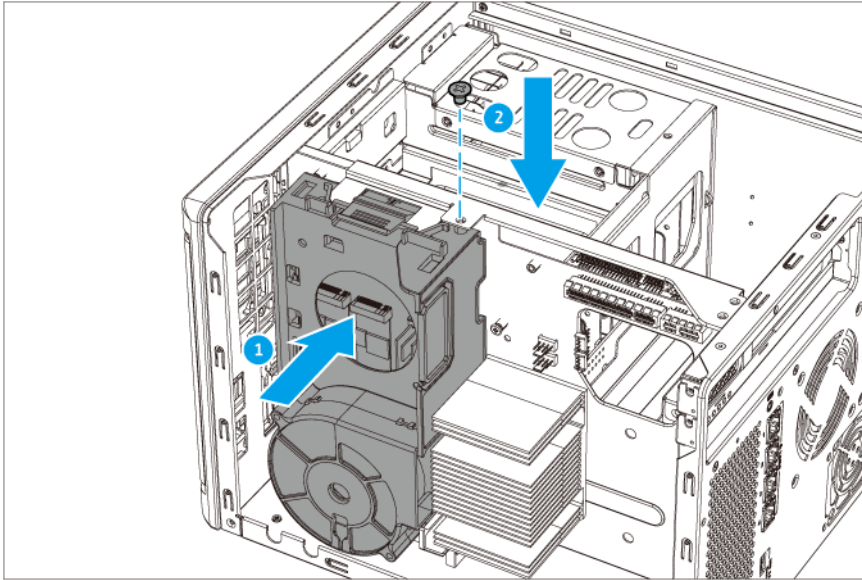
For M.2 2110 SSDs, change the position of the pushpin first.

1. Turn the pushpin counter clockwise.
2. Pull out the pushpin, then insert the pushpin into the new position.
3. Turn the pushpin clockwise.

8. Attach the fan module.

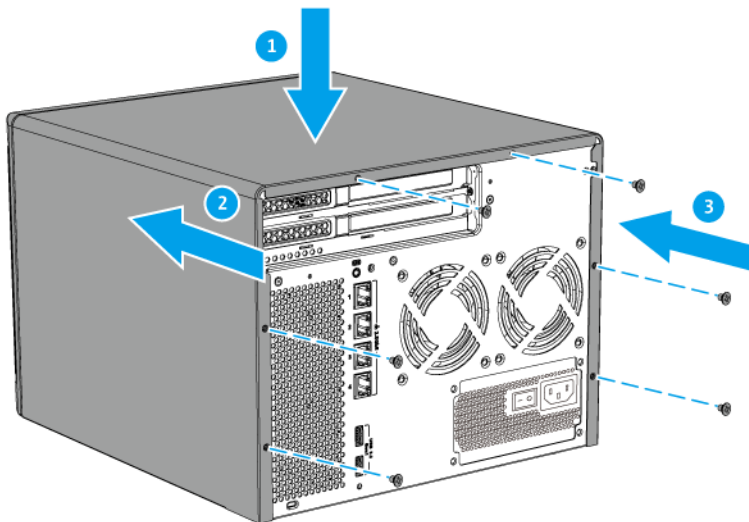
- a. Align the protruding part of the module with the hole on the chassis below the M.2 SSD slot.
- b. Push the module toward the system board until the clip locks the module into place.

c. Attach the screws.



9. Attach the case cover.

- a. Place the cover on the device.
- b. Slide the cover forward.
- c. Tighten the screws.



10. Connect all cables and external attachments.
11. Connect the power cord to the electrical outlet.
12. Power on the device.

## Installing Expansion Cards

The TS-hX86 series supports selected expansion cards, some of which require QNAP PCIe brackets. QNAP-branded expansion cards purchased from the company website are shipped with the brackets necessary to fit the TS-hX86 series.



### Warning

- Only qualified personnel should perform the following steps. Failure to follow instructions can result in serious injury or death.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

- 



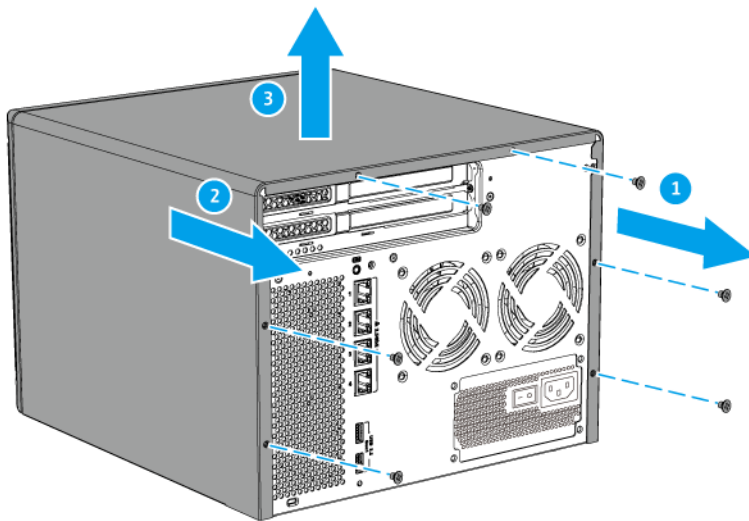
**Moving fan blades:** Keep your hands and other body parts away from moving fan blades.

- 



**Other moving components:** Keep your hands and other body parts away from other moving components.

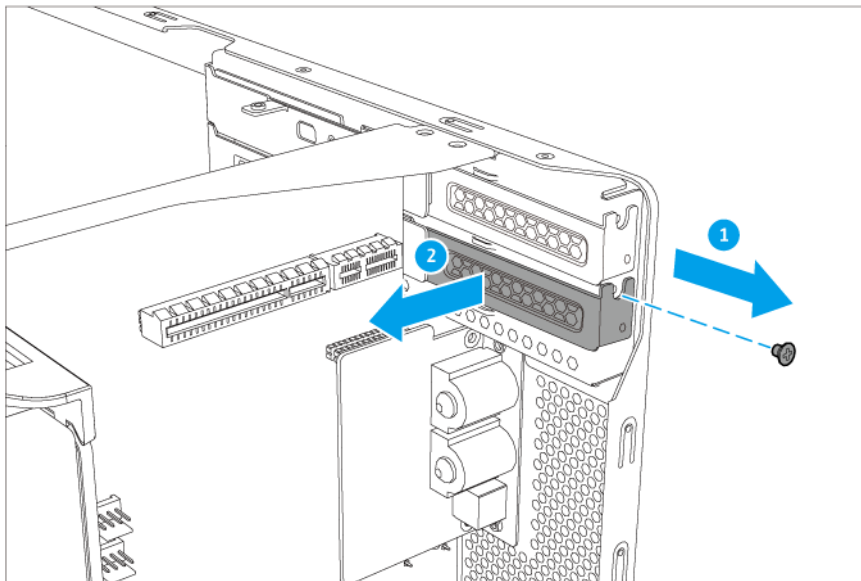
1. Power off the device.
2. Disconnect the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the case cover.
  - a. Loosen the screws.
  - b. Slide the cover back.
  - c. Lift the cover off the device.



**5. Remove the PCIe cover.**

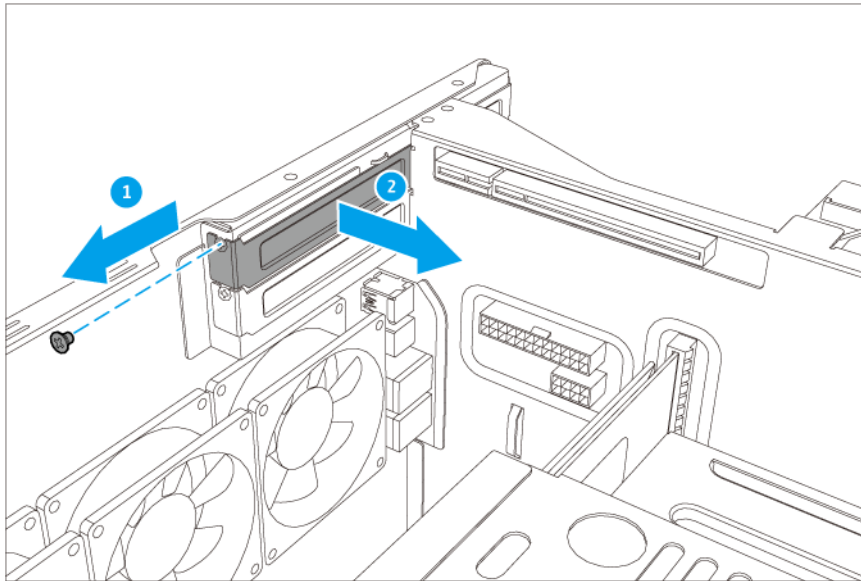
**a. Remove the screw that secures the cover to the bracket.**

**b. Pull the cover away from the slot.**  
Right Panel

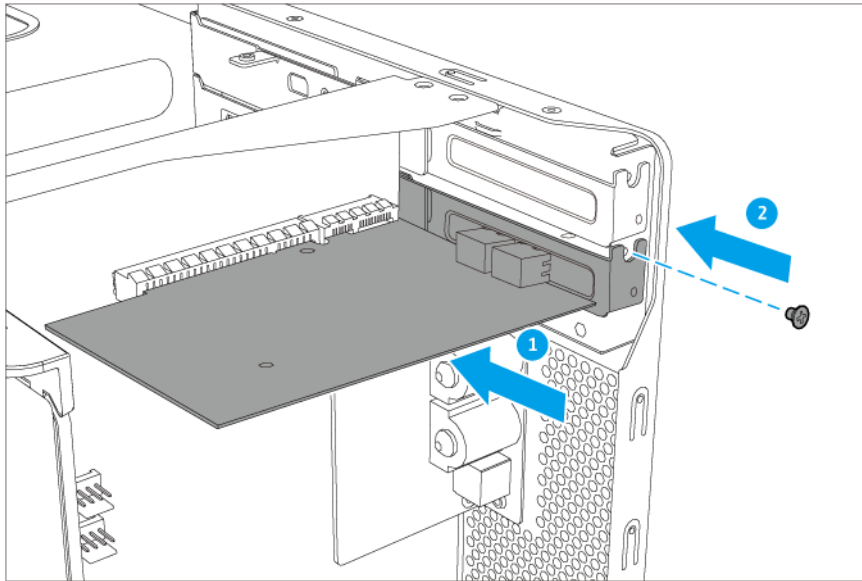


Left Panel

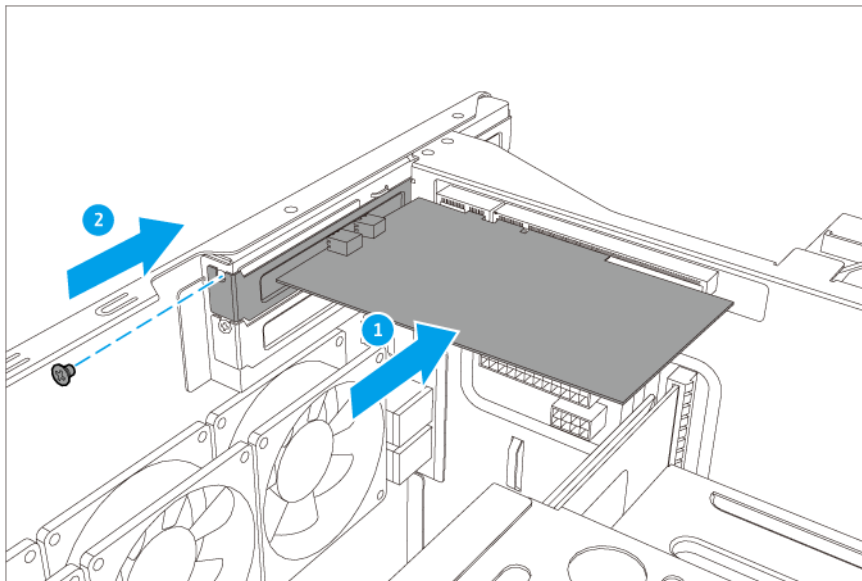




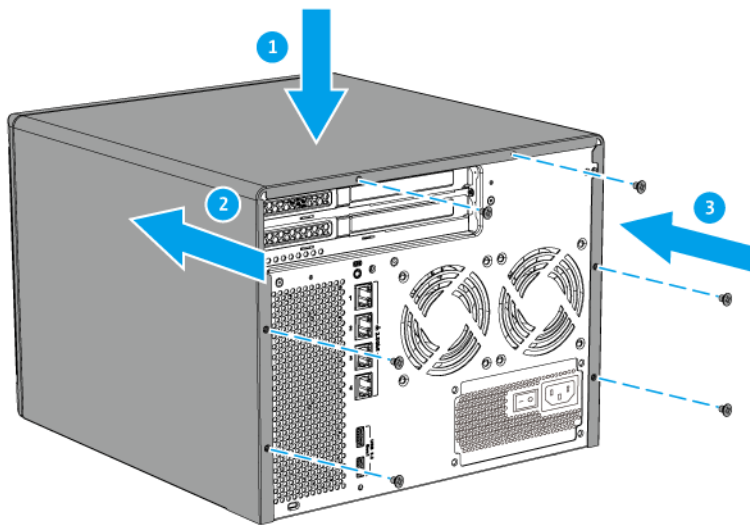
6. Optional: Attach the QNAP bracket to the expansion card.
  - a. Remove all screws of the existing bracket.
  - b. Carefully pull the bracket away from the card.
  - c. Attach the QNAP bracket to the card using the same screws.
  - d. Verify that the bracket does not move.
7. Install the expansion card.
  - a. Hold the card by the edges.
  - b. Insert the card into the slot.
  - c. Attach the screw.  
Right Panel



Left Panel



8. Attach the case cover.
  - a. Place the cover on the device.
  - b. Slide the cover forward.
  - c. Tighten the screws.



9. Connect all cables and external attachments.
10. Connect the power cord to the electrical outlet.
11. Power on the NAS.

## Replacing Memory Modules

The TS-hX86 series has four memory slots. You can increase the memory capacity of the NAS by upgrading memory modules. For optimal quad-channel performance, replace memory modules in all four slots at the same time.

Use only QNAP modules of the same type and capacity to maintain system performance and stability. You can purchase QNAP memory modules from authorized resellers.



### Important

QNAP recommends installing modules in pairs.

- Ensure that all four modules are identical.
- Install the pairs in sequence and follow the assigned slots for each pair.
- 

For details on slot numbering, see [Right Panel](#).

Module Pair	Slot Number
First pair	Slots 1 and 3
Second pair	Slots 2 and 4



### Warning

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

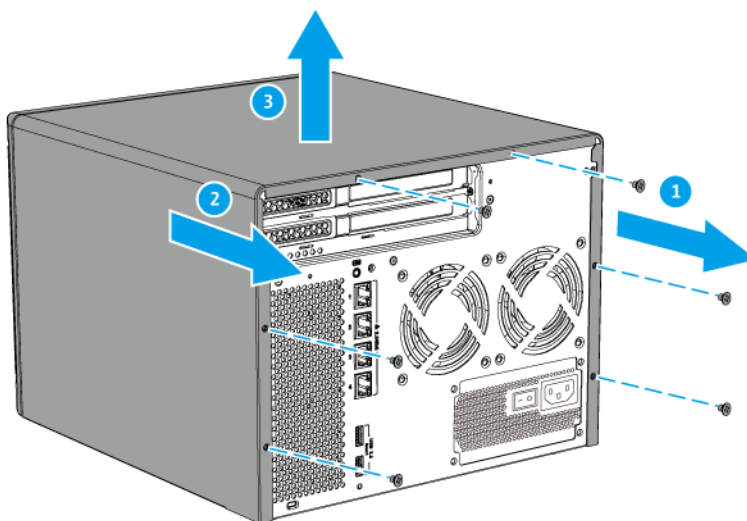


**Moving fan blades:** Keep your hands and other body parts away from moving fan blades.

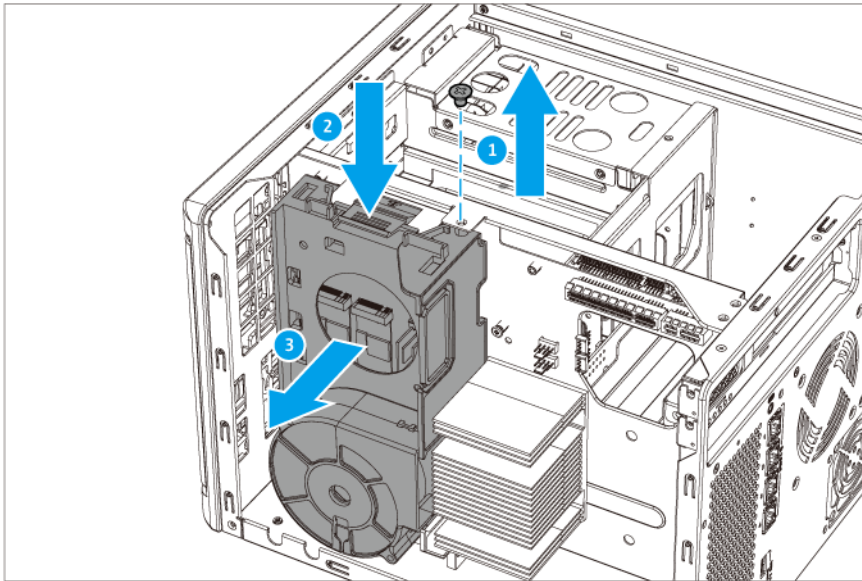


**Other moving components:** Keep your hands and other body parts away from other moving components.

1. Power off the device.
2. Disconnect the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the case cover.
  - a. Loosen the screws.
  - b. Slide the cover back.
  - c. Lift the cover off the device.



5. Remove the fan module.
  - a. Disconnect the fan cable from the system board.
  - b. Remove the screw that secures the module to the chassis.
  - c. Press the clip and then pull the module away from the system board.



6. Remove an existing module.

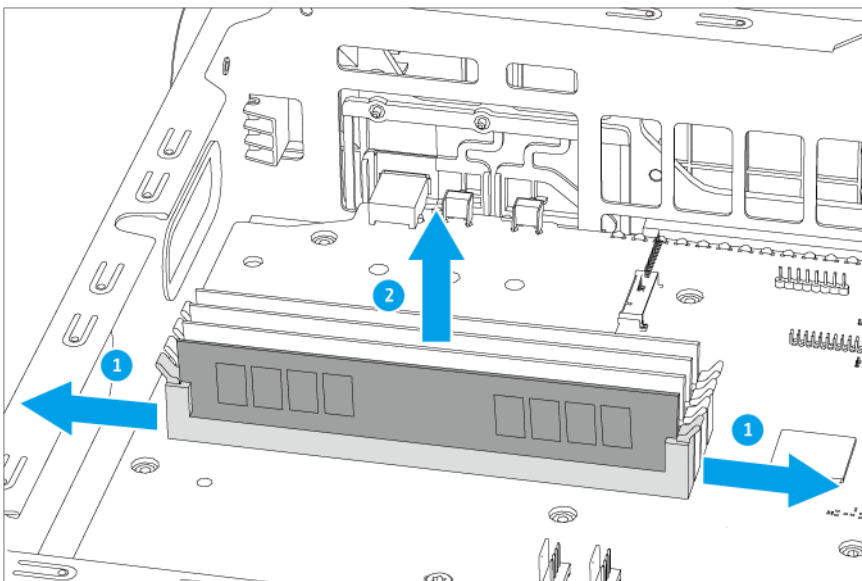
- a. Push the retention clips outward simultaneously to release the module.
- b. Verify that the module has tilted upward and is completely released from the slot.



**Warning**

Attempting to remove a module that is not completely released may damage the module and the motherboard.

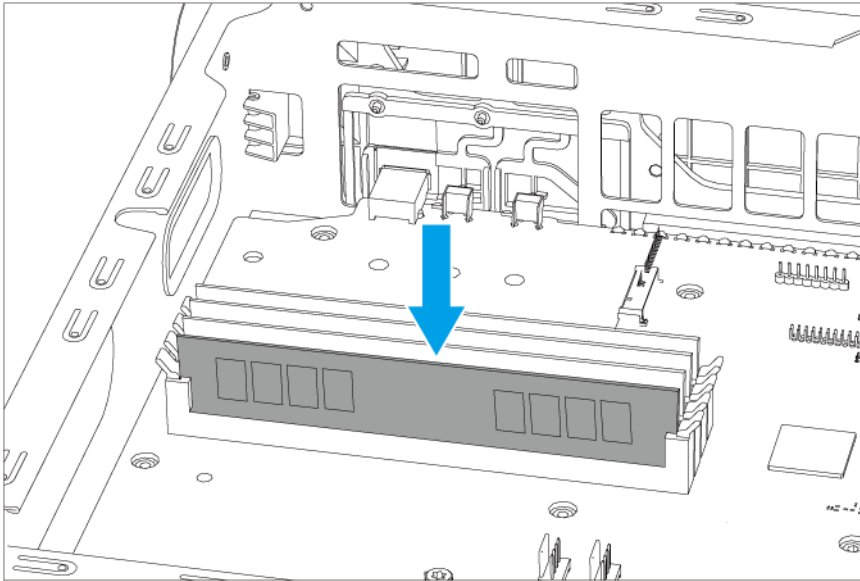
- c. Hold the module by the edges.
- d. Carefully slide the module out of the slot.



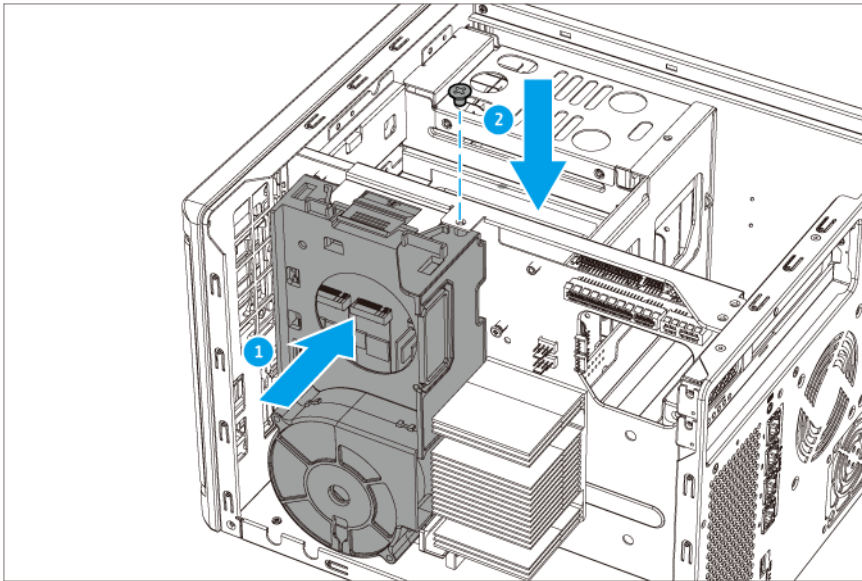
**Warning**

- Do not touch the internal components, particularly the metal connectors.
- Do not bend the module.

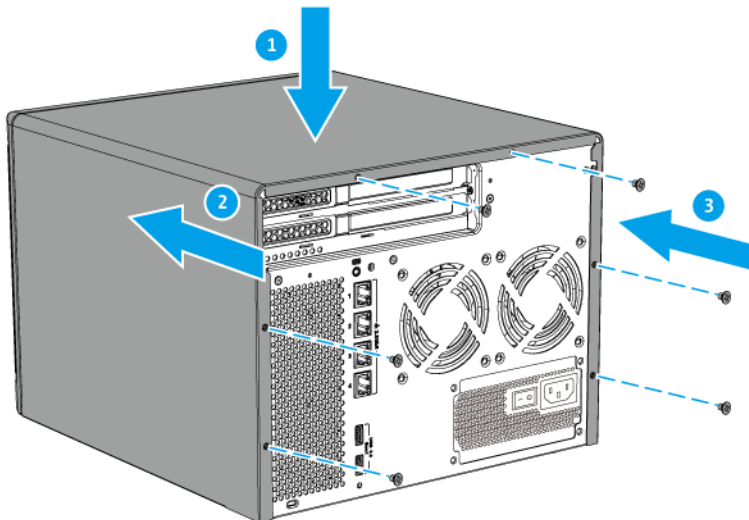
7. Install a new module.
  - a. Align the notch with the ridge in the slot.
  - b. Insert the module into the slot.



- c. Verify that the metal connectors are completely inserted into the slot.
  - d. Carefully press down on the module until the retention clips lock the module into place.
8. Attach the fan module.
    - a. Align the protruding part of the module with the hole on the chassis below the M.2 SSD slot.
    - b. Push the module toward the system board until the clip locks the module into place.
    - c. Attach the screws.



9. Attach the case cover.
  - a. Place the cover on the device.
  - b. Slide the cover forward.
  - c. Tighten the screws.



## Expansion Unit Installation

The TS-hX86 series supports USB expansion units. Refer to the following table for details.

You can purchase storage expansion accessories from QNAP or an authorized reseller.

For details, go to <https://shop.qnap.com/>.

For the list of compatible expansion units and the maximum number of applicable expansion units, go to <http://www.qnap.com/go/compatibility-expansion>.

Expansion Unit Model	Description	Required Accessories
TL-D400S	<ul style="list-style-type: none"> <li>• Uses a SAS 6 Gbps (SFF-8088) interface</li> <li>• Supports SATA/HDD/SSD</li> </ul>	<ul style="list-style-type: none"> <li>• 1 x SFF-8088 connector cable</li> <li>• QXP-400eS-A1164 host bus adapter</li> </ul>
TL-D800S	<ul style="list-style-type: none"> <li>• Uses a SAS 6 Gbps (SFF-8088) interface</li> <li>• Supports SATA/HDD/SSD</li> </ul>	<ul style="list-style-type: none"> <li>• 2 x SFF-8088 connector cables</li> <li>• QXP-800eS-A1164 host bus adapter</li> </ul>
TL-D1600S	<ul style="list-style-type: none"> <li>• Uses a SAS 6 Gbps (SFF-8088) interface</li> <li>• Supports SATA/HDD/SSD</li> </ul>	<ul style="list-style-type: none"> <li>• 4 x SFF-8088 to SFF-8644 connector cables</li> <li>• QXP-1600eS host bus adapter</li> </ul>
TL-R400S	<ul style="list-style-type: none"> <li>• Uses a SAS 6 Gbps (SFF-8088) interface</li> <li>• Supports SATA/HDD/SSD</li> </ul>	<ul style="list-style-type: none"> <li>• 1 x SFF-8088 connector cable</li> <li>• QXP-400eS-A1164 host bus adapter</li> <li>• RAIL-B02</li> </ul>
TL-R1200S-RP	<ul style="list-style-type: none"> <li>• Uses a SAS 6 Gbps (SFF-8088) interface</li> <li>• Supports SATA/HDD/SSD</li> </ul>	<ul style="list-style-type: none"> <li>• 3 x SFF-8088 to SFF-8644 connector cables</li> <li>• QXP-1600eS host bus adapter</li> <li>• RAIL-B02</li> </ul>
TR-002	<ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 2 Type-C interface</li> <li>• Supports SATA drives</li> </ul>	<ul style="list-style-type: none"> <li>• USB 3.2 Gen 2 Type-A to Type-C cable</li> </ul>
TR-004	<ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 1 Type-C interface</li> <li>• Supports SATA drives</li> </ul>	<ul style="list-style-type: none"> <li>• USB 3.2 Gen 1 Type-A to Type-C cable</li> <li>•</li> </ul>
TR-004U	<ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 1 Type-C interface</li> <li>• Supports SATA drives</li> </ul>	<ul style="list-style-type: none"> <li>• USB 3.2 Gen 1 Type-A to Type-C cable</li> <li>• RAIL-B02</li> </ul>
TL-D800C	<ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 2 Type-C interface</li> <li>• Supports SATA drives</li> </ul>	<ul style="list-style-type: none"> <li>• USB 3.2 Gen 2 Type-A to Type-C cable</li> </ul>
TL-R1200C-RP	<ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 2 Type-C interface</li> <li>• Supports SATA drives</li> </ul>	<ul style="list-style-type: none"> <li>• USB 3.2 Gen 2 Type-A to Type-C cable</li> <li>• RAIL-B02</li> </ul>

## Connecting USB Expansion Units

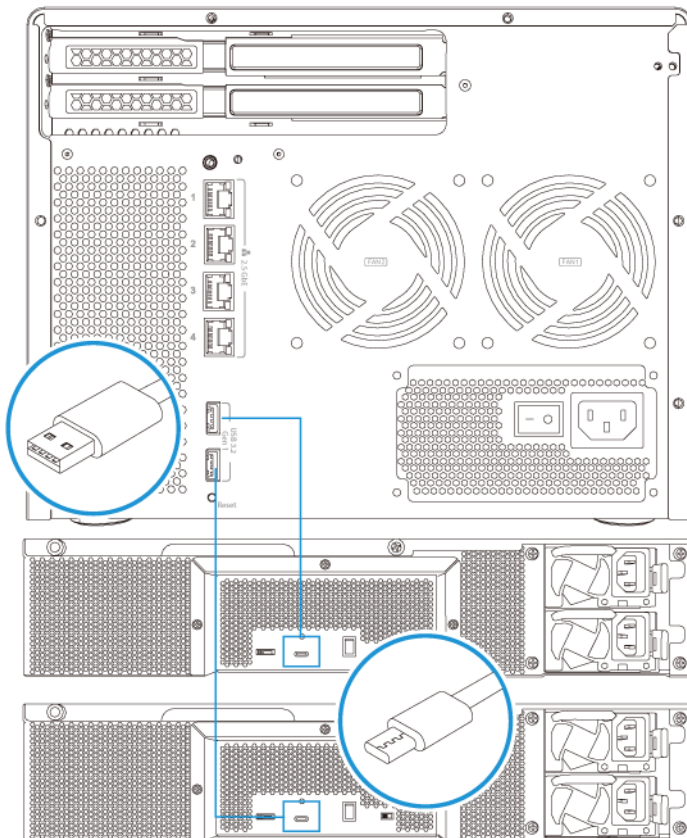
The TS-hX86 series supports a maximum of two USB expansion units and is compatible with the following models:



- TR-002
- TR-004
- TR-004U
- TL-D800C
- TL-R1200C-RP

1. Connect the expansion unit to the NAS.

- a. Connect the USB cable to the USB Type-C port on the expansion unit.
- b. Connect the USB cable to a USB 3.2 Gen 1 Type-A port on the NAS.



2. Power on the expansion units.

3. Verify that the expansion units are recognized by the NAS.

- a. Log on to QuTS hero as administrator.
- b. Go to **Main Menu > Storage & Snapshots > Overview > System**.
- c. Verify that the expansion units are listed.

## Connecting SATA Expansion Units

The TS-hX86 series supports one SATA expansion unit and is compatible with the following models:

- TL-D400S
- TL-D800S
- TL-D1600S
- TL-R400S
- TL-R1200S-RP

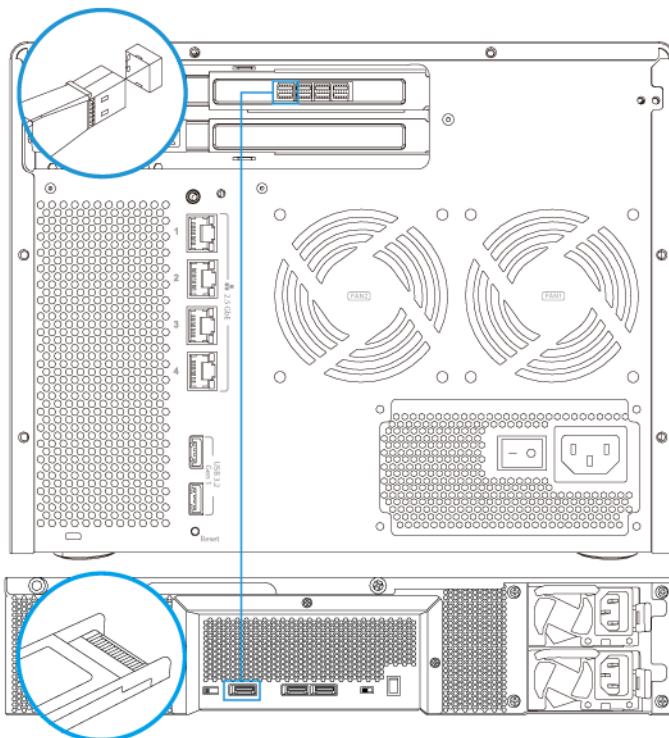
1. Power off the NAS.
2. Install a host bus adapter on the PCIe slot.



### Note

The QNAP QXP host bus adapter is required for connecting the SATA JBOD enclosure to a host device. Third-party host bus adapters are not compatible with QNAP JBOD enclosures. For details, see [Installing Expansion Cards](#).

3. Connect the expansion units to the NAS using the following topology.



4. Power on the SATA JBOD expansion units.
5. Power on the NAS.
6. Verify that the expansion units are recognized by the NAS.

- a. Log on to QTS as administrator.
- b. Go to **Main Menu > Storage & Snapshots > Overview > Storage > System** .
- c. Verify that the expansion units are listed.

## QuTS hero Installation

The TS-hX86 series uses the QNAP QuTS hero operating system. You can install QuTS hero using any of the following methods.

Method	Description	Requirements
Qfinder Pro installation (Recommended)	<p>If the NAS is connected to your local area network, you can do the following:</p> <ul style="list-style-type: none"> <li>• Locate the NAS using Qfinder Pro.</li> <li>• Complete the steps in the Smart Installation Guide wizard.</li> </ul> <p>For details, see <a href="#">Installing QuTS hero Using Qfinder Pro</a>.</p>	<ul style="list-style-type: none"> <li>• Computer</li> <li>• Network cable</li> <li>• Qfinder Pro installer</li> </ul>
Cloud installation	<p>If the NAS is connected to the internet, you can do the following:</p> <ul style="list-style-type: none"> <li>• Scan the QR code on the NAS.</li> <li>• Log into your myQNAPcloud account.</li> <li>• Use myQNAPcloud Link to remotely access your NAS.</li> <li>• Complete the steps in the Smart Installation Guide wizard.</li> </ul> <p>For details, see <a href="#">Installing QuTS hero Using the Cloud Key</a>.</p>	<ul style="list-style-type: none"> <li>• Computer or mobile device</li> <li>• Network cable</li> <li>• myQNAPcloud account</li> <li>• Cloud Key</li> </ul>

## Installing QuTS hero Using Qfinder Pro



### Warning

Installing QuTS hero deletes all data on the drives. Back up your data before proceeding.



### Note

You can revert to QuTS hero operating system anytime. For details, see QuTS hero user guide.

1. Power on the device.
2. Connect the device to your local area network.
3. Run Qfinder Pro on a computer that is connected to the same local area network.



### Note

To download Qfinder Pro, go to <https://www.qnap.com/utilities>.

4. Locate the NAS in the list and then double-click the name or IP address.

The **Smart Installation Guide** opens in the default web browser.

5. Click **Start Smart Installation Guide**.  
The **Install Firmware** window appears.
6. Install firmware using any of the following methods:

Installation methods	Steps
Automatic	<ol style="list-style-type: none"> <li>a. Click <b>Start</b>. Automatically searches for available firmware updates and installs firmware.</li> </ol>
Manual installation	<ol style="list-style-type: none"> <li>a. Click <b>Manual Installation</b>. The <b>Install Firmware</b> window appears.</li> <li>b. Click <b>Browser</b>. The upload file window appears.</li> <li>c. Select file.</li> <li>d. Click <b>Open</b>. Starts firmware installation.</li> </ol>
Skip	<ol style="list-style-type: none"> <li>a. Click <b>Skip</b>. Skips firmware installation.</li> </ol>

7. Specify the following information
  - **NAS name:** Specify a name with 1 to 14 characters. The name supports letters (A to Z, a to z), numbers (0 to 9), and hyphens (-), but cannot end with a hyphen.
  - **Password:** Specify an administrator password with 1 to 64 characters. The password supports all ASCII characters.
8. Click **Next**.
9. Specify the time zone, date, and time.



**Tip**

QNAP recommends connecting to an NTP server to ensure that the NAS follows the Coordinated Universal Time (UTC) standard.

10. Click **Next**.  
The **Configure the network settings** screen appears.
11. Select **Obtain an IP address automatically (DHCP)**.
12. Click **Next**.  
The **Cross-platform file transfer service** screen appears.
13. Select the types of devices that you will use to access shared folders on the NAS.
14. Click **Next**.
15. Review the settings.
16. Click **Apply**.  
A confirmation message appears.

**Warning**

Clicking **Yes** deletes all data on the drive before installing QuTS hero.

17. Click **Yes**.

- The **QuTS hero** installation progress bar appears.
- **QuTS hero** is installed.

**Note**

It may take a couple of minutes to complete QuTS hero installation.

18. Optional: Click **Go to NAS Management**.

**Tip**

Click **Go to NAS Management** to set more advanced QuTS hero configurations and settings. For details, see QuTS hero User Guide.

## Installing QuTS hero Using the Cloud Key

**Warning**

Installing QuTS hero deletes all data on the drives. Back up your data before proceeding.

**Note**

You can revert to QuTS hero operating system anytime. For details, see QuTS hero user guide.

1. Power on the device.
2. Connect the device to the internet.
3. Go to the QNAP Cloud Installation page using one of the following methods:
  - On your computer, go to <http://install.qnap.com/>.
  - Scan the QR code on the NAS using a mobile device.

The web page lists all the uninitialized QNAP NAS devices on the local network.

4. Locate the NAS in the list and then click **Initialize**.

**Note**

If your NAS is not listed, follow the instructions on the web page to specify the Cloud Key on the NAS.

The installation wizard opens in the default web browser.

5. Create an account or sign in to myQNAPcloud.

**Note**

You must return to this page to complete the installation after creating an account.

6. Specify the myQNAPcloud device name for the NAS.

**Note**

- The myQNAPcloud device name is used when remotely accessing the NAS.

- For security purposes, the myQNAPCloud Link remote connection service will be disabled on your NAS after initialization. You can enable it by connecting to QuTS hero through LAN and then installing myQNAPCloud Link.

7. Click **Next**.

The **Smart Installation Guide** opens in the default web browser.

8. Perform any of the following actions.

- To check for the latest available version, click **Start**.  
The wizard downloads the latest available version, and then the NAS restarts after the download is complete. If a newer version is not available, the wizard automatically displays the **Smart Installation Guide**.
- To install the out-of-the-box version, click **Skip**.

9. Click **Start Smart Installation Guide**.

The **Install Firmware** window appears.

10. Install firmware using any of the following methods:

Installation methods	Steps
Automatic	<p>a. Click <b>Start</b>. Automatically searches for available firmware updates and installs firmware.</p>
Manual installation	<p>a. Click <b>Manual Installation</b>. The <b>Install Firmware</b> window appears.</p> <p>b. Click <b>Browser</b>. The upload file window appears.</p> <p>c. Select file.</p> <p>d. Click <b>Open</b>. Starts firmware installation.</p>
Skip	<p>a. Click <b>Skip</b>. Skips firmware installation.</p>

11. Specify the following information

- **NAS name:** Specify a name with 1 to 14 characters. The name supports letters (A to Z, a to z), numbers (0 to 9), and hyphens (-), but cannot end with a hyphen.
- **Password:** Specify an administrator password with 1 to 64 characters. The password supports all ASCII characters.

12. Click **Next**.

13. Specify the time zone, date, and time.



**Tip**

QNAP recommends connecting to an NTP server to ensure that the NAS follows the Coordinated Universal Time (UTC) standard.

14. Click **Next**.

The **Configure the network settings** screen appears.

15. Select **Obtain an IP address automatically (DHCP)**.

16. Click **Next**.  
The **Cross-platform file transfer service** screen appears.
17. Select the types of devices that you will use to access shared folders on the NAS.
18. Click **Next**.
19. Review the settings.
20. Click **Apply**.  
A confirmation message appears.

**Warning**

Clicking **Confirm** deletes all data on the drive before installing QuTS hero.

21. Click **Confirm**.  
QuTS hero is installed.
22. Optional: Click **Go to NAS Management**.


**Tip**

Click **Go to NAS Management** to set more advanced QuTS hero configurations and settings.  
For details, see QuTS hero User Guide.


## 4. Basic Operations

This chapter describes basic NAS operations.

### Power Button

Operation	User Action	Result
Power on	Press the button once.	The device powers on.
Power off	Press and hold the button for 1.5 seconds.	The device powers off.
Force power off	Press and hold the button for 5 seconds.	The device powers off.   <b>Important</b> Use this method only when the device is unresponsive.

### Reset Button

Operation	User Action	Result
Basic system reset	Press and hold the button for 3 seconds.	<p>The following settings are reset to default:</p> <ul style="list-style-type: none"> <li>System administrator password: MAC address of adapter 1 without special characters. For example, if the MAC address of adapter 1 is 11:22:33:44:55:66, then the admin password will be 112233445566.</li> </ul> <p> <b>Tip</b> You can find the MAC address of adapter 1 using Qfinder Pro. A label attached to the device also lists the address as MAC1.</p> <ul style="list-style-type: none"> <li>TCP/IP configuration: <ul style="list-style-type: none"> <li>Obtain IP address settings automatically via DHCP</li> <li>Disable jumbo frames</li> <li>If port trunking is enabled (multi-LAN models only), the port trunking mode is reset to "Active Backup (Failover)".</li> </ul> </li> <li>System port: 8080 (system service port)</li> <li>Security level: Low (Allow all connections)</li> <li>LCD panel password: (blank)</li> <li>VLAN: Disabled</li> </ul>
Advanced system reset	Press and hold the button for 15 seconds.	<p>The default factory settings are restored.</p> <ul style="list-style-type: none"> <li>To retrieve old data after an advanced system reset, recreate the previous folder structure on the NAS.</li> </ul>



## USB One Touch Copy Button

The USB One Touch Copy button allows you to copy data backups from a USB device to the NAS or from the NAS to a USB device.

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

## LCD Panel



### Note

The LCD panel is only available on the TS-h886.

The LCD panel allows you to perform the following operations:

- Restart and power off the device
- Configure or change the LCD panel password
- View and configure network settings
- View information on the system, physical disks, and volumes

## Viewing TCP/IP Settings

You can view the following settings for each network adapter on the NAS.

- IP address
- Subnet mask
- Default gateway
- Primary DNS
- Secondary DNS

### 1. Press **Enter** or **Select**.

The panel displays the NAS name and QuTS hero version.

### 2. Press and **Enter** for two seconds.

The panel displays `Main Menu 1. TCP/IP`.

### 3. Press and hold **Enter**.

The panel displays the IP address of the first network adapter.

### 4. Press and hold **Select** to view the next TCP/IP screen.

### 5. Optional: Repeat step 4 as necessary.

## Configuring TCP/IP Settings

You can configure the following settings for each network adapter on the device:

- IP address
- Subnet mask

- Default gateway
  - Primary DNS
  - Secondary DNS
1. Press **Enter** or **Select**.  
The panel displays the NAS name and QuTS hero version.
  2. Press and hold **Enter** for two seconds.  
The panel displays `Main Menu 1. TCP/IP`.
  3. Press and hold **Enter**.  
The panel displays the IP address of the first network adapter.
  4. Press **Select** repeatedly until the panel displays `Enter Network Settings`.
  5. Press and hold **Enter**.  
The panel displays the configurable network settings.
  6. Press **Select** and **Enter** to configure the settings.  
For details, see [Front Panel](#).

## Viewing Drive Information

The LCD panel can display the temperature and capacity of each drive installed in the NAS.

1. Press **Enter** or **Select**.  
The panel displays the NAS name and QuTS hero version.
2. Press and hold **Enter** for two seconds.  
The panel displays `Main Menu 1. TCP/IP`.
3. Press **Enter** repeatedly until the panel displays `Main Menu 2. Physical disk`.
4. Press and hold **Enter**.  
The panel displays the temperature and capacity of the drive in bay 1.
5. Press and hold **Select**.  
The panel displays the temperature and capacity of the next drive.
6. Optional: Repeat step 5 as necessary.

## Viewing Volume Information

The LCD panel can display the name and capacity of each volume.

1. Press **Enter** or **Select**.  
The panel displays the NAS name and QuTS hero version.
2. Press and hold **Enter** for two seconds.  
The panel displays `Main Menu 1. TCP/IP`.
3. Press **Enter** repeatedly until the panel displays `Main Menu 3. Volume`.
4. Press and hold **Enter**.  
The panel displays the name and capacity of the first volume.
5. Press and hold **Select**.

The panel displays the name and capacity of the next volume.

- Optional: Repeat step 5 as necessary.

## Viewing System Information

The LCD panel can display the CPU temperature, system temperature, and system fan speed.

- Press **Enter** or **Select**.  
The panel displays the NAS name and QuTS hero version.
- Press and hold **Enter** for two seconds.  
The panel displays `Main Menu 1. TCP/IP`.
- Press **Enter** repeatedly until the panel displays `Main Menu 4. System`.
- Press and hold **Enter**.  
The panel displays the CPU and system temperature.
- Press and hold **Select**.  
The panel displays the system fan speed.

## Powering Off the NAS

- Press **Enter** or **Select**.  
The panel displays the NAS name and QuTS hero version.
- Press and hold **Enter** for two seconds.  
The panel displays `Main Menu 1. TCP/IP`.
- Press **Enter** repeatedly until the panel displays `Main Menu 5. Shut down`.
- Press and hold **Enter**.  
The NAS powers off.

## Restarting the NAS

- Press **Enter** or **Select**.  
The panel displays the NAS name and QuTS hero version.
- Press and hold **Enter** for two seconds.  
The panel displays `Main Menu 1. TCP/IP`.
- Press **Enter** repeatedly until the panel displays `Main Menu 6. Reboot`.
- Press and hold **Enter**.  
The NAS restarts.

## LCD Error Messages


System Message	Description
Sys. Fan Failed	System fan has failed.
Sys. Overheat	System has overheated.
HDD Overheat	Drive has overheated.
CPU Overheat	CPU has overheated.

System Message	Description
Network Lost	LAN 1 and LAN 2 disconnected in failover or load-balancing mode.
LAN [number] Lost	LAN [number] has disconnected.
HDD Failure	Drive has failed.
Vol [number] Full	Volume is full.
HDD Ejected	Drive has ejected.
Vol [number] Degraded	Volume [number] is in degrade mode.
Vol [number] Unmounted	Volume [number] has unmounted.
Vol [number] Inactive	Volume [number] is inactive.

## LEDs

LEDs indicate the system status and related information when the device is powered on. The following LED information applies only when the drive is correctly installed and when the device is connected to the network or to a host.

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

LED	Status	Description
System Status	Flashes green and red alternately every 0.5 seconds	<ul style="list-style-type: none"> <li>• The drive is being formatted.</li> <li>• The device is being initialized.</li> <li>• The operating system is being updated.</li> <li>• RAID rebuilding is in progress.</li> <li>• Online RAID Capacity Expansion is in progress.</li> <li>• Online RAID Level Migration is in progress.</li> <li>• The firmware is being updated.</li> </ul> <p> <b>Important</b> When updating the firmware, do not remove the power cord or USB cable, and do not force-exit the application.</p>
	Red	<ul style="list-style-type: none"> <li>• The drive is invalid.</li> <li>• The disk volume has reached its full capacity.</li> <li>• The disk volume is about to reach its full capacity.</li> <li>• The system fan is not functioning.</li> <li>• An error occurred when accessing (read/write) the data.</li> <li>• A bad sector is detected on the hard drive.</li> <li>• The device is in degraded read-only mode (two member drives failed in RAID 5 or RAID 6 but the data can still be read).</li> <li>• A hardware self-test error occurred.</li> </ul>
	Flashes red every 0.5 seconds	The device is in degraded mode (one member drive failed in RAID 1, RAID 5, or RAID 6).
	Green	The device is ready.
	Flashes green every 0.5 seconds	<ul style="list-style-type: none"> <li>• The device is not configured.</li> <li>• A drive is not formatted.</li> </ul>
	Off	<ul style="list-style-type: none"> <li>• All drives are in standby mode.</li> <li>• The device is powered off.</li> </ul>
Drive	Flashes red	The data is being accessed and a read/write error occurs during the process.
	Red	A drive read/write error occurred.
	Flashes green	Data is being accessed.
	Green	The drive is ready.
	Off	No drive was detected.

LED	Status	Description
M.2 Drive	Flashes red	The data is being accessed and a read/write error occurs during the process.
	Red	A drive read/write error occurred.
	Flashes green	Data is being accessed.
	Green	The drive is ready.
	Off	No drive was detected.
M.2 Drive Status	Green	The drive is ready.
	Red	A drive read/write error occurred.
	Flashes red 5 times per second	The drive is being located in the operating system.
	Off	No drive was detected.
2.5 Gigabit Speed LAN	Green	The network connection is operating at 2.5 Gbps.
	Orange	The network connection is operating at 1 Gbps.
	Off	<ul style="list-style-type: none"> <li>The network connection is operating at 100 Mbps.</li> <li>There is no network connection.</li> </ul>
2.5 Gigabit Activity LAN	Orange	A network connection has been established.
	Flashes orange	The device is being accessed from the network.
	Off	There is no network connection.
USB One Touch Copy	Flashes blue every 0.5 seconds	<ul style="list-style-type: none"> <li>A USB device connected to the front USB port is detected.</li> <li>A USB device connected to the front USB port is being removed from the device.</li> <li>A USB device connected to the front USB port is being accessed.</li> </ul>
	Blue	A USB device is detected in the front USB port.
	Off	No USB device is detected.

## Audio Alert

Duration	Frequency	Description
Short beep (0.5 seconds)	1	<ul style="list-style-type: none"> <li>The NAS is starting up.</li> <li>The NAS is shutting down.</li> <li>The NAS is being reset (reset button).</li> </ul>
Short beep (0.5 seconds)	3	<ul style="list-style-type: none"> <li>The user tried to copy the NAS data to the external storage device from the front USB port, but the data cannot be copied.</li> <li>The NAS has completed a firmware update.</li> </ul>

Duration	Frequency	Description
Long beep (1.5 seconds)	3 (every 5 minutes)	The system fan is not functioning.
	2	<ul style="list-style-type: none"><li>• The storage pool is about to reach full capacity.</li><li>• The storage pool has reached full capacity.</li><li>• The drives are in degraded mode.</li><li>• The user started the drive rebuilding process.</li><li>• A drive is plugged in or out.</li></ul>
	1	<ul style="list-style-type: none"><li>• The NAS was powered off by force shutdown (hardware shutdown).</li><li>• The NAS was powered on successfully and is ready.</li></ul>

## 5. Troubleshooting

This chapter describes basic troubleshooting information.

### Forcing Qfinder Pro or myQNAPcloud to Locate the NAS

If Qfinder Pro or myQNAPcloud is unable to locate the NAS during QuTS hero installation, the drives or data may be faulty.

1. Power off the NAS.
2. Remove all drives.
3. Power on the NAS.
4. Locate the NAS using Qfinder Pro or myQNAPcloud.
5. Reinsert the drives.
6. Continue with the QuTS hero installation.

### Hot-swapping Failed Drives

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

RAID Type	Number of Disks	Situation
RAID 1	2	One member drive fails
RAID 5	≥ 3	One member drive fails
RAID 6	≥ 4	One or two member drives fail
RAID 10	≥ 4 (Must be an even number)	One or two member drives in two different pairs fail.
RAID 50	≥ 6	One disk per subgroup fails.
RAID 60	≥ 8	Two disks per subgroup fail.
Triple Mirror	Multiple of 3. (For example, 3, 6, 9, 12 disks and so forth.)	One or two member drives fail.
RAID-TP	≥ 5	One, two, or three member drives fail.

1. Log on to QuTS hero.
2. Go to **Main Menu > Storage & Snapshots > Storage > Disks/VJBOD** .
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 device.
6. Wait for 20 seconds or until the device 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 NAS beeps twice.



10. Go to **Main Menu > Storage & Snapshots > Storage Space** .
11. Locate the volume that contains the new drive and then verify that the status is *Rebuilding*.

## Recovering Unintentionally Removed Healthy Drives

The NAS supports exclusive RAID recovery technology to recover failed RAID disk volumes from unintentional disconnection or removal of drives. Users can recover an inactive RAID 1, RAID 5, RAID 6, RAID 10, RAID 50, RAID 60, triple mirror, and RAID-TP volume from degraded mode.

Disk Volume	RAID Recovery Support	Number of Disks	Maximum Number of Removed Drives
RAID 0	Yes	≥ 2	N/A
RAID 1	Yes	2	1
RAID 5	Yes	≥ 3	1
RAID 6	Yes	≥ 4	2
RAID 10	No	≥ 4 (Must be an even number)	One or two member drives in two different pairs fail.
RAID 50	Yes	≥ 6	One disk per subgroup fails.
RAID 60	Yes	≥ 8	Two disks per subgroup fail.
Triple Mirror	Yes	Multiple of 3. (For example, 3, 6, 9, 12 disks and so forth.)	2
RAID-TP	Yes	≥ 5	3

## Support and Other Resources

QNAP provides the following resources:

Resource	URL
Documentation	<a href="https://docs.qnap.com">https://docs.qnap.com</a>
Compatibility List	<a href="https://www.qnap.com/compatibility/">https://www.qnap.com/compatibility/</a>
NAS Migration Compatibility	<a href="https://www.qnap.com/en/nas-migration">https://www.qnap.com/en/nas-migration</a>
Expansion Unit Compatibility	<a href="http://www.qnap.com/go/compatibility-expansion">http://www.qnap.com/go/compatibility-expansion</a>
Service Portal	<a href="https://service.qnap.com">https://service.qnap.com</a>
Product Support Status	<a href="https://www.qnap.com/product/eol.php">https://www.qnap.com/product/eol.php</a>
Downloads	<a href="https://download.qnap.com">https://download.qnap.com</a>
Community Forum	<a href="https://forum.qnap.com">https://forum.qnap.com</a>
QNAP Accessories Store	<a href="https://shop.qnap.com/">https://shop.qnap.com/</a>

## 6. Glossary

### **myQNAPcloud**

Provides various remote access services such as DDNS and myQNAPcloud Link

### **myQNAPcloud Link**

Enables you to access the NAS over the internet without configuring complex port forwarding settings

### **QuTS hero**

QNAP NAS operating system featuring ZFS file system

### **Qfinder Pro**

QNAP utility that lets you locate and access QNAP NAS devices in your local area network

### **Cloud Key**

Unique 8-digit code assigned to each NAS device

## 7. Notices

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Version 3, 29 June 2007

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## END OF TERMS AND CONDITIONS

### CE Notice



This QNAP NAS complies with CE Compliance Class B.

### 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.

## VCCI Notice



VCCI-B

## BSMI Notice



## SJ/T 11364-2006



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金属螺帽	0	0	0	0	0	0
电缆组装	0	0	0	0	0	0
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