



**QNAP**

# **TS-h1290FX**

## **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-h1290FX

The all-flash TS-h1290FX is a lightweight (8.99kg) and quiet (23.1 dB(A)) enterprise-grade desktop NAS optimized for fast collaborative video editing, file sharing, AI applications, and more. With 2nd Gen AMD EPYC™ 7002 series processors and twelve 2.5-inch drive trays supporting U.2 NVMe PCIe Gen 4 and SATA SSDs, the TS-h1290FX performs high-speed random read/write IOPS, making it ideal for 4K/8K video editing and other I/O intensive operations. The ZFS-based operating system guarantees data integrity while also supporting inline data deduplication and compression, over 65,000 snapshots, and real-time SnapSync. The two 25 GbE SFP28 ports and two 2.5 GbE ports can be used in conjunction with four quad-port PCIe Gen 4 expansion cards (sold separately) to directly connect up to 20 devices. The TS-h1290FX supports connecting SAS, SATA, and USB JBOD enclosures for storage expansion.

### 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
TS-h1290FX-7232P-64G	AMD EPYC™ 7232P	64 GB
TS-h1290FX-7302P-128G	AMD EPYC™ 7302P	128 GB
TS-h1290FX-7302P-256G	AMD EPYC™ 7302P	256 GB

Component	TS-h1290FX-7232P-64G	TS-h1290FX-7302P-128G	TS-h1290FX-7302P-256G
Processor			
CPU	AMD EPYC™ 7232P	AMD EPYC™ 7302P	
Frequency	8-core/16-thread 3.1 GHz base/3.2 GHz burst	16-core/32-thread 3.0 GHz base/3.3 GHz burst	
Architecture	x86 64-bit		
Encryption engine	AES-NI		
Memory			
Pre-installed memory	64 GB RAM: 8 x 8 GB DDR4 ECC RDIMM	128 GB RAM: 8 x 16 GB DDR4 ECC RDIMM	256 GB RAM: 8 x 32 GB DDR4 ECC RDIMM

Component	TS-h1290FX-7232P-64G	TS-h1290FX-7302P-128G	TS-h1290FX-7302P-256G
Memory slots	8 x DDR4 Long-RDIMM   <b>Important</b> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Using unsupported modules may degrade performance, cause errors, or prevent the operating system from starting.</li> <li>• Do not mix registered DIMM (RDIMM) and load-reduction DIMM (LRDIMM) on the same system board.</li> </ul>		
Maximum memory	1 TB RAM: 8 x 128 GB		
Flash memory	5 GB (dual-boot OS protection)		
Storage			
Drive bays	12 x 2.5-inch U.2 NVMe PCIe Gen 4/SATA		
Drive compatibility	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> <li>• 2.5-inch U.2 NVMe PCIe Gen 4 solid-state drives</li> </ul>  <b>Tip</b> <ul style="list-style-type: none"> <li>• For the list of compatible drive models, go to <a href="https://www.qnap.com/compatibility">https://www.qnap.com/compatibility</a>.</li> </ul>		
SSD cache acceleration support	2.5-inch drive bays: 1-12		
Hot-swapping	2.5-inch drive bays: 1-12		
Network			
2.5 Gigabit network interface	2 x 2.5 GbE RJ45   <b>Note</b> The 2.5 Gigabit Ethernet RJ45 port supports the following network connectivity speeds: 2.5 GbE, 1 GbE, 100 Mb, and 10 Mb.		
25 Gigabit network interface	2 x 25GbE SFP28 SmartNIC   <b>Note</b> The 25 Gigabit Ethernet SFP28 port supports the following network connectivity speeds: 25 GbE, 10 GbE, and 1 GbE.		
External I/O Ports & Expansion Slots			

Component	TS-h1290FX-7232P-64G	TS-h1290FX-7302P-128G	TS-h1290FX-7302P-256G
PCIe slots	<ul style="list-style-type: none"> <li>• 1 x PCIe 4.0 x8</li> <li>• 3 x PCIe 4.0 x16</li> </ul> <p> <b>Tip</b> For the list of compatible drive models and expansion cards, go to <a href="https://www.qnap.com/compatibility">https://www.qnap.com/compatibility</a>.</p>		
USB ports	<ul style="list-style-type: none"> <li>• Front: 1 x USB 3.2 Gen 1 Type-A</li> </ul> <p> <b>Note</b> This USB port supports One Touch Copy.</p> <ul style="list-style-type: none"> <li>• Rear: 2 x USB 3.2 Gen 1 Type-A</li> </ul>		
Interface			
Buttons	<ul style="list-style-type: none"> <li>• Power</li> <li>• Reset</li> <li>• USB One Touch Copy</li> <li>• LCD enter</li> <li>• LCD select</li> </ul>		
Dimensions			
Form factor	Tower		
Dimensions (H x W x D)	150 x 368 x 362 mm (5.9 x 14.48 x 14.25 in)		157.2 x 368 x 362 mm (6.18 x 14.48 x 14.25 in)
Net weight	8.99 kg (19.82 lbs)		
Others			
Power supply unit	1 x 750W, 100-240V		
System battery	CR2032 lithium battery (3V, 225 mAh)		
Sound level	23.1 dB(A)		
	<p> <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.</p>		
Fans	<ul style="list-style-type: none"> <li>• System Fans: 2 x 92 mm, 12V DC fans</li> <li>• CPU Fan: 1 x 80mm, 12V DC 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>		


**Tip**

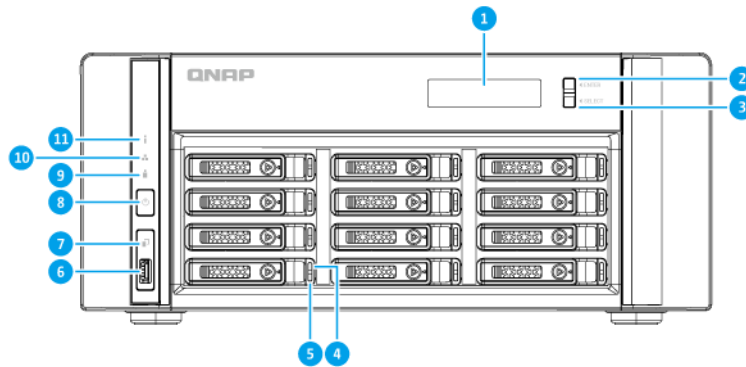
Model specifications are subject to change without prior notice. To see the latest specifications, go to <https://www.qnap.com>.

## Package Contents

Item	Quantity
TS-h1290FX	1
Drive trays	12
Drive tray keys	2
Power cord	1
Screws for 2.5-inch drives	4 x 12 = 48 screws
Quick Installation Guide (QIG)	1

## Components

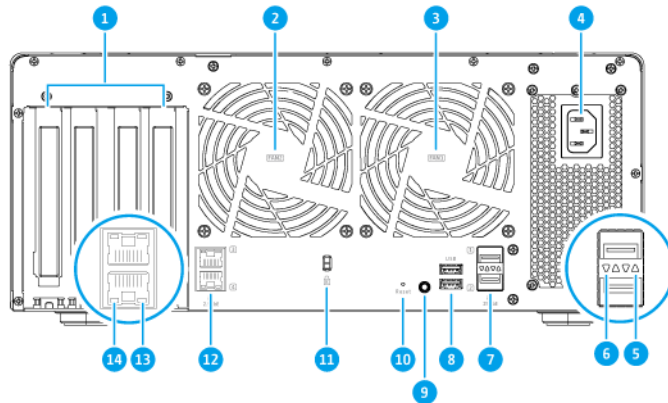
### Front Panel




No.	Component	No.	Component
1	LCD panel	7	USB One Touch Copy button
2	LCD enter button	8	Power button
3	LCD select button	9	Expansion unit LED
4	Drive status LED	10	LAN LED
5	Drive activity LED	11	System status LED
6	USB 3.2 Gen 1 One Touch Copy Type-A port	-	-

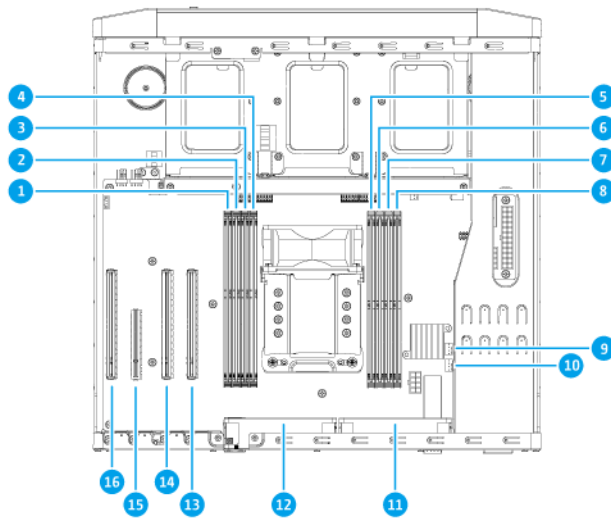


## Rear Panel



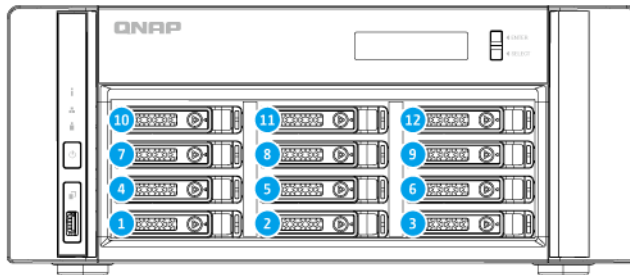
No.	Component	No.	Component
1	PCIe full-height covers	8	USB 3.2 Gen 1 Type-A ports
2	System fan 1	9	COM port
			 <b>Note</b> This port is only for engineering purposes.
3	System fan 2	10	Reset button
4	Power input	11	Kensington security slot
5	25 Gigabit Ethernet activity LED	12	2.5 Gigabit Ethernet ports (RJ45)
6	25 Gigabit Ethernet speed LED	13	2.5 Gigabit Ethernet activity LED
7	25 Gigabit Ethernet ports (SFP28)	14	2.5 Gigabit Ethernet speed LED

## System Board



No.	Component	No.	Component
1	Memory slot 8 (Channel D, DIMM 1)	9	Fan connector 1
2	Memory slot 7 (Channel C, DIMM 1)	10	Fan connector 2
3	Memory slot 6 (Channel B, DIMM 1)	11	System fan 1
4	Memory slot 5 (Channel A, DIMM 1)	12	System fan 2
5	Memory slot 4 (Channel E, DIMM 1)	13	PCIe slot 1 (PCIe 4.0 x16)
6	Memory slot 3 (Channel F, DIMM 1)	14	PCIe slot 2 (PCIe 4.0 x16)
7	Memory slot 2 (Channel G, DIMM 1)	15	PCIe slot 3 (PCIe 4.0 x8)
8	Memory slot 1 (Channel H, DIMM 1)	16	PCIe slot 4 (PCIe 4.0 x16)

## Drive Numbering



## Safety Information

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

### 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.
- 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.

- The device is not suitable for use in locations where children are likely to be present.

## 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> </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 carefully before setting up the NAS or installing NAS components.

1. Place your NAS device in an environment that meets the requirements.  
For details, see [Installation Requirements](#).
2. Install the drives.  
For details, see [Installing 2.5-inch Solid State Drives on 2.5-inch Trays](#):



### Tip

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

3. Install expansion cards.

For details, see [Installing Expansion Cards](#).

4. Connect the Expansion Units.
  - [Connecting SAS Expansion Units](#)
  - [Connecting SATA Expansion Units](#)
  - [Connecting USB Expansion Units](#)
5. Connect the power cord and all applicable cables.
6. Power on the NAS.  
For details, see [Power Button](#).
7. Install QuTS hero.  
For details, see [QuTS hero Installation](#).
8. Log on to QuTS hero.  
If QuTS hero finds unused disks in your NAS, it will ask you to initialize these disks. Click **Initialize** to start the process.

## 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, expansion cards, system fans, and expansion units.

#### Installing 2.5-inch Drives



##### 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.

- 



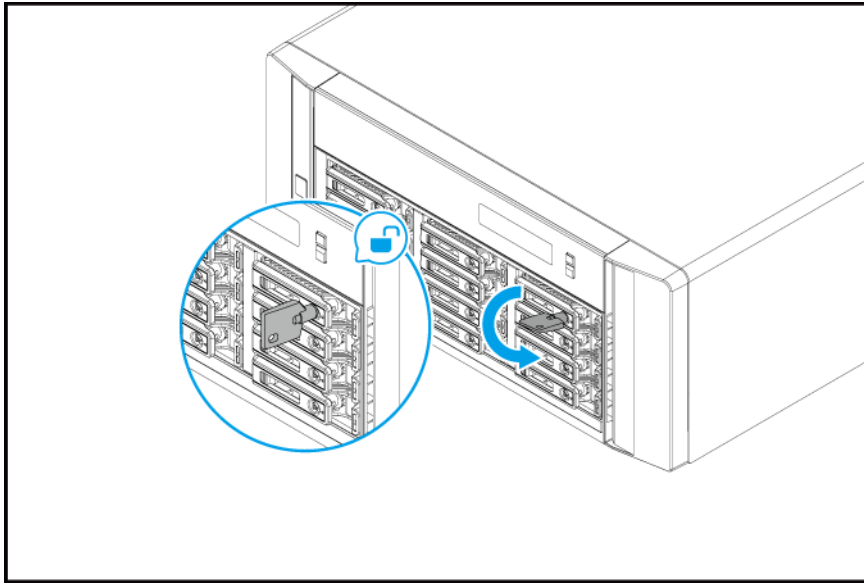
**Other moving components:** Keep your hands and other body parts away from other moving components.



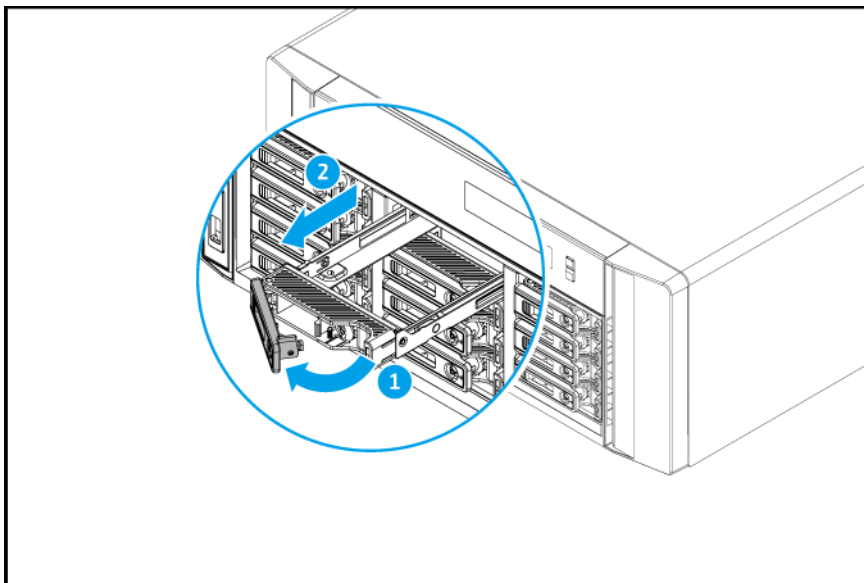
##### Tip

The TS-h1290FX is compatible with 2.5-inch U.2 NVMe PCIe solid-state drives, SATA solid-state drives, and SATA hard disk drives.

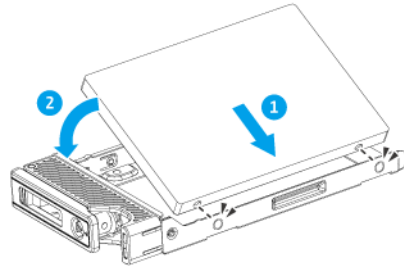
1. Power off the NAS.
2. Remove the drive tray.
  - a. Optional: Insert the drive tray key and turn counter-clockwise to unlock the drive tray.



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



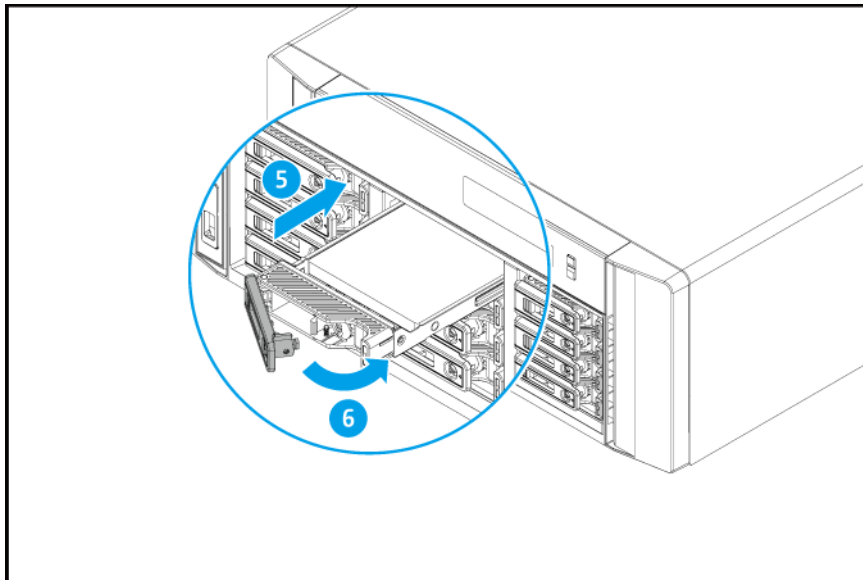
- 3.** Install a drive on the tray.
  - a.** Place the drive on the tray so that the nodules on the sides of the drive are aligned with the indentations on the sides of the tray.



**b.** Push the drive down firmly to secure it to the drive tray.

**4.** Load the tray into the bay.

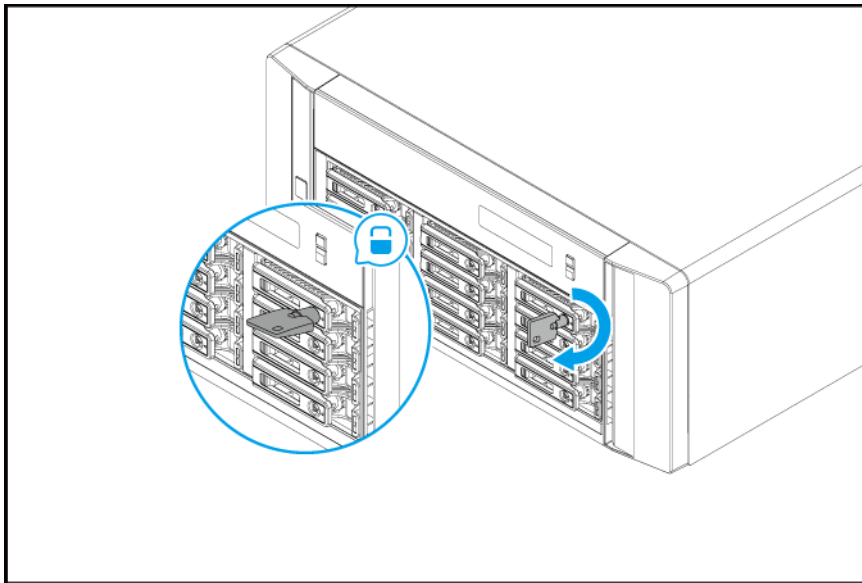
**a.** Insert the tray into the bay.



**b.** Push the handle.

**c.** Optional: Insert the drive tray key and turn clockwise to lock the drive tray.





5. Power on the NAS.

## Replacing Memory Modules

The TS-h1290FX has 8 memory slots. You can increase the memory capacity of the NAS by upgrading memory modules. For optimal 8-channel performance, replace memory modules in all eight slots at the same time.

Use only QNAP memory modules to maintain system performance and stability. You can purchase QNAP memory modules from authorized resellers.



### Important

QNAP recommends installing modules in groups of eight.

- Ensure that all eight modules are identical.



### 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.

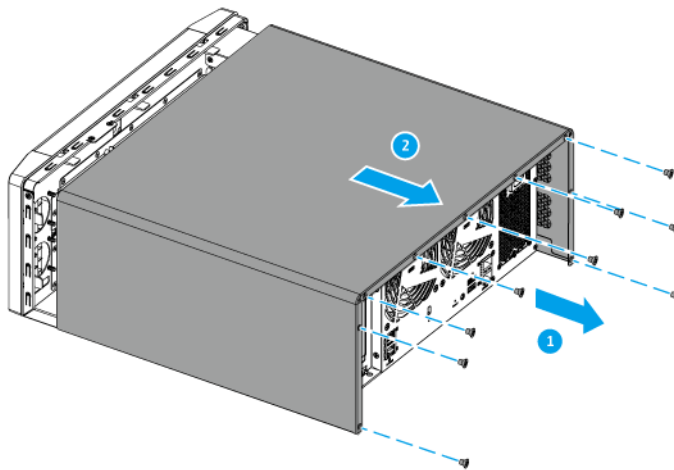
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**Other moving components:** Keep your hands and other body parts away from other moving components.

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.

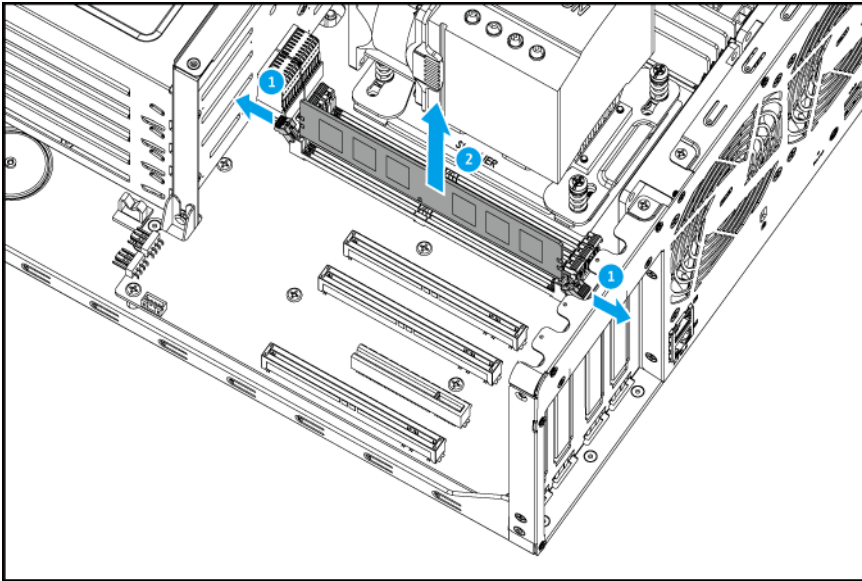


5. Remove an existing module.
  - a. Push the retention clips outward simultaneously to release the module.
  - b. Verify that the module is completely released from the slot.

**Warning**

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

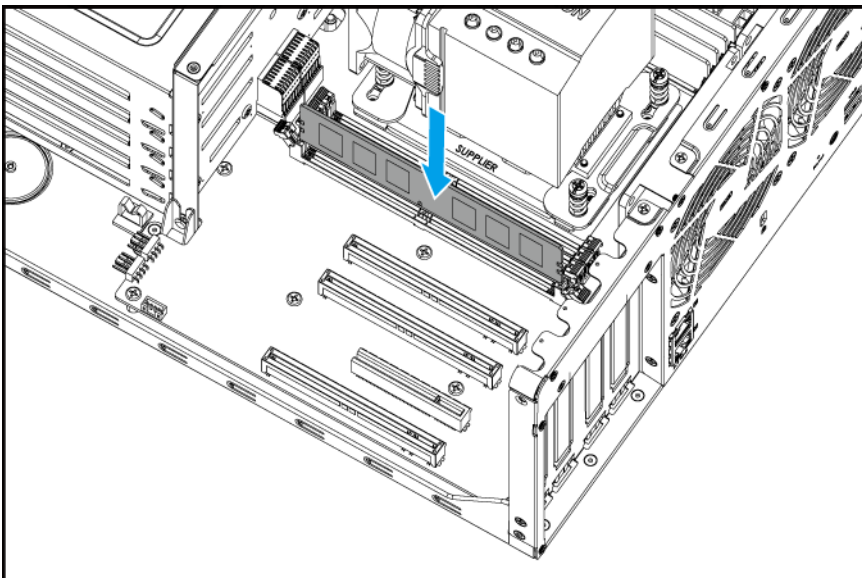
- c. Hold the module by the edges.
- d. Carefully slide the module out of the slot.



### Warning

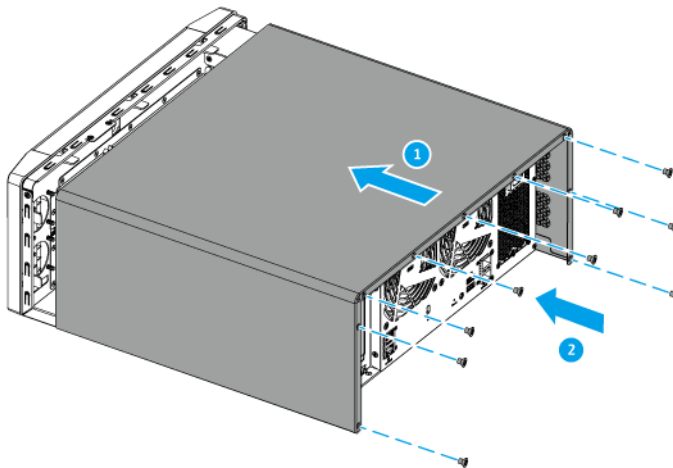
- Do not touch the internal components, particularly the metal connectors.
- Do not bend the module.

6. 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.

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



8. Connect all cables and external attachments.
9. Power on the device.
10. Verify that the module is recognized by the device.
  - a. Log on to QuTS hero as administrator.
  - b. Go to **Control Panel > System > System Status > Hardware Information** .
  - c. Check the value for **Total memory**.

## Installing Expansion Cards

The TS-h1290FX series supports selected expansion cards. QNAP-branded expansion cards purchased from the company website are shipped with the brackets necessary to fit the TS-h1290FX 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.
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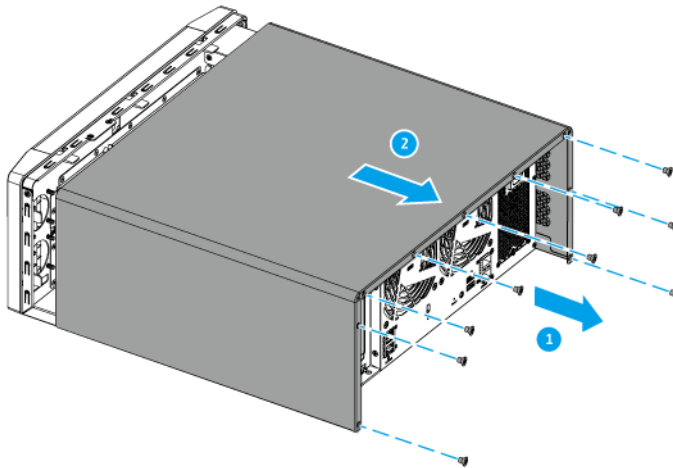


**Moving fan blades:** Keep your hands and other body parts away from moving fan blades.

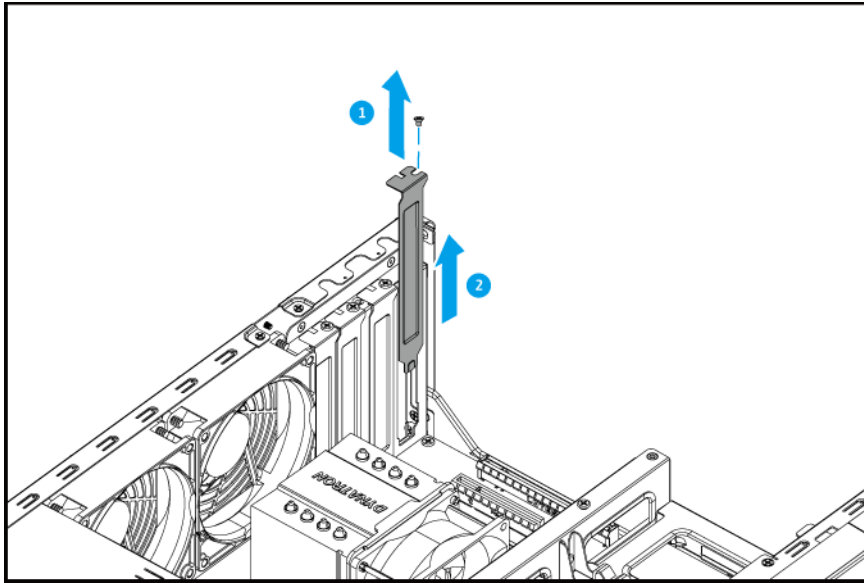


**Other moving components:** Keep your hands and other body parts away from other moving components.

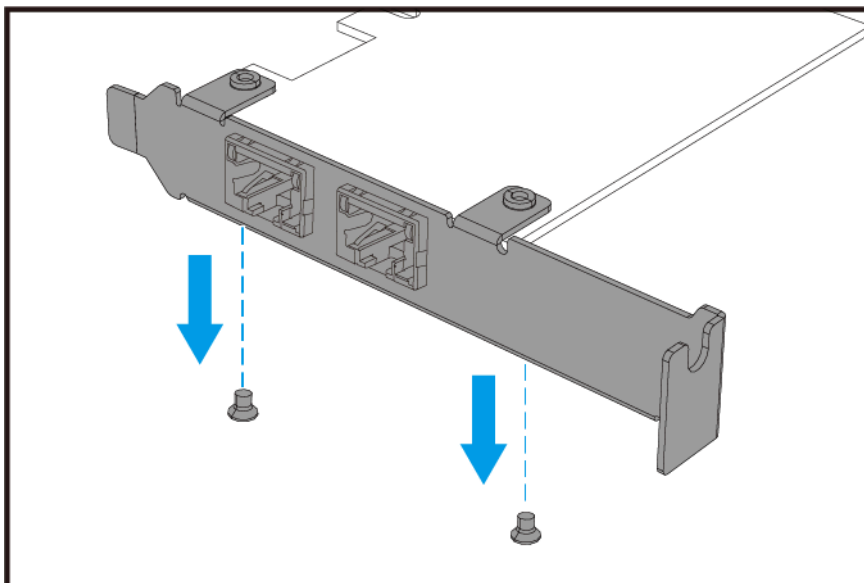
1. Power off the device.
2. Disconnect the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the case cover.
  - a. Loosen the screws.
  - b. Slide the cover back.
  - c. Lift the cover off the device.



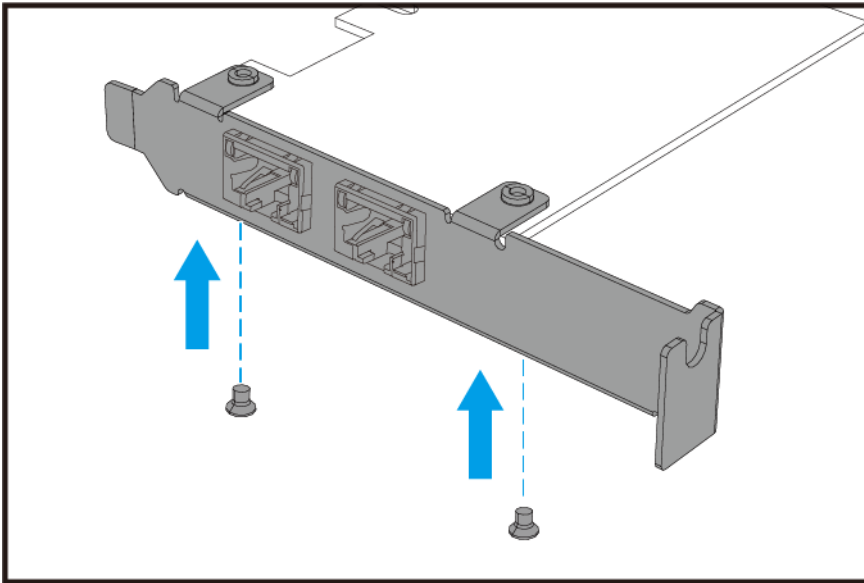
5. Remove the PCIe cover.
  - a. Remove the screw that secures the cover to the bracket.
  - b. Pull the cover away from the slot.



6. Optional: Attach the full-height bracket to the expansion card.
  - a. Remove all screws of the existing bracket.



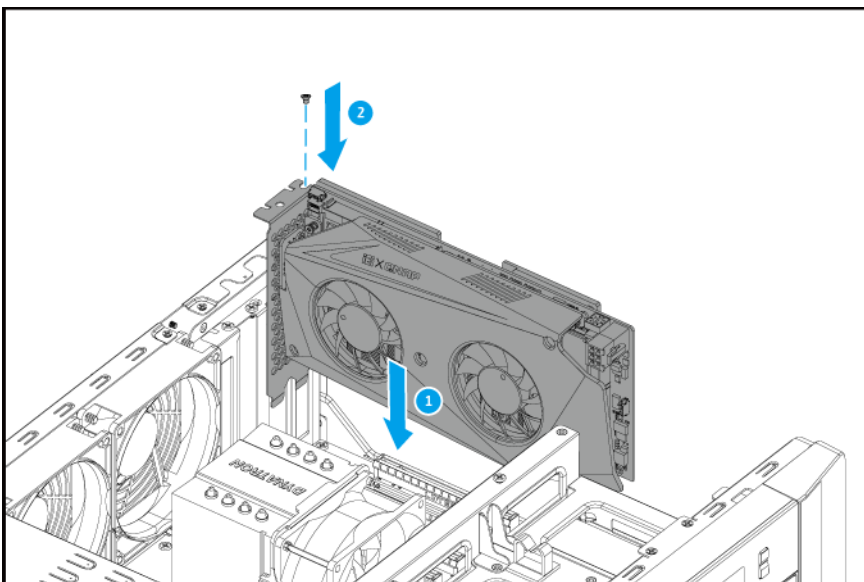
- b. Carefully pull the bracket away from the card.
    - c. Attach the full-height bracket to the card using the same screws.



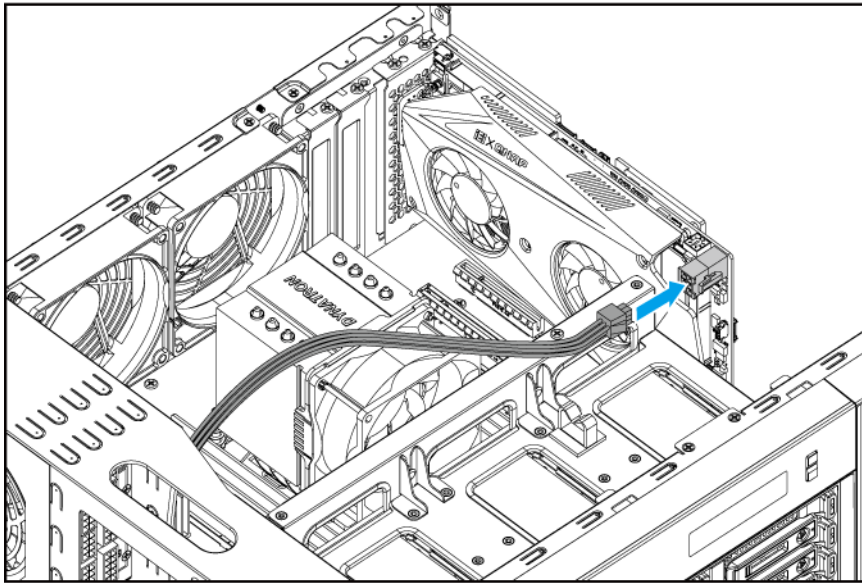
d. Verify that the bracket does not move.

7. Install the expansion card.

- a. Hold the card by the edges.
- b. Insert the card into the slot.
- c. Attach the screw.



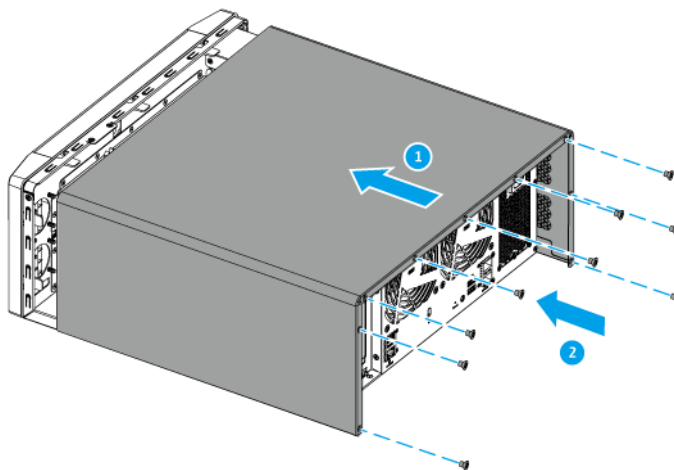
d. Optional: Attach the PCIe power connector to the expansion card.

**Note**

Larger expansion cards may require you to attach the PCIe power connector before inserting the card into the slot.

**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 System Fans



### Warning

- 



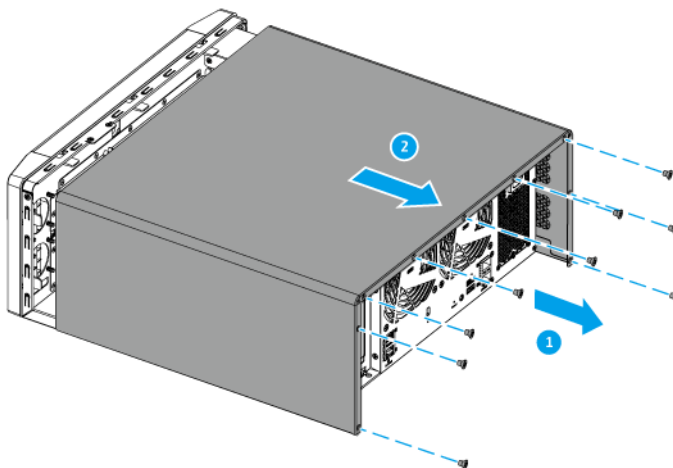
**Moving fan blades:** Keep your hands and other body parts away from moving fan blades.

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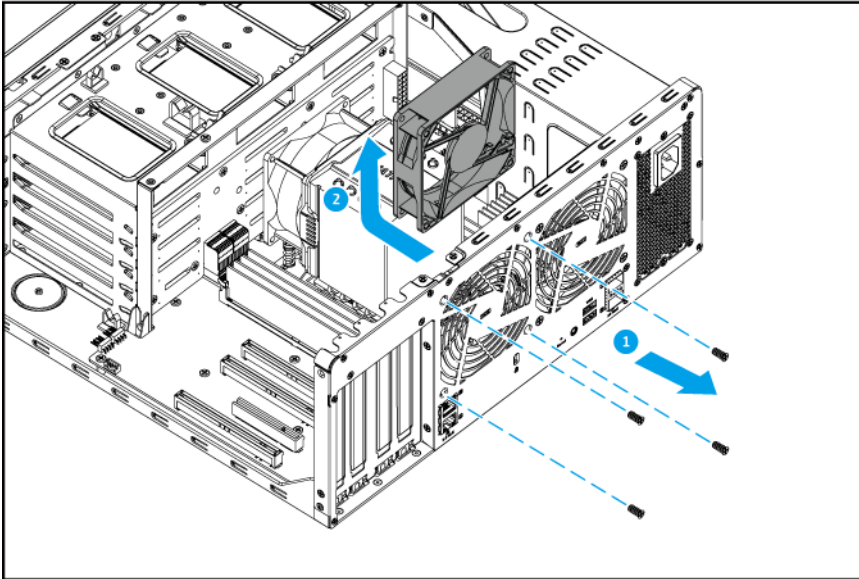
**Other moving components:** Keep your hands and other body parts away from other moving components.

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.

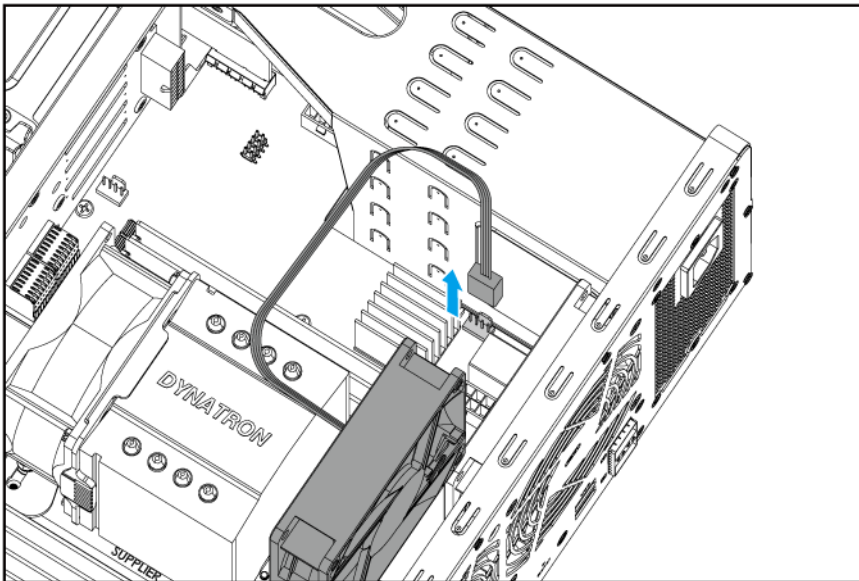


5. Remove the fan module.

- a. Remove the screw that secures the fan module to the chassis.



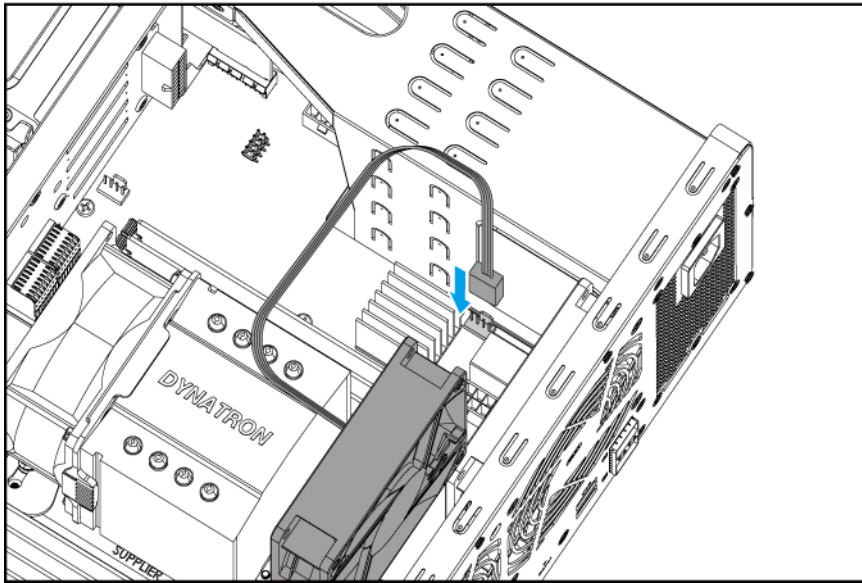
- b. Disconnect the fan cable from the system board.



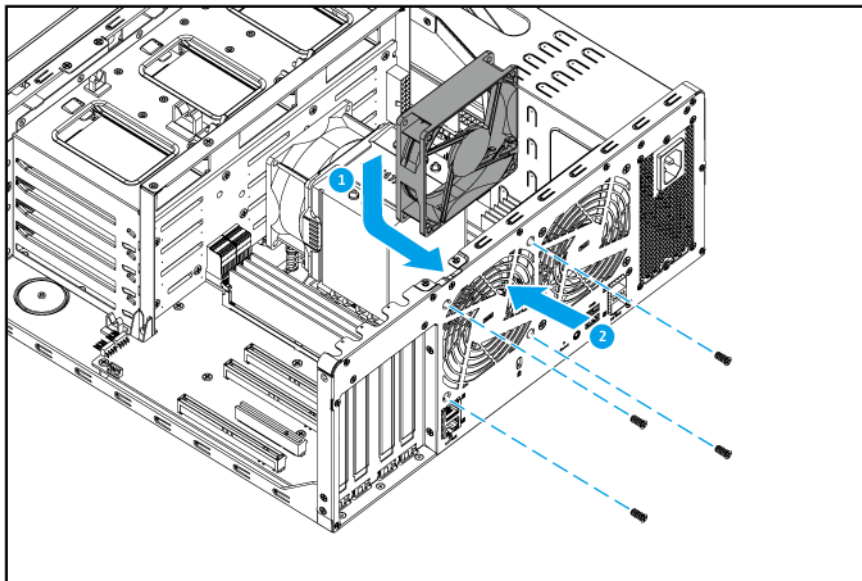
- c. Carefully pull the fan module away from the system board.

## 6. Install a new fan module.

- a. Insert the module into the chassis.
- b. Connect the fan cable to the system board.

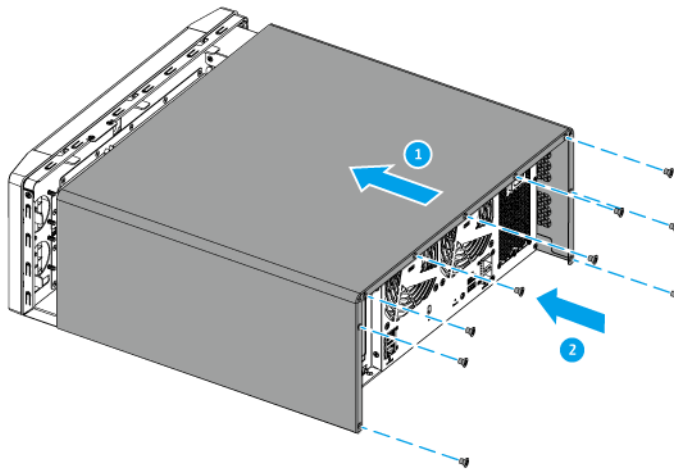


- c.** Attach the screws that secure the fan module to the chassis.



**7.** Attach the case cover.

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



- 8. Connect all cables and external attachments.
- 9. Connect the power cord to the electrical outlet.
- 10. Power on the device.

### Expansion Unit Installation

The TS-h1290FX supports SAS, SATA, and USB expansion units. For details, see the table below.

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 <https://www.qnap.com/go/compatibility-expansion>.

Expansion Unit Model	Description	Required Accessories
TL-R1620Sep-RP	<ul style="list-style-type: none"> <li>• Uses a SAS 12 Gbps (SFF-8644) interface</li> <li>• Supports SAS/SATA HDD/SSD</li> </ul>	<ul style="list-style-type: none"> <li>• One of the following storage expansion cards:                             <ul style="list-style-type: none"> <li>• QXP-820S-B3408</li> <li>• QXP-1620S-B3616W</li> </ul> </li> <li>• mini-SAS SFF-8644 cable</li> <li>• RAIL-A03-57</li> </ul>

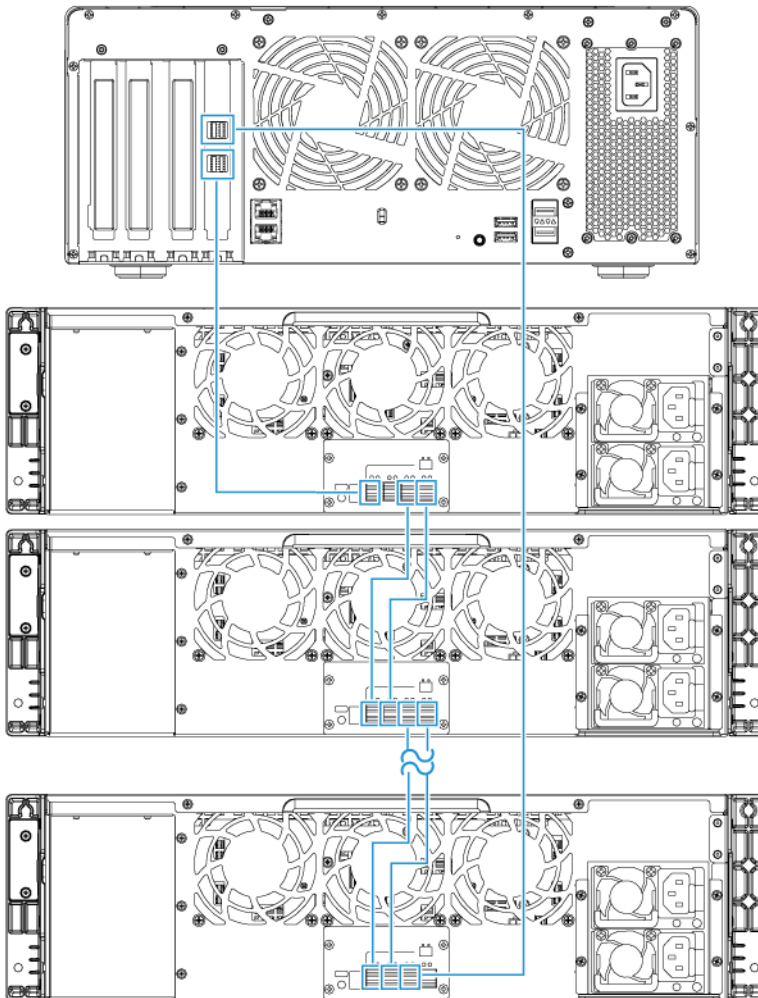
Expansion Unit Model	Description	Required Accessories
TL-R1220Sep-RP	<ul style="list-style-type: none"> <li>• Uses a SAS 12 Gbps (SFF-8644) interface</li> <li>• Supports SAS/SATA HDD/SSD</li> </ul>	<ul style="list-style-type: none"> <li>• One of the following storage expansion cards:               <ul style="list-style-type: none"> <li>• QXP-820S-B3408</li> <li>• QXP-1620S-B3616W</li> </ul> </li> <li>• mini-SAS SFF-8644 cable</li> <li>• RAIL-A03-57</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 HDD/SSD</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 HDD/SSD</li> </ul>	<ul style="list-style-type: none"> <li>• USB 3.2 Gen 1 Type-A to Type-C cable</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 HDD/SSD</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 HDD/SSD</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 HDD/SSD</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>
TL-D400S	<ul style="list-style-type: none"> <li>• Uses a SATA 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 SATA 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 SATA 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-A1164 host bus adapter</li> </ul>
TL-R1200S-RP	<ul style="list-style-type: none"> <li>• Uses a SATA 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-A1164 host bus adapter</li> <li>• RAIL-B02</li> </ul>
TL-R400S	<ul style="list-style-type: none"> <li>• Uses a SATA 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>

## Connecting SAS Expansion Units

To connect the device to SAS expansion units, a storage expansion card must be installed in the device.

For required accessories details, see [Expansion Unit Installation](#).

1. Install a storage expansion card on the PCIe slot.  
For details, see [Installing Expansion Cards](#).
2. Connect the expansion units to the device using the following topology.



QNAP recommends always using dual-path configuration to prevent storage downtime due to expansion unit failure or cable disconnection. Single-path configuration should be used only in a situation where it is not possible to use dual-path configuration.

3. Power on the expansion units.
4. Verify that the expansion units are recognized by the device.
  - 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-h1290FX series supports connecting one SATA expansion unit. For required accessories details, see [Expansion Unit Installation](#)

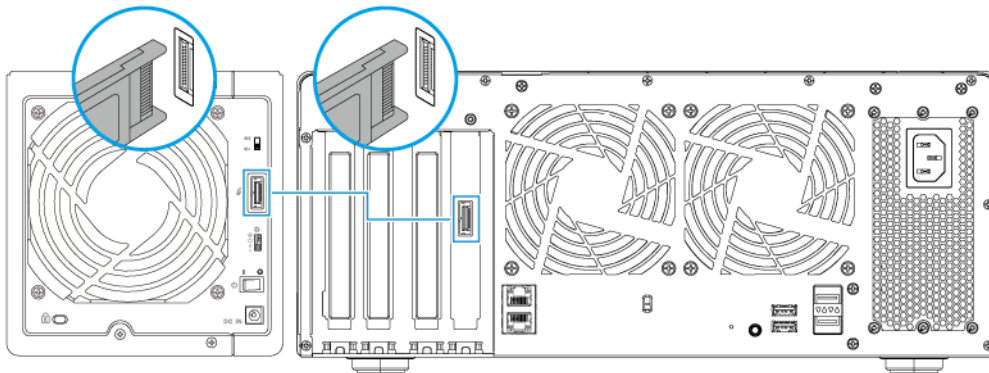
1. Power off the NAS.
2. Install a host bus adapter on the PCIe slot.  
For details, see [Installing Expansion Cards](#)



### 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.

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



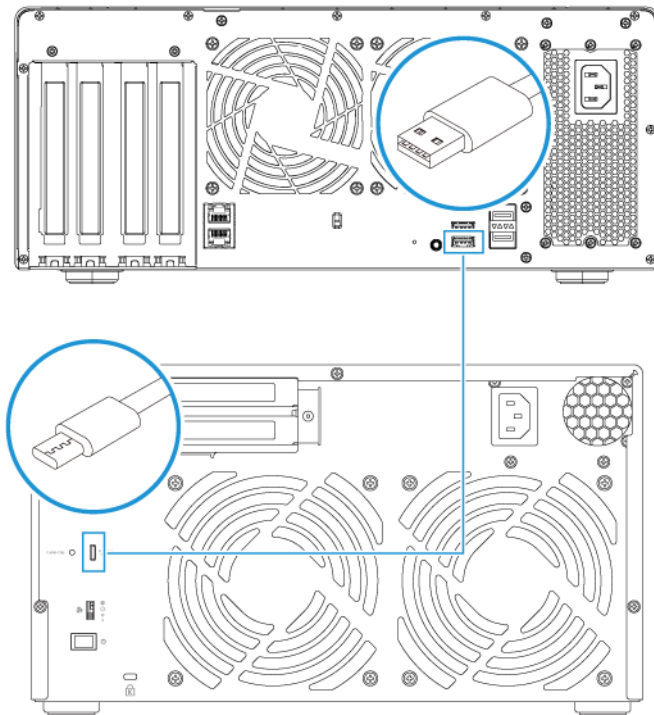
4. Power on the SATA JBOD expansion units.
5. Power on the NAS.
6. Verify that the expansion units are recognized by the NAS.
  - a. Log on to QuTS hero as administrator.
  - b. Go to **Main Menu > Storage & Snapshots > Overview > System** .
  - c. Verify that the expansion units are listed.

## Connecting USB Expansion Units

To connect the TS-h1290FX to USB expansion units, a USB Type-A to USB Type-C cable is required. For required accessories details, see [Expansion Unit Installation](#).

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.

## QuTS hero Installation

The TS-h1290FX 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>

You can also install the QNAP QTS operating system. If your NAS is connected to the internet, the option to install QTS will appear in the Smart Installation Guide wizard using any of the methods in the table. You can also manually download the QTS firmware from <https://download.qnap.com>.



#### Warning

QuTS hero and QTS use different file systems. Switching operating systems will reset the NAS and delete all data.

## Installing QuTS hero Using Qfinder Pro



#### Warning

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

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	Click <b>Start</b> . Automatically searches for available firmware updates and installs firmware.
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>Browse</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.

- 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.

- Power on the device.
- Connect the device to the internet.
- 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.

- 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.

- Create an account or sign in to myQNAPcloud.

**Note**

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

- 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.

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

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

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: The default password is the first MAC address in uppercase letters without special characters. For example, if the first MAC address is 00-08-9B-F6-15-75, then the admin password would be 00089BF61575.</li> </ul> <p> <b>Note</b> You can find the first MAC address with Qfinder Pro or attached to a label on the device listed 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 10 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.

To configure the behavior of the button when an external device is connected to the button's USB port, install and use Hybrid Backup Sync on your QNAP operating system. For details, see the [Hybrid Backup Sync](#) documentation.

## LCD Panel

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 shared folders

## LCD Panel Buttons

Button	Usage
<b>Enter</b>	<ul style="list-style-type: none"> <li>• Display a configuration screen.</li> <li>• Move to the next item on the configuration screen.</li> </ul>
<b>Select</b>	<ul style="list-style-type: none"> <li>• Move to the next item on a menu.</li> <li>• Modify a value on a configuration screen.</li> </ul>

## 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 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 and hold **Select** to view the next TCP/IP screen.  
Repeat this step 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 then **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**.  
Repeat this step as necessary.  
The panel displays the temperature and capacity of the next drive.

## Viewing Shared Folder Information

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

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. Shared Folders`.
4. Press and hold **Enter**.  
The panel displays the name and capacity of the first shared folder.
5. Press and hold **Select**.  
Repeat this step as necessary.  
The panel displays the name and capacity of the next shared folder.

## Viewing System Information

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

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 4. System`.
4. Press and hold **Enter**.  
The panel displays the CPU and system temperature.
5. Press and hold **Select**.  
The panel displays the system fan speed.

## Restarting 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 6. Reboot`.
4. Press and hold **Enter**.  
The NAS restarts.

## Changing the LCD Password

Specifying a password for the LCD panel prevents unauthorized access.

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 7. Password`.
4. Press and hold **Enter**.

The `Change Password` screen appears.

**5. Select **Yes** by pressing and holding **Enter**.**

The `New Password` screen appears.

**6. Press **Select** and **Enter** to specify a new password.**

- Specify a password.
  - Length: 1-8 characters
  - Valid characters: 0-9
- To delete a password, leave the password field blank.

Button	Usage
<b>Enter</b>	Move to the next item in the <code>New Password</code> screen.
<b>Select</b>	Change a character in the <code>New Password</code> and <code>Verify Password</code> screens.

**7. Press **Enter**.**

The NAS saves the password.


## 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.
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.
Shared Folder [number] Full	Shared folder is full.
HDD Ejected	Drive has ejected.
Shared Folder [number] Degraded	Shared folder [number] is in degrade mode.
Shared Folder [number] Unmounted	Shared folder [number] has unmounted.
Shared Folder [number] Inactive	Shared folder [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 shared folder has reached its full capacity.</li> <li>The shared folder 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>
LAN	Orange	The network connection is operating.
	Flashes orange	The device is being accessed from the network.
	Off	The device is not connected to a network.

LED	Status	Description
Drive activity	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.
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 Ethernet speed	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 10 Mbps.</li> <li>There is no network connection.</li> </ul>
2.5 Gigabit Ethernet activity	Orange	A network connection has been established.
	Flashes orange	The device is being accessed from the network.
	Off	There is no network connection.
25 Gigabit Ethernet speed	Green	The network connection is operating at 25 Gbps.
	Orange	The network connection is operating at 10 Gbps or 1 Gbps.
	Off	There is no network connection.
25 Gigabit Ethernet activity	Orange	A network connection has been established.
	Flashes orange	Data is being transmitted.
	Off	There is no network connection.
Expansion	Orange	An expansion unit is connected.
	Off	No expansion unit has been 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>When the reset button is pressed for 3 seconds, the NAS resets configurations.</li> <li>When the reset button is pressed for 10 seconds, the NAS resets configurations and reboots.</li> </ul>
	3	<ul style="list-style-type: none"> <li>The NAS data cannot be copied to the external storage device connected to the front USB port.</li> <li>The operating system was updated.</li> </ul>

Duration	Frequency	Description
Long beep (1.5 seconds)	3 (every 5 minutes)	<ul style="list-style-type: none"> <li>The system fan is not functioning.</li> <li>The fan module has been removed.</li> </ul>
	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>A storage pool status error occurred.</li> <li>The shared folder is about to reach its full capacity.</li> <li>The shared folder has reached its full capacity.</li> <li>A shared folder status error occurred.</li> <li>A drive is plugged in or out.</li> </ul>
	1	<ul style="list-style-type: none"> <li>The NAS is powering off.</li> <li>The NAS was powered on successfully and is ready.</li> </ul>
Long and short beeps	1 long and 2 short beeps	The JBOD expansion unit has been removed.

## Powering Off 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 5. Shut down`.
4. Press and hold **Enter**.  
The NAS powers off.

## 5. NAS Migration

You can migrate data and settings from your current NAS to another NAS model with minimal disruptions by installing all the hard drives from the source NAS to the destination NAS. RAID configuration and other settings are retained on the destination NAS after migration.

### NAS Migration Requirements

You can only migrate drives and system settings to specific NAS models, depending on your source NAS. For the list of NAS models compatible with direct NAS migration, see <https://www.qnap.com/en/nas-migration>.

Your device must meet the following requirements:

- The destination NAS must run on the same QuTS hero version as the source NAS (or later).



#### Important

Due to incompatibilities in file system, system migration between QTS NAS and QuTS hero NAS is not supported.



#### Warning




Migrating drives between QTS NAS and QuTS hero NAS can cause data corruption.


- The destination NAS must have sufficient free drive bays to accommodate all the drives that you are migrating from the source NAS.

For NAS models that do not support NAS migration, see [How to Migrate Data and Folder Permissions between QTS and QuTS hero with HBS3](#).

### Status and Setting Changes After NAS Migration

The status of NAS data and settings varies after migration.

Data and Settings	After NAS Migration
Registered myQNAPcloud name	Your registered myQNAPcloud name is not migrated.
Encrypted shared folders	<p>If the NAS does not support file system encryption, encrypted shared folders are not migrated.</p> <p> <b>Warning</b> To prevent data loss, back up and save the encryption keys of encrypted shared folders in a safe place. You can also choose to decrypt shared folders before migration.</p>
Shared folders	<p>All shared folders and the downloaded files stored in them are retained.</p> <p> <b>Warning</b> To prevent data loss, back up and save encryption keys or passwords of encrypted shared folders in a safe place before migration.</p> <p> <b>Important</b> Folder permissions on the destination NAS must be reconfigured after migration.</p>

Data and Settings	After NAS Migration
Network	If the number of network ports or network port specifications on the destination NAS is different from the source NAS, the following network and virtual settings may change and require reconfiguration: port trunking, virtual machines, Thunderbolt, and more.
Windows AD configuration	Windows AD configurations must be reconfigured.
Licenses	Licenses are not migrated.   <b>Warning</b> QNAP recommends deactivating licenses on the source NAS before data migration.
Applications	If the destination NAS has less RAM than the source NAS, the following features and applications might not function: Virtualization Station, Qsirch, and Snapshots.
Services	Only services supported by the destination NAS are available.
Multimedia features	Some multimedia features are disabled by default.

## Migrating a NAS



### Important

Before performing NAS migration, ensure that you understand all requirements and possible changes after migration.  
For details see the following topics:

- [NAS Migration Requirements](#)
- [Status and Setting Changes After NAS Migration](#)

1. Power off the source NAS and the destination NAS.
2. Remove the drives.



### Important

QNAP recommends following the source NAS drive order when installing the drives. Take note of the drive tray order when removing the drives.

- a. Remove the drives from the source NAS.
- b. Remove the drive trays from the destination NAS.
3. Install the drives.
  - a. Install source NAS drives onto the destination NAS drive trays.
  - b. Insert the drive trays into the destination NAS.
4. Power on the destination NAS.
5. Log on to QuTS hero as an administrator on the destination NAS.  
The destination NAS automatically checks for the latest firmware update.

## 6. 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	$\geq 3$	One member drive fails.
RAID 6	$\geq 4$	One or two member drives fail.
RAID 10	$\geq 4$ (Must be an even number)	One or two member drives in two different pairs fail.
RAID 50	$\geq 6$	One disk per subgroup fails.
RAID 60	$\geq 8$	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	$\geq 5$	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 shared folder 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	$\geq 2$	N/A
RAID 1	Yes	2	1
RAID 5	Yes	$\geq 3$	1
RAID 6	Yes	$\geq 4$	2
RAID 10	No	$\geq 4$ (Must be an even number)	One or two member drives in two different pairs fail.
RAID 50	Yes	$\geq 6$	One disk per subgroup fails.
RAID 60	Yes	$\geq 8$	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	$\geq 5$	3

## Support and Other Resources

QNAP provides the following resources:

Resource	URL
Documentation	<a href="https://download.qnap.com">https://download.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/go/nas-migration">https://www.qnap.com/go/nas-migration</a>
Expansion Unit Compatibility	<a href="https://www.qnap.com/go/compatibility-expansion">https://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/go/product/eol.php">https://www.qnap.com/go/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>

## 7. Glossary

### **Cloud Key**

Unique 8-digit code assigned to each NAS device

### **myQNAPcloud**

Provides various remote access services such as DDNS and myQNAPcloud Link

### **myQNAPcloud Link**

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

### **Qfinder Pro**

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

### **QuTS hero**

QNAP NAS operating system featuring ZFS file system

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END OF TERMS AND CONDITIONS

### CE Notice



This device complies with CE Compliance Class B.

### UKCA Notice



This device complies with the UKCA requirements for products sold in Great Britain.

### 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



R33B77  
RoHS

## SJ/T 11364-2006



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部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	0	0	0	0	0	0
显示	0	0	0	0	0	0
印刷电路板	0	0	0	0	0	0
金属螺帽	0	0	0	0	0	0
电缆组装	0	0	0	0	0	0
风扇组装	0	0	0	0	0	0
电力供应组装	0	0	0	0	0	0
电池	0	0	0	0	0	0
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