TS-hx83XU-RP

TS-h1683XU-RP
TS-h2483XU-RP

User Guide

Contents

1. Preface

2. Product Overview

3. Installation and Configuration

4. Basic Operations

5. Troubleshooting

6. Glossary

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-hx83XU-RP

Powered by Intel® Xeon® E-2236 processor, the TS-hx83XU-RP is an enterprise rackmount NAS designed for AI applications, such as deep learning, data analysis, and other large data volume applications. The NAS runs on QNAP's latest QuTS hero operating system that is optimized for applications on the powerful ZFS file system. The TS-hx83XU-RP is available in 16-drive bays and 24-drive bay models for storing tetrabytes of data. The NAS also features four-channel long-DIMM DDR4 memory that can be scaled up to 128 GB, expansion card slots, and pre-installed 10 Gigabit Ethernet network cards, and various input/output (I/O) ports for better scalability and flexibility.

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	Drive bays	Memory	Power supply
TS-h1683XU-RP-E2236-128G	16	128 GB	Redundant
TS-h2483XU-RP-E2236-128G	24	128 GB	Redundant

Component	TS-h1683XU-RP-E2236-128G	TS-h2483XU-RP-E2236-128G
Processor		
CPU	Intel® Xeon® E-2236	
Frequency	6-core/ 12-threads/ 3.4 GHz /4.8 GHz burst	
Architecture	x86 64-bit	
Encryption engine	AES-NI	
Memory		
Pre-installed memory	128 GB RAM: 4 x 32 GB ECC DDR4 UDIMM	

Component	TS-h1683XU-RP-E2236-128G	TS-h2483XU-RP-E2236-128G
Memory slots	4 x Long-DIMM DDR4	
	⊘ Important 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	
Flash memory	5 GB (dual-boot OS protection)	
Storage		
Drive bays	16 x 3.5-inch SATA 6 Gbps	24 x 3.5-inch SATA 6 Gbps
	🗩 Note The SATA 6 Gbps interface is backward compatible with SATA 3 Gbps.	
Drive compatibility	3.5-inch bays: • 3.5-inch SATA hard disk drives • 2.5-inch SATA hard disk drives • 2.5-inch SATA solid-state drives	
SSD cache acceleration support	3.5-inch drive bays: 1 to 16	3.5-inch drive bays: 1 to 24
Hot-swapping	Supported	
Network		
10 Gigabit Ethernet ports	• 2 x 10 GbE SmartNIC SFP+ • 2 x 10GBase-T RJ45	
Gigabit Ethernet ports	4 x GbE RJ45	
Wake-on-LAN	Yes (GbE RJ45)	
External I/O Ports & Expansion Slots		
PCIe slots	• 1 x PCIe Gen 2 x 4 • 2 x PCIe Gen 3 x 4 • 1 x PCIe Gen 3 x 8	• 3 x PCIe Gen 2 x 4 • 1 x PCIe Gen 3 x 4 • 1 x PCIe Gen 3 x 8
USB ports	• 4 x USB 3.2 Gen 2 (10 Gbps) 4V/1A Type-A • 2 x USB 3.2 Gen 2 (10 Gbps) 5V/3A Type-C	
Interface		
Buttons	• Power • Reset	
Dimensions		
Form factor	3U Rackmount	4U Rackmount
Dimensions (H x W x D)	130 x 481 x 573.5 mm 5.12 x 18.93 x 22.58 in	176.15 x 481.04 x 672.02 mm 6.94 x 18.94 x 26.46 in

Component	TS-h1683XU-RP-E2236-128G	TS-h2483XU-RP-E2236-128G
Net weight	13.76 kg (30.34 lbs)	20.67 kg (45.57 lbs)
Others		
Rail compatibility	RAIL-A03-57	RAIL-A02-90
	Note • Rail kits are not included with the NAS and must be purchased separately. For details, contact an authorized reseller or go to http://shop.qnap.com. • Information on rail kit installation can be found in the installation guide included in the rail kit package.	
Power supply unit	TS-h1683XU-RP: 2 x 500W, 100-240V AC, 50/60 Hz	TS-h2483XU-RP: 2 x 800W, 100-240V AC, 50/60 Hz
System battery	CR2032 lithium battery (3V, 225 mAh)	
Sound level	53 dB(A)	28.7 dB(A)
	Note 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	• TS-h1683XU-RP: 4 x 92mm, 12V DC system fans • TS-h2483XU-RP : 3 x 80mm, 12V DC system fans	
Operating temperature	0˚C to 40˚C (32˚F to 104˚F)	
Relative humidity	• Non-condensing relative humidity: 5% to 95% • Wet-bulb temperature: 27˚C (80.6˚F)	

Tip
For the list of compatible drive models and expansion cards, go to https://www.qnap.com/compatibility.

Package Contents

Item	Quantity
TS-hx83XU-RP NAS	1
Power cord	• TS-h1683XU-RP: 2 • TS-h2483XU-RP: 2
Ethernet cable	• 2 x 1GbE (Cat5e) • 2 x 10GbE (Cat6a)
Screws for 2.5-inch drives	• TS-h1683XU-RP: 64 • TS-h2483XU-RP: 96
Screws for 3.5-inch drives	• TS-h1683XU-RP: 64 • TS-h2483XU-RP: 96

Item	Quantity
Quick Installation Guide (QIG)	1

Components

Front Panel
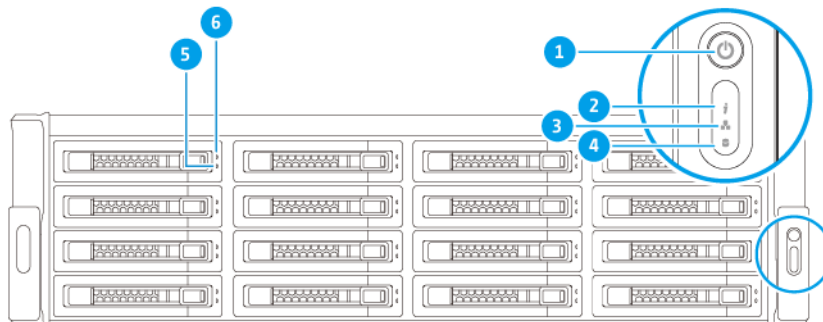
No.	Component	No.	Component
1	Power button	4	Expansion unit LED
2	Status LED	5	Drive status LED
3	LAN LED	6	Drive activity LED

Rear Panel
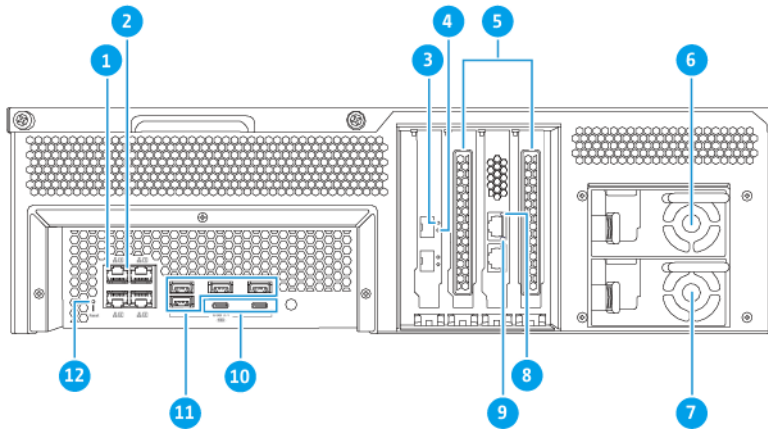
TS-h1683XU-RP

No.	Component	No.	Component
1	Gigabit Ethernet activity LED	7	Power supply unit 2
2	Gigabit Ethernet speed LED	8	10 Gigabit Ethernet Speed (RJ45) LED
3	10 Gigabit Ethernet Speed (SFP+) LED	9	10 Gigabit Ethernet Activity (RJ45) LED
4	10 Gigabit Ethernet Activity (SFP+) LED	10	USB 3.2 Gen 2x2 5V/3A (10Gbps) Type-C ports
5	PCIe full-height covers	11	USB 3.2 Gen 2 4V/1A (10Gbps) Type-A ports
6	Power supply unit 1	12	Reset button
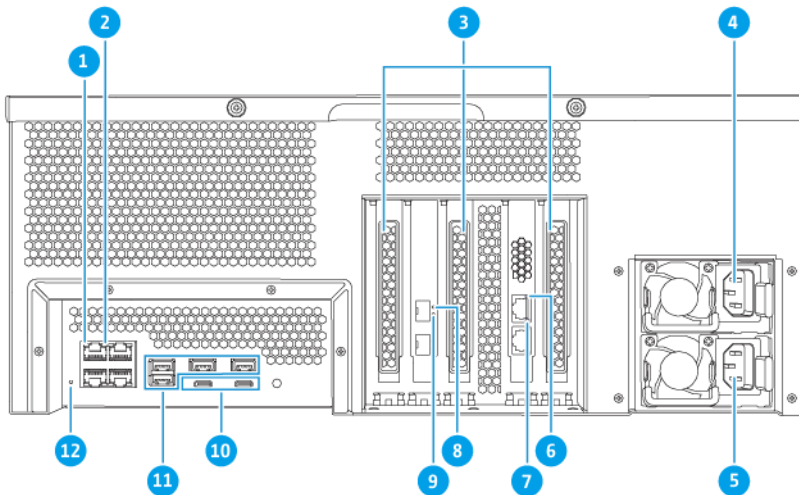
TS-h2483XU-RP

No.	Component	No.	Component
1	Gigabit Ethernet activity LED	7	10 Gigabit Ethernet Activity (RJ45) LED
2	Gigabit Ethernet speed LED	8	10 Gigabit Ethernet Speed (SFP+) LED
3	PCIe full-height covers	9	10 Gigabit Ethernet Activity (SFP+) LED
4	Power supply unit 1	10	USB 3.2 Gen 2x2 5V/3A (10Gbps) Type-C ports
5	Power supply unit 2	11	USB 3.2 Gen 2 4V/1A (10Gbps) Type-A ports
6	10 Gigabit Ethernet Speed (RJ45) LED	12	Reset button

Rear Panel Network Interface
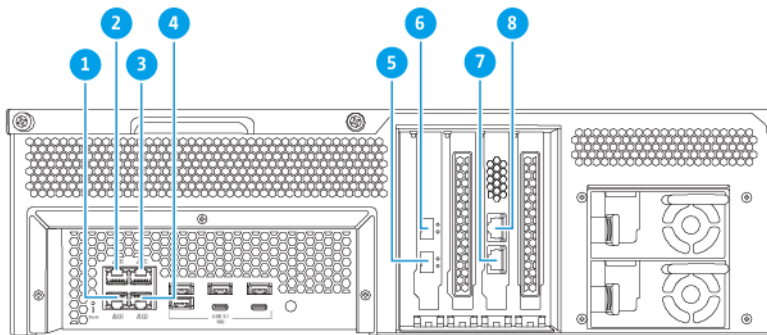
TS-h1683XU-RP

Note
Only Gigabit Ethernet (RJ45) ports support Wake-on-LAN configurations.

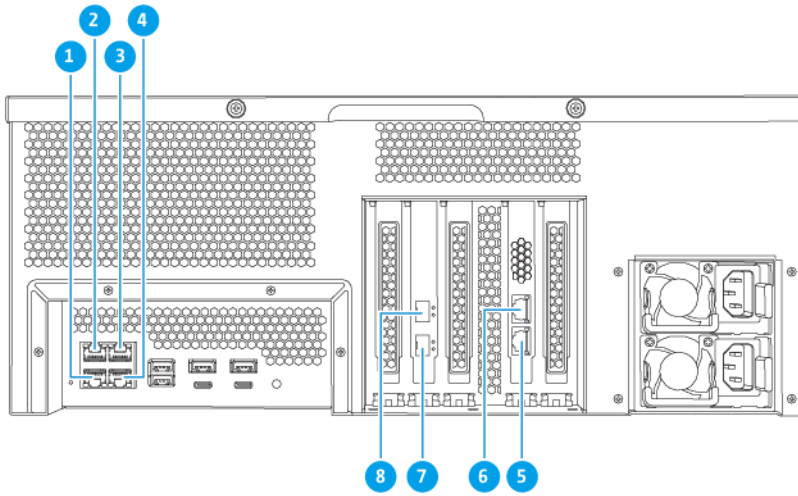| No.	Component	Specifications	No.	Component	Specifications
1	Ethernet port 4	GbE RJ45	5	Ethernet port 7	10GbE SFP+ SmartNIC
2	Ethernet port 3	GbE RJ45	6	Ethernet port 8	10GbE SFP+ SmartNIC
3	Ethernet port 1	GbE RJ45	7	Ethernet port 5	10GbaseT RJ45
4	Ethernet port 2	GbE RJ45	8	Ethernet port 6	10GbaseT RJ45

TS-h2483XU-RP

> 📝 **Note**
> Only Gigabit Ethernet (RJ45) ports support Wake-on-LAN configurations.

No.	Component	Specifications	No.	Component	Specifications
1	Ethernet port 4	GbE RJ45	5	Ethernet port 5	10GbaseT RJ45
2	Ethernet port 3	GbE RJ45	6	Ethernet port 6	10GbaseT RJ45
3	Ethernet port 1	GbE RJ45	7	Ethernet port 7	10GbE SFP+ SmartNIC
4	Ethernet port 2	GbE RJ45	8	Ethernet port 8	10GbE SFP+ SmartNIC

System Board

TS-h1683XU-RP

No.	Component	No.	Component
1	PCIe slot 1 (PCIe 2.0 x4)	5	Memory slot 4
2	PCIe slot 2 (PCIe 3.0 x8) **Note** A dual-port 10 Gbase-T network expansion card is pre-installed on this PCIe slot.	6	Memory slot 3
3	PCIe slot 3 (PCIe 3.0 x4)	7	Memory slot 2
4	PCIe slot 4 (PCIe 3.0 x4) **Note** A dual-port 10 GbE SFP+ network expansion card is pre-installed on this PCIe slot.	8	Memory slot 1

TS-h2483XU-RP

No.	Component	No.	Component
1	PCIe slot 1 (PCIe 2.0 x4)	6	Memory slot 4
2	PCIe slot 2 (PCIe 3.0 x4) **Note** A dual-port 10 Gbase-T network expansion card is pre-installed on this PCIe slot.	7	Memory slot 3
3	PCIe slot 3 (PCIe 2.0 x4)	8	Memory slot 2

No.	Component	No.	Component
4	PCIe slot 4 (PCIe 3.0 x8) **Note** A dual-port 10 GbE SFP+ network expansion card is pre-installed on this PCIe slot.	9	Memory slot 1
5	PCIe slot 2 (PCIe 3.0 x4)	-	-

Drive Numbering

TS-h1683XU-RP

TS-h2483XU-RP

Safety Information

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

General Instructions

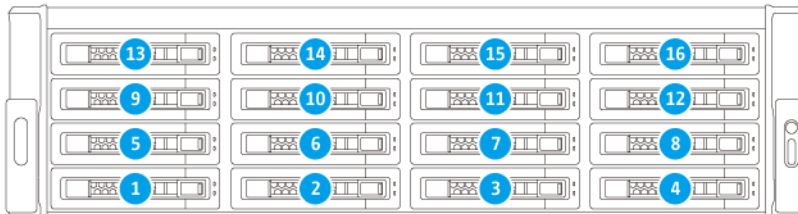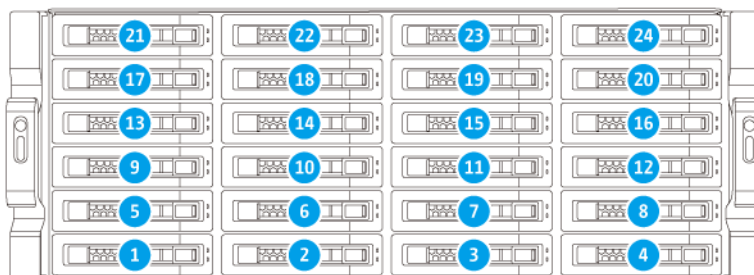- The device should be stored in a secure location with restricted access, controlled through the use of a tool, lock and key, or any means of security.

- 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	• Room temperature: 0˚C to 40˚C (32˚F to 104˚F) • Non-condensing relative humidity: 5% to 95% • Wet-bulb temperature: 27˚C (80.6˚F) • Flat, anti-static surface without exposure to direct sunlight, liquids, or chemicals
Hardware and peripherals	• Storage drives For details on compatible drives, go to https://www.qnap.com/compatibility/. • Network cable
Tools	• Phillips #1 or #2 screwdriver • Anti-static wrist strap

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 NAS on a rack.

3. Verify that the intake vents on the bottom of the case are unobstructed.

4. 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

5. Optional: Install expansion cards.
   For details see, Removing Expansion Cards.

6. Optional: Connect the expansion units.
   For details, see Connecting SAS Expansion Units.

7. Connect the power cord and all applicable cables.

8. Power on the NAS.

9. Install QuTS hero.
   For details, see QuTS hero Installation.

10. 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-hx83XU-RP is compatible with 3.5-inch and 2.5-inch hard drives, and 2.5-inch solid-state drives.

Installing 3.5-inch Hard Drives on 3.5-inch Trays

> **Warning**
>
> - Installing a drive and installing QuTS hero 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. Slide the lock to the left.

b. Push the button to release the tray handle.

c. Pull the tray out.

3. Install a drive on the tray.

   a. Place the drive on the tray so that the holes on the sides of the drive are aligned with the holes on the sides 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 to the right.

5. Power on the NAS.

Installing 2.5-inch Hard Drives on 3.5-inch Trays

⚠ Warning

- Installing a drive and installing QuTS hero deletes all data on the drive.

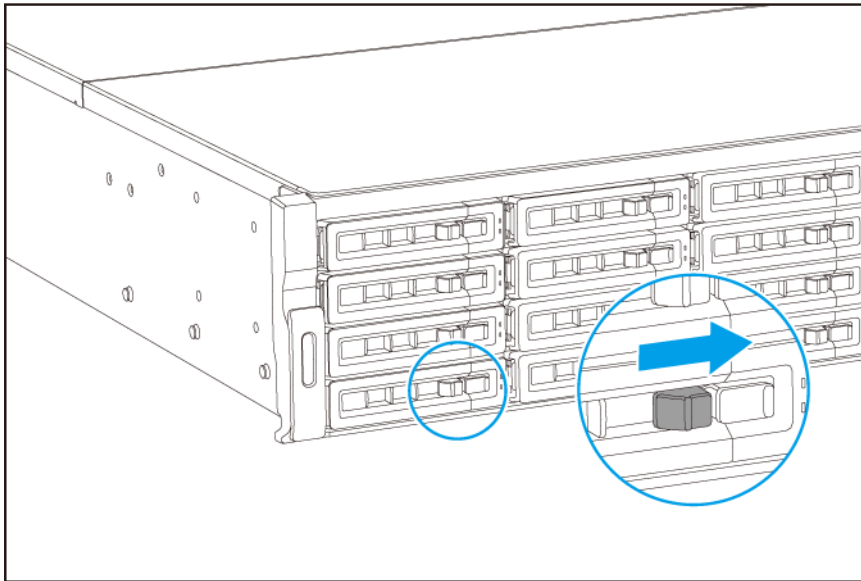- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

-

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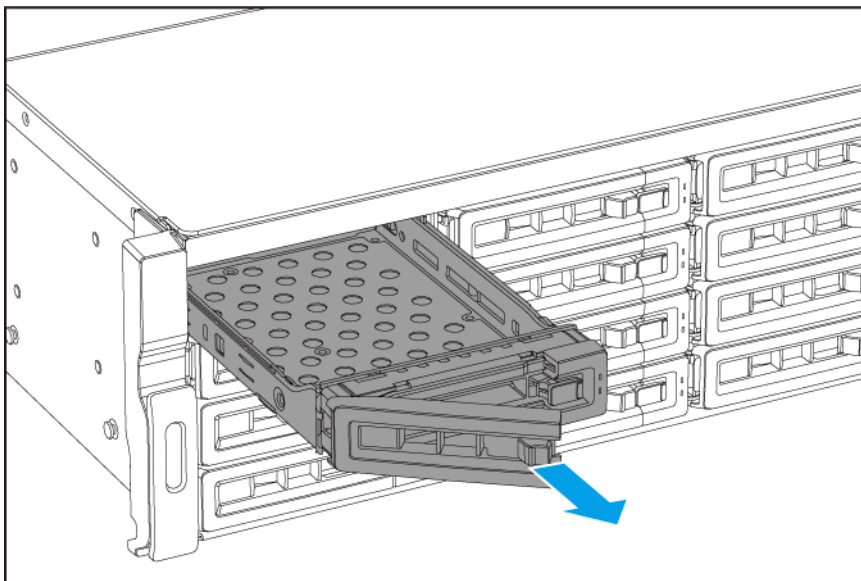
-

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

1. Power off the NAS.

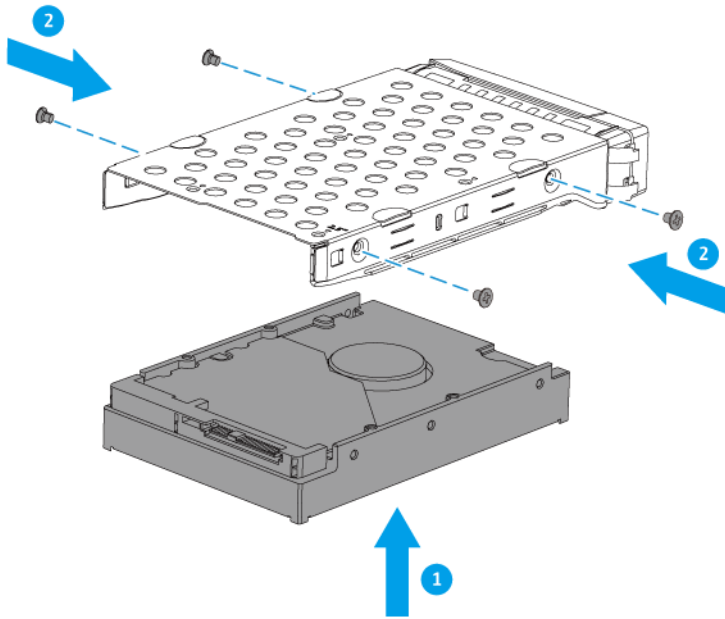2. Remove the drive tray.

   a. Slide the lock to the left.

b. Push the button to release the tray handle.
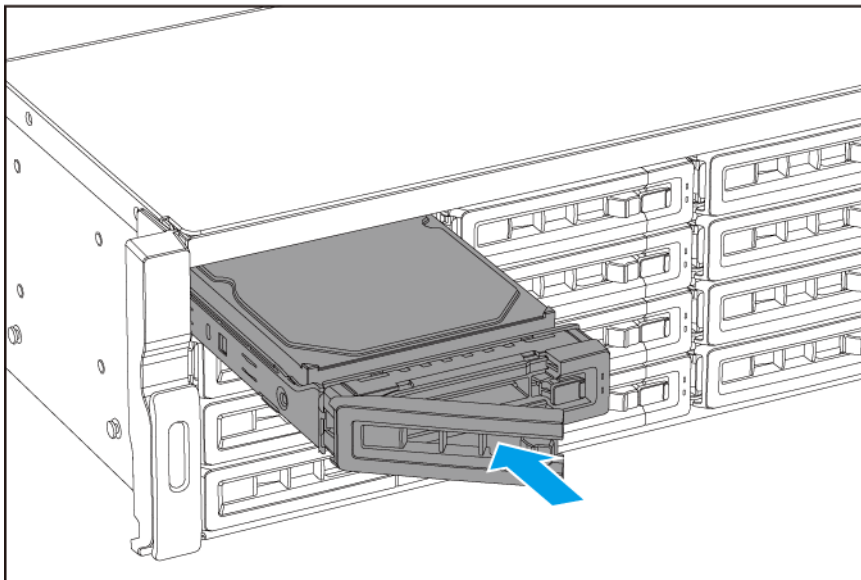
c. Pull the tray out.
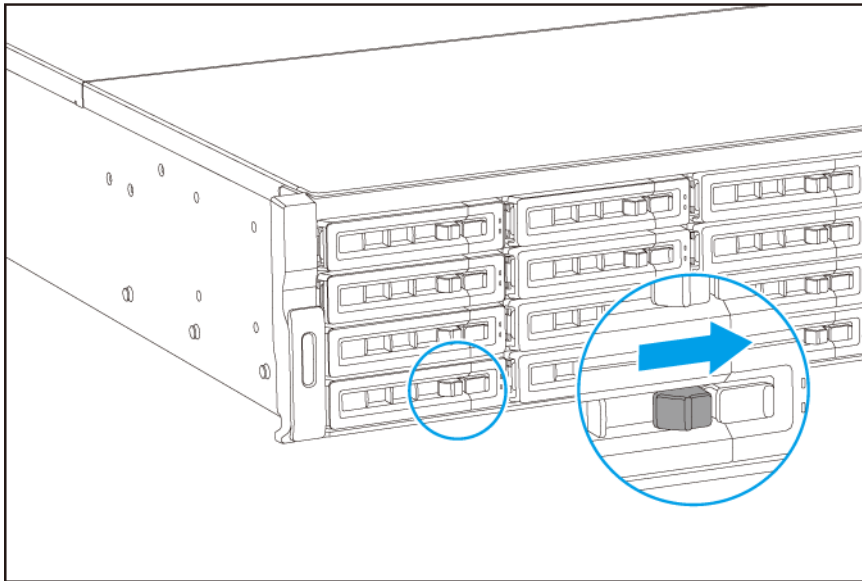

3. Install a drive on the tray.

    a. Place the drive on the tray so that the holes on the sides of the drive are aligned with the holes on the sides 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 to the right.

5. Power on the NAS.

Replacing Memory Modules

The TS-hx83XU-RP has four memory slots. You can increase the memory capacity of the NAS by upgrading memory modules. For optimal dual-channel performance, replace memory modules in all four 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 pairs.
> Ensure the following when replacing memory modules:
>
> - When installing one memory module, install the memory in slot 1.
>
> - When replacing two memory modules, ensure that each pair uses identical modules.
>
> - When replacing four memory modules, ensure that all four modules are identical.
>
> - Install the pairs in sequence and follow the assigned slots for each pair.
>
> - When installing four memory modules, install the memory in slots 2, 4, 1, and 3.
>
> For details on slot numbering, see System Board.

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

> **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.
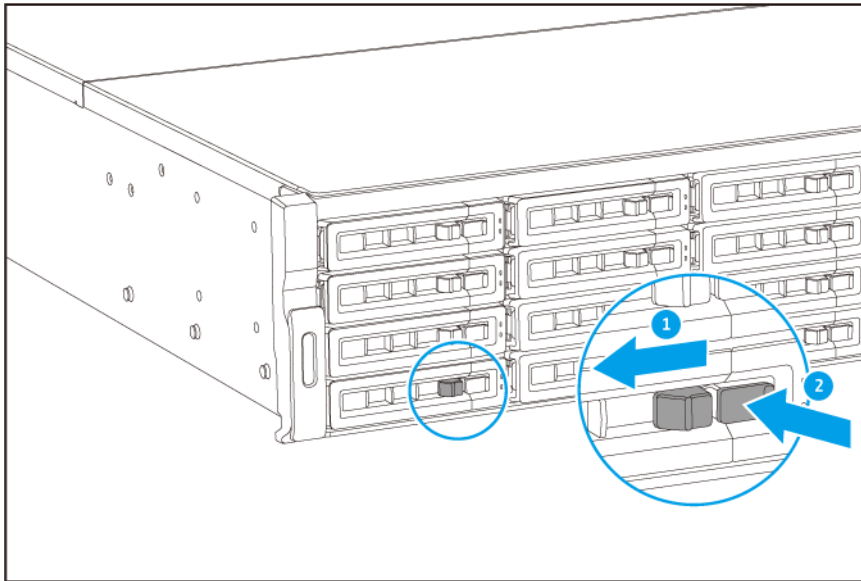
-

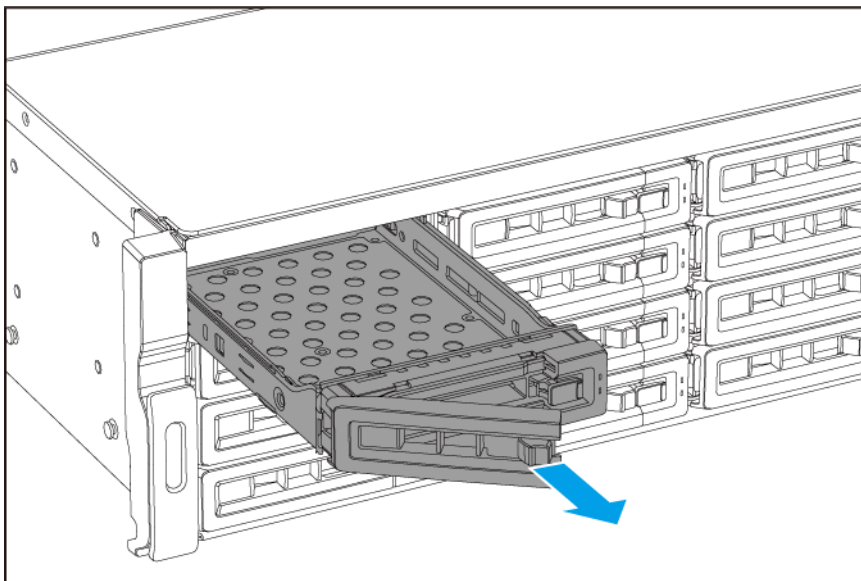**Moving fan blades:** Keep your hands and other body parts away from moving fan blades.

-

Other moving components: Keep your hands and other body parts away from other moving components.
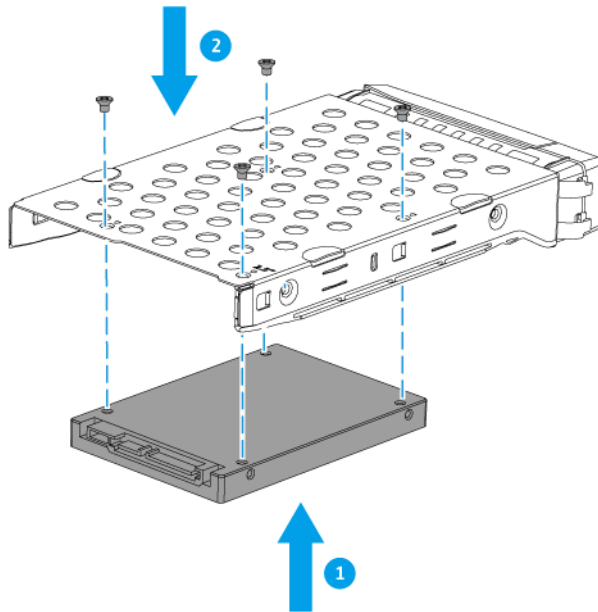
1. Power off the device.

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.
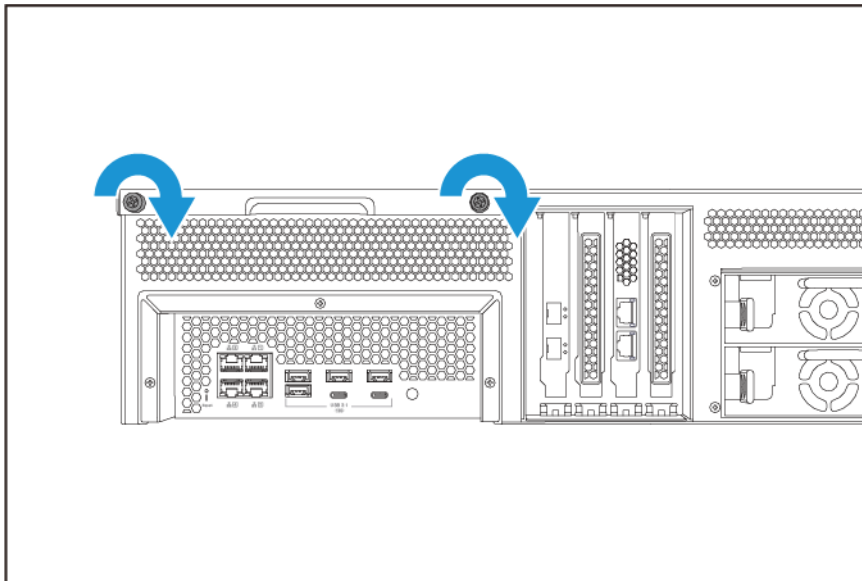
   b. Slide the cover back.

   c. Lift the cover off the device.
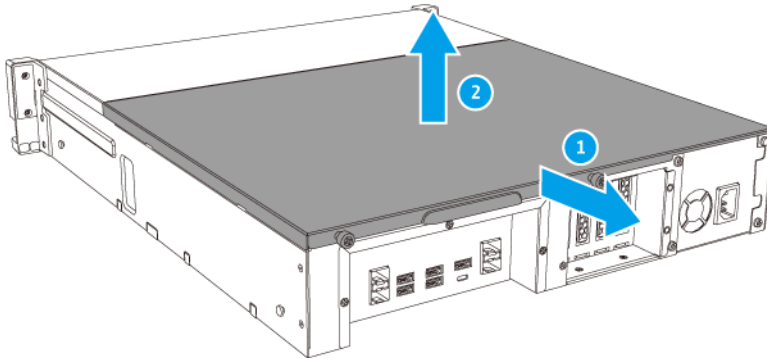
5. Remove an existing module.

    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.
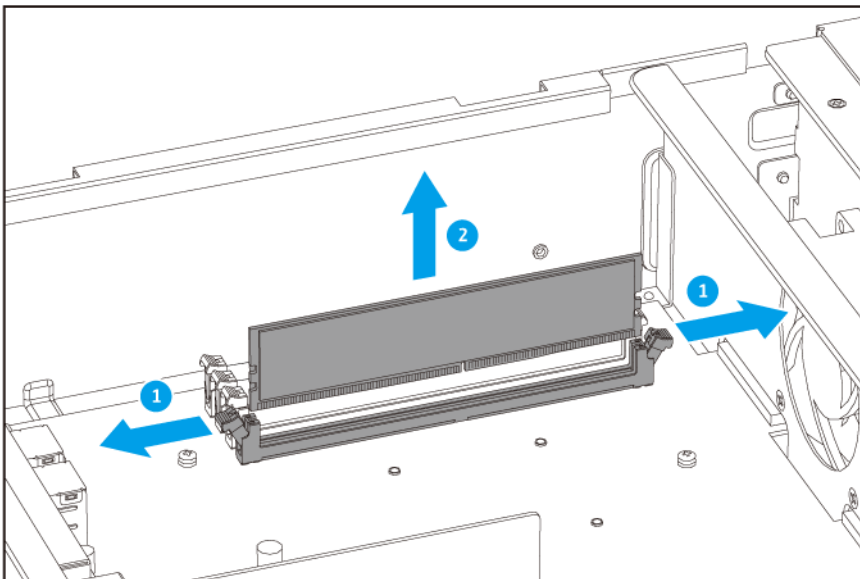
⚠️ **Warning**

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

- Do not bend the module.

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.
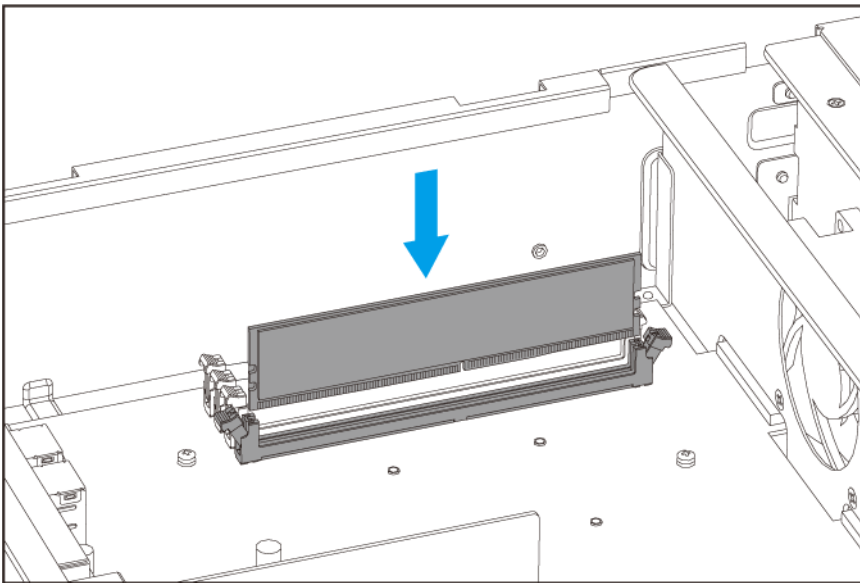
7. Attach the case cover.

    a. Place the cover on the device.
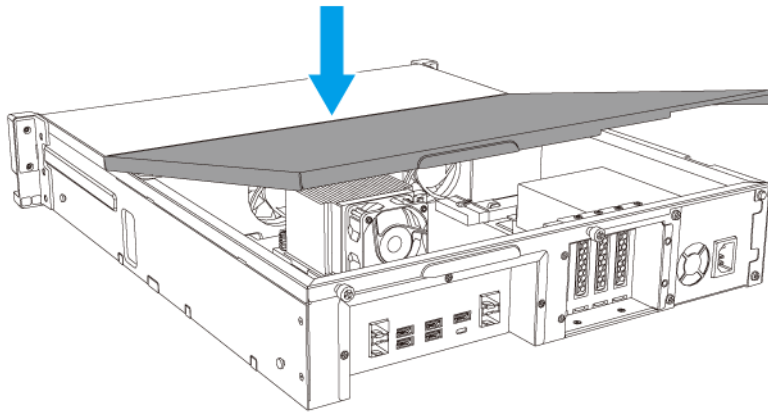
b. Slide the cover forward.
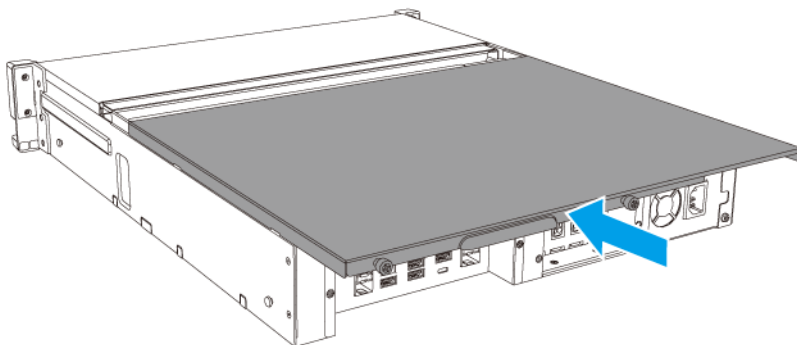
c. Tighten the screws.
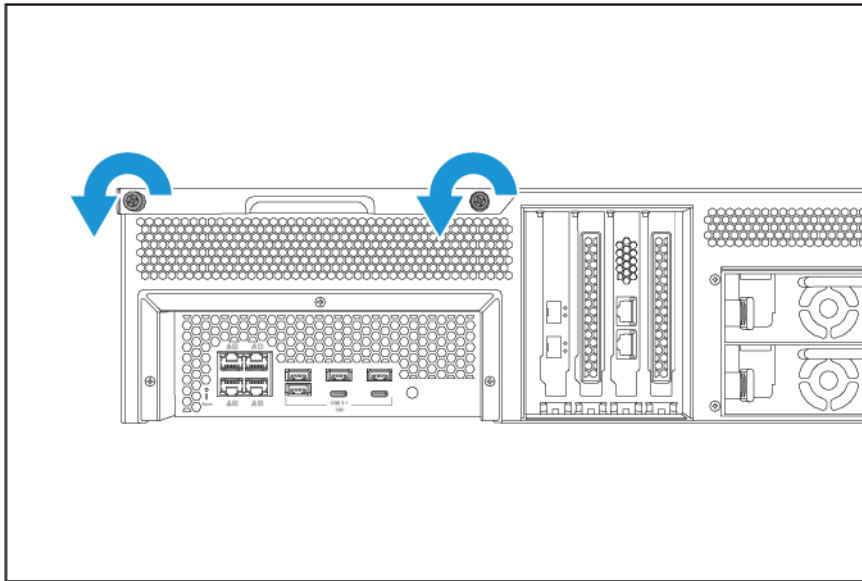
8. Connect all cables and external attachments.

9. Power on the device.

10. Verify that the module is recognized by the device.

11. Log on to QuTS hero as administrator.

12. Go to **Control Panel** > **System** > **System Status** > **Hardware Information** .

13. Check the value for **Total memory**.

Replacing Expansion Cards

The device 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 device.

> **Warning**
>
> •
>
> **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.
>
> • Observe electrostatic discharge (ESD) procedures to avoid damage to 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.
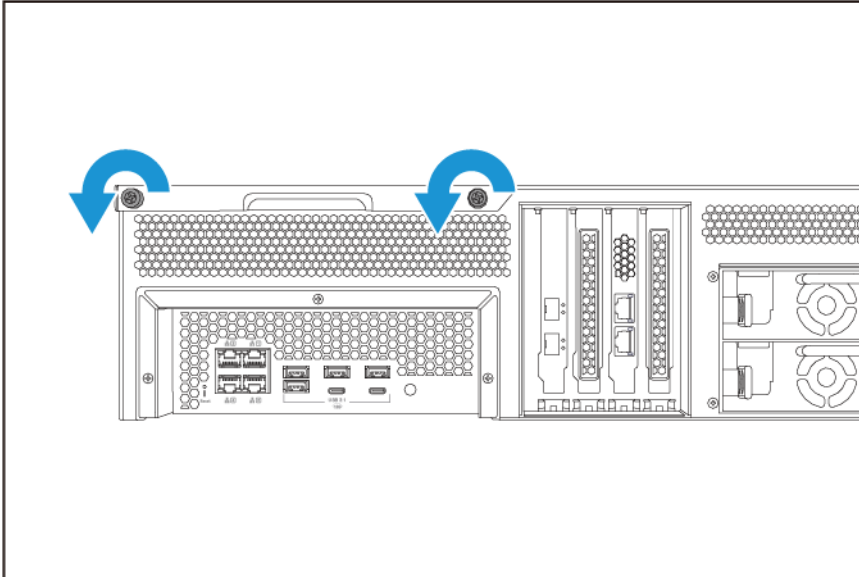
   b. Slide the cover back.

   c. Lift the cover off the device.
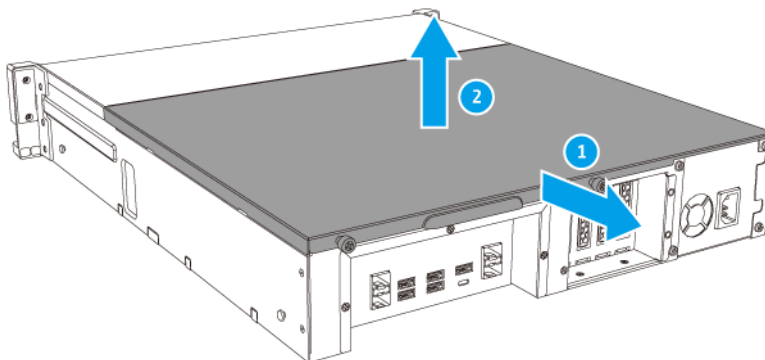
5. Remove the PCIe cover.

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

b. Pull the cover away from the slot.
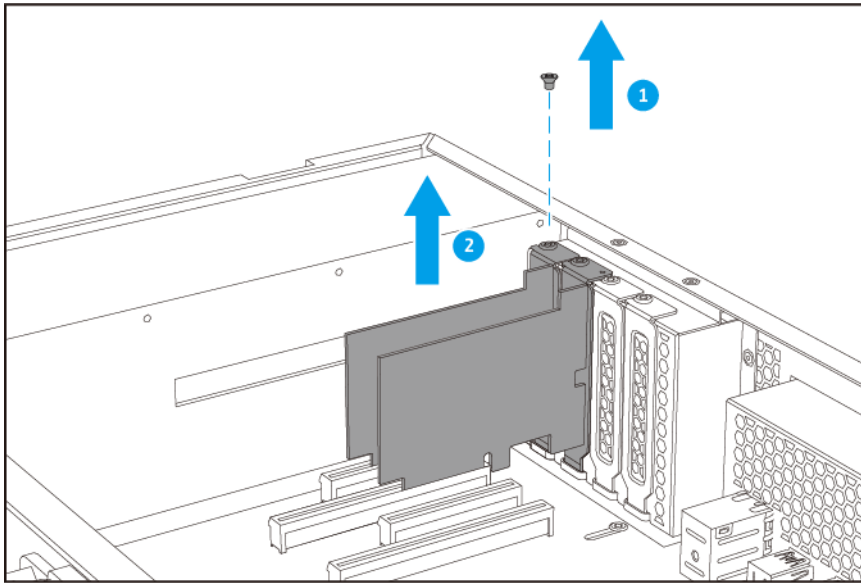
> **Note**
> This image shows removing an expansion card from a TS-h1683XU-RP NAS.

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.
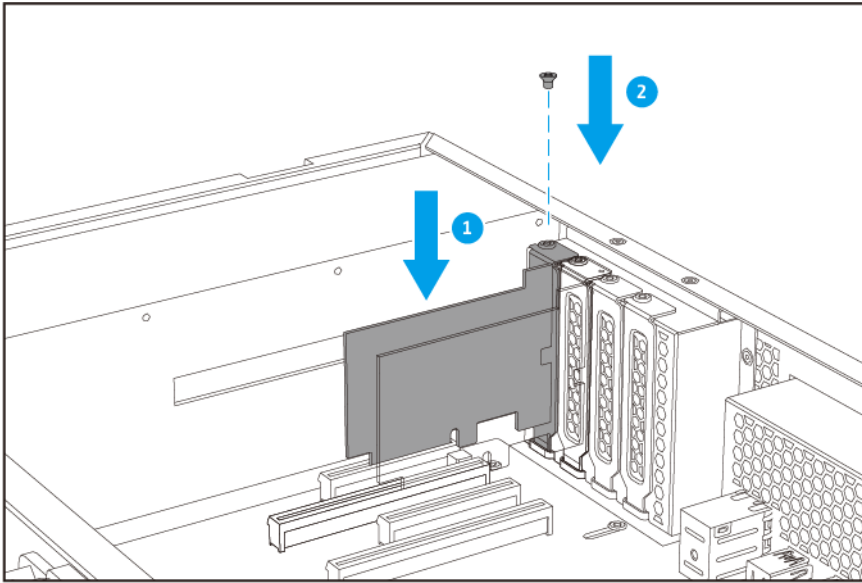
> **Note**
> This image shows removing an expansion card from a TS-h1683XU-RP NAS.

8. Attach the case cover.

    a. Place the cover on the device.
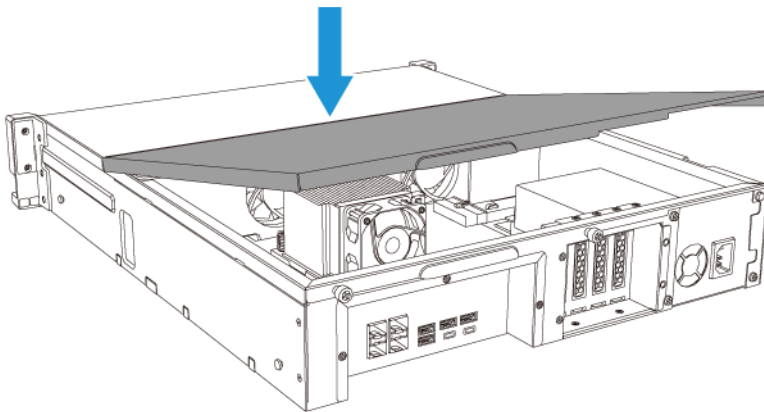
    b. Slide the cover forward.
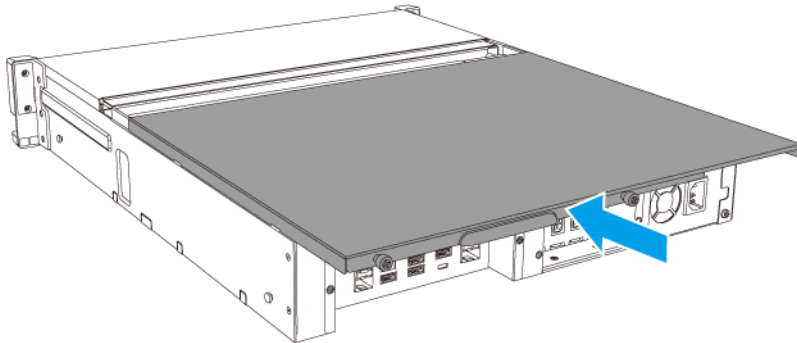
   c. Tighten the screws.
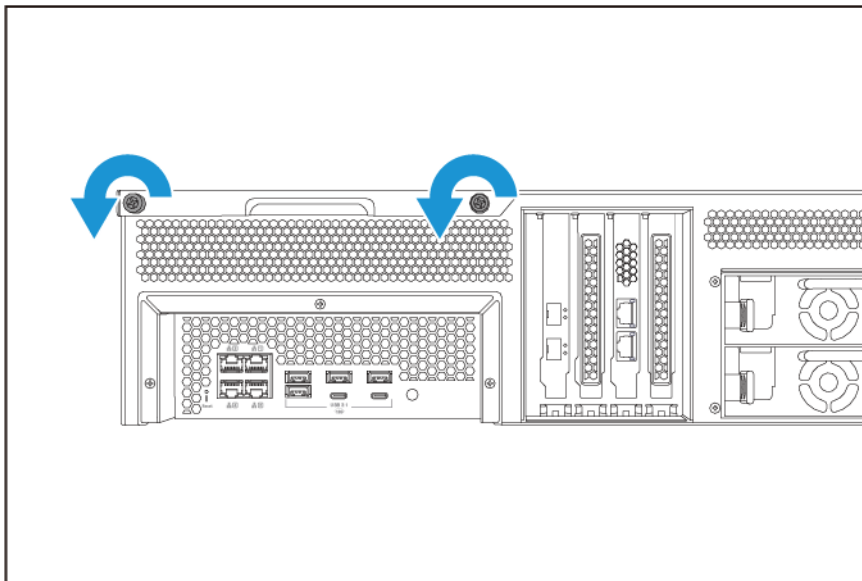
9. Connect all cables and external attachments.

10. Connect the power cord to the electrical outlet.

11. Power on the device.

Hot-swapping Redundant Power Supply Units

⚠️ **Warning**

The NAS may have one or more power supply unit (PSU) cords. To avoid serious injuries, a trained service technician must disconnect all PSU cords before installing or replacing system components.

1. Power off the device.

2. Disconnect the power cord from the electrical outlet and the power supply unit (PSU) that you are replacing.

3. Firmly press the latch toward the handle and then pull the PSU out.
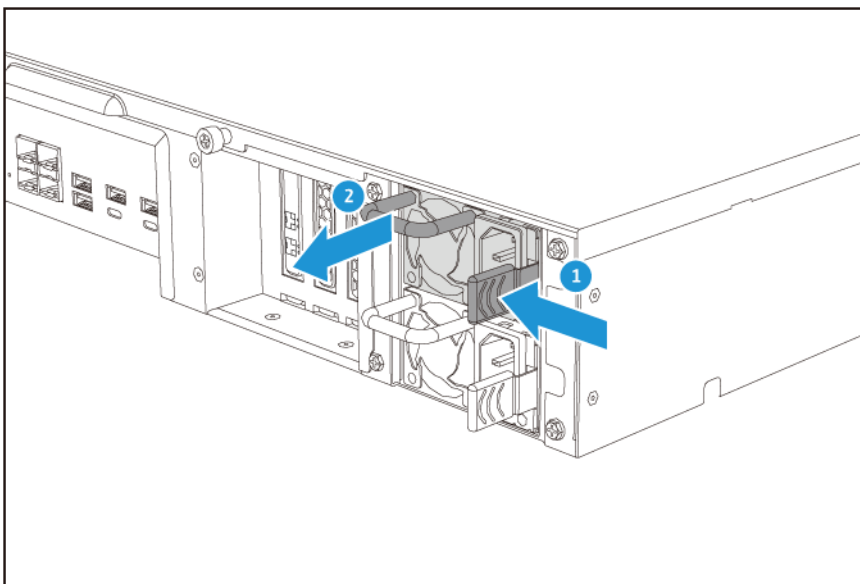
4. Insert the new PSU.
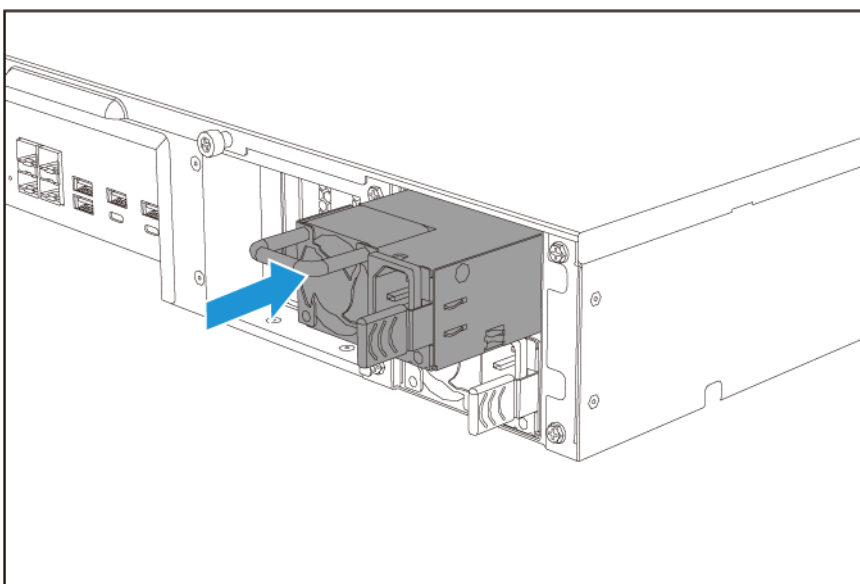
5. Connect the power cord to the PSU and the electrical outlet.

6. Power on the device.

Rail Kits

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

The TS-hx83XU-RP is compatible with the following rail kit models:

Model	Compatible Rail Kit
TS-h1683XU-RP	RAIL-A03-57
TS-h2483XU-RP	RAIL-A02-90

You can find installation information in the rail kit package.

Expansion Unit Installation

The TS-hx83XU-RP supports SAS expansion units. For details, please see table below.

The device supports SAS expansion units, SATA JBOD expansion units, and USB expansion units. For details, please see 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 http://www.qnap.com/go/compatibility-expansion.

Expansion Unit Model	Description	Required Accessories
REXP-1620U-RP REXP-1220U-RP	• Uses a SAS 12 Gbps (SFF-8644) interface • Supports SAS/SATA HDD/SSD	• SAS-12G2E storage expansion card • mini-SAS SFF-8644 cable • RAIL-A03-57
REXP-1610U-RP REXP-1210U-RP	• Uses a SAS 6 Gbps (SFF-8644) interface • Supports SATA/HDD/SSD	• SAS-12G2E storage expansion card • mini-SAS SFF-8644 cable • RAIL-A03-57
TL-D400S	• Uses a SAS 6 Gbps (SFF-8088) interface • Supports SATA/HDD/SSD	• 1 x SFF-8088 connector cable • QXP-400eS-A1164 host bus adapter
TL-D800S	• Uses a SAS 6 Gbps (SFF-8088) interface • Supports SATA/HDD/SSD	• 2 x SFF-8088 connector cables • QXP-800eS-A1164 host bus adapter

Expansion Unit Model	Description	Required Accessories
TL-R400S	• Uses a SAS 6 Gbps (SFF-8088) interface • Supports SATA/HDD/SSD	• 1 x SFF-8088 connector cable • QXP-400eS-A1164 host bus adapter • RAIL-B02
TR-002	• Uses a USB 3.2 Gen 2 Type-C interface • Supports SATA drives	• USB 3.2 Gen 2 Type-A to Type-C cable • USB 3.2 Gen 2 Type-C to Type-C cable
TR-004	• Uses a USB 3.2 Gen 1 Type-C interface • Supports SATA drives	• USB 3.2 Gen 2 Type-A to Type-C cable • USB 3.2 Gen 2 Type-C to Type-C cable
TR-004U	• Uses a USB 3.2 Gen 1 Type-C interface • Supports SATA drives	• USB 3.2 Gen 1 Type-A to Type-C cable • USB 3.2 Gen 2 Type-C to Type-C cable • RAIL-B02
TL-D800C	• Uses a USB 3.2 Gen 2 Type-C interface • Supports SATA drives	• USB 3.2 Gen 2 Type-A to Type-C cable • USB 3.2 Gen 2 Type-C to Type-C cable
TL-R1200C-RP	• Uses a USB 3.2 Gen 2 Type-C interface • Supports SATA drives	• USB 3.2 Gen 2 Type-A to Type-C cable • USB 3.2 Gen 2 Type-C to Type-C cable • RAIL-B02

Connecting SAS Expansion Units

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

1. Install a storage expansion card on the PCIe slot.
   For details, see Removing Expansion Cards.

2. Connect the expansion units to the device using the following topology.
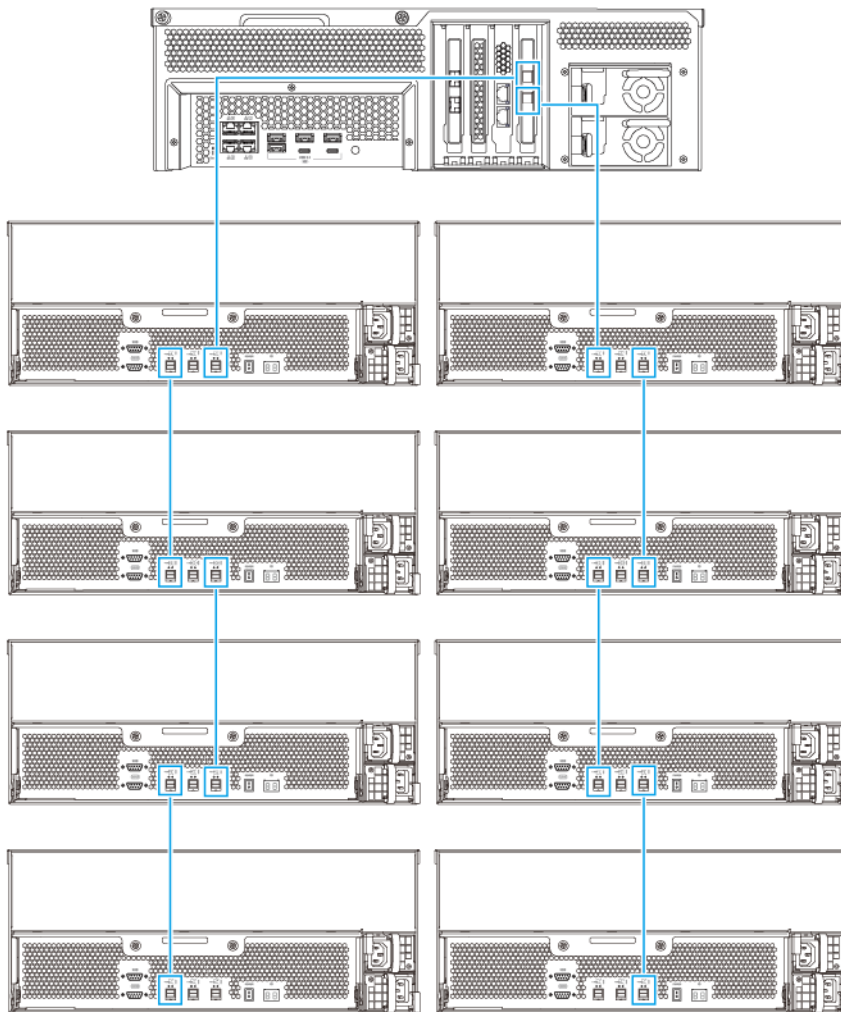
3. Power on the expansion units.

4. Verify that the expansion units are recognized by the device.

5. Log on to QuTS hero as administrator.

6. Go to **Main Menu** > **Storage & Snapshots** > **Overview** > **System** .

7. Verify that the expansion units are listed.

Connecting SATA JBOD Expansion Units

To connect the TS-hx83XU-RP to SATA JBOD expansion units, a host bus adapter must be installed on the NAS.

For required accessories details, see Expansion Unit Installation.

1. Power off the NAS.

2. Install a host bus adapter on the PCIe slot.

> ⓘ **Important**
> 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 Replacing Expansion Cards.

3. Connect the expansion units to the NAS using the following topology.
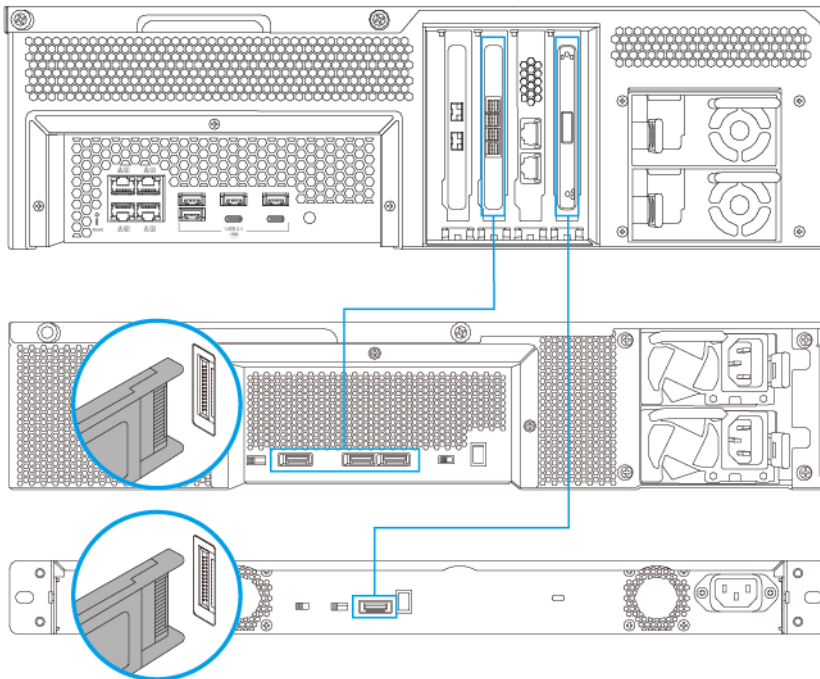
> 📝 **Note**
> This image shows connecting the NAS to a TL-R400S and TL-R1200S-RP.

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 device to USB expansion units, USB Type-A to USB Type-C cables or USB Type-C to USB Type-C cables are 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 or USB Type-C port on the NAS.
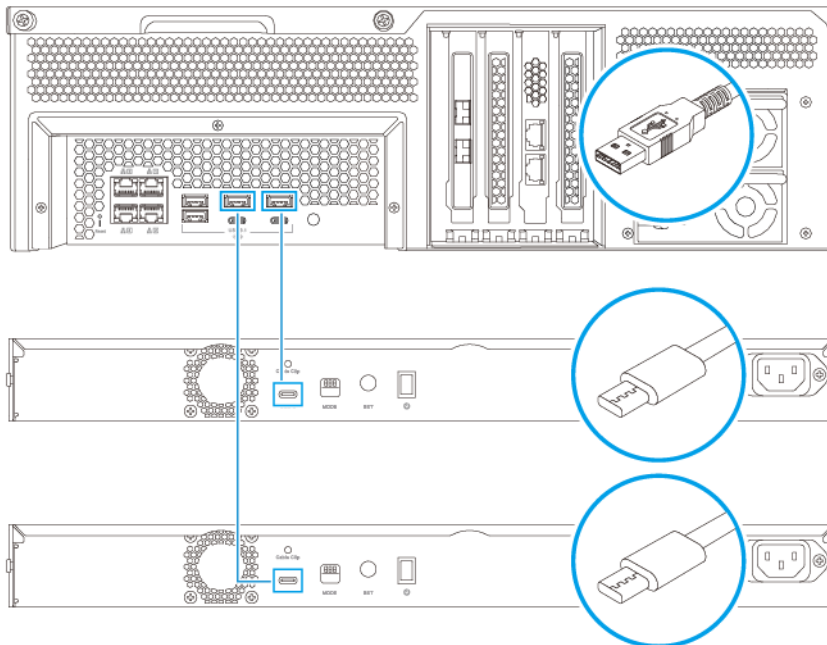
Note

This image shows the NAS connected to TL-R1200-RP USB expansion units.

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-hx83XU-RP 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)	If the NAS is connected to your local area network, you can do the following: • Locate the NAS using Qfinder Pro. • Complete the steps in the Smart Installation Guide wizard. For details, see Installing QuTS hero Using Qfinder Pro.	• Computer • Network cable • Qfinder Pro installer
Cloud installation	If the NAS is connected to the internet, you can do the following: • Scan the QR code on the NAS. • Specify the Cloud Key. • Log into your myQNAPcloud account. • Use myQNAPcloud Link to remotely access your NAS. • Complete the steps in the Smart Installation Guide wizard. For details, see Installing QuTS hero Using the Cloud Key.	• Computer or mobile device • myQNAPcloud account • Cloud Key

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

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 QTS 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	Click **Start**. Automatically searches for available firmware updates and installs firmware.
Manual installation	a. Click **Manual Installation**. The **Install Firmware** window appears. b. Click **Browse**. The upload file window appears. c. Select file. d. Click **Open**. Starts firmware installation.
Skip	Click **Skip**. 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. ⊘ **Important** 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.	The following settings are reset to default:
		
		• 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 will be 00089BF61575.
		
		💡 **Tip**
		You can find the first MAC address using Qfinder Pro. A label attached to the device also lists the address as MAC1.
		
		• TCP/IP configuration:
		
		  • Obtain IP address settings automatically via DHCP
		
		  • Disable jumbo frames
		
		  • If port trunking is enabled (multi-LAN models only), the port trunking mode is reset to "Active Backup (Failover)".
		
		• System port: 8080 (system service port)
		
		• Security level: Low (Allow all connections)
		
		• LCD panel password: (blank)
		
		• VLAN: Disabled

Operation	User Action	Result
Advanced system reset	Press and hold the button for 15 seconds.	The default factory settings are restored. • To retrieve old data after an advanced system reset, recreate the previous folder structure on the NAS.

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	• The drive is being formatted. • The device is being initialized. • The operating system is being updated. • RAID rebuilding is in progress. • Online RAID Capacity Expansion is in progress. • Online RAID Level Migration is in progress. • The firmware is being updated. **Important** When updating the firmware, do not remove the power cord or USB cable, and do not force-exit the application.
	Red	• The drive is invalid. • The shared folder has reached its full capacity. • The shared folder is about to reach its full capacity. • The system fan is not functioning. • An error occurred when accessing (read/write) the data. • A bad sector is detected on the hard drive. • The device is in degraded read-only mode (two member drives failed in RAID 5 or RAID 6 but the data can still be read). • A hardware self-test error occurred.
	Flashes red every 0.5 seconds	The device is in degraded mode (one member drive failed in RAID 1, RAID 5, or RAID 6).
	Flashes red once	The device has received a command from the remote control.
	Green	The device is ready.
	Flashes green every 0.5 seconds	• The device is not configured. • A drive is not formatted.
	Flashes orange	The device is in sleep mode.
	Off	• All drives are in standby mode. • The device is powered off.
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.

LED	Status	Description
Drive Activity	Green	The drive is ready.
	Flashes green	The drive is being accessed.
	Off	No drive was detected.
LAN	Orange	The network connection is operating at 1 Gbps. **Note** The LAN LED can only detect the device's in-built Gigabit Ethernet port connections. It cannot detect network expansion cards' Gigabit Ethernet port connection status.
	Flashes orange	The device is being accessed from the network.
	Off	The device is not connected to a network.
Expansion	Orange	• A SAS JBOD expansion unit has been detected. • A REXP expansion unit has been detected.
	Off	No JBOD expansion unit has been detected.
10 Gigabit Ethernet (SFP+) speed	Green	The network connection is operating at 10 Gbps
	Off	There is no network connection.
10 Gigabit Ethernet (SFP+) activity	Orange	A network connection has been established.
	Flashes orange	Data is being transmitted.
	Off	There is no network connection.
10 Gigabit Ethernet (RJ45) speed	Green	A 10 GbE network connection has been established.
	Orange	The network connection is operating at below 10 Gbps.
	Off	There is no network connection.
10 Gigabit Ethernet (RJ45) activity	Orange	A network connection is established.
	Flashes orange	Data is being transmitted.
	Off	There is no network connection.
1 Gigabit Ethernet speed	Green	The network connection is operating at 1 Gbps.
	Orange	The network connection is operating at 100 Mbps.
	Off	There is no network connection.
1 Gigabit Ethernet activity	Green	A network connection has been established.
	Flashes green	The device is being accessed from the network.
	Off	There is no network connection.

Audio Alert

Duration	Frequency	Description
Short beep (0.5 seconds)	1	• The NAS is starting up. • When the reset button is pressed for 3 seconds, the NAS resets configurations. • When the reset button is pressed for 10 seconds, the NAS resets configurations and reboots. • The operating system was updated.
	3	Cannot detect installed disk.
Long beep (1.5 seconds)	3 (every 5 minutes)	• A power error occurred. • The system fan is not functioning.
	2	• The shared folder is about to reach full capacity. • The shared folder is about to reach full capacity. • The shared folder has reached full capacity. • A drive is plugged in or out.
	1	• The NAS was powered off by force shutdown (hardware shutdown). • The NAS was powered on successfully and is ready.

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 shared folder that contains the new drive and then verify that the status is `Rebuilding`.

Recovering Unintentionally Removed 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	https://download.qnap.com
Compatibility List	https://www.qnap.com/compatibility/
NAS Migration Compatibility	https://www.qnap.com/en/nas-migration
Expansion Unit Compatibility	http://www.qnap.com/go/compatibility-expansion
Service Portal	https://service.qnap.com
Product Support Status	https://www.qnap.com/product/eol.php
Downloads	https://download.qnap.com
Community Forum	https://forum.qnap.com
QNAP Accessories Store	https://shop.qnap.com/

6. 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 the NAS 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

QNAP ID

User account that enables you to use myQNAPcloud remote access and other QNAP services

QuTS hero

QNAP NAS operating system featuring ZFS file system