



QNAP

TS-2088XU

User Guide



Document Version: 7
28/04/2020

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1. Preface





About This Guide

This guide provides information on the QNAP TS-2088XU NAS 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 TS-2088XU NAS.

About the TS-2088XU

The TS-2088XU is an enterprise rackmount NAS designed for AI applications, data storage, backup, sharing, and centralized management. Powered by high-performance Intel® Xeon® W multi-core processors, and loaded with four-channel DDR4 ECC RDIMM memory that can be scaled up to 256 GB, the TS-2088XU can handle large volume computing tasks. Equipped with two PCIe Gen 3 x4 slots and four PCIe Gen 3 x8 slots, the NAS supports installation of GPU cards and accelerators for AI applications. The TS-2088XU supports up to 20 storage drives, and data integrity is guaranteed through the device's redundant power supply.

Hardware Specifications






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-2088XU-W2123-32G	Intel® Xeon® W-2123	32 GB
TS-2088XU-W2133-64G	Intel® Xeon® W-2133	64 GB
TS-2088XU-W2145-128G	Intel® Xeon® W-2145	128 GB
TS-2088XU-W2175-128G	Intel® Xeon® W-2175	128 GB
TS-2088XU-W2195-256G	Intel® Xeon® W-2195	256 GB

Component	TS-2088XU-W2123-32G TS-2088XU-W2133-64G TS-2088XU-W2145-128G	TS-2088XU-W2175-128G TS-2088XU-W2195-256G
Processor		
CPU	Intel® Xeon® W-2123 Intel® Xeon® W-2133 Intel® Xeon® W-2145	Intel® Xeon® W-2175 Intel® Xeon® W-2195
Frequency	<ul style="list-style-type: none"> 4-core/8-thread 3.6 GHz base/3.9 GHz burst 6-core/12-thread 3.6 GHz base/3.9 GHz burst 8-core/16-thread 3.7 GHz base/4.5 GHz burst 	<ul style="list-style-type: none"> 14-core/28-thread 2.5 GHz base/4.3 GHz burst 18-core/36-thread 2.3 GHz base/4.3 GHz burst
Architecture	x86 64-bit	
Encryption engine	AES-NI	
Memory		

Component	TS-2088XU-W2123-32G TS-2088XU-W2133-64G TS-2088XU-W2145-128G	TS-2088XU-W2175-128G TS-2088XU-W2195-256G
Pre-installed memory	<ul style="list-style-type: none"> 32 GB RAM: 4 x 8 GB RDIMM DDR4 ECC 64 GB RAM: 4 x 16 GB RDIMM DDR4 ECC 128 GB RAM: 4 x 32 GB RDIMM DDR4 ECC 	<ul style="list-style-type: none"> 128 GB RAM: 4 x 32 GB RDIMM DDR4 ECC 256 GB RAM: 4 x 64 GB LRDIMM DDR4 ECC
Memory slots	<p>4 x DDR4 RDIMM/LRDIMM</p> <div style="border-left: 2px solid red; padding-left: 10px;"> <p> Important</p> <ul style="list-style-type: none"> 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. You can only use one type of dual in-line memory module (DIMM) at a time. Do not use registered DIMM (RDIMM) with load-reduced DIMM (LRDIMM) memory. </div>	
Maximum memory	256 GB RAM: 4 x 64 GB	
Flash memory	4 GB (dual-boot OS protection)	
Storage		
Drive bays	<ul style="list-style-type: none"> 12 x 3.5-inch SATA 6 Gbps 6 x 2.5-inch SATA 6 Gbps 2 x 2.5-inch U.2 PCIe NVMe and SATA 6 Gbps <div style="border-left: 2px solid blue; padding-left: 10px;"> <p> Note</p> <p>The SATA 6 Gbps interface is backward compatible with SATA 3 Gbps.</p> </div>	
Drive compatibility	<p>3.5-inch bays:</p> <ul style="list-style-type: none"> 3.5-inch SATA hard disk drives 2.5-inch SATA solid-state drives 2.5-inch SATA hard disk drives <p>2.5-inch bays:</p> <ul style="list-style-type: none"> 2.5-inch SATA solid-state drives 2.5-inch U.2 NVMe Gen 3 solid-state drives <div style="border-left: 2px solid blue; padding-left: 10px;"> <p> Note</p> <p>Only drive bays A1 and A2 support 2.5-inch U.2 NVMe Gen 3 solid-state drives. For details, see Drive Numbering.</p> </div>	

Component	TS-2088XU-W2123-32G TS-2088XU-W2133-64G TS-2088XU-W2145-128G	TS-2088XU-W2175-128G TS-2088XU-W2195-256G
M.2 SSD slots	1 x M.2 PCIe Gen 3 x4 NVMe	
M.2 SSD form factor	2280	
SSD cache acceleration support	<ul style="list-style-type: none"> • 3.5-inch drive bays: C1 to C12 • 2.5-inch drive bays: A1 to A2 and B1 to B6 • M.2 SSD slot 1 • Optional: M.2 SSD slots on an M.2 SSD expansion card <p> Note The TS-2088XU supports full-height expansion cards with a maximum length of 300 mm.</p>	
Hot-swapping	Supported	
Network		
10 Gigabit Ethernet ports	1 x 10 GbE RJ45	
Gigabit Ethernet ports	1 x GbE RJ45	
External I/O Ports & Expansion Slots		
PCIe slots	<ul style="list-style-type: none"> • 4 x PCIe 3.0 x8 • 2 x PCIe 3.0 x4 <p> Tip For the list of compatible expansion cards, go to https://www.qnap.com/compatibility.</p>	
USB ports	<ul style="list-style-type: none"> • 2 x USB 2.0 Type-A • 4 x USB 3.2 Gen 1 Type-A 	
Interface		
Display panel	Monochrome backlit LCD display	
Buttons	<ul style="list-style-type: none"> • Enter • Power • Select 	
Switches	Power supply unit	
Dimensions		
Form factor	4U Rackmount	
Dimensions (H x W x D)	176.15 x 480.94 x 644 mm (6.93 x 18.93 x 25.35 in)	
Net weight	23.59 kg (52.01 lbs)	
Others		

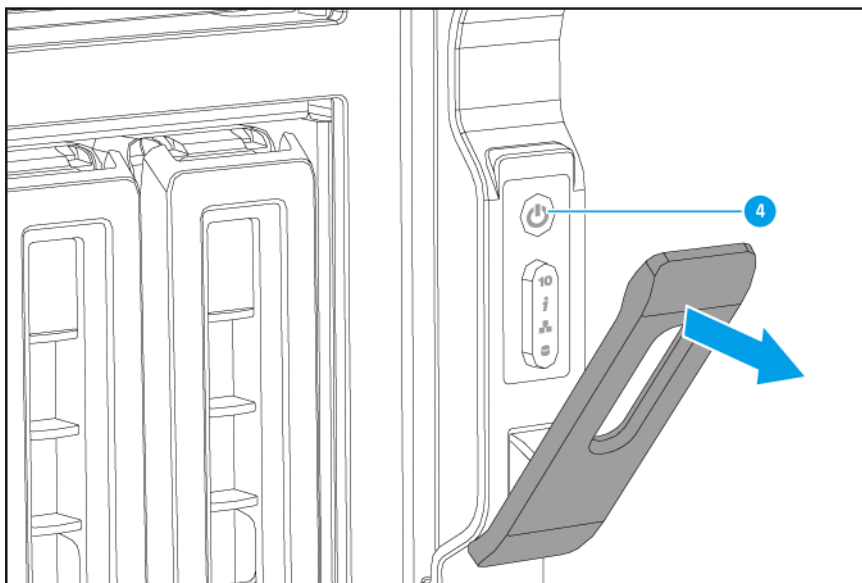
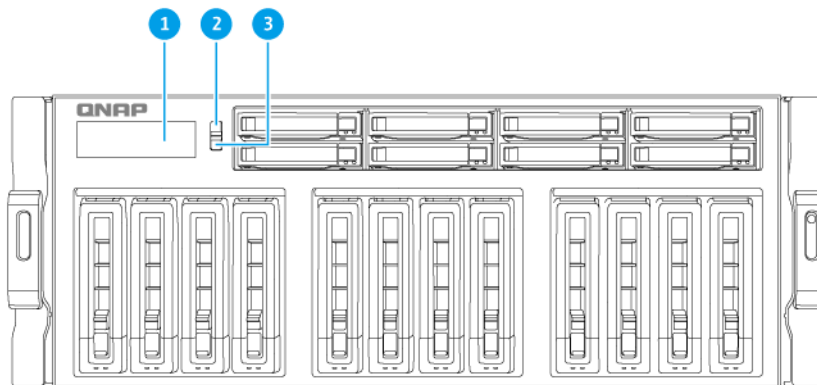
Component	TS-2088XU-W2123-32G TS-2088XU-W2133-64G TS-2088XU-W2145-128G	TS-2088XU-W2175-128G TS-2088XU-W2195-256G
Rail compatibility	RAIL-A02-90  Note Rail kits are not included with the NAS and must be purchased separately. For details, contact an authorized reseller or go to http://shop.qnap.com .	
Power supply unit	1200W, 100-127V/220-240V AC, 47/63 Hz	
System battery	CR2032 lithium battery (3V, 225 mAh)	
Sound level	49.3 (dbA)  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	CPU: <ul style="list-style-type: none"> • 1 x 8 cm fan • 1 x 12 cm fan System: 2 x 12 cm, 12V DC fans	
Operating temperature	0°C to 40°C (32°F to 104°F)	
Relative humidity	<ul style="list-style-type: none"> • Non-condensing relative humidity: 5% to 95% • Wet-bulb temperature: 27°C (80.6°F) 	

Package Contents

Item	Quantity
TS-2088XU	1
Power cords	2
Ethernet cables	<ul style="list-style-type: none"> • 1 x 1GbE (Cat 5e) • 1 x 10GbE (Cat 6A)
Screws for 3.5-inch drives	48
Screws for 2.5-inch drives	80
Quick Installation Guide (QIG)	1

Components

Front Panel

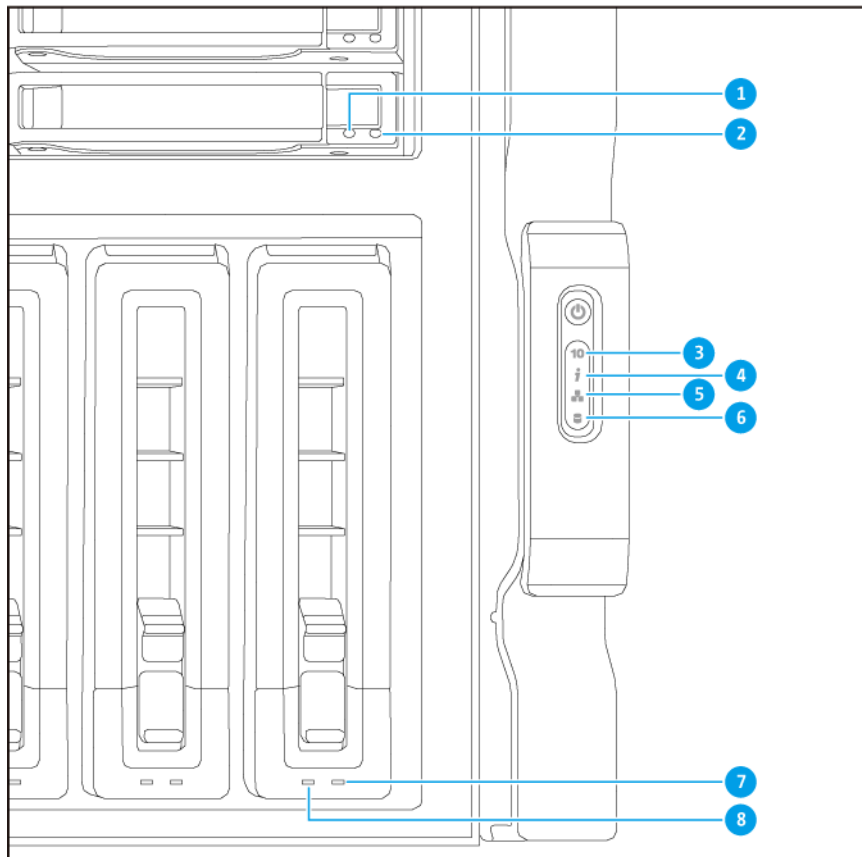


Note

Pull down the panel cover to access the power button.

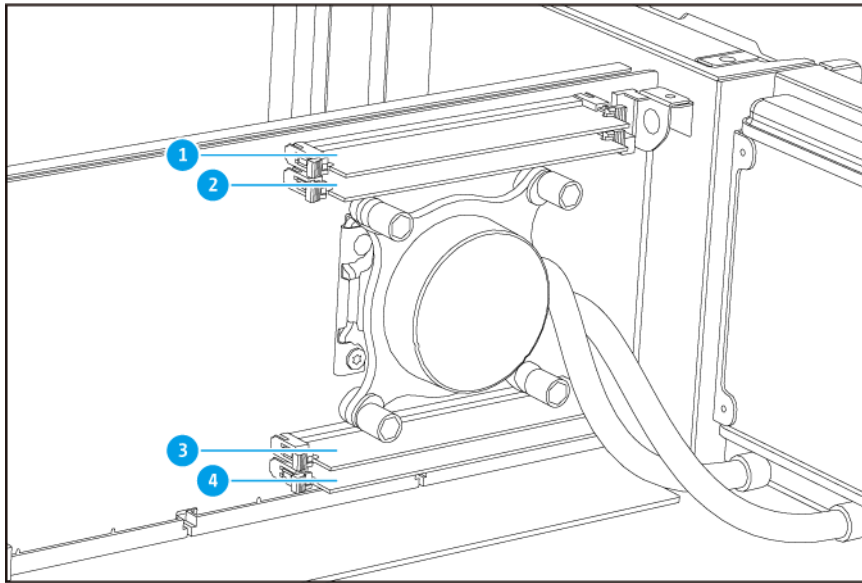
No.	Component	No.	Component
1	LCD panel	3	Select button
2	Enter button	4	Power button

Front Panel LEDs



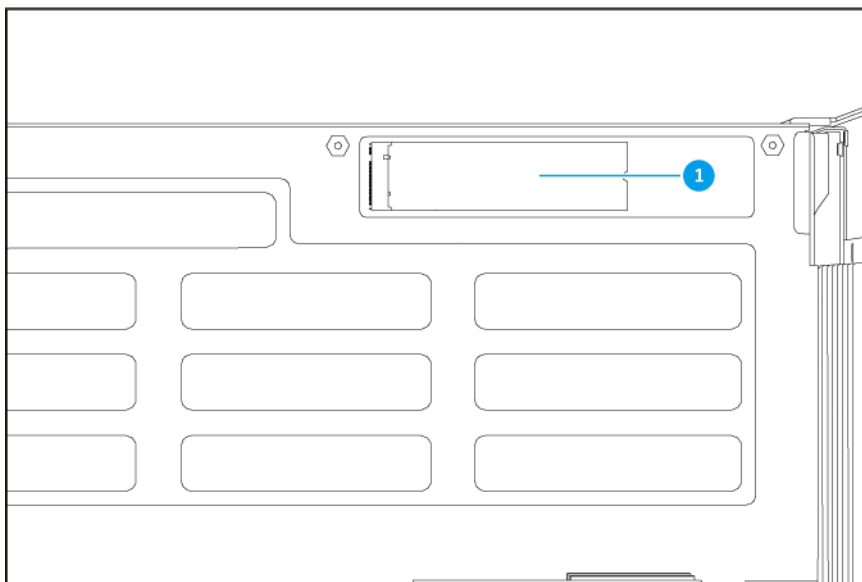
No.	Component	No.	Component
1	2.5-inch drive status LED	5	LAN LED
2	2.5-inch drive activity LED	6	Expansion unit LED
3	10 Gigabit Ethernet LED	7	3.5-inch drive activity LED
4	Status LED	8	3.5-inch drive status LED

Left Panel



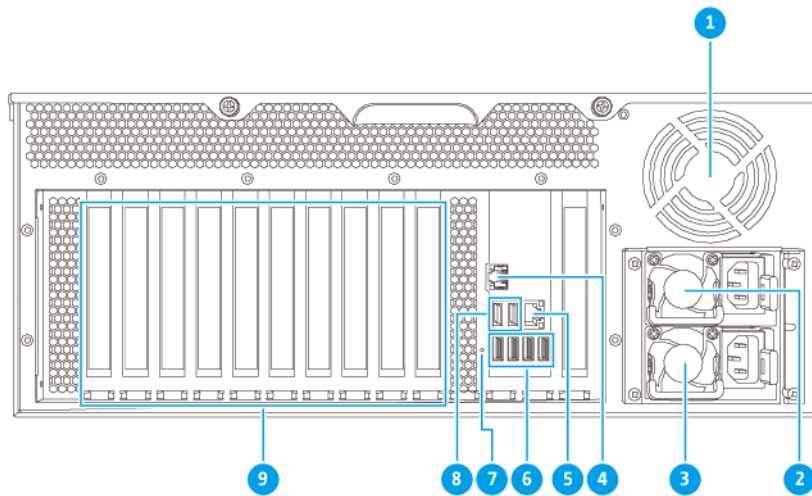
No.	Component	No.	Component
1	Memory slot 1	3	Memory slot 3
2	Memory slot 2	4	Memory slot 4

Right Panel



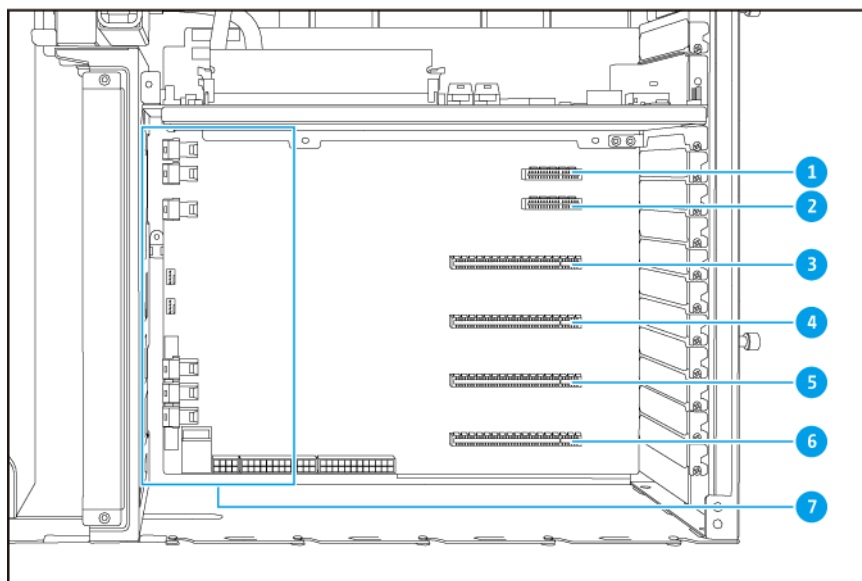
No.	Component
1	M.2 SSD slot 1

Rear Panel



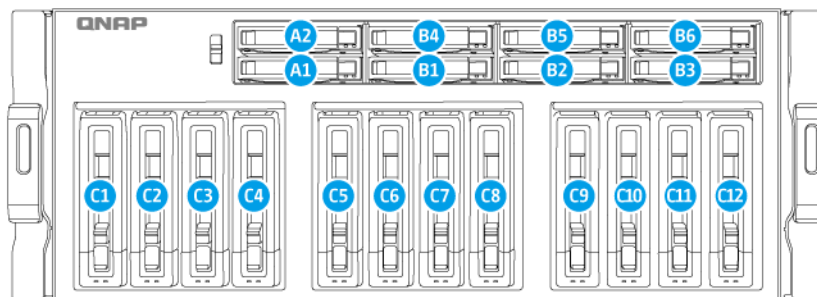
No.	Component	No.	Component
1	CPU fan	6	USB 3.2 Gen 1 Type-A ports
2	Power supply unit 1	7	Reset button
3	Power supply unit 2	8	USB 2.0 Type-A ports
4	Ethernet port 1 (10Gbase-T RJ45)	9	PCIe full-height covers
5	Ethernet port 2 (1GbE RJ45)	-	-

System Board



No.	Component	Specifications
1	PCIe slot 1	PCIe 3.0 x4
2	PCIe slot 2	PCIe 3.0 x4
3	PCIe slot 3	PCIe 3.0 x8
4	PCIe slot 4	PCIe 3.0 x8
5	PCIe slot 5	PCIe 3.0 x8
6	PCIe slot 6	PCIe 3.0 x8
7	PCIe power connectors	

Drive Numbering



Drive Label	Drive Type	Compatible Drives
A1 to A2	2.5-inch U.2 PCIe NVMe	<ul style="list-style-type: none"> 2.5-inch U.2 solid-state drives 2.5-inch SATA 6 Gbps solid-state drives
B1 to B6	2.5-inch SATA	<ul style="list-style-type: none"> 2.5-inch SATA 6 Gbps solid-state drives
C1 to C12	3.5-inch SATA	<ul style="list-style-type: none"> 3.5-inch SATA 6 Gbps hard disk drives 2.5-inch SATA 6 Gbps hard disk drives 2.5-inch SATA 6 Gbps solid-state drives

Safety Information

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

General Instructions

- The NAS should be stored in a secure location with restricted access, controlled through the use of a tool, lock and key, or any means of security.
- Only qualified, skilled, and authorized person with knowledge of all restrictions, safety precautions, and installation and maintenance procedures should have physical access to the NAS.
- 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.



The device 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.

System Battery

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

Moving Parts



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



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

Installation Requirements

Category	Item
Environment	<ul style="list-style-type: none"> • Room temperature: 0°C to 40°C (32°F to 104°F) • Non-condensing relative humidity: 5% to 95% • Wet-bulb temperature: 27°C (80.6°F) • Flat, anti-static surface without exposure to direct sunlight, liquids, or chemicals • Free from objects that may obstruct NAS ventilation or apply pressure to the NAS or power cord
Hardware and peripherals	<ul style="list-style-type: none"> • Storage drives For the list of compatible drive models, go to https://www.qnap.com/compatibility. • Network cable
Tools	<ul style="list-style-type: none"> • Phillips #1 or #2 screwdriver • Anti-static wrist strap

Setting Up the NAS



Important

Read all safety requirements and information in [Safety 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 the following topics:

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

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

3. Optional: Install expansion cards.
For details, see [Installing Expansion Cards](#).
4. Connect the NAS to the network.
5. Optional: Connect expansion units. For details, see the following topics:
 - [Connecting SAS Expansion Units](#)
 - [Connecting USB Expansion Units](#)
6. Connect the power cord and all applicable cables.

7. Power on the NAS.
For details, see [Front Panel](#).
8. Install QTS.
For details, see [QTS Installation](#).
9. Log on to QTS.

3. Installation and Configuration

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

Hardware Installation

This section provides information on removing or installing drives, expansion cards, power supply units, memory modules, and expansion units.

Removing the Case Cover



Warning

-



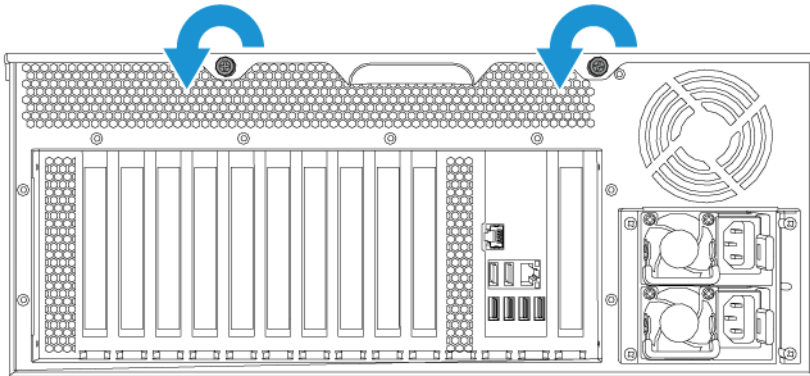
Moving fan blades: Keep your hands and other body parts away from moving fan blades.

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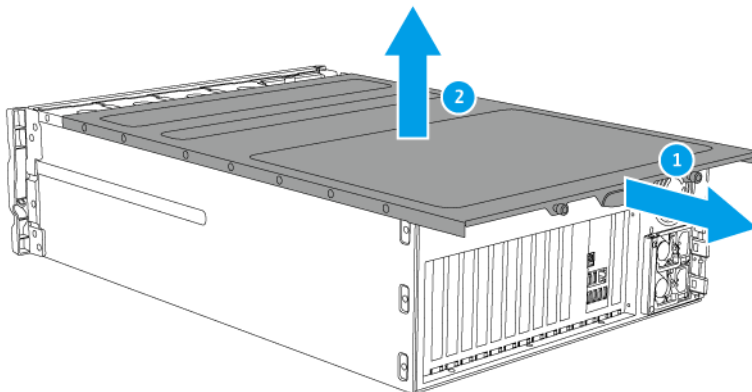


Other moving components: Keep your hands and other body parts away from other moving components.

1. Power off the NAS.
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 NAS.



Attaching the Case Cover



Warning

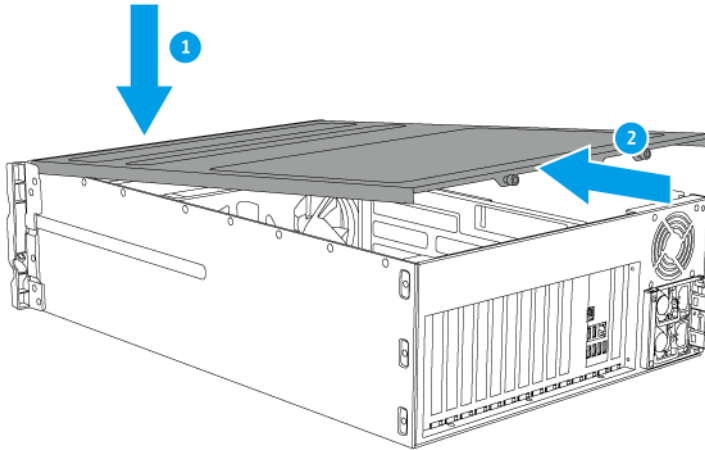


Moving fan blades: Keep your hands and other body parts away from moving fan blades.

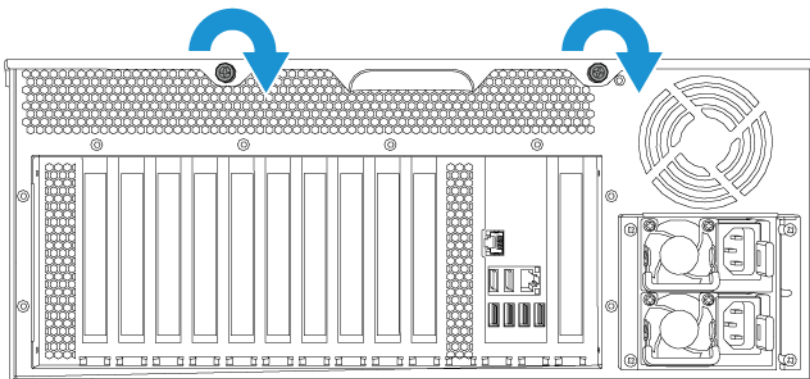


Other moving components: Keep your hands and other body parts away from other moving components.

1. Place the cover on the NAS.
2. Slide the cover forward.



3. Tighten the screws.



4. Connect all cables and external attachments.
5. Connect the power cord to the electrical outlet.

6. Power on the NAS.

Drive Installation

The TS-2088XU is compatible with 3.5-inch and 2.5-inch hard drives, 2.5-inch solid-state drives, and M.2 solid-state drives.

Installing 3.5-inch Hard Drives on 3.5-inch Trays

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



Warning

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



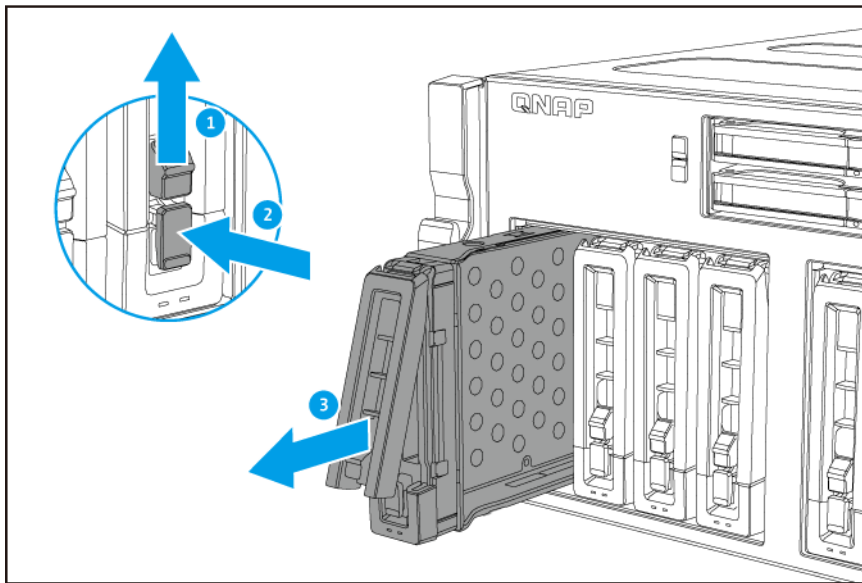
Moving fan blades: Keep your hands and other body parts away from moving fan blades.

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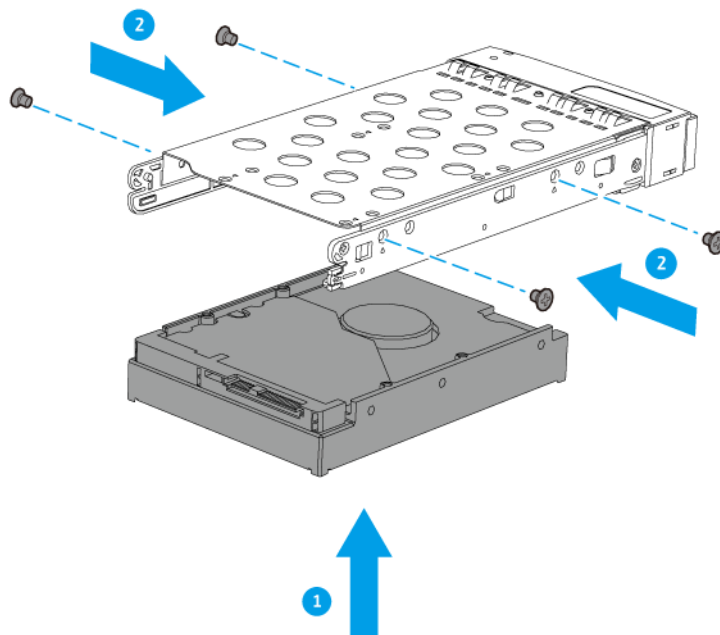
Other moving components: Keep your hands and other body parts away from other moving components.

1. Power off the NAS.
2. Remove the drive tray.
 - a. Slide the lock up.
 - b. Press the button to release the handle.
 - c. Pull the tray out.



3. Install a drive on the tray.

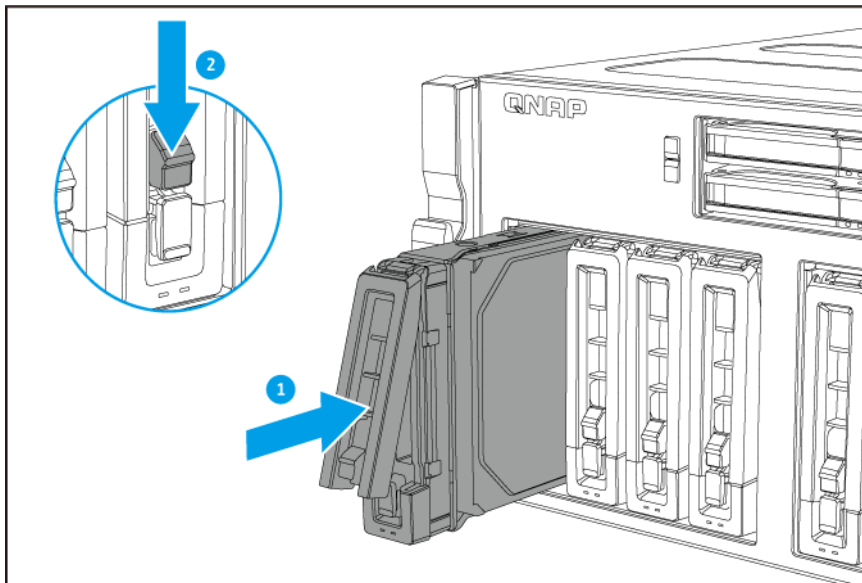
- a. Place the drive on the tray so that the holes on the sides of the drive are aligned with the holes on the sides of the tray.
- b. Attach the screws.



4. Load the tray into the bay.

- a. Insert the tray into the bay.

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



5. Power on the NAS.

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

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



Warning

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



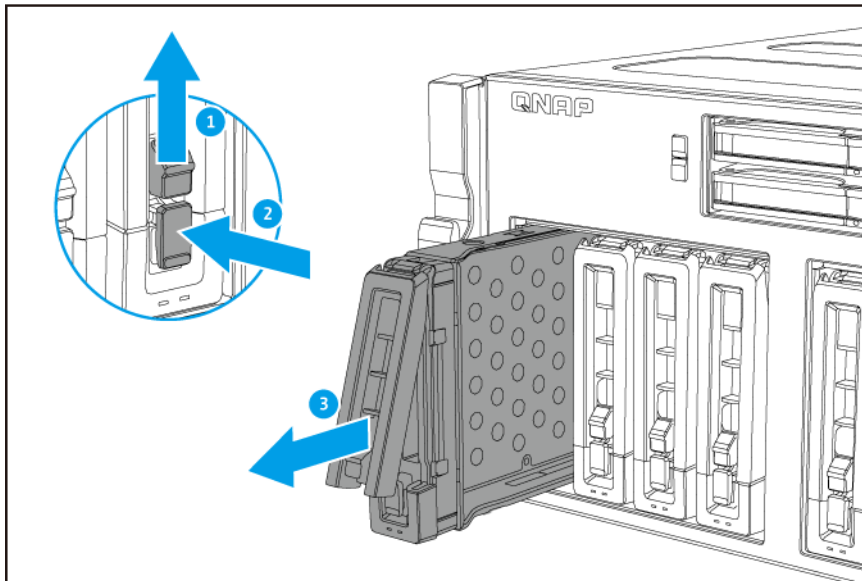
Moving fan blades: Keep your hands and other body parts away from moving fan blades.



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

1. Power off the NAS.
2. Remove the drive tray.
 - a. Slide the lock up.
 - b. Press the button to release the handle.

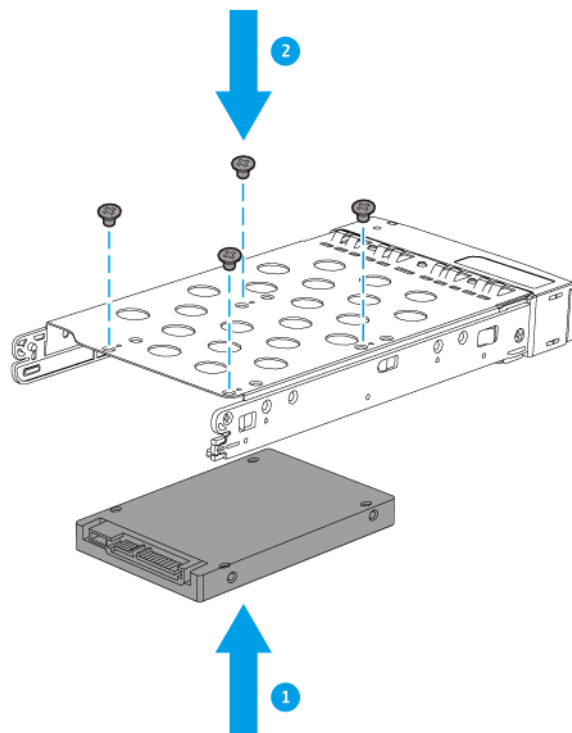
c. Pull the tray out.



3. Install a drive on the tray.

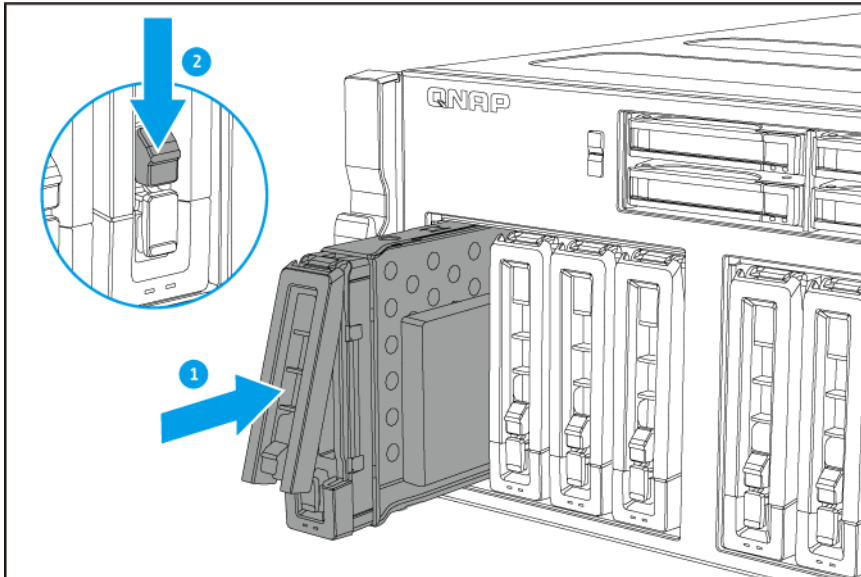
a. Place the drive on the tray so that the holes on the bottom of the drive are aligned with the holes on the bottom of the tray.

b. Attach the screws.



4. Load the tray into the bay.

- a. Insert the tray into the bay.
- b. Push the handle.
- c. Slide the lock down.



5. Power on the NAS.

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



Warning

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

-



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

-



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

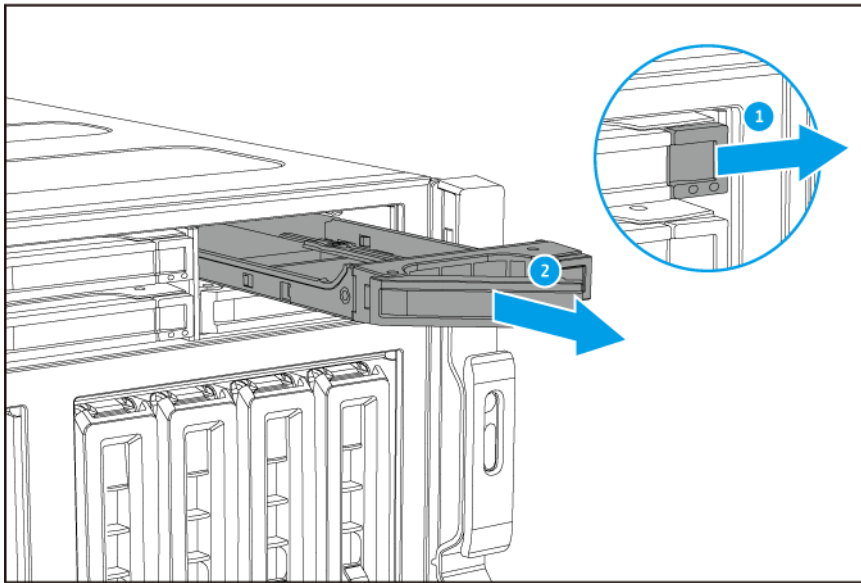


Note

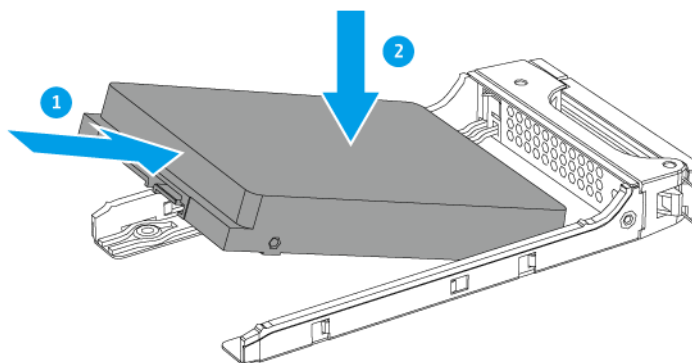
Install U.2 drives only in drive trays A1 to A2. For details, see [Drive Numbering](#).

1. Power off the NAS.
2. Remove the drive tray.

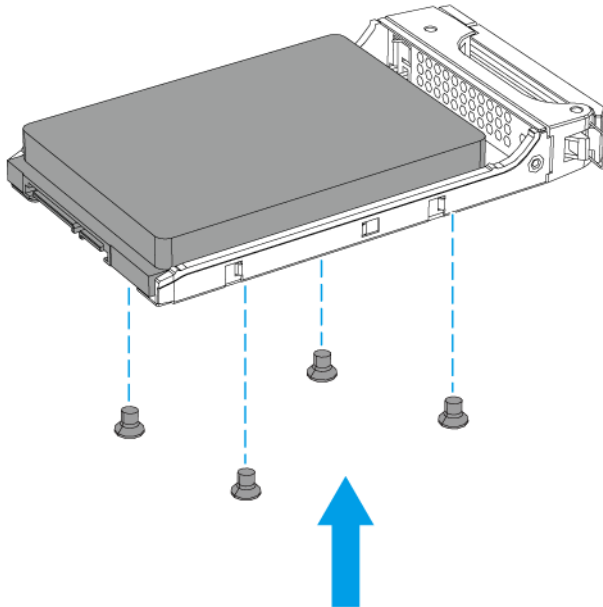
- a. Slide the lock to the right.



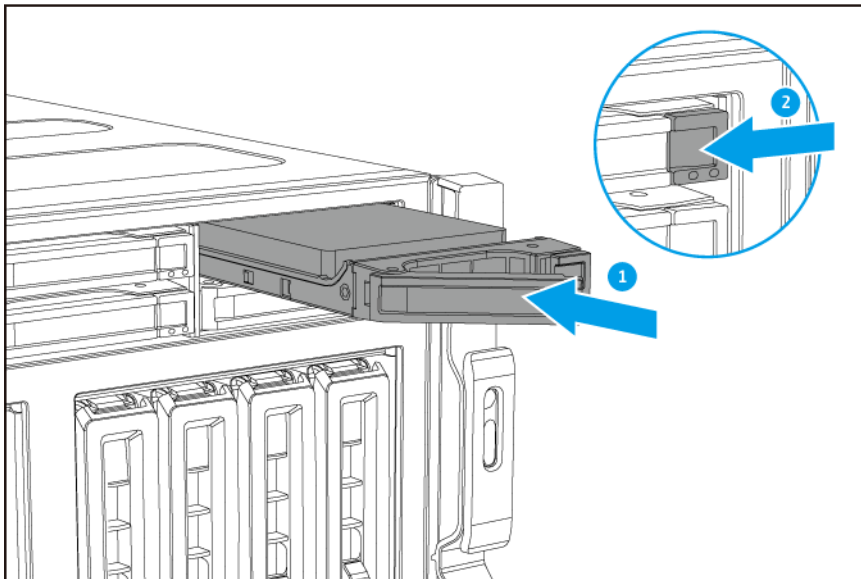
- b. Press the button to release the handle.
 - c. Pull the tray out.
3. Install a drive on the tray.
 - a. Place the drive on the tray so that the holes on the bottom of the drive are aligned with the holes on the bottom of the tray.



- b. Attach the screws.



4. Load the tray into the bay.
 - a. Insert the tray into the bay.
 - b. Push the handle.
 - c. Slide the lock to the left.



5. Power on the NAS.

Installing M.2 Solid-State Drives on the Right Panel

The TS-2088XU has one M.2 SSD slot on the [Right Panel](#). For a list of compatible M.2 SSDs, go to <http://www.qnap.com/compatibility>.



Warning

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

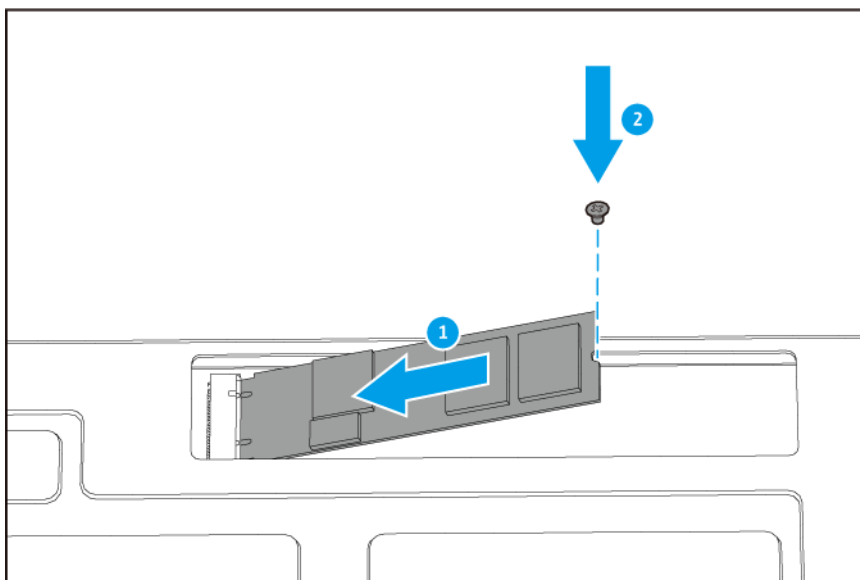


Moving fan blades: Keep your hands and other body parts away from moving fan blades.



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

1. Remove the case cover.
For details, see [Removing the Case Cover](#).
2. Install the M.2 SSD.
 - a. Remove the screw.
 - b. Insert the M.2 SSD into the slot.
 - c. Attach the screw.



3. Attach the case cover.

For details, see [Attaching the Case Cover](#).

Installing Expansion Cards

The TS-2088XU supports selected expansion cards, some of which require QNAP PCIe brackets. QNAP-branded expansion cards purchased from the company website are shipped with the brackets necessary to fit the TS-2088XU.



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.

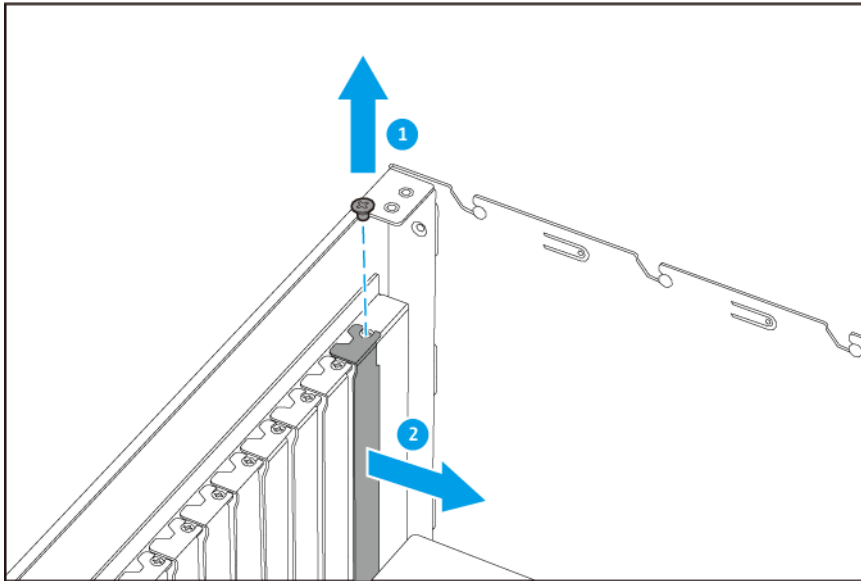


Note

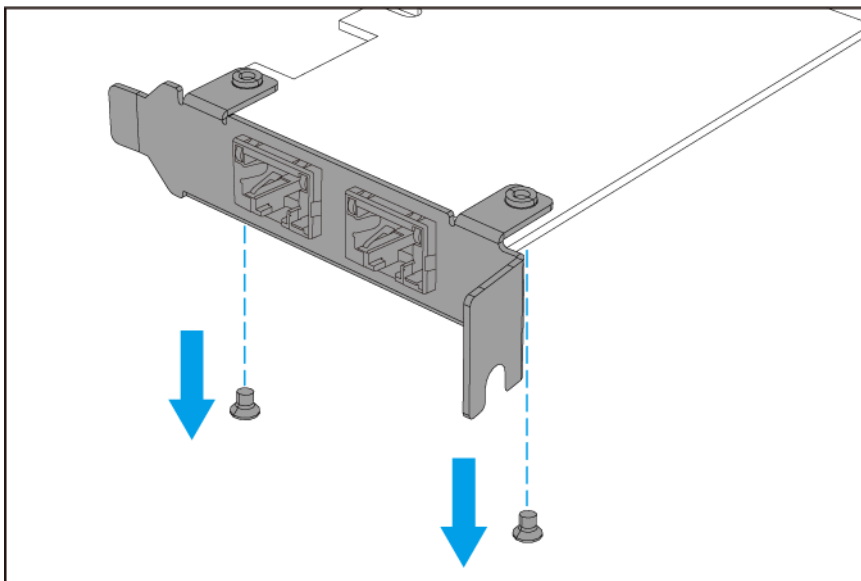
- Check the expansion card power supply requirements and compatibility list before installation. For more information, see www.qnap.com/compatibility.
- When all drive bays have drives installed, the TS-2088XU power consumption range is 260.62W to 469.25W. Actual power consumption may vary according to your NAS environment. The PSU maximum wattage output is dependent on the voltage range. See the table below for details.

Voltage	PSU Maximum Wattage Output
100V to 127V	1000W
200V to 240V	1200W

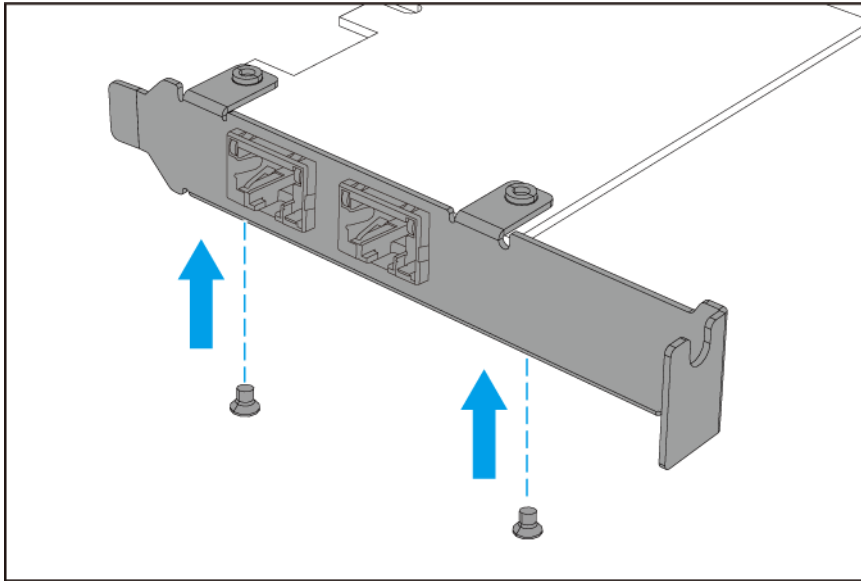
1. Remove the case cover.
For details, see [Removing the Case Cover](#).
2. Remove the PCIe cover.
 - a. Remove the screw that secures the cover to the bracket.
 - b. Pull the cover away from the slot.



3. Optional: Attach the QNAP full-height bracket to the expansion card.
 - a. Remove all screws from the existing bracket.

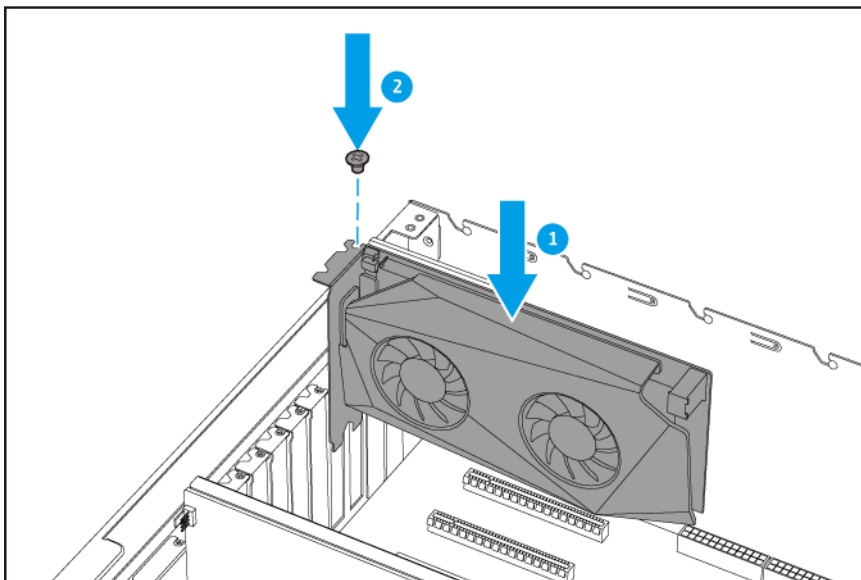


- b. Carefully pull the bracket away from the card.
 - c. Attach the full-height bracket to the card using the same screws.

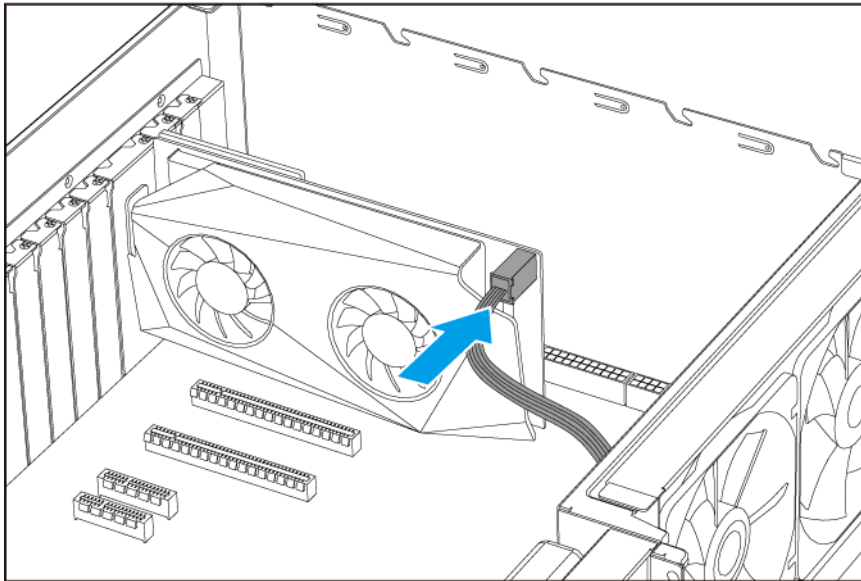
**Note**

This image shows a full-height PCIe cover being attached to a low-profile PCIe card.

- d. Verify that the bracket does not move.
4. 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.



5. Attach the case cover.
For details, see [Attaching the Case Cover](#).

Replacing Memory Modules

The TS-2088XU has four memory slots. You can increase the memory capacity of the NAS by upgrading memory modules. For optimal quad-channel performance, replace memory modules in all four slots at the same time.

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



Important

Ensure that all four memory 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.

-



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

1. Remove the case cover.
For details, see [Removing the Case Cover](#).

2. Remove an existing module.

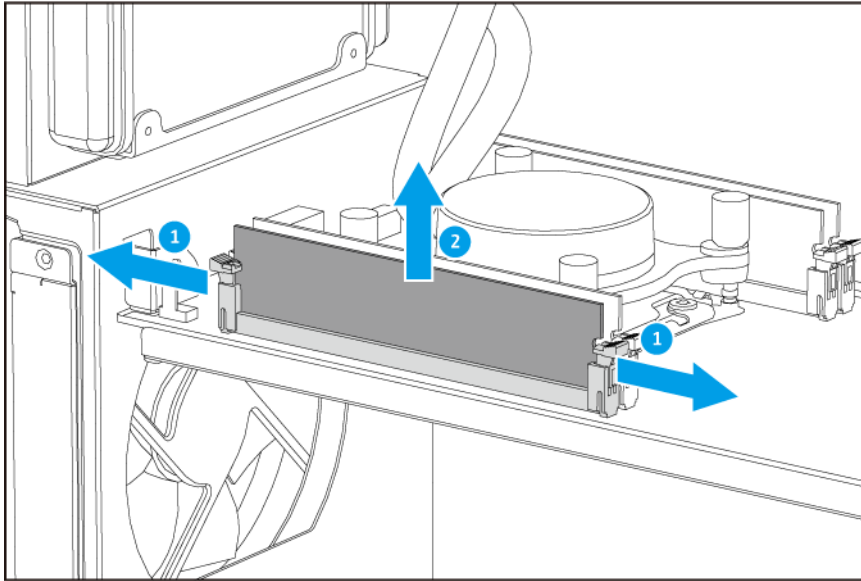
- a. Push the retention clips outward simultaneously to release the module.



Warning

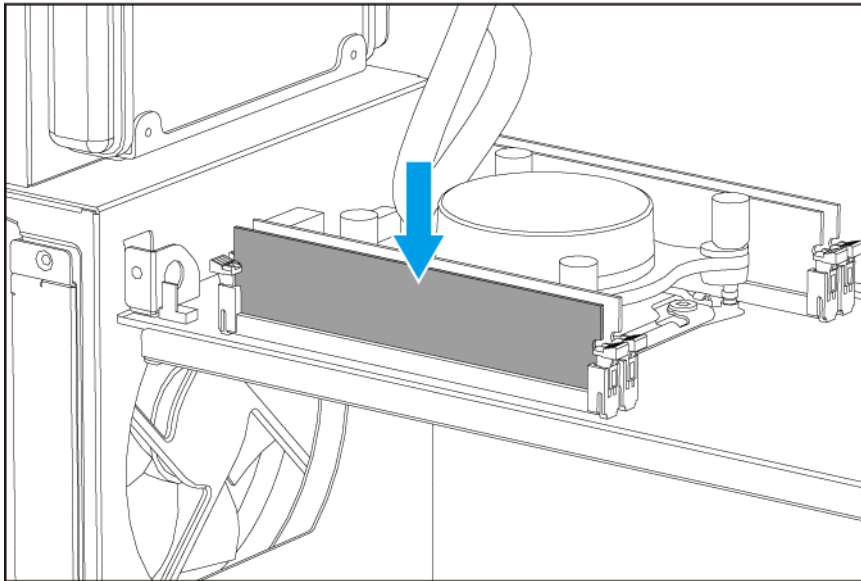
Attempting to remove a module that is not completely released may damage the module and the motherboard.

- b. Hold the module by the edges.



3. 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.



4. Attach the case cover.
For details, see [Attaching the Case Cover](#).
5. Verify that the module is recognized by the NAS.
 - a. Log on to QTS as administrator.
 - b. Go to **Control Panel > System > System Status > Hardware Information**.
 - c. Check the value for **Total memory**.

Hot-Swapping Redundant Power Supply Units

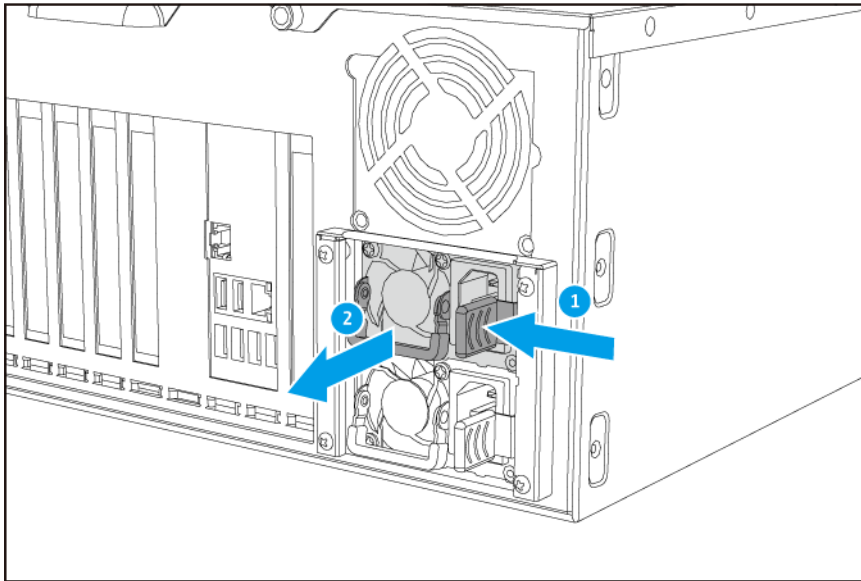


Warning

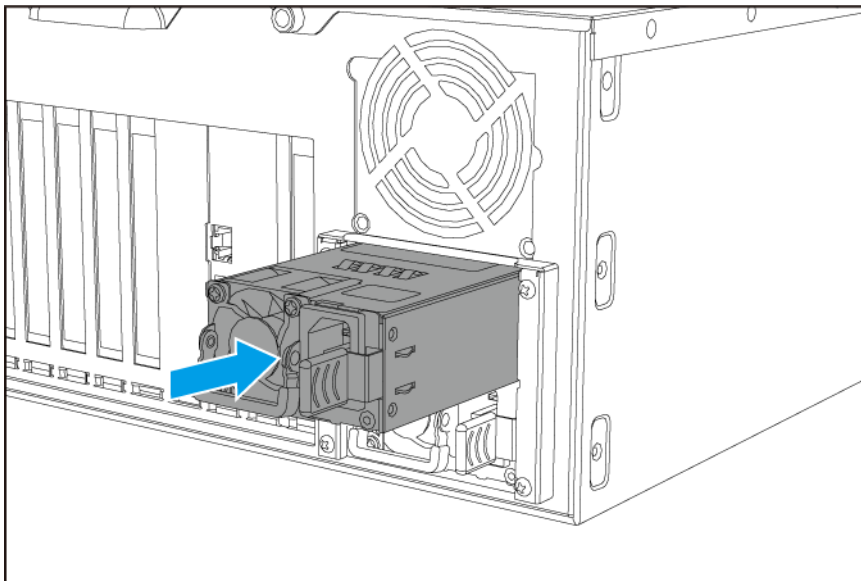


The NAS may have one or more power supply unit (PSU) cords. To avoid serious injuries, a trained service technician must disconnect all PSU cords before installing or replacing system components.

1. Power off the NAS.
2. Disconnect the power cord from the electrical outlet and the 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 NAS.

7. Enable alerts for PSU failures.

- a. Log on to QTS as administrator.
- b. Go to **Control Panel > System > Hardware > General** .
- c. Select **Enable Redundant Power Supply Mode**.
- d. Click **Apply All**.

Expansion Unit Installation

The TS-2088XU supports both SAS and USB expansion units. Refer to the following table for details.

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

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

Expansion Unit Type	Description	Required Accessories	Maximum Expansion Units Supported
REXP-1620U-RP	<ul style="list-style-type: none"> • Uses a SAS 12 Gbps (SFF-8644) interface. • Supports SAS/SATA HDD/SSD 	<ul style="list-style-type: none"> • SAS-12G2E storage expansion card • mini-SAS SFF-8644 cable • RAIL-A03-57 	8
REXP-1220U-RP	<ul style="list-style-type: none"> • Uses a SAS 12 Gbps (SFF-8644) interface. • Supports SAS/SATA HDD/SSD 		
REXP-1610U-RP	<ul style="list-style-type: none"> • Uses a SAS 6 Gbps (SFF-8644) interface. • Supports SATA/HDD/SSD 		
REXP-1210U-RP	<ul style="list-style-type: none"> • Uses a SAS 6 Gbps (SFF-8644) interface. • Supports SATA HDD/SSD 		
TR-002	<ul style="list-style-type: none"> • Uses a USB 3.2 Gen 2 Type-C interface • Supports SATA 	<ul style="list-style-type: none"> • USB 3.2 Gen 2 Type-A to Type-C cable 	2
TR-004	<ul style="list-style-type: none"> • Uses a USB 3.2 Gen 1 Type-C interface • Supports SATA 	<ul style="list-style-type: none"> • USB 3.2 Gen 1 Type-A to Type-C cable 	
TR-004U			

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

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

Connecting SAS Expansion Units

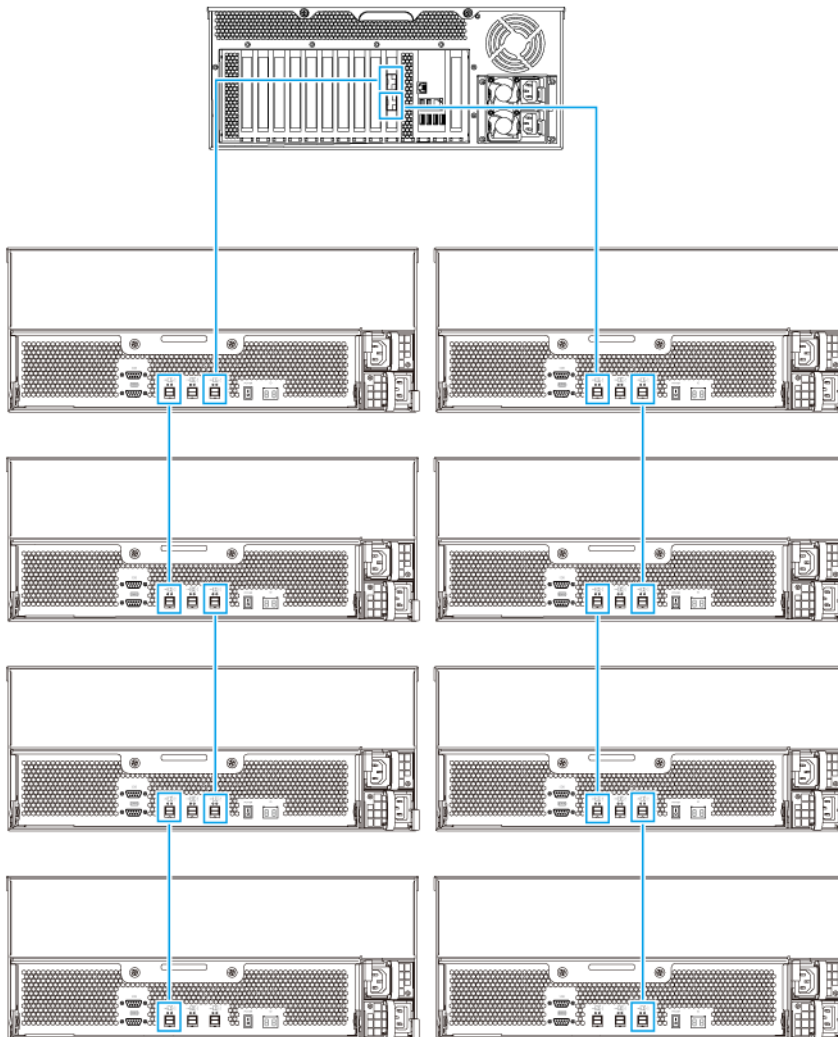
The TS-2088XU supports a maximum of eight SAS expansion units and is compatible with the following models:

- REXP-1620U-RP
- REXP-1220U-RP
- REXP-1610U-RP
- REXP-1210U-RP

To use SAS expansion units, an SAS-12G2E storage expansion card must be installed in the NAS and connected to the expansion units using mini-SAS SFF-8644 cables. You can purchase storage expansion accessories from QNAP or an authorized reseller.

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

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



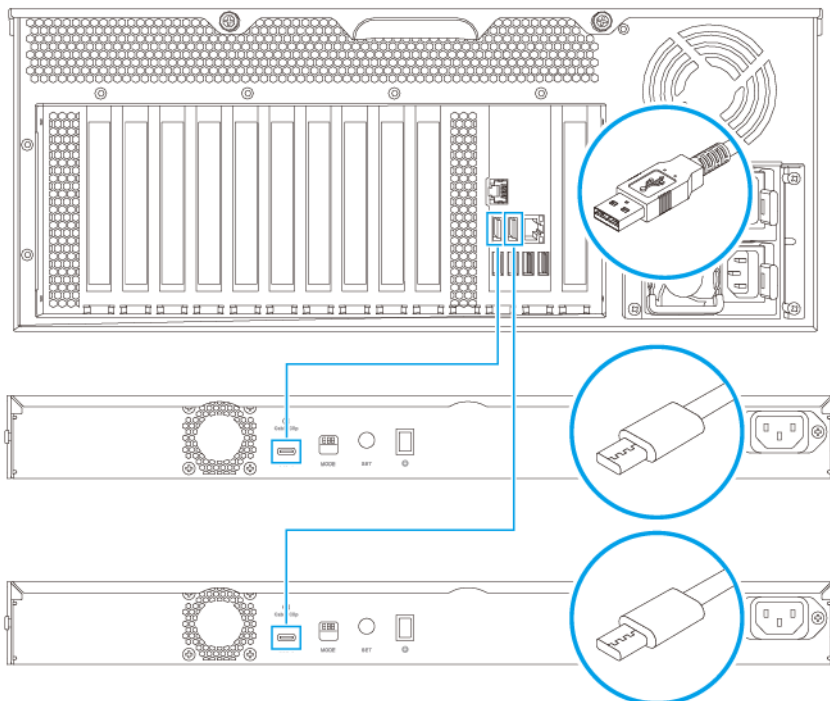
3. Power on the expansion units.
4. Verify that the expansion units are recognized by the NAS.
 - a. Log on to QTS as administrator.
 - b. Go to **Main Menu > Storage & Snapshots > Overview > System**.
 - c. Verify that the expansion units are listed.

Connecting USB Expansion Units

The TS-2088XU supports a maximum of two USB expansion units and is compatible with the following models:

- TR-002
- TR-004
- TR-004U

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

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>.

Model	Compatible Rail Kit
TS-2088XU	RAIL-A02-90

You can find installation information in the rail kit package.

QTS Installation

The TS-2088XU uses the QNAP QTS operating system. You can install QTS 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"> • Locate the NAS using Qfinder Pro. • Complete the steps in the Smart Installation Guide wizard. 	<ul style="list-style-type: none"> • Computer • Network cable • Qfinder Pro installer
Cloud installation	<p>If the NAS is connected to the internet, you can do the following:</p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Computer or mobile device • myQNAPcloud account • CloudKey

Installing QTS Using Qfinder Pro



Warning

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

1. Power on the NAS.
2. Connect the NAS 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**.
6. 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.

7. Click **Next**.
8. 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.

9. Click **Next**.
10. Select **Obtain an IP address automatically (DHCP)**.
11. Click **Next**.
12. Select the types of devices that you will use to access shared folders on the NAS.
13. Click **Next**.
14. Review the settings.
15. Click **Apply**.
A confirmation message appears.



Warning

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

16. Click **Confirm**.
QTS is installed.

Installing QTS Using the Cloud Key



Warning

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

1. Power on the NAS.
2. Connect the NAS 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. Find your NAS from 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 QTS through LAN and then installing myQNAPcloud Link.

7. Click **Next**.

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

8. Click **Start Smart Installation Guide**.

9. 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.

10. Click **Next**.

11. 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.

12. Click **Next**.

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

14. Click **Next**.

15. Select the types of devices that you will use to access shared folders on the NAS.

16. Click **Next**.

17. Review the settings.

18. Click **Apply**.

A confirmation message appears.

**Warning**

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


19. Click **Confirm**.

QTS is installed.


4. Basic Operations

This chapter describes basic NAS operations.

Power Button

Operation	User Action	Result
Power on	Press the button once.	The NAS powers on.
Power off	Press and hold the button for 1.5 seconds.	The NAS powers off.
Force power off	Press and hold the button for 5 seconds.	The NAS shuts down.  Important Use this method only when the NAS 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"> System administrator password: MAC address of adapter 1 without special characters. For example, if the MAC address of adapter 1 is 11:22:33:44:55:66, then the admin password will be 112233445566. <p> Tip You can find the MAC address of adapter 1 using Qfinder Pro. A label attached to the device also lists the address as MAC1.</p> <ul style="list-style-type: none"> TCP/IP configuration: <ul style="list-style-type: none"> 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
Advanced system reset	Press and hold the button for 15 seconds.	<p>The default factory settings are restored.</p> <ul style="list-style-type: none"> To retrieve old data after an advanced system reset, recreate the previous folder structure on the NAS.

LCD Panel

The LCD panel allows you to perform the following operations:

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

LCD Panel Buttons

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

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 QTS version.
2. Press and **Enter** for two seconds.
The panel displays `Main Menu 1. TCP/IP`.
3. Press and hold **Enter**.
The panel displays the IP address of the first network adapter.
4. Press and hold **Select** to view the next TCP/IP screen.
5. Optional: Repeat step 4 as necessary.

Configuring TCP/IP Settings

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

- IP address
- Subnet mask

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

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

Viewing Volume Information

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

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

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

- Optional: Repeat step 5 as necessary.

Viewing System Information

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

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

Powering off the NAS

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

Restarting the NAS

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

LCD Error Messages

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

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

LEDs

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

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"> The drive is being formatted. The NAS 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.
	Red	<ul style="list-style-type: none"> The drive is invalid. The disk volume has reached its full capacity. The disk volume is about to reach its full capacity. The system fan is not functioning. An error occurred when accessing (read/write) the data. A bad sector is detected on the hard drive. The NAS 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 NAS is in degraded mode (one member drive failed in RAID 1, RAID 5, or RAID 6).
	Flashes green every 0.5 seconds	<ul style="list-style-type: none"> The NAS is starting up. The NAS is not configured. A drive is not formatted.
	Green	The NAS is ready.
	Off	All drives are in standby mode.
LAN	Orange	A read/write error occurred while another device is accessing data.
	Flashes orange	The NAS is being accessed from the network.
Drive	Flashes red	The drive is being accessed and a read/write error occurs during the process.
	Red	A drive read/write error has occurred.
	Flashes green	The data is being accessed.
	Green	The drive can be accessed.
Drive status	Green	The drive is ready.
	Red	A drive read/write error has occurred.
	Flashes red	QTS is locating the drive.
	Off	No drive has been detected or the drive has not been initialized.

LED	Status	Description
Drive activity	Green	The drive is ready.
	Flashes green	The drive is being accessed.
	Off	No drive has been detected.
Expansion unit	Orange	An expansion unit is connected.
	Off	No expansion units are connected.
10 Gigabit Ethernet	Green	The network connection is operating at 10Gbps.
	Flashes green	The NAS is being accessed on a 10GbE network.
	Off	There is no 10GbE network connection.

Audio Alert

Duration	Frequency	Description
Short beep (0.5 seconds)	1	<ul style="list-style-type: none"> The NAS is starting up. The NAS is shutting down (software shutdown). The user pressed the Reset button. The operating system was updated.
	3	The user tried to copy the NAS data to the external storage device from the front USB port, but the data cannot be copied.
Long beep (1.5 seconds)	3 (every 5 minutes)	The system fan is not functioning.
	2	<ul style="list-style-type: none"> The disk volume is about to reach its full capacity. The disk volume has reached its full capacity. The drives are in degraded mode. The user started the drive rebuilding process. A drive is plugged in or out.
	1	<ul style="list-style-type: none"> 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 QTS 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 QTS installation.

Hot-Swapping Failed Drives

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

- RAID 1: One member drive fails
 - RAID 5: One member drive fails
 - RAID 6: One or two member drives fail
1. Log on to QTS.
 2. Go to **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 NAS.
 6. Wait for 20 seconds or until the NAS 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 **Storage & Snapshots > Storage > Storage/Snapshots** .
 11. Locate the volume that contains the new drive and then verify that the status is `Rebuilding`.

Recovering Unintentionally Removed Healthy Drives

The NAS supports exclusive RAID recovery technology to recover failed RAID disk volumes from unintentional disconnection or removal of drives. Users can recover an inactive RAID 1, RAID 5, or RAID 6 volume to degraded mode, or an inactive RAID 0 and JBOD configuration to normal.

Disk Volume	RAID Recovery Support	Maximum Number of Removed Drives
Single	No	N/A
JBOD	Yes	1
RAID 0	Yes	1
RAID 1	Yes	1
RAID 5	Yes	2
RAID 6	Yes	3
RAID 10	No	N/A

Support and Other Resources

QNAP provides the following resources:

Resource	URL
Documentation	https://docs.qnap.com
Service Portal	https://service.qnap.com
Downloads	https://download.qnap.com
Community Forum	https://forum.qnap.com

6. Glossary

myQNAPcloud

Provides various remote access services such as DDNS and myQNAPcloud Link

myQNAPcloud Link

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

QTS

QNAP NAS operating system

Qfinder Pro

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

CloudKey

Unique 8-digit code assigned to each NAS device

7. Notices

This chapter provides information about warranty, disclaimers, licensing, and federal regulations.

Limited Warranty

QNAP offers limited warranty service on our products. Your QNAP-branded hardware product is warranted against defects in materials and workmanship for a period of one (1) year or more from the date printed on the invoice. ("Warranty Period"). Please review your statutory rights at www.qnap.com/warranty, which may be amended from time to time by QNAP in its discretion.

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Should you return any components of the package of QNAP products such as NAS (Network Attached Storage) for refund or maintenance, make sure they are carefully packed for shipping. Any form of damages due to improper packaging will not be compensated.

All the features, functionality, and other product specifications are subject to change without prior notice or obligation. Information contained herein is subject to change without notice.

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Version 3, 29 June 2007

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FCC Class A Notice



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壳体	0	0	0	0	0	0
显示	0	0	0	0	0	0
印刷电路板	0	0	0	0	0	0
金属螺帽	0	0	0	0	0	0
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