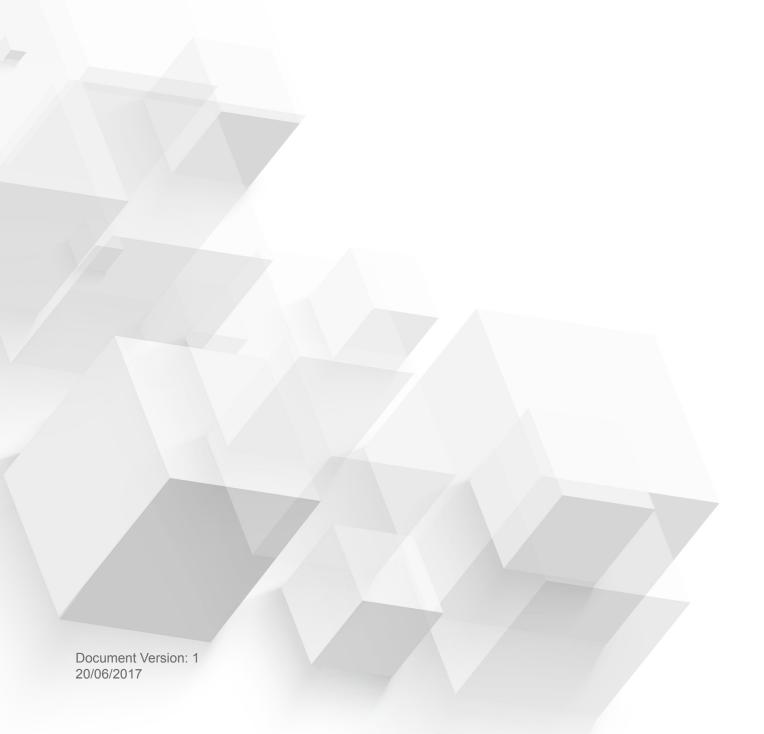


TS-431X2

User Guide



Contents

1.	Preface	
	About This Guide	3
	Audience	3
	Document Conventions	3
2.	Product Overview	
	About the TS-431X2	4
	Hardware Specifications	4
	Package Contents	
	Components	
	Front Panel	
	Back Panel	
	Left Panel	
	Drive Numbering	
	Installation Requirements	
	Setting Up the NAS	8
3.	Installation and Configuration	
	Hardware Installation	
	Installing Drives	
	Replacing Memory Modules	
	QTS Installation	
	Installing QTS Using Qfinder ProInstalling QTS Using the Cloud Key	
_		
4.	Basic Operations	
	Power Button	
	Reset Button	
	USB One-Touch Copy Button	
	LEDs	
	ьеер Аіаіті	. 29
5.	Troubleshooting	
	Forcing Qfinder Pro or myQNAPcloud to Locate the NAS	
	Hot-Swapping Failed Drives.	
	Recovering Unintentionally Removed Healthy Drives	
	Support and Other Resources	. 31
6.	Glossary	
	CloudKey	
	CloudLink	
	myQNAPcloud	
	myQNAPcloud ID	
	Qfinder Pro	
	QTS	32
7.	Notices	
	Limited Warranty	
	Disclaimer	
	GNU Public License	.33

FCC Notice	. 41
CE Notice	.41
SJ/T 11364-2006	.42

1. Preface

About This Guide

This guide provides information on the QNAP TS-431X2 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 consumers and storage administrators. This guide assumes that the user has a basic understanding of storage and backup concepts.

Document Conventions

Symbol	Description				
	Notes provide default configuration settings and other supplementary information.				
1	Important notes provide information on required configuration settings and other critical information.				
	Tips provide recommendations or alternative methods of performing a task or configuring settings.				
A	Warnings provide information, that when ignored, may result to potential loss, injury, or even death.				

2. Product Overview

This chapter provides basic information about the QNAP TS-431X2 NAS.

About the TS-431X2

The TS-431X2 supports four drives and comes with a built-in 10GbE SFP+ port to support 10GbE network environments. Equipped with a strong encryption engine, the TS-431X2 provides a secure and reliable quadcore NAS solution. The TS-431X2 is a cost-effective network storage solution designed for growing businesses looking for backup, restoration, private cloud, storage for virtualization, and to future-proof their IT infrastructure for 10GbE networks.

Hardware Specifications



Important

Modifying the hardware or software of your QNAP product invalidates the warranty. QNAP is not responsible for any damage or data loss caused by unauthorized modifications and installation of unsupported third-party applications.

Component	TS-431X2
Ordering P/N	• TS-431X2-2G
	• TS-431X2-8G
Drive bays	4 x SATA 6Gb/s
Drive compatibility	3.5-inch hard disk drives
	2.5-inch hard disk drives
	2.5-inch solid state drives
CPU	AnnapurnaLabs Alpine AL-314 quad-core ARM® Cortex-A15 1.7 GHz
Encryption engine	AES 256-bit
Memory	TS-431X2-2G
	• 2 GB DDR3 (1 x 2 GB)
	TS-431X2-8G
	• 8 GB DDR3 (1 x 8 GB)
Maximum memory	8 GB (1 x 8 GB)
Memory slots	1 x SODIMM DDR3
Flash memory	512 MB
10 gigabit Ethernet ports	1 x 10 Gigabit SFP+
Gigabit Ethernet ports	2 x Gigabit
USB ports	Front: 1 x USB 3.0 port
	Rear: 2 x USB 3.0 ports
Buttons	Power
	USB One Touch Copy
	Reset

Component	TS-431X2
LED indicators	Status
	• LAN
	• USB
	Drives 1 to 4
Security slot	Kensington security slot
Form factor	Tower
Dimensions (H x W x D)	169 x 160 x 219 mm
	6.65 x 6.3 x 8.62 inch
Net weight	3kg (6.61 lbs)
System fans	1 x 12 cm
Power supply unit	90W AC adapter, 100-240V
Operating temperature 0 to 40°C (32 to 104°F)	
Relative humidity	Non-condensing relative humidity: 5 to 95%
	Wet-bulb temperature: 27°C (80.6°F)



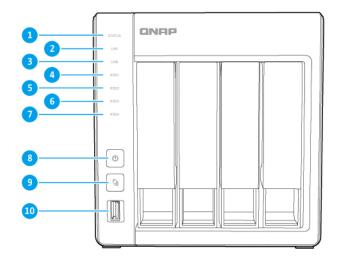
Model specifications are subject to change without prior notice. To see the latest specifications, go to https://www.qnap.com.

Package Contents

Item	Quantity
TS-431X2 NAS	1
AC power adapter	1
Power cord	1
Ethernet cable	2
Screws for 3.5-inch drives	16
Screws for 2.5-inch drives	12
Quick Installation Guide (QIG)	1

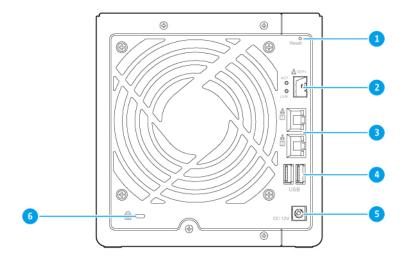
Components

Front Panel



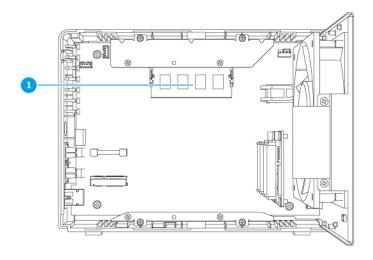
No.	Component	No.	Component	
1	Status LED	6	Drive 3 LED	
2	LAN LED	7	Drive 4 LED	
3	USB LED	8	Power button	
4	Drive 1 LED	9	USB One Touch Copy button	
5	Drive 2 LED	10	USB 3.0 One Touch Copy port	

Back Panel



No.	Component	No.	Component	
1	Reset button	4	USB 3.0 ports	
2	10 gigabit SFP+ port	5	Power input	
3	Gigabit ports	6	Kensington security slot	

Left Panel





The image does not include the chassis.

No.	Component	No.	Component
1	Memory slot	-	-

Drive Numbering



Installation Requirements

Category	Item
Environment	Room temperature: 0 to 40°C (32 to 104°F)
	Non-condensing relative humidity: 5 to 95%
	Wet-bulb temperature: 27°C (80.6°F)
	 Flat, anti-static surface with no exposure to direct sunlight, liquids, and 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

- 1. Place your NAS device in an environment that meets the requirements. For details, see Installation Requirements.
- 2. Install the drives. For details, see Installing 3.5-inch Hard Drives and Installing 2.5-inch Hard Drives or Solid State Drives.
- 3. Connect the power cord and all applicable cables.
- 4. Power on the NAS.
- 5. Install QTS. For details, see QTS Installation.

6. 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 installing drives, memory modules, and expansion cards.

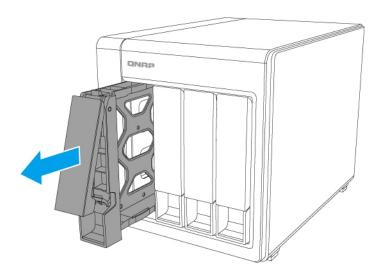
Installing Drives

The TS-431X2 is compatible with 3.5-inch and 2.5-inch hard drives, and solid state drives. All four drive bays support SSD cache acceleration.

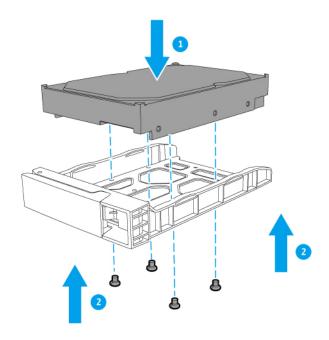
Installing 3.5-inch Hard Drives



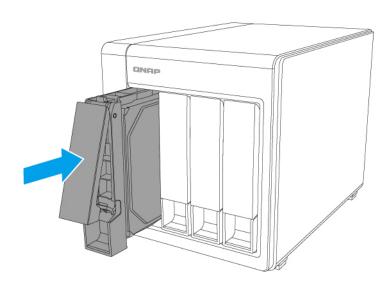
- · Installing a drive deletes all data on the drive.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.
- 1. Power off the NAS.
- 2. Remove drive tray.
 - **a.** Pull the tray handle forward.
 - **b.** Pull the tray out.



- 3. Install a drive on the tray.
 - **a.** Place the drive so that the SATA connector is exposed.
 - **b.** Attach the screws to lock the drive to the tray.



- **4.** Load the tray into the bay.
 - **a.** Slide the drive tray into the drive bay.
 - **b.** Push in the handle.



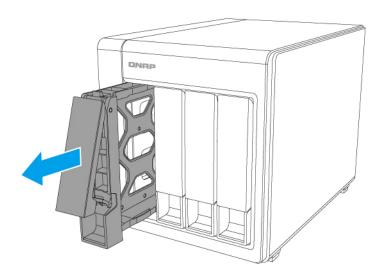
5. Power on the NAS.

Installing 2.5-inch Hard Drives or Solid State Drives

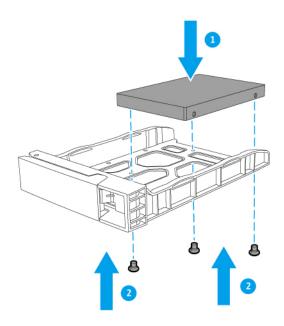


Warning

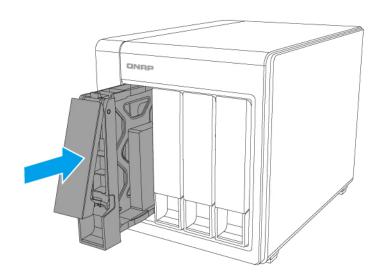
- Installing a drive deletes all data on the drive.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.
- 1. Power off the NAS.
- 2. Remove drive tray.
 - a. Pull the tray handle forward.
 - **b.** Pull the tray out.



- 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 to lock the drive to the tray.



- **4.** Load the tray into the bay.
 - **a.** Slide the drive tray into the drive bay.
 - **b.** Push in the handle.



5. Power on the NAS.

Replacing Memory Modules

The NAS has one memory slot. Depending on the model, you can increase the memory capacity of the NAS by upgrading the memory module. Use only QNAP memory modules to maintain system performance and stability. You can purchase QNAP memory modules from authorized resellers.



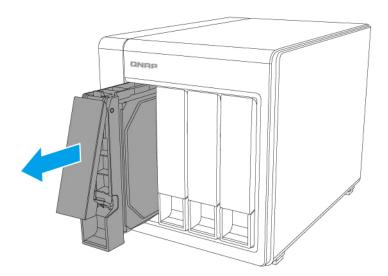
Warning

- · 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.
- 1. Power off the NAS.
- 2. Unplug the power cord from the electrical outlet.
- 3. Disconnect all cables and external attachments.
- 4. Remove the drive trays.
 - **a.** Pull the tray handle forward.
 - **b.** Pull the tray out.

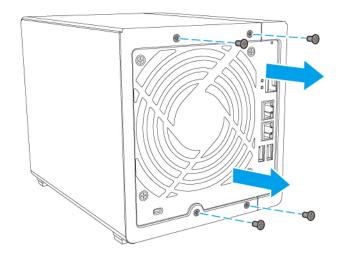


Important

Remember the number of each drive. The drive trays will need to be returned to their original bays.



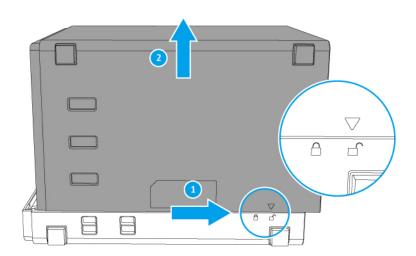
- 5. Remove the case cover.
 - a. Remove the screws on the back of the NAS that connect the case cover to the chassis.



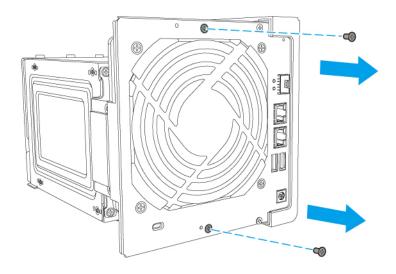


The case cover screws are longer than the other screws that will be removed.

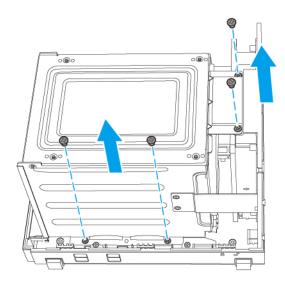
- **b.** Place the NAS on its left side.
- **c.** Slide the case cover to the right so that the triangle aligns with the unlock icon.
- **d.** Pull the case cover up until it completely detaches from the chassis.

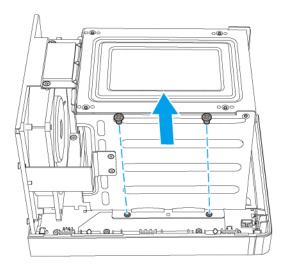


6. Remove the top and bottom screws on the back of the NAS.

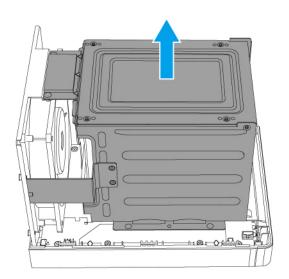


- 7. Place the NAS on its left side.
- 8. Remove the 6 screws that connect the drive tray chassis to the NAS.

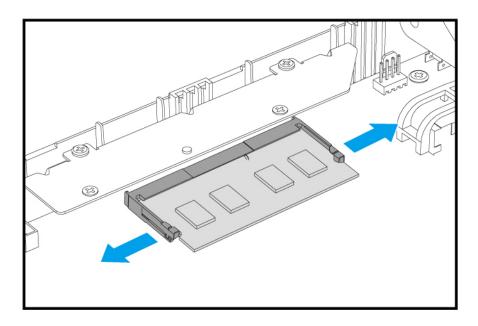




9. Carefully remove the drive tray chassis.



- **10.** Remove an existing module.
 - $\boldsymbol{a}.\;$ Push the retention clips outward simultaneously to release the module.



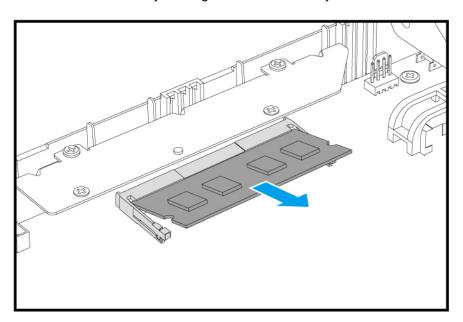
b. Verify that the module has tilted upward and is completely released from the slot.



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 and then carefully slide it out of the slot.



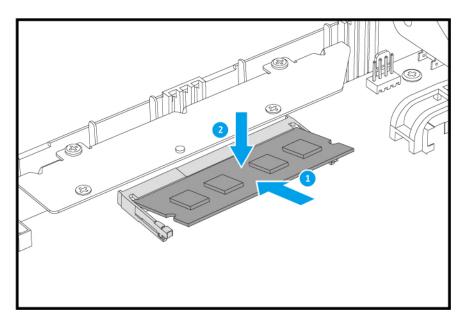


Warning

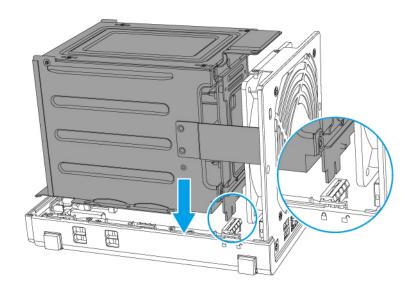
Do not touch the components, particularly the metal connectors. Do not bend the module.

- 11. Install a new module.
 - a. Align the notch with the ridge in the slot.

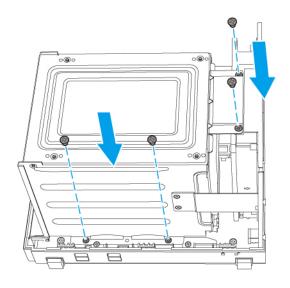
- **b.** Insert the module into the slot.
- c. Verify that the metal connectors are completely inserted into the slot.
- **d.** Carefully press down on the module until the retention clips lock the module into place.

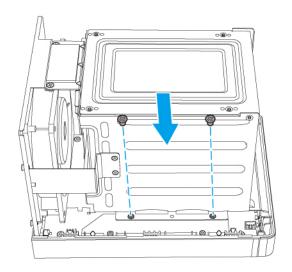


- **12.** Place the drive tray chassis onto the NAS.
 - **a.** Line up the SATA connector on the drive tray chassis to the SATA socket on the motherboard.
 - **b.** Carefully insert the SATA connector into the SATA socket.

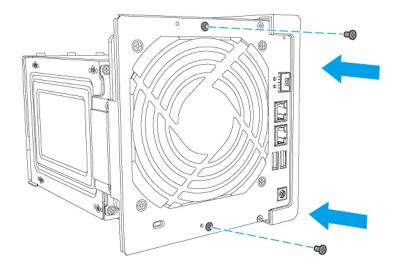


13. Attach the 6 screws that connect the drive tray chassis to the NAS.



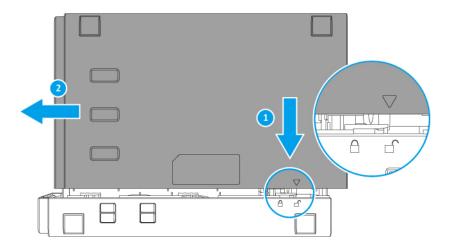


14. Attach the top and bottom screws on the back of the NAS.

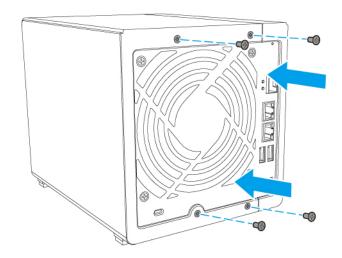


15. Attach the case cover.

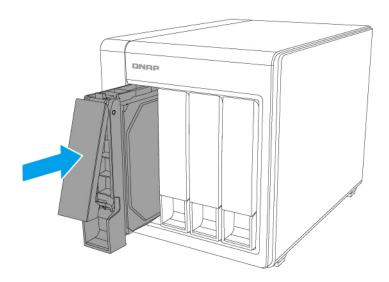
- a. Place the NAS on its left side.
- **b.** Align the triangle icon on the case cover with the unlock icon on the chassis.
- **c.** Slide the case cover onto the chassis.
- **d.** Slide the case cover to the left so that the triangle aligns with the lock icon.



e. Attach the screws to the back side of the case.



- **16.** Return drive trays into their original bays.
 - **a.** Slide the drive tray into the drive bay.
 - **b.** Push in the handle.



- **17.** Connect all cables and external attachments.
- **18.** Power on the NAS.
- **19.** 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**.

QTS Installation

TS-431X2 uses the QNAP QTS operating system. You can install QTS 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 QTS Using Qfinder Pro.	ComputerNetwork cableQfinder Pro installer
Cloud installation	If the NAS is connected to the internet, you can do the following: • Scan the QR code on the NAS. • Log into your myQNAPcloud account. • Use CloudLink to remotely access your NAS. • Complete the steps in the Smart Installation Guide wizard. For details, see Installing QTS Using the Cloud Key.	 Computer or mobile device Network cable myQNAPcloud account CloudKey

Installing QTS Using Qfinder Pro



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. 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 QTS Installation Wizard page loads in the default web browser.
- 5. Click Start Smart Installation Guide. The **Enter the NAS name and administator's password** screen appears.
- **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.

The Set the date and time screen appears.

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



qiT

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

9. Click Next.

The Configure the network settings screen appears.

- 10. Select Obtain an IP address automatically (DHCP).
- 11. Click Next.

The Cross-platform file transfer service screen appears.

- 12. Select the types of devices that you will use to access shared folders on the NAS.
- 13. Click Next.

The Select the disk configuration screen appears.

14. Select Configure disks later.

For details on configuring disks, see the Storage Manager section of the QTS User Guide.

15. Click Next.

The **Enable multimedia functions** screen appears.

16. Select No.

Enabling the multimedia functions allows you to install multimedia applications after configuring the disks in Storage Manager.

For details on enabling multimedia functions on QTS, see the System Administration section of the QTS User Guide.

17. Click Next.

The **Summary** screen appears.

- 18. Review the settings.
- 19. Click Apply.

A confirmation message appears.



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

20. 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.
- 4. Specify the Cloud Key on the NAS.
- **5.** Create an account or log in to myQNAPcloud.
- 6. Specify the myQNAPcloud name for the NAS. The myQNAPcloud name is used when remotely accessing the NAS.
- 7. Optional: Select CloudLink.

CloudLink allows you to remotely access the NAS without having to configure port forwarding on your router. You can remotely access the NAS by logging into QTS or by using mobile apps. You can also enable CloudLink by installing the CloudLink app on the NAS.

8. Click Next.

The Smart Installation Guide appears.

9. Click Start Smart Installation Guide.

The Enter the NAS name and administator's password screen appears.

- **10.** 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.
- 11. Click Next.

The **Set the date and time** screen appears.

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



aiT

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

13. Click Next.

The Configure the network settings screen appears.

- 14. Select Obtain an IP address automatically (DHCP).
- 15. Click Next.

The Cross-platform file transfer service screen appears.

- Select the types of devices that you will use to access shared folders on the NAS.
- 17. Click Next.

The Select the disk configuration screen appears.

18. Select Configure disks later.

For details on configuring disks, see the Storage Manager section of the QTS User Guide.

19. Click Next.

The **Enable multimedia functions** screen appears.

20. Select No.

Enabling the multimedia functions allows you to install multimedia applications after configuring the disks in Storage Manager.

For details on enabling multimedia functions on QTS, see the System Administration section of the QTS User Guide.

21. Click Next.

The **Summary** screen appears.

22. Review the settings.

23. Click Apply.

A confirmation message appears.



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

24. 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 N	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.		
		0	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.	The following settings are reset to default:		
		System administrator password: admin		
		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		
Advanced system reset	Press and hold the button for 10 seconds.	The default factory settings are restored.		
		 To retrieve old data after an advanced system reset, recreate the previous folder structure on the NAS. 		

USB One-Touch Copy Button

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

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

For details on configuring USB One-Touch Copy, see the QTS User Guide.

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	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	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 occured 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).		
		Hardware self-test error		
	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	The NAS is starting up.		
	seconds	The NAS is not configured.		
		A drive is not formatted.		
	Flashes green every 2 seconds	The NAS is in S3 sleep mode.		
	Green	The NAS is ready.		
	Off	All drives are in standby mode.		
LAN	Orange	A read/write error occured while another device is accessing data.		
	Flashes orange	The NAS is being accessed from the network.		

LED	Status	Description	
Drive	Flashes red	The data is being accessed and a read/write error occur during the process.	
	Red	A drive read/write error occured.	
	Flashes green	The data is being accessed.	
	Green	The drive can be accessed.	
USB	Flashes blue every 0.5 sec	 A USB device (connected to the front USB port) is detected. A USB device (connected to the front USB port) is being removed from the NAS. A USB device (connected to the front USB port of the NAS) is being accessed. Data is being copied to or from a USB or eSATA device. 	
	Blue	A USB device is detected in the front USB port.	
	Off	 No USB device is detected. The NAS has finished copying data to or from the USB device connected to the front USB port. 	

Beep Alarm

Duration	Frequency	Description
Short beep (0.5 seconds)	1	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	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	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 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 Main Menu > Storage Manager > 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 Main Menu > Storage Manager > Storage Space.
- 11. Locate the volume that contains the new drive and then verify that the status is Rebuilding.

Recovering Unintentionally Removed Healthy Drives

The NAS supports exclusive RAID recovery technology to recover failed RAID disk volumes from unintentional disconnection or removal of drives. Users can recover an inactive RAID 1, RAID 5, 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	http://docs.qnap.com		
Help Desk	http://helpdesk.qnap.com		
Downloads	http://download.qnap.com		
Community Forum	http://forum.qnap.com		

6. Glossary

CloudKey

Unique 8-digit code assigned to each NAS device

CloudLink

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

myQNAPcloud

Provides various remote access services such as DDNS and CloudLink

myQNAPcloud ID

Email address that was used to register for a myQNAPcloud account

Qfinder Pro

Enables you to locate and access the QNAP NAS devices in your local area network

QTS

QNAP NAS operating system

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FCC Notice



FCC Class B Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1. This device may not cause harmful interference.
- 2. This device must accept any interference received, including interference that may cause undesired operation.



Note

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.



Important

Any modifications made to this device that are not approved by QNAP Systems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

CE Notice



This QNAP NAS complies with CE Compliance Class B.

SJ/T 11364-2006



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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
电缆组装	0	0	0	0	0	0
风扇组装	0	0	0	0	0	0
电力供应组装	0	0	0	0	0	0
电池	0	0	0	0	0	0

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。

X:表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。