



ReadyNAS Rack-Mount Storage Systems Hardware Manual

Models:

1500
2100
3100
3200
4200

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San Jose, CA 95134
USA

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Getting Started

1

Congratulations on your purchase of a NETGEAR® ReadyNAS® rack-mount storage unit. *ReadyNAS Rack-Mount Storage Systems Hardware Manual* describes the physical features of ReadyNAS rack-mount storage products. This chapter includes the following sections:

- *System Shutdown*
- *Factory Settings*

For detailed information about configuring, managing, and using your ReadyNAS rack-mount storage system, see the *ReadyNAS for Business Software Manual*, which is available at <http://www.readynas.com/documentation>.

NETGEAR maintains a community website that supports ReadyNAS products. Visit <http://readynas.com> for reviews, tutorials, a comparison chart, software updates, documentation, an active user forum, and much more.

System Shutdown

You can shut down your unit in these ways:

- **Using the Power button:**
 - **Preferred shutdown.** Press the **Power** button two times to initiate a graceful shutdown.
 - **Forced shutdown.** If the unit is hung, press the **Power** button and hold for 5 seconds to force shutdown.
- **Using FrontView.** For information about using FrontView to shut down your unit, see the *ReadyNAS for Business Software Manual*.

Factory Settings

The following table lists factory settings for ReadyNAS rack mount storage systems.

Table 1. Factory settings

Feature		Default
Login		
	User login URL when the ReadyNAS is not connected to a DHCP server	https://192.168.168.168/admin
	Admin user name (case sensitive)	admin
	Admin login password (case sensitive)	netgear1
Management		
	System configuration	FrontView web-based configuration and status monitoring built in to the ReadyNAS Radiator firmware
	Discovery, multi-unit status monitoring, and RAID formatting utility	RAIDar for Windows, Mac, and Linux
LAN Connections		
	MAC address	See product sticker on top of unit
	MTU size	1500
	Ports	2 Auto Sense 10/100/1000BASE-T, RJ-45
	LAN IP address	DHCP acquired

2. ReadyNAS 1500 and 2100

2

This chapter describes the physical features of the ReadyNAS1500 and 2100. It includes the following sections:

- *Front Panel*
- *Rear Panel*
- *Status Information*
- *Boot Menu*
- *Rack-Mount Setup*
- *Technical Specifications*

Front Panel

The following figure shows the front panel of the ReadyNAS 1500 and 2100.

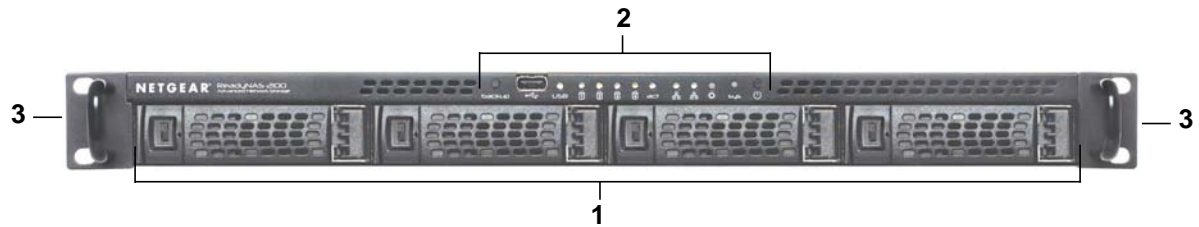


Figure 1. Front panel

1. Drive bays
2. Control panel
3. Mounting bracket

The following figure shows the control panel in more detail.

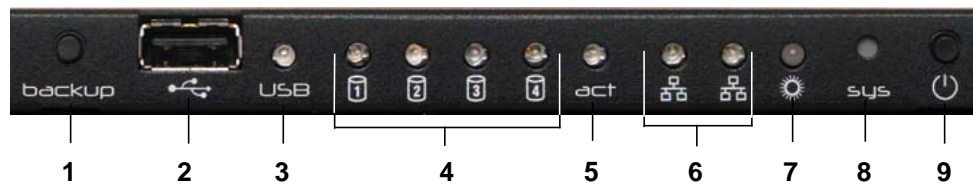


Figure 2. Control panel

1. Backup button
2. USB port
3. USB status LED
4. Disk LEDs
5. Disk activity LED
6. Ethernet LEDs
7. Power status LED
8. Reset button
9. Power button

Each drive bay features a latch that releases a pop-out tray handle, as shown in the following figure.

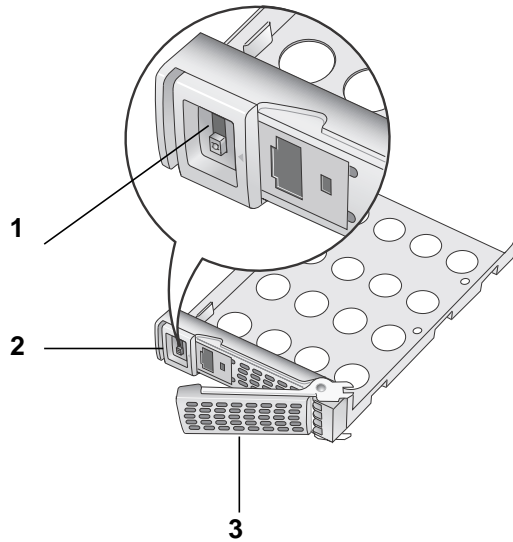


Figure 3. Disk tray handle and release latch

1. Disk tray lock
2. Disk release latch
3. Disk tray handle



WARNING!

No matter how many hard drives are installed in your system, ensure that all drive trays remain in the drive bays to maintain proper airflow.

Rear Panel

The following figure shows the rear panel of the of the ReadyNAS 1500 and 2100.

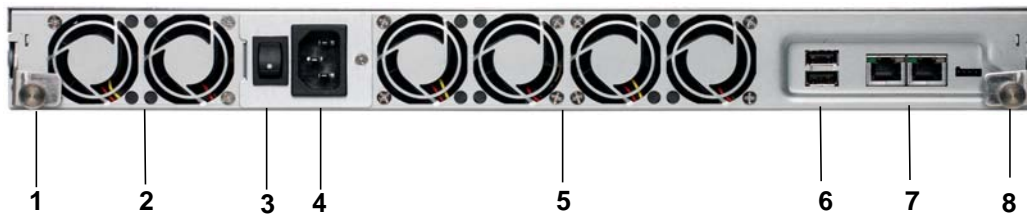


Figure 4. Rear panel

1. X-Change system module thumb screw
2. System exhaust fans
3. Power switch
4. Power cable socket
5. Disk exhaust fans
6. USB ports
7. 1-gigabit Ethernet ports with LED status indicators
8. X-Change system module thumb screw

Status Information

You can obtain information about the status of your ReadyNAS 1500 or 2100 by reviewing the indicators listed in the following table.

Table 2. Status information

Indicator	Description
USB status LED	<p>The USB status LED has these states:</p> <ul style="list-style-type: none"> • On. A USB device is mounted. • Blinking. A USB device is dismounting or a FrontView-scheduled backup job is running. • Off. No USB device is mounted.
Disk LEDs (1, 2, 3, 4)	<p>The disk LEDs have these states:</p> <ul style="list-style-type: none"> • Green. Disk installed • Off. No disk installed. • Blinking: <ul style="list-style-type: none"> - In unison. The Power button was pressed one time; press the Power button a second time to initiate a graceful shutdown. - Slow. Disk synchronization or disk failure. - Panic. Power button was pressed and held. - Marching. Volume expansion is in progress.
Disk activity LED	<p>The disk activity LED has these states:</p> <ul style="list-style-type: none"> • On. A disk is active. • Blinking. A disk is resynchronizing • Off. No disk is active.
Ethernet LEDs (front panel)	<p>The Ethernet LEDs have these states:</p> <ul style="list-style-type: none"> • Green. An Ethernet cable is connected. • Blinking. An Ethernet cable is active. • Off. An Ethernet cable is disconnected.
Ethernet port LEDs (rear panel)	<p>Two LED status indicators are built into these ports. The left LED indicates port activity. The right LED indicates connection speed as follows:</p> <ul style="list-style-type: none"> • Amber. The port is operating at 1 Gbps. • Green. The port is operating at 100 Mbps. • Off. The port is operating at 10 Mbps.
Power status LED	<p>The power status LED has these states:</p> <ul style="list-style-type: none"> • On. The unit is powered on. • Blinking. The unit is powering on or powering off. • Off. Power is not supplied to the unit.

Boot Menu

Use the boot menu to restart or troubleshoot your ReadyNAS unit. It has the following boot modes:

- **Normal.** Initiates a normal boot process, just like booting using the Power button.
- **Factory default.** Initiates a short disk test that takes approximately 5 minutes, then begins a 10-minute time-out period waiting for RAIDar. During the 10-minute time-out period, the system can be powered off safely without causing any data loss. After 10 minutes, or if you select the factory default option using RAIDar during the time-out period, the factory process begins.



WARNING!

The factory default reboot process resets the unit to factory settings, erases all data, resets all defaults, and reformats the disk to X-RAID2.

- **OS reinstall.** Reinstalls the firmware from the internal flash to the disks. Use the OS reinstall boot mode when the system crashes and corrupts some configuration files. OS reinstall boot mode also resets some settings on your unit, such as Internet protocol settings and the administrator password, to defaults.
- **Tech support.** Boots into a low-level diagnostic mode. Use the tech support boot mode only when instructed to do so by a NETGEAR technical support representative.
- **Skip volume check.** After a system crash, the system tries to scan and fix the volume via a file system check. If several problems are found on a disk, this process can stall, causing the system not to boot. Use this option to skip the scan and let the system boot.



WARNING!

Use the skip volume check boot mode only when instructed to do so by a NETGEAR technical support representative, otherwise data loss might occur.

- **Memory test.** Performs a memory test. The pass or fail result is reported using the unit's LEDs. Contact a NETGEAR technical support representative to interpret memory test results.
- **Disk test.** Performs an offline full disk test. This can take 4 hours or more, depending on the size of your disks. Any problems are reported in the RAIDar discovery tool.

➤ **To access the boot menu:**

1. Power off your unit.
2. Using a straightened paper clip, press and hold the **Reset** button.
3. Press the **Power** button to power up the unit.
4. Continue to press the **Reset** button until all the LEDs except the disk activity LED illuminate.
5. Press and release the **Backup** button to scroll through the boot menu modes.

The following table lists the boot menu's LED status blink pattern, which you can use to identify boot mode options.

Boot Menu Mode	USB LED Status	Disk 1 LED Status	Disk 2 LED Status	Disk 3 LED Status	Disk 4 LED Status
Normal	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Factory default	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OS reinstall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Tech support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Skip volume check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Memory test	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Disk test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Legend:

- Off: ☐
- On: ☒

6. Press the **Reset** button to confirm your boot mode choice.

The system boots in the selected boot mode.

Rack-Mount Setup

Use the rack-mount hardware included with your ReadyNAS1500 or 2100 to install it in a rack. Read the [Rack-Mount Precautions](#) section in Appendix A.

Considerations

Keep the following considerations in mind as you install your unit:

- **Ambient operating temperature.** If the unit installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment might be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum rated ambient temperature found in [Technical Specifications](#) on page 15.
- **Reduced airflow.** Mount the equipment into a rack so that the amount of airflow required for safe operation is not compromised.
- **Mechanical loading.** Mount the equipment into a rack so that a hazardous condition does not arise due to uneven mechanical loading.
- **Circuit overloading.** Consider the equipment's connection to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Consider equipment nameplate ratings when addressing this concern.
- **Reliable ground.** This product requires that a reliable ground be maintained at all times. To ensure this, ground the rack itself. Pay particular attention to power supply connections other than the direct connections to the branch circuit (for example, the use of power strips).
- **Setup location.** This product is intended for installation in a restricted access location (dedicated equipment rooms, service closets, and the like) only.
- **Clearance.** Leave enough clearance in front of the rack (about 25 inches) to enable you to open the front door completely and in the back of the rack (about 30 inches) to allow for sufficient airflow and ease in servicing.

Installation

Read these instructions in their entirety before you begin. Locate the shipping carton, remove the rack-mounting kit, and prepare to work with it.

➤ **To install the system into a rack:**

1. Place the unit in the rack.
2. Attach the unit to the rack by fastening the screws that came with it through each of the four holes in the mounting brackets and into your rack.

The rack-mount installation is complete.

Technical Specifications

The following table lists the technical specifications for the ReadyNAS 1500 and 2100. Note that the 1500 does not support iSCSI.

Table 3. Technical specifications

Feature		Specification
Electrical		
	Power supplies (PSU)	220W server-rated AC power supply
	Input	100-240V AC, 50/60Hz
	Power consumption	80W typical with 4 1 TB disks
Thermal		
	Cooling fans	Three dual 40 mm ball-bearing chassis cooling fans
	Fan failure alerts	Hardware LED, software via FrontView and high temperature email alert with auto-shutdown option
Operating Environmental		
	Temperature	0° to 40° C (32° to 104° F)
	Humidity (non-condensing)	20% - 80%
Physical		
	Form factor	1U rack-mount with 4 hot swappable SATA drive bays
	Dimensions (H x W x D)	1.7 x 16.9 x 12.5 in (43 x 430 x 318 mm)
	Weight	22 lb (9.5 kg) with 4 disks
Optional Spare Parts		
	Disk tray	Hot-swappable SATA drive tray
	Cooling fan	Dual 40 mm ball-bearing chassis cooling fan
	X-Change system module	Instant system board, fans and power supply replacement
	Rack mount	Sliding rails

3. ReadyNAS 3100

3

This chapter describes the physical features of the ReadyNAS 3100. It includes the following sections:

- *Front Panel*
- *Rear Panel*
- *Status Information*
- *Boot Menu*
- *Rack-Mount Setup*
- *Technical Specifications*

Front Panel

This following figure shows the front panel of the ReadyNAS 3100.

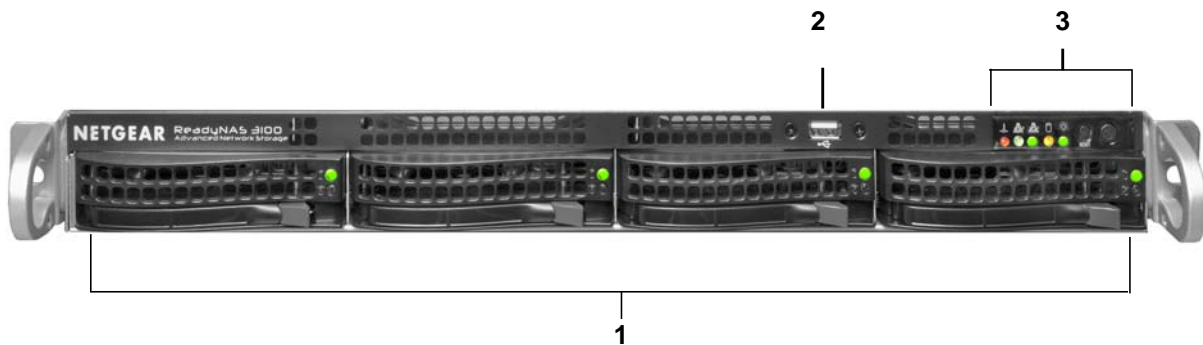


Figure 5. Front panel

1. Drive bays with disk status LEDs
2. USB port
3. Control panel

The following figure shows the control panel in more detail.

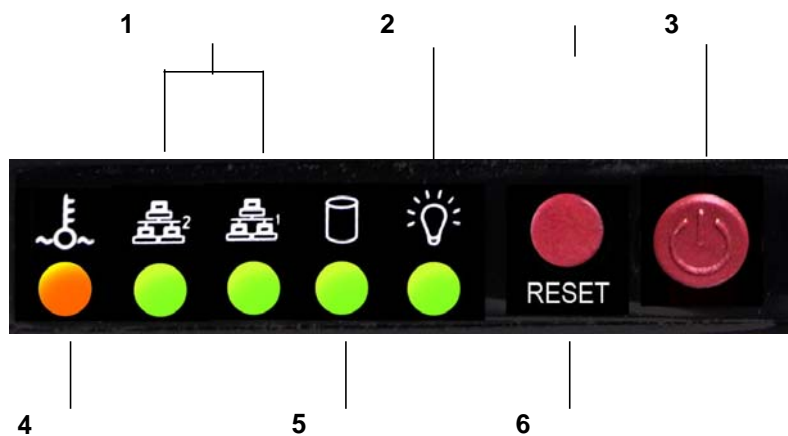


Figure 6. Control panel

1. Ethernet LEDs
2. Power LED
3. Power button
4. Fan LED
5. Disk activity LED
6. Reset button

Each drive bay features a latch that releases a pop-out tray handle, as shown in the following figure.



Figure 7. Disk tray handle and release latch

1. Disk tray handle
2. Disk tray release latch



WARNING!

No matter how many hard drives are installed in your system, ensure that all drive trays remain in the drive bays to maintain proper airflow.

Rear Panel

This following figure shows the rear panel of the 3100.

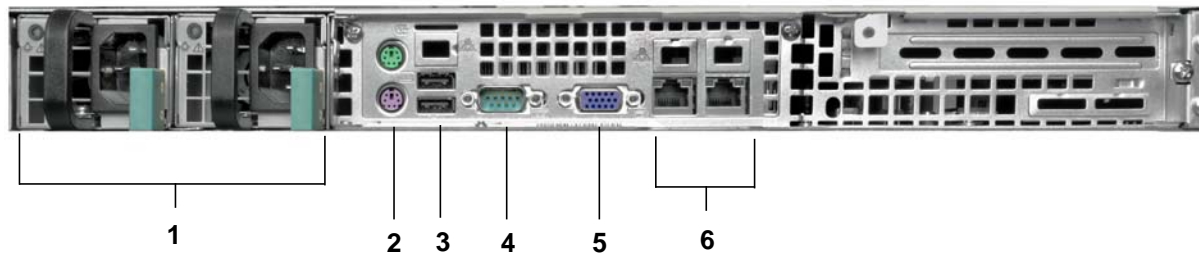


Figure 8. Rear panel

1. Power supplies
2. PS2 keyboard and mouse ports
3. USB ports
4. RS232 console port
5. VGA monitor port
6. 1-gigabit Ethernet ports with LED status indicators

Status Information

You can obtain information about the status of your unit by reviewing the indicators listed in the following table.

Table 4. Status information

Indicator	Description
Power LED	The power LED has these states: <ul style="list-style-type: none"> • Green. The unit is powered on. • Red. Power failure. • Off. The unit is powered off.
Disk LED on control panel	The LED indicates disk activity as follows: <ul style="list-style-type: none"> • Blinking. A disk is active. • Off. No disk is inactive.
Ethernet LEDs (front panel)	The Ethernet port LEDs have these states: <ul style="list-style-type: none"> • Green. An Ethernet cable is connected. • Blinking. An Ethernet cable is active. • Off. An Ethernet cable is disconnected.
Ethernet port LEDs (rear panel)	Two LED status indicators are built into these ports. The left LED indicates port activity. The right LED indicates connection speed as follows: <ul style="list-style-type: none"> • Amber. The port is operating at 1 Gbps. • Green. The port is operating at 100 Mbps. • Off. The port is operating at 10 Mbps.
Fan LED	The fan LED has these states: <ul style="list-style-type: none"> • Red. Overheating or fan failure. • Off. Normal operation.
Disk LEDs on disk trays	The top LED indicates disk activity as follows: <ul style="list-style-type: none"> • Blinking. The disk in the bay is active. • Off. The disk in the bay is inactive. The bottom LED indicates disk failure, as follows: <ul style="list-style-type: none"> • Off. Normal operation • On. Disk failure

Boot Menu

Use the boot menu to restart or troubleshoot your ReadyNAS unit. It has the following boot modes:

- **Normal.** Initiates a normal boot process, just like booting using the Power button.
- **Factory default.** Initiates a short disk test that takes approximately 5 minutes, then begins a 10-minute time-out period waiting for RAIDar. During the 10-minute time-out period, the system can be powered off safely without causing any data loss. After 10 minutes, or if you select the factory default option using RAIDar during the time-out period, the factory process begins.



WARNING!

The factory default reboot process resets the unit to factory settings, erases all data, resets all defaults, and reformats the disk to X-RAID2.

- **OS reinstall.** Reinstalls the firmware from the internal flash to the disks. Use the OS reinstall boot mode when the system crashes and corrupts some configuration files. OS reinstall boot mode also resets some settings on your unit, such as Internet protocol settings and the administrator password, to defaults.
- **Tech support.** Boots into a low-level diagnostic mode. Use the tech support boot mode only when instructed to do so by a NETGEAR technical support representative.
- **Skip volume check.** After a system crash, the system tries to scan and fix the volume via a file system check. If several problems are found on a disk, this process can stall, causing the system not to boot. Use this option to skip the scan and let the system boot.



WARNING!

Use the skip volume check boot mode only when instructed to do so by a NETGEAR technical support representative, otherwise data loss might occur.

- **Memory test.** Performs a memory test. The pass or fail result is reported using the unit's LEDs. Contact a NETGEAR technical support representative to interpret memory test results.
- **Disk test.** Performs an offline full disk test. This can take 4 hours or more, depending on the size of your disks. Any problems are reported in the RAIDar discovery tool.

➤ **To access the boot menu:**

1. Power off your unit.
2. Press and hold the **Reset** button.
3. Press the **Power** button to power up the unit.

Ignore the first blink of the fan LED when power is turned on. Watch for the fan LED to turn on and stay on. This happens when the boot loader recognizes that the button was pressed.

4. Release the **Reset** button.
5. Press and release the **Reset** button to scroll through the boot menu options.

The following table lists the fan LED blink pattern, which you can use to identify boot mode options.

Boot Mode	Fan LED Blink Pattern
Normal	□ □ ■ □
Factory default	□ □ ■ □ ■ □
OS reinstall	□ □ ■ □ ■ □ ■ □
Tech support	□ □ ■ □ ■ □ ■ □ ■ □
Skip volume check	□ □ ■ □ ■ □ ■ □ ■ □ ■ □
Memory test	□ □ ■ □ ■ □ ■ □ ■ □ ■ □ ■ □
Disk test	□ □ ■ □ ■ □ ■ □ ■ □ ■ □ ■ □ ■ □

Legend:

- Off: □
- On: ■

6. To select a boot mode, press the **Reset** button for 5 seconds until the fan LED illuminates.
7. Release the **Reset** button.

This triggers the execution of the boot option selected. The LED quickly blinks twice, and then turns off to confirm that your selection is being executed. Do not press the Reset button again; if you do, the process is aborted.

Rack-Mount Setup

Use the rack-mount hardware included with your ReadyNAS 3100 to install it in a rack. Read the [Rack-Mount Precautions](#) section in Appendix A.

Considerations

Keep the following considerations in mind as you install your unit:

- **Ambient operating temperature.** If the unit installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment might be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum rated ambient temperature found in [Technical Specifications](#) on page 25.
- **Reduced airflow.** Mount the equipment into a rack so that the amount of airflow required for safe operation is not compromised.
- **Mechanical loading.** Mount the equipment into a rack so that a hazardous condition does not arise due to uneven mechanical loading.
- **Circuit overloading.** Consider the equipment's connection to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Consider equipment nameplate ratings when addressing this concern.
- **Reliable ground.** This product requires that a reliable ground be maintained at all times. To ensure this, ground the rack itself. Pay particular attention to power supply connections other than the direct connections to the branch circuit (for example, the use of power strips).
- **Setup location.** This product is intended for installation in a restricted access location (dedicated equipment rooms, service closets, and the like) only.
- **Clearance.** Leave enough clearance in front of the rack (about 25 inches) to enable you to open the front door completely and in the back of the rack (about 30 inches) to allow for sufficient airflow and ease in servicing.

Installation

Read these instructions in their entirety before you begin. Locate the shipping carton, remove the rack-mounting kit, and prepare to work with it.

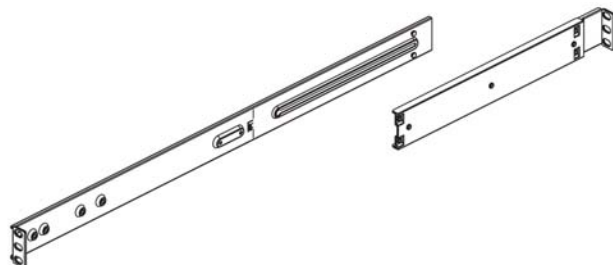
The rack-mounting kit contains two rail assemblies. Each assembly consists of two sections:

- An inner fixed chassis rail that secures directly to the ReadyNAS 3100 chassis.
- An outer fixed rack rail that secures directly to the rack itself.

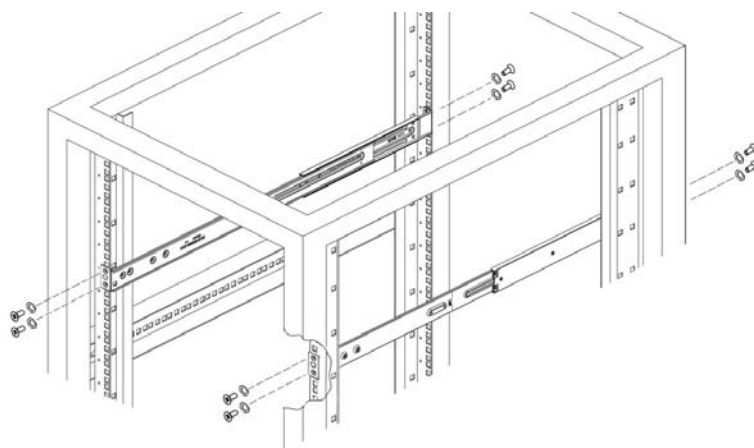
➤ **To install the system into a rack:**

Read these instructions in their entirety before you begin. Locate the ReadyNAS shipping carton and remove the rack-mounting kit.

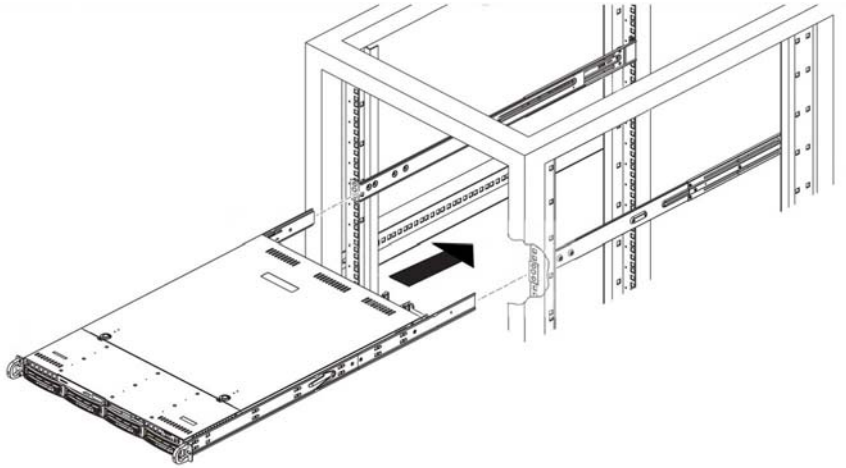
1. Extend the rail assembly by pulling it outward.
2. Press the release tab and separate the inner rail from the outer assembly.



3. Connect the rails.
4. Use the provided mounting screws to mount the inner rails to the system chassis, as follows:
 - a. Fasten the backs of the outer rails to the rack with screws.
 - b. Press the release to extend the rails.
 - c. Hang the rails into the rack holes and fasten the rails to the rack.



5. Attach the chassis to the rack, as follows:
 - a. Extend the ball shuttle to the very front.
 - b. Align the rails and push the chassis in.
 - c. Secure the handles to the outer rails with screws.



The rack-mount installation is complete.

Technical Specifications

The following table lists the technical specifications for the ReadyNAS 3100.

Table 5. Technical specifications

Feature		Specification
Electrical		
	Power supplies (PSU)	Two 450W server rated AC power supplies
	Input	100-240V AC, 50/60Hz
	Power consumption	170W typical
Thermal		
	Cooling fans	Three 40 mm dual ball-bearing chassis cooling fans
	Fan failure alerts	Hardware LED, software via FrontView and high temperature email alert with auto-shutdown option.
Operating Environmental		
	Temperature	0° - 40° C (32° - 104° F)
	Humidity (non-condensing)	20% - 80%
Physical		
	Form factor	1U rack mount with 4 hot-swappable SATA drive bays
	Dimensions (W x H x D)	16.8 x 3.5 x 25.5 in. (427 x 89 x 648 mm)
	Weight	44 lb (19.91 kg) with 4 disks
Optional Spare Parts		
	Disk tray	Hot-swappable SATA drive tray
	Cooling fan	40 mm dual ball-bearing chassis cooling fan
	PSU	Hot-swappable 450W PSU
	Rack mount	Sliding rails

4. ReadyNAS 3200 and 4200

4

This chapter describes physical features of the ReadyNAS 3200 and 4200. It includes the following topics:

- *Front Panel*
- *3200 Rear Panel*
- *4200 Rear Panel*
- *Status Information*
- *Boot Menu*
- *Rack-Mount Setup*
- *Technical Specifications*

Front Panel

This following figure shows the front panel of the 3200 and 4200.

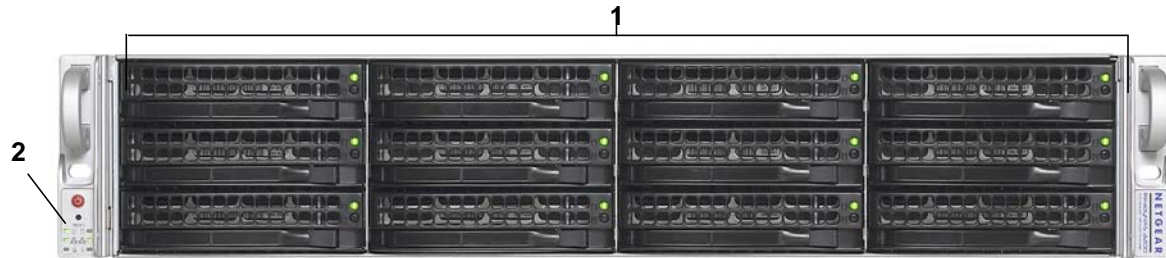


Figure 9. Front panel

1. Drive bays with disk status LEDs
2. Control panel

The following figure shows the control panel in more detail.

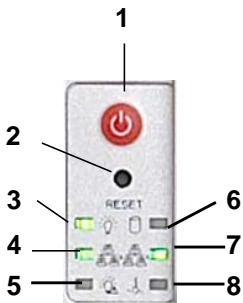


Figure 10. Control panel

1. Power button
2. Reset button
3. Power LED
4. Ethernet LED
5. Power diagnostic LED
6. Disk activity LED
7. Ethernet LED
8. Fan LED

Each drive bay features a latch that releases the pop-out tray handle, as shown in the following figure.



Figure 11. Disk tray handle and release latch

1. Disk tray handle
2. Disk tray release latch



WARNING!

No matter how many hard drives are installed in your system, ensure that all drive trays remain in the drive bays to maintain proper airflow.

3200 Rear Panel

This following figure shows the rear panel of the 3200.

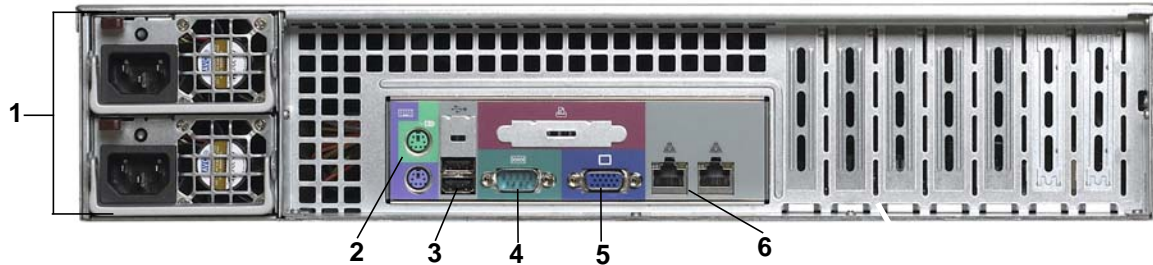


Figure 12. 3200 rear panel

1. Power supplies
2. PS2 keyboard and mouse ports
3. USB ports
4. RS232 console port
5. VGA monitor port
6. 1-gigabit Ethernet ports with LED status indicators

4200 Rear Panel

This following figure shows the rear panel of the 4200.

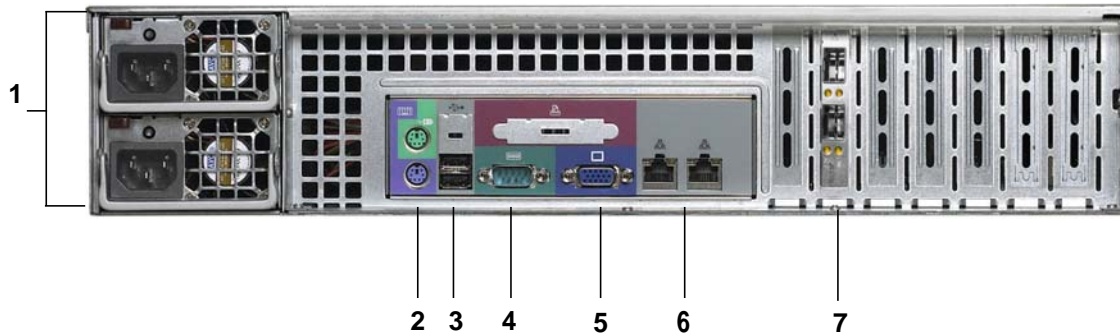


Figure 13. 4200 rear panel

1. Power supplies
2. PS2 keyboard and mouse ports
3. USB ports
4. RS232 console port
5. VGA monitor port
6. 1-gigabit Ethernet ports with status LED status indicators
7. 10-gigabit Ethernet ports with status LED status indicators

Status Information

You can obtain information about the status of your unit by reviewing the indicators listed in the following table.

Table 6. Status indicators

Indicator	Description
Power LED	The LED has these states: <ul style="list-style-type: none"> • On. The unit is powered on. • Off. The unit is powered off.
Disk LED	The LED has these states: <ul style="list-style-type: none"> • On. A disk is active. • Off. No disk is active.
Power diagnostic LED	The LED has these states: <ul style="list-style-type: none"> • On. Power failure • Off. Normal operation
Fan LED	The LED has these states: <ul style="list-style-type: none"> • On. Overheating or fan failure • Off. Normal operation
Disk LEDs on disk tray	The top LED indicates disk activity as follows: <ul style="list-style-type: none"> • Blinking. The disk in the bay is active. • Off. The disk in the bay is inactive. The bottom LED indicates disk failure, as follows: <ul style="list-style-type: none"> • Off. Normal operation • On. Disk failure
Ethernet LEDs (front panel)	The Ethernet port LEDs have these states: <ul style="list-style-type: none"> • Green. An Ethernet cable is connected. • Blinking. An Ethernet cable is active. • Off. An Ethernet cable is disconnected.
1-gigabit Ethernet port LEDs (rear panel)	The Ethernet port LEDs have these states: <ul style="list-style-type: none"> • Amber. The LAN port is operating at 1 Gbps. • Green. The LAN port is operating at 100 Mbps. • Off. The LAN port is operating at 10 Mbps.
10-gigabit Ethernet ports (rear panel)	The Ethernet port LEDs have these states: <ul style="list-style-type: none"> • Green. The LAN port is operating at 10 Gbps. • Amber. The LAN port is operating at 1 Gbps. <p>NOTE: 4200 only with CX4 or SFP PCIe card</p>

Boot Menu

Use the boot menu to restart or troubleshoot your ReadyNAS unit. It has the following boot modes:

- **Normal.** Initiates a normal boot process, just like booting using the Power button.
- **Factory default.** Initiates a short disk test that takes approximately 5 minutes, then begins a 10-minute time-out period waiting for RAIDar. During the 10-minute time-out period, the system can be powered off safely without causing any data loss. After 10 minutes, or if you select the factory default option using RAIDar during the time-out period, the factory process begins.



WARNING!

The factory default reboot process resets the unit to factory settings, erases all data, resets all defaults, and reformats the disk to X-RAID2.

- **OS reinstall.** Reinstalls the firmware from the internal flash to the disks. Use the OS reinstall boot mode when the system crashes and corrupts some configuration files. OS reinstall boot mode also resets some settings on your unit, such as Internet protocol settings and the administrator password, to defaults.
- **Tech support.** Boots into a low-level diagnostic mode. Use the tech support boot mode only when instructed to do so by a NETGEAR technical support representative.
- **Skip volume check.** After a system crash, the system tries to scan and fix the volume via a file system check. If several problems are found on a disk, this process can stall, causing the system not to boot. Use this option to skip the scan and let the system boot.



WARNING!

Use the skip volume check boot mode only when instructed to do so by a NETGEAR technical support representative, otherwise data loss might occur.

- **Memory test.** Performs a memory test. The pass or fail result is reported using the unit's LEDs. Contact a NETGEAR technical support representative to interpret memory test results.
- **Disk test.** Performs an offline full disk test. This can take 4 hours or more, depending on the size of your disks. Any problems are reported in the RAIDar discovery tool.

➤ **To access the boot menu:**

1. Power off your unit.
2. With a straightened paper clip, press and hold the **Reset** button.
3. Press the **Power** button to power on the unit.
4. Continue to press the **Reset** button until the power diagnostic LED and the fan LED are both lit.

This takes approximately 1 minute.

5. Release the **Reset** button.
6. Press the **Reset** button within 2 seconds to enter the boot menu.
7. Press and release the **Reset** button to scroll through the boot menu options.

Watch the blink pattern of the power diagnostic LED and the fan LED. The following table shows the how the system displays the current option using the power diagnostic LED and fan LED.

Boot Mode	Power Diagnostic LED and Fan LED Blink Pattern								
Normal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Factory default	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OS reinstall	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tech support	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Skip volume check	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Memory test	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Disk test	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Legend:

- Left: Power diagnostic LED
- Right: Fan LED
- Off: ☐
- On: ☒

8. Press and hold the **Reset** button for 3 seconds to select a boot mode.

The system confirms the selection by blinking the power diagnostic LED and the fan LED twice, and then begins to boot the system in the selected boot mode.

Rack-Mount Setup

Use the rack-mount hardware included with your ReadyNAS 3200 or 4200 to install it in a rack. Read the [Rack-Mount Precautions](#) section in Appendix A.

**DANGER:**

A unit with installed drives can weigh more than 80 pounds. To avoid injury or damage to the equipment, perform the rack mount installation with appropriate assistance.

Considerations

Keep the following considerations in mind as you install your unit:

- **Ambient operating temperature.** If the unit installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment might be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum rated ambient temperature found in [Technical Specifications](#) on page 37.
- **Reduced airflow.** Mount the equipment into a rack so that the amount of airflow required for safe operation is not compromised.
- **Mechanical loading.** Mount the equipment into a rack so that a hazardous condition does not arise due to uneven mechanical loading.
- **Circuit overloading.** Consider the equipment's connection to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Consider equipment nameplate ratings when addressing this concern.
- **Reliable ground.** This product requires that a reliable ground be maintained at all times. To ensure this, ground the rack itself. Pay particular attention to power supply connections other than the direct connections to the branch circuit (for example, the use of power strips).
- **Setup location.** This product is intended for installation in a restricted access location (dedicated equipment rooms, service closets, and the like) only.
- **Clearance.** Leave enough clearance in front of the rack (about 25 inches) to enable you to open the front door completely and in the back of the rack (about 30 inches) to allow for sufficient airflow and ease in servicing.

Installation

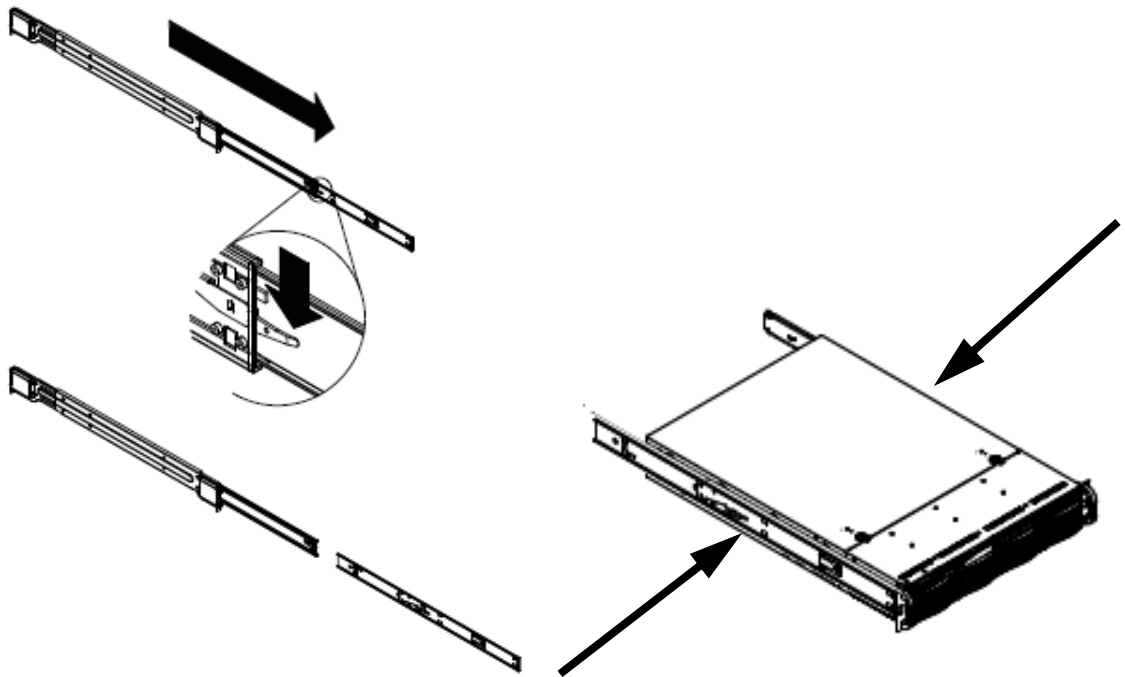
Read these instructions in their entirety before you begin. Locate the shipping carton, remove the rack-mounting kit, and prepare to work with it.

The rack-mounting kit contains two rail assemblies. Each assembly consists of two sections:

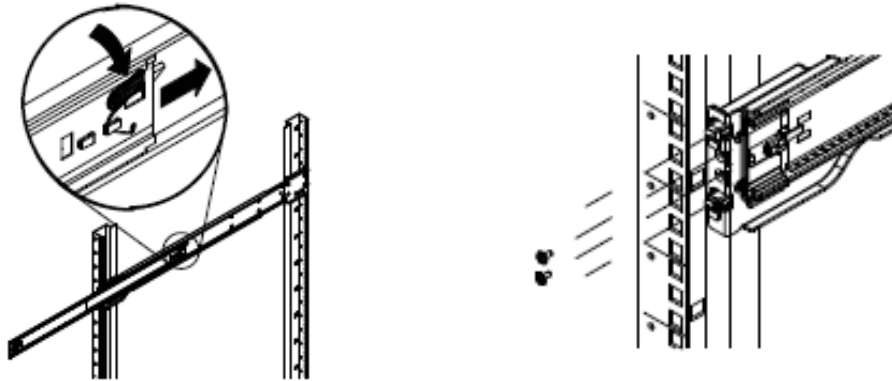
- An inner fixed chassis rail that secures directly to the unit's chassis.
- An outer fixed rack rail that secures directly to the rack itself.

➤ **To install the system into a rack:**

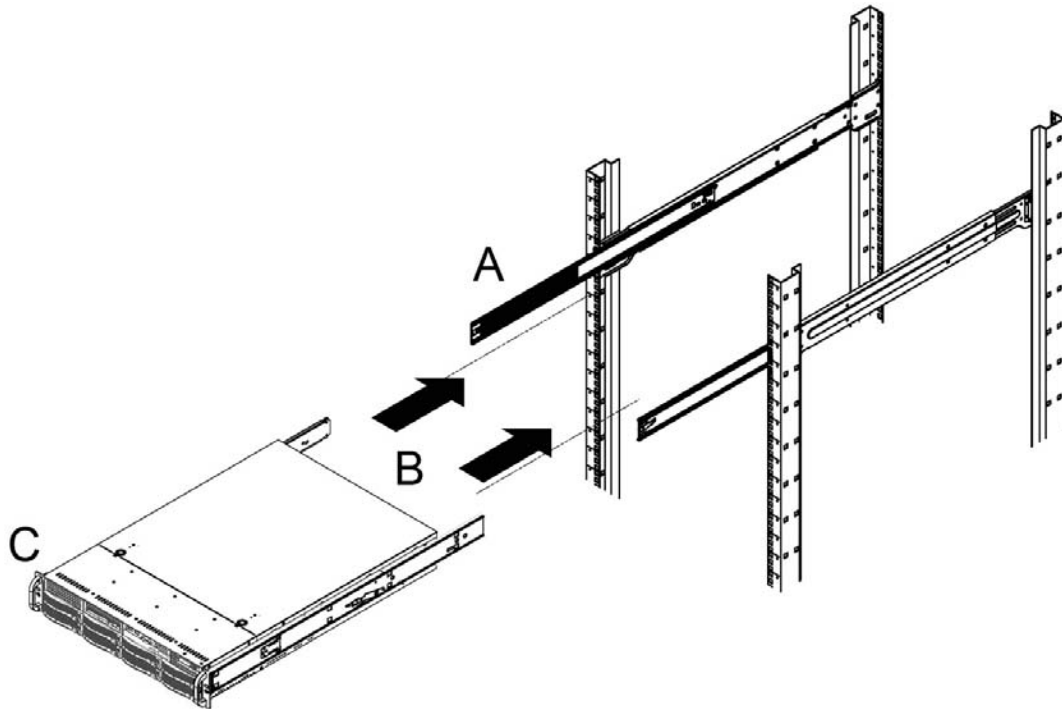
1. Extend the rail assembly by pulling it outward.
2. Press the release tab and separate the inner rail from the outer assembly.



3. Use the provided mounting screws to mount the inner rails to the system chassis, as follows:
 - a. Fasten the backs of the outer rails to the rack with screws.
 - b. Press the release to extend the rails.
 - c. Hang the hooks of the rails into the rack holes, and fasten the rails to the rack.



4. Attach the chassis to the rack, as follows:
 - a. Extend the ball shuttle (A) to the very front.
 - b. Align the rails (B) and push the chassis in.
 - c. Secure the handles to the outer rails (C) with screws.



The rack-mount installation is complete.

Technical Specifications

The following table lists the technical specifications for the ReadyNAS 3200 and 4200.

Table 7. Technical specifications

Feature		Specification
Electrical		
	Power supplies (PSU)	Two 700W server rated AC power supplies
	Input	100-240V AC, 50/60Hz
	Power consumption	170W typical with 6 1TB disks
Thermal		
	Cooling fans	Three 80 mm dual ball-bearing chassis cooling fans
	Fan failure alerts	Hardware LED, software via FrontView and high temperature email alert with auto-shutdown option.
Operating Environmental		
	Temperature	0° - 40° C (32° - 104° F)
	Humidity (non-condensing)	20% - 80%
Physical		
	Form factor	2U rack-mount with 12 hot swappable SATA drive bays
	Dimensions (H x W x D)	3.5 x 17.2 x 25.5 in. (89 x 437 x 648 mm)
	Weight	76 lb. (32.8 kg) with 12 disks
Optional Spare Parts		
	Disk tray	Hot-swappable SATA drive tray
	Cooling fan	80 mm dual ball-bearing chassis cooling fan
	PSU	Hot-swappable 700W PSU
	Rack mount	Sliding rails

5. Maintenance

5

This chapter describes how to perform maintenance activities like adding disks and replacing disks and system components. It includes the following topics:

- *Disks*
- *System Components*

Disks

Supported Disks

Use only supported disks in your ReadyNAS storage system. If you use non-supported disks, NETGEAR technical support will not provide assistance. For a list of supported disks, see the NETGEAR Hardware Compatibility List at http://www.readynas.com/?page_id=82

Failed Disk Notification

When a disk fails in your ReadyNAS, you are notified by email. Email alerts must be set up for notifications to be sent. In addition, FrontView provides information about the failed disk.

Each disk bay includes a failed disk LED that turns amber when its disk fails.

NETGEAR recommends replacing a failed disk with the same disk model. Contact the disk vendor and arrange to have the disk replaced if the disk is still under warranty. A disk RMA from the vendor requires that you provide the serial number of the disk. To locate the serial number, open the disk tray and take out the failed disk.

Use FrontView to determine the disk vendor and model used in your unit.

For information about setting up email alerts and using FrontView, see the *ReadyNAS for Business Software Manual*, which is available at <http://www.readynas.com/?cat=40>.



WARNING!

No matter how many hard drives are installed in your unit, ensure that all drive trays remain in the drive bays to maintain adequate airflow.

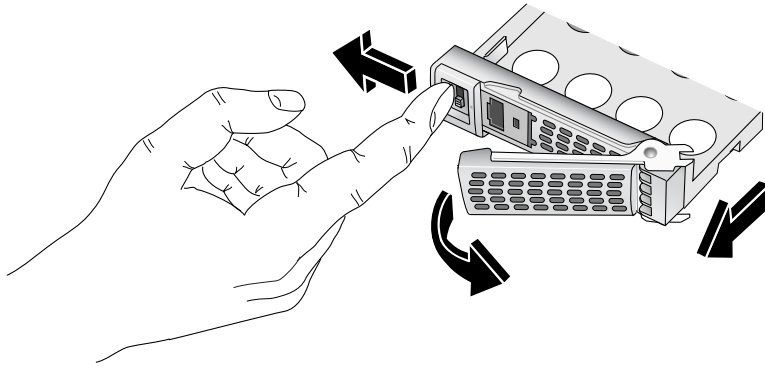
Adding a Disk

You can add a hard disk to an empty disk bay. You do not need to shut down your unit before adding a disk.

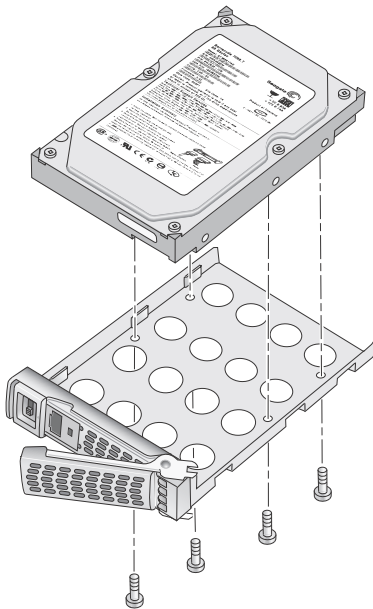
➤ **To add a disk to a 1500 or 2100:**

1. If necessary, unlock the disk tray lock, then press the disk release latch.

The tray handle pops out.



2. Pull out the disk tray and place a disk in the tray.



3. Assemble the disk tray.

Make sure that the hard disk connectors face the interior of the disk bay when you reassemble the disk.

4. Slide the disk tray into the unit and secure the handle.

The volume automatically synchronizes with the new disk in the background. This could take several hours depending on the disk size. You can continue to use your ReadyNAS, although access is slower until the volume synchronization finishes. You are notified by email when the process is complete.

➤ **To add a disk to a 3100, 3200, or 4200:**

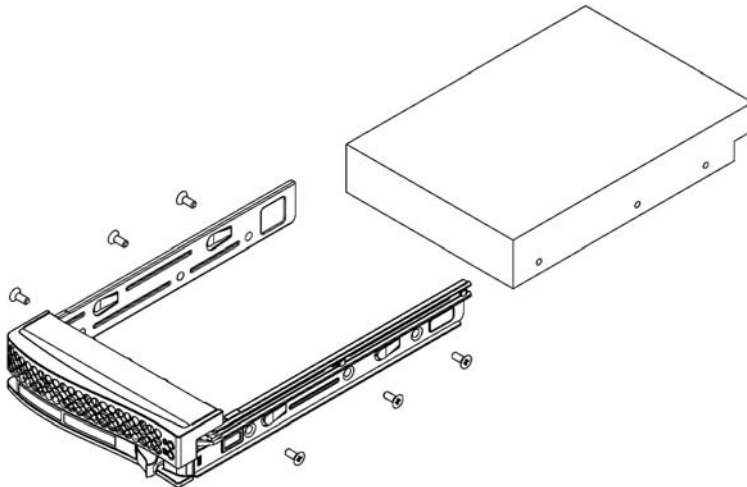
1. Pull the disk tray release pull switch.

The tray handle pops out.



1. Disk tray handle
2. Disk tray release pull switch

2. Pull out the disk tray and place a disk in the tray.



3. Assemble the disk tray.

Make sure that the hard disk connectors face the interior of the disk bay when you reassemble the disk.

4. Slide the disk tray into the unit and secure the handle.

The volume automatically synchronizes with the new disk in the background. This could take several hours depending on the disk size. You can continue to use your ReadyNAS, although access is slower until the volume synchronization finishes. You are notified by email when the process is complete.

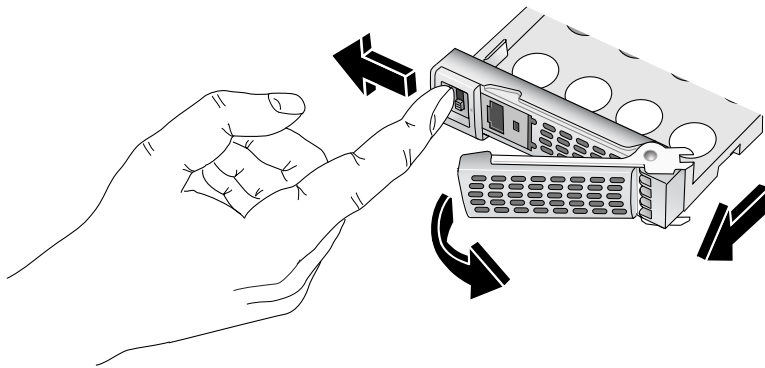
Replacing a Disk

In the case of a failed disk, the unit provides email alerts and status messages about the need to replace a disk. ReadyNAS supports hot-swap bays, so you do not need to power down your unit when replacing a disk.

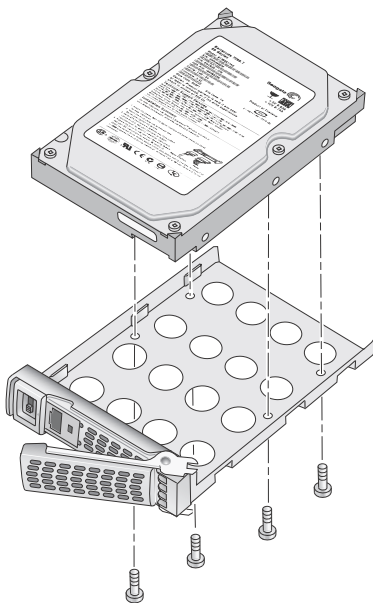
➤ **To replace a disk on a 1500 or 2100:**

1. In the case of a failed disk, scan the disk LEDs on the control panel to identify the failed disk.
2. If necessary, unlock the tray, then press the disk release latch.

The tray handle pops out.



3. Pull out the disk tray, remove the screws, remove the old disk, and replace it with a new disk.



4. Reassemble the disk tray.

Make sure that the hard disk connectors face the interior of the disk bay when you reassemble the disk tray.

5. Slide the disk tray back into the unit and secure the handle.

The volume automatically synchronizes with the new disk in the background. This could take several hours depending on the disk size. You can continue to use your ReadyNAS, although access is slower until the volume synchronization finishes. You are notified by email when the process is complete.

➤ **To replace a disk on a 3100, 3200, or 4200:**

1. In the case of a failed disk, scan disk LEDs on the disk bays to identify the failed disk.
2. Pull the disk tray release pull switch.

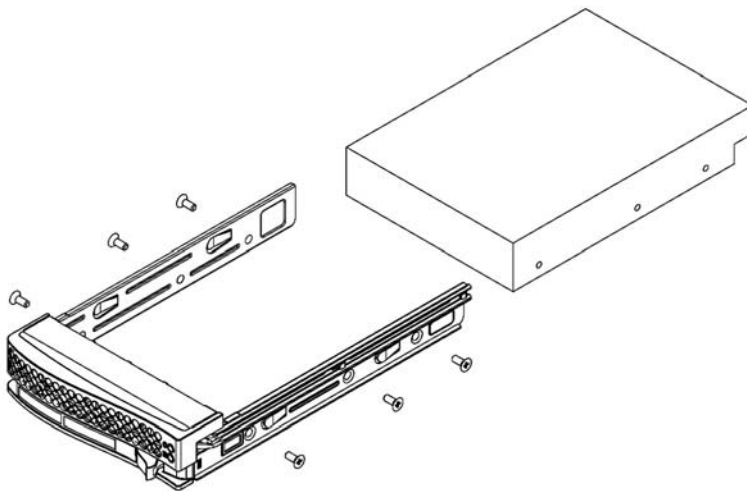
The tray handle pops out.



1. Disk tray handle

2. Disk tray release pull switch

3. Pull out the disk tray, remove the screws, remove the old disk and replace it with a new disk.



4. Reassemble the disk tray.

Make sure that the hard disk connectors face the interior of the disk bay when you reassemble the disk tray.

5. Slide the disk tray back into the unit and secure the handle.

The volume automatically synchronizes with the new disk in the background. This could take several hours depending on the disk size. You can continue to use your ReadyNAS, although access is slower until the volume synchronization finishes. You are notified by email when the process is complete.

System Components

You can replace system components on your ReadyNAS rack-mount storage system.

X-Change System Module

On the 1500 and 2100, replace the X-Change system module to replace any components such as power supplies, fans, or batteries.

➤ **To replace the X-Change system module:**

1. Loosen the thumb screws at the back of the unit.
2. Slide the old X-Change system module off the unit.



1. Front of unit

2. X-Change system module

3. Slide a new X-Change system module onto the unit.
4. Tighten the thumb screws.

Individual Components

On the 3100, 3200, and 4200, you replace power supplies, fans, and batteries individually.

Replacing a Power Supply

If either of the two power supply modules fails, the other module takes the full load and allows the system to continue operation without interruption. The power diagnostic LED illuminates until the failed unit is replaced.

You do not need to shut down the system to replace a power supply unit. The backup power supply module keeps the system up and running while you replace the failed hot-swap power supply. Replace a failed power supply with the same model.

➤ **To replace a power supply:**

1. Unplug the AC power cord from the failed power supply module.
2. Depress the locking tab on the power supply module and use the handle to pull it straight out with the rounded handle.
3. Push the new power supply unit into the power bay until you hear a click.
4. Secure the locking tab on the unit.
5. Plug the AC power cord back into the unit.

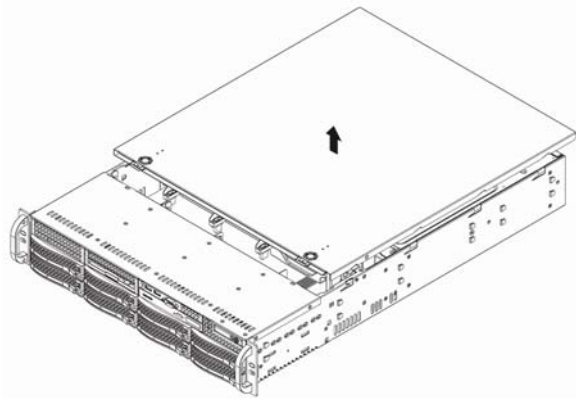
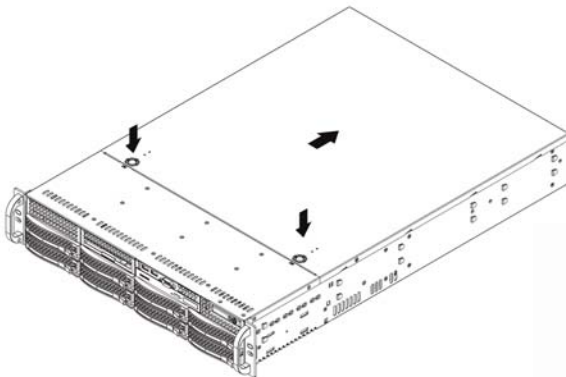
Accessing the Inside of a 3100, 3200, or 4200

You need to access the inside of the unit to replace a fan or battery.

➤ **To access the inside of a 3100, 3200, or 4200:**

1. Grasp the two handles on either side and pull the unit straight out until it locks.
The unit is locked when you hear a click sound.
2. Press the two buttons on the top of the chassis to release the top cover.

3. Lift the top cover from the chassis to gain full access to the inside of the system.



WARNING!

Ensure that the chassis cover is in place when the system is operating to allow proper cooling. Out-of-warranty damage to the system can occur if you do not strictly follow this practice.

Replacing a Fan

If a fan fails, the remaining fans ramp up to full speed, the fan LED on the control panel illuminates and an email alert is sent to the system administrator. Replace a failed fan as soon as possible. Remove the top chassis cover while the system is still running to determine which fan failed.

Fans are hot-pluggable, so you do not need to power down your unit when replacing a fan.

➤ To replace a fan on a 3100:

1. Remove the chassis cover.
2. Press the tabs on the sides of the fan to unlock and remove the fan and its housing.
3. Disconnect the fan's power connections.
4. Replace the failed fan with an identical fan.
5. Connect the new fan's power connections.

If the system power is on, the hot-plug feature causes the fan to start immediately.

➤ **To replace a fan on a 3200 or 4200:**

1. Remove the chassis cover.
2. Press the tabs on the sides of the fan to unlock and remove the fan and its housing.
The fan's power connection automatically detaches.
3. Replace the failed fan with an identical fan.

You hear a click when the fan is fully installed and the power connections are made. If the system power is on, the hot-plug feature causes the fan to start immediately upon being connected to its header on the mainboard.

Replacing the Onboard Battery

Replace the battery with the same or an equivalent type recommended by NETGEAR only. Dispose of used batteries according to the manufacturer's instructions.



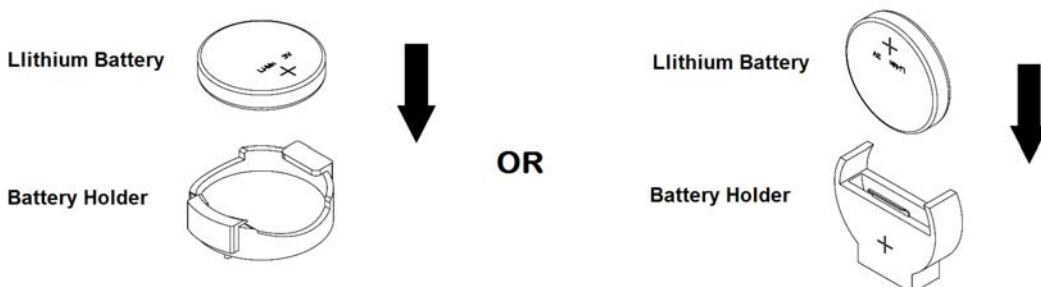
DANGER:

Installing the onboard upside down, which reverses its polarities, creates a danger of explosion. Take care to install the battery properly.

➤ **To replace the battery:**

1. Open the system and locate the battery holder.
2. Remove the old battery.
3. Install the new battery.

Take care to install the new battery with the correct side up.



A Warnings and Precautions



This appendix contains safety warnings and precautions for the ReadyNAS 1500, 2100, 3100, 3200, and 4200. It includes the following sections:

- *Safety Warnings*
- *Electrical Safety Precautions*
- *General Safety Precautions*
- *Electrostatic Discharge (ESD) Precautions*
- *Rack-Mount Precautions*

Safety Warnings

1. The equipment is certified for installation only by trained personnel, according to the installation instructions provided with each unit.
2. The socket outlet shall be installed near the equipment and shall be easily accessible.
3. Observe the onboard battery precautions. Follow the battery replacement instructions from [Replacing the Onboard Battery](#) on page 47.

**DANGER:**

Installing the onboard upside down, which reverses its polarities, creates a danger of explosion. Take care to install the battery properly.

4. The units and their associated LAN connections shall be interconnected only with equipment within the same building.
5. Slide or rail mounted equipment is not to be used as a shelf or a work space.



Electrical Safety Precautions

Follow basic electrical safety precautions to protect yourself from harm and the ReadyNAS from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch, or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.
- Do not work alone when working with high voltage components.
- Always disconnect power from the system when removing or installing main system components, such as the main board or memory modules. When disconnecting power, you should first power down the system with the operating system and then unplug the power cords of all the power supply units in the system.
- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.
- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.
- Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.
- The power supply cords must include a grounding plug and must be plugged into grounded electrical outlets.

General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the ReadyNAS clean and free of clutter.
- The ReadyNAS weighs approximately 82 pounds when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.
- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they will not accidentally be stepped on.
- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.
- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.
- Onboard battery: This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.



DANGER:

There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities.

- Main board replaceable soldered-in fuses: Self-resetting PTC (positive temperature coefficient) fuses on the main board must be replaced by trained service technicians only. The new fuse must be the same as or equivalent to the one replaced. Contact technical support for details and support.

Electrostatic Discharge (ESD) Precautions

Electrostatic discharge is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:



- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing the board from the antistatic bag.

- Do not let components or PCBs come into contact with your clothing, which might retain a charge even if you are wearing a wrist strap.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules, or contacts.
- When handling chips or modules, avoid touching their pins.
- Put the main board and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the main board.
- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

Rack-Mount Precautions

Follow these rack-mount precautions:

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single-rack installations, stabilizers should be attached to the rack. In multiple-rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time; extending two or more simultaneously might cause the rack to become unstable.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the ReadyNAS from power surges, and voltage spikes and to keep your system operating in case of a power failure.
- Allow any hot-plug drives and power supply modules to cool before touching them.
- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

B Notification of Compliance



NETGEAR Wired Products

Regulatory Compliance Information

This section includes user requirements for operating this product in accordance with National laws for usage of radio spectrum and operation of radio devices. Failure of the end-user to comply with the applicable requirements may result in unlawful operation and adverse action against the end-user by the applicable National regulatory authority.

This product's firmware limits operation to only the channels allowed in a particular Region or Country. Therefore, all options described in this user's guide may not be available in your version of the product.

FCC Requirements for Operation in the United States

FCC Information to User

This product does not contain any user serviceable components and is to be used with approved antennas only. Any product changes or modifications will invalidate all applicable regulatory certifications and approvals.

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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Guidelines for Human Exposure

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

FCC Declaration Of Conformity

We, NETGEAR, Inc., 350 East Plumeria Drive, San Jose, CA 95134, declare under our sole responsibility that the NETGEAR ReadyNAS Rack-Mount Storage Systems complies with Part 15 of FCC Rules.

Operation is subject to the following two conditions:

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

FCC Radio Frequency Interference Warnings & Instructions

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following methods:

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

Modifications made to the product, unless expressly approved by NETGEAR, Inc., could void the user's right to operate the equipment.

Canadian Department of Communications Radio Interference Regulations

This digital apparatus, NETGEAR ReadyNAS, does not exceed the Class B limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

European Union

The NETGEAR ReadyNAS complies with essential requirements of EU EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC as supported by applying the following test methods and standards:

- EN55022: 2006 / A1: 2007
- EN55024: 1998 / A1: 2001 / A2 : 2003
- EN60950-1: 2005 2nd Edition
- EN 61000-3-2:2006
- EN 61000-3-3:1995 w/A1: 2001+A2: 2005

GPL License Agreement

GPL may be included in this product; to view the GPL license agreement go to <ftp://downloads.netgear.com/files/GPLnotice.pdf>.

For GNU General Public License (GPL) related information, please visit http://support.netgear.com/app/answers/detail/a_id/2649.

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