

JBOD Enclosure Software User Guide

User Guide

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1. Overview

About QNAP JBOD Enclosures

QNAP JBOD enclosures are a series of expansion units designed to increase the storage capacity of your NAS, computer, or server. JBOD enclosures offer a wide range of storage applications. You can manage drives independently or group them together in a software RAID configuration using a host NAS, computer, or server. QNAP offers JBOD enclosures with USB 3.2 Gen 2 Type-C or SFF interface ports to ensure quick and efficient data transfer between the JBOD enclosure and the host device.

QNAP JBOD Enclosure Types

Enclosure Type	Description	Supported Platforms	Example Models
Single-controller SAS JBOD enclosure	A JBOD enclosure that uses SFF interface ports to connect to a NAS or server. These enclosures can only connect to a host device with an installed PCIe SAS storage expansion card.	Server: • Windows • Linux NAS: • QTS • QuTS hero	TL-R1220Sep-RP, TL-R1620Sep-RP
Dual-controller SAS JBOD enclosure	A JBOD enclosure with dual controllers that uses SFF interface ports to connect to a NAS or server. These enclosures can only connect to a host device with available Mini-SAS ports or an installed PCIe SAS storage expansion card.	Server: • Windows • Linux NAS: • QES	TL-R1620Sdc
SATA JBOD enclosure	A JBOD enclosure that uses SFF interface ports to connect to a NAS or computer. These enclosures can only connect to a host device with an installed QNAP QXP host bus adapter.	Computer: • Windows • Linux NAS: • QTS • QuTS hero	• TL-D400S, TL-D800S, TL-D1600S • TL-R400S, TL-R1200S-RP

Enclosure Type	Description	Supported Platforms	Example Models
USB JBOD enclosure	A JBOD enclosure that uses USB 3.2 Gen 2 Type-C ports to connect to a NAS or computer.	Computer: • Windows • Linux • macOS NAS: • QTS • QuTS hero	• TL-D800C • TL-R1200C-RP

2. QNAP JBOD Manager

QNAP JBOD Manager is a utility for Windows, Linux, and macOS that enables you to view and configure connected QNAP JBOD enclosures.



Tip

To download QNAP JBOD Manager, go to <https://www.qnap.com/utilities>.

Home Screen

The home screen displays basic information about the selected device and provides access to several device management options.



UI Element	Description
Select device 	Select a JBOD enclosure to manage. View the status of each installed disk. • Green: The disk is healthy and operating normally. • Orange: The disk has encountered one or more issues.  Tip Click an installed disk to view S.M.A.R.T. information for the disk.
Action > Locate	Prompt the drive LEDs to blink and the enclosure to beep so that you can easily locate the device in a server room or on a rack.

UI Element	Description
Action > View Mapping Table (SATA JBOD only)	Open the SATA JBOD Mapping Table screen. This table shows which JBOD enclosures are connected to each QXP card. Each JBOD port can connect 4 JBOD enclosure disks to the host.
Action > View Topology (SAS JBOD only)	Open the View Topology screen. This topology shows which JBOD enclosures are connected to each QXP card, and the port statuses and zone groups in each JBOD enclosure.
Action > Rename (SATA JBOD only)	Modify the display name of your SATA JBOD enclosure.
Action > Edit Alert	Enable or disable audio alerts.  Note This feature is only available when the JBOD enclosure's audio alert switch is toggled on. For details, refer to the JBOD enclosure's hardware user guide.
• Action > Eject (Windows) • Action > Unmount Volumes (Linux/macOS)	Disconnect the device from the host computer.
	View the system logs. For details, see System Logs .
	Check for updates, view help, and modify the language or region settings.

Device Information

This screen displays basic information about the selected JBOD enclosure.

**Tip**

Click  to refresh enclosure information and statuses.

Modifying the Device Temperature Threshold

QNAP JBOD Manager issues a temperature warning when the device's internal temperature reaches the specified threshold.

1. Open QNAP JBOD Manager.
2. Go to **Device Information**.
3. Click the system temperature.
The **Device Temperature Threshold** window appears.
4. Specify a temperature threshold between 55°C and 69°C.
5. Click **Apply**.

Zoning Settings

This screen displays the zoning settings on the selected JBOD enclosure. You can group disks into different zones.

**Note**

These settings are only available to SAS JBOD enclosures and may require the installation of SAS expansion cards on the host device. For details, see the user guide for your JBOD enclosure model.



Enabling Zoning

Zoning allows you to limit host access to specific groups of disks.



Note

These settings are only available to SAS JBOD enclosures and may require the installation of SAS expansion cards on the host device. For details, see the user guide for your JBOD enclosure model.

1. Open QNAP JBOD Manager.
2. Go to **Zoning Settings**.
3. Next to **Zoning**, click  to enable zoning.
4. Next to **Zone configuration**, click . The **Zone Configuration Settings** window opens.
5. Select a zone configuration.

Zone Configuration	Disk Groups	Description
0	1	All installed disks and ports are treated as a single group. Disks are accessible through any port.
1	2	Installed disks and ports are divided into two groups. The disk group you can access depends on which port you connect to. For dual-controller JBOD enclosures, all ports on the same controller are in one group.

Zone Configuration	Disk Groups	Description
Customized	User-defined	Allows you to define your own disk and port groups.  Note This configuration is only available after running a command through the command-line interface (CLI). For details, see the SAS JBOD CLI User Guide.

- Click **Apply Configuration**.
A confirmation window appears.

- Click **Yes**.

Disk Information

This screen shows basic disk information and the status of selected disks. You can choose to view information for a single disk or select **All disks** to view the installed disks as a list.



QNAP JBOD Manager

Disk Information

Disks installed: 2

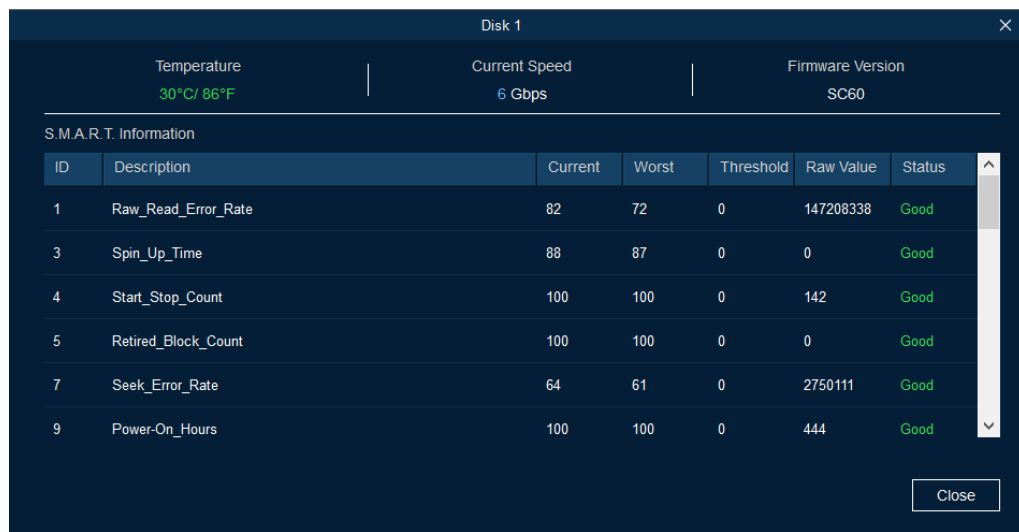
Show: All disks S.M.A.R.T. polling time: 5 mins

Disk	Manufacturer / Model	Capacity	Status
Disk 1 HDD	WDC WD5003ABYZ-011FA0	465.69 GB	Good
Disk 2 HDD	WDC WD5000AAKX-22ERMA0	465.69 GB	Good



Tip

Click on a disk status indicator to view detailed information about the disk, including any S.M.A.R.T. information.



Disk 1						
Temperature		Current Speed		Firmware Version		
30°C/ 86°F		6 Gbps		SC60		
S.M.A.R.T. Information						
ID	Description	Current	Worst	Threshold	Raw Value	Status
1	Raw_Read_Error_Rate	82	72	0	147208338	Good
3	Spin_Up_Time	88	87	0	0	Good
4	Start_Stop_Count	100	100	0	142	Good
5	Retired_Block_Count	100	100	0	0	Good
7	Seek_Error_Rate	64	61	0	2750111	Good
9	Power-On_Hours	100	100	0	444	Good

Modifying the S.M.A.R.T. Polling Time

You can specify how often the device checks disks for S.M.A.R.T. errors.

1. Open QNAP JBOD Manager.
2. Go to **Disk Information**.
3.  Next to **S.M.A.R.T. polling time**, click . The **S.M.A.R.T. Polling Time** window appears.
4. Specify the S.M.A.R.T. polling time in minutes.
 - Allowed values: 1 to 60
 - Default value: 5



Important

High polling frequency may affect disk performance.

5. Click **Apply**.

Locating a Disk

1. Open QNAP JBOD Manager.
2. Under **Select device**, select the device where the disk is physically located.
3. Go to **Disk Information**.
4. Next to **Show**, select **All disks**.
5. Identify a disk to locate.
6.  Click . The **Locate Disk** window opens.

The disk LED starts blinking.

7. After you have located the disk, click **Stop Blinking**.

Enabling SSD Trim on a Solid-State Drive

SSD Trim cleans deleted data blocks on a solid-state drive to maintain write performance.

1. Open QNAP JBOD Manager.
2. Under **Select device**, select a device.
3. Go to **Disk Information**.
4. Next to **Show**, select an SSD.
5. Next to **SSD Trim**, click **Disabled**.
The **Enable SSD Trim** window opens.
6. Click **Yes**.
7. Click **OK**, or click **Restart Now** if prompted.



Note

Some operating systems may require a restart before SSD Trim can be enabled.

Firmware Information

This screen shows the current firmware version of your JBOD enclosure and provides options for updating the firmware.



Firmware Update Method	Description
Automatic update	QNAP JBOD Manager automatically downloads and installs the latest version of the device firmware. For details, see Updating the Firmware Automatically.  Note You can only select this option if a firmware update is available for the JBOD enclosure.
Manual update	Update the firmware by uploading a local firmware IMG file from your computer. For details, see Updating the Firmware Manually.  Tip You can download firmware updates at https://download.qnap.com.

Updating the Firmware Automatically



Important

- All cables must be connected to the JBOD enclosure to update the firmware.
- Dual-controller JBOD enclosures require a multipath connection to the host to update the firmware.
- In macOS, the host device must be connected to power to update the firmware.
- QNAP recommends unmounting RAID groups from disks installed in the JBOD enclosure before updating the firmware.

1. Open QNAP JBOD Manager.
2. Go to **Firmware Information**.
3. Select the devices to update.
4. Under **Update method**, select **Automatically install the latest firmware version**.



Note

You can only select this option if a firmware update is available for the selected devices.

5. Click **Update Firmware**.
The **Firmware Update** window appears.
QNAP JBOD Manager downloads the firmware update file.
6. Restart the device.
QNAP JBOD Manager opens and installs the firmware.
7. Ensure that the firmware is updated.
 - a. Go to **Firmware Information**.
 - b. Verify that the **Current firmware version** matches the **Latest firmware version**.

Updating the Firmware Manually



Important

- All cables must be connected to the JBOD enclosure to update the firmware.
- Dual-controller JBOD enclosures require a multipath connection to the host to update the firmware.
- In macOS, the host device must be connected to power to update the firmware.
- QNAP recommends unmounting RAID groups from disks installed in the JBOD enclosure before updating the firmware.

1. Open QNAP JBOD Manager.
2. Go to **Firmware Information**.
3. Select the devices to update.
4. Under **Update method**, select **Select a local firmware file**.



Tip

You can download firmware updates at <https://download.qnap.com>.

5. Click **Browse**.
6. Select the firmware update file from your computer.
7. Click **Update Firmware**.
The **Firmware Update** window appears.
8. Restart the device.
QNAP JBOD Manager opens and installs the firmware.
9. Ensure that the firmware is updated.
 - a. Go to **Firmware Information**.
 - b. Verify that the **Current firmware version** matches the **Latest firmware version**.

System Logs

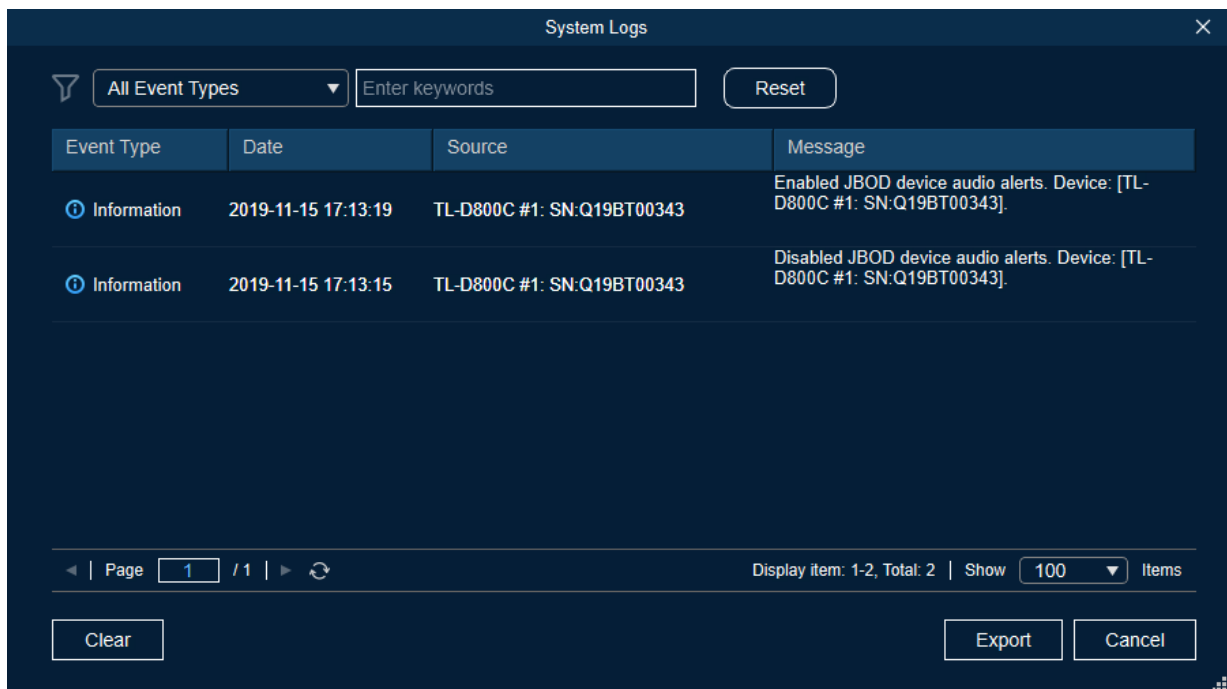
System logs are records of all the events that occur on a JBOD enclosure. You can filter, search, and download logs for help with troubleshooting.



Tip



Click  on the [Home Screen](#) to open the **System Logs** window.



UI Element	Description
	Filter the log messages by event type or keyword. Select one of the following event types: • All Event Types • Information • Warning • Error
Reset	Remove the filter and show all log messages.
Clear	Delete all log messages.
Export	Export all log messages to a CSV file. If a filter is applied, only the filtered logs are exported.
Cancel	Close the System Logs window.

3. QTS JBOD Management

You can manage JBOD enclosures in QTS from the following locations in the Storage & Snapshots utility.

Location	Description
Disks/VJBOD	View, manage, and configure storage for attached JBOD enclosures. You can create storage pools, volumes, and RAID groups using disks installed in the JBOD enclosure.
External Storage	View and manage attached JBOD enclosures and installed disks.

Disks/VJBOD

Open QTS and go to **Storage & Snapshots > Storage > Disks/VJBOD** to access JBOD enclosure storage configuration options.

For information on managing disks, including creating and managing storage pools, volumes, and other features, see the QTS User Guide.

UI Element	Description
Device menu	Select a JBOD enclosure or disk to manage.
Performance test	QTS can test the sequential and random read speeds of your disks. For more information, see the QTS User Guide.
Recover > Recover Enclosure	Recover storage pools or static volumes on a JBOD enclosure that was accidentally disconnected from the NAS. For more information, see the QTS User Guide.
Recover > Reinitialize Enclosure IDs	Reset all expansion unit IDs, and then give each unit a new ID number starting from 1 based on the order that they are physically connected.  Tip Use this action if the expansion unit IDs appear out of sequential order in the enclosure list.
Recover > Attach and Recover Storage Space	Scan all free disks on the NAS and all connected expansion units for existing volumes, LUNs, and storage pools.  Tip Perform this action after moving disks between NAS devices.
RAID Group	Select and view RAID group details.

JBOD Enclosure Actions

Go to **Storage & Snapshots > Storage > Disks/VJBOD** and select a JBOD enclosure to perform any of the following actions.

Action	Description
Enclosure Info	View full hardware details of the expansion unit, including the model, serial number, firmware version, BUS type, CPU temperature, system temperature, power status, and fan speeds.
Action > Locate	Prompt the expansion unit chassis LEDs to blink, so that you can locate the device in a server room or rack.

Action	Description
Action > Safely Detach	Stop all activity and safely unmount the enclosure from the host NAS.
Action > Update Firmware	Update the expansion unit's firmware.
Action > Rename Enclosure	Rename the selected expansion unit.
Action > View QXP Card Connections	View which enclosures and their disks are connected to which expansion cards on the NAS.

JBOD Enclosure Disk Actions

Go to **Storage & Snapshots > Storage > Disks/VJBOD** and select a disk installed in a JBOD enclosure to perform any of the following actions.

Action	Description
Disk Info	View full details of the installed disk, including the manufacturer, model, serial number, firmware version, and BUS type.
Disk Health	View detailed information about the health of the installed disk, including health summary and S.M.A.R.T. information. You can also run a S.M.A.R.T. test and modify disk settings. For more information, see the QTS User Guide.
Action > Scan for Bad Blocks	Scan the installed disk for bad blocks and other disk errors.
Action > Locate	Prompt the drive LED to blink so that you can easily locate the disk in a server room or on a rack.
Action > Secure Erase	Permanently delete all data on the disk to ensure that the data is not recoverable. Performing this action also restores the disk's performance to its original factory state. For more information, see the QTS User Guide.
Action > New Volume	Create a new static volume or RAID group using the disks installed in the JBOD enclosure. For more information, see the QTS User Guide.
Action > Detach	Safely disconnect the disk containing a storage pool or static volume.
Action > Set as Enclosure Spare	Assign the disk as a global hot spare for all RAID groups within the same enclosure (NAS or expansion unit).

External Storage

Go to **Storage & Snapshots > Storage > External Storage** to view installed disks and partitions in the JBOD enclosure. To manage a device, disk, or partition, select one and then click **Actions**.

External Storage Device Actions

Action	Description
Erase	Delete all data and partitions on the device.
Eject	Safely unmount the external storage device from the NAS, so that you can disconnect it.

External Storage Disk Actions

Action	Description
Full Disk Format	Format the disk. For details, see Formatting an External Storage Disk or Partition .
Secure Erase	Permanently erase all data on a disk. For more information, see the QTS User Guide.

External Storage Partition Actions

Action	Description
Storage Information	Display details about the selected partition, including partition name, capacity, used space, and file system type.
Format	Format the partition. For details, see Formatting an External Storage Disk or Partition .
Encryption Management	Manage encryption on a previously encrypted device. You can lock or unlock the device, change the encryption password, or download the encryption key.
Eject	Unmount the partition. The external storage device and any stored partitions will continue working.

Formatting an External Storage Disk or Partition

1. Go to **Storage & Snapshots > Storage > External Storage**.
2. Select a disk or partition.
3. Click **Actions**, and then select **Full Disk Format** or **Format**.
The **Full Disk Format** or **Format Partition** window opens.
4. Select a file system.

File System	Recommended Operating Systems and Devices
NTFS	Windows
HTS+	macOS
FAT32	Windows, macOS, NAS devices, most cameras, mobile phones, video game consoles, tablets  Important The maximum file size is 4 GB.
exFAT	Windows, macOS, some cameras, mobile phones, video game consoles, tablets  Important Verify that your device is compatible with exFAT before selecting this option.
EXT3	Linux, NAS devices
EXT4	Linux, NAS devices

5. Specify a label.
The label must consist of 1 to 16 characters from any of the following groups:

- Letters: A to Z, a to z
- Numbers: 0 to 9
- Special characters: Hyphen "-"

6. Optional: Enable encryption.

a. Select an encryption type.

Select one of the following options:

- AES 128 bits
- AES 192 bits
- AES 256 bits

b. Specify an encryption password.

The password must consist of 8 to 16 characters from any of the following groups:

- Letters: A to Z, a to z
- Numbers: 0 to 9
- All special characters (excluding spaces)

c. Confirm the encryption password.

d. Optional: Select **Save encryption key.**

Select this option to save a local copy of the encryption key on the NAS. This enables the system to automatically unlock and mount the encrypted storage space when the NAS starts up. If the encryption key is not saved, you must specify the encryption password each time the NAS restarts.



Warning

- Saving the encryption key on the NAS can result in unauthorized data access if unauthorized personnel are able to physically access the NAS.
- If you forget the encryption password, the storage space will become inaccessible and all data will be lost.

7. Click **Format.**

A warning message appears.

8. Click **OK.**

Updating JBOD Enclosure Firmware in QTS

1. Open **Storage & Snapshots.**

QTS periodically checks for the latest firmware for each connected enclosure on login. If a new firmware update is available, QTS opens the **Start Firmware Update** window.

2. Follow the instructions to install the firmware update.

Depending on the model you may be asked to power off then power on the device, or disconnect then reconnect the device.

QTS re-detects the device and displays a notification message.

3. Wait for confirmation that the firmware update has finished.

4. Go to **Storage & Snapshots > Storage > Disks/VJBOD** .
5. Click **Recover**, and then select **Attach and Recover Storage Pool**.

4. QuTS hero JBOD Management

You can manage JBOD enclosures in QuTS hero from the following locations in the Storage & Snapshots utility.

Location	Description
Disks/VJBOD	View, manage, and configure storage for attached JBOD enclosures. You can create storage pools, shared folders, and RAID groups using disks installed in the JBOD enclosure.
External Storage	View and manage attached JBOD enclosures and installed disks.

Disks/VJBOD

Open QuTS hero and go to **Storage & Snapshots > Storage > Disks/VJBOD** to access JBOD enclosure storage configuration options.

For information on managing disks, including creating and managing storage pools, shared folders, and other features, see the QuTS hero User Guide.

UI Element	Description
Device menu	Select a JBOD enclosure or disk to manage.
Performance test	QuTS hero can test the sequential and random read speeds of your disks. For more information, see the QuTS hero User Guide.
Recover > Reinitialize Enclosure IDs	Reset all expansion unit IDs, and then give each unit a new ID number starting from 1 based on the order that they are physically connected.  Tip Use this action if the expansion unit IDs appear out of sequential order in the enclosure list.
Recover > Attach and Recover Storage Pool	Scan all free disks on the NAS and all connected expansion units for existing shared folders, LUNs, and storage pools.  Tip Perform this action after moving disks between NAS devices.
RAID Group	Select and view RAID group details.

JBOD Enclosure Actions

Go to **Storage & Snapshots > Storage > Disks/VJBOD** and select a JBOD enclosure to perform any of the following actions.

Action	Description
Enclosure Info	View full hardware details of the expansion unit, including the model, serial number, firmware version, BUS type, CPU temperature, system temperature, power status, and fan speeds.
Action > Locate	Prompt the expansion unit chassis LEDs to blink, so that you can locate the device in a server room or rack.
Action > Safely Detach	Stop all activity and safely unmount the enclosure from the host NAS.

Action	Description
Action > Update Firmware	Update the expansion unit's firmware.
Action > Rename Enclosure	Rename the selected expansion unit.
Action > View QXP Card Connections	View which enclosures and their disks are connected to which expansion cards on the NAS.

JBOD Enclosure Disk Actions

Go to **Storage & Snapshots > Storage > Disks/VJBOD** and select a disk installed in a JBOD enclosure to perform any of the following actions.

Action	Description
Disk Info	View full details of the installed disk, including the manufacturer, model, serial number, firmware version, and BUS type.
Disk Health	View detailed information about the health of the installed disk, including health summary and S.M.A.R.T. information. You can also run a S.M.A.R.T. test and modify disk settings. For more information, see the QuTS hero User Guide.
Action > Scan for Bad Blocks	Scan the installed disk for bad blocks and other disk errors.
Action > Locate	Prompt the drive LED to blink so that you can easily locate the disk in a server room or on a rack.
Action > Secure Erase	Permanently delete all data on the disk to ensure that the data is not recoverable. Performing this action also restores the disk's performance to its original factory state. For more information, see the QuTS hero User Guide.
Action > Detach	Safely disconnect the disk containing a storage pool or static volume.
Action > Set as Enclosure Spare	Assign the disk as a global hot spare for all RAID groups within the same enclosure (NAS or expansion unit).

External Storage

Go to **Storage & Snapshots > Storage > External Storage** to view installed disks and partitions in the JBOD enclosure. To manage a device, disk, or partition, select one and then click **Actions**.

External Storage Device Actions

Action	Description
Erase	Delete all data and partitions on the device.
Eject	Safely unmount the external storage device from the NAS, so that you can disconnect it.

External Storage Disk Actions

Action	Description
Full Disk Format	Format the disk. For details, see Formatting an External Storage Disk or Partition .
Secure Erase	Permanently erase all data on a disk. For more information, see the QuTS hero User Guide.

External Storage Partition Actions

Action	Description
Storage Information	Display details about the selected partition, including partition name, capacity, used space, and file system type.
Format	Format the partition. For details, see Formatting an External Storage Disk or Partition .
Encryption Management	Manage encryption on a previously encrypted device. You can lock or unlock the device, change the encryption password, or download the encryption key.
Eject	Unmount the partition. The external storage device and any stored partitions will continue working.

Formatting an External Storage Disk or Partition

1. Go to **Storage & Snapshots > Storage > External Storage**.
2. Select a disk or partition.
3. Click **Actions**, and then select **Full Disk Format** or **Format**.
The **Full Disk Format** or **Format Partition** window opens.
4. Select a file system.

File System	Recommended Operating Systems and Devices
NTFS	Windows
HTS+	macOS
FAT32	Windows, macOS, NAS devices, most cameras, mobile phones, video game consoles, tablets  Important The maximum file size is 4 GB.
exFAT	Windows, macOS, some cameras, mobile phones, video game consoles, tablets  Important Verify that your device is compatible with exFAT before selecting this option.
EXT3	Linux, NAS devices
EXT4	Linux, NAS devices

5. Specify a label.
The label must consist of 1 to 16 characters from any of the following groups:
 - Letters: A to Z, a to z
 - Numbers: 0 to 9
 - Special characters: Hyphen "-"
6. Optional: Enable encryption.
 - a. Select an encryption type.
Select one of the following options:

- AES 128 bits
 - AES 192 bits
 - AES 256 bits
- b.** Specify an encryption password.
The password must consist of 8 to 16 characters from any of the following groups:
- Letters: A to Z, a to z
 - Numbers: 0 to 9
 - All special characters (excluding spaces)
- c.** Confirm the encryption password.
- d.** Optional: Select **Save encryption key**.
Select this option to save a local copy of the encryption key on the NAS. This enables the system to automatically unlock and mount the encrypted storage space when the NAS starts up. If the encryption key is not saved, you must specify the encryption password each time the NAS restarts.



Warning

- Saving the encryption key on the NAS can result in unauthorized data access if unauthorized personnel are able to physically access the NAS.
- If you forget the encryption password, the storage space will become inaccessible and all data will be lost.

- 7.** Click **Format**.
A warning message appears.
- 8.** Click **OK**.

Updating JBOD Enclosure Firmware in QuTS hero

- 1.** Open **Storage & Snapshots**.
QuTS hero periodically checks for the latest firmware for each connected enclosure on login. If a new firmware update is available, QuTS hero opens the **Start Firmware Update** window.
- 2.** Follow the instructions to install the firmware update.
Depending on the model you may be asked to power off then power on the device, or disconnect then reconnect the device.
QuTS hero re-detects the device and displays a notification message.
- 3.** Wait for confirmation that the firmware update has finished.
- 4.** Go to **Storage & Snapshots > Storage > Disks/VJBOD**.
- 5.** Click **Recover**, and then select **Attach and Recover Storage Pool**.