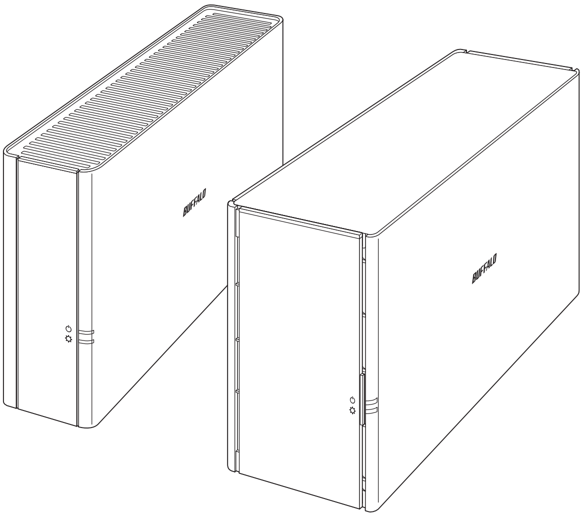
BUFFALO™

Network Attached Storage

LinkStation 200

User Manual



Please make sure to read this manual before using and follow the procedures. If you have any inquiries about the product, contact the number on the warranty statement or the packing box. Do not discard the included documents, the warranty statement, or the packing box.

Americas: www.buffaloamericas.com
Europe: www.buffalo-technology.com
Asia Pacific: www.buffalo-asia.com

35020312-20
March 2024

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Chapter 1 Notice

Regulatory Compliance Information

For Customers in the United States

FCC Statement

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 generates, 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 measures:

- 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/TV technician for help.

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.

Proposition 65

WARNING:

This product and its components contain chemicals known to the State of California to cause cancer and birth defects, or reproductive harm. Wash hands after handling.

For Customers in Europe

EU Declaration of Conformity

AC Adapter

The external power adapter should be a UL/CSA62368-1 or UL/CSA60950-1 certified power adapter. Make sure it is approved by Buffalo accordingly before using or replacing it.

The chart below lists the product models of the AC adapter included with your LinkStation unit. The "x" at the end of the AC adapter's model name represents a variable alphabetic character between D and Z.

LS210D0101, LS210D0201	Asian Power Devices Inc. WB-18L12R-Z080*x*
LS210D0301, LS210D0401	Asian Power Devices Inc. WA-24Q12R-Z079*x*
LS220D, LS220DE, LS220DR	Asian Power Devices Inc. DA-48T12-Z067*x*

ErP Lot 7

The chart below lists detailed information on the AC adapters included with your LinkStation unit for compliance with "Commission Regulation (EU) 2019/1782, ecodesign requirements for external power supplies pursuant to Directive 2009/125/EC of the European Parliament and of the Council". The "x" at the end of the AC adapter's model name represents a variable alphabetic character between D and Z.

WB-18L12R-Z080*x*	Product manufacturer's name	BUFFALO INC.
	Commercial registration number	1800-01-041423
	Address	AKAMONDORI Bldg., 30-20, Ohsu 3-chome, Naka-ku, Nagoya 460-8315, Japan
	Input voltage	100–240 V
	Input AC frequency	50–60 Hz
	Output voltage	12.0 V
	Output current	1.5 A
	Output power	18.0 W
	Average active efficiency	88.2%
	Efficiency at low load (10%)	82.0%
	No-load power consumption	0.06 W
WA-24Q12R-Z079*x*	Product manufacturer's name	BUFFALO INC.
	Commercial registration number	1800-01-041423
	Address	AKAMONDORI Bldg., 30-20, Ohsu 3-chome, Naka-ku, Nagoya 460-8315, Japan
	Input voltage	100–240 V
	Input AC frequency	50–60 Hz
	Output voltage	12.0 V
	Output current	2.0 A
	Output power	24.0 W
	Average active efficiency	88.2%
	Efficiency at low load (10%)	88.1%
	No-load power consumption	0.07 W
DA-48T12-Z067*x*	Product manufacturer's name	BUFFALO INC.
	Commercial registration number	1800-01-041423
	Address	AKAMONDORI Bldg., 30-20, Ohsu 3-chome, Naka-ku, Nagoya 460-8315, Japan
	Input voltage	100–240 V
	Input AC frequency	50–60 Hz
	Output voltage	12.0 V
	Output current	4.0 A
	Output power	48.0 W
	Average active efficiency	89.2%
	Efficiency at low load (10%)	86.5%
	No-load power consumption	0.08 W

Warning Symbols and Graphical Icons on the Product

Warning symbols are used on the product for safety operation and prevention of injury to you and damage to the unit. The following explains the meanings of symbols used on the product.

⚠	This symbol indicates important warnings or cautions for operation and maintenance. Additional information will follow this symbol.
⎓	This symbol indicates the presence of a direct current.
⊖-◐-⊕	This symbol indicates polarity of DC connector.

Safety Precautions

Before using your device, basic safety instructions should always be followed.

(1) Read these instructions.

(2) Keep these instructions.

(3) Heed all warnings and follow all instructions.

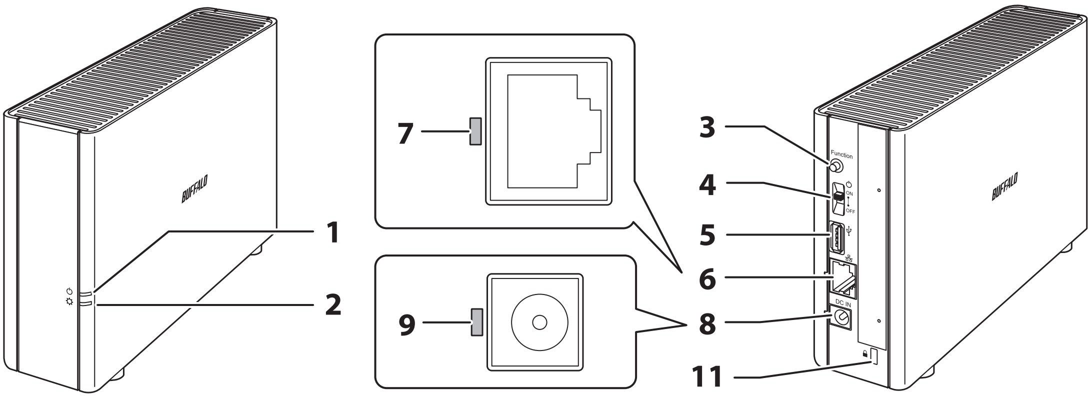
(4) Only use the cables and accessories that are included in the package. Don't use other accessories or cables unless specifically instructed to in the documentation. Also, do not use USB cables that are 3 meters or longer to connect USB devices.

Chapter 2 Getting Started

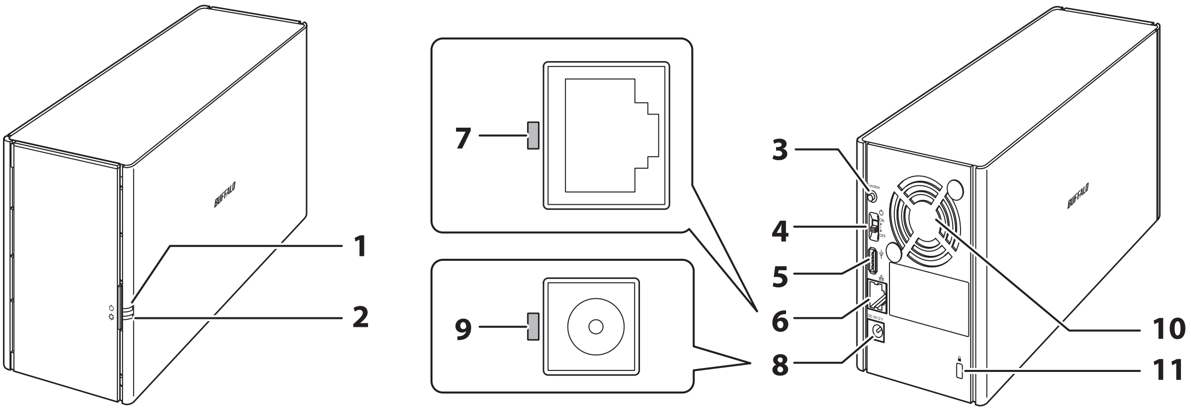
Diagrams

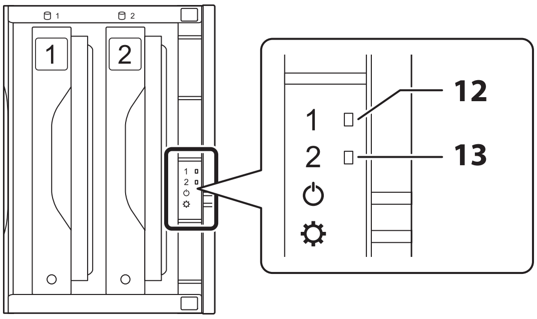
Depending on the number or type of drives in the unit, the model name will be different. Check the sticker on the packing box for your unit's model name.

LS210D


7
3
Function
4
ON
OFF
5
1
6
2
9
8
DC IN
11
BUFFALO

LS220D, LS220DE, LS220DR


7
3
4
1
5
2
9
6
8
10
11
BUFFALO



1 Power LED

The power LED glows white while the LinkStation is on.
The power LED blinks white while the LinkStation is booting or shutting down.
If an error occurs, the power LED blinks red.
If there is a status message, the power LED blinks amber.
If there is new firmware available, the power LED glows amber.

2 Function LED

This LED glows white while the LinkStation is being initialized and while dismounting USB devices. It blinks white during Direct Copy.
For enclosure models, the red function LED glows when turning the LinkStation on for initial hard drive installation and blinks after pressing the function button.

3 Function Button

Use this button for Direct Copy, dismounting USB devices, and initializing settings.

4 Power Switch

Move the switch up and down to power the device on and off.

5 USB Port

Connect a compatible USB drive, USB memory device, digital camera, or USB printer. USB hubs are not supported. Connect only one USB device at a time.

6 LAN Port

Connect an Ethernet cable to use this port for your network. It is available for communicating at max. 1000 Mbps.

7 Link/Act LED

Blinks green when the connection is experiencing activity.

8 Power Connector

Use the included power cable to connect to a surge protector or outlet.

9 Power Status LED

Glows green when the power cable is connected.

10 Fan

Spins to prevent overheating inside. Do not block the fan.

11 Anti-Theft Security Slot

Use this slot to secure your LinkStation with a cable lock (not included).

12 Drive 1 Error LED

If there is an error on the drive in slot 1, this LED will light.

13 Drive 2 Error LED

If there is an error on the drive in slot 2, this LED will light.

Installing Software

NAS Navigator2

NAS Navigator2 is a utility program that makes it easy to access Settings, change the Buffalo NAS device's IP address, or check its drives. To install NAS Navigator2, refer to the appropriate procedure below for your computer.

Windows

1 Go to the d.buffalo website (https://d.buffalo.jp/LS200/) to download the installer.

2 Select the region and model to go to your specific model's d.buffalo website.

3 Download the NAS Navigator2 installer and install it onto your computer.

Refer to the software help for more detailed information on operating the software. To open the help, launch NAS Navigator2 and navigate to *Menu* > *Help*.

macOS 10.13 and Later

For the procedure on a macOS device running macOS 10.12 and earlier, refer to the Windows section above.

1 Open Mac App Store and search for the NAS Navigator2 software.

2 Click *GET*, then *INSTALL*.

Refer to the software help for more detailed information on operating the software. To open the help, launch NAS Navigator2 and navigate to *Help* > *NAS Navigator2 Help* from the menu bar.

SmartPhone Navigator

SmartPhone Navigator will allow you to open LinkStation's Settings, change the IP address, and configure WebAccess settings from a mobile device. Follow the procedure below to install the app.

1 Open App Store (iOS or iPadOS devices) or Google Play (Android devices).

2 Search for and install "SmartPhone Navigator".

You can also install the apps from the QR codes below. Use the appropriate QR code for your mobile device.

iOS and iPadOS

Android

WebAccess

WebAccess will allow you access files on the LinkStation from a mobile device. Follow the procedure below to install the app.

1. Open App Store (iOS or iPadOS devices) or Google Play (Android devices).
2. Search for and install "WebAccess".

You can also install the apps from the QR codes below. Use the appropriate QR code for your mobile device.

iOS

iPadOS

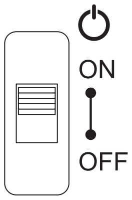
Android

NovaBACKUP

NovaBACKUP is a Windows utility that lets you back up data on your computer.
The NovaBACKUP installer is available from the d.buffalo website, accessible from https://d.buffalo.jp/LS200/.
Once you have accessed the URL, select the region and model to go to your specific model's d.buffalo website.
Download the NovaBACKUP installer and install the utility onto your computer.
To download the installer, you will need the serial number of your LinkStation. The serial number is printed on the label on the back of the unit.

Turning the LinkStation On and Off

Move the power switch to the "On" position to turn the device on.
To turn off the LinkStation, move the switch to the "Off" position. When the power LED turns off, the shutdown process is finished.
Don't unplug the AC adapter without powering the LinkStation off first.



You can restart the LinkStation remotely from Settings. For the detailed procedure, refer to the "Restarting the LinkStation from Settings" section below.

Accessing Settings

Configure and manage your LinkStation using the Settings interface, accessible from a browser window. Open the interface using the appropriate procedure below or type the LinkStation's IP address into the URL field of your browser. Within Settings, the Easy Admin page gives you quick access to commonly-used settings.

Note: Internet Explorer 9, Microsoft Edge, Firefox 18, Google Chrome 24, Safari 5, and later are supported. If you have difficulty viewing Settings, check whether you have a proxy server enabled in the browser settings. If you do, disable the proxy server.

Opening Settings

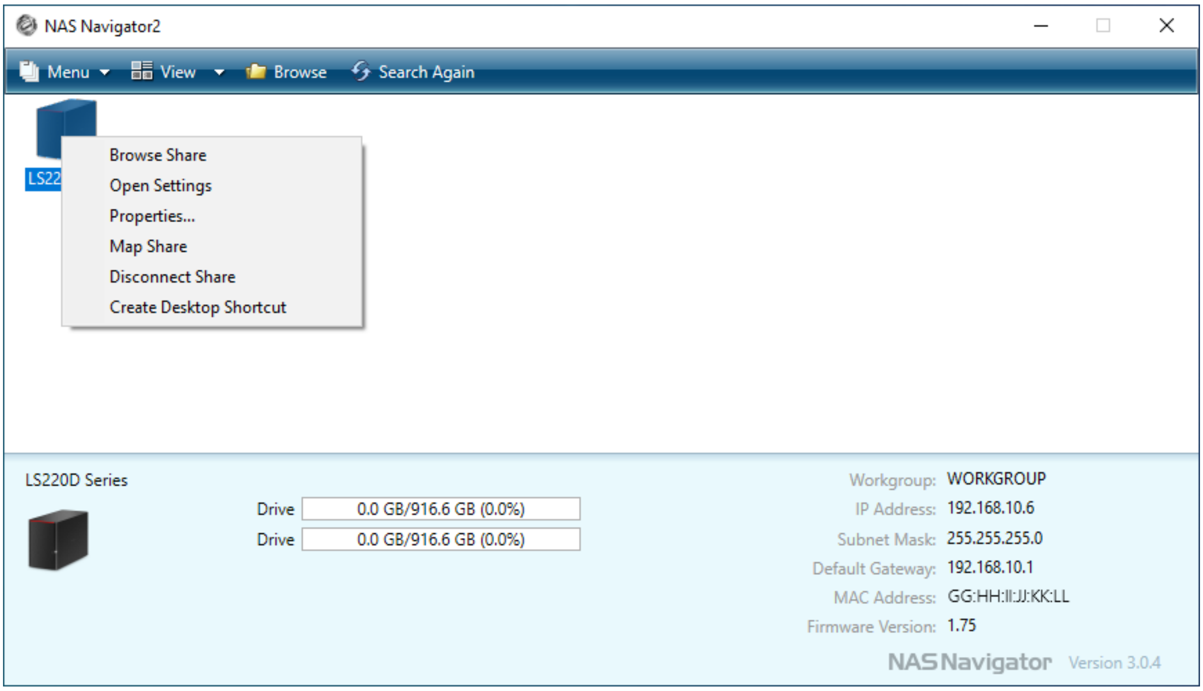
You can open Settings from a computer or a mobile device. Follow the appropriate procedure below to open Settings.

Using a Computer (Easy Admin)

The Easy Admin page makes it easy to change common settings. Follow the procedure below to open Easy Admin.

1 Double-click the NAS Navigator2 icon ( ) to start NAS Navigator2.

2 Right-click your LinkStation's icon and select *Open Settings*. For macOS, select the LinkStation's icon while holding down the control key, then select *Open Settings*.


NAS Navigator2
Menu
View
Browse
Search Again
LS22
Browse Share
Open Settings
Properties...
Map Share
Disconnect Share
Create Desktop Shortcut
NAS Navigator Version 3.0.4

LS220D Series

Drive 0.0 GB/916.6 GB (0.0%)

Drive 0.0 GB/916.6 GB (0.0%)

Workgroup: WORKGROUP

IP Address: 192.168.10.6

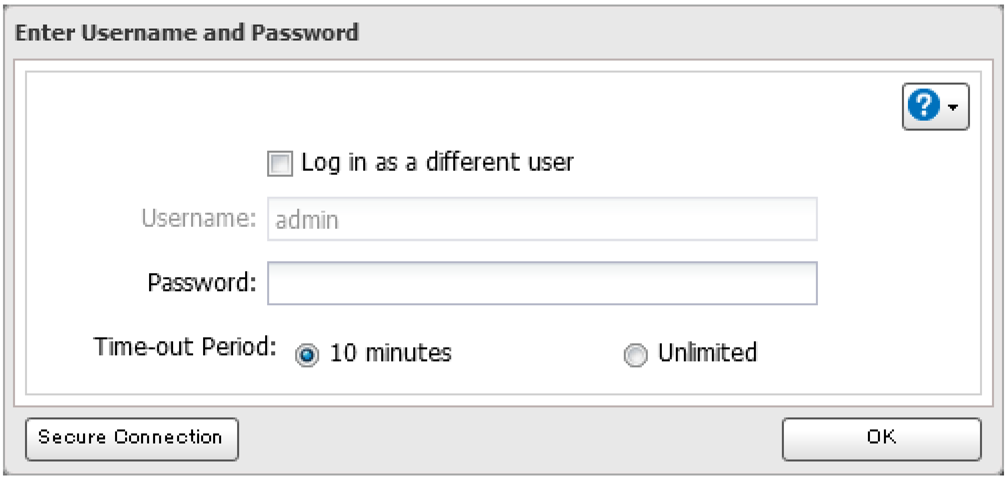
Subnet Mask: 255.255.255.0

Default Gateway: 192.168.10.1

MAC Address: GG:HH:II:JJ:KK:LL

Firmware Version: 1.75

3 Enter the username and password, then click *OK*.



Enter Username and Password

☐ Log in as a different user

Username: admin

Password:

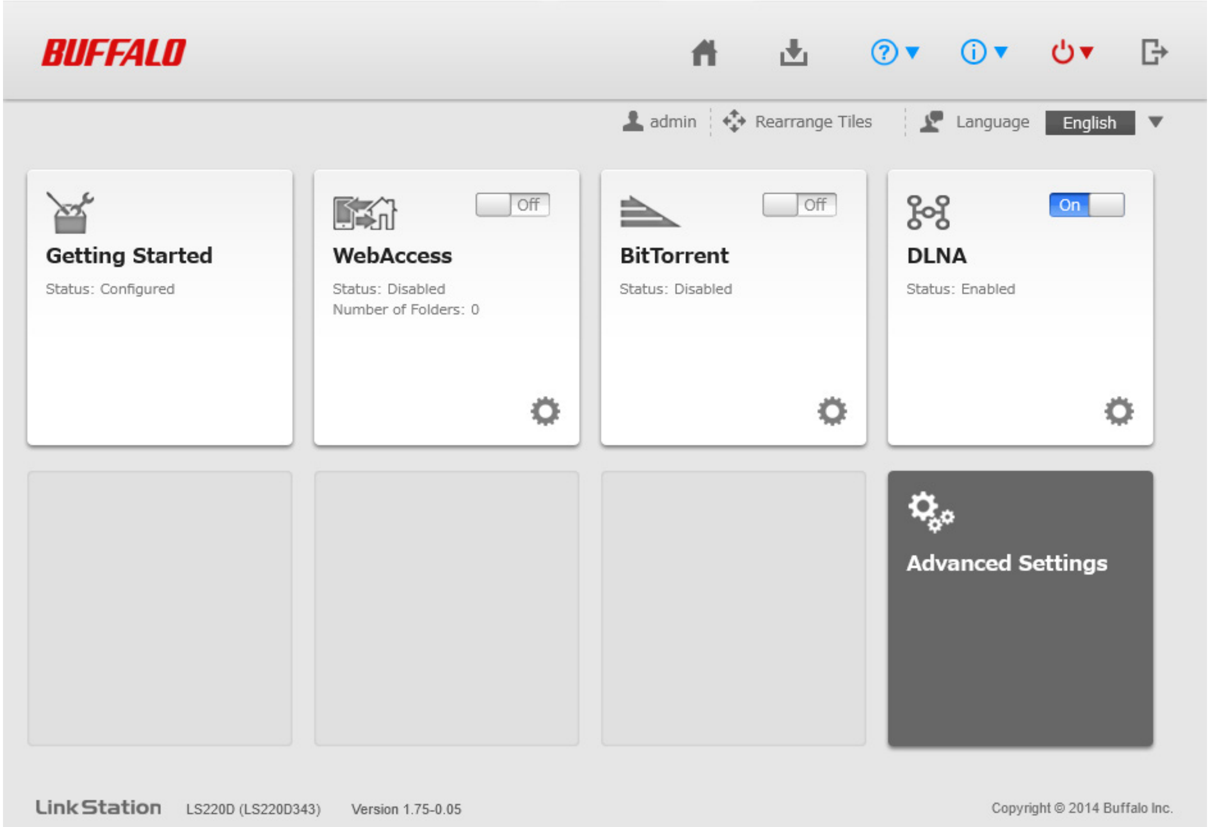
Time-out Period: ● 10 minutes ○ Unlimited

Secure Connection
OK

Notes:

- If the time-out period is set to "10 minutes", you will be logged out of Settings after 10 minutes of inactivity.
- Click *Secure Connection* to log in using an encrypted connection. For detailed information about encrypted connections, refer to the "Encrypting Data Transmission" section in chapter 10.

4 The process is complete when Easy Admin is opened.



Getting Started
Status: Configured

WebAccess Off
Status: Disabled
Number of Folders: 0

BitTorrent Off
Status: Disabled

DLNA On
Status: Enabled

Language: English

LinkStation LS220D (LS220D343) Version 1.75-0.05

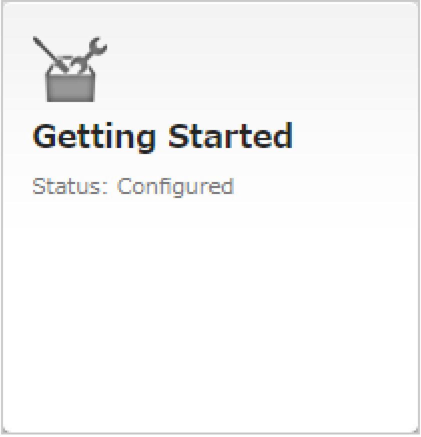
BUFFALO
admin
Rearrange Tiles
Language
English
Advanced Settings
Copyright © 2014 Buffalo Inc.

The settings available on Easy Admin are described as below:

Getting Started

The wizard lets you configure the following settings:

- Changing the administrator password
- Creating shared folders
- Configuring access restrictions

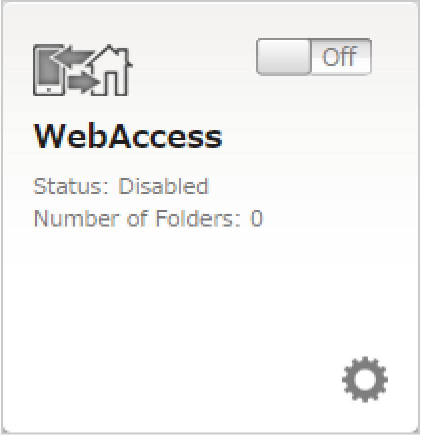


Getting Started

Status: Configured

WebAccess

Configure WebAccess to access your LinkStation remotely. Refer to the "WebAccess" section in chapter 6 for more information.

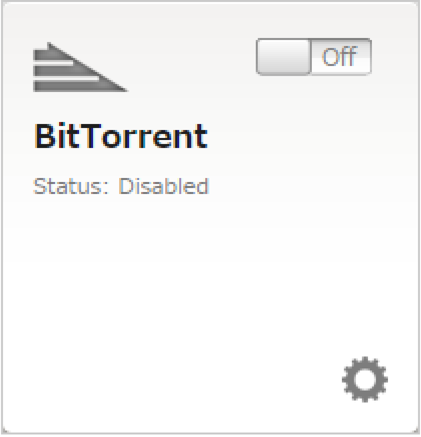


WebAccess

Status: Disabled
Number of Folders: 0

BitTorrent

Configure BitTorrent to download large files efficiently. Refer to the "BitTorrent" section in chapter 7 for more information.

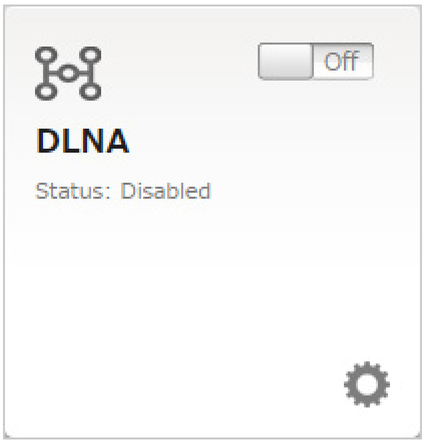


BitTorrent

Status: Disabled

DLNA

Configure DLNA to stream media files to DLNA-compatible devices on the LAN. Refer to the "DLNA" section in chapter 7 for more information.

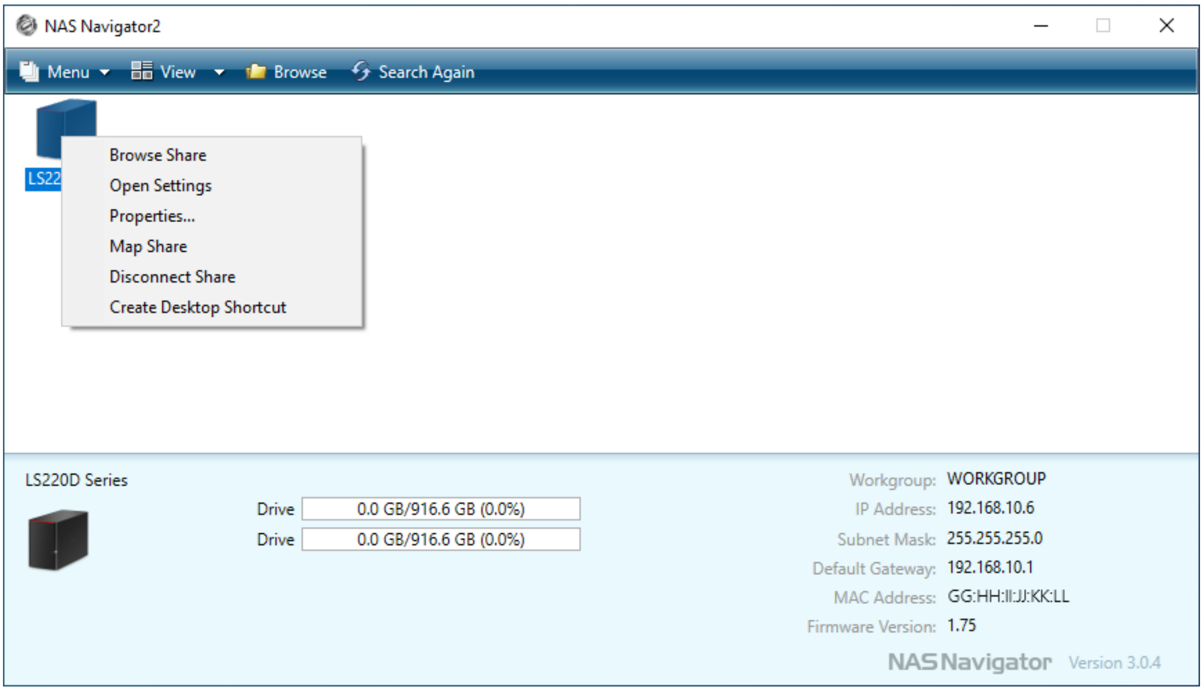


Status: Disabled

Using a Computer (Advanced Settings)

1 Double-click the NAS Navigator2 icon ( ) to start NAS Navigator2.

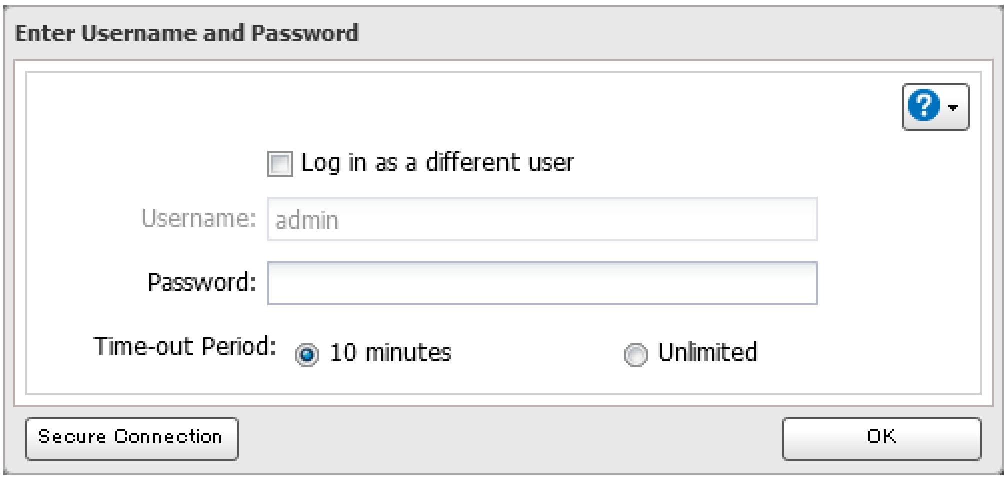
2 Right-click your LinkStation’s icon and select *Open Settings*. For macOS, select the LinkStation’s icon while holding down the control key, then select *Open Settings*.


NAS Navigator2
Menu
View
Browse
Search Again
LS22
Browse Share
Open Settings
Properties...
Map Share
Disconnect Share
Create Desktop Shortcut
LS220D Series
NAS Navigator Version 3.0.4

Drive 0.0 GB/916.6 GB (0.0%)
Drive 0.0 GB/916.6 GB (0.0%)

Workgroup: WORKGROUP
IP Address: 192.168.10.6
Subnet Mask: 255.255.255.0
Default Gateway: 192.168.10.1
MAC Address: GG:HH:II:JJ:KK:LL
Firmware Version: 1.75

3 Enter the username and password, then click *OK*.


Enter Username and Password

☐ Log in as a different user

Username: admin

Password:

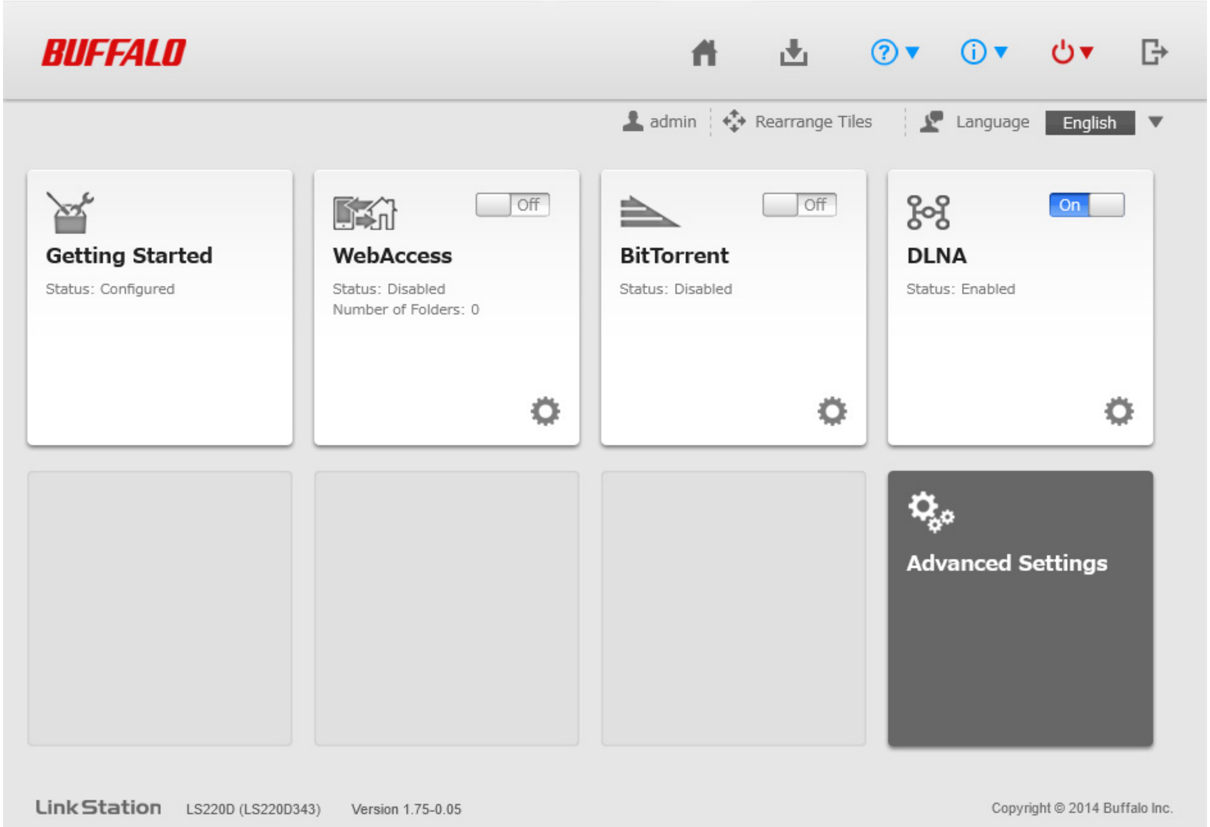
Time-out Period: ● 10 minutes ○ Unlimited

Secure Connection
OK

Notes:

- If the time-out period is set to "10 minutes", you will be logged out of Settings after 10 minutes of inactivity.
- Click *Secure Connection* to log in using an encrypted connection. For detailed information about encrypted connections, refer to the "Encrypting Data Transmission" section in chapter 10.

4 Easy Admin will open. Click *Advanced Settings*.


BUFFALO
admin
Rearrange Tiles
Language
English

Getting Started
Status: Configured

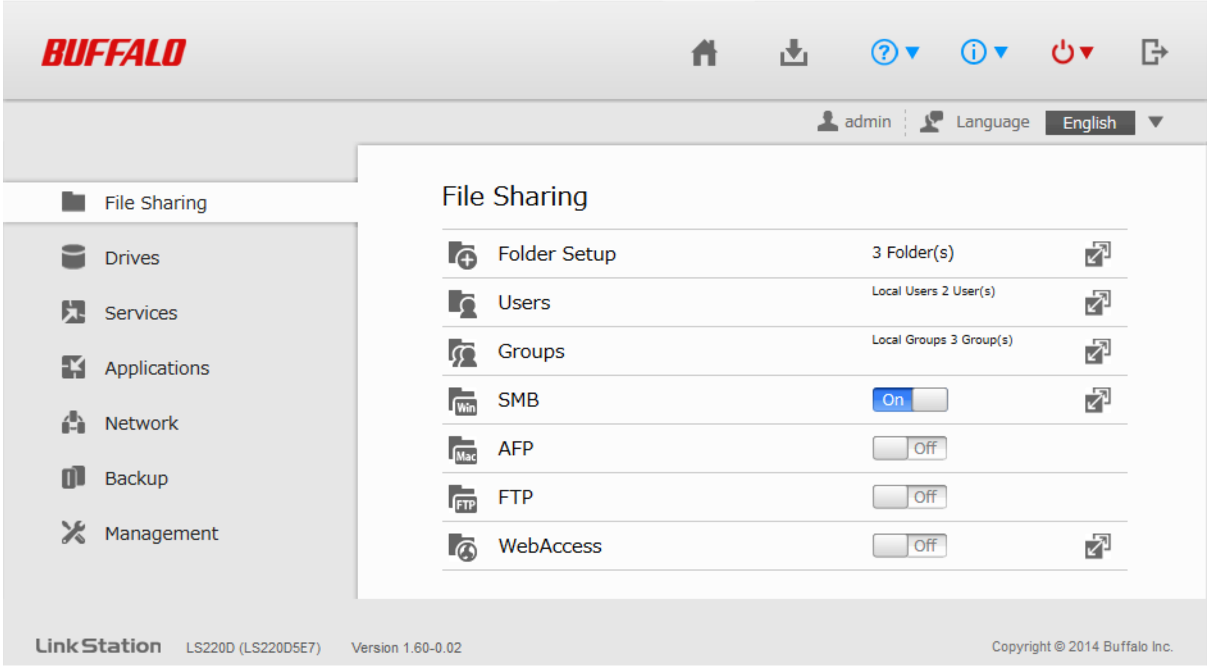
WebAccess (Off)
Status: Disabled
Number of Folders: 0

BitTorrent (Off)
Status: Disabled

DLNA (On)
Status: Enabled

Advanced Settings
LinkStation
LS220D (LS220D343)
Version 1.75-0.05
Copyright © 2014 Buffalo Inc.

5 The process is complete when Advanced Settings is opened.


BUFFALO
admin
Language
English
File Sharing
Drives
Services
Applications
Network
Backup
Management
LinkStation
LS220D (LS220D5E7)
Version 1.60-0.02
Copyright © 2014 Buffalo Inc.

File Sharing

Folder Setup	3 Folder(s)
Users	Local Users 2 User(s)
Groups	Local Groups 3 Group(s)
SMB	On
AFP	Off
FTP	Off
WebAccess	Off

Using a Mobile Device

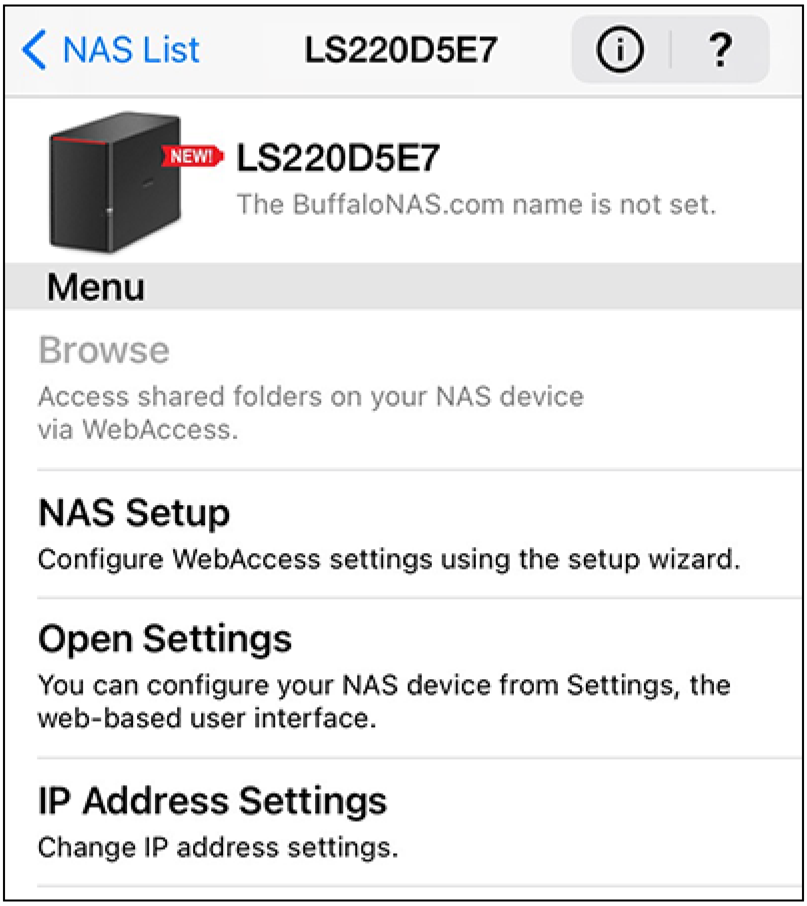
Notes:

- If you have an older version of SmartPhone Navigator installed on your device, update it to the latest version. Your icons and software may be slightly different from the examples in this manual.
- You must be logged in as a member of the administrator group.
- Mobile devices that support mobile-optimized Settings display are described in the "Specifications" section in chapter 12.

1 Tap the SmartPhone Navigator icon ( ) on your mobile device.

2 Tap your LinkStation from the list of devices.

3 Tap *Open Settings*.



LS220D5E7

The BuffaloNAS.com name is not set.

Menu

Browse

Access shared folders on your NAS device via WebAccess.

NAS Setup

Configure WebAccess settings using the setup wizard.

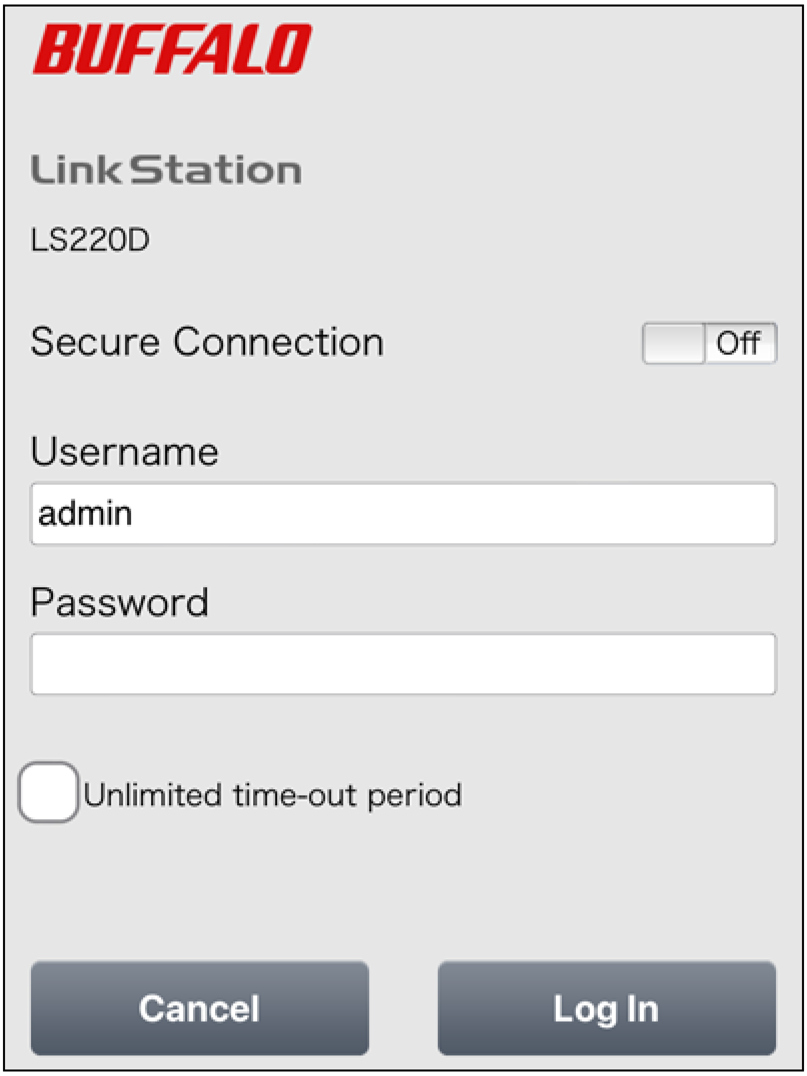
Open Settings

You can configure your NAS device from Settings, the web-based user interface.

IP Address Settings

Change IP address settings.

4 Enter the username and password, then tap *Log In*.



BUFFALO
LinkStation
LS220D
Secure Connection
Off

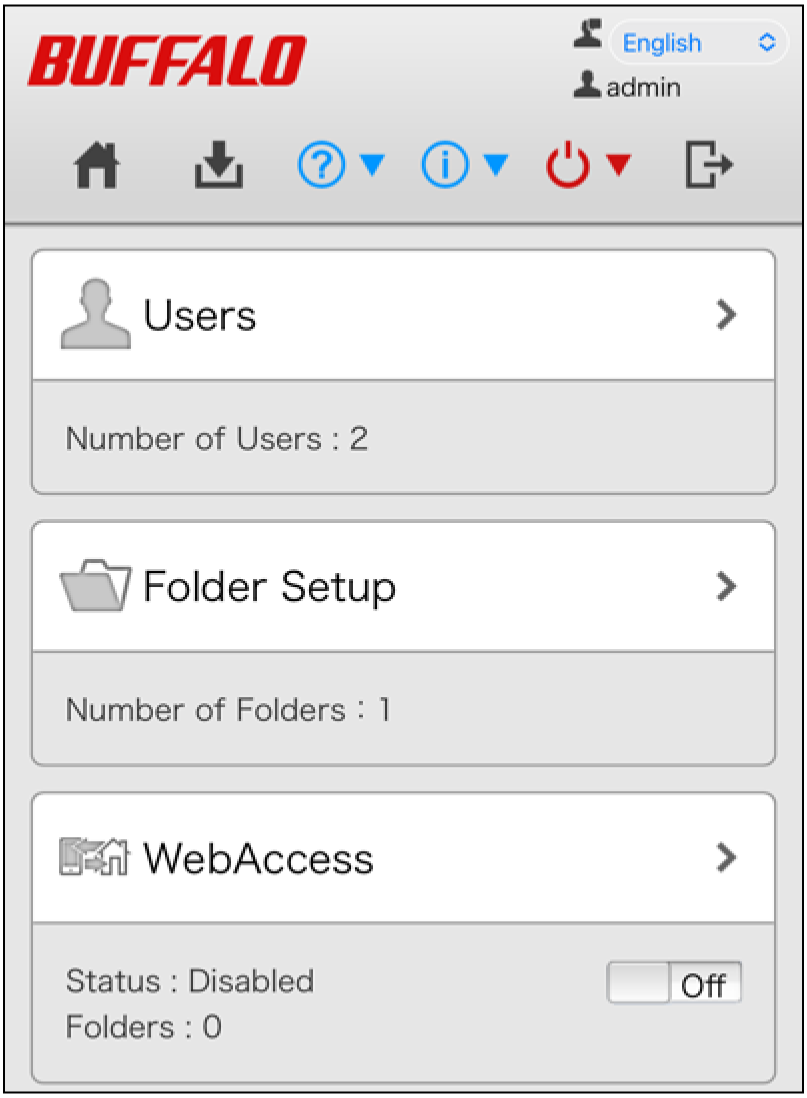
Username: admin

Password:

☐ Unlimited time-out period
Cancel
Log In

Note: The default username and password are "admin" and "password".

5 The process is complete when Settings is opened.



Number of Users : 2

Number of Folders : 1

Status : Disabled

Folders : 0

Notes:

- Username/Password Combinations:

Username	Password	Settings Available
admin (default)	password (default)	All
guest	blank	Guest user information
Your username	Your password	If a user is assigned as an administrator, all settings are available. If assigned to a power users group, creating or editing shared folders, users, and groups is available. If assigned to a general users group, only changing the password of logged-in users is available.

- To go back to Easy Admin, click the home icon (🏠).
- Tap *Desktop* on Settings optimized for mobile devices to show Advanced Settings. This screen gives the full array of settings that could be changed from a computer, but it is not optimized for mobile devices.

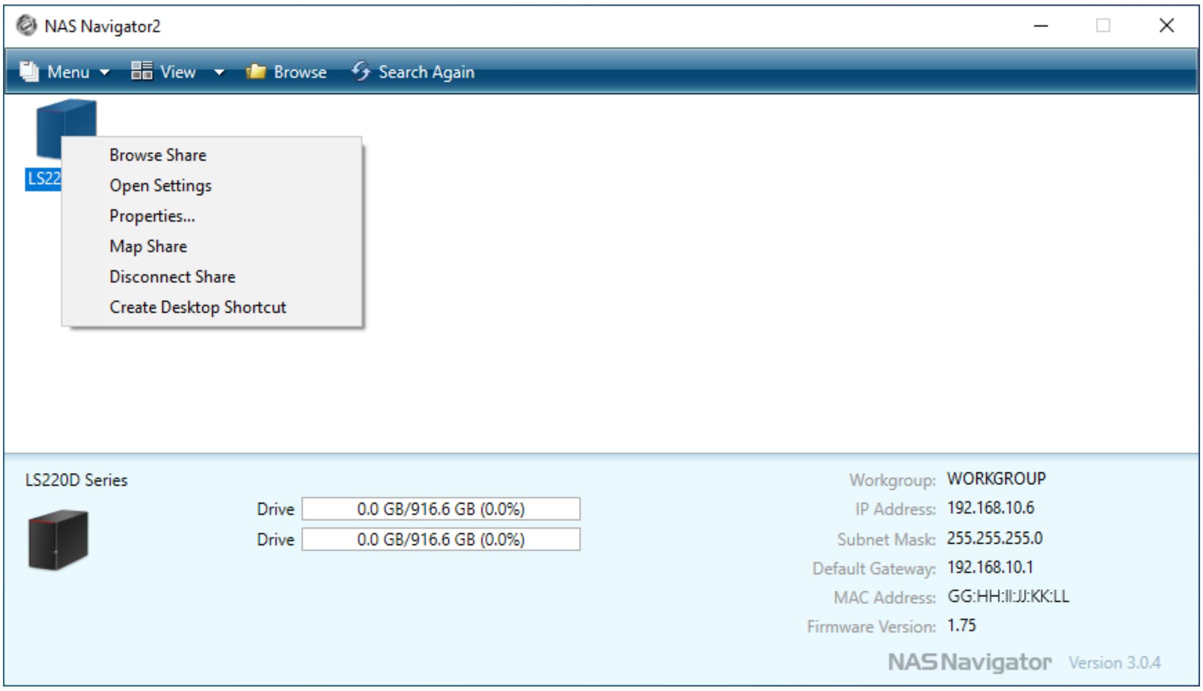
Configuring Settings via Setup Wizard

When you access Settings for the first time, or after initializing the LinkStation's settings, the setup wizard will automatically appear. To set up the LinkStation using the wizard, follow the procedure below.

Note: The following procedure is an example on a computer. For mobile devices, you will also have a chance to correct the time zone settings and select the RAID mode (models with 2+ drives only).

1 Double-click the NAS Navigator2 icon ( ) to start NAS Navigator2.

2 Right-click your LinkStation's icon and select *Open Settings*. For macOS, select the LinkStation's icon while holding down the control key, then select *Open Settings*.


NAS Navigator2
Menu
View
Browse
Search Again
LS22
Browse Share
Open Settings
Properties...
Map Share
Disconnect Share
Create Desktop Shortcut
NAS Navigator
Version 3.0.4

LS220D Series

Drive 0.0 GB/916.6 GB (0.0%)

Drive 0.0 GB/916.6 GB (0.0%)

Workgroup: WORKGROUP

IP Address: 192.168.10.6

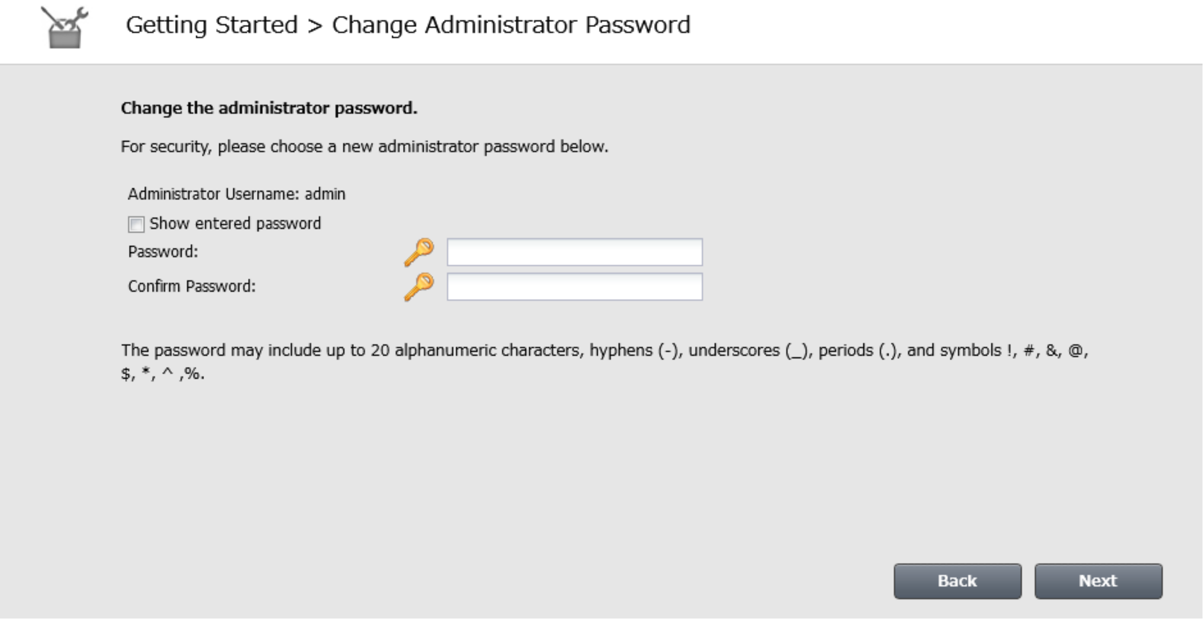
Subnet Mask: 255.255.255.0

Default Gateway: 192.168.10.1

MAC Address: GG:HH:II:JJ:KK:LL

Firmware Version: 1.75

3 Changing the password from the default is recommended.


Getting Started > Change Administrator Password
Back
Next

Change the administrator password.

For security, please choose a new administrator password below.

Administrator Username: admin

☐ Show entered password

Password:

Confirm Password:

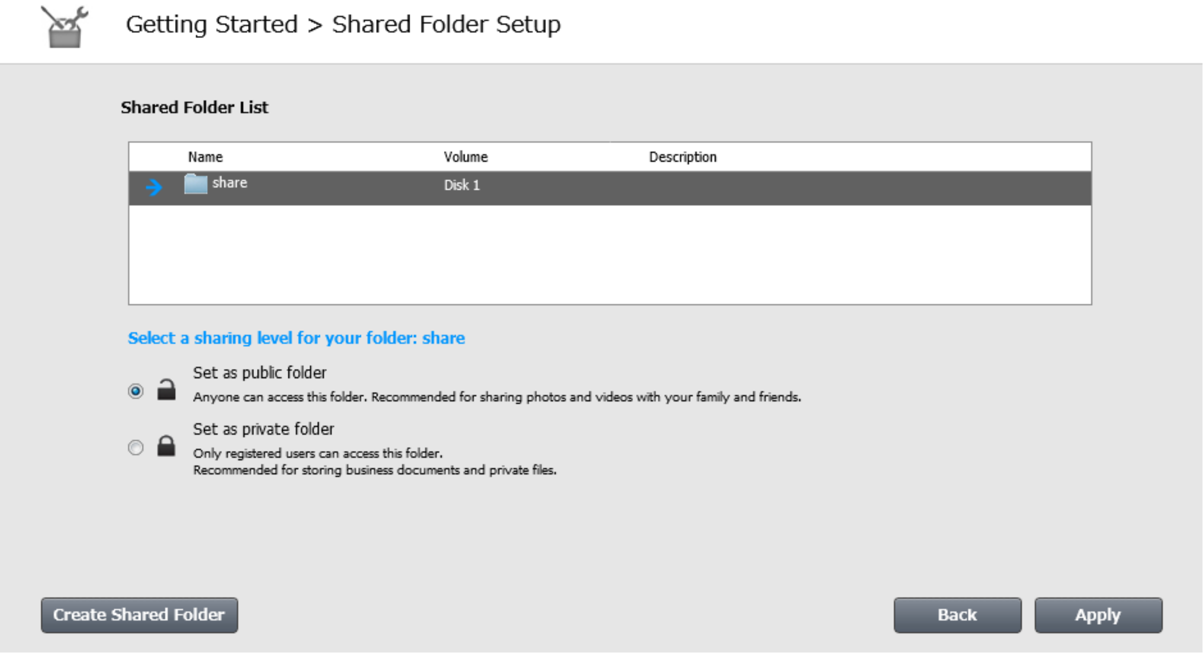
The password may include up to 20 alphanumeric characters, hyphens (-), underscores (_), periods (.), and symbols !, #, &, @, $, *, ^ ,%.

Note: You can open this same screen by clicking *Getting Started* from Easy Admin.

4 Enter the new password (twice), then click *Next*.

Note: The default username and password are "admin" and "password". To keep the defaults, leave both fields blank and click *Next*.

5 Configure levels of sharing for all existing shared folders (public or private) to finish the initial setup wizard.



Getting Started > Shared Folder Setup

Shared Folder List

Name	Volume	Description
share	Disk 1	

Select a sharing level for your folder: share

● Set as public folder
Anyone can access this folder. Recommended for sharing photos and videos with your family and friends.

○ Set as private folder
Only registered users can access this folder.
Recommended for storing business documents and private files.

Notes:

- Select "Set as private folder" to restrict access to the folder to specific users.
- Click *Create Shared Folder* to create a new shared folder from the wizard. By default, SMB and AFP connections can be used to access this folder.

6 Follow the procedure on the screen and finish the setup wizard.

7 The process is complete once you close the wizard.

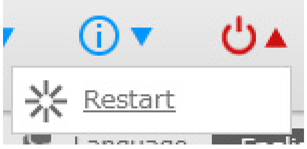
Restarting the LinkStation from Settings

You can restart the LinkStation remotely from a computer or a mobile device. Follow the appropriate procedure below to remotely restart the LinkStation from Settings.

Using a Computer (Advanced Settings)

1 Log in to Settings using NAS Navigator2.

2 Click ⏻▼ at the top-right of Settings and choose *Restart*.



3 Click *Yes*.

4 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

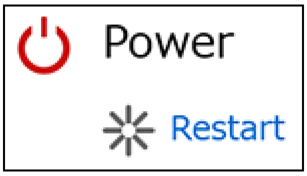
5 The process is complete when the power LED turns from blinking to glowing.

Using a Mobile Device

1 Log in to Settings using SmartPhone Navigator on your mobile device.

2 Tap the power icon (⏻) at the top-right corner of Settings.

3 Tap *Restart*.



Power

Restart

4 Tap *Yes*.

5 The "Confirm Operation" screen will open. Enter the confirmation number, then tap *OK*.

6 The process is complete when the power LED turns from blinking to glowing.

Accessing Shared Folders

Using a Computer

1 Double-click the NAS Navigator2 icon ( ) to start NAS Navigator2.

2 Double-click your LinkStation's icon.

3 File Explorer will open with shared folders' lists. For macOS, the LinkStation is mounted as a drive icon on the desktop or it is displayed in the sidebar of the Finder.

Note: When you access a shared folder from a Windows PC, you may be asked to enter a username and password. In such a case, enter "guest" for the username and leave the password field blank.

Using a Mobile Device

To access shared folders from a mobile device with the following procedure, you must configure WebAccess settings first. To configure WebAccess, refer to the "WebAccess" section in chapter 6.

1 Tap the SmartPhone Navigator icon ( ) on your mobile device.

2 Tap your LinkStation from the list of devices.

3 Tap *Browse*.

Note: Alternatively, you can access shared folders from the WebAccess app. Open the application and tap your LinkStation's hostname in the NAS list.

Chapter 3 File Sharing

You can create users and groups to access the shared folders on the LinkStation and configure access restrictions to limit access to key data.

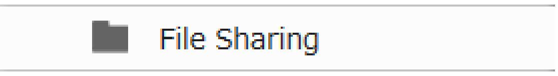
Configuring Shared Folders

Adding a Shared Folder

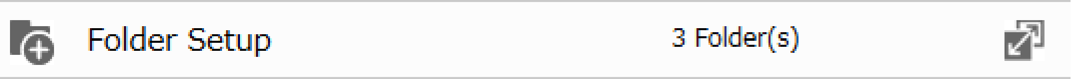
You can create a shared folder from a computer or a mobile device. Follow the appropriate procedure below to create a shared folder.

Using a Computer

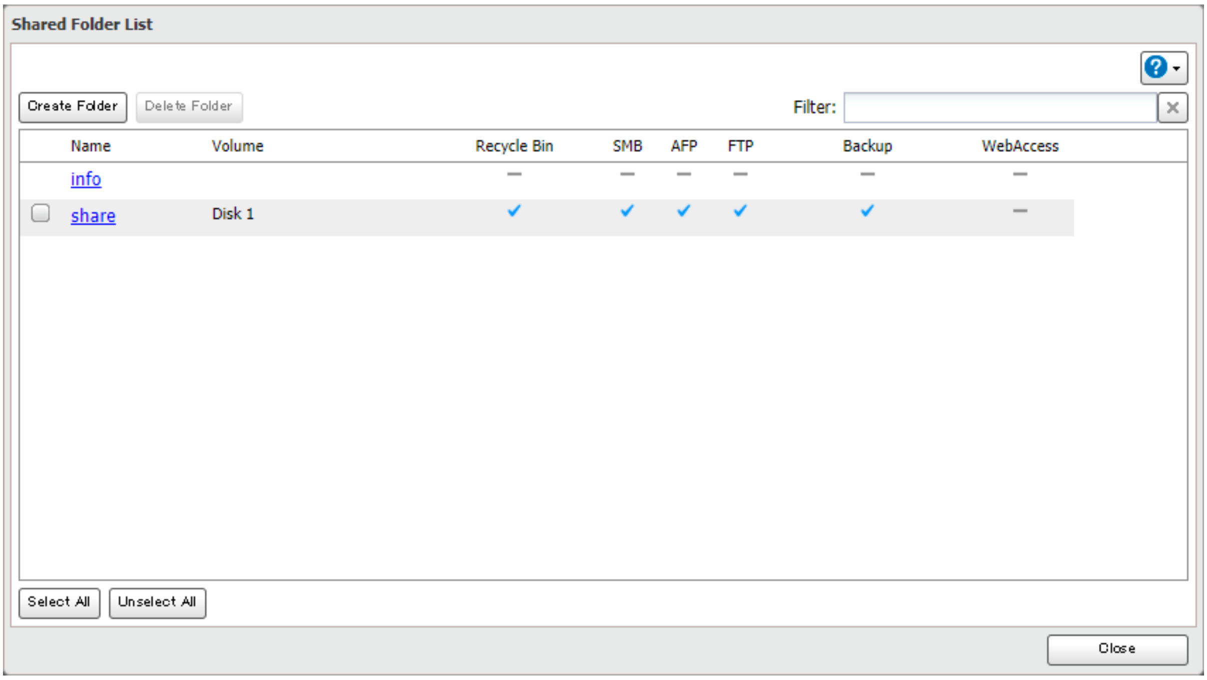
1 From Advanced Settings, click *File Sharing*.


File Sharing

2 Click the settings icon ( ) to the right of "Folder Setup".

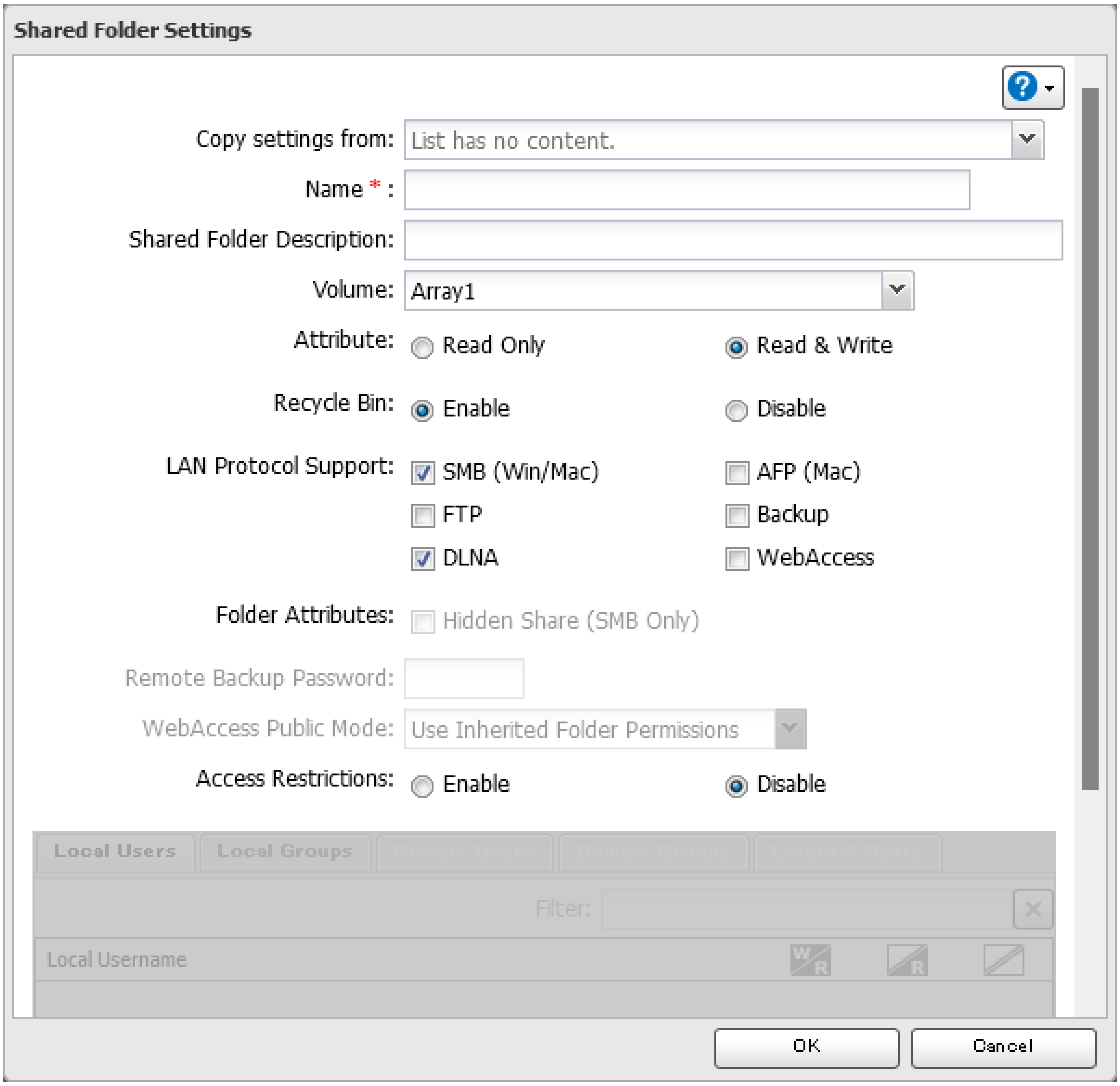

Folder Setup
3 Folder(s)

3 Click *Create Folder*.


Shared Folder List
Create Folder
Delete Folder
Filter:
Select All
Unselect All
Close

	Name	Volume	Recycle Bin	SMB	AFP	FTP	Backup	WebAccess
	info		—	—	—	—	—	—
☐	share	Disk 1	✓	✓	✓	✓	✓	—

4 Configure the desired settings, then click *OK*.



Shared Folder Settings

Copy settings from: List has no content.

Name * :

Shared Folder Description:

Volume: Array1

Attribute: ○ Read Only ● Read & Write

Recycle Bin: ● Enable ○ Disable

LAN Protocol Support: ☑ SMB (Win/Mac) ☐ AFP (Mac) ☐ FTP ☐ Backup ☑ DLNA ☐ WebAccess

Folder Attributes: ☐ Hidden Share (SMB Only)

Remote Backup Password:

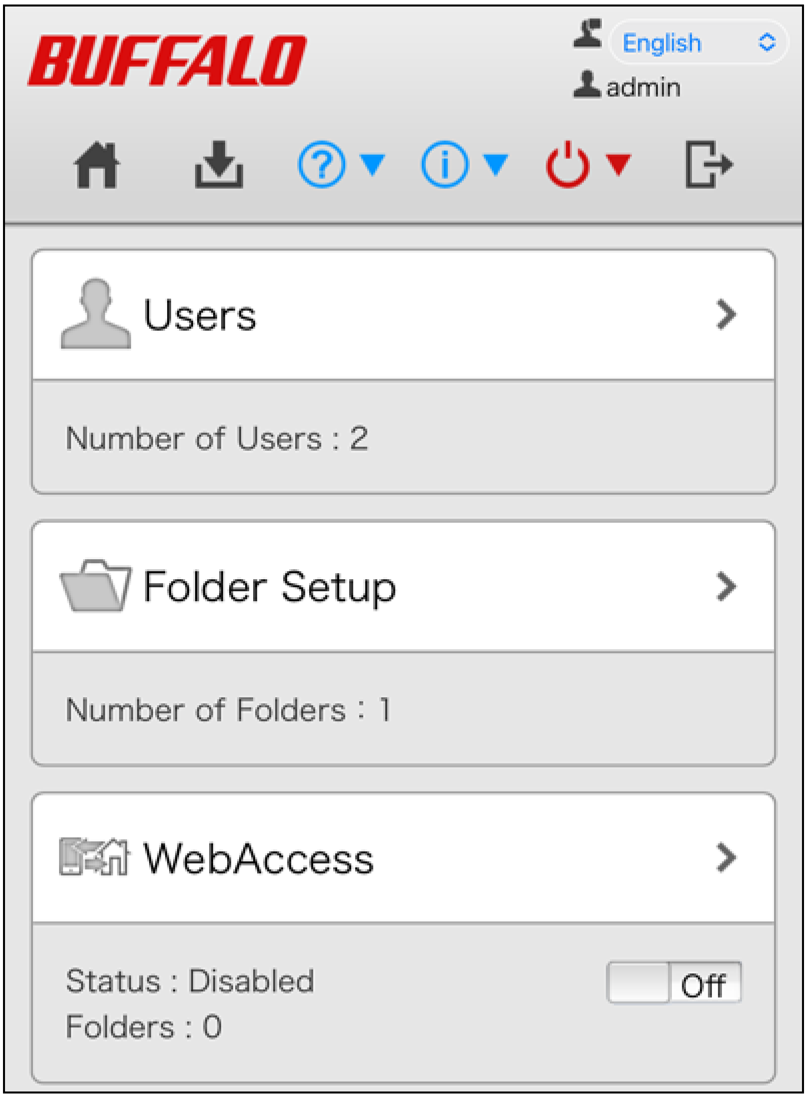
WebAccess Public Mode: Use Inherited Folder Permissions

Access Restrictions: ○ Enable ● Disable

5 The process is complete once you close the confirmation window that appears.

Using a Mobile Device

1 From Settings, tap *Folder Setup*.


BUFFALO
English
admin
Users
Folder Setup
WebAccess
Off

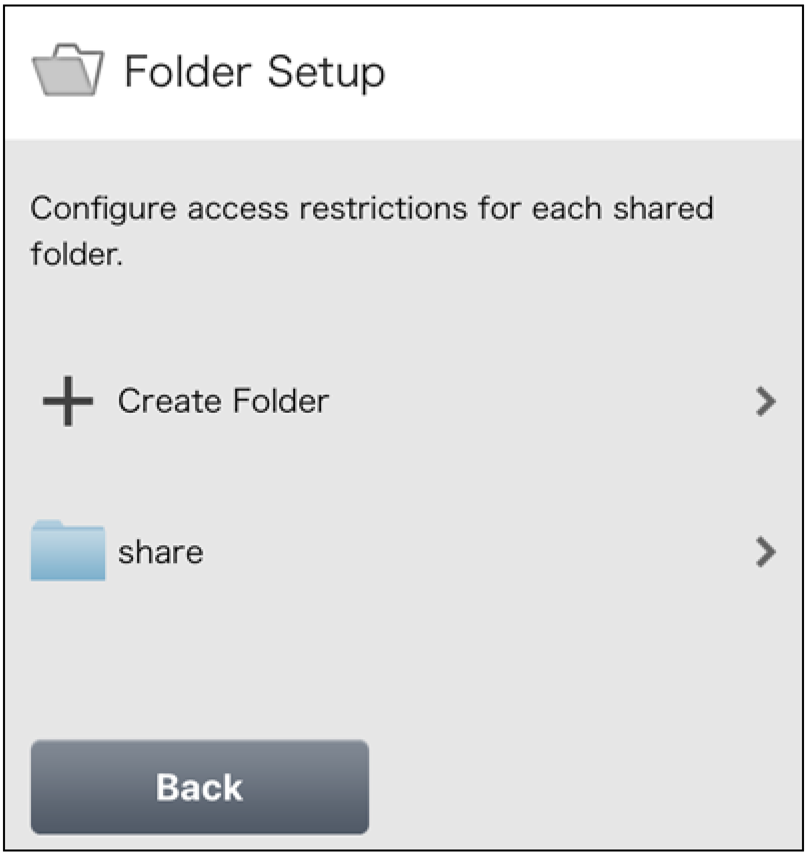
Number of Users : 2

Number of Folders : 1

Status : Disabled

Folders : 0

2 Tap *Create Folder*.

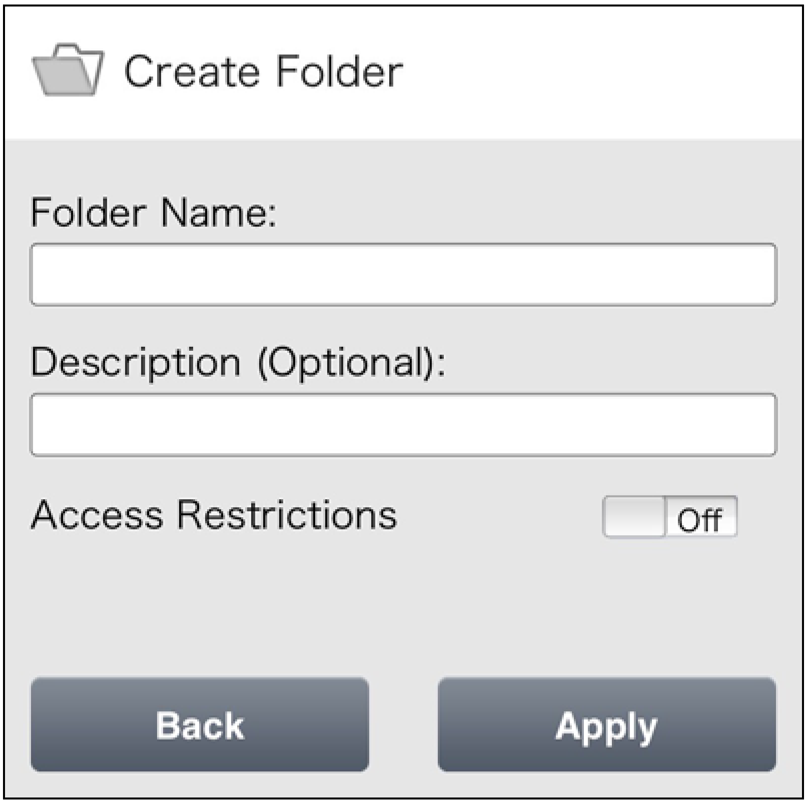


Folder Setup

Configure access restrictions for each shared folder.

Create Folder
share
Back

3 Enter the desired folder name and tap *Apply*.



Create Folder

Folder Name:

Description (Optional):

Access Restrictions Off

4 The process is complete once you close the confirmation window that appears.

Notes:

- Names may contain up to 27 alphanumeric characters, hyphens (-), and underscores (_). Multibyte characters are supported. The first character should not be a symbol.
- Descriptions may contain up to 75 alphanumeric characters, hyphens (-), underscores (_), and spaces. Multibyte characters are supported. The first character should not be a symbol or space.
- You may create up to 400 shared folders.
- The names of shared folders should not use characters from more than one language. For example, mixing Japanese and Korean characters in names is not supported.
- If the names of shared folders accessed via AFP and FTP connections contain multibyte characters, configure the client language in *Management* > *Name/Time/Language* to match the characters. If the setting and display language do not match, the shared folder name will not be displayed correctly.
- The following characters are handled differently by macOS and Windows devices. Avoid using these characters when sharing data between macOS and Windows devices:

  — ～ ∥ － ￠ ￡ ￢
- Windows does not support some characters that macOS and the LinkStation allow. If you create a filename on a macOS device that includes any of the following symbols, it will not display correctly on a Windows computer. You may have to connect to the LinkStation via AFP in order to display or copy files that contain these symbols in their filenames.

  ?] [/ \ = + > < ; : " , | *
- Do not use any of the following words for the name of a shared folder as these words are reserved for internal use by the LinkStation: authtest, global, homes, info, lost+found, lp, msdfs_root, mt-daapd, printers, ram, spool, usbdisk *x* (where "x" is a number, for example: usbdisk1)
- Don't use any of the characters from the list below in shared folder names, workgroup names, or filenames:

  Unsupported Character List

  ①②③④⑤⑥⑦⑧⑨⑩⑪⑫⑬⑭⑮⑯⑰⑱⑲⑳ Ⅰ Ⅱ Ⅲ Ⅳ Ⅴ Ⅵ Ⅶ Ⅷ Ⅸ Ⅹ
  ⅰ ⅱ ⅲ ⅳ ⅴ ⅵ ⅶ ⅷ ⅸ ⅹ ㎜㎝㎞㎎㎏㏄㎡№㏍℡㊤㊥㊦㊧㊨㈱㈲㈹㍾㍽㍼㍻㍉㌔㌢㍍㌘㌧㌃㌶㍑㍗㌍㌦㌣㌫㍊㌻
  ￤ ＇ ＂ 〝〟 ∮ ∑ ∟ ⊿
  纊褜鍈銈蓜俉炻昱棈鋹曻彅丨仡仼伀伃伹佖侒侊侚侔俍偀倢俿倞偆偰偂傔僴僘兊兤冝冾凬刕劜劦勀勛匀匇匤
  卲厓厲叝﨎咜咊咩哿喆坙坥垬埈埇﨏塚增墲夋奓奛奝奣妤妺孖寀甯寘寬尞岦岺峵崧嵓﨑嵂嵭嶸嶹巐弡弴彧德
  忞恝悅悊惞惕愠惲愑愷愰憘戓抦揵摠撝擎敎昀昕昻昉昮昞昤晥晗晙晴晳暙暠暲暿曺朎朗杦枻桒柀栁桄棏﨓楨
  﨔榘槢樰橫橆橳橾櫢櫤毖氿汜沆汯泚洄涇浯涖涬淏淸淲淼渹湜渧渼溿澈澵濵瀅瀇瀨炅炫焏焄煜煆煇凞燁燾犱
  犾猤猪獷玽珉珖珣珒琇珵琦琪琩琮瑢璉璟甁畯皂皜皞皛皦益睆劯砡硎硤礰礼神祥禔福禛竑竧靖竫箞精絈絜
  綷綠緖繒罇羡羽茁荢荿菇菶葈蒴蕓蕙蕫﨟薰蘒﨡蠇裵訒訷詹誧誾諟諸諶譓譿賰賴贒赶﨣軏﨤逸遧郞都鄕鄧釚
  釗釞釭釮釤釥鈆鈐鈊鈺鉀鈼鉎鉙鉑鈹鉧銧鉷鉸鋧鋗鋙鋐﨧鋕鋠鋓錥錡鋻﨨錞鋿錝錂鍰鍗鎤鏆鏞鏸鐱鑅鑈閒隆
  﨩隝隯霳霻靃靍靏靑靕顗顥飯飼餧館馞驎髙髜魵魲鮏鮱鮻鰀鵰鵫鶴鸙黑畩秕緇臂蘊訃躱鐓饐鷀
- File and folder names may contain up to 255 single-byte characters.
- Folder and workgroup names whose names contain multibyte characters may not be displayed correctly.
- If shared folders are accessed from a macOS device, information files for the macOS device may be generated automatically. Do not delete these files. If they are deleted from a Windows device, this may prevent further access from a macOS device.
- The LinkStation belongs to the default zone in AppleShare; the zone cannot be specified.
- When files are copied to the LinkStation or to a USB drive connected to the LinkStation, file information such as date created, date modified, and other date information may be updated or changed.
- During a file transfer, if settings are changed, the file transfer operation may be aborted.
- File copying to the LinkStation is protected by a journaling file system. If the Ethernet cable is disconnected or a power outage occurs while copying data, the following may occur:
  - Preset data such as the LinkStation name, users, and groups may be erased.
  - An incomplete file may be copied and the file can no longer be deleted. If this occurs, restart the LinkStation, delete the file, and perform the copy operation again.
- If "Auto" or "Mandatory" is selected for SMB signing, you will be unable to access shared folders via the SMBv1 connection. To connect via SMBv1, disable SMB signing.

Recycle Bin

To protect your data from accidental deletion, you may configure your LinkStation to use a recycle bin instead of deleting files immediately. The recycle bin will only work with SMB connections.

Read-Only Shares

By default, new shares are set with read and write access, but you may change the folder attribute. Follow the procedure below to change the shared folder attribute to read-only.

1. From Advanced Settings, navigate to *File Sharing* > *Folder Setup* and choose a shared folder.
2. Click *Edit* and change the "Attribute" option to "Read Only", then click *OK*.
3. The process is complete once you close the confirmation window that appears.

Both read-only shares and HFS Plus-formatted USB drives will have "(Read Only)" added under "Comments" in File Explorer.

Note: Configure the share attribute only through Settings. Configuring folder attributes through Windows is not supported and may cause unexpected behavior.

Hidden Shares

If a shared folder becomes hidden, it will not be displayed under Network, and only certain users will be allowed to access it. To hide a shared SMB folder, follow the procedure below.

1. From Advanced Settings, navigate to *File Sharing* > *Folder Setup* and choose a shared folder to make hidden. A USB drive is not available as a hidden share.
2. Select the "Hidden Share (SMB Only)" checkbox and click *OK*.
3. The process is complete once you close the confirmation window that appears.

Notes:

- If protocols other than "SMB (Win/Mac)" or "Backup" under "LAN Protocol Support" are enabled, the hidden shares option will be grayed out and cannot be selected.
- Configure hidden share attributes only through Settings. Configuring them through Windows is not supported and may cause unexpected behavior.

To access a hidden folder, open File Explorer in your computer and enter "\\LinkStation name\shared folder name$\" into the address bar. For example, if the LinkStation name is "LSXXX001" and the shared folder name is "share", enter "\\LSXXX001\share$\" to open it.

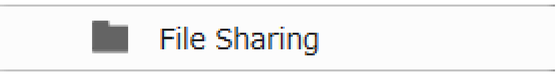
Configuring Users

Adding a User

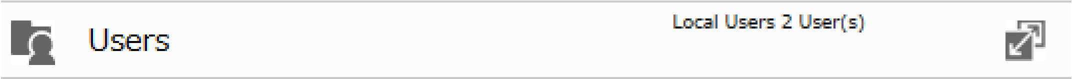
You can add a user from a computer or a mobile device. Follow the appropriate procedure below to add a user.

Note: You may add up to 300 users, which include the default users "admin" and "guest".

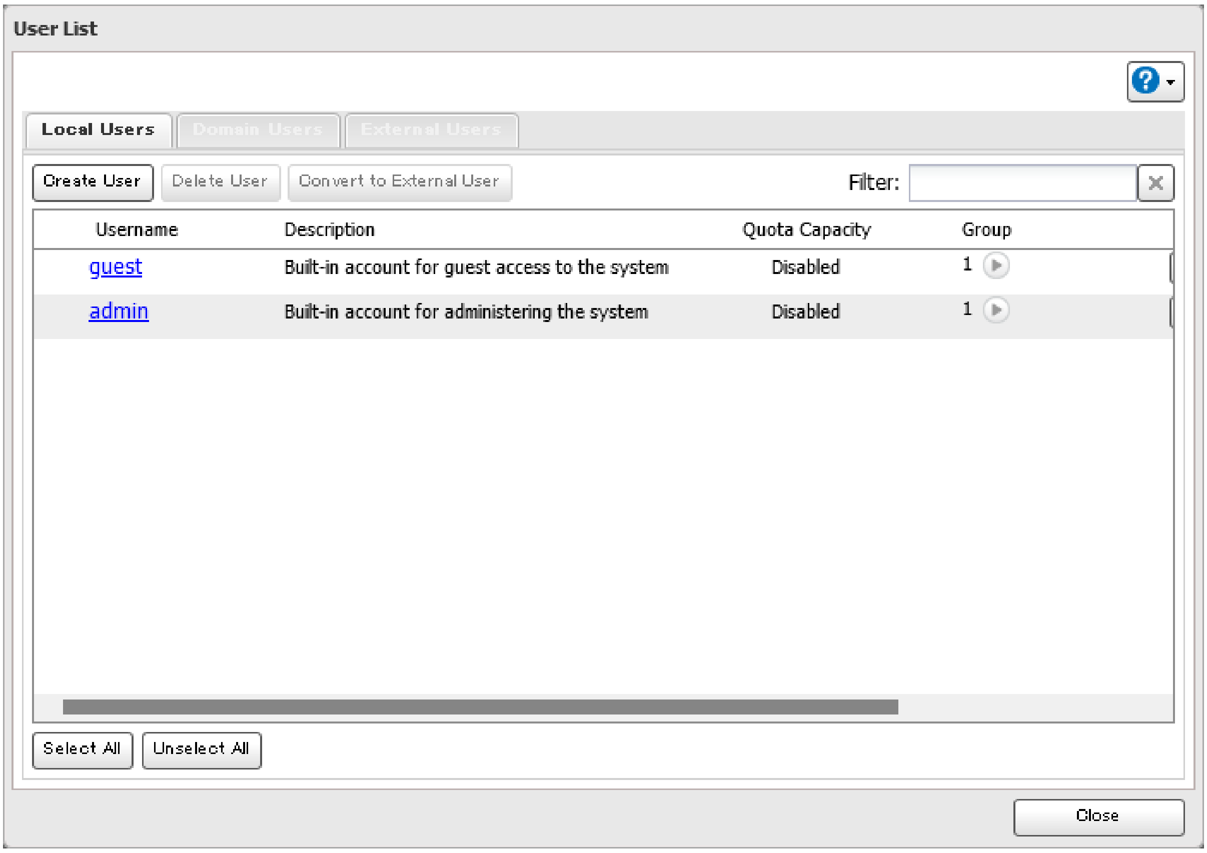
1. From Advanced Settings, click *File Sharing*.



2 Click the settings icon ( ) to the right of “Users”.

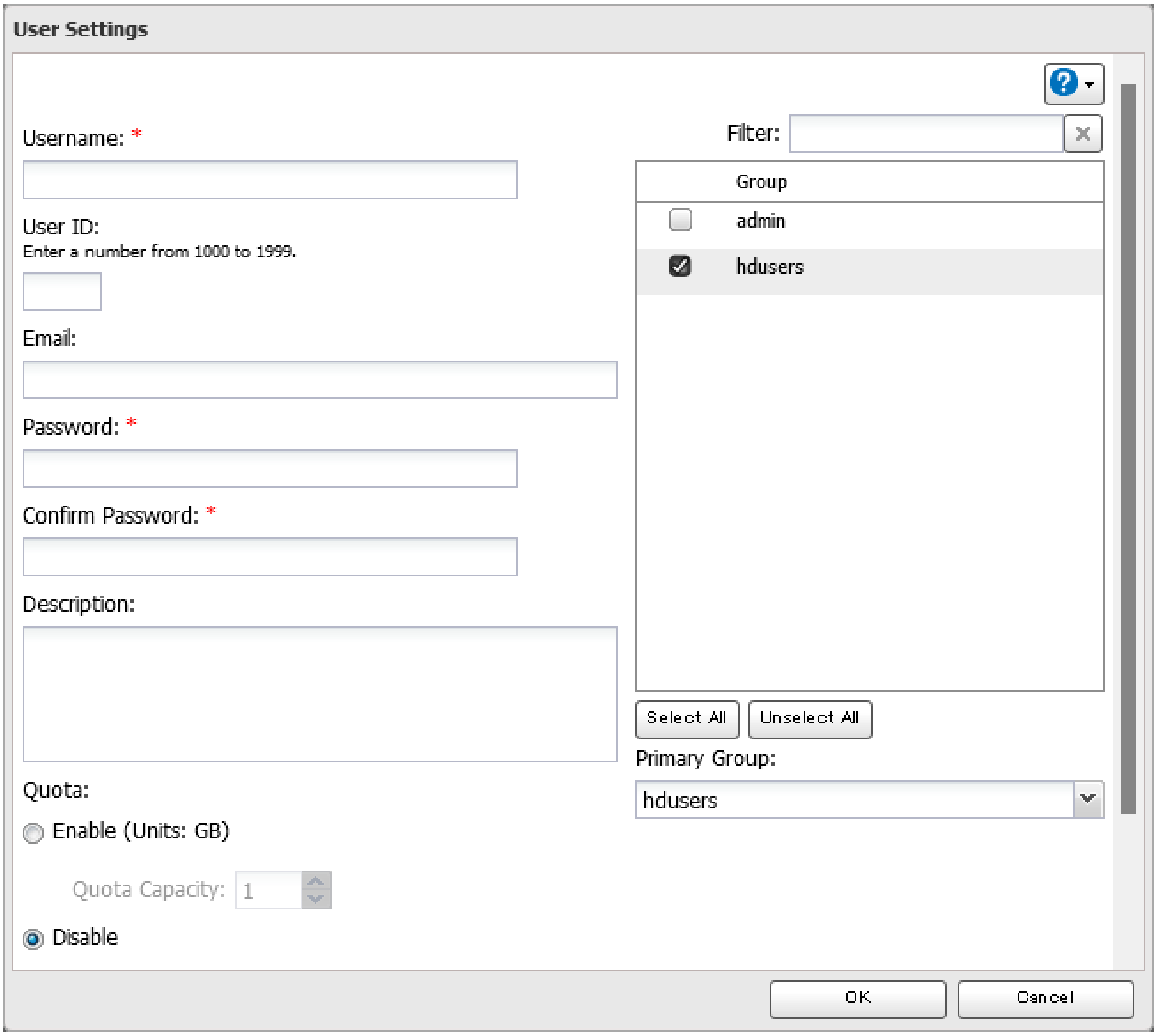

Users
Local Users 2 User(s)

3 Click *Create User*.


User List
Local Users
Domain Users
External Users
Create User
Delete User
Convert to External User
Filter:
Select All
Unselect All
Close

Username	Description	Quota Capacity	Group
guest	Built-in account for guest access to the system	Disabled	1
admin	Built-in account for administering the system	Disabled	1

4 Enter the desired settings, then click *OK*.

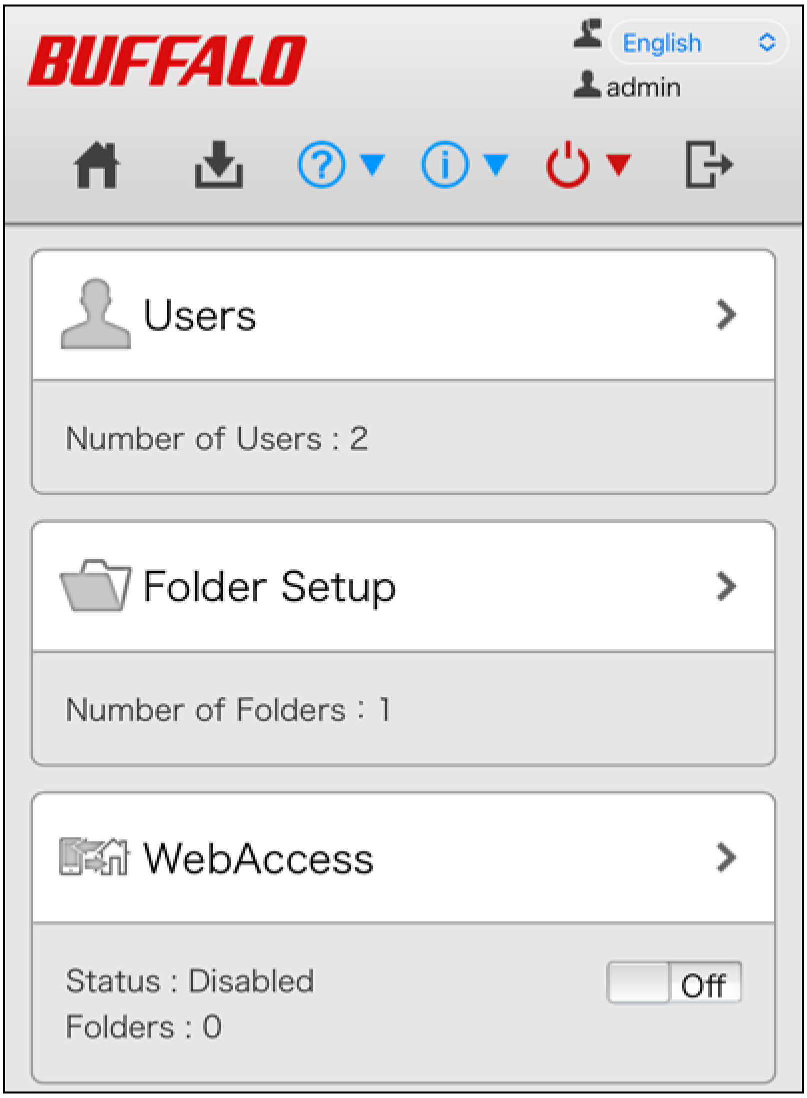


User Settings
Username: *
User ID:
Enter a number from 1000 to 1999.
Email:
Password: *
Confirm Password: *
Description:
Quota:
○ Enable (Units: GB)
Quota Capacity: 1
● Disable
Filter:
Group
☐ admin
☑ hdusers
Select All
Unselect All
Primary Group:
hdusers
OK
Cancel

5 The process is complete once you close the confirmation window that appears.

Using a Mobile Device

1 From Settings, tap *Users*.

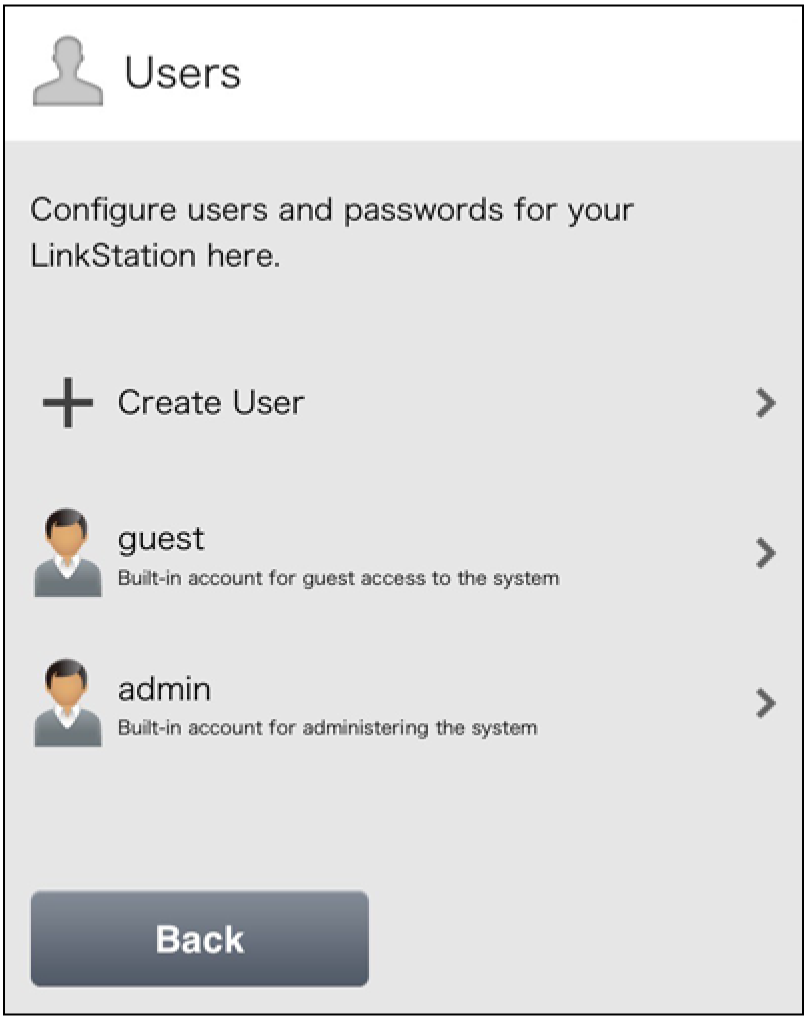

BUFFALO
English
admin
Users
Folder Setup
WebAccess
Off

Number of Users : 2

Number of Folders : 1

Status : Disabled
Folders : 0

2 Tap *Create User*.

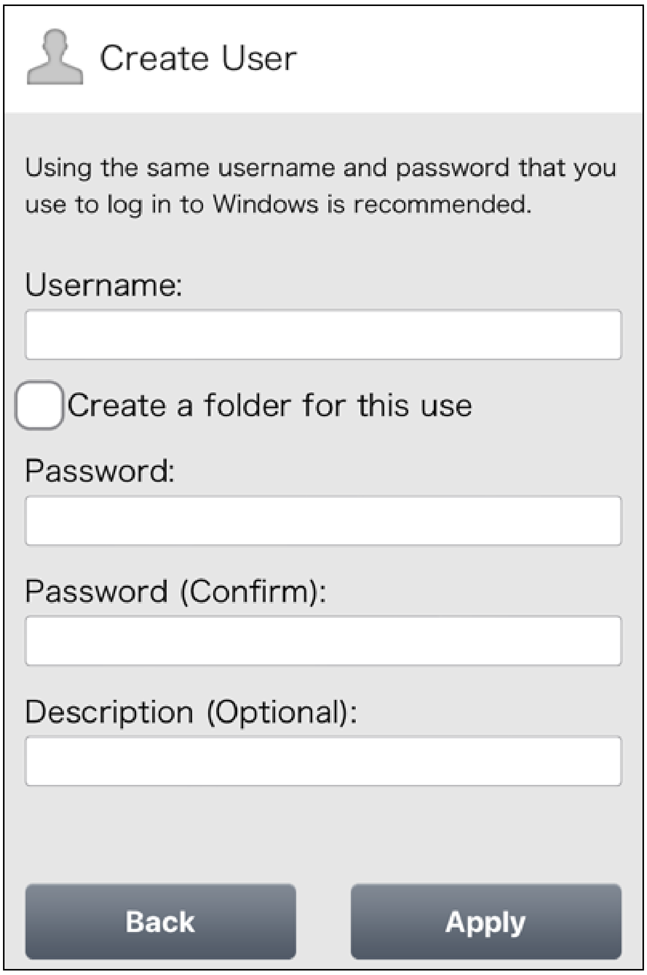


Users

Configure users and passwords for your LinkStation here.

+ Create User
guest
Built-in account for guest access to the system
admin
Built-in account for administering the system
Back

3 Enter the desired username and password (twice), then tap *Apply*.



Create User

Using the same username and password that you use to log in to Windows is recommended.

Username:

☐ Create a folder for this use

Password:

Password (Confirm):

Description (Optional):

Note: If you select the "Create a folder for this user" option, a shared folder with the same name as the username will automatically be created.

4 The process is complete once you close the confirmation window that appears.

Notes:

- Usernames may contain up to 128 alphanumeric characters, hyphens (-), underscores (_), periods (.), and the symbols ! # & @ $ * ^ %. The first character should not be a symbol.
- The user ID should be a number from 1000 to 1999. Each user ID should be unique. If this field is left blank, a user ID is assigned automatically.
- Do not duplicate user IDs, group IDs, usernames, or group names. Each should be distinct and unique.
- User descriptions may contain up to 75 alphanumeric characters, hyphens (-), underscores (_), and spaces. Multibyte characters are supported. The first character should not be a symbol or space.
- Passwords may contain up to 20 alphanumeric characters, hyphens (-), underscores (_), commas (,), periods (.), semicolons (;), tildes (~), and the symbols @ ! # $ % & ') (* + / > < = ? "] [^ } { |. The first character should not be a symbol unless it is an underscore.
- Use the same username and password for both Windows and the LinkStation or you may be unable to access shared folders.
- If a user belongs to multiple groups, the most strict access restrictions will apply. For example, if a user is added to a group with read and write access, and also to a read-only group, the user will effectively have read-only access.
- Do not use any of the following words as a username as these words are reserved for internal use by the LinkStation: adm, admin, administrator, all, apache, bin, daemon, disk, ftp, ftpuser, guest, halt, hdusers, kmem,

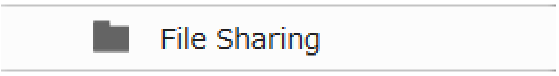
lp, mail, man, mysql, news, nobody, nogroup, none, operator, root, shadow, shutdown, sshd, sync, sys, tty, users, utmp, uucp, www

Converting Local Users into External Users

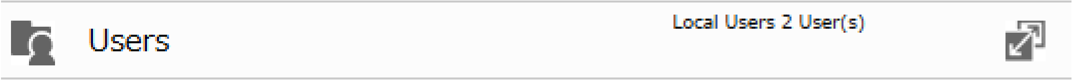
If using an external SMB server for authentication, you may convert any local users into external users. This way, the LinkStation will have a user list that matches the users in the external SMB server, and access restrictions for this LinkStation's shared folders may be assigned to the converted "external" users.
Follow the procedure below to convert a local user into an external user. If a local user is converted, their user information (including passwords) will be removed from the LinkStation. External users cannot be reverted to local users.

Note: External authentication should be enabled before local users can be converted. For more information on external authentication, refer to the "Restricting External User Access to Shared Folders" section.

1 From Advanced Settings, click *File Sharing*.



2 Click the settings icon (⤢) to the right of "Users".



3 From the user list screen, select the checkboxes of any users to be converted to an external user, then click *Convert to External User*.

4 Click *OK*.

5 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

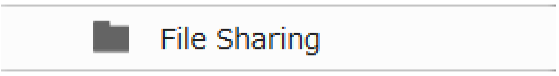
6 The process is complete once you close the confirmation window that appears.

Converted users are displayed under the "External Users" tab. You can then configure access restrictions for external users.

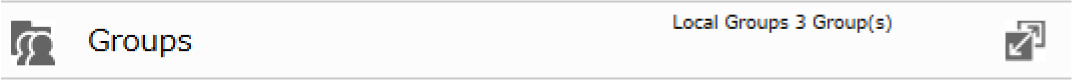
Adding a Group

Note: You may add up to 300 groups.

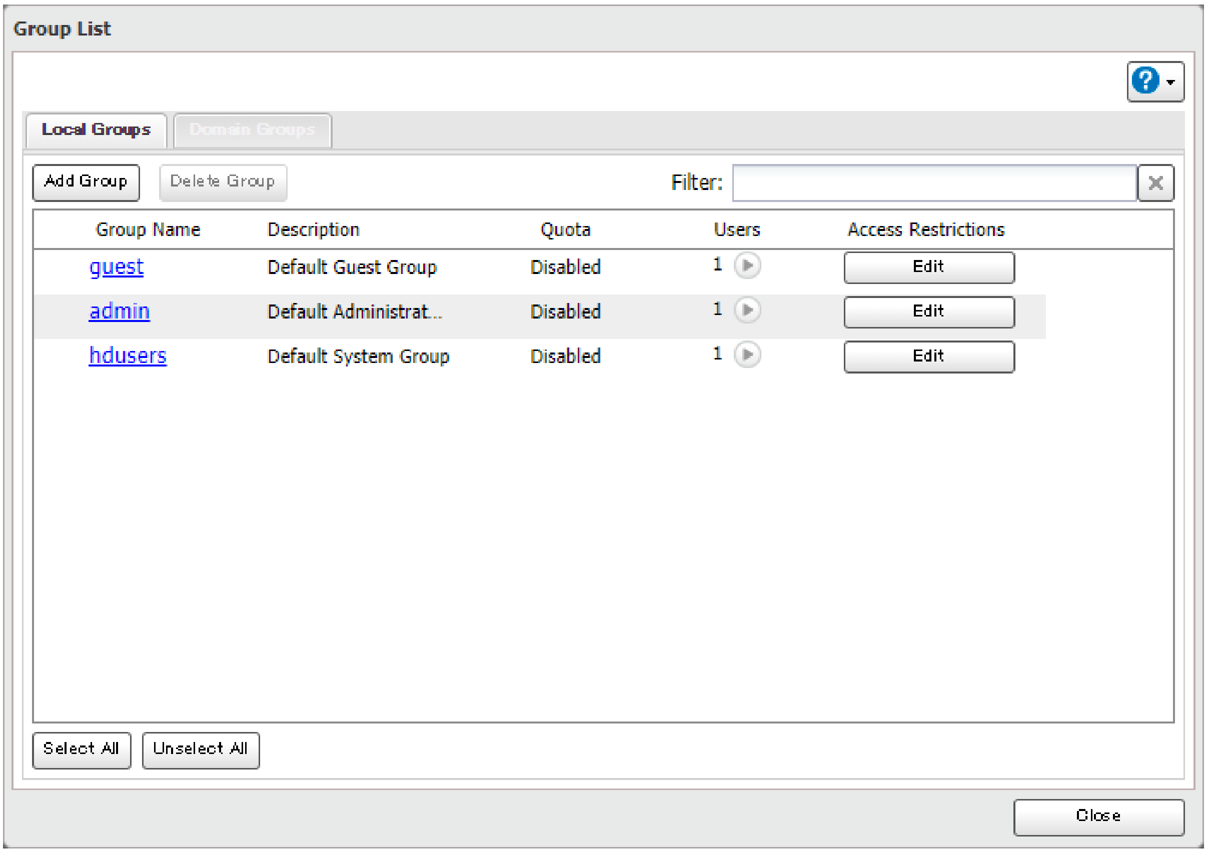
1 From Advanced Settings, click *File Sharing*.



2 Click the settings icon (⤢) to the right of "Groups".

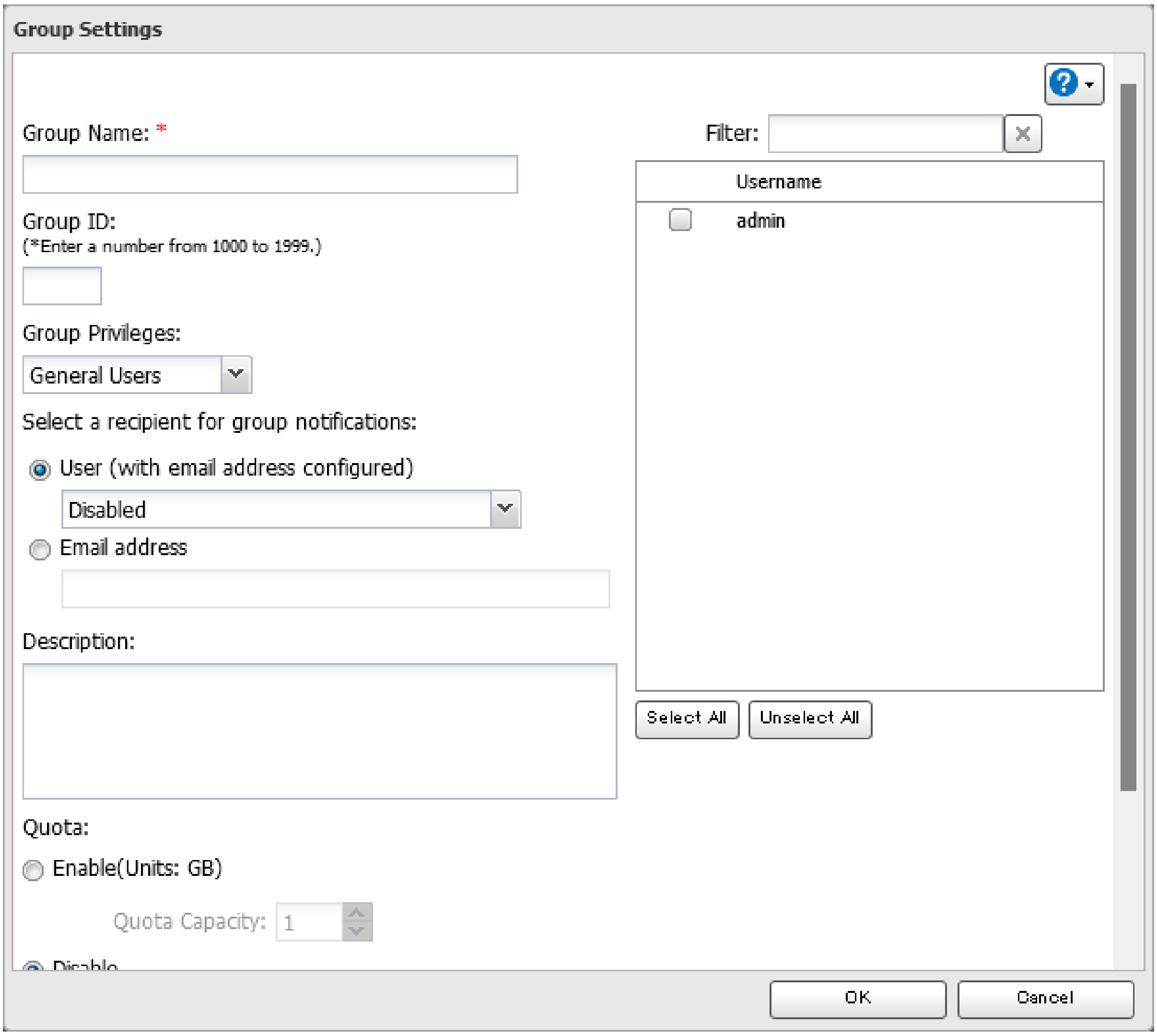


3 Click *Add Group*.


Group List
Local Groups
Domain Groups
Add Group
Delete Group
Filter:
Edit
Select All
Unselect All
Close

Group Name	Description	Quota	Users	Access Restrictions
guest	Default Guest Group	Disabled	1	Edit
admin	Default Administrat...	Disabled	1	Edit
hdusers	Default System Group	Disabled	1	Edit

4 Enter the desired settings, then click *OK*.



Group Settings

Group Name: *

Group ID:
(*Enter a number from 1000 to 1999.)

Group Privileges: General Users

Select a recipient for group notifications:

● User (with email address configured)

Disabled

○ Email address

Description:

Quota:

○ Enable(Units: GB)

Quota Capacity: 1

● Disable

Filter:

	Username
☐	admin

5 The process is complete once you close the confirmation window that appears.

Notes:

- Group names may contain up to 20 alphanumeric characters, hyphens (-), underscores (_), and periods (.). The first character should not be a symbol unless it is an underscore.
- Group descriptions may contain up to 75 alphanumeric characters, hyphens (-), underscores (_), and spaces. Multibyte characters are supported. The first character should not be a symbol or space.
- If the group ID field is left blank, a group ID is automatically assigned. Use numbers between 1000 and 1999 to set a group ID manually. Don't use duplicate group IDs.
- If you are logged in as an administrator, you can change any setting, including other users' passwords. If you are logged in as a member of the power users group, you can create and edit shared folders, users, and groups. If you are logged in as a member of the general users group, you can only change your own password.
- Do not use any of the following words as a group name as these words are reserved for internal use by the LinkStation: adm, admin, administrator, all, apache, bin, daemon, disk, ftp, ftpuser, guest, halt, hdusers, kmem, lp, mail, man, mysql, news, nobody, nogroup, none, operator, root, shadow, shutdown, sshd, sync, sys, tty, users, utmp, uucp, www

Configuring Access Restrictions

You may restrict access for specific shared folders, including external USB drives.

Notes:

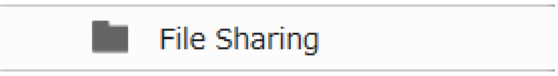
- Access restrictions can be set separately for each shared folder, but not for subfolders within the shared folders.
- Configure access restrictions only through Settings. Configuring access restrictions through Windows is not supported and may cause unexpected behavior.

Restricting Local User Access to Shared Folders

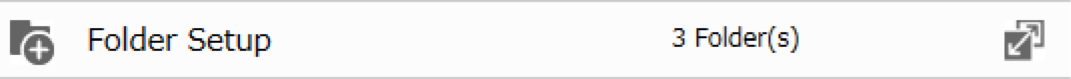
You can configure access restrictions using local users and groups from a computer or a mobile device. Follow the appropriate procedure below to configure access restrictions.

Using a Computer

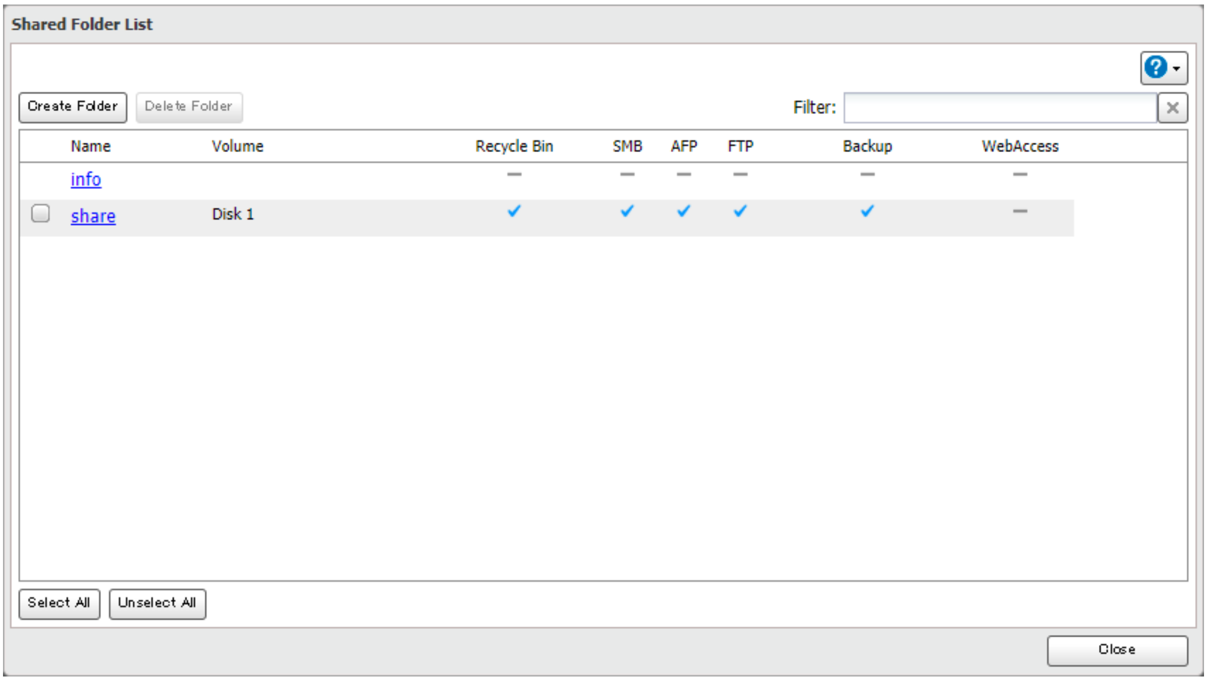
1 From Advanced Settings, click *File Sharing*.


File Sharing

2 Click the settings icon ( ) to the right of "Folder Setup".

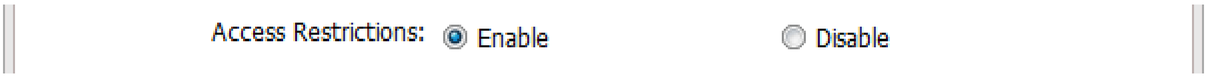

Folder Setup
3 Folder(s)

3 Click the shared folder that you want to set access restrictions for.


Shared Folder List
Create Folder
Delete Folder
Filter:
Select All
Unselect All
Close

	Name	Volume	Recycle Bin	SMB	AFP	FTP	Backup	WebAccess
	info		—	—	—	—	—	—
☐	share	Disk 1	✓	✓	✓	✓	✓	—

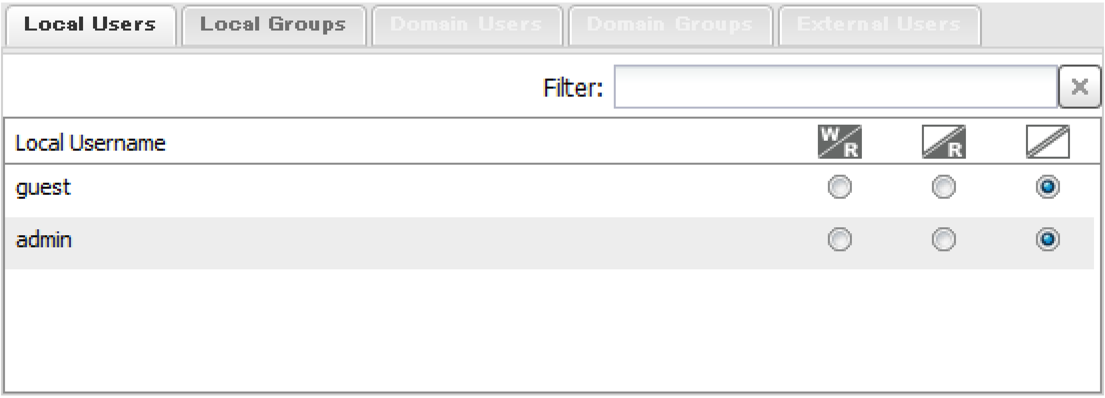
4 Click *Edit* and enable "Access Restrictions".



Access Restrictions: ● Enable ○ Disable

5 Select the level of access for the user or group and click *OK*.

WR : Read and write R : Read-only ⧄ : No access


Local Users
Local Groups
Domain Users
Domain Groups
External Users
Filter:
×

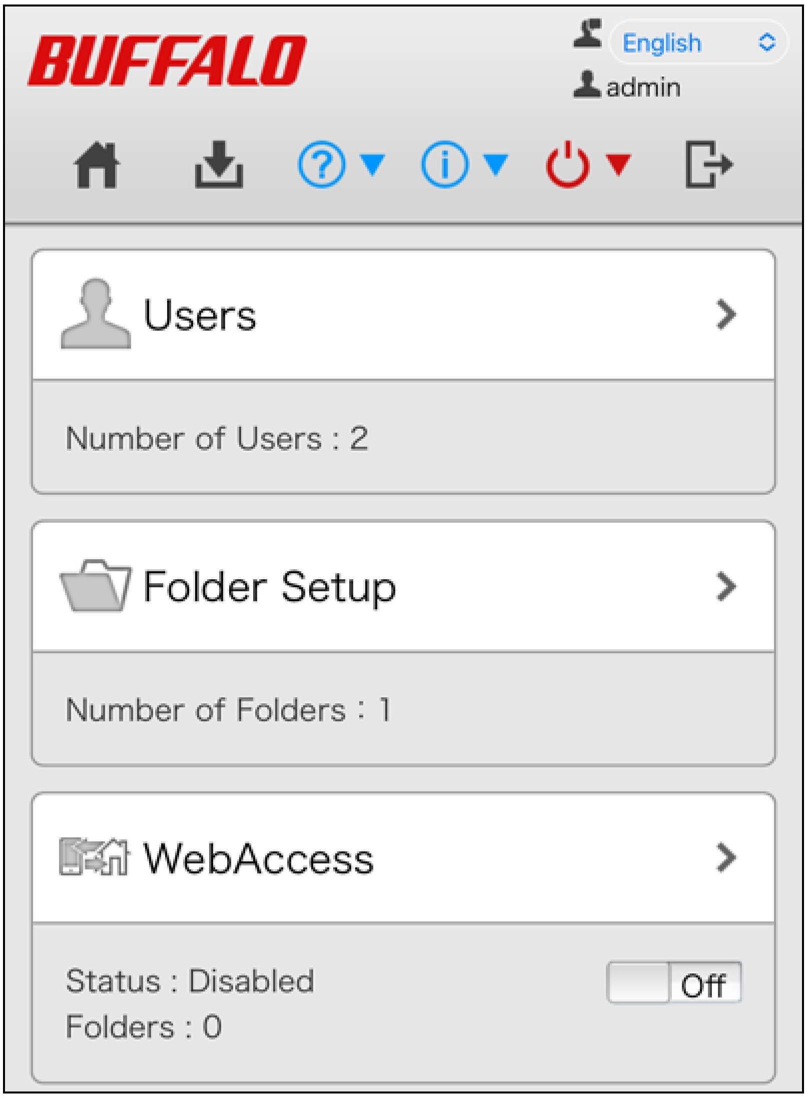
Local Username	WR	R	⧄
guest	○	○	●
admin	○	○	●

Note: The example above shows access restrictions by users. To restrict access by group, click the *Local Groups* tab and select group permissions.

6 The process is complete once you close the confirmation window that appears.

Using a Mobile Device

1 From Settings, tap *Folder Setup*.

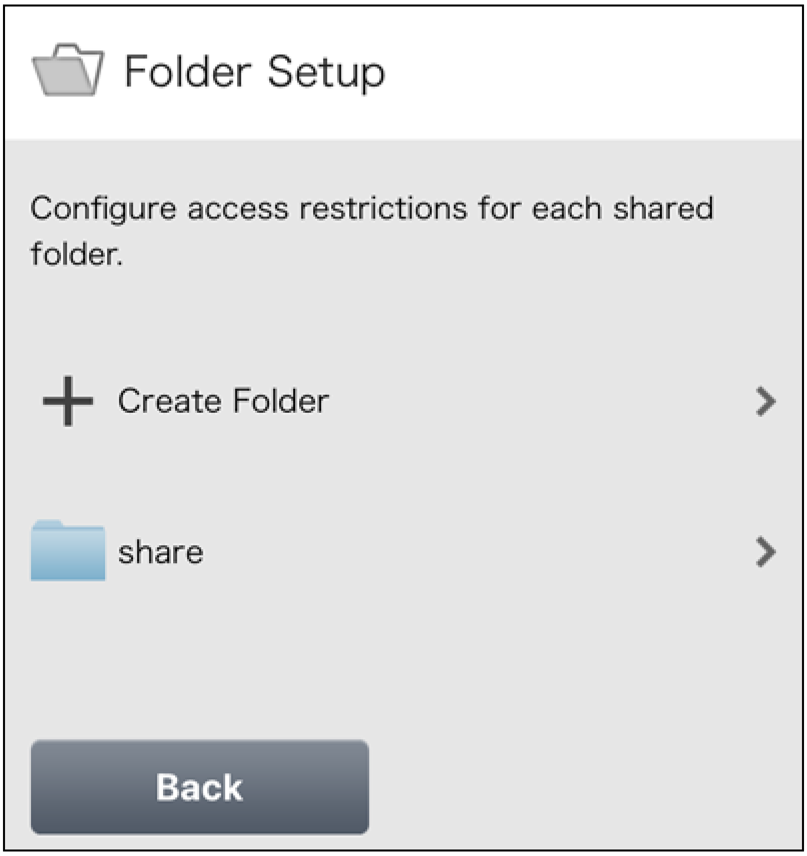

BUFFALO
English
admin
Users
Folder Setup
WebAccess
Off

Number of Users : 2

Number of Folders : 1

Status : Disabled
Folders : 0

2 Tap the shared folder that you want to set access restrictions for.

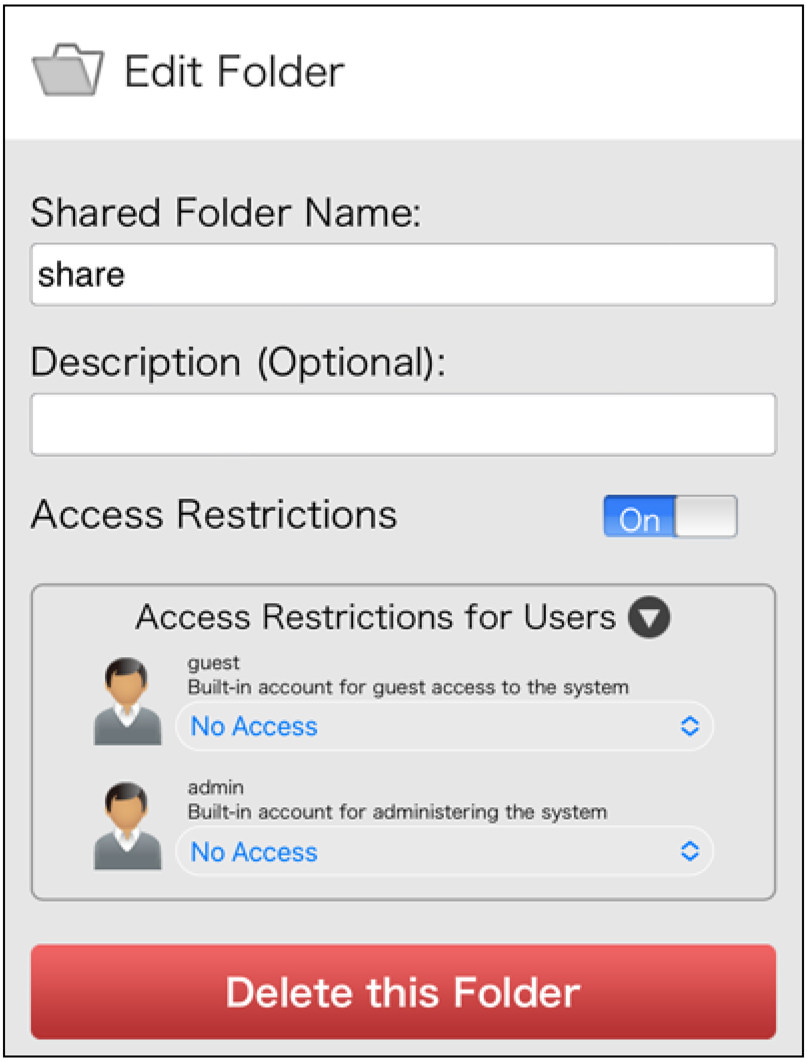


Folder Setup

Configure access restrictions for each shared folder.

Create Folder
share
Back

3 Move the access restrictions switch (Off) to the On position to enable access restrictions.



Edit Folder

Shared Folder Name: share

Description (Optional):

Access Restrictions: On

Access Restrictions for Users

guest
Built-in account for guest access to the system
No Access

admin
Built-in account for administering the system
No Access

4 Select the level of access for the users, then tap *Apply*.

5 The process is complete once you close the confirmation window that appears.

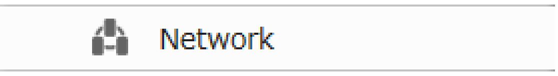
Note: The most restrictive access settings will always apply. For example, if both read-only and read and write permissions are given to a user, the user will have read-only access.

Restricting AD Domain User Access to Shared Folders

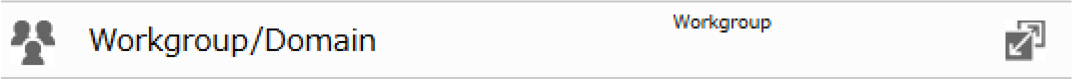
If there is an Active Directory environment, the LinkStation will use account information from the Active Directory domain controller to set access restrictions for shared folders on the LinkStation. There is no need to perform individual account management for the LinkStation. If multiple LinkStations are installed on the network, the account information will be centrally managed in Active Directory, greatly reducing the operations required for installation and management.

Note: The LinkStation supports an Active Directory domain environment with a maximum of 1000 users and groups total.

1 From Advanced Settings, click *Network*.

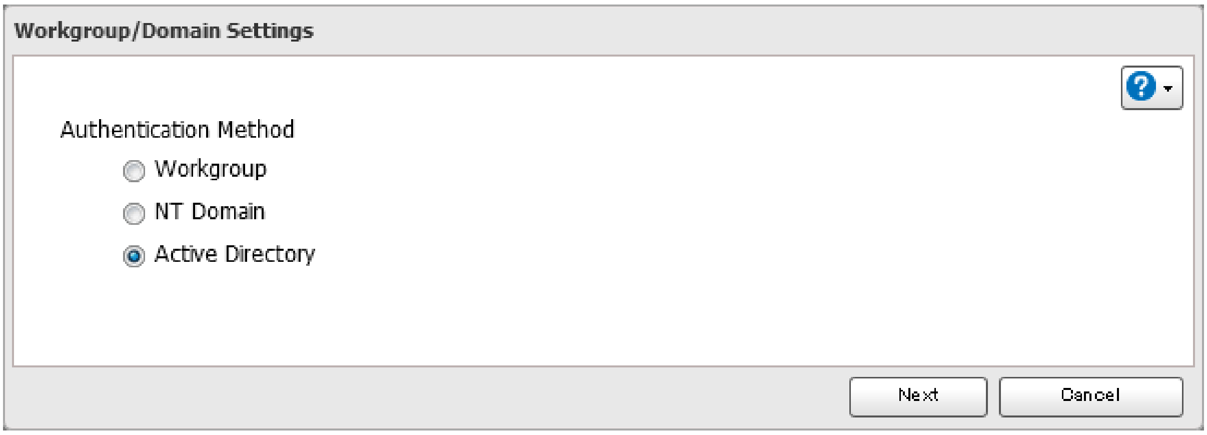


2 Click the settings icon ( ) to the right of “Workgroup/Domain”.



Workgroup/Domain Workgroup

3 Click *Edit* and select “Active Directory”, then click *Next*.



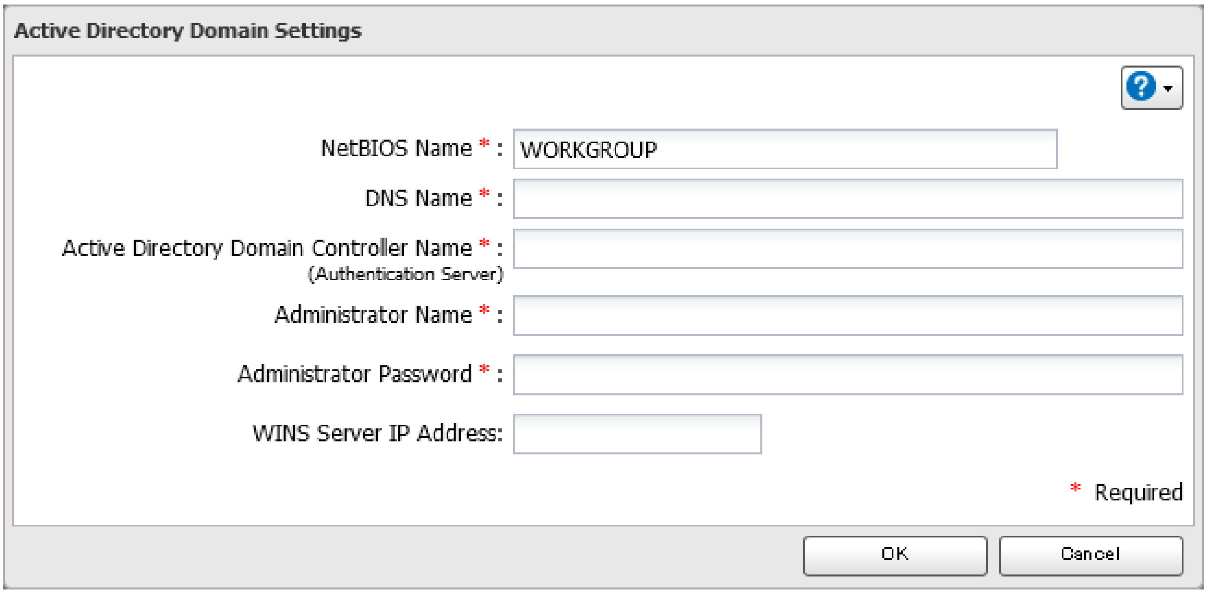
Workgroup/Domain Settings

Authentication Method

- ○ Workgroup
- ○ NT Domain
- ● Active Directory

4 Click *Yes*.

5 Enter the desired settings, then click *OK*.



Active Directory Domain Settings

NetBIOS Name * : WORKGROUP

DNS Name * :

Active Directory Domain Controller Name * : (Authentication Server)

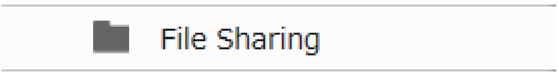
Administrator Name * :

Administrator Password * :

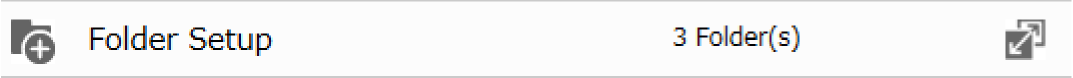
WINS Server IP Address:

* Required

6 From Advanced Settings, click *File Sharing*.

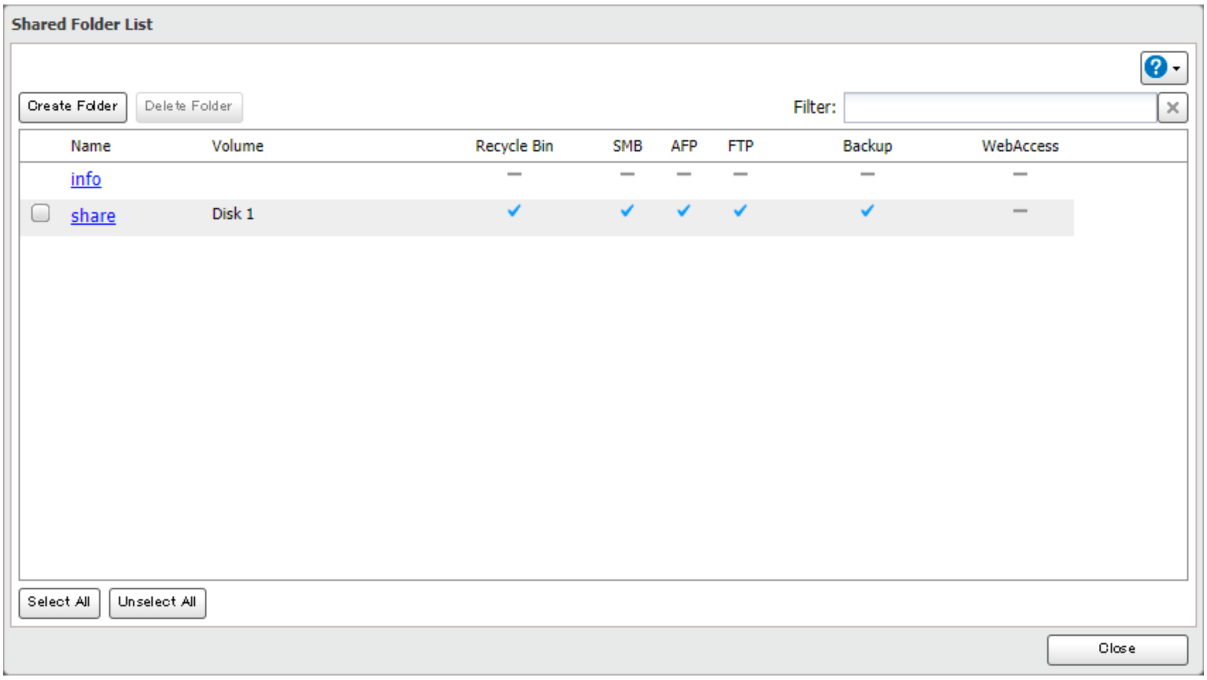


7 Click the settings icon ( ) to the right of “Folder Setup”.



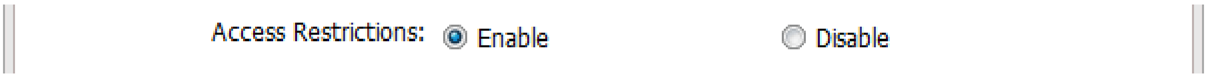
Folder Setup 3 Folder(s)

8 Click the shared folder that you want to set access restrictions for.



	Name	Volume	Recycle Bin	SMB	AFP	FTP	Backup	WebAccess
	info		—	—	—	—	—	—
☐	share	Disk 1	✓	✓	✓	✓	✓	—

9 Click *Edit* and enable "Access Restrictions".



Access Restrictions: ● Enable ○ Disable

10 Select the level of access for the user or group and click *OK*.

WR : Read and write R : Read-only : No access

11 The process is complete once you close the confirmation window that appears.

Notes:

- If you change the LinkStation's name, you will no longer be able to use domain users and groups or access restrictions. To repair this, rejoin the domain.
- To have the LinkStation join an Active Directory domain, configure it to use a DNS server that can resolve names for the Active Directory domain.
- After building an Active Directory domain, the administrator password for joining the domain must be changed at least once, or joining the Active Directory domain will fail.
- The DNS name and NetBIOS name of Active Directory domains should be identical.
- The most restrictive access settings will always apply. For example, if both read-only and read and write permissions are given to a user, the user will have read-only access.
- If there is a difference of more than five minutes between the LinkStation's clock and the domain controller's clock, joining the domain or authenticating domain users and groups may fail. For best results, use an NTP server to set the time for all network devices.
- To use the LinkStation as a member server in an Active Directory domain, the LinkStation should be logged in to the domain and accessed from a computer that is not a member of the domain with a valid domain account.
- If the LinkStation is a member server of an Active Directory domain, you cannot connect as a guest user via AFP.
- If your LinkStation is a member server in an Active Directory domain and you change the authentication method to "Workgroup", the account on the domain controller will not be deleted automatically.
- When the LinkStation joins an Active Directory domain, FTP is disabled. Before using FTP, move the FTP switch back to the "On" position.

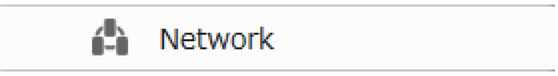
- Don’t disable the SMB protocol while Active Directory is used for access restrictions. If you do, you will need to enable SMB again and reconfigure AD from scratch.

Restricting NT Domain User Access to Shared Folders

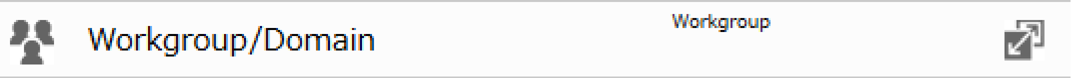
If there is an NT domain environment, the LinkStation will use account information from the NT domain server to set access restrictions for shared folders on the LinkStation. There is no need to perform individual account management for the LinkStation. If multiple LinkStations are installed on the network, the account information will be centrally managed in the NT domain, greatly reducing the operations required for installation and management.

Note: The LinkStation supports an NT domain environment with a maximum of 1000 users and groups total.

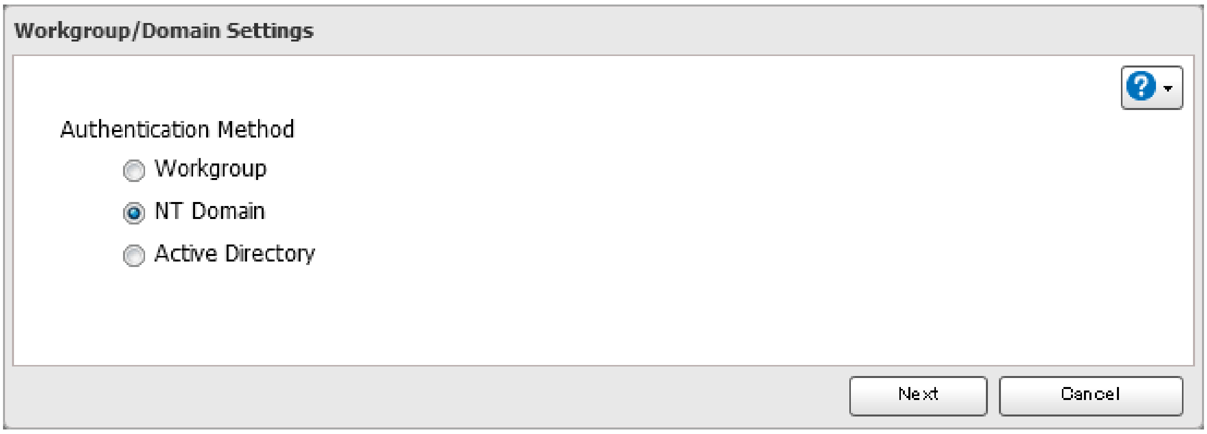
1 From Advanced Settings, click *Network*.



2 Click the settings icon ( ) to the right of “Workgroup/Domain”.



3 Click *Edit* and select “NT Domain”, then click *Next*.


Workgroup/Domain Settings

Authentication Method

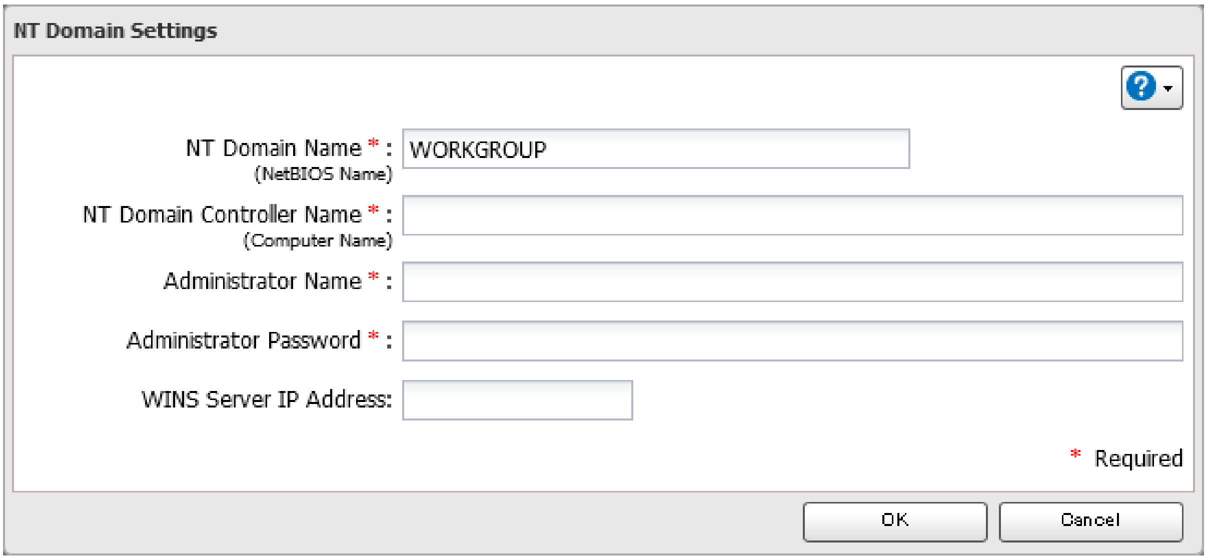
○ Workgroup

● NT Domain

○ Active Directory

4 Click *Yes*.

5 Enter the desired settings, then click *OK*.



NT Domain Settings

NT Domain Name * : WORKGROUP
(NetBIOS Name)

NT Domain Controller Name * :
(Computer Name)

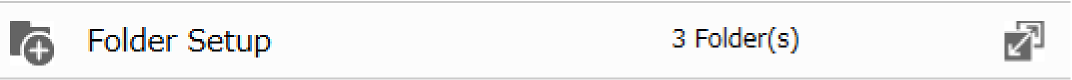
Administrator Name * :

Administrator Password * :

WINS Server IP Address:

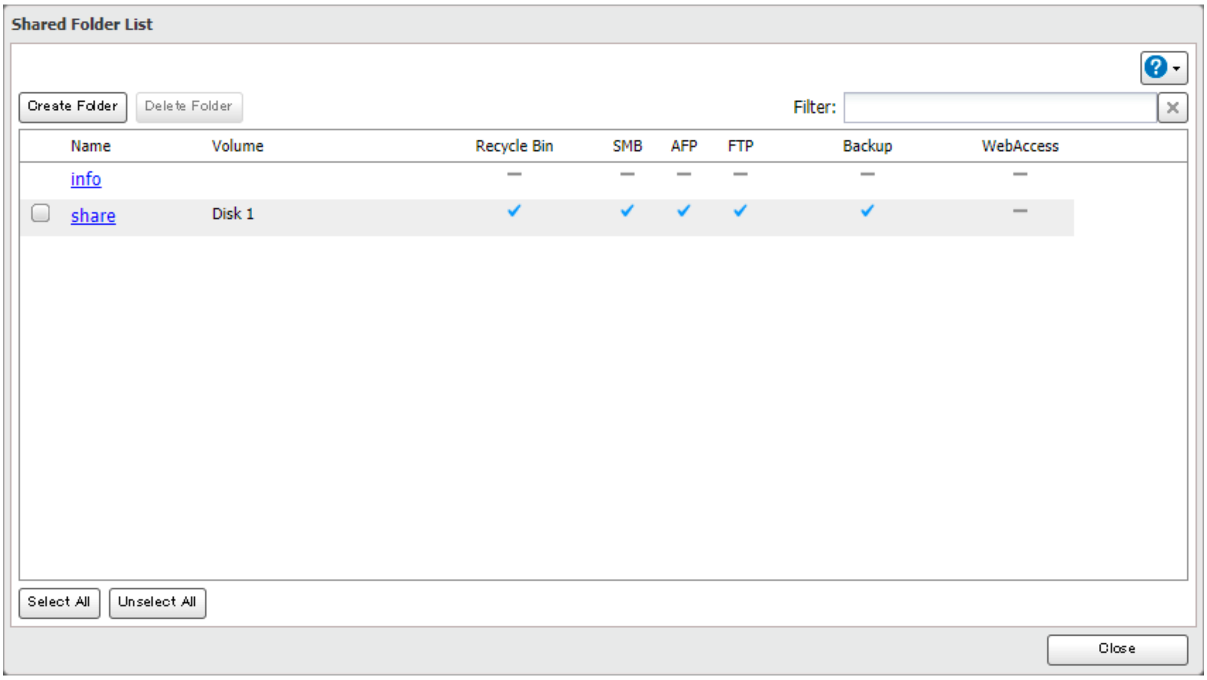
* Required

6 Click the settings icon (↗) to the right of "Folder Setup".



Folder Setup
3 Folder(s)

7 Click the shared folder that you want to set access restrictions for.



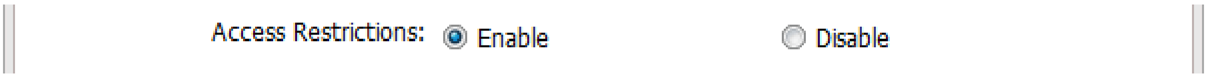
Shared Folder List

Create Folder
Delete Folder
Filter:

	Name	Volume	Recycle Bin	SMB	AFP	FTP	Backup	WebAccess
	info		—	—	—	—	—	—
☐	share	Disk 1	✓	✓	✓	✓	✓	—

Select All
Unselect All
Close

8 Click *Edit* and enable "Access Restrictions".



Access Restrictions: ● Enable ○ Disable

9 Select the level of access for the user or group.

WR : Read and write R : Read-only : No access

10 The process is complete once you close the confirmation window that appears.

Notes:

- If you change the LinkStation's name, you will no longer be able to use domain users and groups or access restrictions. To repair this, rejoin the domain.
- The most restrictive access settings will always apply. For example, if both read-only and read and write permissions are given to a user, the user will have read-only access.
- If a domain username is more than 20 bytes long, the LinkStation truncates it to 20 bytes.
- To use the LinkStation as a member server in an NT domain, the LinkStation should be logged in to the domain and accessed from a computer that is not a member of the domain with a valid domain account.
- If the LinkStation is a member server of an NT domain, you cannot connect as a guest user via AFP.
- When you change the user or group settings on the domain controller, these changes may not take effect immediately on the LinkStation until it is rebooted.
- If your LinkStation is a member server in an NT domain and you change the authentication method to "Workgroup", the account on the domain controller will not be deleted automatically.
- If the LinkStation has joined a domain network, you cannot connect to it via FTP.
- Don't disable the SMB protocol while an NT domain server is used for access restrictions. If you do, you will need to enable SMB again and reconfigure the NT domain settings from scratch.

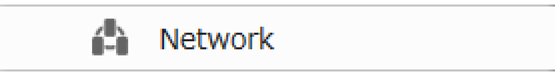
Restricting External User Access to Shared Folders

LinkStations on your network can be linked to an external authentication server for centralized management of user accounts and passwords. The authentication server should be another Buffalo NAS device. Other external SMB authentication servers are not supported.

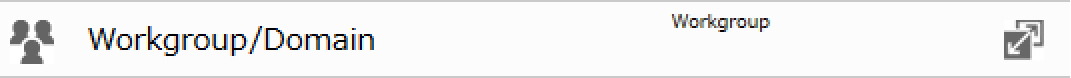
Notes:

- Disable SMB2 before using external authentication.
- Access restrictions for local users and groups will still apply to shared folders if an external SMB server is used for authentication.
- The procedure below contains methods to automatically register external users. You can also manually add external users by converting them from local users. Refer to the "Converting Local Users into External Users" section above for more details on converting local users.

1 From Advanced Settings, click *Network*.

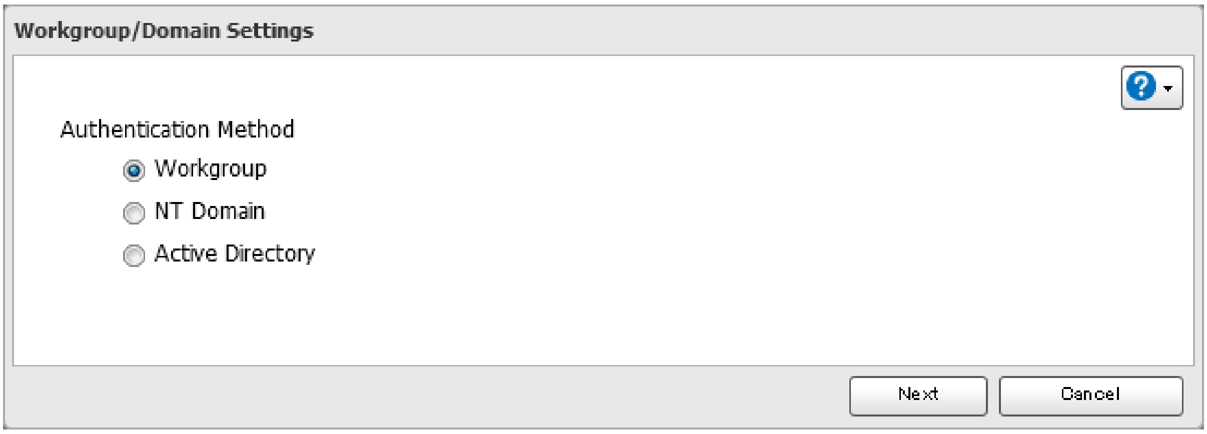


2 Click the settings icon (⤢) to the right of "Workgroup/Domain".



Workgroup/Domain Workgroup

3 Click *Edit* and select "Workgroup", then click *Next*.



Workgroup/Domain Settings

Authentication Method

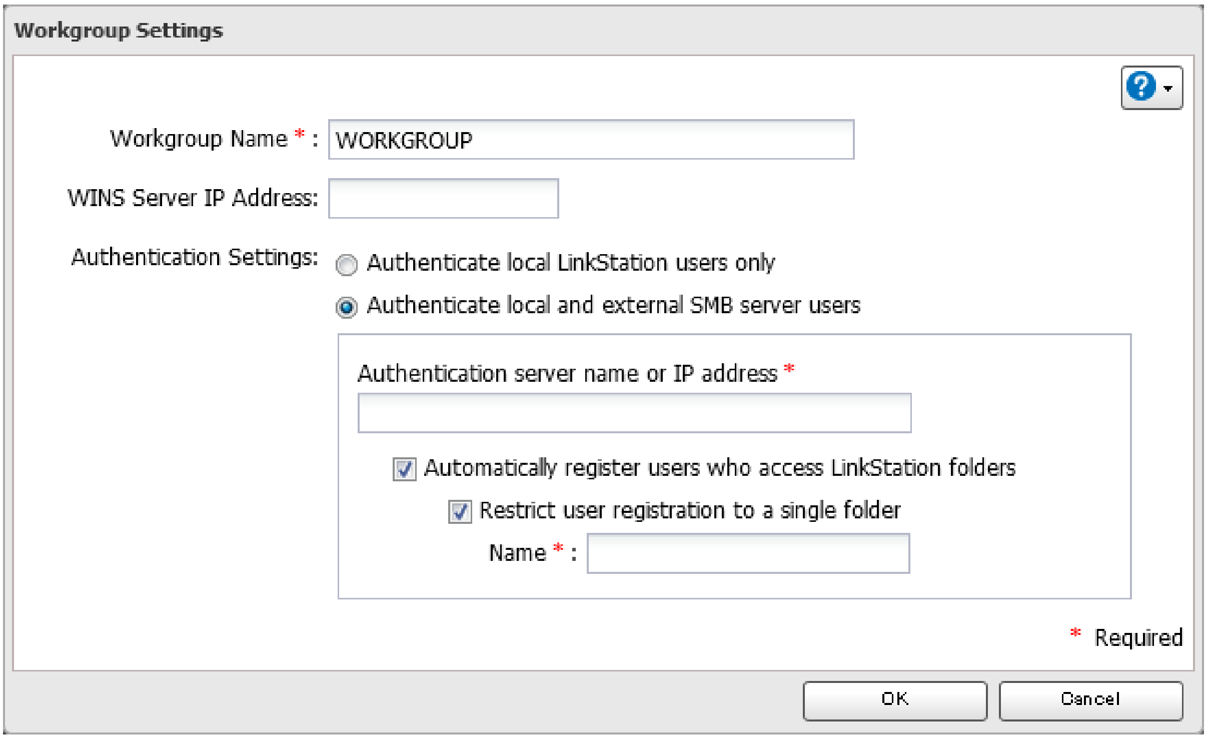
● Workgroup

○ NT Domain

○ Active Directory

4 Click *Yes*.

5 Enter a workgroup name. Select "Authenticate local and external SMB server users" and enter the SMB server's IP address. You can also specify a server from another subnet.



Workgroup Settings

Workgroup Name * : WORKGROUP

WINS Server IP Address:

Authentication Settings:

○ Authenticate local LinkStation users only

● Authenticate local and external SMB server users

Authentication server name or IP address *

☑ Automatically register users who access LinkStation folders

☑ Restrict user registration to a single folder

Name * :

* Required

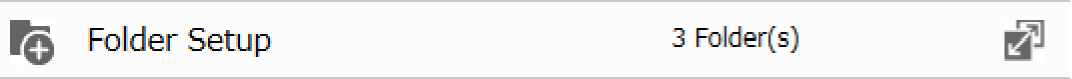
6 If "Automatically register users who access LinkStation folders" is selected, users that access any of the LinkStation's folders will be automatically registered as external users. This process only applies to folders that have access restrictions disabled. After new external users are added, disable this option to limit the number of authenticated user accounts.

7 If "Restrict user registration to a single folder" is checked, the LinkStation will automatically create a read-only shared folder. Enter the shared folder name. Users that access this specific folder will be automatically registered as external users. If this setting is deselected at a later time, the LinkStation will automatically remove the folder.

Note: Connect to the authentication folder via SMB, not FTP or AFP. Automatic user registration may not work the first time if on macOS 10.8 (or later). If this occurs, try rebooting the LinkStation, then access the authentication shared folder again.

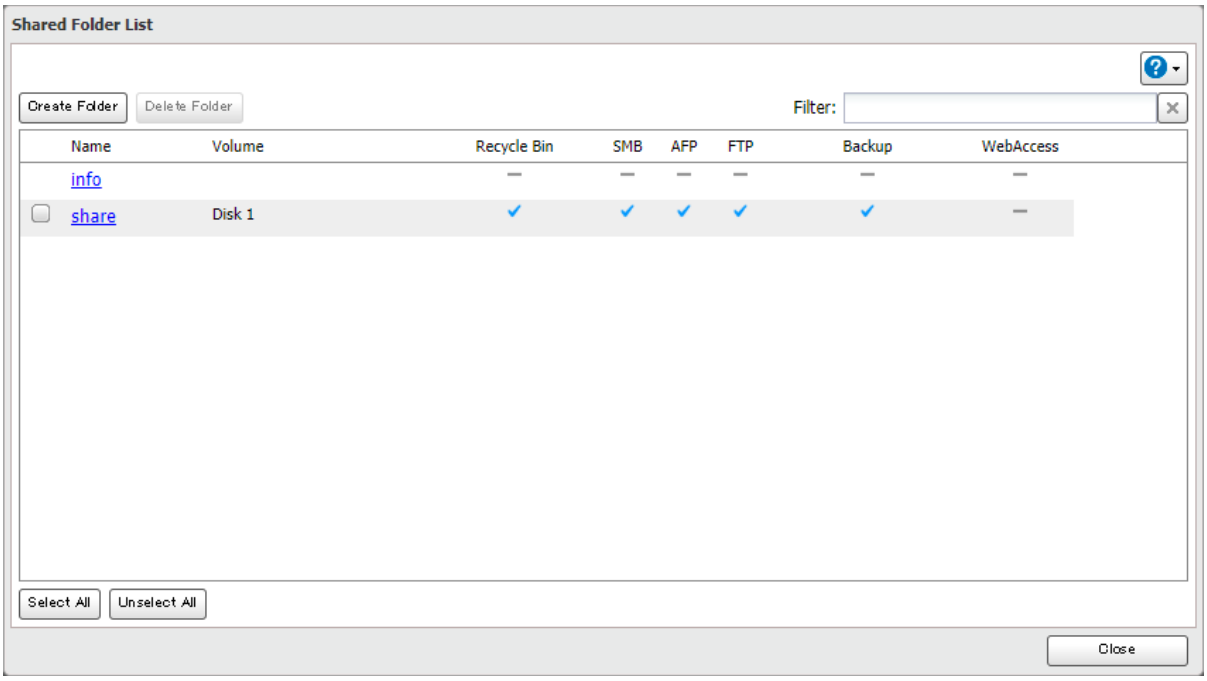
8 Click *OK* to save any changes. When saving changes to the external authentication server settings, you may not convert all current local users to external users. If a local user is converted to an external user, their user information (including passwords) will be removed from the NAS. External users cannot be reverted to local users.

9 Click the settings icon ( ) to the right of "Folder Setup".



Folder Setup 3 Folder(s)

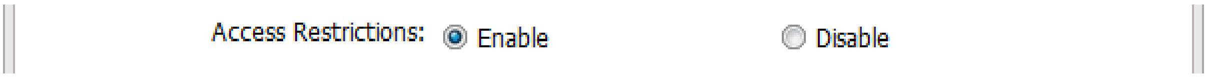
10 Click the shared folder that you want to set access restrictions for.



Shared Folder List

	Name	Volume	Recycle Bin	SMB	AFP	FTP	Backup	WebAccess
	info		—	—	—	—	—	—
☐	share	Disk 1	✓	✓	✓	✓	✓	—

11 Click *Edit* and enable "Access Restrictions".



Access Restrictions: ● Enable ○ Disable

12 Click the *External Users* tab and select the level of access for each external user.

WR : Read and write R : Read-only : No access

13 The process is complete once you close the confirmation window that appears.

Notes:

- Users that are automatically registered belong to the "hdusers" group. They can be added to other groups from within group settings. Added users will be listed in "Users" > "External Users". To delete a user that was registered automatically, select that user and click *Delete External User*.
- The most restrictive access settings will always apply. For example, if both read-only and read and write permissions are given to a user, the user will have read-only access.
- To access access-limited shared folders from OS X 10.7, use AFP instead of SMB; under "LAN Protocol Support", check "AFP (Mac)" on the destination folders to use AFP and click *OK*.
- If access restrictions are set for users and groups from the authentication server, guest and anonymous connections will not be possible with AFP connections.
- FTP connections do not support authentication with an external SMB server.

- If using a Windows PC for external authentication, the default Windows SMB security settings may need to be changed. An easy way to do this is to run File Sharing Security Level Change Tool, available from this product's download page on the Buffalo website. This utility will let you easily change or restore your Windows security settings to work with external authentication.

Chapter 4 RAID Modes and Drive Management

Available RAID Modes

The LinkStation supports multiple types of RAID. The type of RAID arrays available for use depends on how many drives are installed on your LinkStation.

Notes:

- If you change the RAID mode, all data on the array is deleted. This is true for every procedure in this chapter. Always back up any important data before performing actions that affect your RAID array.
- Some arrays will allow you to change the RAID mode without losing data by adding drives. To change a RAID mode by adding drives to the existing array, refer to the "Managing a RAID Array Without Deleting Data" section below.
- Drive capacity is displayed in Settings in actual gigabytes. The Properties window in Windows may show GiB instead, which will be a smaller number.
- After the RAID mode is changed (except when creating a RAID 0 array), the LinkStation performs a RAID scan that will take about 10 hours per TB. File transfers are slower during this period. While the `I17` message appears as a notification, do not turn off the LinkStation. If you do, the RAID scan will start over.

JBOD

This mode treats the drives inside the LinkStation as individual drives. The usable space is equal to the total capacity of both drives on the LinkStation. If any of the drives fail, then all data on that drive will be lost.

RAID 1

A RAID 1 array combines two drives into a mirrored array. The usable space is equal to the capacity of a single drive. Identical data is written to each drive. If a drive fails, data can be recovered by replacing the failed drive. As long as one drive in the array remains undamaged, all data in the array can be recovered.

RAID 0

A RAID 0 array combines two drives into a single array. The usable space is equal to the total capacity of both drives in the array. If a single drive in the array fails, then all data in the array will be lost.

The default RAID mode is RAID 1 for the LS220D and LS220DR LinkStation models.

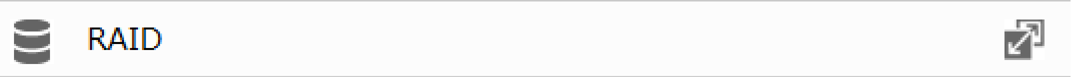
Working with RAID Arrays

Using JBOD

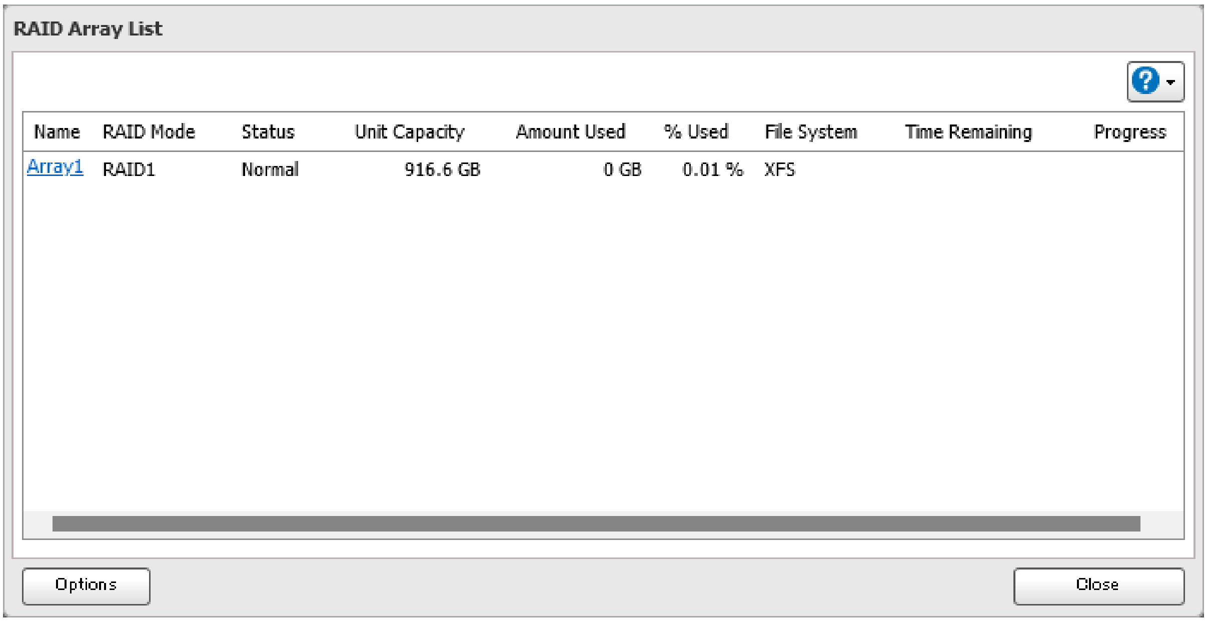
With JBOD, each drive on the LinkStation is addressed separately. To put drives in an array into JBOD, follow the procedure below.

1 From Advanced Settings, click *Drives*.

2 Click the settings icon (↗) to the right of "RAID".

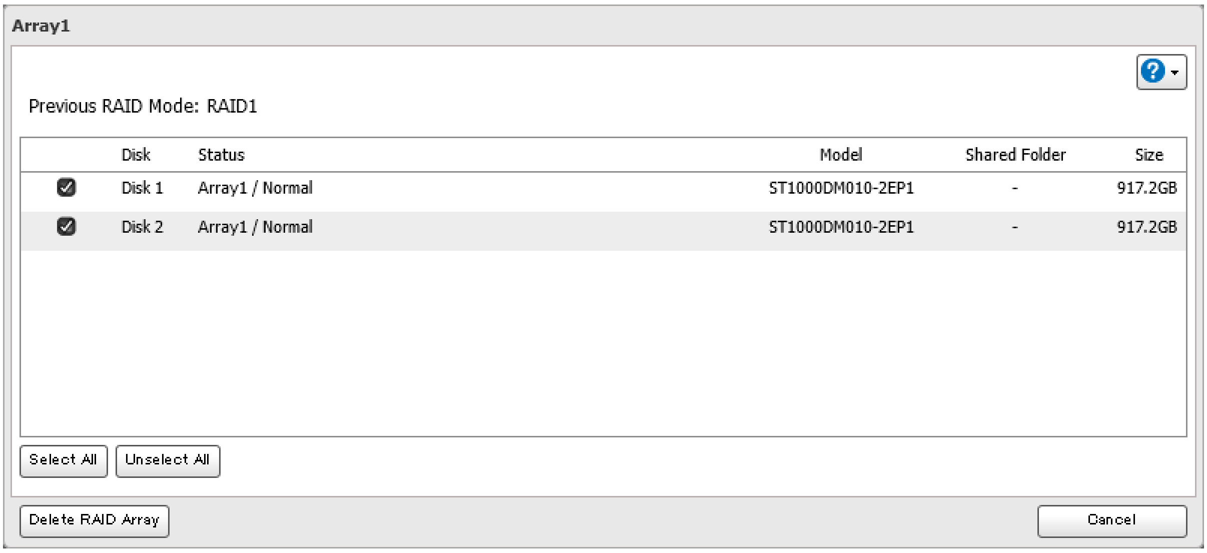


3 Click *Array1*.


RAID Array List
?
Options
Close

Name	RAID Mode	Status	Unit Capacity	Amount Used	% Used	File System	Time Remaining	Progress
Array1	RAID1	Normal	916.6 GB	0 GB	0.01 %	XFS		

4 Click *Delete RAID Array*.


Array1
?
Select All
Unselect All
Delete RAID Array
Cancel

Previous RAID Mode: RAID1

	Disk	Status	Model	Shared Folder	Size
☑	Disk 1	Array1 / Normal	ST1000DM010-2EP1	-	917.2GB
☑	Disk 2	Array1 / Normal	ST1000DM010-2EP1	-	917.2GB

5 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

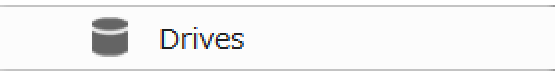
6 The process is complete once you close the confirmation window that appears.

When the drives are put into JBOD, next create a shared folder by referring to the "Adding a Shared Folder" section in chapter 3.

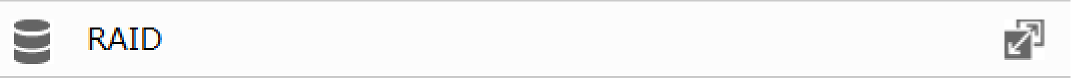
Creating a RAID Array

Before creating a new RAID array, first put the drives into JBOD by referring to the "Using JBOD" section above. Then, follow the procedure below.

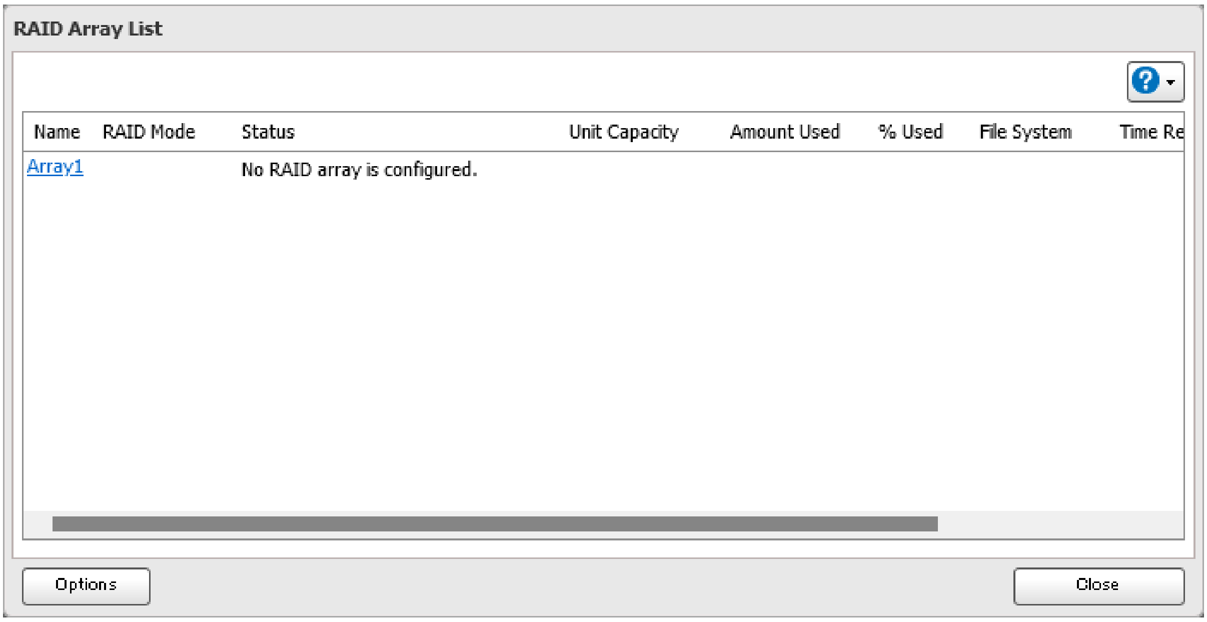
1. From Advanced Settings, click *Drives*.



2. Click the settings icon (⤢) to the right of "RAID".



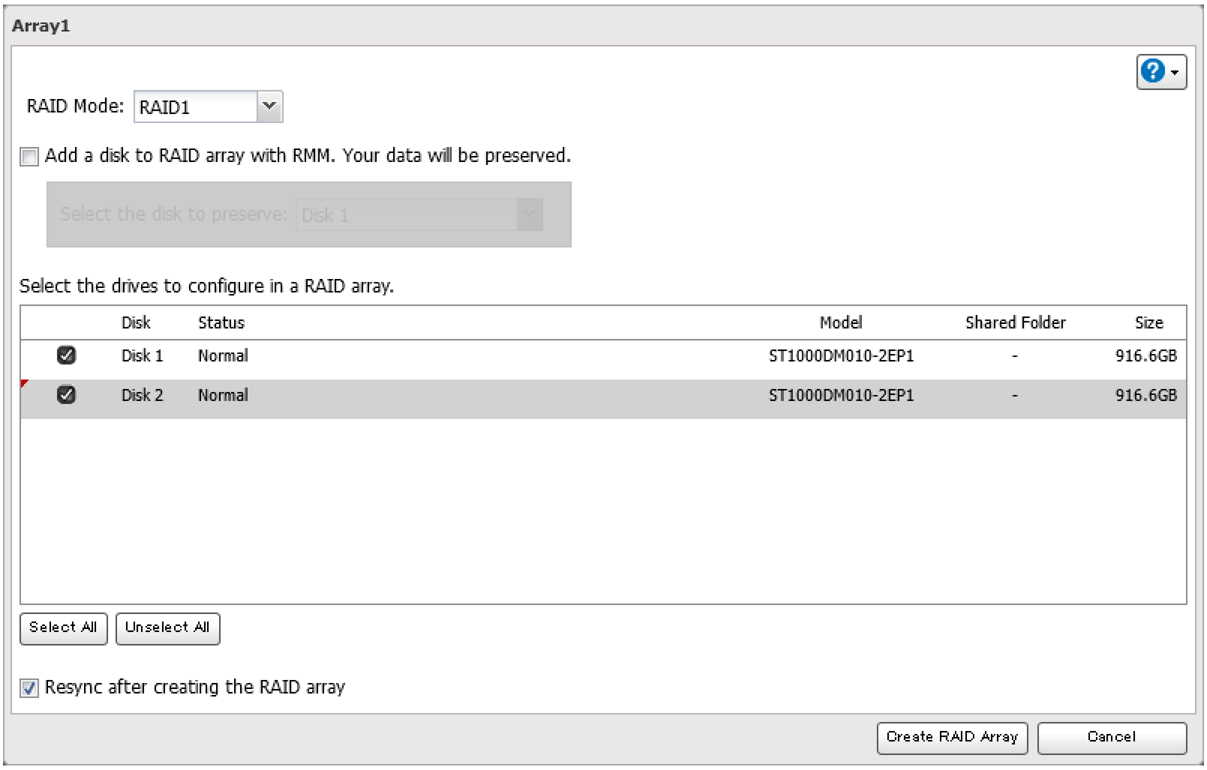
3. Click *Array1*.



RAID Array List

Name	RAID Mode	Status	Unit Capacity	Amount Used	% Used	File System	Time Re
Array1		No RAID array is configured.					

4 Select a RAID mode and both drives 1 and 2 to be used, then click *Create RAID Array*.



Array1

RAID Mode: RAID1

☐ Add a disk to RAID array with RMM. Your data will be preserved.

Select the disk to preserve: Disk 1

Select the drives to configure in a RAID array.

	Disk	Status	Model	Shared Folder	Size
☑	Disk 1	Normal	ST1000DM010-2EP1	-	916.6GB
☑	Disk 2	Normal	ST1000DM010-2EP1	-	916.6GB

☑ Resync after creating the RAID array

Note: Normally, after a RAID array is created, it is "resynced", which optimizes the array, making it more stable. The resyncing process will take about one hour per terabyte of space in the array. File transfers will be slower during this period, but the array will remain fully usable. The `I17` message will also be displayed in NAS Navigator2 during the resync. If you clear the "Resync after creating the RAID array" checkbox, the resyncing process will be skipped. If the LinkStation is rebooted during the resyncing process, the resync will begin again from the beginning.

5 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

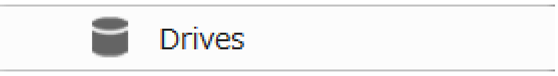
6 The process is complete once you close the confirmation window that appears.

When the RAID array has been created, next create a shared folder by referring to the "Adding a Shared Folder" section in chapter 3.

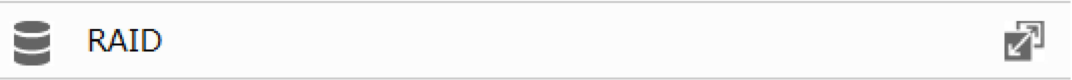
Managing a RAID Array Without Deleting Data

If the drives are currently in JBOD (not in a RAID array), you may change it to a RAID 1 array without erasing data on the drives.

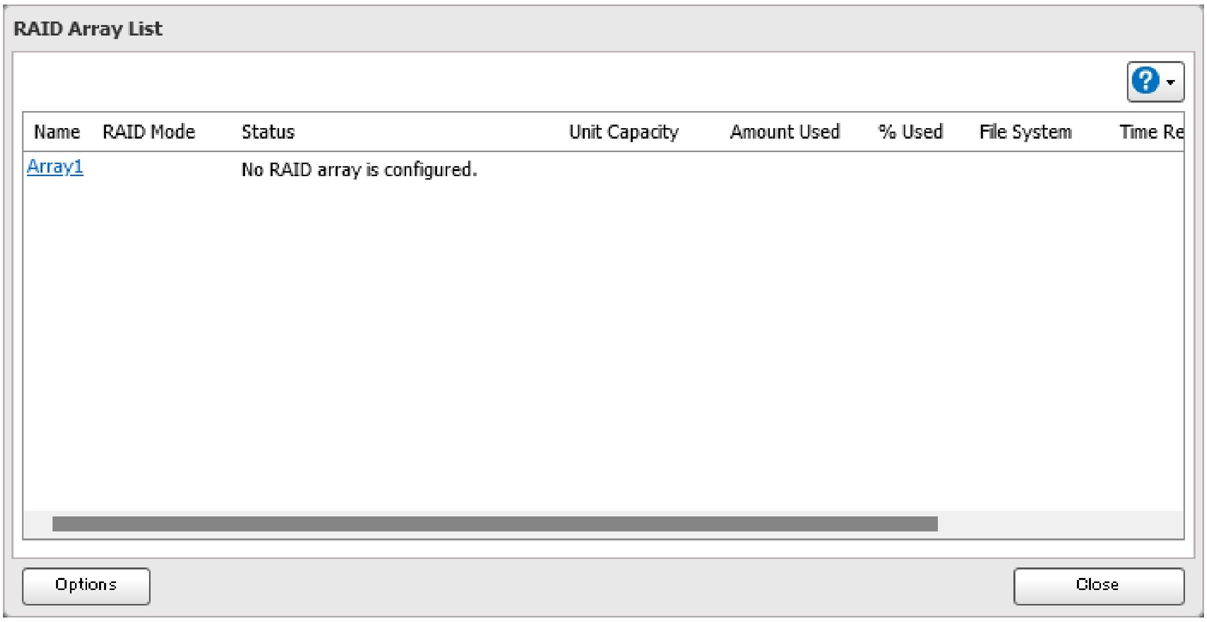
1 From Advanced Settings, click *Drives*.



2 Click the settings icon (⤢) to the right of "RAID".



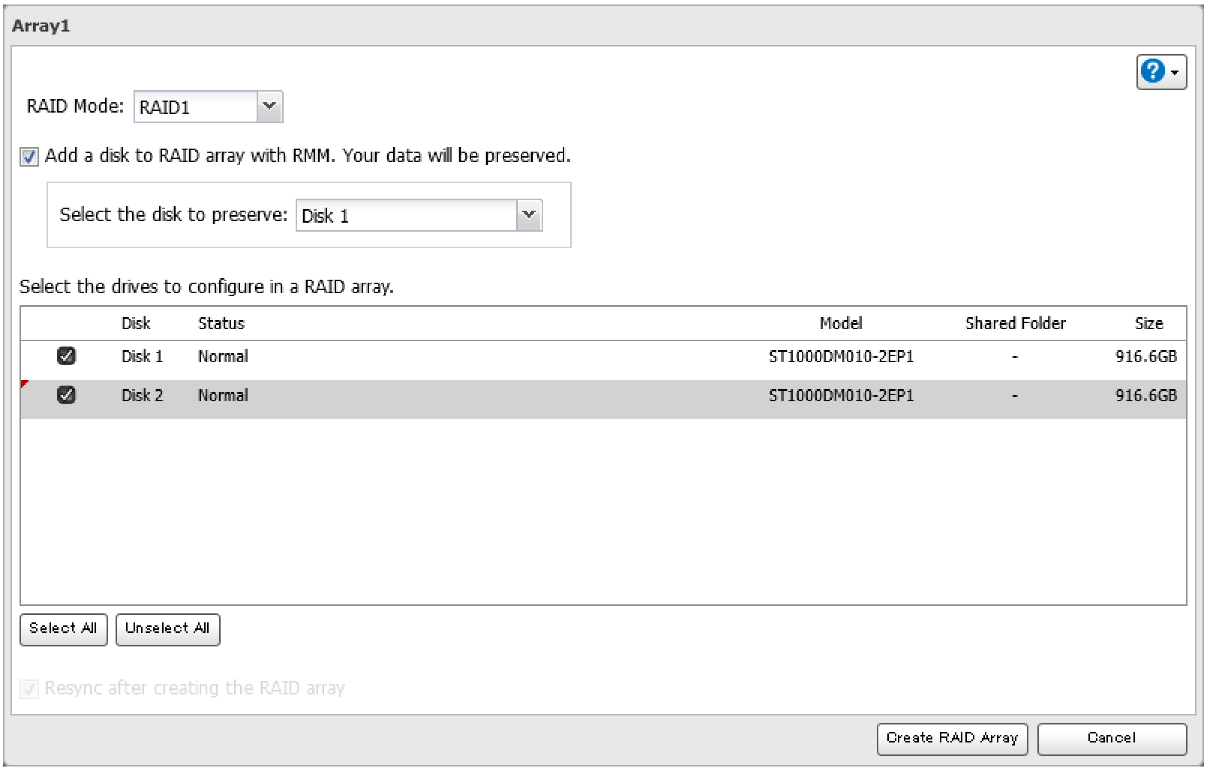
3 Click *Array1*.



RAID Array List

Name	RAID Mode	Status	Unit Capacity	Amount Used	% Used	File System	Time Re
Array1		No RAID array is configured.					

4 Set the RAID mode to "RAID 1".



Array1

RAID Mode: RAID1

☑ Add a disk to RAID array with RMM. Your data will be preserved.

Select the disk to preserve: Disk 1

Select the drives to configure in a RAID array.

	Disk	Status	Model	Shared Folder	Size
☑	Disk 1	Normal	ST1000DM010-2EP1	-	916.6GB
☑	Disk 2	Normal	ST1000DM010-2EP1	-	916.6GB

☑ Resync after creating the RAID array

5 Select the "Add a disk to RAID array with RMM. Your data will be preserved." checkbox.

6 Select the drive whose data will be saved from the drop-down list.

7 Select the drive to add to the RAID array.

8 Click *Create RAID Array*.

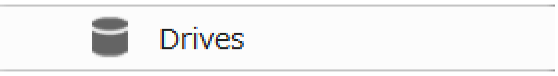
9 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

10 The process is complete once you close the confirmation window that appears.

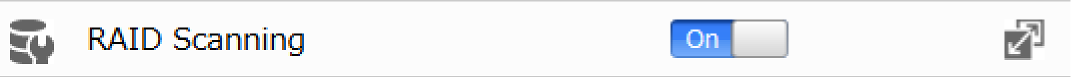
RAID Scanning

A RAID scan checks your RAID array for bad sectors and if it finds any, it automatically repairs them. Only RAID 1 arrays are supported. For best results, run RAID scans regularly.

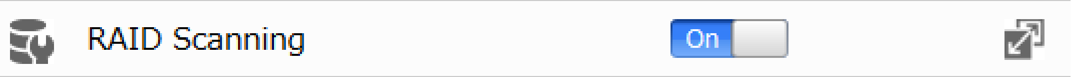
1 From Advanced Settings, click *Drives*.



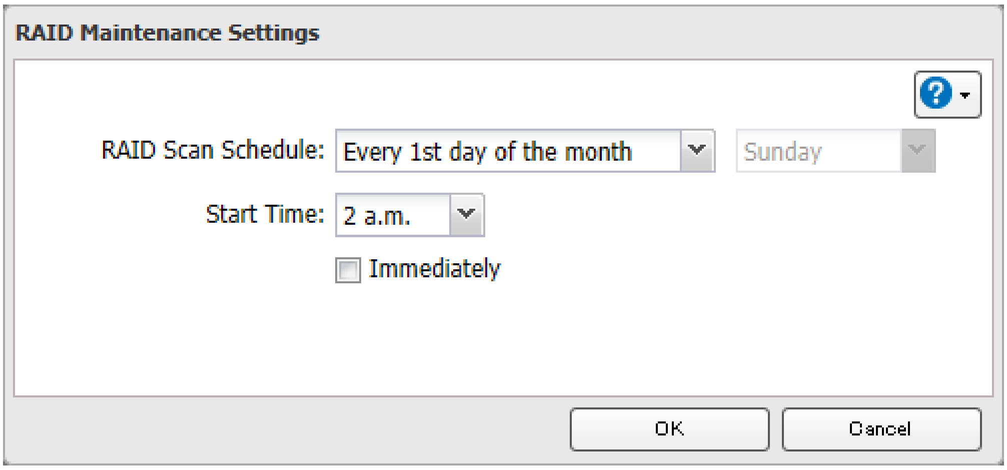
2 Move the RAID scanning switch (Off) to the On position to enable RAID scanning.



3 Click the settings icon ( ) to the right of "RAID Scanning".



4 Click *Edit* and select when to run the scan, then click *OK*.


RAID Maintenance Settings

RAID Scan Schedule: Every 1st day of the month | Sunday

Start Time: 2 a.m.

☐ Immediately

5 The process is complete once you close the confirmation window that appears.

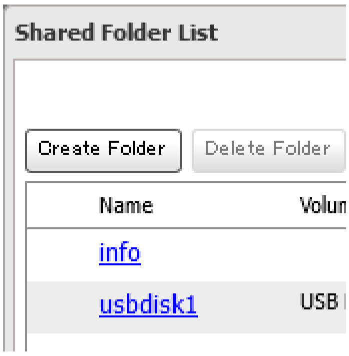
Notes:

- Select the "Immediately" checkbox to run a RAID scan immediately.
- To stop a RAID scan, click *Cancel RAID Scan*.

Adding an External Drive

Your LinkStation features a USB port, and you can connect an external drive to this port. Once connected, it appears as a shared folder on the LinkStation. A formatted drive is detected automatically. Unformatted drives should be formatted in Settings.

After a USB drive is recognized, the LinkStation adds “usbdisk1” to the shared folder list.



Compatibility

The following devices are supported by the LinkStation. Buffalo external USB drives are recommended but DUB and DIU series drives are not supported.

- USB storage devices
- Card readers (except for card readers that can recognize two or more memory cards)

Supported file systems for external USB drives are below:

	Ext3*	XFS	NTFS*	exFAT*	FAT32	HFS Plus*
Accessing via SMB	R	R/W	R/W	R/W	R/W	R
Using as a backup drive	R/W	R/W	R/W	R/W	R/W	R
Using for Direct Copy	R/W	R/W	R/W	R/W	R/W	R

R/W: Read and write, R: Read-only

*This cannot be formatted from Settings.

Make sure only one device is connected to a USB port on the LinkStation. Some external drives with automatic power-on won’t turn on automatically when connected to the LinkStation. Use their manual power switch to turn them on. Be sure to connect only one bus-powered drive at a time. If there is insufficient bus power for your USB drive, connect its AC adapter. Note that only the first partition of a connected USB drive is mounted. Additional partitions are not recognized.

Dismounting Drives

If the LinkStation is powered on, dismount drives (internal and external) before unplugging them. You may dismount the external USB drive using the function button, or dismount any drive from Settings. If the LinkStation is off, then all drives are already dismounted and may be unplugged safely.

Note: If you unplug your external drives without dismounting them, Settings may still show “usbdisk” in the shared folder list. Reboot your LinkStation to clear it.

Using the Function Button

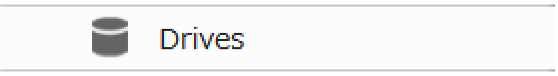
Press and hold down the function button for three seconds. The white function LED will go out as all attached USB drives are dismounted. You may now unplug any USB drives safely.

Using Settings

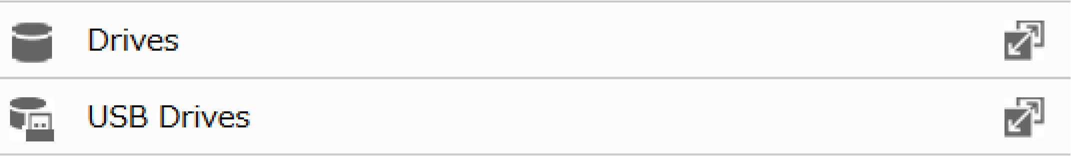
You can dismount a USB drive from a computer or a mobile device. Follow the appropriate procedure below to dismount a USB drive.

Using a Computer

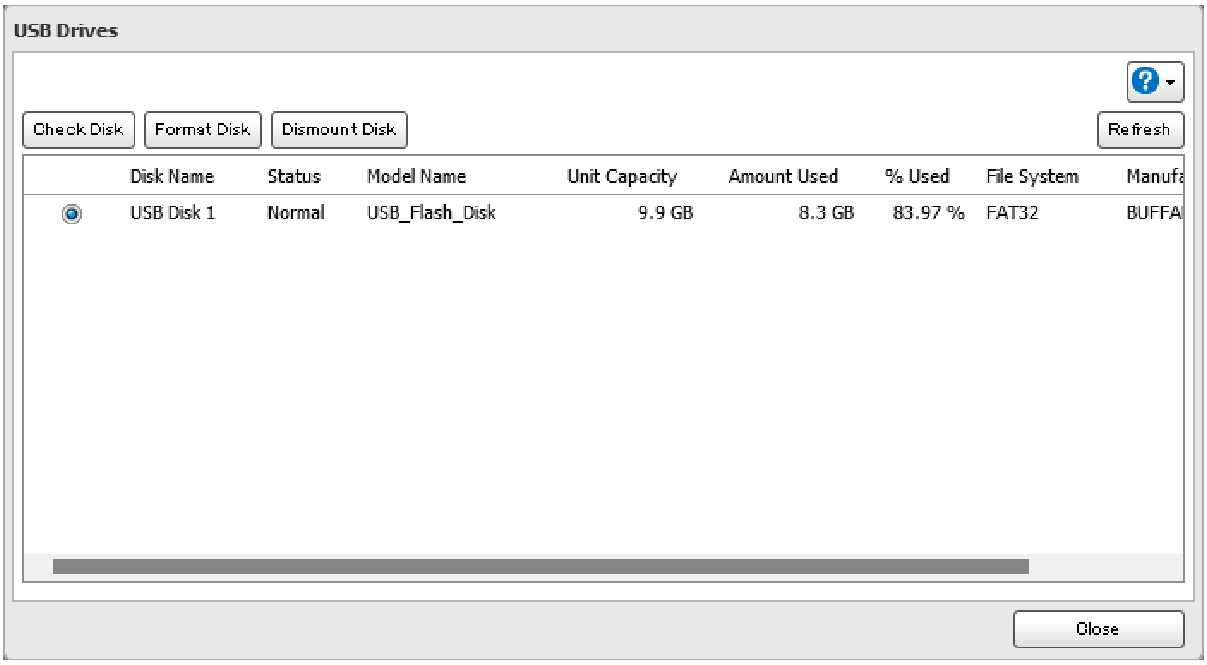
1 From Advanced Settings, click *Drives*.



2 Click the settings icon (⤢) to the right of "Drives" to dismount an internal drive or "USB Drives" to dismount an external drive.


Drives
USB Drives

3 Select the drive to dismount and click *Dismount Disk*.


USB Drives
Check Disk
Format Disk
Dismount Disk
Refresh
Close

	Disk Name	Status	Model Name	Unit Capacity	Amount Used	% Used	File System	Manufa
●	USB Disk 1	Normal	USB_Flash_Disk	9.9 GB	8.3 GB	83.97 %	FAT32	BUFFA

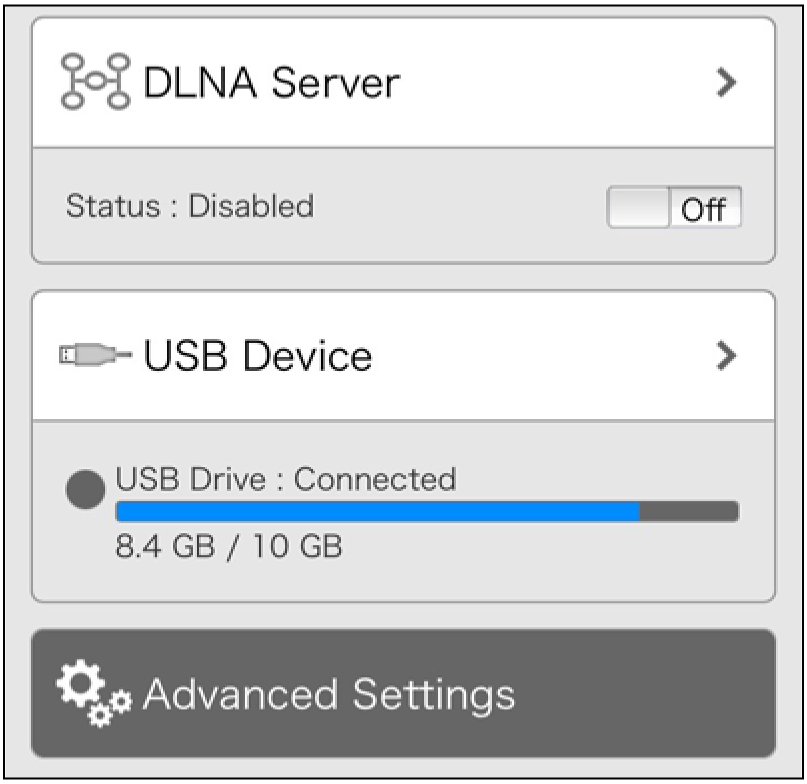
4 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

5 The process is complete once you close the confirmation window that appears.

When the dismounting process is finished, it is safe to unplug the drive. Disconnect the drive from the LinkStation.

Using a Mobile Device

1 From Settings, tap *USB Device*.

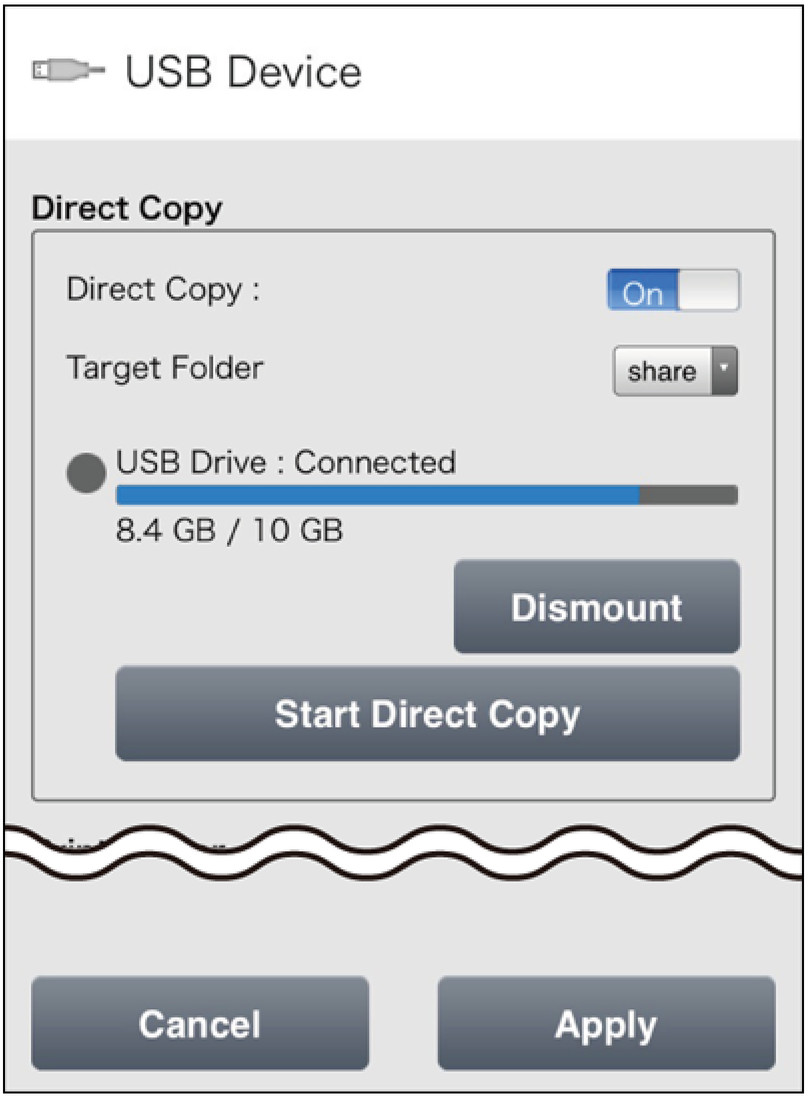


DLNA Server
Status : Disabled
Off
USB Device
Advanced Settings

USB Drive : Connected

8.4 GB / 10 GB

2 Tap *Dismount*.


USB Device
Direct Copy
Direct Copy :
On
Target Folder
share
USB Drive : Connected
8.4 GB / 10 GB
Dismount
Start Direct Copy
Cancel
Apply

3 The process is complete once you unplug the USB device and tap *OK*.

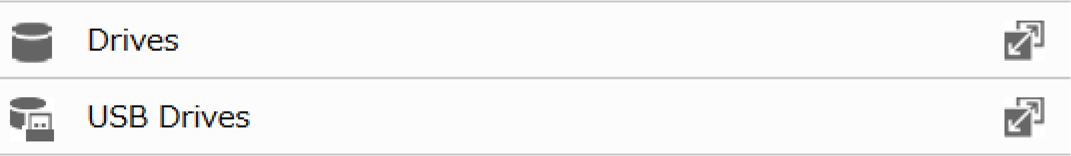
Note: To remount the drive, unplug it and then plug it back in.

Checking Drives

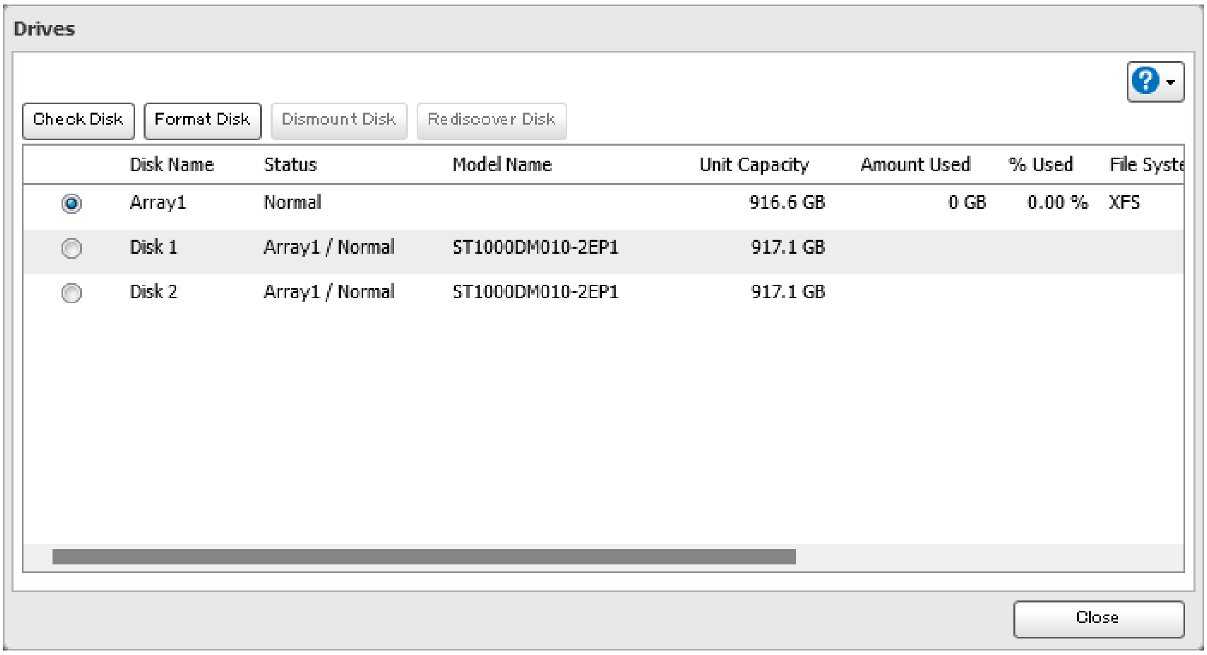
A drive check tests the data on a drive on the LinkStation or one that is connected via USB for integrity. Detected errors are fixed automatically. With large drives, a drive check may run for many hours. Shared folders cannot be accessed during a drive check. Do not turn off the LinkStation until the drive check is finished. Follow the procedure below to run a drive check.

1 From Advanced Settings, click *Drives*.

2 Click the settings icon (⇗) to the right of "Drives" to check an internal drive or "USB Drives" to check an external drive.

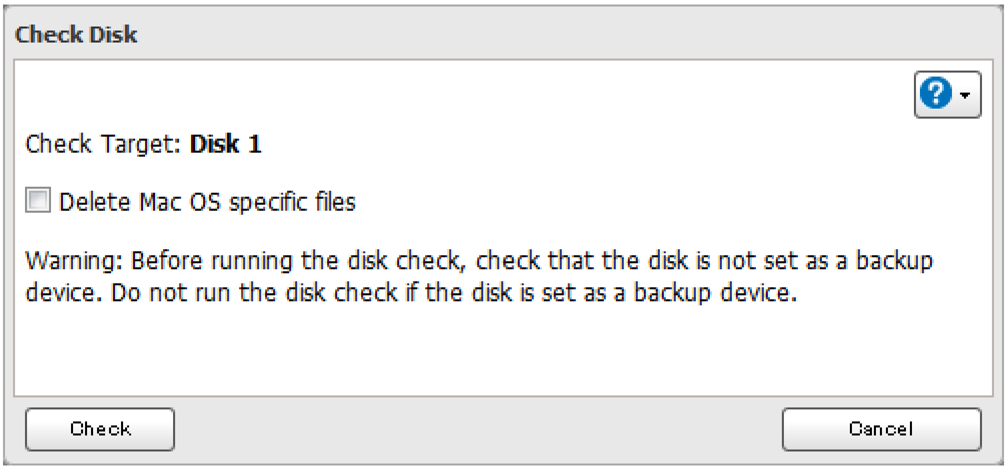

Drives
USB Drives

3 Select the drive or array to test, then click *Check Disk*.


Drives
Check Disk
Format Disk
Dismount Disk
Rediscover Disk
Close

	Disk Name	Status	Model Name	Unit Capacity	Amount Used	% Used	File Syste
●	Array1	Normal		916.6 GB	0 GB	0.00 %	XFS
○	Disk 1	Array1 / Normal	ST1000DM010-2EP1	917.1 GB			
○	Disk 2	Array1 / Normal	ST1000DM010-2EP1	917.1 GB			

4 Click *Check*. You have the option of deleting information files from macOS during the check if desired.


Check Disk
Check
Cancel

Check Target: **Disk 1**

☐ Delete Mac OS specific files

Warning: Before running the disk check, check that the disk is not set as a backup device. Do not run the disk check if the disk is set as a backup device.

5 Either the `I14` message for RAID arrays, the `I21` message for drives, or the `I27` message for USB drives will appear as a notification.

6 The process is complete once you close the confirmation window that appears.

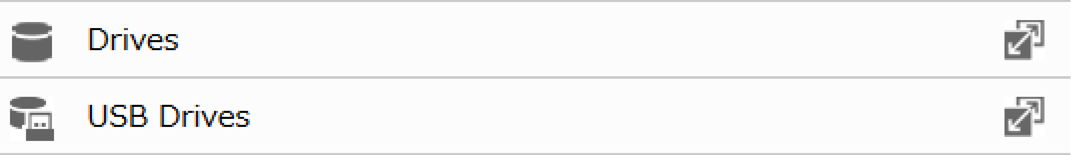
Formatting Drives

Notes:

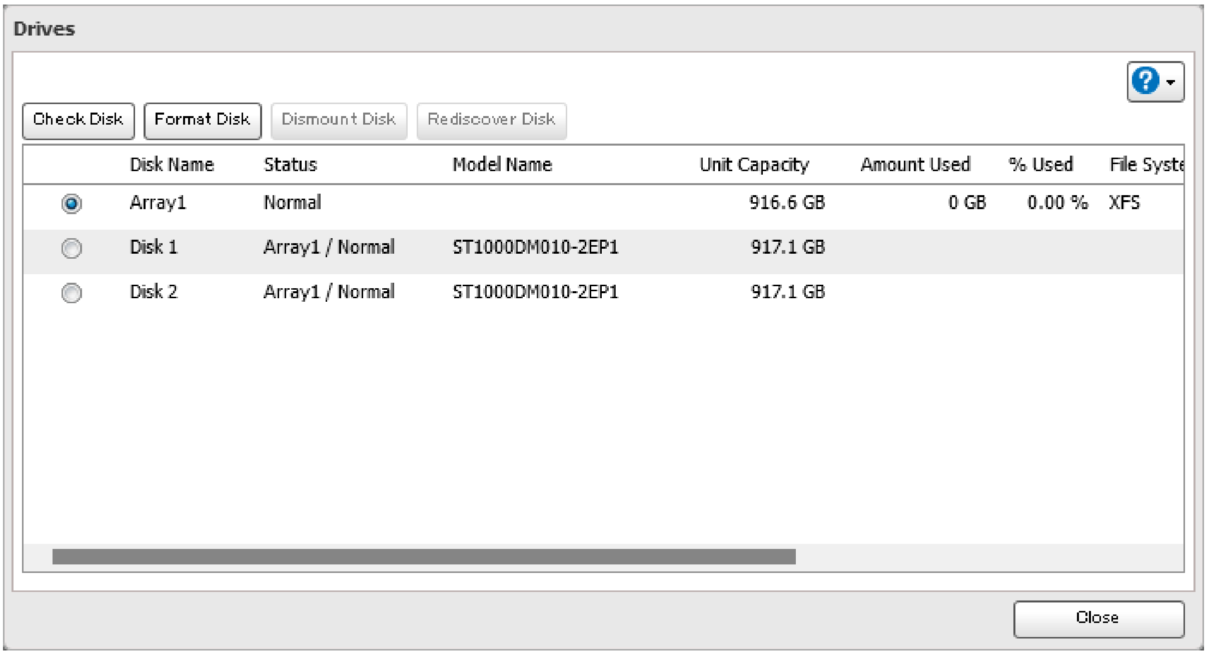
- Under some circumstances, data deleted when a drive is formatted can be recovered. To ensure that data is "gone forever", a format might not be sufficient. Refer to the "Erasing Data on the LinkStation Completely" section below for more information.
- After a drive is formatted, the "% Used" and "Amount Used" in Settings will not be 0. This is because some drive space is used for the system area.

1 From Advanced Settings, click *Drives*.

2 Click the settings icon (⤢) to the right of "Drives" to format an internal drive or "USB Drives" to format an external drive.



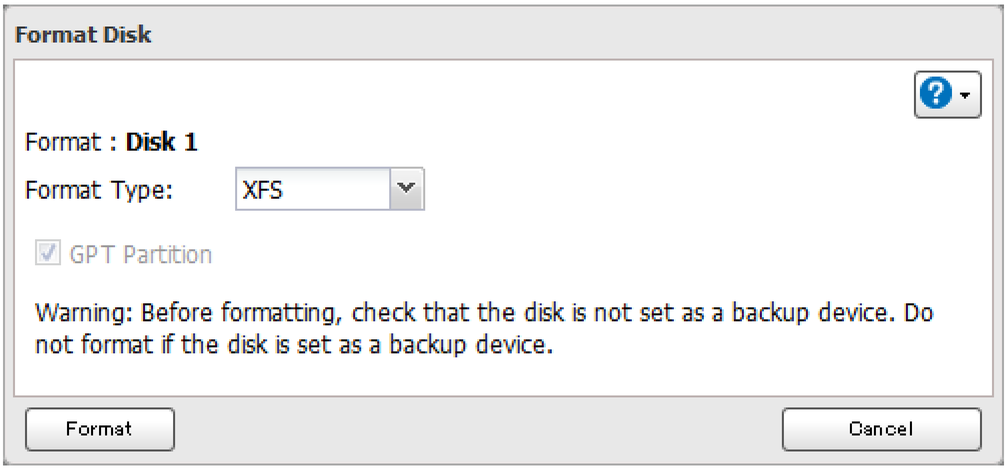
3 Select the drive or array to format, then click *Format Disk*.



	Disk Name	Status	Model Name	Unit Capacity	Amount Used	% Used	File Syste
●	Array1	Normal		916.6 GB	0 GB	0.00 %	XFS
○	Disk 1	Array1 / Normal	ST1000DM010-2EP1	917.1 GB			
○	Disk 2	Array1 / Normal	ST1000DM010-2EP1	917.1 GB			

Note: If you connect an external drive to the LinkStation and the drive status is still shown as "Unformatted", refresh the status by clicking *Rediscover Disk*. If the status doesn't change, disconnect and reconnect the USB drive.

4 Select a format type, then click *Format*.



Format : **Disk 1**

Format Type: XFS

☑ GPT Partition

Warning: Before formatting, check that the disk is not set as a backup device. Do not format if the disk is set as a backup device.

5 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

6 Depending on the size of your drive, the format may take several minutes or several hours to complete. Either the `I13` message for RAID arrays, the `I20` message for drives, or the `I28` message for USB drives will appear as a notification.

7 The process is complete once you close the confirmation window that appears.

Notes:

- Do not turn off or disconnect power to the LinkStation while formatting a drive.
- For drives that are 2.2 TB or larger, make sure that the "GPT Partition" checkbox is selected. If you accidentally format a larger drive without GPT, disconnect and then reconnect it before reformatting with GPT.

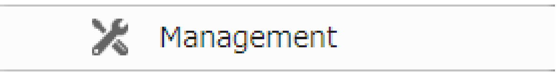
Erasing Data on the LinkStation Completely

Under some circumstances, data from formatted drives can be recovered. The drive erasure process in this section does a much more thorough job of erasing data. This procedure is recommended for removing all data from a drive in a way that makes it nearly impossible to recover with current tools. The LinkStation will then be in the following state:

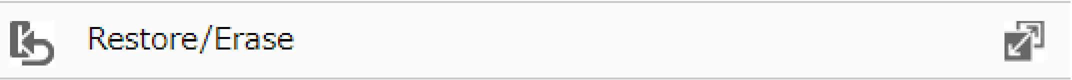
- Both drives in JBOD
- An empty shared folder on each drive
- All settings returned to their default values
- All logs deleted

Follow the procedure below to completely and permanently erase all data from your LinkStation.

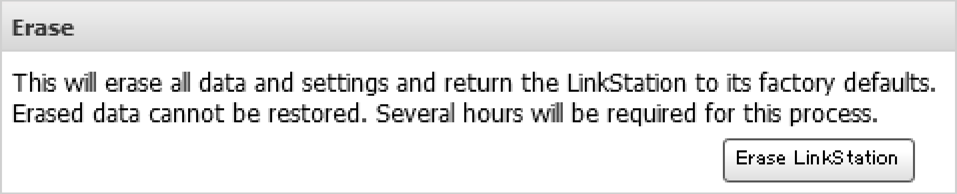
1 From Advanced Settings, click *Management*.



2 Click the settings icon (↗) to the right of "Restore/Erase".



3 Click *Erase LinkStation*.



Erase

This will erase all data and settings and return the LinkStation to its factory defaults. Erased data cannot be restored. Several hours will be required for this process.

4 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

5 The complete format process will begin. The process is complete after the LinkStation has been restarted and the power LED turns from blinking to glowing.

Quotas

You can set a quota for each user or group.

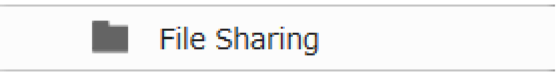
Notes:

- When using quotas, disable the recycle bin or empty the trash folder often. The limited space includes the space used for trash.
- Quotas apply per drive or per array. If a quota is set to 1 GB, each array or drive can use a maximum of 1 GB.
- Quotas cannot be set for external drives connected to the LinkStation.
- If both user and group quotas are configured for a user, the most restrictive quota will always apply.

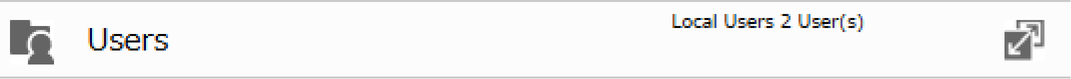
Limits for Users

Follow this procedure to limit the shared folder space available for a user.

1 From Advanced Settings, click *File Sharing*.

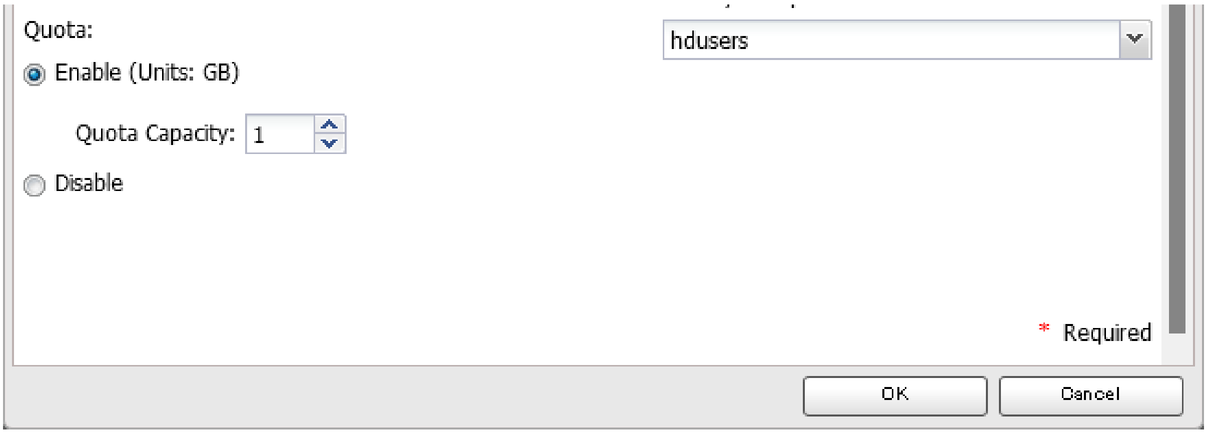


2 Click the settings icon ( ) to the right of "Users".



3 Select the user that will be given a quota and click *Edit*. If you want to set a quota for a new user, create a user by referring to the "Adding a User" section in chapter 3.

4 Enable "Quota" and choose the maximum amount of space the user will be allowed to use, then click *OK*.



Quota:

● Enable (Units: GB)

Quota Capacity: 1

○ Disable

hdusers

* Required

5 Click *Close*.

6 Click ⏻▼ at the top-right of Settings and choose *Restart*.

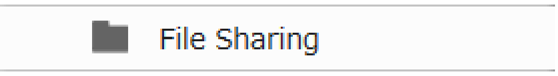
7 The process is complete after the LinkStation has been restarted.

Note: If you change the primary group, restart the LinkStation to apply the quota settings.

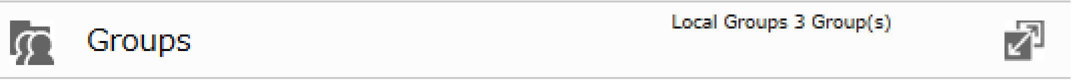
Limits for Groups

Follow the procedure below to limit the space for shared folders that each group can use.

1 From Advanced Settings, click *File Sharing*.

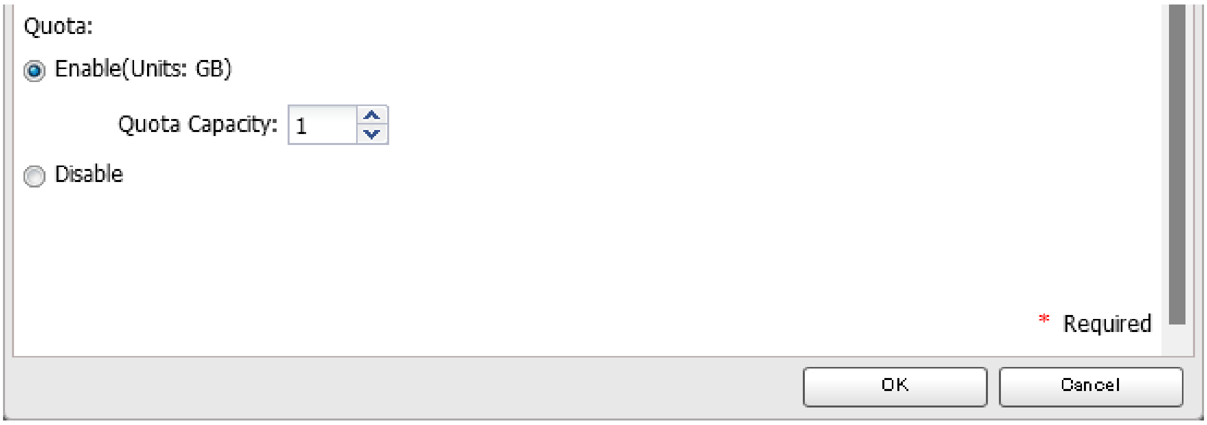


2 Click the settings icon (⤢) to the right of "Groups".



3 Select the group that will be given a quota and click *Edit*. If you want to set a quota for a new group, create a group by referring to the "Adding a Group" section in chapter 3.

4 Enable "Quota" and choose the maximum amount of space the group will be allowed to use, then click *OK*.



Quota:

● Enable(Units: GB)

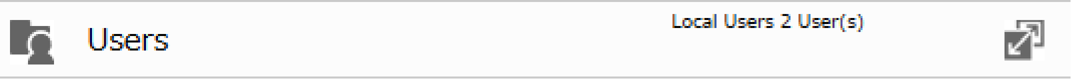
Quota Capacity: 1

○ Disable

* Required

5 Click *Close*.

6 Click the settings icon (⤢) to the right of "Users".



Users

Local Users 2 User(s)

7 Select the user that will inherit the group quota settings and click *Edit*. If you want to add a new user to a group with a quota, create a user by referring to the "Adding a User" section in chapter 3.

8 Select the group's checkbox to join and change the user's primary group to the group with the quota, then click *OK*.

9 Click *Close*.

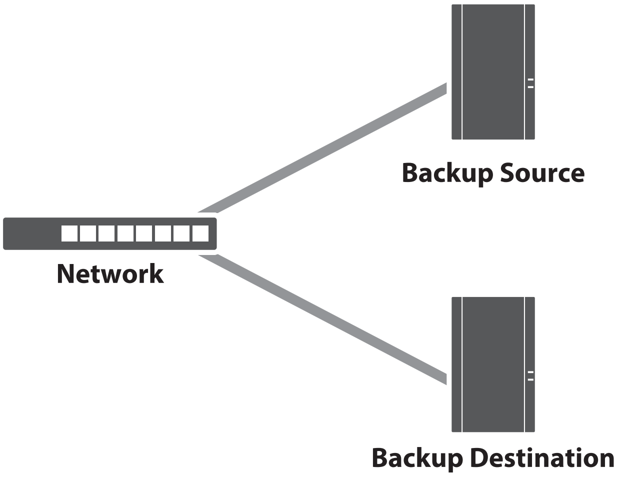
10 Click ⏻▼ at the top-right of Settings and choose *Restart*.

11 The process is complete after the LinkStation has been restarted.

Chapter 5 Backup

Backing Up Data on the LinkStation

You can back up the LinkStation folders to another shared folder on the same LinkStation, a connected USB drive, or a shared folder on another Buffalo NAS device, either on the same network or on another network.



Backup Modes

The following types of backup are available from this LinkStation. To restore data from backup, refer to the "Restoring Backup Data" section below.

Normal Backup

All files in the source will be backed up to the destination. The backup data will be stored in the folder whose name will be the backup date and time.

- **Folders available as backup sources:**
  - Shared folder on the backup source LinkStation (excluding the "info" folder)
  - USB drive connected to the backup source LinkStation
  - Shared folder on another Buffalo NAS device*
- **Folders available as backup destinations:**
  - Shared folder on the backup source LinkStation (excluding the "info" folder)*
  - USB drive connected to the backup source LinkStation*
  - Shared folder on another Buffalo NAS device*,**

*The folder should have the "Backup" checkbox selected under "LAN Protocol Support" on the shared folder settings.
**You can select up to the second level of folders.

Overwrite (Incremental)

The first backup job runs like a normal backup. As each subsequent backup job runs, only files that have been changed since the last normal backup will be backed up, but any files deleted from the backup source folder will also remain in the backup destination folder. The folder structure in the backup destination folder will be the same as the backup source folder.

- **Folders available as backup sources:**
  - Shared folder on the backup source LinkStation (excluding the "info" folder)

  - USB drive connected to the backup source LinkStation
  - Shared folder on another Buffalo NAS device*
- **Folders available as backup destinations:**
  - Shared folder on the backup source LinkStation (excluding the "info" folder)*
  - USB drive connected to the backup source LinkStation*
  - Shared folder on another Buffalo NAS device*,**

*The folder should have the "Backup" checkbox selected under "LAN Protocol Support" on the shared folder settings.
**You can select up to the second level of folders.

Overwrite (Differential)

The first backup job runs like a normal backup. As each subsequent backup job runs, only files that have been changed since the last normal backup will be backed up, and any files deleted from the backup source folder will also be deleted from the backup destination folder. The backup destination folder will always remain the same size as the backup source folder, and the folder structure in the backup destination folder will be the same as the backup source folder.

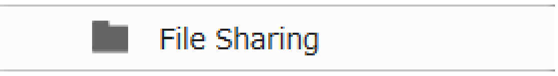
- **Folders available as backup sources:**
  - Shared folder on the backup source LinkStation (excluding the "info" folder)
  - USB drive connected to the backup source LinkStation
  - Shared folder on another Buffalo NAS device*
- **Folders available as backup destinations:**
  - Shared folder on the backup source LinkStation (excluding the "info" folder)*
  - USB drive connected to the backup source LinkStation*
  - Shared folder on another Buffalo NAS device*,**

*The folder should have the "Backup" checkbox selected under "LAN Protocol Support" on the shared folder settings.
**You can select up to the second level of folders.

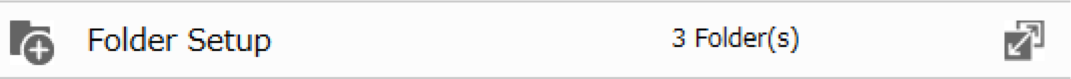
Preparing a Backup Destination

Configure a shared folder on a Buffalo NAS device or connected USB drive as a backup destination. The following procedure explains using another shared folder on the LinkStation as a backup destination. The procedure may vary depending on which Buffalo NAS device is selected as a destination.

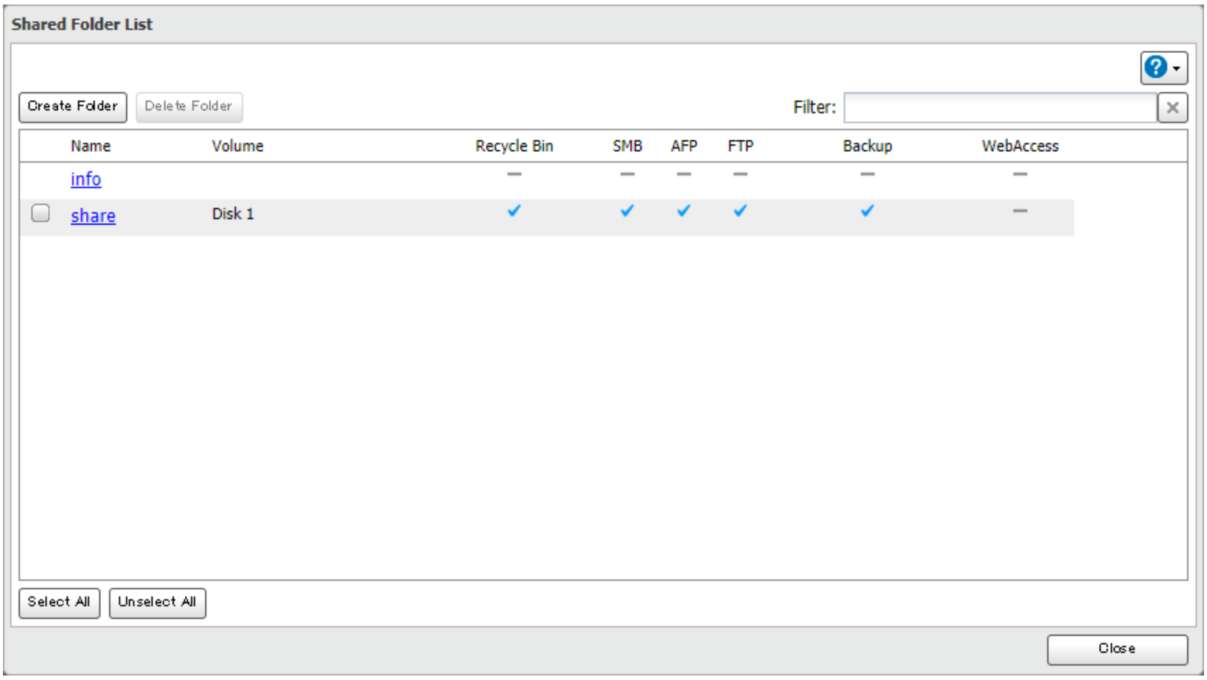
1 From Advanced Settings, click *File Sharing*.



2 Click the settings icon (⤢) to the right of "Folder Setup".


Folder Setup 3 Folder(s)

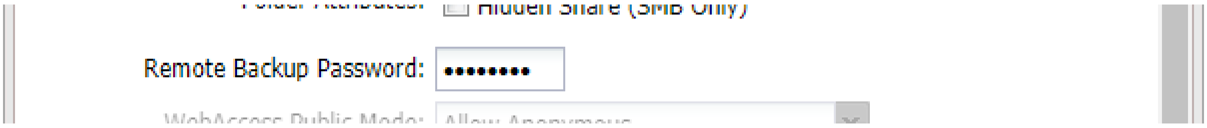
3 Choose the folder to be set as a backup destination.



	Name	Volume	Recycle Bin	SMB	AFP	FTP	Backup	WebAccess
	info		—	—	—	—	—	—
☐	share	Disk 1	✓	✓	✓	✓	✓	—

4 Click *Edit* and under "LAN Protocol Support", select the "Backup" checkbox.

5 Enter the desired characters into the remote backup password field and click *OK*.


Remote Backup Password: ••••••••

Notes:

- You may leave this field blank if you do not want a backup password, but for security reasons we highly recommend entering one for the shared folder. If a backup password is configured for the shared folder, that folder will not show up as a target for the backup source or destination when configuring a backup job on another Buffalo NAS device unless it's entered. You may create multiple folders using different backup passwords for backup, but only one password can be used on the LinkStation. Folders that are configured with a different password cannot be used.
- A backup password is not available when a new shared folder is created by a power user.

6 The process is complete once you close the confirmation window that appears.

Note: If you want to back up to a Buffalo NAS device on another network, follow the procedure below to add the Buffalo NAS device so it can be used as a backup destination.

(1) Create a new backup job by referring to the "Configuring a Backup Job" section below.

(2) From the Backup Job Settings screen, click *LinkStation and TeraStation List*.

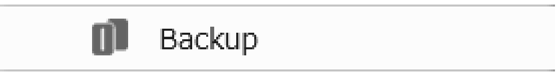
(3) Click *Add*; enter the IP address or hostname/FQDN of the destination Buffalo NAS device, then click *OK*.

(4) Click *Refresh* and make sure the desired Buffalo NAS device has been added to the list.

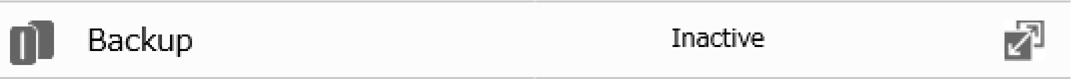
Configuring a Backup Job

You can configure backup jobs by using another shared folder on the Buffalo NAS device or a USB drive connected to the LinkStation as a destination. You can also back up to a Buffalo NAS device on another network as long as the two networks are connected by a VPN or the route is configured properly.

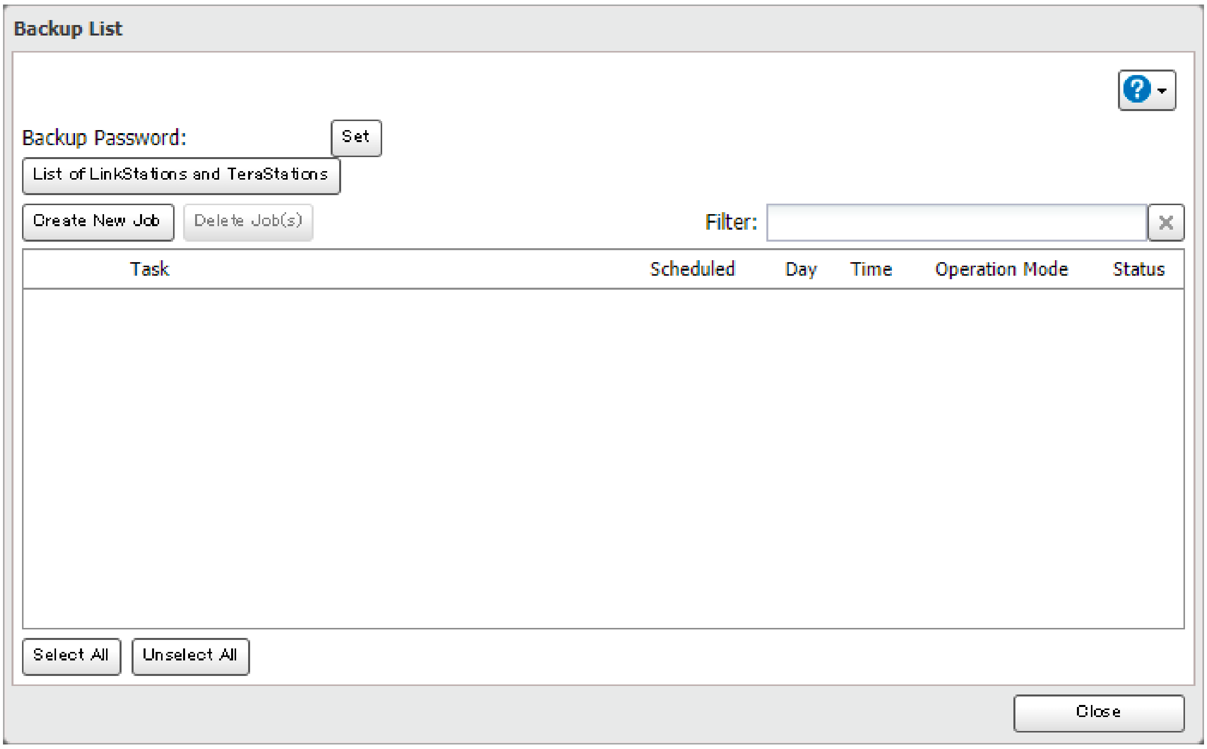
1 From Advanced Settings, click *Backup*.



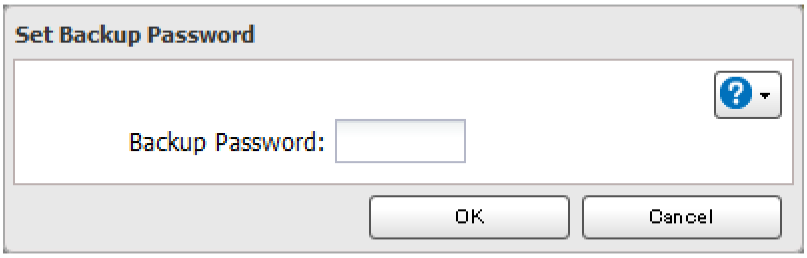
2 Click the settings icon (↗) to the right of “Backup”.


Backup
Inactive

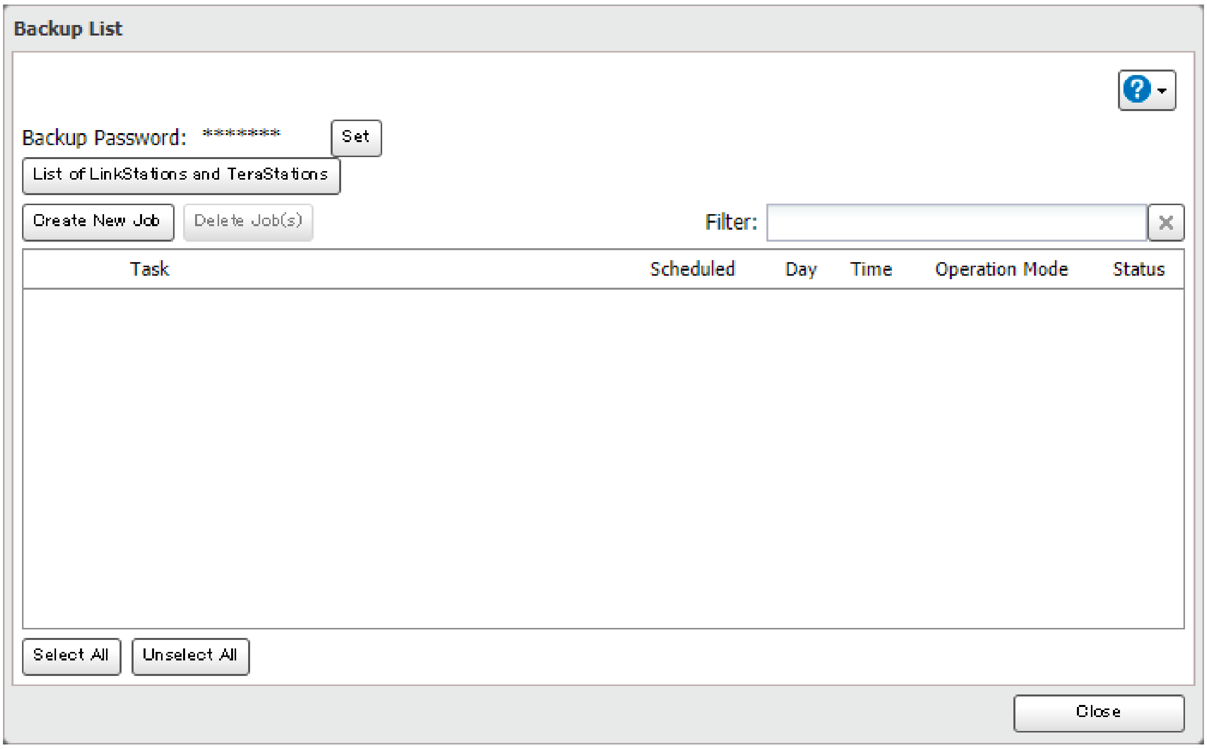
3 If you had configured a backup password for the backup source folder on another Buffalo NAS device or the backup destination folder, click *Set*. If you hadn’t, skip to step 5.


Backup List
Backup Password:
Set
List of LinkStations and TeraStations
Create New Job
Delete Job(s)
Filter:
Task
Scheduled
Day
Time
Operation Mode
Status
Select All
Unselect All
Close

4 Enter the backup password and click *OK*.

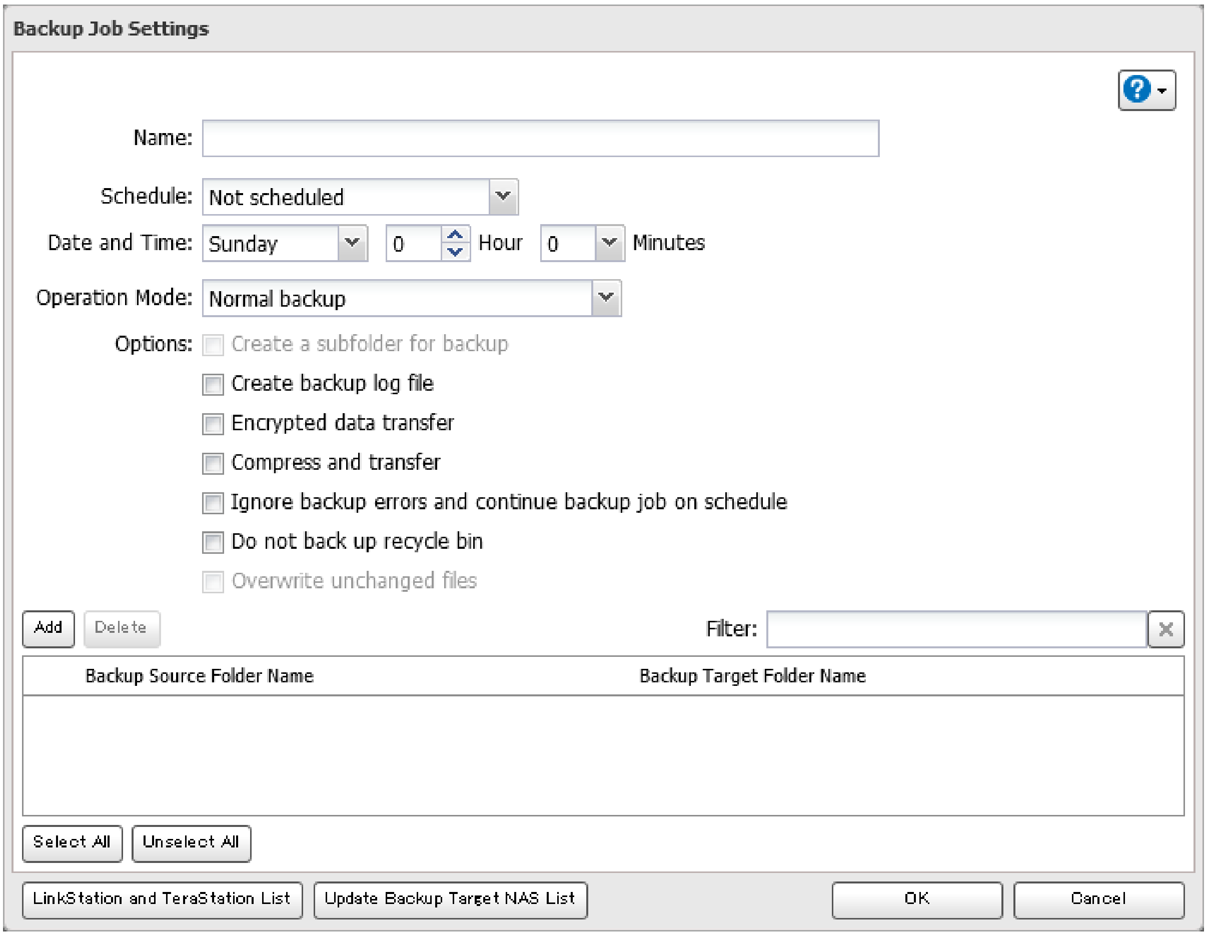

Set Backup Password
Backup Password:
OK
Cancel

5 Click *Create New Job*.


Backup List
List of LinkStations and TeraStations
Create New Job
Delete Job(s)
Filter:
Task
Scheduled
Day
Time
Operation Mode
Status
Select All
Unselect All
Close

Backup Password: ******** Set

6 Select backup settings such as date and time to run, then select a backup mode for the "Operation Mode" drop-down list. Refer to the differences between the backup modes from the "Backup Modes" section above.


Backup Job Settings
Add
Delete
Filter:
Backup Source Folder Name
Backup Target Folder Name
Select All
Unselect All
LinkStation and TeraStation List
Update Backup Target NAS List
OK
Cancel

Name:

Schedule: Not scheduled

Date and Time: Sunday 0 Hour 0 Minutes

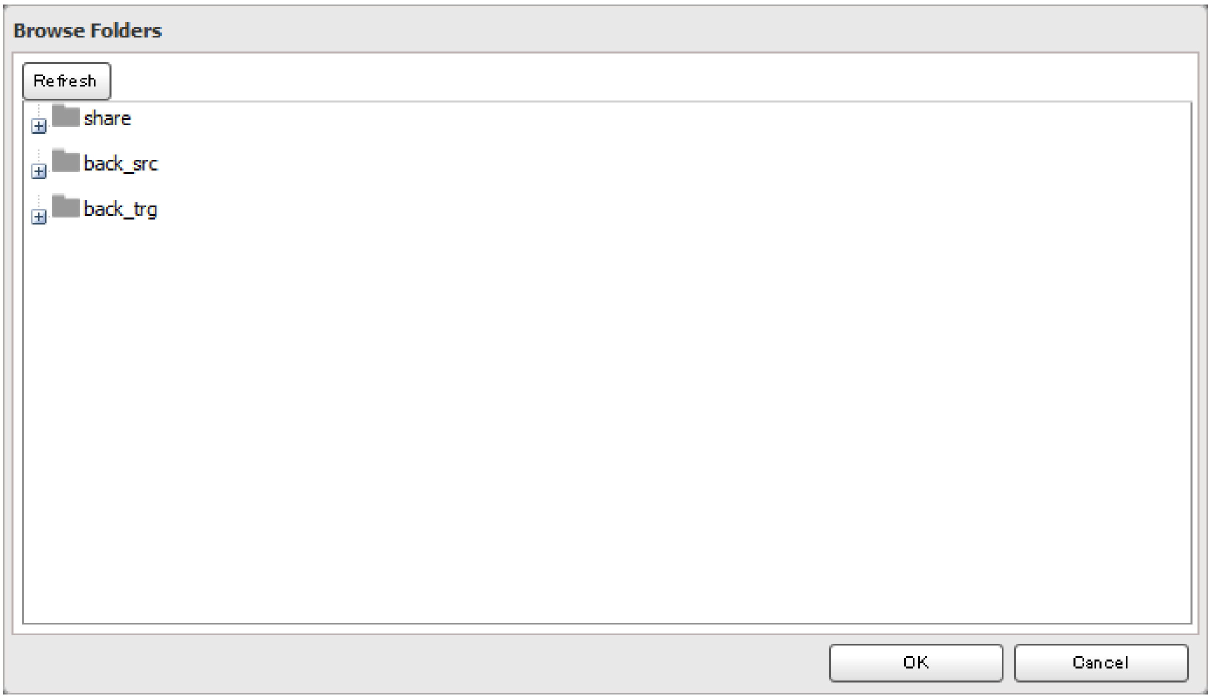
Operation Mode: Normal backup

Options:
- ☐ Create a subfolder for backup
- ☐ Create backup log file
- ☐ Encrypted data transfer
- ☐ Compress and transfer
- ☐ Ignore backup errors and continue backup job on schedule
- ☐ Do not back up recycle bin
- ☐ Overwrite unchanged files

7 Click *Add*.

8 Click *Browse* under "Backup Source Folder Name".

9 Select the shared folder that will be the backup source, then click *OK*.

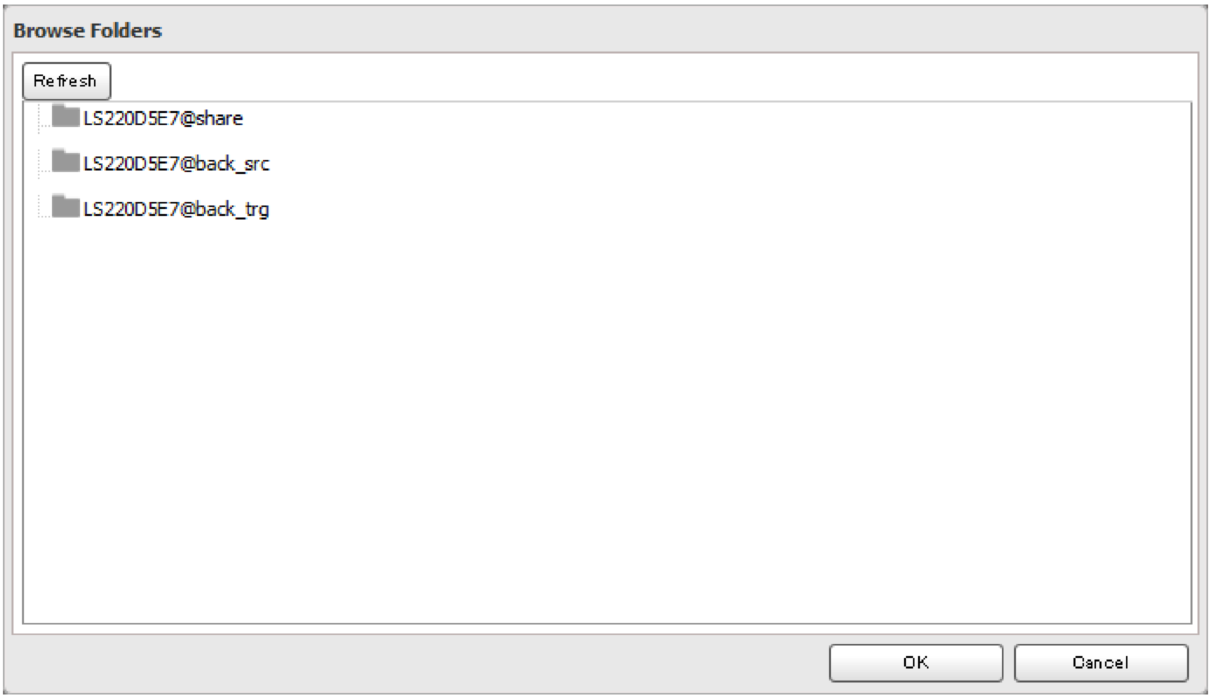


Browse Folders

Refresh
share
back_src
back_trg
OK
Cancel

10 Click *Browse* under "Backup Target Folder Name".

11 Select the shared folder that will be the backup destination.



Browse Folders

Refresh
LS220D5E7@share
LS220D5E7@back_src
LS220D5E7@back_trg
OK
Cancel

12 Click *OK*, then click *OK* again.

13 The process is complete once you close the confirmation window that appears. The backup job will be added to the backup jobs list.

Notes:

- Up to eight backup jobs can be configured.
- To back up data between Buffalo NAS devices on a network using jumbo frames, make sure that both devices are configured to use identical (or similar) Ethernet frame sizes. If Ethernet frame sizes are significantly different, the backup job may not be properly performed. In such a case, select the default frame size (1,500 bytes) for both devices.
- Backup data, such as ".DS_Store" files, from macOS may include characters that cannot be read on FAT32-formatted drives in its filename. For best results, reformat the drive before using it as a backup destination.

Restoring Backup Data

The procedure for restoring backup data varies depending on the backup mode. Refer to the following subsection corresponding to the backup mode you have used for backup. When restoring backup data, make sure you have enough available space on the LinkStation to accommodate the backup data, otherwise the restore process will fail.

Full Backup

Copy and paste the backed up files from the backup destination folder to a folder which you want to restore.

Overwrite Backups (Incremental and Differential)

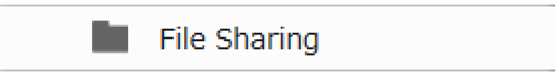
Files and folders have already been stored on the desired destination. You can access them by switching the operation to the backup destination LinkStation. Alternatively, you can restore any files or folders by creating a backup job and configuring the backup destination as a backup source and selecting the same backup mode for the "Operation Mode" drop-down list. Do not use the same folder as the backup destination to restore backup data from multiple backup sources, as this may cause the restored data to get overwritten.

Backing Up Your Mac with Time Machine

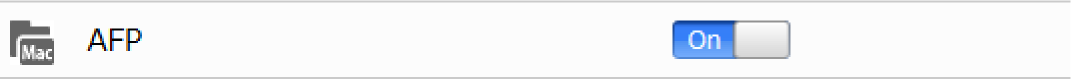
Time Machine is a backup program included with macOS. Configure your LinkStation as shown below to use Time Machine.

1. Preparing a Shared Folder for Time Machine

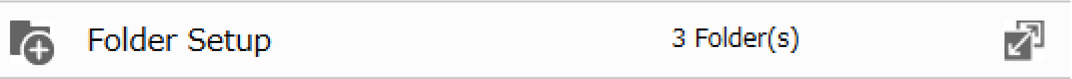
1 From Advanced Settings, click *File Sharing*.



2 Move the AFP switch (Off) to the On position to enable AFP.


AFP On

3 Click the settings icon (⧉) to the right of "Folder Setup".


Folder Setup 3 Folder(s)

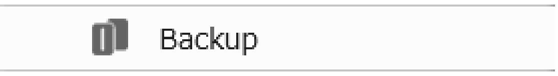
4 Choose a shared folder as your backup destination for Time Machine.

5 Click *Edit* and under "LAN Protocol Support", select the "AFP (Mac)" checkbox and click *OK*.

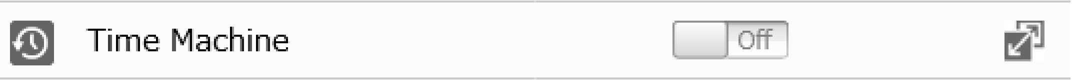
6 The process is complete once you close the confirmation window that appears.

2. Configuring a Shared Folder as a Backup Destination

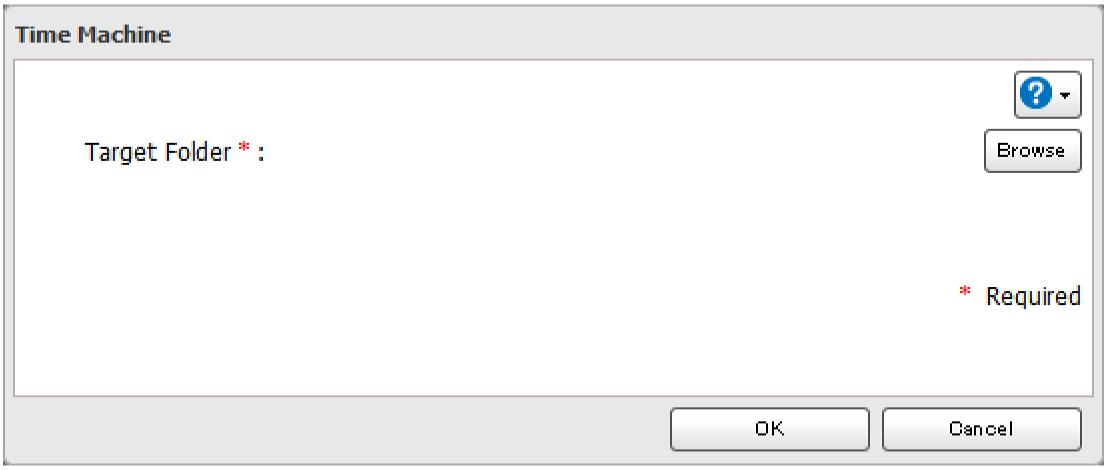
1 From Advanced Settings, click *Backup*.



2 Click the settings icon (⤢) to the right of "Time Machine".

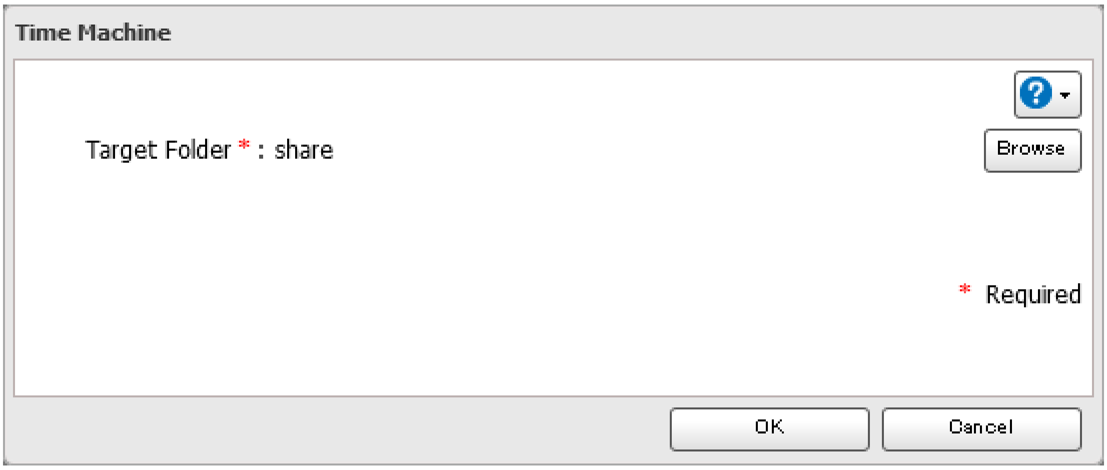

Time Machine
Off

3 Click *Edit*, then *Browse*.


Time Machine
Target Folder * :
Browse
* Required
OK
Cancel

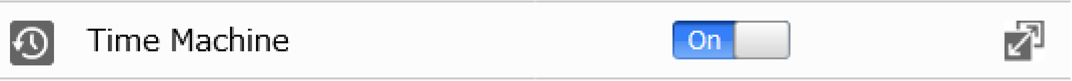
4 Select the shared folder and click *OK*.

5 Click *OK*, then click *OK* again.


Time Machine
Browse
* Required
OK
Cancel

Target Folder * : share

6 The process is complete when you move the Time Machine switch (Off) to the On position to enable Time Machine.

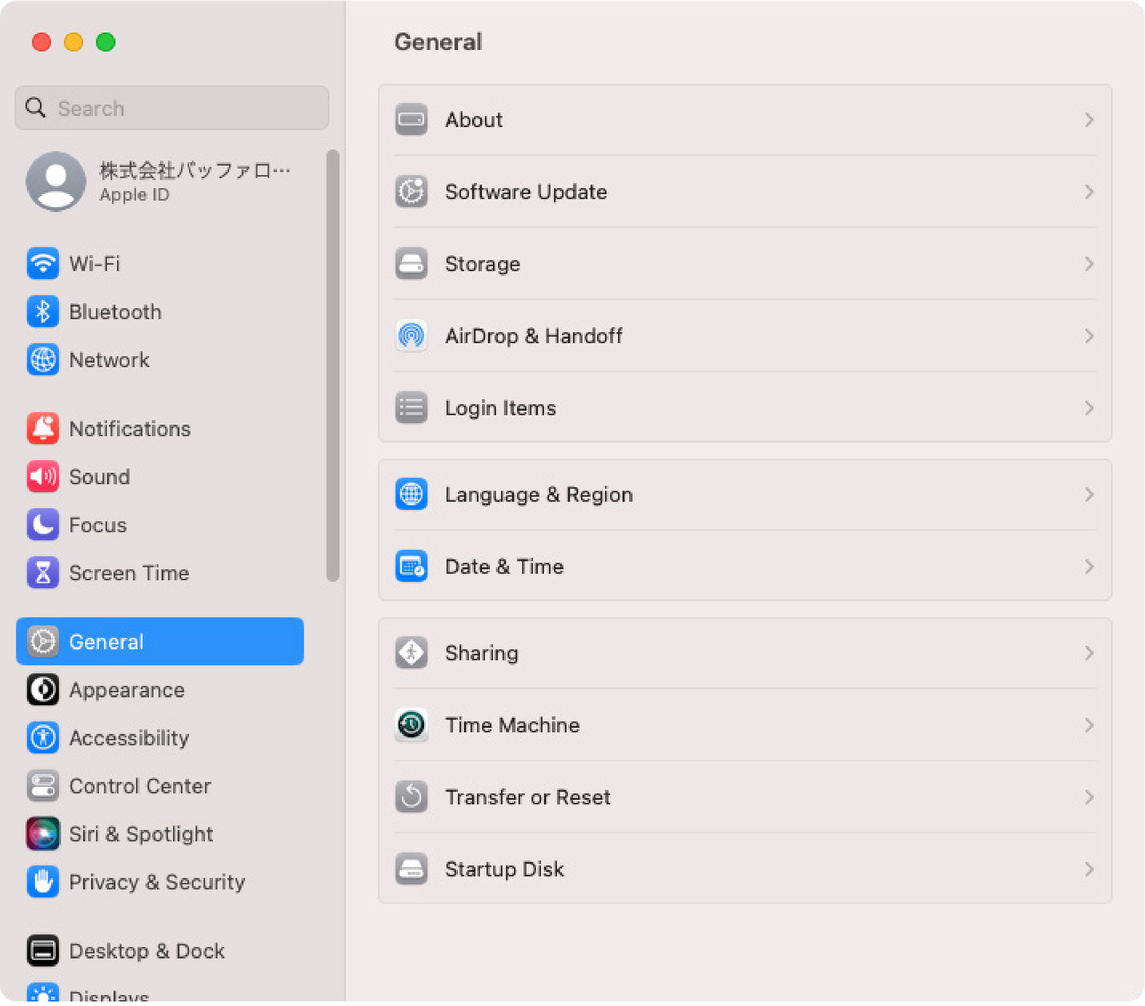

Time Machine
On

3. Configuring Time Machine on macOS

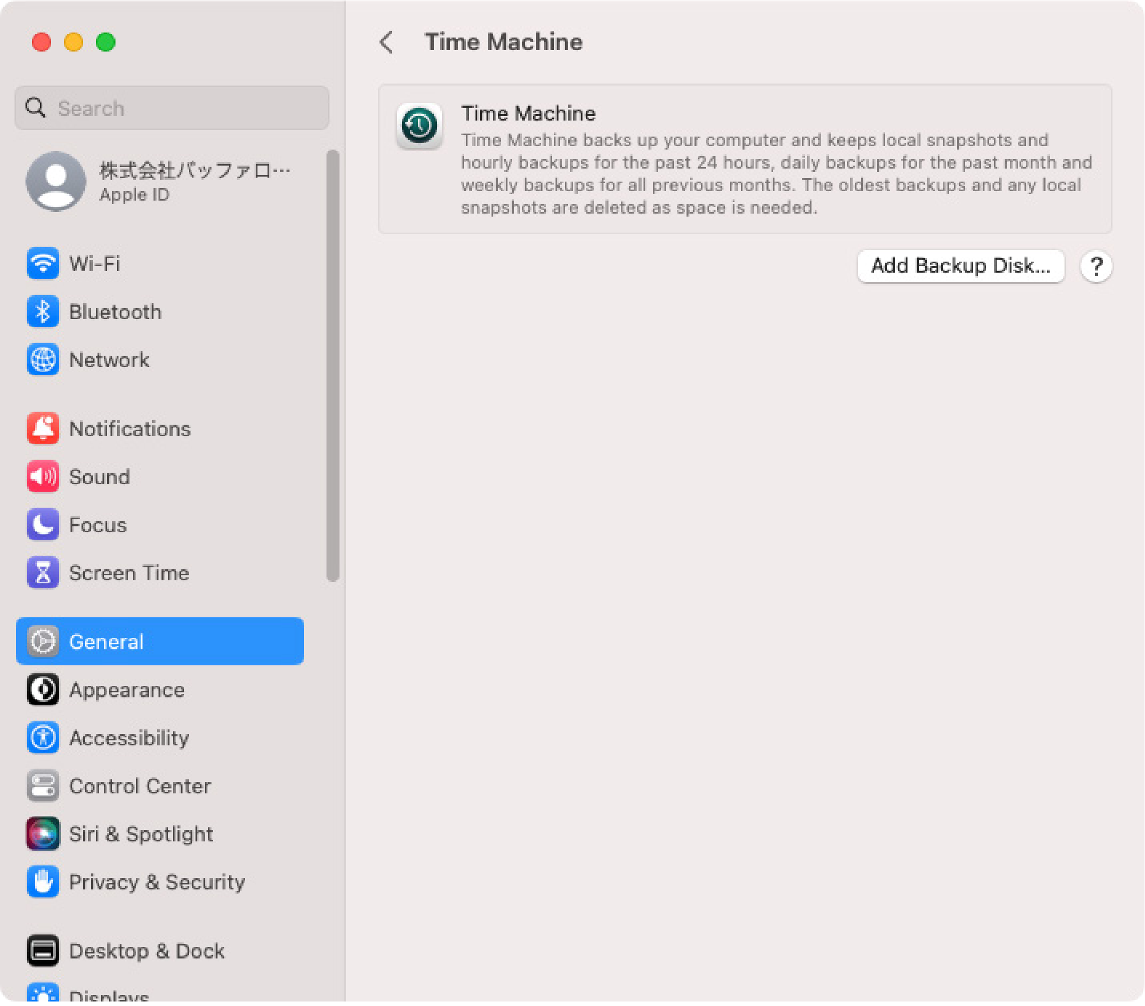
This procedure uses macOS 13.0 as an example.

1 From the Apple menu, open *System Settings*.

2 Navigate to *General* > *Time Machine*.


Search
株式会社バッファロー…
Apple ID
Wi-Fi
Bluetooth
Network
Notifications
Sound
Focus
Screen Time
General
Appearance
Accessibility
Control Center
Siri & Spotlight
Privacy & Security
Desktop & Dock
Displays
General
About
Software Update
Storage
AirDrop & Handoff
Login Items
Language & Region
Date & Time
Sharing
Time Machine
Transfer or Reset
Startup Disk

3 Click *Add Backup Disk*.

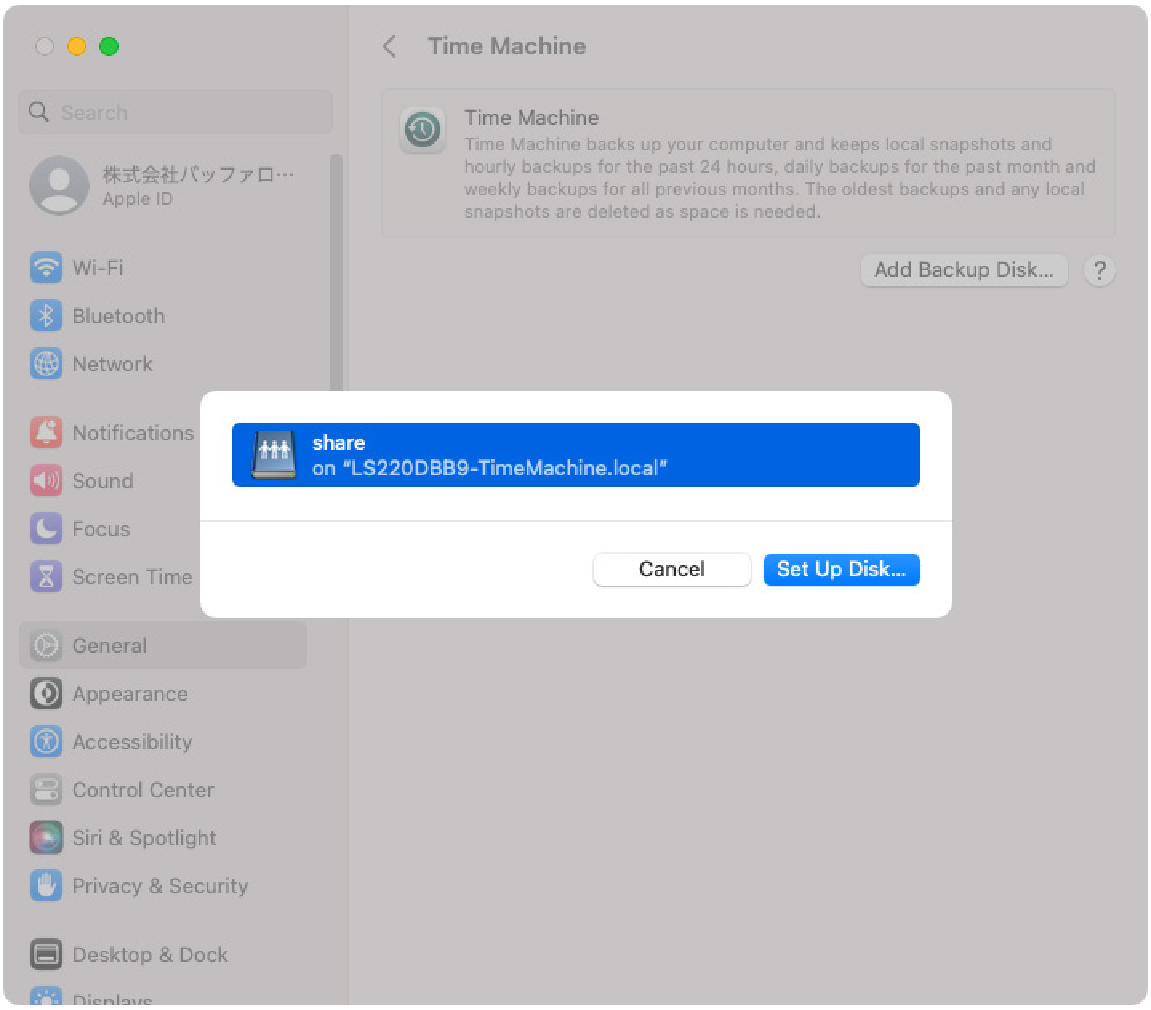


Search
株式会社バッファロ…
Apple ID
Wi-Fi
Bluetooth
Network
Notifications
Sound
Focus
Screen Time
General
Appearance
Accessibility
Control Center
Siri & Spotlight
Privacy & Security
Desktop & Dock
Displays
Time Machine
Add Backup Disk...
?

Time Machine

Time Machine backs up your computer and keeps local snapshots and hourly backups for the past 24 hours, daily backups for the past month and weekly backups for all previous months. The oldest backups and any local snapshots are deleted as space is needed.

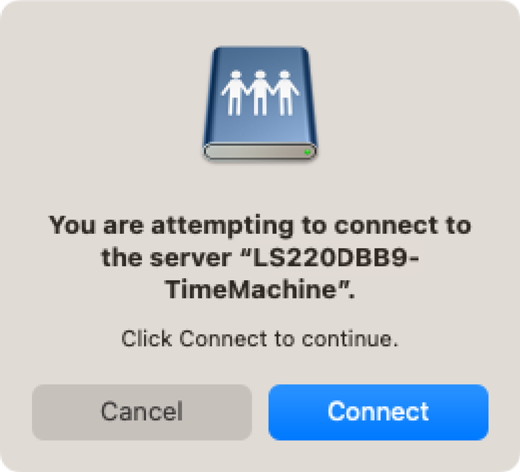
4 Select the shared folder, then click *Set Up Disk*.


Search
株式会社バッファロー…
Apple ID
Wi-Fi
Bluetooth
Network
Notifications
Sound
Focus
Screen Time
General
Appearance
Accessibility
Control Center
Siri & Spotlight
Privacy & Security
Desktop & Dock
Displays
Time Machine
Add Backup Disk...
?
share
on "LS220DBB9-TimeMachine.local"
Cancel
Set Up Disk...

Time Machine

Time Machine backs up your computer and keeps local snapshots and hourly backups for the past 24 hours, daily backups for the past month and weekly backups for all previous months. The oldest backups and any local snapshots are deleted as space is needed.

5 Click *Connect*.

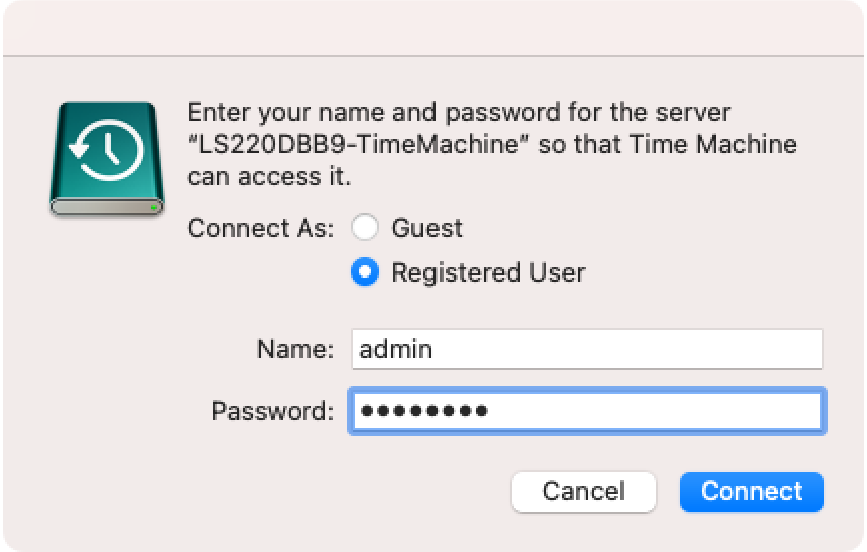

Cancel
Connect

You are attempting to connect to the server "LS220DBB9-TimeMachine".

Click Connect to continue.

6 Enter a username and password to be used for accessing the shared folder and click *Connect*.

If access restrictions are not configured on the destination share, log in using the administrator account. The default username and password for the administrator account are "admin" and "password". If access restrictions are configured, log in using an account with write privileges.



Enter your name and password for the server "LS220DBB9-TimeMachine" so that Time Machine can access it.

Connect As: ○ Guest ● Registered User

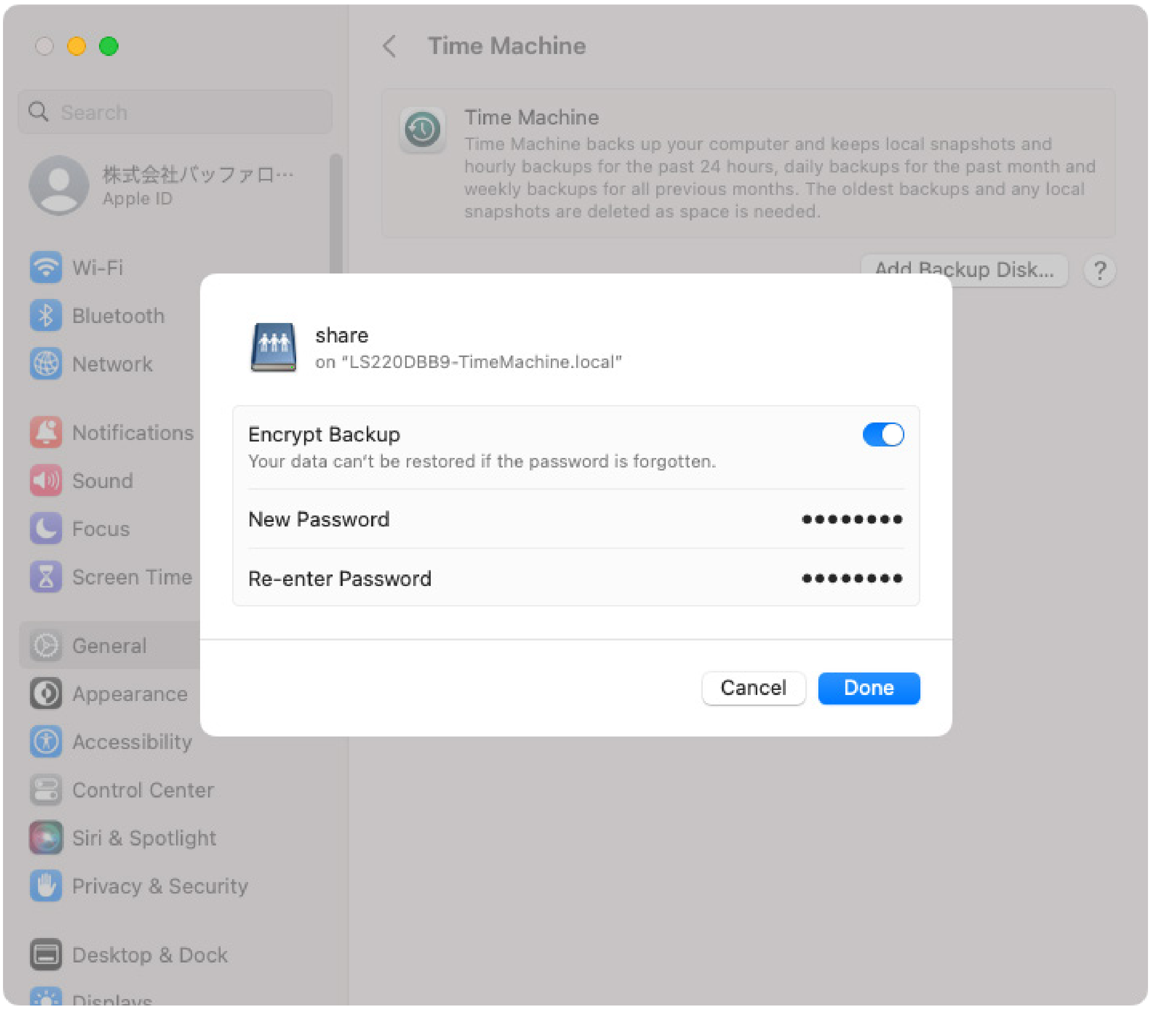
Name: admin

Password: ••••••••••

Cancel
Connect

7 Select whether to encrypt the backup data and click *Done*.

If enabling encryption, enter the password for backup twice.



Time Machine

Time Machine backs up your computer and keeps local snapshots and hourly backups for the past 24 hours, daily backups for the past month and weekly backups for all previous months. The oldest backups and any local snapshots are deleted as space is needed.

share
on "LS220DBB9-TimeMachine.local"

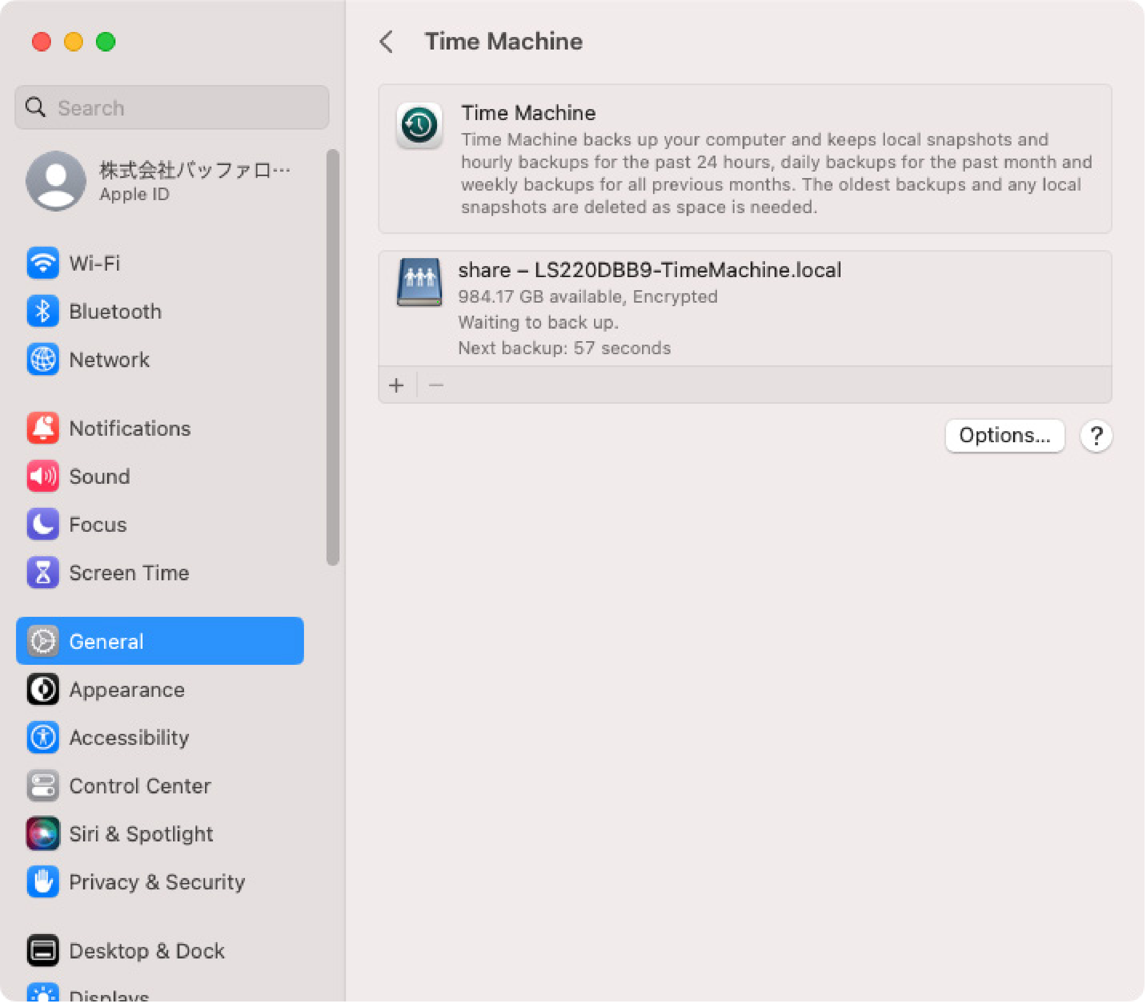
Encrypt Backup ●
Your data can't be restored if the password is forgotten.

New Password ••••••••••

Re-enter Password ••••••••••

Search
株式会社バッファロ…
Apple ID
Wi-Fi
Bluetooth
Network
Notifications
Sound
Focus
Screen Time
General
Appearance
Accessibility
Control Center
Siri & Spotlight
Privacy & Security
Desktop & Dock
Displays
Time Machine
Add Backup Disk...
?
Cancel
Done

8 The process is complete once Time Machine finishes counting down from 60 seconds. The backup process will then start.


Search
株式会社バッファロ…
Apple ID
Wi-Fi
Bluetooth
Network
Notifications
Sound
Focus
Screen Time
General
Appearance
Accessibility
Control Center
Siri & Spotlight
Privacy & Security
Desktop & Dock
Displays
+
−
Options...
?

Time Machine

Time Machine

Time Machine backs up your computer and keeps local snapshots and hourly backups for the past 24 hours, daily backups for the past month and weekly backups for all previous months. The oldest backups and any local snapshots are deleted as space is needed.

share – LS220DBB9-TimeMachine.local
984.17 GB available, Encrypted
Waiting to back up.
Next backup: 57 seconds

Copying from a USB Device

Use Direct Copy to copy data from a USB device directly to the LinkStation. You can configure or start Direct Copy from a computer or a mobile device. Follow the appropriate procedure below to configure or start Direct Copy.

Supported Devices:

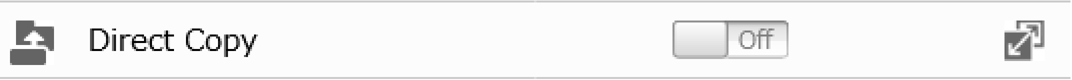
- USB mass storage devices
- Card readers (except for card readers that can recognize two or more memory cards)
- Digital cameras and other PTP devices

Configuring Direct Copy

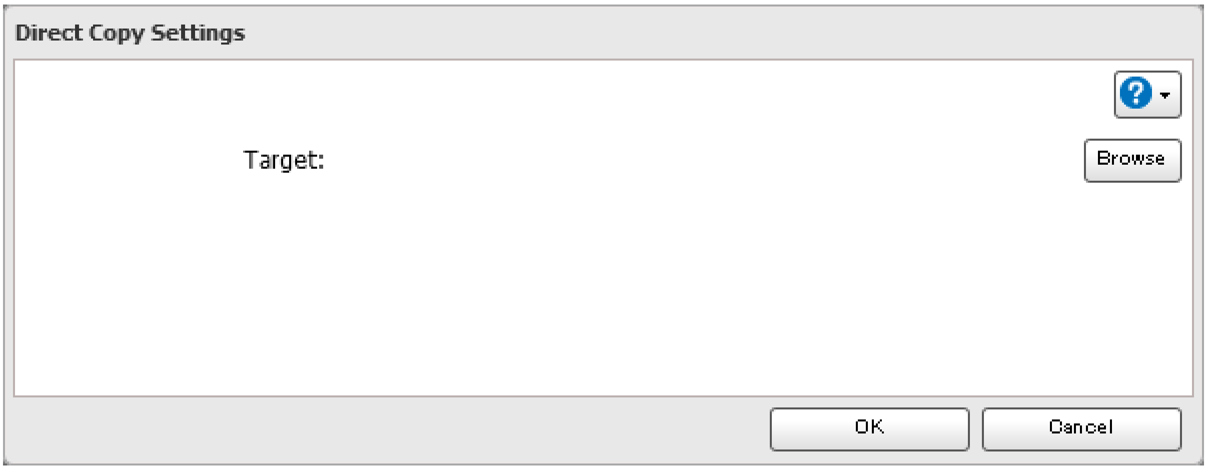
Using a Computer

1 From Advanced Settings, click *Backup*.

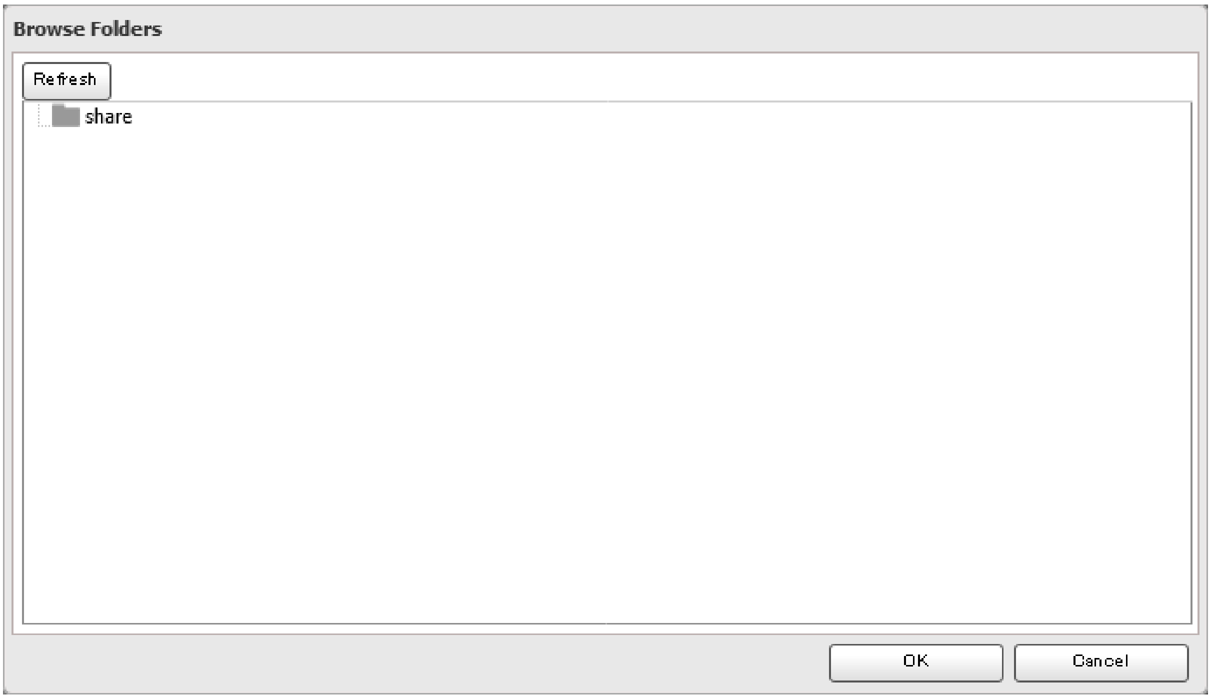
2 Click the settings icon (⤢) to the right of “Direct Copy”.


Direct Copy
Off

3 Click *Edit*, then *Browse*.

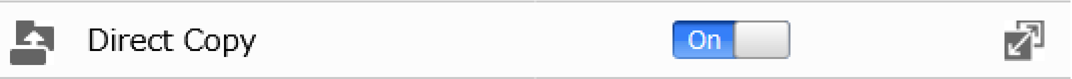

Direct Copy Settings
?
Target:
Browse
OK
Cancel

4 Select the Direct Copy target folder and click *OK*.


Browse Folders
Refresh
share
OK
Cancel

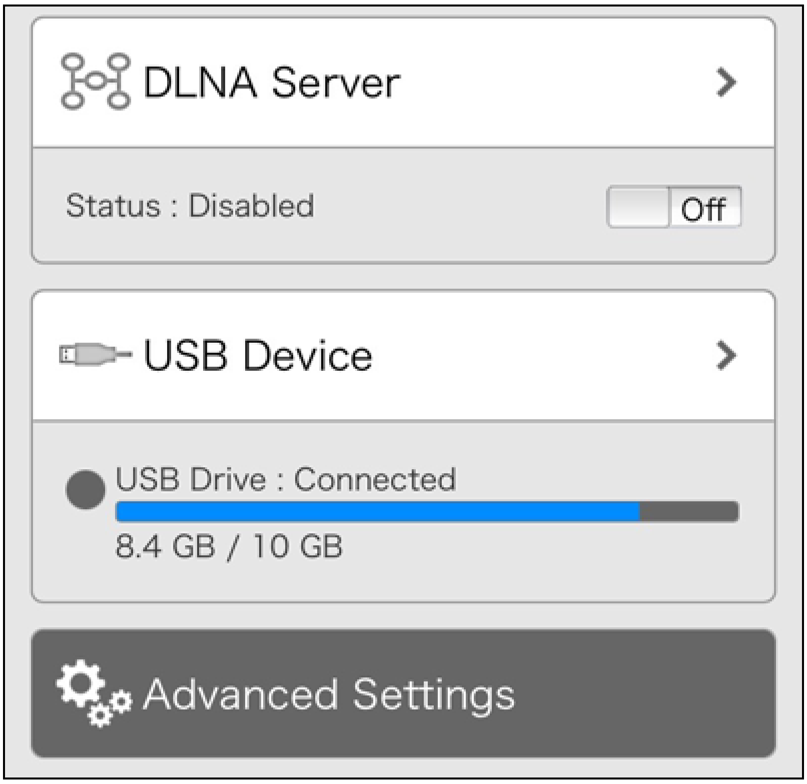
5 Click *OK*.

6 The process is complete when you move the Direct Copy switch (Off) to the On position to enable Direct Copy.


Direct Copy
On

Using a Mobile Device

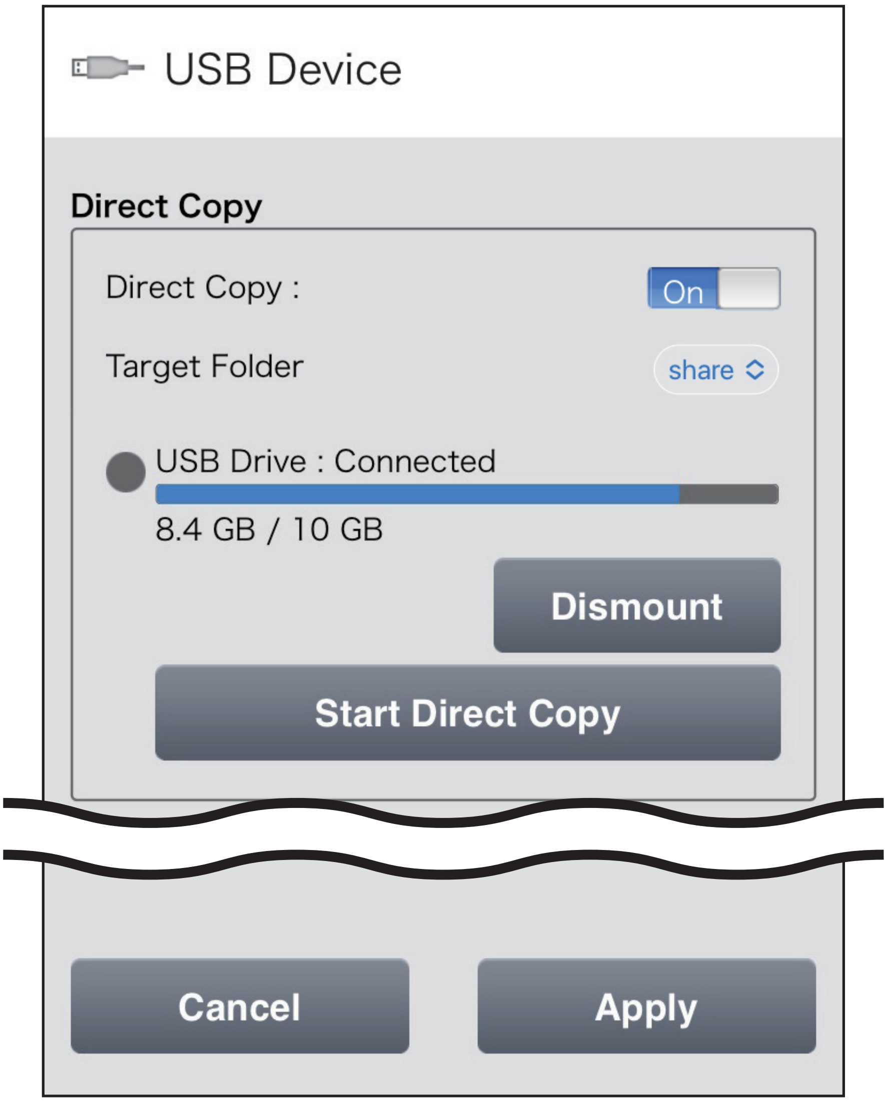
1 From Settings, tap *USB Device*.


DLNA Server
Status : Disabled
Off
USB Device
Advanced Settings

USB Drive : Connected

8.4 GB / 10 GB

2 Move the Direct Copy switch (Off) to the On position to enable Direct Copy.



USB Device

Direct Copy

Direct Copy : On

Target Folder: share

USB Drive : Connected

8.4 GB / 10 GB

3 Select the Direct Copy target folder and tap *Apply*.

4 The process is complete once you close the confirmation window that appears.

Starting Direct Copy

Using the Function Button

1 Connect the USB device. When it mounts (about 10 seconds), the function LED will light up.

Notes:

- Devices that don't cause the function LED to light up are not supported.
- When you connect PTP devices, the function LED may not light up. In such a case, disconnect the PTP device from the LinkStation, then reconnect it.

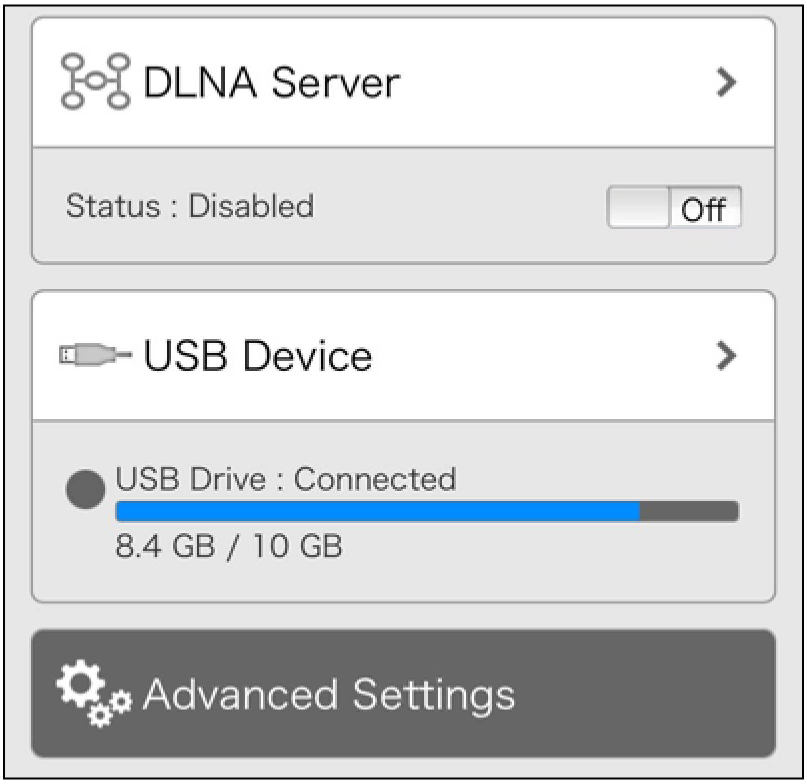
2 You now have 60 seconds to press the function button once.

3 The function LED will blink as all the files on the USB device are copied to the Direct Copy folder on the LinkStation. When the copy operation is finished, the access LED of the USB device will stop blinking.

Using a Mobile Device

1 Connect the USB device to any USB port on the LinkStation. After it mounts (about 10 seconds), the function LED will light up. Unsupported devices will not cause the function LED to light.

2 From Settings, tap *USB Device*.



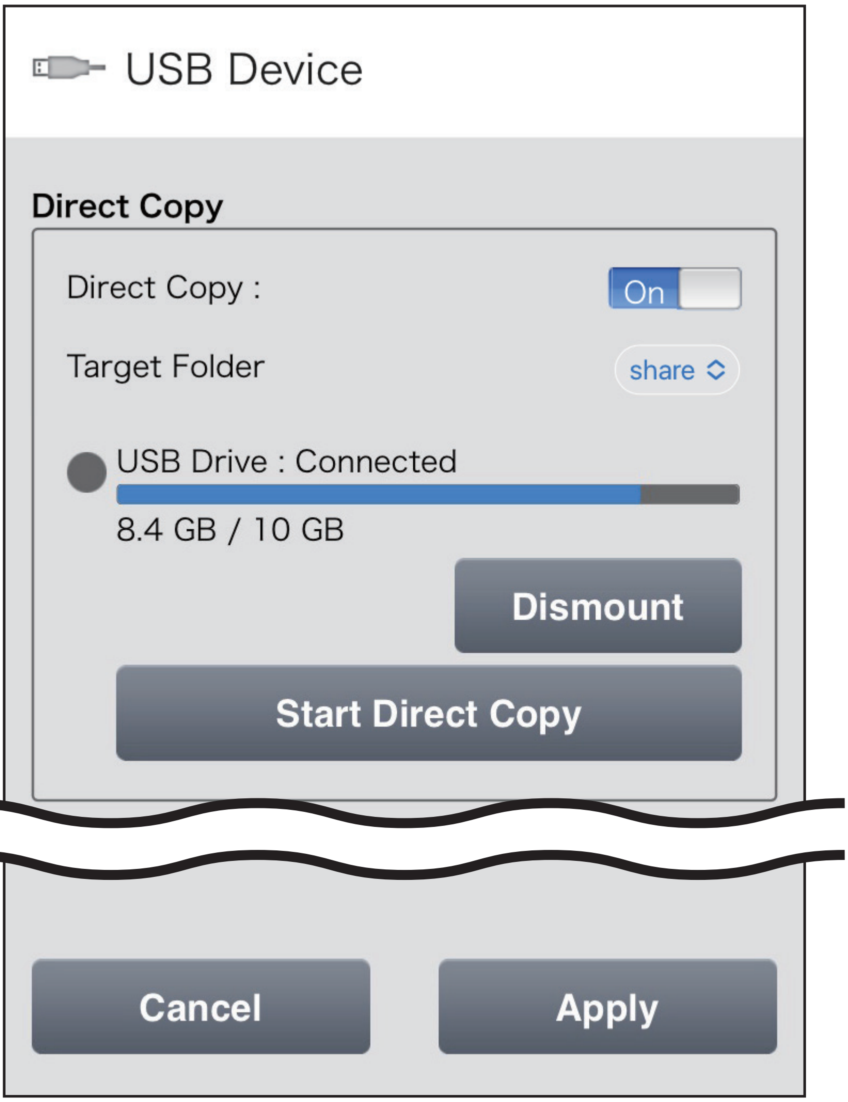
DLNA Server
Off
USB Device
Advanced Settings

Status : Disabled

USB Drive : Connected

8.4 GB / 10 GB

3 Tap *Start Direct Copy*.



USB Device

Direct Copy

Direct Copy : On

Target Folder: share

USB Drive : Connected

8.4 GB / 10 GB

4 The function LED will blink as all the files on the USB device will now be copied to the Direct Copy folder on the LinkStation. When the copy operation is finished, the access LED of the USB device will stop blinking.

Notes:

- While the function LED is blinking, press the function button once to cancel Direct Copy. You can also cancel the copy operation from a mobile device by logging in to Settings and tapping *Cancel Direct Copy*.
- For digital cameras that are not in the USB mass storage class, all files on the digital camera are copied.

Chapter 6 Remote Access

WebAccess

WebAccess is a software utility for accessing the files in the shared folder of your LinkStation from your computer or mobile devices through the Internet. **Be careful when configuring WebAccess. Certain settings can make the files in the shared folder available to anyone on the Internet, without any access restrictions.**

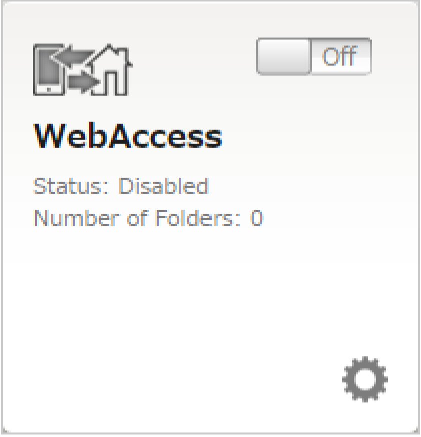
Note: WebAccess supports downloading up to 60,000 files at a time. Attempting to download 60,000 or more files at a time may result in unexpected behavior.

Configuring WebAccess

You can configure WebAccess from a computer or a mobile device. Follow the appropriate procedure below to configure WebAccess.

Using a Computer (Easy Admin)

1 From Easy Admin, click *WebAccess*.

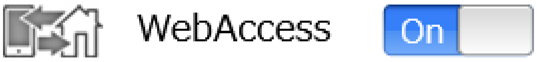


WebAccess

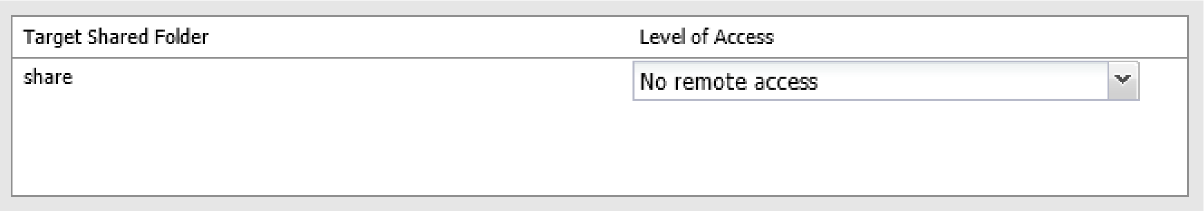
Status: Disabled

Number of Folders: 0

2 Move the WebAccess switch (Off) to the On position to enable WebAccess.

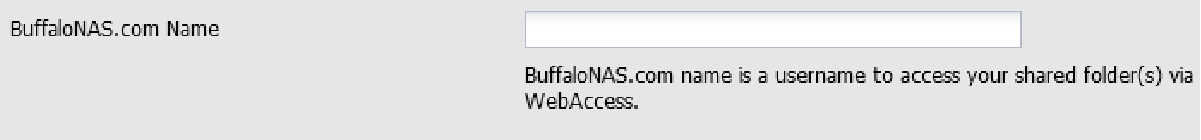


3 Select the level of access for each shared folder from the drop-down list.



Target Shared Folder	Level of Access
share	No remote access

4 Enter a BuffaloNAS.com name for your BuffaloNAS account.



BuffaloNAS.com Name

BuffaloNAS.com name is a username to access your shared folder(s) via WebAccess.

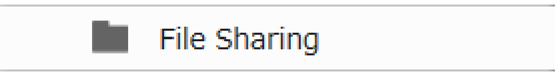
Note: The BuffaloNAS.com name may contain between 3 and 20 alphanumeric characters, underscores (_), and hyphens (-). The BuffaloNAS.com name is case-sensitive.

5 Click *Apply*.

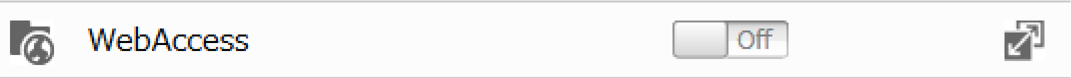
6 Continue with the procedure at http://buffalonas.com/manual/setup/en/.

Using a Computer (Advanced Settings)

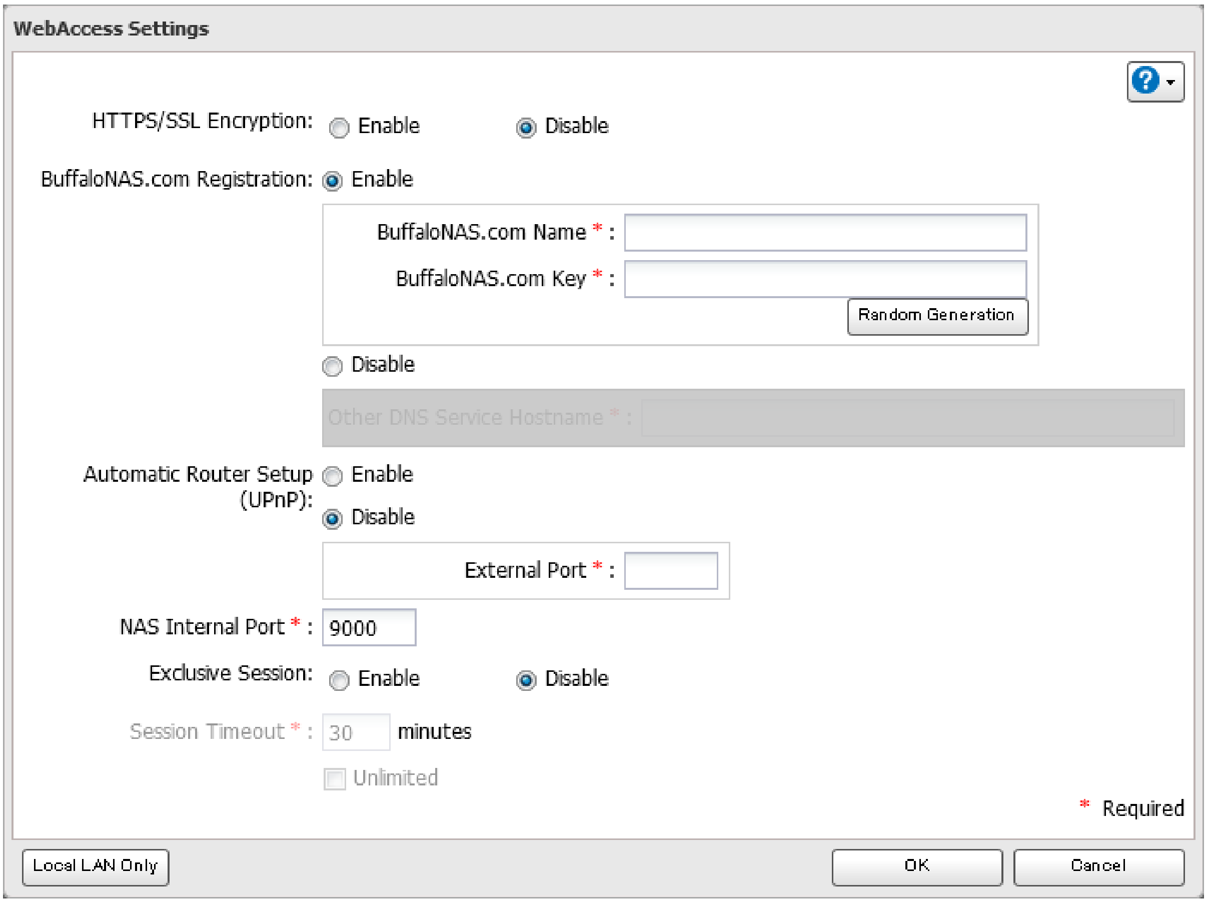
1 From Advanced Settings, click *File Sharing*.



2 Click the settings icon ( ) to the right of "WebAccess".



3 Click *Edit* and configure the desired settings, then click *OK*.



WebAccess Settings

HTTPS/SSL Encryption: ○ Enable ● Disable

BuffaloNAS.com Registration: ● Enable

BuffaloNAS.com Name * :

BuffaloNAS.com Key * :

Random Generation

○ Disable

Other DNS Service Hostname * :

Automatic Router Setup (UPnP): ○ Enable ● Disable

External Port * :

NAS Internal Port * : 9000

Exclusive Session: ○ Enable ● Disable

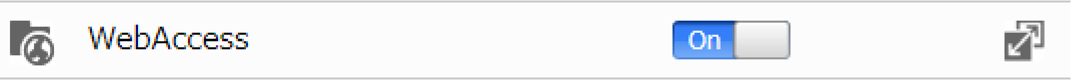
Session Timeout * : 30 minutes

☐ Unlimited

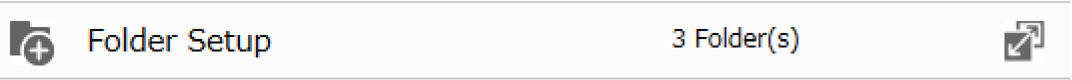
* Required

- To use SSL encryption for more secure data transfers, enable "HTTPS/SSL Encryption". However, some WebAccess applications may not support HTTPS/SSL encryption. Disable it if this is an issue. For more details, refer to the WebAccess help guide.
- You may use the BuffaloNAS.com server as a DNS server, or disable it to use a different DNS server.
- Choose a "BuffaloNAS.com Name" and "BuffaloNAS.com Key" for your WebAccess account. Names and keys may contain between 3 and 20 alphanumeric characters, underscores (_), and hyphens (-).
- If UPnP is not enabled on your network, setup will finish at the screen below and you will only be able to access your NAS device from the local network. To use WebAccess from outside your home, reconfigure WebAccess by referring to the "Unable to Successfully Configure WebAccess" section below.
- If "Exclusive Session" is enabled, multiple users cannot be logged in to WebAccess at the same time. Only the last login will be active.
- Enter a time in minutes (1 to 120, or "Unlimited") before inactive users are logged out of WebAccess.

4 Move the WebAccess switch (Off) to the On position to enable WebAccess.

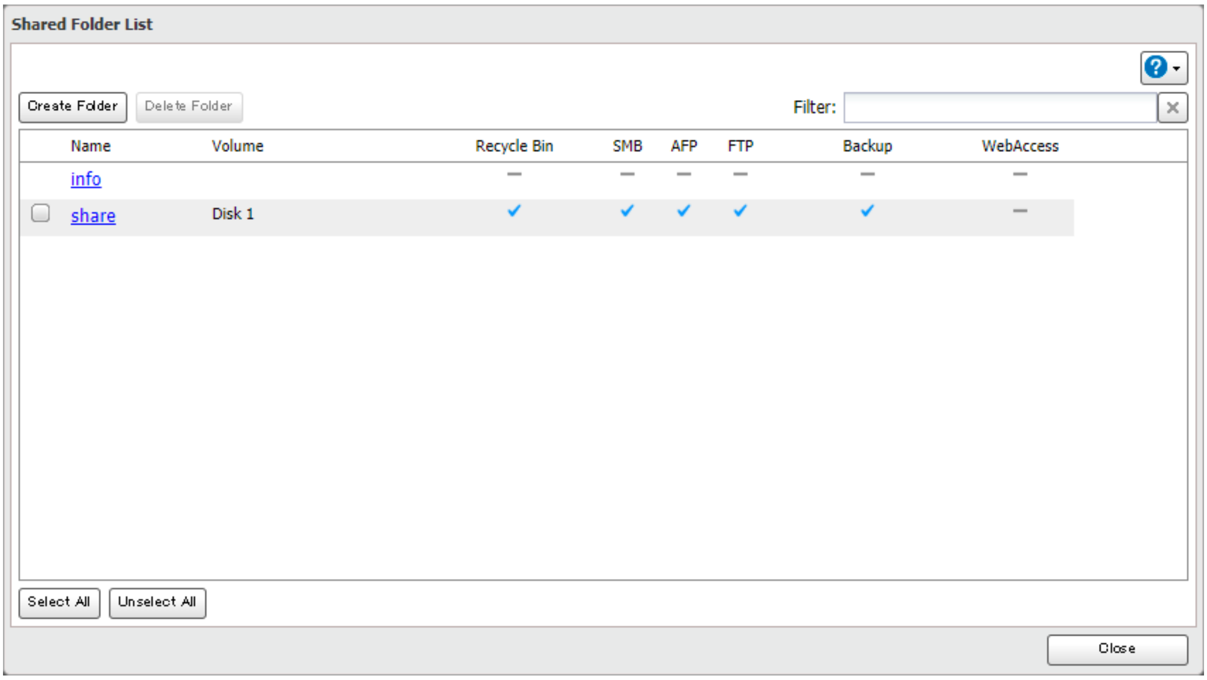


5 Click the settings icon ( ) to the right of "Folder Setup".



6 Click *Create Folder*.

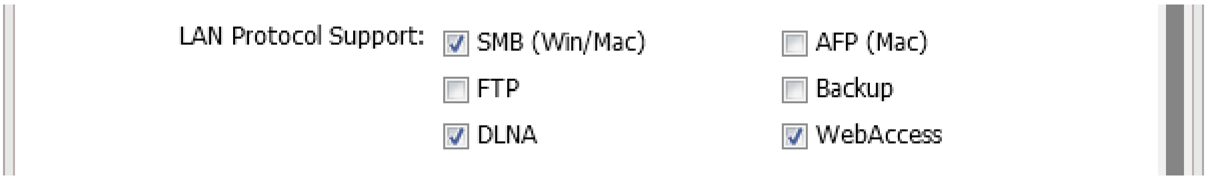
For best results, create a new dedicated share for WebAccess to prevent opening files accidentally.



	Name	Volume	Recycle Bin	SMB	AFP	FTP	Backup	WebAccess
	info		—	—	—	—	—	—
☐	share	Disk 1	✓	✓	✓	✓	✓	—

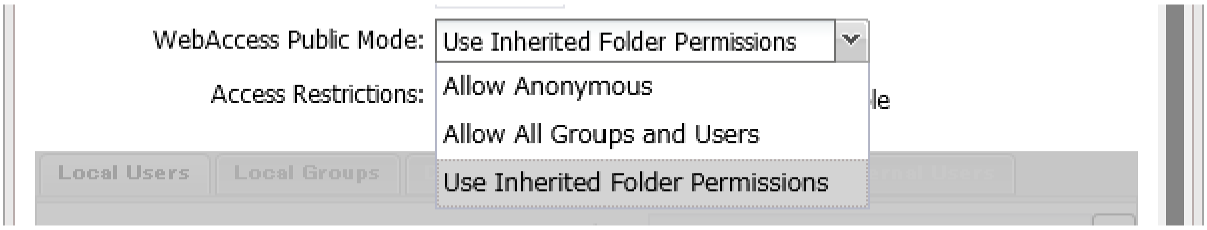
Note: When accessing shared folders through WebAccess from a remote location, a username and password may be required for certain operations. For best results, create a user account with permissions on the WebAccess share before using WebAccess.

7 Click *Edit* and under “LAN Protocol Support”, select the “WebAccess” checkbox.



LAN Protocol Support:
☑ SMB (Win/Mac) ☐ AFP (Mac)
☐ FTP ☐ Backup
☑ DLNA ☑ WebAccess

8 Select the desired WebAccess security level for “WebAccess Public Mode”. For more detailed information about each WebAccess security level, refer to the note below.



WebAccess Public Mode: Use Inherited Folder Permissions
Access Restrictions:

Allow Anonymous
Allow All Groups and Users
Use Inherited Folder Permissions
Local Users
Local Groups

9 Configure other settings such as a folder name and click *OK*.

10 The process is complete once you close the confirmation window that appears.

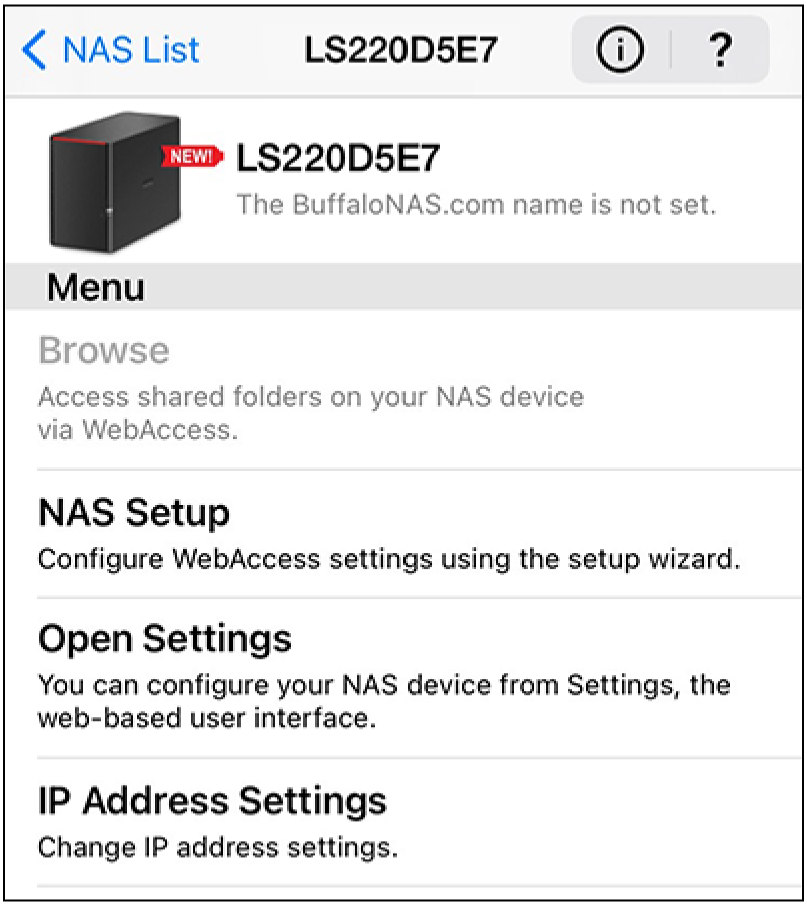
Using a Mobile Device

On your mobile device, download and install the “SmartPhone Navigator” and “WebAccess” apps from App Store (iOS or iPadOS devices) or Google Play (Android devices).

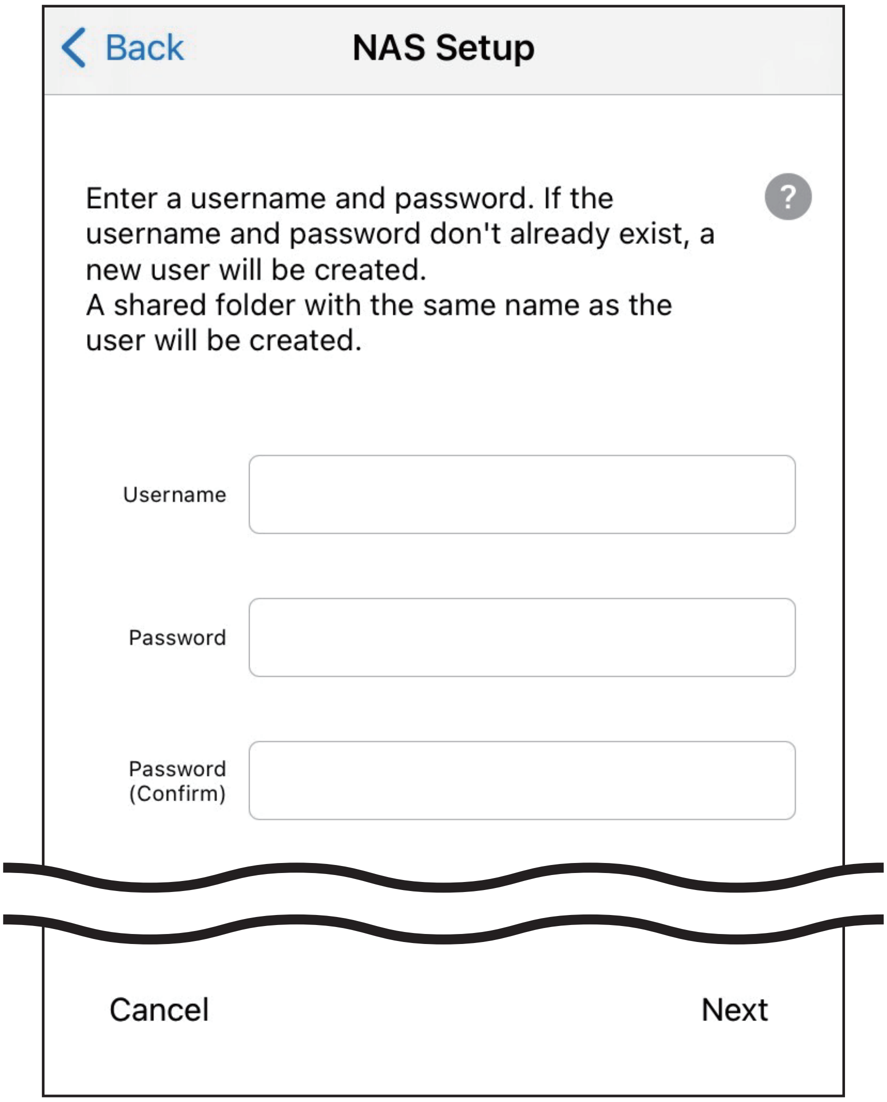
1 Tap the SmartPhone Navigator icon ( ) on your mobile device.

2 Select the NAS device from the NAS list to configure WebAccess.

3 Tap *NAS Setup*.


NAS List
LS220D5E7
NEW!
LS220D5E7
The BuffaloNAS.com name is not set.
Menu
Browse
Access shared folders on your NAS device via WebAccess.
NAS Setup
Configure WebAccess settings using the setup wizard.
Open Settings
You can configure your NAS device from Settings, the web-based user interface.
IP Address Settings
Change IP address settings.

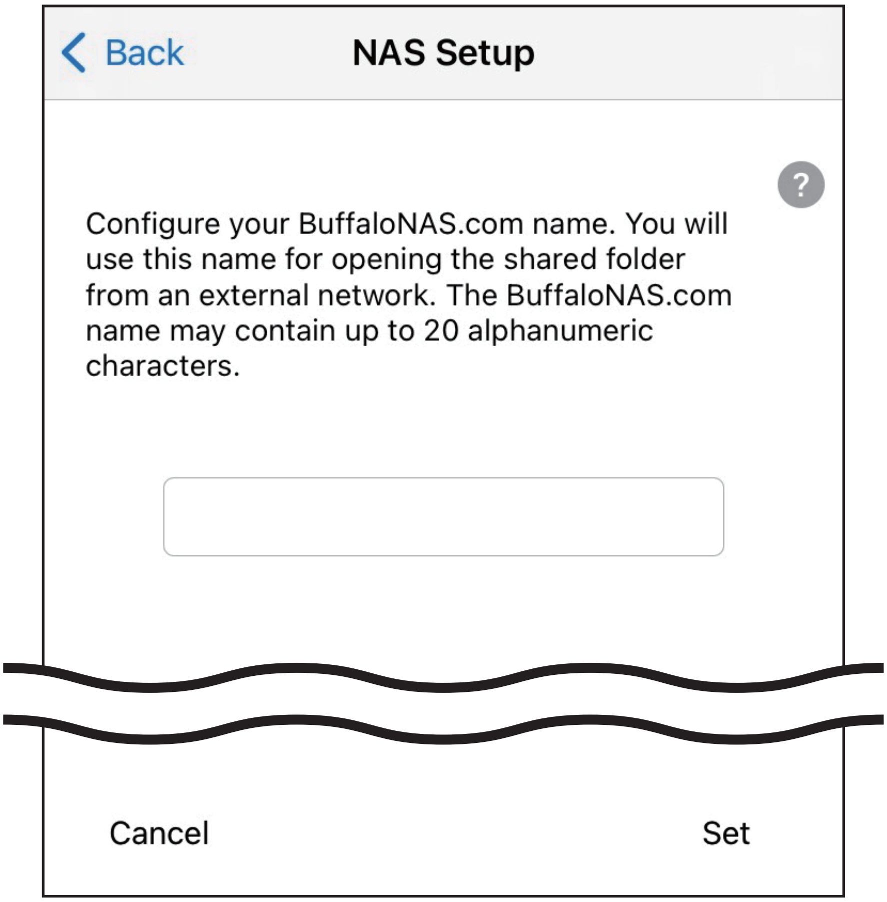
4 Enter a username and password (twice), then tap *Next*. If the user with the entered username doesn’t already exist, a new user and a shared folder with the same name as the username will be created.



Enter a username and password. If the username and password don't already exist, a new user will be created.
A shared folder with the same name as the user will be created.

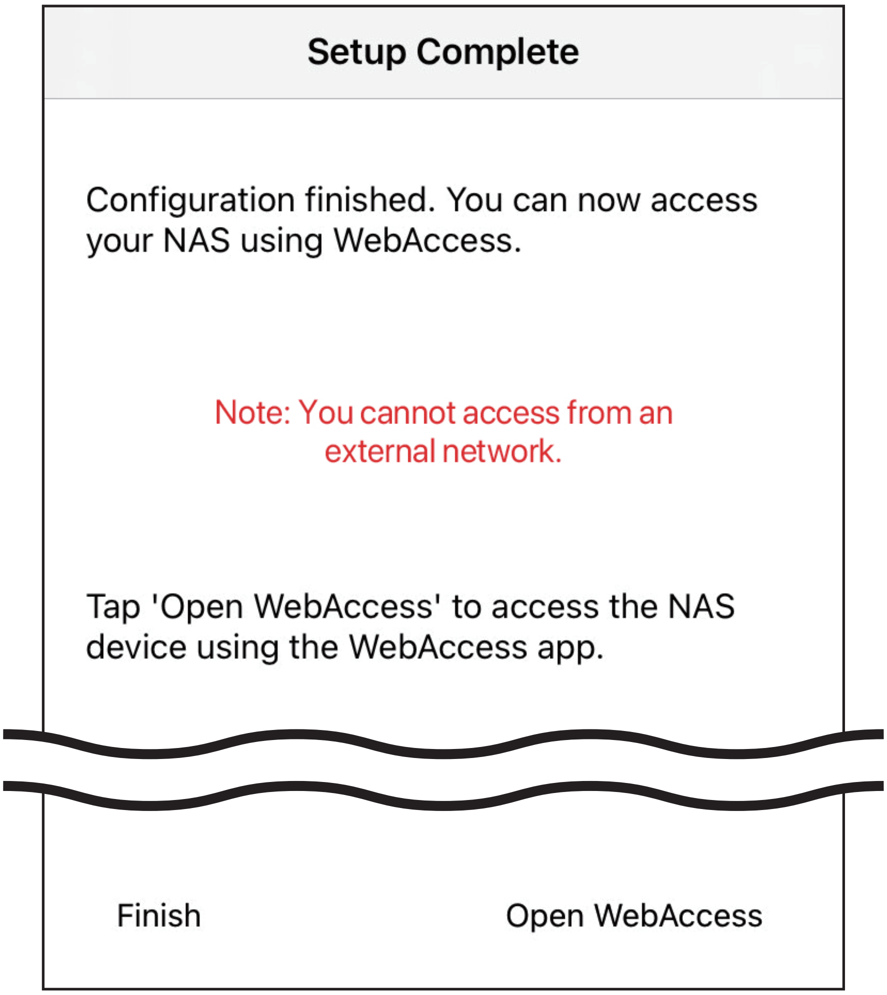
Back
NAS Setup
?
Username
Password
Password (Confirm)
Cancel
Next

5 Enter the desired BuffaloNAS.com name and tap *Set*.



Configure your BuffaloNAS.com name. You will use this name for opening the shared folder from an external network. The BuffaloNAS.com name may contain up to 20 alphanumeric characters.

If UPnP is not enabled on your network, setup will finish at the screen below and you will only be able to access your NAS device from the local network. To use WebAccess from outside your home, reconfigure WebAccess by referring to the “Unable to Successfully Configure WebAccess” section below.



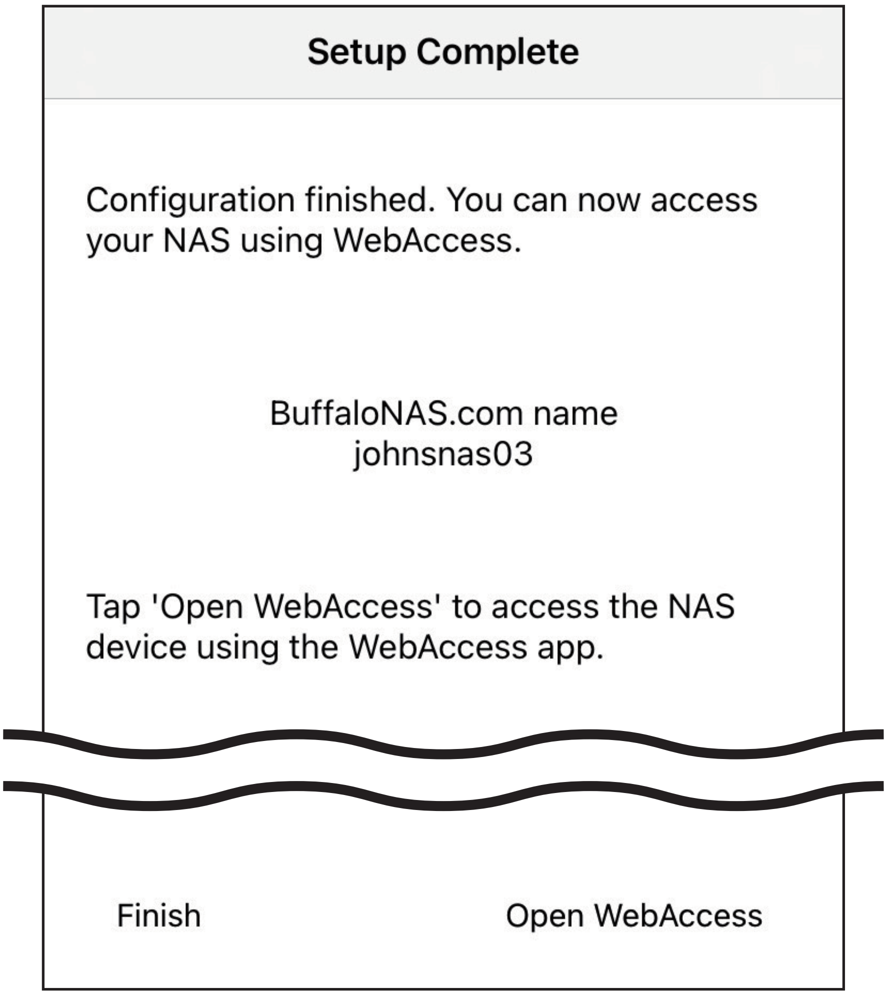
Setup Complete

Configuration finished. You can now access your NAS using WebAccess.

Note: You cannot access from an external network.

Tap 'Open WebAccess' to access the NAS device using the WebAccess app.

6 Tap *Finish*. The process is complete once you exit the app. Alternatively, tap *Open WebAccess* to launch the WebAccess app and create a shortcut to your Buffalo NAS device.



Setup Complete

Configuration finished. You can now access your NAS using WebAccess.

BuffaloNAS.com name
johnsnas03

Tap 'Open WebAccess' to access the NAS device using the WebAccess app.

Note: Whether a user or group can access a folder through WebAccess depends on a combination of WebAccess settings and the shared folder’s settings.
Allow Anonymous: Anyone can access (view) shared folders. (Access restrictions configured for shared folders will not work.)
Allow All Groups and Users: All groups and users registered on the Buffalo NAS device can use WebAccess. (Access restrictions configured for shared folders will not work.)
Use Inherited Folder Permissions: Users and groups have the same access permissions with WebAccess that they do locally. If access restrictions are not set for the shared folder, then this option will not be shown.

		Not logged in	Access restrictions for the logged-in users		
			No access	Read-only	Read and write
WebAccess Public Mode	Allow Anonymous	R	R/W	R/W	R/W
	Allow All Groups and Users	-	R/W	R/W	R/W
	Use Inherited Folder Permissions	-	-	R	R/W

R/W: Read and write, R: Read-only, -: No access

Accessing via WebAccess

There are many ways to access WebAccess folders depending on your device:

For Mobile Devices

To access from a mobile device, install the "WebAccess" app by referring to the "WebAccess" section in chapter 2. Refer to the app's help guide for more detailed information on using the app.

For Computers

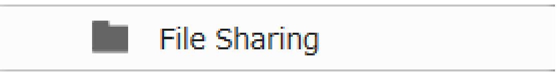
Use a web browser on a computer; supported browsers include Microsoft Edge, Firefox, Google Chrome, Internet Explorer 9 or later, Safari 9 or later. Refer to the help guide at the BuffaloNAS.com website after connecting with your BuffaloNAS.com name for more detailed information.

Unable to Successfully Configure WebAccess

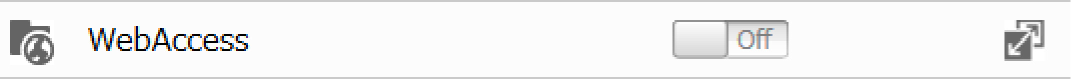
If UPnP is disabled on your router, configuring WebAccess may not be successfully complete. If this occurs, try the following procedure.

Using a Computer

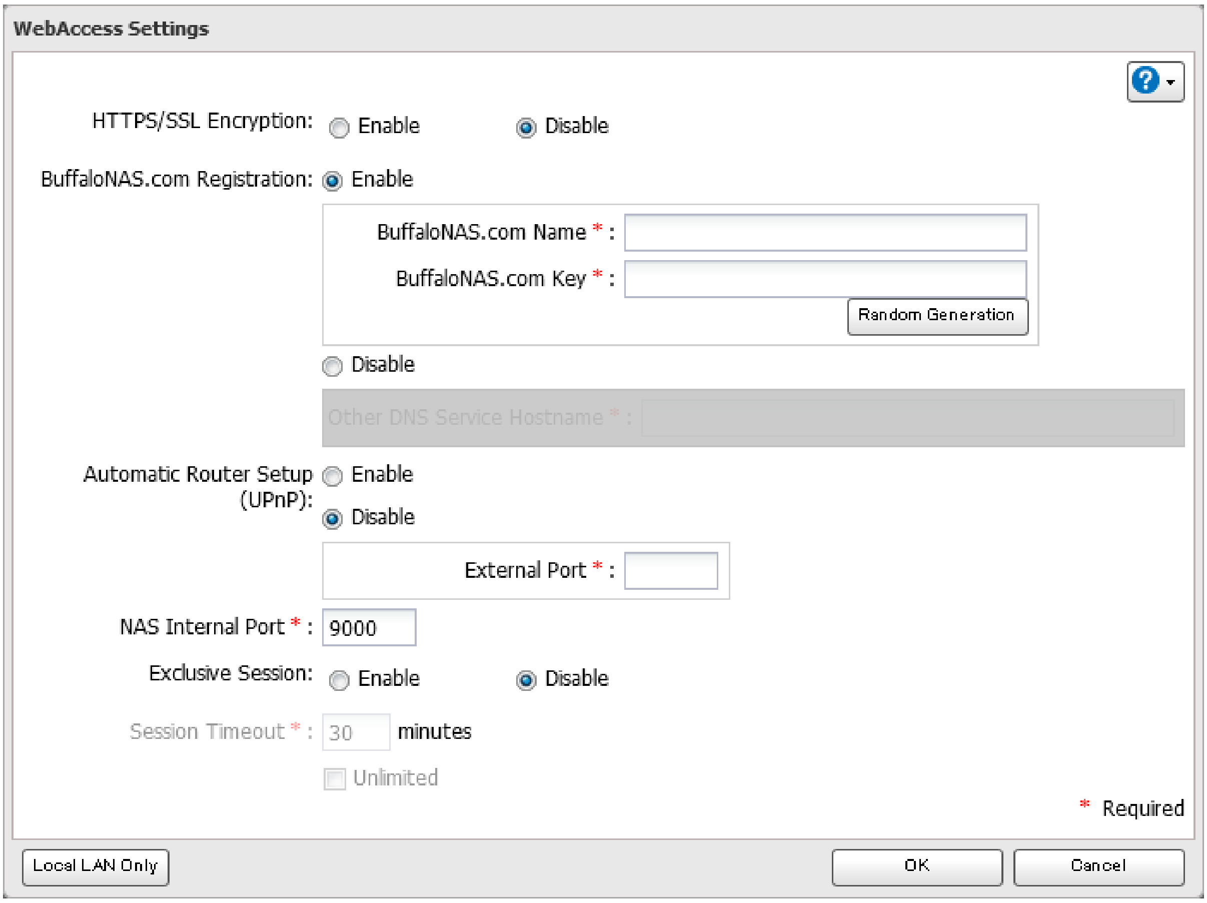
1 From Settings, click *File Sharing*.



2 Click the settings icon ( ) to the right of "WebAccess".



3 Click *Edit*, then enable "BuffaloNAS.com Registration" and enter the desired BuffaloNAS.com name and key.



WebAccess Settings

HTTPS/SSL Encryption: ○ Enable ● Disable

BuffaloNAS.com Registration: ● Enable

BuffaloNAS.com Name * :

BuffaloNAS.com Key * :

○ Disable

Other DNS Service Hostname * :

Automatic Router Setup (UPnP): ○ Enable ● Disable

External Port * :

NAS Internal Port * : 9000

Exclusive Session: ○ Enable ● Disable

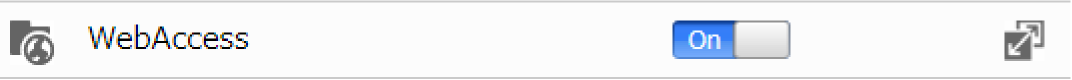
Session Timeout * : 30 minutes

☐ Unlimited

* Required

4 Disable "Automatic Router Setup (UPnP)" and enter a router's port number into the "External Port" field, then click *OK*.

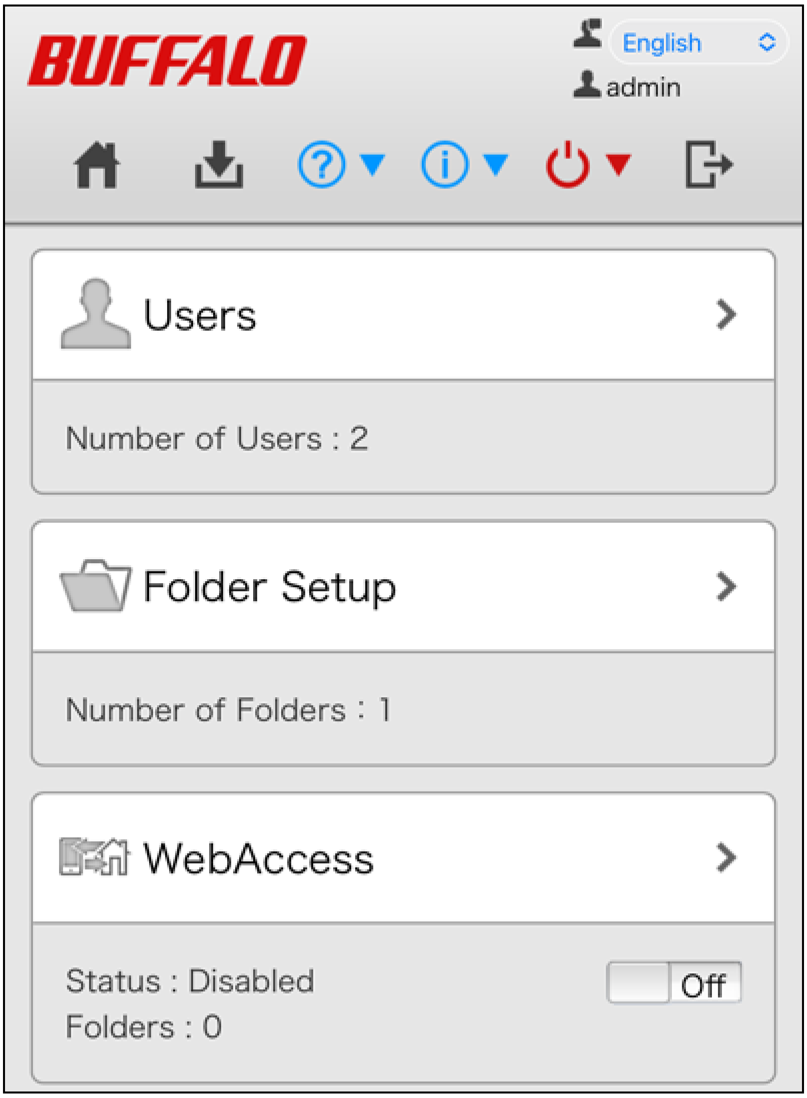
5 Move the WebAccess switch (Off) to the On position to enable WebAccess.


WebAccess
On

6 After configuring the required settings on the Buffalo NAS device is finished, next configure the router using the port number set at step 4 above.

Using a Mobile Device

1 From Settings, tap *WebAccess*.


BUFFALO
English
admin
Users
Folder Setup
WebAccess
Off

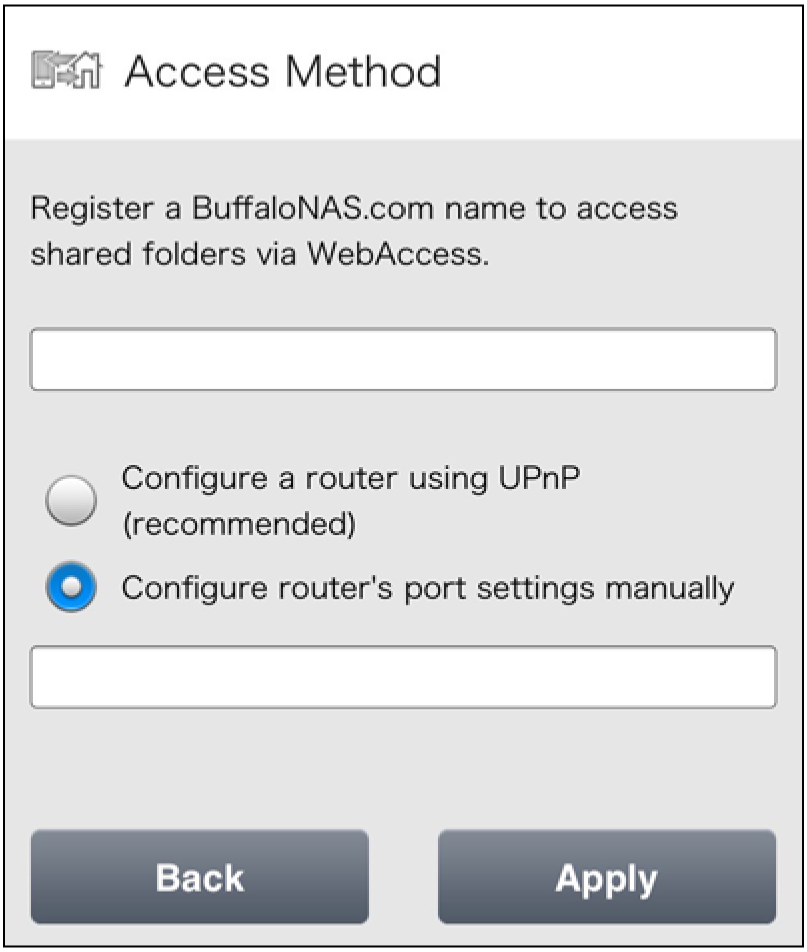
Number of Users : 2

Number of Folders : 1

Status : Disabled
Folders : 0

2 Tap *Target Folder* and select the desired WebAccess security level of shared folders, then tap *Apply*.

3 Tap *Access Method* and enter the desired BuffaloNAS.com name.



Access Method

Register a BuffaloNAS.com name to access shared folders via WebAccess.

○ Configure a router using UPnP (recommended)

● Configure router's port settings manually

4 Select "Configure router's port settings manually" and enter the router's port number, then tap *Apply*.

5 After configuring the required settings on the Buffalo NAS device is finished, next configure the router using the port number set at step 4 above.

FTP

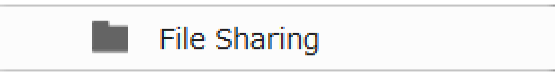
By default, the LinkStation's shares are only accessible by users connected to the same network or router as the LinkStation. The optional FTP server allows users outside the local network to access the LinkStation.

Note: FTP is intended for users who already have FTP client software and have experience with it.

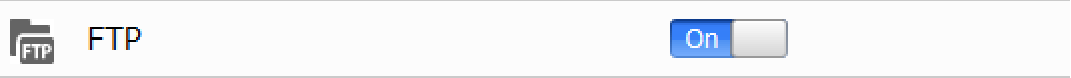
Enabling FTP

Follow the procedure below to enable FTP service to allow access via FTP connections.

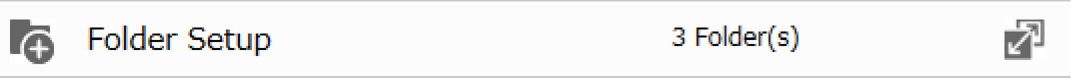
1 From Advanced Settings, click *File Sharing*.



2 Move the FTP switch (Off) to the On position to enable FTP.

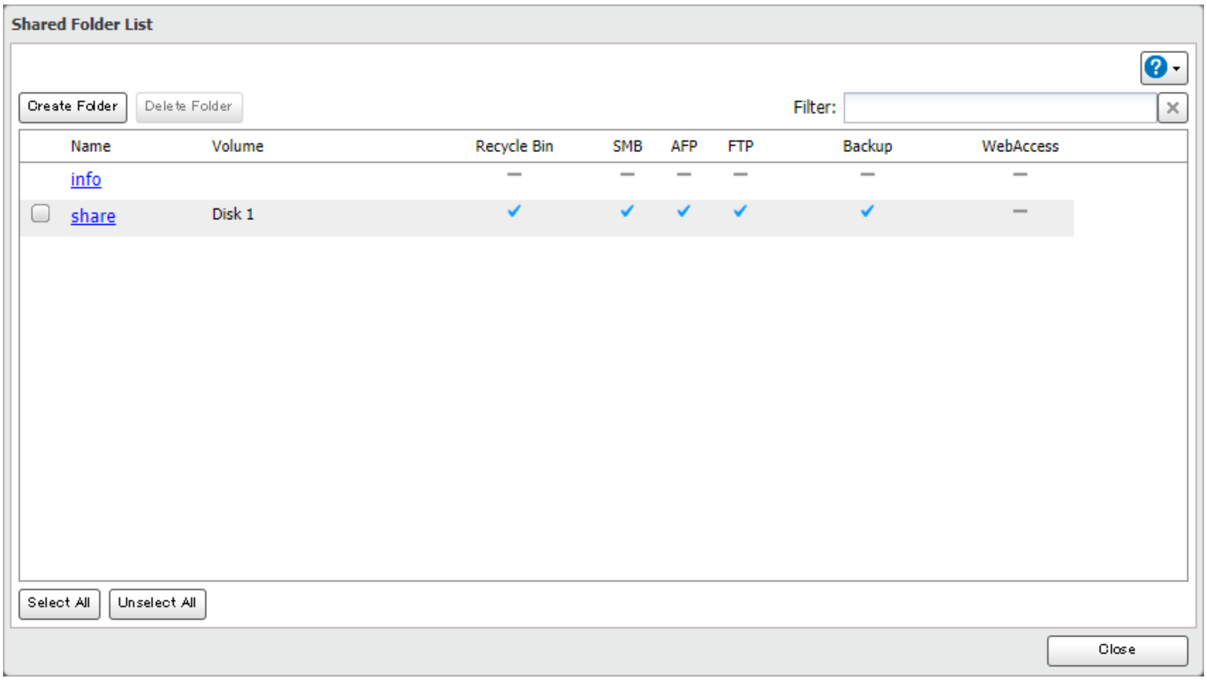


3 Click the settings icon ( ) to the right of "Folder Setup".



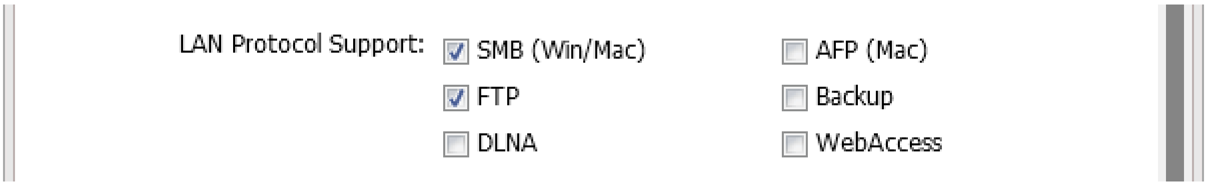
Folder Setup 3 Folder(s)

4 Choose a folder to enable remote FTP access on.



	Name	Volume	Recycle Bin	SMB	AFP	FTP	Backup	WebAccess
	info		–	–	–	–	–	–
☐	share	Disk 1	✓	✓	✓	✓	✓	–

5 Click *Edit* and under "LAN Protocol Support", select the "FTP" checkbox; select read-only or read and write for the shared folder's attribute and click *OK*.



LAN Protocol Support: ☑ SMB (Win/Mac) ☐ AFP (Mac)
☑ FTP ☐ Backup
☐ DLNA ☐ WebAccess

6 The process is complete once you close the confirmation window that appears.

Accessing the LinkStation with an FTP Client

Accessing as a Registered User

To access the LinkStation via FTP, configure your FTP client software with the following settings:

- Hostname: IP address of the LinkStation
- Username: the LinkStation's username
- Password: the LinkStation's password
- Port: 21

Accessing as an Anonymous User

To allow anonymous access to your FTP share, disable access restrictions. Configure your FTP client software with the following settings for anonymous FTP access:

- Hostname: IP address of the LinkStation
- Username: "Anonymous"
- Password: any character string
- Port: 21

Notes:

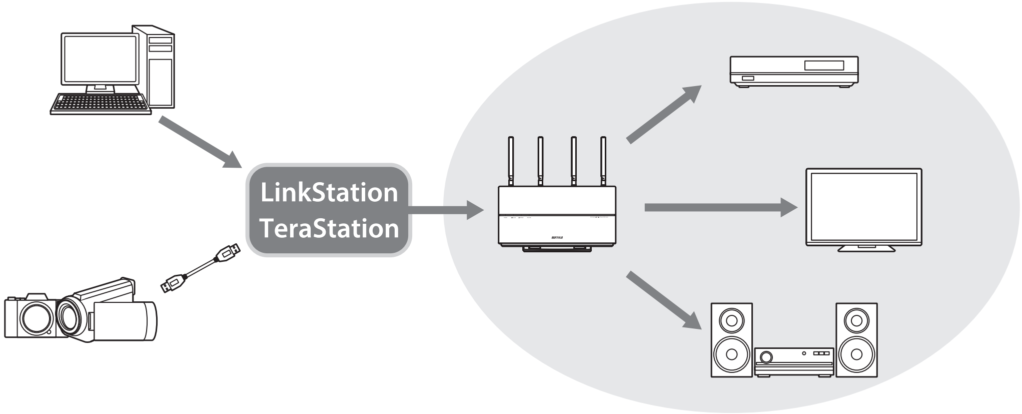
- If the LinkStation joins a domain, domain and anonymous users cannot remote access via FTP.
- Shared folders connected by FTP are available from the "/mnt" folder. Examples of default locations are:

  /mnt/array1/share
  /mnt/disk1/share
  /mnt/usbdisk1
- Don't use FTP to share files and folders with multibyte characters in their names with a Mac. Use an AFP or SMB connection instead.
- If a file was created or copied using AFP, you may be unable to delete it using an FTP connection. If this occurs, use an SMB or AFP connection instead to delete the file.
- For FTP connections, make sure that the total filename length including the folder path is 250 single-byte characters or fewer.

Chapter 7 Multimedia

DLNA

DLNA is a set of guidelines for sharing digital media. The LinkStation includes a DLNA server compliant with the DLNA guidelines. Videos, images, and music saved on the LinkStation can be played back on DLNA-compatible TVs, stereo equipment, game consoles, and other devices on the local network.

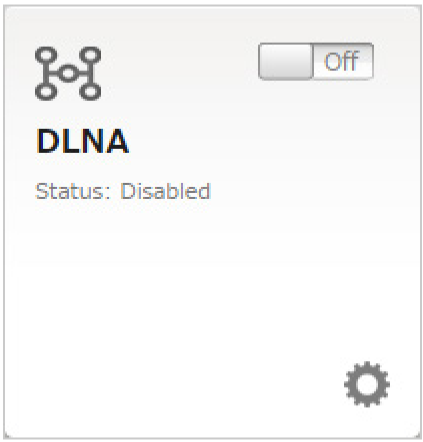


Enabling DLNA

You can enable DLNA from a computer or a mobile device. Follow the appropriate procedure below to enable DLNA.

Using a Computer (Easy Admin)

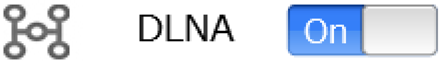
1 From Easy Admin, click *DLNA*.



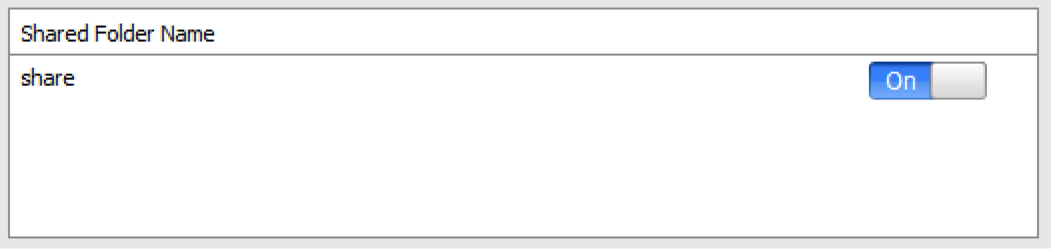
DLNA

Status: Disabled

2 Move the DLNA switch (Off) to the On position to enable DLNA.



3 Move the switch for the folder you'll use for DLNA media to the On position as well.



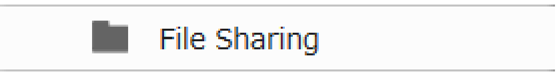
Shared Folder Name	
share	On

4 Click *Apply*.

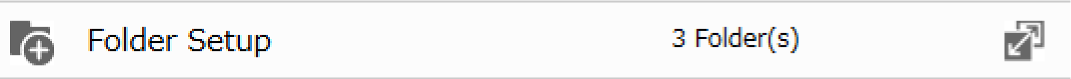
5 The process is complete once you close the confirmation window that appears.

Using a Computer (Advanced Settings)

1 From Advanced Settings, click *File Sharing*.



2 Click the settings icon (⤢) to the right of "Folder Setup".



Folder Setup 3 Folder(s)

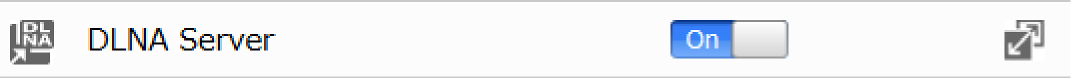
3 Select the folder that you want to share with media players and other DLNA-compatible devices.

4 Click *Edit* and under "LAN Protocol Support", select the "DLNA" checkbox and click *OK*.

5 Click *Close*.

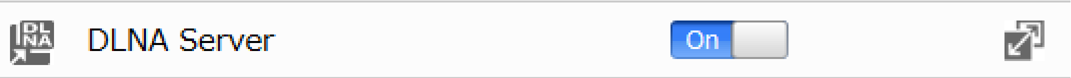
6 Click *Services*.

7 Move the DLNA switch (Off) to the On position to enable DLNA.



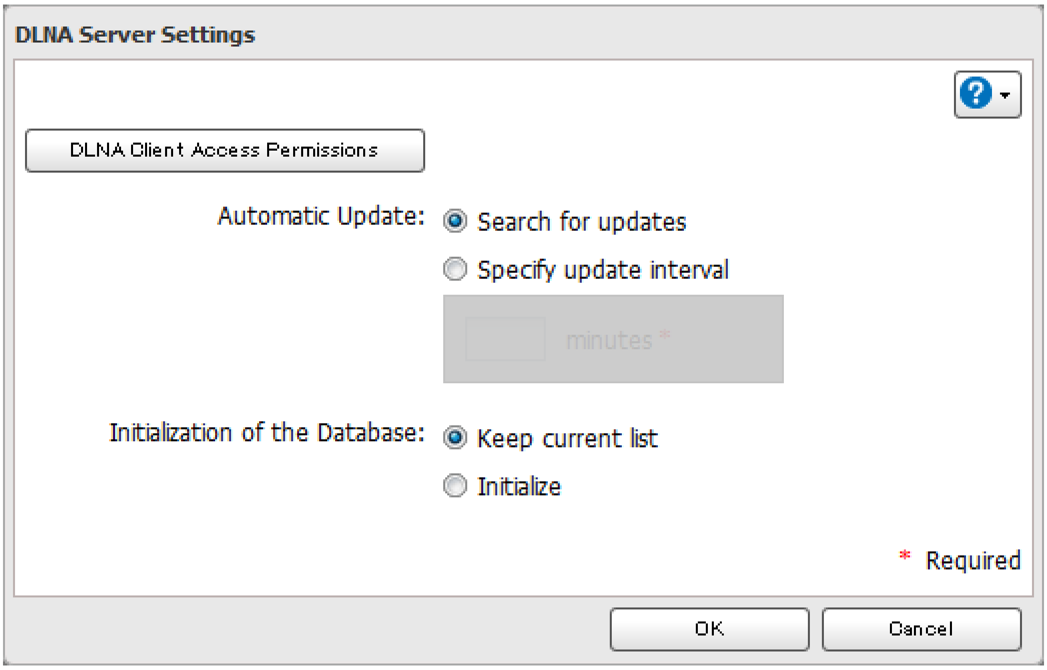
DLNA Server On

8 Click the settings icon (⤢) to the right of "DLNA Server".



DLNA Server On

9 Click *Edit* and select an interval for DLNA server database updates, then click *OK*.



DLNA Server Settings

DLNA Client Access Permissions

Automatic Update: ● Search for updates

○ Specify update interval

minutes *

Initialization of the Database: ● Keep current list

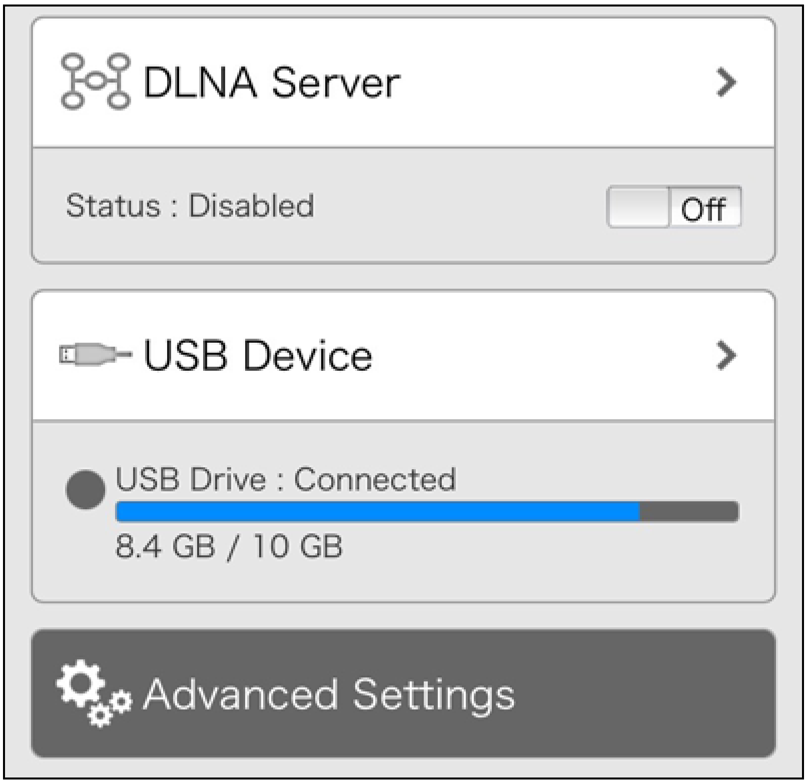
○ Initialize

* Required

10 The process is complete once you close the confirmation window that appears.

Using a Mobile Device

1 From Settings, tap *DLNA Server*.



DLNA Server

Status : Disabled Off

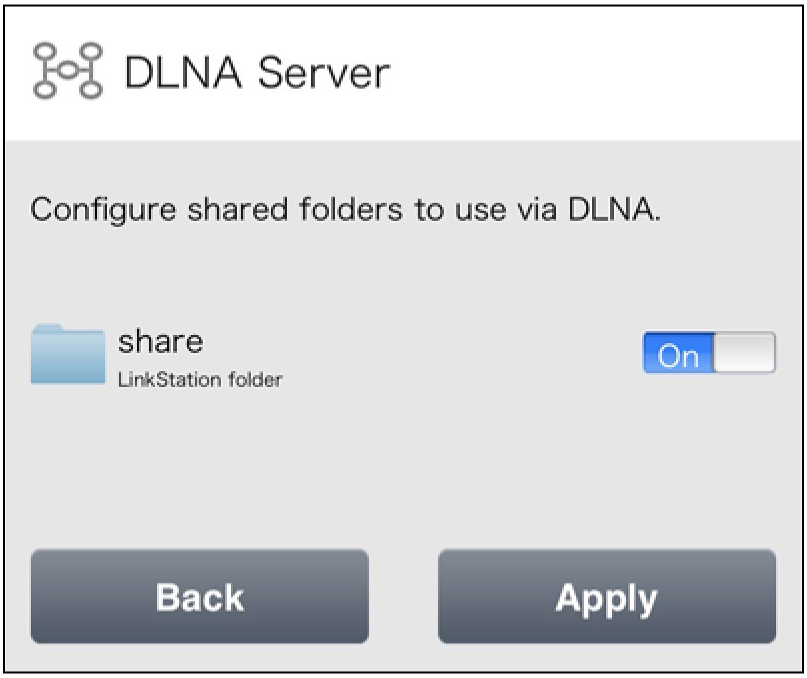
USB Device

USB Drive : Connected

8.4 GB / 10 GB

Advanced Settings

2 Move the DLNA switch (Off) to the On position to enable DLNA and tap *Apply*.



Configure shared folders to use via DLNA.

3 The process is complete once you close the confirmation window that appears.

Playing Files

To play back a file from a DLNA-compatible device:

1 Connect the DLNA-compatible device to the same network as the LinkStation and turn it on.

2 Select the LinkStation from the software of the DLNA-compatible device.

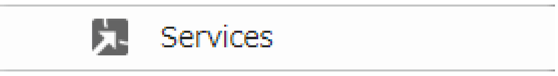
3 Select the file to be played back.

Note: For more information on playing files, refer to the DLNA-compatible devices' manuals.

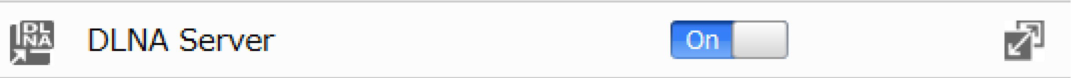
Connected DLNA-Compatible Devices

Follow the procedure below to view the DLNA-compatible devices connected to your LinkStation.

1 From Advanced Settings, click *Services*.

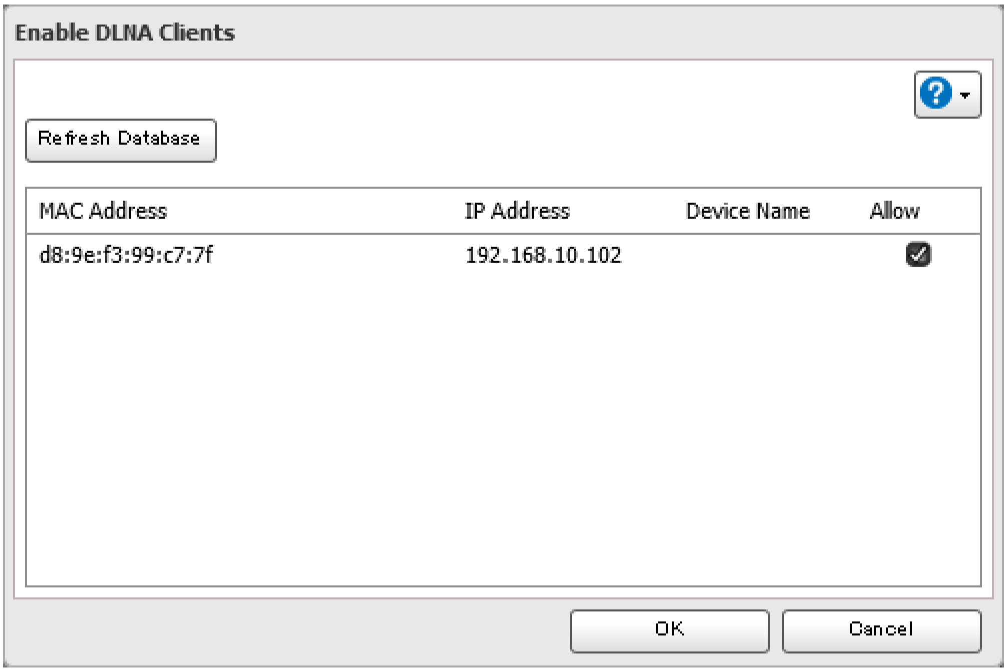


2 Click the settings icon (⤢) to the right of "DLNA Server".



3 Click *DLNA Client Access Permissions*.

4 The process is complete once a list of the MAC addresses, IP addresses, and device names of the DLNA-compatible devices connected to the same network as the LinkStation is displayed. If your device is not listed, click *Refresh Database*.


Enable DLNA Clients

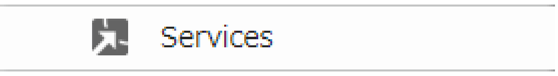
MAC Address	IP Address	Device Name	Allow
d8:9e:f3:99:c7:7f	192.168.10.102		☑

Refresh Database
OK
Cancel

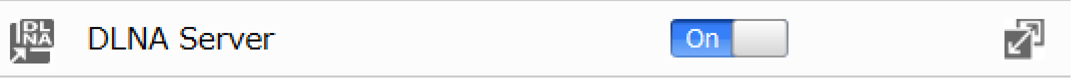
Streaming to DLNA-compatible Devices

When new movies, photos, and music files are added to the LinkStation's DLNA folder, the database must be updated before the new files can be streamed. By default, the database is updated when the files are stored on the LinkStation. You can change this interval or update the database manually.

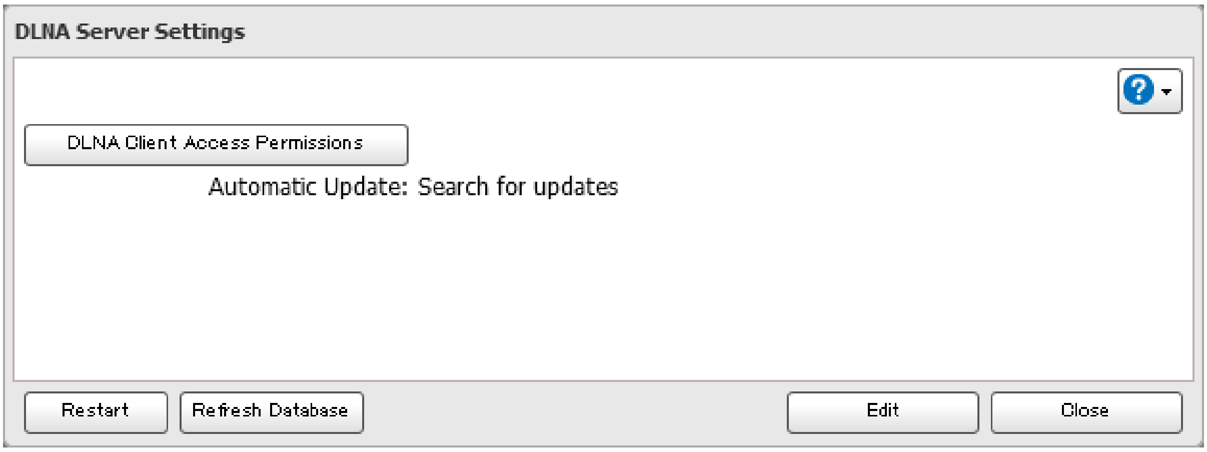
1 From Advanced Settings, click *Services*.



2 Click the settings icon ( ) to the right of "DLNA Server".


DLNA Server: On

3 Click *Refresh Database* to update the database immediately, or select *Edit* and change the update interval.


DLNA Server Settings

Automatic Update: Search for updates

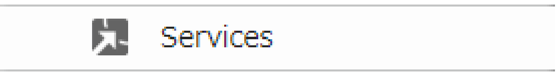
DLNA Client Access Permissions
Restart
Refresh Database
Edit
Close

4 The process is complete once you close the confirmation window that appears.

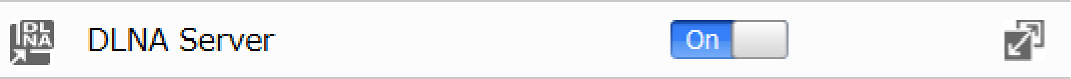
Disabling Playback from Specific Devices

You may block specific DLNA devices from playing back media content.

1 From Advanced Settings, click *Services*.

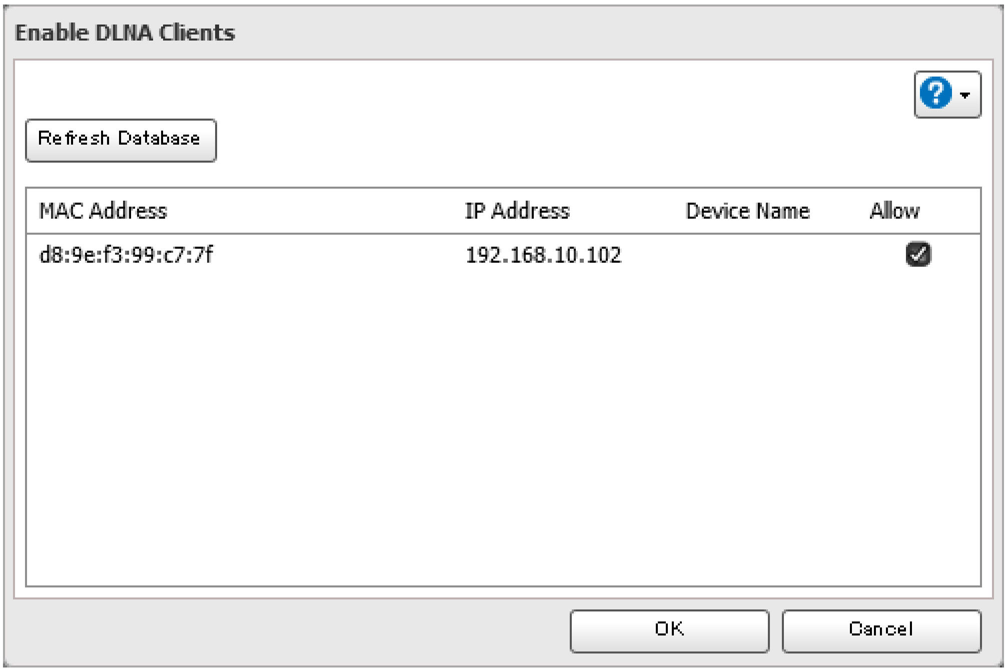


2 Click the settings icon ( ) to the right of "DLNA Server".


DLNA Server
On

3 Click *DLNA Client Access Permissions*.

4 Clear the checkboxes under "Allow" for any devices you do not want to allow to play media and click *OK*.


Enable DLNA Clients

MAC Address	IP Address	Device Name	Allow
d8:9e:f3:99:c7:7f	192.168.10.102		☑

5 The process is complete once you close the confirmation window that appears.

Supported File Types

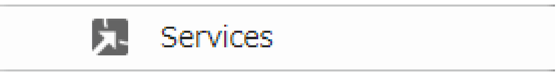
The LinkStation supports DLNA streaming of files with the extensions below.

Types	File Extensions
Video files	.3gp, .asf, .avi, .divx, .dvr-ms, .m1v, .m2p, .m2t, .m2ts, .m4v, .mov, .mp4, .mpe, .mpeg, .mpeg2, .mpg, .mts, .spts, .tp, .ts, .tts, .vdr, .vob, .wmv, .xvid
Picture files	.bmp, .gif, .jpeg, .jpg, .png, .tif, .tiff, .yuv
Music files	.3gp, .aac, .ac3, .aif, .aiff, .apl, .dff, .dsf, .flac, .lpcm, .m3u, .m4a, .mp1, .mp2, .mp3, .mp4, .mpa, .ogg, .pcm, .wav, .wma

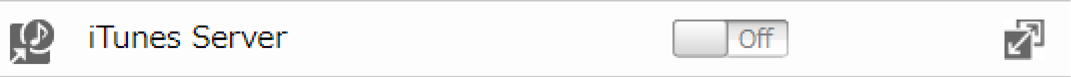
iTunes Server

If iTunes server is enabled, computers on your network with iTunes can play music files stored on the LinkStation and transfer them to your iOS devices. iTunes server supports playback from up to five computers.

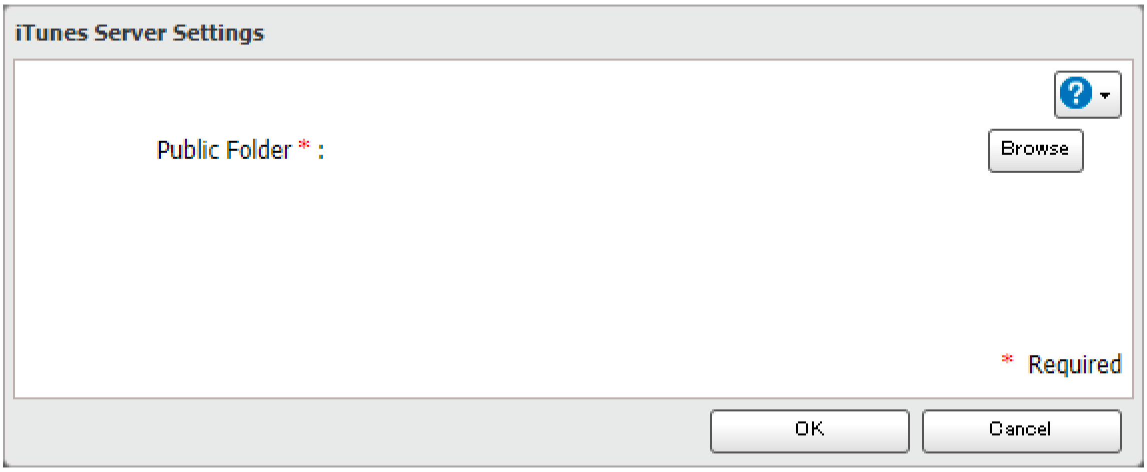
1 From Advanced Settings, click *Services*.



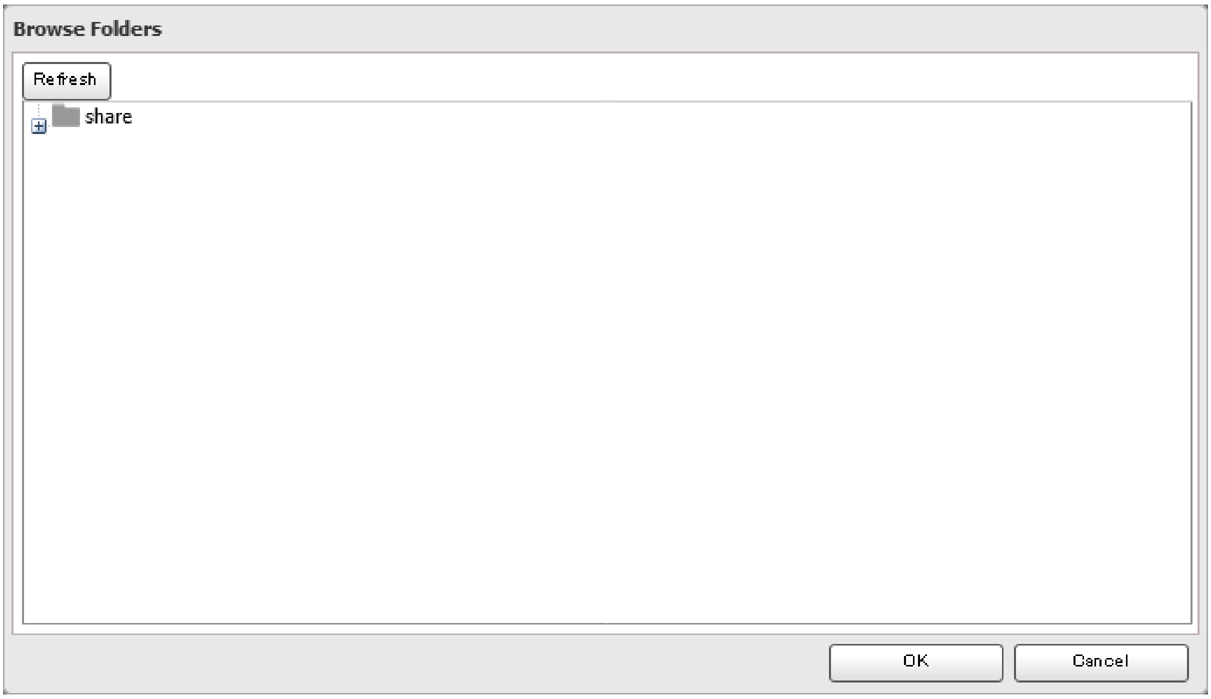
2 Click the settings icon (⤢) to the right of "iTunes Server".


iTunes Server
Off

3 Click *Edit*, then *Browse*.

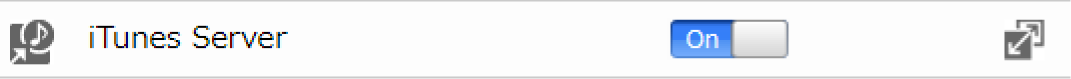

iTunes Server Settings
?
Public Folder * :
Browse
* Required
OK
Cancel

4 Select the shared folder that you want to make available to iTunes, then click *OK*.


Browse Folders
Refresh
share
OK
Cancel

5 Click *OK*.

6 The process is complete once you move the iTunes server switch (Off) to the On position to enable iTunes server.



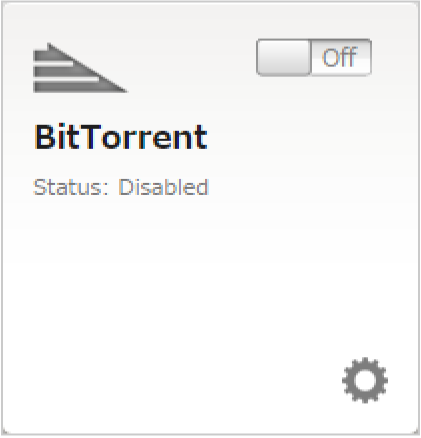
BitTorrent

BitTorrent is a protocol for distributing large amounts of data efficiently. The information in this section is only for users who are familiar with BitTorrent.

Configuring BitTorrent

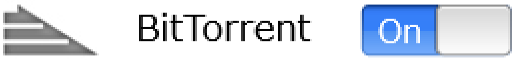
Using Easy Admin

1 From Easy Admin, click *BitTorrent*.



Status: Disabled

2 Move the BitTorrent switch (Off) to the On position to enable BitTorrent.

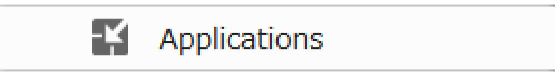


3 Select the shared folder to save files downloaded via BitTorrent from the drop-down list, then click *Apply*.

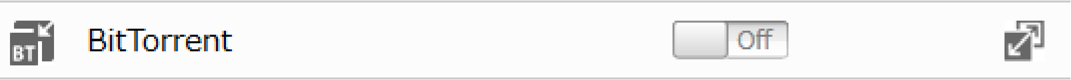
4 The process is complete once you close the confirmation window that appears.

Using Advanced Settings

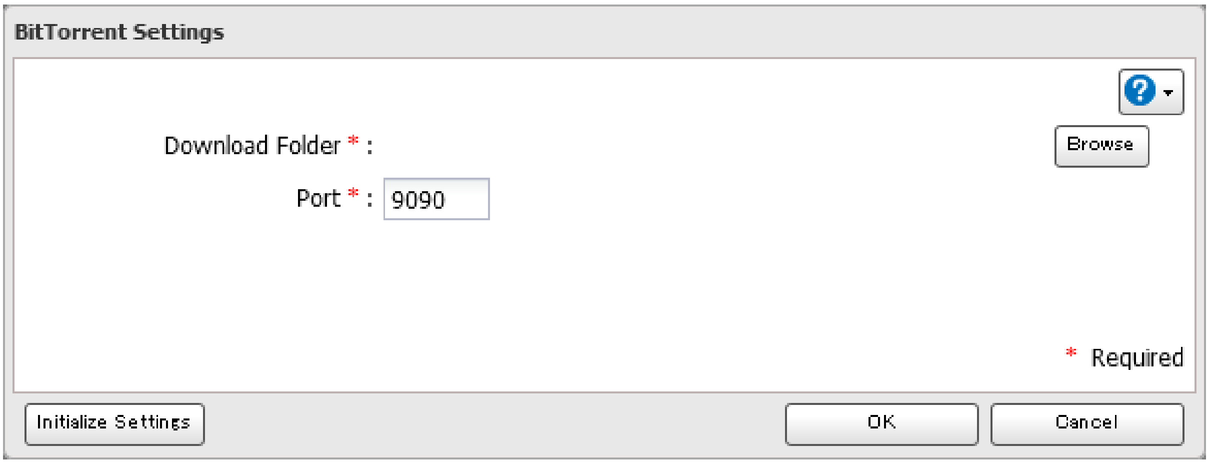
1 From Advanced Settings, click *Applications*.



2 Click the settings icon (⤢) to the right of "BitTorrent".



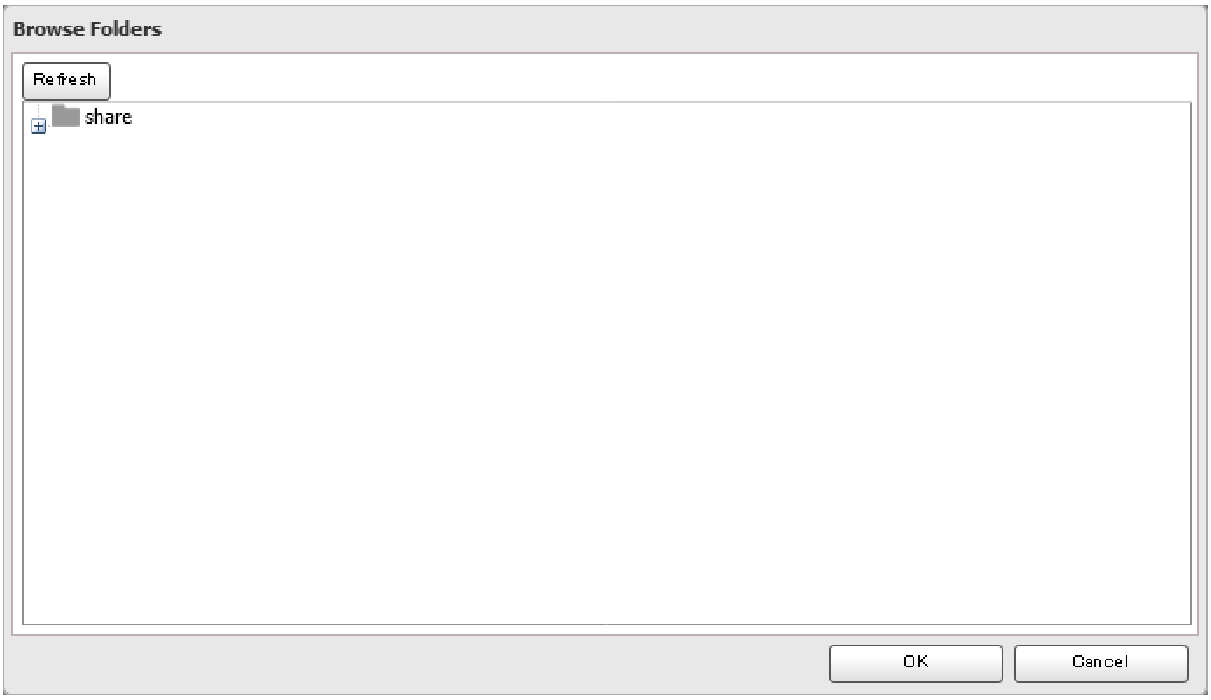
3 Click *Edit*, then *Browse*.


BitTorrent Settings
Browse
Initialize Settings
OK
Cancel
* Required

Download Folder * :

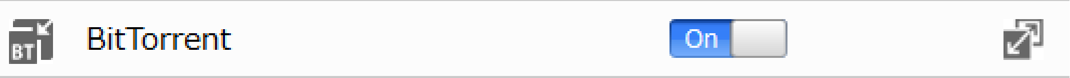
Port * : 9090

4 Select the shared folder where the downloaded file will be saved to, then click *OK*.


Browse Folders
Refresh
share
OK
Cancel

5 Enter the port number, then click *OK*.

6 The process is complete once you move the BitTorrent switch (Off) to the On position to enable BitTorrent.

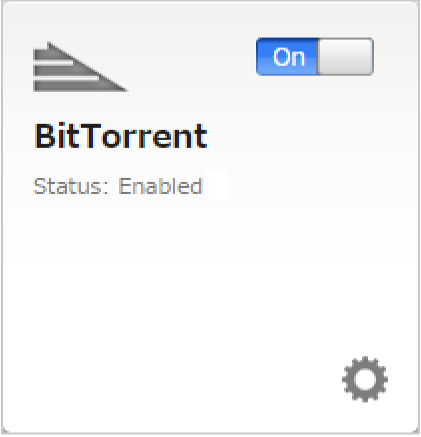

BT
BitTorrent
On

Opening the Download Manager

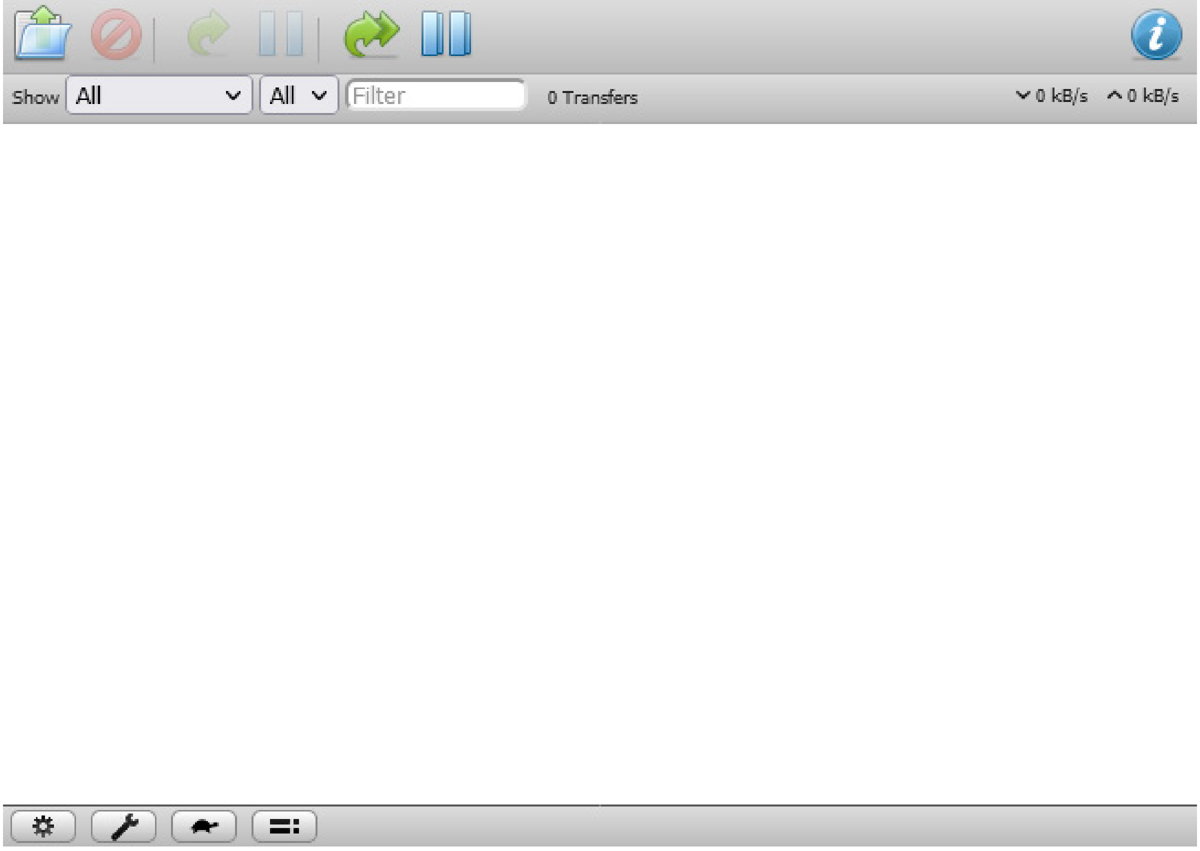
Note: The default username is "admin" and the default password is blank (no password).

Using Easy Admin

1 From Easy Admin, click *BitTorrent*.

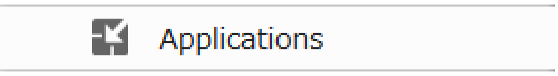

On
BitTorrent
Status: Enabled

2 The process is complete once the download manager is opened.

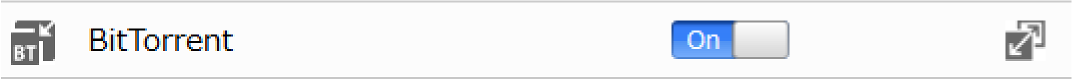

Show
All
All
Filter
0 Transfers
0 kB/s
0 kB/s

Using Advanced Settings

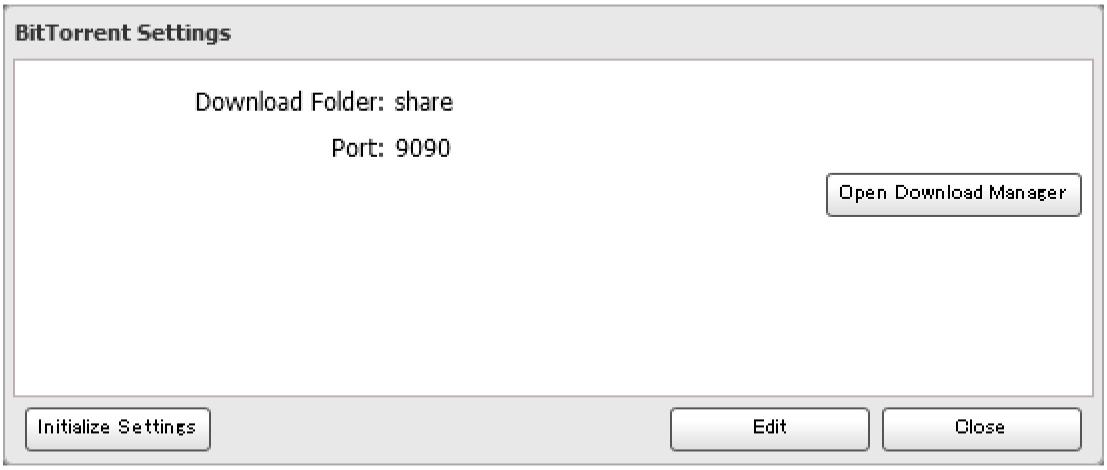
1 From Advanced Settings, click *Applications*.


Applications

2 Click the settings icon ( ) to the right of "BitTorrent".


BitTorrent On

3 Click *Open Download Manager*.

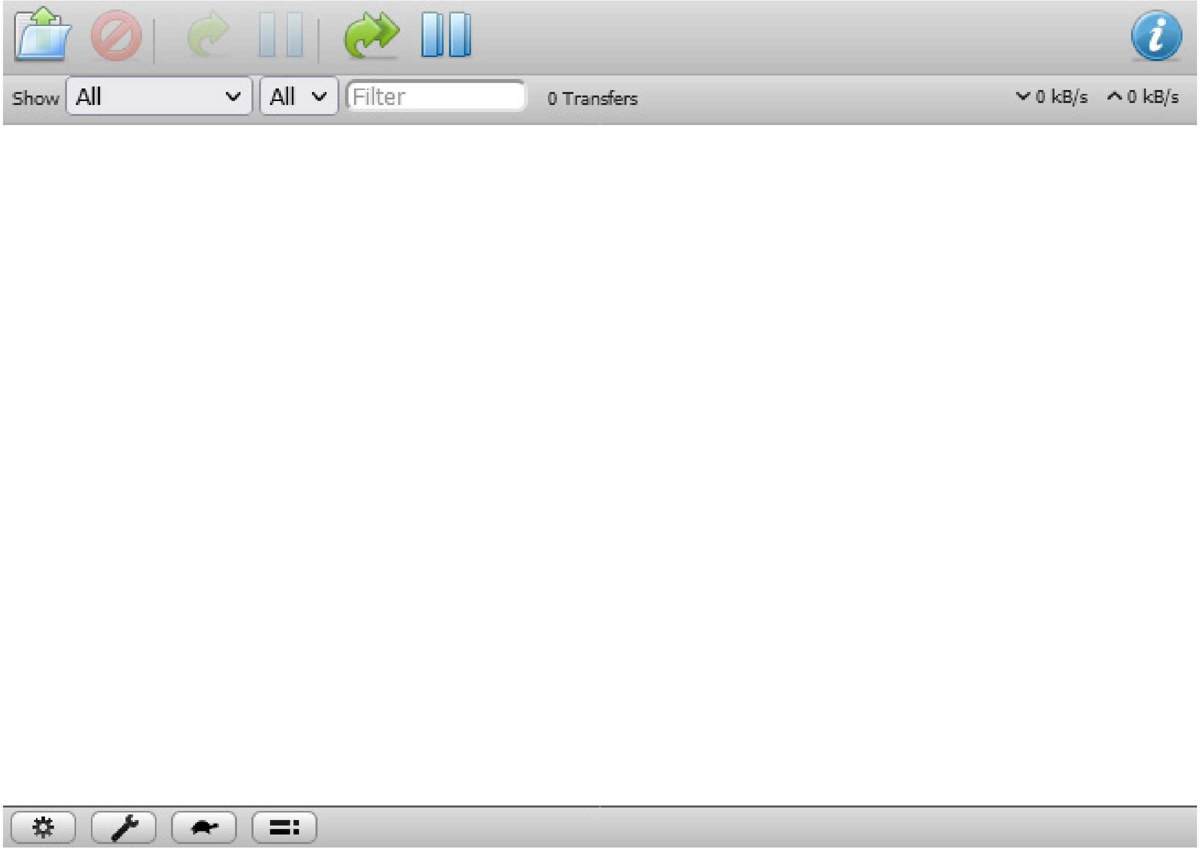

BitTorrent Settings

Download Folder: share

Port: 9090

Open Download Manager
Initialize Settings
Edit
Close

4 The process is complete once the download manager is opened.


Show
All
All
Filter
0 Transfers
0 kB/s
0 kB/s

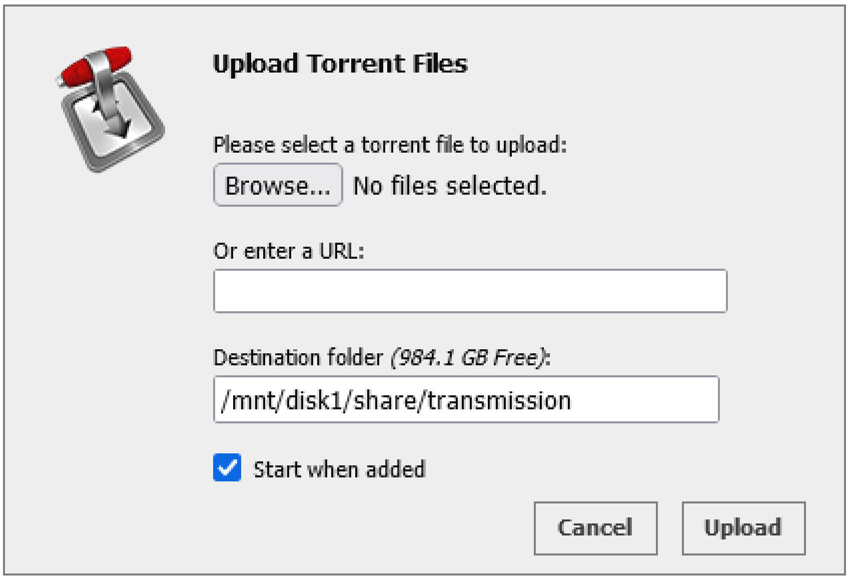
Downloading Files

1 Open the download manager.

2 Click the icon.

3 Select a file to upload or enter the URL into the “Or enter a URL:” field, specify the location to save the downloaded file, then click *Upload*.

Select “Start when added” to start downloading immediately after clicking *Upload*.



Upload Torrent Files

Please select a torrent file to upload:

Browse... No files selected.

Or enter a URL:

Destination folder *(984.1 GB Free)*:

/mnt/disk1/share/transmission

☑ Start when added

4 The process is complete once downloading starts.

To cancel downloading, click ⊘, then *Remove*. Click ⏸ to pause the download. Click ↷ or ↷ to resume.

Print Server

You can connect a printer to the USB port on the LinkStation.
You can configure a print server from a computer or a mobile device. Follow the appropriate procedure below to configure the print server.

Notes:

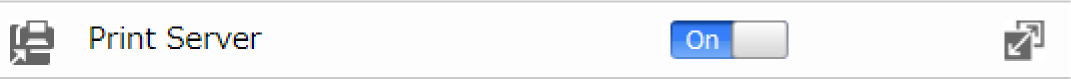
- Only one USB printer can be connected to the LinkStation.
- Bidirectional communication is not supported i.e., remaining ink quantities and other printer status information is not displayed.
- Don’t disable the SMB protocol while the print server is enabled. If you do, you will need to enable SMB again and reconfigure the print server from scratch.

Using a Computer

1 Connect a printer to the LinkStation’s USB port, then turn the printer on.

2 From Advanced Settings, click *Services*.

3 Move the print server switch (Off) to the On position to enable the print server.



Print Server On

4 Refer to the manual supplied with the printer and install the printer drivers.

5 Launch NAS Navigator2. Double-click your LinkStation’s icon.

6 Double-click the icon of the connected printer (the shared name is displayed).

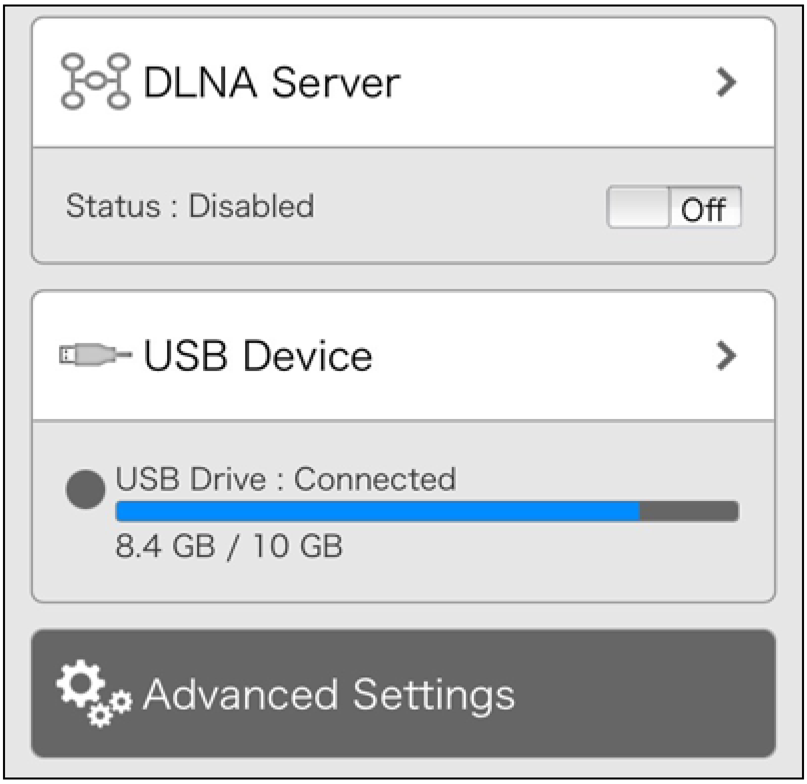
7 Click *OK*.

8 Select your printer, then click *OK*.

9 The process is complete once the printer is registered.

Using a Mobile Device

1 From Settings, tap *USB Device*.

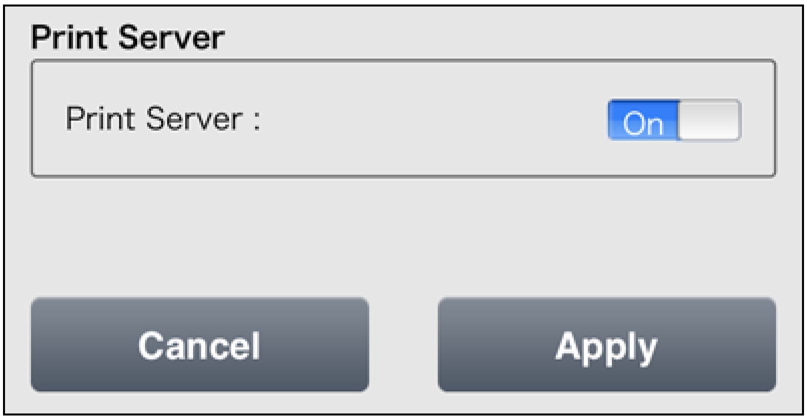


Status : Disabled Off

USB Drive : Connected

8.4 GB / 10 GB

2 Move the print server switch (Off) to the On position to enable the print server and tap *Apply*.



Print Server

Print Server : On

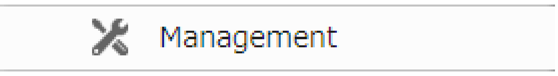
3 The process is complete once you close the confirmation window that appears.

Chapter 8 Settings Restoration

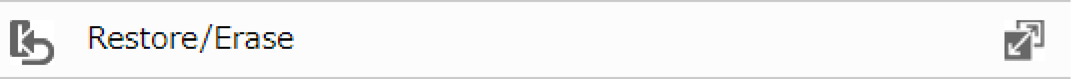
Restoring Factory Defaults

The settings on the LinkStation can be restored to factory defaults using Settings. To initialize the LinkStation to its factory defaults from Settings, follow the procedure below.

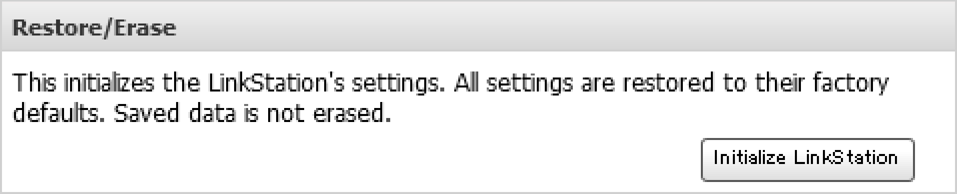
1. From Advanced Settings, click *Management*.



2. Click the settings icon (↗) to the right of "Restore/Erase".



3. Click *Initialize LinkStation*.



Restore/Erase

This initializes the LinkStation's settings. All settings are restored to their factory defaults. Saved data is not erased.

4. The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.
5. The settings will be restored to its factory default settings. The `I26` message will appear as a notification while settings are being restored.
6. The process is complete when the `I26` message disappears.

Resetting the Administrator Password

If you forget the admin username or password and cannot log in to Settings, or incorrect network settings are configured and Settings becomes inaccessible, initialize these settings by following the procedure below.

1. Turn off the LinkStation.
2. Turn the LinkStation on while holding down the function button. The function LED will blink white.
3. Press the function button again while the LED is blinking.
4. The `I23` message will appear as a notification during initialization.
5. When initialization is finished, the LinkStation will automatically restart. The process is complete after the LinkStation has been restarted and the power LED turns from blinking to glowing.

This will typically reset the admin username and password, IP address settings, and Ethernet frame size.
The function button reset can be disabled in Settings; to do so, navigate to *Management* > *Restore/Erase* > *Edit* then select "Keep current settings" and click *OK*. Be careful with this option! If this is selected and you lose your admin password, you will not be able to reset it.

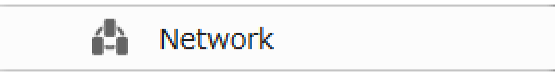
Chapter 9 Network Settings

Jumbo Frames

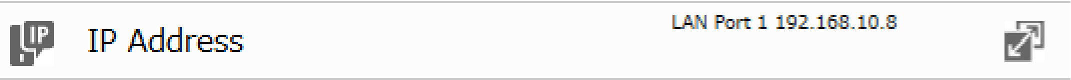
If your other network devices support jumbo frames, you may be able to improve network performance.

Note: Make sure the LinkStation's Ethernet frame size is smaller than the hub or router's. Larger frame sizes may cause data to not transfer properly to the LinkStation.

1. From Advanced Settings, click *Network*.



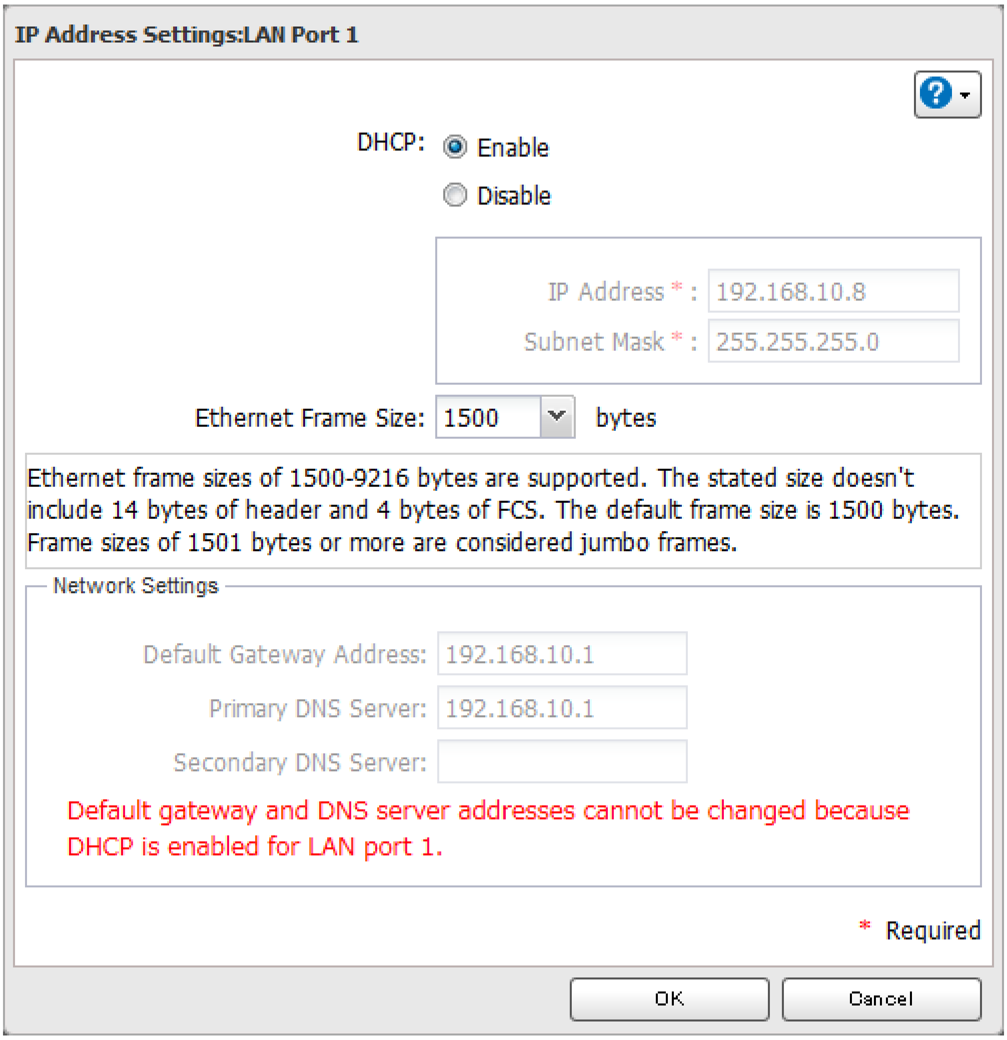
2. Click the settings icon (⤢) to the right of "IP Address".



IP Address LAN Port 1 192.168.10.8

3. Click the LAN port where the jumbo frames will be used.

4 Select the desired Ethernet frame size and click *OK*.



IP Address Settings:LAN Port 1

DHCP: ● Enable

○ Disable

IP Address * : 192.168.10.8

Subnet Mask * : 255.255.255.0

Ethernet Frame Size: 1500 bytes

Ethernet frame sizes of 1500-9216 bytes are supported. The stated size doesn't include 14 bytes of header and 4 bytes of FCS. The default frame size is 1500 bytes. Frame sizes of 1501 bytes or more are considered jumbo frames.

Network Settings

Default Gateway Address: 192.168.10.1

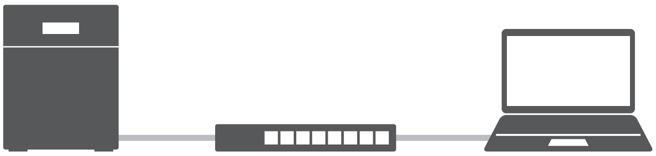
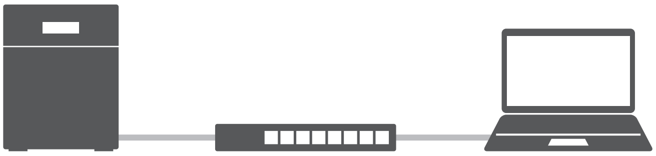
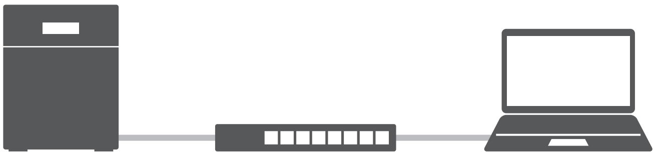
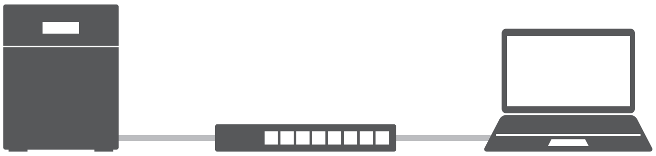
Primary DNS Server: 192.168.10.1

Secondary DNS Server:

Default gateway and DNS server addresses cannot be changed because DHCP is enabled for LAN port 1.

* Required

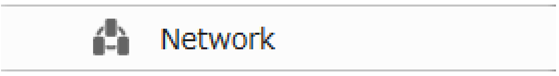
5 The process is complete once you close the confirmation window that appears.

Connection			Transmission	
 Jumbo Frame	Jumbo Frame Compatible Switch	Jumbo Frame Compatible PC	○	Transfer data using jumbo frames.
 Jumbo Frame	Jumbo Frame Compatible Switch	Jumbo Frame **Incompatible** PC	△	Transfer data without using jumbo frames.
 Jumbo Frame	Jumbo Frame **Incompatible** Switch	Jumbo Frame **Incompatible** PC	△	Transfer data without using jumbo frames.
 Jumbo Frame	Jumbo Frame **Incompatible** Switch	Jumbo Frame Compatible PC	×	No data can be transferred.

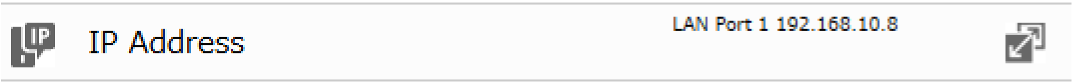
Changing the IP Address

Normally, the LinkStation's IP address is set automatically by a DHCP server on your network. If you prefer, you can set it manually. An easy way to do this is to change it on NAS Navigator2. The procedure to change the IP address in Settings is below.

1 From Advanced Settings, click *Network*.



2 Click the settings icon (⤢) to the right of "IP Address".

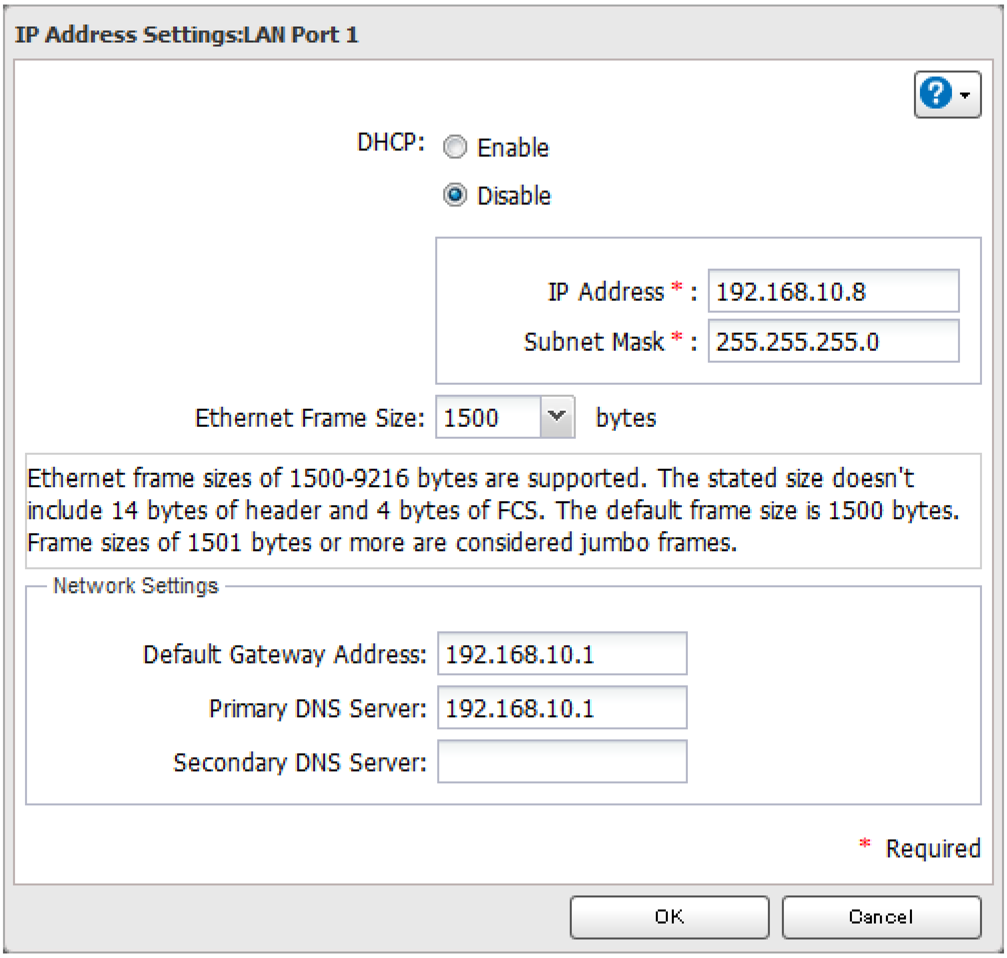


IP Address

LAN Port 1 192.168.10.8

3 Click the LAN port where the IP address will be changed.

4 Disable "DHCP", then enter the desired IP address and its subnet mask.



IP Address Settings:LAN Port 1

DHCP: ○ Enable
● Disable

IP Address * : 192.168.10.8
Subnet Mask * : 255.255.255.0

Ethernet Frame Size: 1500 bytes

Ethernet frame sizes of 1500-9216 bytes are supported. The stated size doesn't include 14 bytes of header and 4 bytes of FCS. The default frame size is 1500 bytes. Frame sizes of 1501 bytes or more are considered jumbo frames.

Network Settings

Default Gateway Address: 192.168.10.1
Primary DNS Server: 192.168.10.1
Secondary DNS Server:

* Required

5 Under "Network Settings", enter the default gateway and DNS server addresses. If no changes are necessaries, keep them as is.

6 Click *OK*. The process is complete once you close the confirmation window that appears.

Note: The following IP addresses are reserved and should not be used. If you configure one of them by accident, initialize settings by referring to the "Resetting the Administrator Password" section above.
Local loopback address: 127.0.0.1, 255.255.255.0
Network address: 0.0.0.0, 255.255.255.0
Broadcast address: 255.255.255.255, 255.255.255.0
The IP address range from 224.0.0.0 to 255.255.255.255

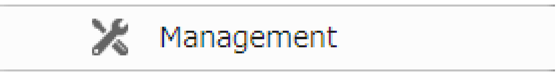
Chapter 10 Advanced Features

Email Notification

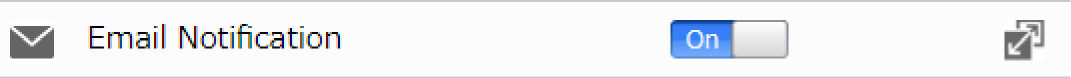
Your LinkStation can send you email reports daily, or whenever settings are changed or an error occurs. You can configure the events that will trigger notifications from any of the following functions: drives (internal, external, or RAID array), fan (models with 2+ drives only), backup, scheduled status report.

Follow the procedure below to enable email notification functionality.

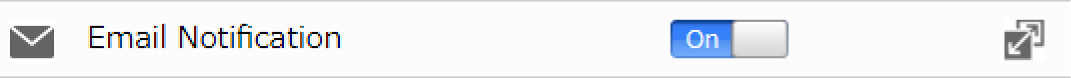
1 From Advanced Settings, click *Management*.



2 Move the email notification switch (Off) to the On position to enable email notification.

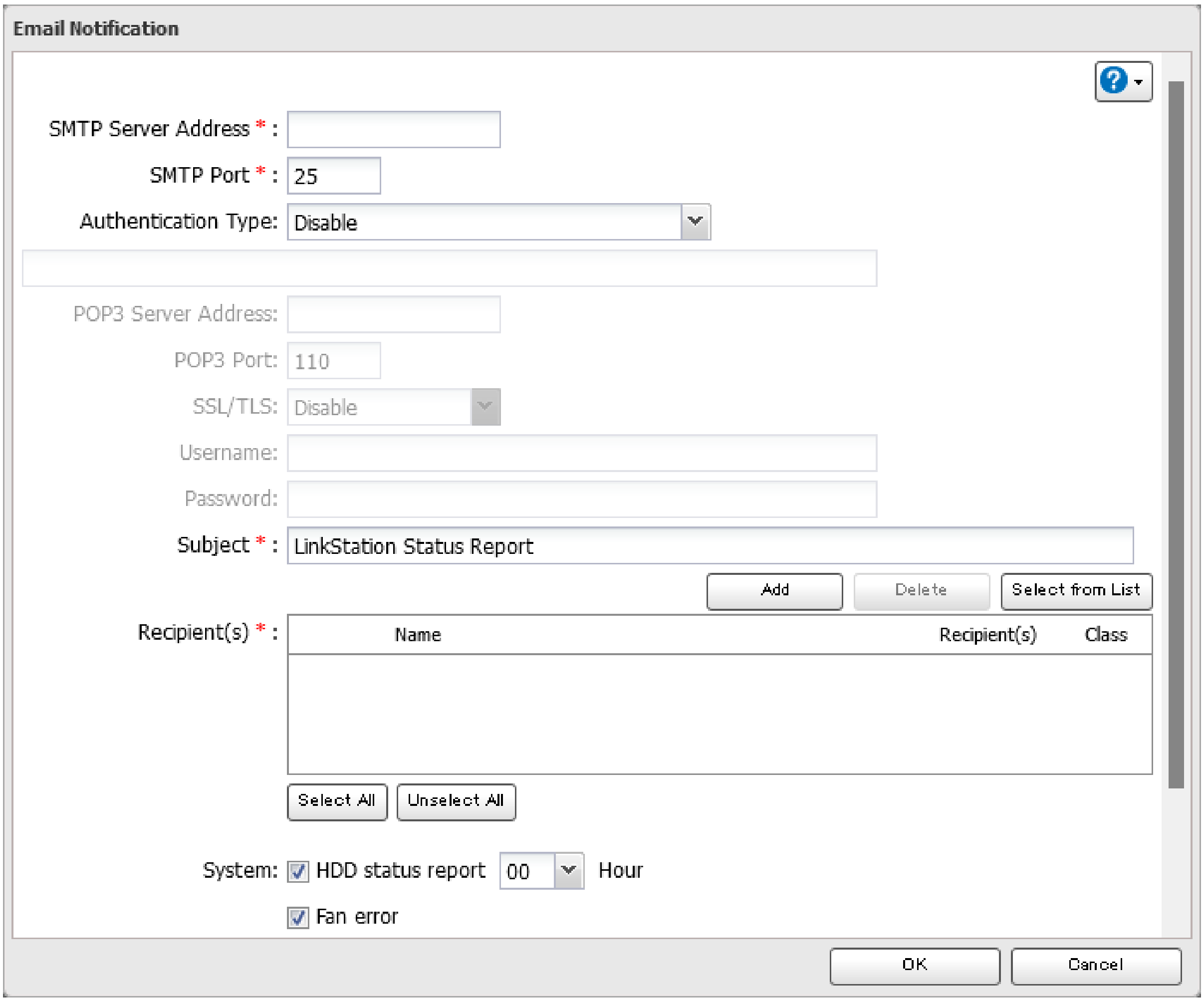


3 Click the settings icon (⤢) to the right of "Email Notification".



4 Click *Edit* and enter your email server settings and the notification email's default subject, then configure recipients and the time when email reports will be sent.

If you select an authentication type other than "Disable" from the drop-down list, you can enter the sender email address and credentials of the email server. If the password includes an apostrophe (') or a space, that email server account cannot be used.



Email Notification

SMTP Server Address * :
SMTP Port * : 25
Authentication Type: Disable
POP3 Server Address:
POP3 Port: 110
SSL/TLS: Disable
Username:
Password:
Subject * : LinkStation Status Report
Recipient(s) * :

Name	Recipient(s)	Class

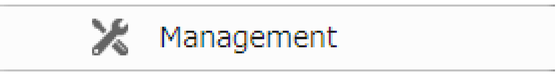
System: ☑ HDD status report 00 Hour
☑ Fan error

5 Click *OK*. The process is complete when you select either *Yes* or *No* to have a test email sent.

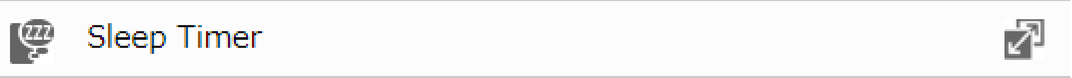
Sleep Mode

To save energy, you can specify times to put the LinkStation into sleep (standby) mode, during which the drives and LEDs are turned off.

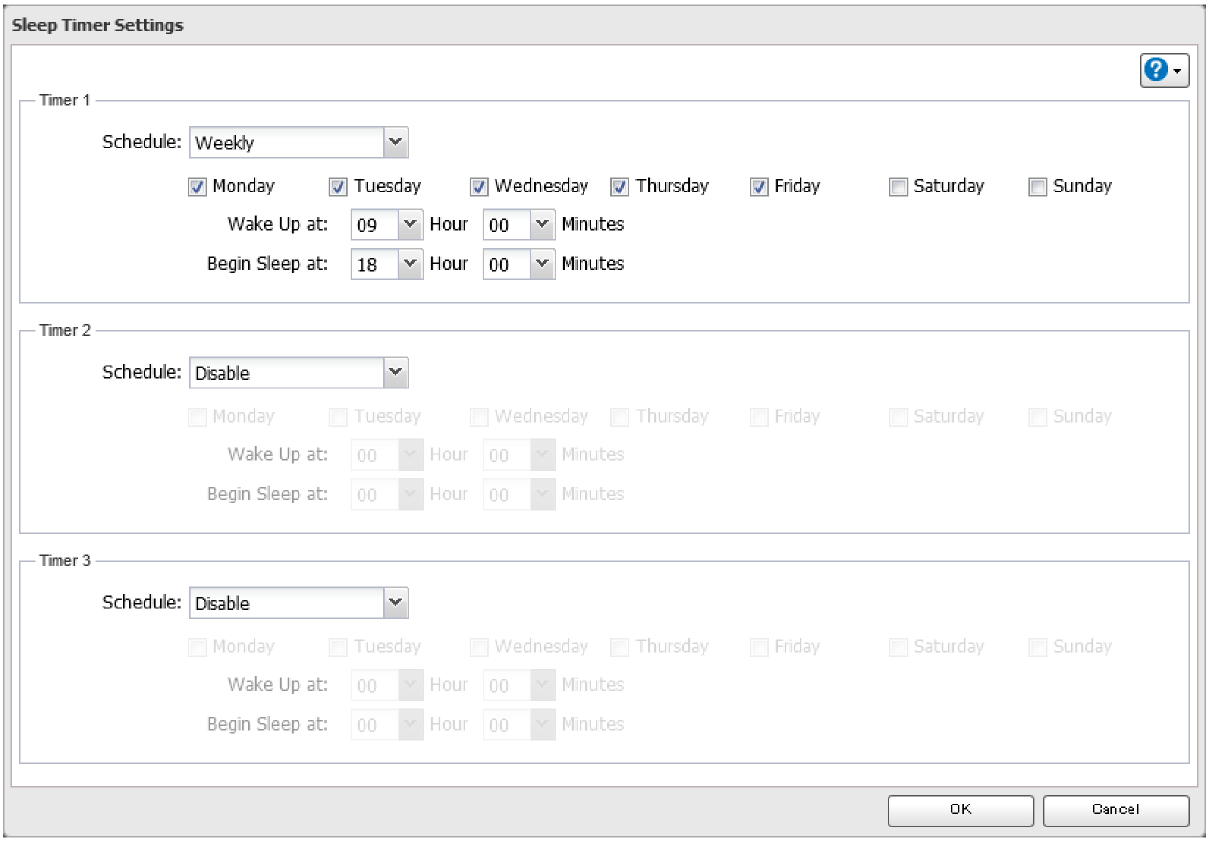
1 From Advanced Settings, click *Management*.



2 Click the settings icon ( ) to the right of "Sleep Timer".



3 Click *Edit* and specify the timer interval, wake-up time, and time to enter sleep mode, then click *OK*.



Sleep Timer Settings

Timer 1

Schedule: Weekly

☑ Monday ☑ Tuesday ☑ Wednesday ☑ Thursday ☑ Friday ☐ Saturday ☐ Sunday

Wake Up at: 09 Hour 00 Minutes

Begin Sleep at: 18 Hour 00 Minutes

Timer 2

Schedule: Disable

☐ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday ☐ Saturday ☐ Sunday

Wake Up at: 00 Hour 00 Minutes

Begin Sleep at: 00 Hour 00 Minutes

Timer 3

Schedule: Disable

☐ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday ☐ Saturday ☐ Sunday

Wake Up at: 00 Hour 00 Minutes

Begin Sleep at: 00 Hour 00 Minutes

4 The process is complete once you close the confirmation window that appears.

Notes:

- Up to three timers can be set.
- The time to enter sleep mode can be set from 12:00 a.m. to 3:45 a.m. of the next day. The time to wake from sleep mode can be set from 12:00 a.m. to 11:45 p.m. If the time to enter sleep mode is after 12:00 a.m., the wake-up time setting may be from 4:00 a.m. to 11:45 p.m.
- The time to enter sleep mode should not be set to the same time as or earlier than the start time.
- If sleep mode timer is scheduled to go off while checking or formatting a drive, running a backup process, or setting a backup job within five minutes of the current time, the LinkStation will not enter sleep mode when the configured time is reached.
- Examples of timer settings are shown below:
  - **Example 1:**

    Sleep Timer Settings

    Timer 1: Daily 12:00 (wake up)–24:00 (begin sleep)

    Timer 2: Not used

    Timer 3: Not used

    Actual Behavior

    Normal operation begins at 12:00 p.m. and the unit enters sleep mode at 12:00 a.m.
  - **Example 2:**

    Sleep Timer Settings

    Timer 1: Daily 9:00 (wake up)–18:00 (begin sleep)

    Timer 2: Wednesday 10:00 (wake up)–20:00 (begin sleep)

    Timer 3: Not used

  Actual Behavior

  On days other than Wednesday, normal operation begins at 9:00 a.m. and the unit enters sleep mode at 6:00 p.m. On Wednesday, normal operation begins at 9:00 a.m. and the unit enters sleep mode at 8:00 p.m., as when scheduled times on the timer overlap on Wednesday, normal operation begins at the earliest time, and the unit enters sleep mode at the latest time.

  - **Example 3:**

    Sleep Timer Settings

    Timer 1: Daily 9:00 (wake up)–18:00 (begin sleep)

    Timer 2: Wednesday 10:00 (wake up)–1:00 a.m. of the next day (begin sleep)

    Timer 3: Not used

    Actual Behavior

    On days other than Wednesday, normal operation begins at 9:00 a.m. and the unit enters sleep mode at 6:00 p.m. On Wednesday, normal operation begins at 9:00 a.m. and the unit enters sleep mode at 1:00 a.m. of the next day, as when scheduled times on the timer overlap on Wednesday, normal operation begins at the earliest time, and the unit enters sleep mode at the latest time.

  - **Example 4:**

    Sleep Timer Settings

    Timer 1: Daily 9:00 (wake up)–18:00 (begin sleep)

    Timer 2: Wednesday 7:30 (wake up)–22:00 (begin sleep)

    Timer 3: Not used

    Actual Behavior

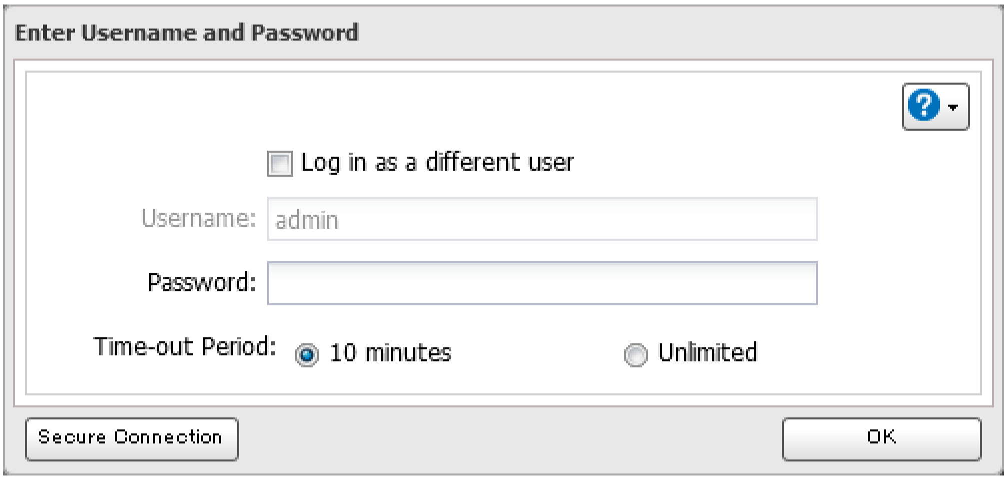
    On days other than Wednesday, normal operation begins at 9:00 a.m. and the unit enters sleep mode at 6:00 p.m. On Wednesday, normal operation begins at 7:30 a.m. and the unit enters sleep mode at 10:00 p.m., as when scheduled times on the timer overlap on Wednesday, normal operation begins at the earliest time, and the unit enters sleep mode at the latest time.

- To wake the LinkStation from sleep mode before the wake-up time, press the function button.

Encrypting Data Transmission

Encrypting Settings Data

All communication with Settings can use SSL encryption if you access the Settings page by changing "http://" to "https://" in the browser address bar or click *Secure Connection* from the login window. Once you are logged in using the HTTPS connection and wish to disable SSL encryption, click *Normal Connection* from the login window.



Enter Username and Password

☐ Log in as a different user

Username: admin

Password:

Time-out Period: ● 10 minutes ○ Unlimited

Encrypting FTP Transfer Data

You can encrypt passwords and files using SSL/TLS for secure FTP communication. First, open a shared folder's settings and click *Edit*; under "LAN Protocol Support", select the "FTP" checkbox and click *OK*. Afterwords, enable SSL security in the setup screen for your FTP client. The procedure depends on the FTP client software.

SSL

SSL (Secure Socket Layer) is a protocol that uses a public key encryption system to establish secure communication channels between networked devices, allowing for encrypted Internet traffic and server identity verification.
The SSL protocol uses a pair of keys – one private, one public – to authenticate and manage secure connections. SSL keys are used during setup screen operations.

SSL Key Formats/Extensions

The SSL keys may include the following encoding formats and extensions:

SSL Certificate (server.crt)

The server.crt is the server public key, and is generated by the LinkStation. A computer that receives the server.crt uses it to encrypt data, and the LinkStation then uses the server.key file to decrypt the data.
In SSL, this key contains the server certificate, and depending on your computer environment, a check may be performed to determine the trustworthiness of the certificate. The server certificate included in the LinkStation's default settings was created by Buffalo, and in some cases, the security certificate warning message may appear in your browser or another security software. If this occurs, disregard the message and continue.

SSL Private Key (server.key)

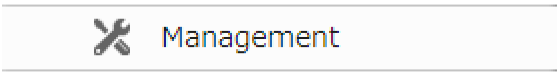
This file is the server private key, and it is usually not revealed. The server.key file is paired with the server.crt file to decrypt data encrypted by the SSL certificate.

Note: The passphrase for the private key must be removed before importing to the LinkStation.

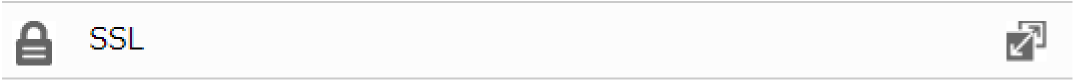
Updating SSL Key Files

To update a server certificate and a private key for SSL, follow this procedure.

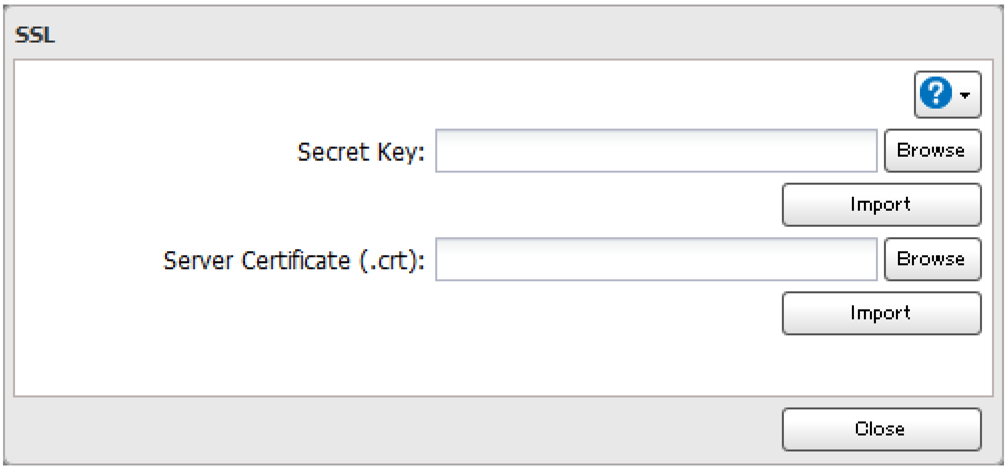
1 From Advanced Settings, click *Management*.



2 Click the settings icon ( ) to the right of "SSL".



3 Enter "server.key" for "Secret Key" and "server.crt" for "Server Certificate (.crt)", then click *Import*.



4 The process is complete once you close the confirmation window that appears.

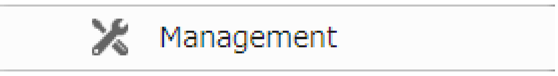
Updating the Firmware

If a new firmware version is available, a message is displayed when you access Settings. To update the firmware from Settings, follow the procedure below.

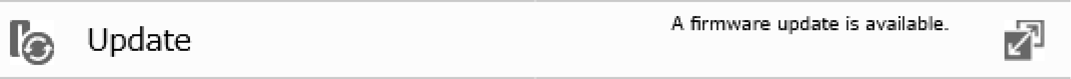
Notes:

- Settings will not be available while the firmware is updating. Don't try to access Settings from another computer or mobile device until the update is finished.
- You can disable update notifications in *Management* > *Update*.
- To clear an update notification, press the function button.

1 From Advanced Settings, click *Management*.



2 Click the settings icon (↗) to the right of "Update".



A firmware update is available.

3 Click *OK*.

4 Click *Install Update*.

5 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

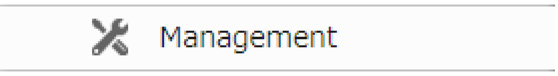
6 The process is complete once you close the confirmation window that appears.

You can also download the latest firmware from the Buffalo website.

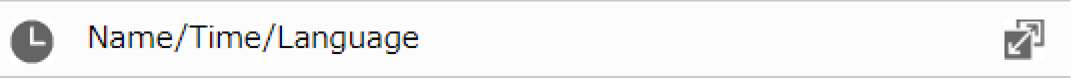
Name, Date, Time, and Language

Configure the LinkStation's hostname, date, time, and language as shown below.

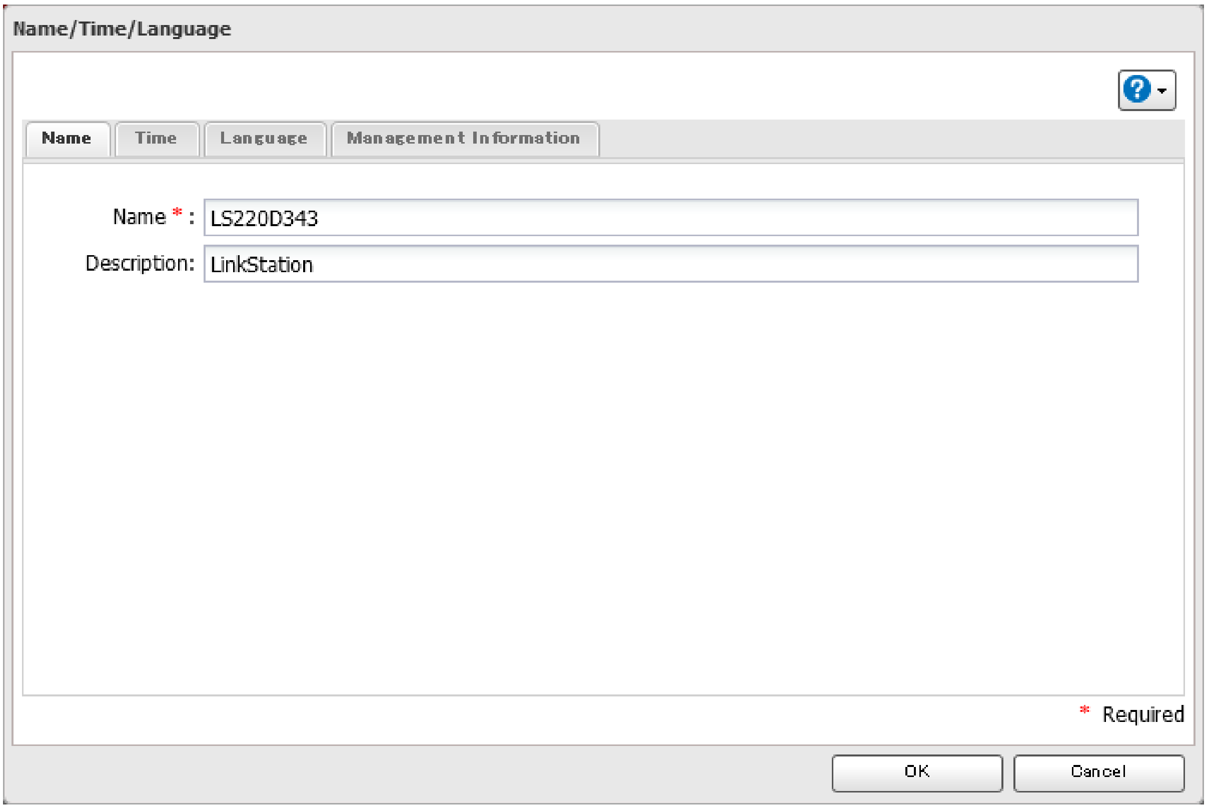
1 From Advanced Settings, click *Management*.


Management

2 Click the settings icon ( ) to the right of “Name/Time/Language”.


Name/Time/Language

3 From the *Name* tab, click *Edit*, then enter the LinkStation’s name and description.

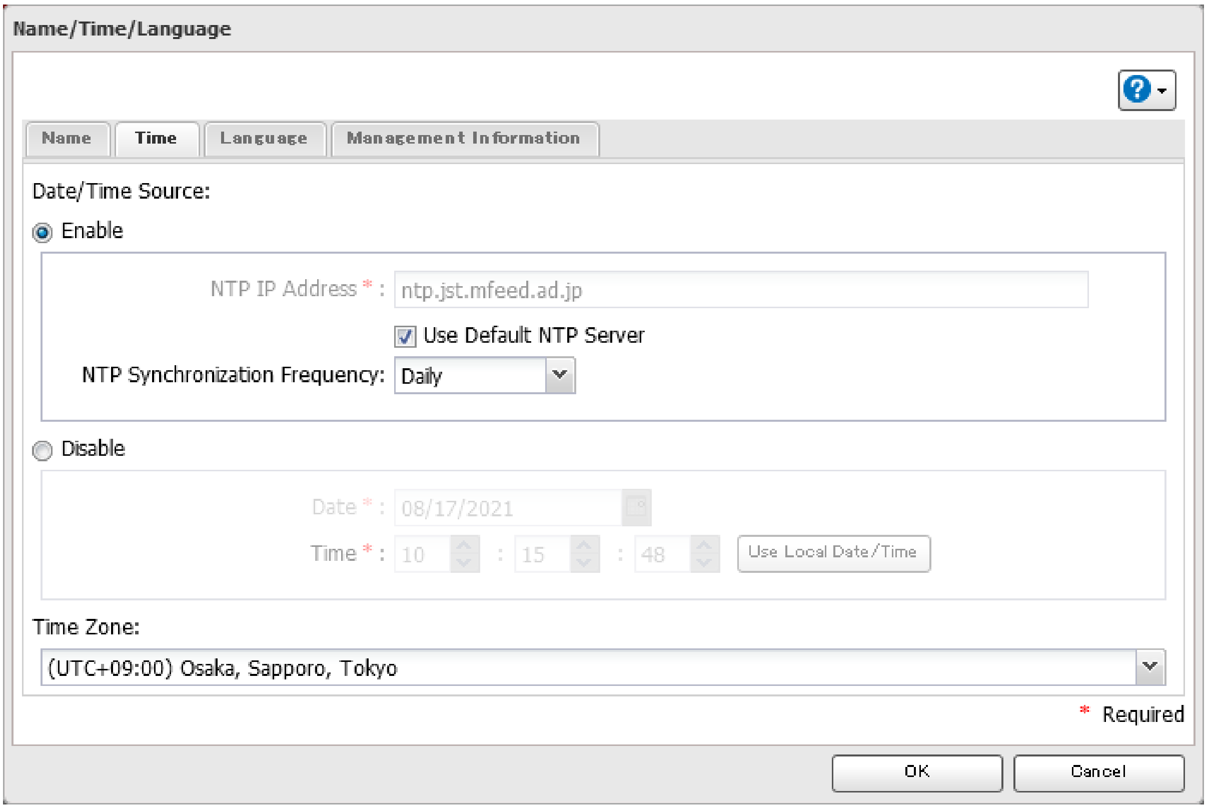

Name/Time/Language
?
Name
Time
Language
Management Information
OK
Cancel

Name * : LS220D343

Description: LinkStation

* Required

4 Click the *Time* tab. Enable "Date/Time Source" and select the "Use Default NTP Server" checkbox. If you disable the NTP function, click *Use Local Date/Time* to use your computer's time settings for the LinkStation.



Name/Time/Language

Date/Time Source:

● Enable

NTP IP Address * : ntp.jst.mfeed.ad.jp

☑ Use Default NTP Server

NTP Synchronization Frequency: Daily

○ Disable

Date * : 08/17/2021

Time * : 10 : 15 : 48

Time Zone:

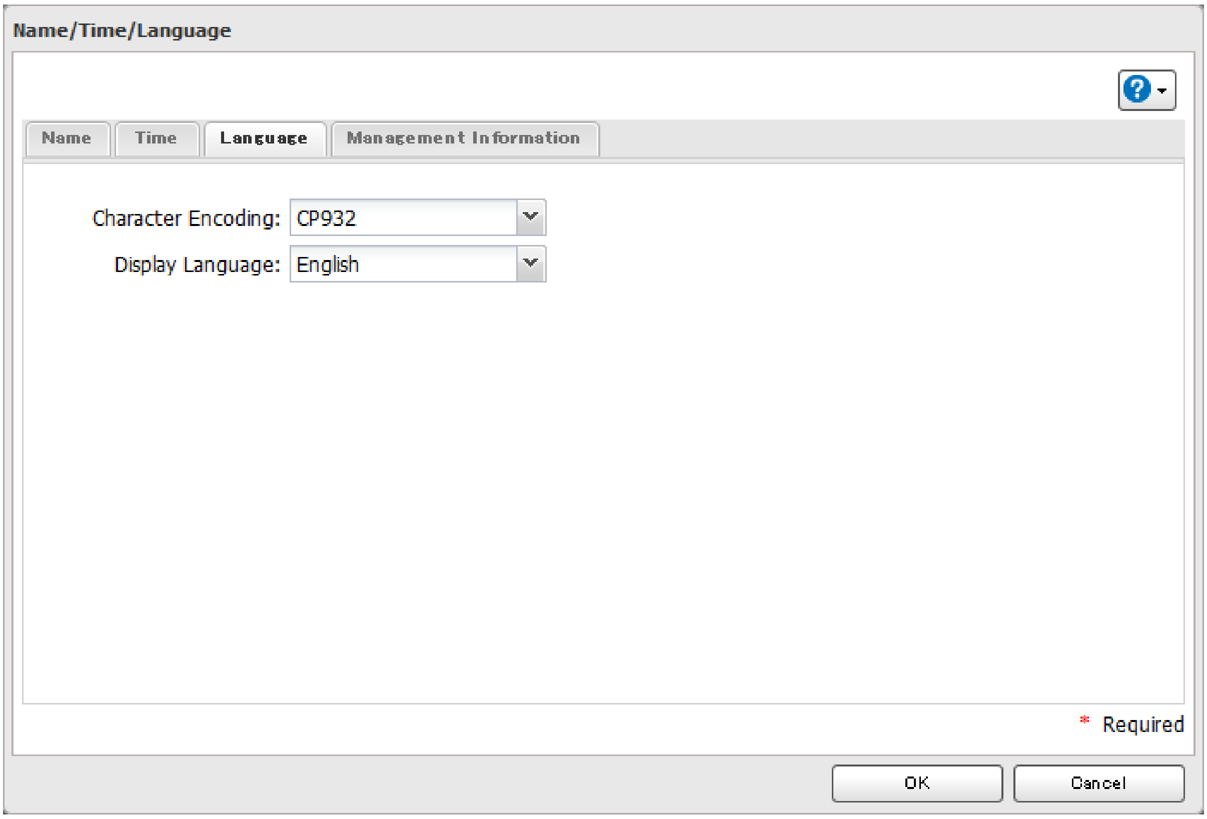
(UTC+09:00) Osaka, Sapporo, Tokyo

* Required

By default, the LinkStation adjusts its clock automatically by using a default NTP server. This NTP server belongs to Internet Multi Feed Inc. For more information, visit http://www.jst.mfeed.ad.jp.
To use a different NTP server, clear the "Use Default NTP Server" checkbox and enter a new NTP IP address or its hostname, then click *OK*. If an NTP server is specified by name instead of IP address, make sure that a DNS server is configured for the LinkStation.

Note: The internal clocks of the LinkStation and other devices on your network may run at slightly different speeds. Over a long period of time, your network devices may show somewhat different times, which can cause network problems. If clocks on your network vary by more than five minutes, unexpected behavior may occur. For best results, keep all clocks on your network devices set to the same time by adjusting them regularly, or use an NTP server to correct them all automatically.

5 Click the *Language* tab and select the language to be used.

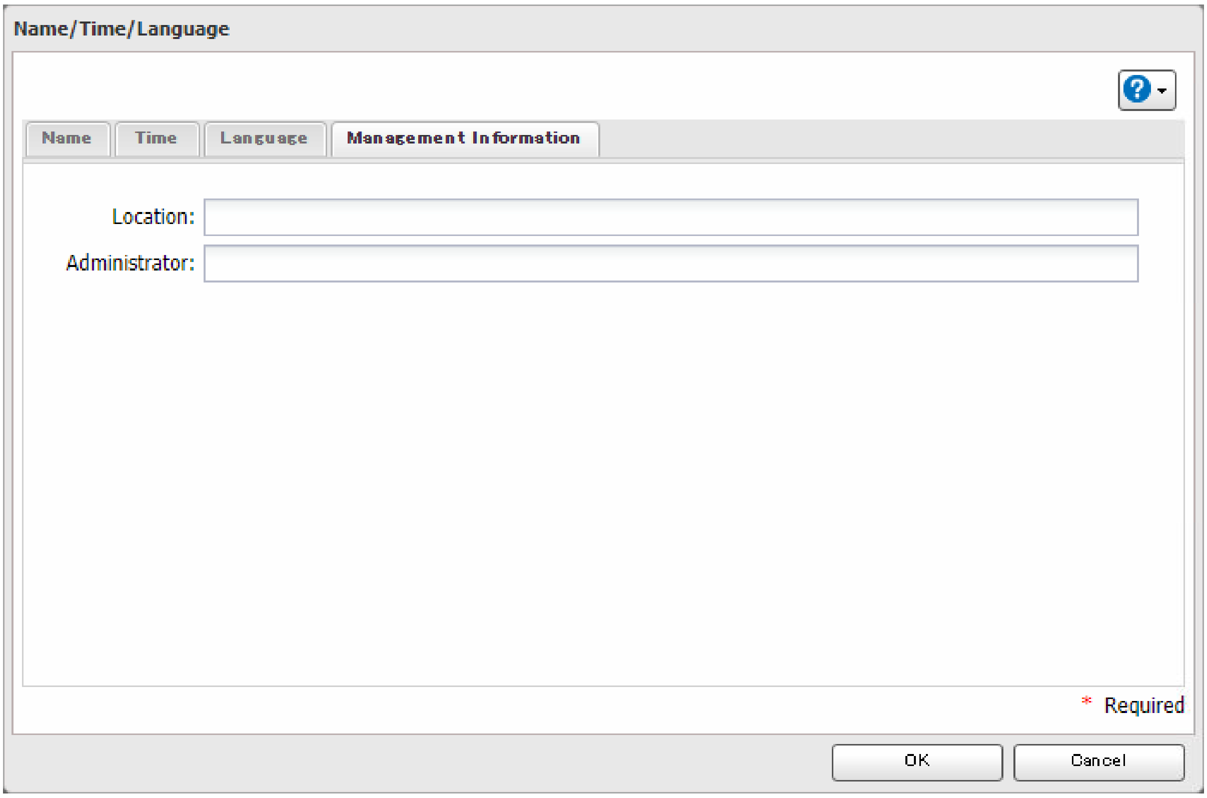

Name/Time/Language
Name
Time
Language
Management Information
* Required
OK
Cancel

Character Encoding: CP932

Display Language: English

Note: This tab changes the language used by the LinkStation for email notifications, DLNA, and other functions. To change the language displayed in Settings, go to Settings and click *Language* from the menu bar. Choose your desired language from the drop-down list.

6 Click the *Management Information* tab. Enter the desired location and administrator information.


Name/Time/Language
Name
Time
Language
Management Information
Location:
Administrator:
* Required
OK
Cancel

7 Click *OK* when all settings are configured.

8 The process is complete once you close the confirmation window that appears.

Chapter 11 Drive Replacement and Device Troubleshooting

Replacing a Defective Drive

Drive replacement procedures will vary depending on what RAID mode is configured for the LinkStation. Refer to the appropriate replacement procedure in the following sections that corresponds to the configured RAID mode.

Notes:

- Do not replace a running drive while the LinkStation is turned on. Power down the LinkStation before changing the drive. While the LinkStation is running, never unplug or remove drives without dismounting them first.
- If using the LS220DR LinkStation model, use a Buffalo OP-HDBN series drive as the replacement drive. Use a Buffalo OP-HDBST series drive as the replacement drive for other series LinkStations. The replacement drive should be the same capacity or larger as the original drive. If a larger drive is used, the extra space will not be usable in a RAID array.
- If sending a defective drive to Buffalo for replacement, please keep the cartridge as Buffalo will only replace the drive and not the cartridge.
- To avoid damaging the LinkStation with static electricity, ground yourself by touching something made of metal before handling any sensitive electronic parts.
- After a drive is replaced, it will take about 30 minutes before normal file reading and writing operations are restored. Settings may not be accessible during this period.
- Do not change the order of the drives on the LinkStation. For example, pulling out the drive in slot 1 and replacing it with the drive in slot 2 may cause data to be corrupted or lost.
- If a new drive is not recognized after installing it, click *Rediscover Disk* in Settings.

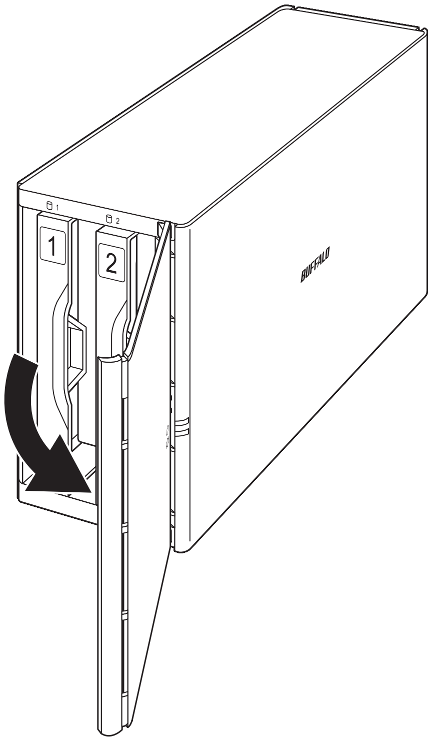
Drive Replacement for a RAID 1 Array

If a drive used in a RAID 1 array fails, you will need to recover the RAID array after replacing the defective drive with a new drive. You can recover the RAID array from a computer or a mobile device. Follow the appropriate procedure below to replace a defective drive used in a RAID 1 array.

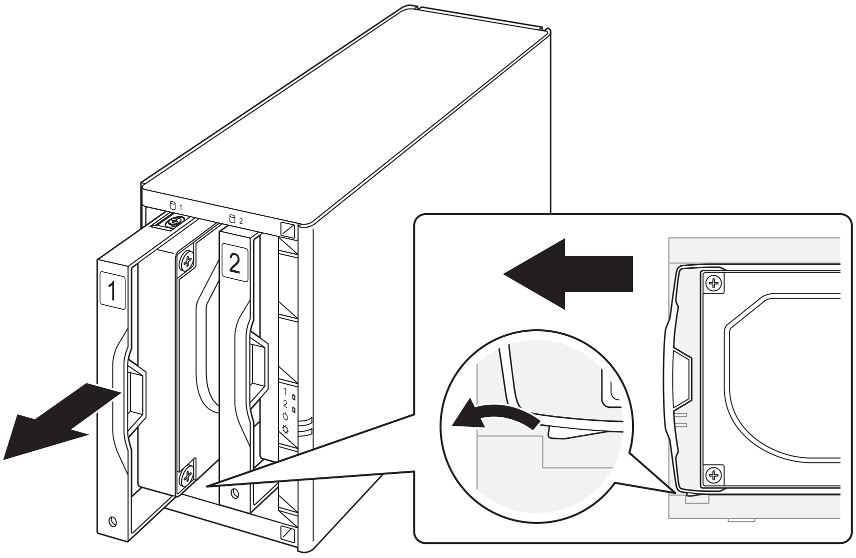
Using a Computer

1 Turn the LinkStation off and remove all cables.

2 Squeeze the left side of the front panel and swing it open.



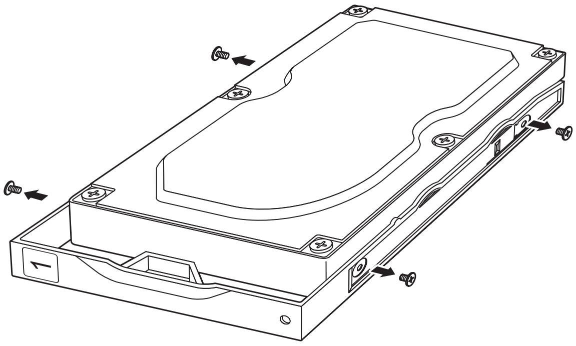
3 Push the failed drive’s cartridge up and remove it from the LinkStation.



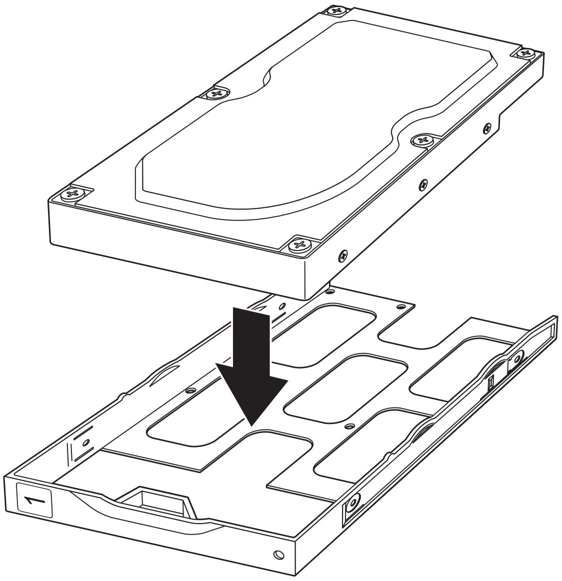
Notes:

- Do not press hard on the top of the LinkStation.
- Pull the drive straight out the front of the chassis.

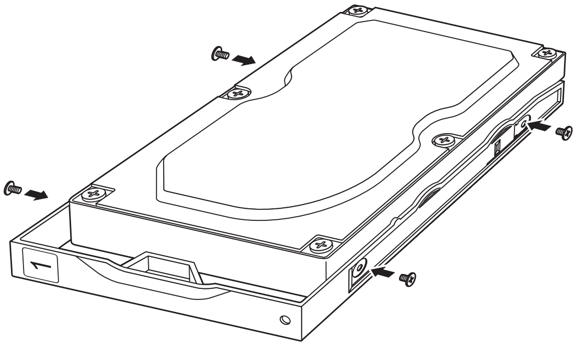
4 Unscrew the four screws and remove the drive from the cartridge.



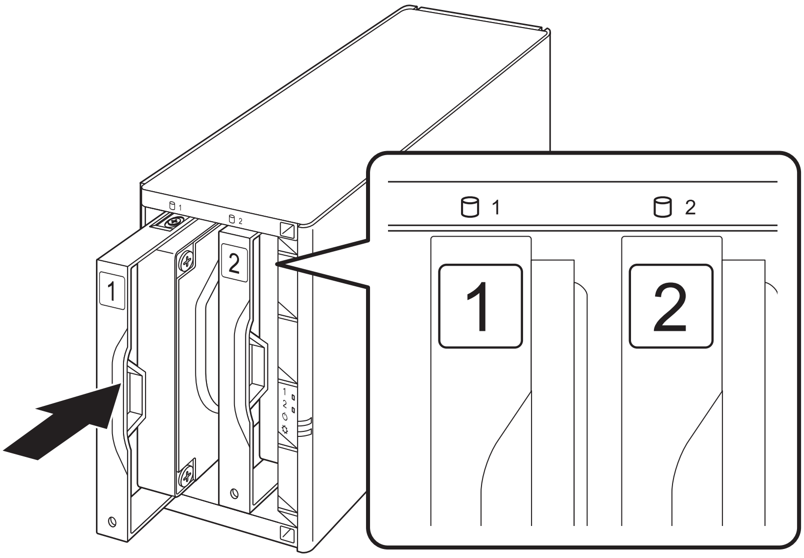
5 Install a new drive (sold separately) into the cartridge.



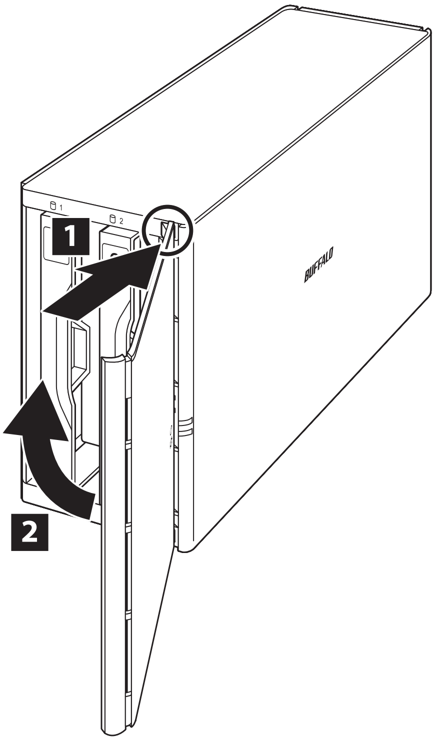
6 Replace the four screws.



7 Insert the new drive back into the empty slot.



8 Close the front panel.



9 Connect all cables, then turn on the LinkStation. When the replaced drive is detected, the power LED will blink amber.

10 From Advanced Settings, navigate to *Drives* > *RAID*.

11 Click *Array1*, then select the replaced drive and click *Recover RAID Array*.

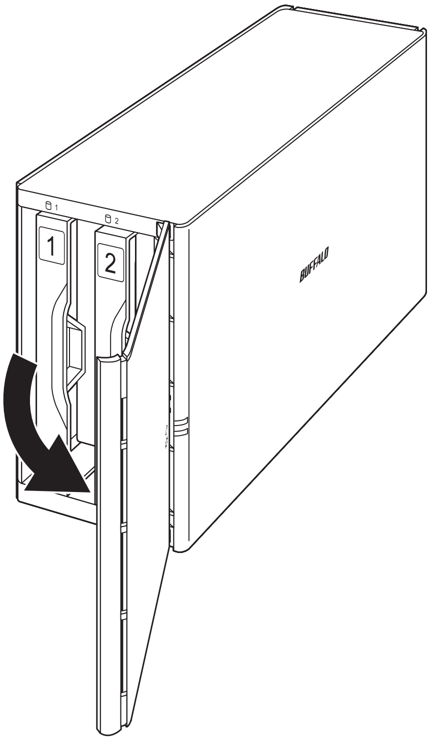
12 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

13 The RAID array recovery will begin. The `I18` message will appear as a notification after a few minutes. The process is complete when the `I18` message disappears.

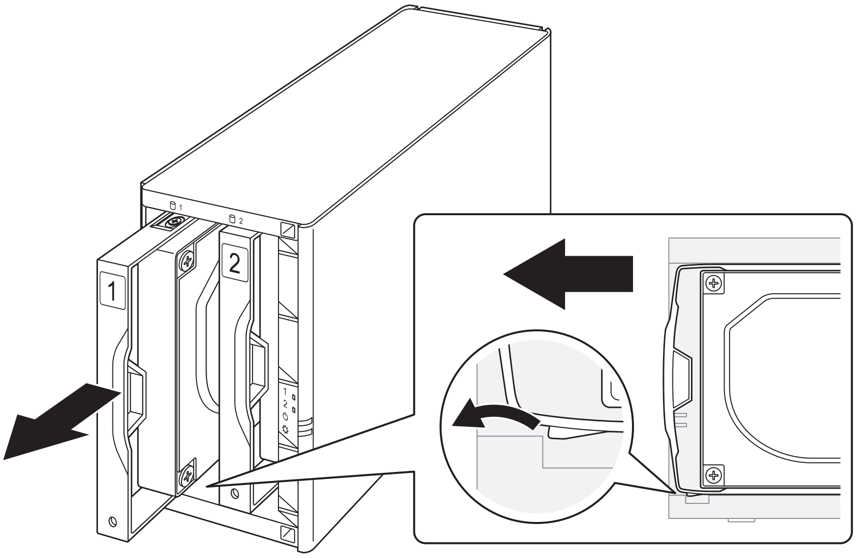
Using a Mobile Device

1 Turn the LinkStation off and remove all cables.

2 Squeeze the left side of the front panel and swing it open.



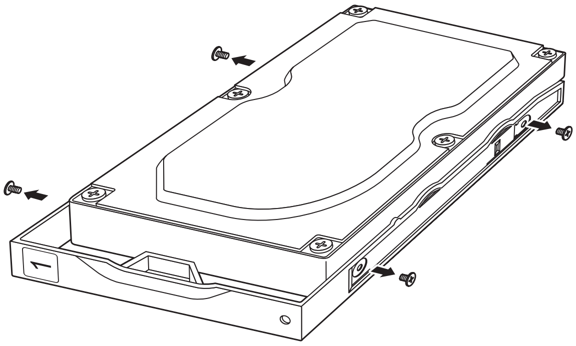
3 Push the failed drive's cartridge up and remove it from the LinkStation.



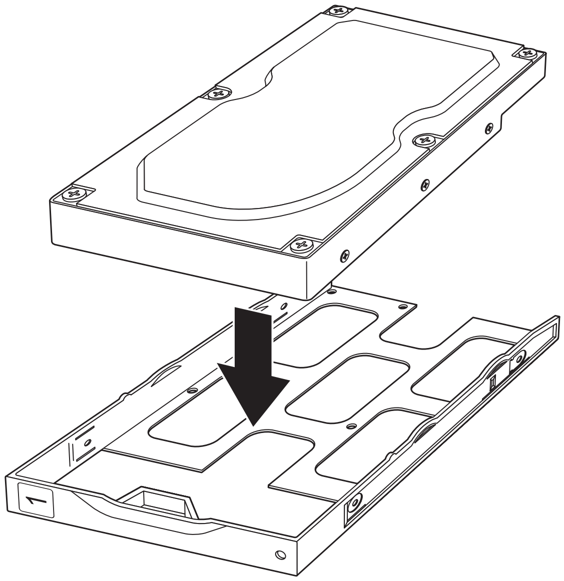
Notes:

- Do not press hard on the top of the LinkStation.
- Pull the drive straight out the front of the chassis.

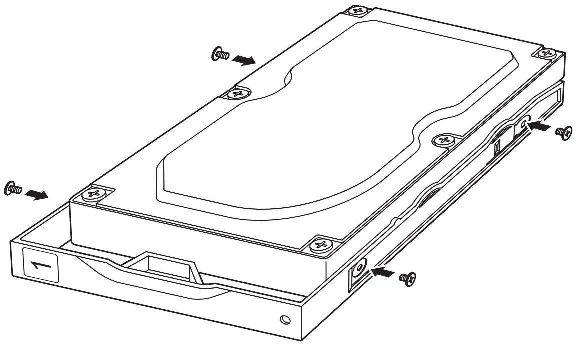
4 Unscrew the four screws and remove the drive from the cartridge.



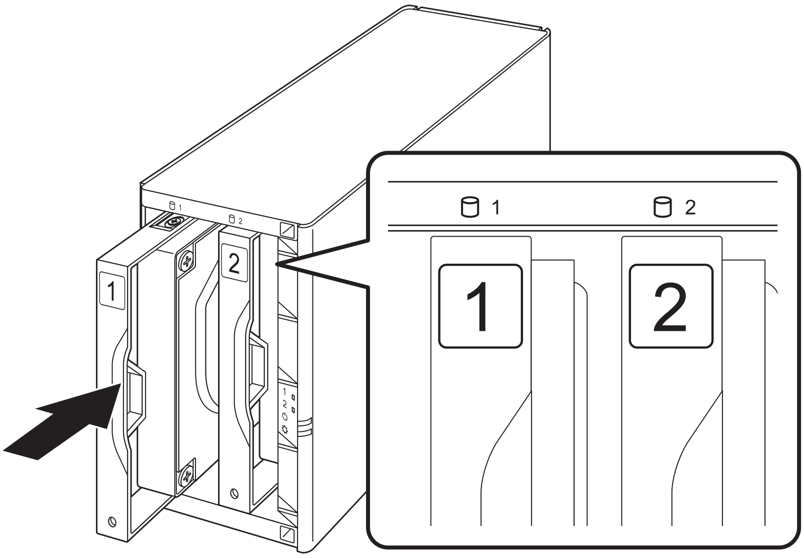
5 Install a new drive (sold separately) into the cartridge.



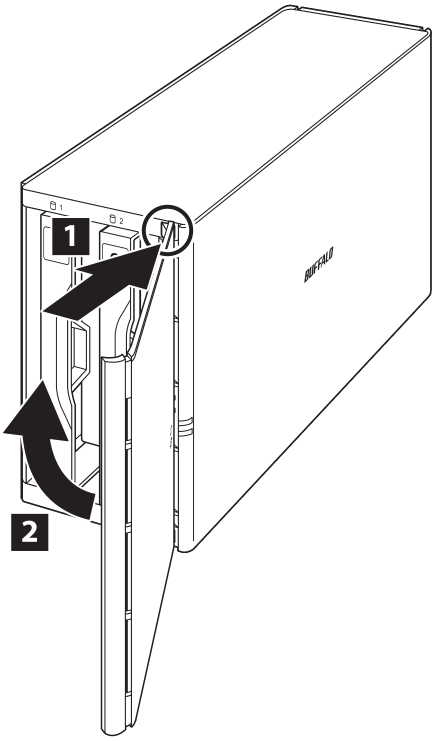
6 Replace the four screws.



7 Insert the new drive back into the empty slot.



8 Close the front panel.



9 Connect all cables, then turn on the LinkStation. When the replaced drive is detected, the power LED will blink amber.

10 From Settings, tap the blinking yellow information icon (ⓘ).

11 Tap *Recover RAID Array*, then tap *Recover RAID Array* again.

12 Tap *Yes*.

13 The “Confirm Operation” screen will open. Enter the confirmation number, then tap *OK*.

14 The RAID array recovery will begin. The `I18` message will appear as a notification after a few minutes. The process is complete when the `I18` message disappears.

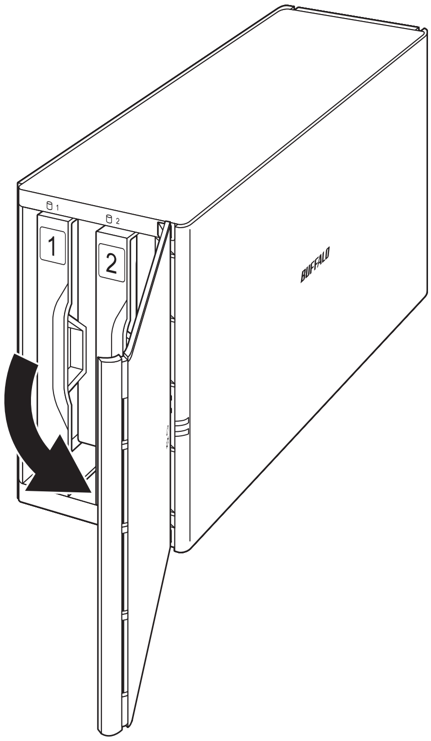
Drive Replacement for a RAID 0 Array

If a drive used in a RAID 0 array fails, you will need to create a RAID array again after replacing the defective drive with a new drive. Follow the procedure below to replace a defective drive used in a RAID 0 array.

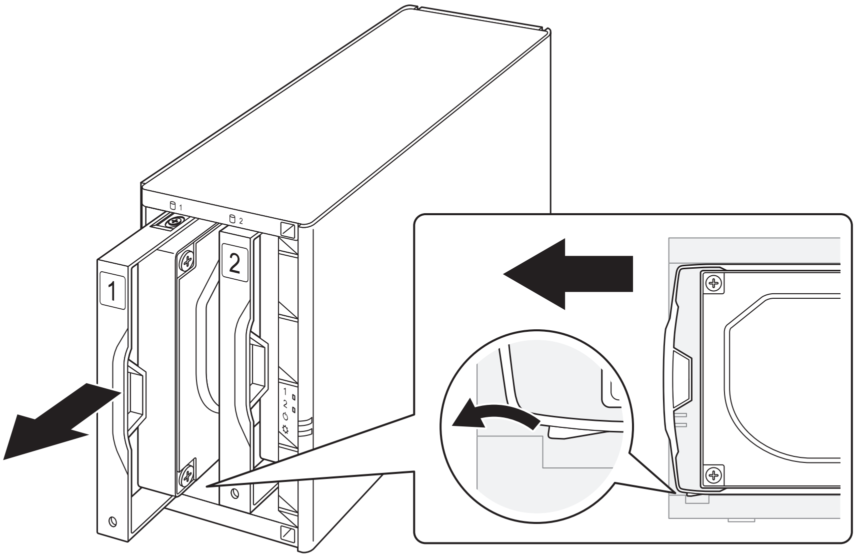
Note: If a drive malfunctions in a RAID 0 array, all data on the RAID array will be lost. All of the settings for the shared folders (such as access restrictions) are erased after replacing a drive from a RAID 0 array.

1 Turn the LinkStation off and remove all cables.

2 Squeeze the left side of the front panel and swing it open.



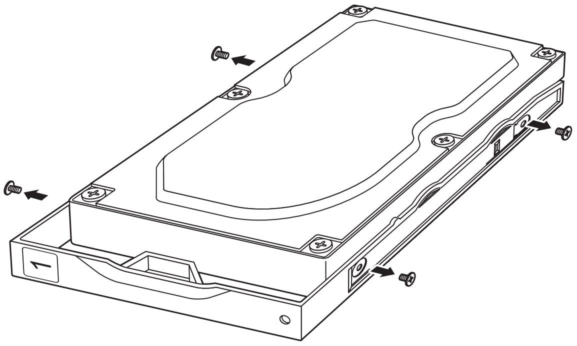
3 Push the failed drive's cartridge up and remove it from the LinkStation.



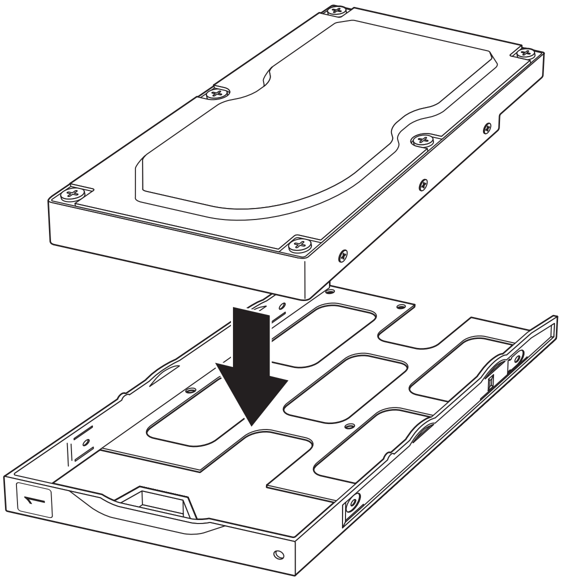
Notes:

- Do not press hard on the top of the LinkStation.
- Pull the drive straight out the front of the chassis.

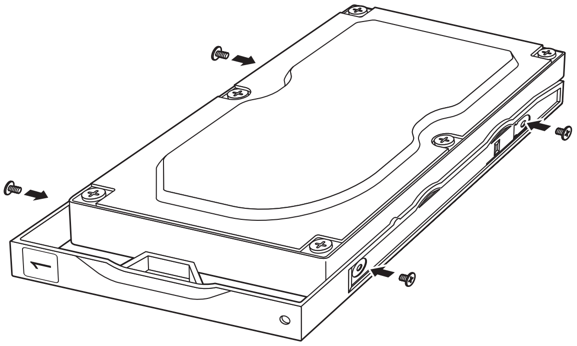
4 Unscrew the four screws and remove the drive from the cartridge.



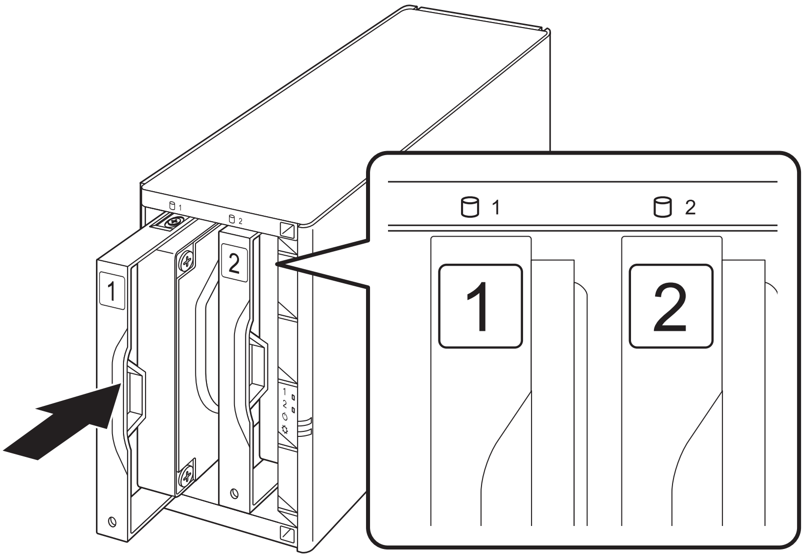
5 Install a new drive (sold separately) into the cartridge.



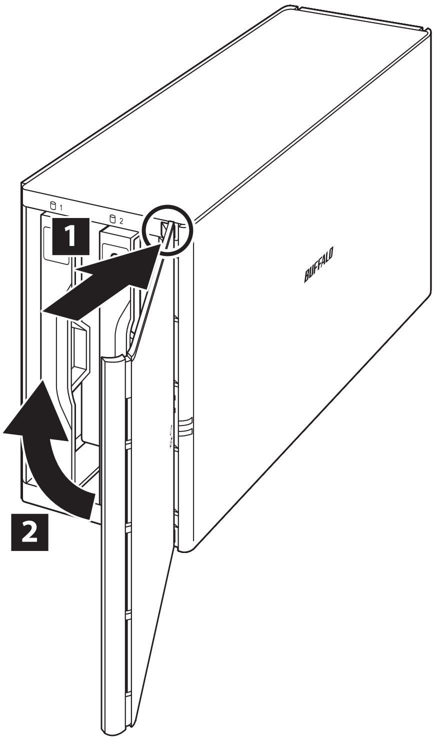
6 Replace the four screws.



7 Insert the new drive back into the empty slot.



8 Close the front panel.



9 Connect all cables, then turn on the LinkStation. When the replaced drive is detected, the power LED will blink amber.

10 Delete the RAID array that held the failed drive by referring to the "Using JBOD" section in chapter 4.

11 Format the replaced drive by referring to the "Formatting Drives" section in the same chapter.

12 Create a new RAID 0 array by referring to the "Creating a RAID Array" section in the same chapter.

13 The process is complete once the new RAID 0 array is created. Next, create a shared folder by referring to the "Adding a Shared Folder" section in chapter 3.

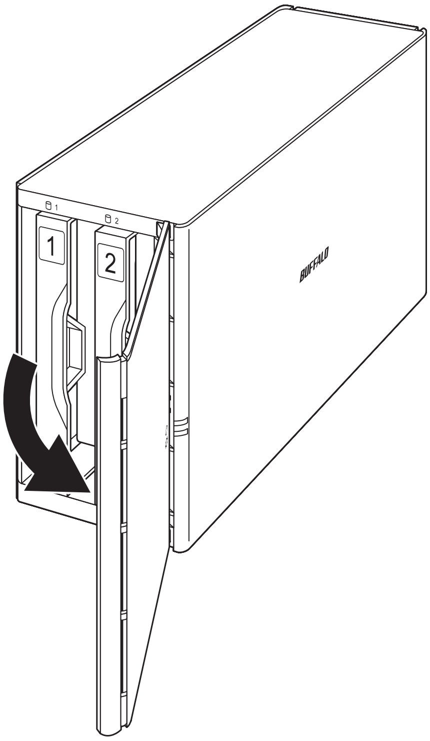
Drive Replacement for a JBOD

If a drive used as a JBOD fails, you will need to format the replaced drive after replacing the defective drive with a new drive. Follow the procedure below to replace a defective drive used as a JBOD.

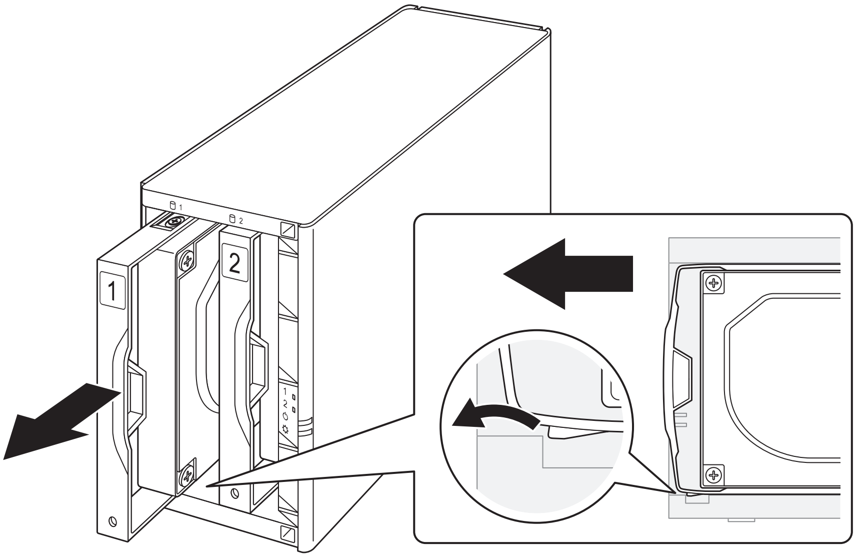
Note: If a drive malfunctions in JBOD, all data on the drive will be lost.

1 Turn the LinkStation off and remove all cables.

2 Squeeze the left side of the front panel and swing it open.



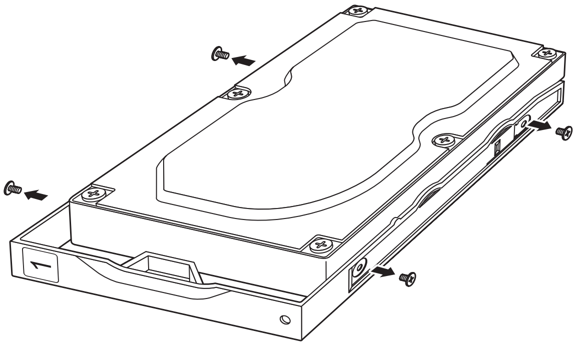
3 Push the failed drive's cartridge up and remove it from the LinkStation.



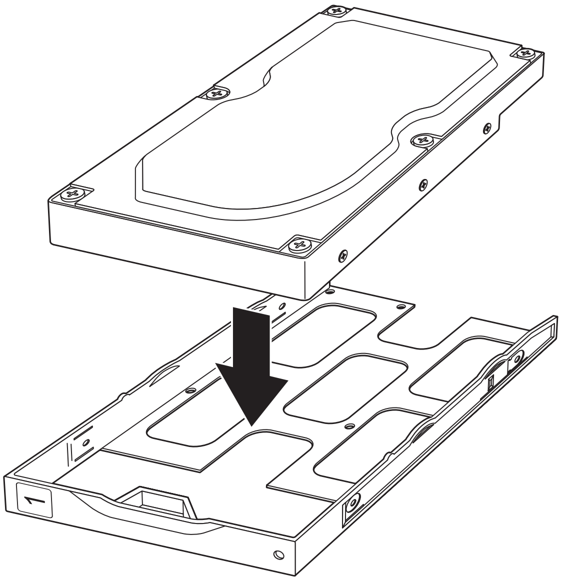
Notes:

- Do not press hard on the top of the LinkStation.
- Pull the drive straight out the front of the chassis.

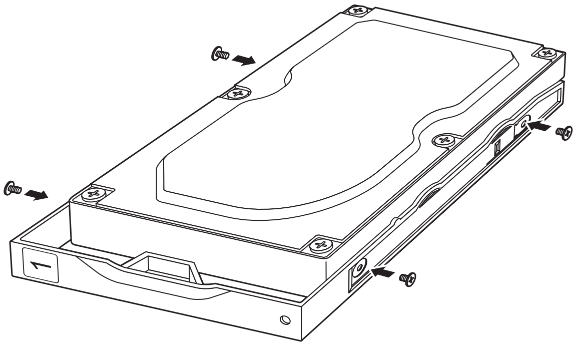
4. Unscrew the four screws and remove the drive from the cartridge.



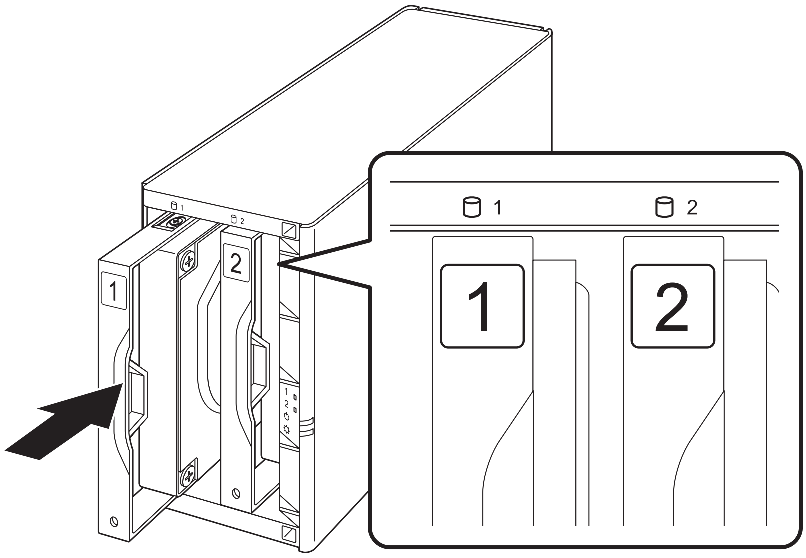
5. Install a new drive (sold separately) into the cartridge.



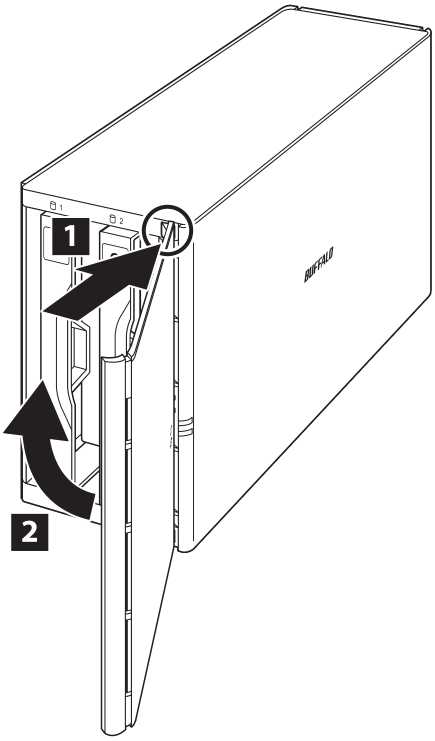
6. Replace the four screws.



7 Insert the new drive back into the empty slot.



8 Close the front panel.



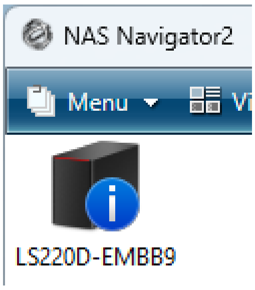
9 Connect all cables, then turn on the LinkStation. When the replaced drive is detected, the power LED will blink amber.

10 Format the replaced drive by referring to the "Formatting Drives" section in chapter 4.

11 The process is complete once the drive is formatted. Next, create a shared folder by referring to the "Adding a Shared Folder" section in chapter 3.

Booting the LinkStation in Emergency Mode

If the LinkStation boots up in emergency mode, depending on your LinkStation model, an “i” symbol is displayed with the LinkStation icon and “EM” is added to your LinkStation’s hostname.



To recover from emergency mode, follow the procedure below.

1 Download the firmware updater from the Buffalo website.

2 Extract the downloaded file by double-clicking it and launch the updater.

3 Update the firmware for the LinkStation unit that is currently in emergency mode.

When the “i” symbol and “EM” disappear from the icon and the hostname on NAS Navigator2, the LinkStation is no longer in emergency mode.

Note: If the LinkStation is not shut down properly, such as due to a power outage or the power cable getting disconnected while the LinkStation is on, data on the LinkStation may be corrupted when the LinkStation boots in emergency mode. In such a case, the corrupted data may not be recoverable even if you try the procedure above.

Chapter 12 Appendix

Power LED Operations

This section explains the details of power LED patterns when an event occurs. If there is a corresponding corrective action described below for a code, try it first. If the LED still blinking due to an issue outlined below, contact Buffalo technical support for assistance.

Blinking Red (Errors)

If a critical error occurs, the power LED will blink red. The pattern of the blink gives the code that denotes the error occurred. You can also confirm the current status by using NAS Navigator2.

Place of Code	Status
10s Place of Code	The LED blinks for 1 second every 0.3 seconds. This gives the tens place of the code.
1s Place of Code	The LED blinks for 0.5 seconds every 0.3 seconds. This gives the ones place of the code.

Code	Description	Corrective Action
E07	The firmware is corrupted.	Contact Buffalo technical support for assistance.
E11	An error occurred in the fan speed.	Check that no foreign objects or dust are clogging the fan. If any foreign objects or dust are found, use a pair of tweezers, an air duster, or other tools to remove them.
E12	A rise in the system temperature may have exceeded the allowable safety value.	Move the LinkStation to a cool location. Do not place objects in the area around the LinkStation.
E14	The RAID array cannot be mounted.	Run a drive check on the RAID array by referring to the "Checking Drives" section in chapter 4.
E15	The number of bad sectors has reached a dangerous level.	Replace the drive by referring to the "Replacing a Defective Drive" section in chapter 11.
E16	Unable to find the drive.	Make sure the drive has been inserted properly.
E22	Unable to mount the drive.	Format the drive by referring to the "Formatting Drives" section in chapter 4. After formatting, if the error still appears after rebooting, replace the drive by referring to the "Replacing a Defective Drive" section in chapter 11.
E23	An error occurred, so the drive was removed from the RAID array.	Replace the drive by referring to the "Replacing a Defective Drive" section in chapter 11.

Code	Description	Corrective Action
`E30`	An error occurred, so the drive was removed from the RAID array.	Replace the drive by referring to the "Replacing a Defective Drive" section in chapter 11.

Blinking Amber (Notices)

If a non-critical error occurs, the power LED will blink amber. The pattern of the blink gives the code that denotes the error occurred. You can also confirm the current status by using NAS Navigator2.

Place of Code	Status
10s Place of Code	The LED blinks for 1 second every 0.3 seconds. This gives the tens place of the code.
1s Place of Code	The LED blinks for 0.5 seconds every 0.3 seconds. This gives the ones place of the code.

Code	Description	Corrective Action
`I10`	A rise in the system temperature may have exceeded the allowable safety value.	Move the LinkStation to a cool location. Do not place objects in the area around the LinkStation.
`I11`	The drive has too many bad sectors.	Replace the drive by referring to the "Replacing a Defective Drive" section in chapter 11.
`I12`	Operating in degraded mode.	Check if the `E30` error is also displayed. If it is, refer to the corrective action for the `E30` error.
`I54`	The backup job failed.	Make sure that the backup job is configured correctly. Make sure that the backup destination NAS device is on and not in standby mode. If the backup job still fails, check the status of the network, as well as the backup source and destination.

Blinking Amber (Information Events)

The power LED will also blink amber after you change any settings. The pattern of the blink gives the code that denotes which action occurred. You can also confirm the current status by using NAS Navigator2.

Place of Code	Status
10s Place of Code	The LED blinks for 1 second every 0.3 seconds. This gives the tens place of the code.
1s Place of Code	The LED blinks for 0.5 seconds every 0.3 seconds. This gives the ones place of the code.

Code	Description	Corrective Action
`I13`	Formatting the RAID array.	-
`I14`	Checking the RAID array.	-
`I15`	Examining the error status of the RAID array. **Note:** Transfer speeds are slower during the examination process.	-

Code	Description	Corrective Action
`I16`	Creating the RAID array.	-
`I17`	Resynchronizing the RAID array. **Note:** Transfer speeds are slower during resynchronization.	-
`I18`	Recovering the RAID array. **Note:** Transfer speeds are slower during the rebuilding process.	-
`I19`	Rewriting drives in the LinkStation with 0s.	-
`I20`	Formatting the drive.	-
`I21`	Checking the drive.	• If the code appears while running a drive check, wait until the process finishes. • For LS220D, LS220DE, and LS220DR LinkStation models, the code may appear right after the LinkStation boots up. If this occurs, restart the LinkStation after waiting 60 minutes. If the code appears again, replace the drive by referring to the "Replacing a Defective Drive" section in chapter 11.
`I22`	Rewriting drives in the LinkStation with 0s.	-
`I23`	The initialization process has been started by using the function button and settings are being initialized.	-
`I25`	Updating the LinkStation firmware.	Do not turn off the LinkStation's power.
`I26`	The initialization process has been started by using Settings and all settings are being initialized.	Do not turn off the LinkStation's power.
`I27`	Checking the USB drive.	-
`I28`	Formatting the USB drive.	Do not turn off the LinkStation's power.
`I32`	A new drive has been detected.	Format the drive by referring to the "Formatting Drives" section in chapter 4.
`I46`	Data migration or conversion (RAID migration) is in progress.	Do not turn off the LinkStation's power.
`I47`	Data migration or conversion (RAID migration) is in progress.	Do not turn off the LinkStation's power.

Glowing Amber

When a new firmware version is available, the power LED will glow amber. You can also confirm the current status by using NAS Navigator2.

Code	Description	Corrective Action
`I52`	A new firmware version has been released.	Update the firmware by referring to the "Updating the Firmware" section in chapter 10.

Default Settings

Administrator's Name	admin	
Password	password	
Shared Folders	"share"* and "info" for both Windows and macOS computers. *The recycle bin is enabled by default.	
IP Address	The LinkStation will get its IP address automatically from a DHCP server on the network. If no DHCP server is available, then an IP address will be assigned as follows: IP Address: 169.254.*xxx.xxx* ("xxx" is a number randomly assigned when booting the LinkStation.) Subnet Mask: 255.255.0.0	
Registered Groups	"hdusers", "admin", and "guest" You cannot edit or delete these default groups.	
Microsoft Network Group Settings	WORKGROUP	
Ethernet Frame Size	1,500 bytes	
SMB	Enabled	
	SMB Protocol	Switch between SMB2 and SMB1 automatically
	SMB Signing	Disabled
	Exclude Mac OS temp files from recycle bin	Yes
AFP	Disabled	
FTP	Disabled	
WebAccess	Disabled	
RAID Scanning	Disabled	
DLNA Server	Disabled	
iTunes Server	Enabled	
Print Server	Disabled	
BitTorrent	Disabled	
Time Machine	Disabled	
Direct Copy	Disabled	
Name/Time/Language	Date/Time Source (NTP)	Enabled
Email Notification	Disabled	
Restore/Erase	Administrator Username and Password	Restore factory default settings
Update	Update Notification	Enabled
RAID Mode	LS220D and LS220DR: RAID 1	

Specifications

Check the Buffalo website for the latest product information and specifications.

LAN Interface	Standards Compliance	IEEE 802.3ab (1000BASE-T), IEEE 802.3u (100BASE-TX), IEEE 802.3 (10BASE-T)
	Data Transfer Rates	10/100/1000 Mbps (auto sensing)
	Number of Ports	1
	Connector Type	RJ-45 8-pin (auto MDI-X)
	Supported Protocols	TCP/IP
	Network File Services	SMB/CIFS, AFP, FTP/FTPS, HTTP/HTTPS
	Ethernet Frame Sizes	1,500, 4,084, 7,404, and 9,216 bytes
USB Interface	Standards Compliance	USB 2.0
	Data Transfer Rates	Max. 480 Mbps
	Number of Ports	1
	Connector Type	Type A
Internal Drive	Number of Drive Bays	LS210D: 1 LS220D, LS220DE, LS220DR: 2
	Drive Interface	SATA 3 Gbps
	Supported RAID	LS220D, LS220DE, LS220DR: 0, 1, JBOD (individual drives)
	Replacement Drive	LS220D, LS220DE: Buffalo OP-HDBST series drive LS220DR: Buffalo OP-HDBN series drive **Note:** The replacement drive should be the same capacity or larger as the original drive. The drives listed above are available from the Buffalo website.
Others	Power Supply	AC 100–240 V, 50/60 Hz
	Power Consumption	LS210D (2 TB or smaller model): max. 18 W LS210D (3 TB or larger model): max. 24 W LS220D, LS220DE, LS220DR: max. 48 W
	Dimensions (W × H × D, excluding protruding parts)	LS210D: 45 × 128 × 205 mm (1.8 × 5.0 × 8.1 in.) LS220D, LS220DE, LS220DR: 87 × 128 × 205 mm (3.4 × 5.0 × 8.1 in.)
	Weight	LS210D: approx. 1.1 kg (2.4 lbs) LS220D, LS220DR: approx. 2.5 kg (5.5 lbs) LS220DE: approx. 0.9 kg (1.9 lbs)
	Operating Environment	Temperature: 5–35°C (41–95°F) Humidity: 20–80% non-condensing
	Compatible Devices	Windows PCs, Apple silicon- and Intel-based Mac computers, iOS devices, and Android devices with wired or wireless Ethernet connection.
	Supported OS	• For LS210D, LS220D, LS220DE: Windows 11, 10, 8.1, 8, 7, Vista, XP*, RT 8.1, RT macOS 13.0, 12.0, 11.0, 10.15, 10.14, 10.13, 10.12, 10.11, 10.10, 10.9, 10.8, 10.7, 10.6 Windows Server 2022, 2019, 2016, 2012 R2, 2012, 2008 R2, 2008 iOS 5 or later Android 2.3 or later • For LS220DR: Windows 11, 10, 8.1, 7 macOS 13.0, 12.0, 11.0, 10.15, 10.14, 10.13, 10.12, 10.11 iOS 10 or later Android 4.4 or later *32-bit