



ATTO Technology, Inc.

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**ATTO FibreBridge™**  
**Installation and Operation Manual**  
**ATTO FibreBridge 7500**  
16-Gigabit Fibre Channel to 12-Gigabit SAS Storage Controller

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ATTO Technology, Inc. limited warranty

# 1.0 ATTO FibreBridge Overview

The ATTO FibreBridge™ 7500 is a storage controller that connects multiple shelves of SAS and SATA JBOD storage and virtualizes it to a Fibre Channel SAN Connection.

The ATTO FibreBridge 7500 allows IT departments to architect storage systems with the flexibility to use standard interface off-the-shelf storage hardware with increased bandwidth and low latency levels which improve performance and response. As a Data Center building block, the 7500 allows IT managers to architect their storage solution on their terms, avoiding vendor lock-in with modularity at each layer. The 7500 is used to aggregate and virtualize storage on a SAN

(Storage Area Network) and has undergone qualifications with industry leading storage and SAN infrastructure products. The 7500 is easily integrated into IT infrastructures, providing lower operational costs with tools like a PCIe Analyzer, Drive Map Director™ and ExpressNAV™.

## ATTO FibreBridge 7500 features, benefits

The ATTO FibreBridge 7500 is a 16-Gigabit Fibre Channel to 12-Gigabit SAS bridge configured with two independent 16Gb Fibre Channel ports and four 12Gb x4 SAS connectors.

Designed to integrate industry-leading performance and SAN capabilities into the future generation of storage solutions, the FibreBridge 7500 uses a high-performance architecture suited for OEMs looking to incorporate SAS or SATA disk storage devices in their Fibre Channel SAN.

- Two independent 16Gb Fibre Channel ports which auto-negotiate to 4Gb, 8Gb or 16Gb Fibre Channel
- SFP+ Fibre Channel modules included
- Single or Dual Power Supplies
- Full support for FC-AL, FC-AL2, FC-FLA, FC-FS, FCP-3, PLDA

- Support for private loop, public loop, point-to-point or fabric point-to-point
- Support for direct connect to F-port switches
- Four independent 12Gb SAS/SATA x4 mini-SAS HD connectors which auto-negotiate to 3Gb, 6Gb or 12Gb
- Automatic LUN Mapping
- Patented Drive Map Director™ reduces operating expense by auto-configuring storage
- 2500 MB/s throughput for 1 MB transfers
- 500,000 IOPS for 4KB read transfers and 400,000 IOPS for 4KB write transfers
- ExpressNAV™ integrated management console for remote configuration, management and diagnostic capabilities
- Supports SAS and SATA hard disk drives



# 1.1 ATTO FibreBridge 7500

The ATTO FibreBridge 7500 is a high-performance storage controller which adds 16-Gigabit Fibre Channel connectivity to 12-Gigabit SAS or SATA storage devices.

The FibreBridge 7500 is available in an industry-standard 1U form factor for easy integration into racks.

## Dimensions

**Width:** 17 inches

**Length:** 11 inches

**Height:** 1.7 inches (1U)

**Weight:** approximately 10 pounds

## Cooling and airflow

**Operating temperature:** 5-40 °C external

**Humidity:** 10-90% non-condensing

Air enters from the front and is exhausted out the connector side. Ambient air near the inlets should not exceed 40°C. The unit automatically stops operation if the temperature goes beyond this threshold.



### CAUTION

**Do not block the enclosure's vents. The FibreBridge does not allow data transfer if overheating occurs.**

## Power

The 7500 features two hot swappable power supplies and can be operated with only a single power supply inserted. Each power supply has a standard IEC320 power receptacle and cooling fan. The power requirements of the ATTO FibreBridge 7500 plus the power draw of other equipment in the rack must not overload the supply circuit and or wiring of this rack.

**Input voltage:** 100-240; VAC 1A; 50/60Hz.

## Fibre Channel ports

The dual independent 16Gb/s Fibre Channel ports connect the FastStream 7500 to Fibre Channel hosts using optical SFP+ connectors and multimode fiber optic cable. Make sure all cables are anchored securely at both ends with the proper connectors.

## SAS/SATA ports

The four (x4) 12Gb/s SAS/SATA connectors connect storage devices into the Storage Area Network (SAN) using mini-SAS HD cable plug connectors.

## Management ports

Management is provided using the dual 100/1000BASE-T Ethernet ports accessible from two right angle RJ-45 connectors, or the RS-232 serial header console port accessible from the serial RJ-45 connector.

## LED indicators

LED indicators can be viewed from the connector side and the front side of the FibreBridge 7500.

*LEDs on the connector side are:*

**Power Supplies:** One LED for each supply. Blue indicates on and ready, while blinking Red indicates an unplugged or failed supply.

**Ready/Alert:** On one shared LED a lit green means ready, yellow indicates an alert condition.

**Ethernet port connectors:** A green LED embedded in each Ethernet port connector indicates Link/Activity, where green solid indicates link, blinking indicates activity and OFF means no link is present. A second green LED embedded in each Ethernet port connector indicates connection speed, where green solid indicates either a 100MbE or 1000MbE connection.

**Fibre Channel port:** A lit green LED indicates link, and OFF means no link. FC Port LEDs are located next to the SFP connectors.

**SAS/SATA device:** SAS LEDs are located below the mini-SAS HD connector. A lit green LED indicates a link has been established on at least one PHY, and OFF means there are no links.

LEDs on the faceplate are:

**Power Supplies:** One LED for each supply. Green indicates on and ready while amber indicates an unplugged or failed supply.



Note

If both power supplies are on and both LEDs are yellow at the same time, this indicates a bad status connection. Status harnesses may not be connected.

**Power:** A lit green LED indicates power has been turned ON to the bridge.

**Ready:** A lit green LED indicates ready and OFF to show not ready.

**Alert:** A lit yellow LED indicates an alert condition.

**Fibre Channel Port Activity:** A lit green FC port activity LED indicates FC traffic on the port, and OFF indicates no port activity.

**Fibre Channel Port Speed:** A bi-color FC port speed LED is lit as follows: Yellow = 16Gb/s, Green = 8Gb/s, and OFF = 4Gb/s.

**SAS/SATA Device Activity:** A lit green LED for each SAS connector indicates port activity on at least one PHY in the connector, and OFF means no port activity.

Exhibit 1.1-1 7500 Connectors, LEDs and power receptacle on the connector side.

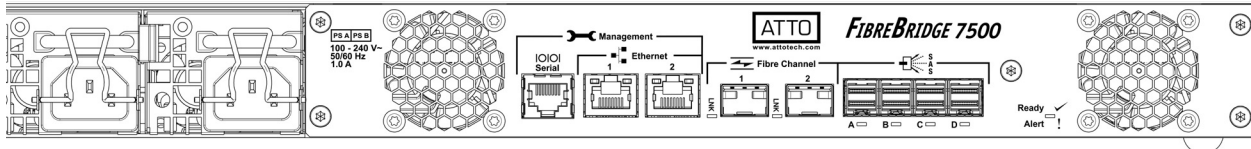
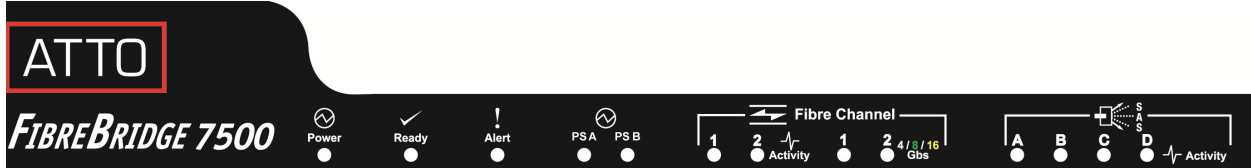


Exhibit 1.1-2 7500 LEDs on the faceplate.



## 2.0 Install the FibreBridge

If you have not already completed the instructions on the Quick Start page packed with your FibreBridge, use the following instructions to install the FibreBridge.

### Unpack the packing box; verify contents

- The FibreBridge. Note the serial number of your FibreBridge unit: \_\_\_\_\_
- Power cords
- “L” brackets for mounting in a 19” rack
- Ethernet cable
- RS-232 cable

### Install the FibreBridge

- 1 Place the FibreBridge on a stable flat surface or install it into a standard rack.
- 2 If installing into a rack, attach the brackets to both sides of the FibreBridge enclosure. Then install the FibreBridge assembly horizontally within the rack so it does not reduce the air flow within the rack.
- 3 Connect the host computer by connecting the cable to FC port 1 or 2.
- 4 Connect target devices by connecting SAS cables to SAS connector A, B, C or D.
- 5 Power up the target devices.
- 6 Connect the Ethernet port to your network.
- 7 Connect the AC power cords from the FibreBridge to the proper AC source outlets.



Note  
*Power is automatically supplied to the 7500 when plugged into an AC outlet.*



#### CAUTION

**The power source must be connected to a protective earth ground and comply with local electrical codes. Improper grounding may result in an electrical shock or damage to the unit. Also, be aware that this unit is powered on once a power source is connected. Make sure the power supply module is fully inserted before applying power. Failure to do so may cause injury or damage the unit.**

If you are using a rack:

- a. Properly ground the FibreBridge to the rack equipment. The earth ground connection must be maintained.
  - b. The power requirements plus the power draw of the other equipment in the rack must not overload the supply circuit and/or wiring of the rack.
- 8 Wait for the **FibreBridge Ready LED** to light, indicating that the FibreBridge has completed its power-on self test sequence.

### Discover the IP address



Note  
*The FibreBridge is initially configured with DHCP enabled. It is best if you have access to a DHCP server.*

- 1 Power on your system and log in as a user with proper administrative privileges from the computer attached to the FibreBridge Ethernet port on the same domain.
- 2 Go to [www.attotech.com](http://www.attotech.com).
- 3 Select **Downloads** from the **Support** menu.
- 4 Register or log in if previously registered.
- 5 Select **Storage Controllers** from the product list.
- 6 Select your model.
- 7 From the table, find your Operating System.
- 8 Click on the entry for the QuickNAV utility.
- 9 Select a download destination and allow the download to complete. Double-click the downloaded QuickNAV file to install onto your operating system.
- 10 Locate the FibreBridge with the serial number recorded earlier.
- 11 Highlight the serial number.
- 12 Click **Next**.

If a DHCP server is available on your network, an address is assigned automatically by the server. Note the assigned address:

---



If you do not have a DHCP server, get an IP address and subnet mask from your network administrator, type it into the area provided, and click on **Next**.

13 Click on **Launch Browser**.

Your browser points to the ATTO ExpressNAV splash screen. If you use Internet Explorer as a browser, you may continue on to the optional [Internet Explorer setup](#) below. If not, continue on to [Begin initial configuration](#) .

### Internet Explorer setup

- 1 Open your browser
- 2 Go to the browser toolbar and select **Tools**.
- 3 Select **Internet Options**.
- 4 In the **Internet Options** screen, select the **Security** tab.
- 5 Click on the **Trusted Sites** icon.
- 6 Click on the **Sites** button.
- 7 Uncheck the **Require server verification** check box.
- 8 In the text box **Add this web site to the zone**, add the IP address of the appliance. You may use wild cards.
- 9 Click **Close**.
- 10 At the bottom of the **Internet Options** dialog, click **OK**.

### Begin initial configuration

- 1 The ExpressNAV interface welcome screen appears. Click on **Enter Here**.
- 2 Type in the user name and password.



Note

The default values are user name **root** and password **Password**. The user name is case insensitive and the password is case

sensitive. It is best practice to change the default user name and password. Refer to [Modify passwords](#) on page 7.

- 3 The ExpressNAV FibreBridge status page appears. Continue to [Map Devices](#) on page 8.

Exhibit 2.0-1 Brackets to install the FibreBridge 7500 into a rack.

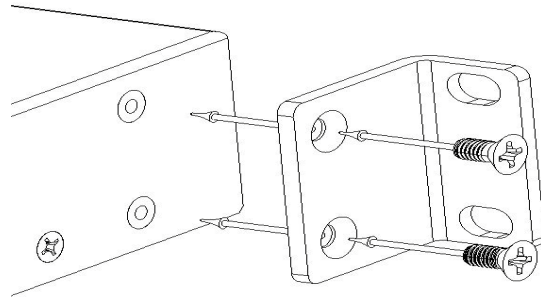


Exhibit 2.0-2 Brackets to install the FibreBridge 7500 into a rack.

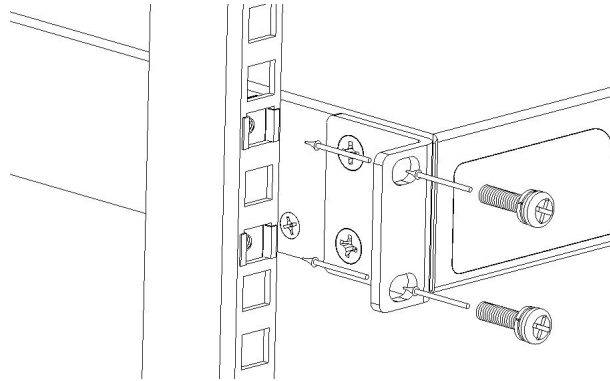
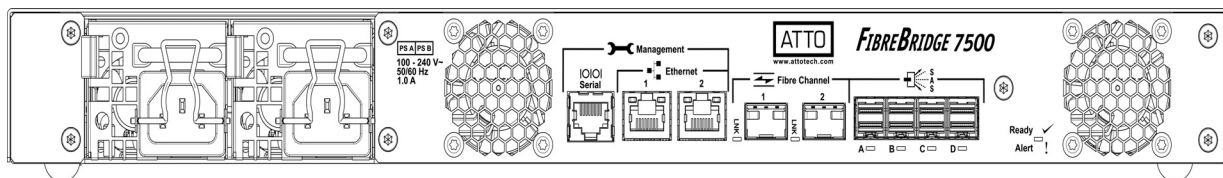


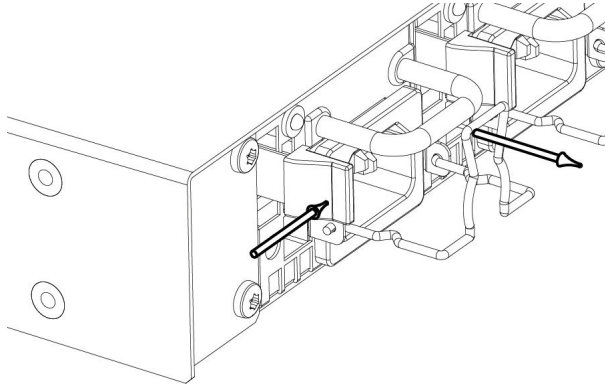
Exhibit 2.0-3 FibreBridge 7500, LEDs, power receptacle and ports



## Installation and Removal of Power Supply Modules

- 1 To remove a power supply module, first remove the power cord.
- 2 Press the side latch inward and pull out on the handle

Exhibit 2.0-4



- 3 To install a power module, insert module until you hear the latch click.



### Note

*Handle and latch should be on top.*

- 4 Install power cord.



### CAUTION

Remove the power source before removing the power supply module. Failure to do so may cause injury or damage the unit.

## 3.0 Configure the FibreBridge

To configure the ATTO FibreBridge, use the ATTO ExpressNAV System Manager GUI. Default values are appropriate for most configurations, but may be modified.

The best way to access the FibreBridge to view and change settings is to use ATTO ExpressNAV System Manager, a browser-based graphical interface. Other methods are also available. Refer to [5.0 Interface options](#) on page 14.

Help is available from within ExpressNAV by clicking on the text indicating each setting. For more information on any of these parameters, refer to the specific CLI command in [Command explanations](#) on page v of the Appendix.

To change mapping, refer to [Map Devices](#) on page 8.

To use Email notification or SNMP, refer to [Remote monitoring, management](#) on page 10.

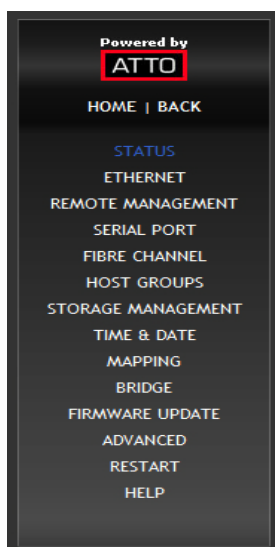
You may make changes to several pages before going to the Restart page and restarting the FibreBridge to save the changes.

### Preliminary steps

- 1 If you are not already in the ExpressNAV interface, type the IP address of your FibreBridge in a standard browser as found in [Using ExpressNAV System Manager](#) on page 14, click **Enter Here**, type in your user name and password, and click **OK**.

- 2 The **Status** page appears. Choose one of the following options:

- View all settings to ensure they are appropriate for your configuration.
- Keep the automatic settings created when you powered up your Fibre Bridge and do nothing, accepting all the default settings for all ports.



- Use the individual pages listed on the side menu to make changes or use other features such as Email notification or SNMP as needed.

### Port configurations

- 1 Follow the Preliminary steps.
- 2 Click on the port you wish to configure on the left hand menu: **Ethernet**, **Serial Port** or **Fibre Channel**.
- 3 Select the parameters you wish to change.
- 4 Click **Submit**.
- 5 If you have completed all changes for this session, go to the **Restart** page and restart the Fibre Bridge.

### Modify passwords

- 1 Follow the Preliminary steps.
- 2 From the side menu select **Bridge**. The **Bridge Configuration** page is displayed. The Administrator user name that you are currently logged in with and the current read only user name, if present, are displayed in their text boxes.
- 3 Enter the Administrator (**Admin**) password where indicated.
- 4 Enter appropriate information into the **New Admin Password**, **Confirm New Admin Password** or **New Read Only Password** and

A screenshot of the "Usernames and Passwords" configuration page. It has a title "Usernames and Passwords" and a subtitle "To change usernames or passwords you must enter the current Admin password:". There are several input fields: "Admin Username" with the value "root", "New Admin Password", "Confirm New Admin Password", "Read Only Username" with the value "user", "New Read Only Password", and "Confirm New Read Only Password". Each password field has a masked input (dots).

**Confirm New Read Only Password** text boxes.

5 Click **Submit**.

6 If you have completed all changes for this session, go to the **Restart** page and restart the FibreBridge.

# 3.1 Map Devices

After getting an IP address and logging into the ATTO ExpressNAV System Manager, you have options to map devices so that the FibreBridge can access the devices in your network.

The ATTO FibreBridge allows parallel SAS/SATA devices to participate in a Fibre Channel arbitrated loop or on a fabric. Fibre Channel and SAS/SATA use different models to address devices. The FibreBridge translates between these addressing models.

## FibreBridge mapping

On a Fibre Channel Arbitrated Loop, the FibreBridge appears at a single Arbitrated Loop Port Address (AL\_PA). Each device on an arbitrated loop is assigned a unique AL\_PA during loop initialization. The FibreBridge supports both modes of AL\_PA assignment, commonly referred to as hard and soft addressing.



**Note**  
*Fibre Channel Arbitrated Loop technology is only available for 4Gb/s and 8Gb/s.*

**WWN:** to identify each Fibre Channel device while addressing, each Fibre Channel device is assigned a unique World Wide Name (WWN). The 64-bit WWN has the following format:

Field Name	WWN Format		Company ID			Device ID		
	0	1	2	3	4	5	6	7
Value	20	00	00	10	86	xx	xx	xx

**Soft addressing** allows the loop initialization master to assign the FibreBridge a unique address during the loop initialization process. The address assigned cannot be determined before loop initialization. Adding new devices to an arbitrated loop may change the address assigned to the FibreBridge.

**Hard addressing** allows a predetermined address to be assigned to the FibreBridge. The FibreBridge tries to acquire the desired hard address. If another device has already been assigned the specified address, the FibreBridge acquires a currently unassigned address.



**Note**  
*The default mode is soft addressing.*

## SAS/SATA device mapping

SAS/SATA devices connected to the FibreBridge are viewed as Fibre Channel LUNs to the host computer.

The ATTO ExpressNAV interface displays the current mapping information for SAS/SATA devices. Refer to [5.0 Interface options](#) on page 14.



**Note**  
*SCSI commands sent to offline devices are rejected.*

## RAID device mapping

When using the FibreBridge 7500 with a device that supports multiple LUNs behind a target, such as a RAID array, you must disable SAS Mapping by Topology.

- 1 If you are not already in the ExpressNAV interface, type the IP address of your FibreBridge into a standard browser
- 2 Click on the **Advanced** menu item on the left side of the screen
- 3 The **Advanced CLI Configuration** page appears
- 4 Type **Set SASMapByTopology disabled**
- 5 Type **SaveConfiguration restart**

Once the FibreBridge restarts, any attached RAID devices will be scanned and all LUNs will be mapped.



**Note**  
*If SASMapByTopology is enabled, RAID Processor LUNs will be mapped, but not RAID Groups. Alternatively, you may connect to the CLI via the FibreBridge serial port and issue the above commands.*

## Drive Map Director™

Drive Map Director uses SMP to provide a predictable mapping structure for devices attached to the FibreBridge 7500. To use this feature, drive enclosures must support SAS expanders with SMP protocol such as the HP StorageWorks D2700 SAS JBOD. If SMP supporting expanders are not present in your storage system the FibreBridge will revert to the AutoMap feature (see [AutoMap devices](#)).

## Mapping Devices with SMP

Drive Map Director assigns a Fibre target number to each shelf of storage and a Fibre LUN is reserved for each slot within the enclosure. This numbering scheme is static and will remain with the shelf and slot

location whenever a drive or shelf is added or removed. This allows maps to remain the same when shelves or drives need to be swapped out due to

failure and remain consistent during power cycles of the FibreBridge.

```
routedisplay fc
19
; FL Device Address LUN VendorID ProductID SerialNumber
;=====
0 Bridge
1 5000c5001cb9d6b9 0 HP EG0300FAWHV 3SE19E9X00009023NNJZ
2 5000c5001cb96915 0 HP EG0300FAWHV 3SE1AAG900009023UPVC
3 5000c5001cb3fd45 0 HP EG0300FAWHV 3SE1B6AL00009022K5E8
4 5000c5001cb3b789 0 HP EG0300FAWHV 3SE1B7HC00009022L2YV
5 5000c5001cb38ed5 0 HP EG0300FAWHV 3SE1B8BK00009022KBRX
16 5000c5001cbaf199 0 HP EG0300FAWHV 3SE1ABD500009023TBAX
17 5000c5001cab46c9 0 HP EG0300FAWHV 3SE19GEB00009022KVBW
18 5000c5001cba0a81 0 HP EG0300FAWHV 3SE16SGD00009023V6JM
19 5000c5001cb961e5 0 HP EG0300FAWHV 3SE1AX4G00009023M8VU
20 5000c5001cbb2951 0 HP EG0300FAWHV 3SE1BGWX00009023RX5P
21 5000c5001cbae9b1 0 HP EG0300FAWHV 3SE1B7GL00009023TMEE
22 5000c5001cb93fa5 0 HP EG0300FAWHV 3SE1AYA600009023RRL1
23 5000c5001cb91a95 0 HP EG0300FAWHV 3SE1AZBP00009023RS03
24 5000c5001cb993d9 0 HP EG0300FAWHV 3SE1AXLS00009023SYTC
25 5000c5001cb8420d 0 HP EG0300FAWHV 3SE1BFE500009022J7P2
26 50014380052bb03e 0 HP D2700 SAS AJ941A CN8931000N
```



Note gap in LUNs, reserved for drives not currently installed in enclosure

- 1 If you are not already in the ExpressNAV interface, type the IP address of your FibreBridge in a standard browser as found in [Using ExpressNAV System Manager](#) on page 14, click **Enter Here**, type in your user name and password, and click **OK**.
- 2 The **Status** page appears.
- 3 From the ExpressNAV main menu, click on the **Mapping** menu item on the left side of the screen.
- 4 The **Mapping** page appears. If your storage supports SMP, the ExpressNAV System Manager will display mapping information for your devices.

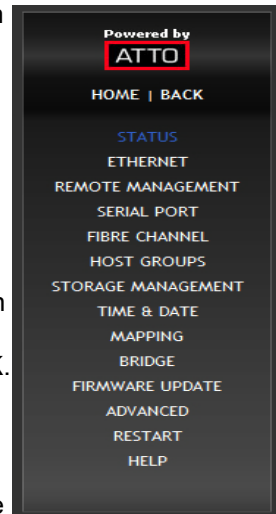


**Note**  
If your devices do not support SMP you will be able to use the AutoMap feature to map your storage devices.

### AutoMap devices

- 1 If you are not already in the ExpressNAV interface, type the IP address of your FibreBridge in a standard browser as found in [Using ExpressNAV System Manager](#) on page 14, click **Enter Here**, type in your user name and password, and click **OK**.
- 2 The **Status** page appears.
- 3 From the ExpressNAV main menu, click on the **Mapping** menu item on the left side of the screen.
- 4 The **Mapping** page appears. Wait for the automatic scan for devices to complete.
- 5 Click **AutoMap**.

All the commands necessary to enable mapping and the command **SaveConfiguration norestart** are performed.



## 3.2 Remote Monitoring, Management

The Ethernet port provides monitoring and management using the ExpressNAV System Manager.

Remote system monitoring may be set up through the Remote Management page of the ExpressNAV interface (see Exhibit 3.0-3, below) using the Simple Network Management Protocol (SNMP) or Email.

Various types of problems may create a notification:

- Device errors such as medium error, aborted command and hard error
- Device transitions from online to offline
- Critical and warning temperature conditions
- Power supply status conditions

Messages may state that a device is not working, a medium has an error, or a command has been stopped.

You may designate which warning level a recipient receives. For example, a recipient with a critical severity level only receives critical messages and not warning or informational messages.

In both monitoring systems, you select the warning levels for each recipient:

- **All:** all warnings, critical events and informational messages
- **Warning:** events which are either warnings or critical events
- **Critical:** only events which are critical
- **None:** no messages are sent

Exhibit 3.0-3 The Remote Management page in the ExpressNAV System Manager.

The screenshot displays the Remote Management configuration page, divided into two main sections: SNMP Configuration and Email Configuration. At the bottom center is a large black button labeled 'SUBMIT'.

**SNMP Configuration:**

- SNMP:  enabled  disabled
- SNMP Traps:  enabled  disabled
- SNMP Extended Traps:  enabled  disabled

**SNMP Trap Recipient IP Addresses:**

0.0.0.0	None
0.0.0.0	None
0.0.0.0	None
0.0.0.0	None
0.0.0.0	None
0.0.0.0	None

**Email Configuration:**

- Email Notification:  enabled  disabled
- SMTP Server Address (IP or Name):
- Username:
- Password:
- Sender Address (From):

**Recipient Address (To):**

<input type="text"/>	None
<input type="text"/>	None
<input type="text"/>	None
<input type="text"/>	None
<input type="text"/>	None



## SNMP-based monitoring

The Simple Network Management Protocol (SNMP) facilitates the exchange of management information between network devices.

An agent residing in the FibreBridge takes information from the FibreBridge and translates it into a form compatible with SNMP.



Note

Consult your network administrator for further assistance with SNMP.

- 1 If you are not already in the ExpressNAV interface, type the IP address of your FibreBridge in a standard browser as found in [Using ExpressNAV System Manager](#) on page 14, click **Enter Here**, type in your user name and password, and click **OK**.
- 2 On the left-hand menu, click **Remote Management**.
- 3 The **Remote Management** page appears. Click on the **enabled** radio button next to the SNMP heading.
- 4 Click on the appropriate radio button for **SNMP Traps, SNMP Extended Traps**.
  - **SNMP Traps** and **SNMP Extended Traps** are notifications for SNMP functions such as device transition and device error.
- 5 Enter the IP addresses of those who should receive messages (SNMP trap recipients) in the text boxes on the left.
- 6 Select the type of message you wish each recipient to receive from the drop down box next to each address.
- 7 Click **Submit**.

*Exhibit 3.0-4 Events triggering SNMP notification for extended or standard trap generation, severity level and explanation.*

Event	Severity Level	Extended Traps disabled	Extended Traps enabled	Explanation
Aborted Command	Warning	No	Yes	A command has been aborted.
Device Transition	Info	No	Yes	A target device has failed, become offline or come online.
Fibre Channel Loop Down	Info	Yes	Yes	A loop down event on a Fibre Channel port has occurred.
Fibre Channel Loop Up	Info	Yes	Yes	A loop up event on a Fibre Channel port has occurred.
Hardware Error	Critical	No	Yes	An unrecoverable target device failure.
Illegal Request	Info	No	Yes	An illegal SCSI request has been attempted.
Medium Error	Warning	No	Yes	A command terminated with an error condition that may have been caused by a flaw in the target device's physical medium or its recorded data.
Power Supply Down	Critical	Yes	Yes	A power supply has powered down or was down after unit power-up.
Temperature	Info	Yes	Yes	The unit's internal temperature has increased or decreased to within standard operating ranges.
Temperature	Critical	Yes	Yes	Unit's internal temperature has increased to at or above the maximum operating temperature or decreased to at or below the minimum operating temperature.
Temperature	Warning	Yes	Yes	Unit's internal temperature has increased to at or within the unit's maximum operating temperature less the unit's temperature warning offset or decreased to at or within the unit's minimum operating temperature plus the unit's temperature warning offset.



Event	Severity Level	Extended Traps disabled	Extended Traps enabled	Explanation
Unit Attention	Info	No	Yes	A unit attention condition has occurred.
Unit Power On	Info	Yes	Yes	The unit has been powered up.

## Email messages provide error notification

Email notification allows the FibreBridge to send an Email message to you, a network administrator or other users when certain events occur. Serious error messages are sent immediately, while messages for less serious errors are sent every 15 minutes.

You may send Emails to up to five Email addresses and designate which conditions prompt each Email notification.

When an event that has been designated as requiring Email notification occurs, the FibreBridge sends the message; it cannot respond to a rejection by a server for an invalid address. Ensure all Email addresses typed in are valid.

Each Email is time stamped when it leaves as part of the SMTP header information as shown in Exhibit 3.0-5.

- 1 If you are not already in the ExpressNAV interface, type the IP address of your FibreBridge in a standard browser as found in [Using ExpressNAV System Manager](#) on page 14, click **Enter Here**, type in your user name and password, and click **OK**.
- 2 On the left-hand menu, click **Remote Management**.
- 3 The **Remote Management** page appears.
- 4 Click on the **enabled** radio button next to the **Email Notification** heading.
- 5 Type in the SMTP Server IP address.
- 6 Type in the user name and password of your SMTP Email account if your server requires it
- 7 Type in the sender address (Emails show this name in the **From** field).
- 8 Type in up to five Email addresses.
- 9 Choose **All**, **Warning**, or **Critical** for each Email address.
- 10 When all information is typed in, click **Submit**.

*Exhibit 3.0-5 The Email messages sent by the FibreBridge follow this format.*

Subject: [The Type of Event that Occurred]

Message Body:

This is a status message from [FibreBridge name]. Identifying information as well as the most recent entries from the event log appear below.

```
***** Unit Information *****
Serial Number : [Serial Number]
IP Addresses:  [IP Address1]
               [IP Address2]
***** Event Log Entries *****
```

## 4.0 Update Firmware

The ATTO FibreBridge has several processors which control the flow of data. The firmware to control these processors can be upgraded in the field using the PUT command from an FTP connection, or ZModem utility over an RS-232 serial connection. The preferred method is to use ATTO ExpressNAV System Manager.



Note

The recommended method for updating firmware for the FibreBridge is the **Firmware Update** page in the ATTO ExpressNAV interface.

The FibreBridge firmware is distributed as a **.zbd** file from the ATTO Technology web site at [www.attotech.com](http://www.attotech.com). Download the file and note the filename.



Note

There is always a backup image in the FibreBridge, in case the flashing process fails. After updating the firmware, verify the correct program version is executing by viewing the status page and checking the firmware revision number.

### Using ExpressNAV

- 1 If you are not already in the ExpressNAV interface, type the IP address of your FibreBridge in a standard browser as found in [Using ExpressNAV System Manager](#) on page 14, click **Enter Here**, type in your user name and password, and click **OK**.
- 2 Click on the **Firmware Update** menu item on the left-hand side of the page.
- 3 The **Firmware Update** page appears. Click the **Browse** or **Choose File** button to locate the firmware that you downloaded earlier.
- 4 Select the file.
- 5 Click **Upload**.
- 6 Wait until a success message is displayed.
- 7 Click on the **Restart** button at the bottom of the page.

### Using FTP

- 1 Establish an FTP link to the bridge that is to be flashed.



Note

The FTP connection must be set up for both Active mode and Binary mode for the transfer to complete correctly.

- 2 Use the **PUT** command to download the firmware file to the bridge. For example:  
PUT c:\bridge\_firmware\at750100.zbd
- 3 Once the download is complete, cycle power on the FibreBridge to implement the new firmware.

### Using the zModem command

- 1 Load a Terminal Program such as Hyper Terminal.
- 2 Set the terminal and the FibreBridge for the highest possible baud rate for your terminal.
- 3 Turn on power to the FibreBridge.
- 4 Once the **Ready** prompt appears, type **ZMODEM RECEIVE**. The FibreBridge displays that it is preparing to receive a file from your terminal program.
- 5 On the terminal program, choose **Transfer Send File**
- 6 In the **Send File** box, enter the current FibreBridge **.zbd** file or click the browse button to find it.
- 7 Click **Send File**.
- 8 The FibreBridge acknowledges receiving the file and displays a message notifying the operator not to interrupt power for 8 minutes. Once the download is complete, cycle power on the FibreBridge to start the new firmware.

## 5.0 Interface Options

---

Alternative methods to the ATTO ExpressNAV Interface may be used to manage the FibreBridge. ATTO ExpressNAV System Manager is the recommended interface.

### Using ExpressNAV System Manager

---

Each page in the ATTO ExpressNAV System Manager provides information and/or configuration parameters based on a specific topic.

ATTO ExpressNAV is the recommended management tool for the FibreBridge. It is a web-based graphical user interface (GUI) that allows you to manage the FibreBridge by clicking choices and commands in traditional GUI fashion or by entering CLI commands directly, as you would in a terminal emulation session, on the **Advanced CLI Configuration** page.

Each page can be reached through the menu at the side of each page. An image on each page's header shows each port in the product faceplate. Each port is clickable and takes you to the appropriate page.

If you have completed configuration operations and have clicked **Submit** on the page you are viewing, go to the **Restart** page and restart the FibreBridge to save the settings.

If you have not completed configuration changes, go on to the next page.

#### Opening an ExpressNAV session

- 1 Point your browser at the IP address of the FibreBridge. Refer to [Discover the IP address](#) on page 4.
- 2 The **ExpressNAV** home page is displayed. Click **Enter**.
- 3 Enter the user name and password values.



#### Note

*The default values are user name: **root** and password: **Password**. The user name is case insensitive and password is case sensitive. It is best practice to change user names and passwords. Refer to [Modify passwords](#) on page 7.*

The **Status** page appears.

#### Optimizing ExpressNAV in Internet Explorer

- 1 Go to the browser toolbar and select **Tools**.
- 2 Select **Internet Options**.
- 3 Select the **Security** tab.
- 4 Click on the **Trusted Sites** icon.
- 5 Select the **Custom Level** button.
- 6 Go to the **Miscellaneous** topic and set the **Allow META REFRESH** option to **Enable**.
- 7 Press the **OK** button in the open dialogs to apply the updated settings.

### Using the serial port

---

- 1 Connect a cable from FibreBridge RS-232 serial port to the serial (COM) port on a personal computer.
- 2 Turn on the FibreBridge.
- 3 Start a terminal emulation program on the personal computer, and use it to connect to the FibreBridge. For example, if you are using HyperTerminal on a computer running a Windows operating system,
  - a. Type **FibreBridge** in the **New Connection** dialog box.
  - b. Click **OK**.
  - c. In the **Connect To** dialog box, for the **Connect using field** select the COM port number to which your serial cable is connected.
  - d. Click **OK**.
  - e. In the COM Properties dialog box select the following values:
    - Bits per second: 115200
    - Data Bits: 8
    - Parity: None

- Stop Bits: 1
  - Flow Control: None
  - Terminal type: ASCII
  - Echo: on
- f. Click **OK**.
- 4 After you connect to the FibreBridge, start-up messages are displayed. These messages are only displayed at start-up. The last line in the start-up message sequence is **Ready**.
  - 5 In serial port sessions, there is no prompt on the line below the word **Ready**. Begin typing commands in the blank line where the cursor is

resting. No user name or password is required for serial port access.

- 6 To verify that you have connected successfully, type **help** after the **Ready** prompt and press **Enter**.
  - If a list of all available commands does not appear on the screen, review the steps in this section, check the cable, or contact service personnel until the problem is solved.

If you have difficulty using the serial port, verify that you have the correct settings and that your serial cable is less than two meters in length.

## Using Telnet

Up to three Telnet sessions can be conducted simultaneously. A serial port session can use the CLI while Telnet sessions are open. Whichever session issues the first **set** CLI command can continue to issue set commands, while the other sessions can only issue **get** commands or display information. Once a connection is established, refer to [CLI provides ASCII-based Interface](#) on page ii of the Appendix.

- 1 Connect to the FibreBridge from a computer on the same Ethernet network.
- 2 Start a Telnet session.



### Note

*There is more than one way to connect to the FibreBridge using a telnet program. Your telnet program may operate differently than in the following instructions.*

- 3 At the telnet prompt, issue the **open** command where x.x.x.x is the IP address of the FibreBridge.

```
telnet > open x.x.x.x
```

- 4 If you have to specify a port type, enter the port type "telnet" and the terminal type "vt100".

```
port type: telnet
```

```
terminal type: vt100
```

- 5 Enter the default values for the user name, **root**, and the password, **Password**, if you did not set new values in [Modify passwords](#) on page 7.

# Appendix A Cabling

ATTO FibreBridge SAS connections connect SAS or SATA storage devices into the Fibre Channel Storage Area Network (SAN). Use an Ethernet connection to use the ATTO ExpressNAV System Manager.

Make sure all cables are anchored securely at both ends with the proper connectors.

## SAS/SATA connections

The FibreBridge supports a wide variety of SAS & SATA storage devices.

Each SAS connection is totally independent from the other SAS connection. SAS PHY auto-negotiates the appropriate sync rates with the connected devices. Check the type of cable, cable length limit and number of devices recommended for each port.

Keep cable lengths as short as possible to ensure the highest signal quality and performance. These cable lengths include the wiring inside the devices.

Device type	Max Cable Length	Max Speed
SFF8644 - SFF8644	1m	12Gb/s
SFF8644 - SFF8644	3m	12Gb/s
SFF8644 - SFF8644	6m	12Gb/s
SFF8644 - SFF8088	1m	6Gb/s
SFF8644 - SFF8088	3m	6Gb/s
SFF8644 - SFF8088	10m	6Gb/s
SFF8643 - SFF8643	1m	12Gb/s
SFF8643 - SFF8087	1m	12Gb/s

## Fibre Channel connections

Fibre Channel technology offers a variety of cabling options. The type of cable required varies depending upon the application, environment and distance.

Cable Type	16Gb/s	8Gb/s	4Gb/s
62.5 µm OM1	15m	21m	70m
50 µm OM2	35m	50m	150m
50 µm OM3	100m	150m	380m
50 µm OM4	125m	190m	400m

Long wave, Single Mode	10,000m	10,000m	10,000m
------------------------	---------	---------	---------



Note

Long wave operation requires long wave SFP+ modules (not supplied).

## Serial port connections

The ATTO FibreBridge supports remote service operations over the RS-232 serial port using standard terminal emulation software available with most systems.

Connect a RJ45 to DB-9 serial cable (null modem) between the ATTO FibreBridge serial port and one of the computer's serial COM ports.

A gender changer or DB-9 to DB-25 converter may be needed depending on the cables being used.

## Ethernet connections

The 100/1000BASE-T Ethernet ports provide remote monitoring and management using the ATTO ExpressNAV System Manager.

When you connect an Ethernet cable between the FibreBridge and a 100/1000BASE-T connection, you may need a crossover cable connecting directly to a computer. The ATTO FibreBridge auto detects the Ethernet speed by default.



Note

All cable types listed on this page are available on the ATTO web store at [www.attotech.com/store](http://www.attotech.com/store)

## Appendix B CLI Provides ASCII-based Interface

The command line interface (CLI) provides access to the ATTO FibreBridge Services through a set of ASCII commands. CLI commands may be entered while in CLI mode.

FibreBridge Services provide configuration and monitoring for the FibreBridge. The command line interface (CLI) is a set of ASCII-based commands which perform these tasks. CLI commands may be entered while in CLI mode.

- CLI commands are context sensitive and generally follow a standard format:

```
[Get|Set] Command [Parameter1|Parameter2]
```

followed by the **return** or **enter** key

- CLI commands are case insensitive: you may type all upper or all lower case or a mixture. Upper and lower case in this manual and the **help** screen are for clarification only.
- Commands generally have three types of operation: get, set and immediate.
- The get form returns the value of a parameter or setting and is an informational command.
- Responses to get commands are followed by **Ready**.

- The set form is an action that changes the value of a parameter or configuration setting. It may require a **SaveConfiguration** command and a restart of the system before it is implemented. The restart can be accomplished as part of the **SaveConfiguration** command or by using a separate **FirmwareRestart** command. A number of set commands may be issued before the **SaveConfiguration** command.
- Responses to set commands are either an error message or **Ready**. \*. The asterisk indicates you must use a **SaveConfiguration** command to finalize the set command. **SaveConfiguration** asks if you want to restart the system or not.
- Set commands which do not require a **SaveConfiguration** command, defined as Immediate commands, are executed.
- Responses to Immediate commands are either an error message or data results followed by **Ready**.

*Exhibit 0.0-1 Symbols, typefaces and abbreviations used to indicate functions and elements of the command line interface used in this manual.*

### Command conventions

Symbol	Indicates
[ ]	Required entry
< >	Optional entry
	pick one of
...	Ellipses, repetition of preceding item
\n	end of line
-	a range (6 – 9 = 6, 7, 8, 9)
fl	Fibre Channel LUN (0 <= fl <= 255)
fp	Fibre Channel port number (1 <= fp <= 1 or 2)
sasConn	SAS connector name (A, B, C, D)
mp1	Ethernet port used to manage the FibreBridge

## CLI error messages

The following error messages may be returned by the Command line Interface

```
ERROR. Invalid Command. Type 'Help' for command list.
```

```
ERROR. Wrong/Missing Parameters
```

```
Usage: <usage string>
```

```
ERROR. Command Not Processed
```

## CLI summary reference

A summary of the Command Line Interface commands, their defaults, and where you can find the specific command. Commands which have no default values associated with them have a blank entry in that column of the table.

Command	Default	Example
AutoMap		automap
BootFibreDelay	0	set bootfibredelay 15
BridgeLUN	enabled	get bridgelun
BridgeModel		get bridgemodel
BridgeName	“ “	set bridgename Omega6
ClearEventLog		cleareventlog
CoreDumpInfo		CoreDumpInfo
Date		set date 03/03/2003
DataMoverStats		get DataMoverStats [all]
DeleteAllMaps		deleteallmaps
DisplayInitiators		DisplayInitiators
DumpConfiguration		dumpconfiguration
DumpEventLog		dumpeventlog
EmailFromAddress		get emailfromaddress
EmailNotify	disabled	get emailnotify
EmailNotifyAddress		set emailnotifyaddress 5 bw@abc.com
EmailPassword		set emailpassword
EmailServerAddress	0.0.0.0	get emailserveraddress
EmailUsername		set emailusername beta321
EthernetSpeed	auto	set ethernetspeed 100
EventLogFilter		get eventlogfilter
Exit		exit
FCConnMode	loop	set fcconnmode all ptp
FCDataRate	auto	get fcdata rate 1
FCHard	disabled	set fchard enabled
FCHardAddress	fp1=3 fp2=4	set fchardaddress 1 122

Command	Default	Example
FCPortErrors		get fcporterrors all
FCPortList		fcportlist
FCSCSIBusyStatus	busy	get fcscsibusystatus
FCSFPInfo		get fcsfpinfo all
FCWWName		get fcwwname 1
FirmwareRestart		firmwarerestart
FlashImages		flashimages
Help		help automap
HGAddInitiator		HGAddInitiator [HostGroupName] [WWN]
HGAddLUN		HGAddLUN [HostGroupName] [lun]
HGCreate		HGCreate [HostGroupName]
HGDelete		HGDelete [HostGroupName   all]
HGDisplay		HGDisplay [HostGroupName   all]
HGMapping		get HGMapping
HGRemoveInitiator		HGRemoveInitiator [HostGroupName] [WWN]
HGRemoveLUN		HGRemoveLUN [HostGroupName] [lun]
HGRename		HGRename [PrevHostGroupName] [NewHostGroupName]
IdentifyBridge	disabled	set identifybridge enabled
IdentifyLUN		IdentifyLUN [lun] ...
Info		info
IPAddress	10.0.0.1	get ipaddress mp1
IPDHCP	enabled	set ipdhcp mp1 disabled
IPDNSServer		get ipdnsserver
IPGateway	0.0.0.0	set ipgateway mp1 200.10.22.3
IPSubnetMask	255.255.0.0	get ipsubnetmask mp1
IsReserved		isreserved
MaxOpTemp	90	get maxoptemp
MinOpTemp	0	set minoptemp 10
OEMConfigFile		get oemconfigfile
OpTempWarn	10	set optempwarn 15
Password	Password	set password
Performance		get performance
Ping		ping mp1 192.42.155.155
ReadOnlyPassword	Password	set readonlypassword
ReadOnlyUsername	user	get readonlyusername
Reserve		reserve
ResetFCPortErrors		resetfcporterrors 1



Command	Default	Example
RestoreConfiguration		restoreconfiguration default
RouteDisplay		routedisplay fc
SASConnectorInfo		get sasconnectorinfo all
SASEnclosures		sasenclosures 1
SASMapByTopology		setsasmapbytopology enabled
SASPortList		sasportlist
SASTargets		sastargets
SaveConfiguration		saveconfiguration restart
SerialNumber		get serialnumber
SerialPortBaudRate	115200	set serialportbaudrate 19200
SerialPortEcho	enabled	get serialportecho
SNMP	disabled	set SNMP enabled
SNMPDumpMIB		snmpdumpmib
SNMPExtendedTraps	disabled	get snmpextendedtraps
SNMPTrapAddress	0.0.0.0 none	set snmptrapaddress 6 192.42.155.155 all
SNMPTraps	disabled	set snmptraps enabled
SNTP	enabled	get sntp
SNTPServer	192.43.244.18	set sntpserver 129.6.15.28
StopIdentifyLUN		StopIdentifyLUN [lun] ...
Temperature		get temperature
Time	00:00:00	set time 03:32:30
TimeZone	EST	set timezone pst
Uptime		get uptime
Username	root	set username Barbara
VirtualDriveResponse		set virtualdriveresponse enabled
ZModem		zmodem receive

## Command explanations

---

### AutoMap

*Automap will automatically map a subset of target devices visible to the firmware to a set of Fibre Channel LUNs. All previous maps will be deleted.*

AutoMap

Requires a SaveConfiguration command

### BootFibreDelay

*BootFibreDelay sets the delay (in seconds) after startup before enabling the Fibre Channel ports. The value "0" constitutes no delay.*

Default: 0 (no delay)

set BootFibreDelay [0-255]

Requires a SaveConfiguration command

get BootFibreDelay

## BridgeModel

*BridgeModel reports the specific model and firmware information to the CLI.*

get BridgeModel

## BridgeLun

*BridgeLun controls the automatic generatrion of a bridge device at LUN 0. After enabling or disabling the bridge LUN, save configuration and run AutoMap to re-map all devices.*

Default: enabled

set BridgeLUN [enabled | disabled]

Requires a SaveConfiguration Restart command

get BridgeLun

## BridgeName

*BridgeName provides a descriptive ASCII name assigned to the unit. This field is used by applications to identify individual units. The specified name can be up to a maximum of 32 characters. If the name contains spaces, it must be enclosed in quotation marks. Unlike other non-immediates, changes to BridgeName take effect immediately.*

Default: " "

set BridgeName [name]

get BridgeName

## ClearEventLog

*ClearEventLog clears the contents of the event log.*

ClearEventLog

## CoreDumpInfo

*Displays information concerning a core dump stored by a prior fault.*

CoreDumpInfo

## DataMoverStats

*Displays statistics on aggregate data copied by the Data Mover. Shows the previous hour and minute. Use "all" to display statistics over the entire 24 hour period.*

Usage: get DataMoverStats [all]

## Date

*Date sets/displays the current date. The date range is 01/01/2000 to 12/31/2099.*

Default: 01/01/2000

set Date [MM] / [DD] / [YYYY]

Requires a SaveConfiguration command

get Date

## DeleteAllMaps

*Removes all mapped devices from the map table. Upon the subsequent POST, if no maps are present the default maps will be loaded.*

DeleteAllMaps

Requires a SaveConfiguration command

## DisplayInitiators

*Displays the FC Port world-wide name of the connected initiators.*

DisplayInitiators

## DumpConfiguration

*Dumps system's configuration.*

DumpConfiguration

## DumpEventLog

*DumpEventLog can be used to dump the contents of the event log to an RS-232 or telnet session. With no parameters, the last 2048 entries will be displayed. The optional parameter "all" specifies all entries will be displayed. An optional numeric parameter specifies the maximum number of entries to display from the end of the log.*

DumpEventLog <NumEntries | all>

## EmailFromAddress

*EmailFromAddress configures the email address that this system will use to talk to the email server. Full email address is a fully qualified Internet email address, not more than 128 characters long.*

set EmailFromAddress [full email address]

get EmailFromAddress

## EmailNotify

*EmailNotify turns on and off email notification. Default is disabled.*

Default: disabled.

set EmailNotify [enabled | disabled]

get EmailNotify

## EmailNotifyAddress

*EmailNotifyAddress configures notification addresses. Index is a number between 1 and 5, inclusive. Full email address is a fully qualified Internet email address, not more than 128 characters long. The level can be "all", "informational", "warning", "critical" or "none". This is the minimum level of severity in order for the event to trigger an email notification.*

set EmailNotifyAddress [index] [full email address]

[warning level]

get EmailNotifyAddress <index | all>

## EmailPassword

*EmailPassword* sets the password used to authenticate the login to the SMTP email server. The password must not be more than 64 characters. A password is not required if the email server does not require authentication.

set EmailPassword

Requires a SaveConfiguration command

## EmailServerAddress

*EmailServerAddress* configures the address of the server that should be contacted in order to send out emails. Either an IP address or a fully qualified domain (e.g. mail.myserver.com) may be specified.

set EmailServerAddress [IP address]

Requires a SaveConfiguration command

get EmailServerAddress

## EmailUsername

*EmailUsername* sets the username used to authenticate the login to the SMTP email server. The username must not be more than 128 characters. A username is not required if the email server does not require authentication.

set EmailUsername [username]

Requires a SaveConfiguration command

get EmailUsername

## EthernetSpeed

*EthernetSpeed* determines the speed of any Ethernet port(s). If Auto is enabled then the Ethernet speed will be negotiated and the value in parentheses returned by the 'get' command indicates the current speed of the Ethernet connection.

Default: auto

set EthernetSpeed [mp[n]] [10 | 100 | 1000 | auto]

Requires a SaveConfiguration Restart command

get EthernetSpeed [mp[n] | all]

If auto enabled, returned value in parentheses indicates current speed

## EventLogFilter

*EventLogFilter* specifies what events to include in the event log display. Type "get EventLogFilter" for a list of valid subsystems. Specify a subsystem with "none" to disable event display for that subsystem. Levels are "info", "warn" and "crit". Specify "info" to display all levels, "warn" to display warnings and critical events, "crit" to display only critical events. Events are classified "factory" or "user" (factory events provide detailed information for factory debug, and they are marked with a dash.) Specify "factory" to display all events, or specify "user" to display only user events.

set EventLogFilter [subsys | all] [[info | warn | crit] [factory | user]] | none]

get EventLogFilter

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## Exit

*Exit* terminates the current CLI session over Telnet. This command has no effect if used during a serial RS-232 session.

exit

## FCConnMode

*FCConnMode* specifies the connection mode used when communicating across a Fibre Channel network. The system will connect to an arbitrated loop (FC\_AL) if 'loop' is selected. The system will connect in point-to-point mode if 'ptp' is selected. The options of 'loop-ptp' (AL Preferred) and 'ptp-loop' (PTP Preferred) allow auto-negotiation while indicating a preference. Loop mode cannot be specified if FcDataRate is set to 16Gb.

Default: loop

set FCConnMode [fp | all] [loop | ptp | loop-ptp | ptp-loop]

Requires a SaveConfiguration Restart command

get FCConnMode [fp | all]

## FCDataRate

*FCDataRate* specifies the Fibre Channel data rate (4Gb, 8Gb or 16Gb) or auto-negotiation to the highest speed (auto). 16Gb cannot be specified when FcConnMode is set to 'loop'.

Default: auto

set FCDataRate [fp | all] [4Gb | 8Gb | 16Gb | auto]

Requires a SaveConfiguration Restart command

get FCDataRate [fp | all]

## FCHard

*FCHard* enables and disables Fibre Channel hard address assignment. When FCHard is enabled, the internal hard address will be used as the loop address on the Fibre Channel loop. Under soft addressing, the loop address is assigned during loop initialization.

Default: disabled

set FCHard [enabled | disabled]

Requires a SaveConfiguration Restart command

get FCHard

## FCHardAddress

*FCHardAddress* specifies the value used as the FC-AL hard address. This value represents the address that will be used if hard addressing is enabled. The range of valid Fibre Channel Hard Address values is 0 through 125.

Default fp1=3; fp2=4

set FCHardAddress [fp | all] [address]

Requires a SaveConfiguration Restart command

get FCHardAddress [fp | all]

## FCPortErrors

*FCPortErrors displays the number of Fibre Channel errors that have occurred since the last reboot/power-on or [ResetFCPortErrors](#) command at the Fibre Channel controller level.*

get FCPortErrors [fp | all]

## FCPortList

*FCPortList returns a list of available FC ports and their current status. Valid status values are **Up**, **Down**, **Failed**, **Reserved** and **Disabled**.*

FCPortList

## FCSCSIBusyStatus

*This option controls reporting of either a 'BUSY' or 'QUEUE FULL' status at a point in time when SCSI commands cannot be accepted.*

set FCSCSIBusyStatus [busy | qfull]

Requires a SaveConfiguration Restart command

get FCSCSIBusyStatus

## FCSFPInfo

*FCSFPInfo displays information about the specified Fibre Channel SFP.*

get FCSFPInfo [fp | all]

## FCWWName

*FCWWName reports the World Wide Node Name of the Fibre Channel interface referenced.*

get FCWWName [fp | all]

## FirmwareRestart

*FirmwareRestart resets and reinitializes the firmware. Use the 'forced' option to override any CLI reservations held by other sessions.*

FirmwareRestart <forced>

## FlashImages

*FlashImages displays the metadata for software images currently stored in the Flash device. The optional parameter "validate" also validates the CRC of the flash images. Note that the CRC validation causes a multi-second delay.*

Usage: FlashImages <validate>

## Help

*The Help command issued with no parameters displays a list of available CLI commands. When a CLI Command name is specified, a command usage string and command description is presented on the CLI.*

Help [command name]

## HGAddInitiator

*Adds an initiator to an existing Host Group. WWN specifies the world-wide name of the FC Port to be added to the Host Group; the CLI command "DisplayInitiators" can be used to display connected initiators.*

HGAddInitiator [HostGroupName] [WWN]

## HGAddLUN

*Adds a LUN to an existing Host Group. The CLI command "RouteDisplay FC" can be used to display attached LUNs.*

HGAddLUN [HostGroupName] [lun]

## HGCreate

*Creates a new empty Host Group. HostGroupName is an ASCII name for the Host Group (32 chars max, no spaces). A HostGroup will expose specified LUNs to specified initiators. To add a LUN to a Host Group use the CLI command "HGAddLUN" and to add a host to a HostGroup use the CLI command "HGAddInitiator".*

HGCreate [HostGroupName]

## HGDelete

*Deletes an existing Host Group.*

HGDelete [HostGroupName | all]

## HGDisplay

*Displays Host Group status information for the specified Host Group, or for all Host Groups.*

HGDisplay [HostGroupName | all]

## HGMapping

*Changes the systems ability to expose specific LUNs to specific initiators or to expose all LUNs to all initiators.*

set HGMapping [enabled | disabled]

get HGMapping

## HGRemoveInitiator

*Deletes an initiator from an existing Host Group. The CLI command "DisplayInitiators" can be used to display connected initiators.*

HGRemoveInitiator [HostGroupName] [WWN]

## HGRemoveLUN

*Removes a LUN from an existing Host Group. The CLI command "RouteDisplay FC" can be used to display attached LUNs.*

HGRemoveLUN [HostGroupName] [lun]

## HGRename

*Renames an existing Host Group.*

HGRename [PrevHostGroupName]  
[NewHostGroupName]

## IdentifyBridge

*IdentifyBridge causes the 'Alert' LED to blink to enable identification of this system. Disable this option to cancel the blinking.*

Default: disabled  
set IdentifyBridge [enabled | disabled]  
get IdentifyBridge

## IdentifyLUN

*Lights the LED(s) of disk drive(s) associated with one or more FC LUNs.*

IdentifyLUN [lun]

## Info

*Info displays version numbers and other product information for key components. Use the optional 'brief' parameter to show a more concise subset of system information.*

Info <brief>

## IPAddress

*IPAddress controls the current IP address of any Ethernet port(s). If IPDHCP is enabled, then the 'get' command reports the current IP address assigned by the network DHCP server, followed by the (DHCP) identifier.*

Default: 10.0.0.1  
set IPAddress [mp[n]] [xxx.xxx.xxx.xxx]  
Requires a SaveConfiguration Restart command  
get IPAddress [mp[n] |all]

## IPDHCP

*IPDHCP allows acquisition of an IP address from a network DHCP server. When this option is disabled, the IP address used will be specified by the IPAddress CLI command.*

Default: enabled  
set IPDHCP [mp[n]] [enabled | disabled]  
Requires a SaveConfiguration Restart command  
get IPDHCP [mp[n] | all]

## IPDNSServer

*Controls the current DNS Server address. If IPDHCP is enabled, then this value is automatically detected. If IPDHCP is disabled, then this value must be manually set.*

set IPDNSServer [xxx.xxx.xxx.xxx]  
get IPDNSServer

## IPGateway

*IPGateway controls the current default gateways used by any Ethernet port(s). If IPDHCP is enabled, the 'get' command reports the current IP gateway assigned by the network DHCP server.*

Default: 0.0.0.0  
set IPGateway [mp[n]] [xxx.xxx.xxx.xxx]  
Requires a SaveConfiguration Restart command  
get IPGateway [mp[n] |all]

## IPSubnetMask

*IPSubnetMask controls the current subnet masks used by any Ethernet port(s). If IPDHCP is enabled, the 'get' command reports the current IP subnet mask assigned by the network DHCP server.*

Default: 255.255.0.0  
set IPSubnetMask [mp[n]] [xxx.xxx.xxx.xxx]  
Requires a SaveConfiguration Restart command  
get IPSubnetMask [mp[n] |all]

## IsReserved

*IsReserved displays the reservation status of the current services session/interface.*

IsReserved

## MaxOpTemp

*Regulates/displays the maximum enclosure temperature alarm of the FibreBridge in degrees Celsius. If the temperature of the FibreBridge rises above the maximum MaxOpTemp, thermal control event handling occurs. Valid entries are between 75 degrees and 90 degrees.*

Default: 90  
set MaxOpTemp [75-90]  
Requires a SaveConfiguration Restart command  
get MaxOpTemp

## MinOpTemp

*Regulates/displays the minimum enclosure temperature alarm of the FibreBridge in degrees Celsius. Valid entries are between 0 degrees and 15 degrees.*

Default: 0  
set MinOpTemp [0-15]  
Requires a SaveConfiguration Restart command  
get MinOpTemp

## OEMConfigFile

*Returns the "name" (the contents of the first record) of the OEM configuration file stored in persistent memory.*

get oemconfigfile

## OpTempWarn

Regulates/displays the number of degrees in Celsius before a warning is sent to the user. Valid entries are between 0 degrees and 15 degrees.

Default: 10

set OpTempWarn [0-15]

Requires a SaveConfiguration Restart command

get OpTempWarn

## Password

Specifies password for all non-serial sessions: Telnet, FTP and ExpressNAV interface. You are prompted for the current password, to enter the new password, and to confirm the new password. If local Echo is enabled, password echoes all \* characters. If [VerboseMode](#) has been enabled, CLI requests that you re-enter the password. When the password is all 0s, Telnet and FTP do not validate the password and MD5 authentication is disabled. Configure an empty password by pressing the **Enter** key when prompted for the new password and the new password confirmation. Passwords are case sensitive and can be 1-32 characters long with no spaces.

Default: Password

set Password

Requires a SaveConfiguration command

## Performance

Returns system performance data. Data consists of the average rate (MB/s) and number of I/Os (IO/s) measured over the previous sampling period (approximately one second). Successful SCSI Read (28h, 88h, A8h) and Write (2Ah, 8Ah, AAh) commands are considered I/Os. Factors that may affect reported performance include port availability and saturation, transfer size, target device speeds, and overall system utilization.

get Performance

## Ping

Sends an ICMP echo request to the specified host.

Ping [mp[n] [IP Address] <count <size>>

## ReadOnlyPassword

Specifies password for all non-serial sessions: Telnet, FTP and ExpressNAV interface. ReadOnlyPassword is case sensitive, 0 to 32 characters, and cannot contain spaces. Configure an empty password by not specifying one.

Default: Password

set ReadOnlyPassword

Requires a SaveConfiguration command

## ReadOnlyUsername

Specifies user name for all Telnet, FTP and ExpressNAV user management console sessions. **Username** is case insensitive, 1-32 characters, no spaces.

Default: User

set ReadOnlyUsername

Requires a SaveConfiguration command

get ReadOnlyUsername

## Reserve

Prevents other CLI sessions from modifying the FibreBridge. When the FibreBridge services interface is reserved, set commands are unavailable but get commands are available. At least one service interface always has access to the FibreBridge at all times. This interface always reports **RELEASED** status, since it may issue set commands. Reservation of the FibreBridge is implicit: if the configuration is changed by any user of CLI sessions, the FibreBridge becomes **RESERVED**. Executing a **SaveConfiguration** command, **RestoreConfiguration** or **FirmwareRestart forced** releases the FibreBridge so that other devices may modify it.

Reserve

## ResetFCPortErrors

Resets all FC error counts for the specified port to zero. Refer to [FCPortErrors](#) command.

ResetFCPortErrors [fp | all]

## RestoreConfiguration

Restores configuration to either the default configuration or the configuration last saved into non-volatile memory. The saved option undoes any changes made since the last save.

RestoreConfiguration [Default | Saved | Factory]

## RouteDisplay

Displays a list of Fibre Channel to SCSI address mappings on the FibreBridge.

RouteDisplay FC <fp> <lun>

## SASConnectorInfo

SASConnectorInfo displays information about the specified SAS connector. Valid connector names are A through D.

get SASConnectorInfo [sasConn | all]

## SASEnclosures

Displays a list of all attached SMP-based enclosures. If the optional enclosure index is specified, it displays the drives in the specified enclosure.

SASEnclosures <n>

## SASMapByTopology

*SASMapByTopology specifies how target devices are mapped to LUNs. When enabled, LUNs are numbered based on the SAS topology, with gaps where there are open slots. When disabled, LUNs are assigned to devices as they are discovered, which may change over time.*

```
set SASMapByTopology [enabled | disabled]
get SASMapByTopology
```

## SASPortList

*Lists the status of all available SAS ports.*

```
SASPortList
```

## SASTargets

*Lists the physical devices that are connected to all SAS connectors and PHYs.*

```
SASTargets
```

## SaveConfiguration

*Many commands require a **SaveConfiguration** command to be executed as indicated by the return **Ready**. \*. When you invoke a **SaveConfiguration** command, the current configuration is permanently saved in the FibreBridge and the new configuration becomes the active configuration. If a firmware restart is required to make the requested change permanent, you are asked to confirm the restart. You can override this request by indicating the override value on the command line. You may make several changes through commands before implementing the restart, but once you have restarted the FibreBridge, all the command changes created before the restart and save are implemented. If you select the restart option, the FibreBridge executes its complete start up cycle.*

```
SaveConfiguration <Restart | NoRestart>
```

## SerialNumber

*Reports the FibreBridge serial number. The serial number, unique for each FibreBridge, is a 13-character field. The first seven alphanumeric characters are an abbreviation of the FibreBridge name while the remaining six numbers are the individual FibreBridge board's number.*

```
get SerialNumber
```

## SerialPortBaudRate

*SerialPortBaudRate configures the baud rate for the RS-232 serial port. The number of data bits per character is fixed at 8 with no parity.*

```
Default: 115200
set SerialPortBaudRate [ 9600 | 19200 | 38400 | 57600 |
  115200]
```

Requires a SaveConfiguration Restart command  
get SerialPortBaudRate

## SerialPortEcho

*Control/reports the status of the display of keyboard input. When enabled, all non-control character keyboard input is output to the display. Local ASCII terminal (or terminal emulator) echo settings should be set to **disabled** while using **SerialPortEcho enabled***

```
Default: enabled
set SerialPortEcho [enabled | disabled]
Requires a SaveConfiguration Restart command
get SerialPortEcho
```

## SNMP

*Controls whether or not SNMP functions on the FibreBridge.*

```
Default: disabled
set SNMP [enabled | disabled]
get SNMP
```

## SNMPDumpMIB

*Dumps the contents of the specified private SNMP MIB to the current CLI session. If no parameter is specified, the Bridge private MIB is dumped. For further assistance with SNMP, consult your network administrator.*

```
SNMPDumpMIB <Bridge | Product | SMI | TC>
```

## SNMPExtendedTraps

*Controls Extended SNMP trap functioning such as device transition and device error. Consult your network administrator for further assistance with SNMP.*

```
Default: disabled
set SNMPExtendedTraps [enabled | disabled]
get SNMPExtendedTraps
```

## SNMPTrapAddress

*Sets/displays the IP trap addresses and levels. Consult your network administrator for further assistance with SNMP.*

```
Index: value between 1 and 6
IPAddress: standard IP address for the host
receiving messages; must be in the same subnet as
the FibreBridge
Trap Level: severity required for an event to trigger a
trap:
  None: no traps are sent to the address
  ALL: all triggering events are sent
  Warning: warning and critical events are sent
  Critical: only critical events trigger a trap
```

```
Default: 0.0.0.0 none
set SNMPTrapAddress [Index] [IPAddress] [None | All |
  Warning | Critical ]
get SNMPTrapAddress [index]
```

## SNMPTraps

Controls SNMP trap functions. Consult your network administrator for further assistance with SNMP.

Default: disabled  
set SNMPTraps [enabled | disabled]  
get SNMPTraps

## SNTP

Controls whether the FibreBridge contacts a specified SNTP time server to initialize or synchronize the time.

Default: enabled  
set SNTP [enabled | disabled]  
Requires a SaveConfiguration Restart command  
get SNTP

## SNTPServer

Controls/displays the main IP address of the SNTP time server. If the FibreBridge is unable to contact the specified SNTP time server within 30 seconds, the FibreBridge tries to contact the first auxiliary SNTP time server. If not successful, the FibreBridge tries to contact the second auxiliary server. If not successful, the FibreBridge continues to keep time based on the most recent SNTP time server, physical RTC or manual initialization or synchronization.

Default: 192.43.244.18  
set SNTPServer [xxx.xxx.xxx.xxx]  
Requires a SaveConfiguration Restart command  
get SNTPServer

## StopIdentifyLUN

Stops lighting the LED(s) of disk drive(s) associated with one or more FC LUNs.

StopIdentifyLUN [lun]

## Temperature

Displays the current internal temperature of the FibreBridge in degrees Celsius.

get Temperature

## Time

Controls/displays the time in a 24-hour format. The default time is 00:00:00 and is accurate until the FibreBridge is reset or power-cycled when it returns to the default. **Time** cannot be set if [SNTP](#) is enabled.

Default: 0:00:00  
set Time [HH :MM :SS]  
Requires a SaveConfiguration command  
get Time

## TimeZone

Controls/displays the time zone if [SNTP](#) is disabled. Setting may be **EST**, **CST**, **MST** **PST** or a numerical offset from GMT in the format +/- **HH:MM**. When [SNTP](#) is enabled, applies the time zone setting to the time retrieved from a specified SNTP time server to determine local time.

Default: EST  
set TimeZone [EST | CST | MST | PST | [+ / - HH : MM]]  
Requires a SaveConfiguration command  
get TimeZone

## Uptime

Returns the time [days:hrs:min:sec] since the last reboot.

get Uptime

## Username

Specifies user name for all Telnet, FTP and ExpressNAV user management console sessions. **Username** is case insensitive, 1-32 characters, no spaces.

Default: root  
set Username [username]  
Requires a SaveConfiguration command  
get Username

## VerboseMode

Specifies the detail of feedback for the command line interface. Disabling this option removes parameter names from action commands and removes descriptions from information commands.

Default: enabled (returns have parameter information)  
set VerboseMode [enabled | disabled]  
get VerboseMode

## VirtualDriveResponse

VirtualDriveResponse (VDR) allows proxy responses to SCSI INQUIRY and TEST UNIT READY commands in the event of a SCSI device selection timeout or busy event. This allows host systems to assign devices consistently regardless of the device's state during the execution of the commands.

set VirtualDriveResponse [enabled | disabled]  
get VirtualDriveResponse

## ZModem

Allows transfer of a firmware bundle to or from the FibreBridge using the zModem file transfer protocol. Available only through the RS232 interface.

ZModem [Send filename | Receive]



# Appendix C Standards and Compliances

*The equipment described in this manual generates and uses radio frequency energy. If this equipment is not used in strict accordance with the manufacturer's instruction, it can and may cause interference with radio and television reception.*

## Regulatory Notices

### FCC Notices (US only)

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.


Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.

### Compliance with ICES-003

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

### Compliance with EN Regulations

Marking by the symbol  indicates compliance of this ATTO device to the EMC Directive and the Low Voltage Directive of the European Union.



The ATTO FibreBridge 7500 complies with Directive 2011/65/EC on the Restriction of the Use of Hazardous Substances in Electrical and Electronic Equipment RoHS2 (recast) and take the following exemptions:

6(c)- Copper alloy containing up to 4% lead by weight.

7(a) -Lead in high melting temperature type solders (i.e. lead based alloys containing 85% by weight or more lead).

7(c)-I -Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in glass or ceramic matrix compound.

15 - Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit flip chip packages.

UL60950-1/CSA C22.2 No. 60950-1



The product has been certified and bears the Mark, as applicable, of the EMC and Product Safety authorities as indicated below:

**Safety:** TUV 72141224, EN 60950, CE, CSA 60950, UL 60950, CB IEC60950-1 (all national deviations)

**Emissions/Immunity:** FCC Part 15 Class B, ICES-003, CE - EN55022, EN55024, IEC61000-3-2, IEC61000-3-3

## Appendix D Warranty Information

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### **ATTO Technology, Inc. limited warranty**

ATTO Technology, Inc. ("ATTO") warrants to the original purchaser of this product ("Product") that the Product is free from defects in material and workmanship for the term described for this specific Product on ATTO's website ([www.attotech.com](http://www.attotech.com)). ATTO's liability shall be limited to replacing or repairing any defective product at ATTO's option. There is no charge for parts or labor if ATTO determines that this product is defective.

PRODUCTS WHICH HAVE BEEN SUBJECT TO ABUSE, MISUSE, ALTERATION, NEGLIGENCE, OR THOSE PRODUCTS THAT HAVE BEEN SERVICED, REPAIRED OR INSTALLED BY UNAUTHORIZED PERSONNEL WILL NOT BE COVERED UNDER THIS WARRANTY. DAMAGE RESULTING FROM INCORRECT CONNECTION OR AN INAPPROPRIATE APPLICATION OF THIS PRODUCT SHALL NOT BE THE RESPONSIBILITY OF ATTO. LIABILITY UNDER THIS LIMITED WARRANTY IS LIMITED TO ATTO PRODUCT(S). DAMAGE TO OTHER EQUIPMENT CONNECTED TO ATTO PRODUCT(S) IS THE CUSTOMER'S RESPONSIBILITY. THIS LIMITED WARRANTY IS MADE IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED. ATTO DISCLAIMS ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE TO THE EXTENT IMPLIED WARRANTIES CANNOT BE EXCLUDED, SUCH IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE EXPRESS WARRANTY PERIOD APPLICABLE TO THE PRODUCT. BECAUSE SOME STATES OR JURISDICTIONS DO NOT ALLOW LIMITATIONS ON THE DURATION OF IMPLIED WARRANTIES, THE ABOVE MAY NOT BE APPLICABLE. ATTO'S RESPONSIBILITY TO REPAIR OR REPLACE A DEFECTIVE PRODUCT IS THE SOLE AND EXCLUSIVE REMEDY PROVIDED TO THE CUSTOMER FOR BREACH OF THIS WARRANTY. ATTO IS NOT RESPONSIBLE FOR DAMAGE TO OR LOSS OF ANY DATA, PROGRAMS OR ANY MEDIA. THE PRODUCTS ARE NOT INTENDED FOR USE IN: (I) MEDICAL DEVICES OR THE MEDICAL FIELD; OR (II) USE IN RUGGED APPLICATIONS.

ATTO IS NOT LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, IRRESPECTIVE OF WHETHER ATTO HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. NO ATTO DEALER, AGENT OR EMPLOYEE IS AUTHORIZED TO MAKE ANY MODIFICATION, EXTENSION OR ADDITION TO THIS WARRANTY.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.