ATTO Technology, Inc.

ATTO FibreBridge

Installation and Operation Manual

ATTO FibreBridge 2370E

ATTO FibreBridge 2390C/R/D

ATTO FibreBridge 2400C/R/D

1/2007

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Contents

1.0 ATTO FibreBridge provides storage options

The ATTO FibreBridge™ family of products provides Fibre Channel-to-SCSI bridges as embeddable boards, stand alone enclosures that can be fitted for rack mount integration, or desktop units.

Fibre Channel is a serial communications technology designed to transfer large amounts of data between a variety of hardware systems over long distances. It is a key technology for applications that require shared, high bandwidth access to storage.

Fibre Channel provides a logical point-to-point serial channel for the transfer of data between a buffer at a source device and a buffer at a destination device. It moves buffer contents from one port to another, without regard to the format or meaning of the data, so different upper level protocols are able to run over Fibre Channel hardware.

All ATTO FibreBridge models can be used in a SAN (Storage Area Network) to connect a variety of Fibre Channel and SCSI devices. A SAN is a shared storage architecture connecting computers and storage devices for online data access. Each connected system can directly access any attached storage device.

The ATTO FibreBridge provides the interface between SCSI and Fibre Channel resources in SANs. Possible configurations depend upon your current hardware.

ATTO FibreBridge 2370E features, benefits

The ATTO FibreBridge 2370E is a Fibre Channel-to-SCSI bridge that offers a high-performance architecture supporting next-generation storage media. The FibreBridge 2370E allows users with SCSI storage to add Fibre Channel connectivity, enabling SAN connectivity for the storage system. With industry-leading support for 4-Gigabit Fibre Channel and Ultra320 SCSI, the FibreBridge 2370E provides the throughput required by advanced storage media in an embeddable form factor for easy integration into SCSI devices.

- One 4-Gb Fibre Channel ports which auto-negotiate to 1-Gb and 2-Gb Fibre Channel
- SFP Fibre Channel connector
- Support for direct connect to F-port fabric switches, full duplex FC data transfers and FC-AL, PLDA and public loop login
- Two independent Ultra320 SCSI connections using standard 68-pin internal SCSI connectors
- Backward compatible with all single-ended SCSI devices and previous SCSI protocols
- Manual and auto SCSI device mapping
- 200 MB/sec. maximum throughput
- ExpressNAV™ integrated management console for remote configuration, management and diagnostic capabilities
- Supports SCSI hard disk drives, tape drives and CD libraries
- RoHS compliant

ATTO FibreBridge 2390C/R/D features, benefits

The ATTO FibreBridge 2390C/R/D is a 4-Gigabit Fibre Channel-to-SCSI bridge configured with a single 4-Gb Fibre Channel port and dual-stacked Ultra320 SCSI buses featuring VHDCI interfaces.

Designed to integrate industry-leading performance and SAN capabilities into advanced storage solutions, the FibreBridge 2390 uses a high performance architecture suited for tape automation OEMs who wish to integrate high performance LTO-3 and SDLT600 tape drives into 4-Gb Fibre Channel SANs, as well as disk OEMs looking to add 4-Gb Fibre Channel connectivity to their disk storage devices.

- One 4-Gb Fibre Channel port which auto negotiates to 1-Gb and 2-Gb FC
- SFP FC connector
- Support for direct connect to F-port fabric switches, full duplex FC data transfers and FC-AL, PLDA and public look login
- Two independent Ultra320 SCSI buses
- Dual-stacked VHDCI SCSI connectors
- Backward compatible with all single-ended SCSI devices and all previous SCSI protocols
- Manual and auto SCSI device mapping
- 215 MB/sec. maximum throughput
- ExpressNAV integrated management console for remote configuration, management and diagnostic capabilities
- Supports SCSI hard disk drives, tape drives and CD libraries

ATTO FibreBridge 2400C/R/D features, benefits

The ATTO FibreBridge 2400C/R/D is a 4-Gigabit Fibre Channel-to-SCSI bridge configured with dual independent 4-Gb Fibre Channel ports and dual-stacked Ultra320 SCSI buses featuring VHDCI interfaces.

Designed to integrate industry-leading performance and SAN capabilities into future generation storage solutions, the FibreBridge 2400 uses a high performance architecture suited for tape automation OEMs who wish to integrate high performance LTO-3 and SDLT600 tape drives into 4-Gb Fibre Channel SANs, as well as disk OEMs looking to add 4-Gb Fibre Channel connectivity to their disk storage devices.

- Two independent 4-Gb Fibre Channel ports which auto negotiate to 1-Gb and 2-Gb FC
- SFP FC connectors
- Support for direct connect to F-port fabric switches, full duplex FC data transfers and FC-AL, PLDA and public look login
- Two independent Ultra320 SCSI buses
- Dual-stacked VHDCI SCSI connectors
- Backward compatible with all single-ended SCSI devices and all previous SCSI protocols
- Manual and auto SCSI device mapping
- 440 MB/sec. maximum throughput
- ExpressNAV™ integrated management console for remote configuration, management and diagnostic capabilities
- Supports SCSI hard disk drives, tape drives and CD libraries

1.1 ATTO FibreBridge 2370E

The ATTO FibreBridge 2370E is a 4-Gigabit Fibre Channel to SCSI bridge offering the ability to add 4-Gigabit Fibre Channel connectivity to Ultra320 SCSI devices.

The FibreBridge 2370E is available in an embeddable card for easy integration into storage devices.

Board dimensions

Width: 3.9 inches

Length: 7.995 inches

Height of tallest component: .55 inches on top, 0.1 inches on bottom

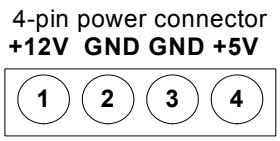
Cooling and airflow

Operating Temperature: 0-40° C

Humidity: 10-90% non-condensing

Power

The FibreBridge board is powered from a standard 4-pin disk drive power connector.



Input voltage and power draw: 5.0V = 10 Watts, 12V = 24 Watts

Fibre Channel port

The 4-Gb Fibre Channel port can connect the FibreBridge to either a Fabric or Arbitrated Loop using a Small Formfactor Pluggable (SFP) interface.

SCSI ports

The two SCSI ports connect storage devices into the Fibre Channel Storage Area Network (SAN). Each port is totally independent from the other.

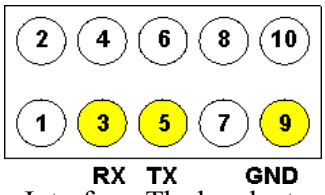
The ports are Ultra320 SCSI busses with internal HD68 connectors, downward compatible with all forms of single-ended SCSI and all previous SCSI protocols.

Ethernet port

The 10/100 Base T Ethernet port is accessible from the RJ45 connector to provide local and remote diagnostics, monitoring and management.

Serial management header

A serial 10-pin header provides support for an RS-232 remote monitoring and management port through a Command Line Interface. The baud rate is programmable and preset at the factory to 115200 bps.



LED indicators

On-board LED indicators are on the board front or LED headers may be connected to outside panels.

SCSI ports: a green LED indicates activity if it is lit, no activity if it is off.

Fibre Channel port: A green LED indicates activity if it is lit, no activity if it is off. A green LED indicates speed: you may set the LED to signify 1 Gb/sec or 2 Gb/sec if it is off or 4 Gb/sec or 2 Gb/sec if it is on.

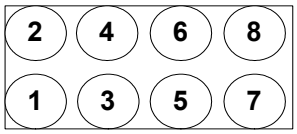
A Ready LED lights green to indicate ready and is off to indicate not ready.

A Power Status LED is on to indicate 5V and 12V are applied to the board; flashing green indicates that 12V is applied but 5V is not.

A Yellow LED indicates fault status: off means not faulted; on means faulted status.

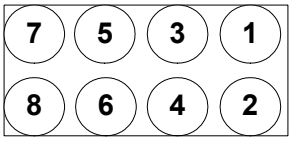
Embedded in the Ethernet port connector: a lighted green LED shows a valid link; off indicates that no link is present. A separate blinking yellow LED indicates activity.

LED Header P5 Pins



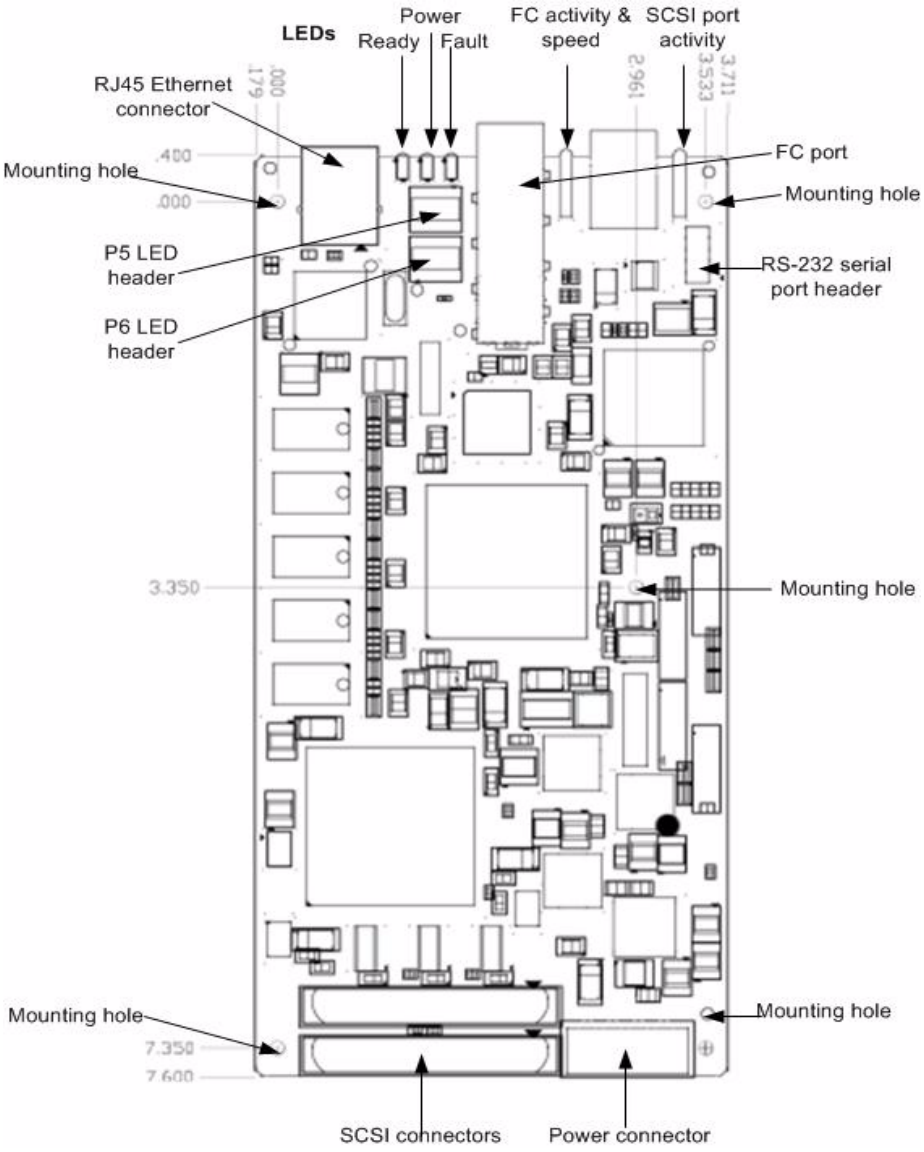
1 Ready LED Cathode
2 VDD 3.3
3 Power OK LED Cathode
4 VDD 3.3
5 Fault LED Cathode
6 VDD 3.3
7 NC
8 NC

LED Header P6 Pins



1 SCSI Port 1 Activity LED Cathode
2 VDD 3.3
3 SCSI Port 2 Activity LED Cathode
4 VDD 3.3
5 Fibre Channel Port Speed LED Cathode
6 VDD 3.3
7 Fibre Channel Port Activity LED Cathode
8 VDD 3.3

Exhibit 1.1-1 FibreBridge 2370E board layout



1.2 ATTO FibreBridge 2390R/D

The ATTO FibreBridge 2390R/D is a 4-Gigabit Fibre Channel to SCSI bridge offering the ability to add 4-Gigabit Fibre Channel connectivity to Ultra320 SCSI devices.

The FibreBridge 2390R/D is available in an industry-standard IU form factor for easy integration into racks. The advanced connectivity options make it suitable to support next-generation storage media such as LTO-3 and SDLT600.

Dimensions

Width: 16.494 inches

Length: 10 inches

Height: 1.579 inches (1U)

Weight: approximately 10 pounds

Cooling and airflow

Operating Temperature: 0-40° 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 power supply circuit is permanently mounted within the enclosure and is not hot swappable. It has one standard IEC320 power receptacle and switch.

The universal power supply provides power for the bridge board and cooling fan.

The power requirements of the ATTO FibreBridge 2390R plus the power draw of the other equipment in the rack must not overload the supply circuit and/or wiring of the rack.

Input voltage: 110/230V AC, with operating input range of 90-132V AC or 175-264V AC, 100-240 VAC; 1.7-.7A, 50-60Hz.

Battery-backed event log SRAM & Real-Time-Clock: A rechargeable Lithium ion battery cell holds the memory in a 512KB SRAM for up to 30 days.

WARNING

Risk of explosion if the battery is removed and/or replaced by an incorrect type. Dispose of used batteries in accordance with your local environmental regulations.

WARNUNG

Explosionsgefahr, wenn die Batterie falsch entfernt und/oder ersetzt wird. Entsorgen Sie benutzte Batterien in Übereinstimmung mit Ihren lokalen Umweltschutzbestimmungen.

If the FibreBridge becomes disconnected from power, recharging begins automatically when power is restored to the system. The battery is fully charged after 24 hours of continuous power application.

Fibre Channel interface

The optical SFP 4-Gb Fibre Channel port auto-negotiates to 1-Gb, 2-Gb or 4-Gb devices.

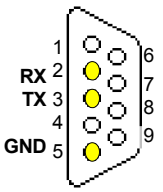
SCSI ports

The two SCSI ports connect storage devices into the Fibre Channel Storage Area Network (SAN). Each port is totally independent from the other.

The ports are Ultra320 SCSI busses with VHDCI connector, downward compatible with all forms of single-ended SCSI and all previous SCSI protocols.

Serial port

The RS-232 serial port provides support for remote monitoring and management using a DB9 connector. The baud rate is programmable and preset at the factory to 115200 bps.



Ethernet port

The 10/100 Base T Ethernet port is accessible from the RJ45 connector to support local and remote diagnostics, monitoring and management.

Reset switch

To reset the FibreBridge, briefly insert a tool in the Reset hole in the back panel.

LED indicators

The LED indicators can be viewed from the connector (back) side and the front side of the FibreBridge 2390R/D. (See Exhibit 1.2-1)

LEDs on the connector (back) side are:

A bicolor Ready/Fault LED lights green to indicate ready, lights yellow to show a faulted condition, and is off to indicate not ready.

Embedded in the Ethernet port connector: a lighted green LED shows a valid link; off indicates that no link is present. A separate blinking yellow LED indicates activity.

Fibre Channel port: A lighted green LED indicates link; off means no link. A separate green LED indicates activity if it is lit, no activity if it is off.

SCSI ports: A green LED on each port indicates activity if is lit.

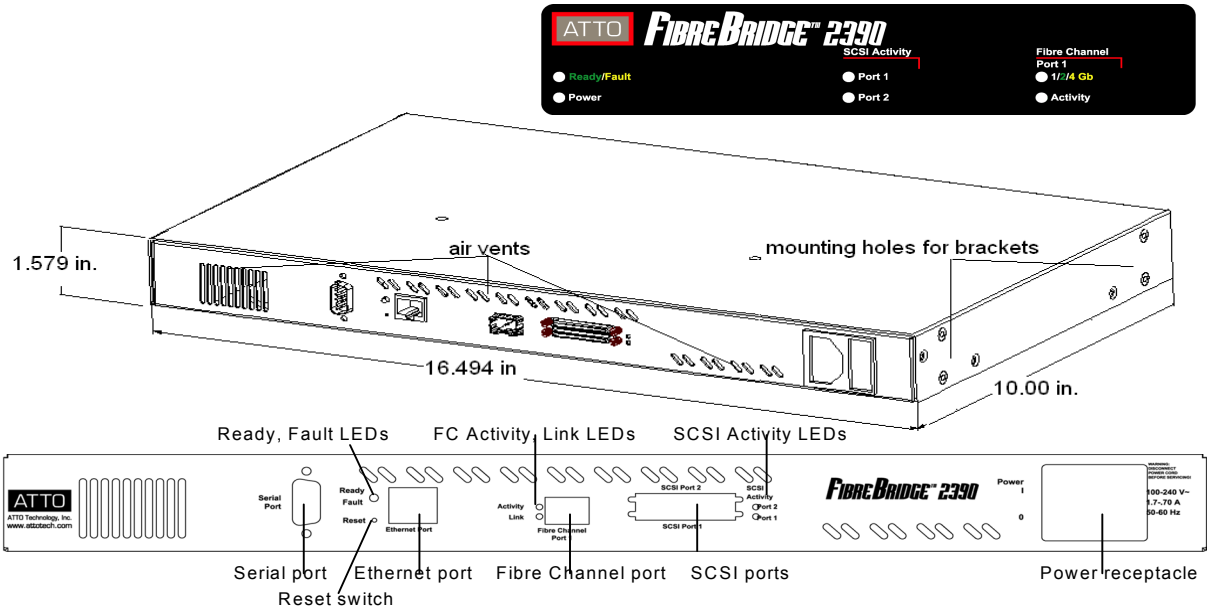
LEDs on the front panel are:

A bicolor Ready/Fault LED is lighted green to indicate ready, lighted yellow to show a faulted condition, and off indicates not ready.

SCSI ports: A green LED on each port indicates activity if is lit.

Fibre Channel port: bicolor LED indicates FC speed. If it is off, speed is 1-Gb; if it is green, 2-Gb, and yellow indicates 4-Gb FC. A separate green LED indicates activity if it is lit, no activity if it is off.

Exhibit 1.2-1 Fibre Bridge 2390R/D dimensions with front panel LEDs and connector side details



1.3 ATTO FibreBridge 2390C

The ATTO FibreBridge 2390C is a 4-Gigabit Fibre Channel to SCSI bridge offering the ability to add 4-Gigabit Fibre Channel connectivity to Ultra320 SCSI devices.

The FibreBridge 2390C is available in an industry-standard 4U cPCI card for easy integration into storage devices. The advanced connectivity options make it suitable to support next-generation storage media such as LTO-3 and SDLT600.

Board dimensions

Width: 6.1939 inches
Length: 6.299 inches
Height of tallest component: .545 inches

Cooling and airflow

Operating Temperature: 0°-40° C external
Humidity: 10-90% non-condensing

Power

The FibreBridge board may be powered from the cPCI backplane connector or a 6-pin connector.
Input voltage: 5.0V
Power draw: 30 Watts
Battery-backed event log SRAM & Real-Time-Clock: A rechargeable Lithium ion battery cell holds the memory in a 512KB SRAM for up to 30 days.

WARNING

Risk of explosion if the battery is removed and/or replaced by an incorrect type. Dispose of used batteries in accordance with your local environmental regulations.

WARNUNG

Explosionsgefahr, wenn die Batterie falsch entfernt und/oder ersetzt wird. Entsorgen Sie benutzte Batterien in Übereinstimmung mit Ihren lokalen Umweltschutzbestimmungen.

If the FibreBridge becomes disconnected from power, recharging begins automatically when power is restored to the system. The battery is fully charged after 24 hours of continuous power application.

Fibre Channel port

The 4-Gb Fibre Channel port can connect the FibreBridge to either a Fabric or Arbitrated Loop using a Small Formfactor Pluggable (SFP) interface.

SCSI ports

The two SCSI ports connect storage devices into the Fibre Channel Storage Area Network (SAN). Each port is totally independent from the other.

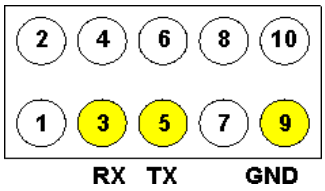
The ports are Ultra320 SCSI busses with VHDCI connectors, downward compatible with all forms of single-ended SCSI and all previous SCSI protocols.

Ethernet port

The 10/100 Base T Ethernet port is accessible from the RJ45 connector to support local and remote diagnostics, monitoring and management.

Serial management header

A serial 10-pin header provides support for an RS232 remote monitoring and management port. The baud rate is programmable and preset at the factory to 115200 bps.



Reset switch

To reset the FibreBridge, briefly insert a tool in the Reset hole in the faceplate.

LED indicators

The on-board LED indicators show through the faceplate and follow left to right.
SCSI ports: a green LED indicates activity if it is lit, no activity if it is off.
Fibre Channel port: A lighted green LED indicates link; off means no link. A separate green LED indicates activity if it is lit, no activity if it is off.
Embedded in the Ethernet port connector: a lighted green LED shows a valid link; off indicates that no link is present. A separate blinking yellow LED indicates activity.
A bicolor Ready/Fault LED lights green to indicate ready, lights yellow to show a faulted condition, and is off to indicate not ready.

Exhibit 1.3-1 The FibreBridge 2390C connectors and LEDs.

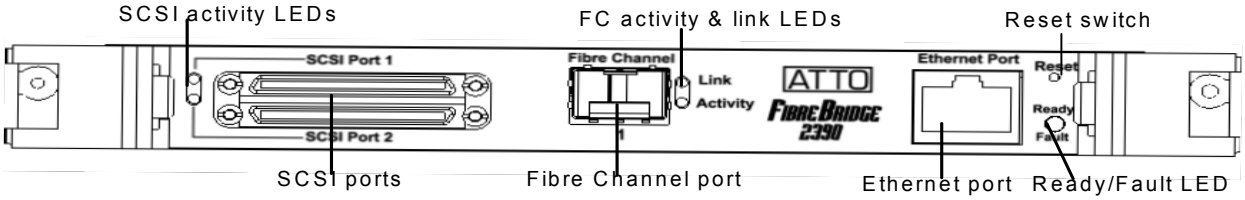
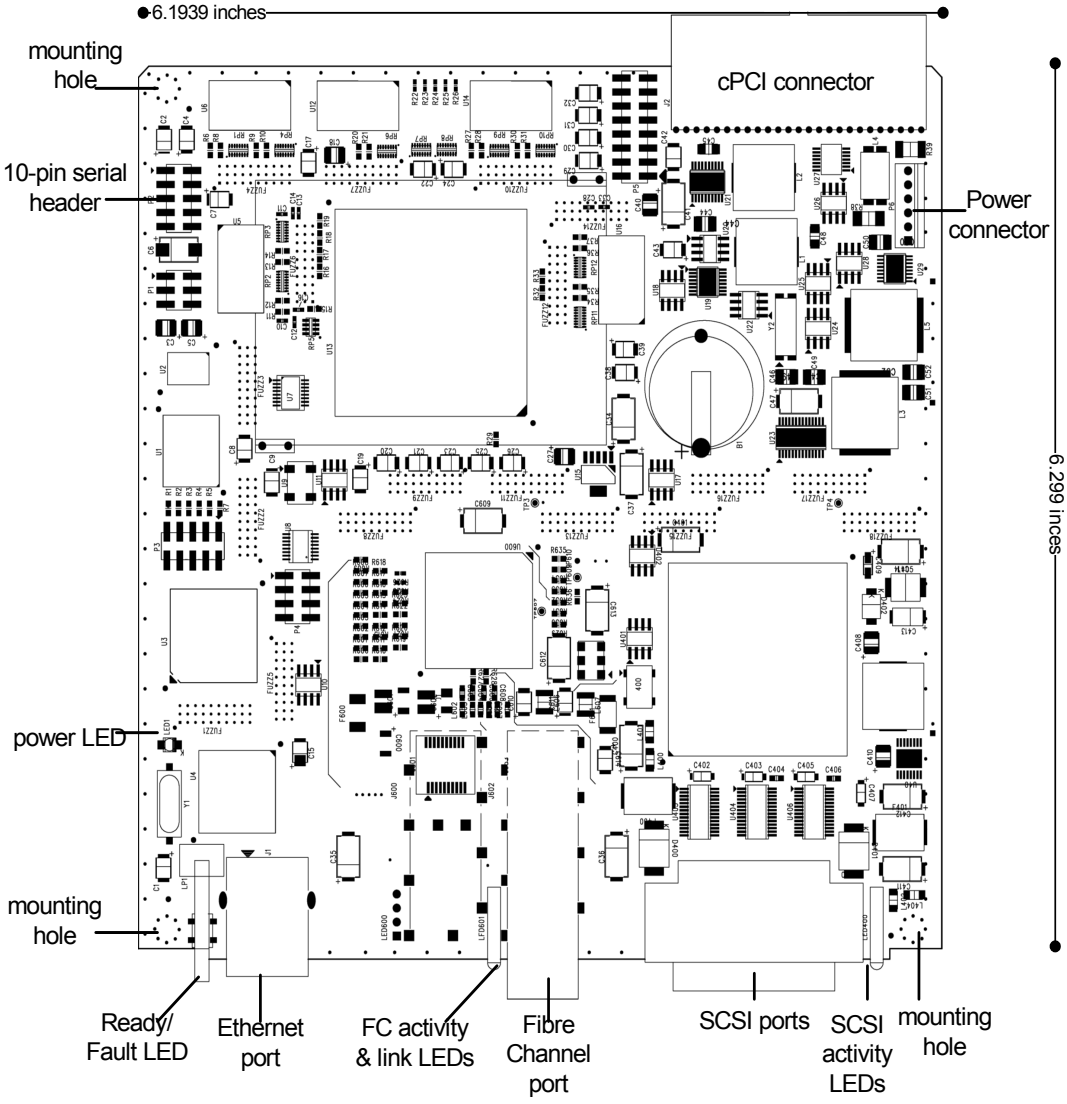


Exhibit 1.3-2 The FibreBridge 2390C board layout.



1.4 ATTO FibreBridge 2400R/D

The ATTO FibreBridge 2400R/D is a high performance bridge adding 4-Gigabit Fibre Channel connectivity to legacy SCSI storage devices.

The FibreBridge 2400R/D is available in an industry-standard 1U form factor for easy integration into racks. It supports next-generation media and, as a result, is equipped to handle the throughputs needed by advanced disk and tape technologies.

Dimensions

Width: 17 inches

Length: 11 inches

Height: 1.7 inches (1U)

Weight: approximately 10 pounds

Cooling and airflow

Operating Temperature: 0-40° 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 power supply circuit is permanently mounted within the enclosure and is not hot swappable. It has one standard IEC320 power receptacle and switch.

The universal power supply provides power for the bridge board and cooling fan.

The power requirements of the ATTO FibreBridge 2400R plus the power draw of the other equipment in the rack must not overload the supply circuit and/or wiring of the rack.

Input voltage: 100-240 VAC; 1.7-.7A; 50-60Hz.

Battery-backed event log SRAM & Real-Time-Clock: A rechargeable Lithium ion battery cell holds the memory in a 512KB SRAM for up to 30 days.

WARNING

Risk of explosion if the battery is removed and/or replaced by an incorrect type.

Dispose of used batteries in accordance with your local environmental regulations.

WARNUNG

Explosionsgefahr, wenn die Batterie falsch entfernt und/oder ersetzt wird. Entsorgen Sie benutzte Batterien in Übereinstimmung mit Ihren lokalen Umweltschutzbestimmungen.

If the FibreBridge becomes disconnected from power, recharging begins automatically when power is restored to the system. The battery is fully charged after 24 hours of continuous power application.

Fibre Channel port

The dual independent 4-Gigabit Fibre Channel ports can connect the FibreBridge to either a Fabric or Arbitrated Loop using a Small Formfactor Pluggable (SFP) interface. The FibreBridge 2400R/D auto negotiates with 1-Gb, 2-Gb and 4-Gb/sec. devices

SCSI ports

The two SCSI ports connect storage devices into the Fibre Channel Storage Area Network (SAN). Each port is totally independent from the other.

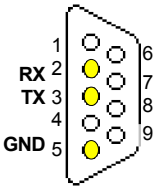
The ports are Ultra320 SCSI busses with VHDCI connector, downward compatible with all forms of single-ended SCSI and all previous SCSI protocols.

Ethernet port

The 10/100 Base T Ethernet port is accessible from the RJ45 connector to support local and remote diagnostics, monitoring and management.

Serial port

The RS-232 serial port provides support for remote monitoring and management using a DB9 connector. The baud rate is programmable and preset at the factory to 115200 bps.



Reset switch

To reset the FibreBridge, briefly insert a tool in the reset hole in the back panel.

LED indicators

The LED indicators can be viewed from the connector side and the front side of the FibreBridge 2400R/D. (See Exhibit 1.4-1)

LEDs on the connector side are:

A bicolor Ready/Fault LED lights green to indicate ready, lights yellow to show a faulted condition, and is off to indicate not ready.

Embedded in the Ethernet port connector: a lighted green LED shows a valid link; off indicates that no link is present. A separate blinking yellow LED indicates activity.

Fibre Channel port: A lighted green LED indicates link; off means no link. A separate green LED indicates activity if it is lit, no activity if it is off.

SCSI ports: A green LED on each port indicates activity if is lit.

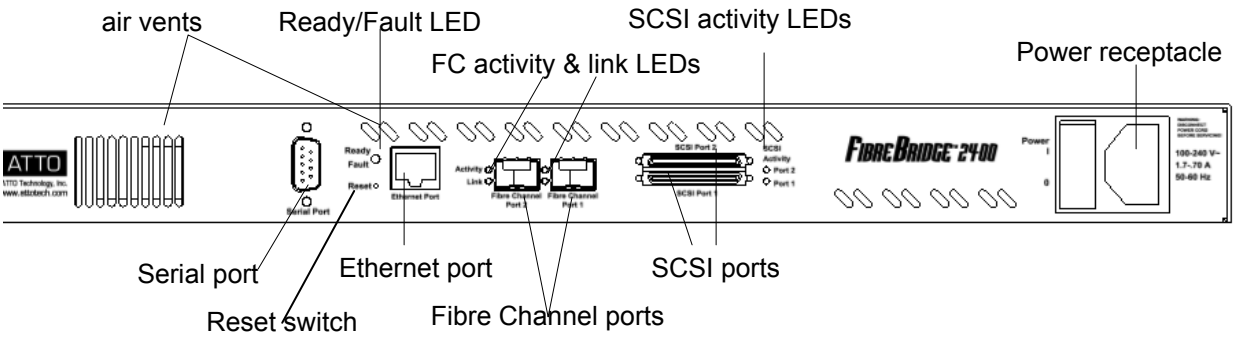
LEDs on the faceplate are:

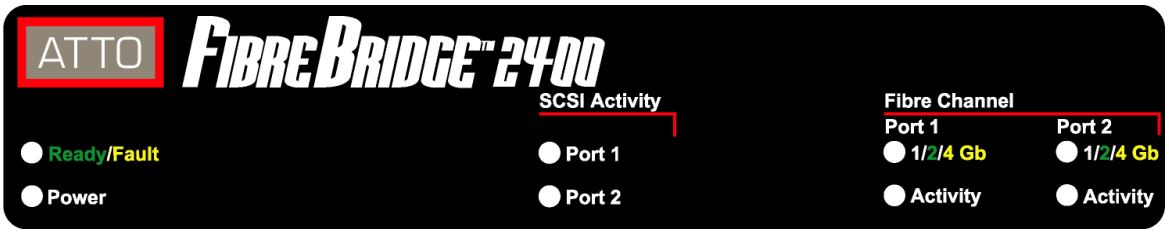
A bicolor Ready/Fault LED is lighted green to indicate ready, lighted yellow to show a faulted condition, and off indicates not ready.

SCSI ports: A green LED on each port indicates activity if is lit.

Fibre Channel port: bicolor LED indicates FC speed. If it is off, speed is 1-Gb; if it is green, 2-Gb, and yellow indicates 4-Gb FC. A separate green LED indicates activity if it is lit, no activity if it is off.

Exhibit 1.4-1 Connectors, LEDs and power receptacle on the connector side and LEDs on the faceplate





1.5 ATTO FibreBridge 2400C

The ATTO FibreBridge 2400C is a high performance bridge adding 4-Gigabit Fibre Channel connectivity to legacy SCSI storage devices.

The FibreBridge 2400C is available in an industry-standard 4U cPCI card for easy integration into storage devices. It supports next-generation media and, as a result, is equipped to handle the throughputs needed by advanced disk and tape technologies.

Board dimensions

Width: 6.1939 inches
Length: 6.299 inches
Height of tallest component: .545 inches

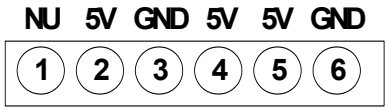
Cooling and airflow

Operating Temperature: 0-40° C
Humidity: 10-90% non-condensing

Power

The FibreBridge board may be powered from the cPCI backplane connector or a 6-pin connector.

6-pin connection pinouts



Input voltage: 5.0V
Power draw: 30 Watts
Battery-backed event log SRAM & Real-Time-Clock: A rechargeable Lithium ion battery cell holds the memory in a 512KB SRAM for up to 30 days.

WARNING

Risk of explosion if the battery is removed and/or replaced by an incorrect type. Dispose of used batteries in accordance with your local environmental regulations.

WARNUNG

Explosionsgefahr, wenn die Batterie falsch entfernt und/oder ersetzt wird. Entsorgen Sie benutzte Batterien in Übereinstimmung mit Ihren lokalen Umweltschutzbestimmungen.

If the FibreBridge becomes disconnected from power, recharging begins automatically when power is restored to the system. The battery is fully charged after 24 hours of continuous power application.

Fibre Channel port

The dual independent 4-Gb Fibre Channel ports can connect the FibreBridge to either a Fabric or Arbitrated Loop using a Small Formfactor Pluggable (SFP) interface. The FibreBridge auto negotiates with 1-Gb, 2-Gb and 4-Gb/sec. devices

SCSI ports

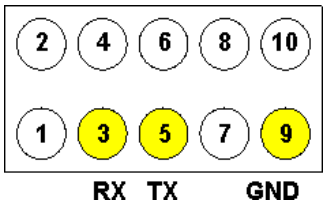
The two SCSI ports connect storage devices into the Fibre Channel Storage Area Network (SAN). Each port is totally independent from the other.
The ports are Ultra320 SCSI busses with VHDCI connectors, downward compatible with all forms of single-ended SCSI and all previous SCSI protocols.

Ethernet port

The 10/100 Base T Ethernet port is accessible from the RJ45 connector to support local and remote diagnostics, monitoring and management.

Serial management header

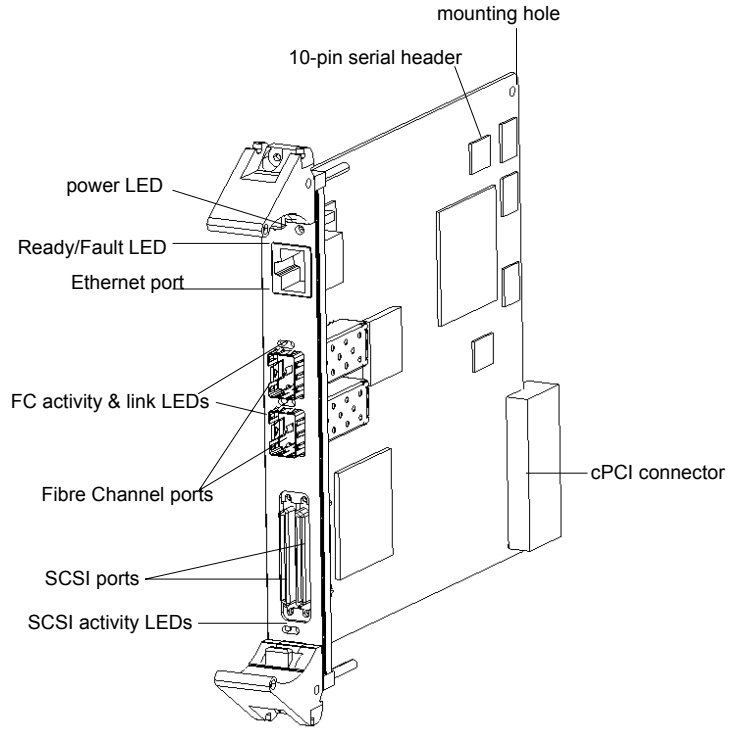
A serial 10-pin header provides support for an RS-232 remote monitoring and management port through a Command Line Interface. The baud rate is programmable and preset at the factory to 115200 bps.

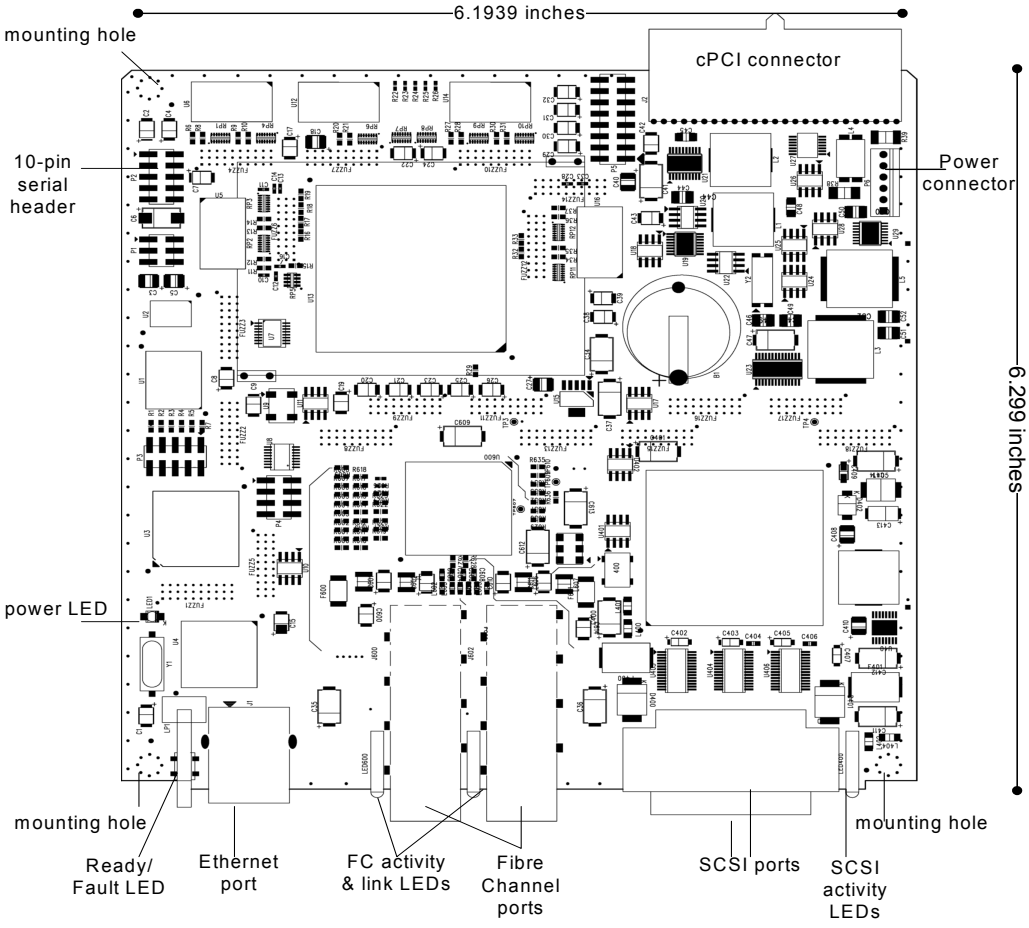


LED indicators

The on-board LED indicators show through the faceplate and follow left to right.
SCSI ports: a green LED indicates activity if it is lit, no activity if it is off.
Fibre Channel port: A lighted green LED indicates link; off means no link. A separate green LED indicates activity if it is lit, no activity if it is off.
Embedded in the Ethernet port connector: a lighted green LED shows a valid link; off indicates that no link is present. A separate blinking yellow LED indicates activity.
A bicolor Ready/Fault LED lights green to indicate ready, lights yellow to show a faulted condition, and is off to indicate not ready.

Exhibit 1.5-1 FibreBridge 2400C bracket detail and board layout





2.0 Installing 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 cord
- “L” brackets for mounting in a 19” rack
- Ethernet cable
- RS 232 cable
- CD which includes the Firmware, Installation and Operation Manual, QuickNAV™ IP discovery program and system drivers

Install the FibreBridge

1 Place the FibreBridge on a stable flat surface, install it into a standard rack or into your device.

If installing the Fibre Bridge 2390R/D or the FibreBridge 2400 R/D into a rack, see Exhibit 2.0-1 and follow these instructions:

a. Attach “L” brackets so that the front side with the LEDs face front and the connector side is at the back.

b. Install the FibreBridge horizontally within the rack so it does not reduce the air flow within the rack.

2 Connect and power up Fibre Channel devices from your SAN to the FibreBridge using SFPs and multimode fiber optic cables for the Fibre Channel ports. Keep cable lengths as short as possible to ensure the highest signal quality and performance. Refer to Cabling on page i of the Appendix.

3 Connect and power up SCSI target devices. Refer to Cabling on page i of the Appendix.

4 Connect the Ethernet port to your network.

5 Connect power according to the FibreBridge model:

- For the FibreBridge 2370E, FibreBridge 2390C and Fibre Bridge 2400C, connect the power connector to the FibreBridge.
- For the FibreBridge 2390C and FibreBridge 2400C, power is already connected if you have installed the unit using the cPCI connection.
- For the FibreBridge 2390R/D and the FibreBridge 2400R/D, connect the AC power cord from the FibreBridge to the proper AC source outlet and turn on the power using the power switch.

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.

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.

6 Wait up to two minutes for the FibreBridge Ready LED to light indicating 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 Work from the computer attached to the FibreBridge Ethernet port on the same domain. From the CD supplied with your FibreBridge, run the QuickNav Utility **QuickNAV-windows.exe** for Windows or **QuickNAV-Mac** for Mac OS X.

2 Locate the FibreBridge with the serial number recorded earlier.

3 Highlight the serial number.

4 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**.

5 Click on **Launch Browser**

Your browser points to the ATTO ExpressNAV splash screen. If you use Internet Explorer as a browser, continue on to Internet Explorer setup below. If not, continue on to Begin initial configuration .

Internet Explorer setup

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

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* Interface options *on page 31.*

Exhibit 2.0-1 Brackets to install the FibreBridge 2390R/D or 2400R/D into a rack.

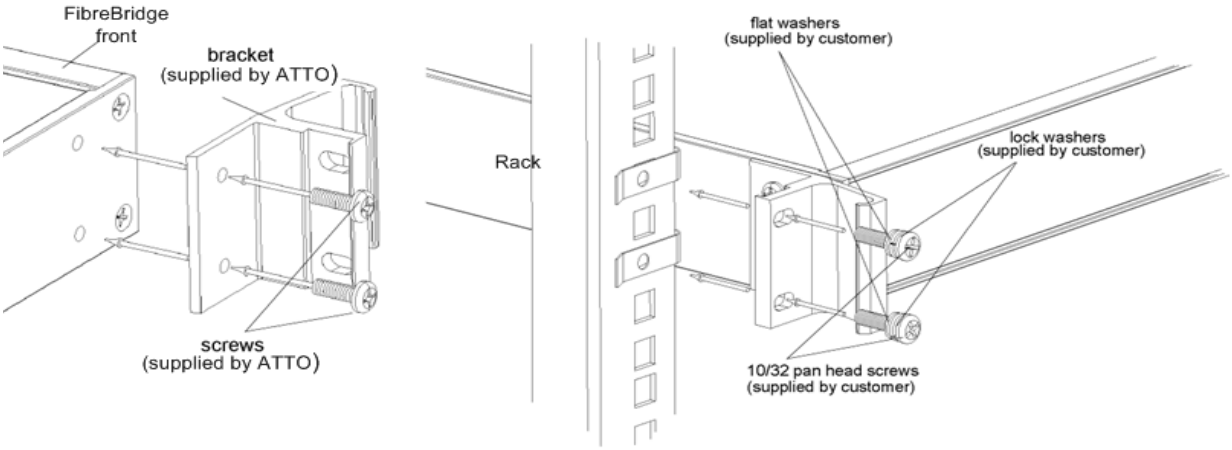
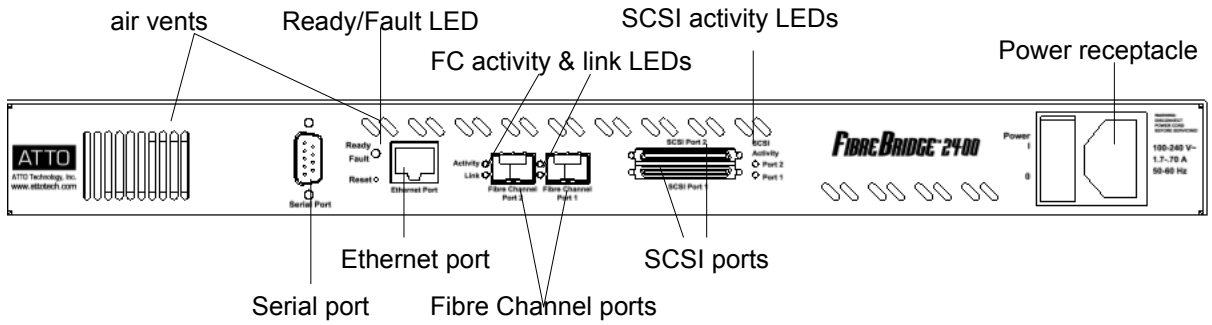


Exhibit 2.0-2 Typical FibreBridge connectors, LEDs and power receptacle



3.0 Configuring the FibreBridge

To configure the ATTO FibreBridge through FibreBridge Services, use ATTO ExpressNAV (a browser-based graphical user interface). Default values are appropriate for most configurations, but may be modified.

ATTO FibreBridge Services includes the means to display and modify various attributes of FibreBridge operation, as well as to update firmware. The best way to access FibreBridge Services is to use ATTO ExpressNAV, a browser-based graphical interface. Refer to ATTO ExpressNAV interface on page 27.

Note

The recommended management tool for the FibreBridge is the ATTO ExpressNAV interface.

Other methods are also available depending on your operating system, what you want to accomplish, and the method you are using to access FibreBridge Services. Refer to Interface options on page 31.

To use ATTO ExpressNAV you must know the IP address for the FibreBridge. Refer to Discover the IP address on page 13.

After getting an IP address and entering ATTO ExpressNAV, you must map devices so that the FibreBridge can access the devices in your network. Refer to Mapping devices on page 17.

Additionally, it is best practice to change the default user name and password. Refer to Optional changes to system configurations on page 19.

3.1 Mapping devices

After getting an IP address and entering ATTO ExpressNAV, you must map devices so that the FibreBridge can access the devices in your network.

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

Fibre Bridge 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.

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		
Byte	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.

SCSI device mapping

SCSI devices connected to the FibreBridge are viewed as Fibre Channel LUNs to the host computer. SCSI devices must be on the same addressing level as the SCSI portion of the FibreBridge. The FibreBridge SCSI ID must be set to a different SCSI ID from the other devices on the same bus.

The ATTO ExpressNAV interface graphically shows you current mapping and the SCSI devices available for mapping. Refer to Use ExpressNAV for mapping devices on page 18.

Note

It is not necessary to set all mapped devices online: SCSI commands sent to offline devices are rejected.

You may map SCSI devices by using the Command Line Interface Route family of commands.The Route and **AutoMap** commands provide the mechanism to map Fibre Channel Port/LUN to SCSI bus/target/LUN. Refer to AutoMap on page vi and Route on page xii in the Appendix for further explanations of the commands.

Use ExpressNAV for mapping devices

Use the ExpressNAV interface to map devices automatically or to customize mapping. You may modify the mapping as needed to make a device inaccessible to a host or to replace a non-functioning mapped unit.

Map devices automatically

1 If not already connected, enter the ExpressNAV interface.
2 From the ExpressNAV main menu, click on the **Mapping** menu item on the left side of the screen.
3 The **Mapping** page appears. Wait for the automatic scan for devices to complete.
4 Click **AutoMap**

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

Map devices manually.

1 From the ExpressNAV main menu, click on the **Mapping** menu item on the left side of the screen.
2 The **Mapping** page appears. Wait for the automatic scan for devices to complete.
3 Select the devices from the box on the right hand side of the screen and drag to the appropriate LUN on the left.
4 Click **Submi**t. All the CLI commands necessary to enable mapping and the command **saveconfiguration norestart** are performed

Multiple Node addressing (FB2400 only)

The FibreBridge has a unique Port name for each Fibre Channel port. By default, each Fibre Channel port also has a separate unique Node name. The host computer perceives the FibreBridge as two separate entities, allowing mapping of a different set of logical units to each FC port.

Use the ExpressNAV interface as described above to map devices to each port.

To change the default setting you must use the Command Line Interface as described in Use the serial port or header on page 31.

1 At the **Ready** prompt, type

```
set FCMultiNode disabled
```

Note

*Changing the state of the **FCMultiNode** command causes all maps to be deleted.*

2 Press **Enter**.
3 Type **saveconfiguration**
4 Press **Enter**
5 Use the ExpressNAV interface to map devices to the FibreBridge, or stay in the CLI mode and use the **Automap** CLI command to automatically map devices or use the **Route** CLI command to define mapping. Refer to AutoMap on page vi and Route on page xii in the Appendix for further explanations of the commands.

3.2 Optional changes to system configurations

Default values are appropriate for most configurations, but may be modified for your needs using ATTO ExpressNAV.

It is best practice to change the default user name and password to a user name and password significant to you.

Change current user name, password

1 If you have not already, open an ExpressNAV session. For instructions, refer to Open an ExpressNAV session on page 27.

2 Click **Bridge**.

The **Bridge Configuration** page is displayed. The user name that you are currently logged in with is displayed in the **Username** text box.

3 Enter the current **Admin password** in the first line of the boxed area.

4 Enter appropriate information into the **Admin Username**, **New Admin Password,** and **Confirm New Admin Password** text boxes.

Note

The user name is case insensitive and password is case sensitive.

5 Click **Submit**.

6 The user name and password for all Telnet, FTP and ATTO ExpressNAV sessions is changed.

Enhance performance

SpeedWrite is a method to improve the performance of WRITE commands to SCSI tape devices attached to the FibreBridge.

Using the CLI command **SpeedWrite**, you can specify the SCSI bus, target and LUN of a mapped device or specify [all] to set or get the state of all currently mapped SCSI devices.

SpeedWriteDefault specifies the state of **SpeedWrite** for any SCSI devices mapped manually or via an **AutoMap** operation. If enabled, any new SCSI device uses **SpeedWrite** performance enhancement by default.

Create a read only password or user name

You may set a read only password or a read only user name. Refer to Command explanations on page vi of the Appendix.

1 If you have not already, open an ExpressNAV session. For instructions, refer to Open an ExpressNAV session on page 27.

2 Click **Bridge**.

The **Bridge Configuration** page is displayed. The user name that you are currently logged in with is displayed in the **Username** text box.

3 Enter the current **Admin password** in the first line of the boxed area.

4 Enter the desired information into the **Read Only Username, New Read Only Password** and **Confirm New Read Only Password** text boxes.

The user name is case insensitive and password is case sensitive.

5 Click **Submit**.

6 The user name or password for all Telnet, FTP and ATTO ExpressNAV sessions is changed.

4.0 Remote monitoring, management

The Ethernet port provides monitoring and management using the ExpressNAV interface.

Remote system monitoring may be set up through Remote Management page of the ExpressNAV interface (see Exhibit 4.0-1) using the Simple Network Management Protocol (SNMP) or E-mail.

Various types of problems may invoke a notification:

- Device errors such as medium error, aborted command and hard error
- Device transitions from online to offline
- Critical and warning temperature conditions
- Critical and warning voltage conditions
- Power cycle/power failure conditions

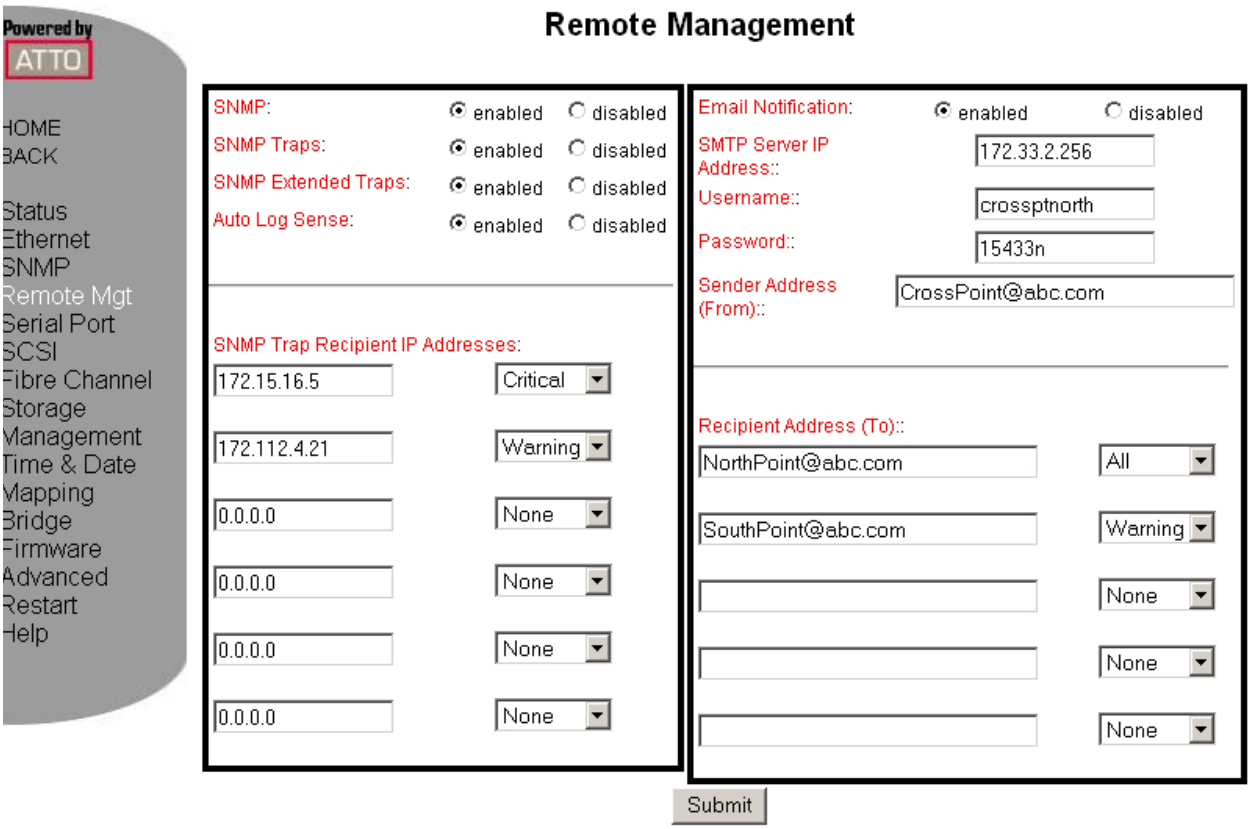
Messages may state that a device is not working, a medium has an error, or a command has been stopped.

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
- **Informational**: informational messages
- **Warning:** events which are either warnings or critical events
- **Critical:** only events which are critical
- **None**: no messages are sent

Exhibit 4.0-1 The Remote Management page in the ExpressNAV interface



SNMP-based monitoring

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

An agent resides in the FibreBridge which takes information from the FibreBridge and translates it into a form compatible with SNMP. If certain conditions arise, the agent sends asynchronous notifications (traps) to a client.

1 If you have not already, open an ExpressNAV session. For instructions, refer to Open an ExpressNAV session on page 27.
2 On the left hand menu, click **Remote Mgt**.
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** and **Auto Log Sense**.
   - **SNMP Traps** and **SNMP Extended Traps** are notifications for SNMP functions such as device transition and device error
   - **Auto Log Sense** controls whether current data from log pages in a SCSI target device is available automatically.
5 Enter the IP addresses of the those who should receive messages (SNMP trap recipients) in the text boxes on the left, and the type of messages you wish each recipient to receive in the drop down boxes on the right.
6 Click **Submit**

Exhibit 4.0-2 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.
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
Unit Attention	Info	No	Yes	A unit attention condition has occurred
Unit Power On	Info	Yes	Yes	The unit has been powered up

Event	Severity Level	Extended Traps disabled	Extended Traps enabled	Explanation
Voltage	Info	Yes	Yes	A monitored voltage level has increased or decreased to within standard operating ranges
Voltage	Critical	Yes	Yes	A monitored nominal voltage level has increased or decreased beyond the percentages listed below: Level VDDA 3.30V VDDB 2.50V VDDC 1.50V VDDD 1.35V Low 5% 4% 5% 4.5% High 8% 5% 5% 5%
Voltage	Warning	Yes	Yes	A monitored nominal voltage level has increased or decreased beyond the percentages listed below: Level VDDA 3.30V VDDB 2.50V VDDC 1.50V VDDD 1.35V Low 3% 3% 3% 3% High 5% 3.5% 3% 3%

E-mail messages provide error notification

E-mail notification allows the FibreBridge to send an E-mail 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 E-mails to up to five E-mail addresses and designate which conditions prompt each E-mail notification.

When an event occurs that warrants E-mail notification, the FibreBridge sends the message; it cannot respond to a rejection by a server for an invalid address. Ensure all E-mail addresses typed in are valid.

Each E-mail is time stamped when it leaves as part of the SMTP header information as shown in Exhibit 4.0-3.

1. If you have not already, open an ExpressNAV session. For instructions, refer to Open an ExpressNAV session on page 27.
2. On the left hand menu, click **Remote Mgt**.
3. The **Remote Management** page appears.
4. Click on the **enabled** radio button next to the **Email Notification** heading.
5. Type in the sender address (E-mails show this name in the **From** field)
6. Type in the SMTP Server IP address
7. Type in the user name and password of your SMTP E-mail account if your server requires it
8. Type in up to five E-mail addresses
9. Choose **All**, **Informational, Warning,** or **Critical** for each E-mail address.
10. When all information is typed in, click **Submit**.

Exhibit 4.0-3 The E-mail 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  ****************
[Listing of the ten latest event log entries]
```

Exhibit 4.0-4 Events triggering an E-mail message, severity level and explanation

Event	Severity Level	Explanation
Aborted Command	Warning	A command has been aborted
Device Down	Warning	A target device has failed or become offline
Hardware Error	Critical	An unrecoverable target device failure
Medium Error	Warning	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.
Temperature	Critical	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	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
Unit Power On	Info	The unit has been powered up
Voltage	Critical	A monitored nominal voltage level has increased or decreased beyond the percentages listed below: Level VDDA (3.30V) VDDB (2.50V) VDDC (1.50V) VDDD(1.35V) Low 5% 4% 5% 4.5% High 8% 5% 5% 5%
Voltage	Warning	A monitored nominal voltage level has increased or decreased beyond the percentages listed below: Level VDDA (3.30V) VDDB (2.50V) VDDC (1.50V) VDDD(1.35V) Low 3% 3% 3% 3% High 5% 3.5% 3% 3%

5.0 Updating 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.*

Note

The recommended management tool for updating firmware for the FibreBridge is the ATTO ExpressNAV interface. Use the Update Firmware page.

The FibreBridge firmware is distributed as a compressed **.zip** file and can be obtained from the ATTO web site, **www.attotech.com**

Preliminary steps

1 The FibreBridge firmware is distributed as a compressed .zip file and can be obtained from the ATTO Technology, Inc. web site at **www.attotech.com** or from the CD which may be included with your Bridge.

2 Uncompress the **.zip** file into an image file (**.ima**). Note the filename.

CAUTION

Before beginning this procedure, ensure that all I/O to the FibreBridge has stopped.

During this procedure, *do not* interrupt the flash process.

***Do not* power down the host or the FibreBridge until the display returns the Ready prompt.**

Interrupting the flash process will make your FibreBridge inoperable and you will have to return it to ATTO Technology for repair.

1 Connect to ExpressNAV and click on the **Firmware** page.

2 Click **Browse** and locate the firmware you unzipped in the preliminary steps.

3 Click **Upload** and wait until a success message is displayed.

CAUTION

Do not interrupt the flash process. Do not power down the host or the FibreBridge until the display returns the *Ready* prompt. Interrupting the flash process will make your FibreBridge inoperable and you will have to return it to ATTO Technology for repair.

4 Click the **Restart** link.

5 Click on **Restart**.

To use FTP over Ethernet to flash new firmware into the FibreBridge

1 Uncompress the.zip file obtained from the ATTO Technology Inc. website (**www.attotech.com**) into an image file (.IMA).

Note

*The **.zip** file can be uncompressed using any utility that supports the **zip** format.*

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

3 Use the **PUT** command to download the firmware. For example

```
PUT c:\bridge_firmware\FB3200100.IMA
```

4 Once the download is complete, cycle power on the FibreBridge to implement the new firmware.

To use the ZModem command over the RS-232 serial link to load new firmware

1 Uncompress the.zip file obtained from the ATTO Technology Inc. website (**www.attotech.com**) into an image file (**.IMA)**.

Note

*The **.zip** file can be uncompressed using any utility that supports the **zip** format.*

2 Load a Terminal Program such as Hyper Terminal.

3 Set the terminal and the FibreBridge for the highest possible baud rate for your terminal.

4 Turn on power to the FibreBridge.

5 Once the Ready prompt appears, type **ZMODEM RECEIVE.** The FibreBridge displays that it is preparing to receive a file from your terminal program.

6 On the terminal program, choose **Transfer Send File**

7 In the **Send File** box, enter the current FibreBridge **.ima** file or click the browse button to find it

8 Click **Send File**

9 The FibreBridge should acknowledge receiving the file and display a message not to interrupt power for 90 seconds.

CAUTION

Do not interrupt the flash process. Do not power down the host or the FibreBridge until the display returns the *Ready* prompt. Interrupting the flash process will make your FibreBridge inoperable and you will have to return it to ATTO Technology for repair.

10 Once the download is complete, cycle power on the FibreBridge to invoke the new firmware.

6.0 ATTO ExpressNAV interface

ExpressNAV 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.

Access ATTO ExpressNAV from any web browser that supports the latest standards for XHTML 1.0 and CSS1. To take full advantage of the ExpressNAV interface you should have Java script enabled through your browser.

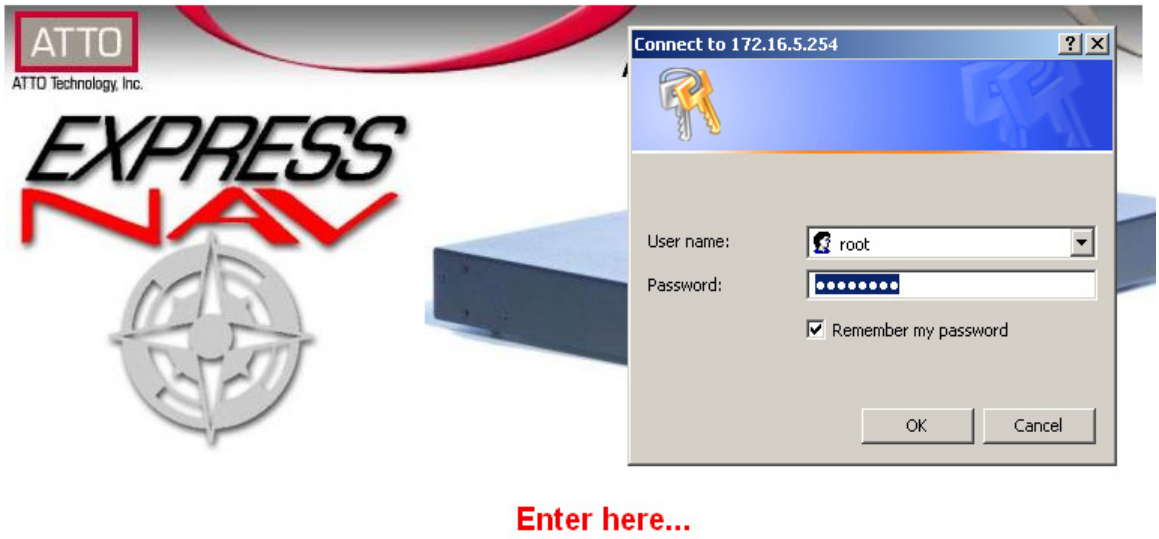
To use the interface you must first be connected to the Ethernet port and have an IP address for the FibreBridge. Refer to Discover the IP address on page 13.

The ExpressNAV interface is the preferred interface for the ATTO FibreBridge.

Open an ExpressNAV session

1. Obtain the IP address of the FibreBridge. Refer to Discover the IP address on page 13.
2. Point your browser at the IP address of the FibreBridge.
3. The ExpressNAV interface home page is displayed. Click on **Enter**.
4. Enter the user name and password. Use the defaults if you have not already changed them as in Change current user name, password on page 19. It is best practice to change the user name and password.
   - The default user name is **root**
   - The default password is **Password**
5. The **Status** page appears. Follow the links on the left hand side of the page to find information or configure your FibreBridge. Each link takes you to a page such as the **Time & Date Configuration** page in Exhibit 6.0-2.

Exhibit 6.0-1 The ExpressNAV opening screen and password dialog box.



ExpressNAV pages

All screens and parameters are not available for all FibreBridge models. Use the following as a guide only.

Command Line Interface commands are the basis for the ExpressNAV pages. Refer to Command explanations on page vi of the Appendix for individual command information.

Status

Displays FibreBridge information

- Vendor ID
- Product ID
- Firmware revision number
- Serial number
- Valid temperature range
- Current temperature
- Ethernet port IP addresses
- Ethernet port status
- World Wide identifiers: node name, port name
- Fibre Channel port status
- SCSI port status

Ethernet port configuration

Configures each port independently for the following parameters: use of DHCP, IP address, IP gateway, IP subnet mask and Ethernet speed.

SNMP

Controls the use of SNMP protocol and displays the trap recipient IP addresses.

For more information on SNMP, refer to Remote monitoring, management on page 21.

Remote management

Controls the use of the SNMP protocol and the ability to E-mail information. For more information, refer to Remote monitoring, management on page 21

Serial port configuration

Configurable options are baud rate and echo.

SCSI configuration

Each SCSI port is configured separately. Displays include a list of attached devices for each bus.

Click on the individual bus for information on each SCSI device such as device type, vendor ID, Product ID and SCSI bus, target and LUN.

Fibre Channel configuration

Configurable options included whether to use hard or soft addressing, how busy status is reported, the data rate, connection mode and hard address value. The node names and port names are displayed.

Storage management

A list of attached SCSI devices and a list of attached Fibre Channel devices are displayed. Click on the individual bus or port for detailed information on each device.

You may also reset SCSI ports on this page or configure the following options: boot scan, boot Fibre delay, SpeedWrite default and virtual drive response.

Time & date configuration

Configures the time zone, real-time clock or access remote time server.

Mapping

You may map drives using the ExpressNAV Mapping page. Refer to Mapping devices on page 17.

Bridge configuration

Configurable options are passwords, user names, minimum and maximum operating temperature, operating temperature warning and identify Bridge. You may also restore defaults.

Firmware

You may update firmware using the ExpressNAV interface. Refer to Updating firmware on page 25.

Advanced CLI configuration

Allows you to input any CLI command available through the FibreBridge.

1 Type in the CLI command in the text box.

2 Click the **Submit** button: this is equivalent to typing in the CLI command into a TCP/IP or serial port CLI session.

A text field beneath the box lists the most recent commands issued to the FibreBridge through this page.

If you enter an incorrect parameter, the CLI help text is displayed, showing the parameters available.

3 If your entry was correct, type **saveconfiguration**

4 Click the **Submit** button. Your changes are implemented.

Restart firmware

Implements a firmware restart of the bridge and makes permanent any changes you have made since the last firmware restart.

CAUTION

Restarting the firmware may take a few minutes.

1 Click the **Restart** button.

A box tells you to wait until the counter gets to 0 and then the browser refreshes.

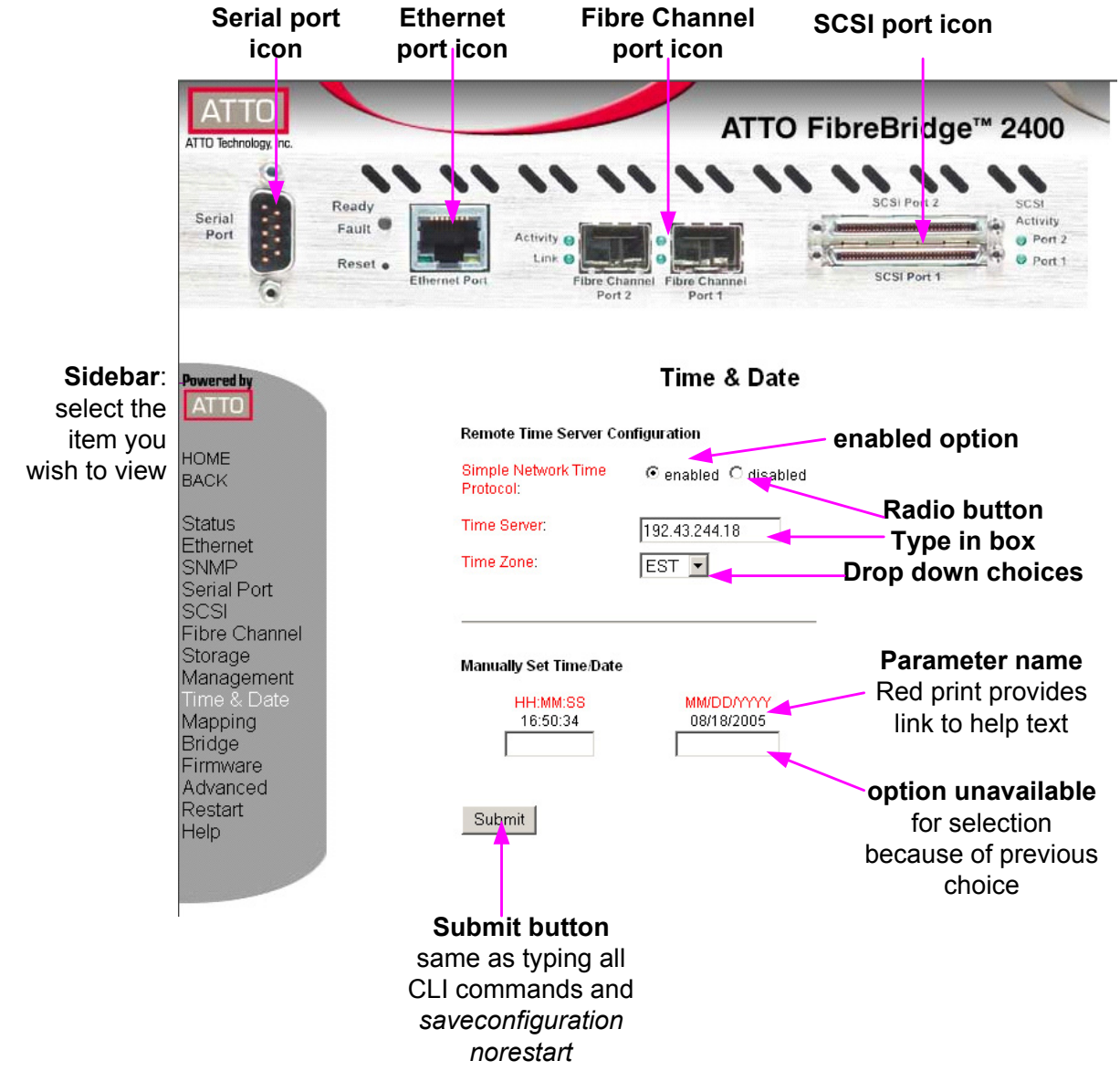
2 If the browser does not refresh after the counter gets to 0, click the link to refresh it manually.

Help

Gives help information about the command line interface commands and troubleshooting tips via links to pages with help text for each category of options and one link to the Troubleshooting Tips and FAQs page on the ATTO website, **www.attotech.com.**

Contact information for ATTO technical support is on the right. **Help** is always available by pressing any word shown in red on the screen.

Exhibit 6.0-2 A typical ExpressNAV page.



7.0 Interface options

Alternative methods to using the ATTO ExpressNAV interface may be used to manage the FibreBridge.

ATTO ExpressNAV is the recommended interface.

Use the serial port or header

1 Connect a cable from FibreBridge RS-232 serial port or header 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: off

   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**. See the example in Exhibit 7.0-1 on page 32.

5 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 then two meters in length.

Use 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 Discover the IP address on page 13.

Exhibit 7.0-1 Start up messages.

```
ATTO FibreBridge 2400
(c) 2002 - 2005 ATTO Technology, Incorporated.

Firmware version 1.00 release date May 24 2005, 13:29:19 Build A75Q

127 Megabytes of RAM Installed.

2 4.25 Gb/s Fibre Channel Interface Port(s).
2 Ultra320 SCSI Interface Port(s).

Bridge World Wide Name = 20 00 00 10 86 20 00 95
Bridge Serial Number   = "FB2400100007"
Bridge Name            = "        "

Internal Temperature = 30 C [0 - 70]

For help, type HELP.
Active Configuration  = ATTO
Aug 19 2005 12:51:27 A79U Initialization Complete
STM41T0 RTC initialized
SCSI Interface 1 PCI Config Test Passed
SCSI Interface 1 Initialization  Passed
SCSI Interface 2 PCI Config Test Passed
SCSI Interface 2 Initialization  Passed
FC Interface 1 PCI Config Test Passed
FC Interface 1 Register Test   Passed
FC Interface 1 Reset Test      Passed
FC Interface 2 PCI Config Test Passed
FC Interface 2 Register Test   Passed
FC Interface 2 Reset Test      Passed

Initializing Port MP1.............
FC Interface 1 Initialization  Passed
FC Interface 2 Initialization  Passed

Power-On Self-Test (POST) Completion Status: GOOD

Ready.
```

Appendix A Cabling

ATTO FibreBridge SCSI ports connect SCSI storage devices into the Fibre Channel Storage Area Network (SAN). Use an Ethernet connection to use the ATTO ExpressNAV interface.

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

SCSI port connections

The FibreBridge supports a wide variety of SCSI storage devices including stand-alone drives, removable drives, JBODs, tape, CD and DVD drives, changers, libraries and magneto optical drives.

Each SCSI port is totally independent from the other SCSI port. Each bus may support up to 15 devices and each SCSI bus auto-negotiates the appropriate sync rates with the connected devices. If slower devices are mixed with faster devices, the bus communicates at the rate of the slowest device.

Connect slower devices to one SCSI port and faster devices to the other port.

Connect a SCSI connector from the SCSI device to a SCSI port on the FibreBridge.

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	Cable limit
Ultra SCSI Single Ended (SE)	1.5 meters
Ultra SCSI High Voltage Differential (HVD)	25 meters
Ultra2 SCSI Low Voltage Differential (LVD)	12 meters
Ultra160 SCSI Low Voltage Differential (LVD)	12 meters
Ultra320 SCSI Low Voltage Differential (LVD)	12 meters

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 length	Cable type	Cable size	FC connector
Up to 175 meters	multi mode fiber optic	62.5 micron	LC
Up to 500 meters	multimode fiber optic	50 micron	LC
Up to 13 meters	unequalized copper		HSSDC-2

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 DB-9 crossover 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 10/100 BaseT Ethernet port provides remote monitoring and management using the ATTO ExpressNAV interface.

When you connect an Ethernet cable between the FibreBridge and a 10/100Base-T connection, you may need a crossover cable connecting directly to a computer. The ATTO FibreBridge auto detects the Ethernet speed by default.

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 <= 31)
fp	Fibre Channel port number (0<= fp <= 2)
sb	SCSI bus number (0<= sb <= 3)
sl	SCSI LUN ID (0 <= sl <= 7)
st	SCSI target ID (0 <= st <= 15)
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 specifics of the command. Commands which have no default values associated with them have a blank entry in that column of the table.

Command	Default	Example
AutoLogSense	disabled	set autologsense enabled
AutoMap		automap
BootFibreDelay	0	set bootfibredelay 15
BootScan	disabled	set bootscan enabled
BootScanPorts (FB2400)	auto	set bootscanports all
BridgeModel		get bridgemodel
BridgeName	“ “	set bridgename Omega6
ClearEventLog		cleareventlog
ClearTraceLog		cleartracelog
Date		set date 03/03/03
DeleteAllMaps		deleteallmaps
DHCPFixedDelay	0	set dhcpfixeddelay 15
DisplayEventLog		displayeventlog
DisplayEventLogFilter	all all all	set displayeventlogfilter all all all
DisplayTraceLog		displaytracelog
DisplayTraceLogFilter	all all all	set displaytracelogfilter all info all
DumpConfiguration		dumpconfiguration
DumpEventLog		dumpeventlog
DumpTraceLog		dumptracelog
EmailFromAddress		get emailfromaddress
EmailNotify	disabled	get emailnotify
EmailNotifyAddress		set emailnotifyaddress 5 bw@abc.com
EmailPassword		set emailpassword
EmailServerAddress		get emailsesrveraddress
EmailUsername		set emailusername beta321

Command	Default	Example
EthernetSpeed	auto	set ethernetspeed 100
EventLog	enabled	set eventlog disabled
EventLogFilter	all all all	set eventlogfilter gen info enabled
Exit		exit
FCConnMode	loop	set fcconnmode all ptp
FCDataRate	auto	get fcdatarate 1
FCHard	disabled	set fchard enabled
FCHardAddress		set fchardaddress 1 122
FCMultiNode (FB2400)	enabled	set fcmultinode disabled
FCPortErrors		get fcporterrors all
FCPortList		fcportlist
FCSCSIBusyStatus	busy	set fcscsibusystatus qfull
FCSpeedLED2G (FB2370)	disabled	set fcspeedled2g enabled
FCWWName		get fcwwname 1
FirmwareRestart		firmwarerestart
Help		help driveinfo
IdentifyBridge	disabled	set identifybridge enabled
Info		info
IPAddress	10.0.0.1	get ipaddress mp1
IPDHCP	enabled	set ipdhcp mp1 disabled
IPGateway	0.0.0.0	set ipgateway mp1 200.10.22.3
IPSubnetMask	255.255.0.0	get ipsubnetmask mp1
IsReserved		isreserved
LogicalUnitAddressing	disabled	set logicalunitaddressing enabled
MaxOpTemp (FB 2390, FB2400}	70	get maxoptemp
MinOpTemp (FB 2390, FB2400}	0	set minoptemp 10
OpTempWarn (FB 2390, FB2400}	5	set optempwarn 15
Password	Password	set password
Performance		get performance 2
Ping		ping 192.42.155.155
ReadOnlyPassword	Password	get readonlypassword
ReadOnlyUsername	user	get readonlyusername
Reserve		reserve
ResetFCPortErrors		resetfcporterrors 1
RestoreConfiguration		restoreconfiguration default
Route		route fc 1 1 bridge
RouteDisplay		routedisplay fc 1 1
SaveConfiguration		saveconfiguration restart
SCSIDomainValidation		scsidomainvalidation

Command	Default	Example
SCSIInitId	0x07	set scsiinitid 2 12
SCSIPortBusSpeed	ultra4	set scsiportbusspeed 2 ultra3
SCSIPortList		scsiportlist
SCSIPortReset		scsiportreset 1
SCSIPortResetOnStartup	enabled	set scsiportresetonstartup 1 disabled
SCSIPortSelTimeout	250	set scsiportseltimeout 128
SCSIPortSyncTransfer	enabled	set scsiportsynctransfer 2 disabled
SCSIPortTermination	enabled	set scsiporttermination 1 disabled
SCSIPortWideTransfer	enabled	set scsiportwidetransfer 2 disabled
SCSITargetLUNs	8	set scsitargetluns 1 64
SCSITargets		scsitargets 1
SerialNumber		get serialnumber
SerialPortBaudRate	115200	set serialportbaudrate 19200
SerialPortEcho	enabled	get seriallportecho
SNMP	enabled	set SNMP disabled
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
SpeedWrite	all disabled	get speedwrite scsi all
SpeedWriteDefault	disabled	set speedwritedefault enabled
TailEventLog		taileventlog
Temperature (FB 2390 & FB 2400)		get temperature
Time	00:00:00	set time 03:32:30
TimeZone	EST	set timezone pst
TraceLog	disabled	set tracelog enabled
TraceLogFilter	all all all	set tracelogfilter all all all
Username	root	set username Barbara
VerboseMode	enabled	set verbosemode disabled
VirtualDriveResponse	disabled	set virtualdriveresponse enabled
Voltage (FB 2390, FB2400}		get voltage
WrapEventLog	enabled	set wrapeventlog disabled
WrapTraceLog	enabled	set wraptracelog disabled
zModem		zmodem receive

Command explanations

AutoLogSense
Controls whether current data from log pages in a SCSI target device is available automatically.

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

AutoMap
Automatically assigns a subset of source protocol LUNs to a subset of target destination devices visible to the FibreBridge. All previous maps are deleted.The unit reports a five-second delay while it scans for devices.

FCMultiNode (FB 2400) enabled: AutoMap <fp>
All other models and FC2400 with FCMultiNode disabled:
AutoMap
Requires a SaveConfiguration command

BootFibreDelay
Regulates the delay (in seconds) which the FibreBridge waits until after startup before enabling Fibre Channel ports.

Default: 0 (no delay)
set BootFibreDelay [0 | 15 | 30 | 45| 60 | 75]
Requires a SaveConfiguration command
get BootFibreDelay

BootScan
Provides dynamic mapping of SCSI devices to the Fibre port/LUN combination via a SCSI bus scan at boot time. All devices discovered during the bus scans are assigned to a Fibre port, Fibre LUN combination until the next reset/power cycle. This dynamic mapping replaces the current, static mapping of the FibreBridge.

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

BootScanPorts (FB 2400)
Regulates the ports to be used for a boot scan.

Default: auto
set BootScanPorts [fp | all | auto]
Requires a SaveConfiguration command
get BootScanPorts

BridgeModel
Reports model and firmware information about the FibreBridge.

get BridgeModel

BridgeName
Specifies the eight-character ASCII name assigned to the FibreBridge used to identify individual units. It is not the World Wide Name. The string is alphanumeric, eight characters long,. Changes take effect immediately.

Default: " "
set BridgeName [name]
get BridgeName

ClearEventLog
Clears the contents of the event log. No new entries are recorded until the operation is completed.

ClearEventLog

ClearTraceLog
Clears the contents of the trace log. No events are recorded until the operation is completed.

ClearTraceLog

Date
Sets/displays the date. The 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 are loaded.

DeleteAllMaps
Requires a SaveConfiguration command

DHCPFixedDelay
Regulates or displays the delay (in seconds) between DHCP client request intervals.

Default: 0
set DHCPFixedDelay [0-255]
Requires a SaveConfiguration Restart command
get DHCPFixedDelay

DisplayEventLog

*Displays the event log. The event log may be filtered using the DisplayEventLogFilter command. The optional parameter **n** is the number of lines to be displayed as a single page with no user interaction. After the command has executed, use +, - or = to scroll through the log. Type **quit** and press **Enter** to exit the command.*

DisplayEventLog <n>

DisplayEventLogFilter

Filters the display of data for specified subsystems and levels if DisplayEventLog is enabled. Valid event log subsystem entries are platform-dependent. For set commands, the final parameter indicates whether or not events from the specified subsystem and level are displayed.

Default: all all all
set DisplayEventLogFilter [subsystem | all] [level | all] [all | none]
get DisplayEventLogFilter [subsystem | all] [level | all]

DisplayTraceLog

*Displays the most recent page of trace log entries. The optional parameter **n** is the number of lines to be displayed as a single page with no user interaction. After the command has executed, use +, - or = to scroll through the log. Type **quit** and press **Enter** to exit the command.*

DisplayTraceLog <n>
Fibre Channel trace log entries depict
FC: an FC trace log
PortID the hexadecimal loop ID of the host device
Bus: specifies the hexadecimal SCSI bus number
Target ID: specifies the hexadecimal SCSI target device number
CDB: each **Cx** character represents the hexadecimal byte-wise contents of the command's SCSI Command Descriptor Block. SCSI CDBs with less than 16 bytes are padded with zeros
SCSI trace log entries depict
SCSI: a SCSI trace log
Bus: hexadecimal SCSI bus number
Target ID: hexadecimal SCSI target device number
LUN: hexadecimal SCSI logical unit number
CDB: each **Cx** character represents the hexadecimal byte-wise contents of the command's SCSI Command Descriptor Block. SCSI CDBs with less than 16 bytes are padded with zeros
Stat: hexadecimal byte-wise SCSI status return code.
Sense Data: each **Sx** character represents the hexadecimal byte-wise contents of the sense data returned by a target device in response to an attempted SCSI command. Maximum 18 bytes of sense data is all zeros for commands that did not cause the target device to return sense data.

DisplayTraceLogFilter

Filters the display of data for specific ports if DisplayTraceLog is enabled.

set DisplayTraceLogFilter [FC | SCSI | all] [fp | sb | all] [none | chkcond | all]
get DisplayTraceLogFilter [FC | SCSI | all] [fp | sb | all]

DumpConfiguration

Displays the FibreBridge configuration.

DumpConfiguration

DumpEventLog

Dumps the entire contents of the event log to the ExpressNAV Advanced page text box, RS-232 or Telnet session.

DumpEventLog

DumpTraceLog

Dumps the entire contents of the trace log to the ExpressNAV Advanced page text box, RS-232 or Telnet session.

DumpTraceLog

EmailFromAddress

Configures the E-mail address that the FibreBridge uses to communicate with the E-mail server. Full E-mail address is a fully qualified Internet E-mail address, not more than 128 characters long.

set EmailFromAddress [full email address]
get EmailFromAddress

EmailNotify

Regulates E-mail notification.

Default: disabled.
set EmailNotify [enabled | disabled]
get EmailNotify

EmailNotifyAddress

*Configures notification addresses. Index is a number 1-5. **Full E-mail address** is a fully qualified Internet E-mail address, not more than 128 characters long. Warning level can be **All, Warning**, **Critica**l or **None**. **None** means no E-mails are sent; **Critical** means only critical severity events sends an E-mail; **Warning** means only warnings and critical events precipitate E-mail, and **All** means all warnings and critical events warrant an E-mail.*

set EmailNotifyAddress [index] [full email address] [warning level]
get EmailNotifyAddress <index | all>

EmailPassword

Configures the password used to authenticate the login to the SMTP E-mail server. The password must not be more than 64 characters. A password is not required if the E-mail server does not require authentication.

set EmailPassword
Requires a SaveConfiguration command

EmailServerAddress

Configures the address of the server the FibreBridge must contact in order to send out E-mail notifications.

set EmailServerAddress [IP address]
Requires a SaveConfiguration command
get EmailServerAddress

EmailUsername

Configures the user name used to authenticate the login to the SMTP E-Mail server. The user name must not be more than 128 characters. A user name is not required if the E-mail server does not require authentication.

set EmailUsername
Requires a SaveConfiguration command
get EmailUsername

EthernetSpeed

Sets/displays the current speed of the Ethernet connection. Choices are 10, 100, and Auto.

Default: auto
set EthernetSpeed [mp1] [10 | 100 | Auto]
Requires a SaveConfiguration Restart command
get EthernetSpeed [mp1]
If auto enabled, value in parentheses indicates current speed

EventLog

Regulates event logging. When enabled, records various system events to the event log.

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

EventLogFilter

Filters data from specific unit subsystems and levels when event logging is enabled. The specific entries supported are platform-dependent. For set commands, the final parameter indicates whether or not events from the specified subsystem and level are displayed.

Default: all all all
set EventLogFilter [subsystem | all] [event level | all] [all | none]
get EventLogFilter [subsystem | all] [level | all]

Exit

Ends the current Ethernet Telnet CLI session; it has no effect if used during a serial CLI session.

Exit

FCConnMode

*Controls/reports the connection the FibreBridge uses when communication across a FC network, either to an arbitrated loop (FC-AL) when you select **loop**, or point-to-point when you choose **ptp**. If you choose **loop-ptp** or **ptp-loop**, the FibreBridge tries to use the first parameter first, but uses the second if it cannot use the first.*

Default: loop
set FCConnMode [fp | all] [loop | ptp | loop-ptp | ptp-loop]
Requires a SaveConfiguration Restart command
get FCConnMode [fp | all]

FCDataRate

Specifies the rate the FibreBridge uses, 1 Gb/sec., 2 Gb/sec. 4 Gb/sec. or auto negotiate.

Default: auto
set FCDataRate [fp | all] [1Gb | 2Gb | 4Gb | auto]
Requires a SaveConfiguration Restart command
get FCDataRate [fp | all]

FCHard

Regulates FC hard address assignment. Under soft addressing, the FibreBridge loop address is assigned during loop initialization. Use FCHardAddress if you enable hard addressing.

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

FCHardAddress

*Specifies the value used as the FC-AL hard address. This value represents the address that is used if hard addressing is enabled (refer to FCHard). The range of valid FC hard address values are 0 through 125. The **all** option is only available with the **get** command.*

Default fp1=3; fp2=4
set FCHard Address [fp | [address]]
Requires a SaveConfiguration Restart command
get FCHardAddress [fp | all]

FCMultiNode (FB 2400)

Determines the reported identity of Fibre Channel ports. When enabled, each port reports a separate unique Node Name and logical units may be mapped to either port. When disabled, each port reports the same Node Name and each logical unit mapping is applied to all ports, providing host-side failover and load balancing capabilities.

Note

Changing this parameter causes all maps to be deleted. Add new maps using the AutoMap or Route commands.

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

FCPortErrors

Displays the number of Fibre Channel errors that have occurred since the last reboot/power-on or Reset FCPortErrors command at the Fibre Channel controller level.

Errors tracked:

Link Failure: Number of times link has failed due to loss of signal, loss of synchronization for greater than 100ms, link fault, LIPs not being recognized for 45 ms or more in the normal-initialize state, or bad N_port state transition

Sync Loss: Number of times signal synchronization has been lost when the controller was not in the offline state

Signal Loss: Number of times the FC controller has detected a loss of signal

Invalid Tx: Number of times FC controller has detected an **Invalid Transmission Word during frame reception**

Invalid CRC: Number of times the FC controller has detected a frame received with a bad CRC

get FCPortErrors [fp | all]

FCPortList

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

FCPortList

FCSCSIBusyStatus

*Specifies the SCSI status value returned when the FibreBridge is unable to accept a SCSI command because of a temporary lack of resources. Choices are **busy** and **queue full**.*

Default: busy
set FCSCSIBusyStatus [busy | qfull]
Requires a SaveConfiguration command
get FCSCSIBusyStatus

FCSpeedLED2G (FB 2370E)

Configures the FC speed LED. When enabled, the LED lights for FC speeds of 2 Gb/sec. or 4 GB/sec. and turns off for an FC speed of 1GB/sec. When disabled, the LED lights for an FC speed of 4 Gb/sec.and turns off for FC speeds of 1 Gb/sec. or 2Gb/sec.

Default: disabled
set FCSpeedLED2G [enabled | disabled]
get FCSpeedLED2G

FCWWName

Reports the Word Wide Name (WWN) of the FC interface. Each FC port has an individual and unique WWN.

get FCWWN [PortNumber]

FirmwareRestart

*Causes the FibreBridge to reboot, then re-initialize its firmware.Use the **forced** option to override any CLI reservation held by other sessions.*

FirmwareRestart <forced>

Help

Displays a list of available commands. If command name is specified, displays detailed command-specific information.

Help [command name]

IdentifyBridge

Enabling this option causes the Ready LED on the FibreBridge to blink until the parameter is disabled.

set IdentifyBridge [enabled | disabled]
get IdentifyBridge

Info

Displays version numbers and other production information for key components within the FibreBridge

Info

IPAddress

*Controls/displays the current FibreBridge IP address.If IPDHCP is enabled, **get** command reports current IP address assigned by the DHCP server.*

Default IP address: 10.0.0.1
set IPAddress [mp1] [xxx.xxx.xxx.xxx]
Requires a SaveConfiguration Restart command
get IPAddress [mp1]

IPDHCP

Selecting DHCP allows the FibreBridge to request an IP address from the network. The network must have at least one DHCP server.

Default: enabled
set IPDHCP [mp1] [enabled | disabled]
Requires a SaveConfiguration Restart command
get IPDHCP [mp1]

IPGateway

*Regulates/displays the current gateway. If IPDHCP is enabled, **get** command reports current IP gateway assigned by a DHCP server.*

Default: 0.0.0.0
set IPGateway [mp1] xxx.xxx.xxx.xxx
Requires a SaveConfiguration Restart command
get IPGateway [mp1]

IPSubnetMask

*Regulates/displays the current subnet mask. If IPDHCP is enabled, **get** command reports current subnet mask assigned by DHCP server.*

Default: 255.255.0.0
set IPSubnetMask xxx.xxx.xxx.xxx
Requires a SaveConfiguration Restart command
get IPSubnetMask

IsReserved

Displays the reservation status of the current FibreBridge.

command: IsReserved

LogicalUnitAddressing

Controls the current device mapping method on the bridge. When disabled, standard peripheral device mapping and formatting is used. Target devices are only made visible to the specific mapped Fibre Channel port. When enabled, static device mapping and formatting is achieved with a discovery bus scan at boot. All target devices are visible to all Fibre Channel ports, with each port sharing a common Fibre Channel Node Name.

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

MaxOpTemp (FB 2390 and FB 2400)

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 55 degrees and 70 degrees

Default: 70
set MaxOpTemp [55-70]
Requires a SaveConfiguration Restart command
get MaxOpTemp

MinOpTemp (FB 2390 and FB 2400)

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

OpTempWarn (FB 2390 and FB 2400)

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: 5
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 the performance data for the FC port you specify. Data includes the average rate (MB per sec.) and number of I/Os measured over the previous sampling period where a sampling period is approximately one second. Successful SCSI Read (08h, 28h) and Write (Oah, 2Ah) commands are considered I/Os.Reported performance may be affected by FC port and SCSI bus availability and saturation, SCSI device speeds and overall system use.

get Performance <fp>

Ping

Sends an ICMP echo request to the specified host.

Ping [mp1] [xxx.xxx.xxx.xxx] <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

Reset FCPortErrors

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]

Route

Assigns a Fibre Channel address to a target destination device. If you try to map a new SCSI BTL to the same FC LUN, the new BTL overwrites the previous map. Using the delete identifier removes the map from its table. If VerboseMode has been enabled, overwriting an existing map requires secondary confirmation.

Route FC [fp] [lun] [SCSI <sb st sl> | Bridge | Delete]

RouteDisplay

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

RouteDisplay FC <fp> <lun>

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>

SCSIDomainValidation

Runs domain validation tests on the SCSI system which may detect problems with SCSI cables, termination or damaged transceivers. Disable VirtualDriveResponse before running the test If tape drives are attached to the FibreBridge, ensure they are loaded with media: media is not overwritten with this test. Reboot the FibreBridge after running this test.

SCSIDomainValidation

SCSIInitID

Specifies or reports the SCSI initiator ID on the specified SCSI port as found in NVRAM. All maps coinciding with the user-specified SCSIInitID are destroyed after the command completes.

Default: 7
set SCSIInitID [sb [0-15]]
get SCSIInitID

SCSIPortBusSpeed

Controls the transfer rate at which the FibreBridge negotiates with its SCSI devices. Valid options are Fast SCSI, Ultra SCSI, Ultra 2 SCSI, Ultra 3 SCSI and Ultra 4 SCSI. Ultra2 and Ultra 3 are valid only if the FibreBridge has LVD-capable SCSI ports.

Default: ultra320
set SCSIPortBusSpeed [sb [fast | ultra | ultra2 | ultra160 | ultra320]
Requires a SaveConfiguration command
get SCSIPortBusSpeed [sb]

SCSIPortList

*Returns a list of available SCSI ports and their current status. Valid status values are **OK** and **Failed***

SCSIPortList

SCSIPortReset

Resets the specified SCSI bus.

SCSIPortReset [sb]

SCSIPortResetOnStartup

Specifies if the SCSI port should be reset on power-up.

Default: enabled
set SCSIPortResetOnStartup [sb [enabled | disabled]]
Requires a SaveConfiguration command
get SCSIPortResetOnStartup [sb]

SCSIPortSelTimeout

Controls the time in milliseconds that the unit waits for a response from a device on the specified SCSI port after a selection request.

CAUTION

If you set this value too low, failures may occur during normal operation.

Default: 250
set SCSIPortSelTimeout [sb] [250 | 128 | 64 | 32 | 16 | 8 | 4 | 2 | 1]
get SCSIPortSelTimeout [sb]

SCSIPortSyncTransfer

Specifies whether synchronous SCSI transfers should be negotiated with devices on the specified SCSI port.

Default: enabled
set SCSIPortSyncTransfer [sb] [enabled | disabled]
Requires a SaveConfiguration command
get SCSIPortSyncTransfer [sb]

SCSIPortTermination

Configures/reports the SCSI internal termination of the SCSI port identified on the FibreBridge.Enabling termination allows the FibreBridge to act as a terminator at the end of a SCSI chain.

Default: enabled
set SCSIPortTermination [sb] [enabled | disabled]
Requires a SaveConfiguration command
get SCSIPortTermination [sb]

SCSIPortWideTransfer

Specifies whether wide SCSI transfers should be negotiated. Enabled allows wide transfer negotiation

Default: enabled
set SCSIPortWideTransfer [sb] [enabled | disabled]
Requires a SaveConfiguration command
get SCSIPortWideTransfer

SCSITargetLUNs

Controls the maximum number of SCSI LUNs per target the FibreBridge queries during a SCSI bus scan.

Default: 8
set SCSITargetLUNs [sb] {8 | 64]
Requires a SaveConfiguration command
get SCSITargetLUNs [sb]

SCSITargets

Lists the physical devices connected and running on the specified SCSI port.

SCSITargets [sb]

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

Configures/reports the baud rate for the FibreBridge RS-232 serial port or header. The number of data bits per character is fixed at 8 with no parity. Choices are 9600, 19200, 38400, 57600 and 115200

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.

SNMP [enabled | disabled]
Default: enabled

SNMPDumpMIB

Displays the contents of the ATTO FibreBridge private SNMP MIB to the current CLI session. Consult your network administrator for further assistance with SNMP.

SNMPDumpMIB

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 timeserver 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

Auxiliary time servers included:
129.6.15.28 (time-a.nist.gov)
132.163.4.101 (time-a.timefreq.blrdoc.gov)
Default: 192.43.244.18 (time.nist.gov)
set SNTPServer xxx.xxx.xxx.xxx
Requires a SaveConfiguration Restart command
get SNTPServer

SpeedWrite

SpeedWrite *is a method to improve the performance of WRITE commands to SCSI tape devices attached to the FibreBridge. You can specify the SCSI bus, target and LUN of a mapped device or specify* ***all*** *to control the state of all currently mapped SCSI devices.*

Default: all disabled
set SpeedWrite SCSI [sb st sl | all] [enabled | disabled]
Requires a SaveConfiguration command
get SpeedWrite SCSI [sb st sl | all]

SpeedWriteDefault

Specifies the state of SpeedWrite for any SCSI devices mapped manually or using an AutoMap command. If enabled, any new SCSI device uses SpeedWrite automatically.

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

TailEventLog

Displays new events to the terminal. Type ***quit*** *and press* ***Enter*** *to exit.*

TailEventLog

Temperature (FB 2390 and FB 2400)

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

TraceLog
When enabled, records various system events to the trace log.

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

TraceLogFilter
Filters the display of data for specific FibreBridge ports when TraceLog is enabled.

Default: all all all
set TraceLogFilter [FC | SCSI | all] [fp | sb | all] [none | ChkCond | all]
get TraceLogFilter [FC | SCSI | all] [fp | sb | all]

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
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
Provides proxy responses to SCSI INQUIRY and TEST UNIT READY commands if a SCSI device is in a timeout or busy. Host systems may then assign devices consistently despite the device's state during execution of SCSI commands.

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

Voltage (FB 2350 and FB 2400)
Displays the voltage levels monitored by the FibreBridge.

VDDA: +3.31 V
VDDB: +2.49 V
VDDC: +1.5V
VDDD: +1.35V
ALL: all monitored voltages
get Voltage [VDDA | VDDB | VDDC | VDDD | all]

WrapEventLog
When enabled, the FibreBridge logs up to 2,048 event entries before wrapping (overwriting the first entries). If disabled, the FibreBridge stops logging event entries when the buffer is full.

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

WrapTraceLog
When enabled, the FibreBridge logs up to 2,048 trace entries before wrapping (overwriting the first entries). If disabled, the FibreBridge stops logging trace entries when the buffer is full.

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

zModem

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

zModem [Send filename | Receive]

CAUTION

After a firmware image is downloaded to the FibreBridge, the image is placed into flash memory. During this time (about 30 seconds), DO NOT remove power to the FibreBridge or the flash may become corrupted.

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. Refer to the ATTO FibreBridge Technical Specification sheet for your particular model for a full list of certifications for that model.

FCC Standards: Radio and Television Interference

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at own expense.

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

- Move the receiving antenna.
- Relocate the bridge with respect to the receiver, or move the bridge away from the receiver.
- Plug the computer into a different outlet so the computer and receiver are on different branch circuits.
- If necessary, consult an ATTO authorized dealer, ATTO Technical Support Staff, or an experienced radio/television technician for additional suggestions.

The booklet *How to Identify and Resolve Radio/TV Interference Problems* prepared by the Federal Communications Commission is a helpful guide. It is available from the US Government printing office, Washington, DC 20402, Stock No. 004-000-00345-4.

Canadian Standards

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

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

European Standards

Declaration of Conformity

This following statement applies to the ATTO FibreBridge.

This device has been tested in the basic operating configuration and found to be compliant with the following European Union standards:

Application of Council Directive: 89/336/EEC

Standard(s) to which conformity is declared: EN55022, EN50082-1, EN60950

In addition the FibreBridge 2370E conforms to EN55024.

This Declaration will only be valid when this product is used in conjunction with other CE approved devices and when the entire system is tested to the applicable CE standards and found to be compliant.

The ATTO FibreBridge 2370E, 2390 and 2400 comply with Directive 2002/95/EC on the Restriction of the Use of Hazardous Substances in Electrical and Electronic Equipment (RoHS).

Certification for the FibreBridge 2400 only

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

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

COMPLIES WITH
UL 60950-1
CSA C22.2
NO. 60950
ITE
LISTING NO: E112422

Appendix D Warranty, contact information

Manufacturer limited warranty

Manufacturer warrants to the original purchaser of this product that it will be free from defects in material and workmanship as described in the ATTO Technology website, **www.attotech.com**. Manufacturer liability shall be limited to replacing or repairing, at its option, any defective product. There will be no charge for parts or labor should Manufacturer determine that this product is defective.

Products which have been subject to abuse, misuse, alteration, neglected, or have been serviced, repaired or installed by unauthorized personnel shall not be covered under this warranty provision. Damage resulting from incorrect connection or an inappropriate application of this product shall not be the responsibility of Manufacturer. Manufacturer's liability is limited to Manufacturer's product(s); damage to other equipment connected to Manufacturer's product(s) will be the customer's responsibility. This warranty is made in lieu of any other warranty, express or implied. Manufacturer disclaims any implied warranties of merchantability or fitness for a particular purpose. Manufacturer's responsibility to repair or replace a defective product is the sole and exclusive remedy provided to the customer for breech of this warranty. Manufacturer will not be liable for any indirect, special, incidental, or consequential damages irrespective of whether Manufacturer has advance notice of the possibility of such damages. No Manufacturer dealer, agent or employee is authorized to make any modification, extension or addition to this warranty.

Contact ATTO Technology, Inc.

Customer service, sales and technical support are available by phone Monday through Friday, 8 a.m. to 5 p.m EST., or by fax and web site 24-hours a day.

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