

# Overland NEO SERIES™

## FCO3 V.I.A. Card

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## About this Guide

This user guide provides installation, configuration, and operational information required for use of the Overland Storage Virtual Interface Architecture (V.I.A.) Fibre Channel Option Generation 3 (FCO3) card in a NEO SERIES™ library. It assumes you are familiar with basic functions of your computer and Fibre Channel infrastructure.

## Obtaining Documentation

FCO3 card product documentation and additional information are available online at <http://support.overlandstorage.com/>.

## Conventions Used

This user guide exercises several typographical conventions to help explain how to use the NEO SERIES FCO3 card.

Convention	Description & Usage
Boldface	Words in <i>boldface</i> indicate items to select such as menu items or command buttons.
Ctrl-Alt-r	This <i>type of format</i> details the keys you press simultaneously. In this example, hold down the <b>Ctrl</b> and <b>Alt</b> keys and press the <b>r</b> key.
NOTE	A <i>Note</i> indicates neutral or positive information that emphasizes or supplements important points of the main text. A note supplies information that may apply only in special cases—for example, memory limitations or details that apply to specific versions of a program.
IMPORTANT	An <i>Important</i> note is a type of note that provides information essential to the completion of a task or that can impact the product and its function. Users can disregard information in a regular note and still complete a task, but they should not disregard an important note.
CAUTION	A <i>Caution</i> contains information that the user needs to know to avoid damaging or permanently deleting data or causing physical damage to the hardware or system.
WARNING	 A <i>Warning</i> contains information essential to people's safety. It advises users that failure to take or avoid a specific action could result in physical harm to the user or hardware.

## Overland Technical Support

For assistance configuring and using your NEO 8000, search for help at:

<http://support.overlandstorage.com/>

Our Overland Storage Technical Support staff is also available to assist you by phone at:

1.877.654.3429 (Toll-free and active only in US and Canada)

1.858.571.5555 x5 (Worldwide)

On normal business days 6 AM through 5 PM (California time) excluding Overland holidays. At all other times we will respond to technical support calls within 4 hours.

Technical support for our European customers is available as well from our United Kingdom office at:

+44 (0) 118-9898050

9:00 am to 5:00 pm (GMT)

Monday through Friday

You can e-mail our technical support staff at [techsupport@overlandstorage.com](mailto:techsupport@overlandstorage.com).

## Electrostatic Discharge Information

A discharge of static electricity can damage static-sensitive devices. Proper packaging and grounding techniques are necessary precautions to prevent damage. To prevent electrostatic damage, observe the following precautions.

- Transport products in static-safe containers such as conductive tubes, bags, or boxes.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free stations.
- Cover the library with approved static-dissipating material.
- Use a wrist strap connected to the work surface and properly-grounded tools and equipment.
- Keep the work area free of non-conductive materials such as foam packing materials.
- Make sure you are always properly grounded when touching a static-sensitive component or assembly.
- Avoid touching pins, leads, or circuitry.



# Table of Contents

## Preface

About this Guide .....	iii
Obtaining Documentation .....	iii
Conventions Used .....	iii
Overland Technical Support .....	iv
Electrostatic Discharge Information .....	iv

## Chapter 1 - Introduction

FCO3 Status LEDs and Connectivity .....	1-1
Benefits and Features .....	1-2
FCO3 Connectivity .....	1-2
Fibre Channel Port .....	1-3
SCSI Ports .....	1-3
Ethernet Port .....	1-3
Device Mapping .....	1-3
Enhanced Performance using SpeedWrite .....	1-4
Specifications .....	1-4
FCO3 Alarm Thresholds and Shutdown .....	1-4

## Chapter 2 - Installation

FCO3 Card Installation .....	2-1
SCSI Port Connections .....	2-3
FCO3 Controls Only the Library .....	2-3
FCO3 Controls Tape Drives and Library .....	2-4
FCO3 Cabling Examples .....	2-5
NEO 2000 .....	2-5
NEO 4000 .....	2-6
NEO 8000 .....	2-8
Connecting the Library to the FC Network .....	2-9
Cable Types and Distances .....	2-9
Management Port Setup .....	2-9
Power On the Library .....	2-9
Configure the PC-to-Ethernet Port Connection .....	2-10
Verify FCO3 Availability on the LAN .....	2-15
Final Installation Check .....	2-16
Fibre Channel Front-End .....	2-16
SCSI Back-End .....	2-17
Ethernet Management Port .....	2-17

## Chapter 3 - GUI Configuration Options

Browser Compatibility .....	3-1
Optimizing Your Browser .....	3-1
Internet Explorer .....	3-1
Netscape/Mozilla/Firefox .....	3-1

Graphical User Interface .....	3-2
Launch Screen .....	3-2
Logon Screen .....	3-2
Primary Configuration and Data Screens .....	3-3
Status Screen .....	3-4
Ethernet Port Configuration Screen .....	3-5
SNMP Screen .....	3-6
Serial Port .....	3-7
SCSI Configuration Screen .....	3-7
Fibre Channel Configuration Screen .....	3-8
Storage Management Screen .....	3-9
Time & Date Screen .....	3-10
Mapping Screen .....	3-11
Bridge Configuration Screen .....	3-12
Firmware Update Screen .....	3-13
Advanced CLI Configuration Screen .....	3-14
Restart Firmware Screen .....	3-15
Help Screen .....	3-16

## Chapter 4 - CLI Command Set

CLI Syntax .....	4-1
Immediate Commands .....	4-1
Modified Commands .....	4-1
General CLI Rules .....	4-1
Command Syntax and Symbology .....	4-2
Definitions and Abbreviations .....	4-2
CLI Responses .....	4-2
CLI Examples .....	4-3
Example 1 .....	4-3
Example 2 .....	4-3
CLI Command Functional Groups .....	4-3
CLI Help Commands .....	4-3
Help .....	4-3
VerboseMode .....	4-4
Status & Information Commands .....	4-4
BridgeModel .....	4-4
Info .....	4-4
SerialNumber .....	4-4
Temperature .....	4-4
Voltage .....	4-5
Ethernet Configuration Commands .....	4-5
DhcpFixedDelay .....	4-5
EthernetSpeed .....	4-5
Exit .....	4-6
IPAddress .....	4-6
IPDHCP .....	4-6
IPGateway .....	4-6
IPSubnetMask .....	4-6
Ping .....	4-7

SNMP Configuration Commands .....	4-7
AutoLogSense .....	4-7
SNMPDumpMIB .....	4-7
SNMPExtendedTraps .....	4-7
SNMPTrapAddress .....	4-7
SNMPTraps .....	4-8
SCSI Configuration Commands .....	4-8
FCSCSIBusyStatus .....	4-8
SCSITargets .....	4-8
SCSIInitID .....	4-9
SCSIPortBusSpeed .....	4-9
SCSIPortList .....	4-9
SCSIPortReset .....	4-9
SCSIPortResetOnStartup .....	4-10
SCSIPortSyncTransfer .....	4-10
SCSIPortTermination .....	4-10
SCSIPortWideTransfer .....	4-10
SCSITargetLUNs .....	4-10
Fibre Channel Configuration Commands .....	4-11
FCConnMode .....	4-11
FCDataRate .....	4-11
FCHard .....	4-11
FCHardAddress .....	4-11
FCPortList .....	4-12
FCPortErrors .....	4-12
Reset FCPortErrors .....	4-12
FCSCSIBusyStatus .....	4-12
FCWWName .....	4-12
Storage Management Commands .....	4-12
BootScan .....	4-13
BootFibreDelay .....	4-13
SpeedWriteDefault .....	4-13
SpeedWrite .....	4-13
VirtualDriveResponse .....	4-14
Time & Date Commands .....	4-14
SNTP .....	4-14
SNTPServer .....	4-14
Date .....	4-14
Time .....	4-15
TimeZone .....	4-15
Mapping Commands .....	4-15
AutoMap .....	4-16
LogicalUnitAddressing .....	4-16
Route .....	4-16
RouteDisplay .....	4-16
Bridge Commands .....	4-17
Username .....	4-17
Password .....	4-17
ReadOnlyUsername .....	4-17

ReadOnlyPassword .....	4-17
MaxOpTemp .....	4-18
MinOpTemp .....	4-18
OpTempWarn .....	4-18
BridgeName .....	4-18
IdentifyBridge .....	4-19
RestoreConfiguration .....	4-19
Maintenance Commands .....	4-19
IsReserved .....	4-19
Reserve .....	4-19
SaveConfiguration .....	4-19
RestoreConfiguration .....	4-20
FirmwareRestart .....	4-20
Diagnostic Commands .....	4-20
EventLog .....	4-20
EventLogFilter .....	4-21
DisplayEventLog .....	4-21
DisplayEventLogFilter .....	4-21
DumpEventLog .....	4-22
TailEventLog .....	4-22
WrapEventLog .....	4-22
ClearEventLog .....	4-23
TraceLog .....	4-23
TraceLogFilter .....	4-23
DisplayTraceLog .....	4-23
DisplayTraceLogFilter .....	4-23
DumpTraceLog .....	4-24
WrapTraceLog .....	4-24
ClearTraceLog .....	4-24
Performance .....	4-24

## **Appendix A - Event Codes & Troubleshooting**

### **Glossary**

### **Index**



# List of Figures

## Chapter 1 - Introduction

Figure 1-1: FCO3 Card Connections and Indicators.....	1-1
---	-----

## Chapter 2 - Installation

Figure 2-1: FCO3 Card Installation Locations .....	2-2
Figure 2-2: Cabling When FCO3 Controls Only the Library.....	2-3
Figure 2-3: Cabling When FCO3 Controls Library & Drives .....	2-4
Figure 2-4: NEO 2000 Cabling Example .....	2-5
Figure 2-5: NEO 4000 LTO-3 Cabling Example.....	2-6
Figure 2-6: NEO 4000 LTO-2/SDLT 600 Cabling Example .....	2-7
Figure 2-7: NEO 8000 Cabling Example .....	2-8
Figure 2-8: QuickNAV Startup Screen .....	2-10
Figure 2-9: QuickNAV Serial Number Screen .....	2-11
Figure 2-10: QuickNAV Network Settings Screen .....	2-11
Figure 2-11: QuickNAV Countdown Screen.....	2-12
Figure 2-12: QuickNAV Finish Screen.....	2-12
Figure 2-13: GUI Welcome Screen.....	2-13
Figure 2-14: Login Screen .....	2-13
Figure 2-15: FCO3 Status Screen.....	2-14
Figure 2-16: FCO3 Ethernet Screen .....	2-14
Figure 2-17: GUI Welcome Screen.....	2-15
Figure 2-18: Login Screen .....	2-16
Figure 2-19: FCO3 Status Screen.....	2-16

## Chapter 3 - GUI Configuration Options

Figure 3-1: FCO3 Launch Screen .....	3-2
Figure 3-2: FCO3 Login Screen.....	3-2
Figure 3-3: Red Text Labels Featuring Pop-up Help.....	3-4
Figure 3-4: GUI Status Screen (Default) .....	3-4
Figure 3-5: GUI Ethernet Screen .....	3-5
Figure 3-6: GUI SNMP Screen.....	3-6
Figure 3-7: GUI SCSI Screen .....	3-7
Figure 3-8: GUI Fibre Channel Screen .....	3-8
Figure 3-9: GUI Storage Management Screen .....	3-9
Figure 3-10: GUI Time & Date Screen .....	3-10
Figure 3-11: GUI (LUN) Mapping Screen .....	3-11
Figure 3-12: GUI Bridge Screen .....	3-12
Figure 3-13: GUI Firmware Screen.....	3-14
Figure 3-14: GUI Advanced Screen.....	3-15
Figure 3-15: GUI Firmware Restart Screen.....	3-16
Figure 3-16: GUI Help Screen.....	3-16

## Chapter 4 - CLI Command Set

## Appendix A - Event Codes & Troubleshooting





# List of Tables

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## Chapter 1 - Introduction

Table 1-1: FCO3 Card Connections and Indicators.....	1-1
Table 1-2: FCO3 Specifications.....	1-4
Table 1-3: FCO3 Thresholds .....	1-5

## Chapter 2 - Installation

Table 2-1: Drive Type Firmware Minimums.....	2-1
Table 2-2: FCO3 Maximum Link Distances.....	2-9

## Chapter 3 - GUI Configuration Options

Table 3-1: FCO3 GUI Screens .....	3-3
-----------------------------------	-----

## Chapter 4 - CLI Command Set

Table 4-1: CLI Symbology .....	4-2
Table 4-2: CLI Command Abbreviations .....	4-2
Table 4-3: FCO3 Nominal Voltage Levels .....	4-5
Table 4-4: SNMPTrapAddress Field Definitions.....	4-8
Table 4-5: Event Log Subsystem and Log_Level Filters.....	4-21
Table 4-6: Event Log Subsystem and Log_Level Filters.....	4-22

## Appendix A - Event Codes & Troubleshooting

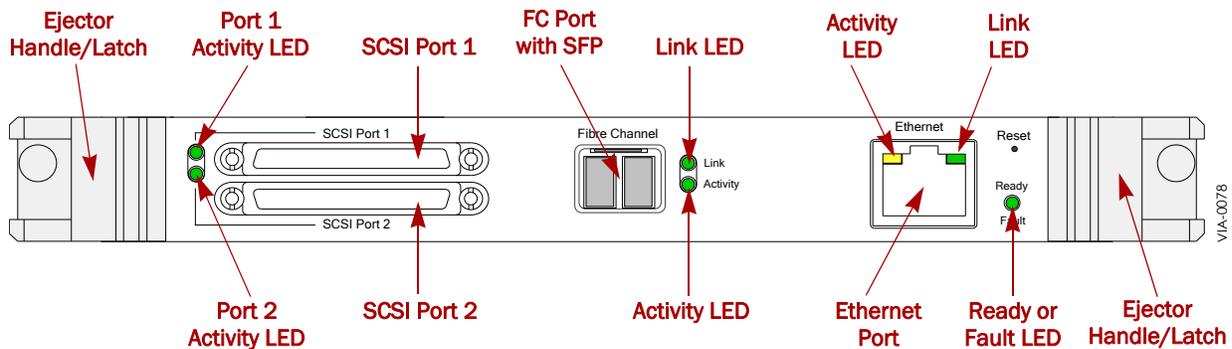
Table A-1: Event Log Messages and Meanings.....	A-1
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The Virtual Interface Architecture (V.I.A.) Fibre Channel Option 3 (FCO3) card is the third generation of Fibre Channel (FC)-to-Small Computer System Interface (SCSI) bridge cards specifically designed for the NEO SERIES tape library family. The FCO3 is rated up to 4 Gbps and is RoHS (Restriction of Hazardous Substances) compliant.

## FCO3 Status LEDs and Connectivity

All normally used status LEDs and connectors for the FCO3 are located on the face plate of the card.



**Figure 1-1: FCO3 Card Connections and Indicators**

The following table provides detailed information about the various connections and indicators visible on the FCO3 face plate.

**Table 1-1: FCO3 Card Connections and Indicators**

Description	Meanings /Function
SCSI Ports 1 & 2 Activity LEDs	Off – No activity through SCSI Port. Flashing Green – Activity through SCSI Port.
SCSI Port 1 & 2 Connectors	Independent Ultra 320 VHDCI-based LVD SCSI ports.
SFP connector	SFP (Small Form-Factor Plug-able) Fibre Channel connector.
Link & Activity LEDs	Link – When illuminated indicates the FCO3 has established a Fibre Channel link. Activity – Flashing green indicates communication is occurring over the Fibre Channel port.

**Table 1-1: FCO3 Card Connections and Indicators**

Description	Meanings /Function
Ethernet Port	RJ-45 connector used to attach the FCO3 card to a LAN for configuration or management purposes. The RJ-45 connector has a built-in Link and Activity LEDs. Green – indicates valid Ethernet link. Off – Indicates no Ethernet link. Blinking Yellow – indicates Ethernet activity.
Ready/Fault LED	No Illumination – either the NEO library is powered off or FCO3 is in midst of POST (Power-On Self-Test). Green – FCO3 card is powered on and ready. Amber – FCO3 card is powered on but in a faulted state. Flashing Green and Amber – The FCO3 is in the Identify Bridge mode of operation.
Reset Portal	Small-aperture hole through which a paper clip is passed to depress the FCO3 card Reset switch.

## Benefits and Features

The FCO3 card offers you these key benefits:

- Lets you seamlessly connect a NEO SERIES library to a Fibre Channel based host or Storage Area Network (SAN).
- Dual Ultra 320 SCSI data ports permit high speed tape drives to run at their maximum burst rate.
- Browser-based GUI allows you to remotely manage the FCO3 card over the LAN.

The FCO3 card provides these major features:

- Auto-supports 1, 2, and 4 Gbps Fibre Channel connectivity.
- SFP-based Fibre Channel connectivity.
- Auto negotiate for Loop, Point-to-Point, and Fabric connectivity.
- Full duplex Fibre Channel data transfers.
- Two independent Ultra 320 SCSI buses.
- Manual and Auto SCSI device mapping.
- Embedded browser-based GUI screens for ease of configuration.
- Command Line Interface (CLI) for scripting.
- RoHS compliant.

## FCO3 Connectivity

The following are brief descriptions of the interfaces provided by the FCO3 card and their uses. See [Chapter 2, “Installation,”](#) for details on connecting to these interfaces.

## Fibre Channel Port

The FCO3 Fibre Channel port provides front-end attachment to Fibre-based hosts or a Storage Area Network. The port uses the industry-standard SFP (Small Form-Factor Pluggable) socket. The FCO3 card ships with a 4 Gbps Short Wave (850nm) Optical SFP. The FCO3 / SFP are capable of running 1, 2, or 4 Gigabits per second matching the speed of the Fibre Channel system.

The FCO3 card is capable of running Class 3 services over all the industry-standard Fibre Channel protocols for storage including Fabric, Point-to-Point, as well as Public and Private Loops in a full duplex manner. The card supports both Hard and Soft addressing on Fibre Channel loops.

The FCO3 Fibre Channel port supports auto negotiation for both connection type (Loop or Point-to-Point) and speed (4, 2, or 1 Gbps) or it can be hard set to a fixed connection type and speed.

## SCSI Ports

The FCO3 provides two independent onboard SCSI buses for back-end library SCSI attachment. Each Ultra 320 (Ultra 4) SCSI bus can support up to 7 devices per bus. In the default mode, both independent SCSI buses are terminated by the FCO3 card simplifying SCSI termination issues. The FCO3 supplies Terminator Power to the SCSI buses.

Both buses negotiate with all attached devices for the actual transfer rate to be used. The card supports Fast (20 MB/s), Ultra (40 MB/s), Ultra 2 (80 MB/s), Ultra 3 (160 MB/s) and Ultra 4 (320 MB/s) rates. The default for both buses is to negotiate the highest possible transfer rate. The maximum transfer rate can be set through the SCSI GUI screen or by a CLI command.

## Ethernet Port

The FCO3 card uses a 10/100Base-T Ethernet port for remote configuration and remote management. The Ethernet port supports the following Ethernet based protocols:

- HTML – remotely configures and manages the FCO3 using an HTML browser.
- Telnet – remotely configures and manages the FCO3 using the CLI commands.
- FTP – remotely updates the FCO3 Firmware using File Transfer Protocol.
- SNTP – permits a remote Time Server to set the FCO3 card's real-time clock.
- SNMP – permits the FCO3 to send SNMP traps to SNMP monitoring stations.
- DHCP – allows a DHCP host to automatically set an IP address for the card.

## Device Mapping

The key function of the FCO3 card is to map back-end SCSI devices (tape drives and media changer robotics) to front-end Fibre Channel LUNs (Logical Unit Numbers). Back-end SCSI devices can be either automatically or manually mapped to front-end Fibre Channel LUNs.

## Enhanced Performance using SpeedWrite

Improved write performance can be realized by permitting the FCO3 card to run with Write Back Cache (WBC) enabled. WBC is enabled through the use of the SpeedWrite function and commands. See [Chapter 3, “Storage Management Screen”](#) for details.

## Specifications

The FCO3 card is a custom CPCI blade-level Fibre Channel to SCSI bridging router.

**Table 1-2: FCO3 Specifications**

Category	Item	Specification
Fibre Channel Connection (Front-end)	Physical Connection	Single SFP-based Fibre Channel port supporting 1, 2, and 4 Gbps transfer rates
	Protocol Support	FC-AL, FC-PLDA, and F-Port Direct Attach
Library Connection (Back-end)	Physical Connection	Dual independent Ultra 320 LVD SCSI buses (SCSI Ports 1 & 2)
Configuration and Management Port	Physical Connection	One RJ-45 based 10/100Base-T Ethernet port.
Visible Indicators	Fibre Channel port	Link and Activity LEDs visible on the face plate
	Management Port	Link and Activity LEDs embedded in the RJ-45 connector visible on the face plate
	SCSI Port 1	Activity LED visible on the face plate
	SCSI Port 2	Activity LED visible on the face plate
	Status Indicator	Bicolored LED visible on the face plate
Power and Cooling	Power	Supplied by the host NEO SERIES library by means of the CPCI connector
	Cooling	Supplied by the host NEO SERIES library
	Operating Humidity	Relative humidity 5% to 95% (non-condensing) and humidity gradient of 10%/hr.

## FCO3 Alarm Thresholds and Shutdown

Alarm conditions make the Status light blink and trigger event messages to be both logged into the Event Log and displayed in the GUI status screen. Additionally, if SNMP is enabled and trap recipients are set, the FCO3 card sends the traps out to the recipient systems.

**Table 1-3: FCO3 Thresholds**

Parameter	Operating Range	Warning	FCO3 Shutdown
Celsius	5° to 55° C	55° C	70° C
Fahrenheit	41° to 131° F	131° F	158° F

---

**IMPORTANT:** If the FCO3 card reaches its shutdown temperature, it logs the event and shuts itself off to prevent permanent damage.

---



**IMPORTANT:** Overland Storage recommends that all V.I.A. cards be installed by an Overland Storage authorized service provider. Improper installation may result in damage which voids existing warranties.

This chapter describes how to install an FCO3 card in a NEO SERIES library. This same information is also available in the *NEO SERIES FCO3 V.I.A. Card Quick Start Guide* that comes with the FCO3 card.

## FCO3 Card Installation

**CAUTION:** If the NEO library firmware is less than version shown in tab, it must be upgraded to support FC drives.

**Table 2-1: Drive Type Firmware Minimums**

Drive Type	NEO 8000 Minimum FW	NEO 2000/4000 Minimum FW
LTO-3	4.03	5.08
LTO-4	5.02	6.02

The FCO3 card can be added to any available V.I.A. bay (excluding the Library Controller card bay) located at the rear of a NEO SERIES library. On the NEO 4000 and NEO 8000, this includes the Expansion or Secondary card cages.

**CAUTION:** The right-most option slot in the primary card cage must ALWAYS contain the Library Controller card. Insertion of an FCO3 card into this slot will damage the PCI backplane and render the library inoperable.

The following items are needed to complete this installation:

- LC-to-LC 50 micrometer ( $\mu\text{m}$ ) or 62.5  $\mu\text{m}$  diameter **Fibre cable** of proper length for host or SAN attachment
- Cat5, Cat5e, or Cat6 **Ethernet cable** of proper length for LAN attachment
- Small **Phillips screwdriver**
- At least two VHDCI-to-VHDCI Ultra 320 **SCSI cables** from Overland (usually shipped with NEO SERIES library and or drives)
- VHDCI Ultra 320 terminators – one per SCSI bus used

### Installation Procedure

1. Carefully unpack and verify that you have **all the parts**:

- FCO3 V.I.A. card
  - 4 Gbps-capable SFP (Small Form-Factor Pluggable) optical transceiver
  - Ethernet crossover cable
  - FCO3 Software And Documentation CD
  - This quick install guide
2. Before installing the card, make a note of the **serial number** (located on a tag in the center of the board) for use during configuration.
  3. Power down the **NEO library**.  
On the NEO 8000, also open the circuit breakers.
  4. Remove all **power cords** from the library.
  5. Using a Phillips screwdriver, remove the **cover plate** of the V.I.A. option bay where the FCO3 card will go (Figure 2-1).

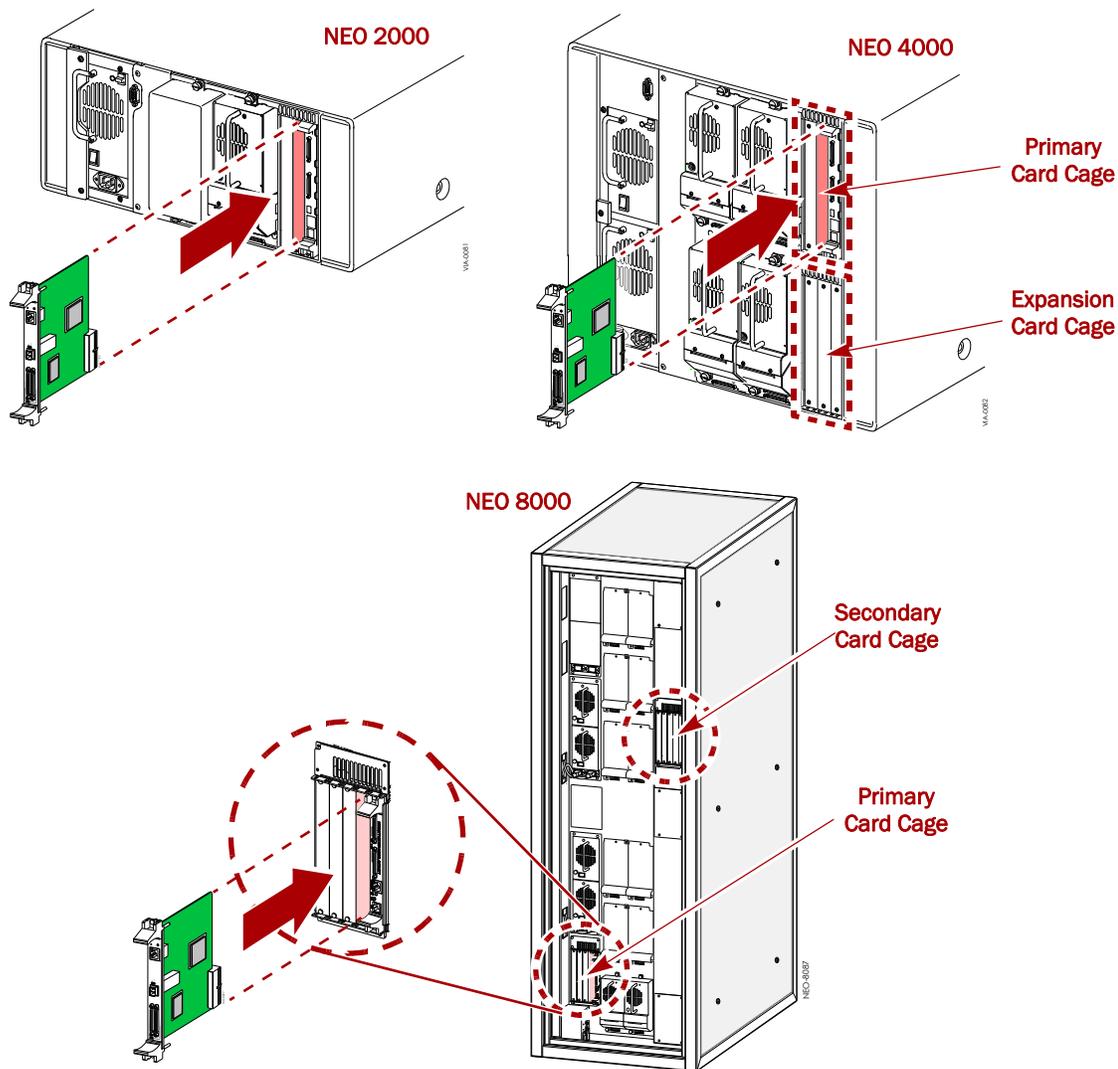


Figure 2-1: FCO3 Card Installation Locations

6. With the SCSI ports positioned at the bottom, carefully slide the **FCO3 card** into the option bay until resistance is felt.
7. Apply just enough force to seat the **card**.
8. Push the **top ejector handle down** and the **bottom ejector handle up** to seat the card and latch it.
9. Plug the supplied **SFP** transceiver into the FCO3 Fibre Channel port.

## SCSI Port Connections

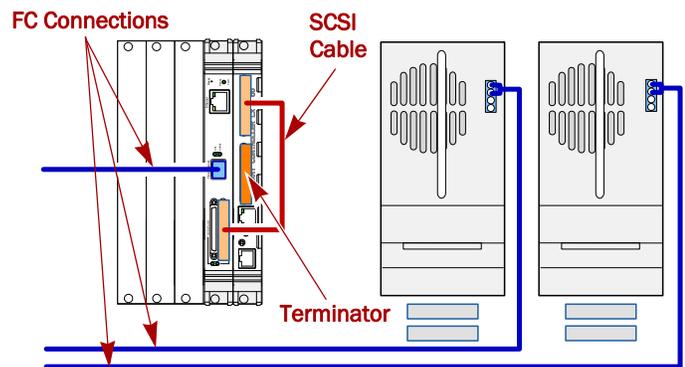
The FCO3 has two independent Ultra 320 SCSI ports that can be used to attach the back-end SCSI devices (tape drives or library via the Library Controller card) to the FCO3 card. These devices then appear as FCO3 Fibre Channel port LUNs when mapped.

---

**CAUTION:** Use only Ultra 320 (SCSI SPI-4) compliant cables and terminators when connecting SCSI devices to the FCO3. Also, use minimal cable lengths when interconnecting NEO library SCSI devices with the FCO3 card.

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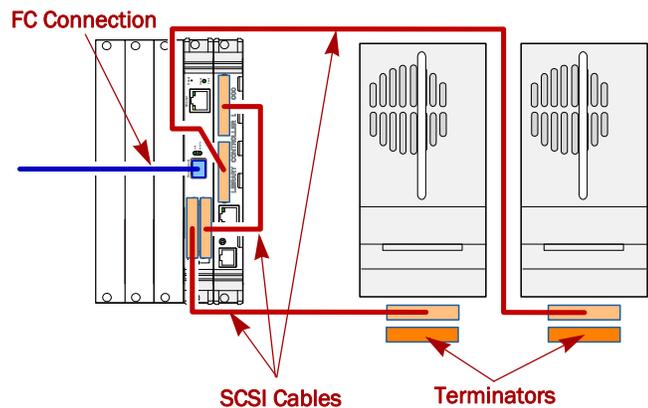
### FCO3 Controls Only the Library



**Figure 2-2: Cabling When FCO3 Controls Only the Library**

1. Verify that the **NEO library** is still powered down.
2. Connect the **SCSI jumper cable** from the NEO Library Controller card SCSI Port 1 to the FCO3 card SCSI Port 2.
3. Attach a **terminator** to the Library Controller card SCSI Port 2.
4. Ensure all SCSI connectors are tight and all SCSI buses are properly terminated.

## FCO3 Controls Tape Drives and Library



**Figure 2-3: Cabling When FCO3 Controls Library & Drives**

**NOTE:** This procedure focuses on using a single FCO3 card. For multiple FCO3 card cabling best practices, see “FCO3 Cabling Examples” on page 2-5.

1. Verify that the **NEO library** is still powered down.
2. Connect the **SCSI jumper cable** from the NEO Library Controller card SCSI Port 1 to the FCO3 card SCSI Port 2.
3. Determine the maximum number of drives for the FCO3 card (based on a 4 Gbps FC connection with compression).
  - LTO-3 or 4– one drive per SCSI port (two per card)
  - LTO-2 – two drives per SCSI port (four per card)
  - SDLT 600– two drives per SCSI port (four per card)
4. Connect the drives to the **Library Controller** card SCSI port 2.
  - a. Connect a **SCSI cable** from the Library Controller card to the first tape drive.
  - b. Do **one** of the following:
    - For the last tape drive in the chain, attach a **terminator** on the drive’s other port.
    - If there are more drives, connect this drive to the next one using a **SCSI cable**.
  - c. If this was **not the last drive**, repeat [Step b](#).
5. Connect the drives to the **FCO3 card** SCSI port 1.
  - a. Connect a **SCSI cable** from the FCO3 card SCSI port 1 to the first tape drive.
  - b. Do **one** of the following:
    - For the last tape drive in the chain, attach a **terminator** on the drive’s other port.
    - If there are more drives, connect this drive to the next one using a **SCSI cable**.
  - c. If this was **not the last drive**, repeat [Step b](#).
6. Ensure all SCSI connectors are tight and all SCSI buses are properly terminated.

## FCO3 Cabling Examples

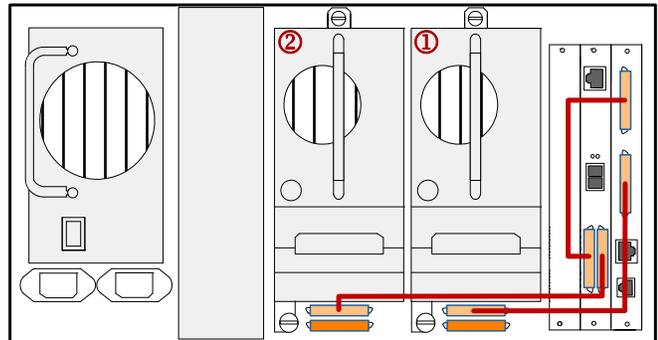
The FCO3 card supports all three product lines in the NEO SERIES family. The following are best practice examples for each member of the NEO SERIES family.

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**CAUTION:** Ensure power is off when you are cabling the back-end SCSI devices to the FCO3 card.

---

### NEO 2000

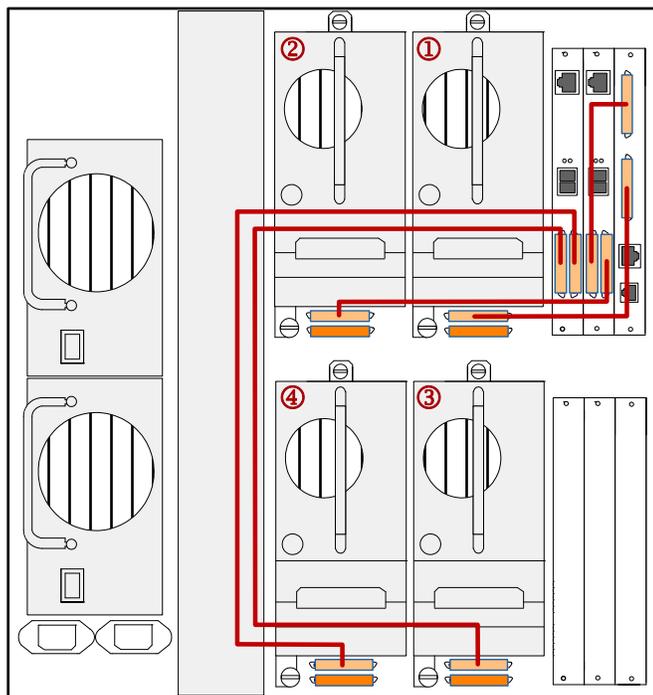


**Figure 2-4: NEO 2000 Cabling Example**

In this example, SCSI Bus 1 (the Library Controller card and tape drive 1) is connected to SCSI Port 1 on the FCO3 card. SCSI Bus 1 is terminated by the FCO3 card and a terminator on the lower connector for tape drive 1.

SCSI Bus 2 (tape drive 2) is connected to SCSI Port 2 of the FCO3 card. SCSI Bus 2 is also terminated by the FCO3 card and a terminator on the lower connector for tape drive 2.

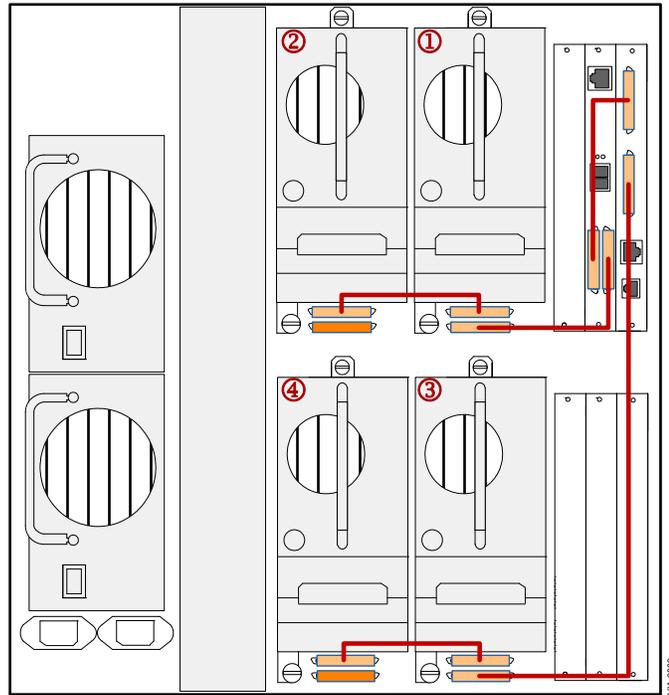
NEO 4000



**Figure 2-5: NEO 4000 LTO-3 Cabling Example**

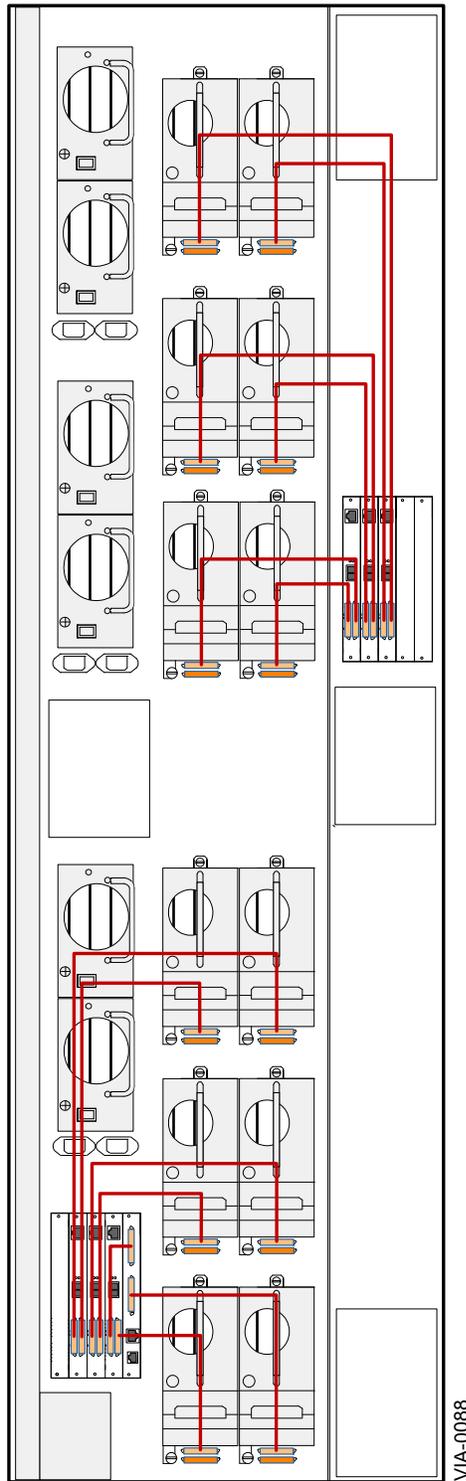
In this example, two FCO3 cards are used to support four LTO-3 drives using compressed (2:1) mode. The first FCO3 card supports the Library Controller and the upper drives 1 and 2. The second FCO3 card supports the lower drives 3 and 4. Termination is supplied to all four SCSI buses by the appropriate FCO3 card and four external terminators applied to the bottom connectors for each drive as shown.

For SDLT 600 or LTO-2 drives using compressed mode, a single FCO3 card could be used with the following SCSI bus configurations to support four drives ([Figure 2-6](#)).



**Figure 2-6: NEO 4000 LTO-2/SDLT 600 Cabling Example**

NEO 8000



**Figure 2-7: NEO 8000 Cabling Example**

In this example two drives per card (one per bus) are connected to each of the six FCO3 cards. Three cards are installed in the primary card cage and three in the secondary.

## Connecting the Library to the FC Network

Connecting the library to the FC network is a simple process of attaching a LC-to-LC Fibre Channel cable from the FCO3 SFP on the FC port to the host or a switch on the SAN.

### Cable Types and Distances

The included SFP uses the LC-type connector for optical cable attachment.

The following table lists the maximum link distances the FCO3 is capable of running with the included SFP using one of two types of multi-mode cables: 50  $\mu\text{m}$  or 62.5  $\mu\text{m}$  diameter.

**Table 2-2: FCO3 Maximum Link Distances**

Frequency	50 $\mu\text{m}$ Cable	62.5 $\mu\text{m}$ Cable
4.25 Gbps	150 meters	70 meters
2.125 Gbps	300 meters	150 meters
1.0625 Gbps	500 meters	300 meters

The FCO3 is capable of greater distances if the factory-supplied SFP is replaced with a 1310 nanometer (nm) long wave laser SFP. The maximum distance the FCO3 will support with the appropriate long wave laser SFP and Single Mode Fibre cable is 2 kilometers.

**NOTE:** The FCO3 can also support 2 Gbps copper SFPs for direct attachment to some NAS boxes.

## Management Port Setup

The following section outlines the procedure for setting up the FCO3 management port using QuickNAV software prior to long term use. The QuickNAV software is contained on the CD that ships with the FCO3 for both Windows and Macintosh and is used to set the IP address for the FCO3 card.

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**IMPORTANT:** QuickNAV can have trouble locating the FCO3 card on large networks. It is highly recommended that you use the following procedure to set up the FCO3 IP address and subnet mask using a dedicated PC and the supplied crossover cable.

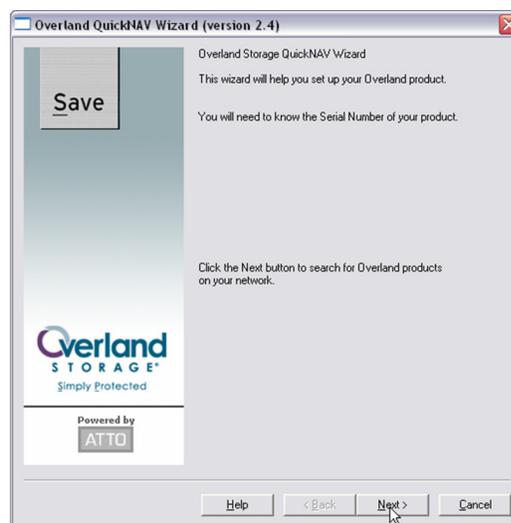
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### Power On the Library

1. Power on the library by toggling each power supply switch (and circuit breakers on the NEO 8000) to **ON**.
2. If needed, press anywhere on the **GUI touch screen** to activate the display and turn the library ON.  
This will also provide power to the FCO3 card.
3. Wait for the library and FCO3 card to complete their **Power On Self Test (POST)**. It should take no more than 3½ minutes to complete.

## Configure the PC-to-Ethernet Port Connection

1. Secure a **static IP address** for the FCO3 card from your LAN administrator.
2. Temporarily set the **IP address of the PC** to one number higher than the IP address that the FCO3 card will use.  
For example, if the FCO3 will use 10.20.30.1 on the management LAN, set the IP address of the PC to 10.20.30.2.
3. Temporarily set the **subnet mask of the PC** to the subnet mask that will be used by the FCO3 card.
4. Install the **QuickNAV software** on the previously configured stand-alone PC.  
Based on the type of stand-alone PC being used, use either the Windows or Macintosh version of the software from the FCO3 *Documentation & Software CD* and follow the on-screen instructions.
5. Using the supplied Ethernet **crossover cable**, connect the FCO3 Ethernet port to a stand-alone PC (desktop or laptop).
6. Launch the **QuickNAV software** to set the IP addresses of the FCO3 card.  
After a few moments, the startup screen appears ([Figure 2-8](#)).



**Figure 2-8: QuickNAV Startup Screen**

- a. Click **Next** to continue to the Serial Number screen ([Figure 2-9](#)).



**Figure 2-9: QuickNAV Serial Number Screen**

- b. At the Serial Number screen, do one of the following:
  - If the correct FCO3 card serial number is highlighted, click **Next** to continue.
  - If the FCO3 card did not appear, click **Rescan**. If the card still does not appear, verify you have a good link indication on the FCO3 and the PC. Also, make sure you are using the supplied crossover cable. Click **Rescan** again. When the card appears, click **Next** to continue.
- c. At the Configure Network Settings screen (Figure 2-10), enter the assigned **IP address** and **subnet mask** for the FCO3 card. Then click **Next**.



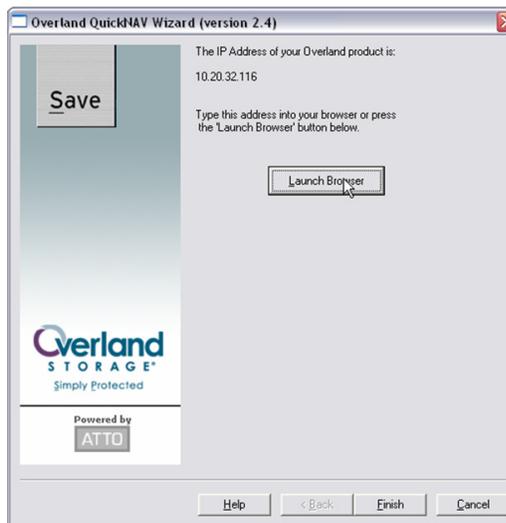
**Figure 2-10: QuickNAV Network Settings Screen**

The FCO3 IP addresses are hard set and the card restarted. Wait about one minute for the process to complete. A countdown screen is displayed during this process (Figure 2-11).



**Figure 2-11: QuickNAV Countdown Screen**

- d. At the Finish screen (Figure 2-12), click Launch Browser to view the FCO3 interactive GUI.



**Figure 2-12: QuickNAV Finish Screen**

**NOTE:** Your browser is automatically pointed at the IP address for the FCO3 card.

7. Using the GUI screen, set a gateway for the FCO3 card management port.
  - e. At the welcome screen (Figure 2-13), click **Enter here** to display login screen.



**Figure 2-13: GUI Welcome Screen**

- f. At the Login screen (Figure 2-14), enter your User Name and Password, and click **OK**.



**Figure 2-14: Login Screen**

The defaults are:

- User Name = **root**
- Password = **Password** (case sensitive)

- g. At the status screen (Figure 2-15), click **Ethernet** (1) in the left-side menu.

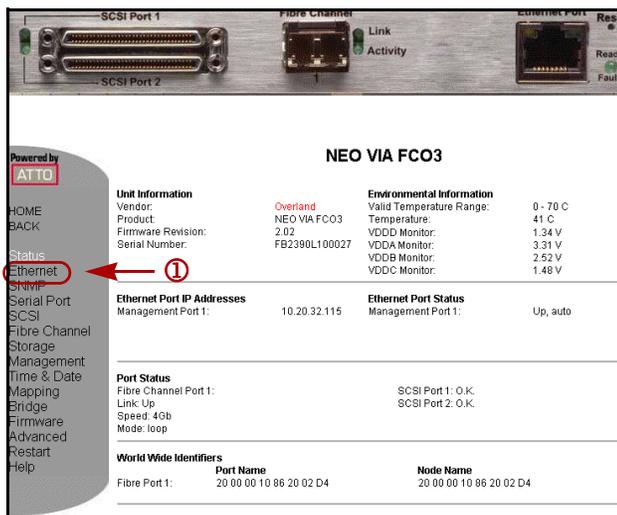


Figure 2-15: FCO3 Status Screen

- h. At the Ethernet screen (Figure 2-16), in the second data field, enter the IP address for the **Gateway** (1), and click **Submit** (2).

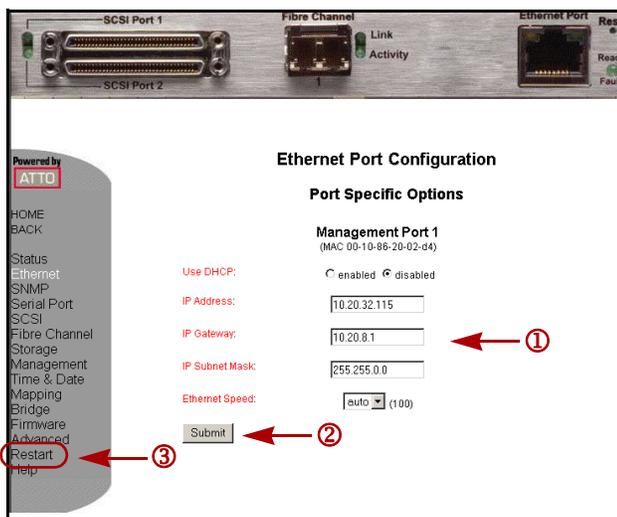


Figure 2-16: FCO3 Ethernet Screen

- i. When the change confirmation message appears at the top of the screen, click **Restart** (3) on the left-side menu.
  - j. At the Restart screen, click the **Restart** button.  
The card restarts (showing an interim countdown screen) and the GUI is refreshed to the status screen.
  - k. Close the **browser** and click **Finish** to close QuickNAV.
8. Remove the crossover cable from the FCO3 card and replace it with **non-crossover cable** to the Management LAN.

See Chapter 3, “GUI Configuration Options,” for more configuration options.

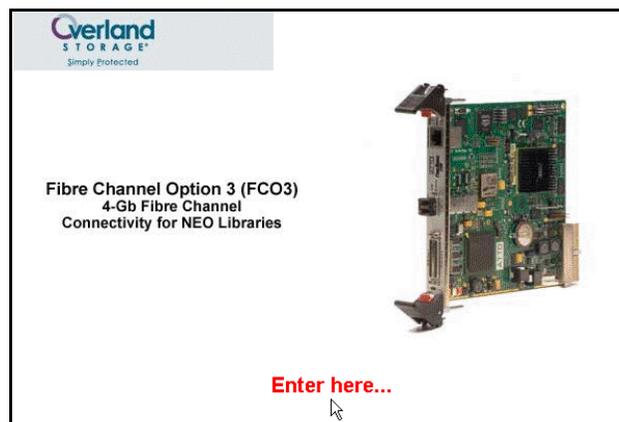
## Verify FCO3 Availability on the LAN

Use this procedure to test for the FCO3 on the LAN:

1. Verify the FCO3 is connected to the LAN with a **non-crossover Ethernet cable**.

**NOTE:** Do not use the crossover Ethernet cable that was shipped with the FCO3. It does not work with a large number of 10/100 hubs and switches. Use a standard Cat5 cable.

2. Check the FCO3 to see that the **Link LED** on the RJ-45 connector is on.
3. Using the management system that will use the FCO3 card (on the same LAN), ping the **IP address** of the FCO3 card from a command window. If the FCO3 responds, proceed to [Step 5](#).
4. If the FCO3 does not respond to the ping:
  - Check and verify there are link lights at both the FCO3 and where the cable attaches to the LAN.
  - Check and ensure the management station you are using has the correct subnet mask (same as what you set the FCO3 subnet mask to), and has a viable IP address for the subnet mask.
  - If necessary, reconnect the standalone PC to the FCO3 card using the crossover cable, access the FCO3 IP address in a browser, and verify through the GUI that Ethernet settings are correct for Management LAN and gateway settings.
  - Resolve any conflicts between the FCO3 setting and your network before continuing. Then, if necessary, restart this procedure at [Step 1](#).
5. At the management station, enter the FCO3 IP address in the browser. In a few seconds you will see the FCO3 welcome screen ([Figure 2-17](#)).



**Figure 2-17: GUI Welcome Screen**

6. Click **Enter here** to display login screen ([Figure 2-18](#)).



Figure 2-18: Login Screen

7. Enter your User Name and Password, and click **OK**.

The defaults are:

- User Name = **root**
- Password = **Password** (case sensitive)

The status screen (Figure 2-19) is displayed.



Figure 2-19: FCO3 Status Screen

**NOTE:** Further information on the GUI interface and completing the FCO3 setup can be found in Chapter 3, “GUI Configuration Options.” Details on the CLI command set that can be used during a Telnet session are listed in Chapter 4, “CLI Command Set.”

## Final Installation Check

With the NEO library powered on, check all three FCO3 low-level connections:

### Fibre Channel Front-End

With the NEO SERIES library and host system (or switch) powered on, verify the Link LED on the FCO3 is illuminated indicating a low level link with the host or switch has been established.

### **SCSI Back-End**

Verify the SCSI terminator LED is green on all external SCSI terminators used to terminate the FCO3 buses.

### **Ethernet Management Port**

Verify you can ping the IP address of the FCO3 card from the management station.



The FCO3 card is configured and managed through its Ethernet interface using either the browser-based GUI or a Telnet session using Command Level Interface (CLI). This chapter describes the configuration of the FCO3 card using the browser-based GUI. See [Chapter 4, “CLI Command Set,”](#) for information about using the CLI interface.

The GUI interface uses traditional GUI actions of point-and-click or drag-and-drop to select choices to configure the FCO3.

## Browser Compatibility

All pages are written in XHTML 1.0 and CSS1 to be compatible with the latest versions of most browsers. The minimum version requirements are:

- Internet Explorer 5.5 or later
- Mozilla Firefox 1.0 or later
- Netscape 6.2 or later
- Mozilla 0.9.2 and later (including variants such as K-Meleon 0.7+, Camino 0.6+, Galeon 1.2+, and Epiphany)
- KHTML based browsers (including Konqueror 2.21+ and Safari)

## Optimizing Your Browser

JavaScript must be enabled to use the browser GUI interface. Use these procedures to verify that it is active:

### Internet Explorer

1. From the menu, choose **Tools > Internet Options**.
2. Click the **Security** tab.
3. Click the **Custom Level** button.
4. Scroll down to **Microsoft VM > Java permissions** and verify that **Disable Java** is NOT selected.
5. Scroll down to **Miscellaneous > Allow META REFRESH** and verify that **Enable** is selected.
6. Click **OK** twice to save and exit.

### Netscape/Mozilla/Firefox

Verify that Java is enabled in the Preferences.

## Graphical User Interface

The GUI system uses a Launch screen, a Login screen, and 15 primary configuration screens to access and make changes to the FCO3 card.

### Launch Screen

The Launch screen (Figure 3-1) is displayed whenever the FCO3 card's IP address is accessed using a browser. By clicking the red "Enter here..." text you will begin to access the FCO3 GUI system.

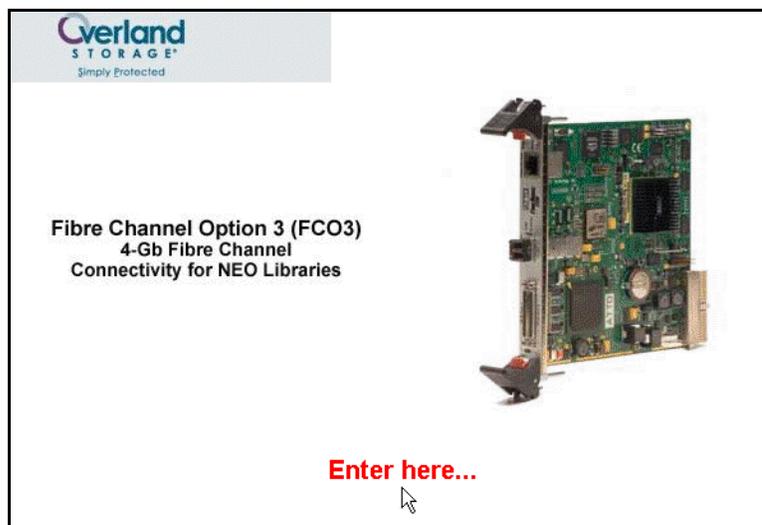


Figure 3-1: FCO3 Launch Screen

### Logon Screen

The Login screen (Figure 3-2) is displayed whenever the FCO3 GUI system is first accessed. To continue, enter a User Name and Password and click OK.

**NOTE:** The default User Name is "root" and the default Password is "Password" (case-sensitive).



Figure 3-2: FCO3 Login Screen

## Primary Configuration and Data Screens

Starting with the status screen, there are 14 screens that provide configuration and information about the FCO3 card.

**Table 3-1: FCO3 GUI Screens**

Screen	Description
Status Screen	Shows operational and environmental status
Ethernet Port Configuration Screen	Configures the FCO3 management port
SNMP Screen	Configures SNMP traps
Serial Port	(Obsolete feature)
SCSI Configuration Screen	Controls the settings of the two FCO3 SCSI ports
Fibre Channel Configuration Screen	Handles the settings for the FCO3 FC port
Storage Management Screen	Manages the storage device handling
Time & Date Screen	Sets the FCO3 onboard clock
Mapping Screen	Maps back-end SCSI devices to front-end FC port LUNs
Bridge Configuration Screen	Modifies operational parameters of the bridge
Firmware Update Screen	Updates the firmware of the FCO3 card
Advanced CLI Configuration Screen	Permits the use of CLI commands through the GUI
Restart Firmware Screen	Forces a firmware restart of the FCO3 card
Help Screen	Provides additional information online

From any screen, you can access a specific screen by clicking the screen name in the gray area on the left side (Figure 3-3). In the white data area, red text labels can be clicked to open a pop-up help window that supplies basic information about the data field.

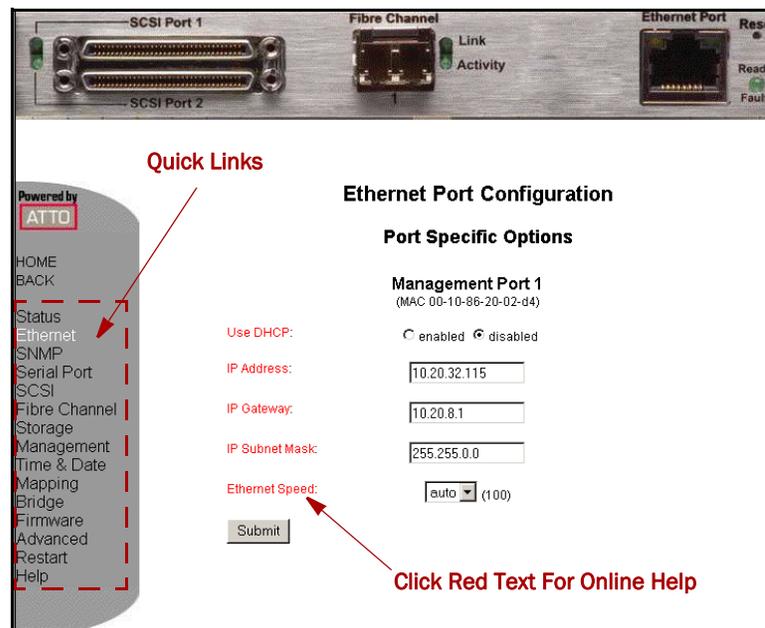


Figure 3-3: Red Text Labels Featuring Pop-up Help

Most screens have fields for configuration data and a Submit button. The Submit button is used to save the information you have changed or entered. Some configuration changes will require the FCO3 card to be rebooted. You will be prompted when you need to restart.

### Status Screen

The default screen displayed by the GUI is the status screen (Figure 3-4). The status screen provides an overview of the environmental and operational status of the FCO3 card.



Figure 3-4: GUI Status Screen (Default)

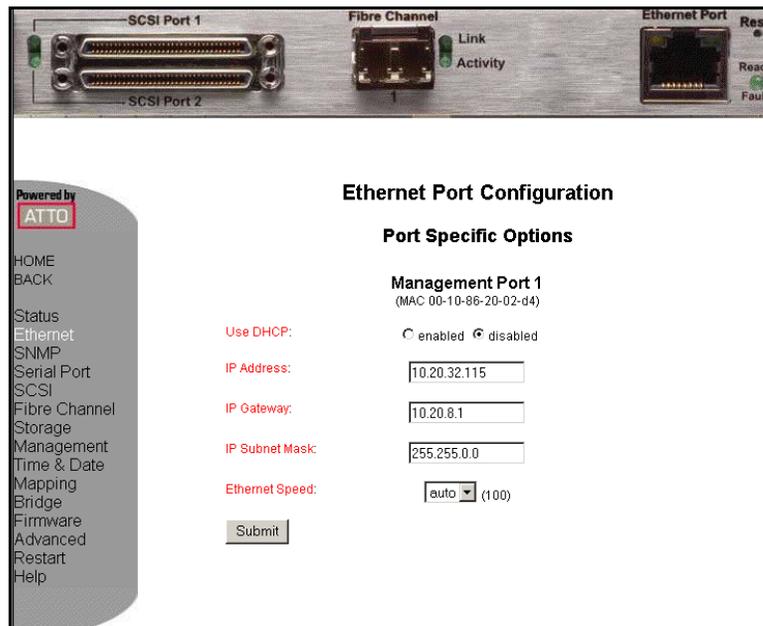
**NOTE:** There are no customer-selectable fields on the status screen. It is an information-only screen.

Key operational parameters shown include:

- Firmware version of FCO3 card
- Serial number of FCO3 card
- Current temperature of FCO3 card
- Current voltages of FCO3 card
- Current IP address of Ethernet management port
- Current status of Fibre Channel port
- Current speed of Fibre Channel port
- Current mode of operation of Fibre Channel port
- Current status of SCSI ports
- Fibre Channel WWN for Node and Port

### Ethernet Port Configuration Screen

This screen provides a method for configuring the five operational parameters of the FCO3 Ethernet management port.



**Figure 3-5: GUI Ethernet Screen**

**NOTE:** No further Ethernet configuration changes should be needed since the required changes were previously done with the QuickNAV software.

- **DHCP** – Dynamic Host Configuration Protocol (DHCP) can either be enabled or disabled by clicking the appropriate radio button. The FCO3 is shipped with DHCP enabled as default to allow the card to be found on a network running DHCP. It is strongly recommend that DHCP is disabled and a static IP address is set for the card once it is found.
- **IP Address** – When DHCP is disabled this field becomes available permitting you to enter a static IP address.
- **IP Gateway** – When DHCP is disabled this field becomes available permitting the static assignment of an IP address for an Ethernet gateway or router.
- **IP Subnet Mask** – When DHCP is disabled this field permits the static assignment of a subnet mask.
- **Ethernet Speed** – This drop-down menu permits the selection of the Ethernet speeds of **10**, **100**, or **auto** (negotiate speed). When the FCO3 is connected to a LAN, the current Ethernet speed is shown in parentheses to the right of the selection menu.

After all the changes are made, click the **Submit** button followed by a **Firmware Restart** for the changes to take effect.

### SNMP Screen

This screen permits configuration of the SNMP (Simple Network Management Protocol) function for systems that support SNMP.

**NOTE:** If you plan to use SNMP you need to set the SNMP recipient addresses to your SNMP management station and appropriate levels for SNMP traps. Recipient systems must be running SNMP management software.

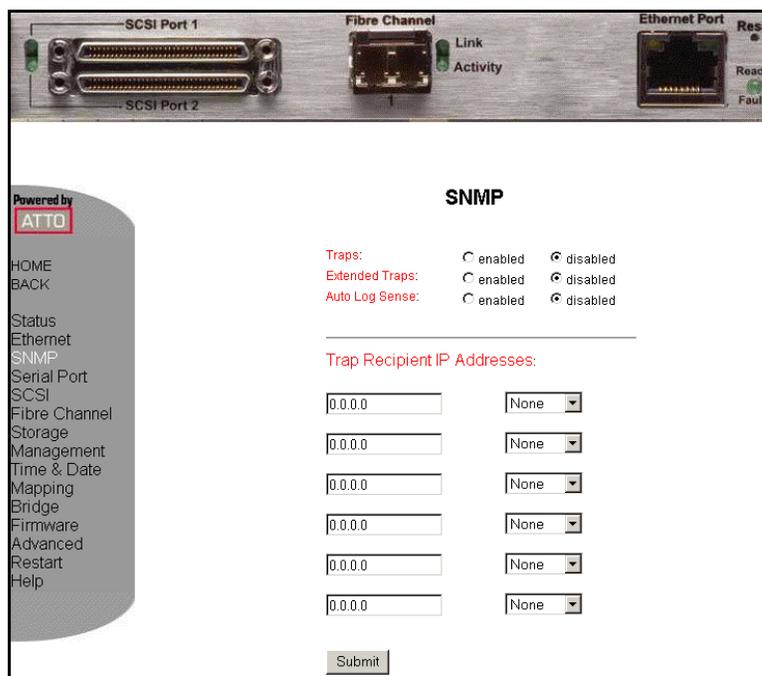


Figure 3-6: GUI SNMP Screen

- **Traps** – Enable SNMP traps by clicking the **enabled** radio button for Traps. This activates basic SNMP functionality to report FCO3-related events and information.

- **Extended Traps** – Enable extended SNMP traps by clicking the **enabled** radio button for Extended Traps. This enables SNMP to report device (tape drive and media changer) related information.

**NOTE:** SNMP traps must also be enabled for extended traps to function.

- **Auto Log Sense** – Enable automatic log sensing by clicking the **enable** radio button for it. This will enable SNMP to report additional information on the devices and media.

**NOTE:** **SNMP Traps** and **Extended Traps** must both be enabled for automatic log sensing to work.

- **Trap Recipient IP Address** – Six fields with associated drop-down menus are provided to set the IP address and level of SNMP trap that is sent to each recipient. Level options are **None**, **Critical**, **Warning**, and **All**.

After all the changes are made, click the **Submit** button to activate the changes.

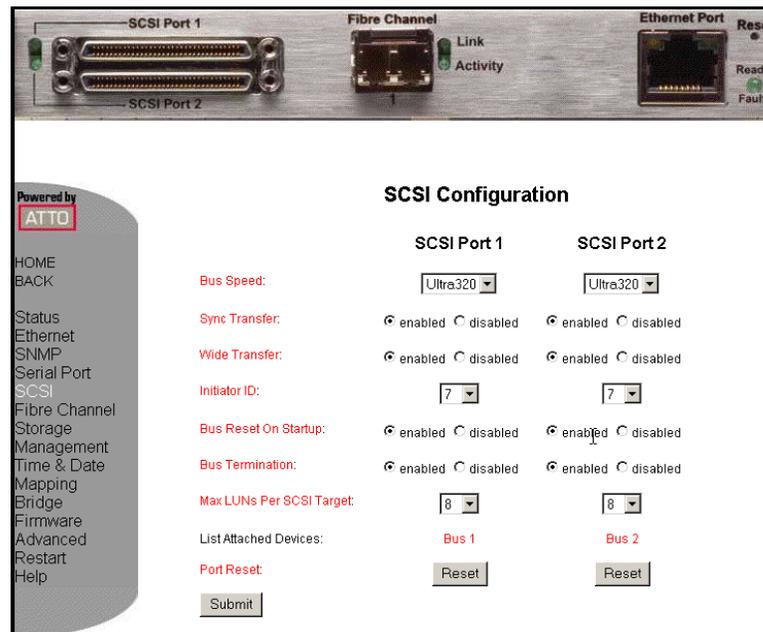
### Serial Port

Not used for the FCO3.

### SCSI Configuration Screen

This screen provides configuration control over the FCO3 card two SCSI buses (SCSI Port 1 and SCSI Port 2).

**NOTE:** For most systems, you do not need to change any values on the SCSI page.



**Figure 3-7: GUI SCSI Screen**

- **Bus Speed** – Drop-down menus are used to set a maximum negotiated transfer speed for each bus. The options are **Ultra 320, Ultra 160, Ultra 2, Ultra**, and **FAST**. The default is *Ultra 320*.
- **Sync Transfer** – Permits Sync transfers to be enabled individually for each bus.
- **Wide Transfer** – Permits Wide transfers to be enabled individually for each bus.
- **Initiator ID** – Drop-down menus permit the setting of the FCO3 ID on each bus.
- **Bus Reset On Startup** – Each bus can be enabled to be reset upon startup.
- **Max LUNs per SCSI Target** – Drop-down menus for each bus set the maximum number of LUNs the FCO3 scans for during a bus scan. The options are **8** or **64**. The default is *8*.
- **List Attached Devices** – Clicking either the red **Bus 1** or **Bus 2** returns a real-time list of devices currently connected to that bus.
- **Port Reset** – Clicking the **Reset** button for either bus will force a real-time SCSI reset of that bus.

After all the changes are made, click the **Submit** button to activate the changes.

### Fibre Channel Configuration Screen

This screen permits the configuration of the FCO3 Fibre Channel port.

**NOTE:** For most 4 Gbps networks, no change to the Fibre Channel port setting is required. In 1 and 2 Gbps environments, it is highly recommended that you set the FCO3 clock rate for the hardware (HBA or switch) with which the FCO3 communicates.

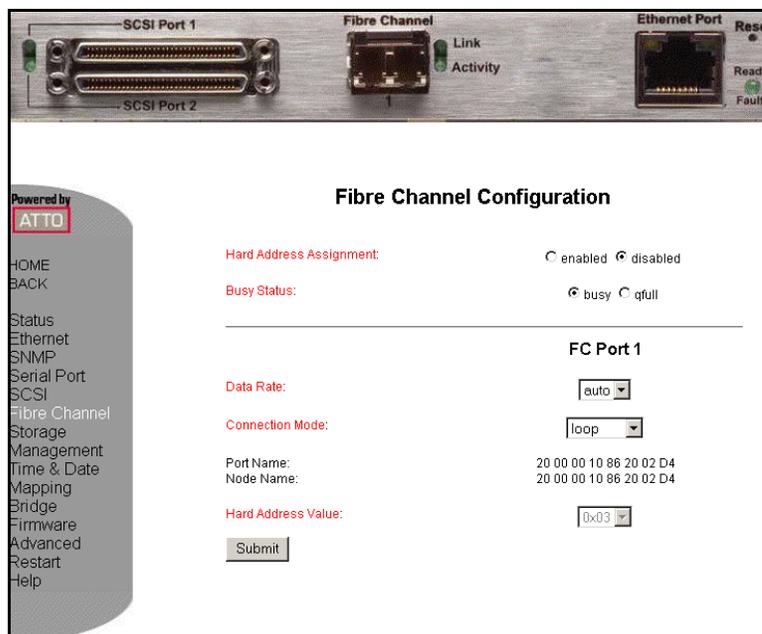


Figure 3-8: GUI Fibre Channel Screen

- **Hard Address Assignment** – When enabled, the FCO3 card takes on the LOOP address set by the Hard Address Value option at the bottom of the screen. The default is *disabled*.

- **Busy Status** – Selects the type of response the FCO3 returns to the host system when a SCSI device is preoccupied. The options are **busy** or **qfull** (queue full). The default is *busy*.
- **Data Rate** – Permits the maximum data rate that the FCO3 card will negotiate up to be set. The options are **1 Gb**, **2 Gb**, **4 Gb**, or **auto**. The default is *auto*.
- **Connection Mode** – Determines the type of Fibre Channel connection used by the FCO3. The options are: **loop**, **ptp** (point-to-point), **loop-ptp**, and **ptp-loop**. The last two options initially try the first type of connection mode and, when that does not work, the second type is tried. The default is *loop*.
- **Hard Address Value** – Selects the hard address the FCO3 will use. Before this address can be set, the **Hard Address Assignment** option must be enabled (by clicking the **enabled** button and then clicking **Submit**).

After all the changes are made, click the **Submit** button to activate the changes.

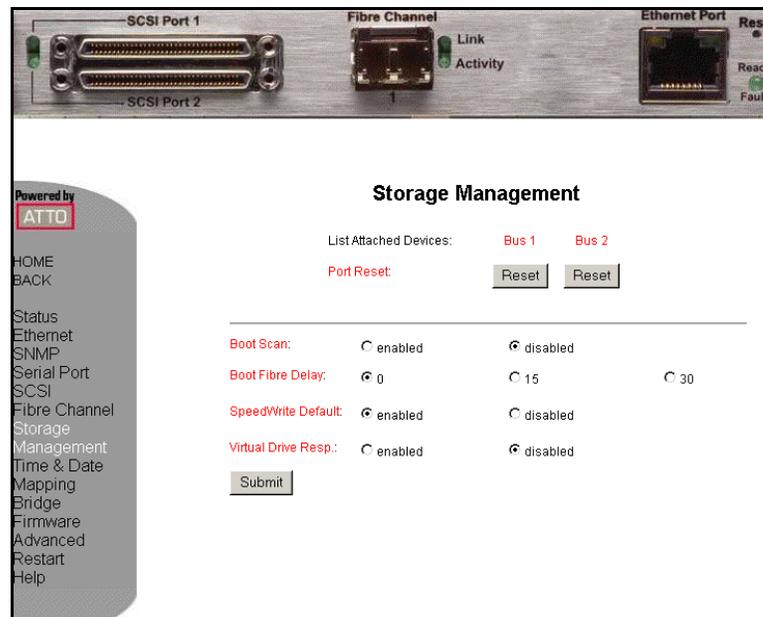
### Storage Management Screen

This screen permits the manipulation and modification of storage device behavior as seen by the host. It also duplicates the List Attached Devices and Port Reset functions found on the SCSI GUI screen. Please see the “[SCSI Configuration Screen](#)” for details on the those functions.

---

**IMPORTANT:** SpeedWrite must be enabled for all devices.

---



**Figure 3-9: GUI Storage Management Screen**

- **Boot Scan** – Provides dynamic mapping of SCSI devices to Fibre Channel LUNs at the boot time of the FCO3 card. The default is *disabled*.
- **Boot Fibre Delay** – Permits a delay to be inserted prior to the initialization process of the FCO3 Fibre Channel port. The options are **0**, **15**, and **30** seconds. The default is *0*.

**NOTE:** Additional delays are available through the use of the “BootFibreDelay” CLI command. See “BootFibreDelay” on page 4-13 for more details.

- **SpeedWrite Default** – Allows the FCO3 card to use the Write Back Cache for write operations.

**NOTE:** It is highly recommended that you verify that SpeedWrite is enabled for all SCSI devices attached the FCO3 card. To verify SpeedWrite is enabled at the SCSI device level use the following CLI command through the Advanced screen or a Telnet session:

“Get SpeedWrite scsi all”.

If some SCSI devices are not enabled, you can enable all the devices using the “Set SpeedWrite scsi all” command.

- **Virtual Drive Resp.** – The virtual drive response option permits the FCO3 card to respond to Inquiry and Test Unit Ready commands for any tape drive that is in the middle of a physical replacement process. The default is *disabled*.

After all the changes are made, click the **Submit** button to activate the changes.

### Time & Date Screen

This screen permits the configuration of the FCO3 card’s clock. Having the clock set correctly is extremely important for potential fault resolution processes since the clock is used to time stamp the FCO3 logs.

**NOTE:** Unless a known Simple Network Time Protocol (SNTP) server is available over your network to set the backup server’s clock, disable SNTP and set the time and date manually.

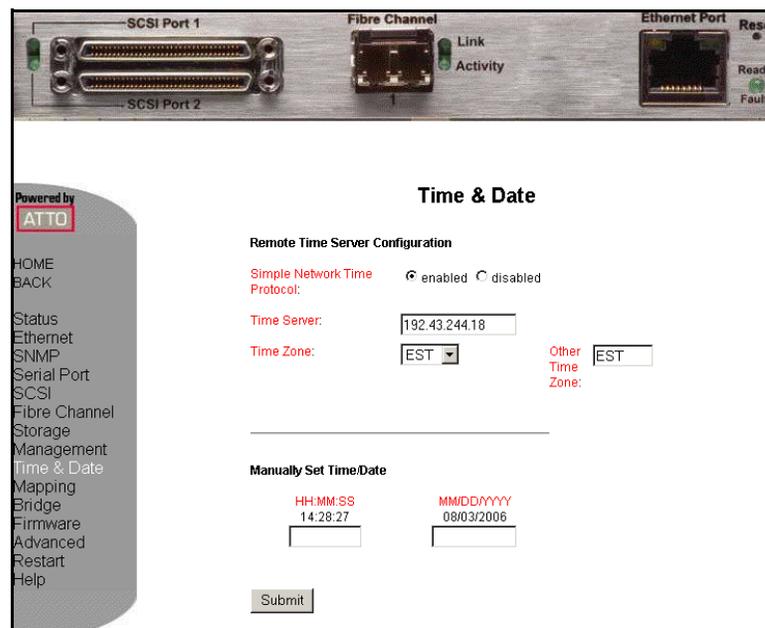


Figure 3-10: GUI Time & Date Screen

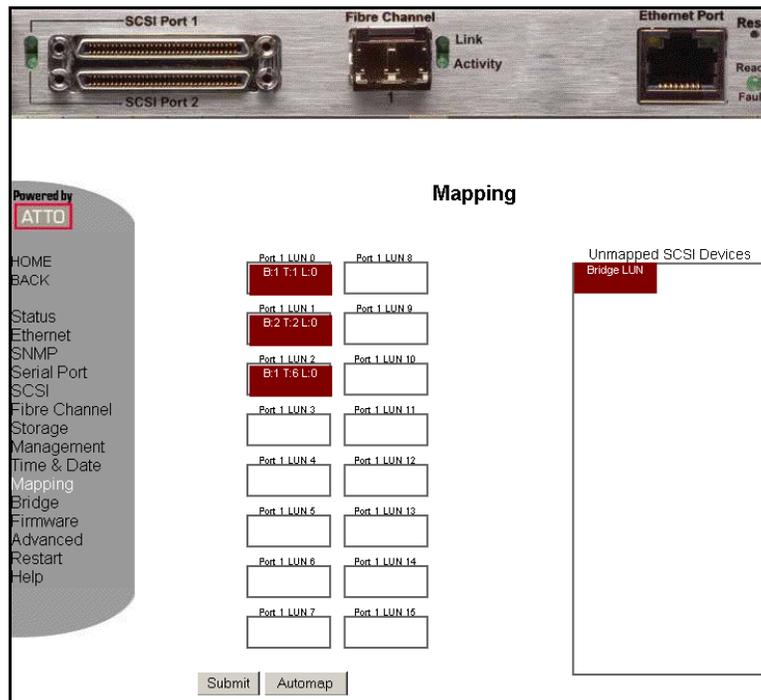
- **Simple Network Time Protocol** – Causes the FCO3 card to synchronize its clock with a remote SNTP server at the IP address specified in the Time Server field. If SNTP is disabled (click **disable** and then **Submit**), it permits the manual entry of date and time in the bottom section.
- **Time Server** – Used to specify the SNTP server IP address used by the FCO3 card.
- **Time Zone** – Permits the setting of the time zone where the FCO3 is located. The options are **EST, CST, MST, PST,** and **Other.**
- **HH-MM-SS** – When SNTP is disabled, this option is used to manually set the time of the FCO3 real-time clock in a Hours–Minutes–Seconds format.
- **MM/DD/YYYY** – When SNTP is disabled, this option is used to manually set the date for the FCO3s real-time clock in a Month–Day–Year format.

After all the changes are made, click the **Submit** button to activate the changes.

### Mapping Screen

This screen provides a graphical means to map back-end SCSI devices to front-end Fibre Channel port LUNs. The Mapping page provides two modes of operation—automap and drag-and-drop.

**NOTE:** SCSI devices must be mapped to FC LUNs for them to be visible through the Fibre Channel port. On Windows systems, do not map the Bridge LUN.



**Figure 3-11: GUI (LUN) Mapping Screen**

The drag-and-drop mode permits the operator to click a device listed on the right in the Unmapped SCSI Devices section and drag-and-drop it into a Fibre Channel LUN listed on the left. After all the changes are made, click the **Submit** button to activate the changes.

The **Automap** button automatically maps all unmapped devices, including the Bridge LUN, to front-end Fibre Channel LUNs. You need not click the **Submit** button if the **Automap** button is used.

### Bridge Configuration Screen

This screen permits the general-purpose operational parameters of the bridge to be modified.

**IMPORTANT:** It is strongly recommended that you change the Admin user name and password and make note of them, securing the note as part of an overall security procedure.

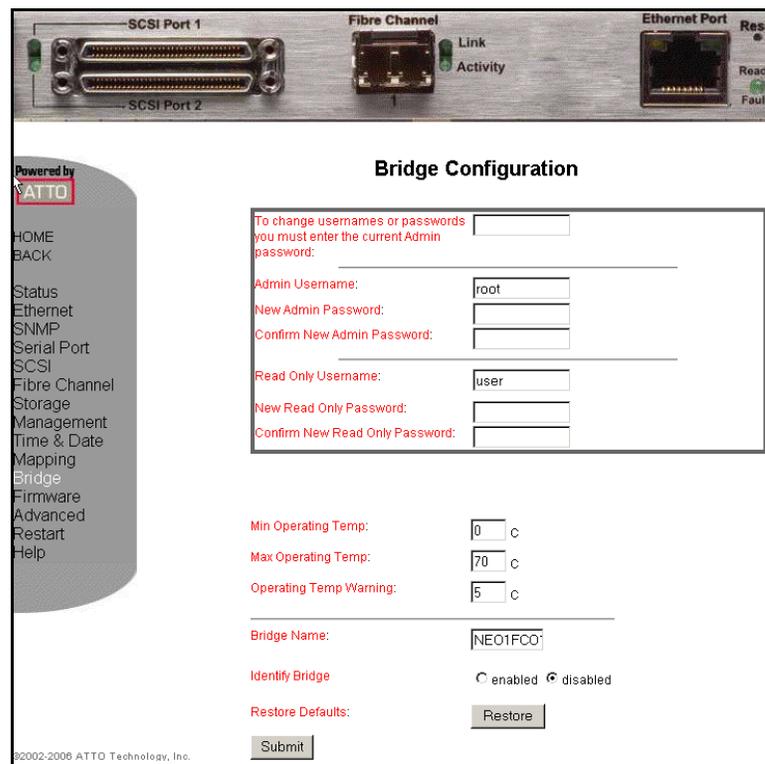


Figure 3-12: GUI Bridge Screen

**NOTE:** To change User Names and Passwords, the current Admin password must be entered in the first field of the Bridge Configuration box. The default Admin password is “Password” (and should be changed immediately).

- **Admin Username** – Permits the Admin-level user name to be changed from its default of “root.”
- **New Admin Password** – Permits the Admin-level password to be changed from its default of “Password.”
- **Confirm New Admin Password** – When changing the Admin-level password, it must be reconfirmed in this field.
- **Read Only Username** – Permits the Read Only-level user name to be changed from its default of “user.”

- **New Read Only Password** – Permits the Read Only-level password to be changed from its default of no password.
- **Confirm New Read Only Password** – When changing the Read Only-level password, it must be reconfirmed in this field.
- **Min Operating Temp** – This field should not be modified.
- **Max Operating Temp** – This field should not be modified.
- **Operating Temp Warnings** – This field should not be modified.
- **Bridge Name** – Permits the FCO3 to be renamed from its default bridge name of “NEO1FCO1.”

The bridge name can be used to uniquely identify multiple bridges in the same library, identify multiple NEO SERIES libraries with FCO3 cards, or both. Here are a few examples.

Multiple FCO3 cards – Single Library	Multiple FCO3 cards – Multiple Libraries
NEO1FCO1	NEO1FCO1
NEO1FCO2	NEO1FCO2
NEO1FCO3	NEO2FCO1
NEO1FCO4	NEO2FCO2

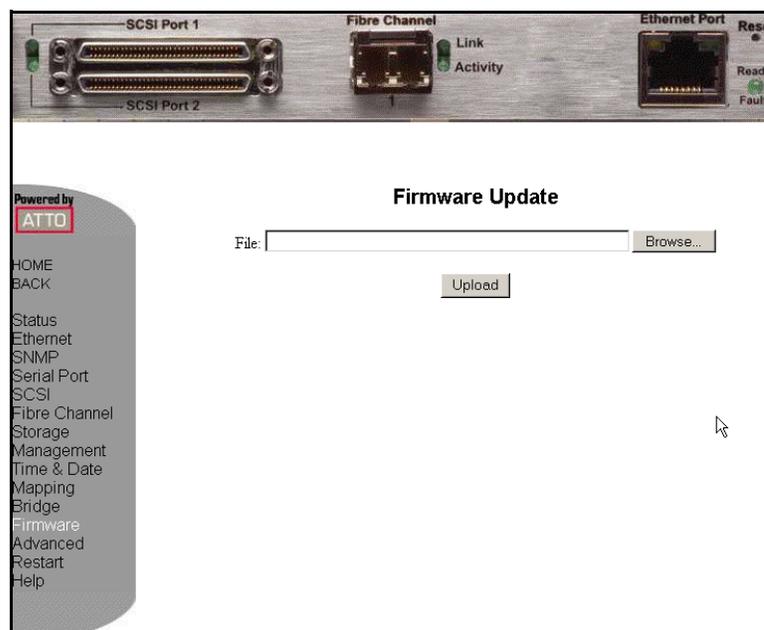
- **Identify Bridge** – Causes the Ready/Fault LED on the bridge to repeatedly flash between amber and green to identify the bridge.
- **Restore Defaults Button** – Forces all parameters back to factory original defaults.

After all the changes are made, click the **Submit** button to activate the changes.

### Firmware Update Screen

This screen is used to update the firmware of the FCO3 card.

**NOTE:** This screen is not used during the normal configuration operations unless the FCO3 card needs to have a firmware upgrade. Check the Overland Support website for the current suggested firmware level.



**Figure 3-13: GUI Firmware Screen**

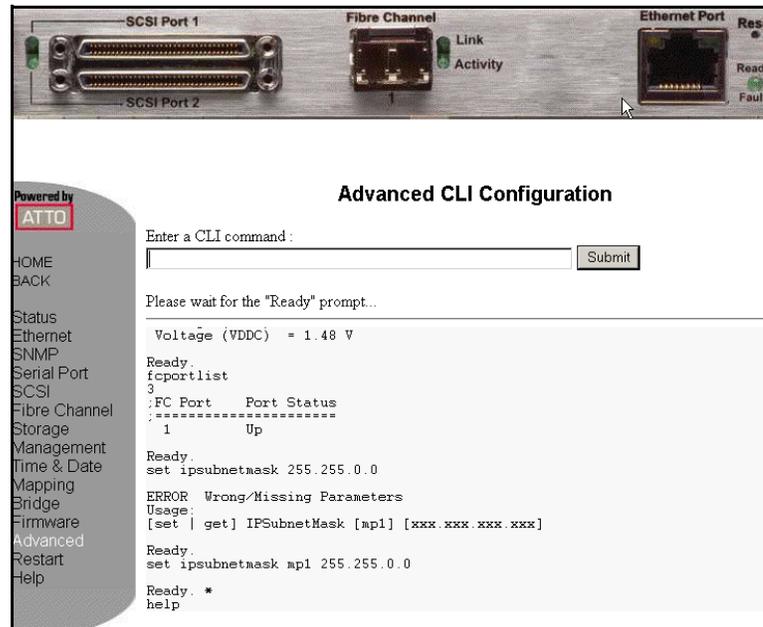
To update the firmware:

1. Download the new **firmware update** to the management station that is running the remote GUI session.
2. Click **Browse** to navigate to where you have stored the firmware update file, select it, and click **OK**.
3. Click **Upload** to begin the upload process.
4. When prompted (after upload completes), go to the **Restart Firmware** screen and restart the firmware.

**NOTE:** Do **NOT** power off the library or FCO3 card during the upload process. This causes serious damage to the FCO3 NVRAM requiring the FCO3 to be replaced.

### Advanced CLI Configuration Screen

This screen permits the administrator to execute CLI commands through the GUI. This is accomplished by entering the CLI command and any parameters that may be required in the submittal box and then clicking the **Submit** button.



**Figure 3-14: GUI Advanced Screen**

The command is echoed in the message window below the submittal box along with command execution status.

**NOTE:** See Chapter 4, “CLI Command Set,” for details on all CLI commands and their syntaxes supported by the FC03 card.

### Restart Firmware Screen

This screen is used to force a firmware restart of the FC03 card by clicking the **Restart** button.

**NOTE:** If changes you have made on other screens require a restart of FC03 firmware, the statement “**Configuration changes have been made. Firmware restart required to take effect.**” appears in bold red at the top of that screen.

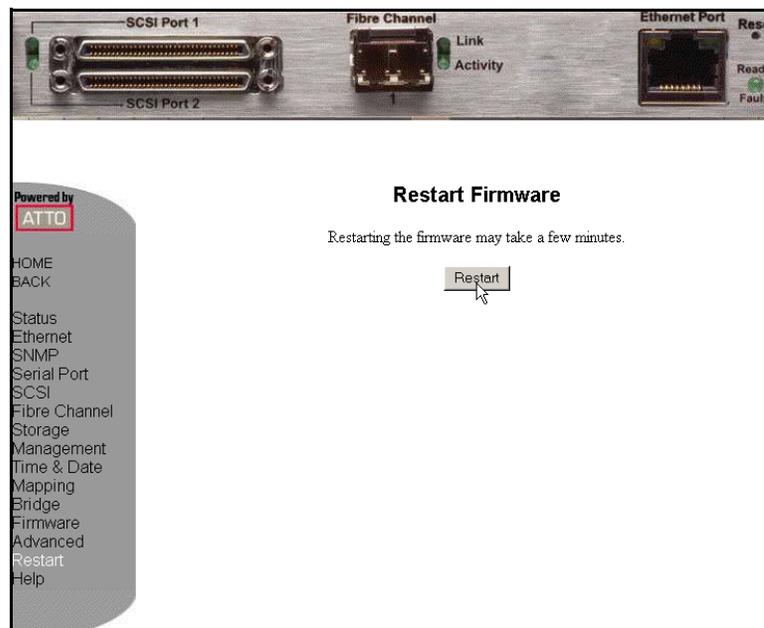


Figure 3-15: GUI Firmware Restart Screen

### Help Screen

This screen provides online help by clicking a red-font topic.

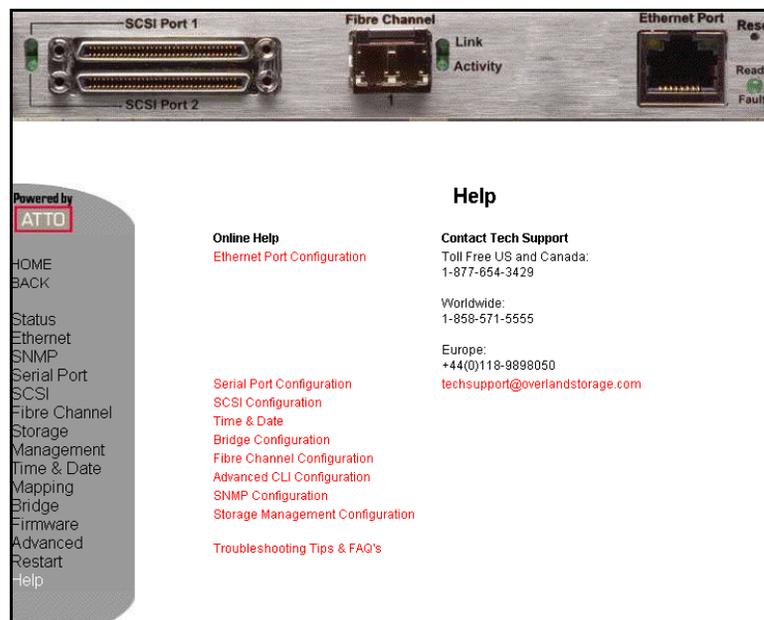


Figure 3-16: GUI Help Screen

The topics available are:

- Ethernet Port Configuration

- Serial Port Configuration
- SCSI Configuration
- Time & Date
- Bridge Configuration
- Fibre Channel Configuration
- Advanced CLI Configuration
- SNMP Configuration
- Storage Management Configuration
- Troubleshooting Tips & FAQ's

Overland contact information is also provided along with an automatic E-mail link. That link opens your mail client and creates an E-mail addressed to Overland Technical Support.



# 4 | CLI Command Set

CHAPTER

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The CLI provide a command level interface to the FCO3 card for advanced users and scripting purposes. All set and monitoring functions that can be performed through the GUI may also be done through a Telnet session using the following CLI command set.

## CLI Syntax

CLI commands consist of either Immediate and Modified command types using a clearly-defined set of rules for syntax and abbreviations.

### Immediate Commands

Immediate commands cause an action to be immediately carried out, and are not preceded by the Get or Set keyword. Persistent configuration data affected by immediate commands is updated immediately. If the form of operation cannot be determined, it is assumed to be the Usage form and a brief help message is displayed. An example of an immediate command is `Help` which displays a list of all commands.

### Modified Commands

Modified commands require a preceding Get or Set command to tell the FCO3 how to respond to the CLI command. When a Modified Set command is executed, an asterisk appears next to the command-line prompt `Ready`. The current configuration must be saved before the new parameters are stored in NVRAM and the asterisk is removed.

Modified Set commands also require a firmware restart before the saved parameters take effect. This is accomplished either by using the `FirmwareRestart` command or by specifying `restart` as part of the `SaveConfiguration` command line.

---

**IMPORTANT:** If you are making several changes, you can issue a “SaveConfiguration” command after each of the CLI commands and, once you have made all the changes, issue a single “FirmwareRestart” command to activate all the changes.

---

Some Modified commands are informational only, such as a Get command. An example is the `Temperature` command that returns the card temperature.

An example of a Modified command is the `VerboseMode` command. The Get version of modified commands returns the current value of the function while the Set version of the command cause the functions value to be to the parameters that follow the CLI command.

### General CLI Rules

- The strings get and set may be abbreviated to `g` and `s`, respectively.
- All commands are case insensitive unless specifically noted.
- Decimal numbers may be entered as raw numerical input (such as 123).
- Octal numbers must be preceded by the number 0 (such as 0713).

- Hexadecimal numbers must be preceded by the C-style 0x prefix (such as 0x1FA4).
- Quoted strings are treated as a single parameter for any command that expects character input, regardless of spaces in the string.

### Command Syntax and Symbology

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

```
[get | set] CommandName [parameter 1 [parameter 2 [...]]<parameter 3>\n
```

Table 4-1 defines the symbology used in the format.

**Table 4-1: CLI Symbology**

Symbol	Meaning
[ ]	A required entry
< >	An option entry or response
	Pick one from a list
...	An optional repetition of the preceding item
\n	End of line
-	Indicates a range

### Definitions and Abbreviations

Table 4-2 defines the abbreviations used in the CLI definitions.

**Table 4-2: CLI Command Abbreviations**

Abbr.	Meaning
sb	SCSI bus number (1 or 2)
st	SCSI target id (0 to 15)
sl	SCSI LUN (0 to 7)
mp[n]	FC03 card Management Port (where n=0)
Esc	Press the Esc key to interrupt

### CLI Responses

CLI responses can take several forms:

- All Responses are followed by the string *Ready* on the next line.
- Responses to Set Commands are either the error message or *Ready*.
- Responses to Get Commands are specified in the Results field for each command, followed by *Ready* below it.

## CLI Examples

The following are some examples of CLI commands and responses with descriptions.

### Example 1

```
"Get IPAddress mp1"
```

Type `Get IPAddress mp1` either on the Advanced CLI Configuration screen or in a Telnet session to request the current IP address of the management port (mp1).

```
"IPAddress = 10.20.30.116
Ready"
```

The current IP address is returned. The `Ready` prompt indicates the FCO3 is ready to accept another command.

### Example 2

```
"Set IPAddress mp1 10.20.30.115"
"Ready. *"
```

This command is entered to set the IP address.

This returns a `Ready` prompt that is accompanied with an asterisk (\*) indicating that you need to issue a `SaveConfiguration` command for the parameter change to take effect.

```
"SaveConfiguration
Restart is necessary...
Ready."
```

Since the IP address of the FCO3 is changing, the return status from the `SaveConfiguration` command indicates a restart is necessary. At this point you need to use the Immediate command `FirmwareRestart` for the new IP address to take effect.

## CLI Command Functional Groups

The CLI commands are roughly grouped on the following pages by GUI screen usage. Command functions that appear on more than one GUI screen, for example, World Wide Port Name, are listed under its main functional group, in this case, Fibre Channel.

## CLI Help Commands

These CLI commands are used to get help when using the CLI interface in a Telnet session.

### Help

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

**Type:** Immediate command

**Syntax:** `Help`  
`Help [command name]`

### 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.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set VerboseMode [enabled | disabled]  
get VerboseMode

**Default:** enabled (returns have parameter information)

### Status & Information Commands

The following can also be found in the section [“Status Screen” on page 3-4](#).

#### BridgeModel

Reports model information about the FCO3.

**Type:** Modified command (informational only)

**Syntax:** get BridgeModel

#### Info

Displays version numbers and other production information for key components of the FCO3.

**Type:** Immediate command

**Syntax:** Info

#### SerialNumber

Reports the FCO3 serial number which is unique for each FCO3 card. The serial number tracks the board throughout its life.

**Type:** Modified command (informational only)

**Syntax:** get SerialNumber

#### Temperature

Returns the current internal temperature of the FCO3 in degrees Celsius.

**Type:** Modified command (informational only)

**Syntax:** get Temperature

## Voltage

Displays the voltage levels monitored by the FCO3 Bridge. They are:

**Table 4-3: FCO3 Nominal Voltage Levels**

Term Name	Nominal Value
VDDA	3.3 V
Vddb	2.5 V
VDDC	1.5 V
VDDD	1.35 V
All	Returns all voltage values

**Type:** Modified command (informational only)

**Syntax:** `get Voltage < VDDA | Vddb | VDDC | VDDD | ALL >`

## Ethernet Configuration Commands

The Ethernet configuration commands configure the Ethernet and TCP/IP parameters. The following can also be found in the section [“Ethernet Port Configuration Screen” on page 3-5](#).

### DhcpFixedDelay

Selects or displays the delay, in seconds, between DHCP client request intervals, from between 0 and 255 seconds. Zero (0) time is typically used.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** `set DhcpFixedDelay [0 - 255]`  
`get DhcpFixedDelay`

**Default:** 0 (no delay)

### EthernetSpeed

Sets or displays the current speed of the Ethernet connection for the management port. Choices are **10**, **100**, and **Auto**.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** `set EthernetSpeed [mp1] [10 | 100 | auto]`  
`get EthernetSpeed`

**Default:** auto

**NOTE:** If auto-enabled, the value shown in parentheses indicates the current speed.

### Exit

Exits the current Ethernet Telnet CLI session.

**Type:** Immediate command

**Syntax:** Exit

### IPAddress

Sets or displays the current FCO3 IP address. If IPDHCP is enabled, the Get command reports current IP address assigned by DHCP server.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set IPAddress [mp1] xxx.xxx.xxx.xxx  
get IPAddress [mp1]

**Default:** 0.0.0.0

### IPDHCP

Selecting DHCP allows the FCO3 to request an IP address from the network. The network must have at least one DHCP server connected to it.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set IPDHCP [mp1] [enabled | disabled]  
get IPDHCP [mp1]

**Default:** Enabled

### IPGateway

Sets or displays the current default gateway. If IPDHCP is enabled, the Get command reports the current gateway assigned by the DHCP server. The gateway address will be rejected if the FCO3 IP address is not in the same subnet as the gateway.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set IPGateway [mp1] xxx.xxx.xxx.xxx  
get IPGateway [mp1]

**Default:** 0.0.0.0

### IPSubnetMask

Sets or displays the current subnet mask. If IPDHCP is enabled, the Get command reports the current subnet mask assigned by DHCP server.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set IPSubnetMask xxx.xxx.xxx.xxx  
get IPSubnetMask

**Default:** 255.255.0.0

## Ping

Sends an ICMP echo request to the specified host.

**Type:** Immediate command

**Syntax:** ping [mp1] [xxx.xxx.xxx.xxx] < count < size > >

## SNMP Configuration Commands

The following can also be found in the section [“SNMP Screen” on page 3-6](#).

### AutoLogSense

Controls Automatic LOG SENSE functionality.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set AutoLogSense [enabled | disabled]  
get AutoLogSense

**Default:** Disabled

### SNMPDumpMIB

Dumps the contents of the FCO3 private SNMP MIB (Management Information Base) to the current CLI session. Consult your network administrator for further assistance with SNMP.

**Type:** Immediate command

**Syntax:** SNMPDumpMIB

### SNMPExtendedTraps

Controls the extended SNMP map functioning such as device transition and device error. Consult your network administrator for further assistance with SNMP.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set SNMPExtendedTraps [enabled | disabled]  
get SNMPExtendedTraps

**Default:** 0.0.0.0

### SNMPTrapAddress

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

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set SNMPTrapAddress [Index] [IPAddress] [level]  
get SNMPTrapAddress

Table 4-4: SNMPTrapAddress Field Definitions

Field	Option
Index Value	Index value between 1 and 6
IP Address	Standard IP address to send the trap
Level	Event level severity options to trigger a Trap: <ul style="list-style-type: none"> <li>• None (default)</li> <li>• All</li> <li>• Informational</li> <li>• Warning</li> <li>• Critical</li> </ul>

### SNMPTraps

Enables or disables SNMP trap functions. Consult your network administrator for further assistance with SNMP. The default is disabled.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** `set SNMPTraps [enabled | disabled]`  
`get SNMPTraps`

**Default:** Disabled

## SCSI Configuration Commands

The SCSI ports are configured with default settings but may be customized to your specifications using the CLI commands in this section. The following can also be found in the section [“SCSI Configuration Screen” on page 3-7](#).

### FCSCSIBusyStatus

Specifies the SCSI status value returned when the FCO3 is unable to accept a SCSI command due to a temporary lack of resources. Choices are busy and qfull. The default is busy.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** `set FCSCSIBusyStatus [busy | qfull]`  
`get FCSCSIBusyStatus`

**Default:** Busy

### SCSITargets

Returns a list of SCSI devices operational on the referenced SCSI port showing the SCSI target number, SCSI LUN number, device type, vendor ID, product ID, revision, and serial number.

**NOTE:** For all FCO3 models except the FCO3 2400, updates the status of any maps or routes to either “online” if a device *is* found, or “unavailable” if a device is *not* found.

**Type:** Immediate command

**Syntax:** SCISITargets [sb]

### 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 is issued.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set SCSIInitID [sb [0-15]]  
get SCSIInitID

**Default:** 7

### SCSIPortBusSpeed

Controls the transfer rate at which the FCO3 will attempt to negotiate 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 FCO3 has LVD-capable SCSI ports.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set SCSIPortBusSpeed [Port Number [fast | ultra | ultra2 | ultra3 | ultra4]]  
get SCSIPortBusSpeed

**Default:** Ultra 4 (Ultra 320)

### SCSIPortList

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

**Type:** Modified command (informational only)

**Syntax:** get SCSIPortList

### SCSIPortReset

Resets the specified SCSI bus.

**Type:** Immediate command

**Syntax:** SCSIPortReset [sb]

### SCSIPortResetOnStartup

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

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set SCSIPortResetOnStartup [sb [enabled | disabled]]  
get SCSIPortResetOnStartup [sb]

**Default:** Enabled

### SCSIPortSyncTransfer

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

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set SCSIPortSyncTransfer [sb [enabled | disabled]]  
get SCSIPortSyncTransfer [sb]

**Default:** Enabled

### SCSIPortTermination

Configures or reports the SCSI internal termination of the SCSI port identified on the FCO3.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set SCSIPortTermination [sb] [enabled | disabled]  
get SCSIPortTermination [sb]

**Default:** Enabled

### SCSIPortWideTransfer

Specifies whether wide SCSI transfers should be negotiated. Enabled allows wide transfer negotiation. The default is enabled.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set SCSIPortWideTransfer [sb [enabled | disabled]]  
get SCSIPortWideTransfer

**Default:** Enabled

### SCSITargetLUNs

Sets the maximum number of SCSI LUNs per target that the FCO3 attempts to query during a SCSI bus scan.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set SCSITargetLUNs [sb] [8 | 64]  
get SCSITargetLUNs

**Default:** 8

## Fibre Channel Configuration Commands

The Fibre Channel port is configured with default settings but can be customized using CLI. The following can also be found in the section [“Fibre Channel Configuration Screen” on page 3-8](#).

### FCConnMode

Controls or reports the connection mode the FCO3 uses when communicating across a FC network, either to an arbitrated loop (FC-AL) when you select loop mode, or point-to-point when you choose ptp mode. If you choose loop-ptp or ptp-loop mode, the FCO3 tries to use the first parameter initially, but will use the second if it is unsuccessful.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** `set FCConnMode 1 [loop | ptp | loop-ptp | ptp-loop]`  
`get FCConnMode 1`

**Default:** Loop

### FCDataRate

Specifies the rate the FCO3 will use, 1 Gbps, 2 Gbps, 4 Gbps, or auto negotiate.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** `set FCDataRate 1 [1Gb | 2Gb | 4Gb | auto]`  
`get FCDataRate 1`

**Default:** Auto (negotiate)

### FCHard

Used to enable or disable FC hard address assignment. Under soft addressing (disabled mode), the FCO3 loop address is assigned during loop initialization. Use FCHardAddress to enable hard addressing.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** `set FCHard [enabled | disabled]`  
`get FCHard`

**Default:** Disabled

### FCHardAddress

Sets or displays the value used as the FC-AL hard address. This hexadecimal value represents the address the FCO3 tries to use if hard addressing is enabled. When an optional address is not present, the current value is displayed. The valid range of values is 0 through 125.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** `set FCHardAddress [1 | [address]]`  
`get FCHardAddress 1`

**Default:** 3 (hard address for fibre port)

### FCPortList

Returns the current status of the FCO3 FC port. Valid status values are Up and Failed for the FCO3.

**Type:** Immediate command

**Syntax:** FCPortList

### FCPortErrors

Displays the number of Fibre Channel errors that have occurred since the last reboot, power-on, or ResetFCPortErrors command.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set FCPortErrors 1 [enabled | disabled]  
get FCPortErrors 1

**Default:** Enabled

### Reset FCPortErrors

Resets all FC error counts for the specified port to zero.

**Type:** Immediate command

**Syntax:** ResetFCPortErrors 1

### FCSCSIBusyStatus

Specifies the SCSI status value returned when the FCO3 is unable to accept a SCSI command because of a temporary lack of resources. Choices are busy and qfull (queue full).

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set FCSCSIBusyStatus [busy | qfull]  
get FCSCSIBusyStatus

**Default:** Busy

### FCWWName

Reports the Word Wide Name (WWN) of the FC interface. Each FC port has an individual and unique WWN. The least significant three bytes of the WWN are used as the Ethernet MAC address. The lower nibble of the highest byte designates the port number.

**NOTE:** The World Wide Names for the FCO3 Port and Node are the same.

**Type:** Modified command (informational only)

**Syntax:** get FCWWName 1

## Storage Management Commands

The following can also be found in the section [“Storage Management Screen” on page 3-9](#).

**BootScan**

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/LUN combination until the next reset or power cycle. This dynamic mapping replaces the current static mapping of the FCO3.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set BootScan [enabled | disabled]  
get BootScan

**Default:** Disabled

**BootFibreDelay**

This command delays the initialization of the FC port to allow a connected Fibre switch to fully initialize before enabling the FCO3 FC ports.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set BootFibreDelay [0 | 15 | 30 | 45 | 60 | 75]  
get BootFibreDelay

**Default:** 0 (no delay)

**SpeedWriteDefault**

Specifies the state of SpeedWrite for any SCSI devices mapped manually or via an AutoMap operation. If enabled, any new SCSI device will use SpeedWrite performance enhancement by default.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set SpeedWriteDefault [enabled | disabled]  
get SpeedWriteDefault

**Default:** Disabled

**SpeedWrite**

SpeedWrite is a method to improve the performance of FCP WRITE commands to SCSI devices attached to the FCO3. 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.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set SpeedWrite scsi [sb st sl | all] [enabled |disabled]  
get SpeedWrite scsi [sb st sl | all]

**Default:** All disabled

### VirtualDriveResponse

Virtual Drive Response allows the FCO3 to provide proxy responses to SCSI INQUIRY and TEST UNIT READY commands if a SCSI device is in a time-out or busy state. Host systems can then assign devices consistently despite the device's state during execution of the SCSI commands.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set VirtualDriveResponse [enabled | disabled]  
get VirtualDriveResponse

**Default:** Disabled

### Time & Date Commands

These commands are used to control the FCO3 onboard real time clock. The following can also be found in the section [“Time & Date Screen” on page 3-10](#).

#### SNTP

Sets or gets the SNTP setting. When enabled, the FCO3 tries at reset and every 12 hours thereafter to contact a specified SNTP time server to initialize or synchronize the time.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set SNTP [enabled | disabled]  
get SNTP

**Default:** Enabled

#### SNTPServer

Sets or gets the IP address of the SNTP time server. If the FCO3 is unable to contact the specified SNTP timeserver within 30 seconds, the FCO3 then tries to contact the first auxiliary SNTP time server. If not successful, the FCO3 tries to contact the second auxiliary server. If not successful, the FCO3 will continue 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) and 132.163.4.101 (time-a.timefreq.blrdoc.gov).

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set SNTPServer xxx.xxx.xxx.xxx  
get SNTPServer

**Default:** 192.43.244.18 (time.nist.gov)

#### Date

Sets or displays the date. The range is 01/01/2000 to 12/31/2099.

**NOTE:** For all models except the FC03 2350, the date is reset to the default whenever the FC03 is reset or power-cycled. The date is persistent in the FC03 2350 because it has a battery backup.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set Date [MM] / [DD] / [YYYY]  
get Date

**Default:** 01/01/2000

## Time

Sets or displays the time in a 24-hour format.

**NOTE:** For all models except the FC03 2350, the time is reset to the default whenever the FC03 is reset or power-cycled. The time is persistent in the FC03 2350 because it has a battery backup.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set Time [HH] : [MM] : [SS]  
get Time

**Default:** 00:00:00

## TimeZone

Sets or displays the time zone if SNTP is disabled. Setting can be EST, CST, MST, PST, or a numerical offset from GMT in the format +/- HH:MM.

**NOTE:** When SNTP is enabled, it applies this time zone setting to the time retrieved from a specified SNTP time server to determine local time.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set TimeZone [EST | CST | MST | PST | [+ / - HH : MM]]  
get TimeZone

**Default:** EST

## Mapping Commands

Access to SCSI devices is via Fibre port and Fibre LUN addresses mapped to SCSI bus, target, and LUNs. CLI commands are used to modify the mapping. The following can also be found in the section [“Mapping Screen” on page 3-11](#).

### AutoMap

Programmatically maps all currently operational SCSI devices attached to the FCO3.

**NOTE:** Issue a `SCSIPortList` CLI command before issuing an `AutoMap` command to scan the bus for operational SCSI buses. `AutoMap` is not available if `LogicalUnitAddressing` is enabled.

**Type:** Immediate command

**Syntax:** `AutoMap 1`

### 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 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 the Fibre Channel port.

**Type:** Modified command (Set option requires `SaveConfiguration/FirmwareRestart`)

**Syntax:** `set LogicalUnitAddressing [enabled | disabled]`  
`get LogicalUnitAddressing`

**Default:** Disabled

### Route

Assigns a Fibre Channel address to a target destination device. If you try to map a new SCSI Bus-Target-LUN (BTL) to the same FC LUN, the new BTL will overwrite the previous map. Using the delete identifier instead of SCSI, removes the map from its table. In verbose mode, overwriting an exiting map requires secondary confirmation.

**NOTE:** Not available if `LogicalUnitAddressing` has been enabled.

**Type:** Immediate command

**Syntax:** `Route FC [fp] [fl] [SCSI [sb st sl] Bridge |Delete]`

### RouteDisplay

Displays a list of Fibre Channel to SCSI address mappings on the FCO3.

**NOTE:** If `LogicalUnitAddressing` has been enabled, `RouteDisplay` shows a list of SCSI-to-SCSI address mappings.

**Type:** Immediate command

Normal mode:

**Syntax:** `RouteDisplay FC <fp> <fl>`

LUA mode:

**Syntax:** `RouteDisplay SCSI <sb> <st> <sl>`

## Bridge Commands

Bridge commands are used to configure operational parameters general to the bridge. The following can also be found in the section [“Bridge Configuration Screen” on page 3-12](#).

### Username

Specifies the user name for all Telnet, FTP, and GUI (browser) management console sessions. Username is case insensitive, 1-32 characters, and no spaces.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set Username [user\_name]  
get Username

**Default:** “root”

### Password

Specifies a password for all Telnet, FTP, and GUI (browser) management console sessions. You are prompted to enter the current password, enter the new password, and to confirm the new password. If local echo is enabled, the password will echo an asterisk (\*) for each character. In verbose mode only, CLI will request the password be reentered.

If the password is all zeros, Telnet and FTP will not validate the password, and MD5 authentication is disabled. Passwords are case-sensitive and can be 1-32 characters long with no spaces. The default password is Password (with an upper-case “P”).

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set Password [ xxx ]

**Default:** “Password”

### ReadOnlyUsername

Specifies the user name for all Telnet, FTP, and GUI (browser) management console sessions. The user name is case-insensitive, 1-32 characters, and has no spaces.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set ReadOnlyUsername [user\_name]  
get ReadOnlyUsername

**Default:** “user”

### ReadOnlyPassword

Specifies a password for all Telnet, FTP, and GUI (browser) management console sessions. An empty password can be configured by not specifying one. The default is Password.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set ReadOnlyPassword [ xxx ]

**Default:** “Password”

### MaxOpTemp

Sets or displays the maximum enclosure temperature alarm of the FCO3 in degrees Celsius. If the temperature of the FCO3 rises above the maximum MaxOpTemp, a thermal control event handling occurs. Valid entries are between 55 and 70 degrees Celsius.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set MaxOpTemp [55-70]  
get MaxOpTemp

**Default:** 70 (degrees Celsius)

### MinOpTemp

Sets or displays the minimum enclosure temperature alarm of the FCO3 in degrees Celsius. If the temperature of the FCO3 falls below the minimum MinOpTemp, a thermal control event handling occurs. Valid entries are between 0 and 15 degrees Celsius.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set MinOpTemp [0-15]  
get MinOpTemp

**Default:** 0 (degrees Celsius)

### OpTempWarn

Sets or displays the number of degrees in Celsius before a thermal control event handling occurs. Warnings can be made via system log entries. Valid entries are between 0 and 15 degrees Celsius.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set OpTempWarn [0-15]  
get OpTempWarn

**Default:** 5 (degrees Celsius)

### BridgeName

Specifies the eight-character name assigned to the FCO3 used to identify individual FCO3 units. It is not the World Wide Name. The string is alphanumeric and eight characters long.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set BridgeName [value] to take effect.  
get BridgeName

**Default:** NEO1FCO1

### IdentifyBridge

Enabling this option causes the Ready LED on the FCO3 card to blink until the parameter is disabled.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set IdentifyBridge [enabled | disabled]  
get IdentifyBridge

### RestoreConfiguration

Restores the FCO3 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.

**Type:** Immediate command

**Syntax:** RestoreConfiguration [Default | Saved]

## Maintenance Commands

The CLI commands outlined in this section can be used to get information or perform functions which are used in a variety of situations with the FCO3.

### IsReserved

Displays the reservation status of the current FCO3 session or interface. The response is either Reserved or Released.

**Type:** Immediate command

**Syntax:** IsReserved

### Reserve

Prevents other CLI sessions from modifying the FCO3. When the FCO3 services interface is reserved, set commands are unavailable but get commands are processed. At least one service interface always has access to the FCO3 at all times. This interface always reports Released status, since it may issue set commands.

Reservation of the FCO3 is implicit. If the configuration is changed by anyone using CLI sessions, the FCO3 becomes Reserved. Executing a SaveConfiguration, RestoreConfiguration, or FirmwareRestart command releases the FCO3 so that other devices may modify it.

**Type:** Immediate command

**Syntax:** Reserved

### SaveConfiguration

Many commands require a SaveConfiguration command to be executed. This is indicated by the prompt "Ready. \*" (with asterisk). When you invoke a SaveConfiguration command, the current configuration is permanently saved in the FCO3 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 can make several changes through commands before implementing the restart, but once you have restarted the FCO3, all the command changes entered before the restart will be implemented. When you select the Restart option, the FCO3 executes its complete start up cycle.

**Type:** Immediate command

**Syntax:** `SaveConfiguration <Restart | NoRestart>`

### RestoreConfiguration

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

**Type:** Immediate command

**Syntax:** `RestoreConfiguration [Default | Saved]`

### FirmwareRestart

Causes the FCO3 to reboot, then re-initialize its firmware. Use the forced option to override any CLI reservation held by other sessions.

**Type:** Immediate command

**Syntax:** `FirmwareRestart <forced>`

## Diagnostic Commands

FCO3 diagnostic commands help validate FCO3 operation and diagnose or isolate FCO3 faults. Event logging is a mechanism for onsite observation of internal FCO3 behavior such as tracing SCSI commands received over the Fibre Channel from the host and the return of data and status to the host.

### EventLog

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

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** `set EventLog [enabled | disabled]`

`get EventLog`

**Default:** Enabled

### EventLogFilter

Filters the display of data for specific subsystems and log levels when in EventLog mode. The specified entries supported are platform dependent. To display all values, type “all all” as the first two parameters.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set EventLogFilter [subsystem] [log\_level] [enabled | disabled]  
get EventLogFilter [subsystem] [log\_level]

**Default:** all all enabled

Use the following tables to determine the options for [subsystem] and [log\_level]:

**Table 4-5: Event Log Subsystem and Log\_Level Filters**

Subsystem		Log_Level	
Option	When set, suppresses:	Option	When set, suppresses:
ECC	ECC events	INFO	Information events
ENET	Ethernet events	WARN	Warning events
GEN	General events	CRIT	Critical events
HTTP	HTTP events	FAIL	Failure events
SCSI	SCSI events	ALL	All log-level events
NVRAM	NVRAM events		
PERF	Performance events		
FC	Fibre Channel events		
ALL	All events		

### DisplayEventLog

Displays the most recent page of event log entries. Typing a “+,” “-,” or “=” causes the next (+), previous (-), or same (=) page of event log entries to be displayed. No events will be recorded until the command has been completed. Type “q” to disable the command, begin new log entries, and return to CLI.

**Type:** Immediate command

**Syntax:** DisplayEventLog < + | - | = | q >

### DisplayEventLogFilter

Filters the display of data for specified subsystems and levels when in DisplayEventLog mode. To display all values, type “all all” as the first two parameters.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set DisplayEventLogFilter [subsystem] [log\_level] [enabled | disabled]  
get DisplayEventLogFilter [subsystem] [log\_level]

**Default:** all all enabled

Use the following tables to determine the options for [subsystem] and [log\_level]:

**Table 4-6: Event Log Subsystem and Log\_Level Filters**

Subsystem		Log_Level	
Option	When set, suppresses:	Option	When set, suppresses:
ECC	ECC events	INFO	Information events
ENET	Ethernet events	WARN	Warning events
GEN	General events	CRIT	Critical events
HTTP	HTTP events	FAIL	Failure events
SCSI	SCSI events	ALL	All log-level events
NVRAM	NVRAM events		
PERF	Performance events		
FC	Fibre Channel events		
ALL	All events		

**DumpEventLog**

Dumps the contents of the entire event log to the current CLI session without impact on the log itself (the log is not cleared). No events are recorded until the command has been completed.

**Type:** Immediate command

**Syntax:** DumpEventLog

**TailEventLog**

Displays new events to the terminal during a serial or Telnet session. Press <ESC> to exit tail mode.

**Type:** Immediate command

**Syntax:** TailEventLog

**WrapEventLog**

When enabled, the FCO3 will log up to 2,048 event entries before wrapping (overwriting the first entries). If disabled, the FCO3 stops logging event entries when the buffer is full.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set WrapEventLog [enabled | disabled]  
get WrapEventLog

**Default:** Enabled

## ClearEventLog

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

**Type:** Immediate command

**Syntax:** ClearEventLog

## TraceLog

When enabled, records various system events to the trace log. The Trace Log is disabled by default for performance reasons.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set TraceLog [enabled | disabled]  
get TraceLog

**Default:** Disabled

## TraceLogFilter

Filters the display of data for a specific FCO3 bridge when in TraceLog mode.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set TraceLogFilter [FC | SCSI | ALL] [fp | sb | ALL] [ChkCond | ALL]  
[enabled | disabled]  
get TraceLogFilter [FC | SCSI | ALL] [fp | sb | ALL] [ChkCond | ALL]

**Default:** Disabled

## DisplayTraceLog

Displays the most recent page of trace log entries. Typing “+,” “-,” or “=” causes the next (+), previous (-), or same (=) page of trace log entries to be displayed. No events will be recorded until the command has been completed. Type “q” to disable the command, begin new log entries, and return to CLI.

**Type:** Immediate command

**Syntax:** DisplayTraceLog < + | - | = | q >

## DisplayTraceLogFilter

Filters the display of data in the trace log when in DisplayTraceLog mode. To display all values, type “all all” as parameters.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set DisplayTraceLogFilter [FC | SCSI | ALL] [fp | sb | ALL] [ChkCond | ALL]  
[enabled | disabled]  
get DisplayTraceLogFilter [FC | SCSI | ALL] [fp | sb | ALL] [ChkCond | ALL]

**Default:** all all enabled

### DumpTraceLog

Dumps the contents of the entire trace log to an serial or Telnet session over Ethernet without impact on the log itself (the log is not cleared). No events are recorded until the command has been completed.

**Type:** Immediate command

**Syntax:** DumpTraceLog

### WrapTraceLog

When enabled, the FCO3 will log up to 2,048 trace entries before wrapping (overwriting the first entries). If disabled, the FCO3 stops logging trace entries when the buffer is full.

**Type:** Modified command (Set option requires SaveConfiguration/FirmwareRestart)

**Syntax:** set WrapTraceLog [enabled | disabled]  
get WrapTraceLog

**Default:** Enabled

### ClearTraceLog

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

**Type:** Immediate command

**Syntax:** ClearTraceLog

### Performance

Returns the performance data for the FC port specified. Data includes the average rate (MB per second) 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 (0Ah, 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.

**Type:** Modified command (informational only)

**Syntax:** get Performance 1

Use the following table to determine the possible problem based on the Event Message and what action should be taken. The event Tag shown is a short-hand label for use when communicating with Overland Technical Support. The Tag does not appear in the Event Message.

**Table A-1: Event Log Messages and Meanings**

Event Message	Tag	Type	Component	Action/Resolution
[ABORT_TYPE] Data Abort Detected ([BUILD])	F-17	FAIL	Software	Firmware error—Send description of setup and a log of the 'dumpeventlog' command.
[ADDR]: CBstack State=[n], inUse=[n], Ir=[REG]	W-31	WARN	Software	Report back to Overland. Send description of setup and a log of the 'dumpeventlog' command.
[WEBSERVER] login successful: [IP_ADDR] to [IFC_NAME]	I-36	INFO	Software	None.
[WEBSERVER] login unsuccessful: [IP_ADDR] to [IFC_NAME]	I-37	INFO	Software	Make sure using correct account and password.
80331 ECC Multi-bit error detected. Addr: [ADDRESS] STS: [ERR_TYPE]	F-5	FAIL	Hardware	Replace the FC03 card. Send a log of the 'dumpeventlog' command, if possible.
80331 ECC Single-bit error detected. Addr: [ADDRESS] STS: [ERR_TYPE]	W-6	WARN	Hardware	None.
ACKing frame in zero window for TCP Port [n]	W-30	WARN	Software	Report back to Overland. Send description of setup and a log of the 'dumpeventlog' command.
Bridge [ACCOUNT NAME] password was modified.	I-6	INFO	Software	None.
Bridge Identification requested via CLI	I-33	INFO	Software	None.
Bridge Identification requested via QuickNAV	I-34	INFO	Software	None.
Bridge was booted/reset. ([BUILD])	I-7	INFO	Software	None.
Can not get a DevPB	F-13	FAIL	Software	Firmware error—Send description of setup and a log of the 'dumpeventlog' command.
Can't allocate DMA descriptors	F-16	FAIL	Software	Firmware error—Send description of setup and a log of the 'dumpeventlog' command.

Table A-1: Event Log Messages and Meanings

Event Message	Tag	Type	Component	Action/Resolution
CRC error on Mgt Port (MP1)	W-5	WARN	Hardware	Check Ethernet cabling.
Cross Flash Protection error.	I-8	INFO	Software	User tried to flash non-FB2390 code.
Cross Flash Protection error: Wrong hardware.	I-9	INFO	Software	User tried to flash non-FB2390 code.
Cross Flash Protection error: Wrong product.	I-10	INFO	Software	User tried to flash non-FB2390 code.
Data BrkPt LR: [n] FSR: [n] FAR: [n] DCSR: [n]	F-18	FAIL	Software	Firmware error—Send description of setup and a log of the 'dumpeventlog' command.
ECC status reg not zero before 1st re-read	F-2	FAIL	Hardware	Replace the FC03 card. Send a log of the 'dumpeventlog' command, if possible.
E-mail notification failed.	W-9	WARN	Software	Check E-mail Server IP address.
E-mail notification successful.	I-1	INFO	Software	None.
ERROR: Re-read status reg ([REGISTER]) not equal to zero for addr [ADDRESS]	F-3	FAIL	Hardware	Replace the FC03 card. Send a log of the 'dumpeventlog' command, if possible.
Ethernet Link Down on [INTERFACE]	W-22	WARN	Software	Check Ethernet cabling.
Ethernet Link Reset on [INTERFACE]	W-23	WARN	Software	Check Ethernet cabling.
Ethernet Link Up on [INTERFACE]	I-2	INFO	Software	None.
Event Log Cleared	I-11	INFO	Software	None.
Event Log Wrap mode disabled	I-12	INFO	Software	None.
Event Log Wrap mode enabled	I-13	INFO	Software	None.
Failing Instr = [n]	F-19	FAIL	Software	Firmware error—Send description.
Failing Instr = [n], FSR = [n]	F-20	FAIL	Software	Firmware error—Send description of setup and a log of the 'dumpeventlog' command.
Failing Instr = [n], FSR = [n]	F-21	FAIL	Software	Firmware error—Send description of setup and a log of the 'dumpeventlog' command.
Failing Instr = [n], FSR = [n]	F-22	FAIL	Software	Firmware error—Send description of setup and a log of the 'dumpeventlog' command.
Fault Addr Reg = [n]	F-23	FAIL	Software	Firmware error—Send description of setup and a log of the 'dumpeventlog' command.

**Table A-1: Event Log Messages and Meanings**

Event Message	Tag	Type	Component	Action/Resolution
Fault Status Reg = [n]	F-24	FAIL	Software	Firmware error—Send description of setup and a log of the 'dumpeventlog' command.
FC Interface [n] -[n] Loopback Test FAILED	F-6	FAIL	Hardware	Replace the FC03 card. Send a log of the 'dumpeventlog' command, if possible.
FC Interface [n] PCI Config Test FAILED	F-10	FAIL	Hardware	Replace the FC03 card. Send a log of the 'dumpeventlog' command, if possible.
FC Interface [n] Register Test FAILED	F-11	FAIL	Hardware	Replace the FC03 card. Send a log of the 'dumpeventlog' command, if possible.
FC Interface [n] Reset Test FAILED	F-12	FAIL	Hardware	Replace the FC03 card. Send a log of the 'dumpeventlog' command, if possible.
FC Port [n] has failed	W-2	WARN	Hard and/or Soft	Check FC cables/SFPs/switch.
FC Port [n] Link Down detected.	W-7	WARN	Software	Check FC cables/SFPs/switch.
FC Port [n] Link Up. Rate: [DATA_RATE], Topology: [TOPOLOGY].	I-3	INFO	Software	None.
FC Port [n]: Discovery Sem( <i>aphore</i> ) failure -terminating task	F-7	FAIL	Hardware	Replace the FC03 card. Send a log of the 'dumpeventlog' command, if possible.
FC Port [n]: DPC Semaphore failure -terminating task	F-8	FAIL	Hardware	Replace the FC03 card. Send a log of the 'dumpeventlog' command, if possible.
FC Port [n]: Mem Semaphore failure -terminating task	F-9	FAIL	Hardware	Replace the FC03 card. Send a log of the 'dumpeventlog' command, if possible.
Firmware ([BUILD]) restart requested. Bridge will now be reset.	I-14	INFO	Software	None.
FTP login successful: [IP_ADDR] to [IFC_NAME]	I-15	INFO	Software	None.
FTP login unsuccessful: [IP_ADDR] to [IFC_NAME]	I-16	INFO	Software	Make sure using correct account and password.
Initiator [WWN] logged in.	I-4	INFO	Software	None.
Instr Address = [n]	W-32	WARN	Software	Report back to Overland. Send description of setup and a log of the 'dumpeventlog' command.

Table A-1: Event Log Messages and Meanings

Event Message	Tag	Type	Component	Action/Resolution
Internal Error -Interface Ports not started	F-31	FAIL	Software	Firmware error—Send description of setup and a log of the 'dumpeventlog' command.
Invalid map detected in flash	W-33	WARN	Software	Report back to Overland. Send description of setup and a log of the 'dumpeventlog' command.
Jump To Zero Detected. Address = [n] ([BUILD])	F-25	FAIL	Software	Firmware error—Send description of setup and a log of the 'dumpeventlog' command.
Mask Regs =[REGISTER] : [REGISTER] : [REGISTER] : [REGISTER]	F-4	FAIL	Hardware	Replace the FC03 card. Send a log of the 'dumpeventlog' command, if possible.
New bridge image uploaded via [IP_ADDR]: [IFC_NAME]	I-17	INFO	Software	None.
New bridge image uploaded via FTP: [IFC_NAME]	I-18	INFO	Software	None.
New bridge image uploaded via Zmodem	I-19	INFO	Software	None.
OS Panic	F-30	FAIL	Software	Firmware error—Send description of setup and a log of the 'dumpeventlog' command.
POST/Extended POST Error	F-1	FAIL	Hard and/or Soft	Replace the FC03 card. Send a log of the 'dumpeventlog' command, if possible.
Prefetch Abort Detected ([BUILD])	F-26	FAIL	Software	Firmware error—Send description of setup and a log of the 'dumpeventlog' command.
READ BUFFER: Illegal BID requested by host	W-10	WARN	Software	Check host application.
READ BUFFER: Insufficient memory. Please stop data and try again.	W-11	WARN	Software	Stop data I/O and retry.
READ BUFFER: Invalid BID requested by host	W-12	WARN	Software	Check host application.
READ BUFFER: Invalid mode requested by host	W-13	WARN	Software	Check host application.
READ BUFFER: Offset requested by host too high	W-14	WARN	Software	Check host application.
RsvCfct1: Host attempting reserve: [RESERVING_HOST]	I-20	INFO	Software	None.

**Table A-1: Event Log Messages and Meanings**

Event Message	Tag	Type	Component	Action/Resolution
RsvCfct2: Dvc [DEVICE_NAME] Rsvd by [RESERVED_HOST]	I-21	INFO	Software	None.
SCSI Interface [n] PCI Config Test FAILED	F-13	FAIL	Hardware	Replace the FC03 card. Send a log of the 'dumpeventlog' command, if possible.
SesElemDevice: FAULT Requested via SES	F-29	FAIL	Software	Firmware error—Send description of setup and a log of the 'dumpeventlog' command.
SesElemDevice: IDENT Requested via SES	I-35	INFO	Software	None.
SesElemNvram: SES requested NvramSetFromDefaults.	I-5	INFO	Software	None.
SesResetBridge: CLI is Reserved.	I-22	INFO	Software	Another CLI/GUI already has control of bridge.
SesResetBridge: SES requested FirmwareRestart.	I-23	INFO	Software	None.
Software Interrupt Detected (SWI) ([BUILD])	W-34	WARN	Software	Report back to Overland. Send description of setup and a log of the 'dumpeventlog' command.
SWI Number = [VECTOR]	W-35	WARN	Software	Report back to Overland. Send description of setup and a log of the 'dumpeventlog' command.
SWWD [n]	F-32	FAIL	Software	Firmware error—Send description of setup and a log of the 'dumpeventlog' command.
Task Management semaphore creation failure.	W-36	WARN	Software	Report back to Overland. Send description of setup and a log of the 'dumpeventlog' command.
Task Management task creation failure.	W-37	WARN	Software	Report back to Overland. Send description of setup and a log of the 'dumpeventlog' command.
TaskMgt: ABORT TASK issued by [HOST_NAME].	I-24	INFO	Software	Check host HBA/OS/App settings.
TaskMgt: ABORT TASK SET issued by [HOST_NAME].	I-25	INFO	Software	Check host HBA/OS/App settings.
TaskMgt: CLEAR TASK SET issued by [HOST_NAME].	I-26	INFO	Software	Check host HBA/OS/App settings.
TaskMgt: LUN RESET issued by [HOST_NAME].	I-27	INFO	Software	Check host HBA/OS/App settings.

Table A-1: Event Log Messages and Meanings

Event Message	Tag	Type	Component	Action/Resolution
TaskMgt: TARGET RESET issued by [HOST_NAME].	I-28	INFO	Software	Check host HBA/OS/App settings.
TaskMgt: UNSUPPORTED MESSAGE issued by [HOST_NAME].	I-29	INFO	Software	Check host HBA/OS/App settings.
Telnet login successful: [IP_ADDR] to [IFC_NAME]	I-30	INFO	Software	None.
Temperature ([n] C) out-of-range ([n], [n] C). Going offline.	W-4	WARN	Hard and/or Soft	Check cooling fans.
Temperature ([n] C) out-of-range ([n], [n] C). Going offline.	F-15	FAIL	Software	Check Cooling/Fans. If good, replace the FCO3 card. Send a log of the 'dumpeventlog' command, if possible.
Temperature [LEVEL] Level reached at [TEMP] C	W-1	WARN	HW and/or SW	Check cooling fans.
Trace Log Wrap mode disabled	I-31	INFO	Software	None.
Trace Log Wrap mode enabled	I-32	INFO	Software	None.
Unable to connect to an SNTP server	W-8	WARN	Software	Check SNTP server address.
Undefined Instruction Exception Detected ([BUILD])	F-27	FAIL	Software	Firmware error—Send description of setup and a log of the 'dumpeventlog' command.
Unused Vector Exception Detected ([BUILD])	F-28	FAIL	Software	Firmware error—Send description of setup and a log of the 'dumpeventlog' command.
Voltage [SENSOR_NAME] [LEVEL] Level reached at [VOLTAGE] Volts	W-3	WARN	Hard and/or Soft	Possible power supply issue.
WRITE BUFFER: Busy writing flash. Cannot accept another WRITE.	W-15	WARN	Software	Check host application.
WRITE BUFFER: Failure occurred while writing flash.	W-24	WARN	Software	Check host application/retry.
WRITE BUFFER: Illegal BID requested by host	W-16	WARN	Software	Check host application.
WRITE BUFFER: Illegal request: Offset+Length>Capacity	W-17	WARN	Software	Check host application.
WRITE BUFFER: Incorrect BID requested by host	W-18	WARN	Software	Check host application.
WRITE BUFFER: Insufficient memory. Please stop data.	W-25	WARN	Software	Stop data I/O and retry.

**Table A-1: Event Log Messages and Meanings**

Event Message	Tag	Type	Component	Action/Resolution
WRITE BUFFER: Invalid BID requested by host	W-19	WARN	Software	Check host application.
WRITE BUFFER: Memory unavailable. Please stop data.	W-26	WARN	Software	Stop data I/O and retry.
WRITE BUFFER: Not enough memory. Please stop data.	W-27	WARN	Software	Stop data I/O and retry.
WRITE BUFFER: Problem occurred while writing flash.	W-28	WARN	Software	Check host application/retry.
WRITE BUFFER: Reservation conflict. Please save configuration.	W-29	WARN	Software	Check host application/retry.
WRITE BUFFER: Wrong mode requested by host	W-20	WARN	Software	Check host application.
WRITE BUFFER: Wrong offset requested by host	W-21	WARN	Software	Check host application.





## Address

An address is a data structure or logical convention used to identify a unique entity, such as a particular process or network device.

## Back-end

Front-end and back-end are terms used to characterize program interfaces and services relative to the initial user, human or program, of these interfaces and services. A "front-end" application is one that application users interact with directly. A "back-end" application or program serves indirectly in support of the front-end services, usually by being closer to the required resource or having the capability to communicate with the required resource. The back-end application may interact directly with the front-end or, perhaps more typically, is a program called from an intermediate program that mediates front-end and back-end activities.

## Bar Code

The machine-readable representation of a product code. Bar codes are read by a scanner that passes over the code and registers the product code. The width of each black line and the subsequent white space between each line coincides with the numbers of the product code.

## Bridging

Devices that connect and pass packets between two network segments that use the same communications protocol.

## Bus or Channel

A common physical path composed of wires or other media, across which signals are sent from one part of a computer to another. A channel is a means of transferring data between modules and adapters, or between an adapter and SCSI devices. A channel topology network consists of a single cable trunk that connects one workstation to the next in a daisy-chain configuration. All nodes share the same medium, and only one node can broadcast messages at a time.

## Cat5 Cable

Short for *Category 5*, it is network cabling that consists of four twisted pairs of copper wire terminated by RJ-45 connectors. Cat5 cabling supports frequencies up to 100 MHz and speeds up to 1000 Mbps. It can be used for ATM, token ring, 1000BaseT, 100BaseT, and 10BaseT networking.

Cat5 is based on the EIA/TIA 568 Commercial Building Telecommunications Wiring Standard developed by the Electronics Industries Association as requested by the Computer Communications Industry Association in 1985.

## Expansion Slot

Area in a computer that accepts additional input/output boards to increase the capability of the computer.

### **F\_port**

A port in the Fibre Channel fabric where a N\_port attaches.

### **FL\_port**

A port in the Fibre Channel fabric where a NL\_port attaches in an arbitrated loop.

### **Fabric**

Two or more Fibre Channel switches interconnected to physically transmit data between any two N\_ports on a switch or switches.

### **Failover**

The ability to automatically substitute a working system for one which has failed.

### **FC-AL**

Short for *Fibre Channel Arbitrated Loop*. An FC-AL is a Fibre Channel network in which up to 126 systems and devices are connected in a loop topology, with each transmitter connecting to the receiver of the device on its logical right. The Fibre Channel Arbitrated Loop protocol used for transmission is different from Fibre Channel switched and point-to-point protocols. Multiple FC-AL loops can be connected via a fabric switch to extend the network.

### **Firmware**

Software stored in read-only memory (ROM) or programmable ROM (PROM). Firmware is often responsible for the behavior of a system when it is first switched on.

### **Front-end**

See Back-end.

### **Gigabit Ethernet**

Also known as GigE, this is the latest Ethernet standard and uses a one Gigahertz (1000 Hz) clock rate to move data.

### **HBA**

Short for *Host Bus Adapter*. An HBA is an I/O adapter that sits between the host computer's bus and the Fibre Channel loop and manages the transfer of information between the two channels. In order to minimize the impact on host processor performance, the HBA performs many low-level interface functions automatically or with minimal processor involvement.

### **Hot Swap**

The action of components being removed and replaced while the unit is running, with power to either the component or a device still connected to the unit. Not all components are hot swappable. Please read installation and maintenance instructions carefully.

### **Internet**

A global network of networks used to exchange information using the TCP/IP protocol. It allows for electronic mail and the accessing and retrieval of information from remote sources.

### **Initiator Device**

A component which originates a command.

**IP**

Short for *Internet Protocol*. IP specifies the format of packets and the addressing scheme.

**iSCSI**

Short for *Internet SCSI*. iSCSI is an IP-based storage networking standard for linking data storage facilities, developed by the Internet Engineering Task Force (IETF). By carrying SCSI commands over IP networks, iSCSI is used to facilitate data transfers over intranets and to manage storage over long distances. The iSCSI protocol is among the key technologies expected to help bring about rapid development of the storage area network (SAN) market, by increasing the capabilities and performance of storage data transmission. Because of the ubiquity of IP networks, iSCSI can be used to transmit data over local area networks (LANs), wide area networks (WANs), or the Internet and can enable location-independent data storage and retrieval.

**iSNS Server**

Short for *Internet Storage Name Service Server*. This is a server on an iSCSI SAN providing name registration service and query capability to other iSCSI clients per the IETF draft iSNS specification.

**LAN**

Short for *Local Area Network*. A network connecting computers in a relatively small area such as a building.

**LED**

Short for *Light-Emitting Diode*. An LED is a type of diode that emits light when current passes through it. Visible LEDs are used as indicator lights on electronic devices.

**LTO**

Short for *Linear Tape Open*, a technology that was developed jointly by HP, IBM and Certance (Seagate). It is ideally suited for backup, restore and archive applications and provides reliability in both stand-alone and automated environments. An Ultrium format generation 3 cartridge has a capacity of up to 800 GB (2:1 compression) and up to 400 GB native, while the Ultrium format generation 2 has a capacity of up to 400 GB (2:1 compression) and up to 200 GB native.

**LUN**

Short for *Logical Unit Number*. A SCSI or Fibre Channel device identifier. LUN is a subdivision of a SCSI target.

**LVD**

Short for *Low Voltage Differential*. LVD is a method of powering SCSI cables that will be formalized in the SCSI-3 specifications. LVD uses less power than the current differential drive (HVD), is less expensive, and allows for higher speeds such as those of Ultra-2 SCSI. LVD requires 3.3 volts (versus 5 volts for HVD).

**MAC Address**

Short for *Media Access Control address*, a hardware address that uniquely identifies each node of a network.

### Mapping table

A table indexed by sequential LUN values, indicating the selected BUS:TARGET:LUN devices. Mapping tables are used by routers and bridges like the GEOi to perform Ethernet-to-SCSI pathing.

### MD5 Algorithm

MD5 is a way to verify data integrity, and is much more reliable than checksum and many other commonly used methods.

### N\_port

A port attached to a node used with point-to-point or fabric configurations.

### Network Interface Card (NIC)

A board that provides network communication capabilities to and from a computer.

### NDMP

Short for *Network Data Management Protocol*. A protocol standard used by some Network Attached Storage systems to provide an industry standard means to do backup and restores of the NAS system without the need for 3rd party agents to be installed on the NAS device. Also see NDMP.org for further details.

### NL\_port

A port attached to a node in Fibre Channel arbitrated loop or fabric loop configurations.

### NVRAM

Abbreviation of Non-Volatile Random Access Memory, a type of memory that retains its contents when power is turned off.

### PTP

Short for *Point-to-Point*. PTP is the common mode of attachment to a single host. PTP is sometimes used to attach to a Fibre Channel switch for SAN connectivity.

### RETMA

Short for *Radio-Electronics-Television Manufacturers' Association*. It is the common name given for a 19-inch distribution frame rack for mounting components.

### Router

A router is a device that enables connectivity between Ethernet network segments.

### SAN

Short for *Storage Area Network*. A shared storage architecture connecting computers and storage devices for online data access. Each connected system can directly access any attached storage device. Usually refers to the network behind servers that links one or more servers to one or more storage systems.

### SCSI

Short for *Small Computer System Interface*. SCSI is an industry standard for connecting peripheral devices and their controllers to an initiator. Storage devices are daisy-chained together and connected to a host adapter. The host adapter provides a shared bus that

attached peripherals use to pass data to and from the host system. Examples of devices attached to the adapter include disk drives, CD-ROM discs, optical disks, and tape drives. In theory, any SCSI device can be plugged into any SCSI controller.

### SCSI addressing

Each device supported by a SCSI adapter has its own unique SCSI address, which dictates the device's priority when arbitrating for access to the SCSI bus. A SCSI address of 7 has the highest priority. For a fast/wide SCSI adapter that supports up to 16 devices, the next highest priority address is 6, then 5, 4, 3, 2, 1, 0, 15, 14, 13, 12, 11, 10, 9, and 8. The narrow SCSI adapter supports up to eight devices, including itself. The SCSI address 7 has the highest priority, followed by 6, 5, 4, 3, 2, 1, and 0.

### SCSI bus

A SCSI bus provides a means of transferring data between SCSI devices. A SCSI bus is either an 8- or 16-bit bus that supports up to 8 or 16 devices, including itself. The bus can consist of any mix of initiators and targets, with the requirement that at least one initiator and one target must be present.

### SCSI device

A SCSI device is a single unit on a SCSI bus that originates or services SCSI commands. A SCSI device is identified by a unique SCSI address. SCSI devices can act as initiators or targets.

### SCSI port

A SCSI port is an opening at the back of a router that provides connection between the SCSI adapter and SCSI bus.

### Storage Area Network

See *SAN*.

### Tape Cartridge

A magnetically coated strip of plastic in a plastic housing on which data can be encoded. Storing data on tapes is considerably cheaper than storing data on disks. Tapes also have large storage capacities, ranging from a few hundred kilobytes to several gigabytes. They are generally used for long-term storage and backup, or for transporting large amounts of data. Tapes come in a variety of sizes and formats.

### Tape Drive

A device, that reads data from and writes it onto a tape.

### Target

A target is a device (peripheral) that responds to an operation requested by an initiator (host system). Although peripherals are generally targets, a peripheral may be required to act temporarily as an initiator for some commands (for example, SCSI COPY command).

### Telnet

A terminal emulation program for TCP/IP networks such as the Internet. The Telnet program runs on a computer and connects it to a server on the network. You enter commands through the Telnet program and they will be executed as if you were entering them directly on the server console. This enables you to control the server and communicate

with other servers on the network. To start a Telnet session, you must log in to a server by entering a valid user name and password. Telnet is a common way to remotely control Web servers.

### **Terminator**

A terminator refers to the electrical connection at each end of a SCSI bus. The terminator is composed of a set of resistors, or possibly other components. The function of a terminator is to provide a pull-up for open collector drivers on the bus, and also impedance matching to prevent signal reflections at the ends of the cable. SCSI buses require that a terminator be placed on the SCSI connector on the last SCSI peripheral. Data errors may occur in a SCSI bus that is not terminated.

### **Topology**

Logical layout of the parts of a computer system or network and their interconnections. There are two types of topology: physical and logical. The physical topology of a network refers to the configuration of cables, computers, and other peripherals. Logical topology is the method used to pass the information between workstations.

### **USB (Universal Serial Bus) Port**

A hardware interface for low-speed peripherals such as the keyboard, mouse, joystick, scanner, printer, and telephony devices.



<b>A</b>		
Advanced CLI Configuration screen.....	3-14	
alarm conditions .....	1-4	
<b>B</b>		
benefits .....	1-2	
Bridge Configuration screen .....	3-12	
browsers .....	3-1	
<b>C</b>		
cabling examples.....	2-5	
CLI		
abbreviations.....	4-2	
examples.....	4-3	
Immediate commands .....	4-1	
Modified commands.....	4-1	
rules.....	4-1	
syntax .....	4-2	
connections.....	1-1	
conventions.....	PR-iii	
customer support .....	PR-iv	
<b>E</b>		
electrostatic discharge information .....	PR-iv	
Ethernet port.....	1-3	
Ethernet Port Configuration screen .....	3-5	
<b>F</b>		
face plate layout.....	1-1	
Fibre Channel Configuration screen .....	3-8	
Firmware Update screen.....	3-13	
<b>H</b>		
Help screen.....	3-16	
<b>I</b>		
indicators.....	1-1	
installation		
additional items .....	2-1	
cabling examples.....	2-5	
locations.....	2-3	
procedure.....	2-1	
interfaces .....	1-2	
<b>J</b>		
JavaScript .....	3-1	
<b>L</b>		
Launch screen .....	3-2	
Login screen .....	3-2	
<b>M</b>		
management port setup.....	2-9	
Mapping screen .....	3-11	
maximum link distances .....	2-9	
<b>O</b>		
Overland technical support .....	PR-iv	
<b>Q</b>		
QuickNAV software .....	2-10	
<b>R</b>		
Restart Firmware screen.....	3-15	
<b>S</b>		
SCSI buses.....	1-3	
SCSI Configuration screen .....	3-7	
SNMP screen.....	3-6	
specifications .....	1-4	
status screen .....	3-3	
Storage Management Screen screen.....	3-9	
<b>T</b>		
technical support.....	PR-iv	
testing for the FCO3 .....	2-15	
Time & Date screen .....	3-10	
typographic conventions .....	PR-iii	

