



Alcatel-Lucent

OmniAccess SafeGuard Controller

Installation Guide

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Preface

In this preface:

- *About This Guide*
 - *Related Publications*
 - *Guide Organization*
-

About This Guide

This guide describes the Alcatel-Lucent SafeGuard Controller™. The guide provides detailed installation instructions and technical specifications for the controller.

Audience

This guide is intended for experienced network administrators and networking or computer technicians who are responsible for installing the SafeGuard Controller.

Conventions Used in This Guide

Table 1 lists the text conventions used in this guide.

Table 1 Text Conventions

Convention	Description
<code>courier</code>	Command name or screen text.
<code>courier bold</code>	Command text to be entered by the user.
<i>italic</i>	Book title, menu item, or new term.

This guide uses the following icons and formats to highlight special messages in the text:



NOTE: This format highlights information that is important or has special interest.



CAUTION: This format highlights information that will help you prevent damage to equipment or loss of data.



WARNING: This format highlights safety information that is related to electric shock or bodily injury.

Related Publications

For information about configuring and managing the SafeGuard Controller, refer to the following guides:

- *OmniVista SafeGuard Manager Administration Guide*

Describes how to manage the OmniAccess SafeGuard Controller using the OmniVista SafeGuard Manager software.

- *OmniAccess SafeGuard OS Administration Guide*

Provides concepts and configuration instructions for the major features of OmniAccess SafeGuard OS and its supported products, which includes End Point Validation (EPV) the integral component for using ICS.

- *ICS Dissolvable Agent for SafeGuard Administration Guide*

Describes how to configure the Integrity Clientless Security (ICS) module of the Alcatel-Lucent Network Admission Control (NAC).

Additional Resources

Alcatel-Lucent publishes documents for customers at: www.alcatel-lucent.com

Guide Organization

Table 2 briefly describes each chapter and appendix in this guide.

Table 2 Guide Organization

Chapter or Appendix	Contents
<i>Chapter 1, Overview of the SafeGuard Controller</i>	An overview of the SafeGuard Controller and its major hardware features.
<i>Chapter 2, Site Preparation and Installation</i>	Preparing the installation site, installing the SafeGuard Controller, and connecting cables.
<i>Appendix A, Technical Specifications</i>	Technical specifications for the SafeGuard Controller.
<i>Appendix B, Safety and Regulatory Compliance</i>	Safety recommendations and regulatory agency compliance statements for the SafeGuard Controller.
<i>Appendix C, Customer Assistance and Product Support</i>	Technical support, customer service, and return materials authorization (RMA) procedures.



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chapter

1

Overview of the SafeGuard Controller

In this chapter:

- *About the SafeGuard Controller*
- *Hardware Overview*
- *Power Supplies*
- *Small Form-Factor Pluggable (SFP) Modules*
- *System and Port LEDs*

About the SafeGuard Controller

The Alcatel-Lucent SafeGuard Controller is the first secure networking controller that enables network managers to see all LAN traffic up to Layer 7 and associates the traffic with users and applications. The SafeGuard Controller enforces access policies and controls malware infection in real time, achieving performance and capabilities previously not possible.

The SafeGuard Controller provides the following functionality:

- Prevents network meltdown by automatically detecting and containing the spread of malware and worms
- Leverages existing authentication infrastructure (Windows Active Directory, RADIUS, and Lightweight Directory Access Protocol)
- Checks the security posture of the host (network access point, and Trusted Computing Group)
- Supports compliance initiatives through user-based auditing
- Exercises file-level control over information access and transmission
- Provides enforcement based on user- and application-defined policies

This chapter presents an overview of the SafeGuard Controller hardware, which is available in two models with two different power options. It shows physical views and describes the interfaces of the front and rear panels for both models.

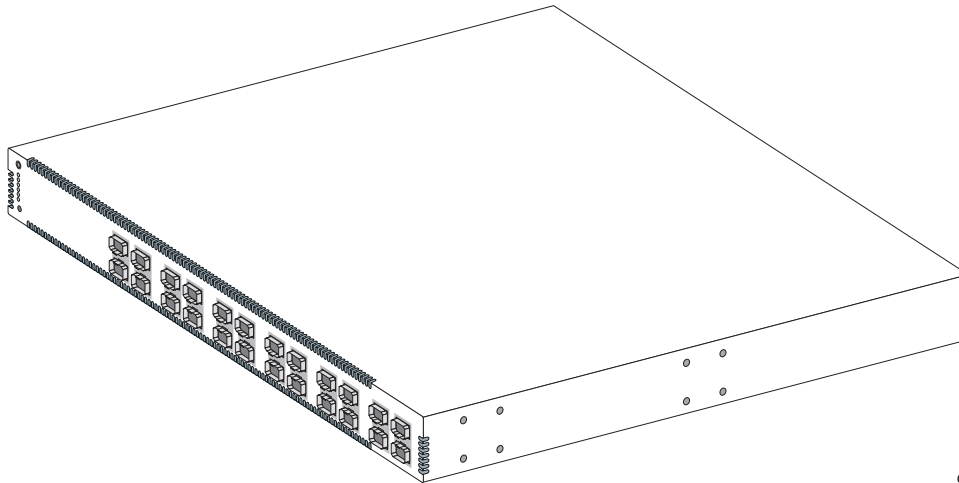
Hardware Overview

The SafeGuard Controller is a compact enclosure 1.7 inches (4.4 cm) high that is designed to be installed in a standard 19-inch equipment rack or on a table or shelf (*Figure 1*). The SafeGuard Controller features front-panel ports implemented as small form-factor pluggable (SFP) modules. The rear panel of the SafeGuard Controller provides management ports, a compact flash slot, and power connectors. Internal fans draw air from the front of the SafeGuard Controller and exhaust it at the rear.

The SafeGuard Controller is available in the following models:

- OAG2400-ACAC with 24 ports and dual redundant AC power supplies
- OAG2400-ACDC with 24 ports, one AC power supply, and one DC supply input
- OAG1000-ACAC with 10 ports and dual redundant AC power supplies
- OAG1000-ACDC with 10 ports, one AC power supply, and one DC supply input

Figure 1 Secure LAN Controller (OAG2400 shown)

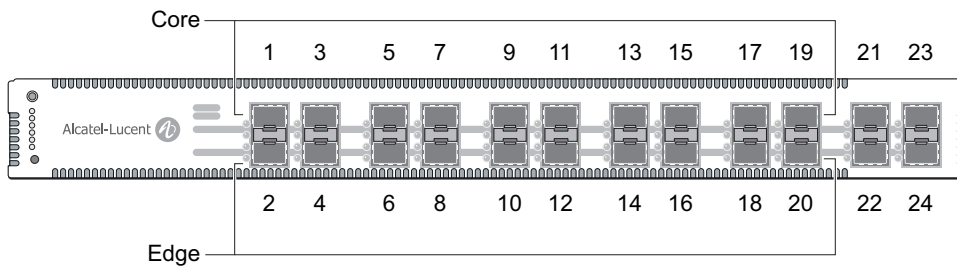


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Front-Panel Interfaces

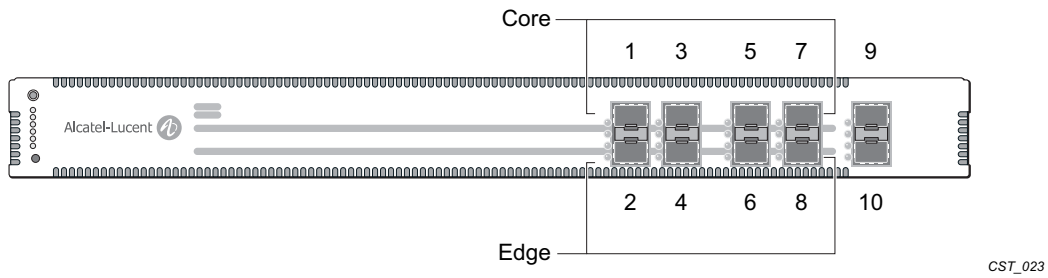
The OAG2400 SafeGuard Controller has 24 front-panel ports ([Figure 2](#)); the OAG1000 SafeGuard Controller has 10 front-panel ports ([Figure 3](#)). Each port has two associated LEDs. One LED indicates link status. You can program the other LED to indicate activity, duplex mode, or speed for the port.

Figure 2 OAG2400 Front Panel



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Figure 3 OAG1000 Front Panel



Each SafeGuard Controller model has secured port pairs that act as bridged ports. These ports can be configured to be synchronized, so that when one port in the pair comes up, its paired port comes up. Similarly, when one port in the pair goes down, its paired port goes down. Within each pair, the top port (odd-numbered) is used to connect the SafeGuard Controller to the upstream core or distribution switch. The bottom port (even-numbered port) is used to connect the SafeGuard Controller to the downstream access (wire-closet) switches. The OAG2400 has 10 core ports and 10 edge ports. The OAG1000 has four network ports and four host ports.

Both SafeGuard Controller models have extensibility ports that include a reserved high-availability port for connecting a peer SafeGuard Controller of the same type and either one (OAG1000) or two (OAG2400) ports for monitoring. In addition, the OAG2400 has a port that is reserved for future use. [Table 3](#) lists the functions of the extensibility ports.

Table 3 Extensibility Ports

OAG2400			OAG1000		
Port	Label	Purpose	Port	Label	Purpose
21	EXT1	Monitoring	9	EXT1	Monitoring
22	EXT2	Monitoring	10	EXT2	High availability
23	EXT3	Future development			
24	EXT4	High availability			

Each front-panel port can be customized by inserting the proper SFP module. The SFP modules supported are single-mode and multi-mode fiber and single-speed and triple-speed copper modules. You can mix and match different types in the same unit. For more information about the SFP modules, see [Small Form-Factor Pluggable \(SFP\) Modules on page 18](#).

To comply with the IEEE 802.3ab standard, by default, the front-panel 10/100/1000 ports of the SafeGuard Controller are capable of auto-negotiation for speed and duplex settings. For example, with auto-negotiation enabled by default, the port detects the interface settings and auto-configures support for the full-duplex or fastest line speed,

depending on the speed and duplex settings of the attached interfaces. If a specific speed for the interface is important, we recommend that you specify the speed of the interface using the command line interface (CLI). Auto-negotiation is available on the 10/100/1000 ports. Half-duplex operation is supported only at the 10/100 speed.

SafeGuard Controller Rear Panel

The rear panel of the SafeGuard Controller includes management ports, a compact flash slot, and power connectors. The SafeGuard Controller is available with dual AC power supplies ([Figure 4](#)) or one AC power supply and one DC power supply ([Figure 5](#)).

Figure 4 SafeGuard Controller Rear Panel—Dual AC Power Supplies

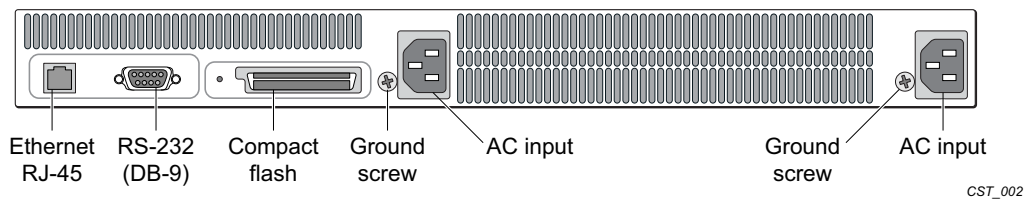
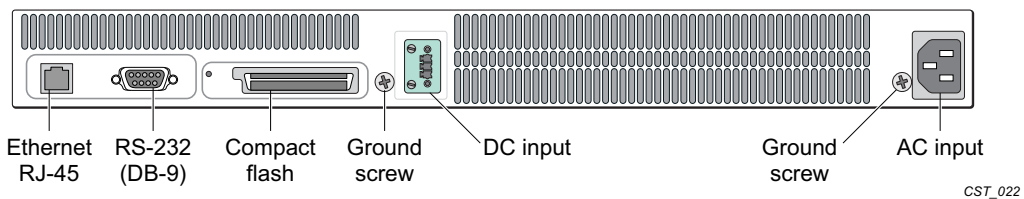


Figure 5 SafeGuard Controller Rear Panel—AC and DC Power Supplies



The SafeGuard Controller management ports are:

- One RJ-45 10/100 BASE-T Ethernet port for out-of-band IP-based management
- One RS-232 management port (male DB-9, DTE) to access the CLI

The compact flash slot provides a way to store configuration files.

The SafeGuard Controller provides two power input connectors, either two AC connectors or an AC and a DC connector. Although a single power connection is adequate to operate the SafeGuard Controller, connecting both power supplies provides backup power that can prevent unscheduled downtime.

Power Supplies

The SafeGuard Controller is available in either of the following power configurations:

- Dual AC power supplies
- One AC power supply and one DC supply input

The system is fully functional with one power cord connected; however, to ensure that your system is operational at all times, install both power cords and make sure that both power cords are connected to different circuits. When one power source fails, the secondary power source becomes the new power source for the SafeGuard Controller.

For uninterrupted operation, it is preferred that one circuit have battery backup. In this way, even if one circuit malfunctions, the system still remains operational with the help of the power supplied by the secondary power source.

The AC power supply for the SafeGuard Controller has a voltage range from 100 to 240 VAC with a maximum current of 2.2 A at 100 VAC. The DC power input has a maximum current of 3.1 A at 48 VDC.

With both AC power supplies connected, the maximum power that is drawn is no more than 2.2 A at 100 VAC from an AC supply or 3.1 A at 48 VDC from a DC supply.



CAUTION: The SafeGuard Controller has redundant power supplies. You must disconnect both power cords to completely remove power from the unit.

Small Form-Factor Pluggable (SFP) Modules

The SafeGuard Controller supports both fiber and copper SFP modules. You can mix and match different types in the same unit.

The SafeGuard Controller uses any of the following types of SFP modules:

- 1000BASE-LX single-mode fiber
- 1000BASE-SX multi-mode fiber
- 10/100/1000BASE-T



NOTE: SFP modules can operate at 10, 100, or 1000 Mbps in full-duplex mode or 10 or 100 Mbps in half-duplex mode.

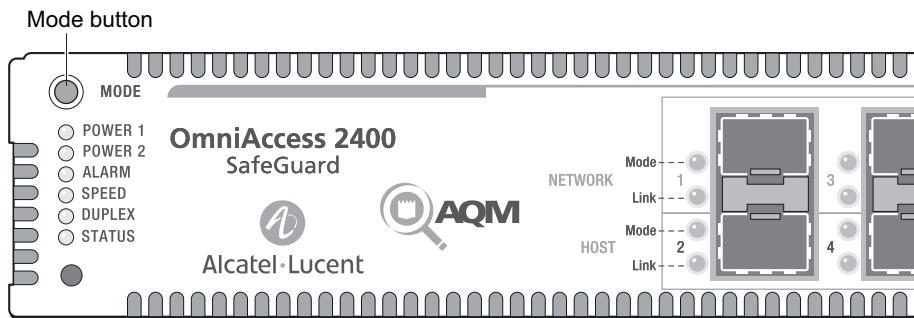


NOTE: Not all SFP modules support 10/100 operation. To ensure guaranteed operation of the system, obtain all SFP modules from Alcatel-Lucent.

System and Port LEDs

The front panel of the SafeGuard Controller provides LEDs to indicate operating status of the SafeGuard Controller system and ports (*Figure 6*).

Figure 6 Front-Panel LEDs (OAG2400 Shown)



At the left side of the front panel are six LEDs and a push button labeled Mode. The top three LEDs indicate power and alarm status for the SafeGuard Controller system; the three lower LEDs are linked to the port LEDs and indicate the operating mode for one port LED in each pair.

Each port has two associated LEDs. The upper LED is bicolor amber and green, and the lower LED is green. The lower LED always indicates link status for the port. The upper LED indicates one of three possible conditions, depending on which mode has been selected using the Mode button at the upper left corner of the front panel. Pushing the Mode button cycles through the modes and selects speed, duplex, or status as the condition being indicated by the upper port LEDs.

Only one of the three port mode LEDs is on at any time. Pushing the Mode button cycles through these three LEDs and changes the operating mode of the upper LEDs for the ports. For example, when the Speed LED is on, the upper port LEDs indicate operating speed for the ports. If you push the Mode button until the Status LED is on, the upper port LEDs indicate the port protection mode.

Table 4 describes the meanings of the system and port mode LEDs; *Table 5* describes the meanings of the port LEDs.

Table 4 System and Port Mode LEDs

Label	Color	Meaning
Power1	Green	Lights when power supply 1 is on.
Power2	Green	Lights when power supply 2 is on.
Alarm	Amber	Lights when an alarm condition exists.
Speed	Green	Lights when the upper port LED indicates operating speed: 10, 100, or 1000 Mbps.
Duplex	Green	Lights when the upper port LED indicates port duplex mode: full-duplex or half-duplex.
Status	Green	Lights when the upper port LED indicates port protection mode: monitor, pass-through, or protect.

Table 5 Port LEDs

LED Position	Mode or Type	Function	Color and Meaning
Upper	Speed	Port operating speed	Off: 10 Mbps Green: 100 Mbps Amber: 1000 Mbps
	Duplex	Port duplex mode	Off: Link down Amber: Half-duplex Green: Full-duplex Blinking: Collision
	Status	Port protection mode	Off: Pass-through Amber: Monitor Green: Protect
Lower	Link	Port link status	Off: Link down Green: Link up Blinking: Tx or Rx activity



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chapter

2

Site Preparation and Installation

In this chapter:

- *Preparing for Installation*
 - *Checking the Package Contents*
 - *Installing the SafeGuard Controller on a Table or Shelf*
 - *Installing the SafeGuard Controller in a Rack*
 - *Connecting Power to the SafeGuard Controller*
 - *Installing Small Form-Factor Pluggable (SFP) Modules*
 - *Connecting Cables*
 - *Initial Configuration*
 - *Troubleshooting*
-

Preparing for Installation

The Alcatel-Lucent SafeGuard Controller can be installed on a shelf or tabletop or in a standard 19-inch equipment rack. When you plan the installation of the SafeGuard Controller, consider space, weight, power, rack, and environmental requirements. For a rack-mounted SafeGuard Controller, make sure that the rack meets the requirements listed in [Rack Requirements on page 23](#).



NOTE: Before you install the SafeGuard Controller, be sure to review the safety guidelines in [Appendix B, Safety and Regulatory Compliance](#).

Space and Weight Requirements

Allow adequate space for unpacking and maneuvering the SafeGuard Controller during installation. You will need space to set aside the packing materials and accessory boxes during the installation process.

For a table or shelf installation, allow an area at least 18 inches wide and 19 inches deep. Allow for these dimensions plus any additional clearances for proper front-to-back cooling of the system. No side, top, and bottom clearances are required because the SafeGuard Controller is cooled from the front to the back. This cooling arrangement allows several systems to be stacked one on top of the other for either table or rack-mounted configurations.

The SafeGuard Controller weighs approximately 20.0 pounds (9.1 kg). It can be easily installed and mounted by two people. If you are installing more than one SafeGuard Controller on a table, make sure that the table can support the combined weight of all the controllers.

Power Requirements

You can provide power for the SafeGuard Controller in either of the following ways:

- For a SafeGuard Controller with two AC power supplies, use two 110 VAC power input sources.
- For a SafeGuard Controller with one AC power supply and one DC supply input, use one 110 VAC power source and one 48 VDC power source.

The AC power supply for the SafeGuard Controller has a voltage range from 100 to 240 VAC with a maximum current of 2.2 A at 100 VAC. The DC power input has a maximum current of 3.1 A at 48 VDC.

For either power configuration, a single power source can operate the SafeGuard Controller, and the second source provides backup.

We recommend that you provide a 10-A fuse on your external DC connection to safeguard against connecting the power source with the incorrect polarity.

The SafeGuard Controller does not have a power switch. To be able to disconnect the power cords when needed, make sure that the power connections are easily accessible.

Make sure that the AC power input source connection is within 8 feet of the SafeGuard Controller installation location.

Rack Requirements

The SafeGuard Controller is designed to fit into an industry-standard, 19-inch four-post or two-post (telco-style) equipment rack. The rack should meet the requirements listed in [Table 6](#).

Table 6 Rack Requirements

Rack type	EIA standard 19-inch, four-post or two-post
Vertical rack space needed	1 RU—1.7 inches (4.4 cm) for each installed SafeGuard Controller
Horizontal depth needed	18.6 inches (47.2 cm)
Stability	Bolted to the floor, ceiling, wall, or other secured racks
Grounding	Grounded
Strength	Support for 20.0 pounds (9.1 kg) for each installed SafeGuard Controller

Environmental Requirements

To ensure optimal system operation, make sure that the installation site meets the environmental requirements listed in [Table 7](#).

Table 7 Environmental Requirements

Operating temperature	0° C to +40° C
Storage temperature	0° C to +40° C
Operating relative humidity	5 to 90% (non-condensing)
Storage relative humidity	5 to 95% (non-condensing)

Grounding Options

The recommended grounding method for the SafeGuard Controller is to use the grounding stud immediately to the left of each power input connector. Connect this stud to earth ground (for example, a grounded rack).

Recommended Cables

Fiber-optic SFP modules require fiber-optic cables with LC connectors. Depending on the type of SFP module, use either of the following cables:

- 1000BASE-LX SFP module: single-mode, 1310 nm, 10-km range
- 1000BASE-SX SFP module: multi-mode, 850 nm, 550-m range

Copper SFP modules require a Category 5 or better cable with RJ-45 connectors. Depending on the connected device, you can use either crossover or straight-through cables. [Table 8](#) lists the recommended cable types.

Table 8 Using Crossover or Straight-through Cables

SafeGuard Controller to . . .	Crossover Cable	Straight-Through Cable
Downstream switch or router	Yes	No
Upstream switch	Yes	Yes

To connect the Ethernet management port on the rear panel, use a Category 5 or better Ethernet cable with RJ-45 connectors. For connector specifications, see [Appendix A, Technical Specifications](#).

To connect the serial console port on the rear panel, use an RS-232 cable with a DB-9 connector. For connector specifications, see [Appendix A, Technical Specifications](#).

Checking the Package Contents

Make sure that you received the following components:

- Secure LAN Controller
- Two power cords:
 - For an ACAC model, two AC power cords (18 AWG, 125 V, 10 A)
 - For an ACDC model, one AC power cord (18 AWG, 125 V, 10 A) and one three-position 2.8-mm terminal plug for 48-VDC connection
- Documentation on a CD-ROM

- RS-232 (DB-9) configuration cable
- Mounting accessories, including:
 - Four rubber feet for installing the SafeGuard Controller on a table
 - Two brackets for installing the SafeGuard Controller in a rack
 - Six Phillips screws for attaching the brackets to the SafeGuard Controller
- Disposable ESD wrist strap
- SFP modules and cables as determined when the SafeGuard Controller was ordered



NOTE: You must provide rack-mounting screws appropriate to your equipment rack and the cable for use with the DC terminal plug.

Installing the SafeGuard Controller on a Table or Shelf

To install the SafeGuard Controller on a table or shelf, follow these steps:

- 1 Lift the controller carefully from the packing material and place it upside down on a flat surface.
- 2 Locate the recessed areas on the bottom of the controller, and attach the four rubber feet from the mounting kit.
- 3 Place the controller on a table or shelf close to an AC power source.

For the ACDC model, an additional 48-VDC power source should be available.

For instructions on connecting the power cords, see [Connecting Power to the SafeGuard Controller on page 29](#).

Installing the SafeGuard Controller in a Rack

You can attach the rack-mounting brackets to the SafeGuard Controller in either of the following positions:

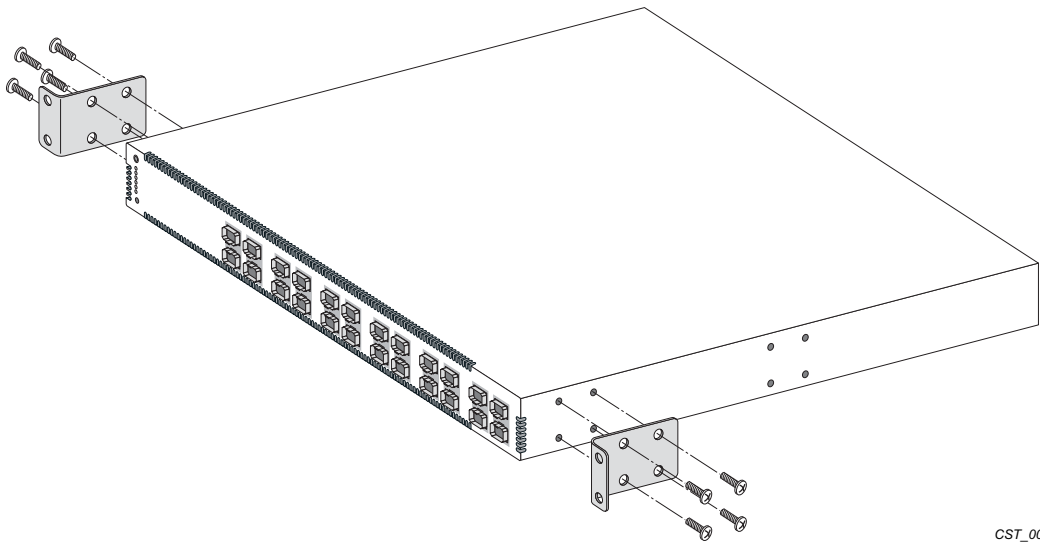
- At the front of the controller to install it in a four-post rack
- At the middle of the controller to install it in a two-post (telco-type) rack

Four-Post Rack

To install the SafeGuard Controller in a four-post rack, follow these steps:

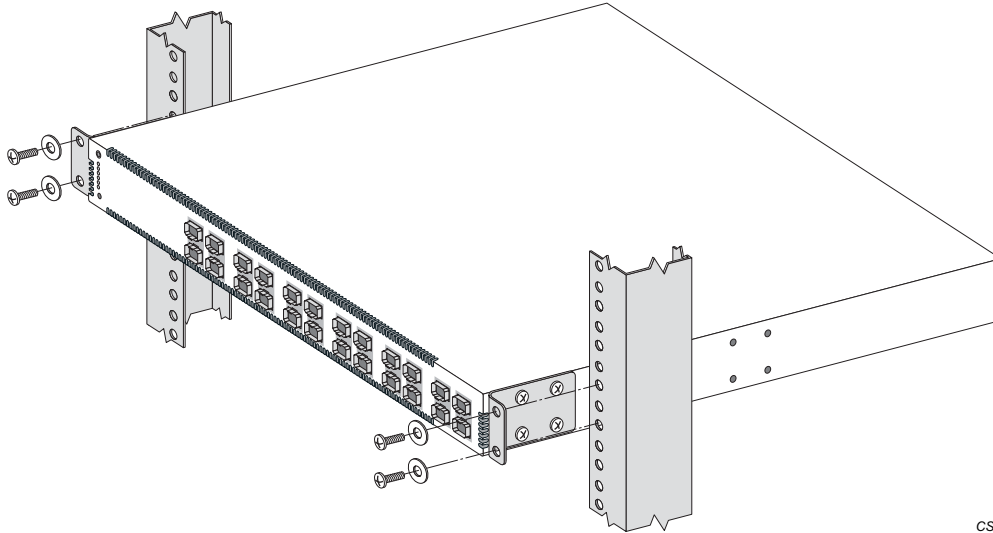
- 1 Lift the controller carefully from the packing material, and set it on a level work surface.
- 2 Using the screws from the mounting accessory kit, attach the rack-mounting brackets, as shown in [Figure 7](#).

Figure 7 Attaching the Rack-Mounting Brackets at the Front



CST_005

- 3 Slide the controller into the rack, and align the mounting holes.
- 4 Using screws appropriate to the equipment rack, attach the brackets to the rack, as shown in [Figure 8](#).

Figure 8 Installing the SafeGuard Controller in a Four-Post Rack

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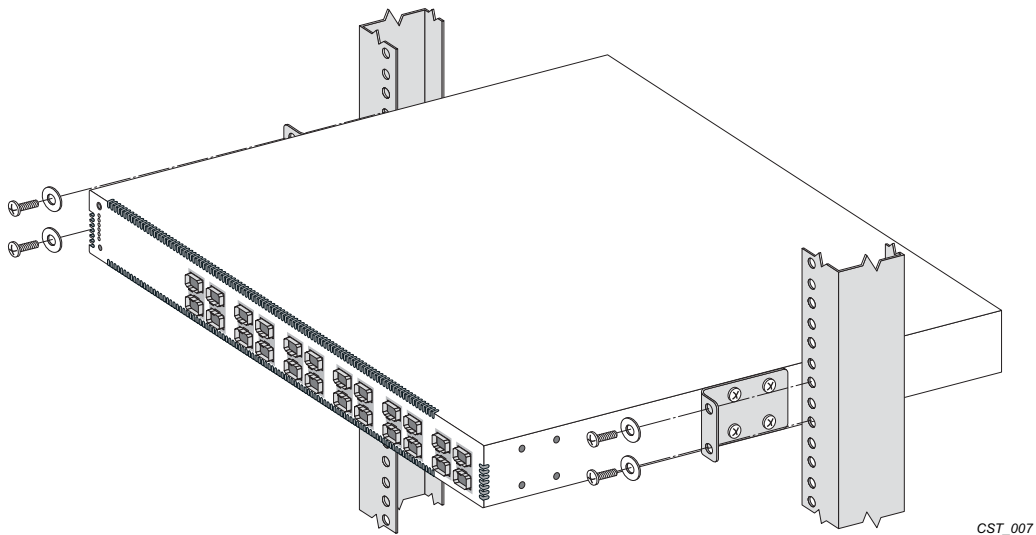
For instructions on connecting the power cords, see [Connecting Power to the SafeGuard Controller on page 29](#).

Two-Post Rack

To install the SafeGuard Controller in a two-post rack, follow these steps:

- 1 Lift the controller carefully from the packing material, and set it on a flat work surface.
- 2 Using the screws from the mounting accessory kit, attach one rack-mounting bracket to the middle of each side, as shown in [Figure 9](#).

Figure 9 Attaching the Rack-Mounting Brackets at the Middle



- 3 Slide the controller into the rack, and align the mounting holes.
- 4 Using screws appropriate to the equipment rack, attach the brackets to the rack, as shown in [Figure 9](#).

For instructions on connecting the power cords, see [Connecting Power to the SafeGuard Controller on page 29](#).

Connecting Power to the SafeGuard Controller

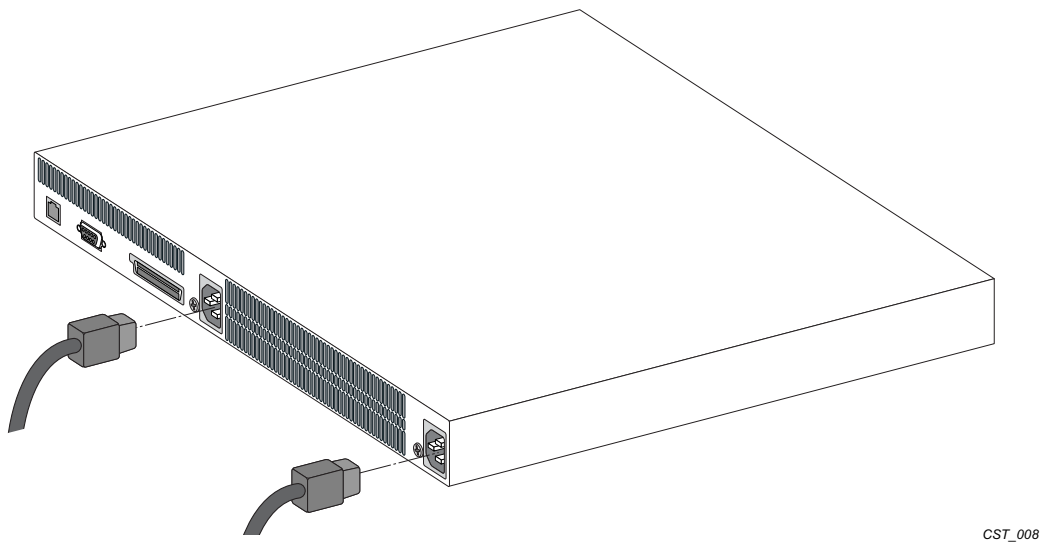
This section describes how to connect power to the AC and DC power input connections on the rear panel of the SafeGuard Controller. An AC power cord is provided for each AC power input on the SafeGuard Controller. For the DC power input, you must attach an appropriate three-wire cable to the provided DC connector.

AC Power

To connect the SafeGuard Controller to an AC power source, follow these steps:

- 1 Connect an AC power cord to an AC power connector on the SafeGuard Controller rear panel, as shown in [Figure 10](#).

Figure 10 Connecting AC Power Cords (Model ACAC Shown)



CST_008

- 2 Connect the other end of the power cord to a grounded AC outlet.
- 3 For an ACAC model in a redundant power configuration, repeat these steps to connect the second AC power supply.

For more information about power requirements for the SafeGuard Controller, see [Appendix A, Technical Specifications](#).

DC Power

The OAG2400-ACDC and OAG1000-ACDC SafeGuard Controllers provide a DC power input connector that allows you to use a 48-VDC power source as backup for the system. You must provide the appropriate cable for use with the connector.

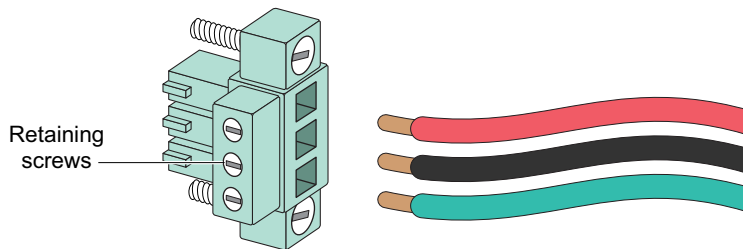


NOTE: We recommend that you provide a 10-A fuse on your external DC connection to safeguard against connecting the power source with the incorrect polarity.

To attach the connector to a three-wire cable, follow these steps:

- 1 Strip 1/8 inch from the end of each wire.
- 2 Loosen the retaining screws along the side of the connector (see [Figure 11](#)).

Figure 11 Attaching the DC Connector to a Cable



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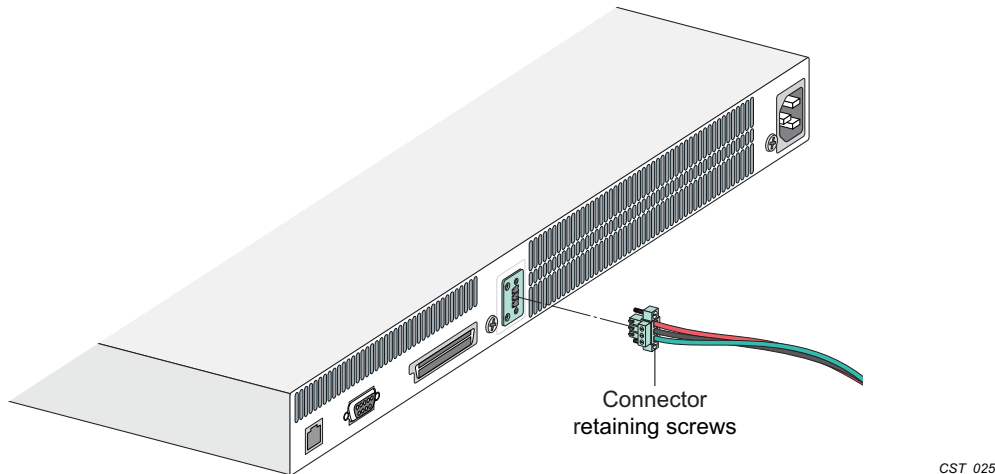
- 3 Insert each wire firmly into the connector, and tighten the retaining screw to secure the wire. Make sure that no wire is exposed beyond the connector housing.

With the retaining screws at the left, the order of wires from top to bottom is red, black, and green.

To connect the SafeGuard Controller to a DC power source, follow these steps:

- 1 Turn off the DC power at the source.
- 2 Connect the DC connector on the cable to the SafeGuard Controller, as shown in [Figure 12](#).

Figure 12 Connecting the DC Power Cord



- 3 Align and tighten the captive retaining screws at the top and bottom of the connector.
- 4 Connect the other end of the DC power cable to the DC power source.
- 5 Turn on the DC power at the source.

Installing Small Form-Factor Pluggable (SFP) Modules

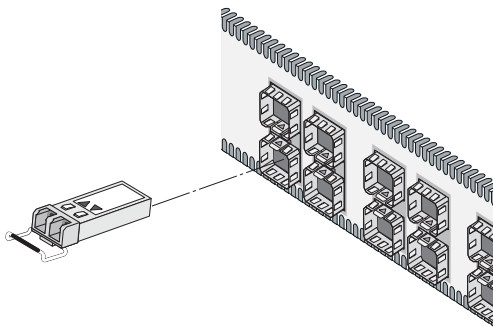
To communicate reliably over fiber-optic cables, make sure that the wavelength of each port matches the wavelength specifications on the other end of the cable. Fiber SFP modules inserted into odd-numbered ports should be oriented so that the send (Tx) and receive (Rx) marks are facing up, and modules inserted into even-numbered ports should be oriented so that the Tx and Rx marks are facing down.

To avoid damaging the cables, connectors, and optical interfaces, always disconnect cables from SFP modules before inserting or removing the modules. To prevent unnecessary wear and tear, insert or remove SFPs only when necessary.

The insertion procedure for copper and fiber SFP modules is the same. To insert an SFP module, follow these steps:

- 1 Put on the ESD-preventive wrist strap, and attach the leash to a grounded bare metal surface on the SafeGuard Controller or equipment rack.
- 2 Identify the Tx and Rx marks on the top of the SFP module.
- 3 Align the module with the SFP module slot, and push it firmly into place until it clicks into place and is completely seated (see [Figure 13](#)).

Figure 13 Inserting an SFP Module



CST_013

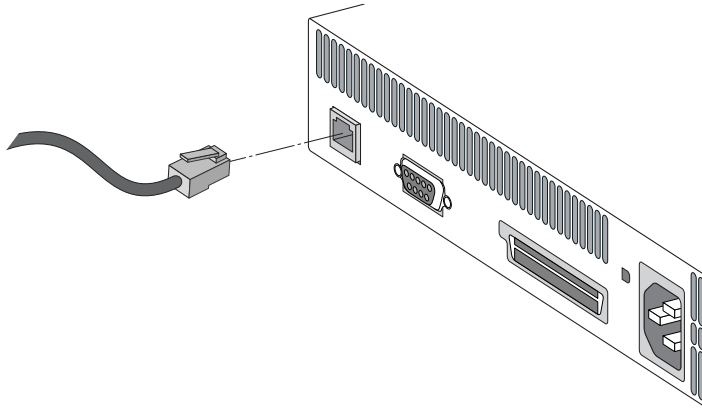
- 4 Check that the SFP module is completely seated by gently pulling on it to see if it comes out of the slot.

Connecting Cables

Connect the front-panel ports using cables appropriate to the installed SFP modules:

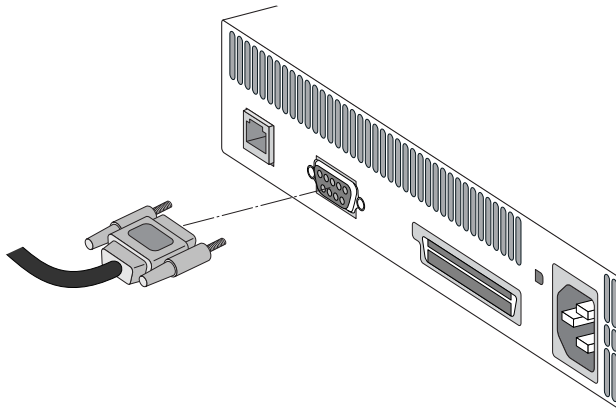
- Single-mode or multi-mode fiber cable with LC connectors
- Category 5 or better copper cable with RJ-45 connectors
- For Gigabit Ethernet connections, Category 5e copper cable with RJ-45 connectors

Connect the Ethernet management port using Category 5 or better cable with RJ-45 connectors, as shown in [Figure 14](#).

Figure 14 Connecting the Ethernet Management Port

CST_012

Connect the serial console port using an RS-232 cable with a DB-9 connector, as shown in [Figure 15](#). The default settings for this port are 9600 baud, 8 data bits, 1 stop bit, and no parity or flow control (9600 8-N-1 none). The default settings may be changed either in the boot monitor or during system operation.

Figure 15 Connecting the Serial Console Port

CST_015

Initial Configuration

To assign IP addresses and perform other initial configuration tasks, refer to the *OmniAccess SafeGuard OS Administration Guide*.

Troubleshooting

[Table 9](#) provides suggestions for troubleshooting basic hardware issues that might arise when you install the SafeGuard Controller.

The software documentation provides detailed troubleshooting instructions for operating and configuration issues. If after reviewing the software documentation your trouble is not resolved, consult the Alcatel-Lucent Technical Assistance Center.

Table 9 Troubleshooting Basic Hardware issues

Cable and Connectivity Issues	
For this problem . . .	Take these actions. . .
No link exists when the optical cable is connected.	<ul style="list-style-type: none"> ■ Verify that you have used the correct cable for the port type. ■ Clean the connectors, and reconnect the cable. ■ Try a new cable. ■ If you are using the factory default configuration, make sure that the port has been enabled through the CLI.
The SafeGuard Controller does not have connectivity when the copper cable is connected.	<ul style="list-style-type: none"> ■ Make sure that you are using the correct choice of crossover or straight-through cable. ■ If the cable type is correct, check the connector pinouts to verify that the cable is wired correctly.
Port Issues	
For this problem . . .	Take these actions. . .
Ports are malfunctioning.	<ul style="list-style-type: none"> ■ Remove and reinsert the affected SFP module. ■ For optical ports, clean the cable connectors, and reconnect the cable. ■ Try a new cable.
Management Console Issues	
For this problem . . .	Take these actions. . .
The SafeGuard Controller management console displays unreadable characters.	Check for an incorrect baud rate and make sure that the baud rate for the terminal emulation software is set to 9600.



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appendix

A

Technical Specifications

In this appendix:

- *Physical Specifications*
 - *Environmental Specifications*
 - *Connector Pinouts*
 - *SFP Module Types and Cables*
-

Physical Specifications

Table 10 lists the physical specifications of the SafeGuard Controller.

Table 10 Physical Specifications

Dimensions	Width: 17.3 inches (43.9 cm) Depth: 18.6 inches 47.2 cm Height: 1.7 inches (4.4 cm)
Approximate Weight	20.0 pounds (9.1 kg)

Environmental Specifications

Table 11 lists environmental specifications for the SafeGuard Controller.

Table 11 Environmental Specifications

Operating temperature	0° C to +40° C
Storage temperature	0° C to +40° C
Operating Relative Humidity	5 to 90% (non-condensing)
Storage Relative Humidity	5 to 95% (non-condensing)



NOTE: The SafeGuard Controller is cooled from the front to the back. Because of this cooling arrangement, keep the air vents clean so that the SafeGuard Controller is cooled properly.

Connector Pinouts

This section provides pinout information for the following connectors on the SafeGuard Controller:

- RJ-45 connectors on copper SFP modules used in the front-panel ports ([Table 12](#))
- RJ-45 connector on the rear-panel Ethernet management port ([Table 13](#))
- DB-9 connector on the rear-panel serial console port ([Table 14](#))
- DC input power connector on the rear panel of ACDC models ([Table 15](#))

Table 12 Front-Panel Copper Port Pinouts

Pin	10/100BASE-T	1000BASE-T
1	RXp	TPp_A
2	RXn	TPn_A
3	TXp	TPp_B
4	NC	TPp_C
5	NC	TPn_C
6	TXn	TPn_B
7	NC	TPp_D
8	NC	TPn_D

Table 13 Ethernet Management Port Pinouts

Pin	10/100BASE-T
1	TXp
2	TXn
3	RXp
4	NC
5	NC
6	RXn
7	NC
8	NC

Table 14 RS-232 Serial Management Port Pinouts for Male DB-9

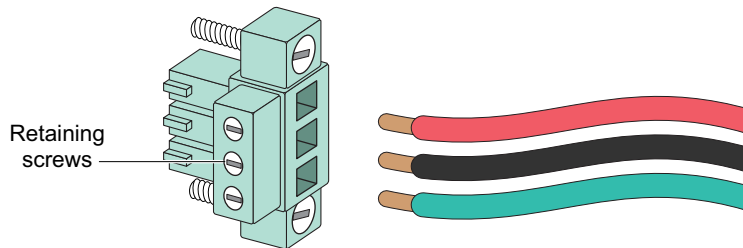
Pin	RS-232 Function	Source
1	DCD (RSLD)	DTE
2	RXD	DTE
3	TXD	DTE
4	DTR	DTE
5	GND	-
6	DSR	DTE
7	RTS	DTE
8	CTS	DTE
9	RI	DTE

Table 15 DC Input Connector Pinouts

Pin	Description
1	Earth ground
2	GND
3	+48 VDC

NOTE: Pin 1 is at the bottom in [Figure 16](#).

Figure 16 DC Input Connector



CST_024

SFP Module Types and Cables

The SafeGuard Controller uses the types of SFP modules and cables listed in [Table 16](#).

Table 16 SFP Modules and Cables

SFP Module Type	Required Cable
1000BASE-LX	Single-mode fiber, 1310 nm, 1-km range
1000BASE-SX	Multi-mode fiber, 850 nm, 550-m range
10/100/1000BASE-T	Category 5 or better copper for 10/100BASE-T Category 5e or better for 1000BASE-T



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appendix

B

Safety and Regulatory Compliance

In this appendix:

- *Safety Guidelines*
 - *Agency Safety Approvals*
 - *Regulatory Compliance and Notices*
-

Safety Guidelines

Review the recommendations in this section before you install the Alcatel-Lucent SafeGuard Controller.

General Safety Recommendations

The following recommendations will help ensure your safety and prevent damage to the equipment:

- Always be careful when lifting and moving heavy or awkward objects. The SafeGuard Controller weighs 20 pounds and may require two people to maneuver it when you install it in a rack.
- Always begin loading a rack from the bottom to the top, especially when you are installing only one SafeGuard Controller.
- Populate the bottom of the rack with the heaviest component.
- While installing the SafeGuard Controller, take the necessary precautions to avoid bodily injury. Make sure that the SafeGuard Controller can be held in a stable position when lifting, mounting, or servicing it.
- Do not wear jewelry when you work on electrical or mechanical equipment.
- If you plan to stack several SafeGuard Controllers, take care that the SafeGuard Controllers are properly installed in a rack or on a table.



WARNING: The SafeGuard Controller is a Class 1 Laser device.

Safety with Electricity

Follow these recommendations when you are working around electrical equipment:

- To be able to disconnect the power cords when needed, make sure that the sockets are easily accessible.
- Disconnect all power cables before you install or remove the SafeGuard Controller.
- Never assume that the source power for the SafeGuard Controller is off; always check.
- When you connect or disconnect power, always connect ground first and disconnect ground last.

- Lightning can cause electromagnetic surges and can damage your equipment. Even if lightning strikes a nearby power line that feeds your site, a surge in voltage can occur and cause electromagnetic energy. As a precaution during lightning storms, do not connect or disconnect cables.
- Always make sure that your cables do not exceed recommended lengths or are not exposed to the outside environment. In either case, the likelihood of lightning-related damage increases.
- Make sure that the SafeGuard Controller is grounded securely. A voltage surge that occurs in the power lines may affect the grounding system, especially if the grounding system has a very low resistance. If an electromagnetic surge occurs, consult experienced electrical surge suppression personnel. They will be able to help your site recover from the effects of the surge.

Electromagnetic Interference Prevention

Electromagnetic interference (EMI) is any electromagnetic disturbance that interrupts, obstructs, or otherwise degrades the effective performance of electronics equipment.

Interference of this nature refers to the impact it has on the equipment, thereby affecting performance of other equipment. Because of EMI, power surges can cause an electrical hazard or damage signal drivers and receivers. As a precaution against EMI-related damage, store all X-ray equipment, hand-held transceivers, and microwave, radio, or television transmitters in a facility that is different from the one in which the SafeGuard Controller is installed. To resolve problems with continual high levels of EMI, consult experienced EMI personnel.

Radio Frequency Interference Prevention

Radio frequency interference (RFI) is high-frequency electromagnetic radiation that upsets the electromagnetic environment. RFI is also known as electromagnetic interference (EMI), but EMI actually encompasses a wider range of frequencies.

If your cables are improperly installed, they can emit RFI. At all times, make sure that your system cables are properly and securely installed, and do not exceed the recommended lengths. If your cables exceed the recommended lengths, use high-quality cables with proper grounding. Using shielded cables helps reduce RFI radiation. If electromagnetic interference persists at your site, consult experienced RFI and EMI personnel.

Electrostatic Discharge Precautions

Components used in the SafeGuard Controller and SFP modules are sensitive to damage from static electricity. A damaging electrical charge can be generated by handling plastic or foam packaging material. The effect of electrostatic discharge (ESD) damage can be

immediate failure, or it can show up as a latent failure affecting the reliability of the equipment.

To minimize the likelihood of ESD damage to the SafeGuard Controller, follow these guidelines when you are handling the SafeGuard Controller or SFP modules:

- Always use an antistatic wrist strap or other antistatic device.

To use the disposable ESD wrist strap that is provided, put the strap on your wrist, ensuring that it makes good contact with the skin. Peel the protective liner from the copper foil at the other end of the wrist strap and connect the foil to any accessible electrical ground that is nearby and exposed.

- Leave the SafeGuard Controller and SFP modules in antistatic packaging until you are ready to install them.
- Always place the SafeGuard Controller on an antistatic mat when it has been removed from the rack.

Agency Safety Approvals

The SafeGuard Controller has been tested and has obtained the following agency approvals:

- CAN/CSA-22.2 No. 60950-1
- EN 60950-1
- IEC 60950-1
- UL 60950-1

Regulatory Compliance and Notices

The SafeGuard Controller meets the following EMC regulatory compliance requirements:

- EN 55022 (Emissions), Class A
- EN 55024 (Immunity)
- Industry Canada Class A
- FCC Part 15 Class A
- VCCI Class A (Japan)

FCC Part 15 Class A

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

Where specified throughout this guide, properly shielded and grounded cables and connectors must be used to meet FCC emission limits. Alcatel-Lucent is not responsible for any radio or television interference caused by the use of incorrect customer cabling. Unauthorized product cabling changes or other modifications could void the authority of the user to operate the equipment. This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Japan VCCI Class A

This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI) by Information Technology Equipment. If this equipment is used in a domestic environment, radio disturbance may occur that may require you to take corrective action.

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



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appendix

C

**Customer Assistance
and Product Support**

Alcatel-Lucent technical support is committed to resolving our customer's technical issues in a timely manner. Customers with inquiries should contact us at:

- **North America Service and Support:** 1-800-995-2696
- **Latin America Service and Support:** 1-877-919-9526
- **European Service and Support:** +33-38-855-6929
- **Asia Pacific Service and Support:** +65-6586-1555
- **Other International:** 1-818-878-4507
- **Email:** support@ind.alcatel.com
- **Internet:** Customers with Alcatel-Lucent service agreements may open cases 24 hours a day via Alcatel-Lucent's support web page at:
 - **Support URL:** <http://www1.alcatel-lucent.com/enterprise/en/support/index.html>
 - **Documentation URL:** http://www1.alcatel-lucent.com/enterprise/en/resource_library/user_manuals.html



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