AT-9400Ts Series Gigabit Ethernet Switches

Basic Layer 3   **AT-9424Ts**
                    AT-9424Ts/XP
                    AT-9448Ts/XP

AT-9400Ts Stack Installation Guide

Allied Telesis ™

Electrical Safety and Emissions Standards

This product meets the following standards.

U.S. Federal Communications Commission
Radiated Energy
Note: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
Note: Modifications or changes not expressly approved of by the manufacturer or the FCC, can void your right to operate this equipment.

Industry Canada
This Class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

RFI Emissions   FCC Class A, EN55022 Class A, EN61000-3-2, EN61000-3-3, VCCI Class A, C-TICK, CE

Warning: In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

EMC (Immunity)   EN55024

Electrical Safety   EN60950 (TUV), UL 60950 ($_{C}$UL$_{US}$)

Laser Safety   EN60825

Translated Safety Statements

Important: The ᴄ⌒ indicates that translations of the safety statement are available in the PDF document "Translated Safety Statements" (613-000405) posted on the Allied Telesis website at www.alliedtelesis.com.

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Preface

This guide explains how to build an AT-9400Ts Stack of the AT-9424Ts, AT-9424Ts/XP, and AT-9448Ts/XP Basic Layer 3 Gigabit Ethernet Switches. This preface contains the following sections:

❐ "Product Documentation" on page 10

❐ "Where to Go First" on page 11

❐ "Safety Symbols Used in this Document" on page 11

❐ "Contacting Allied Telesis" on page 12

Note
For instructions on how to install the switches as stand-alone units, refer to the *AT-9400 Gigabit Ethernet Switch Installation Guide*.

Product Documentation

For overview information on the features of the AT-9400 Switches and the AT-S63 Management Software, refer to:

❐ AT-S63 Management Software Features Guide
(PN 613-000801)

For instructions on how to start a local or remote management session, refer to:

❐ Starting an AT-S63 Management Session Guide
(PN 613-000817)

For instructions on how to install and manage stand-alone AT-9400 Switches, refer to:

❐ AT-9400 Gigabit Ethernet Switch Installation Guide
(PN 613-000357)

❐ AT-S63 Management Software Menus User's Guide
(PN 613-50570-00)

❐ AT-S63 Management Software Command Line User's Guide
(PN 613-001024)

❐ AT-S63 Management Software Web Browser User's Guide for Stand-alone AT-9400 Switches
(PN 613-50592-00)

For instructions on how to install and manage AT-9400Ts Stacks, refer to:

❐ AT-9400Ts Stack Installation Guide
(PN 613-001191)

❐ AT-S63 Management Software Command Line User's Guide
(PN 613-001024)

❐ AT-S63 Management Software Web Browser User's Guide for AT-9400Ts Stacks
(PN 613-001007)

All of the installation and user guides for the Allied Telesis products are available in portable document format (PDF) on our web site at **www.alliedtelesis.com**. You can view the documents online or download them onto a local workstation or server.

Where to Go First

You should read Chapter 1, "Overview," and Chapter 2, "AT-9400Ts Stacks," in the *AT-S63 Management Software Features Guide* before you begin to install the switches. You will find the installation easier to perform and are less likely to encounter problems if you are familiar with the basic material provided in these introductory chapters.

Safety Symbols Used in this Document

This document uses the safety symbols defined in Table 1.

Table 1. Safety Symbols

Symbol	Meaning	Description
⚠	Caution	Performing or omitting a specific action may result in equipment damage or loss of data.
⚡	Warning	Performing or omitting a specific action may result in electrical shock.

Contacting Allied Telesis

This section provides Allied Telesis contact information for technical support and for sales and corporate information.

Online Support You can request technical support online from the Allied Telesis Knowledge Base at **www.alliedtelesis.com/support/kb.aspx**. You can submit questions to our technical support staff from the Knowledge Base and review answers to previously asked questions.

Email and Telephone Support For Technical Support via email or telephone, refer to the Allied Telesis web site at **www.alliedtelesis.com**. Select your country from the list on the web site and then select the appropriate tab.

Returning Products Products for return or repair must first be assigned a return materials authorization (RMA) number. A product sent to Allied Telesis without an RMA number will be returned to the sender at the sender's expense. For instructions on how to obtain an RMA number, go to the Support section on our web site at **www.alliedtelesis.com**.

Warranty For warranty information on the AT-9400 Layer 2+ and Basic Layer 3 Gigabit Ethernet Switches, go to **www.alliedtelesis.com/warranty** for the terms and conditions of the warranty, and for warranty registration.

Sales or Corporate Information You can contact Allied Telesis for sales or corporate information at our web site at **www.alliedtelesis.com**.

Obtaining Management Software Updates New releases of management software for our managed products are available from the following Internet sites:

❑ Allied Telesis web site: **www.alliedtelesis.com**

❑ Allied Telesis FTP server: **ftp://ftp.alliedtelesis.com**

If you are prompted to log on to the FTP server, enter "anonymous" as the user name and your email address as the password.

Chapter 1
Overview

This guide explains how to install the AT-9424Ts, AT-9424Ts/XP and AT-9448Ts/XP Gigabit Ethernet Switches as an AT-9400Ts Stack. This chapter contains the following sections:

❑ "Switch Descriptions" on page 14

❑ "10/100/1000Base-T Twisted Pair Ports" on page 17

❑ "SFP Transceiver Slots" on page 19

❑ "XFP Transceiver Slots" on page 20

❑ "Redundant Twisted Pair Ports" on page 21

❑ "Compact Flash Card Slot" on page 22

❑ "Port LEDs" on page 23

❑ "System LEDs" on page 25

❑ "Stack LEDs" on page 26

❑ "AT-StackXG Stacking Module" on page 27

❑ "Terminal Port" on page 28

❑ "AT-RPS3204 Redundant Power Supply" on page 29

❑ "AC Power Connector" on page 30

Note
Allied Telesis recommends you read Chapter 1, "Overview," and Chapter 2, "AT-9400Ts Stacks," in the *AT-S63 Management Software Features Guide* before you begin to install the stack.

Note
You should not begin the installation procedures in this guide until you have read the Software Release Notes that are included with the latest release of the AT-S63 Management Software. The Notes list the features that AT-9400Ts Stacks support. Stacks may not be suitable for all network environments because they do not support all of the same features as stand-alone AT-9400 Switches. If your network requirements include features that are not supported in a stack, install the switches as stand-alone devices.

Switch Descriptions

The following sections describe the AT-9424Ts, AT-9424Ts/XP, and AT-9448Ts/XP Gigabit Ethernet Switches.

AT-9424Ts Switch

The AT-9424Ts Basic Layer 3 Switch has these hardware features:

❒ 24 10/100/1000Base-T ports

❒ Four Gigabit Ethernet small form-factor pluggable (SFP) transceiver slots

❒ An RJ-45 style serial terminal port for local (out-of-band) management

❒ Status LEDs for the ports, transceiver slots, and system

❒ Redundant power supply connector

❒ Compact flash card slot

❒ Expansion slot for the AT-StackXG Stacking Module

Figure 1 shows the front and back panels of the AT-9424Ts switch.
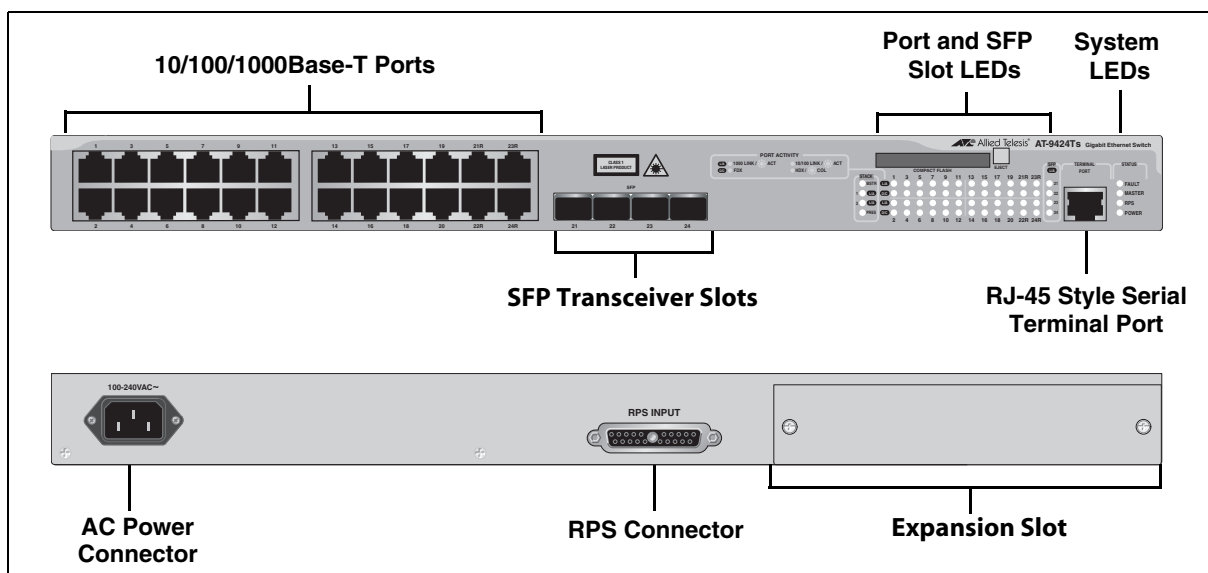
Figure 1 AT-9424Ts Switch - Front and Back Panels

AT-9424Ts/XP Switch

The AT-9424Ts/XP Basic Layer 3 Switch has these hardware features:

❐ 24 10/100/1000Base-T ports

❐ Four Gigabit Ethernet small form-factor pluggable (SFP) transceiver slots

❐ Two 10 Gigabit Ethernet small form factor pluggable (XFP) transceiver slots

❐ An RJ-45 style serial terminal port for local (out-of-band) management

❐ Status LEDs for the ports, transceiver slots, and system

❐ Redundant power supply connector

❐ Compact flash card slot

❐ Expansion slot for the AT-StackXG Stacking Module

Figure 2 shows the front and back panels of the AT-9424Ts/XP switch.
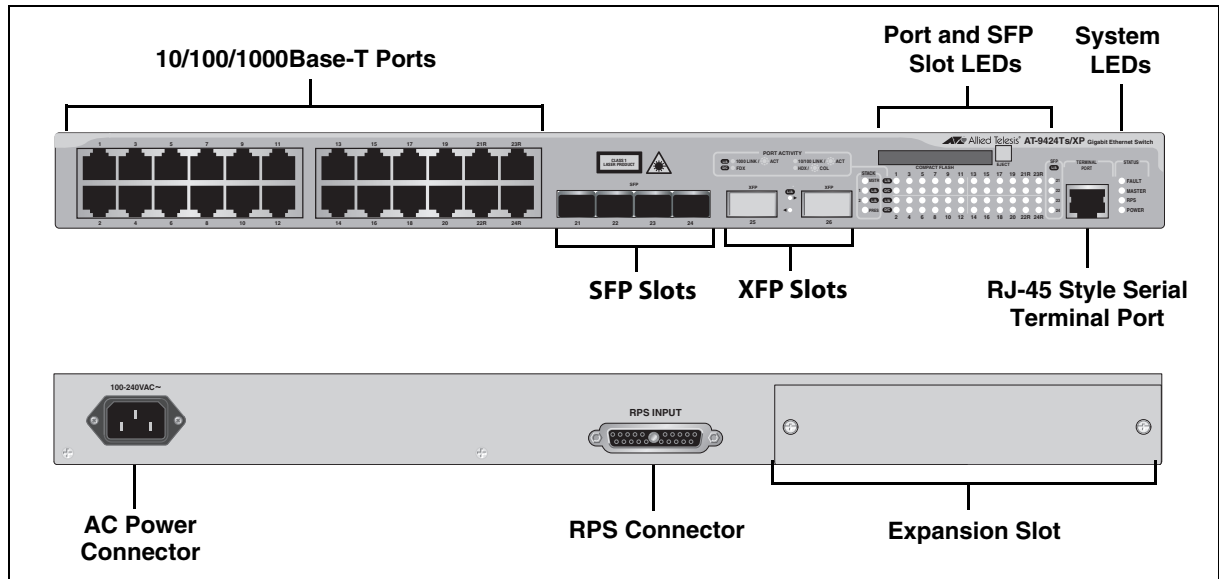
Figure 2 AT-9424Ts/XP Switch - Front and Back Panels

AT-9448Ts/XP Switch

The AT-9448Ts/XP Basic Layer 3 Switch has the following hardware features:

- ❐ 48 10/100/1000Base-T ports
- ❐ Two 10 Gigabit Ethernet small form factor pluggable (XFP) transceiver slots
- ❐ An RJ-45 style serial terminal port for local (out-of-band) management
- ❐ Status LEDs for the ports, transceiver slots, and system
- ❐ Redundant power supply connector
- ❐ Compact flash card slot
- ❐ Expansion slot for the AT-StackXG Stacking Module

Figure 3 shows the front and back panels of the AT-9448Ts/XP switch.
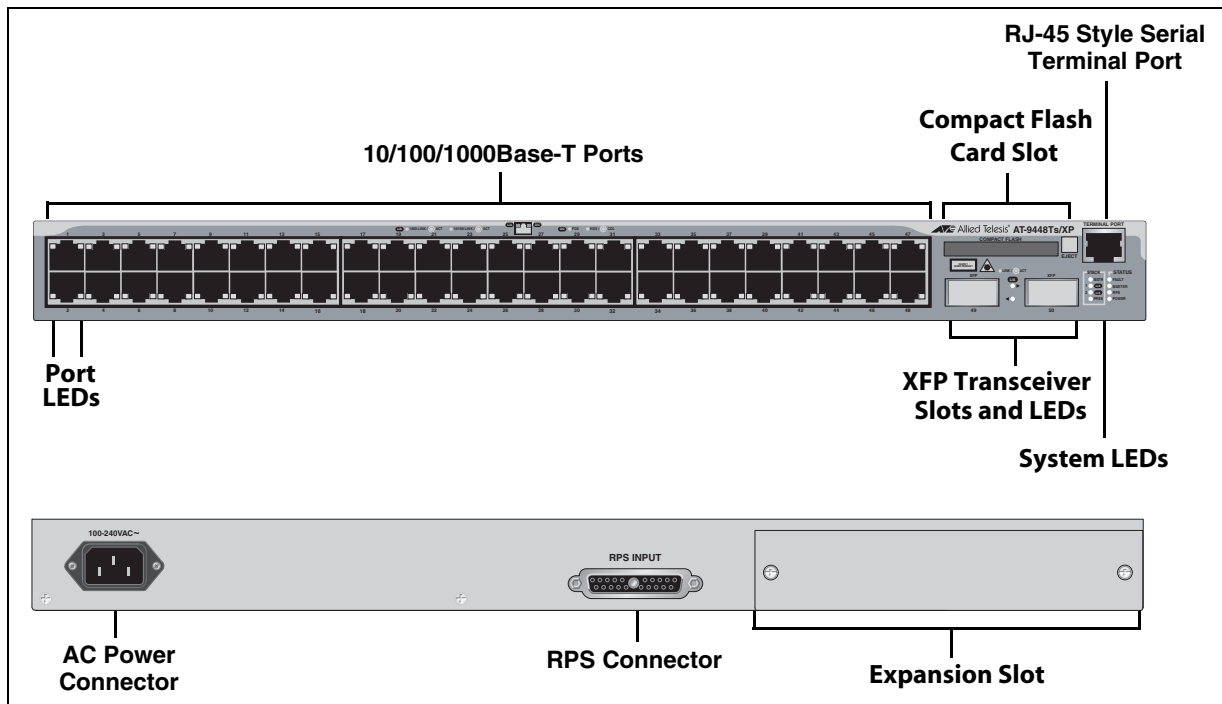
Figure 3 AT-9448Ts/XP Switch - Front and Back Panels

10/100/1000Base-T Twisted Pair Ports

This section describes the twisted pair ports on the switches.

Connector Type The ports have 8-pin RJ-45 connectors that use four pins at 10 or 100 Mbps and all eight pins at 1000 Mbps. For the pin assignments, refer to "RJ-45 Twisted Pair Port Pinouts" on page 101.

Speed The ports can operate at 10, 100, or 1000 Mbps. The speeds can be set automatically through Auto-Negotiation, the default setting, or manually with the AT-S63 Management Software.

> **Note**
> Twisted pair ports must use Auto -Negotiation to operate at 1000 Mbps. They cannot be manually set to 1000 Mbps.

Duplex Mode The twisted pair ports can operate at 10 or 100 Mbps in either half- or full-duplex mode. (Ports that are operating at 1000 Mbps use only full-duplex mode.) The twisted pair ports are IEEE 802.3u-compliant and can set the duplex modes through Auto-Negotiation. You can disable Auto-Negotiation on the switch ports and set the duplex modes manually through the AT-S63 Management Software.

> **Note**
> Ports that are using Auto-Negotiation to set their duplex modes should be connected to end nodes that are also using Auto-Negotiation. Otherwise, duplex mode mismatches can occur. Twisted pair ports that are using Auto-Negotiation default to half-duplex mode if they detect that the end nodes are not using Auto-Negotiation. If the end nodes are operating at a fixed duplex mode of full-duplex, the ports and the end nodes will operate at different duplex modes, which can reduce network speed and efficiency.
>
> To avoid a duplex mode mismatch when connecting an end node with a fixed duplex mode of full-duplex to a switch port, use the AT-S63 Management Software to disable Auto-Negotiation on the port and to set the port speed and duplex mode manually.

Maximum Distance The ports have a maximum operating distance of 100 meters (328 feet).

Cable Type   Table 2 lists the cabling specifications for the 10/100/1000Base-T twisted pair ports.

Table 2. Twisted Pair Cabling and Distances

Speed	Cable Type	Maximum Operating Distance
10 Mbps	Standard TIA/EIA 568-B-compliant Category 3 or better shielded or unshielded cabling with 100 ohm impedance and a frequency of 16 MHz.	100 m (328 ft)
100 Mbps	Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz.	100 m (328 ft)
1000 Mbps	Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz.	100 m (328 ft)

Auto-MDI/ MDI-X   The twisted pair ports are IEEE 802ab-compliant and feature auto-MDI/ MDI-X. This feature, available when a port's speed and duplex mode are set through Auto-Negotiation, automatically configures a switch port to MDI or MDI-X depending on the wiring configuration of the port on the end node. This allows you to connect any network device to a port on the switch using a straight-through twisted pair cable.

If Auto-Negotiation is disabled on a port and the speed and duplex mode are set manually, the auto-MDI/MDI-X feature is also disabled and the port's wiring configuration defaults to the MDI-X setting. This setting can be configured with the AT-S63 Management Software.

Port Pinouts   Table 12 on page 101 has the port pinouts when the twisted pair ports are operating at 10 or 100 Mbps in the MDI configuration. Table 13 on page 101 has the port pinouts for the MDI-X configuration. Table 14 on page 102 has the port pinouts for twisted pair ports that are operating at 1000 Mbps.

SFP Transceiver Slots

The AT-9424Ts and AT-9424Ts/XP Switches feature four slots for optional Gigabit Ethernet SFP transceivers. You can use the transceivers to connect the switches to network devices over large distances using fiber optic cable. Figure 4 illustrates an SFP transceiver.

Each SFP slot is paired with a twisted pair port. A link on an SFP transceiver takes priority in the event both an SFP transceiver and its paired twisted pair port have established links to their respective end nodes. For further information, refer to "Redundant Twisted Pair Ports" on page 21.
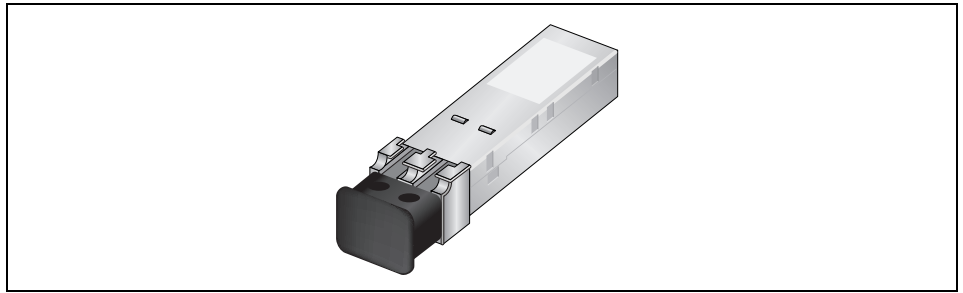
Figure 4 SFP Transceiver

Note
For the list of supported SFP transceivers, contact your Allied Telesis sales representative.

XFP Transceiver Slots

The AT-9424Ts/XP and AT-9448Ts/XP Switches have two slots for optional XFP 10 Gigabit Ethernet transceivers that can be used to connect high speed, 10 gigabit devices to the switches or to create high speed backbone networks between the units. Figure 5 shows an example of an XFP transceiver.
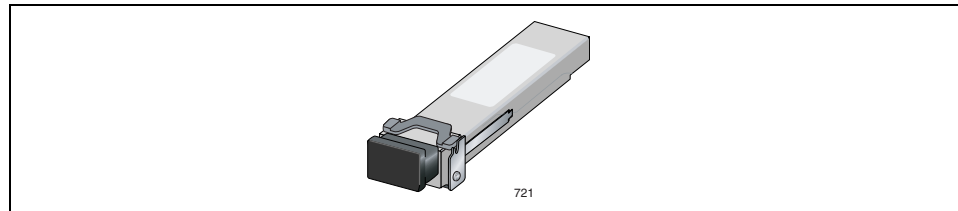
Figure 5 XFP Transceiver

Note
For the list of supported XFP transceivers, contact your Allied Telesis sales representative.

Redundant Twisted Pair Ports

The SFP slots 21 through 24 on the AT-9424Ts and AT-9424Ts/XP Switches are paired with twisted pair ports 21R through 24R, respectively. The "R" in the twisted pair port numbers on the front faceplates of the units stands for "Redundant." Here are the guidelines to using these ports and slots:

❒ Only one port in a pair -- the twisted pair port or the port on the corresponding SFP module -- can be active at a time.

❒ The twisted pair port is the active port when its SFP slot is empty, or when an SFP module is installed but has not established a link to an end node.

❒ The twisted pair port automatically changes to the redundant status mode when an SFP module establishes a link with an end node.

❒ A twisted pair port automatically transitions back to the active status when the link is lost on the SFP module.

❒ In nearly all cases, a twisted pair port and an SFP module share the same configuration settings, including port settings, VLAN assignments, access control lists, and spanning tree.

❒ An exception to the shared settings is port speed. If you disable Auto-Negotiation on a twisted pair port and set the speed and duplex mode manually, the speed reverts to Auto-Negotiation when an SFP module establishes a link with an end node.

> **Note**
> These guidelines do not apply to the XFP slots on the AT-9424Ts/XP and AT-9448Ts/XP Switches.

Compact Flash Card Slot

The switches have slots for compact flash memory cards. You can use the cards to store configuration files or the AT-S63 Management Software image file. Compact flash memory cards can make it easier for you to upgrade the files on a switch or transfer files between AT-9400 Switches.
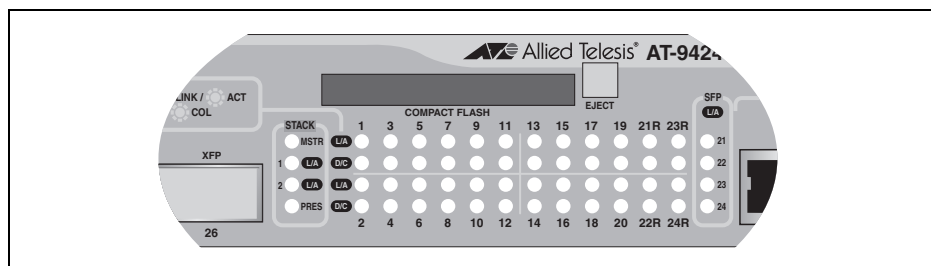
Figure 6 Compact Flash Card Slot

Note
A flash memory card is not required for normal operations of the switch.

Note
The only active compact flash card slot in a stack is on the master switch. The slots on the member switches are deactivated and are not accessible.

The AT-9400 Switches support only the AT-CF128A 128MB compact flash card from Allied Telesis. Contact your Allied Telesis sales representative for more information.

To insert a compact flash card, position it so that the manufacturer's brand label is facing up and press it into the slot until the button marked "Eject" pops out.

To remove the compact flash card, press the button marked "Eject" until it is pressed in completely and then remove the compact flash card.

For information on how to transfer files to and from a flash memory card, refer to the *AT-S63 Management Software User's Guides.*

Port LEDs

The following sections describe the twisted pair and fiber optic port LEDs.

10/100/1000Base-T Twisted Pair Port LEDs

Each twisted pair port has two LEDs labeled L/A (link/activity) and D/C (duplex mode/collisions). The L/A LED indicates the speed and activity on a port. The D/C LED indicates the duplex mode (full- or half-duplex) and the status of collisions on the port.

Table 3 describes the LEDs for the 10/100/1000Base-T twisted pair ports.

Table 3   Twisted Pair Port LEDs

LED	Function	State	Description
L/A	Link Status and Activity	Off	No link is established between the port and the end node.
		Solid green	The port has established a link at 1000 Mbps.
		Flashing green	Packets are being received or transmitted at 1000 Mbps.
		Solid amber	The port has established a link at 10 or 100 Mbps.
		Flashing amber	Packets are being received or transmitted at 10 or 100 Mbps.
D/C	Duplex Mode and Collisions	Green	The port is operating in full-duplex mode.
		Amber	The port is operating in half-duplex mode. (Only when operating at 10 or 100 Mbps.)
		Flashing amber	Collisions are occurring on the port. (Only when operating at 10 or 100 Mbps, half duplex mode.)

Fiber Optic Port and Transceiver Slot LEDs

Each 10 Gigabit Ethernet transceiver slot on the AT-9424Ts/XP and AT-9448Ts/XP Switches has one LED, defined in Table 4.

Table 4 XFP Slot LED

LED	Function	State	Description
L/A	Link Status and Activity	Off	No link is established between the port and the end node.
		Solid green	The port has established a link at 10 Gbps.
		Flashing green	Packets are being received or transmitted at 10 Gbps.

System LEDs

The system LEDs on the front panel display the general status information described in Table 5.

Table 5 System LEDs

LED	State	Description
FAULT or FLT	Off	Normal operation.
	Solid Red	The switch or management software has malfunctioned. (Refer to Chapter 7, "Troubleshooting" on page 89 for instructions on how to troubleshoot a problem.)
	Flashing Red	The switch is saving its configuration or is downloading a new version of the AT-S63 Management Software.
MASTER or MSTR	Off	The switch is not a member of an enhanced stack or has an enhanced stacking status of slave or unavailable. The enhanced stacking feature is not related to or supported on AT-9400Ts Stacks. For information on enhanced stacking, refer to the *AT-S63 Management Software Features Guide*.
	Green	The switch has an enhanced stacking status of master.
RPS	Off	No optional redundant power supply is connected to the switch.
	Green	An optional redundant power supply is physically connected to the switch and may be powered on or off.
POWER or PWR	Off	The switch is not receiving power.
	Green	The switch is receiving power.

Stack LEDs

The Stack LEDs reflect the status of the two Stack ports on the AT-StackXG Stacking Module. These LEDs remain off if the module is not installed.

Table 6 Stack LEDs

LED	State	Description
MSTR	Off	The switch is not part of a stack or is a member unit of a stack.
	Green	The switch is the master unit of a stack.
1 L/A	Off	Stack Port 1 has not established a link to a stacking port on another AT-StackXG Stacking Module.
	Green	Stack Port 1 has established a link to a stacking port on another AT-StackXG Stacking Module.
	Flashing Green	Stack Port 1 has established a link to a stacking port on another AT-StackXG Stacking Module and is sending or receiving packet traffic.
2 L/A	Off	Stack Port 2 has not established a link to a stacking port on another AT-StackXG Stacking Module.
	Green	Stack Port 2 has established a link to a stacking port on another AT-StackXG Stacking Module.
	Flashing Green	Stack Port 2 has established a link to a stacking port on another AT-StackXG Stacking Module and is sending or receiving packet traffic.
PRES	Off	The expansion slot for the AT-StackXG Stacking Module is empty.
	Green	The AT-StackXG Stacking Module is installed in the switch.

AT-StackXG Stacking Module

The AT-9424Ts, AT-9424Ts/XP, and AT-9448Ts/XP Switches have an expansion slot on the back panels for the optional AT-StackXG Stacking Module and its two full-duplex, 12-Gbps stacking ports. A switch must have this module to be a part of a stack. The installation instructions are found in "Installing the AT-StackXG Stacking Module" on page 39 and in the installation guide that ships the module.
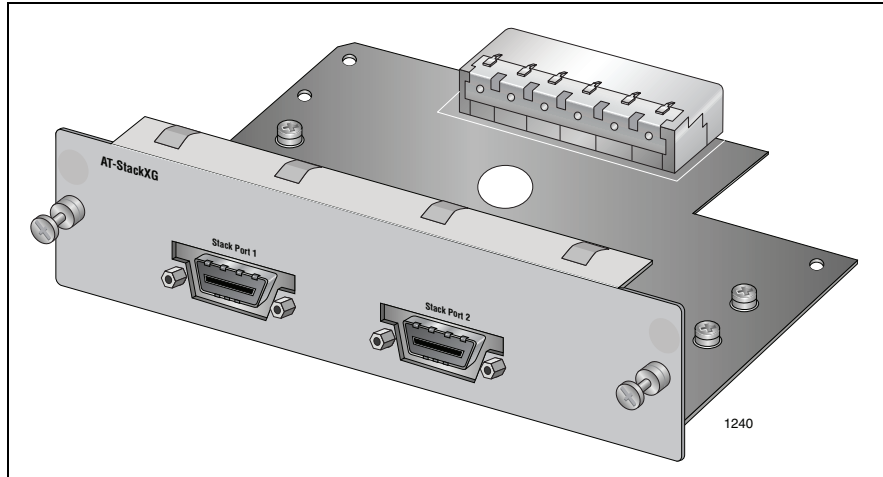
Figure 7 AT-StackXG Stacking Module

Terminal Port

The terminal port is used to establish a local (out-of-band) management session with the switch. You establish a local management session by connecting a terminal or a personal computer with a terminal emulation program to the port.

All local management sessions of a stack must be conducted through the stack's master switch. The master switch can be determined by viewing the Stack MSTR LEDs on the front panels of the switches. The switch whose LED is steady green is the master switch of a stack.

The terminal port has an RJ-45 style connector. An RJ-45 to RS-232 management cable is supplied with the switch.

The terminal port is set to the following specifications:

❐ Default baud rate: 9600 bps (Range is 9600 to 115200 bps)

❐ Data bits: 8

❐ Parity: None

❐ Stop bits: 1

❐ Flow control: None

> **Note**
> These settings are for a DEC VT100 or ANSI terminal, or an equivalent terminal emulation program.

AT-RPS3204 Redundant Power Supply

The RPS connector on the back panel of the switch connects to the optional AT-RPS3204 redundant power supply unit, shown in Figure 8. The unit can provide power to the switch in the event that the switch's internal power supply fails.

The AT-RPS3204 redundant external power supply features one preinstalled AT-PWR3202 Power Module and three empty slots for additional power modules. Each power module can support one switch. When fully populated with AT-PWR3202 Power Modules, the AT-RPS3204 unit can support up to four switches, simultaneously. For information about installing an AT-RPS3204 unit, consult the documentation that ships with the unit.
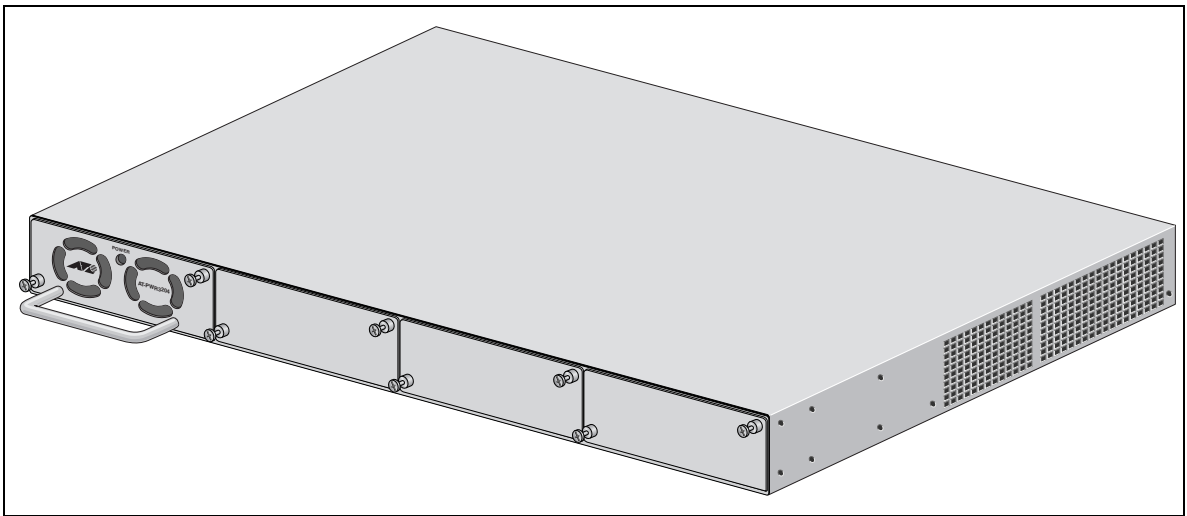
Figure 8 AT-RPS3204 Redundant Power Supply Unit

The pinouts for the redundant power supply's 21-pin D-combo port and connector are described in "RPS 21-pin D-combo Port and Connector Pinouts" on page 104.

AC Power Connector

The AT-9400 Switch have a single AC power supply socket on the back panel, which has autoswitch AC inputs. To power the switch on or off, connect or disconnect the power cord.

Refer to "Technical Specifications" on page 99 for the input voltage range.

⚠	**Warning:** Power cord is used as a disconnection device. To de-energize equipment, disconnect the power cord. ☞ 5

⚠	**Warning:** This unit might have more than one power cord. To reduce the risk of electric shock, disconnect all power cords before servicing the unit. ☞ 32

Chapter 2

Installing the Hardware

This chapter contains an overview of the installation procedures for a stack and the procedures for installing the hardware. The chapter contains the following sections:

❏ "Installation Overview" on page 32

❏ "Reviewing the Safety Precautions" on page 34

❏ "Planning the Installation of a Stack" on page 36

❏ "Maximum Number of Switches in a Stack" on page 37

❏ "Unpacking a Switch" on page 38

❏ "Installing the AT-StackXG Stacking Module" on page 39

❏ "Installing the Power Cord Retaining Clip (AC Switches Only)" on page 42

❏ "Disconnecting the Network Cables" on page 43

❏ "Installing the Switches in an Equipment Rack" on page 44

❏ "Labeling the Switches" on page 46

Installation Overview

Table 7 lists the installation procedures for a stack of the AT-9424Ts, AT-9424Ts/XP, and AT-9448Ts/XP Switches. The procedures, which are divided into four chapters, should be performed in the order presented in the table. Allied Telesis recommends that you print this table and place a check mark beside the procedures as you complete them.

Table 7. Installation Procedures

	Step	Procedure
Chapter 2, "Installing the Hardware"		
	1	Refer to "Reviewing the Safety Precautions" on page 34
	2	Refer to "Planning the Installation of a Stack" on page 36
	3	Refer to "Maximum Number of Switches in a Stack" on page 37
	4	Refer to "Unpacking a Switch" on page 38
	5	Refer to "Installing the AT-StackXG Stacking Module" on page 39
	6	Refer to "Installing the Power Cord Retaining Clip (AC Switches Only)" on page 42
	7	Refer to "Disconnecting the Network Cables" on page 43
	8	Refer to "Installing the Switches in an Equipment Rack" on page 44
	9	Refer to "Labeling the Switches" on page 46
Chapter 3, "Preparing the Switches"		
	10	Refer to "Powering on a Switch" on page 48
	11	Refer to "Starting a Local Management Session" on page 50
	12	Refer to "Verifying the AT-S63 Version Number" on page 52
	13	Refer to "Updating the AT-S63 Management Software" on page 53
	14	Refer to "Assigning the Static Module ID Number 1 to the Master Switch" on page 54

Table 7. Installation Procedures

	Step	Procedure
	15	Refer to "Assigning Static Module ID Numbers to the Member Switches" on page 57
Chapter 4, "Cabling and Powering on the Stack"		
	16	Refer to "Cabling the AT-StackXG Stacking Modules" on page 60
	17	Refer to "Powering On the Switches of the Stack" on page 63
	18	Refer to "Verifying the Installation" on page 65
	19	Refer to "Troubleshooting the Discovery Process" on page 67
Chapter 5, "Cabling the Network Ports"		
	20	Refer to "Installing Optional Transceivers" on page 70
	21	Refer to "Cabling the Twisted Pair and Fiber Optic Ports" on page 74

Reviewing the Safety Precautions

Please review the following safety precautions before you begin to install the switches or any of their components.

Note
The ✐ indicates that a translation of the safety statement is available in a PDF document titled "Translated Safety Statements" (613-000405) posted on the Allied Telesis website at www.alliedtelesis.com.

⚠ **Warning:** Class 1 Laser product. ✐ 1

⚠ **Warning:** Do not stare into the laser beam. ✐ 3

⚠ **Warning:** To prevent electric shock, do not remove the cover. No user-serviceable parts inside. This unit contains hazardous voltages and should only be opened by a trained and qualified technician. To avoid the possibility of electric shock, disconnect electric power to the product before connecting or disconnecting the LAN cables. ✐ 4

⚠ **Warning:** Do not work on equipment or cables during periods of lightning activity. ✐ 5

⚠ **Warning:** Power cord is used as a disconnection device. To de-energize equipment, disconnect the power cord. ✐ 6

⚠ **Warning:** Class I Equipment. This equipment must be earthed. The power plug must be connected to a properly wired earth ground socket outlet. An improperly wired socket outlet could place hazardous voltages on accessible metal parts. ✐ 7

Pluggable Equipment. The socket outlet shall be installed near the equipment and shall be easily accessible. ✐ 8

⚠ **Caution:** Air vents must not be blocked and must have free access to the room ambient air for cooling. ✐ 9

Warning: Operating Temperature. This product is designed for a maximum ambient temperature of 40° degrees C. ✐ 10

All Countries: Install product in accordance with local and National Electrical Codes. ⬿ 11

Circuit Overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern. ⬿ 24

Caution: Risk of explosion if battery is replaced by an incorrect type. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Attention: Le remplacement de la batterie par une batterie de type incorrect peut provoquer un danger d'explosion. La remplacer uniquement par une batterie du même type ou de type équivalent recommandée par le constructeur. Les batteries doivent être éliminées conformément aux instructions du constructeur. ⬿ 25

Warning: Mounting of the equipment in the rack should be such that a hazardous condition is not created due to uneven mechanical loading. ⬿ 28

Warning: This unit might have more than one power cord. To reduce the risk of electric shock, disconnect all power cords before servicing the unit. ⬿ 33

If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra). ⬿ 39

Caution: Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. ⬿ 40

Warning: Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuits (e.g., use of power strips). ⬿ 41

Planning the Installation of a Stack

Observe these requirements when planning the installation of the stack.

Note
The switches of a stack should be installed in a standard 19-inch equipment rack. Installing the switches on a table or desktop is not recommended because it may create a hazardous work area.

❑ The AT-9424Ts, AT-9424Ts/XP, and AT-9448Ts/XP Switches are the only AT-9400 Switches that support the stacking feature.

❑ Each switch must have the AT-StackXG Stacking Module.

❑ Because of the 0.5 meter length of the AT-StackXG/.5 Stacking Cable, the switches must be installed in the same equipment rack.

❑ If the stack will include the optional AT-StackXG/1 Stacking Cable, the distance between the top switch and the bottom switch of the stack must not be greater than one meter.

❑ Check to be sure the equipment rack is safely secured and will not tip over. Devices in a rack should be installed starting at the bottom, with the heavier devices near the bottom of the rack.

❑ The power outlet for the switches should be located near the units and be easily accessible.

❑ The site should provide easy access to the ports on the front of the switches. This will make it easy for you to connect and disconnect cables, as well as view the system LEDs.

❑ To allow proper cooling of the switches, air flow around the units and through the cooling vents on the sides and rears should be unrestricted.

❑ Do not place objects on top of the switches.

❑ Do not expose the switches to moisture or water.

❑ Make sure the site is a dust-free environment.

❑ Use dedicated power circuits or power conditioners to supply reliable electrical power to the network devices.

Maximum Number of Switches in a Stack

A stack can have up to eight 24-port AT-9424Ts and AT-9424Ts/XP Switches, or up to four 48-port AT-9448Ts/XP Switches and four 24-port switches, as shown in the following table.

The AT-9448Ts/XP Switch should not be used as the master switch of a stack. A stack that has one or two AT-9448Ts/XP Switches should also have at least one AT-9424Ts or AT-9424Ts/XP Switch to act as the master switch. A stack that has three or four AT-9448Ts/XP Switches should have at least two 24-port switches to act as the master switch and the backup switch of the stack.

Table 8. Maximum Sizes of Stacks

		Number of 24-Port AT-9424Ts and AT-9424Ts/XP Switches								
Number of 48-Port AT-9448Ts/XP Switches		0	1	2	3	4	5	6	7	8
	0		▓	▓	▓	▓	▓	▓	▓	▓
	1		▓	▓	▓	▓	▓	▓	▓	
	2		▓	▓	▓	▓	▓	▓		
	3			▓	▓	▓	▓			
	4			▓	▓	▓				

Unpacking a Switch

To unpack a switch, perform the following procedure:

1. Remove all the components from the shipping packages.

    > **Note**
    > Store the packaging material in a safe location. You must use the
    > original shipping material if you need to return the unit to Allied
    > Telesis.

2. Place the switch on a level, secure surface.

3. Make sure the following components are included in your switch
    package. If any item is missing or damaged, contact your Allied
    Telesis sales representative for assistance.

    ❒ One AT-9400 Gigabit Ethernet Switch

    ❒ Two rack-mount brackets

    ❒ Eight flathead Phillips rack-mount bracket screws

    ❒ AC power cord (AC switches only; Americas, EU, Australia, and
    UK only)

    ❒ AC power cord retaining clip (AC switches only)

    ❒ Management cable for local management

    ❒ Documentation CD

Installing the AT-StackXG Stacking Module

This procedure contains the installation instructions for the AT-StackXG Stacking Module. The module must be installed in all of the switches of the stack. It is generally easier to install the module before a switch is mounted in the equipment rack.

Note
Although the stacking module can be hot-swapped, meaning that it can be installed while the switch is powered on, Allied Telesis recommends that the switches be powered off during the initial installation of the stack.

Warning
The module can be damaged by static electricity. Be sure to observe all standard electrostatic discharge (ESD) precautions, such as wearing an antistatic wrist strap, to avoid damaging the device.

To install the AT-StackXG Stacking Module in the switch, perform the following procedure:

1. Remove the blank panel from the expansion slot on the back panel of the switch by loosening the two captive screws on the panel with a cross-head screwdriver.
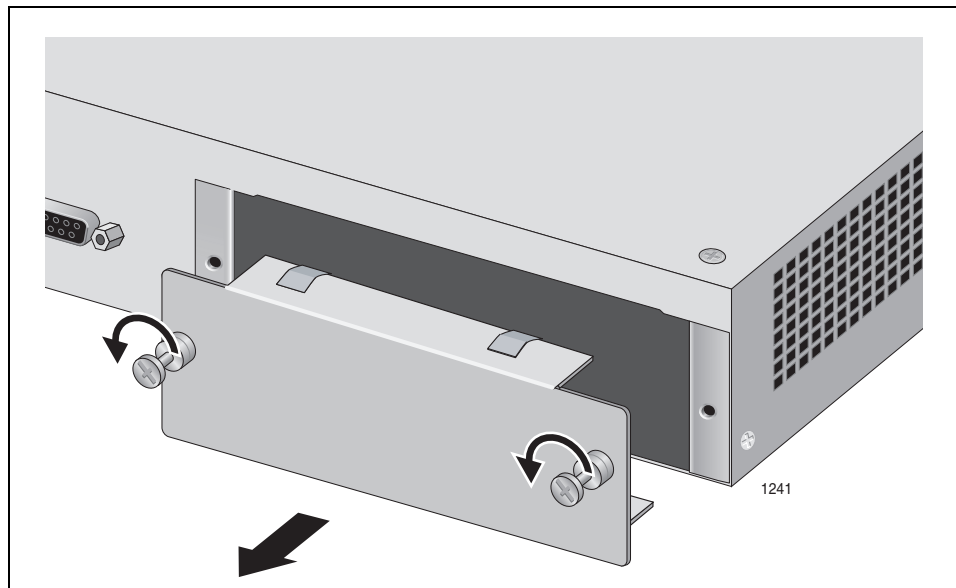
Figure 9. Removing the Blank Panel from the Expansion Slot

Note

Do not remove the blank panel from the chassis until you are ready to install the module. An open slot allows dust to enter the unit and reduces proper airflow and cooling in the chassis.

2. Unpack the AT-StackXG Stacking Module from its shipping package and verify that the following items are included in the package:

   ❐ One AT-StackXG Stacking Module

   ❐ One AT-StackXG/.5 Stacking Cable

   ❐ AT-StackXG Stacking Module Installation Guide

   ❐ Warranty card

   Note

   Store the packaging material in a safe location. You must use the original shipping material if you need to return the unit to Allied Telesis.

3. Align the edges of the module with the guides in the slot and carefully slide the module into the chassis until it is flush with the back panel of the chassis, as shown in Figure 10 on page 41. Light pressure may be needed to seat the module on the connector on the back panel of the chassis.

   Note

   Do not force the module into place. Doing so may damage the connector pins on the backplane inside the chassis. If there is resistance, remove the module and reinsert it after verifying that the edges of the card are properly aligned in the guides in the chassis' expansion slot.
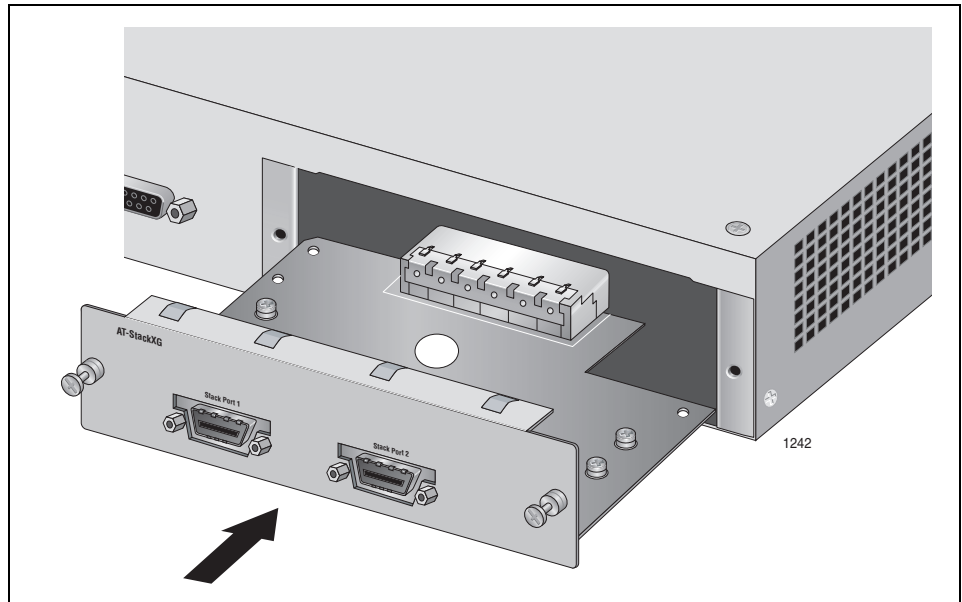
Figure 10. Installing the AT-StackXG Stacking Module

4. Secure the module to the chassis by tightening the two captive screws with a cross-head screwdriver. Refer to Figure 11.
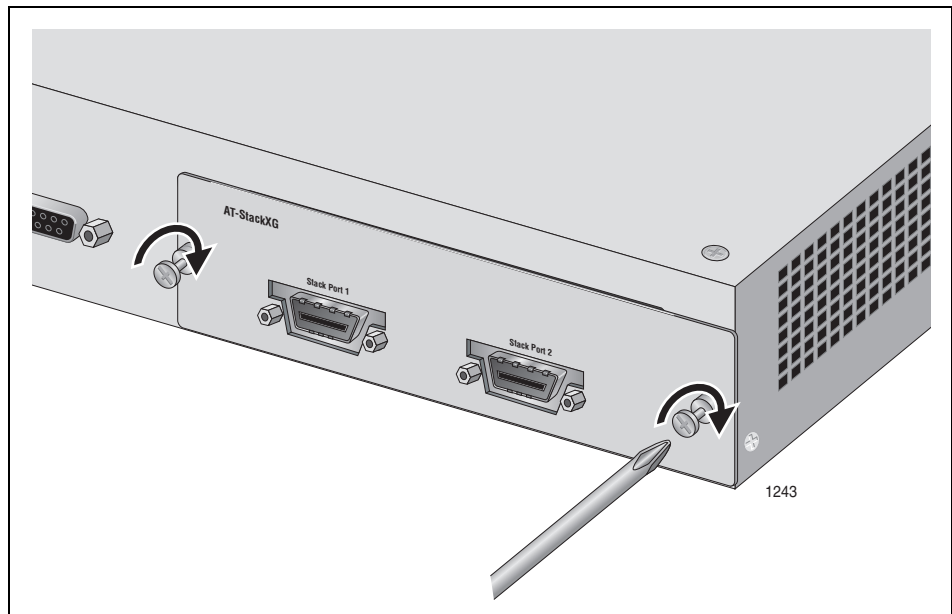
Figure 11. Securing the AT-StackXG Stacking Module

5. Repeat this procedure to install an AT-StackXG Stacking Module in the other switches of the stack.

You are now ready to install the power cord retaining clip, as explained in the next procedure.

Installing the Power Cord Retaining Clip (AC Switches Only)

Perform the following procedure to install the power cord retaining clip on the switches:

1. Locate the power cord retaining clip, shown in Figure 12.
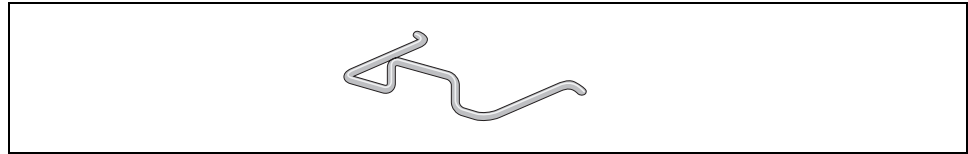
Figure 12. Power Cord Retaining Clip

2. Install the clip on the AC power connector on the back panel of the switch. With the "u" of the clip facing down, press the sides of the clip toward the center and insert the short ends into the holes in the retaining bracket, as shown in Figure 13.
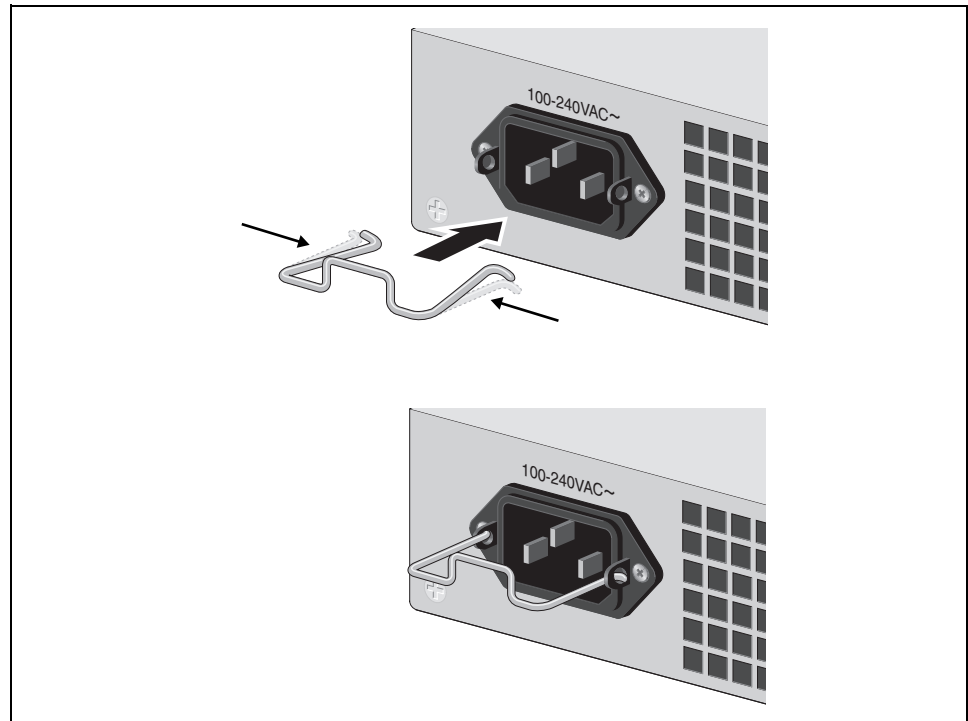
Figure 13. Inserting the Retaining Clip into the Retaining Bracket

If the switches of the stack were used as stand-alone units in your network, go to the next procedure to remove the network cables. Otherwise, go to "Installing the Switches in an Equipment Rack" on page 44.

Disconnecting the Network Cables

If the switches of the planned stack were used as stand-alone devices in your network, label and disconnect all of the network cables from their ports. You will reconnect the cables after the stack is created and after you have reestablished the switches' configuration settings. If you leave the cables connected to the ports during the installation, loops might result in your network topology and that could produce broadcast storms.
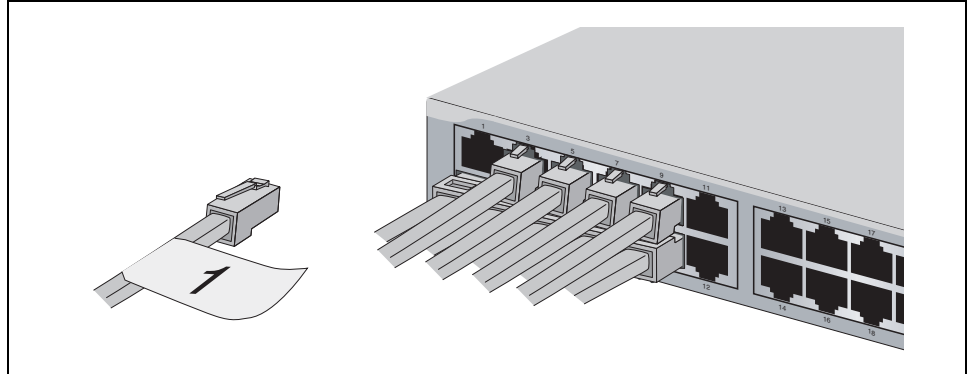
Figure 14. Removing the Network Cables from Stand-alone Switches

Installing the Switches in an Equipment Rack

Note
Installing a stack on a table or desktop is not recommended because it may create a hazardous work area.

Perform the following procedure to install the switches in a standard 19-inch rack:

1. Place the switch upside down on a level, secure surface.

2. Using a flat-head screwdriver, remove the snap-on plastic feet from the bottom of the switch, as shown in Figure 15.
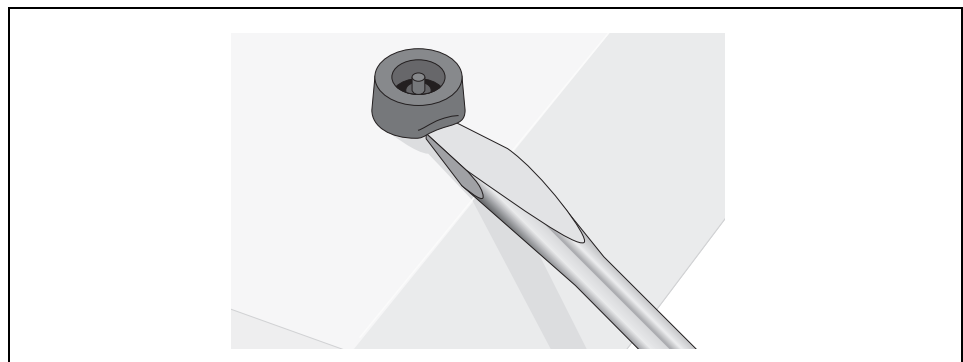
Figure 15. Removing the Feet

3. Turn the switch over.

4. Attach a rack-mount bracket to one side of the switch using four of the screws that come with the switch, as shown in Figure 16.
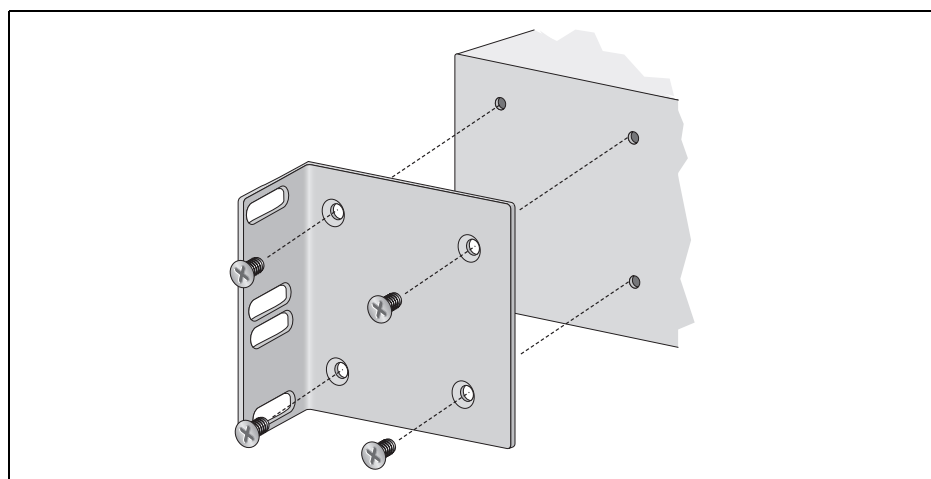
Figure 16. Attaching Rack-Mount Brackets

5. Install the second rack-mount bracket on the other side of the switch with the four remaining screws.

6. Mount the switch in a 19-inch rack using standard screws (not provided), as shown in Figure 17.
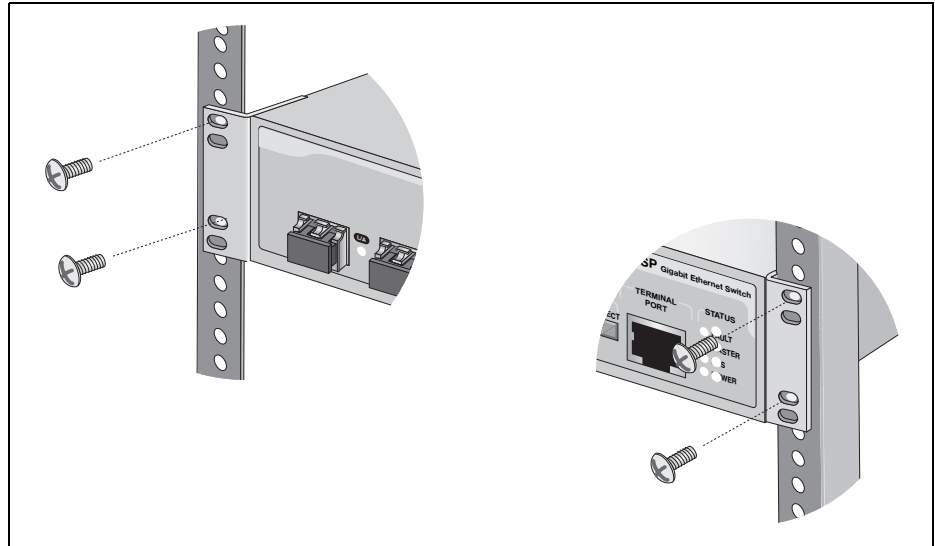
Figure 17. Mounting the Switch in a Rack

After you have installed all the switches of the stack in the equipment rack, you are ready to label the switches, as explained in the next procedure.

Labeling the Switches

Starting with the top or bottom switch of the stack, assign each unit a number starting with 1 and affix labels with the numbers to their front panels or adjacent to the units on the equipment rack. These numbers will be their static module ID numbers, which you'll assign later in "Assigning the Static Module ID Number 1 to the Master Switch" on page 54 and "Assigning Static Module ID Numbers to the Member Switches" on page 57. The number has a range of 1 to 8. An example of a stack with three switches is shown in Figure 18. When numbering the switches, note the following:

❒ The labels should also include the MAC addresses of the switches, which are found on labels on the back panels. The switches will be easier to identify and manage if the labels have both the stack ID numbers and the MAC addresses.

❒ The switches can be numbered in any order, but they will be easier to identify and manage if they are numbered in sequence starting with the top or bottom switch.

❒ The switch assigned number 1 will be the master switch of the stack. As explained in "Maximum Number of Switches in a Stack" on page 37, the AT-9448Ts/XP Switch should not be used as the master switch.
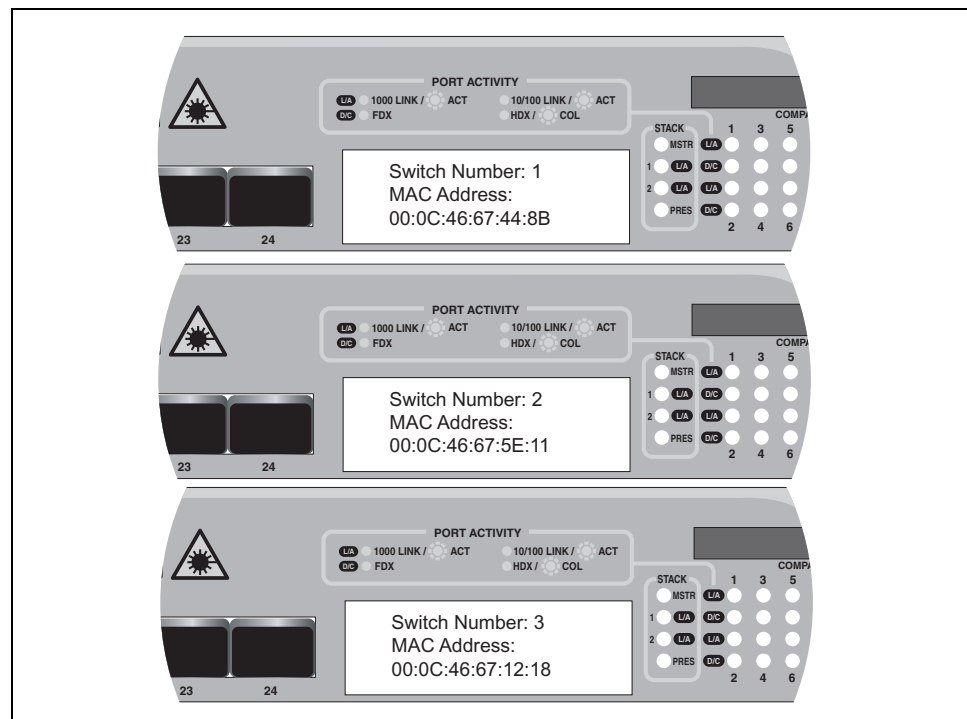
Figure 18. Labelling the Switches

After labeling the units, go to Chapter 3, "Preparing the Switches" on page 47.

Chapter 3
Preparing the Switches

The chapter contains the following procedures:

❒ "Powering on a Switch" on page 48

❒ "Starting a Local Management Session" on page 50

❒ "Verifying the AT-S63 Version Number" on page 52

❒ "Updating the AT-S63 Management Software" on page 53

❒ "Assigning the Static Module ID Number 1 to the Master Switch" on page 54

❒ "Assigning Static Module ID Numbers to the Member Switches" on page 57

Note
The cables should not be connected to the AT-StackXG Modules during the procedures in this chapter.

Powering on a Switch

To power on a switch, perform the following procedure:

1. Position the power cord retaining clip in the up position, as shown in Figure 19.
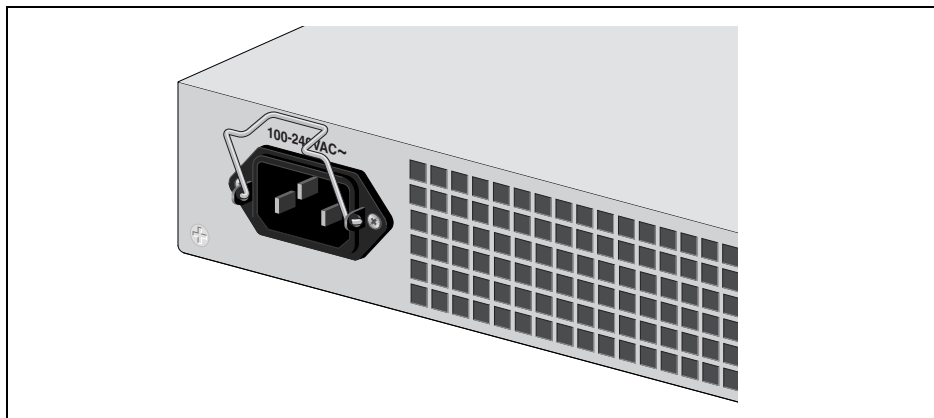
Figure 19. Power Cord Retaining Clip in the Up Position

2. Plug the power cord into the AC power connector on the back panel of the unit (see Figure 20).

> ⚡ **Warning:** Power cord is used as a disconnection device. To de-energize equipment, disconnect the power cord. ✍ 5

> ⚡ **Warning:** This unit might have more than one power cord. To reduce the risk of electric shock, disconnect all power cords before servicing the unit. ✍ 32
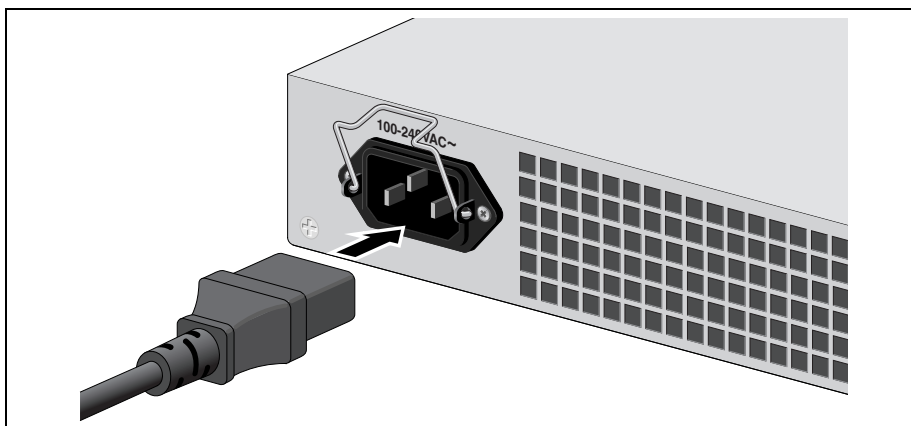
Figure 20. Connecting the AC Power Cord

3. Connect the other end of the power cord to an appropriate AC power outlet. For power specifications for the switch, refer to "Power Specifications" on page 100.

Go to the next procedure to start a local management session on the unit.

Starting a Local Management Session

To start a local management session on the unit, perform the following procedure:

1. Connect the RJ-45 end of the management cable included with the AT-9400 Switch to the Terminal Port on the front panel of the switch, as shown in Figure 21.
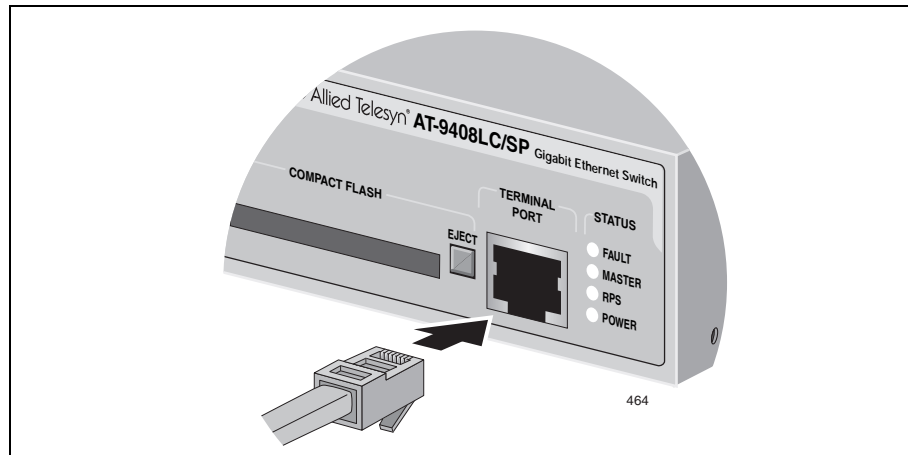
Figure 21. Connecting the Management Cable to the RJ-45 Terminal Port on the Switch

2. Connect the other end of the cable to an RS-232 port on a terminal or a personal computer with a terminal emulation program.

3. Configure the terminal or terminal emulation program as follows:

    ❐ Baud rate: Default is 9600 bps (Range is 9600 to 115200 bps)
    ❐ Data bits: 8
    ❐ Parity: None
    ❐ Stop bits: 1
    ❐ Flow control: None

    Note
    The port settings are for a DEC VT100 or ANSI terminal, or an equivalent terminal emulator program.

4. Press Enter.

    You are prompted for a user name and password.

5. If the switch is new, the user name is "**manager**" and the default password is "**friend**". If the switch was used as a stand-alone unit in your network, enter the appropriate user name and password for manager access. The user name and password are case sensitive.

Go to the next procedure to verify the version number of the AT-S63 Management Software on the unit.

Verifying the AT-S63 Version Number

After you have logged on, the command line interface (CLI) prompt, shown in Figure 22, is displayed.

```
Allied Telesis Ethernet Switch AT-9424Ts/XP - AT-S63 v4.0.0
                        <No system name>
#
```

Figure 22. Command Line Prompt

The version number of the AT-S63 Management Software on the switch is displayed after "AT-S63." In the example it's "V4.0.0."

Note the following:

❒ The management software must be version 3.0.0 or later.

❒ All the switches of a stack must have the same version of the management software.

If you need to upgrade the management software on the switch, go to the next procedure. Otherwise, go to "Assigning the Static Module ID Number 1 to the Master Switch" on page 54 if you are configuring the master switch of "Assigning Static Module ID Numbers to the Member Switches" on page 57 if you are configuring a member switch.

Updating the AT-S63 Management Software

If you need to upgrade the management software on the switch, perform the instructions in this section. If the switch already has the correct version of the management software, go to the next section.

These instructions use Xmodem to transfer the new management software to the switch. If you prefer, you can download the file using TFTP. For instructions, refer to the *AT-S63 Management Software User's Guides*.

> ⚠ **Caution**
>
> This procedure causes the switch to reset. The switch will not forward traffic during the reset. If the unit is connected to a live network, some network traffic will be lost.

This procedure assumes that you established a local management session with the switch, as explained in the previous sections, and that you have obtained the necessary management software from the Allied Telesis web site and stored it on your workstation. For instructions on how to obtain new management software, refer to "Obtaining Management Software Updates" on page 12.

To load new management software on the switch, perform the following procedure:

1. Enter this command at the command prompt:

   ```
   load method=xmodem destfile=appblock
   ```

2. At the confirmation prompt, enter "Y" for yes to continue with the procedure or "N" for no to cancel the procedure.

   This prompt is displayed;

   ```
   Use Hyper Terminal's Transfer/Send file option to
   select Filename & Protocol
   Note: Please select '1K Xmodem' protocol for faster
   download...
   ```

3. Use your Xmodem utility on your workstation to begin the file transfer.

   After receiving the file, the switch writes it to flash memory and then resets. The entire file transfer takes about seven minutes at 115200 bpi on the Terminal port.

Assigning the Static Module ID Number 1 to the Master Switch

This procedure explains how to assign the static module ID number 1 to the master switch of the stack. If the switch will be a member switch, go to the next procedure for instructions on how to assign it a stack ID number.

This procedure assumes that you have already established a local management session with the device that is to be the master switch of the stack. For instructions, refer to "Starting a Local Management Session" on page 50.

To assign the stack ID number 1 to the master switch, perform the following procedure:

1. Enter the following command to view the switch's current module ID assignment:

    show stack

    Note
    If the switch displays the message "CLI Command Not Found or Ambiguous," the AT-S63 Management Software on the unit needs to be updated. For instructions, refer to "Updating the AT-S63 Management Software" on page 53.

    An example of the display is shown in Figure 23.

```
Local MAC Addr                :00:30:84:00:00:03
Standalone Mode ID            :1
Stack Mode                    :AUTO
Stack ID                      :1
Stack Priority                :16
```
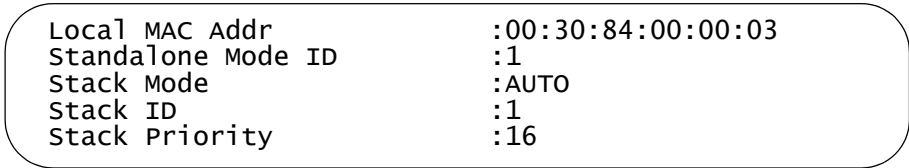
Figure 23. SHOW STACK Command

This command displays the following information:

Table 9. SHOW STACK Command

Field	Description
Local MAC Addr	The MAC address of the switch.
Standalone Mode ID	The module ID number of the switch when the device is not a part of a stack. This parameter can be ignored.

Table 9. SHOW STACK Command

Field	Description
Stack Mode	The assignment method of the module ID number. Auto means the number was assigned dynamically by the management software when the switch was powered on. Static means the number was assigned with the SET STACK command.
Stack ID	The switch's current module ID number.
Stack Priority	The switch's current stack priority value, used to control dynamic module ID numbers.

When this command is performed on a stack, it includes a table that lists the units of the stack. However, since the unit is not yet part of a stack, the table is omitted.

2. Examine the Stack Mode and Stack ID fields. If the Stack Mode is Static and the Stack ID is 1, no command is necessary. Go to step 8.

    If the current setting of Stack Mode is Auto, enter this command to change the switch's dynamic module ID value to the static value of 1:

    ```
    set stack moduleid=1 newmoduleid=1
    ```

    If Stack Mode is Static and Stack ID is a value other than 1, enter the following command, where n is the current value of Stack ID:

    ```
    set stack moduleid=n newmoduleid=1
    ```

    For example, if the current value of Stack ID is 4, the command would be:

    ```
    set stack moduleid=4 newmoduleid=1
    ```

    Note
    If you are already familiar with the AT-S63 Management Software, then you probably know about the SAVE CONFIGURATION command, which is used to save your configuration changes in the active boot configuration file. That command is not required in this procedure because the SET STACK command automatically saves the new module ID number in a hidden system file in the switch's file system.

3. The new module ID number does not take affect until the switch is reset. Reset the unit with this command:

    ```
    restart reboot
    ```

4. Wait for the switch to reset and afterwards reestablish the management session by logging in again.

5. Enter the following command again to verify the switch's stack ID assignment:

    ```
    show stack
    ```

6. Verify that the Stack Mode is Static and the Stack ID is 1. If the values are correct, go to the next step. Otherwise, repeat the procedure starting with step 2.

7. Power off the switch.

Repeat the procedures in this chapter on the other switches of the stack. Afterwards, go to the next chapter for instructions on how to cable and power on the stack.

Assigning Static Module ID Numbers to the Member Switches

This procedure is used to assign a static ID number to a member switch of the stack. It must be performed on a switch before the cables are connected to the AT-StackXG Stacking Module.

This procedure assumes that you have already established a local management session to the device, as explained in "Starting a Local Management Session" on page 50.

To assign a static module ID number to a member switch, perform the following procedure:

1. Enter the following command to view the switch's current module ID assignment:

    ```
    show stack
    ```

    An example of the information the command displays can be found in Figure 23 on page 54.

2. Enter one of the following commands.

    If the Stack Mode is Auto, enter this command, where n is the stack ID number you want to assign the switch:

    ```
    set stack moduleid=1 newmoduleid=n
    ```

    For example, to assign the switch the stack ID number 2, enter:

    ```
    set stack moduleid=1 newmoduleid=2
    ```

    If the Stack Mode is Static, enter this command, where m is the current stack ID number of the switch and n is the new value:

    ```
    set stack moduleid=m newmoduleid=n
    ```

    For example, if the current value of the My ModuleID is 4 and you want to assign the switch the ID 3, the command would be:

    ```
    set stack moduleid=4 newmoduleid=3
    ```

3. The new module ID number does not take affect until the switch is reset. Reset the unit with this command:

    ```
    restart reboot
    ```

4. Wait for the switch to reset and afterwards reestablish the management session by logging in again.

5. Enter the following command again to verify the switch's stack ID assignment:

   ```
   show stack
   ```

6. Verify that Stack ID is showing the number you assigned the switch in step 2. If the value is correct, go to the next step. Otherwise, repeat the procedure starting with step 2.

7. Power off the switch.

Repeat the procedures in this chapter on the other switches of the stack. Afterwards, go to the next chapter for instructions on how to cable and power on the stack.

Chapter 4

Cabling and Powering on the Stack

The chapter contains the following procedures:

❐ "Cabling the AT-StackXG Stacking Modules" on page 60
❐ "Powering On the Switches of the Stack" on page 63
❐ "Verifying the Installation" on page 65
❐ "Troubleshooting the Discovery Process" on page 67

Cabling the AT-StackXG Stacking Modules

Note
Allied Telesis recommends that during the initial installation you
power off the switches before you attach the stacking cables.

To connect the AT-StackXG/.5 Stacking Cables and the optional
AT-StackXG/1 Stacking Cable to the stacking modules, perform the
following procedure:

1. Remove the plastic protectors from the connectors on the
    AT-StackXG/.5 Stacking Cable shipped with the stacking module.
    Refer to Figure 24.
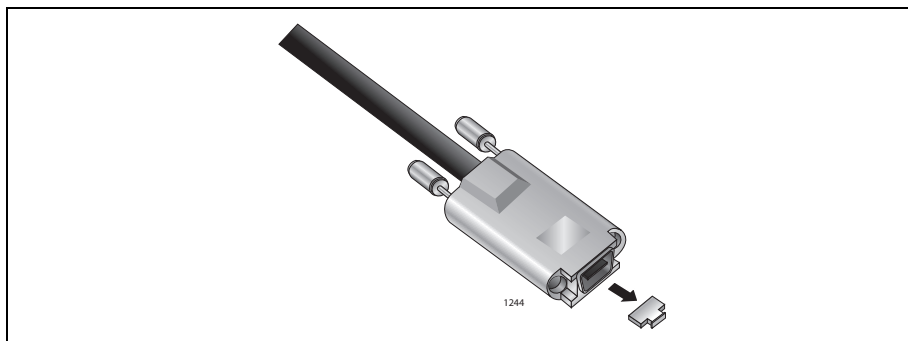
Figure 24. Removing the Plastic Protector

2. Starting with the top switch of the stack, connect the cable to either the
    Stack Port 1 or Stack Port 2 on the stacking module and tighten the
    two thumbscrews to secure it to the module.
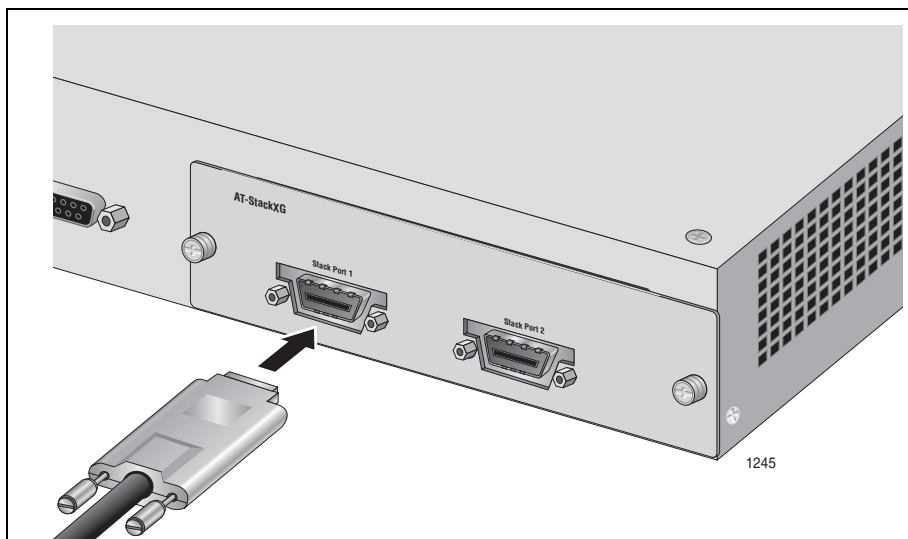
Figure 25. Connecting the AT-StackXG/.5 Stacking Cable

3. Connect the other end of the stacking cable to a Stack Port on the stacking module in the next switch of the stack. The cable connections must crossover to a different numbered port on the next stacking module. Stack Port 1 on a module must connect to Stack Port 2 on another module. Do not connect two Stack Port 1 ports or Stack Port 2 ports together.

4. Repeat steps 1, 2, and 3 to cable the remaining switches of the stack with the AT-StackXG/.5 Stacking Cables. Figure 26 illustrates the cabling configuration for a stack of four switches.
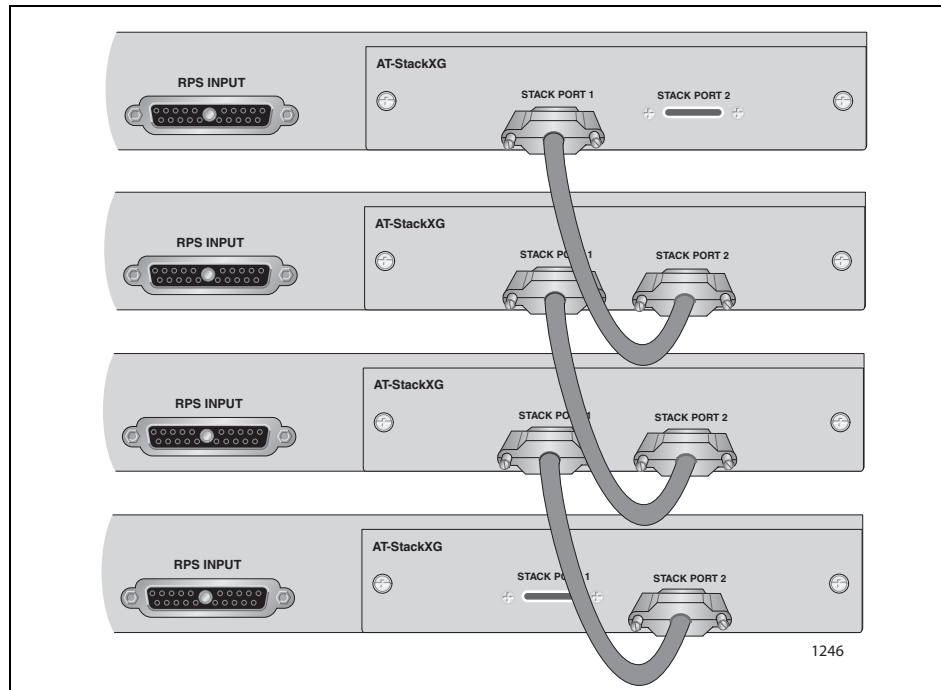
Figure 26. Example of a Cabling Configuration for a Stack with Four Switches

Note
If you purchased the optional AT-StackXG/1 Stacking Cable, continue with this procedure to install it. Otherwise, go to the next procedure to power on the switches.

5. After removing the plastic protectors from the connectors on the AT-StackXG/1 Stacking Cable as shown in Figure 24 on page 60, connect the cable to the unused Stack Ports on the top and bottom switches of the stack. The connections must crossover with the cable connecting to different numbered ports on the stacking modules.

Figure 27 illustrates a stack of four switches in the ring topology.
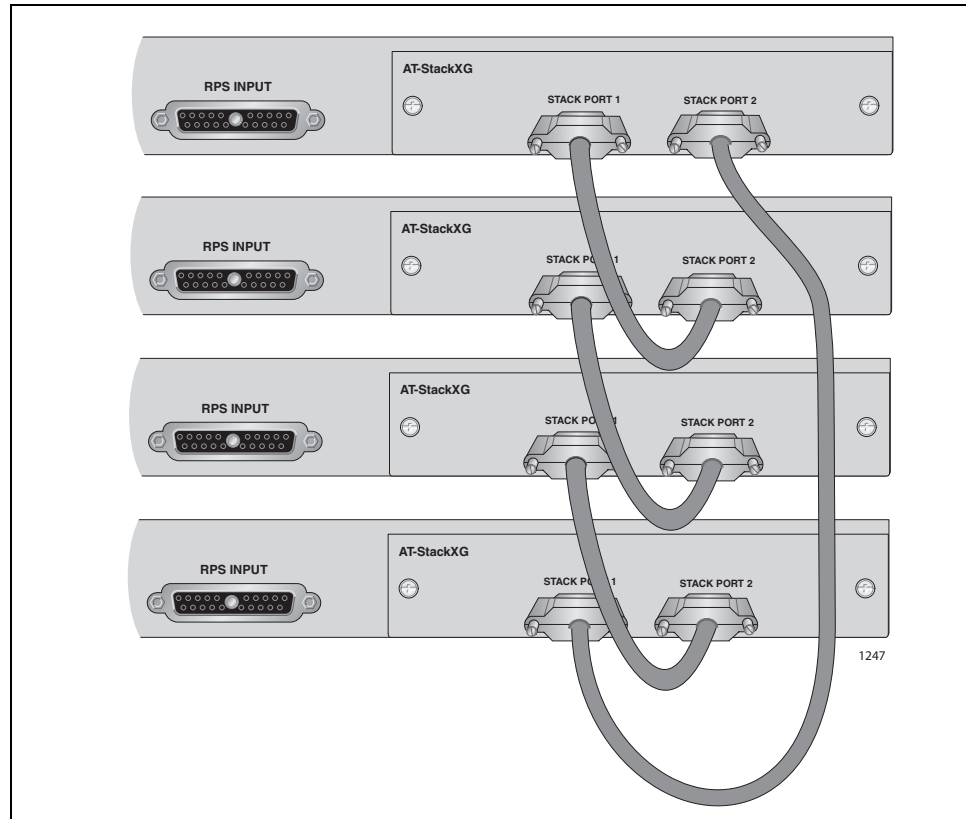
Figure 27. Example Stack of Four Switches in the Ring Topology

6. Go to the next procedure to apply power to the switches of the stack.

Powering On the Switches of the Stack

After cabling the stacking modules, apply power to the switches of the stack by connecting the power cords. The switches of a stack can be powered on in any order. The units initialize their management software, which takes about one minute, and afterwards perform the discovery process. The discovery process, which ascertains the number of switches in the stack, can take from fifteen seconds to several minutes to complete, depending on the size of the stack and the number of the commands in the active configuration file on the master switch.

You can monitor the progress of the stack during these tasks by connecting a terminal or a personal computer with a terminal emulation program to the Terminal Port on the stack's master switch, assigned the static ID number 1.

The commencement by the stack of the discovery process is signalled with the messages in Figure 28.

```
Stack discovery is in progress ...

PLEASE DO NOT ADD/DELETE UNITS TO/FROM THE STACK UNTIL THE
CURRENT STACK SETUP AND THE STACK CONFIGURATION IS LOADED.
```

Figure 28. Commencement of the Discovery Process

Note
If you see any error messages during the discovery process, go to "Troubleshooting the Discovery Process" on page 67.

At the completion of the discovery process, the master switch displays the number of switches in the stack and its own MAC address twice, once as the switch of the local management session and again as the master switch of the stack. Figure 29 is an example of the messages.

```
4 module(s) discovered

Local MAC address: 00:04:75:00:00:11
Master MAC address: 00:04:75:00:00:11
```

Figure 29. Conclusion of the Discovery Process

The master switch then configures the devices with the commands in the active configuration file in its file system. If this is the first time the stack is booted up, you will see the messages in Figure 30.

```
Configuring the Stack............................ done!

Reinitializing Software Modules ................. done!

Configuration file "stack.cfg" not found!
Loading default configuration ........ done!
```

Figure 30. Console Messages at the Completion of the Discovery Process

The default configuration file for a stack is called STACK.CFG. The switch does not come with this file which is why there is the message that the file could not be found. In the next procedure you'll create it with the SAVE CONFIGURATION command.

At this point, the stack is operational and ready to forward network traffic on the ports. To log in and manage the stack, press Return to display the login prompt.

You can also monitor the initialization process by observing the Stack MSTR LED on the front panel of the master switch. The LED is steady green when the stack is ready for network operations. (Do not confuse the Stack MSTR LED with the Status MASTER LED. The latter is used with enhanced stacking, a feature that AT-9400Ts Stacks do not support. For information on enhanced stacking, refer to the *AT-S63 Management Software Features Guide*.)

Go to the next procedure, "Verifying the Installation" on page 65.

Verifying the Installation

To verify the installation of the stack, perform the following procedure:

1. After powering on the stack, wait a least two minutes to give the switches sufficient time to initialize their management software and to complete the discovery process.

2. Examine the Stack MSTR LED on the front panel of the switch labeled 1. As the master switch of the stack, its Stack MSTR LED should be green. (Do not confuse the Stack MSTR LED with the Status MASTER LED. The latter is used with enhanced stacking, a feature that AT-9400Ts Stacks do not support. For information on enhanced stacking, refer to the *AT-S63 Management Software Features Guide*.)

    If the Stack MSTR LED on the switch labelled 1 is off, examine the same LED on the other switches of the stack. If all the Stack MSTR LEDs are off, the discovery process may have encountered a problem. For suggestions on how to resolve it, refer to "Troubleshooting the Discovery Process" on page 67.

3. Establish a local management session on the master switch. For instructions, refer to "Starting a Local Management Session" on page 50.

4. At the command line prompt, enter this command:

    ```
    show stack
    ```

    The command lists the switches of the stack. An example is show in Figure 31.

```
          Allied Telesis Ethernet Switch AT-9424Ts - AT-S63
                         <No system name>
Local Mac Addr              :0:4:75:0:0:11
Master MAC Addr             :0:4:75:0:0:11
Backup Master MAC Addr      :0:4:75:0:0:44
Topology                    :None
My ModuleID                 :1
ModuleID Assignment Mode    :STATIC
Current State               :Master
Module Count                :3


     --------------------------------------------------------------
     Module    Stack State    Model Name     Priority   Mac Address
     --------------------------------------------------------------
     1         Master         AT-9448Ts/XP   16         0:4:75:0:0:11
     2         Member         AT-9424Ts/XP   16         0:4:75:0:0:44
     3         Member         AT-9424Ts/XP   16         0:4:75:0:0:7
```

Figure 31. SHOW STACK Command

5. Match the entries in the table with the switches in the equipment rack by referring to the labels on the front panels of the units. The ID number and MAC address on a switch's label should match the unit's entry in the table. For example, the switch labelled 2 and assigned the static module ID number 2 should correspond to Module 2 in the table.

    If there is a mismatch, you may have assigned the wrong module ID number to a switch. To correct the problem, disconnect the stacking cables and perform "Assigning the Static Module ID Number 1 to the Master Switch" on page 54 or "Assigning Static Module ID Numbers to the Member Switches" on page 57 on any switch with an incorrect module ID number. (The module ID number must be set while a switch is functioning as a stand-alone unit.) Afterwards, reconnect the stacking cables.

    The stack is operating correctly when the physical switches correspond correctly with the information from the command.

    Note
    All of the switches in the new stack use the default values in the AT-S63 Management Software for their parameter settings. This is true even for switches that might have been used as stand-alone units in your network, To restore the stand-alone configurations to the switches, you must recreate the configurations by entering the appropriate commands. This should be performed before you connect the network cables to the ports on the switches. For instructions, refer to the *AT-S63 Management Software Command Line User's Guide*.

6. To create the STACK.CFG configuration file, enter this command:

    ```
    save configuration
    ```

    To continue with the installation, go to Chapter 5, "Cabling the Network Ports" on page 69.

Troubleshooting the Discovery Process

The easiest way to troubleshoot a stack that cannot complete the discovery process is by watching for error messages on the Terminal Port of the master switch. Here are the steps:

1. Connect a terminal or a personal computer with a terminal emulation program to the Terminal Port on the master switch, as explained in "Starting a Local Management Session" on page 50.

2. Power on all the switches in the stack. If the switches are already powered on, power off a switch, wait a few seconds and then power it back on again. Alternatively, disconnect and then reconnect a stacking cable from a stacking module.

Possible error messages are:

```
More than maximum allowed number of switches.
```

The stack has too many switches. Review "Maximum Number of Switches in a Stack" on page 37 and remove one or more of the devices.

```
Mixed module ID mode is not supported. Failed to form a
stack
```

```
Failed to elect a stack Master in the static mode.
Stack setup has failed.
```

The appearance of either of these messages could indicate that the stack has both dynamic and static stack ID numbers. The ID numbers of a stack must be static. Resolving the problem requires disconnecting the stacking cables from the switches and resetting the numbers with the SET STACK command. For instructions, "Assigning the Static Module ID Number 1 to the Master Switch" on page 54 and "Assigning Static Module ID Numbers to the Member Switches" on page 57.

The second message could also indicate that there are no switches numbered 1 or 2 in the stack. A stack must have one switch assigned ID number 1 or 2.

```
Module ID conflict. Failed to form a stack
```

This message indicates that the same static ID number was assigned to more than one switch. To resolve the issue, repeat the procedures "Assigning the Static Module ID Number 1 to the Master Switch" on page 54 and "Assigning Static Module ID Numbers to the Member Switches" on page 57. Alternatively, refer to the SET STACK command in the *AT-S63 Command Line Interface User's Guide*.

If the master switch successfully completes the discovery process but the SHOW STACK command does not display all of the switches in the stack, try the following:

❒ Verify that all of the switches are powered on.

❒ Verify that all of the switches are using the same version of the AT-S63 Management Software. For instructions, refer to "Verifying the AT-S63 Version Number" on page 52.

❒ Verify that the stacking cables are securely connected to the ports on the AT-StackXG Stacking Modules and that the cables crossover to different numbered ports on the modules. For information, refer to "Cabling the AT-StackXG Stacking Modules" on page 60.

Chapter 5

Cabling the Network Ports

This chapter contains the instructions that explain how to connect the network cables to the ports on the switches in the stack. The chapter contains the following sections:

❒ "Installing Optional Transceivers" on page 70

❒ "Cabling the Twisted Pair and Fiber Optic Ports" on page 74

Installing Optional Transceivers

Review the following guidelines before installing an optional SFP or XFP transceiver in a switch:

❐ A transceiver can be hot-swapped; the switch can be powered on when you install it. However, you should always disconnect the cables first before removing a transceiver.

❐ You must install the transceiver before you connect the cables to it.

❐ Fiber optic transceivers are dust sensitive. When a fiber optic cable is not installed, or when you store the transceiver, always keep the plug in the optical bores. When you do remove the plug, keep it for future use.

❐ Unnecessary removal and insertion of a transceiver can lead to premature failure.

❐ The SFP slots on the AT-9424Ts and AT-9424Ts/XP Switches are paired with twisted pair ports. For operational information, refer to "Redundant Twisted Pair Ports" on page 21.

⚠ **Warning**
A transceiver can be damaged by static electricity. Be sure to observe all standard electrostatic discharge (ESD) precautions, such as wearing an antistatic wrist strap, to avoid damaging the device.

Note
The cable specifications for optional SFP and XFP transceiver can be found in the installation guides that ship with the devices.

Installing an SFP Transceiver

To install an SFP transceiver in the AT-9424Ts or AT-9424Ts/XP Switch, perform the following procedure:

1. Remove the dust plug from a transceiver slot on the switch, as shown in Figure 32.
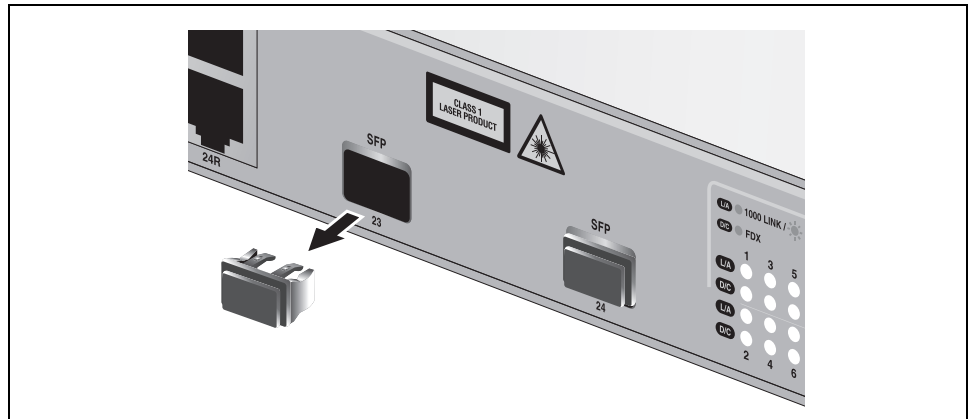
Figure 32. Removing a Dust Plug for an SFP Slot

2. Remove the transceiver from its shipping container and store the packaging material in a safe location.

3. Position the transceiver with the label facing up.

4. Slide the transceiver into the slot until it clicks into place.
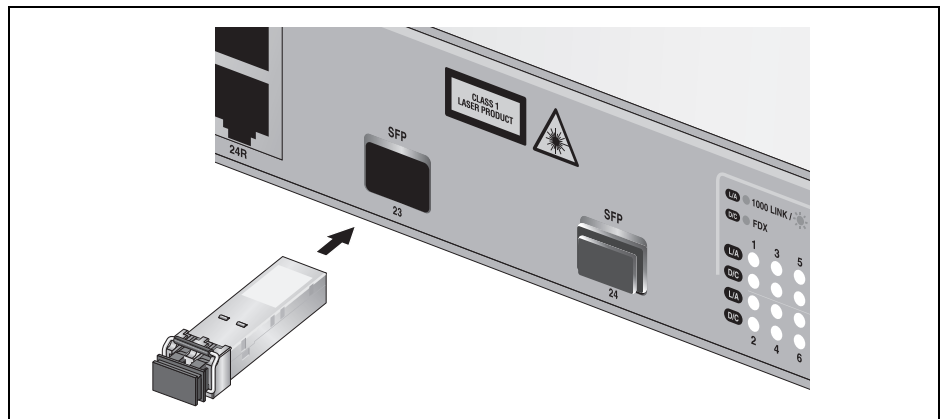
Figure 33. Installing an SFP Transceiver

5. Verify that the handle on the SFP transceiver is in the upright position to secure the module in the slot, as shown in Figure 34.
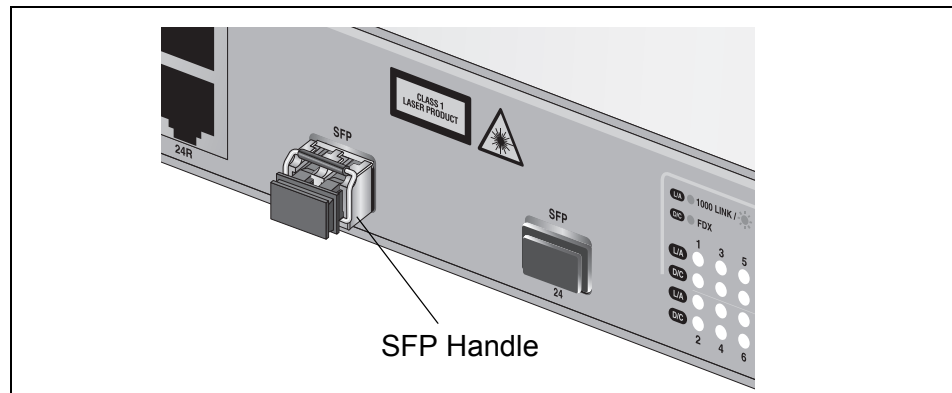
Figure 34. Positioning the SFP Handle in the Upright Position

6. Repeat this procedure to install another SFP transceiver or go to "Cabling the Twisted Pair and Fiber Optic Ports" on page 74.

    For the SFP optical and cabling specifications, consult the documentation that ships with the module.

Installing an XFP Transceiver

To install an XFP transceiver in the AT-9424Ts/XP or AT-9448Ts/XP Switch, perform the following procedure:

1. Remove the dust plug from a transceiver slot on the switch. Refer to Figure 35.
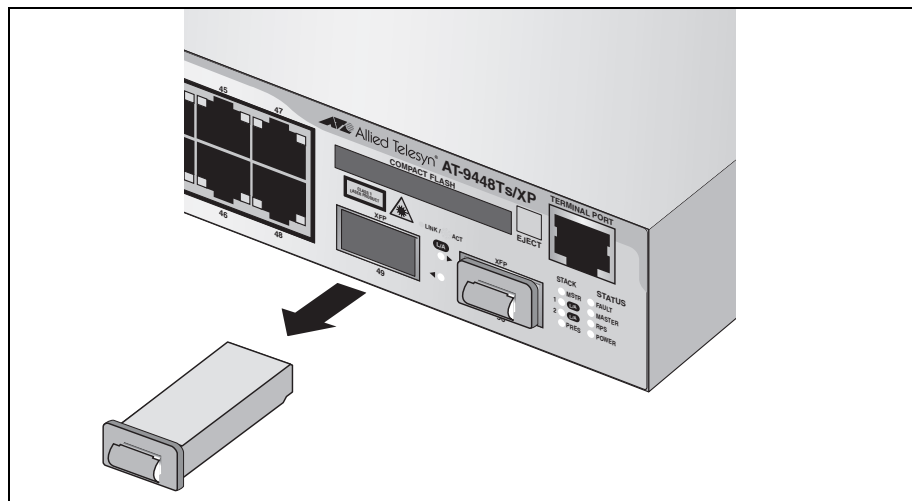
Figure 35. Removing an XFP Dust Plug

2. Remove the transceiver from its shipping container and store the packaging material in a safe location.

3. Position the transceiver with the label facing down.

4. Slide the transceiver into the slot until it clicks into place, as shown in Figure 36.
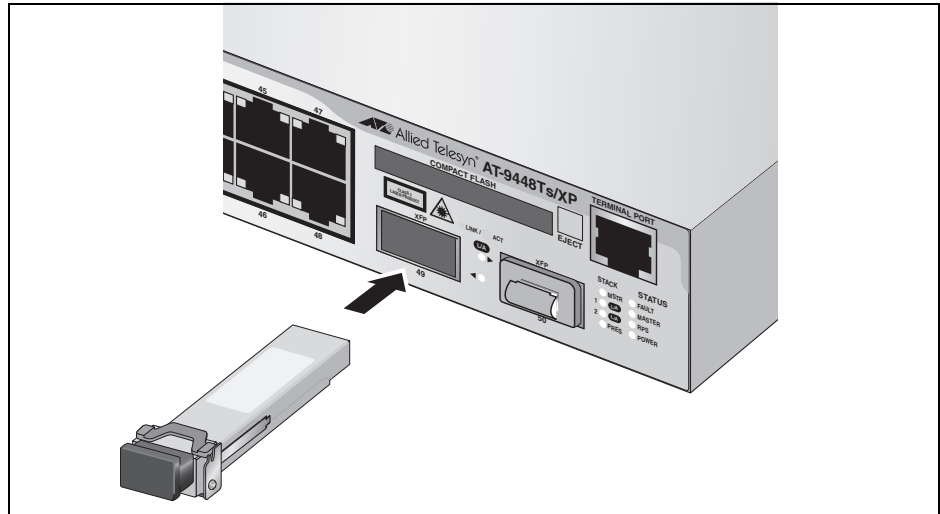
Figure 36. Installing an XFP Transceiver

5. Repeat this procedure to install a second XFP transceiver or go to "Cabling the Twisted Pair and Fiber Optic Ports" on page 74.

    For the XFP optical and cabling specifications, consult the documentation that ships with the module.

Cabling the Twisted Pair and Fiber Optic Ports

Observe the following guidelines when connecting a twisted pair or fiber optic cable to a port on the switch:

❒ The connector on the cable should fit snugly into the port on the switch. The tab on the connector should lock the connector into place.

❒ Because the twisted pair ports on the switch are auto-MDI/MDI-X, you can use a straight-through twisted pair cable to connect any type of network device to a port. If you disable Auto-Negotiation on the port, a port defaults to MDI-X. For instructions on how to configure a port, refer to the *AT-S63 Command Line Interface User's Guide*.

❒ If your network topology contains a loop where two or more network devices can communicate with each other over more than one network path, do not connect the network cables forming the loop until after you have activated a spanning tree protocol on the stack. Data loops can adversely affect network performance. For background information on the different types of spanning tree protocols supported by s stack, refer to the *AT-S63 Management Software Features Guide*.

❒ If you are creating a port trunk, you must configure the stack's management software before connecting the cables of the trunk to the switch. Otherwise, a network loop will result which can adversely affect network performance.

❒ In order for a switch port to successfully Auto-Negotiate its duplex mode with an end node, an end node should also be using Auto-Negotiation. Otherwise, a duplex mode mismatch can occur. A switch port using Auto-Negotiation defaults to half-duplex if it detects that the end node is not using Auto-Negotiation. This will result in a mismatch if the end node is operating at a fixed duplex mode of full-duplex.

To avoid this problem, disable Auto-Negotiation on a switch port and set the port's speed and duplex mode manually if an end node has a fixed duplex mode of full-duplex.

Chapter 6

Adding and Removing Switches

The procedures in this chapter explain how to add and remove switches from a stack. The chapter contains the following sections:

❒ "Replacing the Master Switch" on page 76

❒ "Adding a New Member Switch" on page 85

❒ "Replacing a Member Switch" on page 87

Replacing the Master Switch

This procedure is divided into the following phases:

❐ Phase 1: "Uploading the Active Configuration File" on page 76

❐ Phase 2: "Removing the Current Master Switch" on page 77

❐ Phase 3: "Configuring the New Master Switch" on page 82

❐ Phase 4: "Connecting the New Master Switch to the Stack" on page 84

The phases should be performed in the order presented here.

Uploading the Active Configuration File

The first step to replacing the master switch of a stack is to upload the active configuration file to your workstation or, alternatively, to a TFTP server. The file contains the configuration settings of all the switches in the stack. Later in these procedures you will download the file to the new master switch.

If the current master switch is nonfunctional, perform this procedure on the backup master switch, which has the stack ID number 2. The backup master switch keeps a copy of the configuration file so that if the master switch fails, it can assume the role as the master switch.

You can upload the file using either Xmodem or TFTP. This procedure uses Xmodem. If you prefer to use TFTP, refer to the *AT-S63 Management Software User's Guides* for instructions.

To upload the active configuration file from the master switch or the backup master switch, perform the following procedure:

1. Start a local management session on the current master switch or, if the master switch is not functional, on the backup master switch (stack ID 2). For instructions, refer to "Starting a Local Management Session" on page 50.

2. To identify the name of the active configuration file, enter this command:

   show stack

   Here is an example of the information the command displays.

   ```
   Boot configuration file .............. "stack_eng.cfg" (Exists)
   Current configuration ................ "stack_eng.cfg"
   ```

   Figure 37. SHOW CONFIG Command

This command displays the switch's active boot configuration file. If the lines display different filenames, the active file is displayed in the first line. For more information about this command, refer to the *AT-S63 Management Software Command Line User's Guide*.)

3. Enter this command to upload the file to your workstation:

    `upload method=xmodem srcfile=`*`filename`*`.cfg`

    The *filename* variable is the name of the active boot configuration file displayed with the SHOW CONFIG command in the previous step. When entering the filename, be sure to include the .CFG extension.

4. At the confirmation prompt, type "Y" for yes.

5. After you enter the command, begin the file transfer using your terminal emulator program. The upload, which takes only a few seconds, is completed when the command prompt is displayed again.

6. Go to the next procedure.

Removing the Current Master Switch

Now that you have uploaded the configuration file to your workstation, you can remove the master switch from the stack and the equipment rack.

1. Power off the master switch by disconnecting the power cord from the power source and from the back panel of the switch.

2. Label and disconnect all of the network cables from the twisted pair ports on the switch.
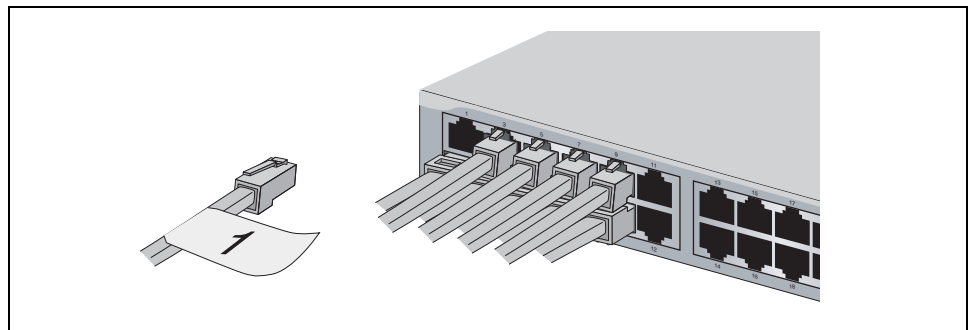
Figure 38. Removing the Network Cables

Note
If the switch has SFP or XFP modules, perform steps 3 to 6.
Otherwise, go to step 7.

3. Label and remove the fiber optic cables from the SFP or XFP modules.

4. Install the dust covers on the fiber optic ports on the modules.
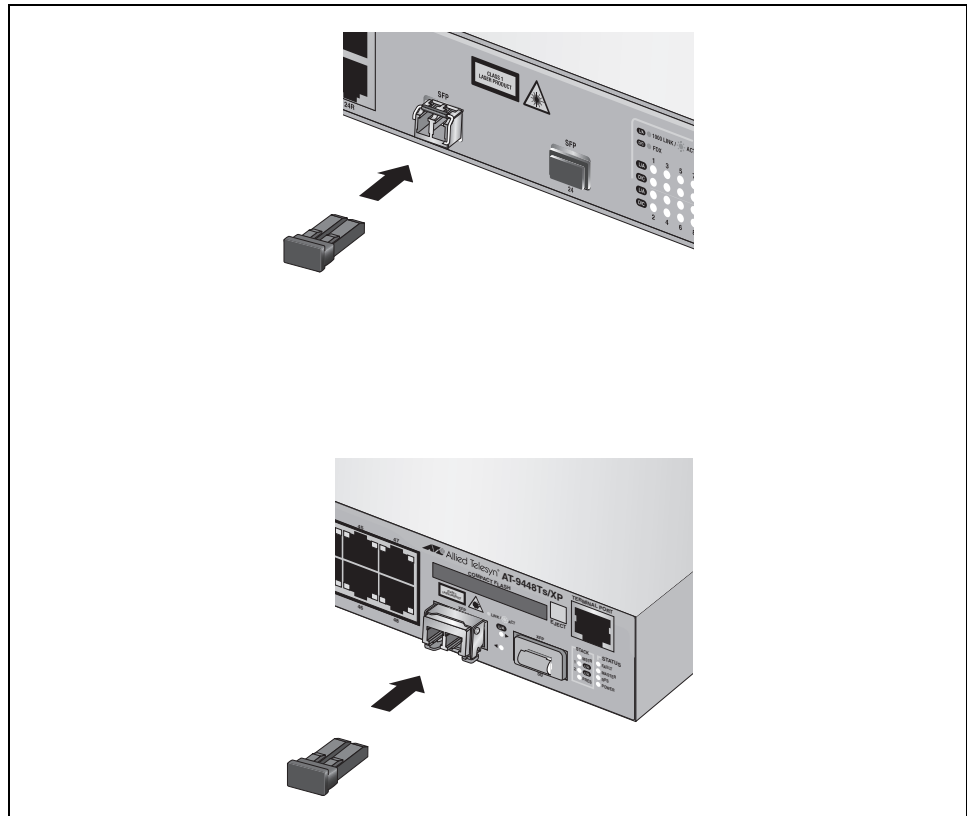
Figure 39. Installing the Dust Covers on the SFP and XFP Modules

5. Label and remove the modules from the switch.
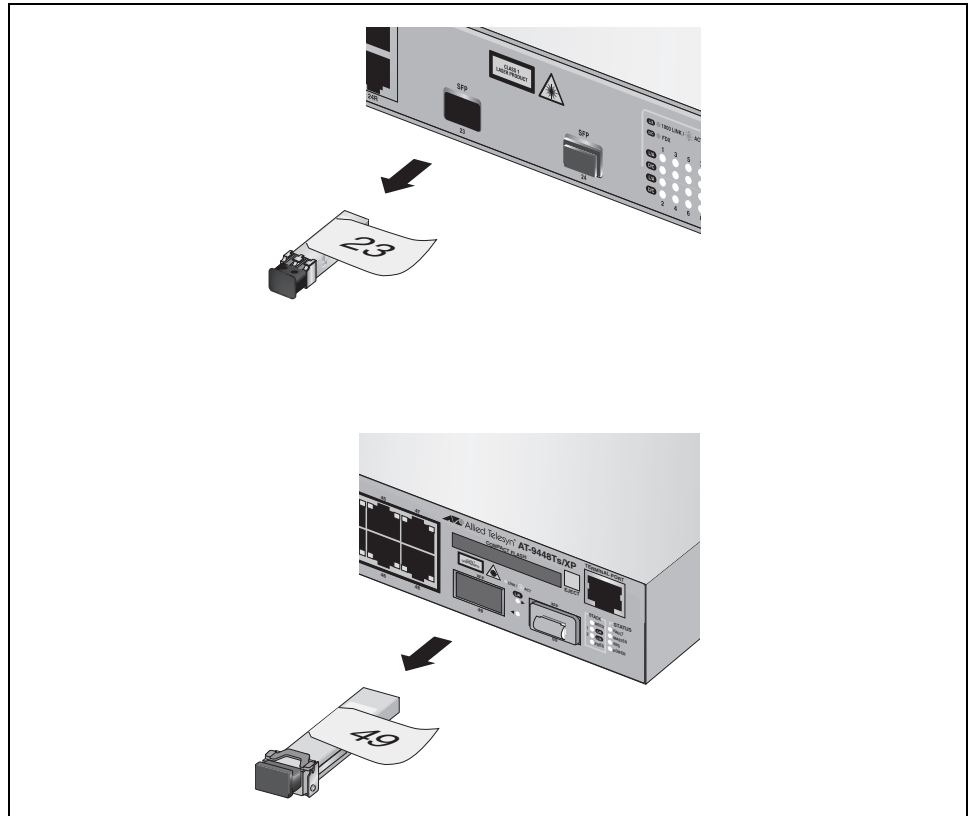
Figure 40. Removing the SFP and XFP Modules

6. Install the dust covers in the SFP and XFP slots.

Figure 41. Installing the Dust Covers in the SFP and XFP Slots

7. Disconnect the stacking cables from the AT-StackXG Stacking Module.
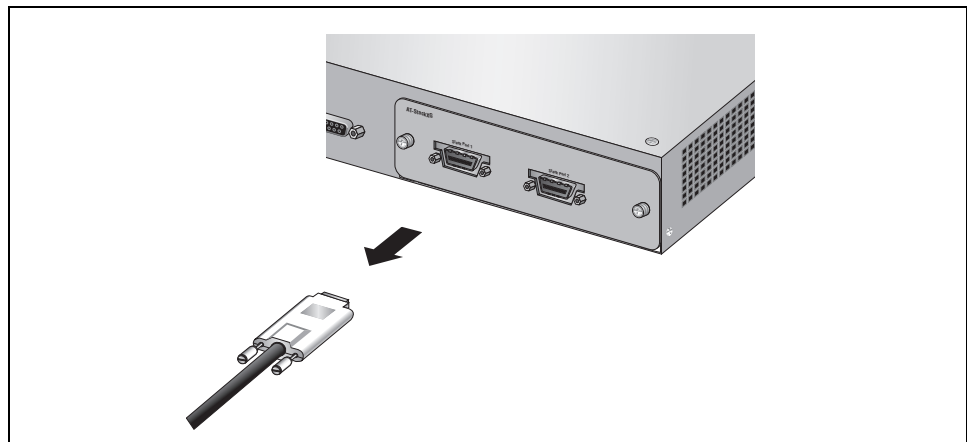
Figure 42. Removing the Stacking Cables from the AT-StackXG Stacking Module

8. Remove the AT-StackXG Stacking Module by loosening the two captive screws and sliding the module from the chassis.
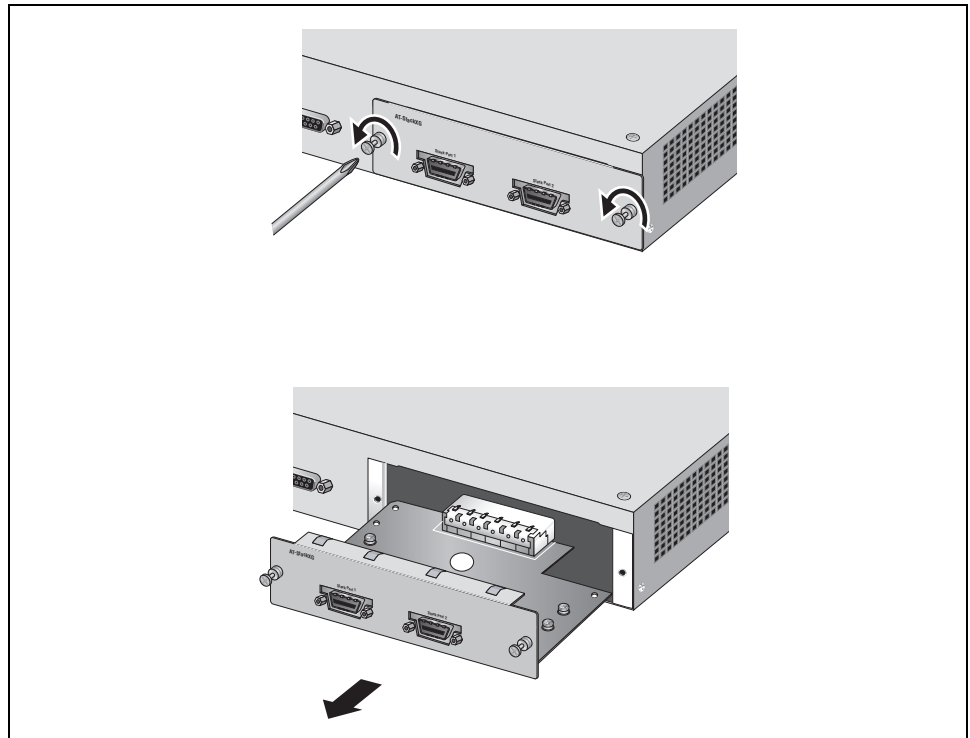
Figure 43. Removing the AT-StackXG Stacking Module

9. Install the slot cover by positioning it over the slot opening and tightening the two captive screws.
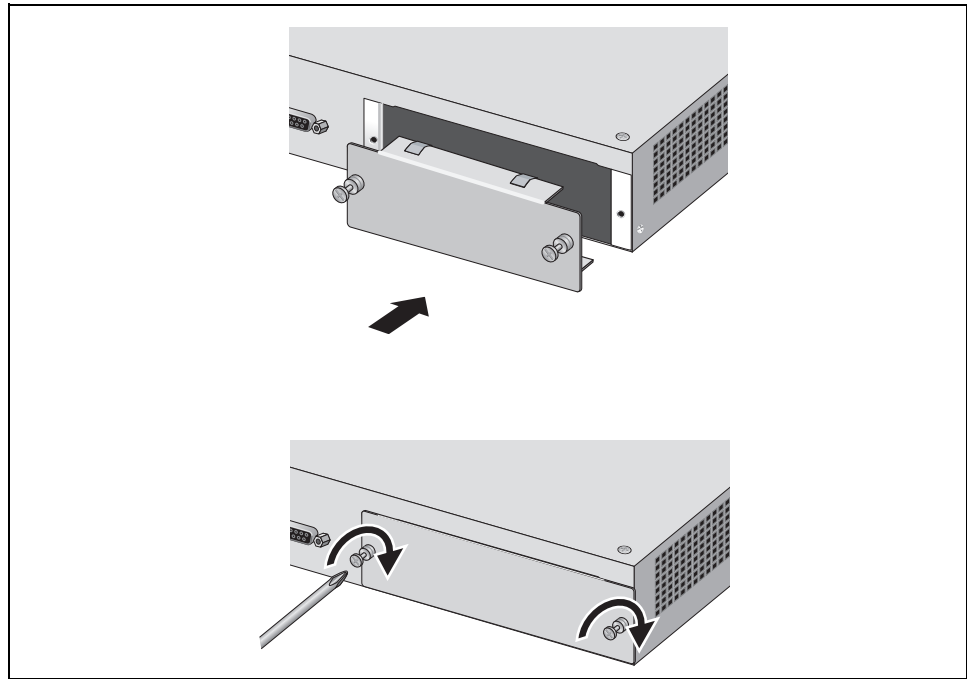
Figure 44. Installing the Slot Cover

10. Remove the switch from the equipment rack.

11. Go to the next procedure.

Configuring the New Master Switch

With the master switch removed from the equipment rack, you are ready to install and configure the new master switch. This stage includes configuring the stack ID number and downloading the configuration file. These steps should be performed before the switch is connected to the stack.

To configure the new master switch, perform the following procedure:

1. Install the AT-StackXG Stacking Module in the new master switch. For instructions, refer to "Installing the AT-StackXG Stacking Module" on page 39.

2. Install the switch in the equipment rack. For instructions, refer to "Installing the Switches in an Equipment Rack" on page 44.

3. Power on the switch by connecting the power cord to the back of the switch and to a power source.

4. After the switch initializes its management software, start a local management session, as explained in "Starting a Local Management Session" on page 50.

5. Since this switch will be the master switch of the stack, you have to assign it the static module ID number 1. For instructions, refer to "Assigning the Static Module ID Number 1 to the Master Switch" on page 54.

6. After configuring the stack ID number and resetting the unit, reestablish your local management session.

7. You should now download onto the switch the configuration file that you uploaded in the first procedure from the previous master switch. Here is the command for downloading the file using Xmodem:

    ```
    load method=xmodem destfile=filename.cfg
    ```

    The *filename*.cfg variable is the name you want to assign the file when it is stored in the switch's file system. The name, which can be up to fifteen alphanumeric characters, not including the ",cfg" extension, must be unique from all of the configuration files that already are stored in the file system on the switch. (To view the names of the files in the file system, use the SHOW FILE command.)

    For example, to assign the name "stack_eng.cfg" to the file, the command is:

    ```
    download method=xmodem srcfile=stack_eng.cfg
    ```

    After entering the command, perform the file transfer using your terminal emulator program.

    Note
    You can skip the next step if the name of the configuration file is "stack.cfg." If the stack's active configuration file is a different name, continue with the next step.

    ---

8. You must now designate the file as the switch's active configuration file so that it knows to use that file to configure the stack and to save new configuration settings. The command is SET CONFIG command. Here is the format:

    set config=*filename*.cfg

    The *filename*.cfg variable is the name of the configuration file you downloaded to the switch. For example, if the name of the file is "stack_eng.cfg," the command would be:

    ```
    set config=stack_eng.cfg
    ```

Note
Do not issue the SAVE CONFIGURATION command. If you do, the switch will overwrite all of the settings in the configuration file with its current settings. If you inadvertently enter the command, download the file again from your workstation by performing step 7.

---

9. To verify the new active configuration file, enter the SHOW CONFIG command. The "Boot configuration file" field should contain the name of the configuration file you designated in the previous step.

10. Power off the switch by disconnecting the power cord from the back panel of the unit.

11. Go to the next procedure.

Connecting the New Master Switch to the Stack

To connect the new master switch to the stack, perform the following procedure:

1. Power off all the switches in the stack by disconnecting the power cords from the power sources or by turning off the power circuit.

2. Cable the AT-StackXG Stacking Module on the new master switch. For instructions, refer to "Cabling the AT-StackXG Stacking Modules" on page 60.

3. Power on the switches of the stack, including the new master switch.

4. To verify that the new master switch is operating properly, perform the steps in "Verifying the Installation" on page 65.

5. Install the SFP and XFP modules in the master switch. For instructions, refer to "Installing Optional Transceivers" on page 70.

6. Connect the network cables to the ports and modules in the switch. For instructions, refer to "Cabling the Twisted Pair and Fiber Optic Ports" on page 74.

Adding a New Member Switch

Table 10 lists the steps to add a new member switch to a stack.

Table 10. Adding a New Member Switch to a Stack

	Task	**Procedure**
1	Before a new switch is added to a stack, you should first verify that the addition of the new member will not exceed the maximum permitted size of a stack.	"Maximum Number of Switches in a Stack" on page 37
2	Install the AT-StackXG Stacking Module in the new switch.	"Installing the AT-StackXG Stacking Module" on page 39
3	Install the power cord retaining clip.	"Installing the Power Cord Retaining Clip (AC Switches Only)" on page 42
4	If the switch is a stand-alone device in your network, label and disconnect all of the network cables from the ports.	"Disconnecting the Network Cables" on page 43
5	Install the switch in the same equipment rack as the stack.	"Installing the Switches in an Equipment Rack" on page 44
6	Add a label to the front panel of the switch or adjacent to it on the equipment rack, with the unit's MAC address, found on the back panel, and the static ID number you intend to assign it. This should be the next available ID number in the stack. (If you do not know the next available stack ID number, start a local or remote management session on the stack and issue the SHOW STACK command.)	"Labeling the Switches" on page 46
7	Power on the switch.	"Powering on a Switch" on page 48
8	Start a local management session on the switch.	"Starting a Local Management Session" on page 50

Table 10. Adding a New Member Switch to a Stack

	Task	Procedure
9	Verify that the new switch has the correct version of the AT-S63 Management Software. It has to be Version 3.0.0 or later and it has to be the same version as the management software on the other switches. (If you do not know the version number of the management software on the stack, start a local or remote management session on the stack. The version number is displayed in the window.)	"Verifying the AT-S63 Version Number" on page 52
10	If you need to update its management software, perform this procedure.	"Updating the AT-S63 Management Software" on page 53
11	Assign the new switch its stack ID number.	"Assigning Static Module ID Numbers to the Member Switches" on page 57
12	Power off the switch by disconnecting the power cord from the power source and from the back panel of the unit.	--
13	Power off the stack.	--
14	Connect the new member switch to the stack by cabling the AT-StackXG Stacking Module.	"Cabling the AT-StackXG Stacking Modules" on page 60
15	Power on the stack.	"Powering On the Switches of the Stack" on page 63
16	Verify that the stack is operating properly with the new member switch.	"Verifying the Installation" on page 65
17	If there is a problem, refer to this section for troubleshooting suggestions.	"Troubleshooting the Discovery Process" on page 67
18	Connect the network cables to the ports on the switch.	"Cabling the Twisted Pair and Fiber Optic Ports" on page 74

Replacing a Member Switch

Table 11 lists the steps to replace a member switch in a stack.

Table 11. Replacing a Member Switch in a Stack

	Task	**Procedure**
1	Power off the stack.	
2	Label and disconnect all of the network cables from the switch you are replacing and remove the unit from the equipment rack. The steps for a member switch are the same as those for the master switch.	"Removing the Current Master Switch" on page 77
3	Install the AT-StackXG Stacking Module in the replacement switch.	"Installing the AT-StackXG Stacking Module" on page 39
4	Install the power cord retaining clip.	"Installing the Power Cord Retaining Clip (AC Switches Only)" on page 42
5	Install the switch in the equipment rack.	"Installing the Switches in an Equipment Rack" on page 44
6	Add a label to the front panel of the switch or adjacent to it on the equipment rack, with the unit's MAC address, found on the back panel, and with the static ID number of the unit it is replacing.	"Labeling the Switches" on page 46
7	Power on the switch.	"Powering on a Switch" on page 48
8	Start a local management session on the switch.	"Starting a Local Management Session" on page 50
9	Verify that the AT-S63 Management Software on the new switch is the correct version. It has to be Version 3.0.0 or later and it has to be the same version that is on the other switches. (If you do not know the version number of the management software on the stack, start a local or remote management session. The version number is displayed in the title in the window.)	"Verifying the AT-S63 Version Number" on page 52
10	If you need to update its management software, perform this procedure.	"Updating the AT-S63 Management Software" on page 53

Table 11. Replacing a Member Switch in a Stack

	Task	Procedure
11	Assign the new switch the stack ID number of the replaced unit.	"Assigning Static Module ID Numbers to the Member Switches" on page 57
12	Power off the switch by disconnecting the power cord from the power source and from the back panel of the unit.	--
13	Connect the replacement switch to the stack by cabling the AT-StackXG Stacking Module.	"Cabling the AT-StackXG Stacking Modules" on page 60
14	Power on the stack.	"Powering On the Switches of the Stack" on page 63
15	Verify that the stack is operating properly with the replacement switch.	"Verifying the Installation" on page 65
16	If there is a problem, refer to this section for troubleshooting suggestions.	"Troubleshooting the Discovery Process" on page 67
17	Connect the network cables to the ports on the replacement switch.	"Cabling the Twisted Pair and Fiber Optic Ports" on page 74

Chapter 7

Troubleshooting

This chapter contains information about how to troubleshoot a switch in the event a problem occurs. Sections in the chapter include:

❒ "No Master Switch" on page 90

❒ "Power LED is Off" on page 91

❒ "Twisted Pair Port Link LED is Off" on page 92

❒ "Fiber Optic Port Link LED is Off" on page 93

❒ "Transceiver is Installed but the Status is "Not Present"" on page 94

❒ "System Fault LED is Blinking" on page 95

❒ "System Fault LED is Steadily On" on page 96

❒ "Cannot Establish a Local (Out-of-Band) Management Session" on page 97

❒ "Switch Functions Intermittently" on page 98

Note
If after following the instructions in this chapter you are unable to resolve a problem, contact Allied Telesis Technical Support for assistance. Refer to "Contacting Allied Telesis" on page 12 for contact information.

No Master Switch

After powering on the switches of a stack and waiting two to three minutes for the stack to complete the discovery process, you observe that the Stack MSTR LEDs on the front panels on all the switches are off. This could indicate that the discovery process encountered a problem that prevented the stack from selecting a master switch. For suggestions on resolving the problem, refer to "Troubleshooting the Discovery Process" on page 67.

Power LED is Off

Check the PWR LED on the front of the switch. If the LED is off, indicating that the unit is not receiving power, do the following:

❐ Make sure the power cord is securely connected to the power source and to the AC connector on the back panel of the switch.

❐ Verify that the power outlet has power by connecting another device to it.

❐ Try connecting the unit to another power source.

❐ Try using a different power cord.

❐ Check that the voltage from the power source is within the required levels for your region.

Twisted Pair Port Link LED is Off

When a twisted pair port on the switch is connected to a properly operating end node, the Link LED for the port should be on. If a Link LED is off, do the following:

> **Note**
> A 1000Base-T connection can take from five to ten seconds to establish a link.

❐ Verify that the end node connected to the port is powered ON and is operating properly.

❐ Check that the twisted pair cable is securely connected to the port on the switch and to the port on the end node.

❐ Make sure that the twisted pair cable does not exceed 100m (328 ft).

❐ Verify that you are using the appropriate category of twisted pair cable. For information, refer to Table 2 on page 18.

❐ Determine if a crossover cable is required. Since the twisted pair ports feature auto MDI/MDI-X, you should be able to use a straight-through cable regardless of the type of device you connect to a port. However, if you disable Auto-Negotiation on a port and set a port's speed and duplex mode manually, the port defaults to MDI-X. Disabling Auto-Negotiation may require manually configuring a port's MDI/MDI-X setting or using a crossover cable.

❐ Make sure that the operating parameters of the port on the switch are compatible with the end node to which the port is connected. This may require using the switch's management software.

❐ In order for a switch port to successfully Auto-Negotiate its duplex mode with an end node, the end node should also be using Auto-Negotiation. Otherwise, a duplex mode mismatch can occur. A switch port using Auto-Negotiation defaults to half-duplex if it detects that the end node is not using Auto-Negotiation. This can result in a mismatch if the end node is operating at a fixed duplex mode of full-duplex.

To avoid this problem, disable Auto-Negotiation on a switch port and set the port's speed and duplex mode manually if the end node has a fixed duplex mode of full-duplex.

❐ The switch has a bad cable detection feature that enables it to determine if a twisted pair cable has a electrical short that might cause a network loop. If the switch detects a bad cable on a port, it does not establish a link on that port. Try replacing the cable.

Fiber Optic Port Link LED is Off

When a fiber optic port on the switch is connected to a properly operating end node, the Link LED for the port should be on. If a Link LED is off, do the following:

❒ Verify that the end node connected to the port is powered ON and is operating properly.

❒ Check that the fiber optic cable is securely connected to the port on the switch and the port on the end node.

❒ If the fiber optic port is on an SFP or XFP transceiver, check to be sure that the transceiver is firmly inserted into the slot on the switch.

❒ Make sure that you are using the appropriate type of fiber optic cable and that the cable length does not exceed the allowed maximum distance. For cable specifications for an SFP or XFP module, refer to the installation instructions shipped with the module.

❒ Use a fiber optic tester to test the attenuation on the cable and the strength of the optical signal. For operating specifications for an SFP or XFP module, refer to the installation instructions shipped with the module.

❒ Check that the operating specifications (for instance, wavelength and maximum operating distance) of the fiber optic port on the remote end node are compatible with the fiber optic port on the switch.

❒ Check to be sure that the fiber optic ports on the switch and on the end node are operating at the same speed and duplex mode.

❒ A fiber optic cable contains two separate fiber strands. One strand is for receiving data and the other is for transmitting data. When you connect a fiber optic cable to a port, be sure that the receive fiber connector is connected to the transmit connector on the remote end node, and that the transmit fiber connector is connected to the receive connector on the remote node.

Note
The L/A LED for an SFP transceiver slot may remain ON if you remove the transceiver when it has a link to an end node without first disconnecting the fiber optic cable. The L/A LED will change to OFF the next time an SFP module is installed in the slot. To avoid this, always disconnect the fiber optic cable before removing a transceiver.

Transceiver is Installed but the Status is "Not Present"

If an SFP or XFP transceiver is installed in a transceiver slot but the Uplink Information menu in the AT-S63 Management Software interface displays "Not Present" for that port, do the following:

❐ Verify that the transceiver is completely inserted in the slot on the front of the switch.

Note
The uplink status does not reflect whether a fiber optic cable is connected to the transceiver.

System Fault LED is Blinking

If the system FAULT LED is blinking, no action is required. A blinking FAULT LED indicates that the switch is downloading a new version of the management software or is updating the active boot configuration file. The LED stops blinking after the switch has downloaded the new management software or updated the boot configuration file.

System Fault LED is Steadily On

If the system FAULT LED is steadily on, a problem has occurred in the switch. Do the following:

❑ Try resetting the switch by disconnecting and reconnecting the AC power cord.

❑ If the FAULT LED remains ON, try downloading a new version of the switch's management software. For instructions, refer to the *AT-S63 Management Software Command Line User's Guide*.

Note
If the FAULT LED remains steadily on, contact Allied Telesis Technical Support for assistance.

Cannot Establish a Local (Out-of-Band) Management Session

If you are unable to establish a local (out-of-band) management session through the Terminal Port on the master switch of the stack, do the following:

❐ Check to be sure that the RJ-45 serial management cable is securely connected to the serial terminal port on the switch and to the RS-232 port on the terminal or personal computer.

❐ Check to be sure that the operating parameters on the terminal or the terminal emulation program have been set correctly. The default settings for the RJ-45 serial terminal port can be found in "Starting a Local Management Session" on page 50.

Switch Functions Intermittently

If a switch functions intermittently, check the system hardware status through the management software:

❑ Note the current voltage for the power supply compared to the optimum rating.

❑ Verify that the system temperature is within the operating range.

Appendix A
Technical Specifications

Physical Specifications

Dimensions (H x W x D):

AT-9424Ts	4.4 cm x 43.8 cm x 30.4 cm
AT-9424Ts/XP	(1.75 in. x 17.30 in. x 12.0 in.)
AT-9448Ts/XP	

Weight:

AT-9424Ts	4.21 kg (9.35 lb.)
AT-9424Ts/XP	4.23 kg (9.40 lb.)
AT-9448Ts/XP	5.09 kg (11.20 lb.)

Recommended Minimum
Ventilation on All Sides: 10 cm (4.0 in)

Environmental Specifications

Operating Temperature:	0° C to 40° C (32° F to 104° F)
Storage Temperature:	-25° C to 70° C (-13° F to 158° F)
Operating Humidity:	5% to 90% noncondensing
Storage Humidity:	5% to 95% noncondensing
Maximum Operating Altitude:	3,048 m (10,000 ft)
Maximum Nonoperating Altitude:	4,000 m (13,100 ft)

Power Specifications

Maximum Power Consumption:

AT-9424Ts	54 watts
AT-9424Ts/XP	68 watts
AT-9448Ts/XP	128 watts

Input Voltage:

AC   100-240 VAC, 2.0 A maximum, 50/60 Hz

Certifications

EMI (Emissions):	FCC Class A, EN55022 Class A, EN61000-3-2, EN61000-3-3, VCCI Class A, CISPR Class A, C-TICK, CE
EMC (Immunity):	EN55024
Electrical and Laser Safety:	EN60950 (TUV), UL 60950 ($_C$UL$_{US}$) EN60825
Quality and Reliability:	MTBF > 100,000 hrs.
Compliance Marks:	CE, $_C$UL$_{US}$, TUV, C-Tick

RJ-45 Twisted Pair Port Pinouts

Figure 45 illustrates the pin layout of an RJ-45 connector and port.
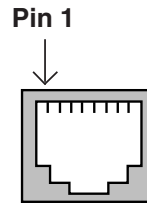
Pin 1

Figure 45. RJ-45 Connector and Port Pin Layout

Table 12 lists the pin signals when a port is operating in the MDI configuration at 10 or 100 Mbps.

Table 12. MDI Pin Signals - 10 or 100 Mbps

Pin	Signal
1	TX+
2	TX-
3	RX+
6	RX-

Table 13 lists the pin signals when a port is operating in the MDI-X configuration at 10 or 100 Mbps.

Table 13. MDI-X Pin Signals - 10 or 100 Mbps

Pin	Signal
1	RX+
2	RX-
3	TX+
6	TX-

The MDI/MDI-X setting is established automatically when a port is set to Auto-Negotiation. If a port's speed and duplex are set manually, the setting defaults to the MDI-X setting.

Table 14 lists the pin signals when a port operating at 1000 Mbps.

Table 14. Pin Signals - 1000 Mbps

Pinout	Pair
1	Pair 1 +
2	Pair 1 -
3	Pair 2 +
4	Pair 3 +
5	Pair 3 -
6	Pair 2 -
7	Pair 4 +
8	Pair 4 -

RJ-45 Style Serial Terminal Port Pinouts

Table 15 lists the pin signals on the RJ-45 style serial terminal port.

Table 15. RJ-45 Style Serial Terminal Port Pin Signals

Pin	Signal
4	Data Carrier Detect
3	Transmit Data
6	Receive Data
7	Data Set Ready
5	Ground
2	Data Terminal Ready
8	Clear to Send
1	Request to Send

RPS 21-pin D-combo Port and Connector Pinouts

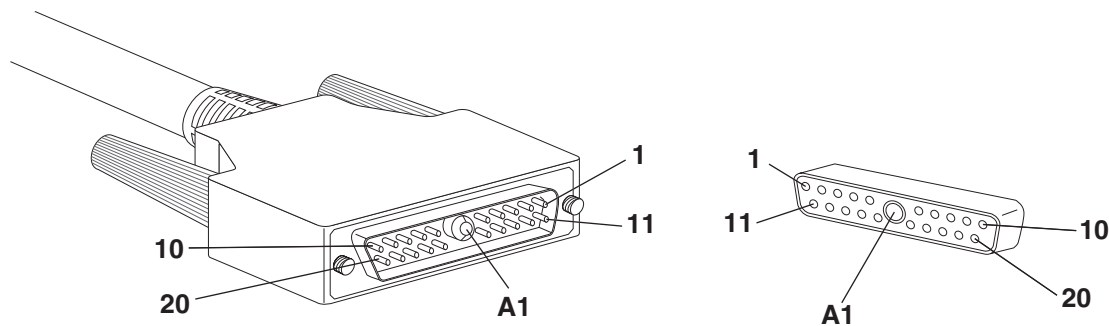Figure 46 illustrates the pin layout of the RPS 21-pin D-combo port and connector.

Figure 46. RPS 21-pin D-combo Connector and Port Pin Layout

Table 16 lists the definitions for the RPS 21-pin D-combo port and connector pins.

Table 16. RPS 21-pin D-combo Port and Connector Pin Definitions

Pin	Definition
1	Reserved
2	Fan 2 status
3	Fan 1 status
4	RPS status
5	Ground
6	Ground
7	RPS status
8	+12.0 VDC sense
9	Reserved
10	No connect
11	Ground
12	Ground
13	Ground
14	Ground
15	Ground

Table 16. RPS 21-pin D-combo Port and Connector Pin Definitions

Pin	Definition
16	Ground
17	Ground
18	+12.0 VDC sense
19	Ground
20	No connect
A-1	+12.0 VDC

Appendix A: Technical Specifications