

# SwitchBlade x3 | I2

Access Edge Chassis Switch

- ❑ AT-SBx3 | I2 Chassis
- ❑ AT-SBx3 | GT24 Line Card
- ❑ AT-SBx3 | GT40 Line Card
- ❑ AT-SBx3 | GP24 PoE Line Card
- ❑ AT-SBx3 | GS24 SFP Line Card
- ❑ AT-SBx3 | GC40 SFP BiDi Line Card
- ❑ AT-SBx3 | XZ4 XFP Line Card
- ❑ AT-SBx3 | XS6 SFP+ Line Card
- ❑ AT-SBx3 | CFC Central Fabric Control Card
- ❑ AT-SBxPWRSYS | System Power Supply
- ❑ AT-SBxPWRPOE | PoE Power Supply
- ❑ AT-SBxFAN | I2 Module



## Installation Guide

Copyright © 2013 Allied Telesis, Inc.

All rights reserved. No part of this publication may be reproduced without prior written permission from Allied Telesis, Inc.

Allied Telesis and the Allied Telesis logo are trademarks of Allied Telesis, Incorporated. All other product names, company names, logos or other designations mentioned herein are trademarks or registered trademarks of their respective owners.

Allied Telesis, Inc. reserves the right to make changes in specifications and other information contained in this document without prior written notice. The information provided herein is subject to change without notice. In no event shall Allied Telesis, Inc. be liable for any incidental, special, indirect, or consequential damages whatsoever, including but not limited to lost profits, arising out of or related to this manual or the information contained herein, even if Allied Telesis, Inc. has been advised of, known, or should have known, the possibility of such damages.

# 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.

## European Union Restriction of the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment

This Allied Telesis RoHS-compliant product conforms to the European Union Restriction of the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment. Allied Telesis ensures RoHS conformance by requiring supplier Declarations of Conformity, monitoring incoming materials, and maintaining manufacturing process controls.

EMI/RFI Emissions: FCC Class A, EN55022 Class A, EN61000-3-2, EN61000-3-3, CISPR Class A, VCCI Class A, AS/NZS Class A

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

Immunity: EN55024

Electrical Safety: EN60950-1 (TUV), UL 60950-1 (cUL<sub>US</sub>), EN60825

Safety Agency Approvals: cUL<sub>US</sub>, TUV, C-TICK, CE



Laser Safety

EN60825

## Translated Safety Statements

---

**Important:** The  indicates that a translation of the safety statement is available in a PDF document titled “Translated Safety Statements” on our web site at <http://www.alliedtelesis.com/support>.

# Contents

---

<b>Preface</b> .....	15
Safety Symbols Used in this Document .....	16
Contacting Allied Telesis .....	17
<b>Chapter 1: Overview</b> .....	<b>19</b>
Introduction.....	20
AT-SBx3112 Chassis .....	23
Ethernet Line and Control Cards Slots.....	25
Power Supply Slots.....	25
AT-SBx31GT24 Line Card.....	27
AT-SBx31GT40 Line Card.....	28
AT-SBx31GP24 PoE Line Card.....	29
AT-SBx31GS24 SFP Line Card .....	30
AT-SBx31GC40 Line Card .....	31
AT-SBx31XZ4 XFP Line Card .....	33
AT-SBx31XS6 SFP+ Line Card.....	34
10/100/1000Base-T Twisted Pair Ports.....	35
Connector Type.....	35
Speed.....	35
Duplex Mode.....	35
Maximum Distance.....	36
Cable Requirements .....	36
Automatic MDIX Detection .....	37
Straight-through or Crossover Cabling.....	37
Port Pinouts.....	38
Power over Ethernet on the AT-SBx31GP24 Line Card.....	39
Powered Device Classes .....	39
Power Budgeting.....	40
PoE Wiring .....	40
Port Numbers on the AT-SBx31GC40 Line Card .....	42
Port LEDs on the Ethernet Line Cards .....	44
AT-SBx31GT24 Line Card .....	44
AT-SBx31GT40 Line Card .....	45
AT-SBx31GP24 Line Card .....	46
AT-SBx31GS24 Line Card .....	48
AT-SBx31GC40 Line Card.....	49
AT-SBx31XZ4 Line Card.....	51
AT-SBx31XS6 Line Card .....	51
AT-SBx31CFC Central Fabric Controller Card.....	53
SYS Status LEDs .....	54
SBx STATUS LEDs.....	55
eco-friendly Button .....	56
Reset Button .....	56
NET MGMT Port .....	58
NET MGMT LED.....	60

Console (RS-232) Port .....	60
SD Card Slot.....	60
SD Status LED .....	61
USB Port.....	61
Power Supplies .....	62
LEDs.....	63
AT-SBxFAN12 Module.....	65
LED.....	65
Power Supply Interfaces (Opto-couplers) .....	66
LED.....	66
Module Names in the Management Software.....	67
Management Software Releases for the Hardware Components.....	68
<b>Chapter 2: Safety Precautions and Site Preparation .....</b>	<b>69</b>
Reviewing Safety Precautions .....	70
Selecting a Site for the SwitchBlade x3112 .....	74
<b>Chapter 3: Installing the Chassis in an Equipment Rack .....</b>	<b>77</b>
Required Tools and Material.....	78
Preparing the Equipment Rack.....	79
Unpacking the AT-SBx3112 Chassis.....	82
Adjusting the Equipment Rack Brackets.....	84
Installing the AT-SBx3112 Chassis in the Equipment Rack.....	86
Removing the Shipping Brace .....	89
Installing the Chassis Grounding Lug .....	90
<b>Chapter 4: Installing the Power Supplies .....</b>	<b>93</b>
Protecting Against Electrostatic Discharge (ESD) .....	94
Installing the AT-SBxPWRSYS1 AC System Power Supply.....	95
Installing the AT-SBxPWRPOE1 AC Power Supply .....	101
Installing the AT-SBxPWRSYS1 DC Power Supply.....	107
<b>Chapter 5: Installing the AT-SBx31CFC Card and Ethernet Line Cards .....</b>	<b>113</b>
Installing the AT-SBx31CFC Central Fabric Controller Card.....	114
Installing the Ethernet Line Cards.....	120
Installing the Blank Slot Covers .....	124
<b>Chapter 6: Installing the Transceivers and Cabling the Ports .....</b>	<b>127</b>
Guidelines to Cabling the AT-SBx31GP24, AT-SBx31GT24, and AT-SBx31GT40 Line Cards .....	128
Connecting Cables to the AT-SBx31GT40 Line Card .....	129
Guidelines to Installing SFP, SFP+, CSFP, and XFP Transceivers.....	131
Installing SFP Transceivers in the AT-SBx31GS24 Line Card .....	132
Installing SFP and CSFP Transceivers in the AT-SBx31GC40 Line Card.....	136
Installing SFP+ Transceivers in the AT-SBx31XS6 Line Card.....	140
Installing AT-SP10TW Cables in the AT-SBx31XS6 Line Card.....	144
Installing XFP Transceivers in the AT-SBx31XZ4 Line Card.....	147
Cabling the NET MGMT Port on the AT-SBx31CFC Card.....	151
<b>Chapter 7: Powering On the Chassis .....</b>	<b>153</b>
Verifying the Installation.....	154
Powering On the AT-SBxPWRSYS1 AC Power Supply .....	155
Powering on the AT-SBxPWRPOE1 AC Power Supply.....	158
Powering On the AT-SBxPWRSYS1 DC System Power Supply .....	161
Choosing a Method for Attaching the Grounding Wire .....	163
Connecting the Grounding Wire with the Grounding Terminal .....	163
Connecting the Grounding Wire with Bare Wire .....	166
Choosing a Method for Attaching the Power Wires.....	167
Connecting the DC Power Wires with the Straight Terminals .....	168

Connecting the DC Power Wires with the Right Angle Terminals.....	175
Connecting Bare DC Power Wires.....	180
Monitoring the Initialization Process.....	184
Using the LEDs to Monitor the Initialization Process.....	185
Using the Console Port to Monitor the Initialization Process.....	186
<b>Chapter 8: Verifying the Hardware Operations of the Chassis .....</b>	<b>189</b>
Using the LEDs to Verify the Chassis.....	190
Using Local Management to Verify the Chassis.....	192
Starting a Local Management Session.....	192
Entering the Management Software Commands.....	193
<b>Chapter 9: Troubleshooting .....</b>	<b>197</b>
AT-SBxPWRSYS1 and AT-SBxPWRPOE1 AC Power Supplies.....	198
AT-SBxPWRSYS1 DC Power Supply.....	199
Ethernet Line Cards.....	201
Twisted Pair Ports.....	203
Power Over Ethernet.....	205
Fiber Optic Transceivers.....	207
AT-SBx31CFC Central Fabric Controller Card.....	209
AT-SBxFAN12 Fan Module.....	210
Local (Out-of-Band) Management Session.....	211
Power Supply Interfaces (Opto-couplers).....	212
<b>Appendix A: Technical Specifications .....</b>	<b>213</b>
Physical Specifications.....	213
Environmental Specifications.....	215
Power Specifications.....	216
Safety and Electromagnetic Emissions Certifications.....	219
Port Pinouts.....	220



# Figures

---

Figure 1: AT-SBx3112 Chassis .....	20
Figure 2: Ethernet Line Cards and AT-SBx31CFC Central Fabric Controller Card.....	20
Figure 3: Ethernet Line Cards and AT-SBx31CFC Central Fabric Controller Card (Continued).....	21
Figure 4: Power Supply Units .....	21
Figure 5: Fan Module .....	22
Figure 6: Front View of the AT-SBx3112 Chassis .....	23
Figure 7: Rear View of the AT-SBx3112 Chassis.....	24
Figure 8: AT-SBx3112 Chassis with Line Cards, Control Cards, and Power Supplies .....	24
Figure 9: Slots for the Ethernet Line and Control Cards.....	25
Figure 10: Power Supply Slots .....	25
Figure 11: AT-SBx31GT24 Line Card .....	27
Figure 12: AT-SBx31GT40 Line Card .....	28
Figure 13: AT-SBx31GP24 PoE Line Card .....	29
Figure 14: AT-SBx31GS24 SFP Line Card .....	30
Figure 15: AT-SBx31GC40 Line Card .....	31
Figure 16: AT-SBx31XZ4 XFP Line Card.....	33
Figure 17: AT-SBx31XS6 Line Card.....	34
Figure 18: Port Numbers for Slots with CSFP Transceivers .....	42
Figure 19: Port Numbers for Slots with Standard SFP Transceivers .....	43
Figure 20: Port LEDs on the AT-SBx31GT24 Line Card .....	44
Figure 21: Port LEDs on an RJ Point 5 Cable Connector for the AT-SBx31GT40 Line Card .....	45
Figure 22: Link/Activity LED on an RJ Point 5 Cable Connector for the AT-SBx31GT40 Line Card.....	45
Figure 23: Port LEDs on the AT-SBx31GP24 PoE Line Card .....	46
Figure 24: Port LEDs on the AT-SBx31GS24 SFP Line Card.....	48
Figure 25: LEDs for the AT-SBx31GC40 Line Card .....	49
Figure 26: LEDs for the AT-SBx31GC40 Line Card, with CSFP Transceivers .....	49
Figure 27: LEDs for the AT-SBx31GC40 Line Card, with SFP Transceivers .....	50
Figure 28: Transceiver Slot LEDs on the AT-SBx31XZ4 XFP Line Card .....	51
Figure 29: SFP+ Slot LEDs on the AT-SBx31XS6 Line Card.....	51
Figure 30: AT-SBx31CFC Central Fabric Controller Card.....	54
Figure 31: AT-SBxFAN12 Module .....	65
Figure 32: Power Supply Interfaces (Opto-couplers) .....	66
Figure 33: 100 - 125 VAC 125 V NEMA 5-20 Plug and Receptacle.....	75
Figure 34: Reserving Vertical Rack Space.....	80
Figure 35: Rack Mounting Hole Locations.....	81
Figure 36: AT-SBx3112 Chassis Items .....	82
Figure 37: AT-SBx3112 Chassis Items (Continued).....	83
Figure 38: Rack Mounting Bracket Locations .....	85
Figure 39: Rack Bracket Locations for Reverse Position of Chassis .....	85
Figure 40: Lifting the AT-SBx3112 Chassis into the Equipment Rack .....	87
Figure 41: Installing the Rack Mount Screws .....	88
Figure 42: Removing the Shipping Brace.....	89
Figure 43: Stripping the Grounding Wire .....	90
Figure 44: Removing the Grounding Lug .....	90
Figure 45: Attaching the Grounding Wire to the Grounding Lug .....	91

Figure 46: Installing the Grounding Lug and Wire .....	91
Figure 47: ESD Socket and Wrist Strap.....	94
Figure 48: Power Supply Slots.....	95
Figure 49: Removing the Blank Slot Cover from Power Supply Slot C.....	96
Figure 50: Items Included with the AT-SBxPWRSYS1 Power Supply Module .....	97
Figure 51: Verifying the AT-SBxPWRSYS1 AC Power Supply.....	98
Figure 52: Raising the Handle on the AT-SBxPWRSYS1 AC Power Supply .....	98
Figure 53: Inserting the AT-SBxPWRSYS1 AC Power Supply.....	99
Figure 54: Lowering the Handle on the AT-SBxPWRSYS1 AC Power Supply.....	100
Figure 55: Power Supply Slots.....	101
Figure 56: Removing the Blank Slot Cover from Power Supply Slot A.....	102
Figure 57: Items Included with the AT-SBxPWRPOE1 Power Supply Module.....	103
Figure 58: Verifying the AT-SBxPWRPOE1 AC Power Supply .....	104
Figure 59: Raising the Handle on the AT-SBxPWRPOE1 AC Power Supply.....	104
Figure 60: Inserting the AT-SBxPWRPOE1 AC Power Supply.....	105
Figure 61: Locking the Handle on the AT-SBxPWRPOE1 AC Power Supply.....	106
Figure 62: Power Supply Slots.....	107
Figure 63: Removing the Blank Slot Cover from Power Supply Slot C.....	108
Figure 64: Items Included with the AT-SBxPWRSYS1 DC Power Supply Module .....	109
Figure 65: Loosening the Handle locking Screw on the AT-SBxPWRPOE1 DC Power Supply .....	110
Figure 66: Raising the Handle on the AT-SBxPWRPOE1 DC Power Supply.....	110
Figure 67: Inserting the AT-SBxPWRSYS1 DC Power Supply.....	111
Figure 68: Locking the Handle on the AT-SBxPWRSYS1 Power Supply .....	112
Figure 69: Slots 4 and 5 for the AT-SBx31CFC Card .....	114
Figure 70: Items Included with the AT-SBx31CFC Central Fabric Controller Card .....	115
Figure 71: Opening the Locking Handles on the AT-SBx31CFC Central Fabric Controller Card .....	115
Figure 72: Removing the Battery Insulator .....	116
Figure 73: Aligning the AT-SBx31CFC Card in the Chassis Slot.....	116
Figure 74: Inserting the AT-SBx31CFC Card in the Chassis Slot.....	117
Figure 75: Closing the Locking Levers on the AT-SBx31CFC Central Fabric Controller Card .....	118
Figure 76: Tightening the Thumb Screws on the AT-SBx31CFC Card.....	119
Figure 77: Slots 0 to 3 and 6 to 11 for the Ethernet Line Cards.....	120
Figure 78: Aligning an Ethernet Line Card in a Chassis Slot .....	121
Figure 79: Inserting an Ethernet Line Card .....	122
Figure 80: Tightening the Thumb Screws on an Ethernet Line Card .....	123
Figure 81: Installing a Blank Slot Cover .....	124
Figure 82: Tightening the Thumbscrews on a Blank Slot Cover .....	125
Figure 83: RJ Point 5 Cable Connector for AT-SBx31GT40 Line Card .....	129
Figure 84: Connecting Cables to Ports on the AT-SBx31GT40 Line Card .....	130
Figure 85: Removing the Dust Cover from an SFP Slot in the AT-SBx31GS24 Line Card .....	132
Figure 86: Handle on SFP Transceiver.....	133
Figure 87: Inserting the SFP Transceiver in the AT-SBx31GS24 Line Card .....	133
Figure 88: Removing the Dust Cover from the SFP Transceiver in the AT-SBx31GS24 Line Card.....	134
Figure 89: Attaching a Fiber Optic Cable to an SFP Transceiver in the AT-SBx31GS24 Line Card .....	135
Figure 90: Removing the Dust Cover from a Transceiver Slot.....	136
Figure 91: Labels on SFP and CSFP Transceivers .....	137
Figure 92: Inserting an SFP or a CSFP Transceiver.....	137
Figure 93: Removing the Dust Cover from an SFP or a CSFP Transceiver.....	138
Figure 94: Attaching a Fiber Optic Cable .....	139
Figure 95: Removing a Dust Cover From an SFP+ Slot in the AT-SBx31XS6 Line Card .....	140
Figure 96: Handle on SFP+ Transceiver.....	141
Figure 97: Installing an SFP+ Transceiver in the AT-SBx31XS6 Line Card .....	141
Figure 98: Removing the Dust Cover from an SFP+ Transceiver in the AT-SBx31XS6 Line Card .....	142
Figure 99: Attaching a Fiber Optic Cable to an SFP+ Transceiver in the AT-SBx31XS6 Line Card .....	143
Figure 100: Removing the Dust Cover From an SFP+ Slot in the AT-SBx31XS6 Line Card .....	144

Figure 101: Release Tab on the AT-SBx31XS6 Line Card .....	145
Figure 102: Installing the AT-SP10TW Cable in the AT-SBx31XS6 Line Card .....	145
Figure 103: Removing the Dust Cover From an XFP Slot on the AT-SBx31XZ4 Line Card .....	147
Figure 104: Handle on the XFP Transceiver .....	148
Figure 105: Installing an XFP Transceiver in the AT-SBx31XZ4 Line Card .....	148
Figure 106: Removing the Protective Cover from an XFP Transceiver in the AT-SBx31XZ4 Line Card .....	149
Figure 107: Attaching a Fiber Optic Cable to an XFP Transceiver in the AT-SBx31XZ4 Line Card .....	150
Figure 108: AC Sockets on the AT-SBx3112 Chassis Rear Panel .....	155
Figure 109: Connecting the AC Power Cord for the AT-SBxPWRSYS1 Power Supply .....	156
Figure 110: Securing the Power Cord for the AT-SBxPWRSYS1 Power Supply to an Anchor .....	157
Figure 111: Connecting the AC Power Cord for the AT-SBxPWRPOE1 Power Supply .....	158
Figure 112: Securing the Power Cord for the AT-SBxPWRPOE1 Power Supply to an Anchor .....	159
Figure 113: Dress and Secure AC Power Cords .....	160
Figure 114: Components of the AT-SBxPWRSYS1 DC Power Supply .....	162
Figure 115: Grounding Wire Terminal .....	163
Figure 116: Stripping the Stranded Grounding Wire .....	163
Figure 117: Attaching the Stranded Grounding Wire to the Grounding Terminal .....	163
Figure 118: Removing the Nut and Washer from the Grounding Post .....	164
Figure 119: Installing the Grounding Wire .....	165
Figure 120: Stripping the solid or Stranded Grounding Wire .....	166
Figure 121: Attaching the Bare Grounding Wire to the Grounding Post .....	166
Figure 122: Securing the Bare Grounding Wire to the Grounding Post .....	167
Figure 123: Power Wire Terminals .....	167
Figure 124: Stripping the Power Wires .....	168
Figure 125: Attaching the Power Wires to the Power Terminal Lugs .....	169
Figure 126: Opening the Plastic Cover .....	169
Figure 127: Removing the Terminal Screws .....	170
Figure 128: Connecting the Power Wires .....	171
Figure 129: Closing the Plastic Cover over the Terminal Connectors .....	172
Figure 130: Tightening the Handle Locking Screw .....	173
Figure 131: Turning On the Power Supply .....	174
Figure 132: Stripping the Power Wires .....	175
Figure 133: Attaching the Power Wires to the Right Angle Terminals .....	175
Figure 134: Removing the Plastic Cover .....	176
Figure 135: Removing the Terminal Screws .....	177
Figure 136: Connecting the Power Wires .....	178
Figure 137: Tightening the Handle Locking Screw .....	179
Figure 138: Turning On the Power Supply .....	180
Figure 139: Stripping Solid or Stranded DC Power Wires .....	180
Figure 140: Connecting the Positive Wire .....	181
Figure 141: Connecting the Negative Lead Wire .....	182
Figure 142: Switch Initialization Messages .....	186
Figure 143: Switch Initialization Messages (Continued) .....	187
Figure 144: Connecting the Management Cable to the Console RS-232 Port .....	192
Figure 145: SHOW SYSTEM Command .....	193
Figure 146: SHOW PSU Command .....	194
Figure 147: SHOW FANMODULE Command .....	195
Figure 148: SHOW CARD Command .....	195
Figure 149: Pin Numbers for the RJ-45 and Point 5 Ports (Front View) .....	220



# Tables

---

Table 1. Twisted Pair Cable for the AT-SBx31GT24 and AT-SBx31GT40 Line Cards .....	36
Table 2. Twisted Pair Cable for the AT-SBx31GP24 Line Card .....	37
Table 3. IEEE802.3af and IEEE802.3at Powered Device Classes .....	39
Table 4. Maximum Number of Powered Devices .....	40
Table 5. Port LEDs on the AT-SBx31GT24 Line Card .....	44
Table 6. Port LEDs for the AT-SBx31GT40 Line Card .....	46
Table 7. Port LEDs on the AT-SBx31GP24 PoE Line Card .....	47
Table 8. Port LEDs on the AT-SBx31GS24 SFP Line Card .....	48
Table 9. Transceiver Slot LEDs on the AT-SBx31GC40 Line Card .....	50
Table 10. Transceiver Slot LEDs on the AT-SBx31XZ4 XFP Line Card .....	51
Table 11. SFP+ Slot LEDs on the AT-SBx31XS6 Line Card .....	52
Table 12. SYS (System) Status LEDs .....	54
Table 13. SBx STATUS LEDs .....	55
Table 14. Features that Use the NET MGMT Port .....	58
Table 15. NET MGMT Port LED .....	60
Table 16. SD Status LED .....	61
Table 17. LEDs on the AT-SBxPWRSYS1 AC Power Supply .....	63
Table 18. LEDs on the AT-SBxPWRSYS1 DC Power Supply .....	64
Table 19. LEDs on the AT-SBxPWRPOE1 AC Power Supply .....	64
Table 20. AT-SBxFAN12 Module LED .....	65
Table 21. Power Supply Interface LED .....	66
Table 22. Card Types in the Management Software .....	67
Table 23. Management Software Releases for the Hardware Components .....	68
Table 24. Front Panel to Rack Rail Dimensions .....	84
Table 25. Switch Initialization Phases .....	185
Table 26. Product Dimensions .....	213
Table 27. Product Weights .....	213
Table 28. Environmental Specifications .....	215
Table 29. Acoustic Noise Test Components .....	215
Table 30. AC Voltage and Frequency Requirements .....	216
Table 31. DC Voltage Requirement .....	216
Table 32. Typical Power Savings in eco-friendly Mode .....	216
Table 33. Maximum Power Consumption .....	216
Table 34. Maximum Power Efficiency .....	217
Table 35. Heat Dissipation .....	217
Table 36. Available Power Over Ethernet with One PoE Power Supply .....	218
Table 37. Available Power Over Ethernet with Two PoE Power Supplies .....	218
Table 38. PoE Mode .....	218
Table 39. Safety and Electromagnetic Emissions .....	219
Table 40. MDI Pin Signals (10Base-T or 100Base-TX) .....	220
Table 41. MDI-X Pin Signals (10Base-T or 100Base-TX) .....	220
Table 42. 1000Base-T Connector Pinouts .....	221



# Preface

---

This guide contains the hardware installation instructions for the SwitchBlade x3112 switch. This preface contains the following sections:

- “Safety Symbols Used in this Document” on page 16
- “Contacting Allied Telesis” on page 17

---

**Note**

This version of the installation guide applies to release 17.0 of the SwitchBlade x3112 Management Software. The latest release of the management software is available from the Restricted Software Downloads web page on the Allied Telesis web site, at [www.alliedtelesis.com/support/software/restricted](http://www.alliedtelesis.com/support/software/restricted).

---

## Safety Symbols Used in this Document

---

This document uses the following conventions.

---

**Note**

Notes provide additional information.

---



---

**Caution**

Cautions inform you that performing or omitting a specific action may result in equipment damage or loss of data.

---



---

**Warning**

Warnings inform you that performing or omitting a specific action may result in bodily injury.

---



---

**Warning**

Laser warnings inform you that an eye or skin hazard exists due to the presence of a Class 1 laser device.

---

## Contacting Allied Telesis

---

If you need assistance with this product, you may contact Allied Telesis technical support by going to the Support & Services section of the Allied Telesis web site at **[www.alliedtelesis.com/support](http://www.alliedtelesis.com/support)**. You can find links for the following services on this page:

- ❑ 24/7 Online Support — Enter our interactive support center to search for answers to your product questions in our knowledge database, to check support tickets, to learn about RMAs, and to contact Allied Telesis technical experts.
- ❑ USA and EMEA phone support — Select the phone number that best fits your location and customer type.
- ❑ Hardware warranty information — Learn about Allied Telesis warranties and register your product online.
- ❑ Replacement Services — Submit a Return Merchandise Authorization (RMA) request via our interactive support center.
- ❑ Documentation — View the most recent installation and user guides, software release notes, white papers, and data sheets for your products.
- ❑ Software Downloads — Download the latest software releases for your managed products.

For sales or corporate information, go to **[www.alliedtelesis.com/purchase](http://www.alliedtelesis.com/purchase)** and select your region.



# Chapter 1

## Overview

---

This chapter describes the SwitchBlade x3112 product in the following sections:

- ❑ “Introduction” on page 20
- ❑ “AT-SBx3112 Chassis” on page 23
- ❑ “AT-SBx31GT24 Line Card” on page 27
- ❑ “AT-SBx31GT40 Line Card” on page 28
- ❑ “AT-SBx31GP24 PoE Line Card” on page 29
- ❑ “AT-SBx31GS24 SFP Line Card” on page 30
- ❑ “AT-SBx31GC40 Line Card” on page 31
- ❑ “AT-SBx31XZ4 XFP Line Card” on page 33
- ❑ “AT-SBx31XS6 SFP+ Line Card” on page 34
- ❑ “10/100/1000Base-T Twisted Pair Ports” on page 35
- ❑ “Power over Ethernet on the AT-SBx31GP24 Line Card” on page 39
- ❑ “Port Numbers on the AT-SBx31GC40 Line Card” on page 42
- ❑ “Port LEDs on the Ethernet Line Cards” on page 44
- ❑ “AT-SBx31CFC Central Fabric Controller Card” on page 53
- ❑ “Power Supplies” on page 62
- ❑ “AT-SBxFAN12 Module” on page 65
- ❑ “Power Supply Interfaces (Opto-couplers)” on page 66
- ❑ “Module Names in the Management Software” on page 67
- ❑ “Management Software Releases for the Hardware Components” on page 68

---

### Note

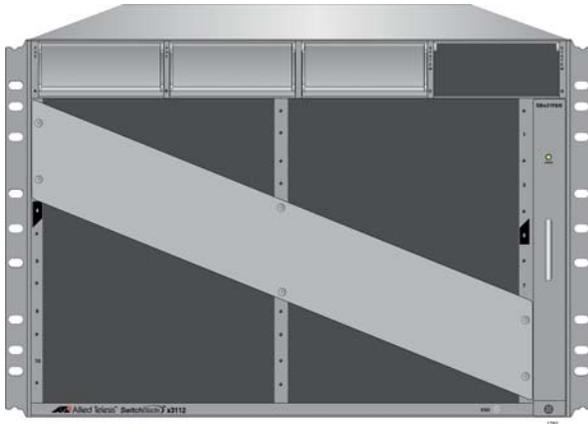
This version of the installation guide applies to release 17.0 of the SwitchBlade x3112 Management Software. The latest release of the management software is available from the Restricted Software Downloads web page on the Allied Telesis web site, at **[www.alliedtelesis.com/support/software/restricted](http://www.alliedtelesis.com/support/software/restricted)**.

---

## Introduction

---

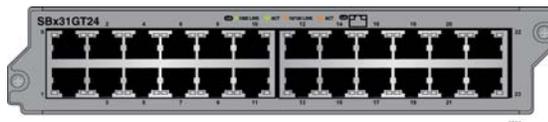
The SwitchBlade x3112 product is a modular Gigabit and 10 Gigabit Ethernet switch. The main components are the AT-SBx3112 Chassis, Ethernet line cards, a control card, a system power supply, a Power over Ethernet Plus (PoE+) power supply, and a fan module. The AT-SBx3112 Chassis is shown in Figure 1.



Slots for ten Ethernet line cards, two control cards, two system power supplies, and two Power over Ethernet Plus (PoE+) power supplies.

Figure 1. AT-SBx3112 Chassis

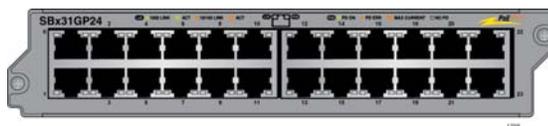
The Ethernet line cards and AT-SBx31CFC Central Fabric Controller card are shown in Figure 2 here and Figure 3 on page 21.



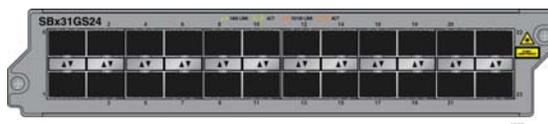
AT-SBx31GT24 Ethernet Line Card with 24 10/100/1000Base-T twisted pair ports.



AT-SBx31GT40 Ethernet Line Card with 40 10/100/1000Base-T twisted pair ports, with RJ point 5 connectors.

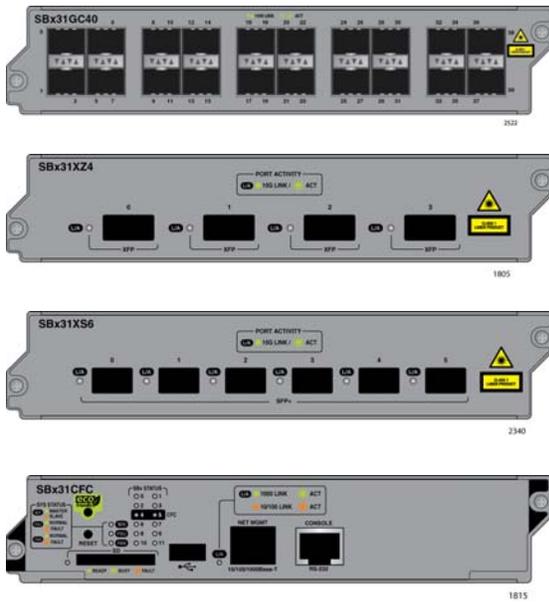


AT-SBx31GP24 Ethernet Line Card with 24 10/100/1000Base-T twisted pair ports, with PoE+.



AT-SBx31GS24 Ethernet Line Card with 24 slots for 100 or 1000Mbps, fiber optic or twisted pair SFP transceivers.

Figure 2. Ethernet Line Cards and AT-SBx31CFC Central Fabric Controller Card



AT-SBx31GC40 Ethernet Line Card with 20 slots for 1000Mbps standard SFP or compact SFP (CSFP) BiDi transceivers.

AT-SBx31XZ4 Ethernet Line Card with four slots for 10Gbps, fiber optic XFP transceivers.

AT-SBx31XS6 Ethernet Line Card with six slots for 10Gbps, fiber optic SFP+ transceivers or Twinax direct connect cables.

AT-SBx31CFC Central Fabric Controller card

Figure 3. Ethernet Line Cards and AT-SBx31CFC Central Fabric Controller Card (Continued)

The three power supplies are shown in Figure 4.



AT-SBxPWRSYS1 AC Power Supply for the Ethernet line cards, controller modules, and fan module.

AT-SBxPWRPOE1 AC Power Supply with 1200 W PoE budget for the ports on the AT-SBx31GP24 PoE Ethernet Line Card.

AT-SBxPWRSYS1 DC Power Supply for the Ethernet line cards, controller modules, and fan module.

Figure 4. Power Supply Units

The fan module is shown in Figure 5.



AT-SBxFAN12 Module, the cooling unit for the chassis

Figure 5. Fan Module

## AT-SBx3112 Chassis

The AT-SBx3112 Chassis is a 7RU unit. It has slots for ten Ethernet line cards, two control cards, two system power supply modules, and two PoE power supply modules. The chassis components are identified in Figure 6 here and Figure 7 on page 24.

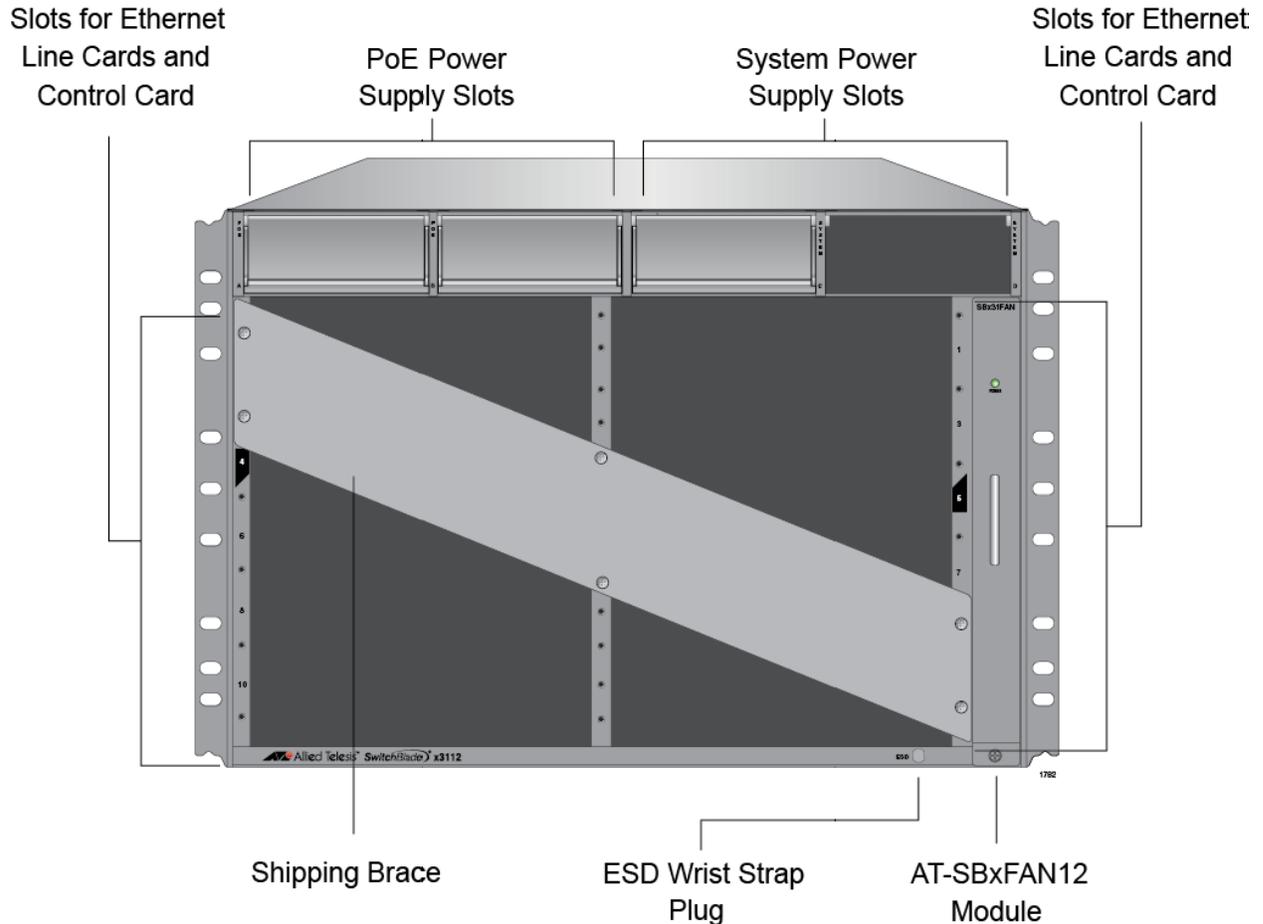


Figure 6. Front View of the AT-SBx3112 Chassis

### Note

Do not remove the shipping brace from the front of the chassis until after the unit is installed in the equipment rack. You might bend the chassis and cause misalignment of the slots and card guides if you lift the chassis into the equipment rack without the shipping brace.

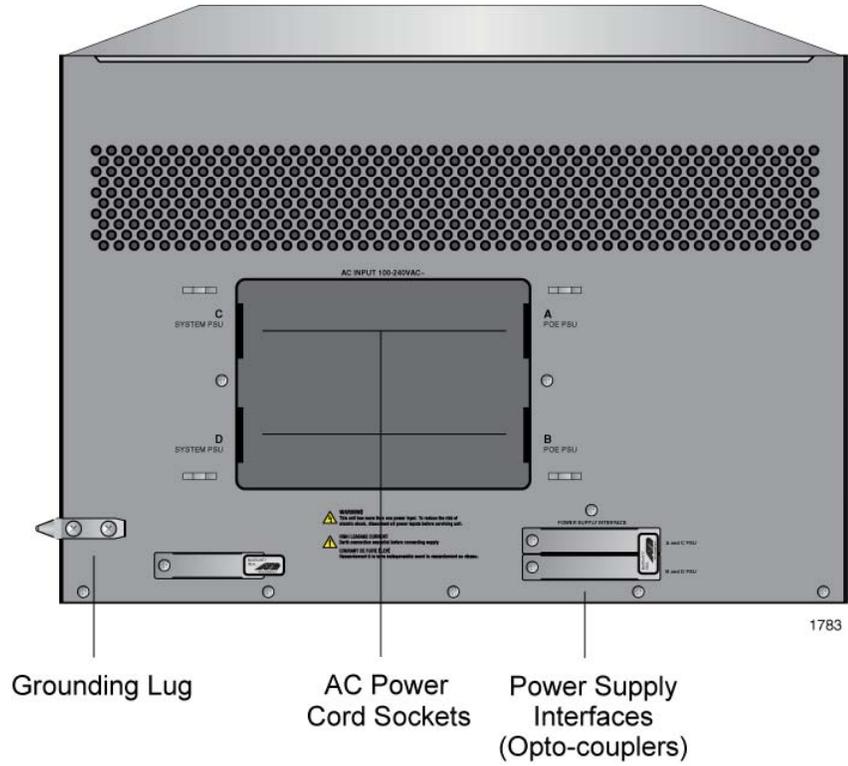


Figure 7. Rear View of the AT-SBx3112 Chassis

Figure 8 is an example of a fully populated chassis.



Figure 8. AT-SBx3112 Chassis with Line Cards, Control Cards, and Power Supplies

## Ethernet Line and Control Cards Slots

The chassis has slots for ten Ethernet line cards and two AT-SBx31CFC Central Fabric Controller cards. The slot definitions are predefined and may not be changed. Figure 9 identifies the slots, which are numbered starting with 0.

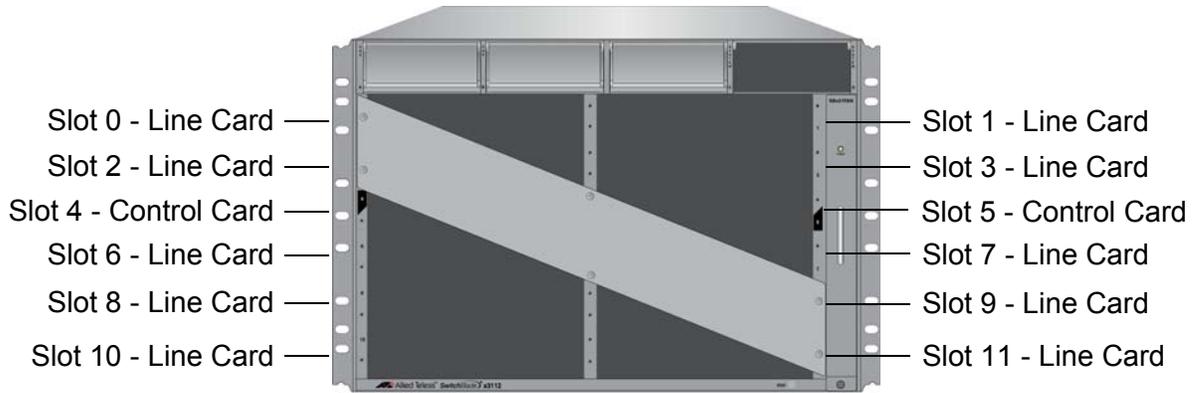


Figure 9. Slots for the Ethernet Line and Control Cards

Slots 0 to 3 and 6 to 11 are for the Ethernet line cards. The cards may be installed in any order or variety in the slots.

Slots 4 and 5 are for the AT-SBx31CFC Central Fabric Controller card, of which there must be at least one in the chassis. You may add a second controller to add redundancy or to increase the available traffic bandwidth of the chassis.

## Power Supply Slots

The chassis has four power supply slots, labelled A to D, across the top of the front of the chassis.

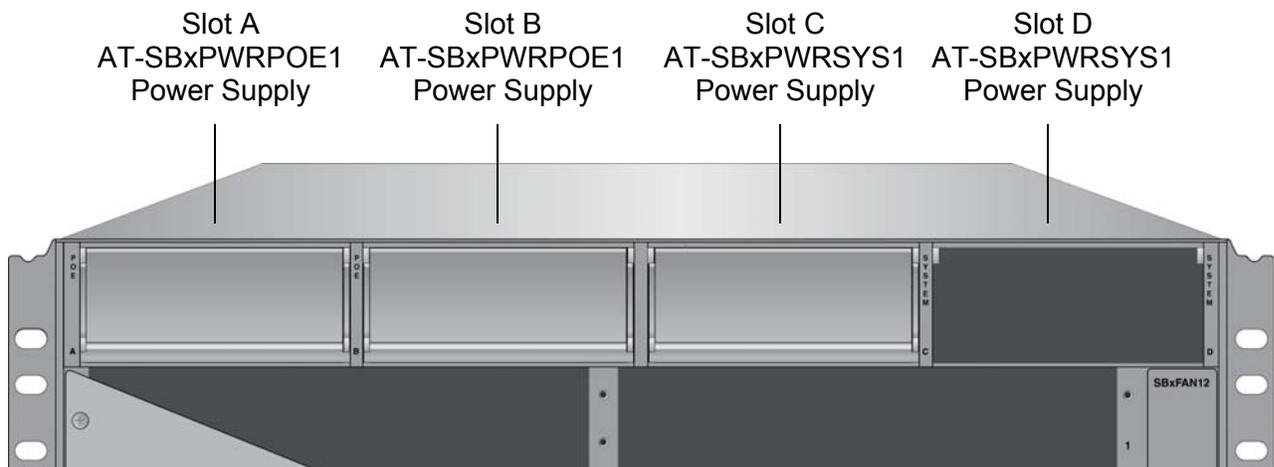


Figure 10. Power Supply Slots

The two right hand slots are for the AT-SBxPWRSYS1 Power Supply, which supplies power to the Ethernet line cards, control modules, and fan module. The only chassis component not powered by the module is the PoE feature on the twisted pair ports of the AT-SBx31GP24 PoE Line Card.

There are AC and DC versions of the AT-SBxPWRSYS1 Power Supply. Refer to Figure 4 on page 21 for illustrations of the modules.

A single AT-SBxPWRSYS1 Power Supply can support a fully populated chassis. However, you may install two power supplies to add power redundancy to the unit.

The two left hand slots are for the AT-SBxPWRPOE1 Power Supply. This unit provides PoE for the ports on the AT-SBx31GP24 Line Card. (It should be noted that the line card also needs the AT-SBxPWRSYS1 Power Supply to operate its switching functions.) You may install two AT-SBxPWRPOE1 Power Supplies in the chassis to increase the amount of available PoE power.

---

**Note**

The AT-SBxPWRSYS1 DC Power Supply is not compatible with the AT-SBxPWRSYS1 AC or AT-SBxPWRPOE1 AC Power Supply. You should not operate the chassis with both AC and DC power supplies. You may, however, operate the chassis for a short period of time with AC and DC power supplies if you are converting it from one type of power supply to another, such as from AC to DC. This allows you to transition the chassis without having to power it off.

---

## AT-SBx31GT24 Line Card

The AT-SBx31GT24 Line Card, shown in Figure 11, is a Gigabit Ethernet switch.

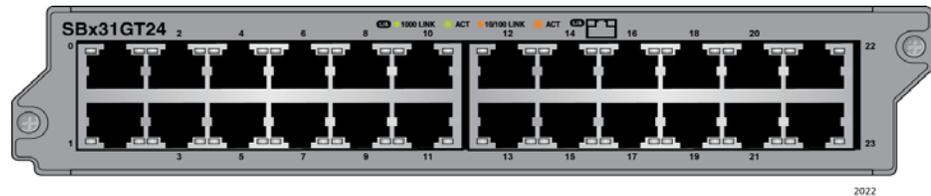


Figure 11. AT-SBx31GT24 Line Card

Here are the main features of the line card:

- ❑ 24 10/100/1000Base-T ports
- ❑ RJ-45 connectors
- ❑ 100 meters (328 feet) maximum operating distance per port
- ❑ Auto-Negotiation for speed and duplex mode
- ❑ Automatic MDIX detection for ports operating at 10/100Base-TX, (Automatic MDIX detection does not apply to 1000Base-T operation.)
- ❑ Port Link/Activity (L/A) LEDs
- ❑ 16K entry MAC address table
- ❑ 12 Mb buffer memory
- ❑ Jumbo frame support:
  - 10240 octets for tagged and untagged traffic between ports on the same line card
  - 10232 octets for untagged traffic between ports on different line cards
  - 10236 octets for tagged traffic between ports on different line cards
- ❑ Non-blocking full-wire speed switching on all packet sizes, with two AT-SBx31CFC Central Fabric Controller cards
- ❑ Hot swappable

The cable requirements for the ports on the AT-SBx31GT24 Line Card are listed in Table 1 on page 36.

## AT-SBx31GT40 Line Card

The AT-SBx31GT40 Line Card, shown in Figure 12, is a Gigabit Ethernet switch.

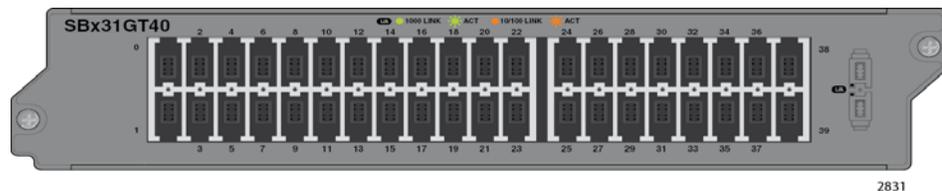


Figure 12. AT-SBx31GT40 Line Card

Here are the main features of the line card:

- ❑ 40 10/100/1000Base-T ports
- ❑ RJ point 5 connectors
- ❑ 100 meters (328 feet) maximum operating distance per port
- ❑ Auto-Negotiation for speed
- ❑ Full-duplex mode only
- ❑ Automatic MDIX detection for ports operating at 10/100Base-TX, (Automatic MDIX detection does not apply to 1000Base-T operation.)
- ❑ Port Link/Activity (L/A) LEDs
- ❑ 32K entry MAC address table
- ❑ 32 Mb buffer memory
- ❑ Jumbo frame support:
  - 10240 octets for tagged and untagged traffic between ports on the same line card
  - 10232 octets for untagged traffic between ports on different line cards
  - 10236 octets for tagged traffic between ports on different line cards
- ❑ Non-blocking full-wire speed switching on all packet sizes, with two AT-SBx31CFC Central Fabric Controller cards
- ❑ Hot swappable

---

### Note

The ports on the line card do not support half-duplex operation.

---

The cable requirements for the ports on the AT-SBx31GT40 Line Card are listed in Table 1 on page 36.

## AT-SBx31GP24 PoE Line Card

The AT-SBx31GP24 PoE Line Card, shown in Figure 13, is a Gigabit Ethernet switch with Power over Ethernet Plus (PoE+) on all the ports.

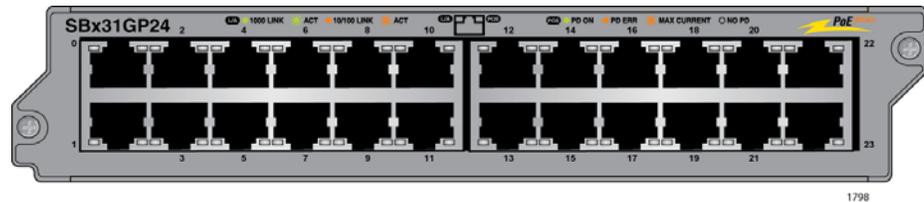


Figure 13. AT-SBx31GP24 PoE Line Card

Here are the main features of the line card:

- 24 10/100/1000Base-T ports
- RJ-45 connectors
- 100 meters (328 feet) maximum operating distance per port
- Auto-Negotiation for speed and duplex mode
- Automatic MDIX detection for ports operating at 10/100Base-TX, (Automatic MDIX detection does not apply to 1000Base-T operation.)
- Port Link/Activity (L/A) and PoE+ LEDs
- 16K entry MAC address table
- 12 Mb buffer memory
- PoE+ on all of the ports
- Up to 30W per port for PoE+
- PoE device classes 0 to 4
- Jumbo frame support:
  - 10240 octets for tagged and untagged traffic between ports on the same line card
  - 10232 octets for untagged traffic between ports on different line cards
  - 10236 octets for tagged traffic between ports on different line cards
- Non-blocking full-wire speed switching on all packet sizes, with two AT-SBx31CFC Central Fabric Controller cards
- Hot swappable

The cable requirements of the PoE ports on the AT-SBx31GP24 Ethernet Line Card are given in Table 2 on page 37.

## AT-SBx31GS24 SFP Line Card

---

The AT-SBx31GS24 SFP Line Card, shown in Figure 14, is a Gigabit Ethernet switch.

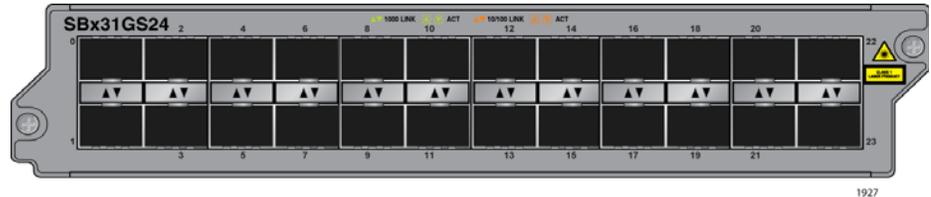


Figure 14. AT-SBx31GS24 SFP Line Card

Here are the main features of the line card:

- ❑ 24 slots for small form-factor pluggable (SFP) transceivers
- ❑ Supports 100Base-FX or 1000Base-SX/LX fiber optic transceivers
- ❑ Supports 100Base-BX or 1000Base-LX bidirectional (BiDi) fiber optic transceivers
- ❑ Supports 10/100/1000Base-T or 1000Base-T twisted pair transceivers
- ❑ Port Link/Activity (L/A) LEDs
- ❑ 32K entry MAC address table
- ❑ 16 Mb buffer memory
- ❑ Jumbo frame support:
  - 10240 octets for tagged and untagged traffic between ports on the same line card
  - 10232 octets for untagged traffic between ports on different line cards
  - 10236 octets for tagged traffic between ports on different line cards
- ❑ Non-blocking full-wire speed switching on all packet sizes, with two AT-SBx31CFC Central Fabric Controller cards.
- ❑ Hot swappable

Contact your Allied Telesis sales representative for a list of supported transceivers.

## AT-SBx31GC40 Line Card

The AT-SBx31GC40 Line Card, shown in Figure 15, is a Gigabit Ethernet switch.

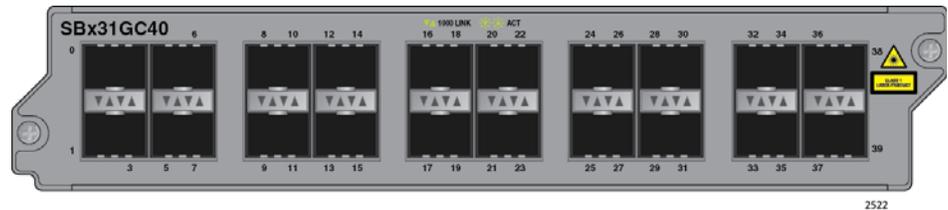


Figure 15. AT-SBx31GC40 Line Card

Here are the main features of the line card:

- Twenty slots for 1000 Mbps, standard SFP or compact SFP (CSFP) bidirectional (BiDi) transceivers
- Adheres to the CSFP Multi-Source Agreement (MSA) standard, Option 2, which defines support for both SFP and CSFP transceivers
- Supports 1000Base-LX, BiDi compact SFP (CSFP), transceivers
- Supports 1000Base-SX/LX, fiber optic SFP transceivers
- Supports 10/100/1000Base-T twisted pair SFP transceivers

---

### Note

Standard 10/100/1000Base-T twisted pair SFP transceivers are only supported at 1000 Mbps.

---

- Port Link/Activity (L/A) LEDs
- 32K entry MAC address table
- 32 Mb buffer memory
- Jumbo frame support:
  - 10240 octets for tagged and untagged traffic between ports on the same line card
  - 10232 octets for untagged traffic between ports on different line cards
  - 10236 octets for tagged traffic between ports on different line cards
- Non-blocking full-wire speed switching on all packet sizes, with two AT-SBx31CFC Central Fabric Controller cards
- Hot swappable

---

**Note**

The AT-SBx31GC40 Line Card does not support 10 or 100 Mbps transceivers.

---

The AT-SBx31GC40 Line Card has twenty slots for standard SFP or CSFP transceivers, and supports twenty or forty networking ports, depending on the types of transceivers. The line card has twenty ports when the slots have standard SFP transceivers, because each SFP transceiver functions as one port. In contrast, the line card has forty ports when the twenty slots have CSFP transceivers, because the two fiber connectors on a CSFP transceiver function as independent, bidirectional networking ports that can be connected to different network devices.

You do not have to install the same type of transceiver into all twenty slots in the line card. You may install a combination of SFP and CSFP transceivers.

Contact your Allied Telesis sales representative for a list of supported transceivers.

## AT-SBx31XZ4 XFP Line Card

The AT-SBx31XZ4 XFP Line Card, shown in Figure 16, is a 10 Gigabit Ethernet switch.

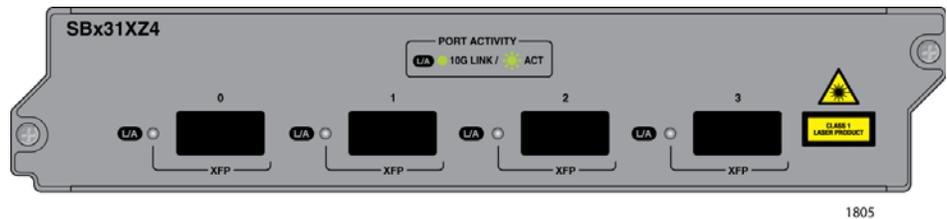


Figure 16. AT-SBx31XZ4 XFP Line Card

Here are the main features of the line card:

- Four slots for 10Gbps XFP transceivers
- Supports 10GBase-SR/LR/ER fiber optic transceivers
- Port Link/Activity (L/A) LEDs
- 32K entry MAC address table
- 16 Mb buffer memory
- Jumbo frame support:
  - 10240 octets for tagged and untagged traffic between ports on the same line card
  - 10232 octets for untagged traffic between ports on different line cards
  - 10236 octets for tagged traffic between ports on different line cards
- Non-blocking full-wire speed switching on all packet sizes, with two AT-SBx31CFC Control Cards
- Hot swappable

Contact your Allied Telesis sales representative for a list of supported transceivers.

## AT-SBx31XS6 SFP+ Line Card

---

The AT-SBx31XS6 Line Card, shown in Figure 17, is a 10 Gigabit Ethernet switch.

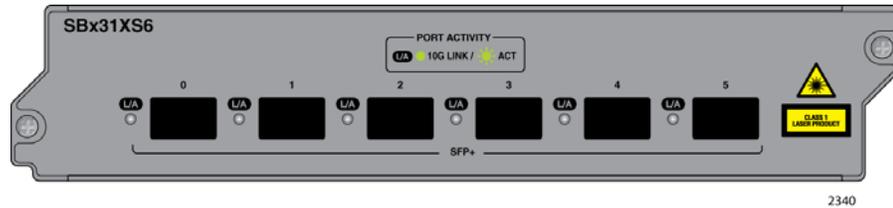


Figure 17. AT-SBx31XS6 Line Card

Here are the main features of the line card:

- ❑ Six slots for 10Gbps SFP+ transceivers
- ❑ Supports 10GBase-SR/LR fiber optic transceivers
- ❑ Supports AT-SP10TW direct connect twisted pair cables with SFP+ transceiver-style connectors
- ❑ Port Link/Activity (L/A) LEDs
- ❑ 32K entry MAC address table
- ❑ 16 Mb buffer memory
- ❑ Jumbo frame support:
  - 10240 octets for tagged and untagged traffic between ports on the same line card
  - 10232 octets for untagged traffic between ports on different line cards
  - 10236 octets for tagged traffic between ports on different line cards
- ❑ Hot swappable

Contact your Allied Telesis sales representative for a list of supported transceivers.

## 10/100/1000Base-T Twisted Pair Ports

---

This section applies to the 10/100/1000Base-T ports on the AT-SBx31GT24, AT-SBx31GT40, and AT-SBx31GP24 PoE Ethernet Line Cards.

**Connector Type** The ports on the AT-SBx31GT24 and AT-SBx31GP24 Line Cards have 8-pin RJ-45 connectors. The ports on the AT-SBx31GT40 Line Card have 8-pin RJ point 5 connectors. The ports use four pins at 10 or 100 Mbps and all eight pins at 1000 Mbps. The pin assignments are listed in “Port Pinouts” on page 220.

**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 SwitchBlade x3112 Management Software.

---

**Note**

Twisted-pair ports have to be set to Auto -negotiation to operate at 1000 Mbps. You cannot manually set twisted-pair ports to 1000 Mbps.

---

**Duplex Mode** The twisted-pair ports on the AT-SBx31GT24 and AT-SBx31GP24 Line Cards can operate in either half- or full-duplex mode at 10 or 100 Mbps. Ports operating at 1000 Mbps can only operate in full-duplex mode. The twisted-pair ports are IEEE 802.3u-compliant and Auto-Negotiate the duplex mode setting.

You can disable Auto-Negotiation on the ports and set the duplex mode manually.

---

**Note**

Switch ports that are connected to 10 or 100 Mbps end nodes that are not using Auto-Negotiation should not use Auto-Negotiation to set their speed and duplex mode settings, because duplex mode mismatches might occur. You should disable Auto-Negotiation and set the speed and duplex mode settings manually with the SwitchBlade x3112 Management Software.

---

---

**Note**

The ports on the AT-SBx31GT40 Line Card only support full-duplex mode.

---

**Maximum Distance**

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

**Cable Requirements**

The cable requirements for the ports on the AT-SBx31GT24 and AT-SBx31GT40 Line Cards are listed in Table 1.

Table 1. Twisted Pair Cable for the AT-SBx31GT24 and AT-SBx31GT40 Line Cards

Cable Type	10Mbps	100Mbps	1000Mbps
Standard TIA/EIA 568-B-compliant Category 3 shielded or unshielded cabling with 100 ohm impedance and a frequency of 16 MHz.	Yes	Yes	No
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.	Yes	Yes	Yes
Standard TIA/EIA 568-B-compliant Category 6 or 6a shielded cabling.	Yes	Yes	Yes

**Note**

Patch cables for the AT-SBx31GT40 Line Card, in lengths of 1 meter and 3 meters with RJ point 5 and RJ-45 connectors, are available from Allied Telesis. Contact your Allied Telesis sales representative for information.

The cable requirements for the PoE ports on the AT-SBx31GP24 Ethernet Line Card are given in Table 2 on page 37.

Table 2. Twisted Pair Cable for the AT-SBx31GP24 Line Card

Cable Type	10Mbps			100Mbps			1000Mbps		
	Non-PoE	PoE	PoE+	Non-PoE	PoE	PoE+	Non-PoE	PoE	PoE+
Standard TIA/EIA 568-B-compliant Category 3 shielded or unshielded cabling with 100 ohm impedance and a frequency of 16 MHz.	Yes	No	No	Yes	No	No	No	No	No
Standard TIA/EIA 568-A-compliant Category 5 shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz.	Yes	Yes	No	Yes	Yes	No	Yes	No	No
Standard TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Standard TIA/EIA 568-B-compliant Category 6 or 6a shielded cabling.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

### Automatic MDIX Detection

The 10/100/1000 Mbps twisted-pair ports on the AT-SBx31GT24, AT-SBx31GT40, and AT-SBx31GP24 Line Cards are IEEE 802.3ab compliant and feature automatic MDIX detection when operating at 10 or 100 Mbps. (Automatic MDIX detection does not apply to 1000 Mbps.) This feature automatically configures the ports to MDI or MDI-X depending on the wiring configurations of the end nodes.

You may not disable automatic MDIX detection on the ports. For automatic MDIX detection to work properly, it must also be present on the network devices. Ports connected to network devices that do not support automatic MDIX detection default to MDIX.

### Straight-through or Crossover Cabling

Here are the guidelines on whether to use straight-through or crossover cables to connect network devices to the line cards:

- ❑ You may use straight-through cables on ports that are connected to network devices that operate at 1000 Mbps.

- ❑ You may use straight-through or crossover cables on ports that are connected to network devices that support automatic MDIX detection and that operate at 10 or 100 Mbps.
- ❑ You *must* use straight-through cables on ports that are connected to network devices that have a fixed wiring configuration of MDI and that operate at 10 or 100 Mbps.
- ❑ You *must* use crossover cables on ports that are connected to network devices that have a fixed wiring configuration of MDIX and that operate at 10 or 100 Mbps.

**Port Pinouts**

Refer to Table 40 on page 220 for the port pinouts of twisted-pair ports that operate at 10 or 100 Mbps in the MDI configuration and Table 41 on page 220 for the MDI-X configuration. For port pinouts when a twisted-pair port operates at 1000 Mbps, refer to Table 42 on page 221.

## Power over Ethernet on the AT-SBx31GP24 Line Card

This section applies only to the AT-SBx31GP24 PoE Line Card. The twisted-pair ports on the line card support Power over Ethernet (PoE). PoE is a mechanism by which the ports supply power to network devices over the twisted pair cables that carry the network traffic. This feature can simplify network installation and maintenance because it allows you to use the switch as a central power source for other network devices.

Devices that receive their power over Ethernet cables are called powered devices (PD), examples of which include wireless access points, IP telephones, web cams, and even other Ethernet switches. A PD connected to a port on the switch receives both network traffic and power over the same twisted-pair cable.

The AT-SBx31GP24 Line Card automatically determines whether a device connected to a port is a PD. A PD has a signature resistor or signature capacitor that the line card can detect over the Ethernet cabling. If the resistor or capacitor is present, the switch assumes that the device is a PD.

A port connected to a network node that is not a PD (that is, a device that receives its power from another power source) functions as a regular Ethernet port, without PoE. The PoE feature remains enabled on the port but no power is delivered to the device.

### Powered Device Classes

The IEEE 802.3af and 802.3at standards define five powered device classes. The classes are defined by the power requirements of the powered devices. The classes are shown in Table 3. The AT-SBx31GP24 Line Card supports all five classes.

Table 3. IEEE802.3af and IEEE802.3at Powered Device Classes

Class	Usage	Maximum Power Output on the PoE Port	PD Power Range
0	Default	15.4W	0.44W to 12.95W
1	Optional	4.0W	0.44W to 3.84W
2	Optional	7.0W	3.84W to 6.49W
3	Optional	15.4W	6.49W to 12.95W
4	Optional	30.0W	12.95W to 25.9W

## Power Budgeting

The power for PoE is provided on the ports of the AT-SBx31GP24 Line Cards is provided by the AT-SBxPWRPOE1 Power Supply. It can provide up to 1200 watts of power for powered devices. You may install up to two power supplies in the chassis for a total of 2400 watts for the powered devices that are connected.

The number of powered devices the chassis can support at one time depends on the number of AT-SBxPWRPOE1 Power Supplies in the chassis and the power requirements of the powered devices in your network. Table 4 lists the maximum number of powered devices by class, for one or two power supplies. The numbers assume that the powered devices require the maximum amount of power for their classes.

---

**Note**

The maximum number of PoE ports in the SwitchBlade x3112 Switch is 240 ports.

---

Table 4. Maximum Number of Powered Devices

Class	Maximum Number of Ports with One PoE PSU (1200 W)	Maximum Number of Ports with Two PoE PSU's (2400 W)
0	77	155
1	240	240
2	171	240
3	77	155
4	40	80

## PoE Wiring

The IEEE 802.3af and 802.3at standards define two methods for delivering power to powered devices over the four pairs of strands that comprise a standard Ethernet twisted-pair cable. The methods are called Alternatives A and B. In Alternative A, power is supplied to powered devices on strands 1, 2, 3, and 6, which are the same strands that carry the 10/100Base-TX network traffic. In Alternative B, power is delivered on strands 4, 5, 7, and 8. These are the unused strands.

---

**Note**

1000BASE-T cables carry the network traffic on all eight strands of the Ethernet cable.

---

The PoE implementation on the AT-SBx31GP24 Line Card is Alternative A, in which power is transmitted over strands 1, 2, 3, and 6.

PDs that comply with the IEEE 802.3af and 802.3at standards typically support both power delivery methods. However, some legacy PDs support only one power delivery method. Legacy devices that only support Alternative B will not work with the AT-SBx31GP24 PoE Line Card. Legacy devices are nodes manufactured before the IEEE 802.3af and 802.3at standards were completed and, consequently, may not adhere to the standards.

## Port Numbers on the AT-SBx31GC40 Line Card

The AT-SBx31GC40 Line Card has two port numbers for each transceiver slot. The numbers are displayed on the front panel alongside and above the slots in the top row and alongside and below the slots in the bottom row. For instance, the first transceiver slot in the top row has the port numbers 0 and 2 and the slot beneath it has the port numbers 1 and 3. (The port numbers 2 and 4 are omitted from the first two slots in the top row on the faceplate to allow for the model name.)

A transceiver uses either one or both port numbers of a slot, depending on whether its a SFP or an CSFP transceiver. A CSFP transceiver is assigned two port numbers because its two connectors function as independent network connections. You may use the two port numbers of a transceiver to configure the ports independently. The left-hand fiber connector is assigned the lower number of a slot and the right-hand connector is given the higher port number. For example, the left-hand fiber connector of an CSFP transceiver in the first top slot is assigned the port number 0 and the right-hand connector is given the port number 2.

Figure 18 illustrates the port numbers for the first two slots when they contain CSFP transceivers.

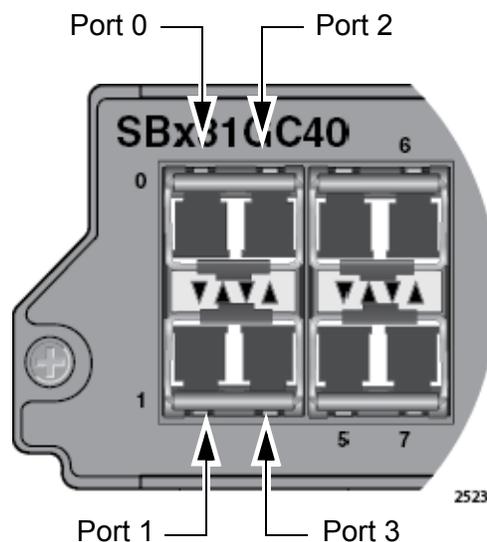


Figure 18. Port Numbers for Slots with CSFP Transceivers

In contrast, the two connectors on an SFP transceiver function as a single port, not as individual ports. Consequently, the switch assigns that type of module one port number instead of two.

The port number of an SFP module depends on whether the module is installed in a slot in the top or bottom row of the line card. An SFP module in a slot in the top row is assigned the lower of the two port numbers of a slot. For example, the port number of an SFP module installed in the first

slot in the top row is port number 0 because it is the lower of the two port numbers of the slot. To configure the transceiver, you have to specify port 0 in the management software. The switch marks the unused port number of the slot, in this case port number 2, as masked or eclipsed to prevent you from using it to manage the transceiver.

In contrast, an SFP module in a slot in the bottom row is assigned the higher number of the slot's two numbers. For instance, an SFP transceiver installed in the first slot in the bottom row is assigned the port number 3 by the switch. Port 1, the unused port number of the slot, is marked as masked by the switch and cannot be used to configure the device.

Figure 19 illustrates the port numbers for the first four slots when they contain standard SFP transceivers.

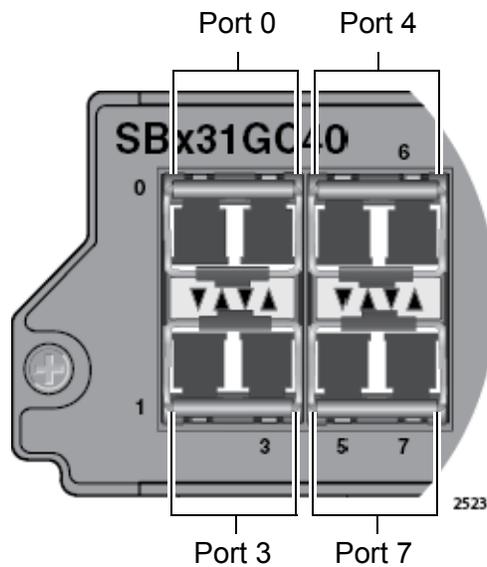


Figure 19. Port Numbers for Slots with Standard SFP Transceivers

## Port LEDs on the Ethernet Line Cards

The following sections define the port LEDs on the Ethernet line cards.

### AT-SBx31GT24 Line Card

Each port on the AT-SBx31GT24 Line Card has two LEDs, but only one of them is used. The LEDs are shown in Figure 20 and described in Table 5.

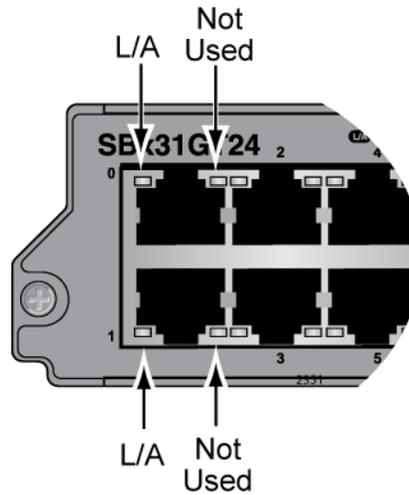


Figure 20. Port LEDs on the AT-SBx31GT24 Line Card

Table 5. Port LEDs on the AT-SBx31GT24 Line Card

LED	State	Description
L/A	Solid Green	The port has established an 1000 Mbps link to a network device.
	Flashing Green	The port is transmitting or receiving data at 1000 Mbps.
	Solid Amber	The port has established a 10 or 100 Mbps link to a network device.
	Flashing Amber	The port is transmitting or receiving data at 10 or 100.
	Off	The port has not established a link with another network device or the LEDs are turned off. To turn on the LEDs, use the eco-friendly button on the control card.
Right LED	-	This LED is not used.

## AT-SBx31GT40 Line Card

The LEDs for the ports on the AT-SBx31GT40 Line Card are found on the RJ point 5 cable connectors. The LEDs are shown in Figure 21.

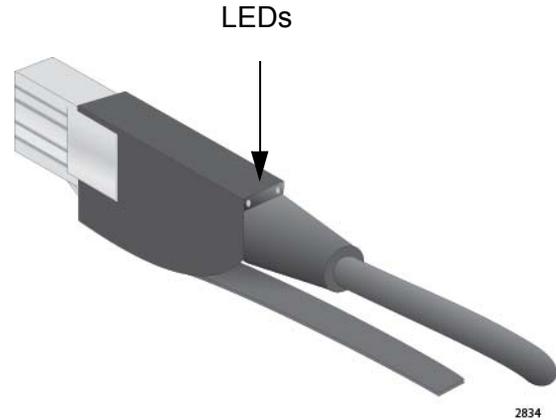


Figure 21. Port LEDs on an RJ Point 5 Cable Connector for the AT-SBx31GT40 Line Card

Only the left LED on a connector is active. Refer to Figure 22. It displays link and activity status information about a port, as described in Table 6 on page 46. The right LED is not used.

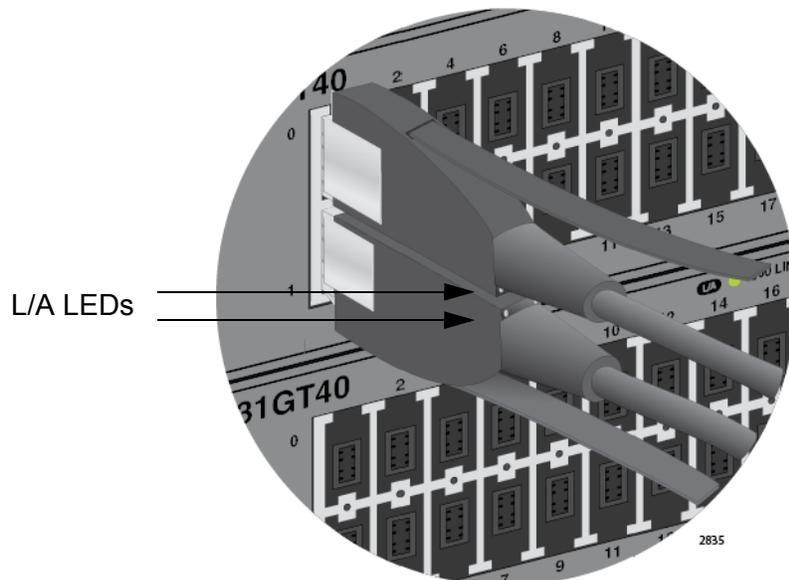


Figure 22. Link/Activity LED on an RJ Point 5 Cable Connector for the AT-SBx31GT40 Line Card

Table 6. Port LEDs for the AT-SBx31GT40 Line Card

LED	State	Description
L/A	Solid Green	The port has established an 1000 Mbps link to a network device.
	Flashing Green	The port is transmitting or receiving data at 1000 Mbps.
	Solid Amber	The port has established a 10 or 100 Mbps link to a network device.
	Flashing Amber	The port is transmitting or receiving data at 10 or 100.
	Off	The port has not established a link with another network device or the LEDs are turned off. To turn on the LEDs, use the eco-friendly button on the control card.
Right LED	-	This LED is not used.

**AT-SBx31GP24  
Line Card**

Each port on the AT-SBx31GP24 PoE Line Card has two LEDs. The LEDs are shown in Figure 23 and described in Table 7 on page 47.

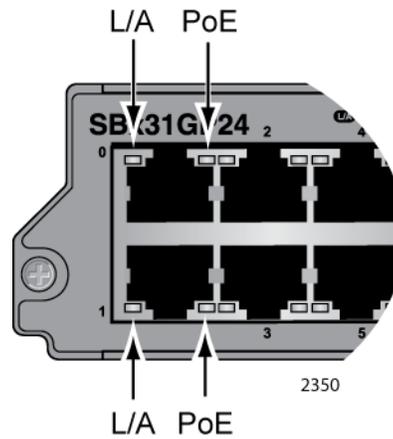


Figure 23. Port LEDs on the AT-SBx31GP24 PoE Line Card

Table 7. Port LEDs on the AT-SBx31GP24 PoE Line Card

LED	State	Description
L/A	Solid Green	The port has established an 1000 Mbps link to a network device.
	Flashing Green	The port is transmitting or receiving data at 1000 Mbps.
	Solid Amber	The port has established a 10 or 100 Mbps link to a network device.
	Flashing Amber	The port is transmitting or receiving data at 10 or 100 Mbps.
	Off	The port has not established a link with another network device or the LEDs are turned off. To turn on the LEDs, use the eco-friendly button on the control card.
PoE	Green	The switch is detecting a powered device (PD) on the port and is delivering power to it.
	Solid Amber	The switch has shutdown PoE+ on the port because of a fault condition.
	Flashing Amber	The switch is detecting a PD on the port but is not delivering power to it because the maximum power budget has been reached.
PoE	Off	<p>This LED state can result from the following conditions:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> The port is not connected to a PD.</li> <li><input type="checkbox"/> The PD is powered off.</li> <li><input type="checkbox"/> The port is disabled in the management software.</li> <li><input type="checkbox"/> PoE is disabled on the port.</li> <li><input type="checkbox"/> The LEDs on the Ethernet line cards are turned off. To turn on the LEDs, use the eco-friendly button.</li> </ul>

## AT-SBx31GS24 Line Card

The SFP slots on the AT-SBx31GS24 SFP Line Card have one LED each, as shown in Figure 24 and described in Table 8.

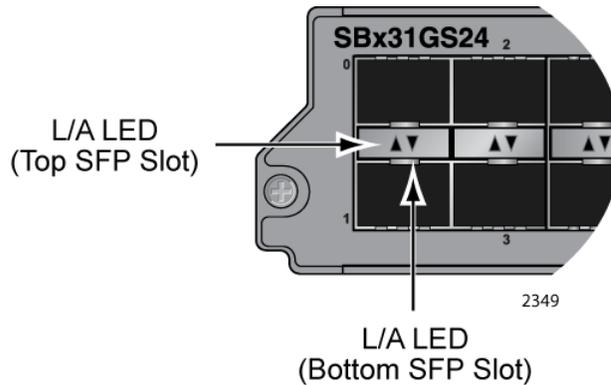


Figure 24. Port LEDs on the AT-SBx31GS24 SFP Line Card

Table 8. Port LEDs on the AT-SBx31GS24 SFP Line Card

LED State	Description
Solid Green	The SFP transceiver in the slot has established a link to a network device.
Blinking Green	The SFP transceiver is transmitting and/or receiving data.
Off	<p>This LED state can result from the following conditions:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> The transceiver slot is empty.</li> <li><input type="checkbox"/> The SFP transceiver has not established a link to a network device.</li> <li><input type="checkbox"/> The LEDs on the Ethernet line cards are turned off. To turn on the LEDs, use the eco-friendly button.</li> </ul>

## AT-SBx31GC40 Line Card

The AT-SBx31GC40 Line Card has two LEDs for each slot. The LEDs, which display link and activity information, are located between the slots, in sets of four. The first and third LEDs of each set are for the bottom slot and the second and fourth LEDs are for the top slot, as shown in Figure 25.

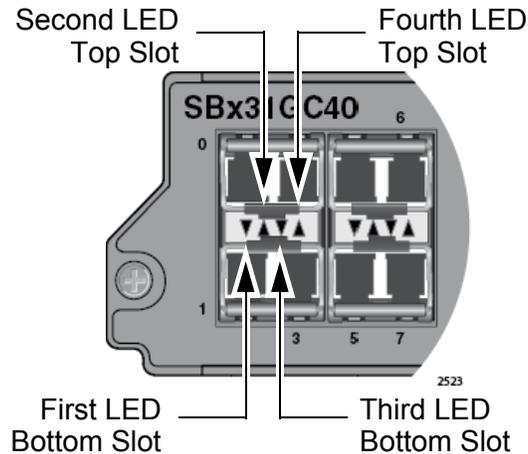


Figure 25. LEDs for the AT-SBx31GC40 Line Card

When a slot contains a CSFP transceiver, both slot LEDs are active. Each LED displays link and activity status information for its respective BiDi connector on a module. As an example, if the first top and bottom slots of the line card contain CSFP transceivers, the first LED between the slots displays link and activity status for port 1, which is the left-hand fiber connector on the bottom transceiver. The second LED displays the same information for port 0, the left-hand fiber connector on the top transceiver. The third and fourth LEDs display the same information for ports 3 and 2, the right-hand connectors on the bottom and top transceivers, respectively. See Figure 26.

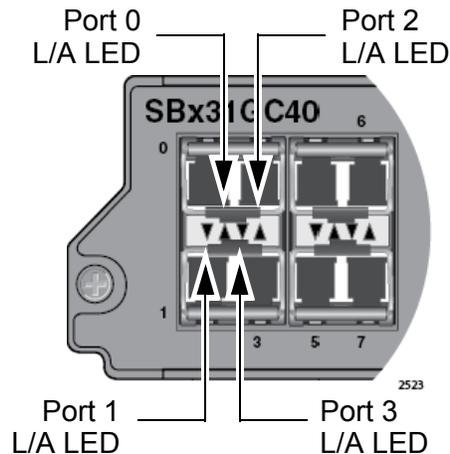


Figure 26. LEDs for the AT-SBx31GC40 Line Card, with CSFP Transceivers

When a slot has a standard SFP, only one LED of a pair is active. The other LED is not used. The active LED is different depending on whether the slot containing the transceiver is in the top or bottom row. When an SFP transceiver is installed in a slot in the top row, the first LED is active and the second inactive. When an SFP transceiver is installed in a slot in the bottom row, the first LED is inactive and the second active. See Figure 27.

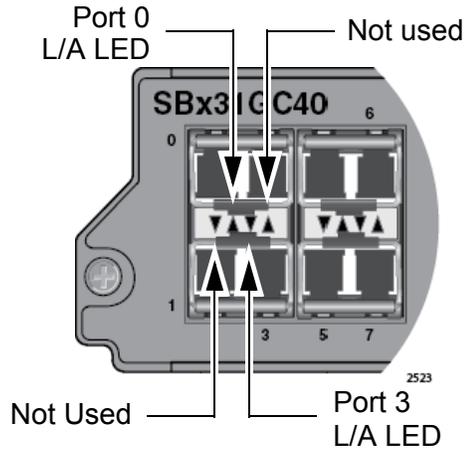


Figure 27. LEDs for the AT-SBx31GC40 Line Card, with SFP Transceivers

The LED states are described in Table 9.

Table 9. Transceiver Slot LEDs on the AT-SBx31GC40 Line Card

LED	State	Description
L/A	Solid Green	The SFP transceiver or CSFP transceiver fiber port has established a link with a network device.
	Flashing Green	The SFP transceiver or CSFP transceiver fiber port is transmitting or receiving data.
	Off	This LED state can result from the following conditions: <ul style="list-style-type: none"> <li><input type="checkbox"/> The transceiver slot is empty.</li> <li><input type="checkbox"/> The SFP transceiver or CSFP fiber port has not established a link to a network device.</li> <li><input type="checkbox"/> The LEDs on the Ethernet line cards are turned off. To turn on the LEDs, use the eco-friendly button.</li> </ul>

## AT-SBx31XZ4 Line Card

Each XFP slot on the AT-SBx31XZ4 XFP Line Card has one LED. The LED is shown in Figure 28 and described in Table 10.

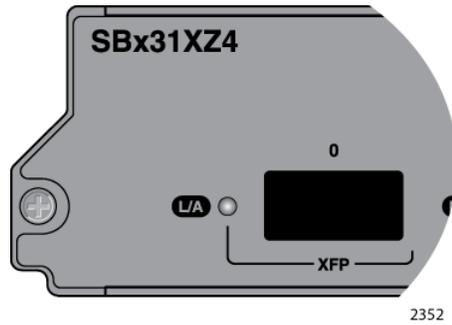


Figure 28. Transceiver Slot LEDs on the AT-SBx31XZ4 XFP Line Card

Table 10. Transceiver Slot LEDs on the AT-SBx31XZ4 XFP Line Card

LED	State	Description
L/A	Solid Green	The XFP module has established a link with a network device.
	Flashing Green	The XFP module is transmitting or receiving data at 10 Gbps.
	Off	The slot is empty or the XFP module has not established a link with a network device.

## AT-SBx31XS6 Line Card

The AT-SBx31XS6 Line Card has one LED for each SFP+ slot. The LED is shown in Figure 29 and described in Table 11 on page 52.

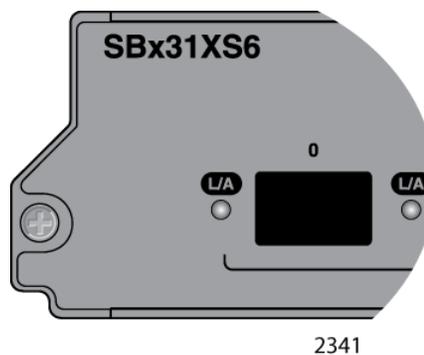


Figure 29. SFP+ Slot LEDs on the AT-SBx31XS6 Line Card

Table 11. SFP+ Slot LEDs on the AT-SBx31XS6 Line Card

<b>LED</b>	<b>State</b>	<b>Description</b>
L/A	Solid Green	The transceiver has established a link with a network device.
	Flashing Green	The transceiver is transmitting or receiving data at 10 Gbps.
	Off	The slot is empty or the transceiver has not established a link with a network device.

## AT-SBx31CFC Central Fabric Controller Card

---

The AT-SBx31CFC Central Fabric Controller card has three primary functions:

- ❑ Chassis Management — The control card is used to monitor and configure the Ethernet line cards in the chassis. You may manage the chassis locally through the Console RS-232 port on the control card or remotely using Telnet, Secure Shell (SSH), and SNMP clients from workstations on your network.
- ❑ Configuration Settings — The control card stores the configuration settings of the Ethernet line cards and downloads the settings to the cards when the chassis is powered on or new line cards are installed. The settings are stored in a database file in nonvolatile memory so that they are retained even when the chassis is reset or powered off.
- ❑ Backplane Control — The control card manages the backplane of the chassis. The backplane is used by line cards to forward traffic to each other, which occurs when the ingress and egress ports of packets are located on different cards.

A single control card provides 200 Gbps of backplane bandwidth. You may install a second control card for a total of 400 Gbps of backplane bandwidth.

Here are the guidelines to the control card:

- ❑ The chassis must have at least one control card. The line cards do not forward traffic without a control card in the chassis.
- ❑ The chassis may have either one or two control cards.
- ❑ Two control cards are recommended for redundancy and to increase the backplane bandwidth from 200 to 400 Gbps.
- ❑ The control cards must be installed in slots 4 and 5 in the chassis.

Here are other features of the AT-SBx31CFC Central Fabric Controller card:

- ❑ LEDs for monitoring the status of the Ethernet line cards.
- ❑ Power-saving eco-friendly button for turning the port and status LEDs on and off on the line cards and control cards.
- ❑ Reset switch for resetting the chassis.
- ❑ SD card slot for data storage and retrieval.
- ❑ Console RS-232 for local management.
- ❑ NET MGMT port and inband interface for remote Telnet, SSH, and SNMP management.
- ❑ Hot swappable.

The components on the card are identified in Figure 30.

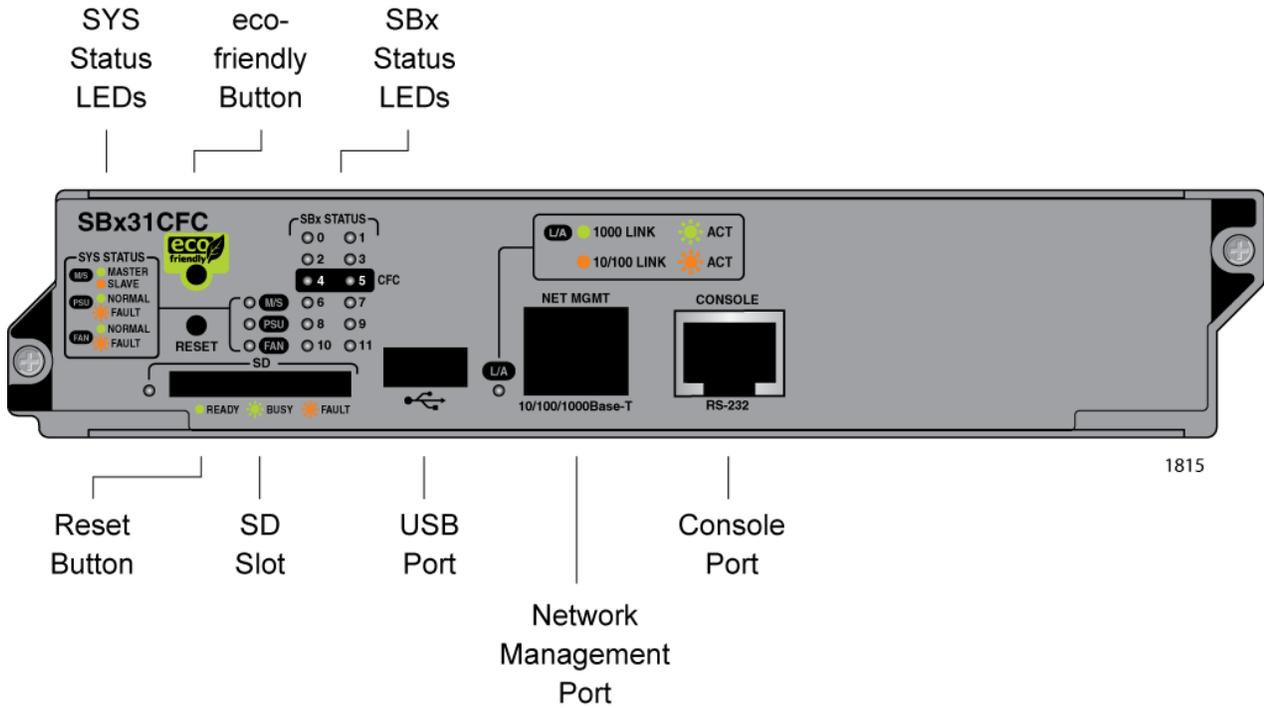


Figure 30. AT-SBx31CFC Central Fabric Controller Card

### SYS Status LEDs

The SYS (System) Status LEDs on the AT-SBx31CFC Central Fabric Controller card display general status information about the control card, power supplies, and fan module. The LEDs are defined in Table 12.

Table 12. SYS (System) Status LEDs

LED	State	Description
M/S	Solid Green	Indicates that the AT-SBx31CFC Central Fabric Controller card is the active master control card in the chassis.
	Solid Amber	Indicates that the control card is the inactive master card or was disabled with the management software.
	Flashing Amber	Indicates that the control card is initializing its management software or synchronizing its database with the active master card.

Table 12. SYS (System) Status LEDs (Continued)

LED	State	Description
PSU	Solid Green	Indicates that the power supplies are operating properly.
	Flashing Amber	Indicates that a power supply is experiencing a problem. Possible causes are: <ul style="list-style-type: none"> <li><input type="checkbox"/> The input AC voltage from a power source is not within the normal operating range of a power supply module.</li> <li><input type="checkbox"/> The output DC voltage from a power supply module to the line cards is not within the normal operating range.</li> <li><input type="checkbox"/> A power supply is experiencing high temperature.</li> <li><input type="checkbox"/> A power supply has failed.</li> </ul> Check the status LEDs on the individual power supply modules to determine which module has a fault condition.
FAN	Solid Green	Indicates that the fan module is operating properly.
	Flashing Amber	Indicates that the fan module has a problem. One or more of the fans is operating below the normal operating range or has stopped.

## SBx STATUS LEDs

The SBx STATUS LEDs display general status information about the Ethernet line cards and control cards. There is one LED for each slot. If the chassis has two control cards, the SBx Status LEDs on both cards are active. The states of the LEDs are defined in Table 13.

Table 13. SBx STATUS LEDs

LEDs	State	Description
0 to 11	Off	Indicates that the slot is empty.
	Solid Green	Indicates that the Ethernet line or control card is operating normally.
	Flashing Green	Indicates that the card is booting up, in test mode, or loading the configuration settings.

Table 13. SBx STATUS LEDs (Continued)

LEDs	State	Description
0 to 11	Solid Amber	Indicates that the card is in an off-line, reset, or disabled state. You may remove the card from the chassis when it is in this state. If the LED is solid amber for an Ethernet line card, it may indicate that the card cannot boot up because the control card does not have the appropriate load file and needs to be updated to the most recent release of management software.
	Flashing Amber	Indicates that the card is reporting a fault condition. Use the management commands to determine the specific problem.

**eco-friendly Button**

You use the eco-friendly button on the control card to turn the LEDs on or off and test the LEDs. You may turn off the LEDs when you are not using them to monitor the control and Ethernet line cards, to conserve electricity. When the LEDs are off, the overall power consumption of the chassis is slightly reduced, approximately 3 watts in a system with 240 active copper ports.

The button controls all of the port LEDs on the Ethernet line cards and all of the LEDs on the control card, except for the M/S (Master/Slave) LED, which is always on. The button does not control the LEDs on the fan module and the power supply systems.

The eco-friendly button is also used to test the LEDs. The LEDs perform a lamp test, flashing in alternating colors for three seconds, when you press the button.

**Reset Button**

You may use the Reset button to reset either the control card or all of the cards in the chassis. The action depends on the number of AT-SBx31CFC Central Fabric Controller cards in the chassis and, if the chassis has two control cards, whether you press the button on the active or inactive master card.

The possible actions are described here:

- ❑ If the chassis has only one control card, pressing the Reset button resets the control card and all of the Ethernet line cards in the chassis. You may perform this function if the chassis and line cards are experiencing a problem.



---

**Caution**

The control and Ethernet line cards do not forward network traffic for a minimum of two minutes while they initialize their management software and configure their parameter settings. Some network traffic may be lost.

---

- ❑ If the chassis has two control cards, pressing the Reset button on the active master card resets the control card, but not the Ethernet line cards. The inactive master control card immediately becomes the new active master card and the Ethernet line cards continue to forward traffic. The reset control card is unavailable for about two minutes while it initializes its management software, after which it becomes the inactive master card in the chassis.

---

**Note**

The available bandwidth across the backplane of the chassis is reduced from 400 to 200 Gbps for about two minutes while the reset control card initializes its management software. This may reduce network performance.

---

If you want the active and inactive master control cards to exchange roles without having to reset the active card, use the SWAP ACTIVITY command in the management software. Refer to the Software Reference for SwitchBlade x3100 Series Switches for information.

- ❑ If the chassis has two control cards, pressing the Reset button on the inactive master control card resets that card, but not the active master control card or the Ethernet line cards.

---

**Note**

The available bandwidth across the backplane of the chassis is reduced from 400 to 200 Gbps for about two minutes while the inactive master control card initializes its management software and synchronizes its database with the active master control card. This may reduce network performance.

---

---

**Note**

To reset individual line cards in the chassis, use the RESTART CARD command in the management software.

---

## NET MGMT Port

The NET MGMT port is used by the control card to perform the features in Table 14. The control card uses the port to access your network to communicate with network devices, such as TFTP servers and Telnet and SSH client workstations.

An alternative to using the NET MGMT port is to configure the inband interface on the control card. The inband interface allows the card to communicate with your network over the backplane and line cards in the chassis.

You may use either the NET MGMT port or inband interface to give the control card access to your network, but you may not use both. For instructions on how to configure the NET MGMT port and inband interface, refer to the Software Reference for SwitchBlade x3100 Series Switches.

Table 14. Features that Use the NET MGMT Port

Feature	Description
Ping	Used to test the NET MGMT port for network connectivity.
FTP client	Used with an FTP server on your network to download files to or upload files from the control card.
RADIUS client	Used for remote management authentication and 802.1x port-based network access control.
RMON with SNMP	Used with the RMON portion of the MIB tree on an SNMP workstation to remotely monitor the switch.
Secure Shell server	Used to remotely manage the chassis with a Secure Shell client.
SNMPv1 and v2c	Used to remotely manage the chassis with SNMP.
SNTP client	Used to set the date and time on the control card, from an NTP or SNTP server on your network or the Internet.
Syslog client	Used to send the event messages from the control card to syslog servers on your network for storage.

Table 14. Features that Use the NET MGMT Port (Continued)

Feature	Description
TACACS+ client	Used with a TACACS+ server on your network for remote management authentication.
Telnet server	Used to remotely manage the chassis with a Telnet client.
TFTP client	Used with a TFTP server on your network to download files to or upload files from the control card.
TRACEROUTE	Used to determine the intermediate nodes (or hops) of network paths.

The NET MGMT port has a standard RJ-45 8-pin connector and operates at 10, 100, or 1000 Mbps in either half- or full-duplex mode. The cable requirements for this port are the same as the ports on the AT-SBx31GT24 Line Card, given in Table 1 on page 36. For the port pinouts, refer to “Port Pinouts” on page 220.

The port uses Auto-Negotiation to set its speed. You may not disable Auto-Negotiation. To avoid a speed or duplex mode mismatch, you should connect the port only to a device that also uses Auto-Negotiation. If connected to a network device that does not support Auto-Negotiation, it defaults to 10 Mbps, half-duplex mode.

The wiring configuration of the NET MGMT port is set automatically with automatic MDIX detection. You may not disable automatic MDIX detection. For automatic MDIX detection to work successfully, the network device you connect to the port must also support the feature. If it does not, the NET MGMT port defaults to MDIX. This may entail the use of a crossover cable. Here are the guidelines to choosing straight-through or crossover cabling for the port:

- ❑ You may use a straight-through cable to connect the port to a network device that operates at 1000 Mbps.
- ❑ You may use a straight-through or crossover cable to connect the port to a network device that supports automatic MDIX detection and that operates at 10 or 100 Mbps.
- ❑ You *must* use a straight-through cable to connect the port to a network device that operates at 10 or 100 Mbps and has a fixed wiring configuration of MDI.
- ❑ You *must* use a crossover cable to connect the port to a network device that operates at 10 or 100 Mbps and has a fixed wiring configuration of MDIX.

**NET MGMT  
LED**

The Network Management (NET MGMT) port on the AT-SBx31CFC Central Fabric Controller card has one Status LED. The states of the LED are described in Table 15.

Table 15. NET MGMT Port LED

LED	State	Description
L/A	Solid Green	The port has a valid 1000 Mbps link.
	Flashing Green	The port is transmitting or receiving data at 1000 Mbps.
	Solid Amber	The port has a valid 10 or 100 Mbps link.
	Flashing Amber	The port is transmitting or receiving data at 10 or 100 Mbps.

**Console (RS-232)  
Port**

The Console Port is used to conduct local management sessions with the switch. Local management sessions are established with a terminal or PC with a terminal emulation program, and the management cable that comes with the card.

Local management is referred to as out-of-band management because it is not conducted over a network. Consequently, the AT-SBx31CFC Central Fabric Controller card does not need an Internet Protocol (IP) address for this type of management.

Your initial management session with the switch must be a local management session. For instructions on how to start a local management session, refer to “Using Local Management to Verify the Chassis” on page 192 or the Software Reference for SwitchBlade x3100 Series Switches.

**SD Card Slot**

The secure digital (SD) memory slot is used for the following management functions:

- Store backup copies of the master configuration and database files on the AT-SBx31CFC Central Fabric Controller card to an SD card so that you can restore the current configuration or a previous configuration, if needed.
- Transfer master configuration files between control cards in different chassis that are to have similar configurations.
- Transfer application load files between control cards.
- Store streaming log files.

An SD card is optional. The AT-SBx31CFC Central Fabric Controller card can operate without a memory card.

The following SD flash memory cards are officially supported in this release.

- SanDisk 2GB Flash card
- SanDisk 4GB SDHC Flash card

---

**Note**

Other brands can be used but are not guaranteed to work.

---

For ordering information, contact your Allied Telesis sales representative or visit our web site.

## SD Status LED

The SD Status LED on the AT-SBx31CFC Central Fabric Controller card is described in Table 16.

Table 16. SD Status LED

LEDs	State	Description
SD	Off	The SD slot is empty, the SD card is improperly installed, or the SD slot was deactivated in the SwitchBlade x3112 Management Software.
	Solid Green	The SD card is properly installed in the slot and ready to transfer data.
	Flashing Green	The AT-SBx31CFC Central Fabric Controller card is retrieving or storing data on the SD card.
	Flashing Amber	The control card is detecting a problem with the SD card. The card may be installed improperly in the slot or there may be a problem with the card itself.



**Caution**

To avoid losing data, do not remove an SD card when the SD status LED is flashing green. Use the DEACTIVATE MEDIA command in the SwitchBlade x3112 Management Software to disable the SD card slot and wait for the SD status LED to turn off before removing an SD card.

---

## USB Port

The USB port is not supported at this time.

## Power Supplies

---

There are three power supplies:

- ❑ AT-SBxPWRSYS1 AC Power Supply: This module supports all the hardware components in the chassis, except for the PoE feature on the ports on the AT-SBx31GP24 Line Cards. A single power supply can support a fully populated chassis, but you may install two power supplies for power redundancy.
- ❑ AT-SBxPWRSYS1 DC Power Supply: This module has the same function as the AC version, but is intended for DC power applications.
- ❑ AT-SBxPWRPOE1 Power Supply: This module provides the PoE power for the ports on the AT-SBx31GP24 PoE Line Cards. The module provides 1200 watts of power for PoE. You may install two PoE power supplies in the chassis, for a total of 2,400 watts of power.

See Figure 4, “Power Supply Units” on page 21 for illustrations of the power supplies.

Here are the power supply guidelines:

- ❑ Power supply modules are not included with the chassis and must be purchased separately.
- ❑ The AT-SBxPWRSYS1 AC and DC Power Supplies are hot swappable. If the chassis has two power supplies and one of them fails, you do not have to power off the operational module to replace the failed unit.
- ❑ The AT-SBxPWRPOE1 AC Power Supply is also hot swappable.
- ❑ The AT-SBxPWRSYS1 AC and DC Power Supplies are installed in slots C and D on the front panel. If you are installing just one power supply, you may install it in either slot. See Figure 4 on page 21.
- ❑ AT-SBxPWRPOE1 Power Supplies are installed in slots A and B.
- ❑ The total number of powered devices the chassis can support on the ports on AT-SBx31GP24 PoE Line Cards depends on the number of AT-SBxPWRPOE1 Power Supplies in the chassis and the power requirements of the devices. For instance, a chassis can support 40 ports of Class 4, PoE+ (IEEE 802.3at) powered devices with one power supply or 80 ports with two power supplies. For further information, refer to Table 4 on page 40.

**Note**

The AT-SBxPWRSYS1 DC Power Supply is not compatible with the AT-SBxPWRSYS1 AC and AT-SBxPWRPOE1 AC Power Supplies. Consequently, the chassis should not contain both AC and DC power supplies. You may, however, operate the chassis for a short period of time with AC and DC power supplies if you are converting it from one type of power supply to another, such as from AC to DC. This allows you to transition the chassis without having to power it off.

**Note**

Given that the AT-SBxPWRSYS1 DC Power Supply is not compatible with the AT-SBxPWRPOE1 AC Power Supply, a chassis that contains one or more AT-SBx31GP24 PoE Line Cards should use the AT-SBxPWRSYS1 AC Power Supply, and not the DC module, as the system power unit.

**LEDs** The LEDs on the AT-SBxPWRSYS1 Power Supply are described in Table 17.

Table 17. LEDs on the AT-SBxPWRSYS1 AC Power Supply

LED	State	Description
AC	Solid Green	The power supply is receiving AC power that is within the normal operating range.
	Off	The power supply is not receiving power from the AC power source.
DC	Solid Green	The DC power that the module is providing to the chassis components is within the normal operating range.
	Off	The power supply is not generating DC power or the power is outside the normal operating range.
Fault	Solid Amber	The power supply has detected a fault condition, such as an under-voltage, or over-temperature condition.
	Off	The power supply is operating normally or is powered off.

The LEDs on the AT-SBxPWRSYS1 DC Power Supply are described in Table 18 on page 64.

Table 18. LEDs on the AT-SBxPWRSYS1 DC Power Supply

LED	State	Description
DC IN	Solid Green	The power supply is receiving DC power that is within the normal operating range.
	Off	The power supply is not receiving power from the DC power source.
DC OUT	Solid Green	The DC power that the module is providing to the chassis components is within the normal operating range.
	Off	The power supply is not generating DC power or the power is outside the normal operating range.
Fault	Solid Amber	The power supply has detected a fault condition, such as an under-voltage, or over-temperature condition.
	Off	The power supply is operating normally or is powered off.

The LEDs on the AT-SBxPWRPOE1 AC Power Supply are described in Table 19.

Table 19. LEDs on the AT-SBxPWRPOE1 AC Power Supply

LED	State	Description
AC	Solid Green	The power supply is receiving AC power that is within the normal operating range.
	Off	The power supply is not receiving power from the AC power source.
DC	Solid Green	The DC power provided by the module over the backplane to the AT-SBx31GP24 PoE Line Cards and the powered devices is within the normal operating range.
	Off	The power supply is not providing any DC power or the power is not within the normal operating range.
Fault	Solid Amber	The power supply has detected a fault condition, such as an under-voltage or over-temperature condition.
	Off	The power supply is operating normally or is powered off.

## AT-SBxFAN12 Module

The AT-SBxFAN12 Module is the cooling unit for the chassis. It is a field-replaceable assembly that is factory installed and shipped with the AT-SBx3112 Chassis.

The module is controlled by the AT-SBx31CFC Central Fabric Controller card. The fan speeds are automatically adjusted according to the internal operating temperature of the switch. The fans are at their lowest speed when the ambient temperature coming into the fan is approximately 20° C. The fan speeds increase to provide additional cooling as the ambient temperature rises.



Figure 31. AT-SBxFAN12 Module

**LED** The POWER LED on the AT-SBxFAN12 Module is described in Table 20.

Table 20. AT-SBxFAN12 Module LED

LED	State	Description
Power	Solid Green	The AT-SBxFAN12 Module is receiving power.
	OFF	The AT-SBxFAN12 Module is not receiving power or has failed.

## Power Supply Interfaces (Opto-couplers)

The chassis has two power supply interfaces, also referred to as opto-couplers, in the lower right corner of the rear panel. The interfaces, labeled Power Supply Interface, are used by the active master control card to obtain status information from the power supplies. The interfaces are shown in Figure 32.

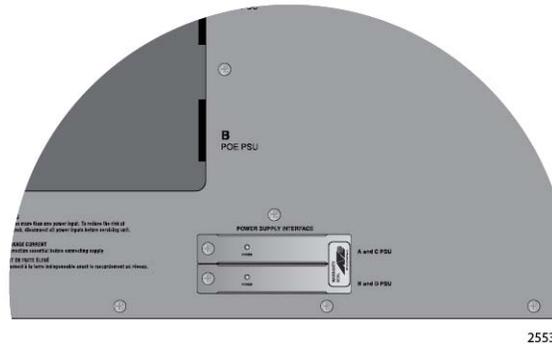


Figure 32. Power Supply Interfaces (Opto-couplers)

The control card uses the top interface to communicate with the power supplies in slots A and C, and the bottom interface to communicate with the power supplies in slots B and D.

The power supply interfaces are not hot swappable and should only be serviced by an authorized service technician.

**LED** Each interface has one LED, labeled Power. The LED is described in Table 21.

Table 21. Power Supply Interface LED

LED	State	Description
Power	Solid Green	The interface is operating normally.
	Off	<p>Here are the possible conditions of this LED state:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> The corresponding power supply slots of the interface are empty.</li> <li><input type="checkbox"/> The power supplies in the power supply slots are powered off or have failed.</li> <li><input type="checkbox"/> The power supplies in the power supply slots are powered on and functioning normally, but the power supply interface has failed.</li> </ul>

## Module Names in the Management Software

---

The line cards, control card, and fan module are referred to in the management software by the card types in Table 22.

Table 22. Card Types in the Management Software

<b>Model Number</b>	<b>Card Type</b>
AT-SBx31GT24	GE24RJ
AT-SBx31GT40	GE40RJ
AT-SBx31GP24	GE24POE
AT-SBx31GS24	GE24SFP
AT-SBx31GC40	GE40CSFP
AT-SBx31XZ4	XE4
AT-SBx31XS6	XE6SFP
AT-SBx31CFC	CFC200
AT-SBxFAN12	FM4

## Management Software Releases for the Hardware Components

---

Table 23 lists the management software releases for the hardware components of the SwitchBlade x3112 product.

Table 23. Management Software Releases for the Hardware Components

<b>Model Number</b>	<b>Initial Release</b>
AT-SBx31GT24	14.1
AT-SBx31GT40	17.0
AT-SBx31GP24	14.1
AT-SBx31GS24	14.2
AT-SBx31GC40	16.0
AT-SBx31XZ4	14.1
AT-SBx31XS6	15.1
AT-SBx31CFC	14.1
AT-SBxPWRSYS1 AC	14.1
AT-SBxPWRPOE1 AC	14.1
AT-SBxPWRSYS1 DC	16.0
AT-SBxFAN12	14.1

## Chapter 2

# Safety Precautions and Site Preparation

---

This chapter contains the safety precautions and guidelines for selecting a site for the chassis. The chapter contains the following sections:

- “Reviewing Safety Precautions” on page 70
- “Selecting a Site for the SwitchBlade x3112” on page 74

## Reviewing Safety Precautions

---

Please review the following safety precautions before you begin to install the switch.

---

### Note

The  indicates that a translation of the safety statement is available for viewing in the “Translated Safety Statements” document on our web site at <http://www.alliedtelesis.com/support>.

---



---

### Warning

Class 1 Laser product.  L1

---



---

### Warning

Do not stare into the laser beam.  L2

---



---

### 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.  E1

---



---

### Warning

Do not work on equipment or cables during periods of lightning activity.  E2

---



---

### Warning

Power cord is used as a disconnection device. To de-energize equipment, disconnect the power cord.  E3

---



---

### 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.  E4

---

---

**Note**

Pluggable Equipment. The socket outlet shall be installed near the equipment and shall be easily accessible.  E5

---

**Caution**

Air vents must not be blocked and must have free access to the room ambient air for cooling.  E6

---

**Warning**

Operating Temperature. This product is designed for a maximum ambient temperature of 40° degrees C.  E7

---

---

**Note**

All Countries: Install product in accordance with local and National Electrical Codes.  E8

---

**Warning**

When installing this equipment, always ensure that the frame ground connection is installed first and disconnected last.  E11

---

**Caution**

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 over current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.  E21

---

**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.  E22

---



**Warning**

Mounting of the equipment in the rack should be such that a hazardous condition is not created due to uneven mechanical loading. *⌘* E25

---



**Warning**

Remove all metal jewelry, such as rings and watches, before installing or removing a line card from a powered-on chassis. *⌘* E26

---



**Warning**

The chassis may be heavy and awkward to lift. Allied Telesis recommends that you get assistance when mounting the chassis in an equipment rack. *⌘* E28

---



**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. *⌘* E30

---

---

**Note**

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 (T<sub>mra</sub>). *⌘* E35

---



**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. *⌘* E36

---



**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). *⌘* E37

---

**Warning**

To reduce the risk of electric shock, the PoE ports on this product must not connect to cabling that is routed outside the building where this device is located. ⚡ E40

---

**Warning**

This product may have multiple AC power cords installed. To de-energize this equipment, disconnect all power cords from the device. ⚡ E43

---

**Caution**

An Energy Hazard exists inside this equipment. Do not insert hands or tools into open chassis slots or sockets. ⚡ E44

---

**Warning**

This equipment shall be installed in a Restricted Access location. ⚡ E45

---

**Warning**

High Leakage Current exists in this chassis. Connect external ground wire before connecting AC power supply(s). ⚡ E46

---

## Selecting a Site for the SwitchBlade x3112

---

Please observe the following site requirements for the switch:

- ❑ The equipment rack must be safely secured so that it 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 switch should be located near the unit and should be easily accessible.
- ❑ The power sources for multiple power supplies of the same type should be on different A/C circuits to protect the unit from a power circuit failure.
- ❑ Use dedicated power circuits or power conditioners to supply reliable electrical power to the network devices.
- ❑ The site should provide easy access to the ports on the front of the chassis so that you can easily connect and disconnect the network cables, as well as view the unit's LEDs.
- ❑ Air flow around the unit and through the side and rear vents should be unrestricted.
- ❑ The site should provide a reliable and earth (grounded) power supply source, preferably dedicated and filtered.
- ❑ Twisted pair cabling must not be exposed to sources of electrical noise, such as radio transmitters, broadband amplifiers, power lines, electric motors, and fluorescent fixtures.
- ❑ Switch ports are suitable for intra-building connections, or where non-exposed cabling is required.
- ❑ Do not place objects on top of the switch.
- ❑ Do not expose the switch to moisture or water.
- ❑ The site should be a dust-free environment.
- ❑ The power cords provided with the AT-SBxPWRSYS1 and AT-SBxPWRPOE1 Power Supplies for 100-125 VAC installations have 20 Amp, 125 V NEMA 5-20P plugs. The plug is only compatible with a NEMA 5-20R receptacle. See Figure 33 on page 75.

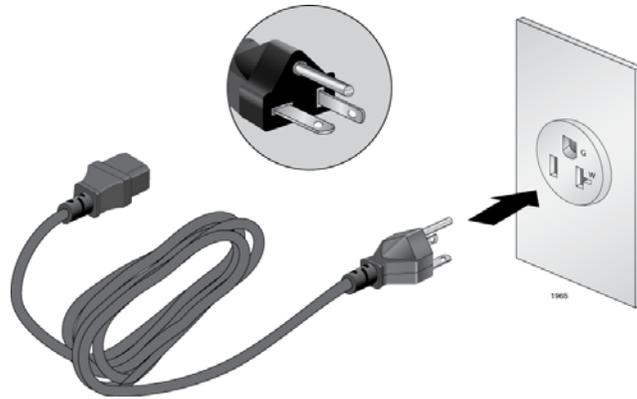


Figure 33. 100 - 125 VAC 125 V NEMA 5-20 Plug and Receptacle



## Chapter 3

# Installing the Chassis in an Equipment Rack

---

This chapter describes how to install the AT-SBx3112 Chassis in an equipment rack. This chapter contains the following sections:

- ❑ “Required Tools and Material” on page 78
- ❑ “Preparing the Equipment Rack” on page 79
- ❑ “Unpacking the AT-SBx3112 Chassis” on page 82
- ❑ “Adjusting the Equipment Rack Brackets” on page 84
- ❑ “Installing the AT-SBx3112 Chassis in the Equipment Rack” on page 86
- ❑ “Removing the Shipping Brace” on page 89
- ❑ “Installing the Chassis Grounding Lug” on page 90

## Required Tools and Material

---

Here is a list of the tools and material you need to install the product:

- #2 Phillips-head screwdriver
- Crimping tool
- Eight equipment rack screws
- One 10 AWG stranded grounding wire
- #2 Phillips-head 5 inch-lbs torque screwdriver (optional)
- #2 Phillips-head 10 inch-lbs torque screwdriver (optional)



### Warning

The chassis may be heavy and awkward to lift. Allied Telesis recommends that you get assistance when mounting the chassis in an equipment rack. *ES* E30

---

If you purchased the AT-SBxPWRSYS1 DC Power Supply, you also need these items:

- Two 8 AWG power wires
- One 10 AWG grounding wire
- 8 mm wrench
- #1 Phillips-head screwdriver
- #3 Phillips-head screwdriver
- #3 Phillips-head 30 to 40 inch-lbs torque screwdriver (optional)

## Preparing the Equipment Rack

---

This section explains how to prepare the equipment rack for the installation of the chassis. The procedure requires the following items:

- ❑ #2 Phillips-head screwdriver (not provided)
- ❑ Two equipment rack screws (not provided)

To prepare the equipment rack for the installation of the AT-SBx3112 Chassis, perform the following procedure:



### Caution

The chassis is heavy and should be mounted as low as possible in the equipment rack to maximize vertical stability.

---

1. Reserve 311.1 mm (12.25") of vertical rack space for the installation of the AT-SBx3112 Chassis, as shown in Figure 34 on page 80.
2. Do not mount any other equipment within 152.4 mm (6") above this space during installation. This additional vertical space is temporary and allows you enough room to lift and tilt the chassis into its position in the equipment rack without hitting other equipment, as shown in Figure 40 on page 87. You may use this additional space for other network equipment after the chassis is installed.

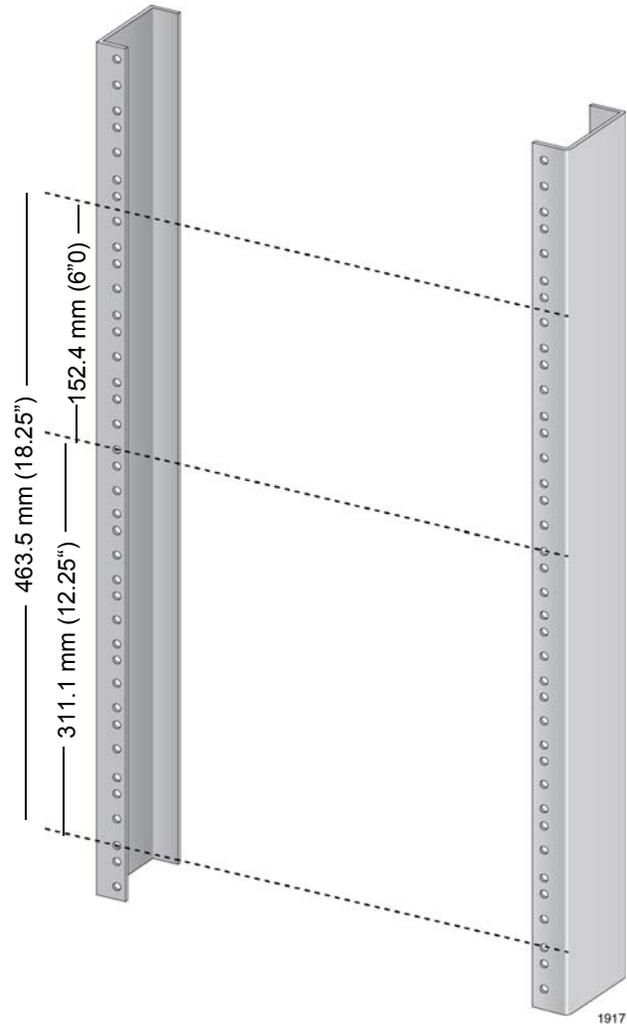


Figure 34. Reserving Vertical Rack Space

3. Identify the lowest 1/2" screw hole pattern on the rack mounting rails within the space reserved for the AT-SBx3112 Chassis.
4. Install one rack mount screw in each vertical rail, at the same height in the top screw hole of the lowest 1/2" hole pattern, as shown in Figure 35 on page 81. The screws are used to support the chassis while you secure it to the rack. Do not fully tighten these two screws at this time. The screw heads should protrude from the rack approximately 6.4 mm (.25 in).

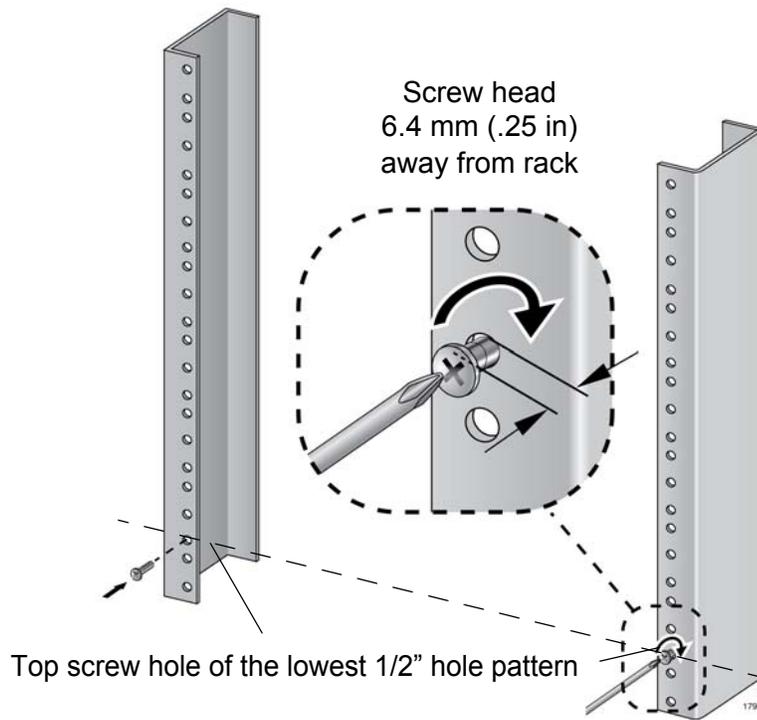


Figure 35. Rack Mounting Hole Locations

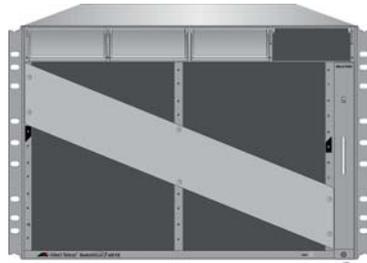
5. After installing the two screws in the equipment rack, go to “Unpacking the AT-SBx3112 Chassis” on page 82.

## Unpacking the AT-SBx3112 Chassis

---

To unpack the AT-SBx3112 Chassis, perform the following procedure:

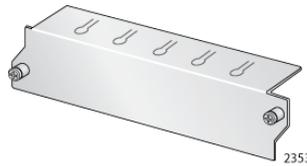
1. Remove all components from the shipping package.
2. Verify the contents of the shipping container by referring to Figure 36 here and Figure 37 on page 83. If any item is missing or damaged, contact your Allied Telesis sales representative for assistance.



One AT-SBx3112 Chassis



One AT-SBxFAN12 Module pre-installed in the vertical slot on the right side of the front panel



Ten blank line card slot covers



Three blank power supply slot covers pre-installed in power supply slots A to C on the front panel

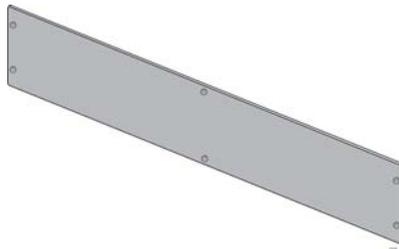


One grounding lug pre-installed in the lower left corner on the back panel

Figure 36. AT-SBx3112 Chassis Items



Two equipment rack brackets pre-installed on the sides of the chassis



One shipping brace pre-installed diagonally across the line card slots on the front panel



One wrist strap

Figure 37. AT-SBx3112 Chassis Items (Continued)

## Adjusting the Equipment Rack Brackets

You may change the positions of the two pre-installed equipment rack brackets so that the front of the chassis is flush with, extends beyond, or is recessed behind the front of the equipment rack. You may also install the chassis so that the rear panel is flush with the front of the equipment rack.

The different bracket positions are listed in Table 24 and illustrated in Figure 38 on page 85 and Figure 39 on page 85. Please review the following information before moving the brackets:

- ❑ Position A, the default position, positions the chassis so that the front of the unit is flush with the front of the equipment rack.
- ❑ Position B recesses the front of the chassis by 27.39 mm (1.1 in).
- ❑ Positions C to E extend the front of the chassis beyond the front of the rack from 27.39 mm (1.1 in) to 140.85 mm (5.545 in).
- ❑ Position F installs the chassis with the rear panel flush with the front of the equipment rack.
- ❑ To install the rack mount brackets in position “E,” you have to remove the two chassis screws from the bottom-middle section of the chassis and re-install them in front where the rack mount bracket screws were originally, as shown in Figure 38.
- ❑ The dimension (X) between the front panel and the rack rails is given for each rack mounting bracket position in Table 24.

Table 24. Front Panel to Rack Rail Dimensions

Figure #	Front Panel Position	Dimension X Front Panel to Rack Rail
38	A (Factory Installed - Flush)	3.69 mm (0.145 in)
38	B (Recessed)	-27.39 mm (-1.078 in)
38	C	27.39 mm (1.078 in)
38	D	47.71 mm (1.878 in)
38	E	140.85 mm (5.545 in)
39	F (Reverse Position)	374.16 mm (14.731 in)

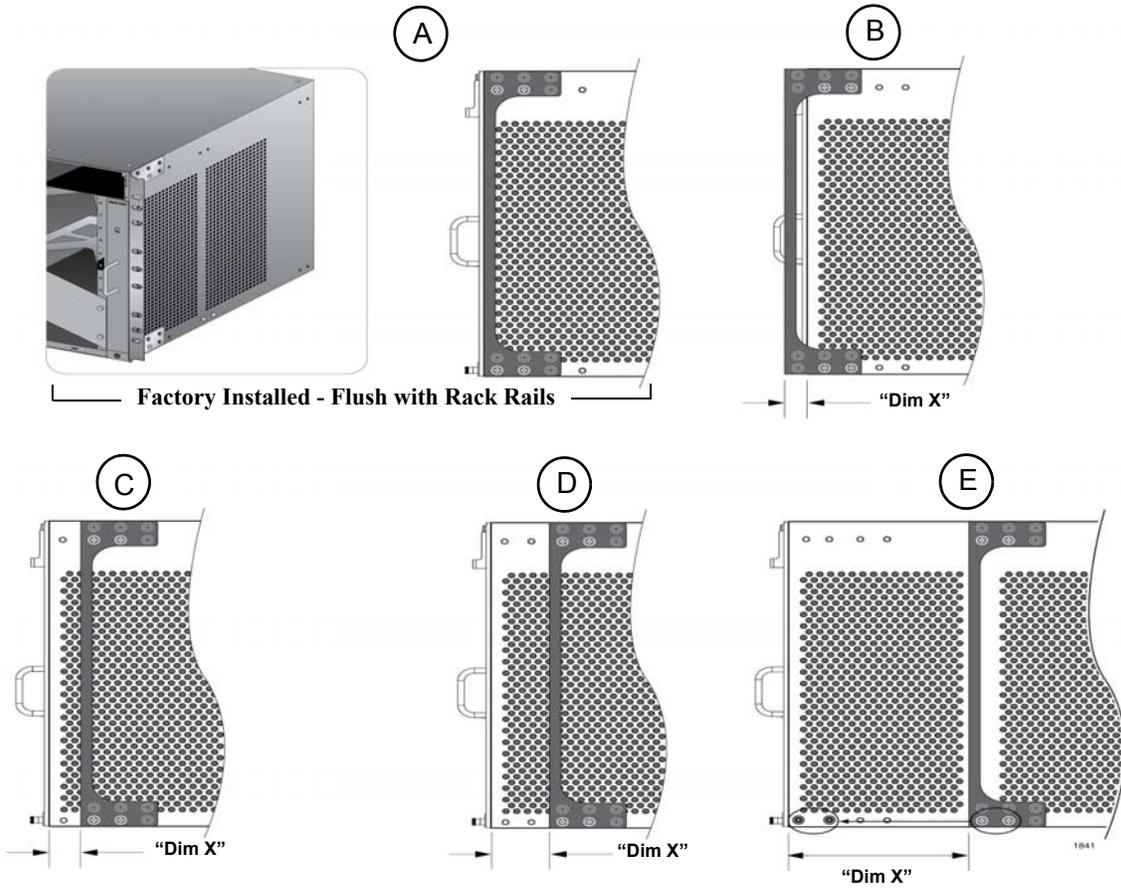


Figure 38. Rack Mounting Bracket Locations

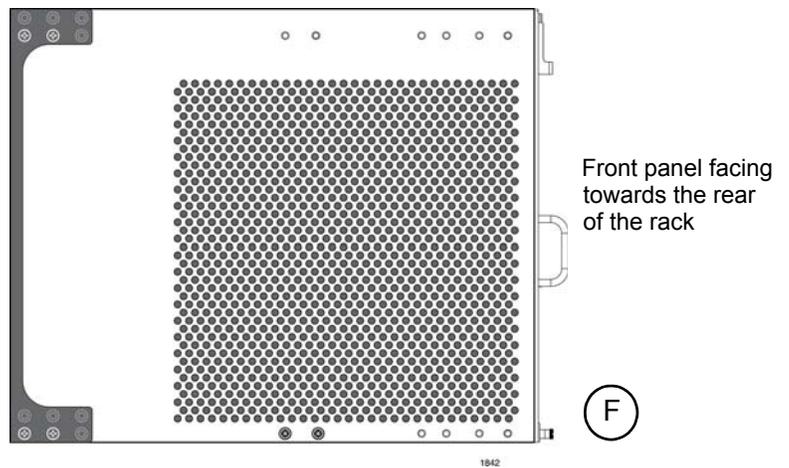


Figure 39. Rack Bracket Locations for Reverse Position of Chassis

## Installing the AT-SBx3112 Chassis in the Equipment Rack

---

The procedure in this section explains how to install the chassis in the equipment rack. The procedure requires the following items:

- #2 Phillips-head screwdriver (not provided)
- Six equipment rack screws (not provided)
- #2 Phillips-head 10 inch-lbs torque screwdriver (optional — not provided)



### Caution

Do not remove the shipping brace from the front of the AT-SBx3112 Chassis until after the unit is securely mounted in the rack. The plate prevents twisting of the chassis frame and mechanical misalignment of the line card slots during shipping and installation.

---



### Warning

The chassis may be heavy and awkward to lift. Allied Telesis recommends that you get assistance when mounting the chassis in an equipment rack. *See* E30

---



### Warning

Allied Telesis recommends having a minimum of three people lift and secure the chassis in the equipment rack.

---

Before installing the chassis in the rack, review the following checklist:

- Did you reserve sufficient space in the equipment rack for the chassis and install two screws in the rack on which to rest the chassis while securing it to the rack? If not, then perform “Preparing the Equipment Rack” on page 79.
- Did you adjust the brackets so that the front of the chassis is positioned correctly for your installation? If not, then perform “Adjusting the Equipment Rack Brackets” on page 84.

To install the AT-SBx3112 Chassis in the equipment rack, perform the following procedure:

1. While facing the front of the chassis, tilt the top of the chassis toward you, as shown in Figure 40 on page 87.

2. Lift the AT-SBx3112 Chassis into the equipment rack and set the bottom of the equipment rack brackets firmly on the two equipment rack screws you installed in “Preparing the Equipment Rack” on page 79.

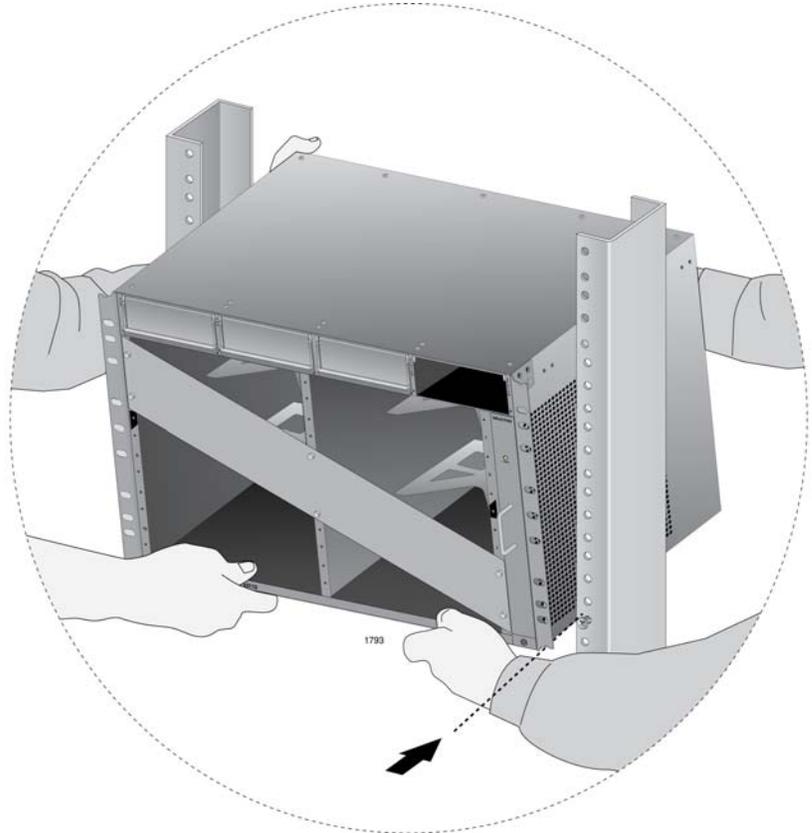


Figure 40. Lifting the AT-SBx3112 Chassis into the Equipment Rack

3. With the bottom of the rack mount ears resting on the two rack mount screws, tilt the top of the chassis back until both rackmount brackets are flush and parallel with the vertical rack rails.
4. Install six rack mount screws (not provided) to secure the chassis to the equipment rack, as shown in Figure 41 on page 88.

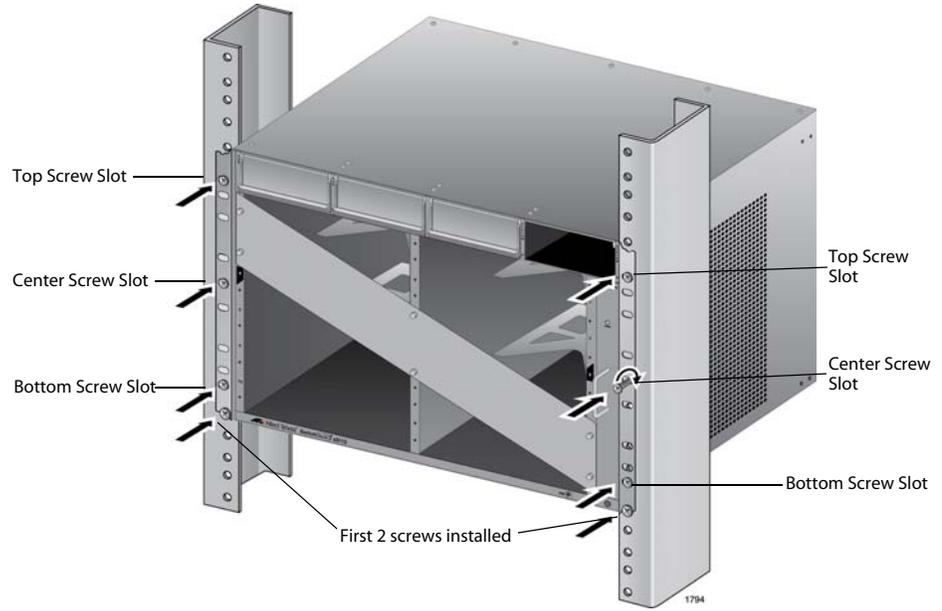


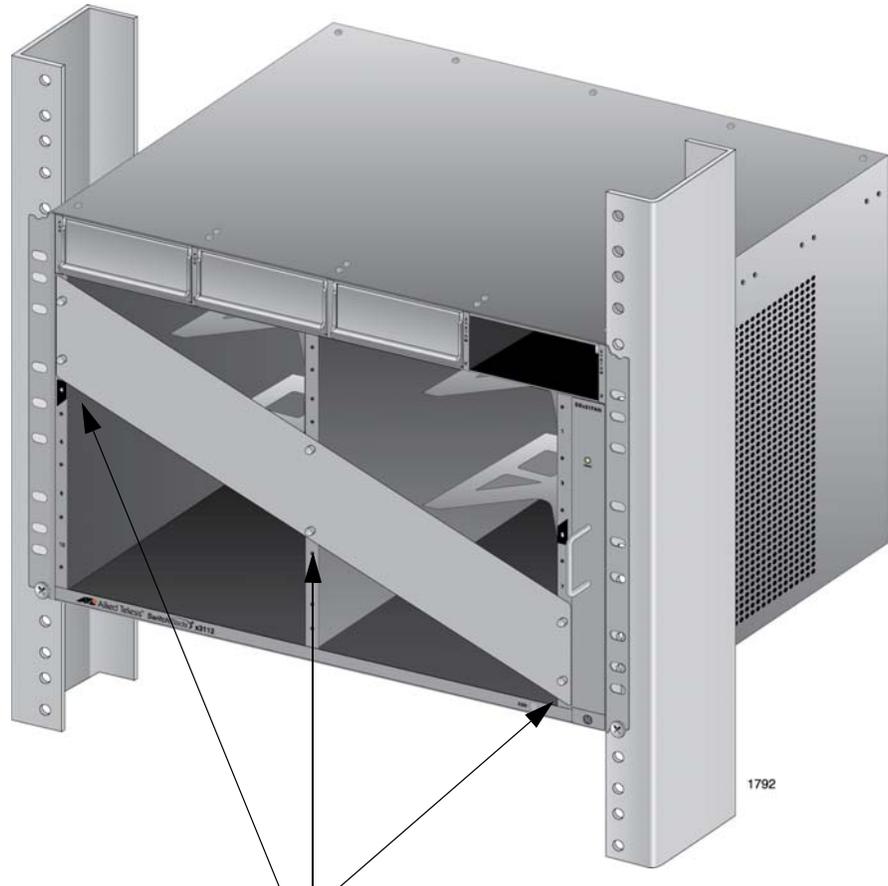
Figure 41. Installing the Rack Mount Screws

5. Tighten all eight screws to secure the chassis to the equipment rack, Allied Telesis recommends tightening the screws to 10 inch-lbs.
6. Go to “Removing the Shipping Brace” on page 89.

## Removing the Shipping Brace

---

Now that the chassis is installed in the equipment rack, you may remove the shipping brace from the front of the unit. To remove the shipping brace, remove the six mounting screws with a #2 Phillips-head screwdriver (not provided).



Shipping Brace Screws

Figure 42. Removing the Shipping Brace

After removing the shipping plate, go to “Installing the Chassis Grounding Lug” on page 90.

## Installing the Chassis Grounding Lug

---

This procedure explains how to connect a ground wire to the chassis. The chassis requires a permanent connection for the line cards and power supplies to a good earth ground. The procedure requires the following items:

- ❑ Grounding lug (pre-installed on the rear panel of the chassis)
- ❑ #2 Phillips-head screwdriver (not provided)
- ❑ Crimping tool (not provided)
- ❑ 10 AWG stranded grounding wire (not provided)
- ❑ #2 Phillips-head 20 inch-lbs torque screwdriver (optional — not provided)

To connect the chassis to an earth ground, perform the following procedure:

1. Prepare an adequate length of stranded grounding wire (10 AWG) for the ground connection by stripping it as shown in Figure 43.

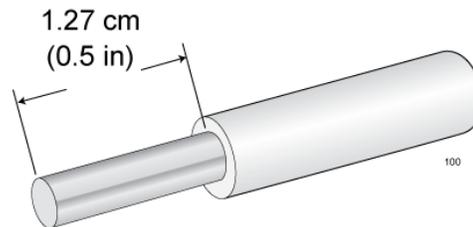


Figure 43. Stripping the Grounding Wire

2. Remove the two screws that secure the grounding lug to the rear panel of the chassis, as shown in Figure 44.

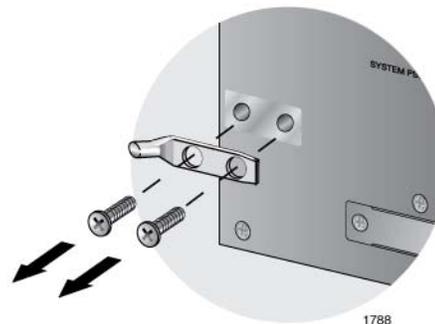


Figure 44. Removing the Grounding Lug

3. Insert one end of the grounding wire into the grounding lug, as shown in Figure 45, and use a crimping tool to secure the wire to the grounding lug.

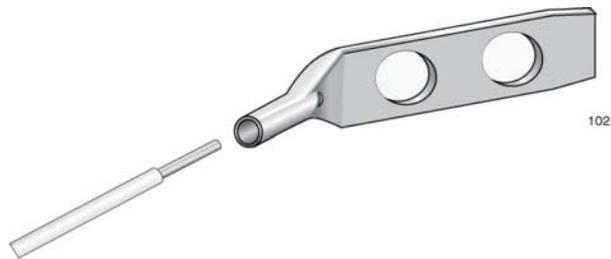


Figure 45. Attaching the Grounding Wire to the Grounding Lug

4. Install the grounding lug on the chassis, as shown in Figure 46. Allied Telesis recommends tightening the screws to 20 inch-lbs.

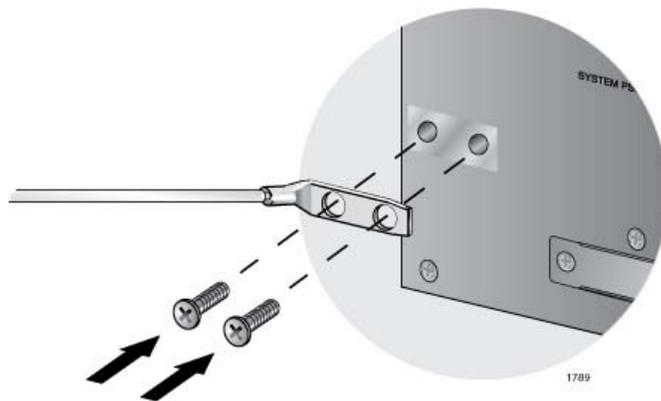


Figure 46. Installing the Grounding Lug and Wire

5. Connect the other end of the grounding wire to the building protective earth.
6. Go to Chapter 4, "Installing the Power Supplies" on page 93.



## Chapter 4

# Installing the Power Supplies

---

This chapter explains how to install the power supplies. It has the following sections:

- ❑ “Protecting Against Electrostatic Discharge (ESD)” on page 94
- ❑ “Installing the AT-SBxPWRSYS1 AC System Power Supply” on page 95
- ❑ “Installing the AT-SBxPWRPOE1 AC Power Supply” on page 101
- ❑ “Installing the AT-SBxPWRSYS1 DC Power Supply” on page 107

## Protecting Against Electrostatic Discharge (ESD)

---

To protect the equipment from damage by Electrostatic Discharge (ESD) during the installation procedure, observe proper ESD protection when handling the SwitchBlade x3112 line cards and power supplies. You should be properly grounded with a wrist or foot strap.



### Caution

Electrostatic Discharge (ESD) can damage the components on the SwitchBlade x3112 line cards and power supplies. Be sure to follow proper ESD procedures during the installation.

---

To guard against ESD, perform this procedure:

1. Verify that the chassis is electrically connected to earth ground.
2. Connect the wrist strap that comes with the chassis to the ESD socket in the bottom right corner of the AT-SBx3112 Chassis, shown in Figure 47. This ensures that ESD voltages safely flow to ground.



Figure 47. ESD Socket and Wrist Strap

3. When you put on the ESD-preventive wrist strap, be sure it makes good contact with your skin.

## Installing the AT-SBxPWRSYS1 AC System Power Supply

For background information on the AT-SBxPWRSYS1 AC Power Supply, refer to “Power Supplies” on page 62. The chassis must have at least one AT-SBxPWRSYS1 AC or DC Power Supply.



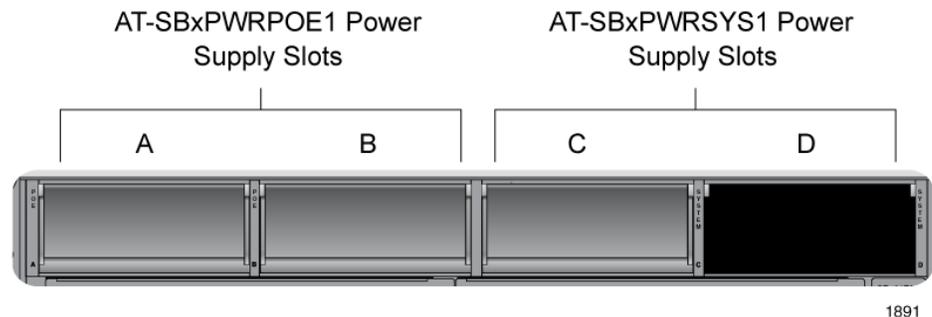
### Warning

The electronic components in the AT-SBxPWRSYS1 AC Power Supply can be damaged by electro-static discharges (ESD). Follow the procedure in “Protecting Against Electrostatic Discharge (ESD)” on page 94 to guard against ESD damage when unpacking and installing the power supply.

To install the AT-SBxPWRSYS1 AC Power Supply, perform the following procedure:

1. Choose a slot for the AT-SBxPWRSYS1 AC Power Supply in the chassis.

You may install it in either slot C and D, shown in Figure 48. The first AT-SBxPWRSYS1 AC Power Supply should be installed in slot D, because the slot does not have a blank power supply panel.



1891

Figure 48. Power Supply Slots



### Caution

The AT-SBxPWRSYS1 AC Power Supply will not work in slot A or B.

2. If the chassis already has a power supply in slot D, remove the blank power supply panel from slot C by lifting the blank panel handle and sliding it out of the slot, as shown in Figure 49 on page 96.

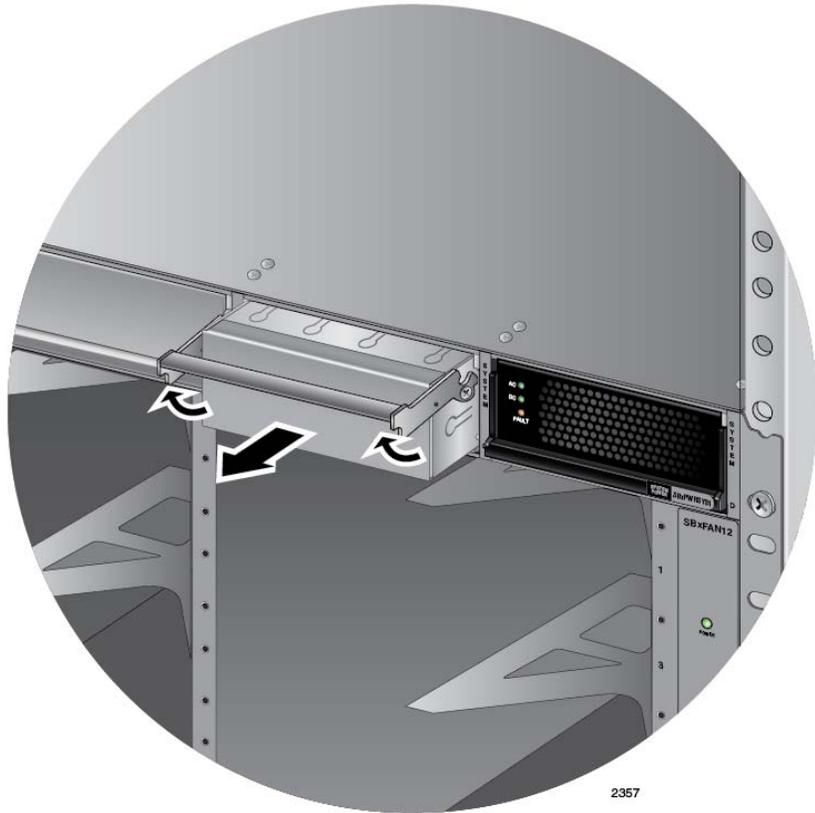


Figure 49. Removing the Blank Slot Cover from Power Supply Slot C

3. Remove the new AT-SBxPWRSYS1 AC Power Supply from the shipping package and verify the package contents, listed in Figure 50 on page 97.

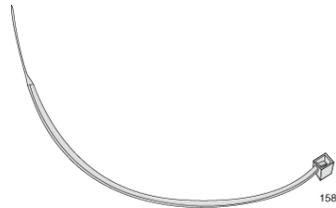
If any item is missing or damaged, contact your Allied Telesis sales representative for assistance.



One AT-SBxPWRSYS1 AC Power Supply Module



One regional AC power cord



One tie wrap

Figure 50. Items Included with the AT-SBxPWRSYS1 Power Supply Module

---

**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.

---



---

**Note**

The tie wrap is used to secure the power cord to the chassis, as explained in “Powering On the AT-SBxPWRSYS1 AC Power Supply” on page 155.

---

4. Check the power supply for its model name, shown in Figure 51 on page 98, to verify the module.

If you received the AT-SBxPWRPOE1 PoE Power Supply instead, do not continue with this procedure. Instead, perform “Installing the AT-SBxPWRPOE1 AC Power Supply” on page 101.



Figure 51. Verifying the AT-SBxPWRSYS1 AC Power Supply

5. Move the locking handle on the AT-SBxPWRSYS1 AC Power Supply to the unlocked or up position. See Figure 52.



Figure 52. Raising the Handle on the AT-SBxPWRSYS1 AC Power Supply

6. Align and insert the AT-SBxPWRSYS1 AC Power Supply into the power supply slot. Figure 53 on page 99 shows the power supply being installed in slot D.

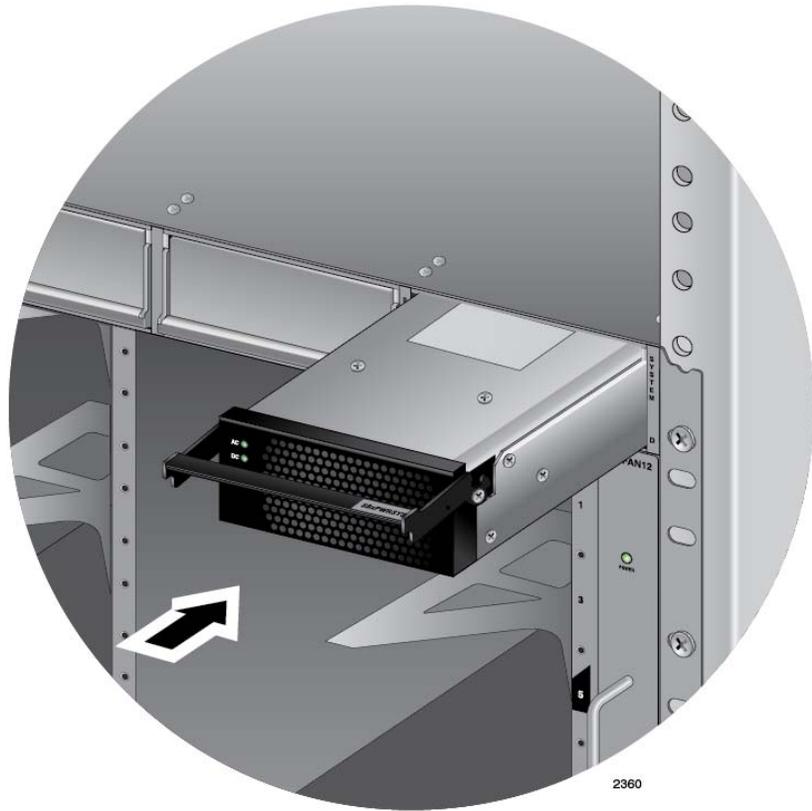


Figure 53. Inserting the AT-SBxPWRSYS1 AC Power Supply

7. Lower the power supply locking handle to secure the power supply to the chassis, as shown in Figure 54 on page 100.



Figure 54. Lowering the Handle on the AT-SBxPWRSYS1 AC Power Supply

8. To install a second AT-SBxPWRSYS1 AC Power Supply, repeat this procedure.

After installing the AT-SBxPWRSYS1 AC Power Supplies, do one of the following:

- ❑ If you purchased the AT-SBxPWRPOE1 AC Power Supply for the PoE+ ports on the AT-SBx31GP24 PoE Line Cards, go to “Installing the AT-SBxPWRPOE1 AC Power Supply” on page 101.
- ❑ Otherwise, go to Chapter 5, “Installing the AT-SBx31CFC Card and Ethernet Line Cards” on page 113.

---

**Note**

Retain the tie wrap that comes with the power supply. You will use it to secure the power cord to the chassis when you power on the unit in “Powering On the AT-SBxPWRSYS1 AC Power Supply” on page 155.

---

## Installing the AT-SBxPWRPOE1 AC Power Supply

This section contains the installation procedure for the AT-SBxPWRPOE1 AC Power Supply, for the PoE+ ports on the AT-SBx31GP24 PoE Line Card. For background information, refer to “Power Supplies” on page 62.



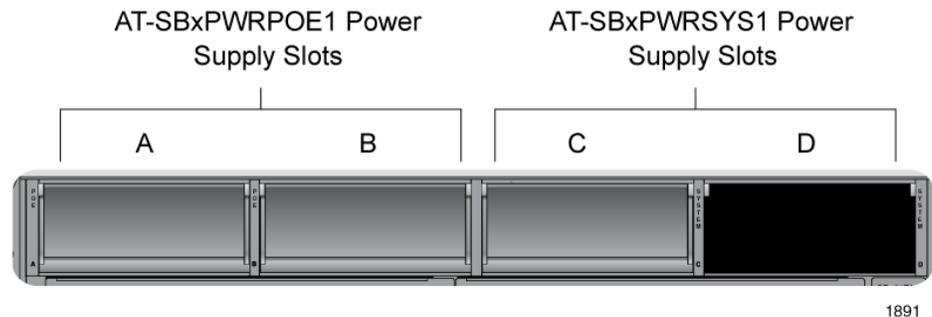
### Caution

The electronic components in the AT-SBxPWRPOE1 AC Power Supply can be damaged by electro-static discharges (ESD). Follow the procedure in “Protecting Against Electrostatic Discharge (ESD)” on page 94 to guard against ESD damage when unpacking and installing the power supply.

To install the power supply, perform the following procedure:

1. Choose a slot for the AT-SBxPWRPOE1 AC Power Supply in the chassis.

You may install it in either slot A or B, shown in Figure 55.



1891

Figure 55. Power Supply Slots

2. Raise the handle on the blank panel covering the selected slot and slide the panel from the chassis, as shown in Figure 56 on page 102.

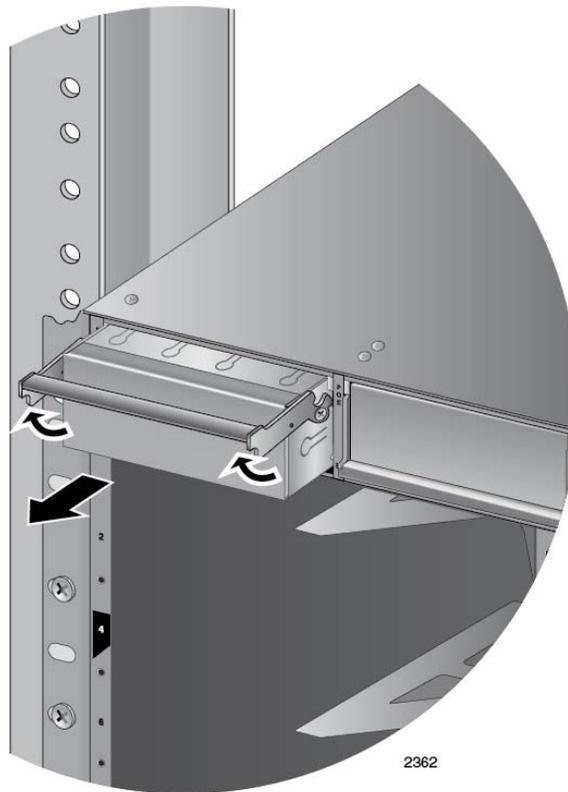


Figure 56. Removing the Blank Slot Cover from Power Supply Slot A

3. Remove the power supply from the shipping package and verify that the shipping package contains the items listed in Figure 57 on page 103.

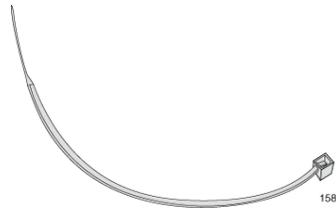
If any item is missing or damaged, contact your Allied Telesis sales representative for assistance.



One AT-SBxPWRPOE1 AC Power Supply Module



One regional AC power cord



One tie wrap

Figure 57. Items Included with the AT-SBxPWRPOE1 Power Supply Module

---

**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.

---



---

**Note**

The tie wrap is used to secure the power cord to the chassis, as explained in “Powering on the AT-SBxPWRPOE1 AC Power Supply” on page 158.

---

4. Check the model name, shown in Figure 58 on page 104, to verify the module.

If you have the AT-SBxPWRSYS1 AC System Power Supply, do not continue with this procedure. Instead, perform “Installing the AT-SBxPWRSYS1 AC System Power Supply” on page 95.



2363

Figure 58. Verifying the AT-SBxPWRPOE1 AC Power Supply

5. Raise the locking handle on the AT-SBxPWRPOE1 AC Power Supply, as shown Figure 59.



2366

Figure 59. Raising the Handle on the AT-SBxPWRPOE1 AC Power Supply

6. Align and insert the AT-SBxPWRPOE1 Module into slot A or B. See Figure 60 on page 105.



---

**Caution**

The AT-SBxPWRPOE1 AC Power Supply will not work in slot C or D.

---

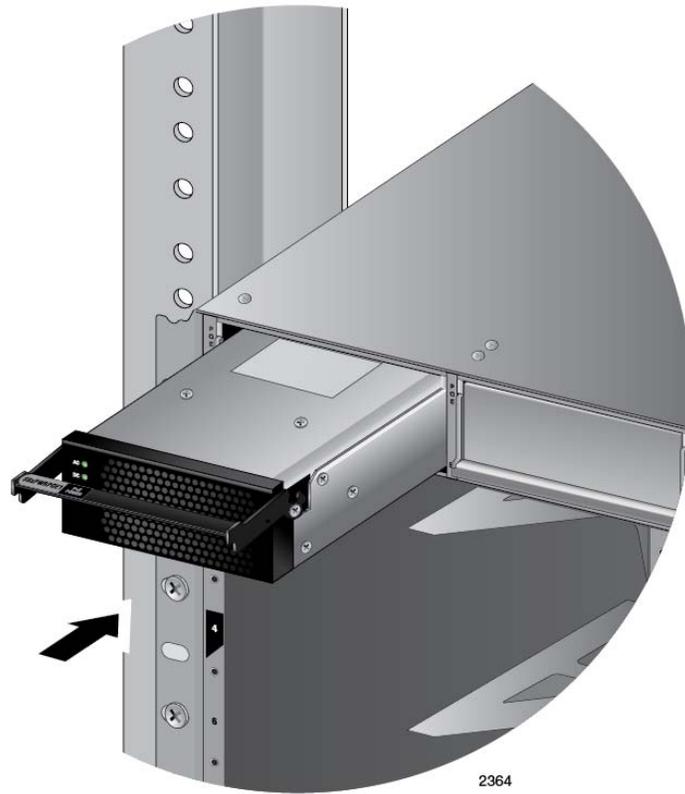


Figure 60. Inserting the AT-SBxPWRPOE1 AC Power Supply

7. Lower the locking handle of the power supply module to secure the module in the slot, as shown in Figure 61.



Figure 61. Locking the Handle on the AT-SBxPWRPOE1 AC Power Supply

8. To install a second AT-SBxPWRPOE1 AC Power Supply, repeat this procedure.
9. After installing the AT-SBxPWRPOE1 Power Supplies, go to Chapter 5, “Installing the AT-SBx31CFC Card and Ethernet Line Cards” on page 113.

---

**Note**

Retain the tie wrap that comes with the power supply. You will use it to secure the power cord to the chassis when you power on the unit in “Powering on the AT-SBxPWRPOE1 AC Power Supply” on page 158.

---

## Installing the AT-SBxPWRSYS1 DC Power Supply

This section contains the installation procedure for the AT-SBxPWRSYS1 DC Power Supply. For background information, refer to “Power Supplies” on page 62.



### Caution

The electronic components in the AT-SBxPWRSYS1 DC Power Supply can be damaged by electro-static discharges (ESD). Follow the procedure in “Protecting Against Electrostatic Discharge (ESD)” on page 94 to guard against ESD damage when unpacking and installing the power supply.

To install the power supply, perform the following procedure:

1. Choose a slot in the chassis for the AT-AT-SBxPWRSYS1 DC System Power Supply.

You may install it in slot C or D, shown in Figure 62. The first AT-SBxPWRSYS1 Power Supply should be installed in slot D, because the slot does not have a blank power supply panel.

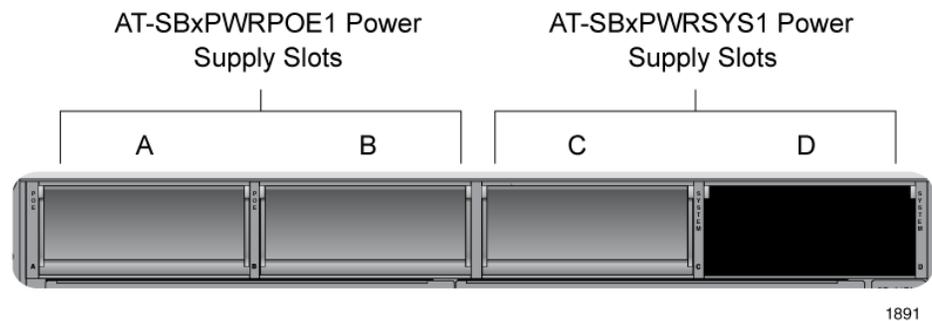


Figure 62. Power Supply Slots



### Caution

The AT-SBxPWRSYS1 DC Power Supply will not work in slot A or B.

2. If the chassis already has a power supply in slot D, remove the blank power supply panel from slot C by lifting the blank panel handle and sliding it out of the slot, as shown in Figure 63 on page 108.

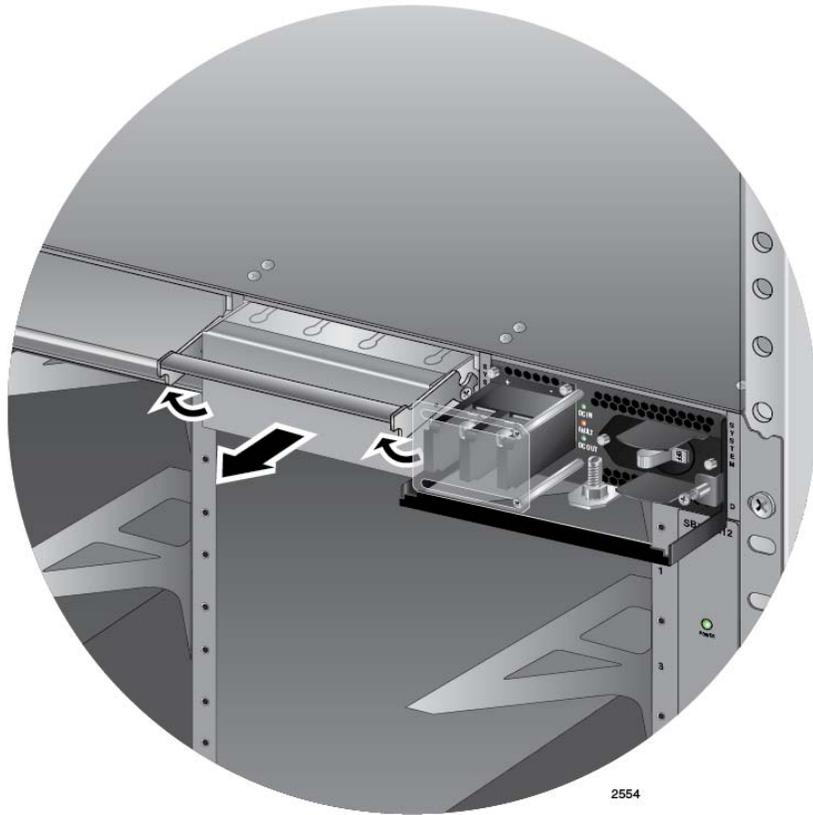
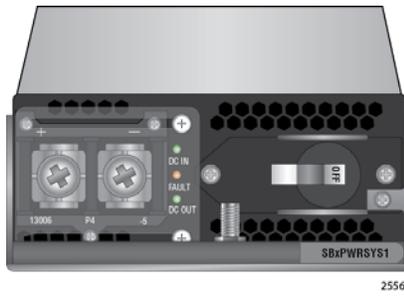


Figure 63. Removing the Blank Slot Cover from Power Supply Slot C

3. Remove the power supply from the shipping package and verify that the shipping package contains the items listed in Figure 64 on page 109.

If any item is missing or damaged, contact your Allied Telesis sales representative for assistance.



One AT-SBxPWRSYS1 DC Power Supply Module



Two straight power wire ring lugs



One grounding wire ring lug



Two right angle power wire ring lugs

Figure 64. Items Included with the AT-SBxPWRSYS1 DC Power Supply Module

---

**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.

---

4. With a #2 Phillips-head screwdriver, loosen the handle locking screw on the power supply, as shown in Figure 65 on page 110.

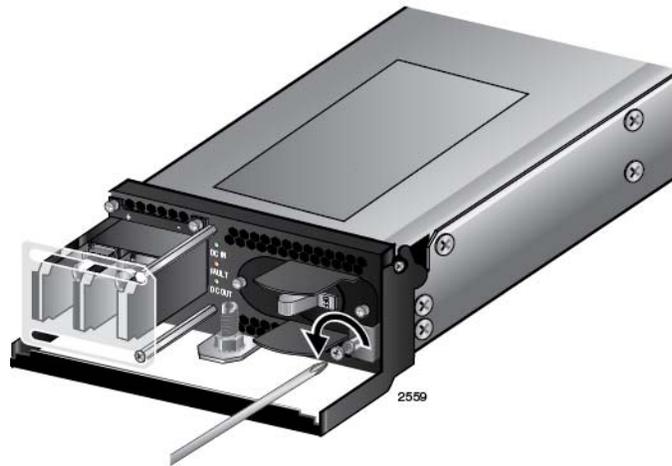


Figure 65. Loosening the Handle locking Screw on the AT-SBxPWRPOE1 DC Power Supply

5. Raise the locking handle on the AT-SBxPWRPOE1 DC Power Supply, as shown Figure 66.



Figure 66. Raising the Handle on the AT-SBxPWRPOE1 DC Power Supply

6. Align and insert the AT-SBxPWRSYS1 Module into slot C or D. Figure 67 on page 111 shows the power supply installed in slot D.



**Caution**

The AT-SBxPWRSYS1 DC Power Supply will not work in slot A or B.

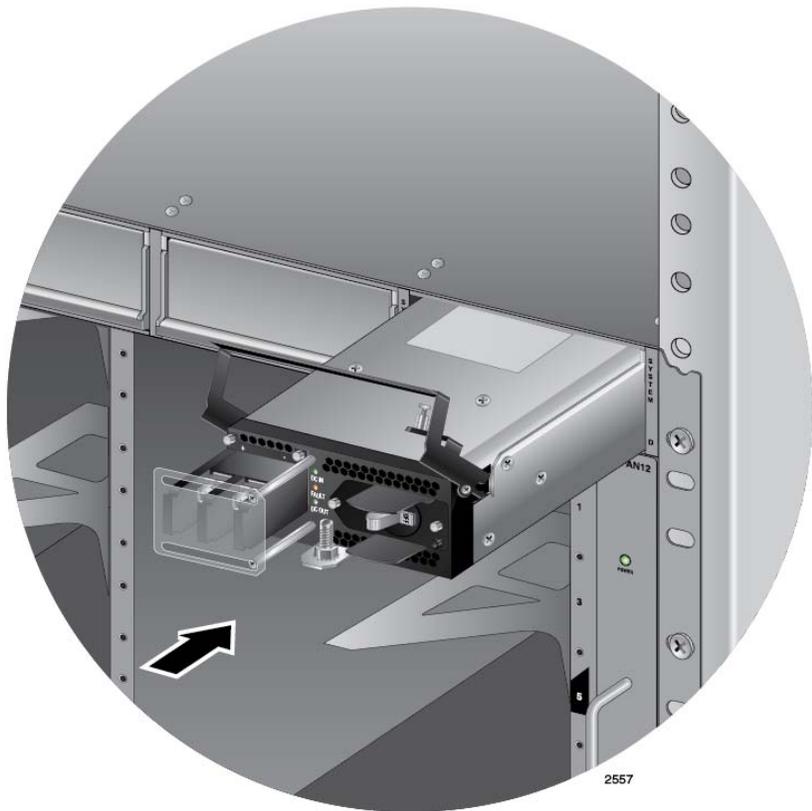


Figure 67. Inserting the AT-SBxPWRSYS1 DC Power Supply

7. Lower the locking handle of the power supply module to secure the module in the slot, as shown in Figure 68.

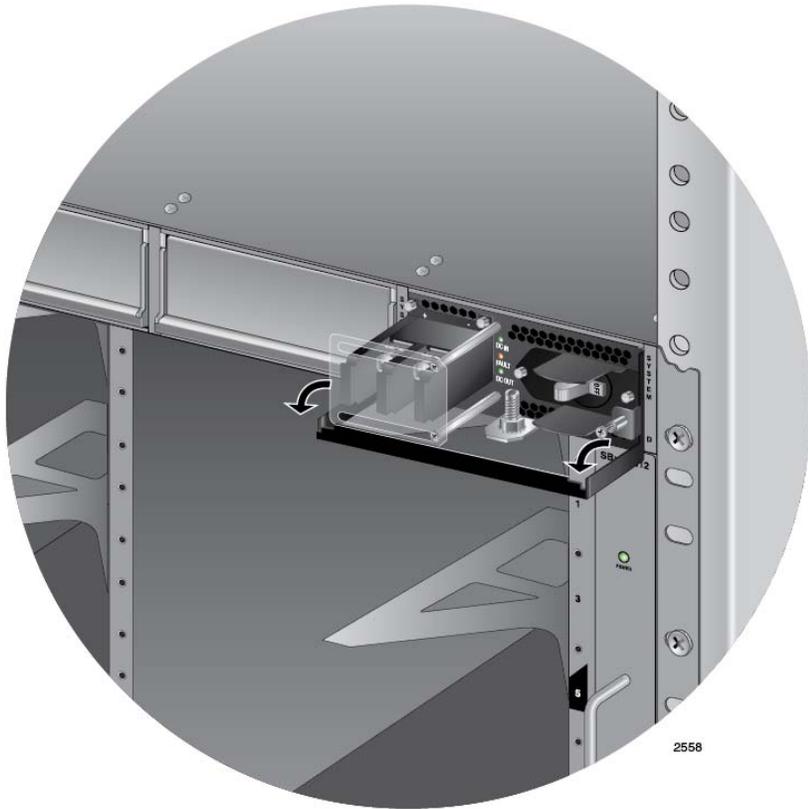


Figure 68. Locking the Handle on the AT-SBxPWRSYS1 Power Supply

---

**Note**

Do not tighten the handle locking screw yet. You may need to slightly lift the handle to move the plastic guard panel when you wire the positive and negative wires in “Powering On the AT-SBxPWRSYS1 DC System Power Supply” on page 161.

---

8. To install a second AT-SBxPWRSYS1 DC Power Supply, repeat this procedure.
9. After installing the AT-SBxPWRSYS1 DC Power Supplies, go to Chapter 5, “Installing the AT-SBx31CFC Card and Ethernet Line Cards” on page 113.

---

**Note**

Retain the five wire ring lugs that come with the power supply. You use them to wire the power supply in “Powering On the AT-SBxPWRSYS1 DC System Power Supply” on page 161.

---

## Chapter 5

# Installing the AT-SBx31CFC Card and Ethernet Line Cards

---

This chapter describes how to install the control and Ethernet line cards. The chapter has the following sections:

- ❑ “Installing the AT-SBx31CFC Central Fabric Controller Card” on page 114
- ❑ “Installing the Ethernet Line Cards” on page 120
- ❑ “Installing the Blank Slot Covers” on page 124

## Installing the AT-SBx31CFC Central Fabric Controller Card

This section contains the installation procedure for the AT-SBx31CFC Central Fabric Controller card. You may install either one or two control cards in the unit. The chassis must have at least one control card. The cards must be installed in slots 4 and 5 in the chassis.



### Caution

The electronic components on the AT-SBx31CFC Card can be damaged by electro-static discharge (ESD). Follow the procedure in “Protecting Against Electrostatic Discharge (ESD)” on page 94 to guard against ESD damage when unpacking and installing the card.

This procedure requires the following tools:

- ❑ #2 Phillips-head screwdriver (not provided)
- ❑ #2 Phillips-head, 5 inch-lbs torque screwdriver (optional — not provided)

To install the AT-SBx31CFC Card, perform the following procedure:

1. Choose a slot in the chassis for the AT-SBx31CFC Central Fabric Controller card.

The card must be installed in slot 4 or 5. If you are installing only one control card, you may install it in either slot. Refer to Figure 69.

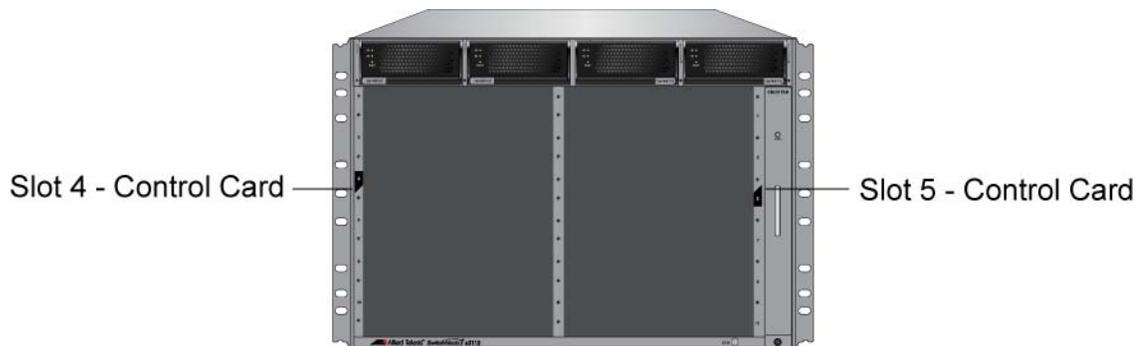
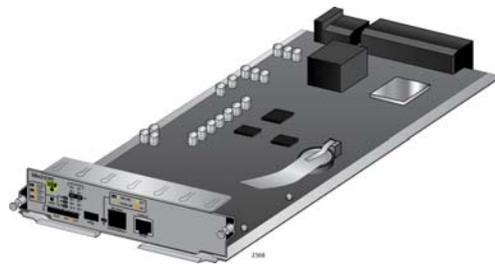


Figure 69. Slots 4 and 5 for the AT-SBx31CFC Card

2. Remove the new AT-SBx31CFC Card from the shipping package and verify the package contents, listed in Figure 70 on page 115.

If any item is missing or damaged, contact your Allied Telesis sales representative for assistance.



One AT-SBx31CFC  
Central Fabric Controller  
Card



One 2 m (6.6 ft) local  
management cable with  
RJ-45 (8P8C) and DB-9  
(D-sub 9-pin) connectors.

Figure 70. Items Included with the AT-SBx31CFC Central Fabric Controller Card

---

**Note**

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

---

3. Move the locking handles on the front panel to the open position, as shown in Figure 71.

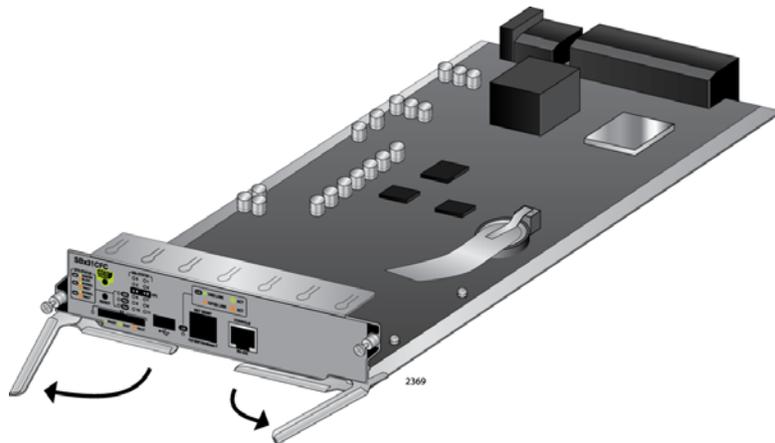


Figure 71. Opening the Locking Handles on the AT-SBx31CFC Central Fabric Controller Card

4. Remove the battery insulator tab on the control card by sliding it out from between the battery and battery clip, as shown in Figure 72 on page 116.

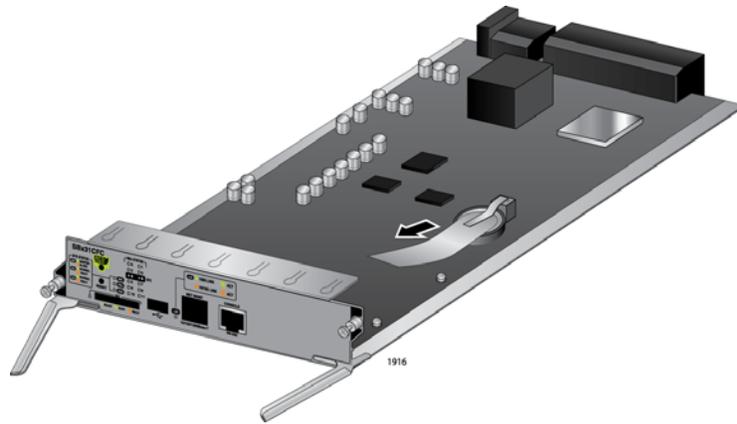


Figure 72. Removing the Battery Insulator

5. Align the edges of the AT-SBx31CFC Management Fabric Card with the internal chassis card guides in slot 4 or 5 of the AT-SBx3112 Chassis. Figure 73 shows the AT-SBx31CFC Card aligned in slot 4.

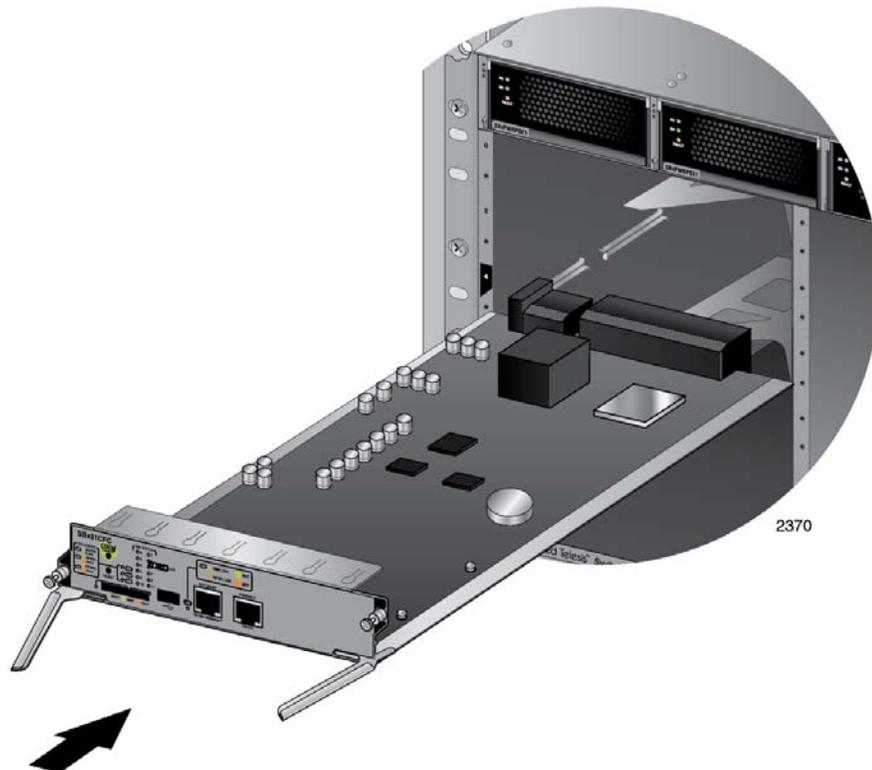


Figure 73. Aligning the AT-SBx31CFC Card in the Chassis Slot

6. Insert the card into the slot until you feel it make contact with the connector on the chassis backplane, as shown in Figure 74 on page 117.





Figure 75. Closing the Locking Levers on the AT-SBx31CFC Central Fabric Controller Card

8. Finger tighten the two thumbscrews on the card to secure the card to the chassis, as shown in Figure 76 on page 119.



Figure 76. Tightening the Thumb Screws on the AT-SBx31CFC Card

9. Tighten the screws with a # 2 Phillips-head screwdriver to secure the control card to the chassis.

Allied Telesis recommends tightening the screws to 5 inch-lbs.

10. if you have a second AT-SBx31CFC Central Fabric Controller card, repeat steps 1 to 9 to install it in the chassis.
11. Go to “Installing the Ethernet Line Cards” on page 120.

## Installing the Ethernet Line Cards

---

This section contains the installation procedure for the Ethernet line cards. The illustrations show the AT-SBx31GP24 Line Card, but the procedure is the same for all the cards.



---

### Caution

The electronic components on the line cards can be damaged by electro-static discharges (ESD). Follow the procedure in “Protecting Against Electrostatic Discharge (ESD)” on page 94 to guard against ESD damage when unpacking and installing the line cards.

---

This procedure requires the following tools:

- #2 Phillips-head screwdriver (not provided)
- #2 Phillips-head, 5 inch-lbs torque screwdriver (optional — not provided)

To install the Ethernet line cards, perform the following procedure:

1. Choose a slot in the chassis for the Ethernet line card. The Ethernet line cards may be installed in slots 0 to 3 and 6 to 11. The slots are shown in Figure 77.



Figure 77. Slots 0 to 3 and 6 to 11 for the Ethernet Line Cards

2. Remove the line card from the shipping package. If it is missing or damaged, contact your Allied Telesis sales representative for assistance.

---

### Note

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

---

3. Align the line card with the internal chassis card guides in the selected slot of the AT-SBx3112 Chassis.

Figure 78 shows an Ethernet line card aligned with slot 0.

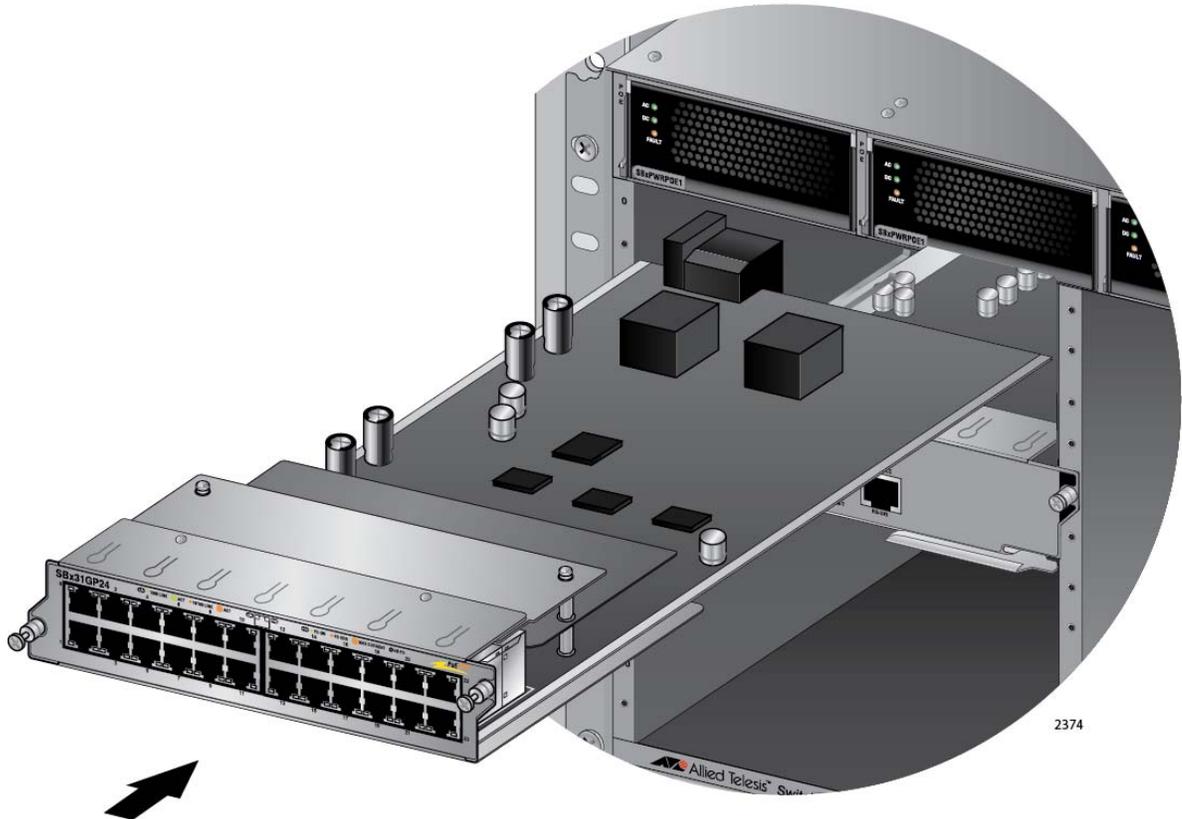


Figure 78. Aligning an Ethernet Line Card in a Chassis Slot

4. Insert the line card into the slot, as shown in Figure 79 on page 122, until the faceplate is firmly seated against the chassis front panel.



#### Caution

Forcing the line card into its chassis slot when it is not properly aligned with the card guides may damage the backplane connector pins inside the chassis. If there is undue resistance, remove the line card. Check to insure that it is properly aligned with the card guides.

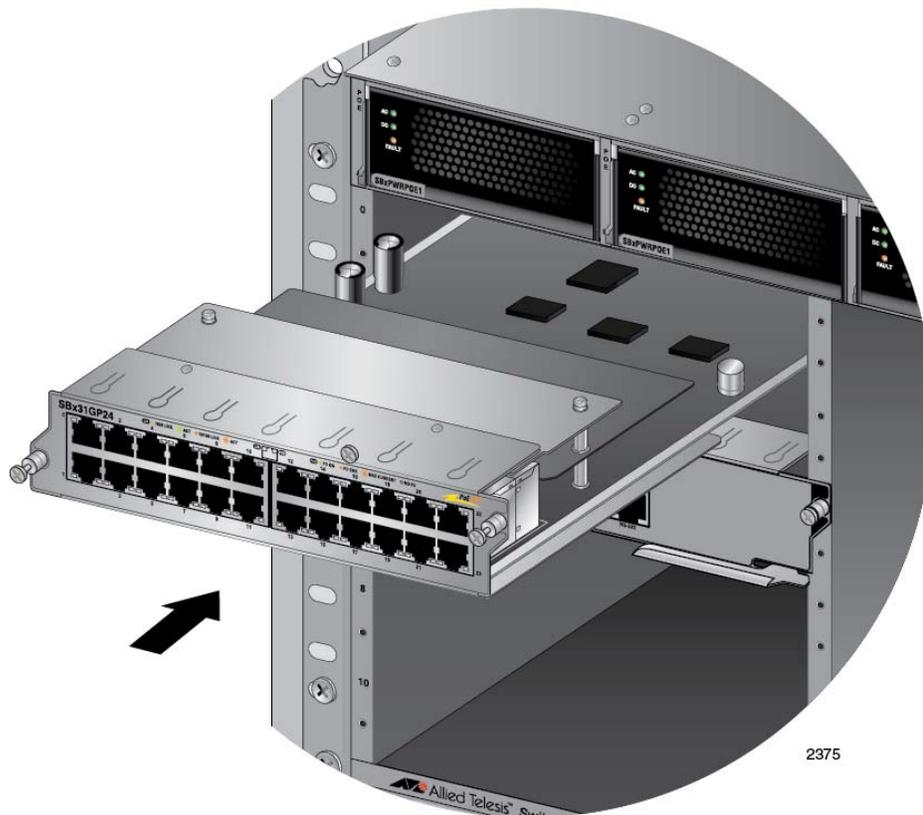


Figure 79. Inserting an Ethernet Line Card

5. Finger tighten the two thumbscrews on each side of the line card to secure it to the chassis, as shown in Figure 80 on page 123.

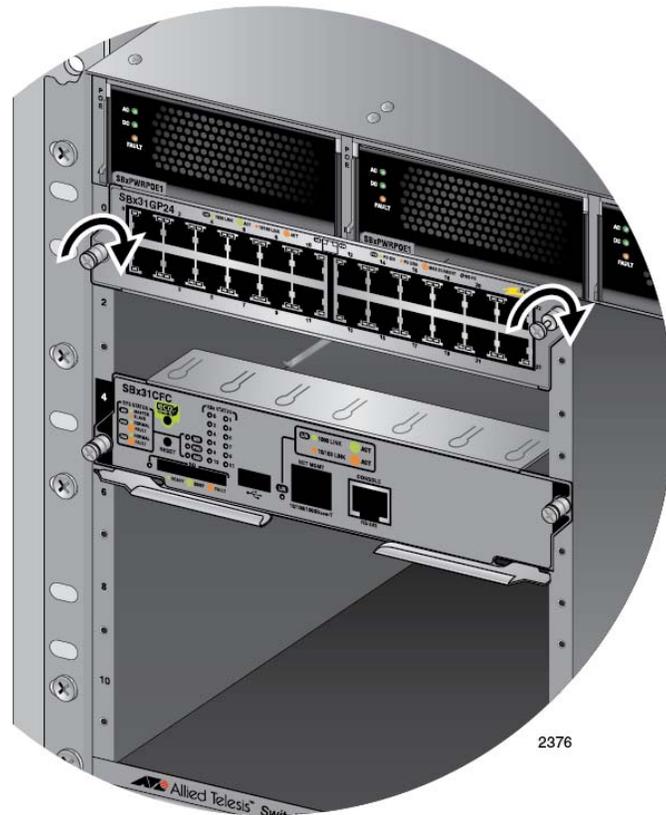


Figure 80. Tightening the Thumb Screws on an Ethernet Line Card

6. Tighten the two screws with a # 2 Phillips-head screwdriver to secure the line card to the chassis.

Allied Telesis recommends tightening the screws to 5 inch-lbs.

7. Repeat this procedure to install the remaining Ethernet line cards.
8. After installing the line cards, go to “Installing the Blank Slot Covers” on page 124.

## Installing the Blank Slot Covers

---

After installing the AT-SBx31CFC Control Cards and Ethernet line cards, check the front panel for any unused slots and cover them with the blank slot covers included with the chassis, as explained in this procedure. The fan module may not be able to maintain adequate airflow across the control and line cards if the chassis is not completely enclosed. If there are no unused slots, go to Chapter 6, “Installing the Transceivers and Cabling the Ports” on page 127.

To install the blank panels on the unused slots, perform the following procedure:

1. Position a blank slot cover over an unused slot, as shown in Figure 81.



Figure 81. Installing a Blank Slot Cover

2. Finger tighten the two thumbscrews to attach the blank panel to the chassis, as shown in Figure 82 on page 125.



Figure 82. Tightening the Thumbscrews on a Blank Slot Cover

3. Tighten the two screws with a # 2 Phillips-head screwdriver to secure the blank slot cover to the chassis.

Allied Telesis recommends tightening the screws to 5 inch-lbs.

4. Repeat this procedure to cover the remaining empty slots with blank slot covers.
5. Store any unused blank panels in a secure place for future use.
6. Go to Chapter 6, “Installing the Transceivers and Cabling the Ports” on page 127.



## Chapter 6

# Installing the Transceivers and Cabling the Ports

---

This chapter describes how to install the fiber optic transceivers and attach the cables to the ports on the line cards. The chapter has the following sections:

- ❑ “Guidelines to Cabling the AT-SBx31GP24, AT-SBx31GT24, and AT-SBx31GT40 Line Cards” on page 128
- ❑ “Guidelines to Installing SFP, SFP+, CSFP, and XFP Transceivers” on page 131
- ❑ “Installing SFP Transceivers in the AT-SBx31GS24 Line Card” on page 132
- ❑ “Installing SFP and CSFP Transceivers in the AT-SBx31GC40 Line Card” on page 136
- ❑ “Installing SFP+ Transceivers in the AT-SBx31XS6 Line Card” on page 140
- ❑ “Installing AT-SP10TW Cables in the AT-SBx31XS6 Line Card” on page 144
- ❑ “Installing XFP Transceivers in the AT-SBx31XZ4 Line Card” on page 147
- ❑ “Cabling the NET MGMT Port on the AT-SBx31CFC Card” on page 151

## Guidelines to Cabling the AT-SBx31GP24, AT-SBx31GT24, and AT-SBx31GT40 Line Cards

---

Here are the guidelines to cabling the 10/100/1000Base-T twisted pair ports on the AT-SBx31GT24, AT-SBx31GP24, and AT-SBx31GT40 Line Cards:

- ❑ The 10/100/1000Base-T twisted pair ports on the AT-SBx31GT24 and AT-SBx31GP24 Line Cards have 8-pin RJ45 connectors.
- ❑ The 10/100/1000Base-T twisted pair ports on the AT-SBx31GT40 Line Card have 8-pin RJ point 5 connectors.
- ❑ The cable specifications for the ports on the AT-SBx31GT24 and AT-SBx31GT40 Line Cards are listed in Table 1 on page 36.
- ❑ The cable specifications for the ports on the AT-SBx31GP24 Line Card are listed in Figure 2 on page 37.
- ❑ The connectors on the cables should fit snugly into the ports, and the tabs should lock the connectors into place.
- ❑ The default setting for PoE on the ports on the AT-SBx31GP24 Line Card is enabled.
- ❑ The default speed setting for the ports is Auto-Negotiation. This setting is appropriate for ports connected to network devices that also support Auto-Negotiation.
- ❑ The default speed setting of Auto-Negotiation is not appropriate for ports connected to network devices that do not support Auto-Negotiation and have fixed speeds or 10 or 100 Mbps. For those switch ports, disable Auto-Negotiation and set the port's speed manually to match the speeds of the network devices.
- ❑ The 10/100/1000Base-T ports must be set to Auto-Negotiation, the default setting, to operate at 1000Mbps.
- ❑ The default duplex mode setting for the ports is Auto-Negotiation. This setting is appropriate for ports connected to network devices that also support Auto-Negotiation for duplex modes.
- ❑ The default duplex mode setting of Auto-Negotiation is not appropriate for ports connected to network devices that do not support Auto-Negotiation and have a fixed duplex mode. Disable Auto-Negotiation on those ports and set their duplex modes manually to avoid the possibility of duplex mode mismatches. 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.

The MDI/MDIX wiring configuration of the ports is set automatically with automatic MDIX detection. You may not disable this feature on the ports.

For automatic MDIX detection to work successfully, the remote device connected to a port must also support the feature. If it does not, a port on a line card defaults to MDIX. This may require the use of a crossover cable.

Here are guidelines to choosing straight-through or crossover cabling for the ports:

- ❑ You may use straight-through cables on ports that are connected to network devices that operate at 1000 Mbps.
- ❑ You may use straight-through or crossover cables on ports that are connected to network devices that support automatic MDIX detection and that operate at 10 or 100 Mbps.
- ❑ You *must* use straight-through cables on ports that are connected to network devices that have a fixed wiring configuration of MDI and that operate at 10 or 100 Mbps.
- ❑ You *must* use crossover cables on ports that are connected to network devices that have a fixed wiring configuration of MDIX and that operate at 10 or 100 Mbps.

### Connecting Cables to the AT- SBx31GT40 Line Card

Here are a few additional guidelines to connecting cables to ports on the AT-SBx31GT40 Line Card:

- ❑ The ports require the RJ point 5 cable connector shown in Figure 83.



Figure 83. RJ Point 5 Cable Connector for AT-SBx31GT40 Line Card

- ❑ To connect a cable to a port in the top role on the line card, orient the connector with the release tab on top. To connect a cable to a port in the bottom role, orient the connector with the release tab on the bottom. Refer to Figure 84 on page 130.
- ❑ To remove a cable from a port, pull gently on the release tab and slide the cable connector from the port.

---

#### Note

Patch cables for the AT-SBx31GT40 Line Card, in lengths of 1 meter and 3 meters with RJ point 5 and RJ-45 connectors, are available from Allied Telesis. Contact your Allied Telesis sales representative for information.

---

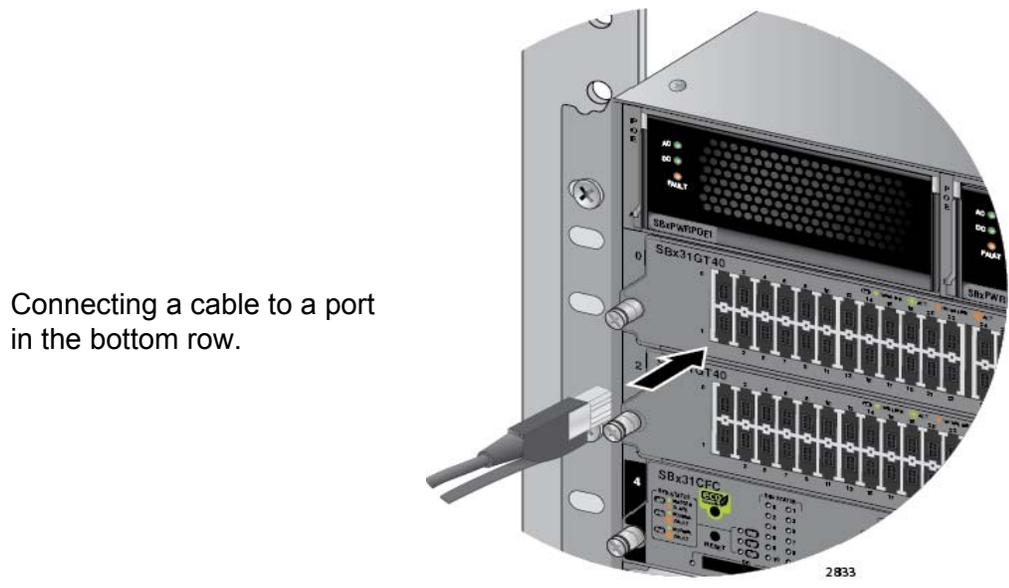
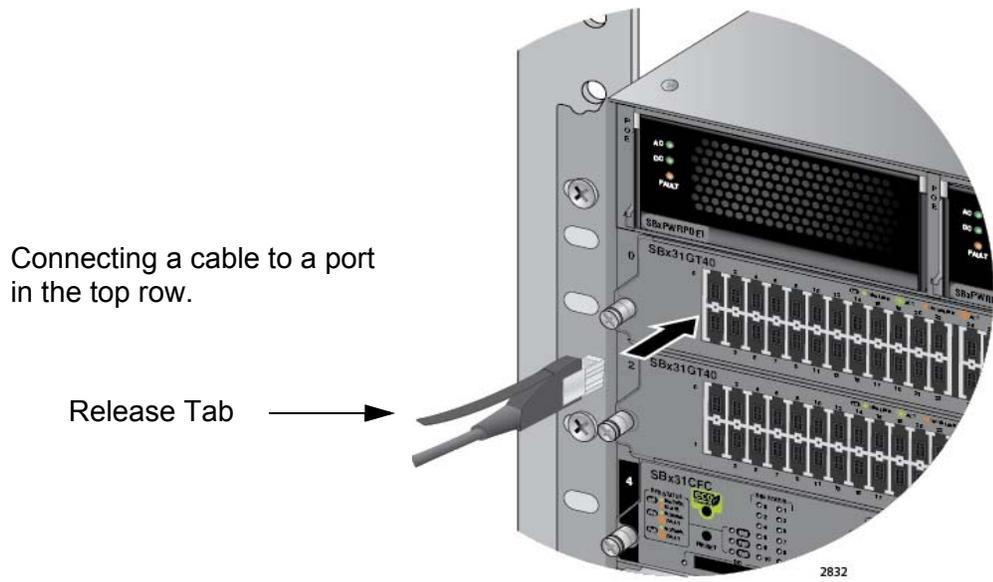


Figure 84. Connecting Cables to Ports on the AT-SBx31GT40 Line Card

## Guidelines to Installing SFP, SFP+, CSFP, and XFP Transceivers

---

Please review the following guidelines before installing fiber optic transceivers in the AT-SBx31GS24, AT-SBx31GC40, AT-SBx31XS6, and AT-SBx31XZ4 Line Cards:

- ❑ You should install a transceiver in a line card before connecting its network cable.
- ❑ A fiber optic transceiver is dust sensitive. Always keep the protective cover in the optical bores when a fiber optic cable is not installed, or when you store the transceiver. When you do remove this cover, retain it for future use.
- ❑ Your Allied Telesis sales representative can provide you with a list of supported transceivers for the line cards.
- ❑ The operational specifications and fiber optic cable requirements of the transceivers are provided in the documents included with the devices.
- ❑ The SFP, SFP+, CSFP, and XFP transceivers and AT-SP10TW cables are hot-swappable. You may install them while the chassis is powered on.
- ❑ Unnecessary removal or insertion of transceivers can lead to premature failures.



### Warning

Transceivers can be damaged by static electricity. Follow the procedure in “Protecting Against Electrostatic Discharge (ESD)” on page 94 to guard against ESD damage when unpacking and installing the devices.

---



### Caution

The temperature of an operational transceiver may exceed 70 C (158 F). Exercise caution when removing or handling a transceiver with unprotected hands.

---

## Installing SFP Transceivers in the AT-SBx31GS24 Line Card

Please review the information in “Guidelines to Installing SFP, SFP+, CSFP, and XFP Transceivers” on page 131 before performing this procedure.

To install SFP transceivers in the AT-SBx31GS24 Line Card, perform the following procedure:

1. Remove the transceiver from its shipping container and store the packaging material in a safe location.
2. Remove the dust cover from the SFP slot chosen for the transceiver. In Figure 85 the dust cover is removed from port 0 on the line card in slot 0.

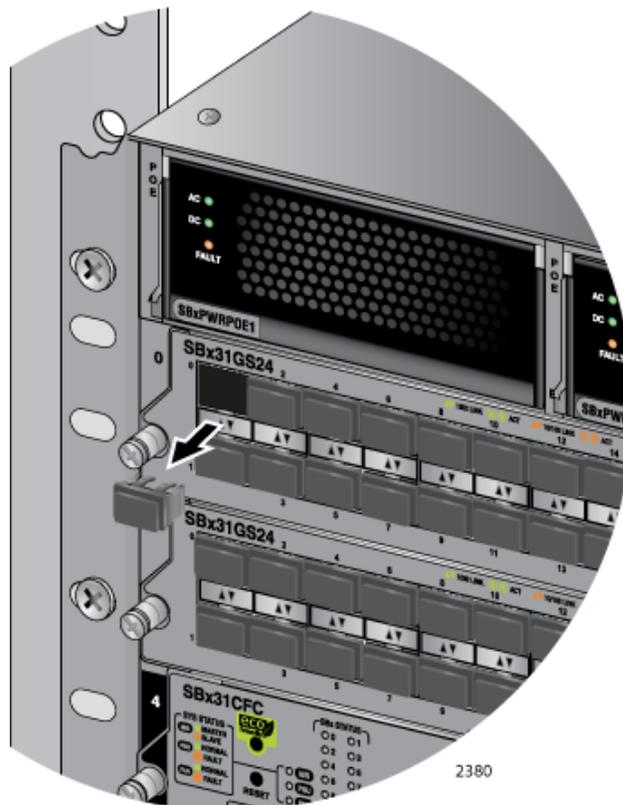


Figure 85. Removing the Dust Cover from an SFP Slot in the AT-SBx31GS24 Line Card

- To install the transceiver in an SFP slot on the top row of the line card, orient the transceiver with the handle on top, as shown in Figure 86. To install it into a slot on the bottom row of the line card, orient it with the handle on the bottom.

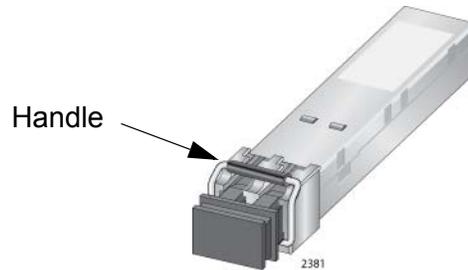


Figure 86. Handle on SFP Transceiver

- Slide the transceiver into the slot until it clicks into place, as shown in Figure 87.

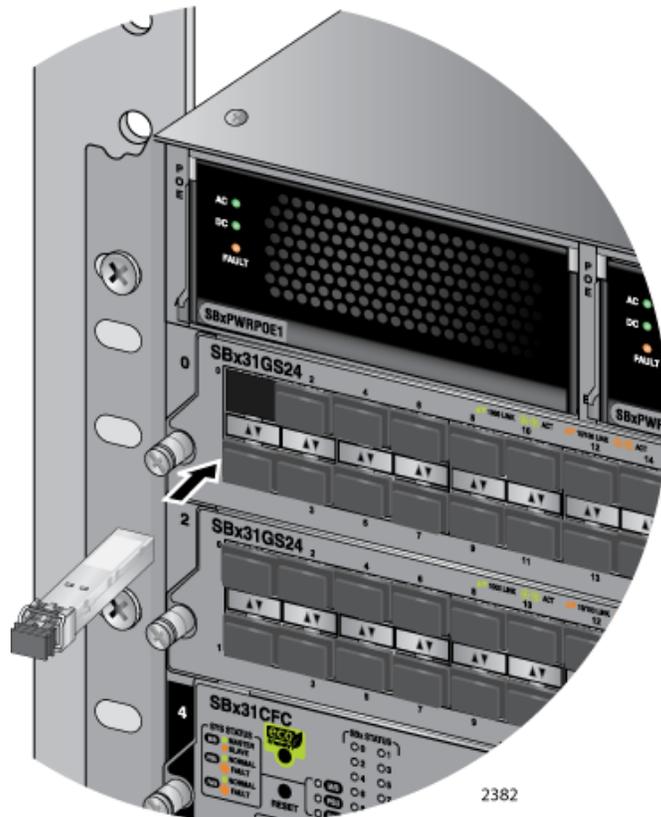


Figure 87. Inserting the SFP Transceiver in the AT-SBx31GS24 Line Card

---

**Note**

If you are ready to attach the fiber optic cable to the transceiver, continue with the next step. Otherwise, repeat steps 1 to 4 to install the remaining SFP transceivers in the line cards.

---

5. Remove the protective cover from the SFP transceiver, as shown in Figure 88.

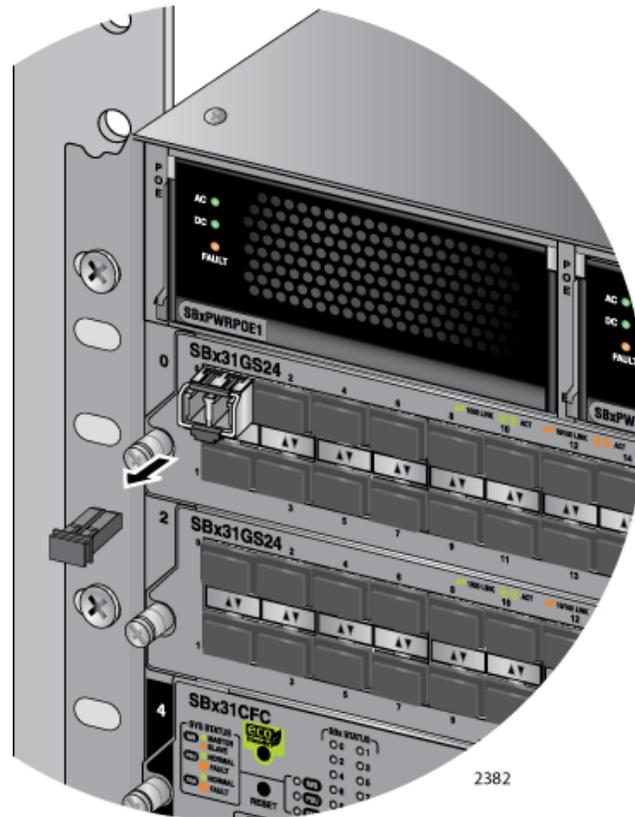


Figure 88. Removing the Dust Cover from the SFP Transceiver in the AT-SBx31GS24 Line Card

---

**Note**

The dust cover protects the fiber optic port on the SFP transceiver from dust contamination. It should not be removed until you are ready to connect the fiber optic cable.

---

6. Connect the fiber optic cable to the port on the transceiver, as shown in Figure 89. The connector should snap into the port.

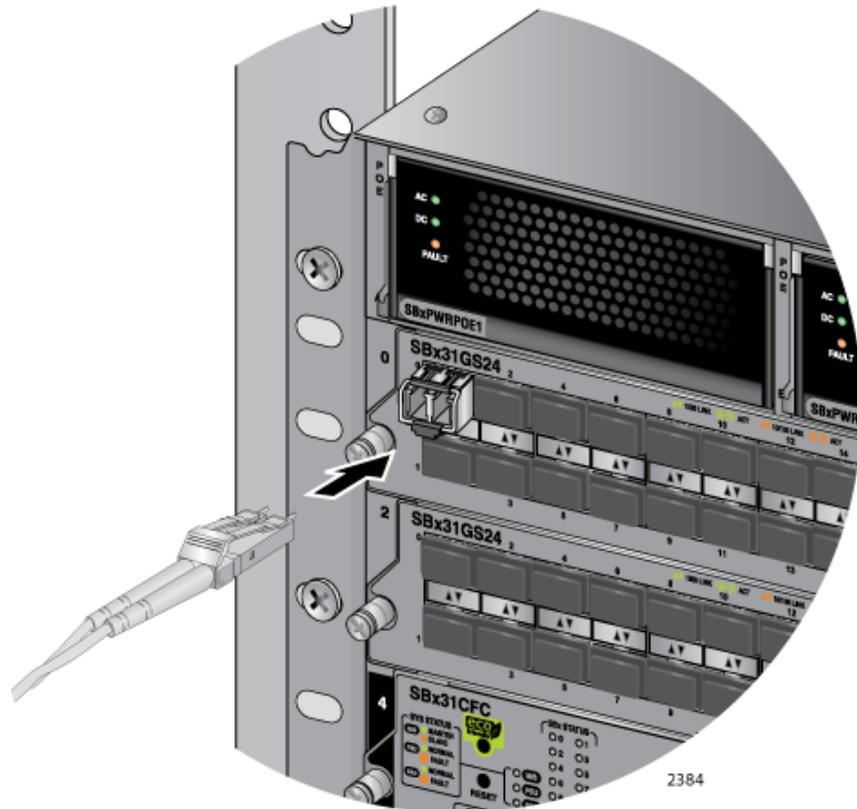


Figure 89. Attaching a Fiber Optic Cable to an SFP Transceiver in the AT-SBx31GS24 Line Card

7. Repeat this procedure to install additional SFP transceivers.

After installing and cabling the SFP transceivers, do one of the following:

- To install and cable additional transceivers, go to the appropriate section in this chapter for instructions.
- After cabling all the ports in the chassis, go to Chapter 7, “Powering On the Chassis” on page 153.

## Installing SFP and CSFP Transceivers in the AT-SBx31GC40 Line Card

---

Please review the information in “Guidelines to Installing SFP, SFP+, CSFP, and XFP Transceivers” on page 131 before performing this procedure.

To install SFP and CSFP transceivers in AT-SBx31GS24 Line Cards, perform the following procedure:

1. Remove the transceiver from its shipping container and store the packaging material in a safe location.
2. Remove the dust cover from the slot chosen for the transceiver. Figure 90 shows the dust cover being removed from the first slot.

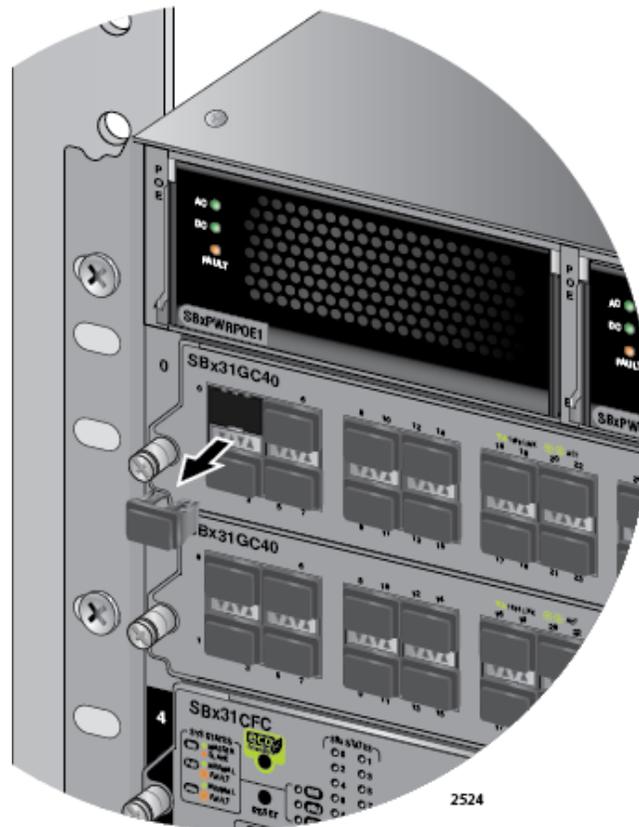


Figure 90. Removing the Dust Cover from a Transceiver Slot

- To install an SFP or a CSFP transceiver in a slot on the top row of the line card, orient it with the label on top, as shown in Figure 91. To install it into a slot on the bottom row of the line card, orient it with the label on the bottom.

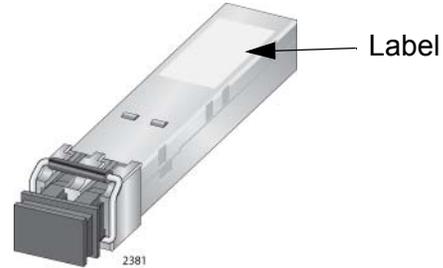


Figure 91. Labels on SFP and CSFP Transceivers

- Slide the transceiver into the slot until it clicks into place, as shown in Figure 92.



Figure 92. Inserting an SFP or a CSFP Transceiver

---

**Note**

If you are ready to attach the fiber optic cable to the transceiver, continue with the next step. Otherwise, repeat steps 1 to 4 to install the remaining SFP or CSFP transceivers in the line cards.

---

5. Remove the protective cover from the ports on the transceiver, as shown in Figure 93.

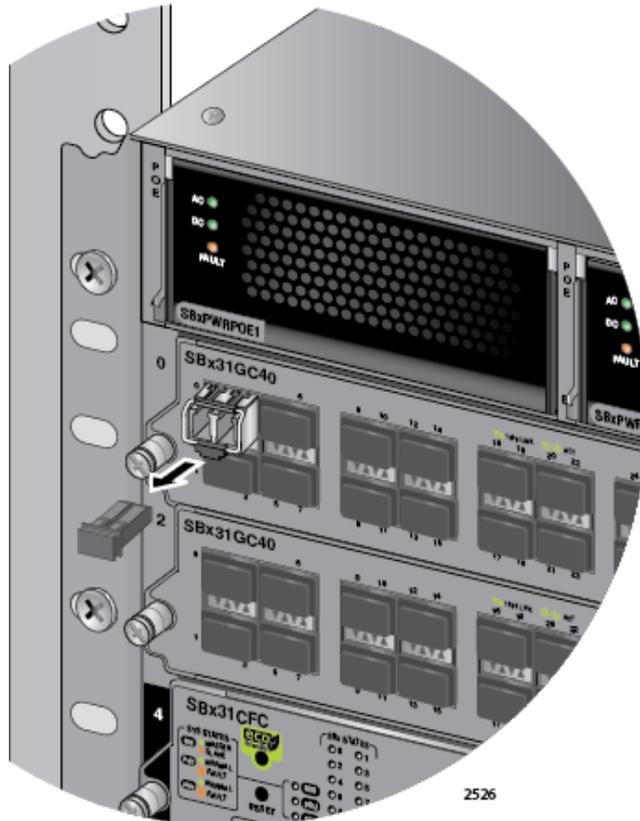


Figure 93. Removing the Dust Cover from an SFP or a CSFP Transceiver

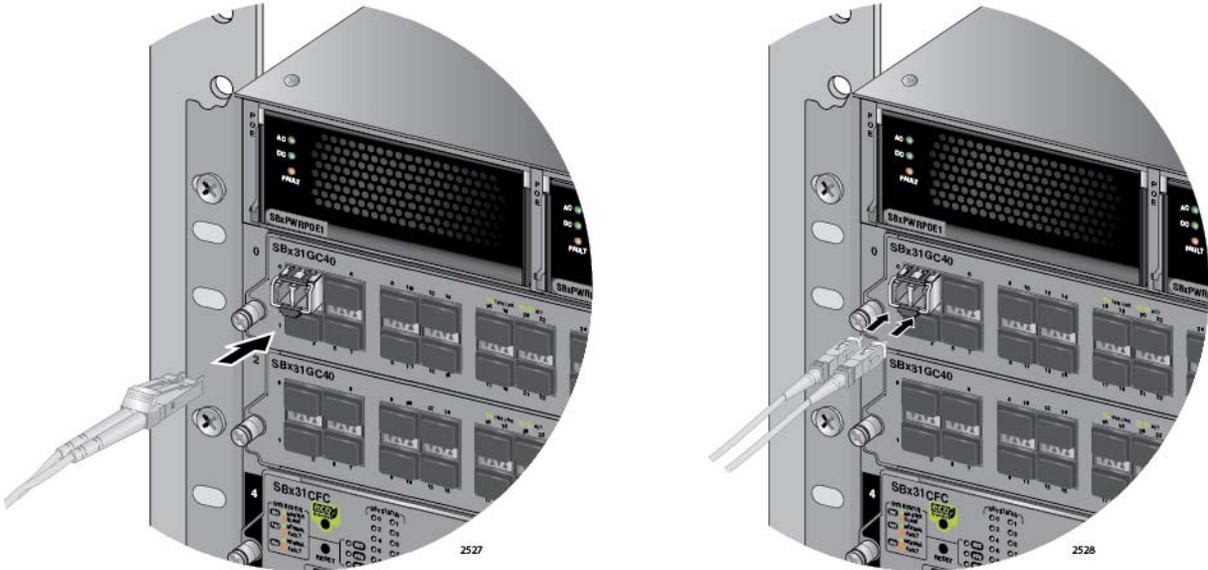
---

**Note**

The dust cover protects the fiber optic ports on the transceiver from dust contamination. It should not be removed until you are ready to connect the fiber optic cable.

---

6. Connect the fiber optic cables to the port on the transceiver, as shown in Figure 94. The connectors should snap into the ports. If you are connecting only one cable to a CSFP transceiver, you may connect it to either port.



SFP Transceiver

CSFP Transceiver

Figure 94. Attaching a Fiber Optic Cable

7. Repeat this procedure to install additional SFP and CSFP transceivers.

After installing and cabling the SFP and CSFP transceivers, do one of the following:

- To install and cable additional transceivers, go to the appropriate section in this chapter for instructions.
- After cabling all the ports in the chassis, go to Chapter 7, “Powering On the Chassis” on page 153.

## Installing SFP+ Transceivers in the AT-SBx31XS6 Line Card

Please review the information in “Guidelines to Installing SFP, SFP+, CSFP, and XFP Transceivers” on page 131 before performing this procedure.

To install 10 Gbps SFP+ transceivers in the AT-SBx31XS6 Line Card, perform the following procedure:

1. Remove the dust plug from the slot chosen for the SFP+ transceiver, as shown in Figure 95.



Figure 95. Removing a Dust Cover From an SFP+ Slot in the AT-SBx31XS6 Line Card

---

### Note

Slots 2 and 3 share backplane connectors with slots 4 and 5 on the line card, respectively. If you are installing from one to four transceivers, Allied Telesis recommends using slots 0 to 3 so that each transceiver has its own dedicated backplane connector. This can improve network performance.

---

**Note**

Do not remove a dust plug from an SFP+ slot if you are not installing a transceiver. A dust plug protects the line card from dust contamination.

2. Orient the SFP+ transceiver with the handle on top, as shown in Figure 96.

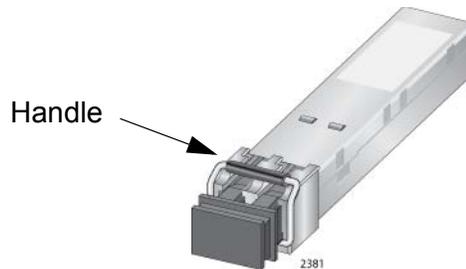


Figure 96. Handle on SFP+ Transceiver

3. Slide the transceiver into the slot until it clicks into place, as shown in Figure 97.



Figure 97. Installing an SFP+ Transceiver in the AT-SBx31XS6 Line Card

---

**Note**

If you are ready to attach the fiber optic cable to the transceiver, continue with the next step. Otherwise, repeat steps 1 to 3 to install the remaining SFP transceivers in the line cards.

---

4. Remove the protective cover from the SFP transceiver, as shown in Figure 98.



Figure 98. Removing the Dust Cover from an SFP+ Transceiver in the AT-SBx31XS6 Line Card

---

**Note**

The dust cover protects the fiber optic port on the SFP transceiver from dust contamination. It should not be removed until you are ready to connect the fiber optic cable.

---

5. Connect the fiber optic cable to the port on the transceiver, as shown in Figure 99. The connector should snap into the port.



Figure 99. Attaching a Fiber Optic Cable to an SFP+ Transceiver in the AT-SBx31XS6 Line Card

6. Repeat this procedure to install additional SFP plus transceivers in the AT-SBx31XS6 Line Cards.

After installing and cabling the SFP+ transceivers, do one of the following:

- To install and cable additional transceivers, go to the appropriate section in this chapter for instructions.
- After cabling all the ports in the chassis, go to Chapter 7, “Powering On the Chassis” on page 153.

## Installing AT-SP10TW Cables in the AT-SBx31XS6 Line Card

This procedure explains how to connect AT-SP10TW Cables to the AT-SBx31XS6 Line Card. The cables may be used in place of fiber optic cables and transceivers for 10 Gbps links of up to 7 meters.

---

**Note**

The AT-SP10TW Cable is only supported in the AT-SBx31XS6 Line Card.

---

To install the AT-SP10TW Cable, perform the following procedure:

1. Remove the dust plug from the SFP+ slot chosen for the cable, as shown in Figure 100.



Figure 100. Removing the Dust Cover From an SFP+ Slot in the AT-SBx31XS6 Line Card

**Note**

Do not remove the dust plug from a SFP+ slot if you are not installing the transceiver at this time. The dust plug protects the line card from dust contamination.

2. Orient the connector on the AT-SP10TW cable so that the release tab is on top, as shown in Figure 101.

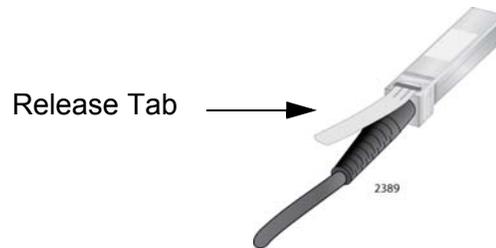


Figure 101. Release Tab on the AT-SBx31XS6 Line Card

3. Slide the connector into the slot until it clicks into place, as shown in Figure 102.



Figure 102. Installing the AT-SP10TW Cable in the AT-SBx31XS6 Line Card

4. Install the other end of the cable into an SFP+ slot on another network device.
5. Repeat this procedure to install additional AT-SP10TW Cables.

---

**Note**

To remove the connector and cable from the SFP+ slot, gently push on the connector, pull on the release tab, and then slide the connector from the slot.

---

After installing the AT-SP10TW Cables in the AT-SBx31XS6 Line Card, do one of the following:

- ❑ To install and cable additional transceivers, go to the appropriate section in this chapter for instructions.
- ❑ After cabling all the ports in the chassis, go to Chapter 7, “Powering On the Chassis” on page 153.

## Installing XFP Transceivers in the AT-SBx31XZ4 Line Card

Please review the information in “Guidelines to Installing SFP, SFP+, CSFP, and XFP Transceivers” on page 131 before performing this procedure.

To install XFP transceivers in the AT-SBx31XZ4 Line Card, perform the following procedure:

1. Remove the dust plug from the slot chosen for the transceiver, as shown in Figure 103.



Figure 103. Removing the Dust Cover From an XFP Slot on the AT-SBx31XZ4 Line Card

---

### Note

Do not remove the dust plug from the XFP slot if you are not installing the transceiver at this time. The dust plug protects the line card from dust contamination.

---

2. Remove the transceiver from its shipping container.

3. Orient the transceiver with the handle on top, as shown in Figure 104.

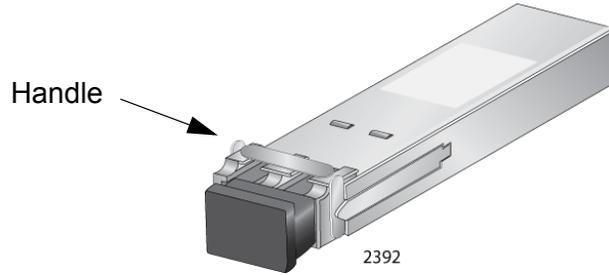


Figure 104. Handle on the XFP Transceiver

4. Slide it into the slot until it clicks into place, as shown in Figure 105.



Figure 105. Installing an XFP Transceiver in the AT-SBx31XZ4 Line Card

---

**Note**

If you are ready to attach the fiber optic cable to the transceiver, continue with the next step. Otherwise, repeat steps 1 to 4 to install the remaining XFP transceivers.

---

5. Remove the protective cover from the fiber optic port on the XFP transceiver, as shown in Figure 106.



Figure 106. Removing the Protective Cover from an XFP Transceiver in the AT-SBx31XZ4 Line Card

---

**Note**

The dust cover protects the fiber optic port on the XFP transceiver from dust contamination and should not be removed until you are ready to connect the fiber optic cable.

---

6. Connect the fiber optic cable to the port on the transceiver, as shown in Figure 107. The connector should snap into the port.



Figure 107. Attaching a Fiber Optic Cable to an XFP Transceiver in the AT-SBx31XZ4 Line Card

7. Repeat this procedure to install additional XFP transceivers.

After installing and cabling the XFP transceivers in the AT-SBx31XZ4 Line Cards, do one of the following:

- To install and cable additional transceivers, go to the appropriate section in this chapter for instructions.
- After cabling all the ports in the chassis, go to Chapter 7, “Powering On the Chassis” on page 153.

## Cabling the NET MGMT Port on the AT-SBx31CFC Card

---

The control card must have access to your network if you want to use any of the management features in Table 14 on page 58. You can do this by configuring the Inband Interface, which enables the card to use the backplane and line cards to communicate with your network, or connecting the NET MGMT port to a network device, such as a switch, router, or workstation. (For instructions on how to configure the Inband Interface, refer to the *Software Reference for SwitchBlade x3100 Series Switches*.)

Here are the guidelines to using the NET MGMT port:

- ❑ The cabling requirements of the port are the same as the ports on the AT-SBx31GT24 Line Card, in Table 1 on page 36.
- ❑ If the chassis has two AT-SBx31CFC Line Cards, connect the NET MGMT ports on both cards to network devices so that the inactive card can perform the management functions if it becomes the active card.
- ❑ The port uses Auto-Negotiation to set its speed and duplex. You may not disable Auto-Negotiation. If you connect the port to a network device that does not support Auto-Negotiation, it defaults to 10 Mbps, half-duplex mode. To avoid a speed or duplex mode mismatch, connect the port only to a device that also uses Auto-Negotiation.
- ❑ You may connect the NET MGMT port to a port on one of the Ethernet line cards in the chassis so that the control card communicates with your network through the line cards. However, you can achieve the same result by configuring the Inband Interface instead, as explained in the *Software Reference for SwitchBlade x3100 Series Switches*.

The wiring configuration of the port is set automatically with automatic MDIX detection. You may not disable automatic MDIX detection. For automatic MDIX detection to work successfully, the network device you connect to the port must also support the feature. If it does not, the NET MGMT port defaults to MDIX. This may entail the use of a crossover cable. Here are the guidelines to choosing a straight-through or crossover cable for the port:

- ❑ You may use a straight-through cable to connect the port to a network device that operates at 1000 Mbps.
- ❑ You may use a straight-through or crossover cable to connect the port to a network device that supports automatic MDIX detection and that operates at 10 or 100 Mbps.
- ❑ You *must* use a straight-through cable to connect the port to a network device that operates at 10 or 100 Mbps and has a fixed wiring configuration of MDI.

- ❑ You *must* use a crossover cable to connect the port to a network device that operates at 10 or 100 Mbps and has a fixed wiring configuration of MDIX.

After cabling the ports in the chassis, go to Chapter 7, “Powering On the Chassis” on page 153.

## Chapter 7

# Powering On the Chassis

---

This chapter describes how to power on the chassis, monitor the initialization process, and confirm the operational status of the components. The chapter contains the following sections:

- ❑ “Verifying the Installation” on page 154
- ❑ “Powering On the AT-SBxPWRSYS1 AC Power Supply” on page 155
- ❑ “Powering on the AT-SBxPWRPOE1 AC Power Supply” on page 158
- ❑ “Powering On the AT-SBxPWRSYS1 DC System Power Supply” on page 161
- ❑ “Monitoring the Initialization Process” on page 184

## Verifying the Installation

---

Please perform the following procedure before powering on the chassis:

1. Verify that the grounding lug on the back panel of the chassis is properly grounded. For instructions, refer to “Installing the Chassis Grounding Lug” on page 90.
2. Verify that all empty slots on the front panel of the chassis are covered with slot covers. To cover open slots, perform the procedure “Installing the Blank Slot Covers” on page 124.
3. Verify that dust plugs are installed in all empty SFP, SFP+, CSFP, and XFP slots on the Ethernet line cards.
4. Verify that dust covers are installed on all SFP, SFP+, CSFP, and XFP transceivers that do not have cables.
5. Verify that the chassis has at least one AT-SBx31CFC Control Card installed in slot 4 or 5.
6. Verify that the chassis has at least one AT-SBxPWRSYS1 Power Supply in slot C or D.
7. If the chassis has AT-SBx31GP24 Line Cards, verify that the chassis has at least one AT-SBxPWRPOE1 Power Supply in slot A or B.
8. When you installed the AT-SBx31CFC Control Card, did you remove the battery insulator, shown in Figure 72 on page 116? If not, remove the control card from the chassis, remove the insulator from the battery, and reinstall the card.

You may now power on the chassis. For instructions, refer to the appropriate procedure:

- “Powering On the AT-SBxPWRSYS1 AC Power Supply” on page 155
- “Powering on the AT-SBxPWRPOE1 AC Power Supply” on page 158
- “Powering On the AT-SBxPWRSYS1 DC System Power Supply” on page 161

---

### Note

If the chassis has both AT-SBxPWRSYS1 and AT-SBxPWRPOE1 Power Supplies, you may power on the power supplies in any order. The power supplies may also be powered on simultaneously.

---

## Powering On the AT-SBxPWRSYS1 AC Power Supply

The procedure in this section explains how to power on the AT-SBxPWRSYS1 AC Power Supply. For installation instructions, refer to “Installing the AT-SBxPWRSYS1 AC System Power Supply” on page 95.

### Note

If the chassis has both AT-SBxPWRSYS1 and AT-SBxPWRPOE1 Power Supplies, you may power on the power supplies in any order. The power supplies may also be powered on simultaneously.

To power on the chassis, perform the following procedure:

1. Identify AC sockets C and D in the recessed panel on the back panel of the chassis, shown in Figure 108. The sockets are for the AT-SBxPWRSYS1 System Power Supplies in slots C and D on the front panel of the chassis.



Figure 108. AC Sockets on the AT-SBx3112 Chassis Rear Panel

2. Plug the AC power cord that comes with the power supply into a plug whose corresponding slot on the front panel has a system power supply.

If there are two system power supplies, you may power on either supply first. The illustration in Figure 109 shows the connection of an AC power cord to connector D.



Figure 109. Connecting the AC Power Cord for the AT-SBxPWRSYS1 Power Supply

3. Use the twist tie included with the power supply to secure the cord to an anchor on the chassis to protect it from being accidentally pulled out, as shown in Figure 110 on page 157.

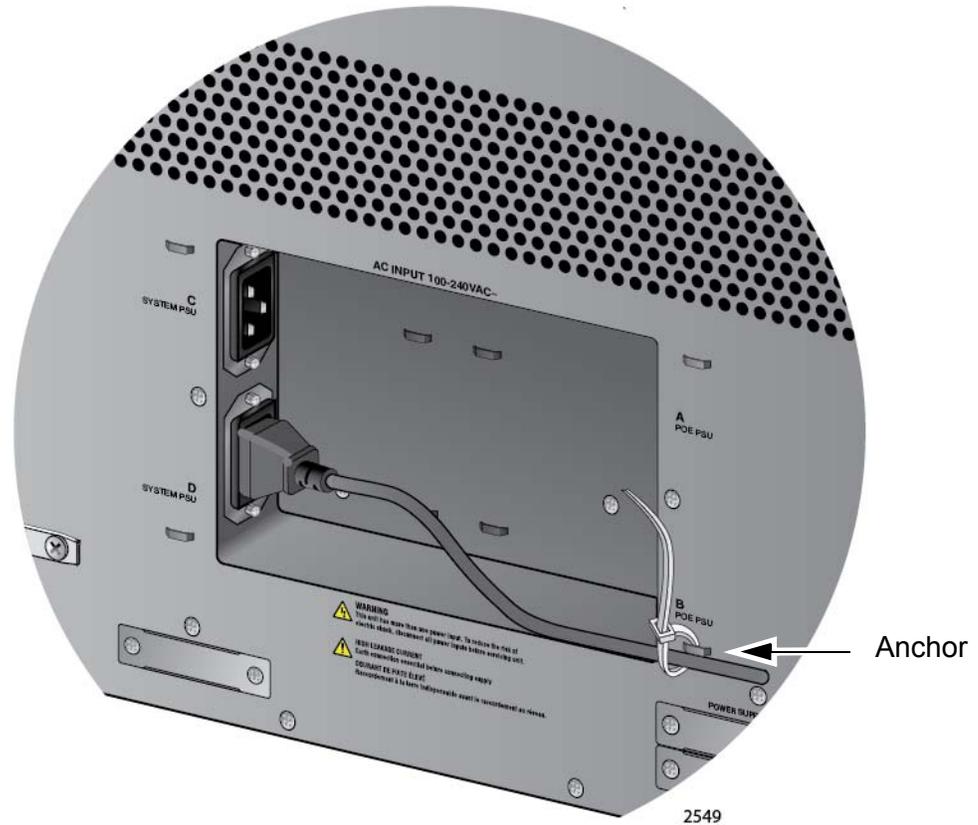


Figure 110. Securing the Power Cord for the AT-SBxPWRSYS1 Power Supply to an Anchor

4. Connect the power cord to an appropriate AC power source to power on the power supply.
5. If the chassis has two AT-SBxPWRSYS1 System Power Supplies, repeat steps 1 to 4 to power on the second power supply.

After powering on the AT-SBxPWRSYS1 System Power Supplies, do one of the follow:

- ❑ If the chassis has AT-SBxPWRPOE1 PoE Power Supplies, perform the procedure in “Powering on the AT-SBxPWRPOE1 AC Power Supply” on page 158.
- ❑ Otherwise, go to “Monitoring the Initialization Process” on page 184.

## Powering on the AT-SBxPWRPOE1 AC Power Supply

This section contains instructions on how to power on the AT-SBxPWRPOE1 AC Power Supply. For installation instructions, refer to “Installing the AT-SBxPWRPOE1 AC Power Supply” on page 101. To power on the power supply, perform the following procedure:

1. Identify AC sockets A and B in the recessed panel on the back panel of the chassis, shown in Figure 108 on page 155. The sockets are for the AT-SBxPWRPOE1 Power Supplies in slots A and B on the front panel of the chassis.
2. Plug the AC power cord that comes with the power supply into one of the plugs, as shown in Figure 111.

The plug should have a power supply in the corresponding slot in the front panel. If the chassis has two AT-SBxPWRPOE1 Power Supplies, you may power on either supply first.



Figure 111. Connecting the AC Power Cord for the AT-SBxPWRPOE1 Power Supply

- Use the twist tie that comes with the power supply to secure the cord to an anchor on the chassis, as shown in Figure 112.

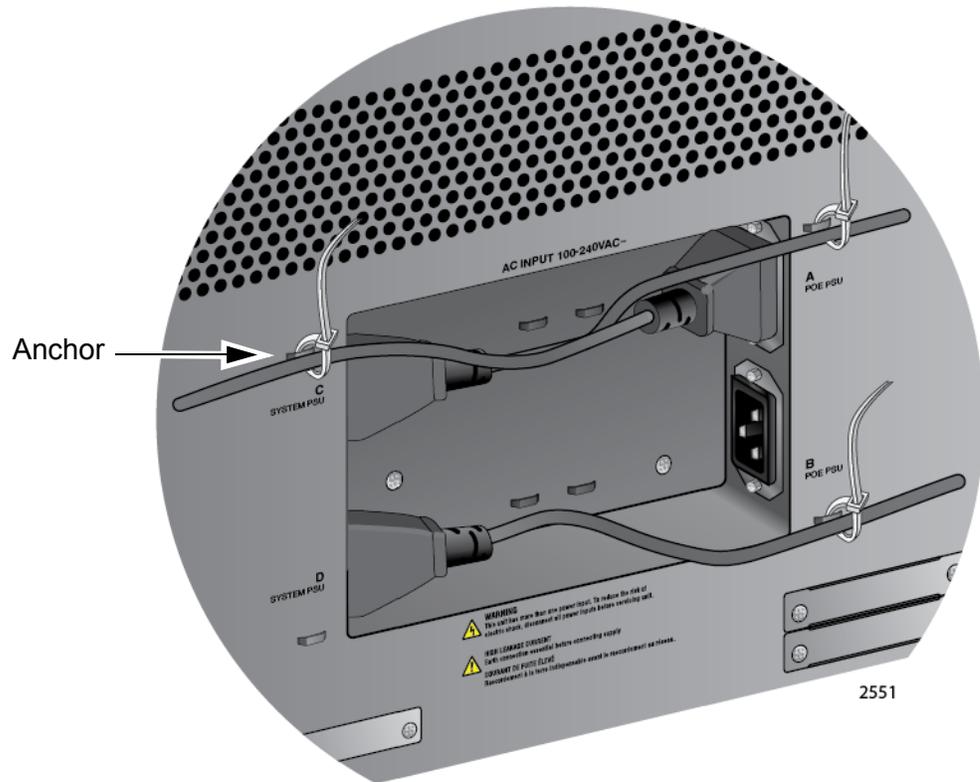
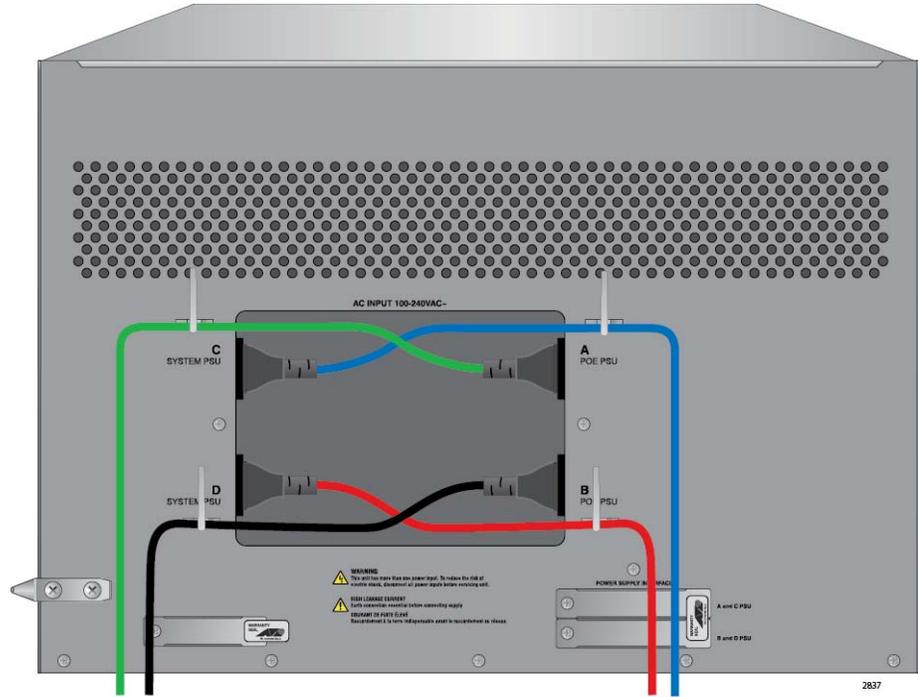


Figure 112. Securing the Power Cord for the AT-SBxPWRPOE1 Power Supply to an Anchor

- Connect the power cord to an appropriate AC power source to power on the power supply.
- If the chassis has two AT-SBxPWRPOE1 Power Supplies, repeat this procedure to power on the second power supply.

Figure 113 on page 160 is an illustration of the power cords for a chassis with four power supplies.



- A POE PSU power cord
- B POE PSU power cord
- C System PSU power cord
- D System PSU power cord

NOTE: The power cords shown in this figure are in color for clarity only.  
All power cords are black.

Figure 113. Dress and Secure AC Power Cords

6. Go to “Monitoring the Initialization Process” on page 184.

## Powering On the AT-SBxPWRSYS1 DC System Power Supply

---

This section contains instructions on how to power on the AT-SBxPWRSYS1 DC Power Supply. For installation instructions, refer to “Installing the AT-SBxPWRSYS1 DC Power Supply” on page 107.

The power supply unit has a ground connection and positive and negative DC terminals. You may install the ground and power lead wires using the terminal lugs that come with the unit. You may also use bare wire installation. The wire requirements are slightly different for terminal installation versus bare wire installation. Here are the wire requirements if you are using the terminals that come with the power supply:

- ❑ Two 8 AWG stranded power wires (not provided)
- ❑ One 10 AWG stranded grounding wire (not provided)

Here are the wire requirements for bare wire installation:

- ❑ Two 8 AWG solid or stranded power wires (not provided)
- ❑ One 10 AWG solid or stranded grounding wire (not provided)

Here is a list of the required tools:

- ❑ Crimping tool (not provided)
- ❑ 8 mm wrench (not provided)
- ❑ #1, #2, and #3 Phillips-head screwdrivers (not provided)
- ❑ #3 Phillips-head 30 to 40 inch-lbs Phillips-head torque screwdriver (optional - not provided)

Here are the procedures for powering on the AT-SBxPWRSYS1 DC Power Supply:

- ❑ “Choosing a Method for Attaching the Grounding Wire” on page 163
- ❑ “Connecting the Grounding Wire with the Grounding Terminal” on page 163
- ❑ “Connecting the Grounding Wire with Bare Wire” on page 166
- ❑ “Choosing a Method for Attaching the Power Wires” on page 167
- ❑ “Connecting the DC Power Wires with the Straight Terminals” on page 168
- ❑ “Connecting the DC Power Wires with the Right Angle Terminals” on page 175
- ❑ “Connecting Bare DC Power Wires” on page 180

The components of the power supply are identified in Figure 114 on page 162.

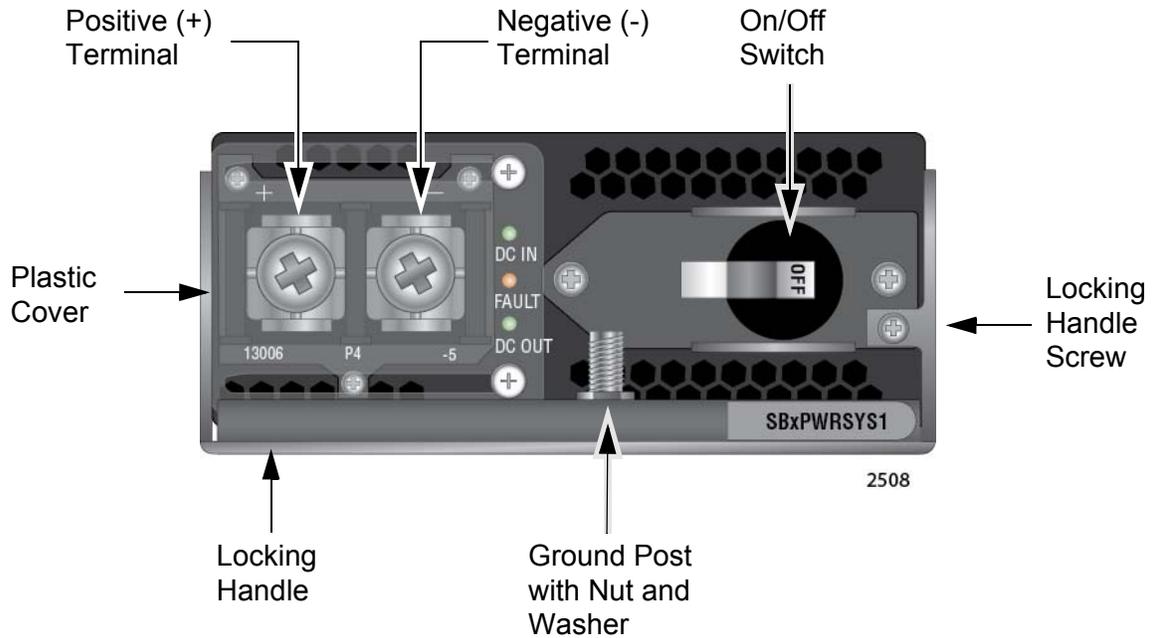


Figure 114. Components of the AT-SBxPWRSYS1 DC Power Supply



**Warning**

As a safety precaution, install a circuit breaker with a minimum value of 50 Amps between the equipment and the DC power source.

Always connect the wires to the LAN equipment first before you connect the wires to the circuit breaker. Do not work with HOT feeds to avoid the danger of physical injury from electrical shock. Always be sure that the circuit breaker is in the OFF position before connecting the wires to the breaker. *E9*



**Warning**

For centralized DC power connection, install only in a restricted access area. *E23*

**Note**

A tray cable is required to connect the power source if the unit is powered by centralized DC power. The tray cable must be a UL listed Type TC tray cable and rated at 600 V and 90 degrees C, with two conductors, 8 AWG. *E24*

## Choosing a Method for Attaching the Grounding Wire

You may attach the grounding wire to the power supply using the supplied terminal, shown in Figure 115, or bare wire.



Figure 115. Grounding Wire Terminal

The two methods are described in the following sections:

- “Connecting the Grounding Wire with the Grounding Terminal” next
- “Connecting the Grounding Wire with Bare Wire” on page 166

## Connecting the Grounding Wire with the Grounding Terminal

To attach a grounding wire to the power supply, perform the following procedure:

1. Prepare an adequate length of stranded 10 AWG grounding wire by stripping it as shown in Figure 116.

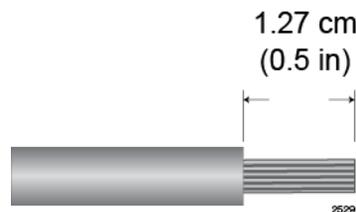


Figure 116. Stripping the Stranded Grounding Wire

---

### Note

You must use stranded wire when using the terminal to connect the ground wire to the grounding post. You may not use solid wire.

---

2. Insert the grounding wire into the grounding terminal provided with the power supply and use a crimping tool to secure it to the grounding terminal. See Figure 117,

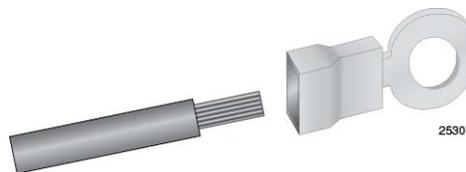


Figure 117. Attaching the Stranded Grounding Wire to the Grounding Terminal

3. Use an 8 mm wrench to remove the grounding post nut and washer, shown in Figure 118, from the power supply.

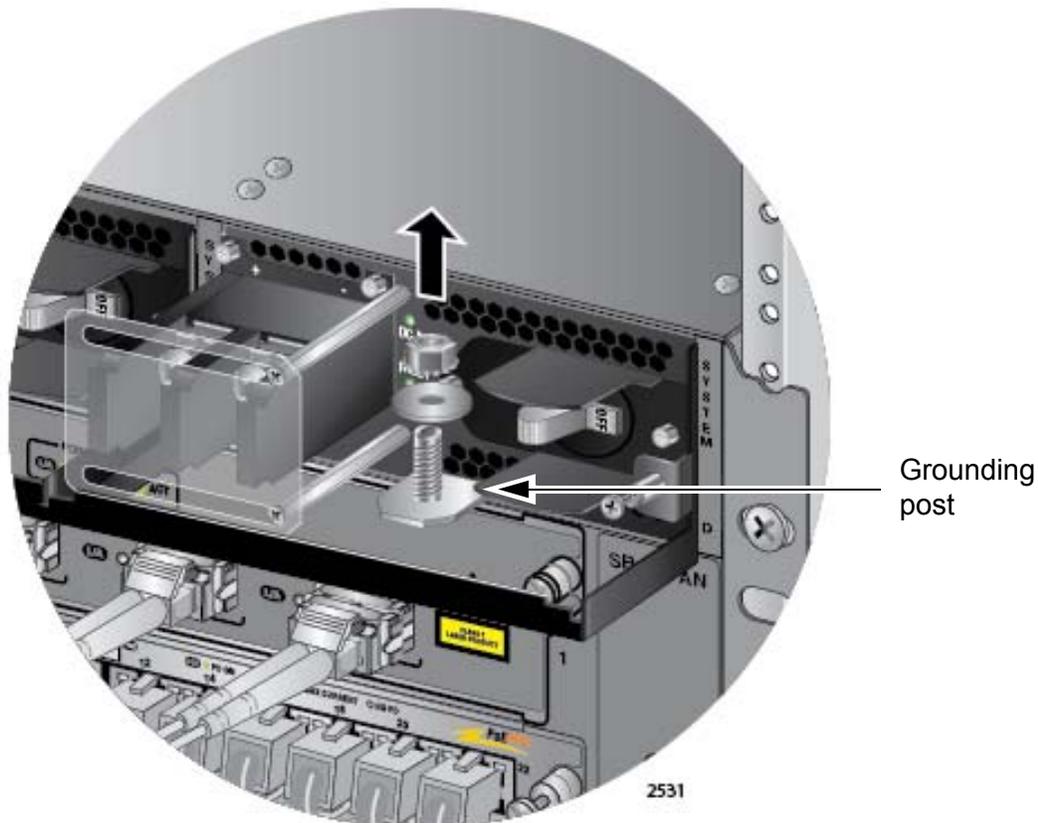


Figure 118. Removing the Nut and Washer from the Grounding Post

4. Attach the grounding lug and wire to the ground post and secure them with the nut and washer removed in the previous step, and an 8 mm wrench.

Review the following before installing the grounding wire:

- You should angle the wire to the right so that you can open the plastic window to access the positive and negative terminals on the terminal block.
- You may route the cable either above or below the locking handle.

The grounding wire is illustrated in Figure 119 on page 165.

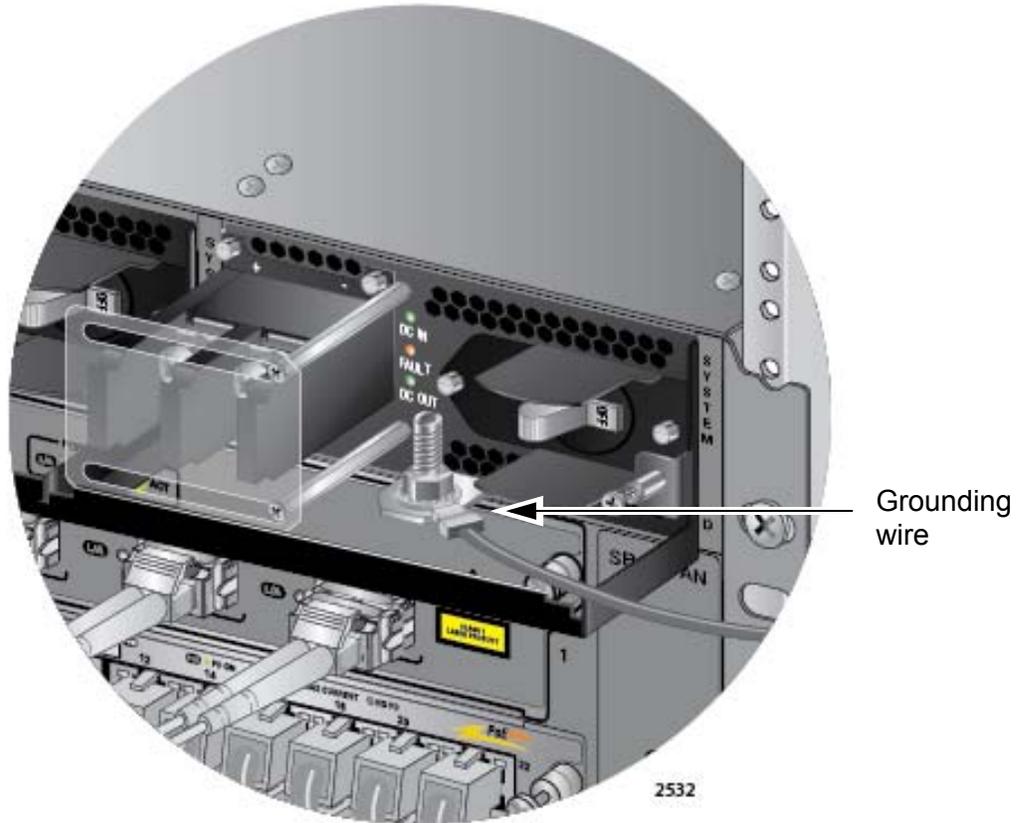


Figure 119. Installing the Grounding Wire

5. Connect the other end of the grounding wire to the building protective earth.



#### Warning

When installing this equipment, always ensure that the power supply ground connection is installed first and disconnected last. ⚡ E11

#### Note

This system will work with a positive grounded or negative grounded DC system. ⚡ E13

## Connecting the Grounding Wire with Bare Wire

To attach the grounding wire to the power supply with bare wire, perform the following procedure:

1. Prepare an adequate length of solid or stranded 10 AWG grounding wire by stripping it as shown in Figure 120.

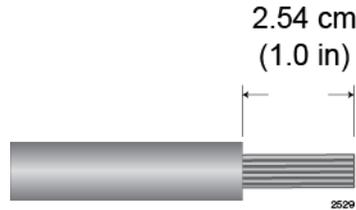


Figure 120. Stripping the solid or Stranded Grounding Wire

2. Use an 8 mm wrench to remove the grounding post nut and washer, shown in Figure 118 on page 164, from the grounding post on the power supply.
3. Wrap the grounding wire clockwise around the base of the grounding post, as shown in Figure 121.

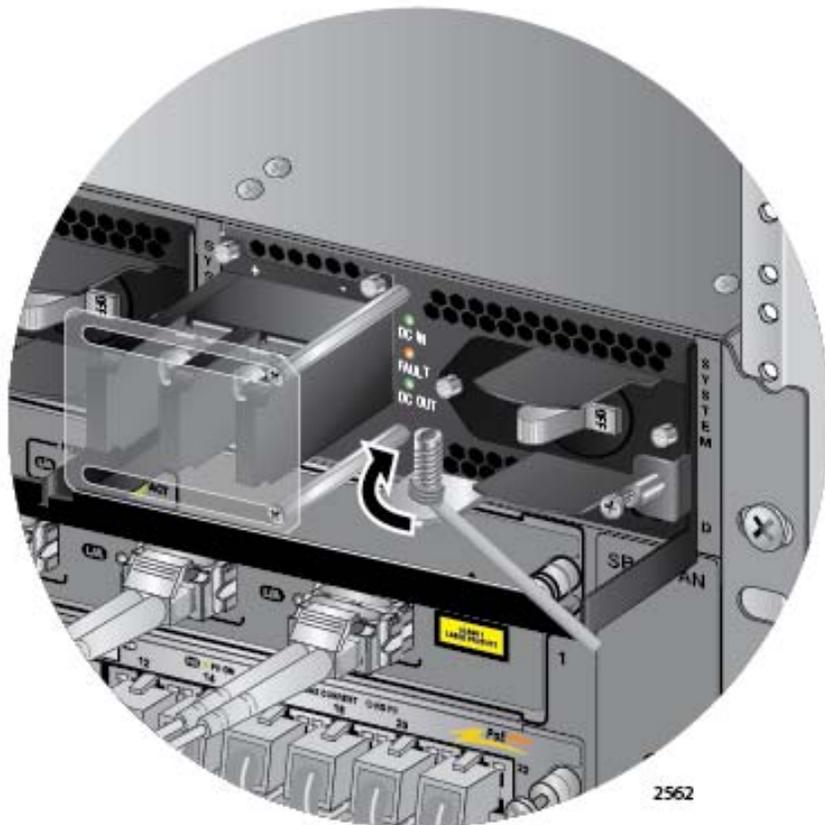


Figure 121. Attaching the Bare Grounding Wire to the Grounding Post

4. Secure the wire with the nut and washer removed in step 2, and an 8 mm wrench, as shown in Figure 122.

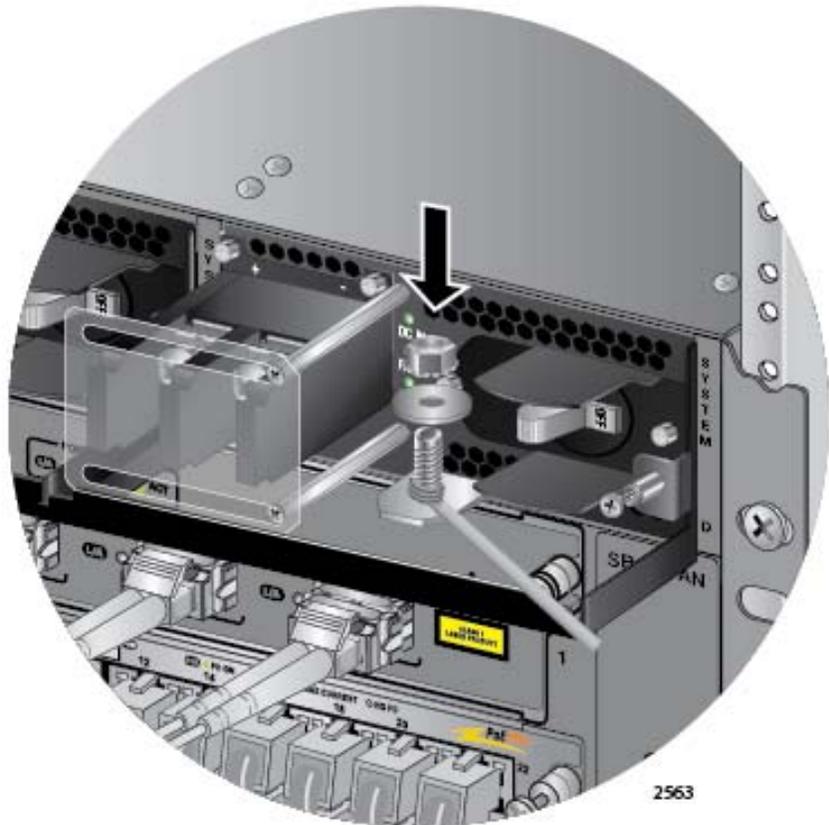


Figure 122. Securing the Bare Grounding Wire to the Grounding Post

### Choosing a Method for Attaching the Power Wires

The AT-SBxPWRSYS1 DC Power Supply comes with two sets of power wire terminals. The terminals are shown in Figure 123. You may use either set to connect the positive (+) and negative (-) wires to the terminal block on the power supply. The straight terminals are used to route the wires above or below the terminal block. The right angle terminals are used to route the power wires directly away from the terminal block.



Straight Terminals



Right Angle Terminals

Figure 123. Power Wire Terminals

---

**Note**

The right angle terminals require the removal of the plastic cover from the terminal block.

---

You may also install the wires using bare wires.

Here are the procedures to wiring the positive and negative terminal block on the power supply:

- ❑ “Connecting the DC Power Wires with the Straight Terminals” next
- ❑ “Connecting the DC Power Wires with the Right Angle Terminals” on page 175
- ❑ “Connecting Bare DC Power Wires” on page 180

### Connecting the DC Power Wires with the Straight Terminals

To use the straight terminals to connect the DC power wires to the positive and negative terminals on the power supply, perform the following procedure:

1. Prepare adequate lengths of two stranded 8 AWG power wires by stripping them as shown in Figure 124.



---

**Warning**

Do not strip more than the recommended amount of wire. Stripping more than the recommended amount can create a safety hazard by leaving exposed wire on the terminal block after installation. ⚡ E10

---

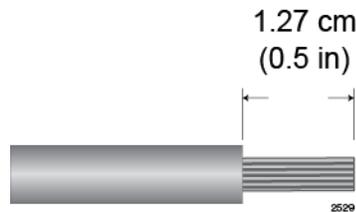


Figure 124. Stripping the Power Wires

---

**Note**

You must use stranded wires with the terminal lugs. You may not use solid wires.

---

2. Insert the power wires into the terminals included with the power supply and use a crimping tool to secure the wires to the terminals. See Figure 125 on page 169.

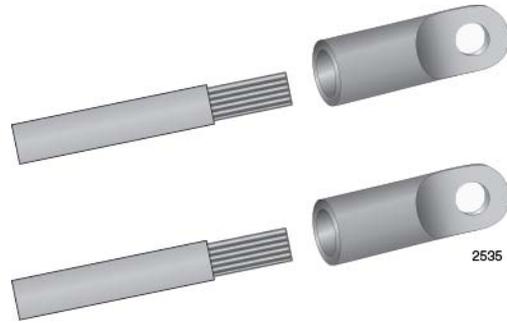


Figure 125. Attaching the Power Wires to the Power Terminal Lugs

3. Use a #1 Phillips-head screwdriver to loosen the two screws on the plastic cover over the positive and negative terminals on the power supply and slide the cover to the right, as shown in Figure 126. You may need to lift the locking handle slightly to access the bottom screw.

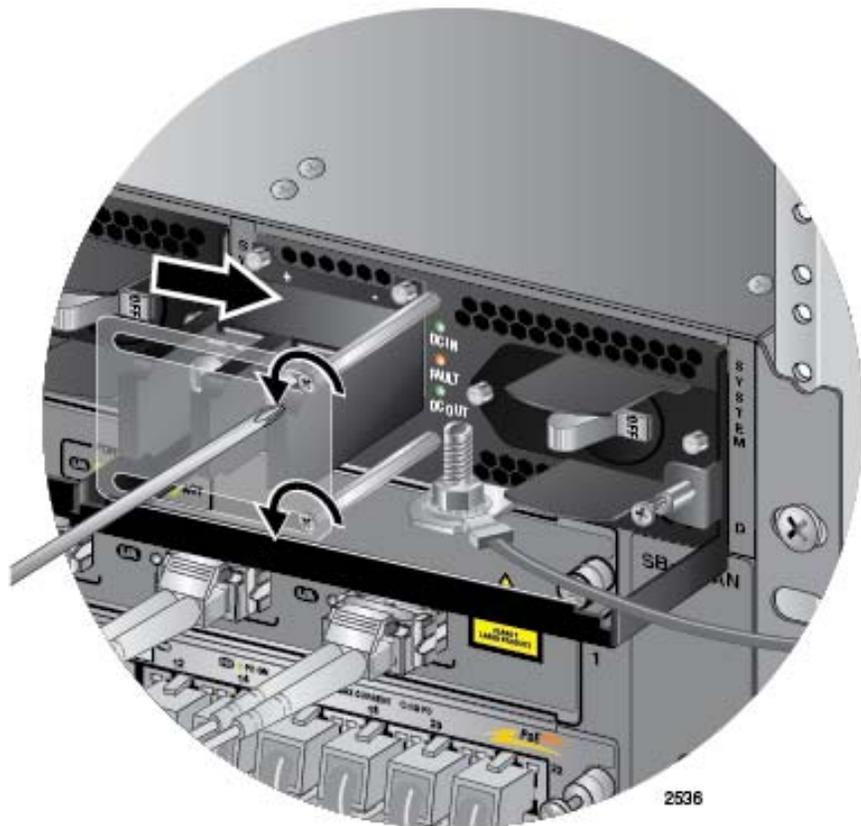


Figure 126. Opening the Plastic Cover

4. Use a #3 Phillips-head screwdriver to remove the two screws from the positive and negative terminals, as shown in Figure 127 on page 170.



Figure 127. Removing the Terminal Screws

5. With a #3 Phillips-head screwdriver, connect the power lead wires to the positive and negative terminals on the power supply, with the terminal screws removed in step 4. The positive terminal is on the left and the negative terminal is on the right. You may attach the terminals with the wires either above or below the terminal block. Figure 128 on page 171 shows the wires above the terminal block.

Allied Telesis recommends tightening the screws to 30 to 40 inch-lbs.

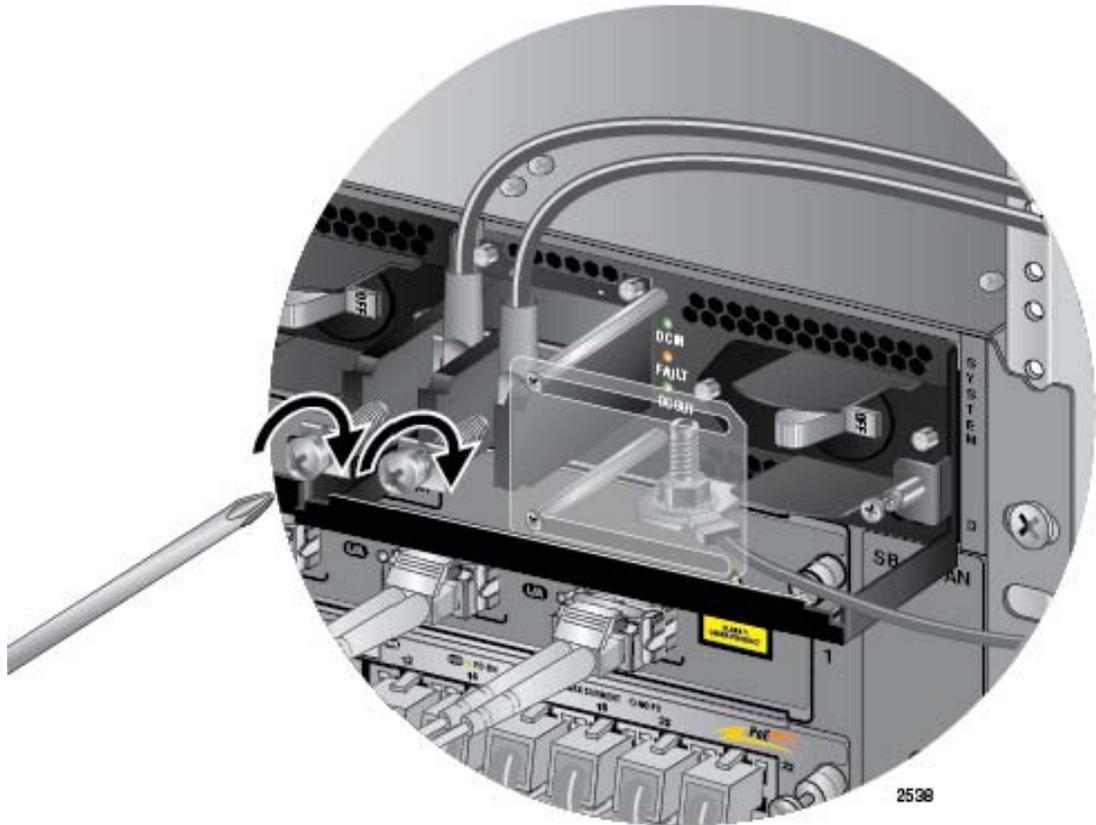


Figure 128. Connecting the Power Wires



### Warning

Check to see if there are any exposed copper strands coming from the installed wires. When this installation is done correctly there should be no exposed copper wire strands extending from the terminal block. Any exposed wiring can conduct harmful levels of electricity to persons touching the wires. ⚡ E12

6. Slide the plastic cover to the left and lightly tighten the two screws with a #1 Phillips-head screwdriver to secure the cover. See Figure 129 on page 172. You might need to lift the locking handle slightly to access the bottom screw.

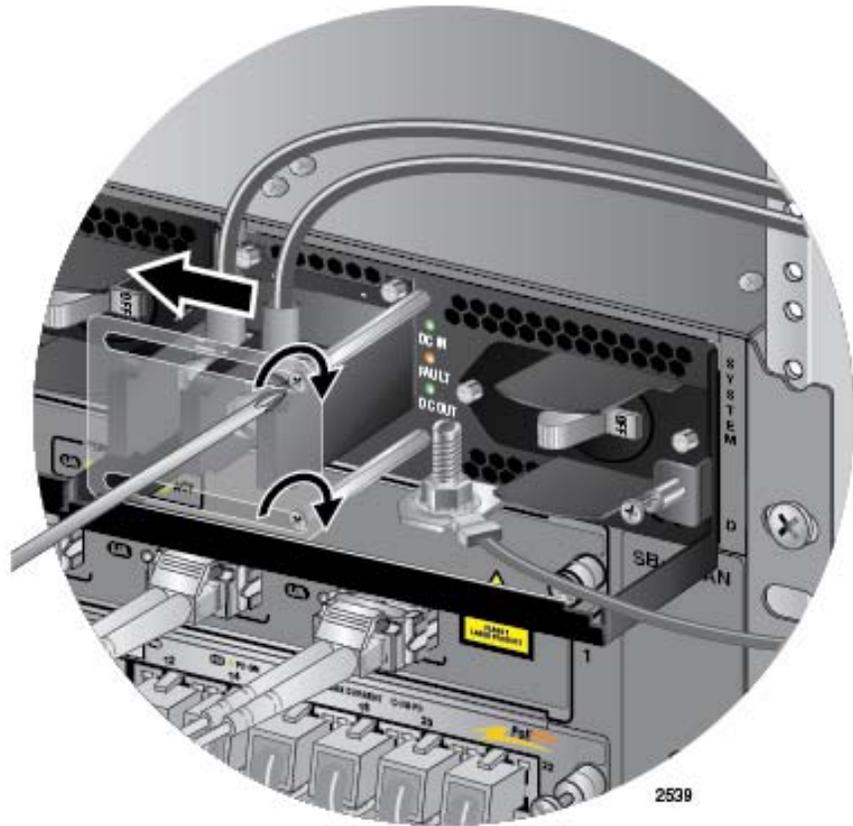


Figure 129. Closing the Plastic Cover over the Terminal Connectors



**Caution**

Do not over tighten the screws or you may crack or break the plastic cover.

7. With a #2 Phillips-head screwdriver, tighten the handle locking screw to secure the power supply to the chassis. See Figure 130 on page 173.

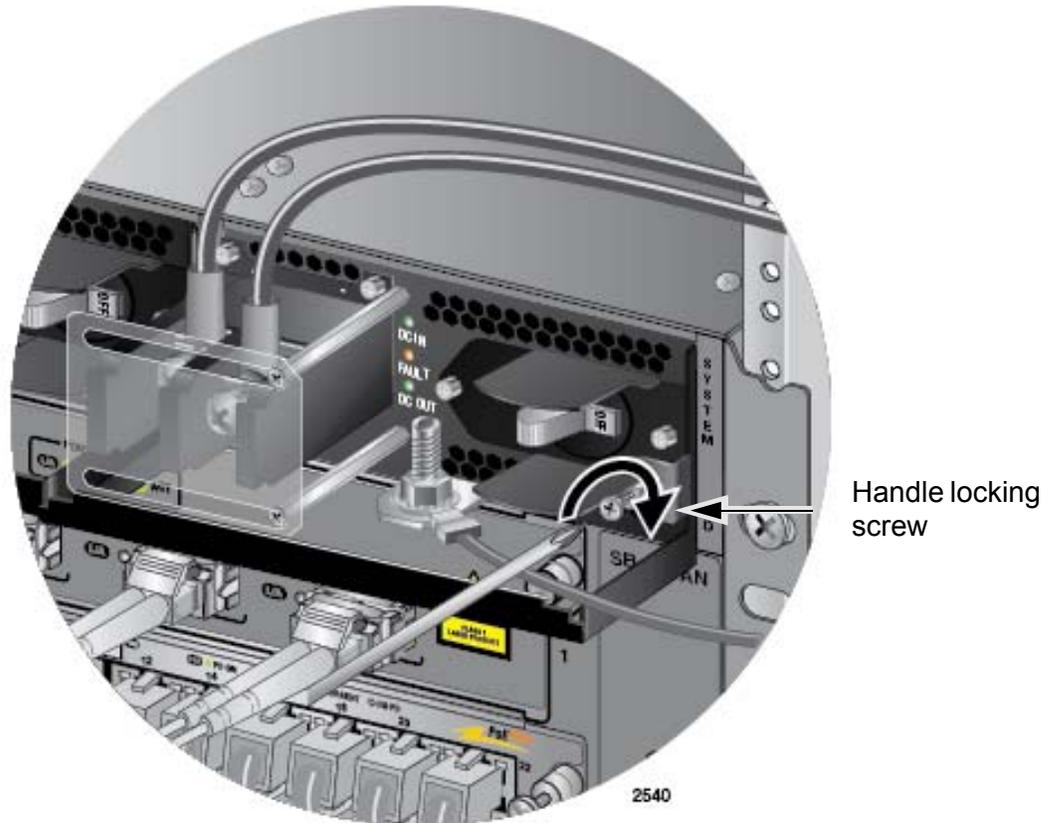


Figure 130. Tightening the Handle Locking Screw

8. Before attaching the power wires from the power supply to the circuit breaker in the wiring closet, check that the circuit breaker is off.
9. Connect the power wires to the circuit breaker.
10. Turn the circuit breaker on.
11. Turn the On/Off switch on the power supply to the On position. See Figure 131 on page 174.

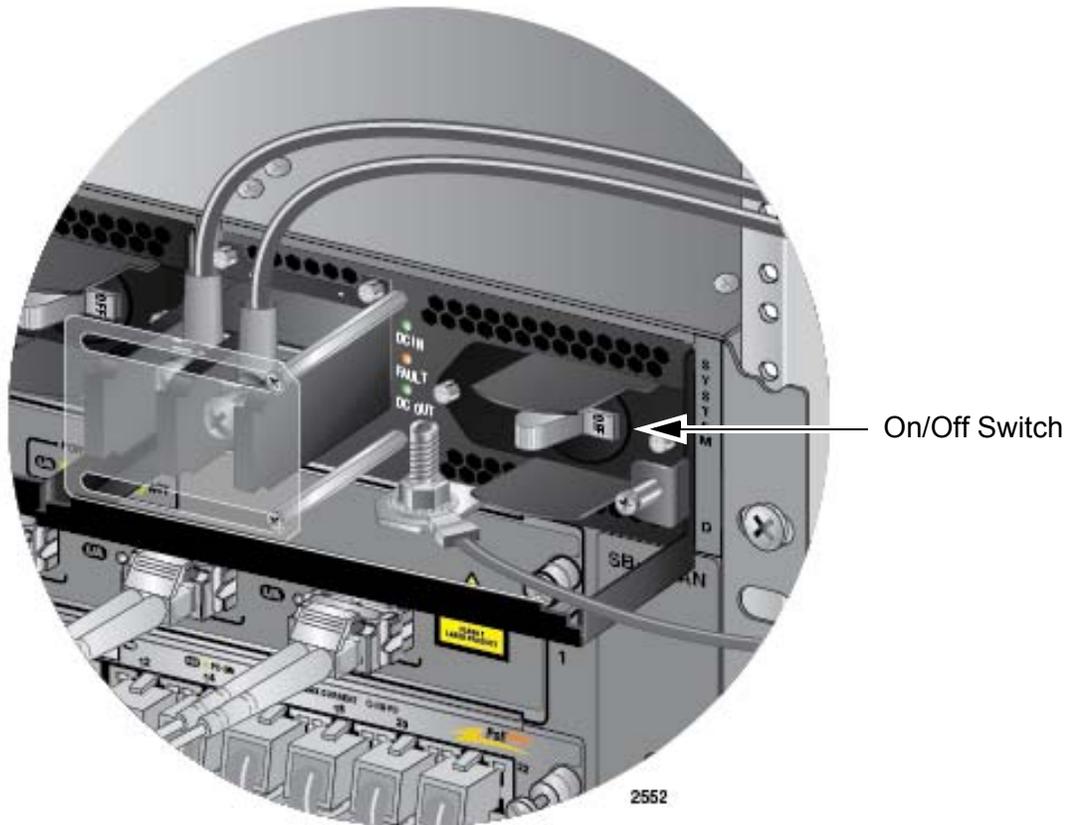


Figure 131. Turning On the Power Supply

12. Do one of the following:

- If the chassis has two AT-SBxPWRSYS1 DC Power Supplies, repeat this procedure to power on the second power supply.
- Otherwise, go to “Monitoring the Initialization Process” on page 184.

## Connecting the DC Power Wires with the Right Angle Terminals

To connect the DC power wires to the positive and negative terminals on the power supply with the right angle terminals, perform the following procedure:

1. Prepare adequate lengths of two stranded 8 AWG power wires by stripping them as shown in Figure 124.



### Warning

Do not strip more than the recommended amount of wire. Stripping more than the recommended amount can create a safety hazard by leaving exposed wire on the terminal block after installation. E10

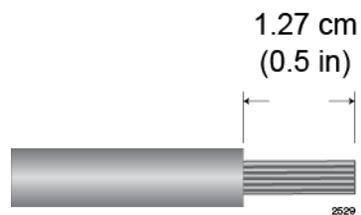


Figure 132. Stripping the Power Wires

### Note

You must use stranded wires with the terminal lugs. You may not use solid wires.

2. Insert the power wires into the right angle terminals included with the power supply and use a crimping tool to secure the wires to the terminals. See Figure 133,



Figure 133. Attaching the Power Wires to the Right Angle Terminals

3. Using a #1 Phillips-head screwdriver, remove the two screws that secure the plastic cover over the positive and negative terminals and remove the plastic cover from the power supply, as shown in Figure 134. You may need to lift the locking handle slightly to access the bottom screw.

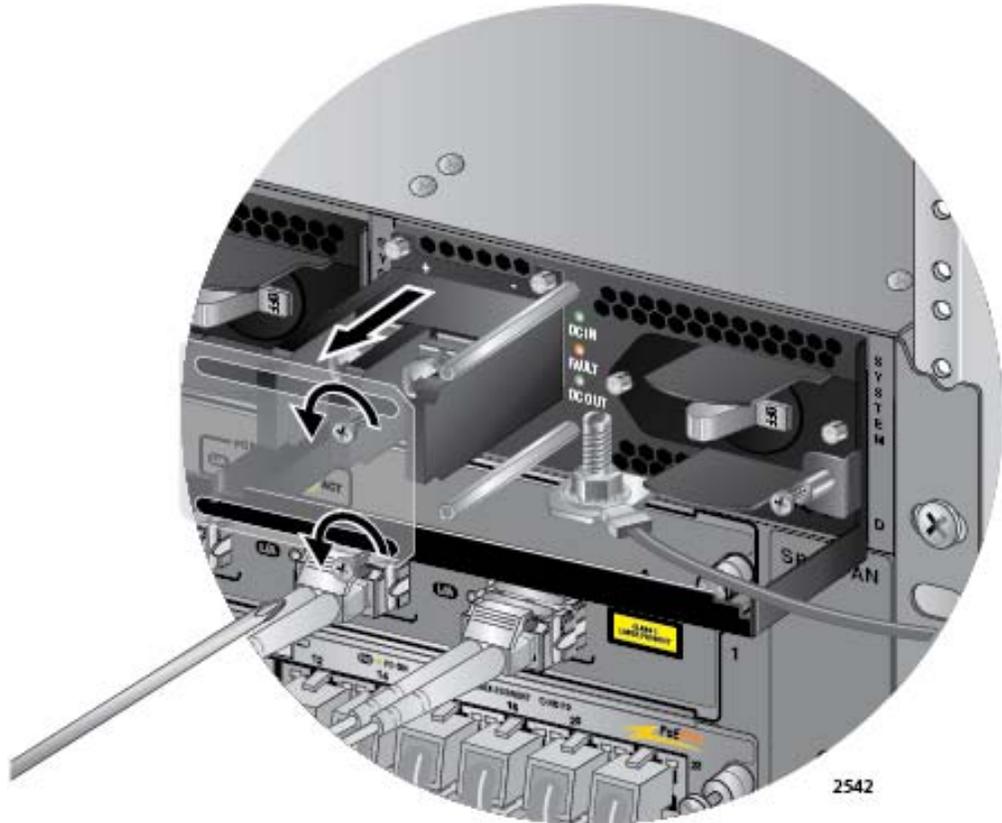


Figure 134. Removing the Plastic Cover

---

**Note**

The plastic cover is not used with the right angle terminals.

---

4. Use a #3 Phillips-head screwdriver to remove the two screws from the positive and negative terminals, as shown in Figure 135 on page 177.



Figure 135. Removing the Terminal Screws

5. Position the power wires over the terminals and secure them to the terminal block, with the terminal screws removed in step 4 and a #3 Phillips-head screwdriver. The positive terminal is on the left and the negative terminal is on the right. Refer to Figure 136 on page 178.

Allied Telesis recommends tightening the screws to 30 to 40 inch-lbs.

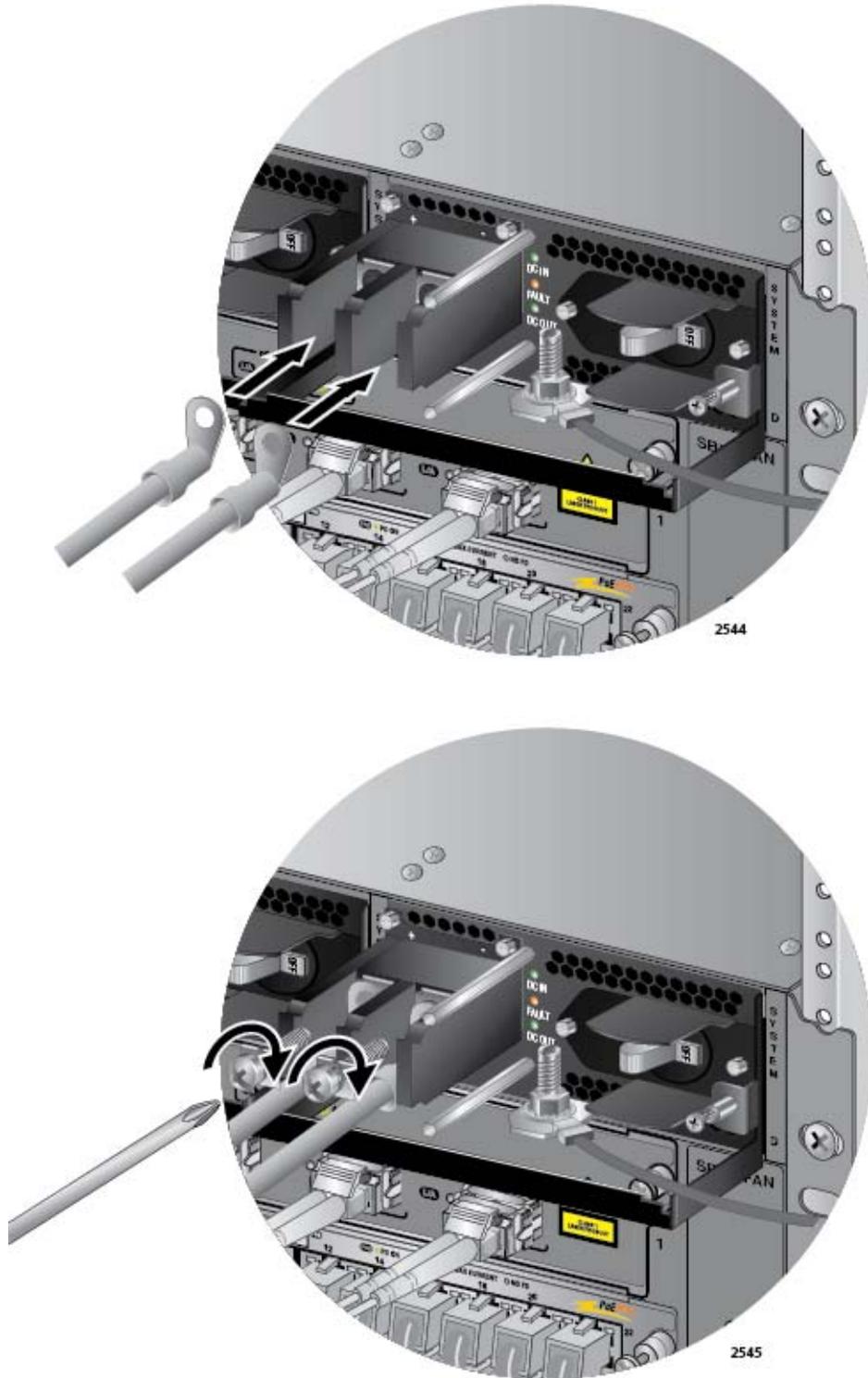


Figure 136. Connecting the Power Wires

**Warning**

Check to see if there are any exposed copper strands coming from the installed wires. When this installation is done correctly there should be no exposed copper wire strands extending from the terminal block. Any exposed wiring can conduct harmful levels of electricity to persons touching the wires. ⚡ E12

6. With a #2 Phillips-head screwdriver, tighten the handle locking screw to secure the power supply to the chassis. See Figure 137.

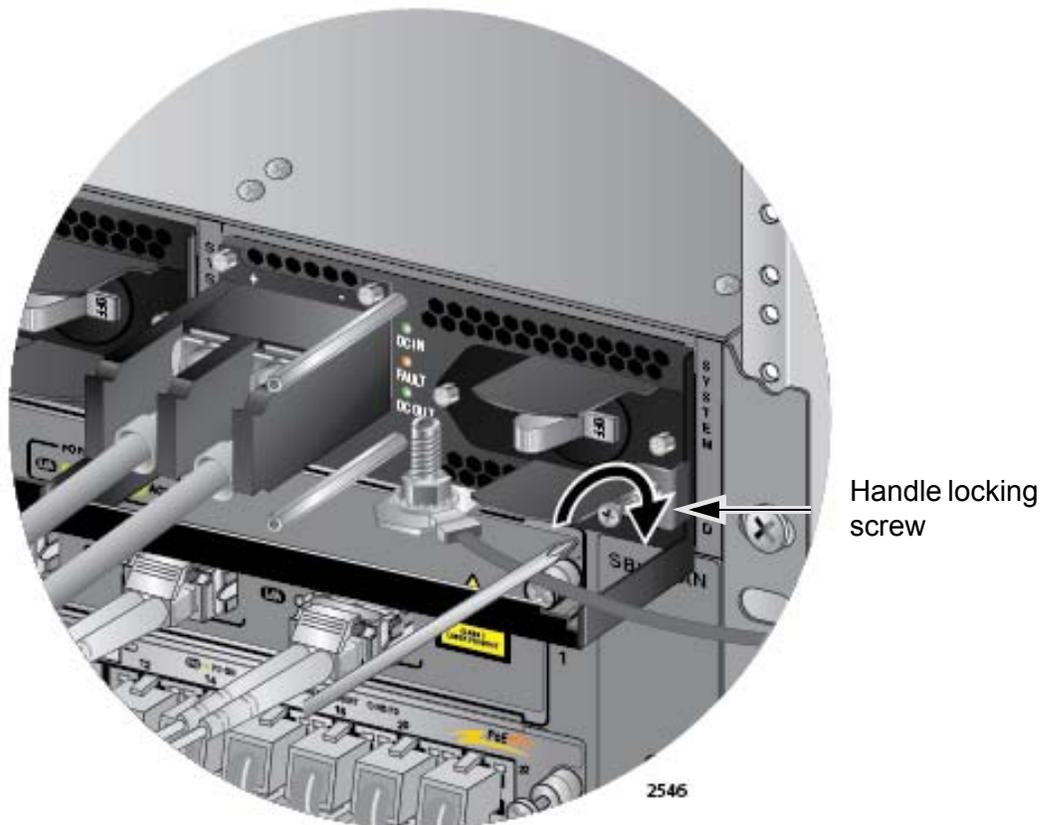


Figure 137. Tightening the Handle Locking Screw

7. Before attaching the power wires from the power supply to the circuit breaker in the wiring closet, check that the circuit breaker is off.
8. Connect the power wires to the circuit breaker.
9. Turn the circuit breaker on.
10. Turn the On/Off switch on the power supply to the On position. See Figure 138 on page 180.

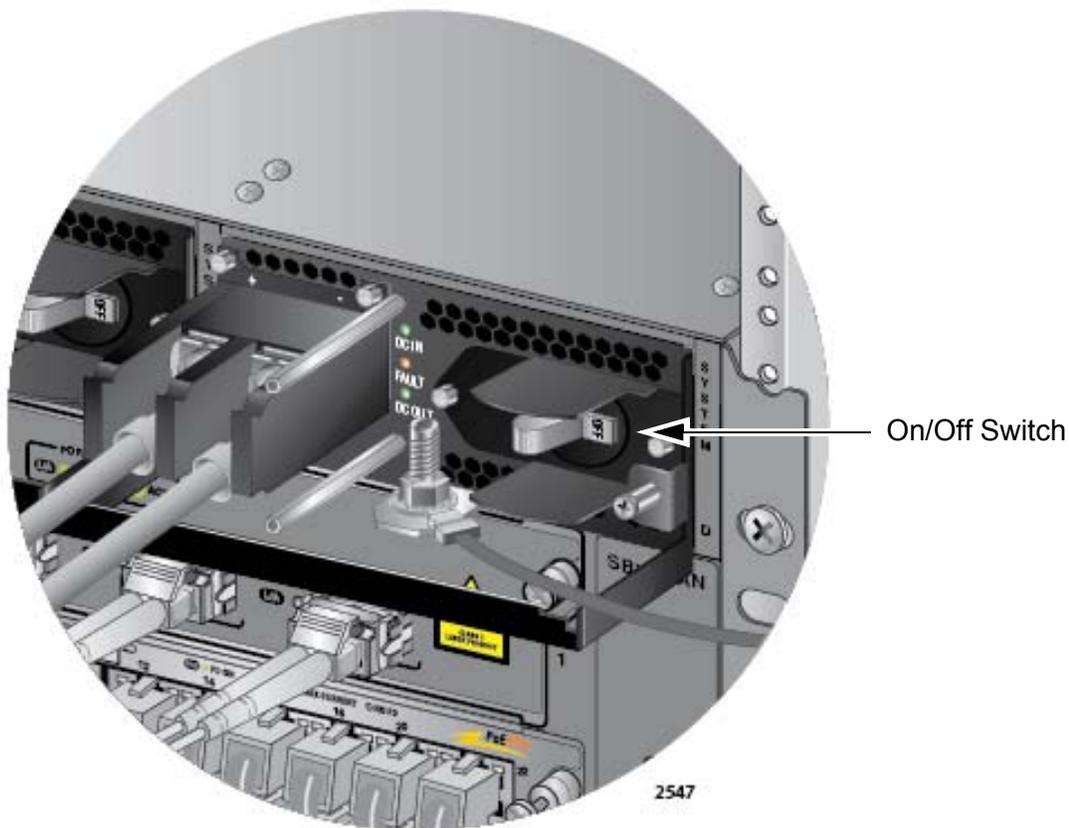


Figure 138. Turning On the Power Supply

11. Do one of the following:

- If the chassis has two AT-SBxPWRSYS1 DC Power Supplies, repeat this procedure to power on the second power supply.
- Otherwise, go to “Monitoring the Initialization Process” on page 184.

### Connecting Bare DC Power Wires

To attach bare lead wires to the positive and negative terminals on the power supply, perform the following procedure:

1. Prepare adequate lengths of two solid or stranded 8 AWG DC power wires by stripping them as shown in Figure 139.

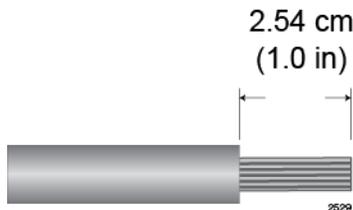


Figure 139. Stripping Solid or Stranded DC Power Wires

2. Use a #1 Phillips-head screwdriver to loosen the two screws on the plastic cover over the positive and negative terminals on the power supply and slide the cover to the right, as shown in Figure 126 on page 169. You may need to lift the locking handle slightly to access the bottom screw.
3. Use a #3 Phillips-head screwdriver to remove the two screws from the positive and negative terminals, as shown in Figure 127 on page 170.
4. Wrap the positive lead wire clockwise around one of the terminal screws and secure the screw and wire to the positive terminal connection on the terminal block with a #3 Phillips-head screwdriver. The positive terminal is on the left. You may attach the wire to the terminal so that it extends either above or below the terminal block. Figure 140 shows the wire above the terminal block. Allied Telesis recommends tightening the screw to 30 to 40 inch-lbs.

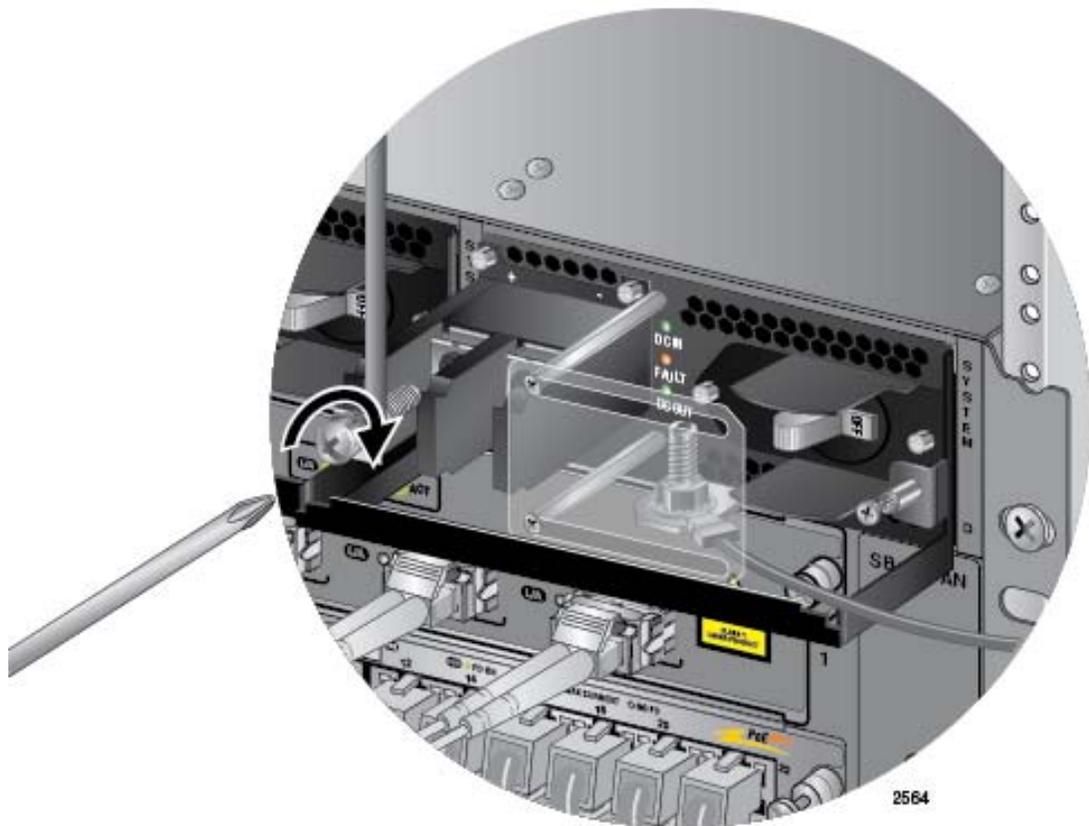


Figure 140. Connecting the Positive Wire

5. Wrap the negative lead wire clockwise around the remaining terminal screw and secure the screw and wire to the negative terminal connection on the terminal block with a #3 Phillips-head screwdriver, as shown in Figure 141 on page 182. The negative terminal is on the right.

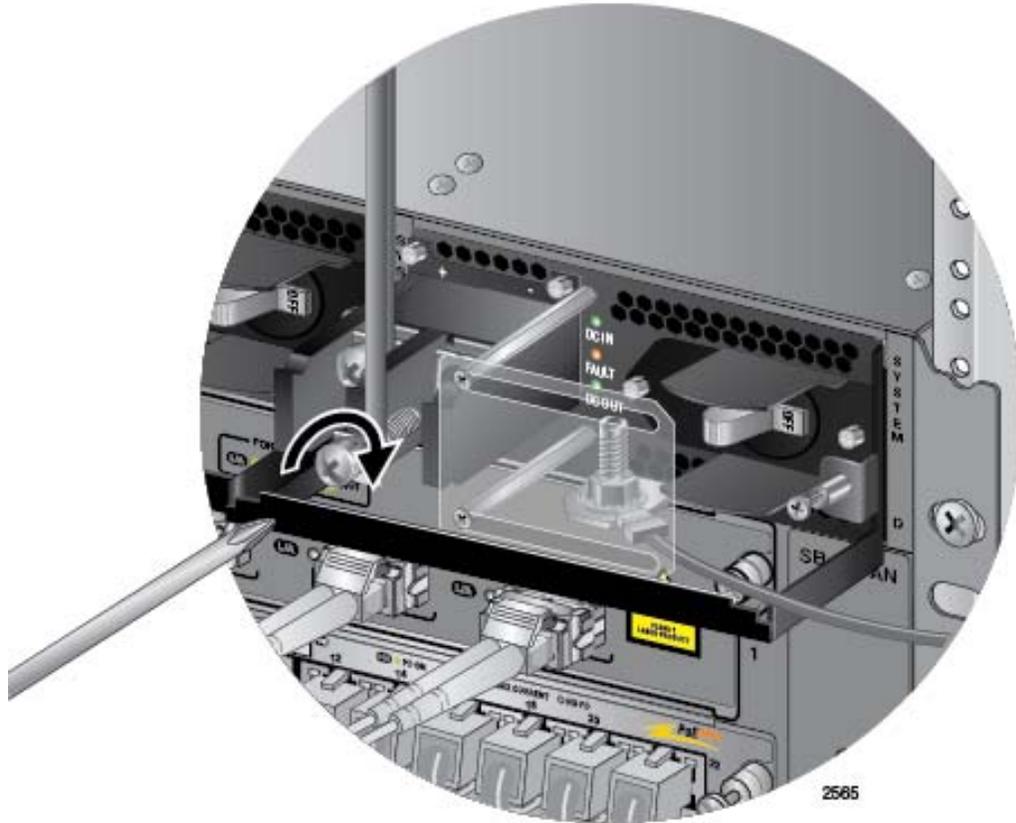


Figure 141. Connecting the Negative Lead Wire

Allied Telesis recommends tightening the screw to 30 to 40 inch-lbs.



**Warning**

Check to see if there are any exposed copper strands coming from the installed wires. When this installation is done correctly there should be no exposed copper wire strands extending from the terminal block. Any exposed wiring can conduct harmful levels of electricity to persons touching the wires. E12

6. Slide the plastic cover to the left and lightly tighten the two screws with a #1 Phillips-head screwdriver to secure the cover. See Figure 129 on page 172. You might need to lift the locking handle slightly to access the bottom screw.



**Caution**

Do not over tighten the screws or you may crack or break the plastic cover.

7. With a #2 Phillips-head screwdriver, tighten the handle locking screw to secure the power supply to the chassis. See Figure 130 on page 173.
8. Before attaching the power wires from the power supply to the circuit breaker in the wiring closet, check that the circuit breaker is off.
9. Connect the power wires to the circuit breaker.
10. Turn the circuit breaker on.
11. Turn the On/Off switch on the power supply to the On position. See Figure 131 on page 174.
12. Do one of the following:
  - If the chassis has two AT-SBxPWRSYS1 DC Power Supplies, repeat this procedure to power on the second power supply.
  - Otherwise, go to “Monitoring the Initialization Process” on page 184.

## Monitoring the Initialization Process

---

The control and line cards perform an initialization process when you power on or reset the chassis. The process may have up to three phases. The number of phases and their durations depend on the number of control cards in the chassis. There are three possible configurations:

- ❑ Configuration 1: Chassis with one control card.

The initialization process for a chassis that has only one control card has two phases. The entire process takes approximately two minutes. In the first phase the control card initializes its management software. In the second phase the line cards initialize their management software and receive their configuration settings from the control card. The control and line cards begin forwarding network traffic at the completion of the initialization process.

- ❑ Configuration 2: Chassis with two control cards that have identical configuration databases and load files.

The initialization process for a chassis with two control cards has three phases. The first two phases are the same as in configuration 1. At their completion, the Ethernet line cards begin to forward traffic from their ports and the active control card starts to forward traffic across the backplane. At this point, the available bandwidth across the backplane is 200Mbps.

In the third phase the inactive control card synchronizes its database and load files with the active card. If the databases and files are already the same, the third phase requires about thirty seconds, after which the inactive control card joins with the active card in forwarding packets across the backplane, to provide the full 400Mbps of backplane bandwidth.

- ❑ Configuration 3: Chassis with two control cards that have different configuration databases and load files.

The initialization process for a chassis with two control cards has three phases. At the completion of the first two phases, which are the same as in configuration 1, the Ethernet line cards begin to forward traffic from their ports and the active control card starts to forward traffic across the backplane. At this point, the available bandwidth across the backplane is 200Mbps.

During the third phase, the inactive control card synchronizes its configuration database and load files with the active control card. The length of the third phase depends on the differences in the files, and may take several minutes to complete. During the synchronization, the inactive control card does not forward traffic across the backplane. Only after it has fully synchronized its files

with the active card does the inactive card begin to forward packets across the backplane.

The phases of the initialization processes and their approximate times are shown in Table 25.

Table 25. Switch Initialization Phases

Phase	Description	Config 1	Config 2	Config 3
1	The control card initializes its management software.	1 minute	1 minute	1 minute
2	The line cards reset, initialize their management software, and receive their configuration settings from the active control card. At the completion of this phase, the Ethernet line cards begin to forward traffic from their ports and the active control card forwards packets across the backplane. If the chassis has two control cards, the inactive card does not begin to forward traffic across the backplane until the completion of phase 3.	1 minute	1 minute	1 minute
3	The inactive control card matches its database and load files with the active control card. After completing this phase, the inactive card joins with the active card in forwarding traffic across the backplane, to provide the full 400Mbps of bandwidth.	NA	30 seconds	30 seconds to 3 minutes

### Using the LEDs to Monitor the Initialization Process

There are two ways to monitor the phases of the initialization process. One way is to use the LEDs on the control card. For phase 1, examine the M/S LED in the System Status LEDs on the control card. It flashes amber while the card initializes its management software and changes to solid green at the completion of the phase. If the chassis has two control cards, the M/S LED continues to flash amber on the inactive card until the card has synchronized its database with the active control card.

To monitor phase 2, watch the SBx Status LEDs. There are twelve LEDs (numbered 0 to 11), one for each slot. The LED for a slot flashes green while the card initializes its management software and configures its settings in accordance with the settings from the active control card. The LED changes to solid green when the corresponding line card completes the initialization process and begins forwarding traffic.

If there are two control cards, you can monitor phase 3 by viewing the M/S LEDs on the control cards. The LED on the active control card turns solid green when the card is finished initializing its management software. The same LED on the inactive LED continues to flash amber until it has

synchronized its database with the active control card, at which point it turns solid amber to indicate the inactive state of the card. However, the inactive card is forwarding traffic over the backplane.

**Using the Console Port to Monitor the Initialization Process**

Another way to monitor the initialization process of the chassis is to connect a terminal or PC with a terminal emulator program to the Console port on the control card and watch the status messages. (The settings for the terminal or terminal emulator program are found in “Using Local Management to Verify the Chassis” on page 192.) Figure 142 here and Figure 143 on page 187 illustrate the messages. The chassis has completed phase 1 when it displays the “Username” prompt. To monitor phases 2 and 3, log in to the switch and use the SHOW CARD command. For instructions, refer to the *Software Reference for SwitchBlade x3100 Series Switches*.

```

@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
ATI 200G Central Fabric Controller Boot Loader
Version 15.0.g.03
Created on Fri 01/14/2011 at 11:11 AM
Copyright Allied Telesis Inc., 2009

Vxworks Version 5.5.1 for MV78100 CFC200 LE MMU ARCH 5
BSP version 1.2/1.3.5_000
Copyright Wind River Systems, Inc., 1984-2002

@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@

*****
* warning: The password for the bootrom is the system default.
*           The password should be changed to avoid a security risk.
*****

Press ^b to stop automatic loading of software image...
0
Automatically loading software image...

FPGA Version 16.0
Starting Application Software Loading
Attaching to Flash File System ... done.
/tffs/ - volume is OK
Boot album is (current, attempt 1): 'cfc200_15.1.0.tar'
checking Album's integrity...done
    
```

Figure 142. Switch Initialization Messages





## Chapter 8

# Verifying the Hardware Operations of the Chassis

---

This chapter describes how to verify the operations of the chassis. The chapter contains the following sections:

- “Using the LEDs to Verify the Chassis” on page 190
- “Using Local Management to Verify the Chassis” on page 192

---

**Note**

Allied Telesis recommends using both methods to confirm the operations of the chassis, control cards, and line cards.

---

## Using the LEDs to Verify the Chassis

---

After powering on the chassis for the first time and waiting a minimum of two minutes for the line and control cards to complete the initialization process, check the operational status of the various hardware components by examining the LEDs, as explained in this procedure:

1. Check the LEDs on the power supplies:
  - ❑ AT-SBxPWRSYS1 and AT-SBxPWRPOE1 AC Power Supplies: The power supplies are operating properly when the AC and DC LEDs are solid green and Fault LEDs are off. If there is a problem with a power supply, refer to “AT-SBxPWRSYS1 and AT-SBxPWRPOE1 AC Power Supplies” on page 198 for troubleshooting suggestions.
  - ❑ AT-SBxPWRSYS1 DC Power Supply: The power supply is operating properly when the DC IN and DC OUT LEDs are solid green and Fault LED is off. If there is a problem, refer to “AT-SBxPWRSYS1 DC Power Supply” on page 199 for troubleshooting suggestions.
2. Check the Power LED on the AT-SBxFAN12 module. The module is operating normally when the LED is solid green. If the LED is off, the fan module has a problem or failed. Power off the chassis and contact your Allied Telesis representative for assistance. Do not operate the chassis without a fully operational fan unit.
3. If the chassis has one control card, check its M/S LED. It should be solid green. If the LED is flashing amber, the card is still initializing its management software. If the LED is still flashing amber after another minute, the card may have encountered a problem completing the initialization process. Power off the chassis and replace the control card.

---

### Note

If all the LEDs on the control card are off, they may have been turned off. Try pressing the eco-friendly button on the card to turn them on.

---

4. If the chassis has two control cards, check the M/S LEDs on both cards. The cards are operating correctly when the LEDs are green on one card and amber or flashing amber on the other. If both LEDs are flashing amber, the control cards are still completing phase 1 of the initialization process. If neither LED changes to green after another minute, the cards have encountered a problem that prevents them from completing the initialization phase. Power off the chassis and replace the cards.

5. To check the status of the Ethernet line cards, inspect the SBx Status LEDs on the control card. (If the chassis has two control cards, you may use the LEDs on either the active or inactive card.) A line card is operating normally when its corresponding LED is solid green. The LED flashes green as the card initializes its management software. If an LED is flashing green after two minutes, the corresponding line card may have a problem. For example, the line card in slot 8 of the chassis is operating normally when the SBx Status 8 LED is solid green. For troubleshooting suggestions, refer to “Ethernet Line Cards” on page 201.
6. To check the status of the links of the individual ports on the line cards, inspect the L/A LEDs on the cards. The LEDs should be solid or flashing green on ports that are connected to active network devices. If there is a problem with a link, refer to “Twisted Pair Ports” on page 203 and “Fiber Optic Transceivers” on page 207 for troubleshooting suggestions.
7. To check the status of PoE on the ports of the AT-SBx31GP24 Line Card, use the PoE LEDs, shown in Figure 23 on page 46. The LEDs are solid green when ports are delivering power to powered devices on your network. If there is a problem, refer to “Power Over Ethernet” on page 205 for troubleshooting suggestions.

## Using Local Management to Verify the Chassis

This section explains how to confirm the operations of the chassis with the commands in the management software on the control card. The section has the following procedure:

- ❑ “Starting a Local Management Session” on page 192
- ❑ “Entering the Management Software Commands” on page 193

The initial management session must be a local management session. For instructions on how to configure the chassis for remote management with Telnet and Secure Shell clients, refer to *Software Reference for SwitchBlade x3100 Series Switches*.

### Starting a Local Management Session

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

1. Connect the RJ-45 end of the management card included with the AT-SBx31CFC Controller Fabric Card to the Console RS-232 port on the front panel of the AT-SBx31CFC Card, as shown in Figure 144. If the chassis has two control cards, you must connect the cable to the Console RS-232 port on the active card. To determine which card is the active card, examine the M/S LEDs. The LEDs are green on the active card and amber on the standby card.

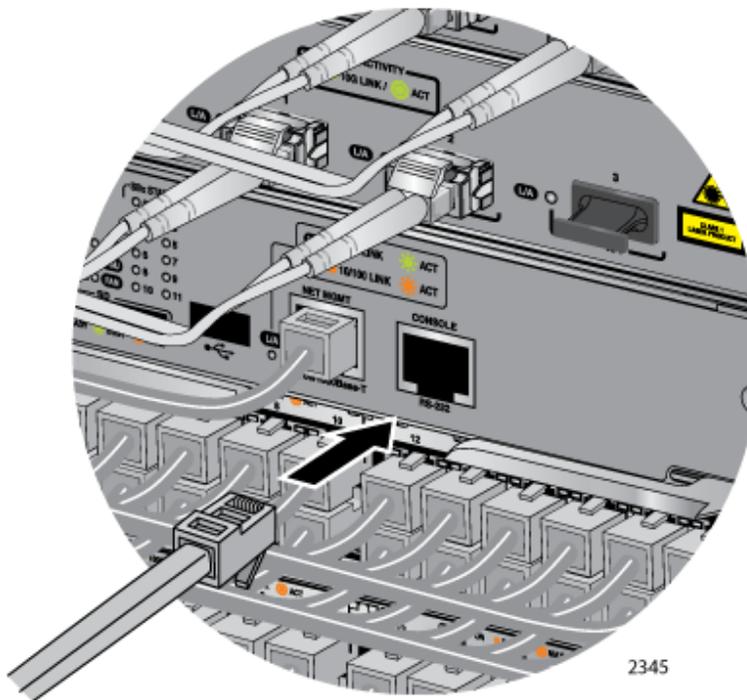


Figure 144. Connecting the Management Cable to the Console RS-232 Port

2. Connect the other end of the cable to an RS-232 port on a terminal or personal computer with a terminal emulation program.
3. Configure the VT-100 terminal or terminal emulation program as follows:
  - Baud rate: 115,200 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. Enter the default user name and password. They are “manager” and “friend” (without the quotes), respectively

**Note**

User names and passwords are case sensitive.

The local management session starts and the command line interface (CLI) prompt is displayed.

## Entering the Management Software Commands

To confirm the operations of the chassis with the commands in the management software, perform the following procedure:

1. Enter the SHOW SYSTEM command to display the software version number of the management software on the control card, as shown in Figure 145.

SHOW SYSTEM

```

--- System Information -----
System Date..... 2013-07-2
System Uptime..... 2 days, 14 hours, 27 minutes, 18 seconds
Software
  Version..... 17.0.0 ← Software Version
  Options ..... Customer-Release Build Number
  Created ..... Tue 07/21/2012 at 1:25 PM
  Boot From ..... preferred

```

Figure 145. SHOW SYSTEM Command

2. Compare the version number displayed by the SHOW SYSTEM command with the information in Table 23 on page 68 to confirm that the management software on the control card supports all the hardware components in the chassis. If necessary, update the management software on the control card. For example, if the control card has release 14.2 and the chassis has one or more AT-SBx31XS6 Line Cards, which require release 15.1 or later, the line cards do not forward network packets until you update the firmware on the control card. For instructions, refer to the *Software Reference for SwitchBlade x3100 Series Switches*.
3. To display the status of the power supplies, enter the SHOW PSU command.

An example of the status information is shown in Figure 146. The power supplies are operating normally when the states are UP-UP. If there is a problem with a power supply, refer to “AT-SBxPWRSYS1 and AT-SBxPWRPOE1 AC Power Supplies” on page 198 or “AT-SBxPWRSYS1 DC Power Supply” on page 199 for troubleshooting suggestions.

```

SHOW PSU

--- Power Supply Units ---
Slot Type      State      Temp (C)
A   POE        UP-UP     38
B   POE        UP-UP     38
C   System     UP-UP     38
D   System     UP-UP     38

```

Figure 146. SHOW PSU Command

4. To display the state of the fan module, enter the SHOW FANMODULE command.

The module is operating normally when its state is UP-UP-ONLINE, as shown in Figure 147 on page 195. If the state of the fan module is something other than UP-UP-ONLINE, power off the chassis and contact your Allied Telesis representative for assistance. Do not operate the chassis without a fully operational fan unit.

```

SHOW FANMODULE

--- Fan Module ---
Fan Module..... FM4
Module Number..... AT-SBxFAN12
Serial Number..... 102
State..... UP-UP-Online

Actual
Fan Speed
Fan 1..... 2685 rpm
Fan 2..... 2724 rpm
Fan 4..... 2702 rpm
Fan 4..... 2690 rpm
Cold Temperature Shutdown... off

```

Figure 147. SHOW FANMODULE Command

- To view the states of the control and line cards in the chassis, use the SHOW CARD command.

An example of the status information is shown in Figure 148. A card is operating normally when its state is UP-UP-ONLINE. If there is a problem with a card, refer to “Ethernet Line Cards” on page 201 or “AT-SBx31CFC Central Fabric Controller Card” on page 209 for troubleshooting suggestions.

```

SHOW CARD

--- Card Information ---

Slot   Prov   State           Faults
-----
0      GE24RJ  UP-UP-Online   -
1      GE24RJ  UP-UP-Online   -
2      GE24RJ  UP-UP-Online   -
3      GE24RJ  UP-UP-Online   -

```

Figure 148. SHOW CARD Command

- To check the status of PoE on the ports of the AT-SBx31GP24 Line Card, use the SHOW POE INTERFACE=ALL command.

Ports that are delivering power to powered devices have the value Powered in the Power Status column of the display. If there is a problem, refer to “Power Over Ethernet” on page 205 for troubleshooting suggestions.

For information about the command line interface, refer to the *Software Reference for SwitchBlade x3100 Series Switches* on the Allied Telesis web site.



## Chapter 9

# Troubleshooting

---

This chapter contains information on how to troubleshoot the SwitchBlade x3112 product.

---

**Note**

If you are unable to resolve a hardware problem after following the instructions in this chapter, contact Allied Telesis Technical Support for further assistance. Refer to “Contacting Allied Telesis” on page 17 for contact information.

---

The following troubleshooting information is available:

- ❑ “AT-SBxPWRSYS1 and AT-SBxPWRPOE1 AC Power Supplies” on page 198
- ❑ “AT-SBxPWRSYS1 DC Power Supply” on page 199
- ❑ “Ethernet Line Cards” on page 201
- ❑ “Twisted Pair Ports” on page 203
- ❑ “Power Over Ethernet” on page 205
- ❑ “Fiber Optic Transceivers” on page 207
- ❑ “AT-SBx31CFC Central Fabric Controller Card” on page 209
- ❑ “AT-SBxFAN12 Fan Module” on page 210
- ❑ “Local (Out-of-Band) Management Session” on page 211
- ❑ “Power Supply Interfaces (Opto-couplers)” on page 212

## AT-SBxPWRSYS1 and AT-SBxPWRPOE1 AC Power Supplies

---

A power supply is operating normally when its AC and DC LEDs are solid green and the Fault LED is off. Possible fault conditions and their solutions are described here:

Fault Condition 1: If the AC LED is off, the power supply is not receiving power, has overheated and been disabled, or has failed and needs to be replaced. Try the following:

- ❑ Verify that there is a power cord connected to the power supply's connector on the back panel of the chassis. For example, if a power supply in slot C does not have power, check for a power cord on connector C on the back panel.
- ❑ Verify that the power cord is securely connected to the chassis and the AC power source.
- ❑ Verify that the AC power has power by connecting another device to it.
- ❑ Verify that the power from the AC power source is within the required levels for your region.
- ❑ If the chassis is still operating, use the SHOW PSU or SHOW PSU ALL command from a local or remote management session to determine if the power supply has overheated and shutdown.

Fault Condition 2: If the AC LED is solid green and the DC LED is off, the power unit is generating insufficient DC power. Replace the power supply.

Fault Condition 3: If the Fault LED is solid amber, try the solutions in Fault Condition 1. If they do not resolve the problem, replace the power supply.

---

### Note

The power supplies are hot swappable in a redundant configuration. This allows the AT-SBx3112 Chassis to continue operating while you exchange power supplies.

---

Fault Condition 4: If the LEDs on the power supply indicate normal operations but the PSU LED on the active master control card is showing a fault condition, the problem may be with one of the two power supply interfaces (opto-couplers) on the rear panel of the chassis. For troubleshooting suggestions, refer to "Power Supply Interfaces (Opto-couplers)" on page 212.



### Caution

The power supply interfaces are *not* hot swappable and should only be serviced by an authorized service technician.

---

## AT-SBxPWRSYS1 DC Power Supply

---

If you suspect a problem with the DC power supply, examine its LEDs. The power supply is operating normally when the DC IN and DC OUT LEDs are solid green and the Fault LED is off. Possible fault conditions and their solutions are described here:

Fault Condition 1: If the DC IN LED is off, the power supply is not receiving power, has overheated and been disabled, or has failed and needs to be replaced. Try the following:

- ❑ Verify that the On/Off switch on the power supply is in the On position.
- ❑ Verify that the DC circuit breaker is on.
- ❑ Verify that the positive and negative power wires are correctly and securely connected to the terminal block on the power supply and circuit breaker.
- ❑ Verify that the DC circuit break has power by attaching another device to it.
- ❑ Verify that the power from the DC circuit break is within the required levels of the power supply. Refer to “Power Specifications” on page 216.
- ❑ If the chassis is still operating, use the SHOW PSU or SHOW PSU ALL command from a local or remote management session to determine if the power supply has overheated and shutdown.

Fault Condition 2: If the DC IN LED is solid green but the DC OUT LED is off, the power unit is generating insufficient DC power. Replace the power supply.

Fault Condition 3: If the Fault LED is solid amber, try the solutions in Fault Condition 1. If they do not resolve the problem, replace the power supply.

---

### Note

The power supply is hot swappable. If the chassis has two power supplies and one of them fails, you do not have to power off the operational power supply to replace the failed unit.

---

Fault Condition 4: If the LEDs on the power supply indicate normal operations but the PSU LED on the active master control card is off or is showing a fault condition, try the following suggestions:

- ❑ The control card may not be able to detect the DC power supply because it is not running the most recent version of the management software. For instructions on how to verify the

software version on the control card, refer to “Using Local Management to Verify the Chassis” on page 192 and “Management Software Releases for the Hardware Components” on page 68.

- The problem may be with one of the two power supply interfaces (opto-couplers) on the rear panel of the chassis. For troubleshooting suggestions, refer to “Power Supply Interfaces (Opto-couplers)” on page 212.



**Caution**

The power supply interfaces are *not* hot swappable and should only be serviced by an authorized service technician.

---

## Ethernet Line Cards

---

A quick and easy way to check the overall health of the Ethernet line cards in the chassis is by examining the SBx STATUS LEDs on the control card. (If the chassis has two control cards, you may use the LEDs on either card.) There are twelve LEDs, one for each slot. The LEDs are numbered 0 to 11, just like the slots. The cards in the slots are operating normally when the LEDs are green. The Ethernet line card in slot 8 of the chassis, for example, is operating properly when the SBx STATUS LED 8 on the control card is solid green.

If you suspect a problem with an Ethernet line card or control card, try the following:

- ❑ If all the L/A LEDs on the card are off, try pressing the eco-friendly button on the active master control card to verify that the LEDs on the line cards are on.
- ❑ Check the card's status LED in the SBx STATUS LEDs on the control card. If the LED is flashing amber, the card is initializing its management software. Wait one to two minutes for the card to complete the process. If the LED does not change to green, try installing the line card in a different slot. If the problem remains, the card cannot complete the initialization process. Try installing the card in another chassis with a different control card.
- ❑ If the card's status LED in the SBx STATUS LEDs on the control card is solid amber, the card might not be able to boot up because the control card does not have its load file. For example, you would see this problem if you installed the AT-SBx31XS6 Line Card, which requires release 15.1 or later, in a chassis with a control card that has release 14.2. To correct the problem, update the management software on the control card to the latest release.
- ❑ A line card may not boot properly if the load file has not been set correctly with the SET CARD PREFLOAD command on the active master control card.

Here are some other steps to try:

- ❑ Check that the card is completely installed in the slot and that the front plate is flush with the front of the chassis.
- ❑ Try resetting the card with the RESTART CARD command. The example of the command restarts the card in slot 2:

```
officer SEC>> restart card 2
```

You will be prompted as follows - enter y for YES:

```
Do you really want to restart card 2 (Y/N)? y
```

Command has been submitted

officer SEC>>

- ❑ Try installing the card in a different slot. If it works in the new slot, the problem is with the previous slot.
- ❑ Try installing the card in a different chassis. If it works in the new chassis, the problem is with the previous chassis. If the problem persists, the problem is with the card.
- ❑ You can obtain card status information with the Switchblade x3112 Management Software and the SHOW CARD command, as shown in Figure 148 on page 195.

## Twisted Pair Ports

---

The ports on the AT-SBx31GT24 and AT-SBx31GP24 Line Cards have L/A LEDs that are solid or flashing green when the ports are operating at 1000 Mbps, and solid or flashing amber at 10 or 100 Mbps. If a port is cabled to a network device but the L/A LED is off, try the following:

- ❑ If all of the L/A LEDs on the card are off, try pressing the eco-friendly button on the active master control card to verify that the LEDs on the line cards are on.
- ❑ Verify that the end node connected to the port is powered on and operating properly.
- ❑ Check that the twisted pair cable is securely connected to the ports on the line card and the end node.
- ❑ Make sure that the twisted pair cable does not exceed 100 m (328 ft).
- ❑ Refer to Table 1 on page 36 and Table 2 on page 37 to verify the appropriate categories of twisted-pair cables for the AT-SBx31GT24 and AT-SBx31GP24 Line Cards, respectively.
- ❑ Verify that the twisted-pair cable is not faulty by replacing it with a known good cable.
- ❑ Make sure that the operating parameters of the port on the line card and the parameters of the end node are compatible.
- ❑ Use the SHOW INTERFACE and ENABLE INTERFACE commands to be sure that the port is enabled.

If the L/A LED for a port is green, signalling a link to the network device, but link performance is poor or intermittent, the problem may be from a bad cable. Try replacing the cable, as explained in “Guidelines to Cabling the AT-SBx31GP24, AT-SBx31GT24, and AT-SBx31GT40 Line Cards” on page 128.

Another source of poor or intermittent performance on a link can be a speed or duplex mode mismatch between a port and network device. Here are some items to consider when resolving this type of problem:

- ❑ The default speed setting for the ports on the AT-SBx31GT24 and AT-SBx31GP24 Line Cards is Auto-Negotiation. This setting is appropriate for ports connected to network devices that also support Auto-Negotiation.
- ❑ The default speed setting of Auto-Negotiation is not appropriate for ports connected to network devices that do not support Auto-Negotiation and have fixed speeds or 10 or 100 Mbps. For those switch ports, you should disable Auto-Negotiation and set the port's speed manually to match the speeds of the network devices.

- ❑ The ports must be set to Auto-Negotiation, the default setting, to operate at 1000Mbps.
- ❑ The default duplex mode setting for the ports is Auto-Negotiation. This setting is appropriate for ports connected to network devices that also support Auto-Negotiation for duplex modes.
- ❑ The default duplex mode setting of Auto-Negotiation is not appropriate for ports connected to network devices that do not support Auto-Negotiation and have a fixed duplex mode. Disable Auto-Negotiation on those ports and set the duplex modes manually to avoid the possibility of duplex mode mismatches. A switch port using Auto-Negotiation defaults to half-duplex if it detects that the end node is not using Auto-Negotiation, which can result in a mismatch if the end node is operating at a fixed duplex mode of full-duplex.

---

**Note**

The AT-SBx31GT40 Line Card does not support half-duplex mode.

---

Yet another source for a poor or intermittent link can be a MDI/MDIX wiring configuration mismatch. The wiring configurations of the ports on the AT-SBx31GT24, AT-SBx31GT40, and AT-SBx31GP24 Line Cards are set automatically with automatic MDIX detection when the ports are operating at 10 or 100 Mbps. (Automatic MDIX detection does not apply to the ports when they are operating at 1000 Mbps.) You may not disable this feature. For automatic MDIX detection to work successfully, the network device connected to a port must also support the feature. If it does not, a port on the switch defaults to MDIX. This may require the use of a crossover cable. Here are the guidelines to choosing straight-through or crossover cables for the ports:

- ❑ You may use straight-through cables on ports that are connected to network devices that operate at 1000 Mbps.
- ❑ You may use straight-through or crossover cables on ports that are connected to network devices that support automatic MDIX detection and that operate at 10 or 100 Mbps.
- ❑ You *must* use straight-through cables on ports that are connected to network devices that have a fixed wiring configuration of MDI and that operate at 10 or 100 Mbps.
- ❑ You *must* use crossover cables on ports that are connected to network devices that have a fixed wiring configuration of MDIX and that operate at 10 or 100 Mbps.

## Power Over Ethernet

---

This section applies only to the AT-SBx31GP24 Line Card. Each port on the line card has two LEDs. The left LED provides port link and activity status and the right LED provides PoE status information. The PoE LED is solid green when a port is delivering power to a powered device (PD). The PoE LED of a port that is not delivering power will be flashing amber, steady amber, or off. If a powered device is not receiving power from a port on the line card, try the following:

- ❑ If all the L/A LEDs on the line cards in the chassis are off, try pressing the eco-friendly button on the active master control card to turn on the LEDs.
- ❑ Check to be sure that the chassis has at least one AT-SBxPWRPOE1 Power Supply and that the unit is operating properly. The AC and DC LEDs should be solid green and the Fault LED should be off. For troubleshooting suggestions, refer to “AT-SBxPWRSYS1 and AT-SBxPWRPOE1 AC Power Supplies” on page 198.
- ❑ Review the PD’s documentation to confirm that it supports Mode A of the IEEE 802.3at standard. Mode A is one of two modes that define the connector pins that deliver the power from the port on the line card to the PD. In Mode A, the power is carried on pins 1, 2, 3, and 6 on the RJ-45 port, the same pins that carry the network traffic. The second mode, Mode B, defines pins 4, 5, 7, and 8 as the power carriers. The AT-SBx31GP24 Line Card does not support Mode B. Most powered devices are designed to accept power by either mode, but some legacy devices may only support one mode. This can be verified by reviewing the device’s documentation or data sheet. Legacy devices that only support Mode B will not work with this line card.
- ❑ Check that the device’s power requirements do not exceed 30 W. This can be verified by reviewing the device’s documentation or data sheet.
- ❑ Verify that you are using the appropriate category of twisted-pair cable by referring to Table 2 on page 37.
- ❑ Try replacing the twisted-pair cable, as explained in “Guidelines to Cabling the AT-SBx31GP24, AT-SBx31GT24, and AT-SBx31GT40 Line Cards” on page 128.
- ❑ Use the SHOW POE INTERFACE command in the management software to determine whether PoE is enabled on the port. The default setting for PoE is enabled.
- ❑ Use the SHOW POE INTERFACE command to determine whether the PoE power setting for the port has been reduced to a value below the power requirements of the device.

- ❑ Use the `SHOW POE CARD` command to determine whether the switch has reach its maximum power budget.
- ❑ Try connecting the PD to a port on a different AT-SBx31GP24 Line Card.

## Fiber Optic Transceivers

---

The L/A LEDs on the AT-SBx31GS24, AT-SBx31GC40, AT-SBx31XS6, and AT-SBx31XZ4 Line Cards are solid or flashing green when ports on fiber optic transceivers have links to end nodes. If a transceiver is cabled to an end node but the L/A LED is off, try the following:

- ❑ If all of the L/A LEDs on the line cards in the chassis are off, try pressing the eco-friendly button on the active master control card to turn on the LEDs.
- ❑ Check that the fiber optic transceiver is firmly inserted into the slot on the line card.
- ❑ Check that both ends of the fiber optic cable are securely connected to the ports on the transceiver and end node.
- ❑ Verify that the end node is powered on and operating properly.
- ❑ Review the operating specifications of the fiber optic transceiver and end node to verify that the devices have the same speed and duplex mode.
- ❑ Check that the operating specifications, including wavelength and maximum operating distance, of the transceiver are compatible with the fiber optic port on the end node.
- ❑ 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. The cable specifications for the transceivers are provided in the installation instructions that ship with the modules.
- ❑ Use a fiber optic tester to test whether the optical signal is too weak (i.e., sensitivity) or too strong (i.e., maximum input power). The operating specifications of the fiber optic transceivers are shipped with the units.
- ❑ If the problem is with an XFP transceiver in the AT-SBx31XZ4 Line Card, be sure that the transceiver and end node are IEEE 802.3ae (10G Ethernet) and XFP MSA compliant. An XFP transceiver or port that meets a "Fiber Channel" standard may not link up properly with its counterpart device.
- ❑ Try replacing the fiber optic cable.
- ❑ For SFP and XFP transceivers, check the two strands of the fiber optic cable to 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 end node.
- ❑ If a fiber port on a CSFP transceiver in the AT-SBx31GC40 Line Card cannot establish a link with a remote network device, compare the transmit and receive wavelengths of the transceiver

and network device. The devices must be transmitting and receiving on opposite wavelengths. For example, if the fiber port on the CSFP transceiver transmits at 1550 nm and receives at 1310 nm, then the port on the remote network device must transmit at 1310 nm and receive at 1550 nm.

## AT-SBx31CFC Central Fabric Controller Card

---

The consequences of a control card failure depend on the number of control cards in the chassis. If the chassis has one control card and it fails, all network operations stop. The Ethernet line cards stop forwarding all network traffic until the control card is replaced.

If the chassis has two control cards and one fails, the Ethernet line cards continue to forward traffic, but the traffic bandwidth across the backplane is reduced from 400 to 200 Gbps, which, depending on the number of Ethernet line cards present and the amount of traffic traversing the backplane, may result in slower network operations.

If the chassis has one control card, examine the M/S LED on the card. The LED should be solid green. If the LED is flashing amber, the card is initializing its management software. Wait one or two minutes for the card to complete the process and check the LED again. If it has not changed to solid green, the card cannot complete the initialization process. Try moving the control card to the other control card slot, slot 4 or 5, to see if it will work in the new slot. You might also try connecting a terminal or PC with a terminal emulator program to the Console RS232 port to watch for any error messages.

If the chassis has two control cards, check the M/S LEDs on both cards. The LEDs should be solid green on one card and solid or flashing amber on the other card. If the LEDs are both flashing amber, they are initializing their management software. Wait one or two minutes for the cards to complete the process and check the LEDs again. If both LEDs are still flashing amber, the cards cannot complete the initialization process. Try replacing the cards.

The control card has an onboard battery which it uses to maintain the date and time when the chassis is powered off or reset. If you manually set the date and time but the card loses the information after you power off or reset the unit, you may have forgotten to remove the battery insulator when you installed the card in the chassis. The insulator is shown in Figure 72 on page 116. The only way to remedy the problem is to remove the control card from the chassis and remove the battery insulator. If the chassis has only one control card, removing the card causes the Ethernet line cards to stop forwarding traffic.

## AT-SBxFAN12 Fan Module

---

The AT-SBxFAN12 Fan Module is operating correctly when the POWER LED on the module is solid green. If the LED on the fan module is off, check the FAN LED in the SYS STATUS section on the active master control card. The LED should be green. If the FAN LED is off or flashing amber, one or more fans in the module are no longer operating properly. You may also view the status of the unit with the SHOW FANMODULE command in the management software.

You may notice changes in the fan speeds. This is normal. The active master control card automatically adjusts the fan speeds according to the internal temperature of the chassis.

---

**Note**

The AT-SBxFAN12 Fan Module is hot swappable. You do not have to power off the AT-SBx3112 Chassis to replace the module.

---

## Local (Out-of-Band) Management Session

---

If you are unable to establish a local (out-of-band) management session with the switch through the Console RS-232 port on the front panel, do the following:

- ❑ Check to be sure that the RJ-45 serial management cable is securely connected to the Console RS-232 port on the active master control card and the RS-232 port on the terminal or personal computer.
- ❑ If the chassis has two control cards, verify that the management cable is connected to the active master control card. You can discern the active master card by examining the M/S LED. The LED is solid green on the active master control card and solid or flashing amber on the inactive master card.
- ❑ Check to be sure that the operating parameters on the terminal or the terminal emulation program, if you are using a personal computer, have been set correctly. The default settings for the RJ-45 serial terminal port are located in “Using Local Management to Verify the Chassis” on page 192.
- ❑ Check to be sure that the terminal emulator application is compatible with a VT-100 terminal.

## Power Supply Interfaces (Opto-couplers)

---

The two power supply interfaces in the lower right corner of the rear panel are used by the active master control card to obtain status information from the power supplies. The interfaces are shown in Figure 32 on page 66.

Each power supply interface supports two power units. The top interface supports the power supplies in slots A and C. The bottom interface supports the supplies in slots B and D.

An interface is operating normally when its Power LED is solid green. The LED of an interface is off if the two corresponding power supply slots are empty or the power supplies are not powered on. For example, the LED for the bottom interface will be off if power supply slots B and D are empty or if the power supplies are off.

The network operations of the chassis are not affected if one or both of the interfaces fail. However, the active master control card changes the PSU LED to flashing amber to signal the loss of communications to the power supplies.

---

### Note

The power supply interfaces are *not* hot swappable and can only be serviced by an authorized service technician.

---

If the Power LED on a power supply interface is off, do the following:

1. Check that there are power supplies in the corresponding slots in the front panel and that the power supplies are powered on. (The Power LED on an interface is off when the slots are empty or the power supplies are not powered on.)
2. Inspect the LEDs on the power supplies to check for a fault condition. If there is a fault condition, go to “AT-SBxPWRSYS1 and AT-SBxPWRPOE1 AC Power Supplies” on page 198 for troubleshooting suggestions. If the LEDs indicate the power supplies are operating normally, go to step 3.
3. Check the PSU LED on the active master control card. If the LED is solid green, the power supplies and interfaces are operating normally. No corrective steps are required. If the PSU LED is solid amber but the LEDs on the power supplies indicate normal operations, there may be a problem with a power supply interface. Contact your Allied Telesis sales representative for assistance.

## Appendix A

# Technical Specifications

---

## Physical Specifications

---

### Dimensions (W x D x H)

Table 26. Product Dimensions

AT-SBx3112 Chassis	48.03 cm x 38.79 cm x 31.01 cm 18.91 in x 15.27 in x 12.21 in)
AT-SBxPWRSYS1 AC System Power Supply	10.16 cm x 32.21 cm x 4.34 cm (4.00 in x 12.68 in x 1.71 in)
AT-SBxPWRPOE1 AC PoE Power Supply	10.16 cm x 32.21 cm x 4.34 cm (4.00 in x 12.68 in x 1.71 in)
AT-SBxPWRSYS1 DC System Power Supply	10.16 cm x 34.2 cm x 4.34 cm (4.00 in x 13.46 in x 1.71 in)
AT-SBxFAN12 Tray Module	2.74 cm x 33.35 cm x 26.04 cm (1.08 in x 13.13 in x 10.25 in)
All Cards AT-SBx31GT24 Line Card AT-SBx31GT40 Line Card AT-SBx31GP24 PoE Line Card AT-SBx31GS24 SFP Line Card AT-SBx31GC40 Line Card AT-SBx31XZ4 XFP Line Card AT-SBx31XS6 SFP+ Line Card AT-SBx31CFC Central Fabric Controller Card	20.67 x 31.32 cm x 4.06 cm (8.14 in x 12.33 in x 1.6 in)

### Weight (Kilograms)

Table 27. Product Weights

AT-SBx3112 Chassis	17.77 kg (39.10 lb) with 3 PSU and 10 Line Card blank panels
AT-SBx31GT24 Line Card	0.93 kg (2.05 lb)
AT-SBx31GT40 Line Card	1.04 kg (2.30 lb)

Table 27. Product Weights (Continued)

AT-SBx31GP24 PoE Line Card	1.06 kg (2.34 lb)
AT-SBx31GS24 SFP Line Card	1.06 kg (2.34 lb)
AT-SBx31GC40 Line Card	1.11 kg (2.45 lb)
AT-SBx31XZ4 XFP Line Card	0.82 kg (1.80 lb)
AT-SBx31XS6 SFP+ Line Card	1.06 kg (2.34 lb)
AT-SBx31CFC Central Fabric Controller card	1.09 kg (2.40 lb)
AT-SBxPWRSYS1 AC System Power Supply	2.75 kg (6.05 lb) with power cord
AT-SBxPWRPOE1 AC PoE Power Supply	2.73 kg (6.00 lb) with power cord
AT-SBxPWRSYS1 DC System Power Supply	1.9 kg (4.2 lb)
AT-SBxFAN12 Tray Module	1.82 kg (4.00 lb)

## Environmental Specifications

---

Table 28. 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% non-condensing
Storage Humidity	5% to 95% non-condensing
Operating Altitude Range	Up to 3,000 m (9,843 ft)
Acoustic Noise	75.7 dB

---

**Note**

The acoustic noise was measured at 40° C with the following products installed:

---

Table 29. Acoustic Noise Test Components

Product	Quantity
AT-SBx3112 Chassis	1
AT-SBx31CFC Central Fabric Controller Card	2
AT-SBx31GP24 PoE Line Card	5
AT-SBx31XZ4 XFP Line Card	5
AT-SBxPWRSYS1 System Power Supply	2
AT-SBxPWRPOE1 PoE Power Supply	2
AT-SBxFAN12 Tray Module	1

## Power Specifications

---

### AC Voltage, Frequency Requirements (Volts, Hertz)

Table 30. AC Voltage and Frequency Requirements

AT-SBxPWRSYS1 AC Power Supply	100 - 120 / 200 - 240 VAC, 16/8A, 50/60 Hz, (per input)
AT-SBxPWRPOE1 AC Power Supply	100 - 120 / 200 - 240 VAC, 16/8A, 50/60 Hz, (per input)

### DC Voltage Requirement

Table 31. DC Voltage Requirement

AT-SBxPWRSYS1 DC Power Supply	40 - 60V dc (-0% - +20%), 36A (maximum per input)
-------------------------------	---

### Typical power savings in eco-friendly mode (Watts)

Table 32. Typical Power Savings in eco-friendly Mode

AT-SBx31GT24	0.12 W
AT-SBx31GT40	0.79 W
AT-SBx31GP24	0.24 W
AT-SBx31GS24	0.20 W
AT-SBx31GC40	0.42 W
AT-SBx31XZ4	0.00 W
AT-SBx31XS6	0.10 W
AT-SBx31CFC	0.12 W

### Maximum power consumption (Watts)

Table 33. Maximum Power Consumption

AT-SBx31GT24	34.4 W
AT-SBx31GT40	53.9 W
AT-SBx31GP24	34.4 W

Table 33. Maximum Power Consumption (Continued)

AT-SBx31GS24	56.3 W
AT-SBx31GC40	64.0 W
AT-SBx31XZ4	48.3 W
AT-SBx31XS6	54.8 W
AT-SBx31CFC	48.3 W

**Maximum power supply efficiency (based on 100V input voltage)**

Table 34. Maximum Power Efficiency

AT-SBxPWRSYS1 AC	Up to 90%
AT-SBxPWRPOE1	Up to 90%
AT-SBxPWRSYS1 DC	Up to 90%

**Heat dissipation (British Thermal Units/hour)**

Table 35. Heat Dissipation

AT-SBx31GT24	146.72 BTU/hr
AT-SBx31GT40	183.74 BTU/hr
AT-SBx31GP24	146.72 BTU/hr
AT-SBx31GS24	240.13 BTU/hr
AT-SBx31GC40	272.8 BTU/hr
AT-SBx31XZ4	206.01 BTU/hr
AT-SBx31XS6	233.73 BTU/hr
AT-SBx31CFC	206.01 BTU/hr
AT-SBxPWRSYS1 AC	5118.21 BTU/hr
AT-SBxPWRPOE1 AC	5118.21 BTU/hr
AT-SBxPWRSYS1 DC	5118.21 BTU/hr

Heat dissipation of the power supplies is calculate at 80% power efficiency.

**Available Power over Ethernet (Watts/port):**

Table 36. Available Power Over Ethernet with One PoE Power Supply

One PoE Power Supply Installed	1200 W @ 56 VDC
IEEE 802.3at Class 4 (30 W /port)	40 ports Maximum
IEEE 802.3af Class 3 (15.4 W /port)	77 ports Maximum
IEEE 802.3af Class 2 (7.3 W /port)	171 ports Maximum
IEEE 802.3af Class 1 (4.0 W /port)	240 ports Maximum

Table 37. Available Power Over Ethernet with Two PoE Power Supplies

Two PoE Power Supply Installed	2400 W @ 56 VDC
IEEE 802.3at Class 4 (30 W /port)	80 ports Maximum
IEEE 802.3af Class 3 (15.4 W /port)	155 ports Maximum
IEEE 802.3af Class 2 (7.3 W /port)	240 ports Maximum
IEEE 802.3af Class 1 (4.0 W /port)	240 ports Maximum

**PoE Mode**

Table 38. PoE Mode

IEEE 802.3af / IEEE 802.3at:	Alternative Mode A
------------------------------	--------------------

## Safety and Electromagnetic Emissions Certifications

---

### Safety and Electromagnetic Emissions:

Table 39. Safety and Electromagnetic Emissions

EMI/RFI	FCC Class A, EN55022 Class A, EN61000-3-2, EN61000-3-3, CISPR Class A, VCCI Class A, AS/NZS Class A
Immunity	EN55024
Electrical Safety	EN60950-1 (TUV), UL60950-1 (cUL <sub>us</sub> ), EN60825
Safety Agency Approvals	cUL <sub>us</sub> , TUV, C-TICK, CE

## Port Pinouts

This section lists the port pinouts for the AT-SBx31GT24, AT-SBx31GT40, and AT-SBx31GP24 Line Cards.

Figure 149 illustrates the pin layout for RJ-45 and RJ point 5 ports.

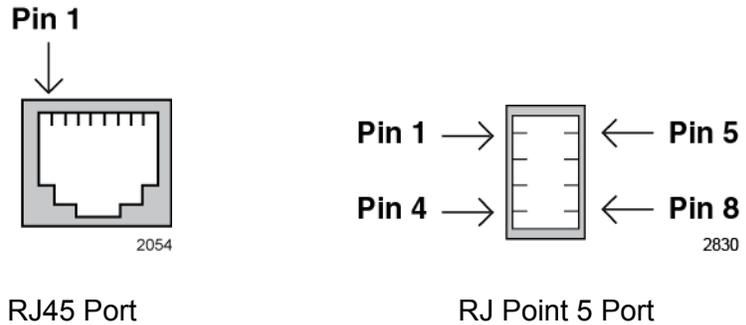


Figure 149. Pin Numbers for the RJ-45 and Point 5 Ports (Front View)

Table 40 lists the pin signals when a twisted-pair port is operating in the MDI configuration.

Table 40. MDI Pin Signals (10Base-T or 100Base-TX)

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

Table 41 lists the port pin signals for the MDI-X configuration.

Table 41. MDI-X Pin Signals (10Base-T or 100Base-TX)

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

Table 42 lists the port pin signals when a 10/100/1000Base-T port is operating at 1000 Mbps.

Table 42. 1000Base-T Connector Pinouts

<b>Pin</b>	<b>Pair</b>	<b>Signal</b>
1	1	TX and RX+
2	1	TX and RX-
3	2	TX and RX+
4	3	TX and RX+
5	3	TX and RX-
6	2	TX and RX-
7	4	TX and RX+
8	4	TX and RX-

