

# SwitchBlade x3 | I2

Access Edge Chassis Switch

## AT-SBx3 | CFC960

Controller Fabric Card (AlliedWareNSP R6.21.0.0)

AT-SBx3 | I2 Chassis

AT-SBx3 | GT24 Ethernet Line Card

AT-SBx3 | GT40 Ethernet Line Card

AT-SBx3 | GP24 Ethernet PoE Line Card

AT-SBx3 | GS24 Ethernet SFP Line Card

AT-SBx3 | GC40 Ethernet SFP or CSFP BiDi Line Card

AT-SBx3 | XZ4 Ethernet XFP Line Card

AT-SBx3 | XS6 Ethernet SFP+ Line Card

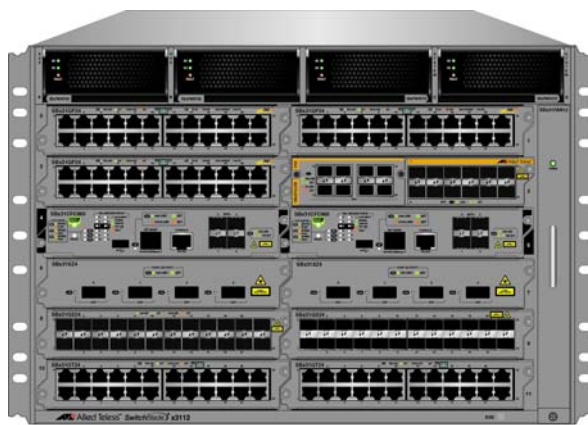
AT-SBx8 | XLEM Ethernet SFP Line Card

AT-SBx8 | XLEM/Q2 Ethernet QSFP+ Expansion Module

AT-SBx8 | XLEM/XS8 Ethernet SFP or SFP+ Expansion Module

AT-SBxPWRSYS1 and AT-SBxPWRSYS2 System Power Supplies

AT-SBxPWRPOE1 PoE Power Supply



## Installation Guide

the **solution** : the **network**

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# Electrical Safety and Emissions Standards

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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

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**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/services-and-support>.

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# Preface

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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

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## **Note**

This version of the installation guide applies to release 6.21.0.0 or later of the AlliedWareNSP 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).

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## Safety Symbols Used in this Document

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This document uses the following conventions.

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**Note**

Notes provide additional information.

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**Caution**

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

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**Warning**

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

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**Warning**

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

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## Contacting Allied Telesis

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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/services-and-support](http://www.alliedtelesis.com/services-and-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/how-to-buy](http://www.alliedtelesis.com/how-to-buy)** and select your region.



## Chapter 1

# Overview of the Chassis and Power Supplies

---

This chapter contains an overview of the hardware components of the AT-SBx3112 Chassis and power supplies. The sections in the chapter are listed here:

- ❑ “AT-SBx3112 Chassis” on page 20
- ❑ “Chassis Slots for Ethernet Line and Controller Cards” on page 23
- ❑ “Power Supplies and Power Supply Slots” on page 24
- ❑ “AT-SBxFAN12 Module” on page 29
- ❑ “Power Supply Interfaces (Opto-couplers)” on page 30

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### **Note**

This version of the installation guide applies to release 6.21.0.0 or later of the AlliedWareNSP 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).

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## AT-SBx3112 Chassis

---

The SBx3112 product is a modular Gigabit and 10 Gigabit Ethernet switch. The main components are the AT-SBx3112 Chassis, Ethernet line cards, a controller 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.

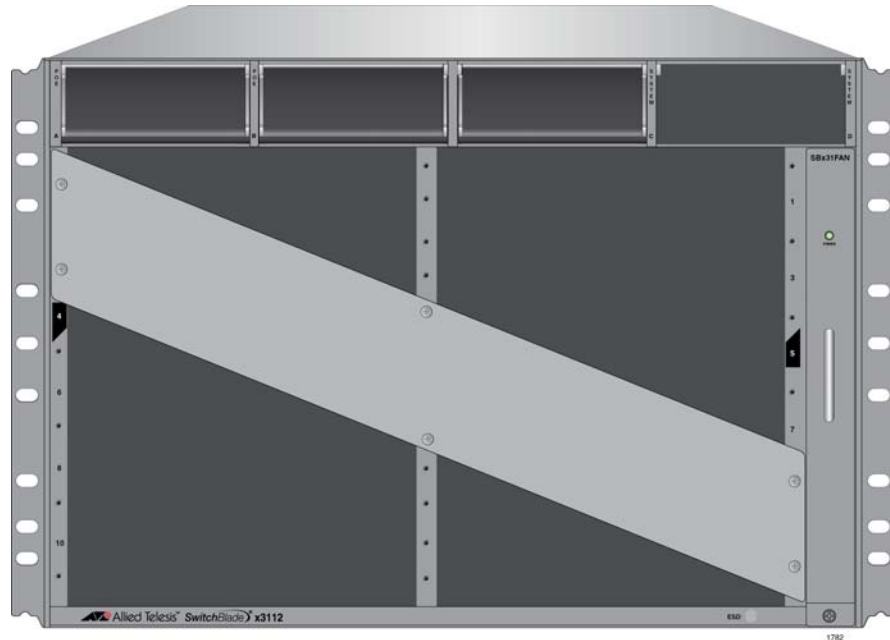


Figure 1. AT-SBx3112 Chassis

The chassis has slots for the following components:

- Ten Ethernet line cards
- Two AT-SBx31CFC960 Controller Fabric Cards
- Two AC or DC system power supplies
- Two Power over Ethernet Plus (PoE+) power supplies
- One AT-SBxFAN12 Fan Module

The chassis components are identified in Figure 2 on page 21 and Figure 3 on page 22.

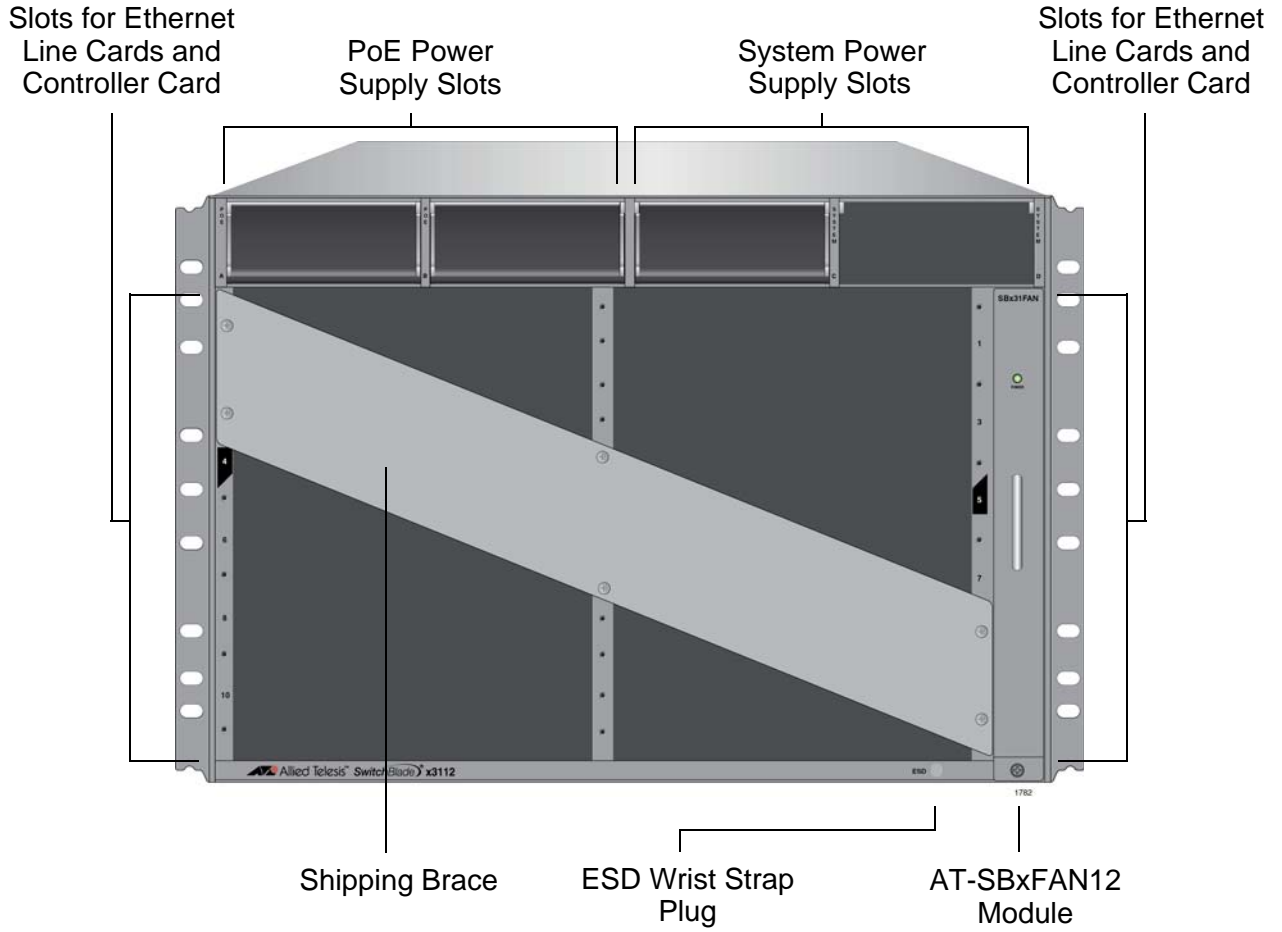


Figure 2. Front View of the AT-SBx3112 Chassis

**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.

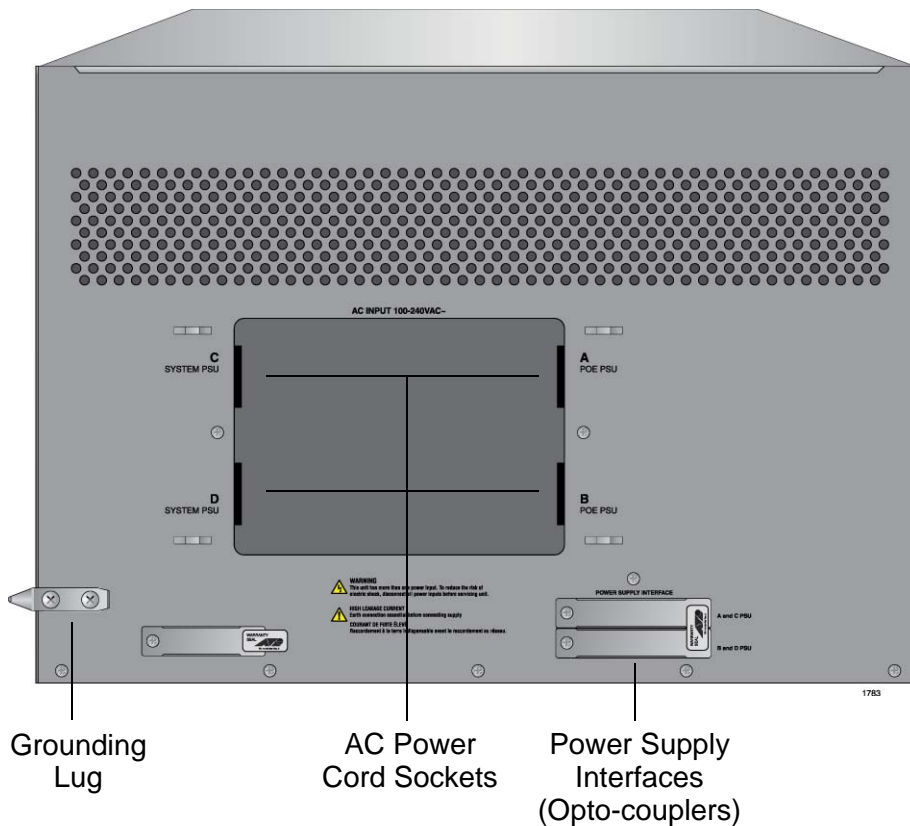


Figure 3. Rear View of the AT-SBx3112 Chassis

Figure 4 is an example of a fully populated chassis.

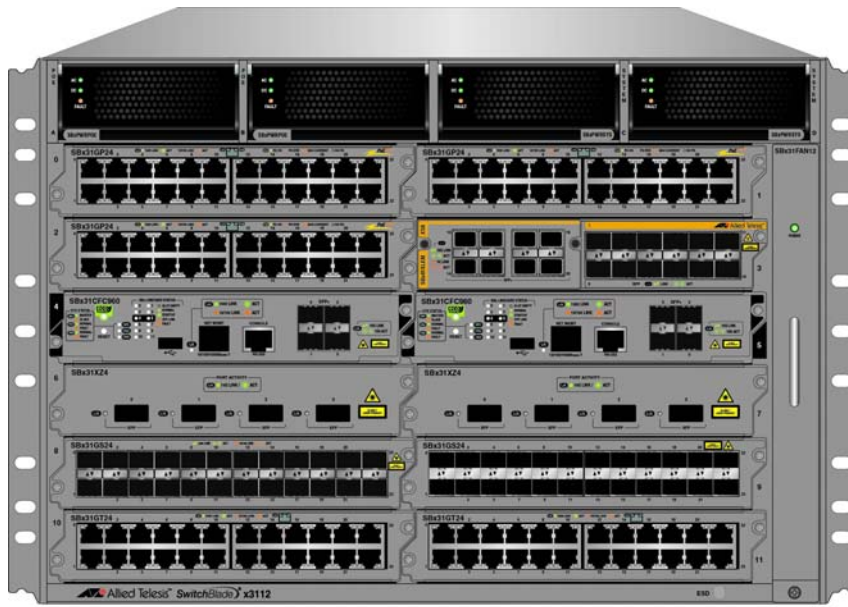


Figure 4. AT-SBx3112 Chassis with Line Cards, Controller Cards, and Power Supplies

## Chassis Slots for Ethernet Line and Controller Cards

The chassis has slots for ten Ethernet line cards and two AT-SBx31CFC960 Controller Fabric Cards. The functions of the slots, which are numbered starting with 0, are predefined and may not be changed. Figure 5 identifies the slots.

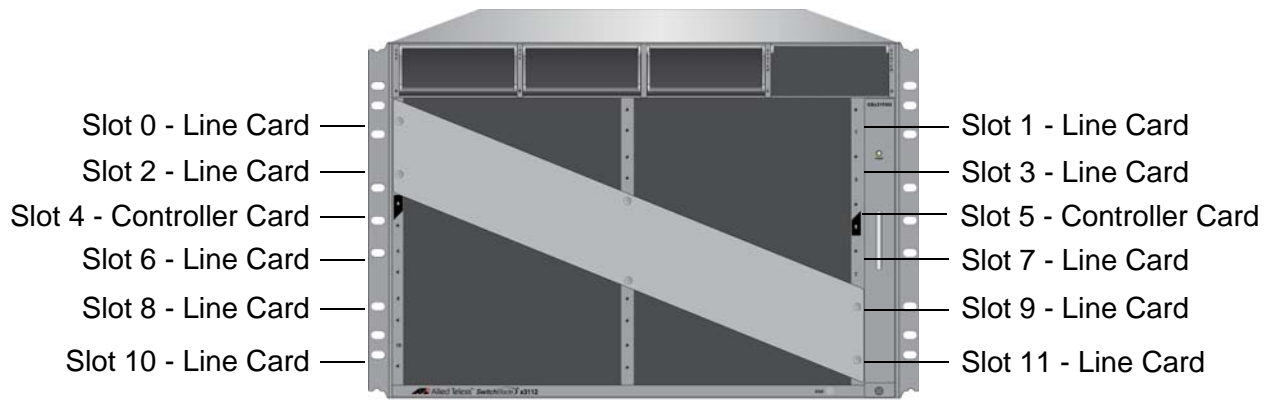


Figure 5. Slots for the Ethernet Line and Controller Cards

Slots 0 to 3 and 6 to 11 are for the Ethernet line cards. Each slot can accommodate one card. You may install the cards in any order or variety in the slots. For more information on the line cards, refer to Chapter 2, “Overview of the Ethernet Line Cards” on page 31.

Slots 4 and 5 are for the AT-SBx31CFC960 Controller Fabric Card. Each slot can accommodate one controller card. The chassis must have at least one controller card. Installing two controller cards provides these benefits:

- Management redundancy.
- Four additional SFP+ slots.
- Increased traffic bandwidth in the chassis.

For more information on the controller card, refer to Chapter 3, “Overview of the AT-SBx31CFC960 Controller Fabric Card” on page 71.

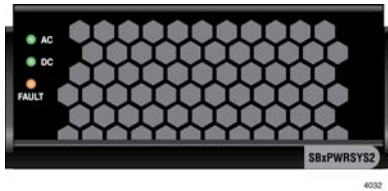
## Power Supplies and Power Supply Slots

---

There are four power supplies for the chassis. They are shown in Figure 6.



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



AT-SBxPWRSYS2 AC System Power Supply for the Ethernet line cards, controller cards, 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 System Power Supply for the Ethernet line cards, controller cards, and fan module.

Figure 6. Power Supply Units

---

### Note

Allied Telesis is discontinuing the AT-SBxPWRSYS1 AC Power Supply and replacing it with the AT-SBxPWRSYS2 AC Power Supply.

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The power supplies are installed in the four slots across the top of the front of the chassis. The slots are labelled A to D. Refer to Figure 7 on page 25.



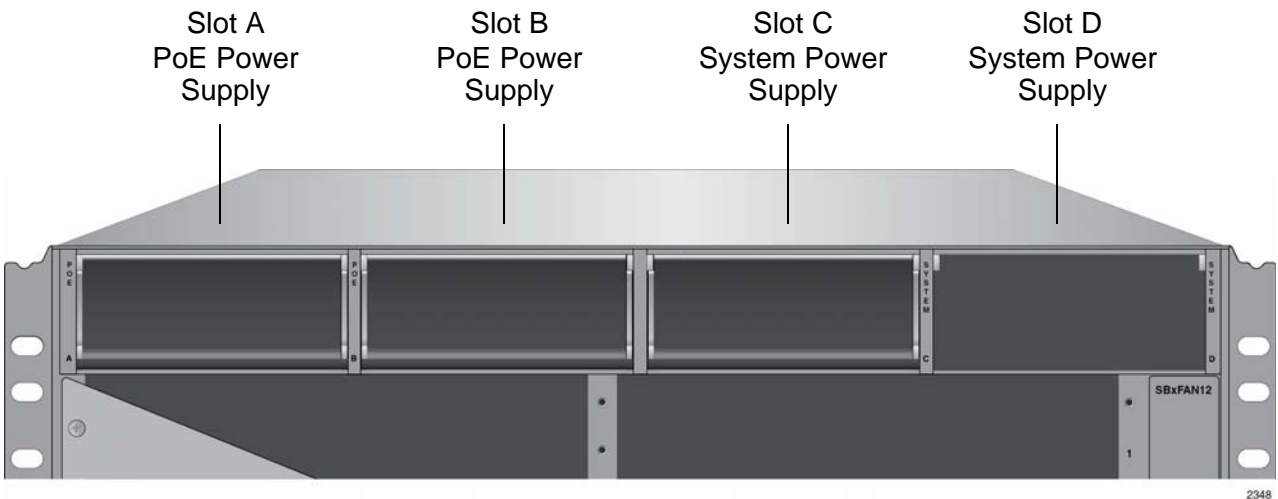


Figure 7. Power Supply Slots

Slots C and D are for system power supplies. The three system power supplies are listed here:

- ❑ AT-SBxPWRSYS1 AC Power Supply
- ❑ AT-SBxPWRSYS2 AC Power Supply
- ❑ AT-SBxPWRSYS1 DC Power Supply

System power supplies provide power for all of the chassis hardware components, including the line cards, controller cards, and fan module. The only component they do not support is the PoE feature on the twisted pair ports on the AT-SBx31GP24 Line Cards. Please review the following items concerning the system power supplies:

- ❑ The system power supplies are installed in slots C and D of the chassis.
- ❑ You may install either one or two system power supplies in the chassis.
- ❑ A single power supply can support a fully populated chassis. Adding a second power supply adds power redundancy to the unit.
- ❑ If you are installing only one system power supply, you may install it in either slot C or D.
- ❑ The AT-SBxPWRSYS1 AC and AT-SBxPWRSYS2 AC System Power Supplies use the AC connectors on the back panel of the chassis and are intended for AC environments.
- ❑ The AT-SBxPWRSYS1 DC System Power Supply has DC power connectors on its front panel and is intended for DC environments.
- ❑ The system power supplies are hot swappable. You do not have to power off the chassis to replace a power supply.

- ❑ The AT-SBxPWRSYS1 AC and AT-SBxPWRSYS2 AC System Power Supplies are compatible and can be used in the same chassis.
- ❑ AT-SBxPWRSYS2 AC System Power Supply was added to the AlliedWareNSP software in version R6.18.0.2. And while it will work with earlier releases, Allied Telesis recommends updating the software on controller cards with earlier versions to the latest release to ensure full compatibility.

---

**Note**

The AT-SBxPWRSYS1 DC System Power Supply is not compatible with the other system and PoE power supplies. It should not be operated in the same chassis with other 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.

---

Slots A and B are for the AT-SBxPWRPOE1 AC PoE Power Supply. This module provides the PoE power for the twisted pair ports on the AT-SBx31GP24 PoE Line Card. Please note the following items concerning the PoE power supply:

- ❑ PoE power supplies are installed in slots A and B of the chassis.
- ❑ You may install either one or two PoE power supplies in the chassis.
- ❑ If you are installing only one power supply, you may install it in either slot A or B.
- ❑ A single PoE power supply provides up to 1,200 watts of power for PoE. Two PoE power supplies provide up to 2,400 watts of power.
- ❑ The PoE power supply is hot swappable. You do not have to power off the chassis to replace it.
- ❑ 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 “Power Budgeting” on page 68.

---

**Note**

Power supplies are not included with the chassis and must be purchased separately.

---

**LEDs** The LEDs on the AT-SBxPWRSYS1 and AT-SBxPWRSYS2 AC System Power Supplies are described in Table 1 on page 27.

Table 1. LEDs on the AT-SBxPWRSYS1 and AT-SBxPWRSYS2 AC System Power Supplies

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 System Power Supply are described in Table 2.

Table 2. LEDs on the AT-SBxPWRSYS1 DC System 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 PoE Power Supply are described in Table 3.

Table 3. LEDs on the AT-SBxPWRPOE1 AC PoE 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-SBx31CFC960 Controller Fabric 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 8. AT-SBxFAN12 Module

**LED** The POWER LED on the AT-SBxFAN12 Module is described in Table 4.

Table 4. 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. Refer to Figure 9. The interfaces, labeled Power Supply Interface, are used by the active master control card to obtain status information from the power supplies.

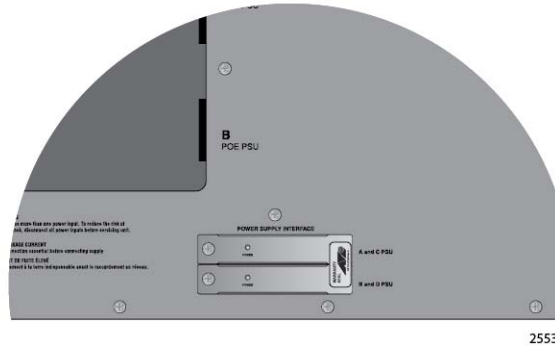


Figure 9. Power Supply Interfaces (Opto-couplers)

The active controller 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 5.

Table 5. Power Supply Interface LED

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

## Chapter 2

# Overview of the Ethernet Line Cards

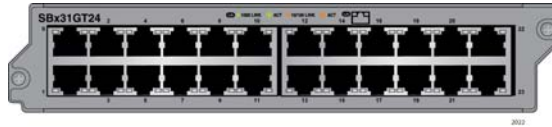
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The sections in this chapter describe the Ethernet line cards:

- ❑ “Ethernet Line Cards” on page 32
- ❑ “AT-SBx31GT24 Line Card” on page 34
- ❑ “AT-SBx31GT40 Line Card” on page 36
- ❑ “AT-SBx31GP24 PoE Line Card” on page 39
- ❑ “AT-SBx31GS24 SFP Line Card” on page 42
- ❑ “AT-SBx31GC40 Line Card” on page 44
- ❑ “AT-SBx31XZ4 XFP Line Card” on page 50
- ❑ “AT-SBx31XS6 SFP+ Line Card” on page 52
- ❑ “AT-SBx81XLEM SFP Line Card” on page 54
- ❑ “AT-SBx81XLEM/Q2 Expansion Module” on page 59
- ❑ “AT-SBx81XLEM/XS8 Expansion Module” on page 61
- ❑ “10/100/1000Base-T Twisted Pair Ports” on page 63
- ❑ “Power over Ethernet on the AT-SBx31GP24 Line Card” on page 67

## Ethernet Line Cards

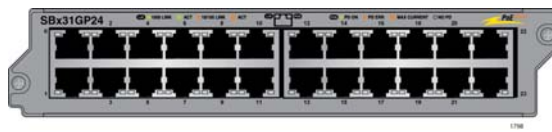
The Ethernet line cards are shown in Figure 10.



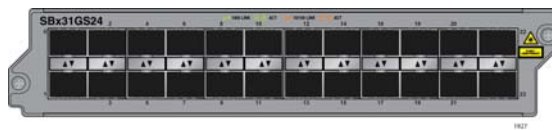
AT-SBx31GT24 Ethernet Line Card with 24 10/100/1000Base-T twisted pair ports.



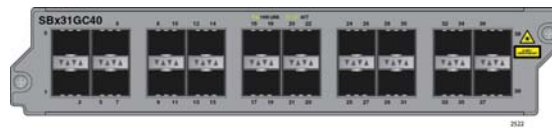
AT-SBx31GT40 Ethernet Line Card with 40 10/100/1000Base-T twisted pair ports, with RJ point 5 connectors.



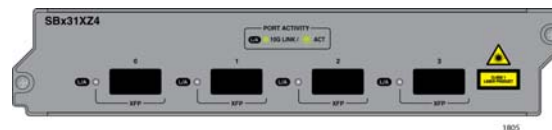
AT-SBx31GP24 Ethernet Line Card with 24 10/100/1000Base-T twisted pair ports, with PoE+.



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



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



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



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

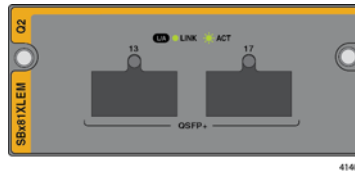


AT-SBx81XLEM SFP Ethernet Card with twelve transceiver slots for 1000Mbps, fiber optic or twisted pair SFP transceivers, and one expansion slot.

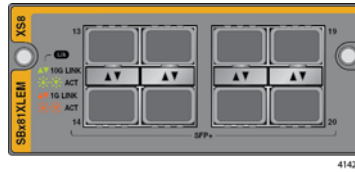
Figure 10. Ethernet Line Cards

The expansion modules for the AT-SBx81XLEM Line Card are shown in Figure 11 on page 33.





AT-SBx81XLEM/Q2 Module with two transceiver slots for 40Gbps QSFP+ transceivers or AT-QSFPCU Direct Connect Cables.



AT-SBx81XLEM/XS8 Module with eight transceiver slots for 1Gbps SFP or 10Gbps SFP+ transceivers, or AT-SP10TW Direct Connect Cables.

Figure 11. Expansion Modules for the AT-SBx81XLEM Line Card

#### Note

The AT-SBx81XLEM Line card has two additional expansion modules that are not supported in the AT-SBx3112 Chassis. They are the AT-SBx81XLEM/GT8 and AT-SBx81XLEM/XT4 modules.

Table 6 lists the types of transceivers supported by line cards with transceiver slots.

Table 6. SFP Transceiver Support

Line Card or Expansion Module	100Mbps SFP	1Gbps SFP	1Gbps CSFP BiDi	10Gbps	40Gbps
AT-SBx31GS24	Yes	Yes	No	No	No
AT-SBx31GC40	No	Yes	Yes	No	No
AT-SBx31XZ4	No	No	No	Yes <sup>a</sup>	No
AT-SBx31XS6	No	No	No	Yes <sup>b</sup>	No
AT-SBx81XLEM <sup>c</sup>	No	Yes	No	No	No
AT-SBx81XLEM/XS8	No	Yes	No	Yes	No
AT-SBx81XLEM/Q2	No	No	No	No	Yes <sup>d</sup>

a. Supports 10Gbps, fiber optic XFP transceivers.

b. Supports 10Gbps, fiber optic SFP+ transceivers or AT-SP10TW Twinax direct connect cables. The AT-SP10TW cables are available in lengths of 1, 3, and 7 meters.

c. Transceiver slots 1 to 12.

d. Supports 40Gbps AT-QSFP transceivers or AT-QSFPCU direct connect cables. The AT-QSFPCU cables are available in lengths of 1 and 3 meters.

## AT-SBx31GT24 Line Card

---

The AT-SBx31GT24 Line Card, shown in Figure 12, is a Gigabit Ethernet switch.

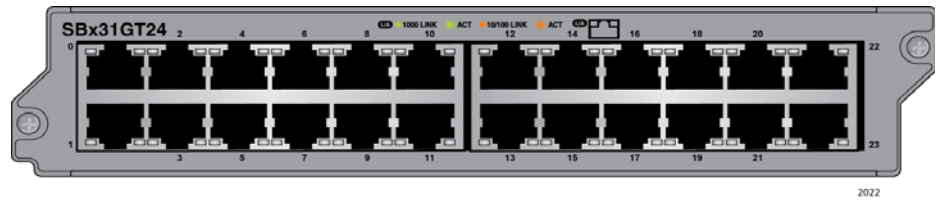


Figure 12. AT-SBx31GT24 Line Card

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-SBx31CFC960 Controller Fabric Cards
- ❑ Hot swappable

The cable requirements for the ports on the AT-SBx31GT24 Line Card are listed in Table 18 on page 64.

**LEDs** Each port on the AT-SBx31GT24 Line Card has two LEDs, but only one of them is used. The LEDs are shown in Figure 13 and described in Table 7.

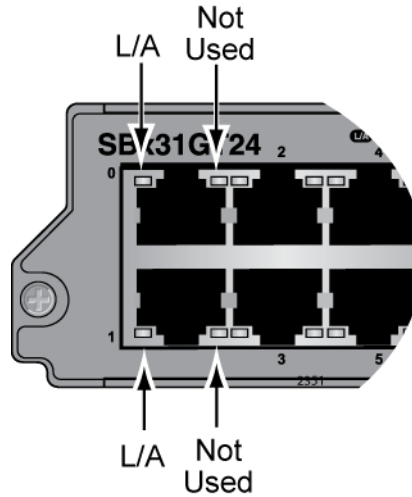


Figure 13. Port LEDs on the AT-SBx31GT24 Line Card

Table 7. 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 AT-SBx31GT40 Line Card, shown in Figure 14, is a Gigabit Ethernet switch.

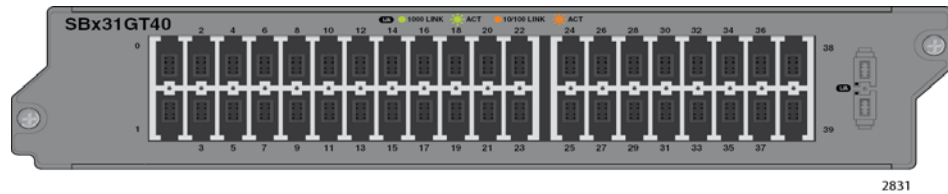


Figure 14. AT-SBx31GT40 Line Card

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-SBx31CFC960 Controller Fabric Cards
- ❑ Hot swappable

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### 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 18 on page 64.

**LEDs** 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 15.

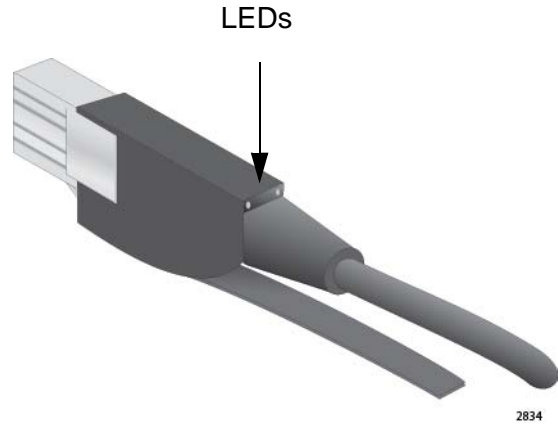


Figure 15. Port LEDs on an RJ Point 5 Cable Connector for the AT-SBx31GT40 Line Card

Only the left LED on a connector is active. Refer to Figure 16. It displays link and activity status information about a port, as described in Table 8 on page 38. The right LED is not used.

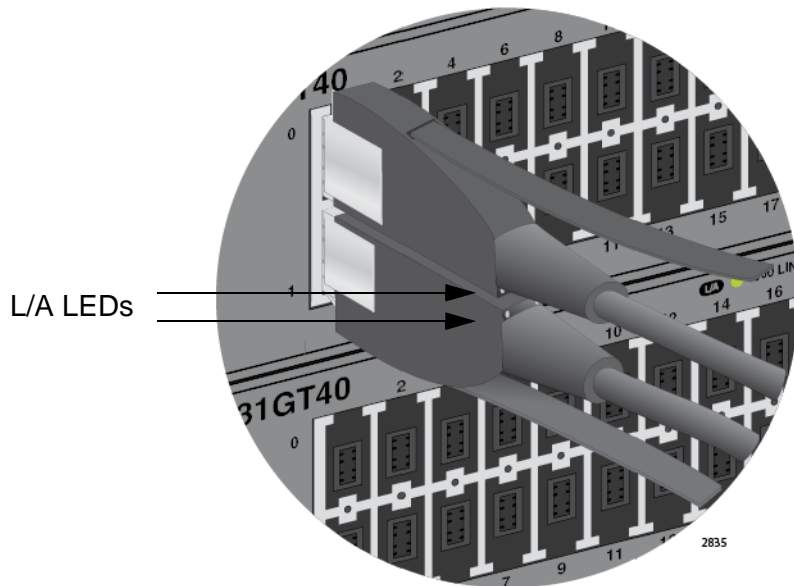


Figure 16. Link/Activity LED on an RJ Point 5 Cable Connector for the AT-SBx31GT40 Line Card

Table 8. 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 PoE Line Card

The AT-SBx31GP24 PoE Line Card, shown in Figure 17, is a Gigabit Ethernet switch with Power over Ethernet Plus (PoE+) on all the ports.

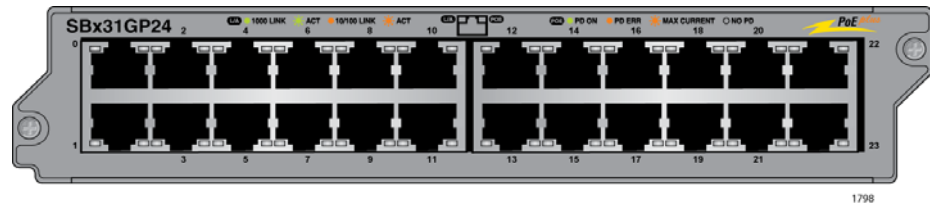


Figure 17. AT-SBx31GP24 PoE Line Card

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 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-SBx31CFC960 Controller Fabric Cards
- ❑ Hot swappable

The cable requirements of the PoE ports on the AT-SBx31GP24 Ethernet Line Card are given in Table 19 on page 65.

**LEDs** Each port on the AT-SBx31GP24 PoE Line Card has two LEDs. The LEDs are shown in Figure 18 and described in Table 9.

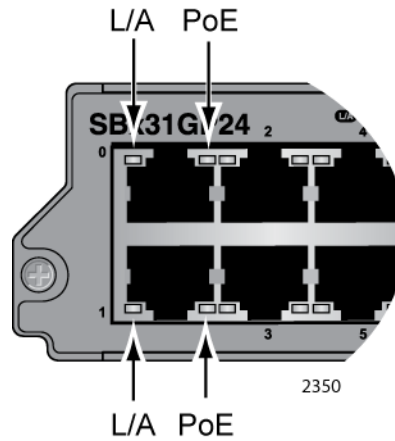


Figure 18. Port LEDs on the AT-SBx31GP24 PoE Line Card

Table 9. 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.



Table 9. Port LEDs on the AT-SBx31GP24 PoE Line Card (Continued)

LED	State	Description
PoE	Off	<p>This LED state can result from the following conditions:</p> <ul style="list-style-type: none"><li data-bbox="862 401 1354 432">❑ The port is not connected to a PD.</li><li data-bbox="862 449 1208 480">❑ The PD is powered off.</li><li data-bbox="862 497 1425 558">❑ The port is disabled in the management software.</li><li data-bbox="862 575 1268 606">❑ PoE is disabled on the port.</li><li data-bbox="862 623 1430 726">❑ The LEDs on the Ethernet line cards are turned off. To turn on the LEDs, use the eco-friendly button.</li></ul>

## AT-SBx31GS24 SFP Line Card

The AT-SBx31GS24 SFP Line Card, shown in Figure 19, is a Gigabit Ethernet switch.

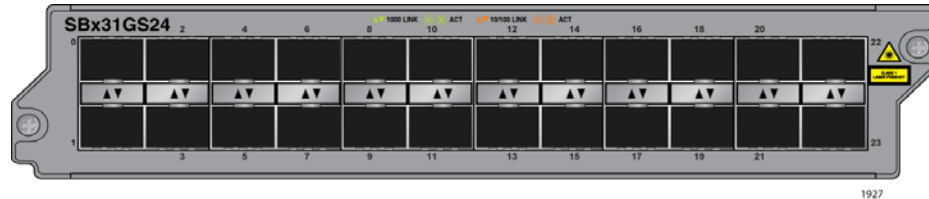


Figure 19. AT-SBx31GS24 SFP Line Card

Here are the main features of the line card:

- ❑ 24 transceiver 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-SBx31CFC960 Controller Fabric Cards.
- ❑ Hot swappable

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

**LEDs** The SFP slots on the AT-SBx31GS24 SFP Line Card have one LED each, as shown in Figure 20 on page 43 and described in Table 10 on page 43.

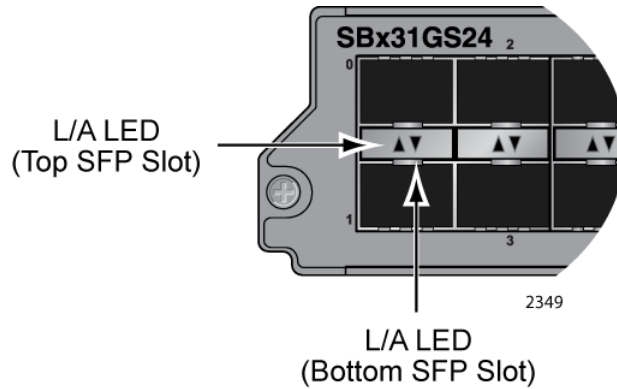


Figure 20. Port LEDs on the AT-SBx31GS24 SFP Line Card

Table 10. 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	This LED state can result from the following conditions: <ul style="list-style-type: none"> <li>❑ The transceiver slot is empty.</li> <li>❑ The SFP transceiver has not established a link to a network device.</li> <li>❑ 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

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The AT-SBx31GC40 Line Card, shown in Figure 21, is a Gigabit Ethernet switch.

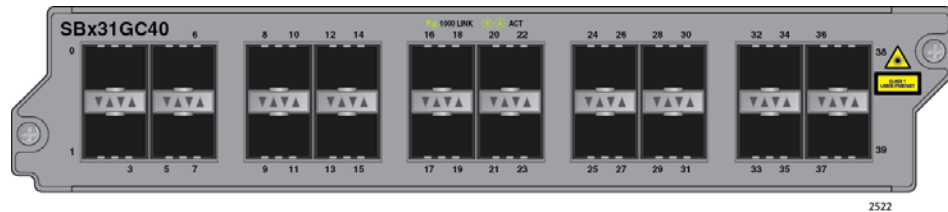


Figure 21. AT-SBx31GC40 Line Card

Here are the main features of the line card:

- ❑ Twenty transceiver 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

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### Note

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

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- ❑ 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-SBx31CFC960 Controller Fabric Cards
- ❑ Hot swappable

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**Note**

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

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The AT-SBx31GC40 Line Card has twenty transceiver 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.

**Port Numbers**

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 22 on page 46 illustrates the port numbers for the first two slots when they contain CSFP transceivers.

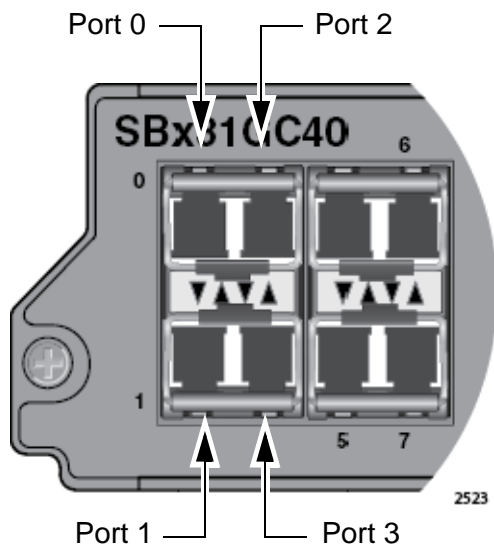


Figure 22. Port Numbers for Slots with CSFP Transceivers

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 transceiver slot in the top or bottom row of the line card. An SFP module in a transceiver 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 transceiver 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 transceiver 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 transceiver 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 transceiver slot in the bottom row is assigned the port number 3 by the switch. Port 1, the unused port number of the transceiver slot, is marked as masked by the switch and cannot be used to configure the device.

Figure 23 on page 47 illustrates the port numbers for the first four transceiver slots when they contain standard SFP transceivers.

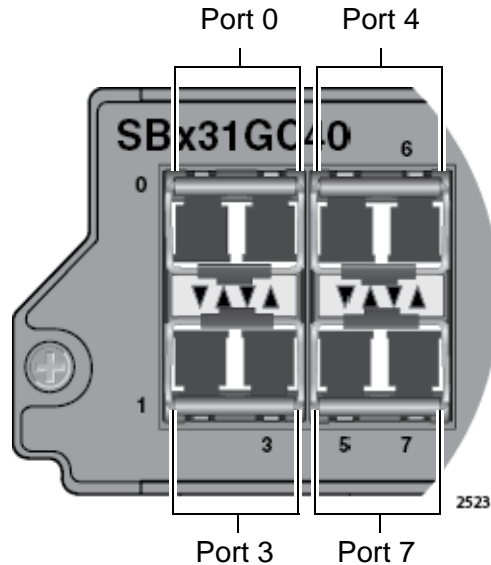


Figure 23. Port Numbers for Transceiver Slots with Standard SFP Transceivers

**LEDs** The AT-SBx31GC40 Line Card has two LEDs for each SFP 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 transceiver slot and the second and fourth LEDs are for the top transceiver slot, as shown in Figure 24.

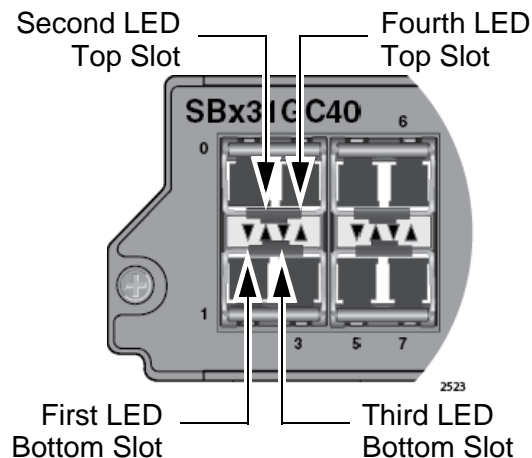


Figure 24. LEDs for the AT-SBx31GC40 Line Card

When a transceiver 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 transceiver 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 25.

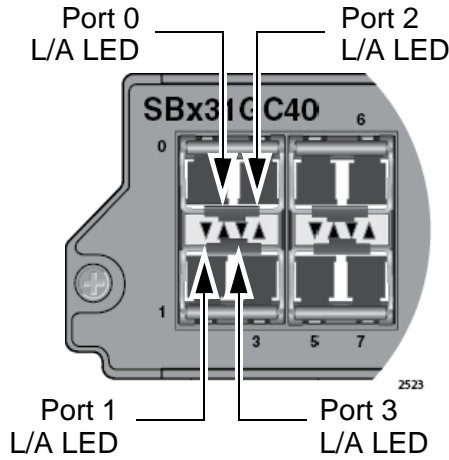


Figure 25. LEDs for the AT-SBx31GC40 Line Card, with CSFP Transceivers

When a transceiver 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 transceiver slot is in the top or bottom row. When an SFP transceiver is installed in a transceiver slot in the top row, the first LED is active and the second inactive. When an SFP transceiver is installed in a transceiver slot in the bottom row, the first LED is inactive and the second active. See Figure 26.

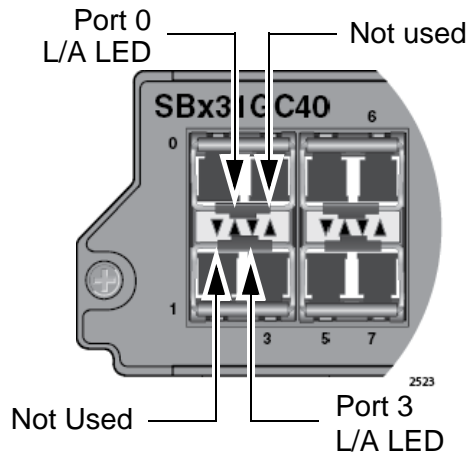


Figure 26. LEDs for the AT-SBx31GC40 Line Card, with SFP Transceivers

The LED states are described in Table 11 on page 49.



Table 11. 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	<p>This LED state can result from the following conditions:</p> <ul style="list-style-type: none"> <li>❑ The transceiver slot is empty.</li> <li>❑ The SFP transceiver or CSFP fiber port has not established a link to a network device.</li> <li>❑ The LEDs on the Ethernet line cards are turned off. To turn on the LEDs, use the eco-friendly button.</li> </ul>

## AT-SBx31XZ4 XFP Line Card

The AT-SBx31XZ4 XFP Line Card, shown in Figure 27, is a 10 Gigabit Ethernet switch.

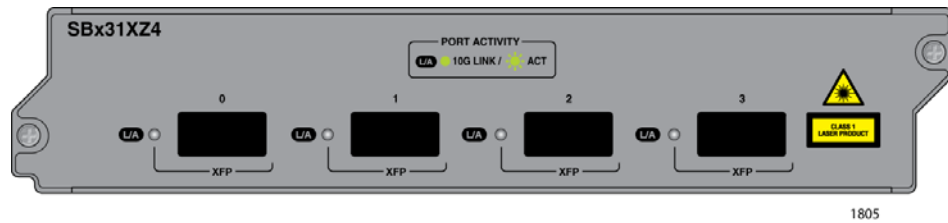


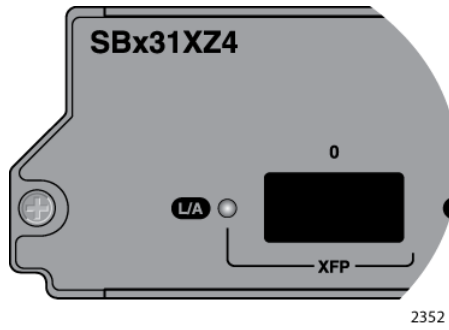
Figure 27. AT-SBx31XZ4 XFP Line Card

Here are the main features of the line card:

- ❑ Four transceiver 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-SBx31CFC960 Control Cards
- ❑ Hot swappable

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

**LEDs** Each transceiver slot on the AT-SBx31XZ4 XFP Line Card has one LED. The LED is shown in Figure 28 on page 51 and described in Table 12 on page 51.



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

Table 12. 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 SFP+ Line Card

The AT-SBx31XS6 Line Card, shown in Figure 29, is a 10 Gigabit Ethernet switch.

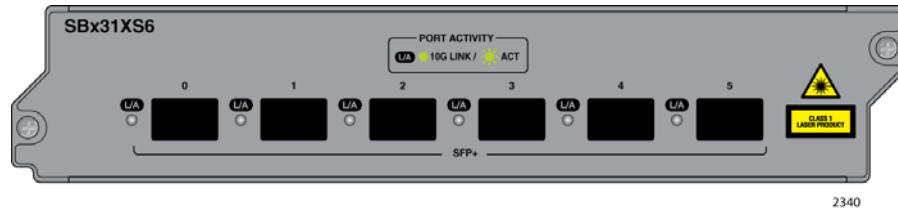


Figure 29. AT-SBx31XS6 Line Card

Here are the main features of the line card:

- ❑ Six transceiver 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.

**LEDs** The AT-SBx31XS6 Line Card has one LED for each SFP+ slot. The LED is shown in Figure 30 on page 53 and described in Table 13 on page 53.

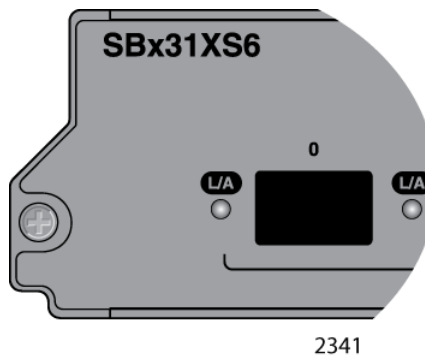


Figure 30. SFP+ Slot LEDs on the AT-SBx31XS6 Line Card

Table 13. SFP+ Slot LEDs on the AT-SBx31XS6 Line Card

LED	State	Description
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-SBx81XLEM SFP Line Card

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The AT-SBx81XLEM SFP Line Card, shown in Figure 31, is a Gigabit Ethernet switch with a slot for an expansion module.

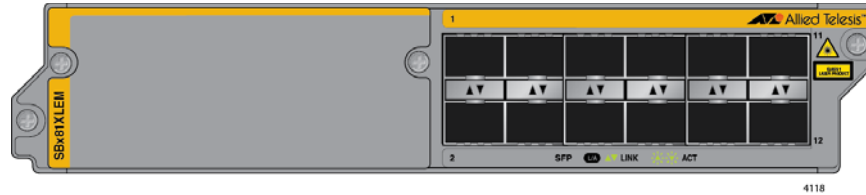


Figure 31. AT-SBx81XLEM SFP Line Card

Here are the main features of the line card:

- Twelve transceiver slots for small form-factor pluggable (SFP) transceivers
- Supports 1000Base-SX/LX fiber optic transceivers
- Supports 1000Base-BX bidirectional (BiDi) fiber optic transceivers
- Supports 1000Base-T twisted pair transceivers (full-duplex mode only)
- One slot for an expansion module
- Port Link/Activity (L/A) LEDs
- 128K entry MAC address table
- 32 Mb buffer memory
- Jumbo frame support up to 10240 bytes
- Hot swappable

For a list of supported transceivers, refer to the SwitchBlade x3100 product sheet on the Allied Telesis web site.

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**Note**

The AT-SBx81XLEM SFP Line Card is hot swappable. However, installing, removing, or replacing an expansion module requires removing the line card from the chassis.

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**Note**

The twelve SFP slots do not support 10 or 100Mbps transceivers.

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The AT-SBx81XLEM Line Card and its expansion modules are members of the SwitchBlade x8100 product line. They are supported in the AT-SBx3112 Chassis with AlliedWareNSP R6.21.0.0 or later management software. The card functions as an independent switch in the chassis

while forwarding tagged and untagged VLAN traffic over the backplane to other line cards.

## Management Controller Cards

The AT-SBx81XLEM Line Card is supported with the AT-SBx31CFC960 Controller Fabric Card, with AlliedWareNSP R6.21.0.0 or later management software. It is not supported with the AT-SBx31CFC Controller Card.

## Chassis Slots

The AT-SBx81XLEM Line Card is supported in all ten line card slots in the AT-SBx3112 Chassis. (The line card slots are identified in Figure 5 on page 23.) The maximum possible backplane bandwidth of the card depends on the line card slot in which it is installed and the number of controller cards in the chassis. Table 14 lists the maximum possible backplane bandwidths of the line card slots for the card.

Table 14. Backplane Bandwidths of the AT-SBx81XLEM Line Card

Line Card Slot	Backplane Bandwidth with One Controller Card	Backplane Bandwidth with Two Controller Cards
0	40Gbps	80Gbps
1	40Gbps	80Gbps
2	40Gbps	80Gbps
3	40Gbps	80Gbps
6	20Gbps	40Gbps
7	40Gbps	80Gbps
8	20Gbps	40Gbps
9	40Gbps	80Gbps
10	20Gbps	40Gbps
11	20Gbps	40Gbps

### Note

The table applies only to the AT-SBx81XLEM Line Card. The SwitchBlade x3100 line cards have a backplane bandwidth of 20Gbps with one controller card or 40Gbps with two controller cards, regardless of the line card slots in which they are installed.

## Expansion Modules

Here are the expansion modules for the AT-SBx81XLEM Line Card:

- ❑ AT-SBx81XLEM/Q2 Module - Features two slots for 40Gbps QSFP+ transceivers or AT-QSFPCU Direct Connect Cables.
- ❑ AT-SBx81XLEM/XS8 Module - Features eight slots for 1Gbps SFP or 10Gbps SFP+ transceivers, or AT-SP10TW Direct Connect Cables.

## Management Software Load File

The AT-SBx81XLEM Line Card and SwitchBlade x3100 product line use different management software. The AT-SBx81XLEM Line Card uses AlliedWare Plus software while the SwitchBlade x3100 controller and line cards use AlliedWareNSP software. An AlliedWare Plus load file is available for the card when it is used in a SwitchBlade x3100 chassis. You have to install the load file in the file system on the AT-SBx31CFC960 Controller Card and specify it as the preferred load file for the card with the SET CARD PREFLOAD command. For instructions, refer to Chapter 11, “Configuring the AT-SBx81XLEM Card” on page 235.

## Card Management

The AT-SBx81XLEM Line Card functions as an independent switch in the chassis and has to be managed separately from other cards. If the chassis has multiple AT-SBx81XLEM Line Cards, each one has to be managed separately.

There are two ways to access the AlliedWare Plus management software on the card. One method is to use the TELNET CARD command from a management session of the AT-SBx31CFC960 Controller Card. The command allows you to access the AlliedWare Plus management software on the card with the Telnet protocol over the backplane in the chassis. When entering the command you have to specify the chassis slot number of the card you want to manage. You can manage only one card at a time.

After entering the command you have to log on to the card using its AlliedWare Plus username and password. The default values are “manager” and “friend”, respectively. The username and password are case-sensitive.

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### Note

The initial management session of the card must be performed with the TELNET CARD command from a local or remote management session of the chassis. For instructions, refer to “Starting a Management Session on the AT-SBx81XLEM Line Card” on page 246.

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You can also manage the card directly by assigning it an IP address and using the Secure Shell (SSH) protocol or SNMP from a management workstation on your network. (Remote Telnet management is not supported.)



The initial management session of the AT-SBx81XLEM Line Card has to be conducted with the TELNET CARD command from a management session of the AT-SBx31CFC960 Controller Card. You can perform SSH or SNMP management on the card after assigning it an IP address.

## **Backplane Static Trunk**

The AT-SBx81XLEM Line Card has four logical ports to forward and receive traffic over the backplane from the other cards in the chassis. The ports are numbered 1.0.21 to 1.0.24. The ports have the same numbers regardless of the card slot or the number of cards in the chassis.

The ports are automatically grouped into a static port trunk named “sa1”. You cannot delete the trunk or add or remove ports from it. However, you can configure it with the AlliedWare Plus commands, such as adding VLANs to it, just as if it were a trunk of ports on the front panel.

Unlike the SwitchBlade x3100 Ethernet Line Cards, which, by default, forward tagged and untagged VLAN over the backplane in the chassis to other cards, the AT-SBx81XLEM Card initially forwards only untagged packets. To configure the card to forward tagged VLAN packets over the backplane, you have to add the necessary VLANs to the card and assign the VLANs to the backplane “sa1” trunk. This is accomplished with the commands in the AlliedWare Plus management software on the card. The procedure for this is explained in “Adding VLANs to the Backplane Trunks on AT-SBx81XLEM Cards” on page 248.

The AT-SBx31CFC960 Controller Card also has backplane trunks that you have to configure for the AT-SBx81XLEM Line Card, as well. This is performed with AlliedWareNSP commands, as explained in “Adding VLANs to the Backplane Trunks on AT-SBx31CFC960 Controller Cards” on page 251.

## **Port Numbering**

Here is the port numbering format to use when configuring the transceiver slots on the front panel of the card, with AlliedWare Plus commands:

```
port1.0.n
```

The variable N is a transceiver slot number. The prefix is always “port1.0”. It should be noted that the ports on the AT-SBx81XLEM Line Card start with “1” while the ports on SwitchBlade x3100 Ethernet line cards start with “0.”

## **Large Address Table Modes**

The AT-SBx81XLEM Line Card has a large address table mode when installed in an SwitchBlade x8100 Chassis. The large address table mode of the card is not supported in the SwitchBlade x3100 Chassis.

## **LEDs**

Each SFP slot on the AT-SBx81XLEM Line Card has one LED. The LED is shown in Figure 32 on page 58 and described in Table 15 on page 58.

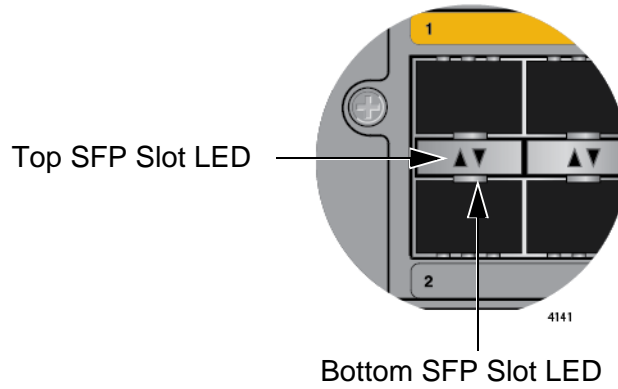


Figure 32. Port LEDs for the SFP Slots on the AT-SBx81XLEM Line Card

Table 15. SFP Slot LEDs on the AT-SBx81XLEM Line Card

LED State	Description
Solid Green	The SFP transceiver in the slot has established a 1000 Mbps link to a network device.
Blinking Green	The transceiver is transmitting and/or receiving data at 1000 Mbps.
Off	The slot is empty or the transceiver has not established a link to a network device.

## AT-SBx81XLEM/Q2 Expansion Module

The AT-SBx81XLEM/Q2 Module, shown in Figure 33, is an expansion module for the AT-SBx81XLEM Line Card. It installs in the slot in the card.

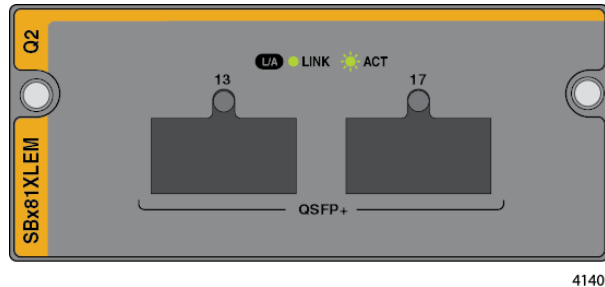


Figure 33. AT-SBx81XLEM/Q2 Expansion Module

The features of the module are listed here:

- Two transceiver slots for 40 Gbps QSFP+ transceivers
- Supports AT-QSFPSR, AT-QSFPSR4, and AT-QSFPLR4 transceivers
- Supports AT-QSFP1CU and AT-QSFP3CU direct connect cables
- Port Link/Activity (L/A) LEDs
- Jumbo frame support up to 10240 bytes

### Note

The AT-SBx81XLEM/Q2 Module supports revision B of the AT-QSFPSR4 transceiver. It does not support revision A. The revision level of the transceiver is printed on the transceiver label, after the serial number. You can also display it with the `SHOW SYSTEM PLUGGABLE DETAIL` command in the AlliedWare Plus operating system.

For a list of supported transceivers, refer to the SwitchBlade x8100 data sheet on the Allied Telesis web site.

**LED** Each transceiver slot has one LED. The states of the LED are described in Table 16.

Table 16. QSFP+ Slot LEDs for the AT-SBx81XLEM/Q2 Expansion Module

LED State	Description
Solid Green	The QSFP+ transceiver in the slot has established a 40 Gbps link to a network device.

Table 16. QSFP+ Slot LEDs for the AT-SBx81XLEM/Q2 Expansion Module (Continued)

LED State	Description
Blinking Green	The transceiver is transmitting and/or receiving data.
Off	The slot is empty or the transceiver has not established a link to a network device.

---

**Note**

The AT-SBx81XLEM/Q2 Module does not support 40G DAC auto-negotiation. Allied Telesis recommends disabling auto-negotiation on transceiver link partners to ensure proper operation.

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## AT-SBx81XLEM/XS8 Expansion Module

The AT-SBx81XLEM/XS8 Module is another expansion module for the AT-SBx81XLEM Line Card. Refer to Figure 34.

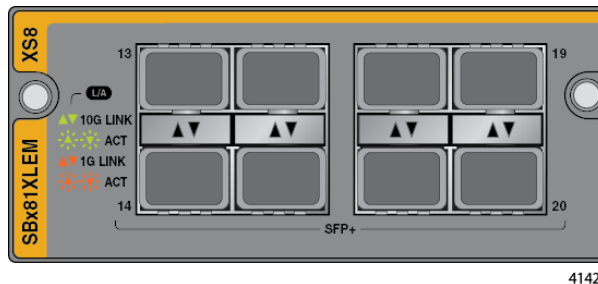


Figure 34. AT-SBx81XLEM/XS8 Expansion Module

The main features of the module are listed here:

- Eight transceiver slots for 1Gbps SFP or 10Gbps SFP+ transceivers
- Supports 10GBase-SR/LR fiber optic transceivers
- Supports AT-SP10TW direct connect twinax cables with SFP+ transceiver-style connectors
- Supports 1000Base-SX/LX fiber optic transceivers
- Supports 1000Base-BX bidirectional (BiDi) fiber optic transceivers
- Supports 1000Base-T twisted pair transceivers (full-duplex mode only)
- Port Link/Activity (L/A) LEDs
- Jumbo frame support up to 10240 bytes

For a list of supported transceivers, refer to the SwitchBlade x8100 data sheet on the Allied Telesis web site.

**LED** Each transceiver slot has one LED. The LED states are defined in Table 17.

Table 17. Slot LEDs on the AT-SBx81XLEM/XS8 Module

LED State	Description
Solid Amber	The SFP transceiver in the slot has established a 1Gbps link to a network device.
Blinking Amber	The transceiver is transmitting and/or receiving data at 1Gbps.

Table 17. Slot LEDs on the AT-SBx81XLEM/XS8 Module (Continued)

<b>LED State</b>	<b>Description</b>
Solid Green	The transceiver in the slot has established a 10Gbps link to a network device.
Blinking Green	The transceiver is transmitting and/or receiving data at 10Gbps.
Off	The slot is empty or the transceiver has not established a link to a network device.

## 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 334.

**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 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.

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**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 management software.

---

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**Note**

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

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**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 18.

Table 18. 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 19 on page 65.



Table 19. 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 48 on page 334 for the port pinouts of twisted-pair ports that operate at 10 or 100 Mbps in the MDI configuration and Table 49 on page 334 for the MDI-X configuration. For port pinouts when a twisted-pair port operates at 1000 Mbps, refer to Table 50 on page 335.

## 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 20. The AT-SBx31GP24 Line Card supports all five classes.

Table 20. 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 source for the PoE feature on the ports of the AT-SBx31GP24 Line Cards is the AT-SBxPWRPOE1 AC PoE Power Supply. The chassis can have two PoE power supplies. The AT-SBxPWRPOE1 AC PoE Power Supply has a power budget of 1200 watts for powered devices. Consequently, the chassis has a power budget of 1200 watts with one power supply and 2400 watts with two power supplies.

The number of powered devices the chassis can support at one time depends on the number of AT-SBxPWRPOE1 AC PoE Power Supplies in the chassis and the power requirements of the powered devices in your network. Table 21 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.

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### Note

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

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Table 21. 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.



## Chapter 3

# Overview of the AT-SBx31CFC960 Controller Fabric Card

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The sections in this chapter describe the AT-SBx31CFC960 Controller Fabric Card:

- ❑ “Controller Fabric Cards for the AT-SBx3112 Chassis” on page 72
- ❑ “Hardware Components on the AT-SBx31CFC960 Card” on page 74
- ❑ “Guidelines” on page 76
- ❑ “Dual Controller Cards” on page 78
- ❑ “SYS Status LEDs” on page 79
- ❑ “eco-friendly Button” on page 80
- ❑ “SBx Linecard Status LEDs” on page 81
- ❑ “SFP+ Transceiver Slots” on page 82
- ❑ “Console (RS-232) Port” on page 83
- ❑ “NET MGMT Port” on page 84
- ❑ “USB Port” on page 87
- ❑ “Reset Button” on page 88
- ❑ “Release Activation and Feature Licenses” on page 90

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### **Note**

For instructions on how to upgrade an operational chassis to the AT-SBx31CFC960 Controller Fabric Card from the older AT-SBx31CFC Card, refer to Chapter 12, “Upgrading to the AT-SBx31CFC960 Card from the AT-SBx31CFC Card” on page 255.

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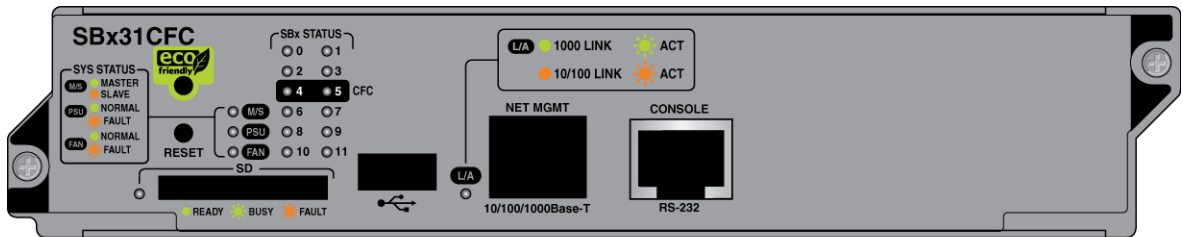
## Controller Fabric Cards for the AT-SBx3112 Chassis

There are two controller fabric cards for the AT-SBx3112 Chassis. The cards are listed here:

- ❑ AT-SBx31CFC Card
- ❑ AT-SBx31CFC960 Card

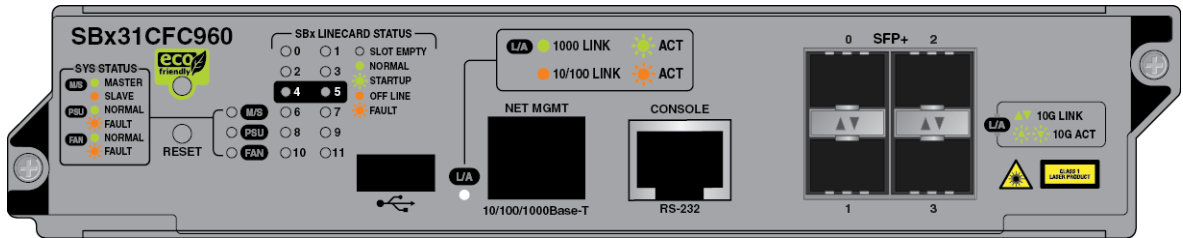
The controller fabric cards are shown in Figure 35.

AT-SBx31CFC Controller Fabric Card



1815

AT-SBx31CFC960 Controller Fabric Card



3149

Figure 35. Controller Fabric Cards for the AT-SBx3112 Chassis

The main differences between the two cards are listed in Table 22.

Table 22. Differences Between the AT-SBx31CFC and AT-SBx31CFC960 Controller Fabric Cards

Component	Description
SFP+ Transceiver Slots	The AT-SBx31CFC960 Card has four SFP+ transceiver slots. You can use the transceiver slots to add four additional networking ports to the chassis. The AT-SBx31CFC Card does not have SFP+ transceiver slots.



Table 22. Differences Between the AT-SBx31CFC and AT-SBx31CFC960 Controller Fabric Cards (Continued)

Component	Description
SD slot	The AT-SBx31CFC Card has an SD slot for storing system files on flash memory cards. The AT-SBx31CFC960 Card does not have an SD slot.
USB port	Both cards have USB ports. However, only the USB port on the AT-SBx31CFC960 Card is functional. You may use it to store system files on flash drives. The USB port on the AT-SBx31CFC Card is not functional at this time.

This manual describes the AT-SBx31CFC960 Controller Fabric Card, For information on the AT-SBx31CFC Card, refer to the *AT-SBx3112 Chassis Switch and AT-SBx31CFC Card Installation Guide*.

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**Note**

You may not install both types of controller cards in the same chassis. When installing two controller cards in a chassis, be sure both cards are the same type.

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## Hardware Components on the AT-SBx31CFC960 Card

The hardware components on the faceplate of the AT-SBx31CFC960 Controller Fabric Card are identified in Figure 36 and briefly described in Table 23.

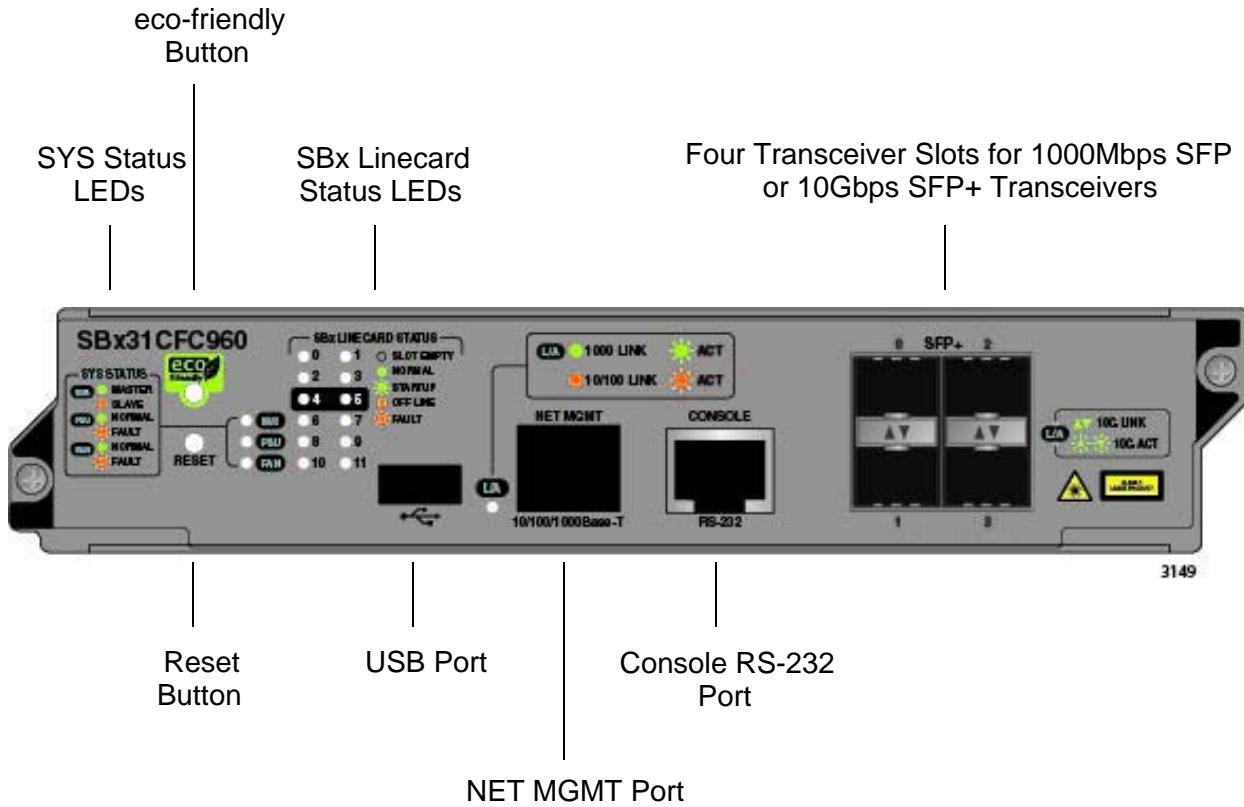


Figure 36. AT-SBx31CFC960 Controller Fabric Card

Table 23. Components on the AT-SBx31CFC960 Controller Fabric Card

Component	Description
SYS Status LEDs	Displays general status information about the controller card, power supplies, and fan module. For more information, refer to “SYS Status LEDs” on page 79.
eco-friendly Button	Turns the LEDs on and off. For more information, refer to “eco-friendly Button” on page 80.

Table 23. Components on the AT-SBx31CFC960 Controller Fabric Card

<b>Component</b>	<b>Description</b>
SBx Linecard Status LEDs	Displays general information about the controller and Ethernet line cards. For more information, refer to “SBx Linecard Status LEDs” on page 81.
Four transceiver slots for 1000Mbps SFP or 10Gbps SFP+ Transceivers	Supports 1000Mbps SFP or 10Gbps SFP+ transceivers. The transceivers, which have to be ordered separately, function as uplink ports for the Ethernet line cards in the chassis. For a list of supported transceivers, refer to the Allied Telesis web site. (The “SFP+” label above the transceiver slots on the front panel of the controller card is meant to indicate support for both 1000Mbps SFP and 10Gbps SFP+ transceivers.)
Console RS-232 Port	Provides local management of the switch, which does not require an IP address configuration. For more information, refer to “Console (RS-232) Port” on page 83.
NET MGMT Port	Provides the controller card with access to your network for remote Telnet or SNMP management and other management functions. For more information, refer to “NET MGMT Port” on page 84.
USB Port	Used with a USB flash memory drive for management functions, such as storing backup copies of the switch configuration and transferring configurations between switches. For more information, refer to “USB Port” on page 87.
Reset Button	Resets the controller and Ethernet line cards. For more information, refer to “Reset Button” on page 88.

## Guidelines

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Here are a few of the functions of the controller card:

- ❑ Chassis management — The controller card is used to manage the Ethernet line cards. You may manage the chassis locally through the Console RS-232 port on the controller card or remotely using Telnet, Secure Shell (SSH), and SNMP clients from workstations on your network.
- ❑ Management software — The controller card stores the AlliedWareNSP Management Software for itself as well as for the Ethernet line cards, and downloads the firmware to the cards over the backplane in the chassis when the chassis is powered on or reset, as part of the initialization process.
- ❑ Configuration settings — The controller card also maintains a configuration database in which it stores its own settings as well as the settings of the Ethernet line cards. When a change is made to a configuration setting on a line card, the controller card transmits the change over the backplane to the appropriate line card and updates its configuration database. The database is retained even when the chassis is powered off because controller card stores it in nonvolatile memory. You may download the database to a management workstation or network server to maintain a history of configurations or to transfer a configuration to multiple chassis.
- ❑ Backplane management — The controller card manages the backplane in the chassis, which the line cards use to forward traffic to each other when the ingress and egress ports of packets are located on different cards. The bandwidth of the backplane depends on the number of controller cards in the chassis. The chassis has 20Gbps per line card slot of backplane bandwidth when the chassis has one controller card and 40Gbps per slot with two controller cards.

Here are the guidelines to the controller card:

- ❑ The chassis must have at least one controller card. The line cards do not forward traffic without at least one controller card in the chassis.
- ❑ The chassis may have either one or two controller cards.
- ❑ Two controller cards are recommended for redundancy and to increase the per slot backplane bandwidth from 20 to 40Gbps.
- ❑ Controller cards are installed in chassis slots 4 and 5.

Here are other features of the 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.
- ❑ USB port for data storage and retrieval.
- ❑ Console RS-232 for local management.
- ❑ NET MGMT port and inband interface for remote Telnet, SSH, or SNMP management.
- ❑ Hot swappable.

## Dual Controller Cards

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You may install either one or two controller cards in the chassis. Here are the advantages to having two controller cards in the chassis.

- ❑ Having a second controller card improves the performance of the chassis by increasing the backplane bandwidth for the Ethernet line cards. The backplane bandwidth is increased from 20Gbps per line card slot with one controller card to 40Gbps per slot with two controller cards.
- ❑ Installing a second controller card adds redundancy. If a controller card fails in the chassis, the second card enables the Ethernet line cards to maintain network operations.
- ❑ You may use the SFP+ transceiver slots on both controller cards to add uplink transceivers for the Ethernet line cards to the network.

Here are the guidelines to dual controller cards:

- ❑ One card operates as the active master card and the other as the inactive master card. You can determine the state of a controller card by the M/S LED. For information, refer to “SYS Status LEDs” on page 79.
- ❑ The controller cards automatically determine their states when the chassis is powered on or reset. The card that boots up first is designated as the active master card. If both cards boot up at the same time, the card in chassis slot 4 is designated as the active master card.
- ❑ All management sessions have to be conducted through the active controller card.
- ❑ To establish a local management session, you have to use the Console RS-232 port on the active controller card.
- ❑ When the chassis is powered on or reset, the two controller cards perform an initialization process, part of which involves the inactive card synchronizing its management files with the active card. During this phase of the initialization process, which may take several minutes, the inactive card does not participate with the active card in forwarding traffic over the backplane and its SFP+ transceiver slots are nonfunctional. After the inactive card has finished the initialization process, it joins with the active card in forwarding traffic on the backplane and activates its SFP+ transceiver slots. For more information, refer to “Monitoring the Initialization Process” on page 218.

## SYS Status LEDs

The SYS (System) Status LEDs on the AT-SBx31CFC960 Controller Fabric Card display general status information about the card, power supplies, and fan module. The LEDs are defined in Table 24.

Table 24. SYS (System) Status LEDs

LED	State	Description
M/S	Solid Green	Indicates that the AT-SBx31CFC960 Controller Fabric Card is the active master controller card in the chassis.
	Solid Amber	Indicates that the controller card is the inactive master card or was disabled with the management software.
	Flashing Amber	Indicates that the controller card is initializing its management software or synchronizing its database with the active master card.
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. A fan is operating below the normal operating range or has stopped.

## **eco-friendly Button**

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The eco-friendly button on the controller card is used to turn the LEDs on or off and test the LEDs. You may turn off the LEDs to conserve electricity when you are not using them to monitor the controller and Ethernet line cards. 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 the LEDs on the ports on the Ethernet line cards and the LEDs on the controller 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.



## SBx Linecard Status LEDs

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The SBx Linecard Status LEDs display general status information about the controller and Ethernet line cards. There is one LED for each chassis slot. If the chassis has two controller cards, the SBx Linecard Status LEDs are active on both cards. The states of the LEDs are defined in Table 25.

Table 25. SBx Linecard Status LEDs

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

## SFP+ Transceiver Slots

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The four SFP+ transceiver slots on the front panel of the controller card support 1000Mbps SFP or 10Gbps SFP+ transceivers. The transceiver slots can be used to add high speed uplink ports to the chassis. A list of supported transceivers is available from the Allied Telesis web site.

The SFP+ transceiver slots operate independently of the active or inactive state of a controller card. The inactive controller card in a chassis with two controller cards forwards traffic on its SFP+ transceiver slots just like the active controller card. Consequently, a chassis with two controller cards has eight active SFP+ transceiver slots.

Each SFP+ transceiver slot has one LED. The states of the LED are described in Table 26.

Table 26. LEDs for the SFP+ Transceiver Slots on the AT-SBx31CFC960 Controller Card

LED	State	Description
L/A	Solid Green	The transceiver has established a 10Gbps link with a network device.
	Flashing Green	The transceiver is transmitting or receiving data at 10Gbps.
	Solid Amber	The transceiver has established a 1000Mbps link with a network device.
	Flashing Amber	The transceiver is transmitting or receiving data at 1000Mbps.
	Off	The transceiver slot is empty or the transceiver has not established a link with a network device.

## Console (RS-232) Port

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The Console Port on the front panel of the controller card 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, you do not have to assign an Internet Protocol (IP) address to the AT-SBx31CFC960 Controller Fabric Card for this type of management.

For instructions on how to start a local management session, refer to “Using Local Management to Verify the Chassis” on page 226 or the *Software Reference for SwitchBlade x3100 Series Switches*.

## NET MGMT Port

---

You have to provide the controller card with access to your network if it is to perform any of the management features in Table 27. There are two ways you can do this. One way is by connecting the NET MGMT port on the front panel of the controller card to a switch or router on your network. Another way is by configuring the in-band interface. 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 in-band interface to provide the controller card with access to your network, but you may not configure both. The default is the NET MGMT port. For instructions on how to configure the NET MGMT port and inband interface, refer to the Software Reference for SwitchBlade x3100 Series Switches.

Table 27. Management Features Requiring Network Access

Feature	Description
Ping	Used to test for network connectivity to the chassis.
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 27. Management Features Requiring Network Access (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 18 on page 64. For the port pinouts, refer to “Port Pinouts” on page 334.

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 must 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  
Port LED**

The Network Management (NET MGMT) port on the AT-SBx31CFC960 Controller Fabric Card has one Status LED. The states of the LED are described in Table 28.

Table 28. 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.

## USB Port

---

The USB port is used for the following management functions:

- ❑ Store backup copies of the master configuration and database files on the AT-SBx31CFC960 Controller Fabric Card to a USB flash memory drive.
- ❑ Transfer configuration files between controller cards in different chassis that are to have similar configurations.
- ❑ Transfer application load files between controller cards.
- ❑ Store streaming log files.

A USB flash memory drive is optional. The AT-SBx31CFC960 Controller Fabric Card can operate without a flash drive.

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

## Reset Button

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You may use the Reset button to reset either the controller card or all of the cards in the chassis. The action depends on the number of AT-SBx31CFC960 Controller Fabric Cards in the chassis and, if the chassis has two controller 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 controller card, pressing the Reset button resets the controller card and all the Ethernet line cards in the chassis. You may perform this function if the chassis and line cards are experiencing a problem.



### Caution

The controller 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 controller cards, pressing the Reset button on the active master card resets the controller card, but not the Ethernet line cards. The inactive master controller card immediately becomes the new active master card and the Ethernet line cards continue to forward traffic. The reset controller 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 backplane bandwidth for each line card chassis slot is reduced from 40 to 20 Gbps for about two minutes while the reset controller card initializes its management software. This may reduce network performance.

---

If you want the active and inactive master controller 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 controller cards, pressing the Reset button on the inactive master controller card resets that card, but not the active master controller card or the Ethernet line cards.



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**Note**

The available backplane bandwidth for each line card chassis slot is reduced from 40 to 20 Gbps for about two minutes while the reset controller card initializes its management software. This may reduce network performance.

---

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**Note**

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

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## Release Activation and Feature Licenses

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The AT-SBx31CFC960 Card uses two types of software licenses:

- ❑ Release activation licenses
- ❑ Feature licenses

A release activation license applies to the AlliedWareNSP management software on the controller card. It unlocks the features on the controller and Ethernet line cards. Without a license, the controller and line cards still forward network traffic, but many features remain locked and are not functional. Here are the general guidelines to release activation licenses:

- ❑ Factory-shipped controller cards do not need release activation licenses because their AlliedWareNSP management software are already activated.
- ❑ New release activation licenses are not required for minor releases of the management software. For instance, a controller card would not need a new license if you upgraded the management software from 6.18.0 to 6.18.1.
- ❑ Major releases, such as from version 6.18.0 to 6.19.0, do require new release activation licenses for the controller card.
- ❑ When there are two controller cards in a chassis, each card must have its own license.
- ❑ Ethernet line cards do not have release activation licenses.

Some features on the switch may have their own separate licenses. The features are locked and cannot be configured until the appropriate licenses are installed on the controller cards.

Release activation and feature licenses are available from the Allied Telesis web site. For further information, refer to the *Software Reference for SwitchBlade x3100 Series Switches*.

## Chapter 4

# Safety Precautions and Site Preparation

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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 92
- ❑ “Selecting a Site for the SwitchBlade x3112” on page 96
- ❑ “Installation Tools and Material” on page 98


## Reviewing Safety Precautions

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

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### 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/services-and-support>.

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### Warning


Class 1 Laser product.  L1

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### Warning


Do not stare into the laser beam.  L2

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### 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

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### Warning


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

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### Warning


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

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---


### 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

---


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**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. *ES* E25

---



**Warning**

Remove all metal jewelry, such as rings and watches, before installing or removing a line card from a powered-on chassis. *ES* 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. *ES* 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. *ES* E30

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---

**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>). *ES* 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. *ES* 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). *ES* 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. ⚡ E41

---



**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

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Please perform the following procedure to determine the suitability of the site for the chassis:

1. Check that the equipment rack is safely secured so that it will not tip over. You should install devices starting at the bottom of the rack, with the heavier devices near the bottom.
2. Verify that the power outlets for the chassis are located near the unit and are easily accessible.
3. Verify that the power sources are on different A/C circuits to protect the unit from a power circuit failure.
4. Verify that the site has dedicated power circuits or power conditioners to supply reliable electrical power to the network devices.
5. Verify that the site allows for 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.
6. Verify that the site allows for adequate air flow around the unit and through the cooling vents. The ventilation direction for the main section of the chassis is from left to right (when facing the front of the chassis), with the fan module drawing air out of the chassis. The power supplies have fans that draw air from the front to the back.
7. Verify that the site has a reliable and earth (grounded) power supply source, preferably dedicated and filtered.
8. Verify that the twisted pair cabling is not exposed to sources of electrical noise, such as radio transmitters, broadband amplifiers, power lines, electric motors, and fluorescent fixtures.
9. Verify that the site protects the chassis from moisture, water, and dust.

Here are other guidelines to consider:

- Switch ports are suitable for intra-building connections, or where non-exposed cabling is required.
- Do not place objects on top of the chassis.
- 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 37 on page 97.



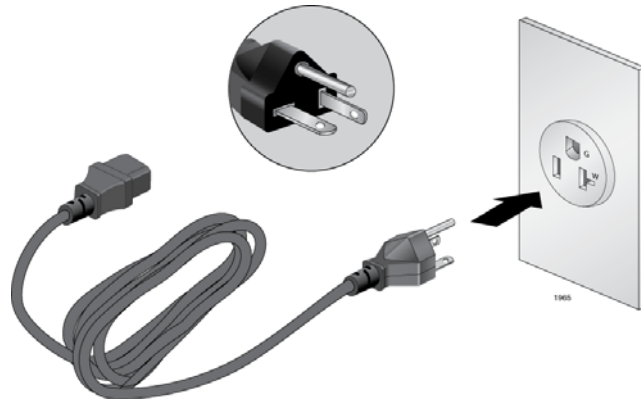


Figure 37. 100 - 125 VAC 125 V NEMA 5-20 Plug and Receptacle

## Installation Tools and Material

---

Here are lists of the tools and material you need to supply to install the product:

Here are the items for installing the chassis in an equipment rack:

- #2 Phillips-head screwdriver
- Six equipment rack screws
- Flat-head screwdriver
- #2 Phillips-head 10 inch-lbs torque screwdriver (optional)

Here are the items for installing the grounding wire:

- #2 Phillips-head screwdriver
- Crimping tool (not provided)
- 10 AWG stranded grounding wire
- #2 Phillips-head 20 inch-lbs torque screwdriver (optional)

Here are the items for installing the AT-SBxPWRSYS1 DC Power Supply:

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

Here are the items for installing the AT-SBx31CFC960 Controller Fabric Card and Ethernet line cards:

- #2 Phillips-head screwdriver
- #2 Phillips-head, 5 inch-lbs torque screwdriver (optional)

## Chapter 5

# 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 100
- ❑ “Preparing the Equipment Rack” on page 101
- ❑ “Unpacking the AT-SBx3112 Chassis” on page 104
- ❑ “Adjusting the Equipment Rack Brackets” on page 106
- ❑ “Installing the AT-SBx3112 Chassis in the Equipment Rack” on page 108
- ❑ “Removing the Shipping Brace” on page 111
- ❑ “Installing the Chassis Grounding Lug” on page 112

## Required Tools and Material

---

You need the following tools and material to install the product in an equipment rack:

- #2 Phillips-head screwdriver
- Eight equipment rack screws
- Flat-head screwdriver
- #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

---

## Preparing the Equipment Rack

---

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 38 on page 102.
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 44 on page 109. You may use this additional space for other network equipment after the chassis is installed.

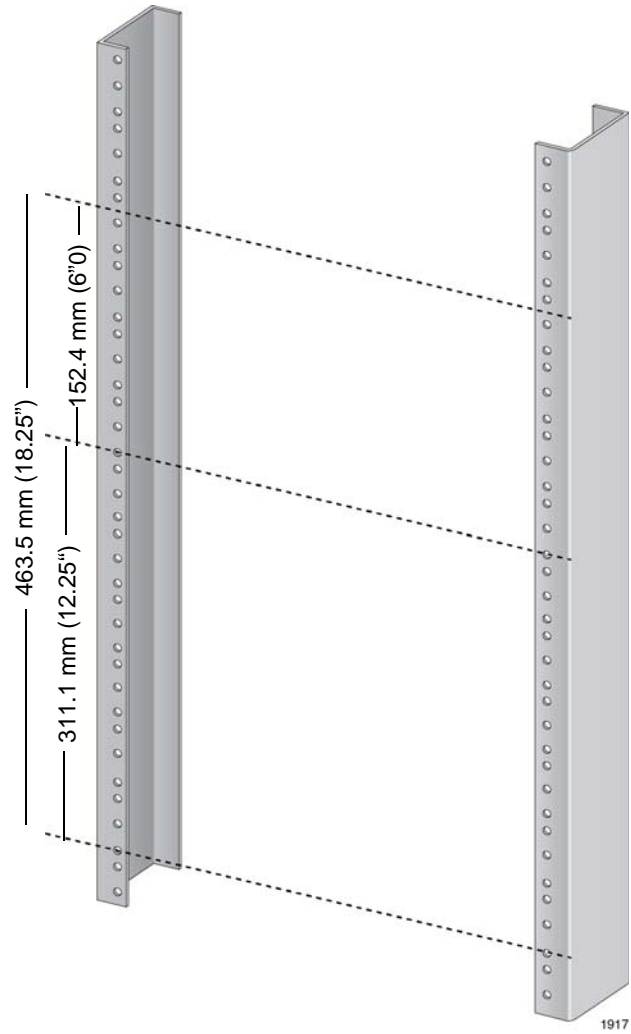


Figure 38. Reserving Vertical Rack Space

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 39 on page 103. 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).

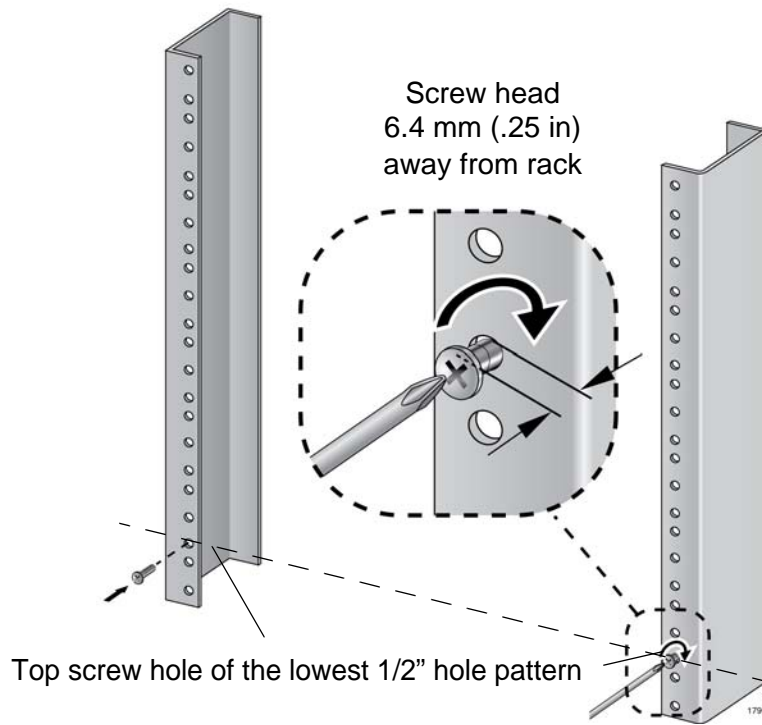


Figure 39. Rack Mounting Hole Locations

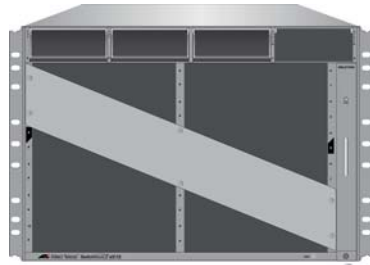
5. After installing the two screws in the equipment rack, go to "Unpacking the AT-SBx3112 Chassis" on page 104.

## Unpacking the AT-SBx3112 Chassis

---

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

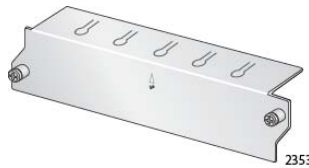
1. Remove all components from the shipping package.
2. Verify the contents of the shipping container by referring to Figure 40 here and Figure 41 on page 105. If any item is missing or damaged, contact your Allied Telesis sales representative for assistance.



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



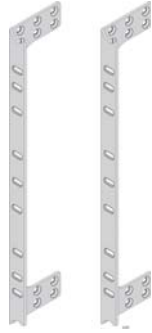
Three blank power supply slot covers pre-installed in power supply slots A to C on the front panel



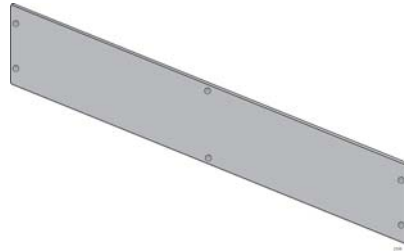
One grounding lug pre-installed in the lower left corner on the back panel

Figure 40. 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 41. 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 29 and illustrated in Figure 42 on page 107 and Figure 43 on page 107. 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 42 on page 107.
- ❑ The dimension (X) between the front panel and the rack rails is given for each rack mounting bracket position in Table 29.

Table 29. Front Panel to Rack Rail Dimensions

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

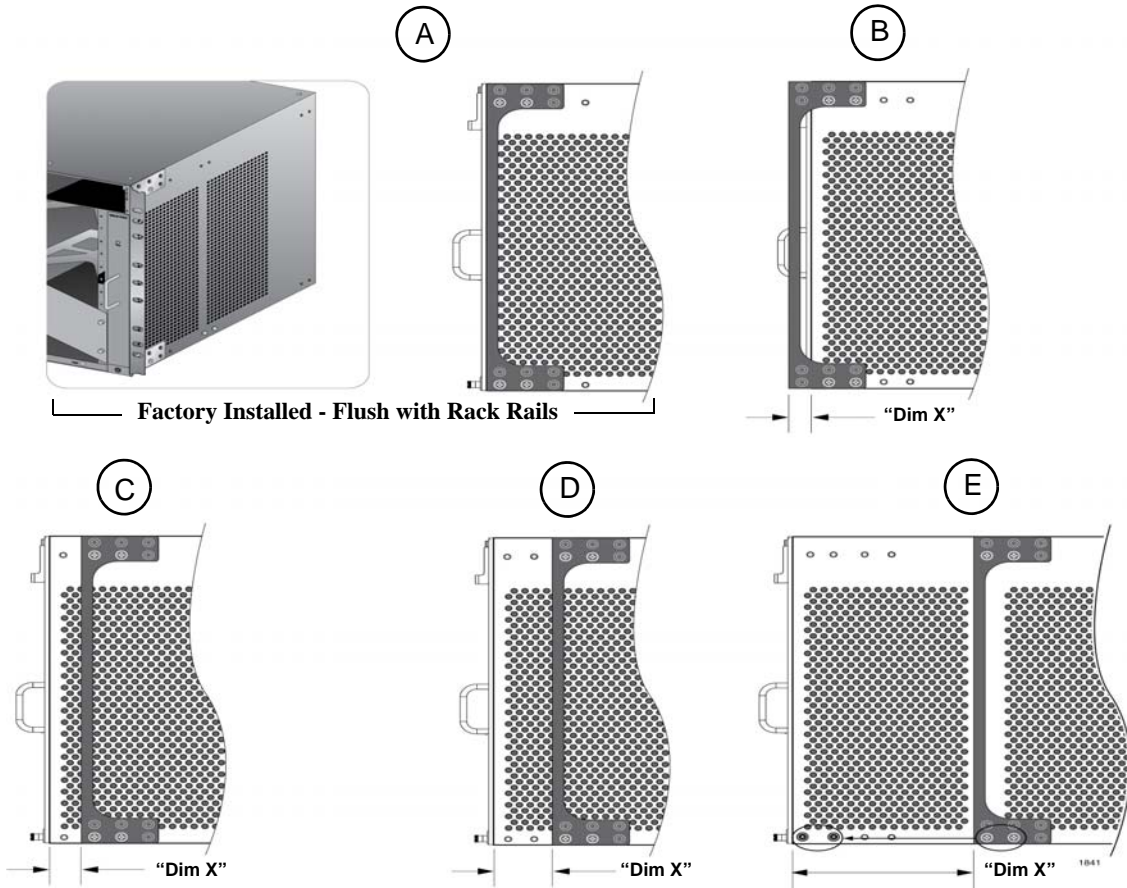


Figure 42. Rack Mounting Bracket Locations

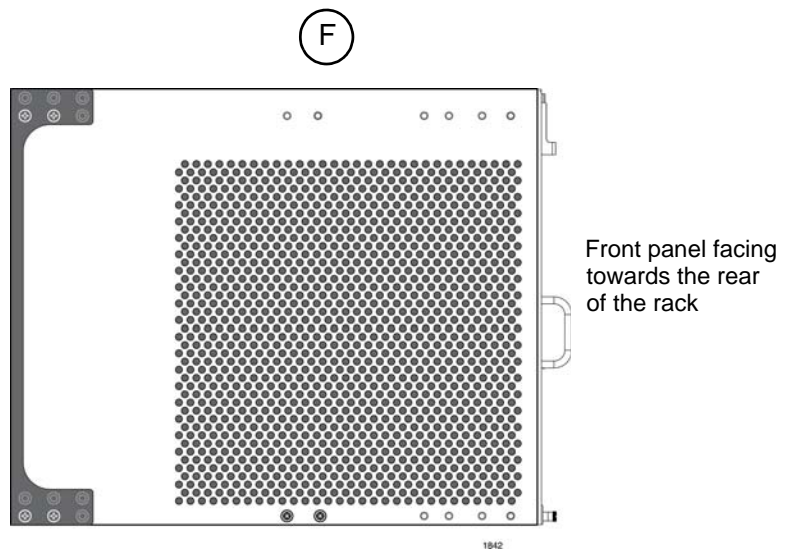


Figure 43. Rack Bracket Locations for Reverse Position of Chassis

## 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 101.
- 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 106.

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.

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 101. Refer to Figure 44.

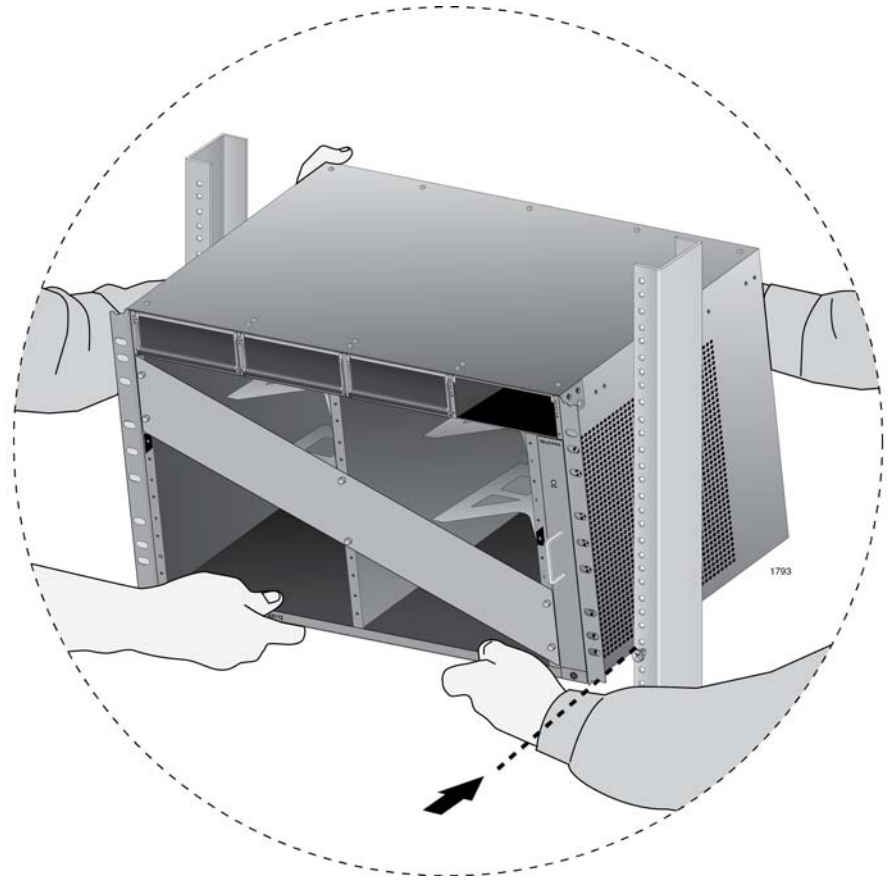


Figure 44. Lifting the AT-SBx3112 Chassis into the Equipment Rack

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 45 on page 110.

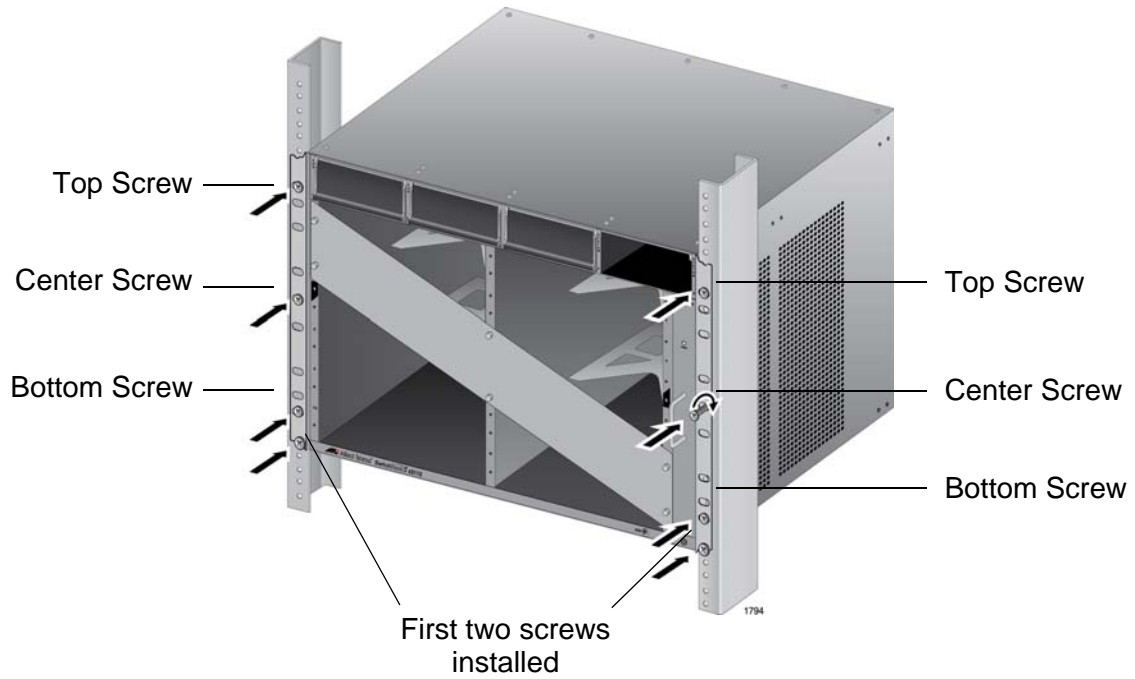


Figure 45. Installing the Rack Mount Screws

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 111.

## 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). Refer to Figure 46.

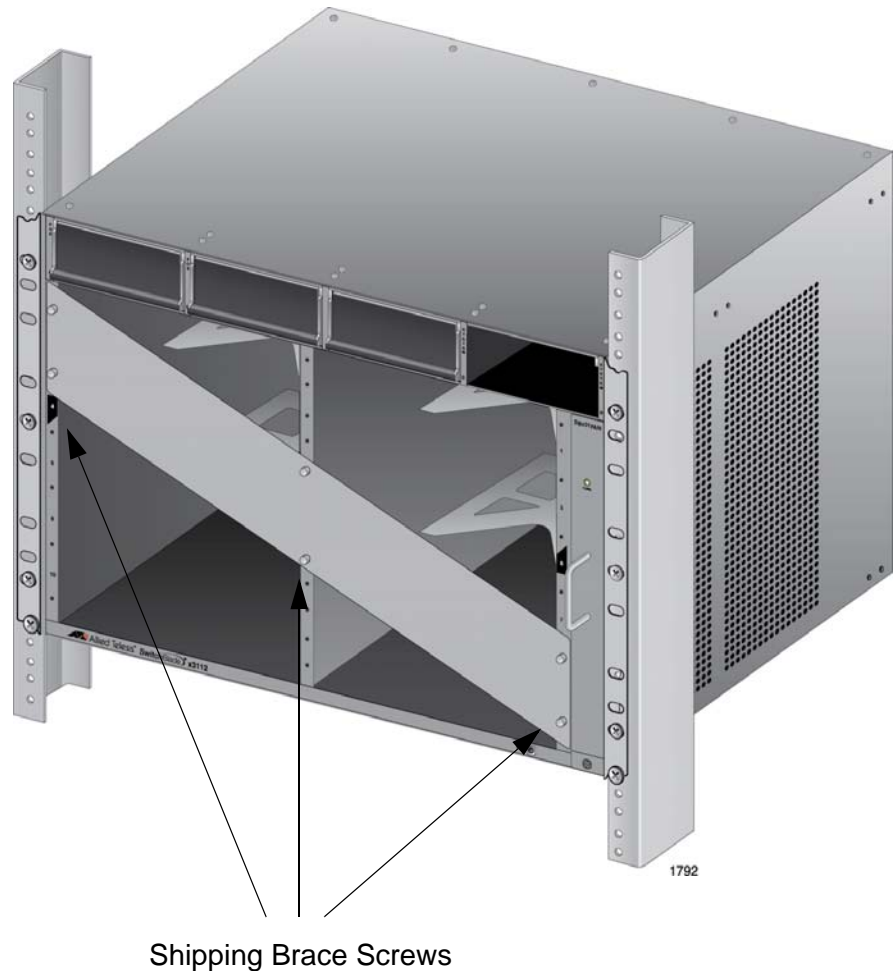


Figure 46. Removing the Shipping Brace

After removing the shipping plate, go to “Installing the Chassis Grounding Lug” on page 112.

## 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 47.

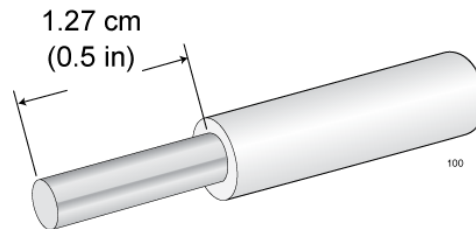


Figure 47. Stripping the Grounding Wire

2. Remove the two screws that secure the grounding lug to the rear panel of the chassis, as shown in Figure 48.

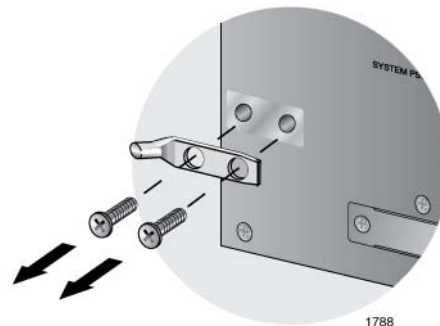


Figure 48. Removing the Grounding Lug



3. Insert one end of the grounding wire into the grounding lug, as shown in Figure 49, and use a crimping tool to secure the wire to the grounding lug.

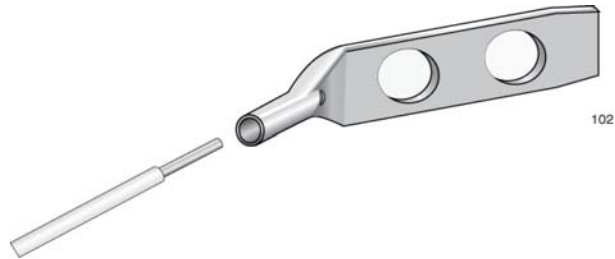


Figure 49. Attaching the Grounding Wire to the Grounding Lug

4. Install the grounding lug on the chassis, as shown in Figure 50. Allied Telesis recommends tightening the screws to 20 inch-lbs.

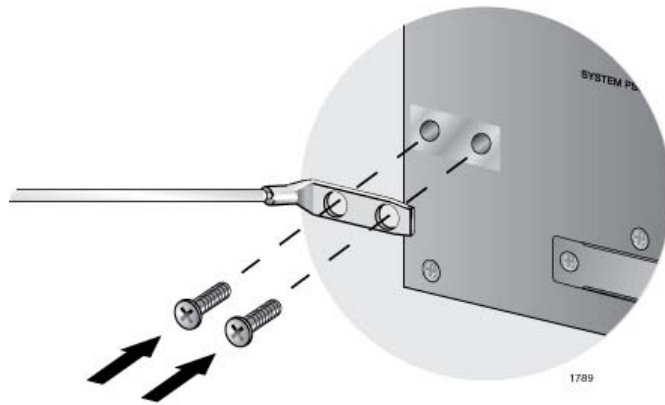


Figure 50. Installing the Grounding Lug and Wire

5. Connect the other end of the grounding wire to the building protective earth.
6. Go to Chapter 6, "Installing the Power Supplies" on page 115.



## Chapter 6

# 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 116
- ❑ “Installing the AT-SBxPWRSYS1 or AT-SBxPWRSYS2 AC System Power Supply” on page 117
- ❑ “Installing the AT-SBxPWRPOE1 AC Power Supply” on page 123
- ❑ “Installing the AT-SBxPWRSYS1 DC System Power Supply” on page 128

## 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 51. This ensures that ESD voltages safely flow to ground.



Figure 51. 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 or AT-SBxPWRSYS2 AC System Power Supply

For background information on the AT-SBxPWRSYS1 and AT-SBxPWRSYS2 AC System Power Supplies, refer to “Power Supplies and Power Supply Slots” on page 24. The chassis must have at least one system power supply.



### Warning

The electronic components in the power supply can be damaged by electro-static discharges (ESD). Follow the procedure in “Protecting Against Electrostatic Discharge (ESD)” on page 116 to guard against ESD damage when unpacking and installing the power supply.

To install the AT-SBxPWRSYS1 or AT-SBxPWRSYS2 AC System Power Supplies, perform the following procedure:

1. Choose a slot in the chassis for the power supply.

You may install it in either slot C or D, shown in Figure 52. The first system power supply should be installed in slot D, because the slot does not have a blank power supply panel.

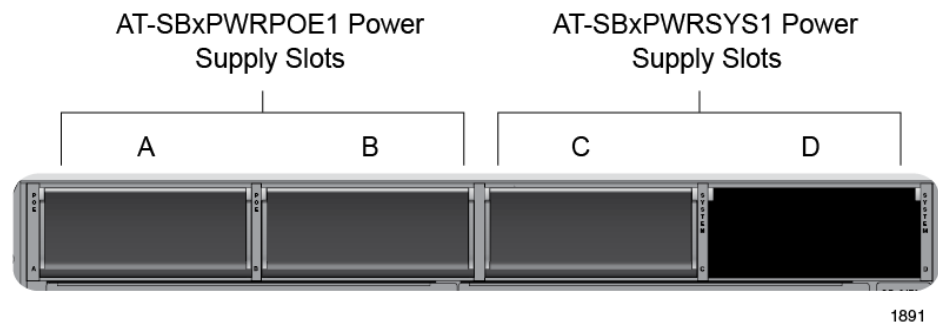


Figure 52. Power Supply Slots



### Caution

The AT-SBxPWRSYS1 and AT-SBxPWRSYS2 Power Supplies 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 53 on page 118.

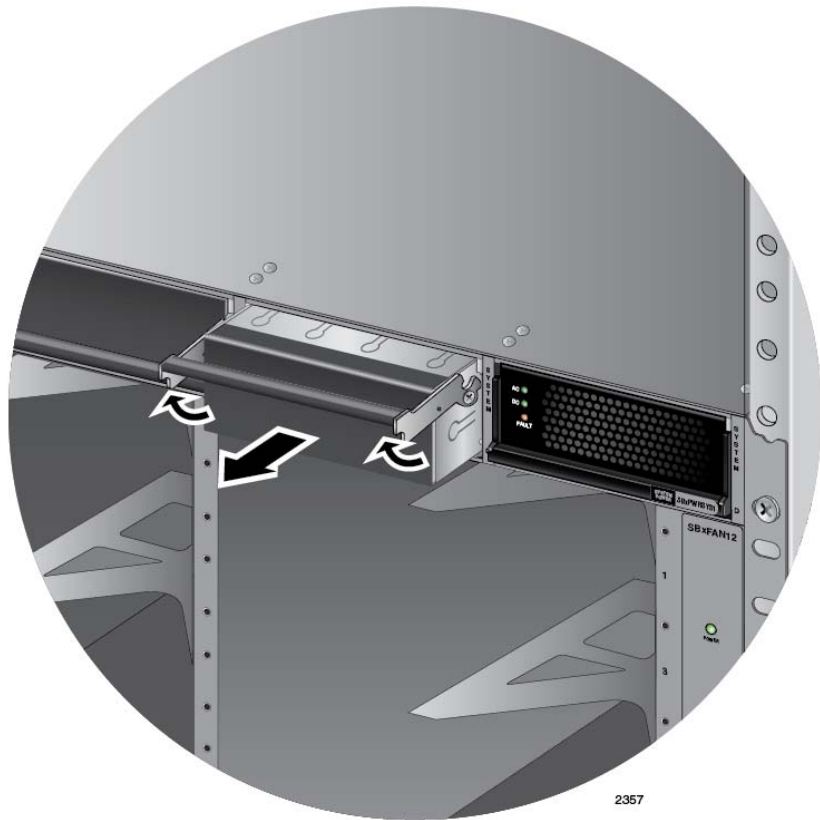


Figure 53. Removing the Blank Slot Cover from Power Supply Slot C

3. Remove the new power supply from the shipping package and verify the package contents, listed in Figure 54 on page 119.

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



One AT-SBxPWRSYS1 or AT-SBxPWRSYS2 AC Power Supply Module



One regional AC power cord



One tie wrap

Figure 54. Items Included with the AT-SBxPWRSYS1 or AT-SBxPWRSYS2 AC System Power Supply

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**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 or AT-SBxPWRSYS2 AC System Power Supply” on page 187.

---

4. Move the locking handle on the power supply to the unlocked or up position. See Figure 55 on page 120.



Figure 55. Raising the Handle on the Power Supply

5. Align and insert the power supply into the power supply slot. Figure 56 shows the power supply being installed in slot D.

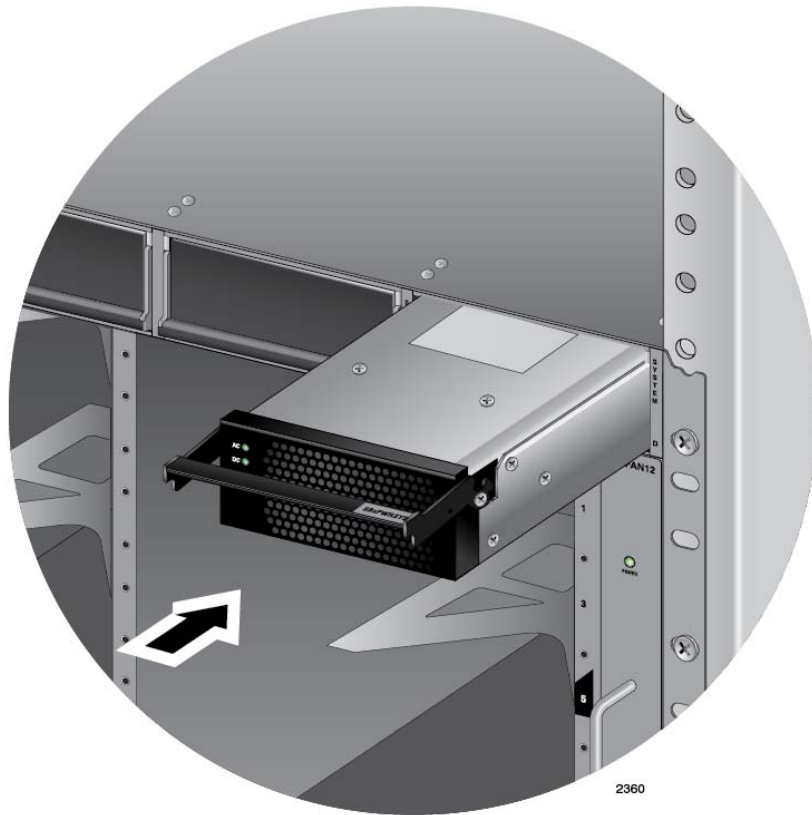


Figure 56. Inserting the AT-SBxPWSYS1 or AT-SBxPWSYS2 AC Power Supply

6. Lower the power supply locking handle to secure the power supply to the chassis, as shown in Figure 57 on page 121.





Figure 57. Lowering the Handle on the AT-SBxPWRSYS1 or AT-SBxPWRSYS2 AC Power Supply

---

**Note**

If the module does not fully seat in the chassis slot, check to be sure you are installing a system power supply and not a PoE power supply. The model name of the module is included on a label on the locking handle. Refer to “Power Supplies and Power Supply Slots” on page 24 for more information.

---

7. To install a second power supply, repeat this procedure.
8. After installing the AT-SBxPWRSYS1 or AT-SBxPWRSYS2 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 123.
  - ❑ Otherwise, go to Chapter 7, “Installing the AT-SBx31CFC960 Card and Ethernet Line Cards” on page 135.

---

**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 or AT-SBxPWRSYS2 AC System Power Supply” on page 187.

---

## Installing the AT-SBxPWRPOE1 AC Power Supply

---

This section contains the installation procedure for the AT-SBxPWRPOE1 AC Power Supply, which supplies power for the PoE+ ports on the AT-SBx31GP24 PoE Line Card. For background information, refer to “Power Supplies and Power Supply Slots” on page 24.



---

**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 116 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-AT-SBxPWRPOE1 AC Power Supply in the chassis.

You may install it in either slot A or B, shown in Figure 52 on page 117.

2. Raise the handle on the blank panel covering the selected slot and slide the panel from the chassis, as shown in Figure 58 on page 124.

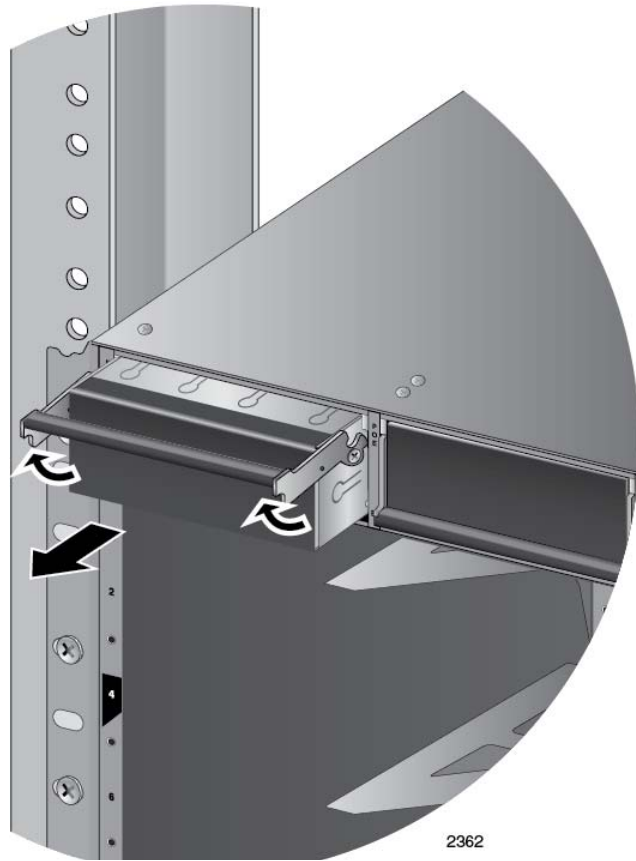


Figure 58. Removing the Blank Slot Cover from Power Supply Slot A

3. Remove the power supply from the shipping package and verify that the shipping package contains the items listed in Figure 59 on page 125.

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 59. Items Included with the AT-SBxPWRPOE1 Power Supply Module

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**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 PoE Power Supply” on page 190.

---

4. Raise the locking handle on the AT-SBxPWRPOE1 AC Power Supply, as shown Figure 60 on page 126.



Figure 60. Raising the Handle on the AT-SBxPWRPOE1 Power Supply

5. Align and insert the AT-SBxPWRPOE1 Power Supply into slot A or B. Figure 61 shows the power supply being installed in slot A.



**Caution**

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

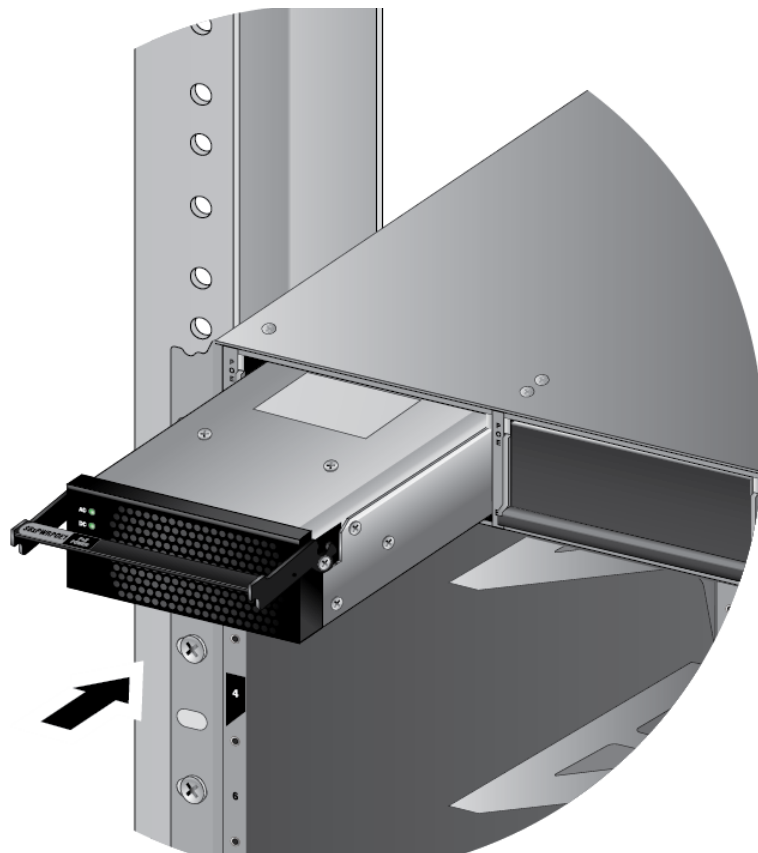


Figure 61. Inserting the AT-SBxPWRPOE1 Power Supply

6. Lower the locking handle of the power supply to secure the module in the slot, as shown in Figure 62.

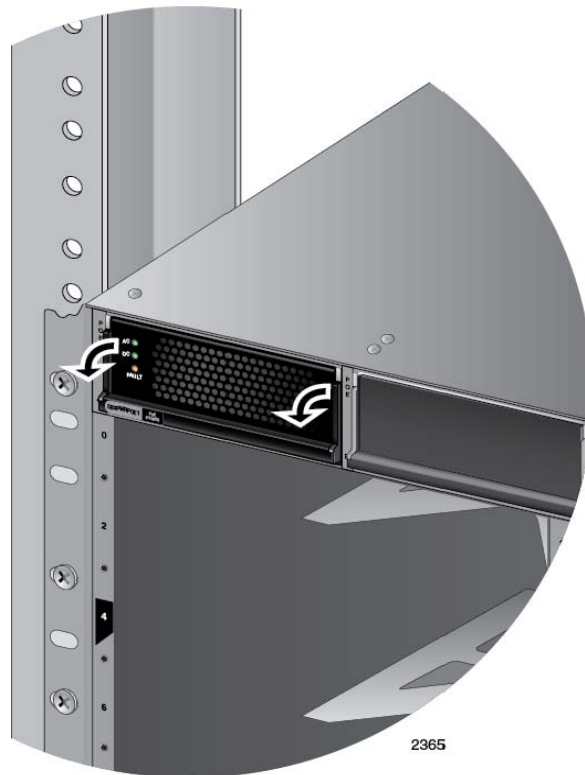


Figure 62. Locking the Handle on the AT-SBxPWRPOE1 Power Supply

---

**Note**

If the module does not fully seat in the chassis slot, check to be sure you are installing a PoE power supply and not a system power supply. The model name of the module is included on a label on the locking handle. Refer to “Power Supplies and Power Supply Slots” on page 24 for more information.

---

7. To install a second AT-SBxPWRPOE1 AC Power Supply, repeat this procedure.
8. After installing the power supplies, go to Chapter 7, “Installing the AT-SBx31CFC960 Card and Ethernet Line Cards” on page 135.

---

**Note**

Retain the tie wrap that comes with the power supply. You will use it to secure the power cord when you power on the unit in “Powering on the AT-SBxPWRPOE1 AC PoE Power Supply” on page 190.

---

## Installing the AT-SBxPWRSYS1 DC System Power Supply

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This section contains the installation procedure for the AT-SBxPWRSYS1 DC System Power Supply. For background information, refer to “Power Supplies and Power Supply Slots” on page 24.

Here is a list of the required material and tools:

- 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)



### Caution

The electronic components in the AT-SBxPWRSYS1 DC System Power Supply can be damaged by electro-static discharges (ESD). Follow the procedure in “Protecting Against Electrostatic Discharge (ESD)” on page 116 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 52 on page 117. The first AT-SBxPWRSYS1 DC System Power Supply should be installed in slot D, because the slot does not have a blank power supply panel.



### Caution

The AT-SBxPWRSYS1 DC System 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 129.



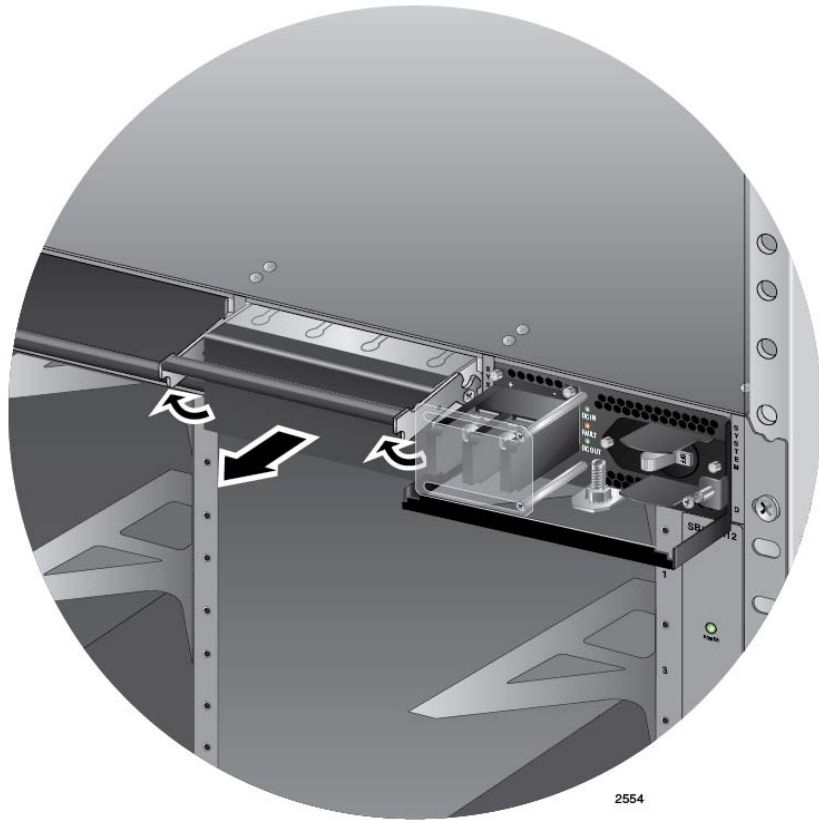
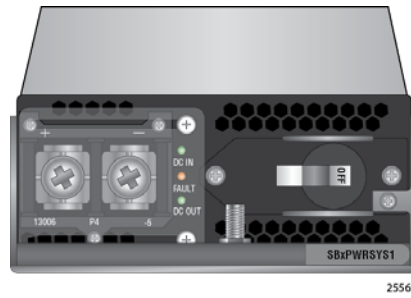


Figure 63. Removing the Blank Slot Cover from Power Supply Slot C

3. Remove the power supply from the shipping package and verify that the shipping package contains the items listed in Figure 64 on page 130.

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



One AT-SBxPWRSYS1 DC System 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 System Power Supply Module

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**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 131.

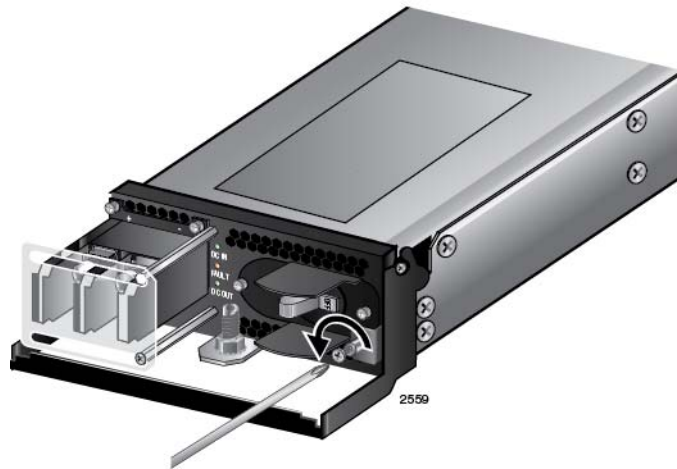


Figure 65. Loosening the Handle locking Screw on the AT-SBxPWRPOE1 DC System Power Supply

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



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

6. Align and insert the AT-SBxPWRSYS1 Module into slot C or D. Figure 67 on page 132 shows the power supply installed in slot D.



**Caution**

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

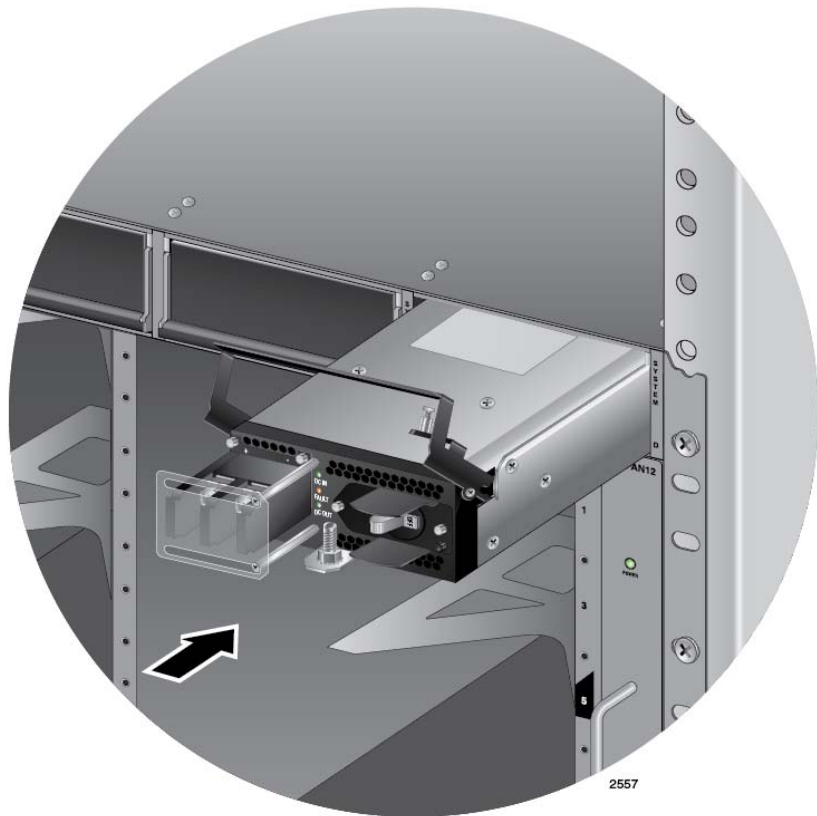


Figure 67. Inserting the AT-SBxPWRSYS1 DC System Power Supply

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

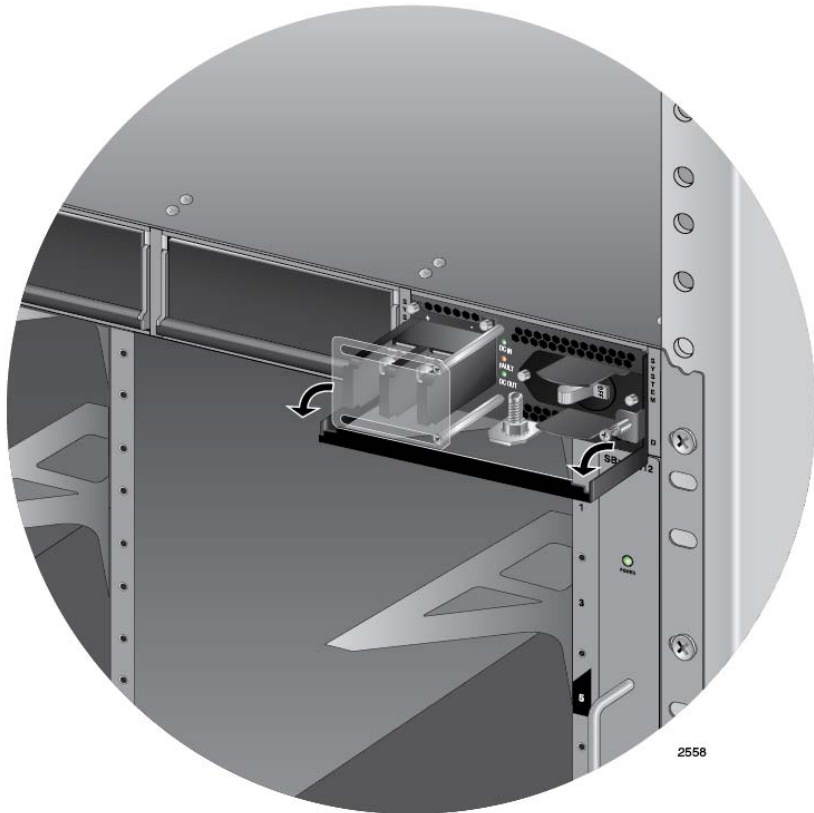


Figure 68. Locking the Handle on the AT-SBxPWRSYS1 DC System Power Supply

---

**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 193.

---

8. To install a second AT-SBxPWRSYS1 DC System Power Supply, repeat this procedure.
9. After installing the AT-SBxPWRSYS1 DC System Power Supplies, go to Chapter 7, “Installing the AT-SBx31CFC960 Card and Ethernet Line Cards” on page 135.

---

**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 193.

---

## Chapter 7

# Installing the AT-SBx31CFC960 Card and Ethernet Line Cards

---

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

- ❑ “Guidelines to Handling the Controller and Line Cards” on page 136
- ❑ “Installing the AT-SBx31CFC960 Controller Fabric Card” on page 138
- ❑ “Installing Expansion Modules in AT-SBx81XLEM Ethernet Line Cards” on page 144
- ❑ “Installing the Ethernet Line Cards” on page 152
- ❑ “Installing the Blank Slot Covers” on page 156

---

### **Note**

For instructions on how to upgrade an operational chassis to the AT-SBx31CFC960 Controller Fabric card from the older AT-SBx31CFC Card, refer to Chapter 12, “Upgrading to the AT-SBx31CFC960 Card from the AT-SBx31CFC Card” on page 255.

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## Guidelines to Handling the Controller and Line Cards

---

Please observe the following guidelines when handling the controller and Ethernet line cards:

- The cards are hot swappable and can be installed or removed while the chassis is powered on.
- Always wear an anti-static device when handling the cards.



### Caution

The electronic components on the controller and line cards can be damaged by electro-static discharges (ESD). Follow the procedure in “Protecting Against Electrostatic Discharge (ESD)” on page 116 to guard against ESD damage when unpacking and installing the line cards.

---

- Hold a card by its faceplate or edges.
- Never touch the electronic components on the top or bottom of a card.
- To avoid damaging the components on the bottom of a card, do not set it down on a table or desk. If you need to set down a card, return it to its anti-static bag and packaging container.
- Do not remove a card from its anti-static bag until you are ready to install it in the chassis.
- If you need to remove a card from the chassis, immediately return it in its anti-static bag and packaging container.
- Never hold or lift a controller card by the handles on the front faceplate. You might bend or damage the handles.



### Caution

Keep a card level as you slide it into or out of the chassis. You might damage the components on the top or bottom of a card if you slide it at an angle. Refer to Figure 69 on page 137.

---



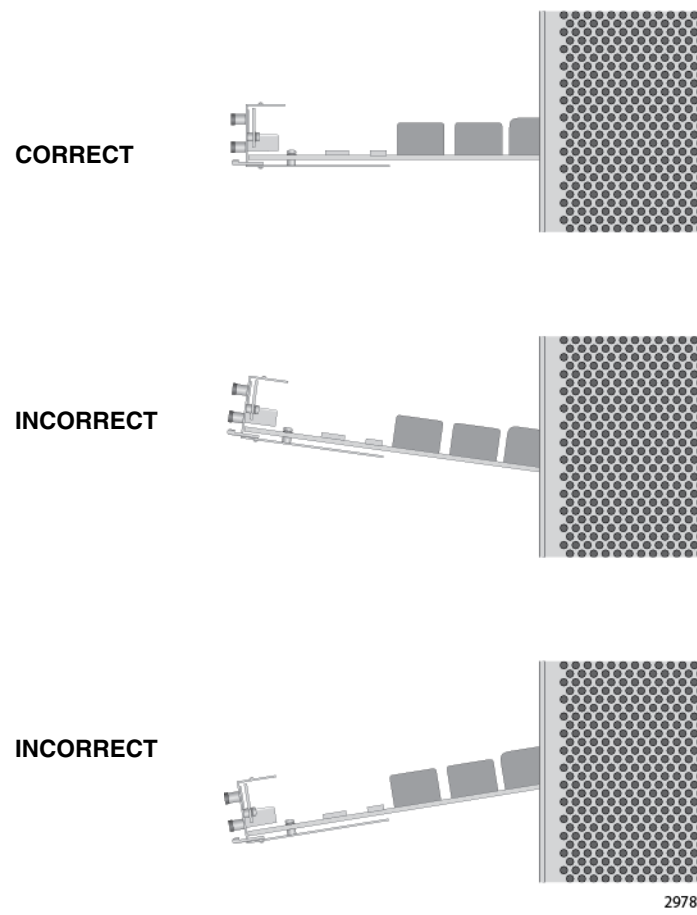


Figure 69. Aligning a Card in a Slot

## Installing the AT-SBx31CFC960 Controller Fabric Card

This section contains the installation procedure for the AT-SBx31CFC960 Controller Fabric Card. You may install either one or two controller cards in the unit. The chassis must have at least one card. The cards must be installed in slots 4 and 5 in the chassis.

---

**Note**

Please review “Guidelines to Handling the Controller and Line Cards” on page 136 before performing this procedure.

---

---

**Note**

For instructions on how to upgrade an operational chassis to the AT-SBx31CFC960 Controller Fabric Card from the older AT-SBx31CFC Card, refer to Chapter 12, “Upgrading to the AT-SBx31CFC960 Card from the AT-SBx31CFC Card” on page 255.

---

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-SBx31CFC960 Card, perform the following procedure:

1. Choose a slot in the chassis for the AT-SBx31CFC960 Controller Fabric 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 70.

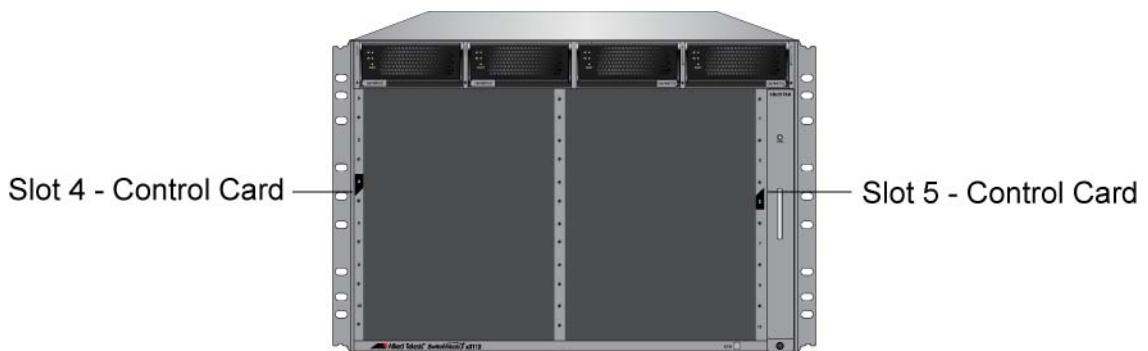


Figure 70. Slots 4 and 5 for the AT-SBx31CFC960 Card

2. Remove the new AT-SBx31CFC960 Card from the shipping package and verify the package contents, listed in Figure 71 on page 139.

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



One AT-SBx31CFC960 Controller Fabric Card



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

Figure 71. Items Included with the AT-SBx31CFC960 Controller Fabric 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.

---

- Carefully remove the controller card from the anti-static bag. Refer to Figure 72.



Figure 72. Removing the AT-SBx31CFC960 Controller Fabric Card from the Anti-static Bag

- Remove the battery insulator tab on the controller card by sliding it out from between the battery and battery clip, as shown in Figure 73 on page 140.

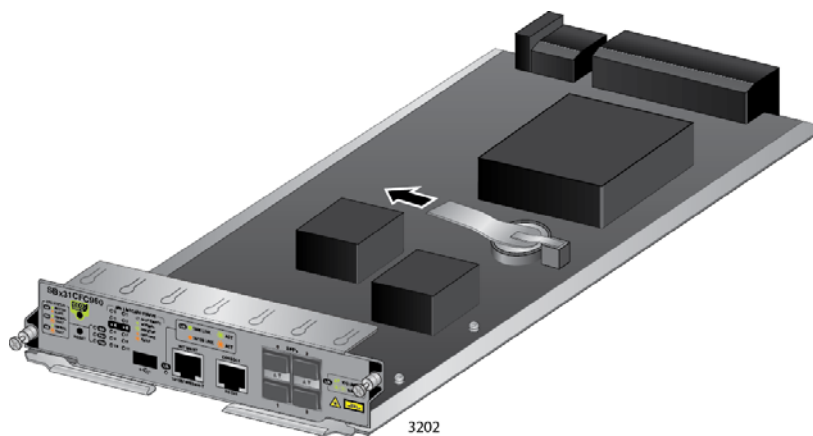


Figure 73. Removing the Battery Insulator

5. Move the locking handles on the front panel to the open position, as shown in Figure 74.

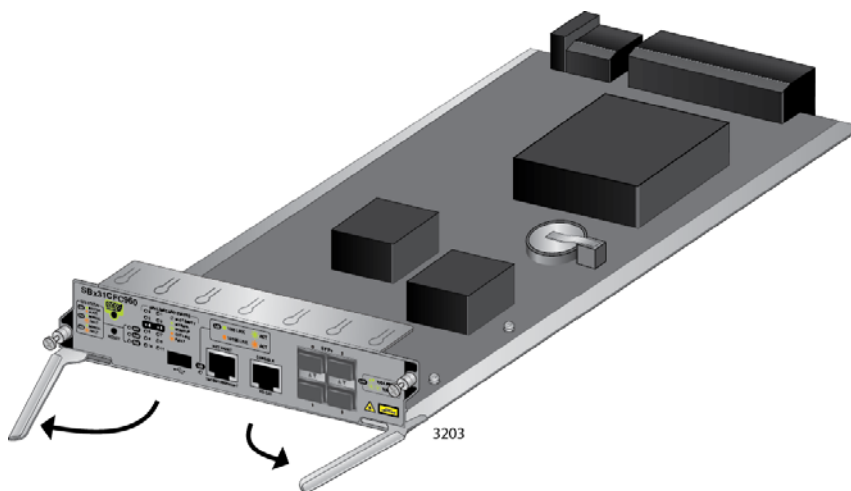


Figure 74. Opening the Locking Handles on the AT-SBx31CFC960 Controller Fabric Card

6. Align the edges of the AT-SBx31CFC960 Card with the internal chassis card guides in slot 4 or 5 of the AT-SBx3112 Chassis. Figure 75 on page 141 shows the AT-SBx31CFC960 Card aligned in slot 4.

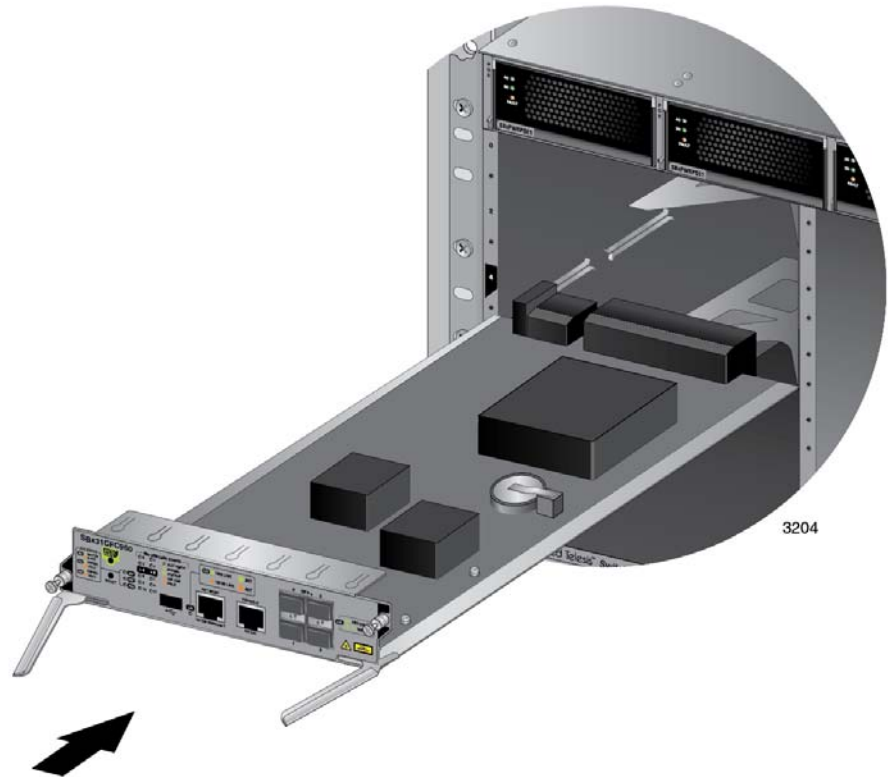


Figure 75. Aligning the AT-SBx31CFC960 Card in the Chassis Slot

7. Slowly and carefully slide the card into the slot.



**Caution**

Keep the card level with the chassis as you slide it into the slot. You might damage the components on the top or bottom of the card if you slide it in at an angle. Refer to Figure 69 on page 137.



**Caution**

Do not force the AT-SBx31CFC960 Card into the slot. If you feel resistance, remove it and try again. Be sure that the edges of the card are properly aligned with the card guides.

8. When you feel the card make contact with the connector on the backplane of the chassis, carefully close the two locking levers on the front panel to secure the card in the chassis. Refer to Figure 76 on page 142.

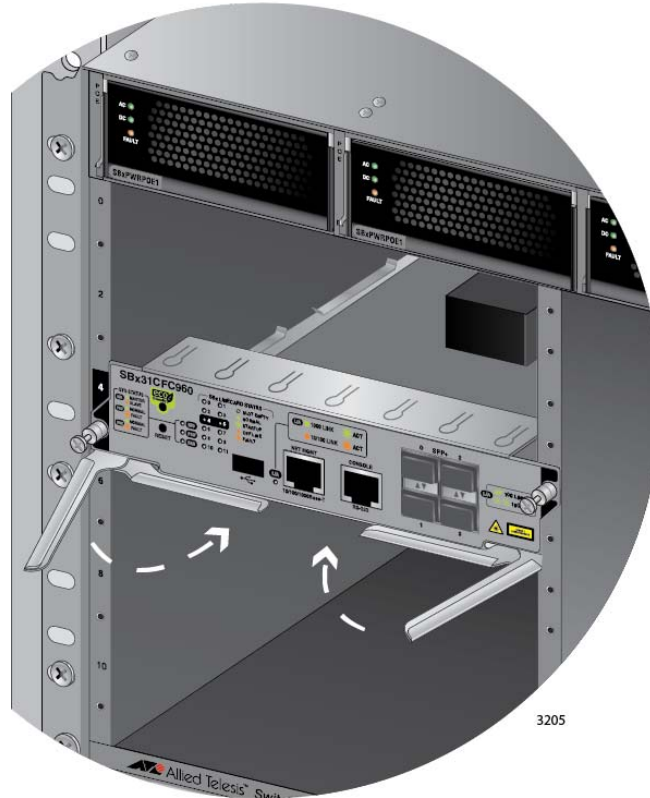


Figure 76. Closing the Locking Levers on the AT-SBx31CFC960 Controller Fabric Card

9. Finger tighten the two thumbscrews on the card to secure the card to the chassis, as shown in Figure 77 on page 143.



Figure 77. Tightening the Thumb Screws on the AT-SBx31CFC960 Card

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

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

11. if you have a second AT-SBx31CFC960 Controller Fabric Card, repeat this procedure to install it in the chassis.
12. After installing the controller cards, do one of the following:
  - ❑ If you purchased AT-SBx81XLEM Ethernet Line Cards with expansion modules, go to “Installing Expansion Modules in AT-SBx81XLEM Ethernet Line Cards” on page 144.
  - ❑ Otherwise, go to “Installing the Ethernet Line Cards” on page 152.

## Installing Expansion Modules in AT-SBx81XLEM Ethernet Line Cards

---

This section contains the procedure for installing an expansion module in the AT-SBx81XLEM Ethernet Line Card. If you did not purchase AT-SBx81XLEM Ethernet Line Cards, skip this procedure and go to “Installing the Ethernet Line Cards” on page 152.



### Caution

You must install the expansion module before installing the AT-SBx81XLEM Ethernet Line Card in the chassis. Attempting to install the module when the line card is installed in the chassis will damage the module and card. If the card is already installed in the chassis, remove it by performing the procedure “Replacing Ethernet Line Cards” on page 273.

---

### Note

Please review “Guidelines to Handling the Controller and Line Cards” on page 136 before performing this procedure.

---

The illustrations in the procedure show the AT-SBx81XLEM/XS8 Expansion Module. The procedure is the same for all expansion modules.

To install an expansion module in the AT-SBx81XLEM Ethernet Line Card, perform the following procedure:

1. Remove the AT-SBx81XLEM Ethernet 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.

---

2. Carefully remove the card from the anti-static bag. Refer to Figure 78 on page 145.





Figure 78. Removing the AT-SBx81XLEM Line Card from the Anti-static Bag

3. Place the card on a level surface.
4. With a #2 Phillips-head screwdriver, remove the two screws that secure the blank slot cover to the card. Refer to Figure 79.

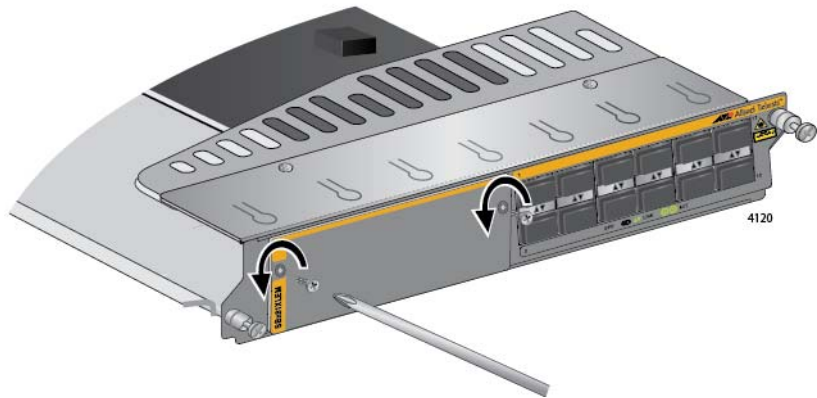


Figure 79. Removing the Screws on the Blank Slot Cover on the AT-SBx81XLEM Line Card

5. Slide the blank slot cover from the slot. Refer to Figure 80 on page 146.

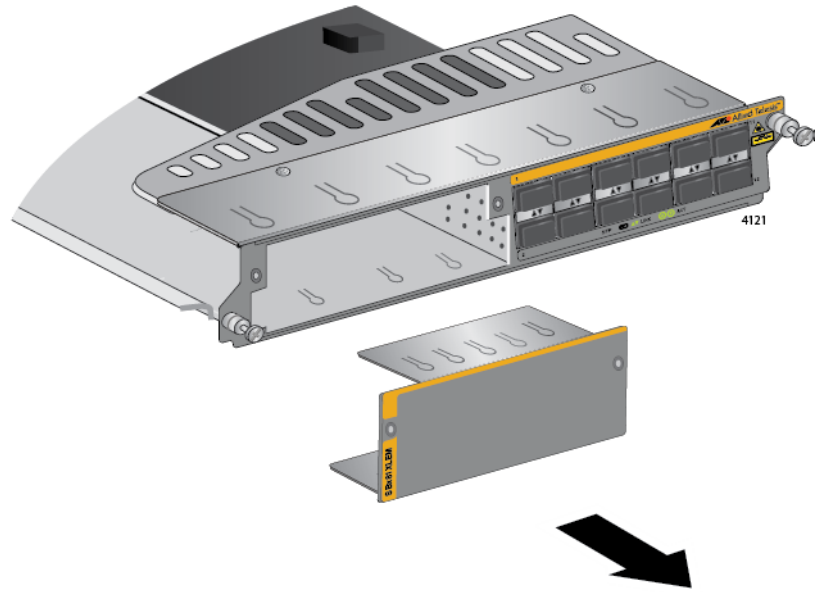


Figure 80. Removing the Blank Slot Cover from the AT-SBx81XLEM Line Card

6. With your thumb and forefinger, pull out the retaining pin on the side of the line card and turn it clockwise one quarter turn so that it remains in the retracted position. Refer to Figure 81 on page 147.

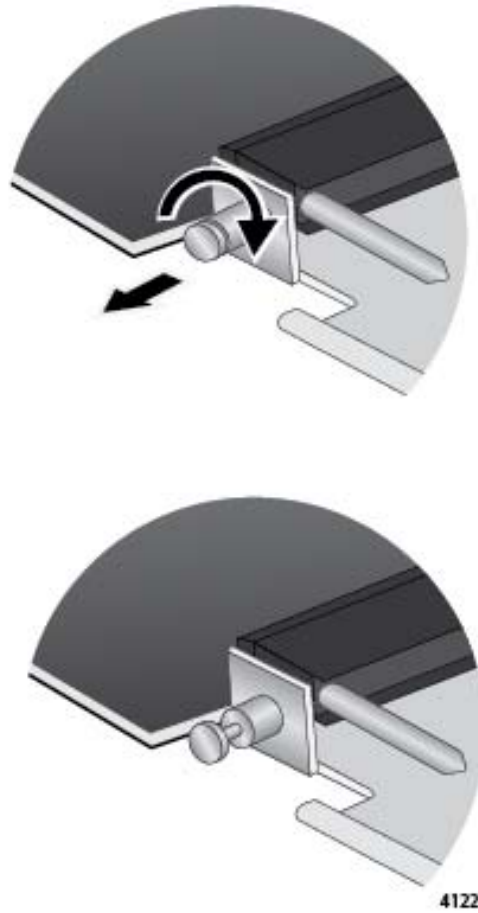


Figure 81. Retracting the Retaining Pin on the AT-SBx81XLEM Line Card

7. Remove the expansion module from its shipping container and anti-static bag. Refer to Figure 82.



Figure 82. Removing the Expansion Module from the Anti-static Bag

- Carefully align the expansion module in the slot, as shown in Figure 83, and slide it into the line card.



**Caution**

Keep the module level with the line card as you slide it into the slot. You might damage the components on the top or bottom of the module if you slide it in at an angle. Refer to Figure 69 on page 137.



**Caution**

Do not force the card into the slot. If you feel resistance, remove the card and try again.

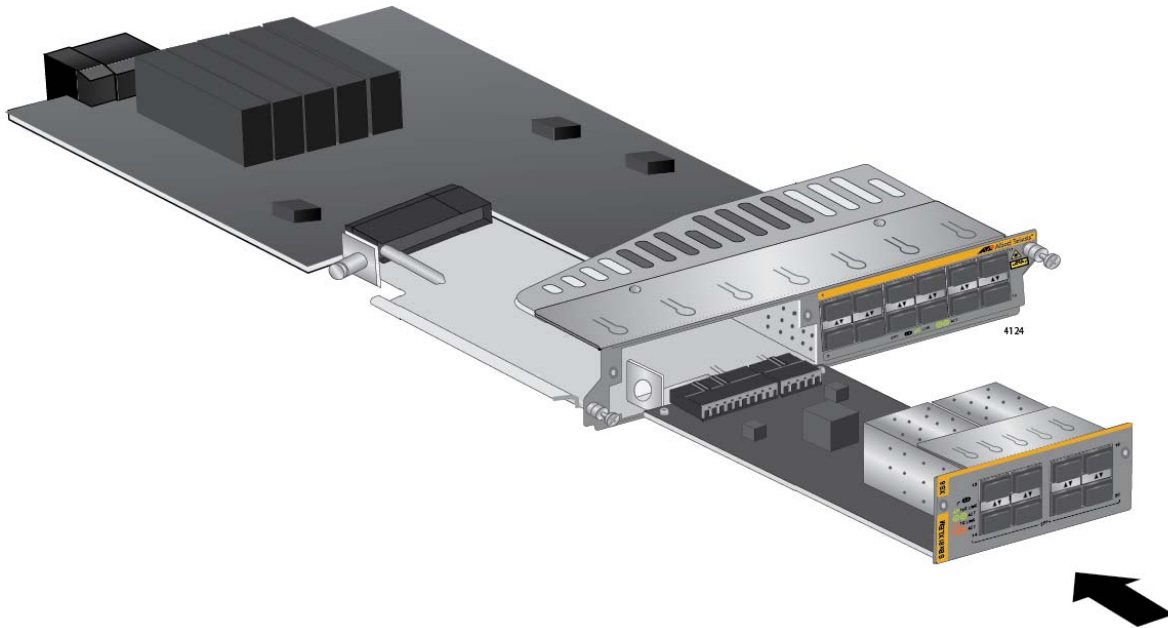


Figure 83. Sliding the Expansion Module into the AT-SBx81XLEM Line Card

- When the expansion module makes contact with the connector inside the line card, gently press on both sides of the faceplate to seat the module on the connector. Refer to Figure 84 on page 149. The module is fully installed when its faceplate is flush against the faceplate of the AT-SBx81XLEM Line Card.

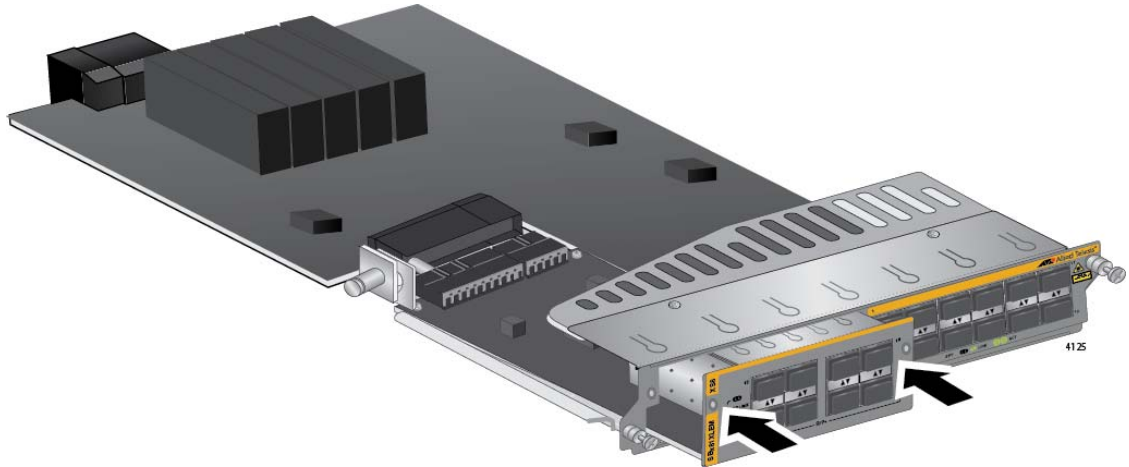


Figure 84. Seating the Expansion Module on the Connector in the AT-SBx81XLEM Line Card

10. With a Phillips-head screwdriver, install the two screws from step 4 to secure the expansion module in the line card. Refer to Figure 85.

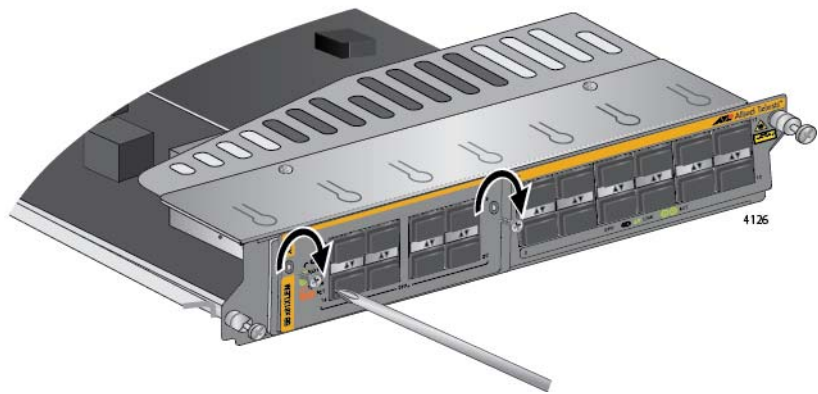


Figure 85. Securing the Expansion Module

11. Turn the retaining pin on the side of the line card one quarter turn to release it. Refer to Figure 86 on page 150.

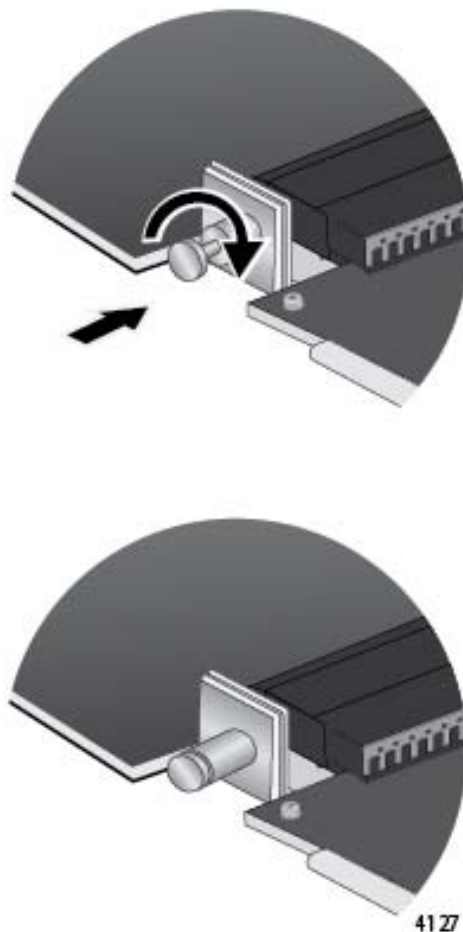


Figure 86. Releasing the Retaining Pin

12. Retain the blank slot cover removed in step 5 and shown in Figure 87 by storing it in a safe location. You should reinstall it on the AT-SBx81XLEM Line Card if, at a later date, you remove the expansion module.



Figure 87. Blank Slot Cover for the AT-SBx81XLEM Line Card

13. If you are not installing the line card in the chassis now, return it to its anti-static bag and shipping container to protect it from damage. Refer to Figure 88 on page 151.



Figure 88. Returning the Line Card to its Anti-static Bag

14. For instructions on how to install the line card in the chassis, go to “Installing the Ethernet Line Cards” on page 152.

## 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.

---

**Note**

Please review “Guidelines to Handling the Controller and Line Cards” on page 136 before performing this procedure.

---

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 identified in Figure 89.



Figure 89. 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. Carefully remove the Ethernet line card from the anti-static bag. Refer to Figure 90.

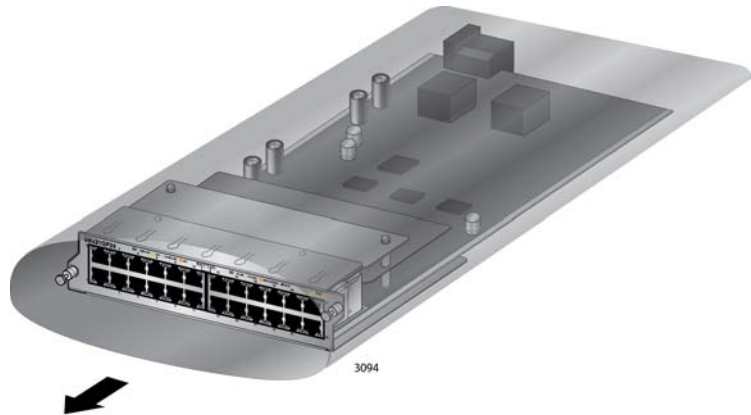


Figure 90. Removing an Ethernet Line Card from the Anti-static Bag

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

Figure 91 shows an Ethernet line card aligned with slot 0.

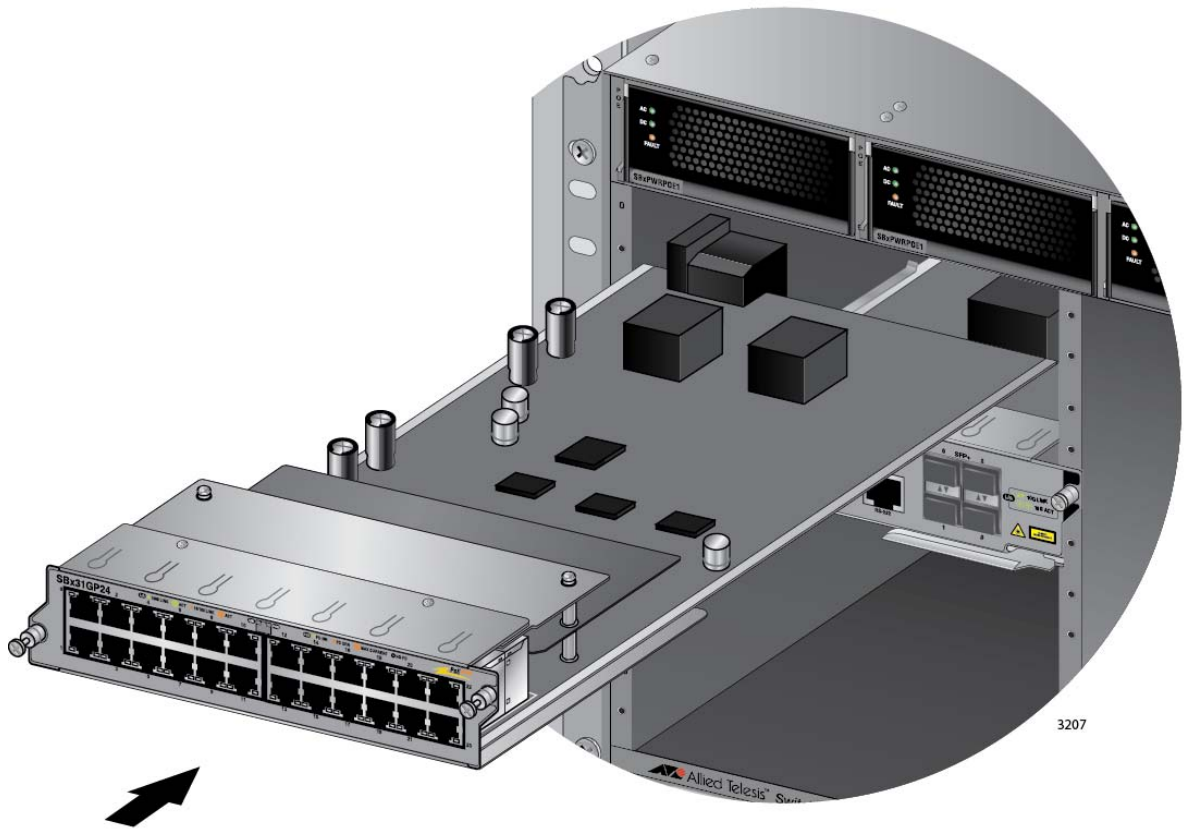


Figure 91. Aligning an Ethernet Line Card in a Chassis Slot

5. Slowly and carefully slide the card into the slot.



**Caution**

Keep the card level with the chassis as you slide it into the slot. You might damage the components on the top or bottom of the card if you slide it in at an angle. Refer to Figure 69 on page 137.



**Caution**

Do not force the card into the slot. If you feel resistance, remove it and try again. Be sure that the edges of the card are properly aligned with the card guides.

6. When you feel the line card make contact with the connector on the backplane of the chassis, gently press on both sides of the faceplate to seat the card on the connector. Refer to Figure 92.



Figure 92. Seating an Ethernet Line Card on the Backplane Connector

7. Finger tighten the two thumbscrews on each side of the line card to secure it to the chassis, as shown in Figure 93 on page 155.



Figure 93. Tightening the Thumb Screws on an Ethernet Line Card

8. 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.

9. Repeat this procedure to install the remaining Ethernet line cards.
10. After installing the line cards, go to “Installing the Blank Slot Covers” on page 156.

## Installing the Blank Slot Covers

---

After installing the AT-SBx31CFC960 Controller Fabric 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. If there are no unused slots, go to Chapter 8, “Installing Transceivers and Cabling Ports” on page 159.

---

### Note

The fan module may not be able to maintain adequate airflow and cooling across the controller and line cards if there are open slots.

---

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 94. The up arrow on the panel must be pointing up.

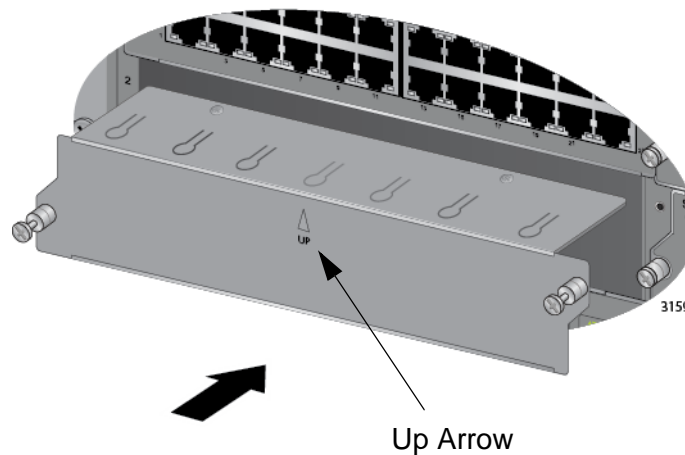


Figure 94. Installing a Blank Slot Cover

2. Finger tighten the two thumbscrews to attach the blank panel to the chassis, as shown in Figure 95 on page 157.

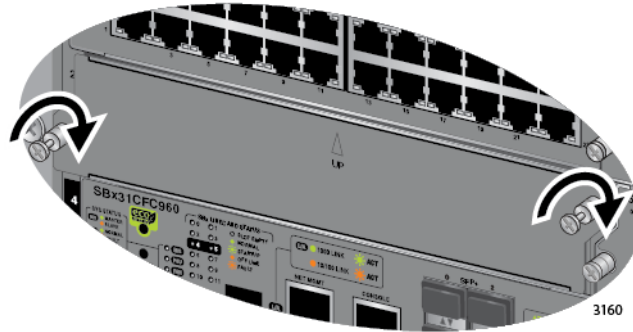


Figure 95. Tightening the Thumbscrews on a Blank Slot Cover

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 8, “Installing Transceivers and Cabling Ports” on page 159.



## Chapter 8

# Installing Transceivers and Cabling 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 Twisted Pair Ports” on page 160
- ❑ “Guidelines to Installing SFP, SFP+, CSFP, or XFP Transceivers” on page 163
- ❑ “Installing SFP, SFP+, or CSFP Transceivers” on page 164
- ❑ “Installing AT-SP10TW Cables in the AT-SBx31XS6 Line Card” on page 168
- ❑ “Installing XFP Transceivers in the AT-SBx31XZ4 Line Card” on page 171
- ❑ “Installing AT-QSFPCU Cables” on page 175
- ❑ “Installing AT-QSFPSR, AT-QSFPSR4, or AT-QSFPLR4 Transceivers” on page 177
- ❑ “Cabling the NET MGMT Port on the AT-SBx31CFC960 Card” on page 178
- ❑ “Installing SFP or SFP+ Transceivers in the AT-SBx31CFC960 Card” on page 180

## Guidelines to Cabling Twisted Pair Ports

---

This section applies to the twisted pair ports on the following products:

- ❑ AT-SBx31GT24 Line Card
- ❑ AT-SBx31GP24 Line Card
- ❑ AT-SBx31GT40 Line Card

Here are guidelines to cabling 10/100/1000Base-T twisted pair ports:

- ❑ The 10/100/1000Base-T twisted pair ports on 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 AT-SBx31GT24 and AT-SBx31GT40 Line Cards are listed in Table 18 on page 64.
- ❑ The cable specifications for the ports on the AT-SBx31GP24 Line Card are listed in Table 19 on page 65.
- ❑ 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 96.



Figure 96. 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 97 on page 162.
- ❑ 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.

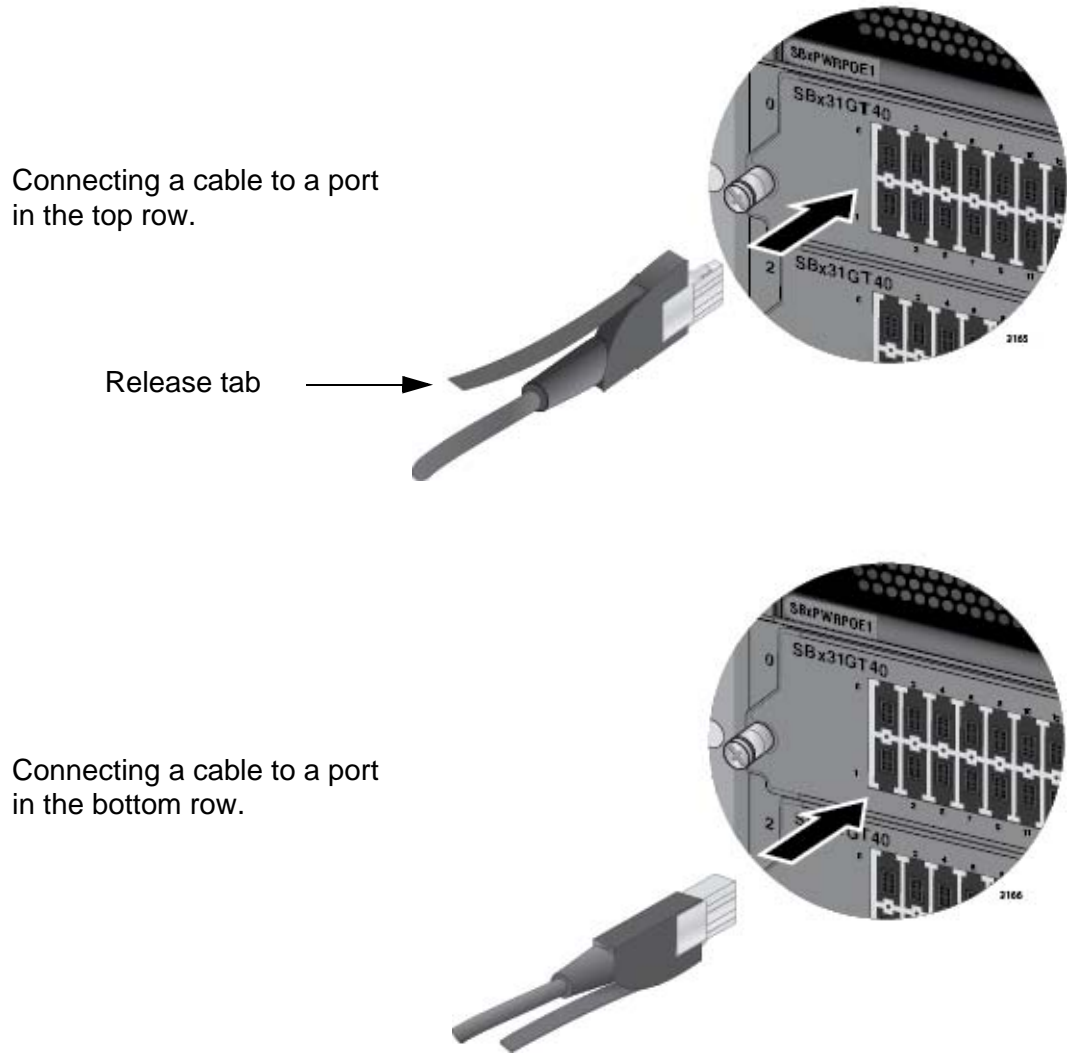


Figure 97. Connecting Cables to Ports on the AT-SBx31GT40 Line Card

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

---

Please review the following guidelines before installing fiber optic transceivers in line cards or expansion modules:

- ❑ 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 116 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, SFP+, or CSFP Transceivers

---

This section applies to the following line cards and expansion module:

- ❑ AT-SBx31GS24 Line Card
- ❑ AT-SBx31GC40 Line Card
- ❑ AT-SBx31XS6 Line Card
- ❑ AT-SBx81XLEM Line Card
- ❑ AT-SBx81XLEM/XS8 Expansion Module

Please review the information in “Guidelines to Installing SFP, SFP+, CSFP, or XFP Transceivers” on page 163 before performing this procedure.

The illustrations show the AT-SBx31GS24 Line Card. The procedure is the same for all devices.

To install fiber optic transceivers, 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 transceiver slot chosen for the transceiver. In Figure 98 the dust cover is removed from port 0 on the line card in transceiver slot 0.

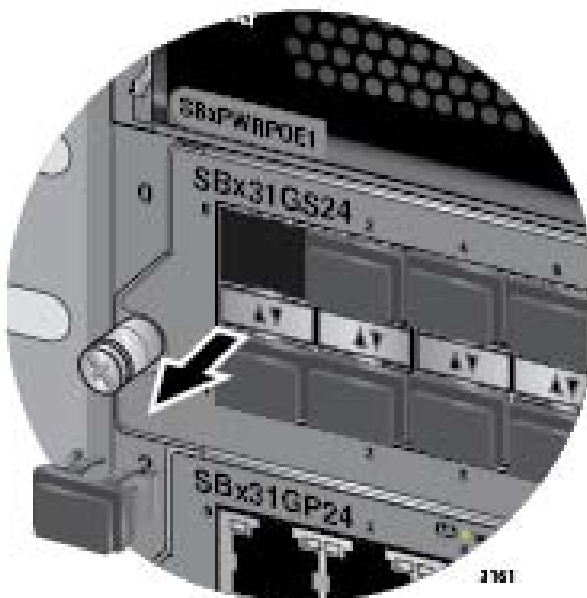


Figure 98. Removing the Dust Cover from a Transceiver Slot

- To install the transceiver in an SFP transceiver slot on the top row of the line card, orient the transceiver with the handle on top, as shown in Figure 99. To install it into a transceiver slot on the bottom row of the line card, orient it with the handle on the bottom.

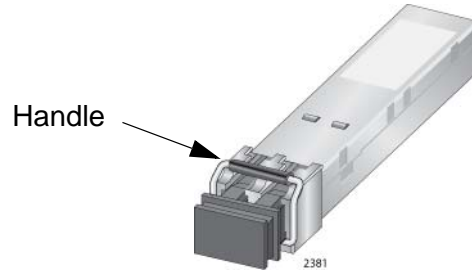


Figure 99. Handle on SFP Transceiver

- Slide the transceiver into the transceiver slot until it clicks into place, as shown in Figure 100.

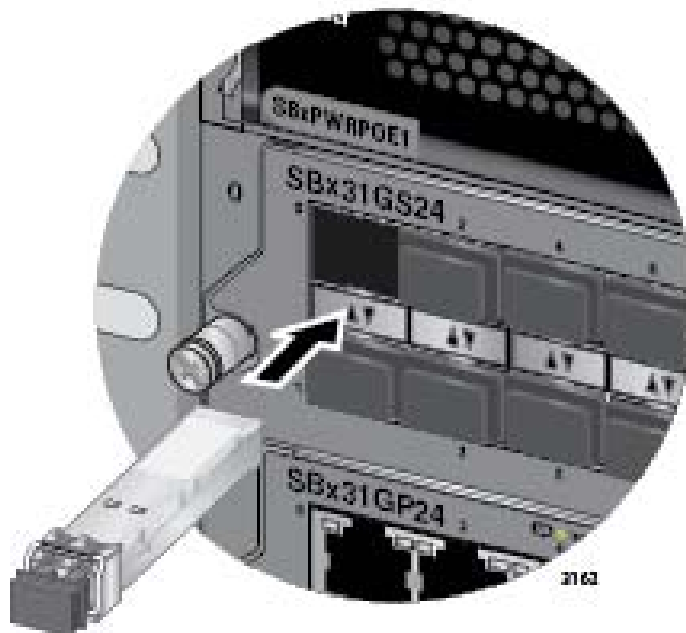


Figure 100. Inserting the Transceiver

---

**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 transceivers in the line cards.

---

- Remove the protective cover from the SFP transceiver, as shown in Figure 101 on page 166.

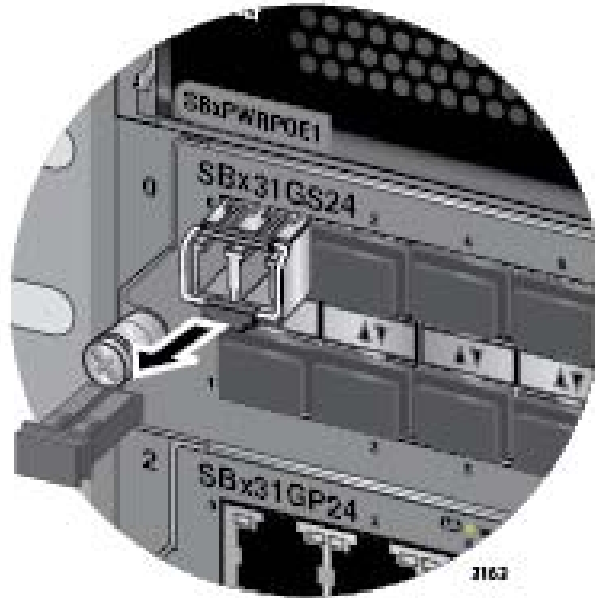


Figure 101. Removing the Dust Cover from a Transceiver

---

**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 102 on page 167. The connector should snap into the port.

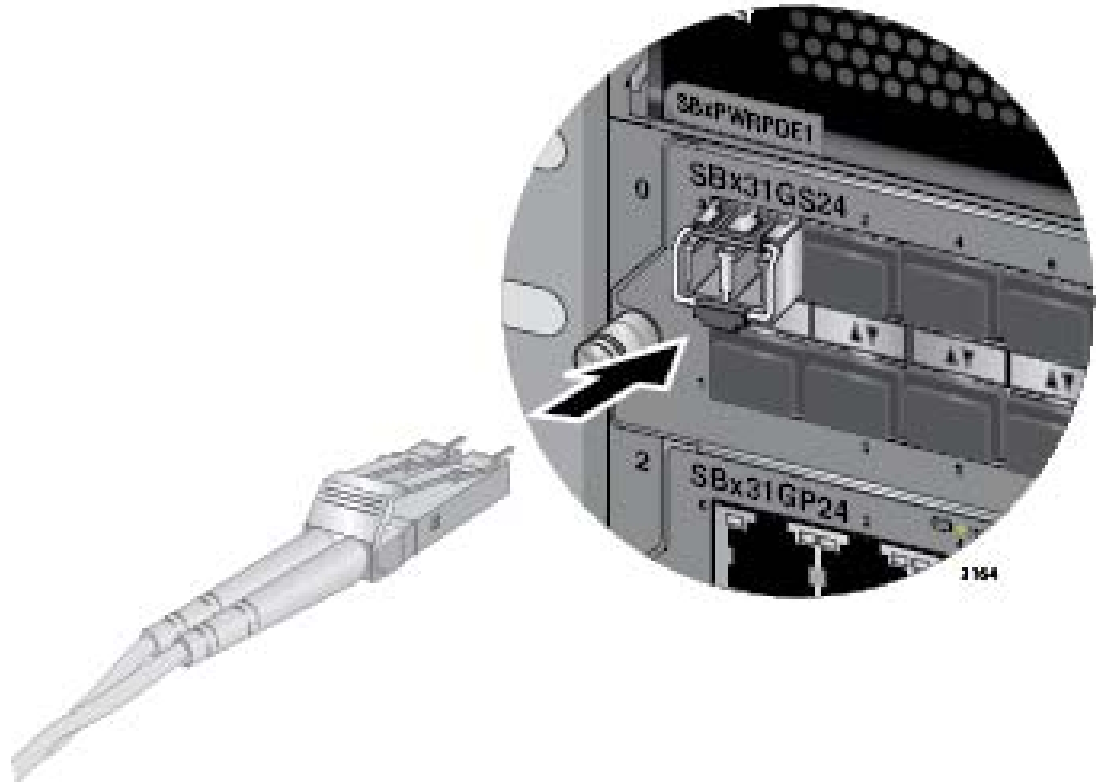


Figure 102. Attaching a Fiber Optic Cable to a Transceiver

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 9, "Powering On the Chassis" on page 185.

## 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+ transceiver slot chosen for the cable.

---

**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 103.

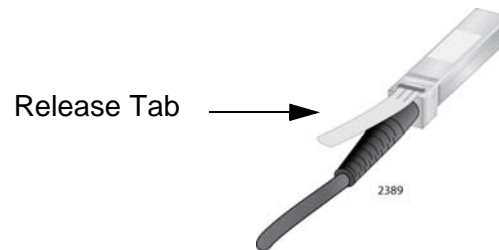


Figure 103. Release Tab on the AT-SBx31XS6 Line Card

3. Slide the connector into the slot until it clicks into place, as shown in Figure 104 on page 169.





Figure 104. Installing the AT-SP10TW Cable in the AT-SBx31XS6 Line Card

4. Install the other end of the cable into an SFP+ transceiver 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+ transceiver slot, gently push on the connector, pull on the release tab, and then slide the connector from the transceiver 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 9, “Powering On the Chassis” on page 185.

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

---

Please review the information in “Guidelines to Installing SFP, SFP+, CSFP, or XFP Transceivers” on page 163 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 transceiver slot chosen for the transceiver, as shown in Figure 105.



Figure 105. Removing the Dust Cover From an XFP Transceiver Slot on the AT-SBx31XZ4 Line Card

---

**Note**

Do not remove the dust plug from the XFP transceiver 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 106 on page 172.

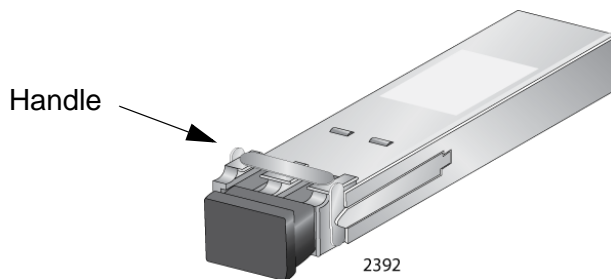


Figure 106. Handle on the XFP Transceiver

- Slide it into the transceiver slot until it clicks into place, as shown in Figure 107.



Figure 107. 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 108 on page 173.

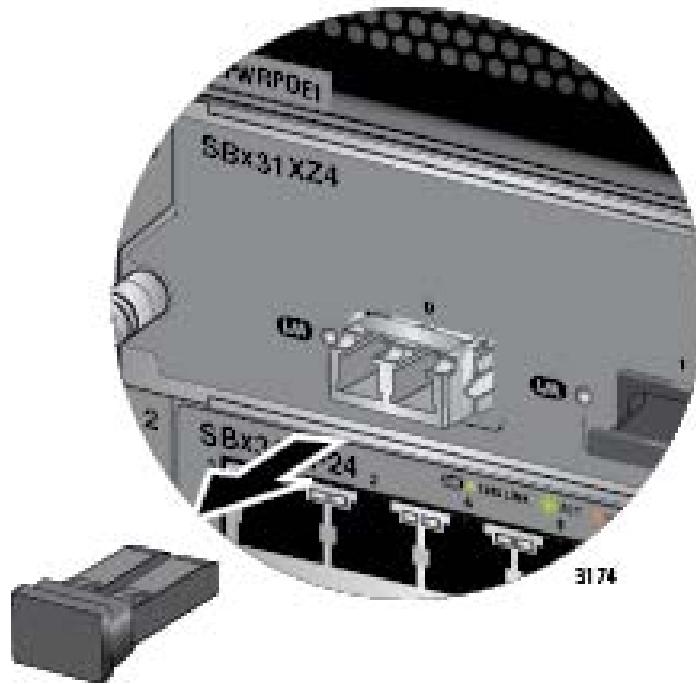


Figure 108. Removing the Protective Cover from an XFP Transceiver in the AT-SBx31XZ4 Line Card

---

**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 109 on page 174. The connector should snap into the port.

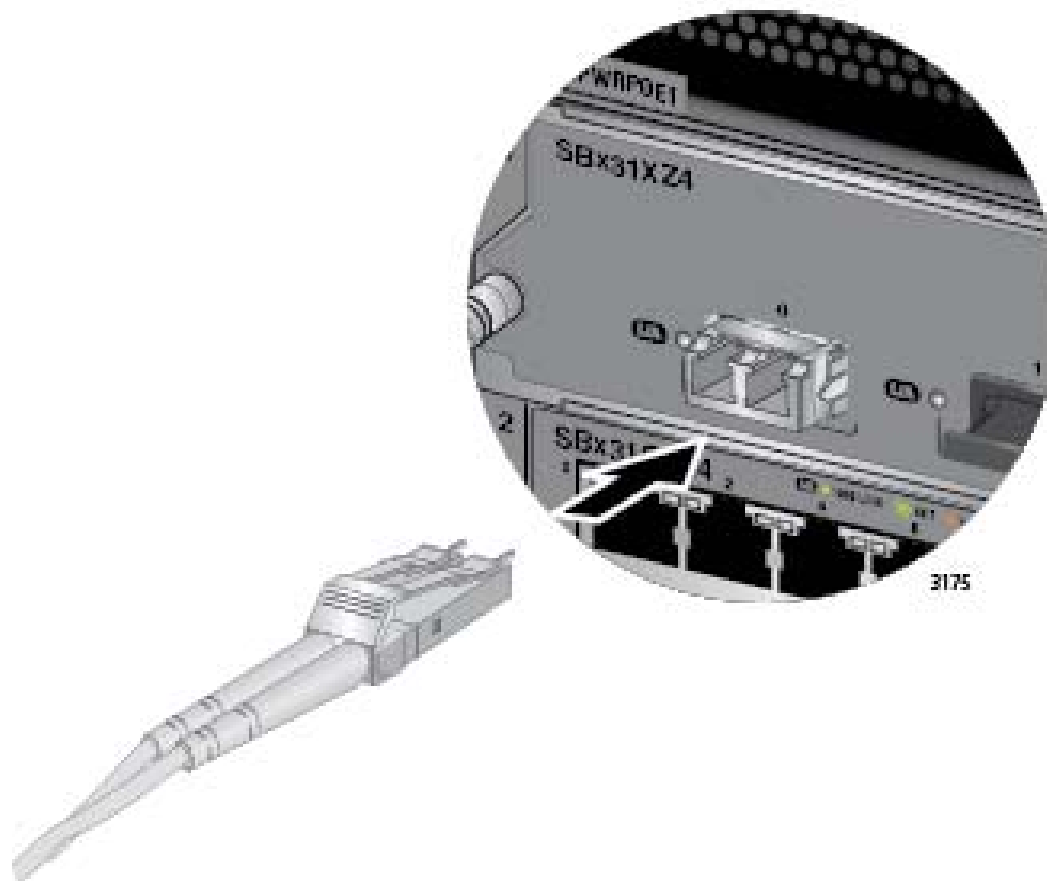


Figure 109. Attaching a Fiber Optic Cable to an XFP Transceiver in the AT-SBx31XZ4 Line Card

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 9, “Powering On the Chassis” on page 185.

## Installing AT-QSFPCU Cables

---

This section contains instructions on how to install AT-QSFPCU Cables in the AT-SBx81XLEM/Q2 Expansion Module for the AT-SBx81XLEM Line Card. You can use the cables in place of fiber optic cables and transceivers for 40GbE links of up to 1 or 3 meters. The model names of the cables are listed here:

- ❑ AT-QSFP1CU - 1 meter
- ❑ AT-QSFP3CU - 3 meters

---

**Note**

The AT-QSFPCU Cables are only supported in the AT-SBx81XLEM/Q2 Expansion Module.

---

Please review “Guidelines to Installing SFP, SFP+, CSFP, or XFP Transceivers” on page 163 before performing this procedure.

To install AT-QSFPCU Cables, perform the following procedure:

1. Remove the dust cover from a transceiver slot on the AT-SBx81XLEM/Q2 Expansion Module. Refer to Figure 110.



Figure 110. Removing the Dust Cover from a Transceiver Slot on the AT-SBx81XLEM/Q2 Expansion Module

2. Orient the connector on the AT-QSFPCU Cable with the release tab on top and slide it into the transceiver slot until it clicks into place. Refer to Figure 111 on page 176.

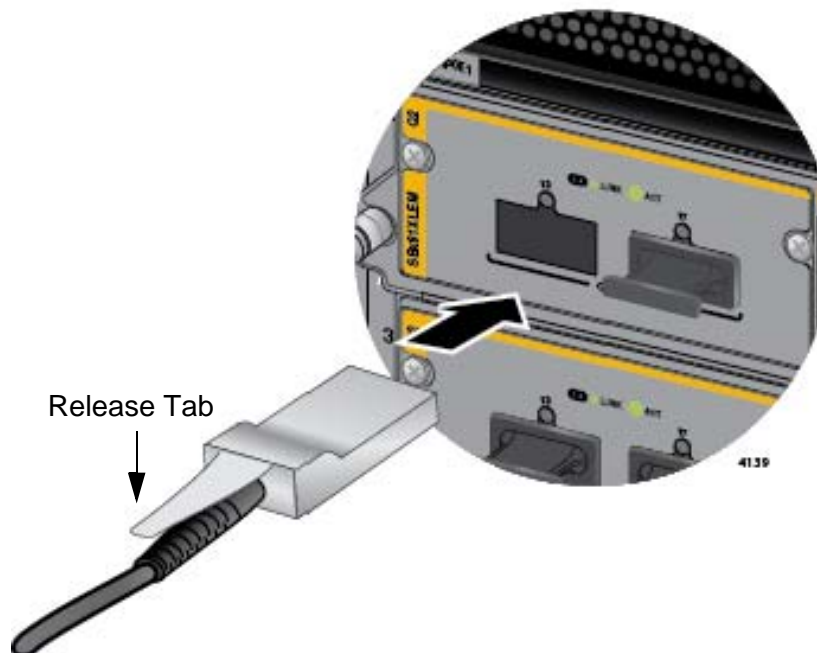


Figure 111. Sliding the AT-QSFPCU Cable into the Transceiver Slot

3. Install the other end of the cable into a compatible QSFP+ transceiver slot on another network device.
4. Repeat this procedure to install additional AT-QSFPCU Cables.

---

**Note**

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

---

5. After installing the AT-QSFPCU Cables, 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 9, "Powering On the Chassis" on page 185.



## Installing AT-QSFPSR, AT-QSFPSR4, or AT-QSFPLR4 Transceivers

---

This section contains the procedure for installing AT-QSFPSR, AT-QSFPSR4, or AT-QSFPLR4 transceivers in the transceiver slots on the AT-SBx81XLEM/Q2 Expansion Module.

---

**Note**

The AT-QSFPSR, AT-QSFPSR4, and AT-QSFPLR4 transceivers are only supported in the AT-SBx81XLEM/Q2 Expansion Module.

---

Please review “Guidelines to Installing SFP, SFP+, CSFP, or XFP Transceivers” on page 163 before performing this procedure.

To install AT-QSFPSR, AT-QSFPSR4, or AT-QSFPLR4 transceivers, perform the following procedure:

1. Remove the dust cover from a transceiver slot on the AT-SBx81XLEM/Q2 Expansion Module. Refer to Figure 110 on page 175.
2. Slide a transceiver into the transceiver slot until it clicks into place.
3. Attach fiber optic cable to the transceiver.
4. Repeat steps 1 to 3 to install and cable transceivers in the other transceiver slots of the expansion module.
5. Connect the cables to compatible QSFP ports in other network devices.

---

**Note**

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

---

6. After installing the 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 9, “Powering On the Chassis” on page 185.

## Cabling the NET MGMT Port on the AT-SBx31CFC960 Card

---

The controller card must have access to your network to support the management features in Table 27 on page 84. You may connect the port to a router, management workstation, or another switch. You can give the controller card access to your network either by configuring the Inband Interface, which allows 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, *Software Reference for SwitchBlade x3100 Series Switches*.)

---

### Note

The controller card has an Easy Startup application that lets you perform the initial configuration of the chassis using a web browser. If you plan to use the application, you should not connect the NET MGMT port to your network at this time. Instructions in Chapter 10, “Verifying the Hardware Operations of the Chassis” on page 223 explain how to use the Easy Startup application with the NET MGMT port.

---

Here are the guidelines to the NET MGMT port:

- ❑ The cabling requirements of the port are the same as the ports on the AT-SBx31GT24 Line Card, in Table 18 on page 64.
- ❑ If the chassis has two AT-SBx31CFC960 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 9, “Powering On the Chassis” on page 185.

## Installing SFP or SFP+ Transceivers in the AT-SBx31CFC960 Card

The AT-SBx31CFC960 Controller Fabric Card has four transceiver slots for 1000Mbps SFP or 10Gbps SFP+ transceivers. The transceivers can be used for high-speed links to network servers, switches, routers, or other network devices. The list of supported SFP and SFP+ transceivers for the controller card is available on the Allied Telesis web site.

To install SFP or SFP+ transceivers in the controller card, perform the following procedure:

1. Remove the dust plug from the transceiver slot chosen for the transceiver, as shown in Figure 112.

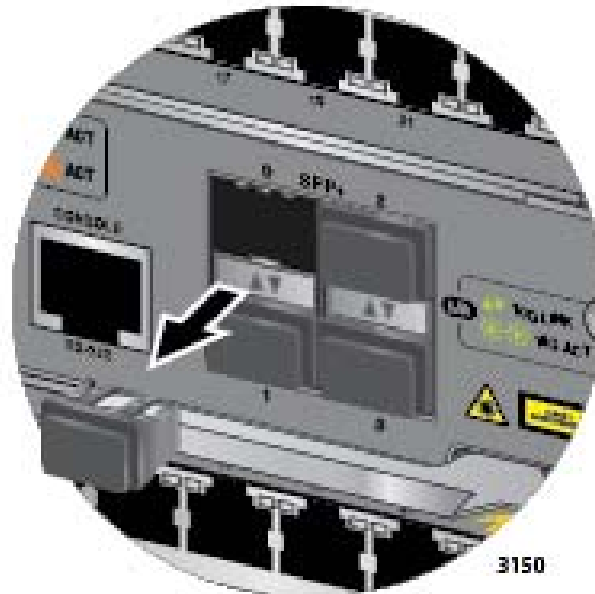


Figure 112. Removing a Dust Cover from a Transceiver Slot in the AT-SBx31CFC960 Controller Fabric Card

---

### Note

Do not remove a dust plug from a transceiver slot if you are not installing a transceiver at this time. A dust plug protects the controller card from dust contamination.

---

2. If you are installing the transceiver in transceiver slot 0 or 2, orient it with the handle on top, as shown in Figure 113 on page 181. To install it into transceiver slot 1 or 3, orient it with the handle on the bottom.

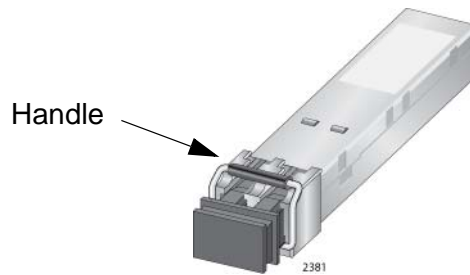


Figure 113. Handle on an SFP or SFP+ Transceiver

3. Slide the transceiver into the transceiver slot until it clicks into place, as shown in Figure 114.

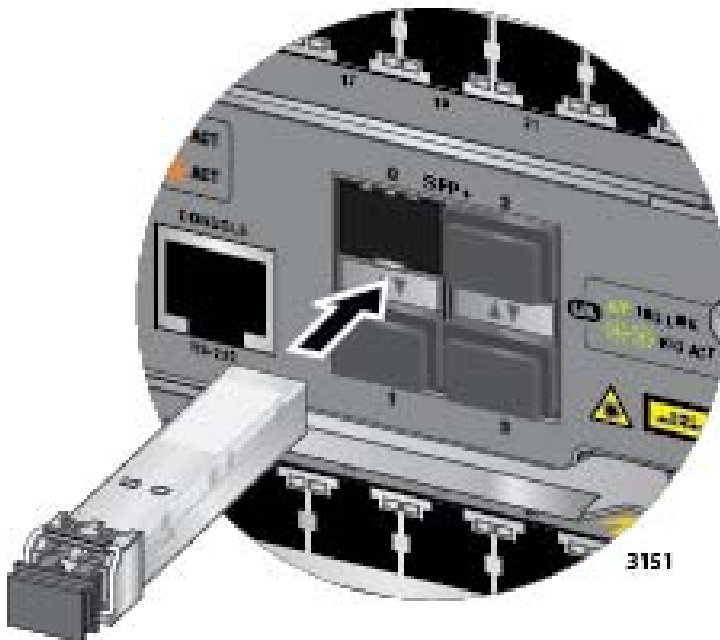


Figure 114. Installing an SFP or SFP+ Transceiver in the AT-SBx31CFC960 Controller Fabric Card

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**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 transceivers in the controller card.

---

4. Remove the protective cover from the transceiver, as shown in Figure 115 on page 182.

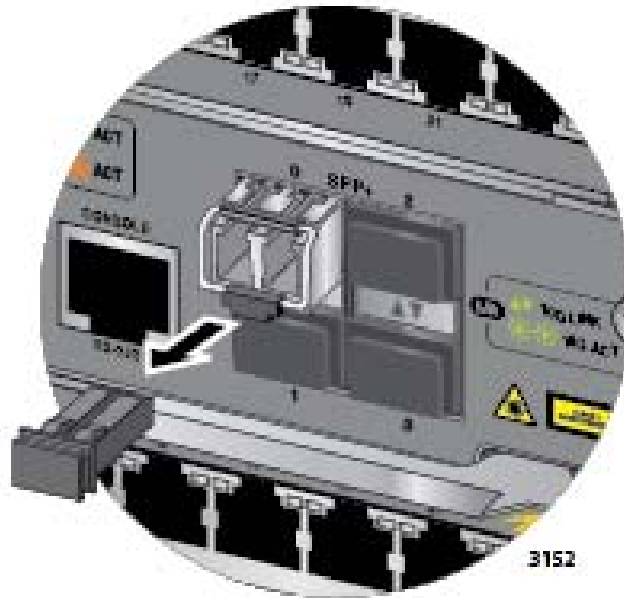


Figure 115. Removing the Dust Cover from an SFP or SFP+ Transceiver in the AT-SBx31CFC960 Controller Fabric Card

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**Note**

The dust cover protects the fiber optic port on the 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 116 on page 183. The connector should snap into the port.

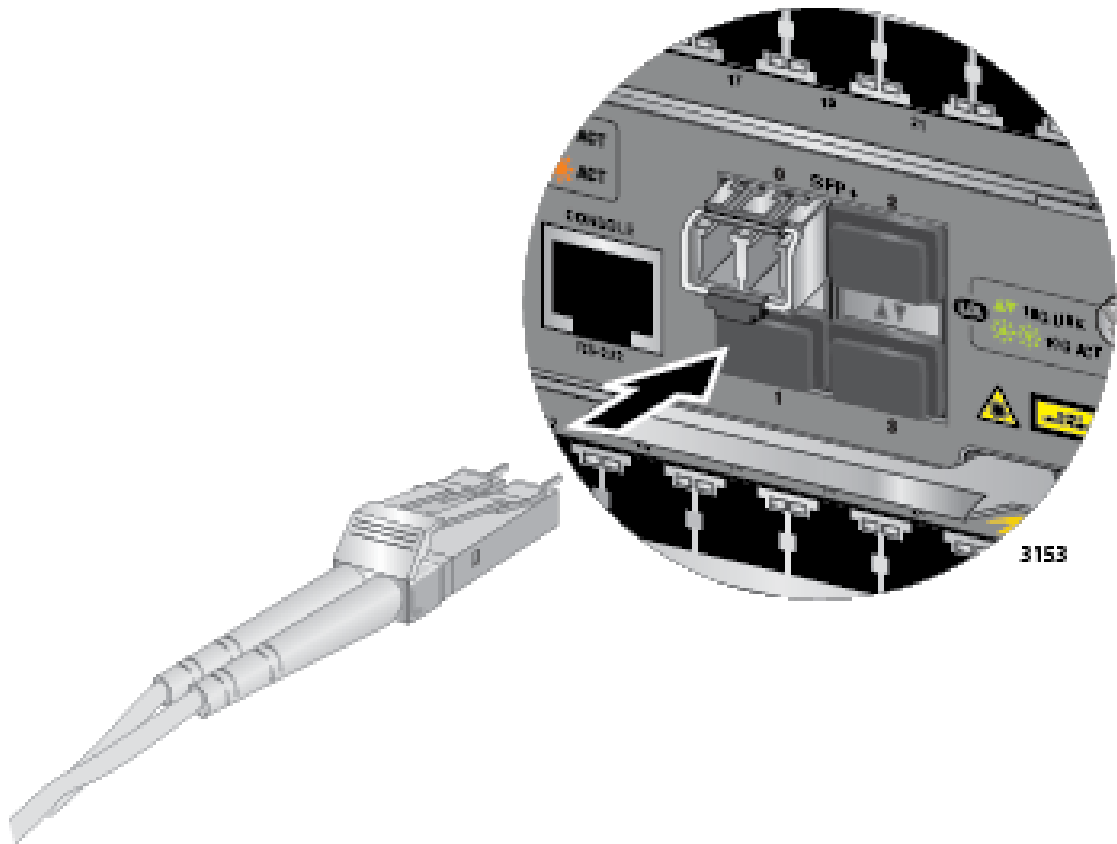


Figure 116. Attaching a Fiber Optic Cable to an SFP or SFP+ Transceiver in the AT-SBx31CFC960 Controller Fabric Card

6. Repeat this procedure to install additional SFP or SFP+ transceivers in the AT-SBx31CFC960 Controller Card.

After installing and cabling the 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 9, “Powering On the Chassis” on page 185.





## Chapter 9

# Powering On the Chassis

---

This chapter contains procedures for powering on the chassis, monitoring the initialization process, and confirming the operational status of the components. The chapter contains the following sections:

- ❑ “Verifying the Installation” on page 186
- ❑ “Powering On the AT-SBxPWRSYS1 or AT-SBxPWRSYS2 AC System Power Supply” on page 187
- ❑ “Powering on the AT-SBxPWRPOE1 AC PoE Power Supply” on page 190
- ❑ “Powering On the AT-SBxPWRSYS1 DC System Power Supply” on page 193
- ❑ “Monitoring the Initialization Process” on page 218

## 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 112.
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 156.
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-SBx31CFC960 Control Card installed in slot 4 or 5.
6. Verify that the chassis has at least one AT-SBxPWRSYS1 or AT-SBxPWRSYS2 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-SBx31CFC960 Controller Fabric Card, did you remove the battery insulator, shown in Figure 73 on page 140? If not, remove the controller 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 or AT-SBxPWRSYS2 AC System Power Supply” on page 187
- “Powering on the AT-SBxPWRPOE1 AC PoE Power Supply” on page 190
- “Powering On the AT-SBxPWRSYS1 DC System Power Supply” on page 193

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**Note**

If the chassis has both system and PoE power supplies, you may power on the power supplies in any order or simultaneously.

---

## Powering On the AT-SBxPWRSYS1 or AT-SBxPWRSYS2 AC System Power Supply

The procedure in this section explains how to power on the AT-SBxPWRSYS1 or AT-SBxPWRSYS2 AC System Power Supply in the chassis. System power supplies provide power for all of the hardware components of the chassis, including line cards, controller cards, and fan module. The only component that system power supplies do not support is the PoE feature on the ports on the AT-SBx31GP24 Line Cards. For installation instructions, refer to “Installing the AT-SBxPWRSYS1 or AT-SBxPWRSYS2 AC System Power Supply” on page 117.

### Note

If the chassis has both system and PoE power supplies, you may power on the power supplies in any order or 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 117. The sockets correspond to the system power supplies in slots C and D on the front panel of the chassis.



Figure 117. 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 118 shows the AC power cord being connected to connector D for the power supply in slot D on the front panel.



Figure 118. Connecting the AC Power Cord for the AT-SBxPWRSYS1 or AT-SBxPWRSYS2 AC System 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 119 on page 189.



Figure 119. Securing the Power Cord for the AT-SBxPWRSYS1 or AT-SBxPWRSYS2 AC System 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 or AT-SBxPWRSYS2 AC System Power Supplies, repeat steps 1 to 4 to power on the second power supply.
6. After powering on the 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 PoE Power Supply” on page 190.
  - ❑ Otherwise, go to “Monitoring the Initialization Process” on page 218.

## Powering on the AT-SBxPWRPOE1 AC PoE Power Supply

This section contains instructions on how to power on the AT-SBxPWRPOE1 AC PoE Power Supply. For installation instructions, refer to “Installing the AT-SBxPWRPOE1 AC Power Supply” on page 123. 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 117 on page 187. 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 a plug whose corresponding slot on the front panel has a PoE power supply.

If the chassis has two AT-SBxPWRPOE1 Power Supplies, you may power on either supply first. The illustration in Figure 120 shows the AC power cord being connected to connector A for the power supply in slot A on the front panel.



Figure 120. 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 121.

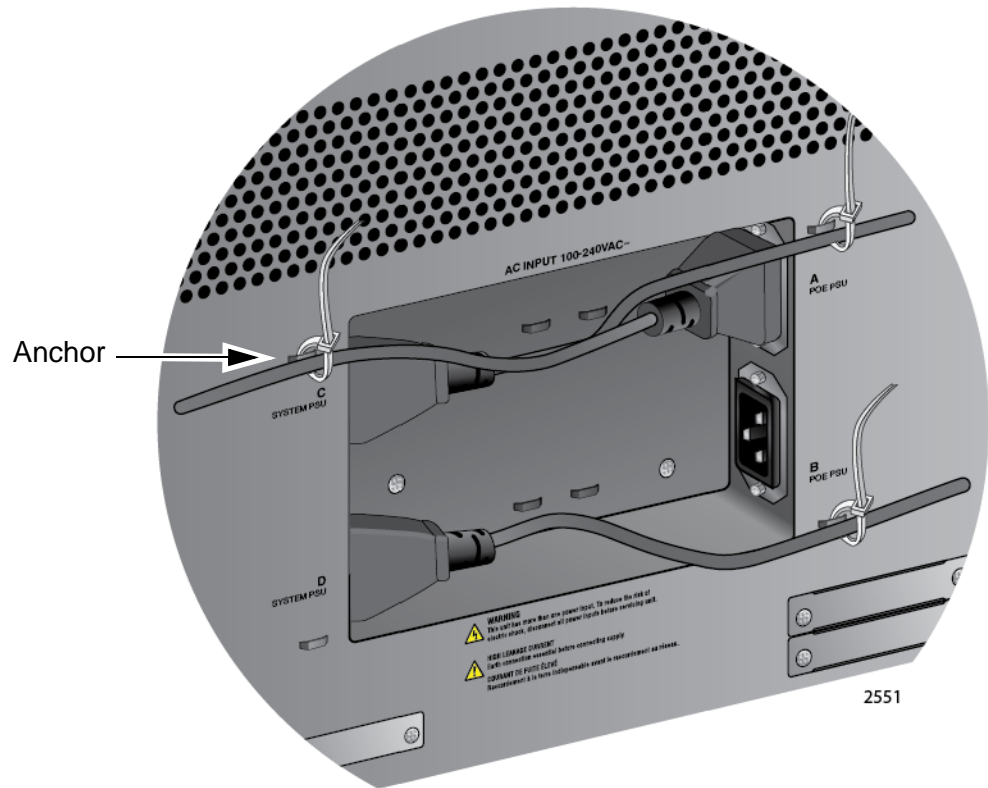
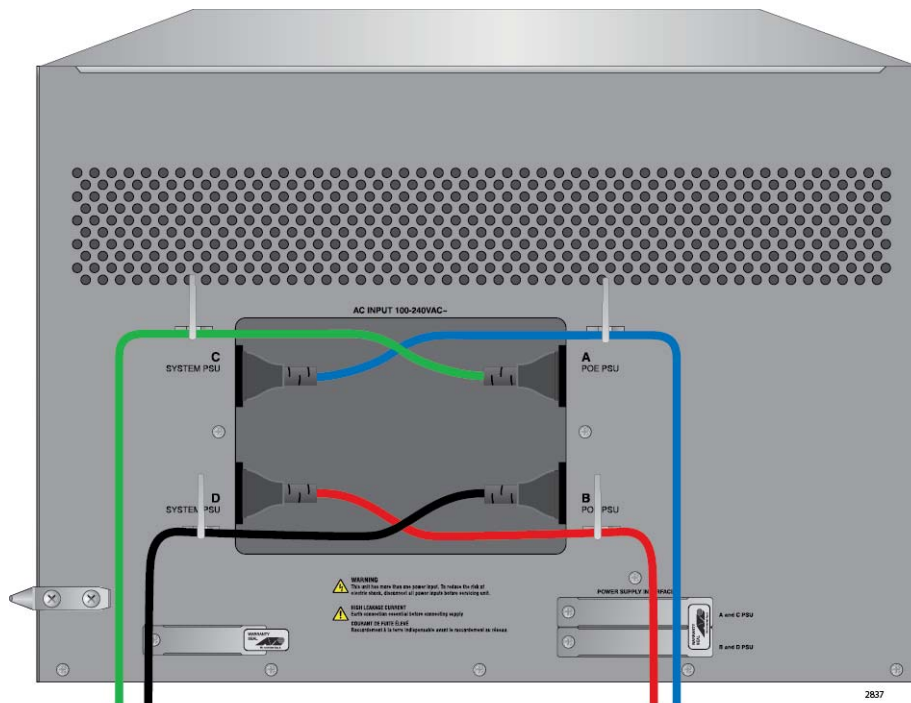


Figure 121. Securing the Power Cord for the AT-SBxPWRPOE1 Power Supply to an Anchor

- 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 122 on page 192 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 122. Dress and Secure AC Power Cords

6. After powering on the PoE power supplies, do one of the follow:
  - If you have not powered on the system power supplies, perform the procedure in “Powering On the AT-SBxPWRSYS1 or AT-SBxPWRSYS2 AC System Power Supply” on page 187.
  - Otherwise, go to “Monitoring the Initialization Process” on page 218.



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

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This section contains instructions on how to power on the AT-SBxPWRSYS1 DC System Power Supply. For installation instructions, refer to “Installing the AT-SBxPWRSYS1 DC System Power Supply” on page 128.

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 195
- “Connecting the Grounding Wire with the Grounding Terminal” on page 195
- “Connecting the Grounding Wire with Bare Wire” on page 198
- “Choosing a Method for Attaching the Power Wires” on page 199
- “Connecting the DC Power Wires with the Straight Terminals” on page 200
- “Connecting the DC Power Wires with the Right Angle Terminals” on page 208
- “Connecting Bare DC Power Wires” on page 214

The components of the power supply are identified in Figure 123 on page

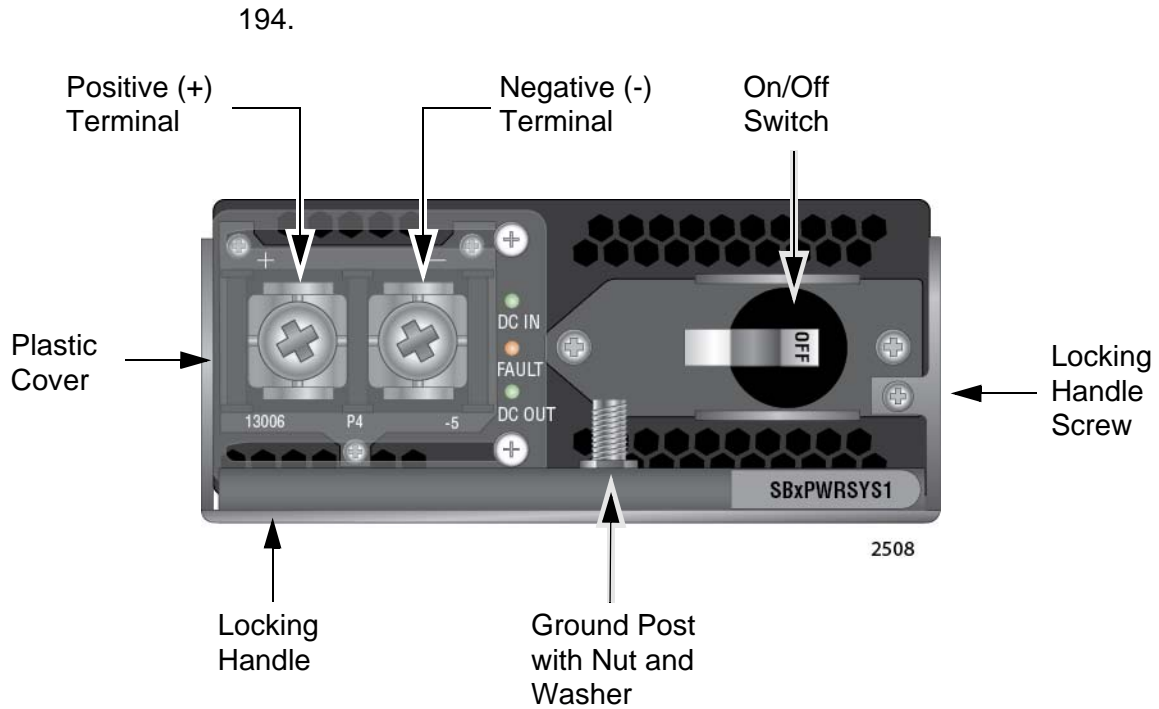


Figure 123. Components of the AT-SBxPWRSYS1 DC Power Supply



**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 124, or bare wire.

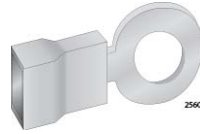


Figure 124. Grounding Wire Terminal

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 198

## 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 125.

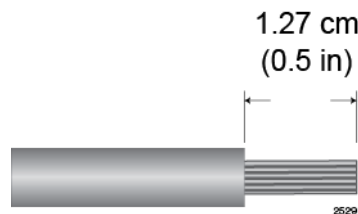


Figure 125. Stripping the Stranded Grounding Wire

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### 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 126,

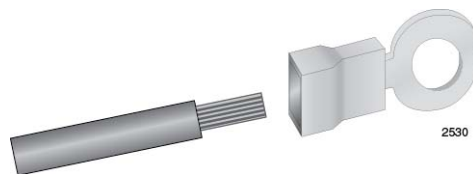


Figure 126. Attaching the Stranded Grounding Wire to the Grounding Terminal

3. Use an 8 mm wrench to remove the grounding post nut and washer, shown in Figure 127, from the power supply.

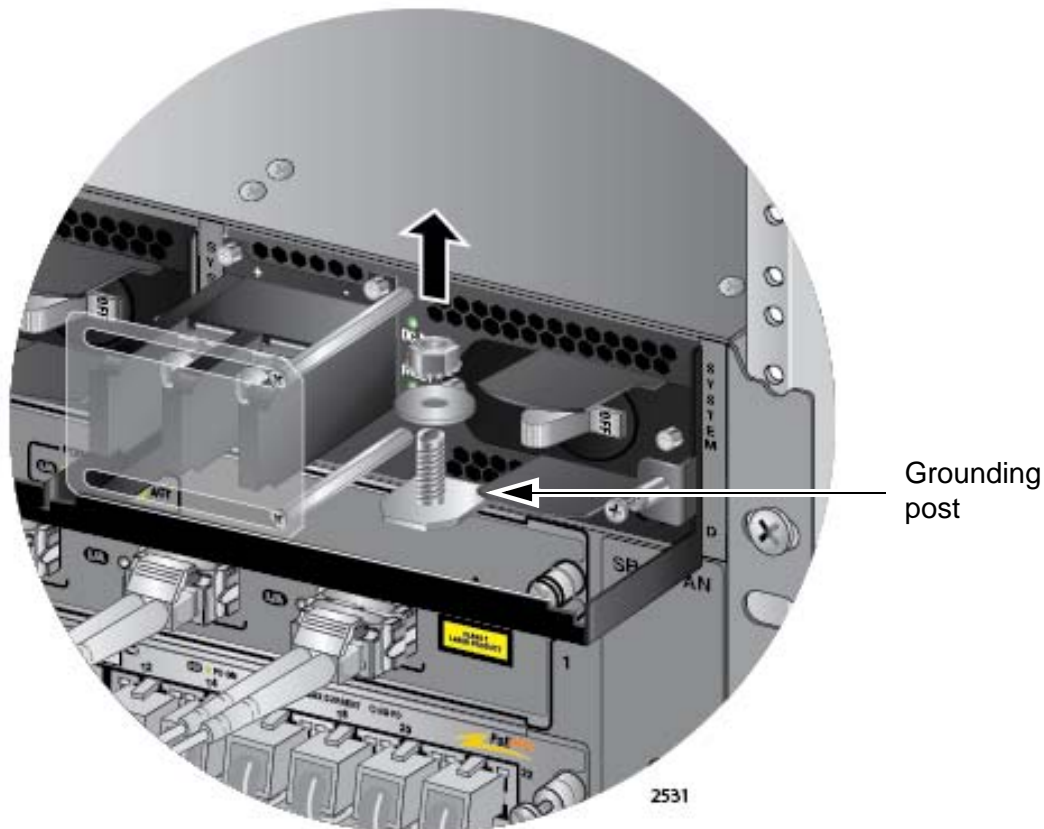


Figure 127. Removing the Nut and Washer from the Grounding Post

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 128 on page 197.

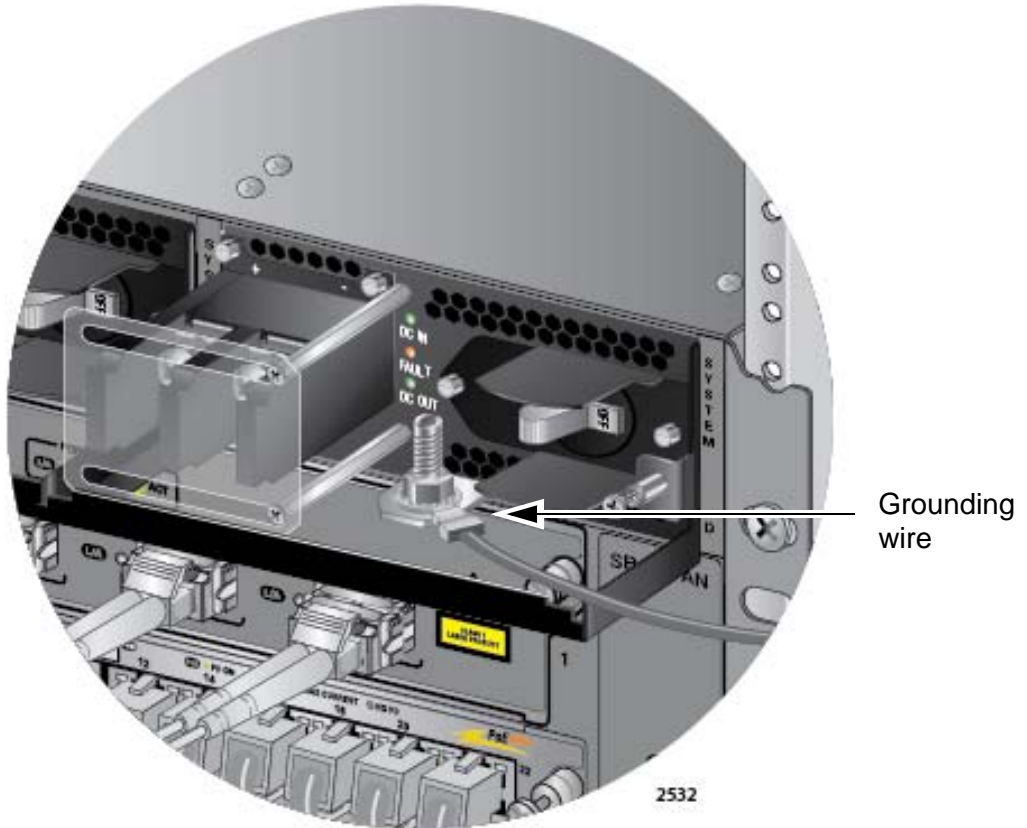


Figure 128. Installing the Grounding Wire

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

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**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 129.

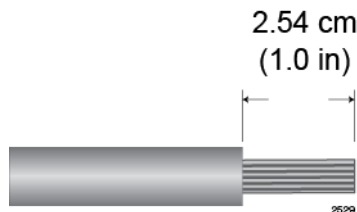


Figure 129. Stripping the solid or Stranded Grounding Wire

2. Use an 8 mm wrench to remove the grounding post nut and washer, shown in Figure 127 on page 196, 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 130.

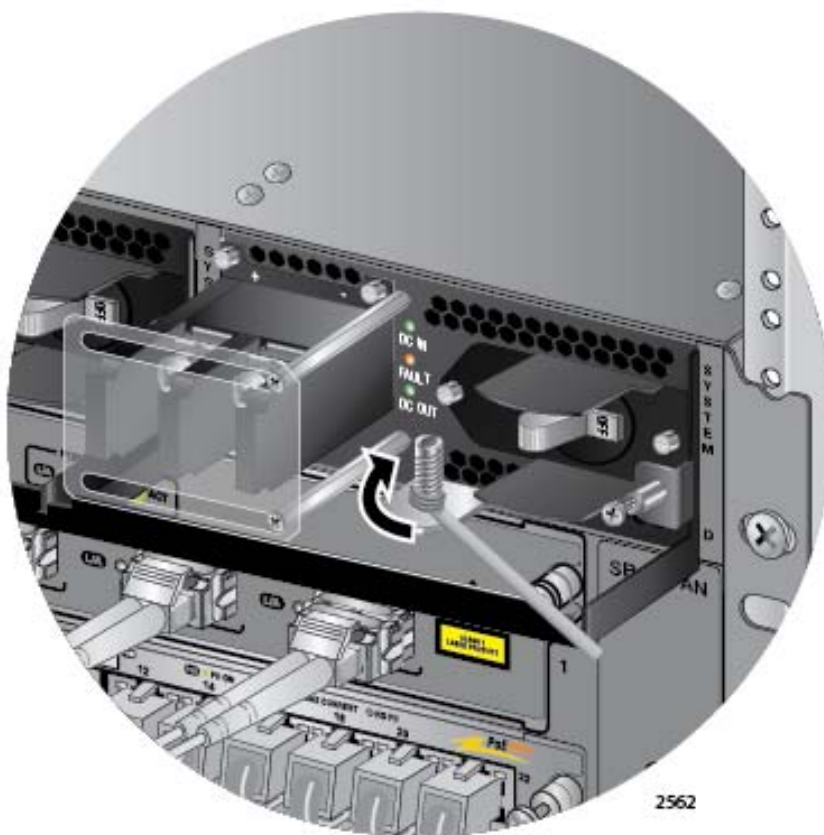


Figure 130. Attaching the Bare Grounding Wire to the Grounding Post

4. Secure the wire with the nut and washer removed in step 2, and an 8 mm wrench, as shown in Figure 131.

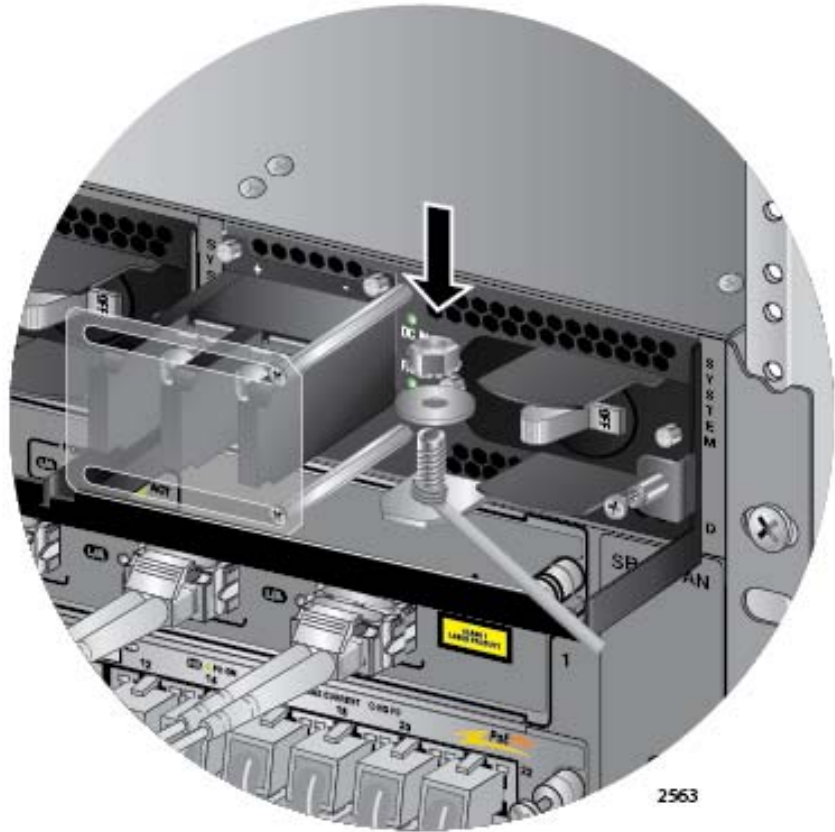


Figure 131. Securing the Bare Grounding Wire to the Grounding Post

### 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 132. 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 132. Power Wire Terminals

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**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 208
- ❑ “Connecting Bare DC Power Wires” on page 214

### 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 133.



---

**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

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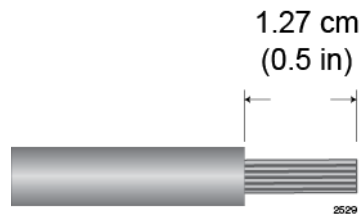


Figure 133. Stripping the Power Wires

---

**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 134 on page 201.



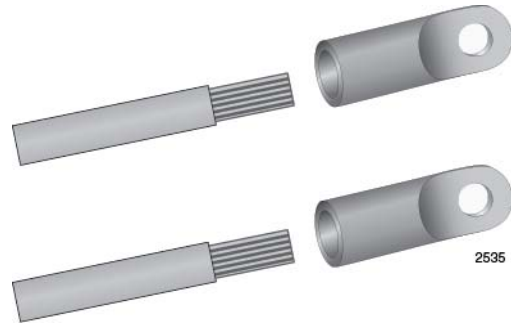


Figure 134. Attaching the Power Wires to the Power Terminal Lugs

3. Verify that the On/Off switch on the AT-SBxPWRSYS1 DC Power Supply is in the Off position. Refer to Figure 135.

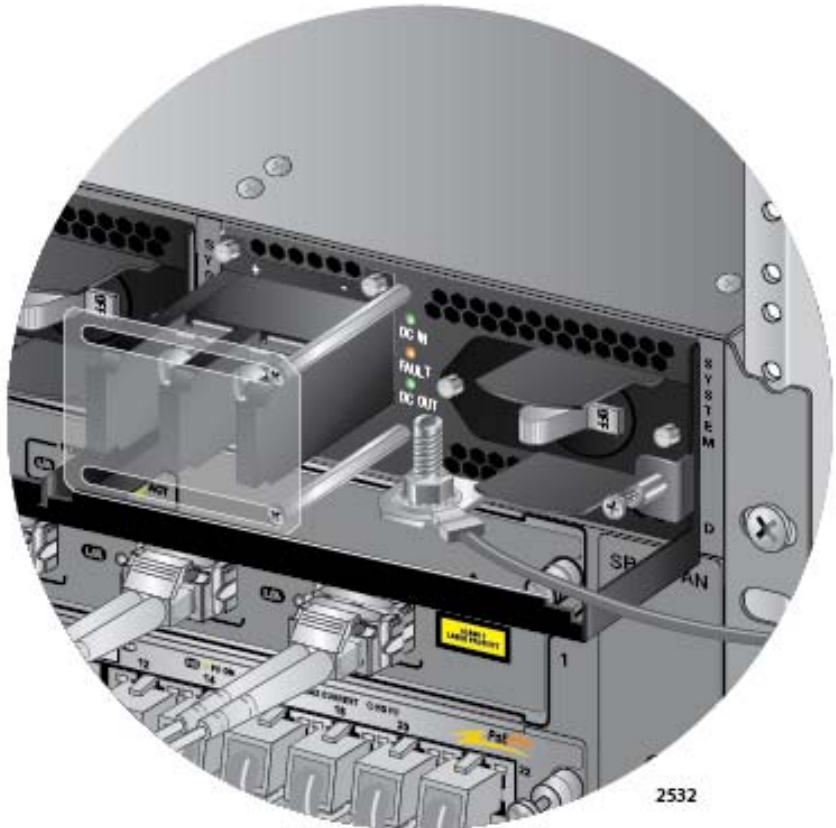


Figure 135. On/Off Switch On the AT-SBxPWRSYS1 DC Power Supply

4. 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 136 on page 202. You may need to lift the locking handle slightly to access the bottom screw.

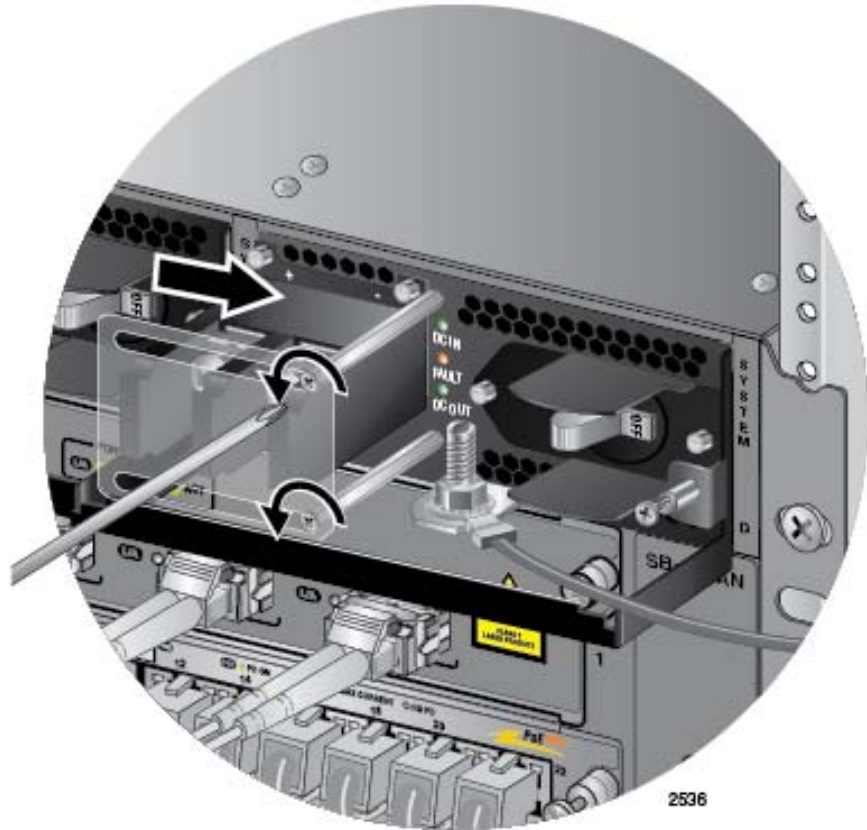


Figure 136. Opening the Plastic Cover

5. Use a #3 Phillips-head screwdriver to remove the two screws from the positive and negative terminals, as shown in Figure 137 on page 203.



Figure 137. Removing the Terminal Screws

6. With a #3 Phillips-head screwdriver, connect the positive (+) power lead wire to the positive terminal on the power supply, with one of the terminal screws removed in the previous step. The positive terminal is on the left. You may attach the terminals with the wires either above or below the terminal block. Figure 138 on page 204 shows the wires above the terminal block.

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

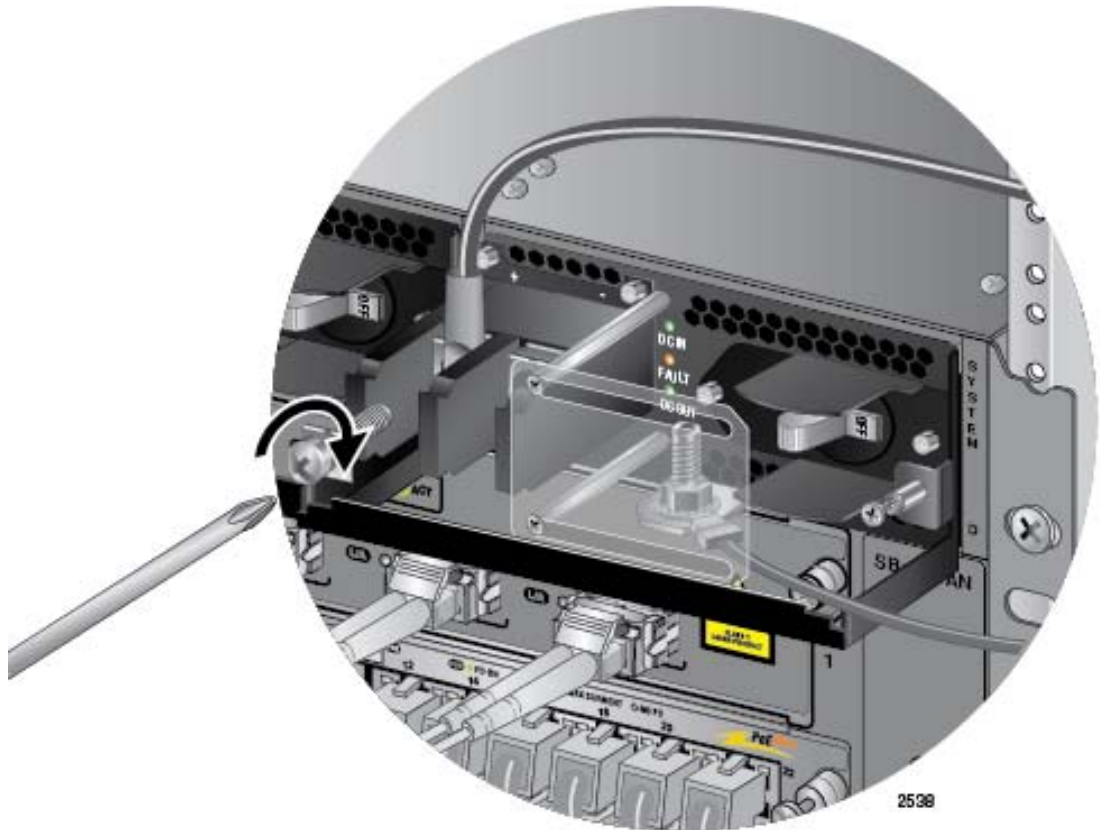


Figure 138. Connecting the Positive (+) Power Wire with a Straight Terminal

7. With a #3 Phillips-head screwdriver, connect the negative (-) power lead wire to the negative terminal on the power supply, with the remaining terminal screw removed in the previous step 5. The negative terminal is on the right. You may attach the terminals with the wires either above or below the terminal block. Refer to Figure 139 on page 205.

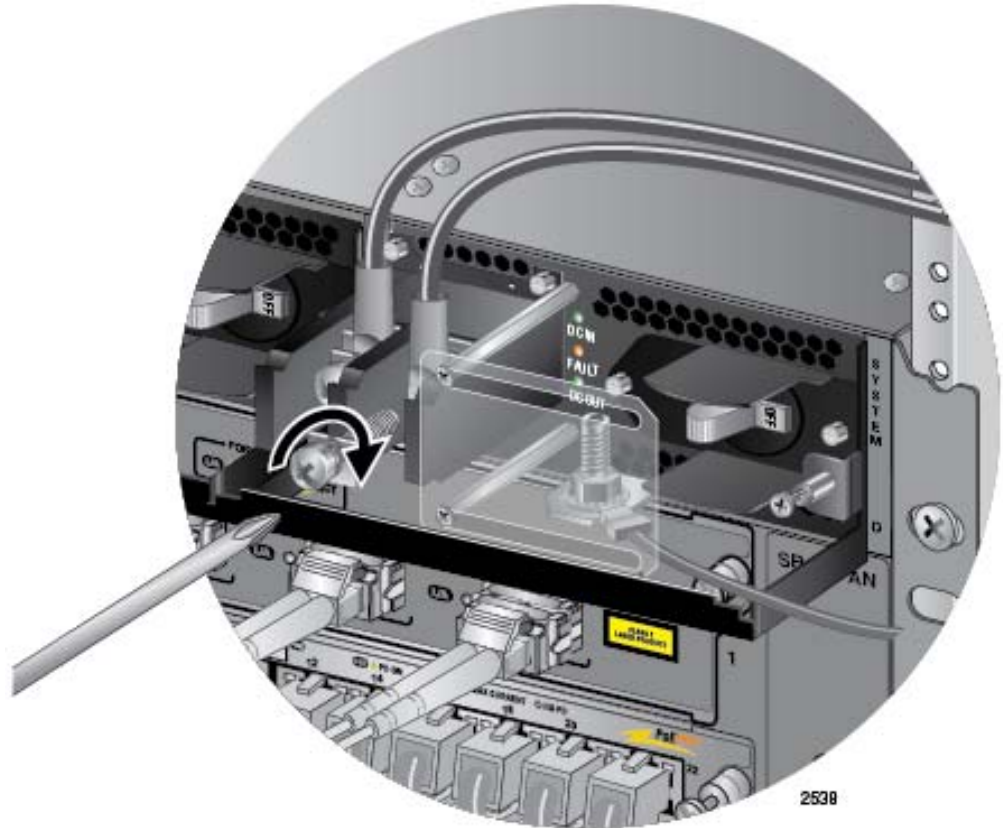


Figure 139. Connecting the Negative (-) Power Wire with a Straight Terminal



### 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*

8. 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 140 on page 206. You might need to lift the locking handle slightly to access the bottom screw.

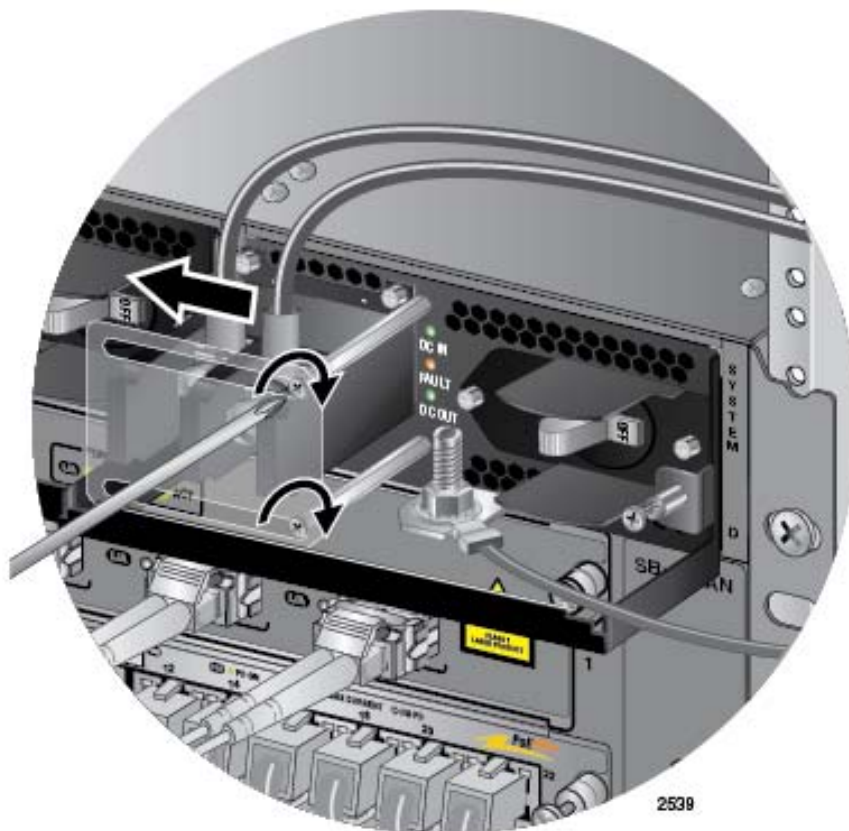


Figure 140. Closing the Plastic Cover over the Terminal Connectors



**Caution**

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

9. With a #2 Phillips-head screwdriver, tighten the handle locking screw to secure the power supply to the chassis. See Figure 141 on page 207.

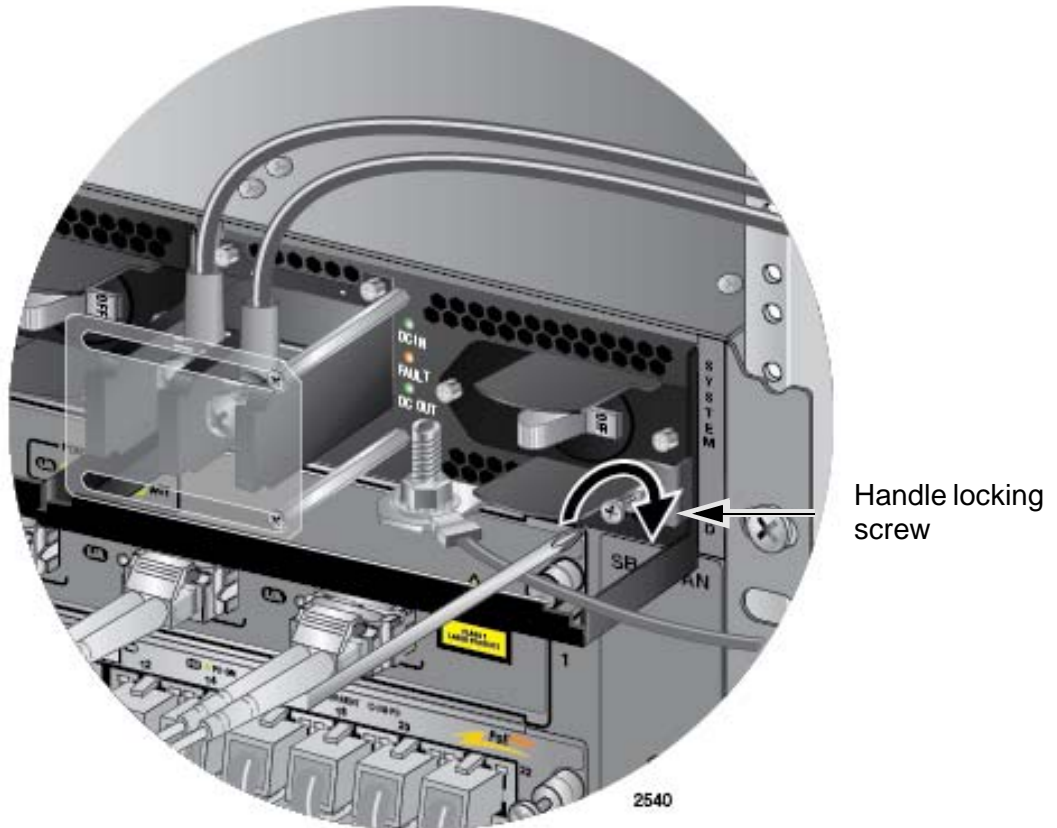


Figure 141. Tightening the Handle Locking Screw

10. Before attaching the power wires from the power supply to the circuit breaker in the wiring closet, check that the circuit breaker is off.
11. Connect the power wires to the circuit breaker.
12. Turn the circuit breaker on.
13. Turn the On/Off switch on the power supply to the On position. See Figure 135 on page 201.
14. 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 218.

## 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 142.



### 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

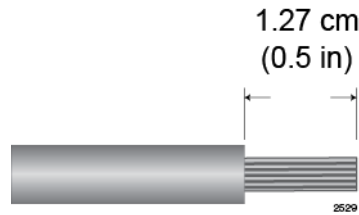


Figure 142. Stripping the Power Wires

### 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 143.

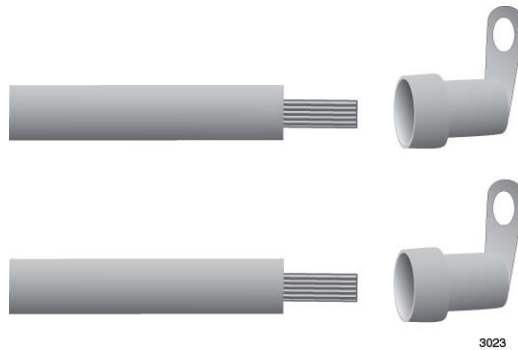


Figure 143. Attaching the Power Wires to the Right Angle Terminals

3. Verify that the On/Off switch on the AT-SBxPWRSYS1 DC Power Supply is in the Off position. Refer to Figure 135 on page 201.



- 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 144. You may need to lift the locking handle slightly to access the bottom screw.

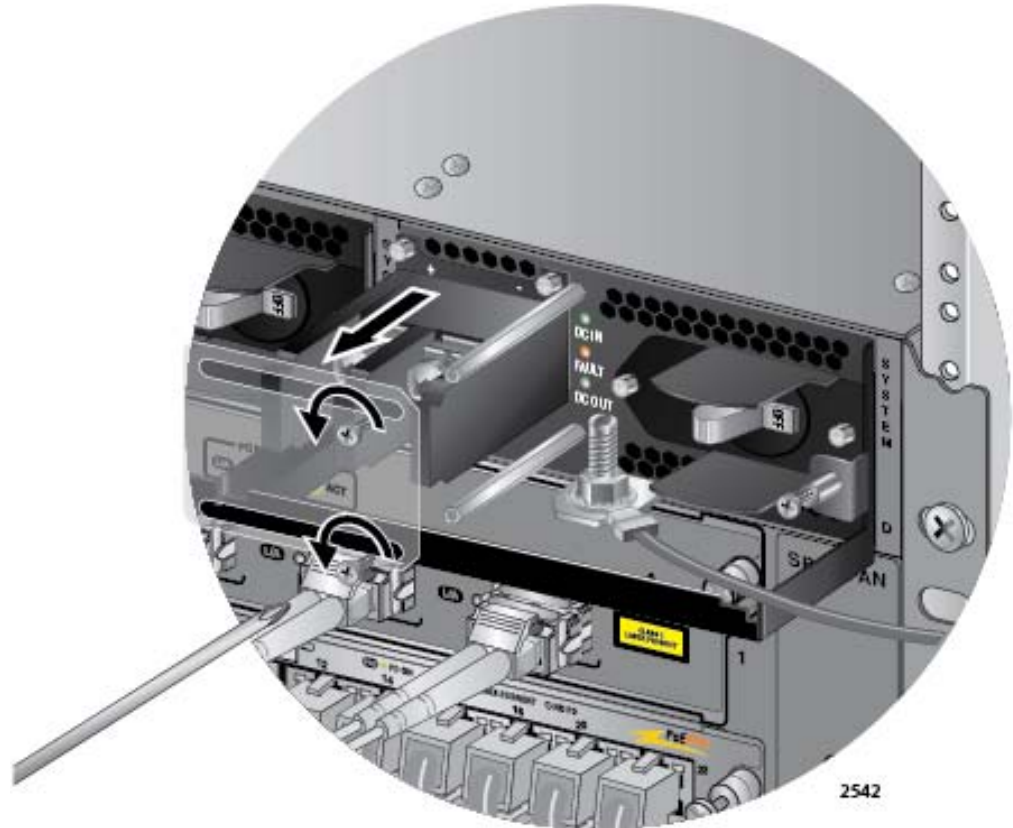


Figure 144. Removing the Plastic Cover

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**Note**

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

---

- Use a #3 Phillips-head screwdriver to remove the two screws from the positive and negative terminals, as shown in Figure 145 on page 210.



Figure 145. Removing the Terminal Screws

6. With a #3 Phillips-head screwdriver, connect the positive (+) power lead wire to the positive terminal on the power supply, with one of the terminal screws removed in the previous step. The positive terminal is on the left. Refer to Figure 146 on page 211.

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



Figure 146. Connecting the Positive (+) Power Wire with a Right Angle Terminal

7. With a #3 Phillips-head screwdriver, connect the negative (-) power lead wire to the negative terminal on the power supply, with the remaining terminal screw removed in step 5. The negative terminal is on the right. Refer to Figure 147 on page 212.

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

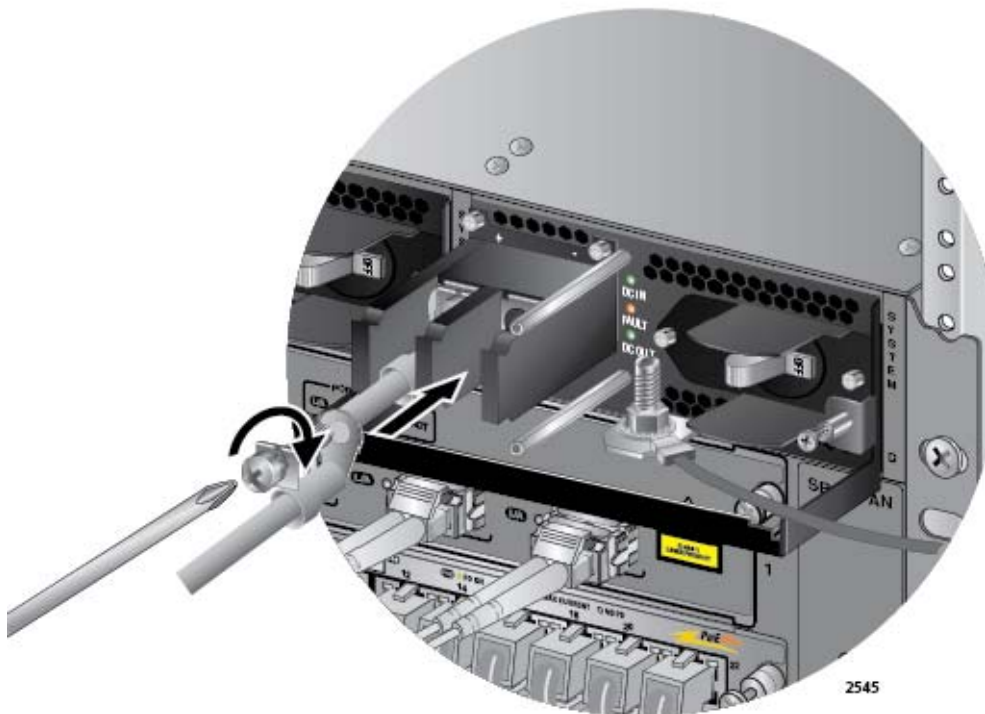


Figure 147. Connecting the Negative (-) Power Wire with a Right Angle Terminal



**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. *ES* E12

8. With a #2 Phillips-head screwdriver, tighten the handle locking screw to secure the power supply to the chassis. See Figure 148 on page 213.

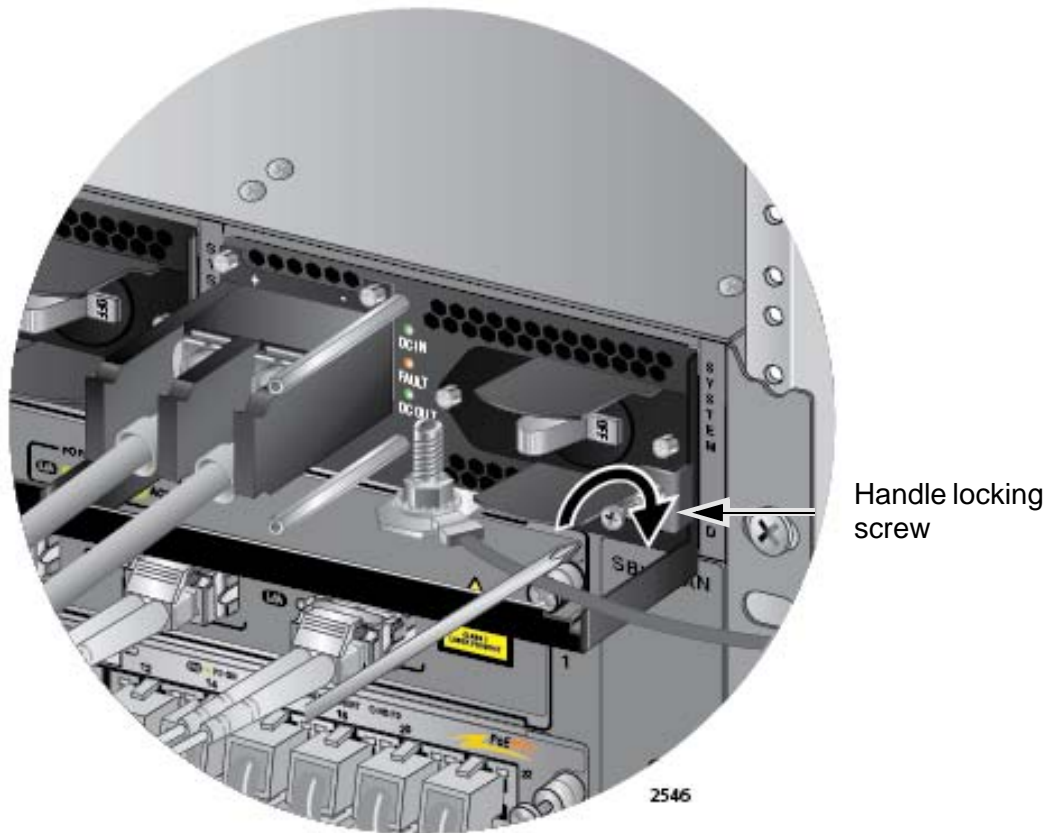


Figure 148. Tightening the Handle Locking Screw

9. Before attaching the power wires from the power supply to the circuit breaker in the wiring closet, check that the circuit breaker is off. Refer to Figure 135 on page 201.
10. Connect the power wires to the circuit breaker.
11. Turn the circuit breaker on.
12. Turn the On/Off switch on the power supply to the On position. See Figure 135 on page 201.
13. 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 218.

## 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 149.

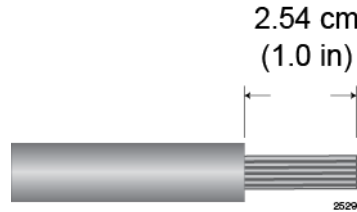


Figure 149. Stripping Solid or Stranded DC Power Wires

2. Verify that the On/Off switch on the AT-SBxPWRSYS1 DC Power Supply is on the Off position. Refer to Figure 135 on page 201.
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 136 on page 202. You may need to lift the locking handle slightly to access the bottom screw.
4. Use a #3 Phillips-head screwdriver to remove the two screws from the positive and negative terminals, as shown in Figure 137 on page 203.
5. 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 150 on page 215 shows the wire above the terminal block. Allied Telesis recommends tightening the screw to 30 to 40 inch-lbs.

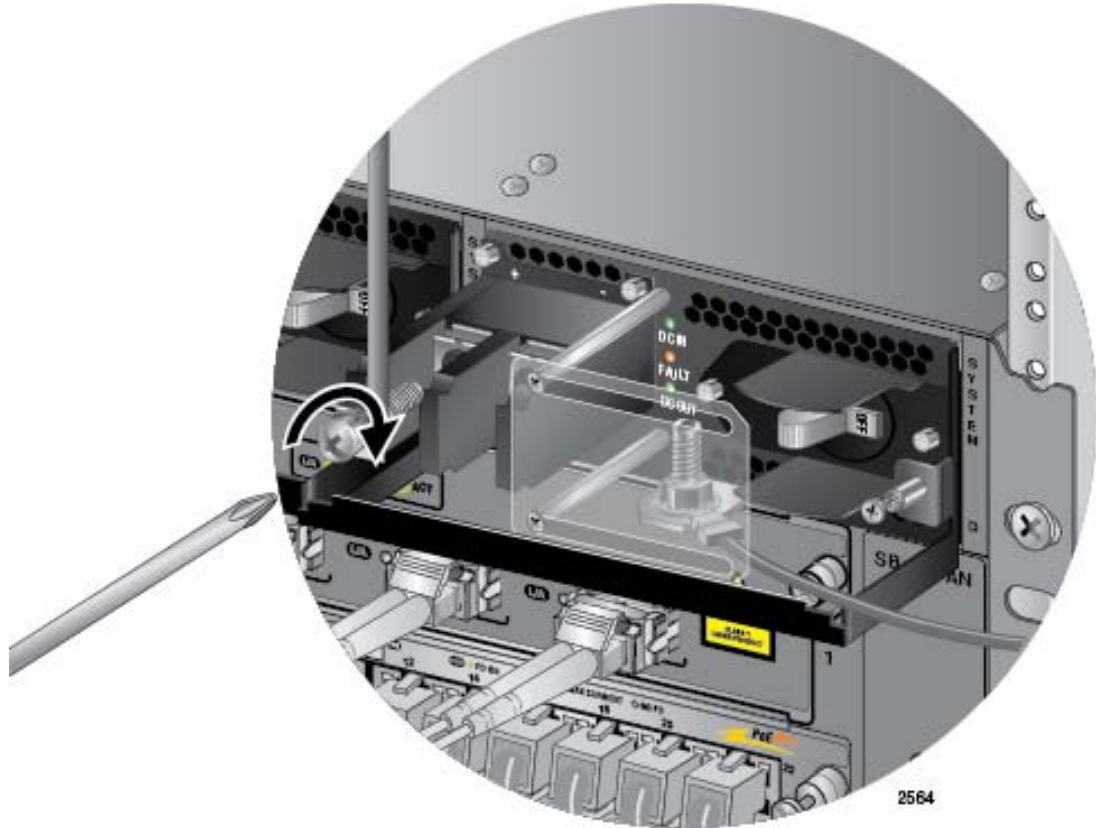


Figure 150. Connecting the Positive Lead Wire

6. 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 151 on page 216. The negative terminal is on the right.

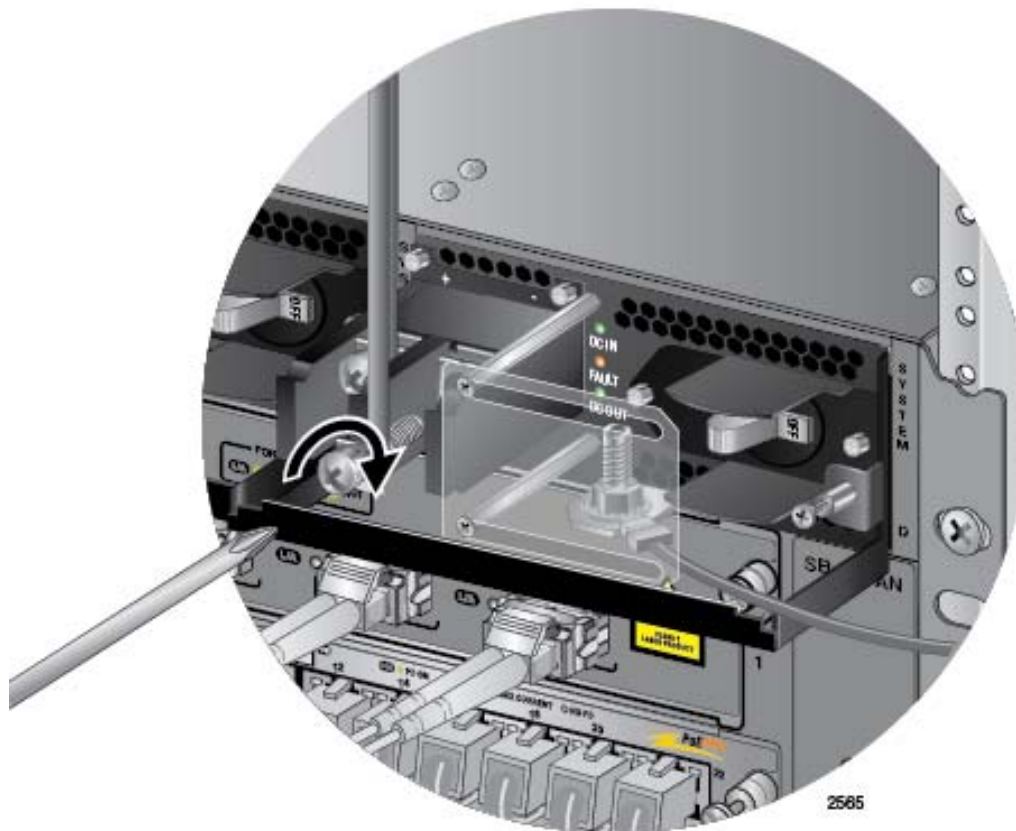


Figure 151. Connecting the Negative Lead Wire

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

7. 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 140 on page 206. 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.



8. With a #2 Phillips-head screwdriver, tighten the handle locking screw to secure the power supply to the chassis. See Figure 141 on page 207.
9. Before attaching the power wires from the power supply to the circuit breaker in the wiring closet, check that the circuit breaker is off.
10. Connect the power wires to the circuit breaker.
11. Turn the circuit breaker on.
12. Turn the On/Off switch on the power supply to the On position. See Figure 135 on page 201.
13. 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 218.

## Monitoring the Initialization Process

---

The controller 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 controller cards in the chassis. There are three possible configurations:

- ❑ Configuration 1: Chassis with one controller card.

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

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

The initialization process for a chassis with two controller 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 controller card starts to forward traffic across the backplane. At this point, the available backplane bandwidth for each line card slot is 20Gbps.

In the third phase the inactive controller 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 controller card joins with the active card in forwarding packets across the backplane, to provide each line card slot with 40Gbps of backplane bandwidth.

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

The initialization process for a chassis with two controller 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 controller card starts to forward traffic across the backplane. At this point, the available backplane bandwidth for each line card slot is 20Gbps.

During the third phase, the inactive controller card synchronizes its configuration database and load files with the active controller 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 controller card does not forward traffic

across the backplane or on its SFP+ slots. Only after it has fully synchronized its files with the active card does the inactive card begin to forward packets across the backplane and from its transceiver ports.

The phases of the initialization processes and their approximate times are shown in Table 30.

Table 30. 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. Afterwards, it joins with the active card in forwarding traffic across the backplane, thereby increasing the bandwidth per slot to 40Gbps.	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 controller card. For phase 1, examine the M/S LED in the System Status LEDs on the controller 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 controller cards, the M/S LED continues to flash amber on the inactive card until the card has synchronized its database with the active controller 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 corresponding card initializes its management software and configures its settings in accordance with the settings from the active controller card. The LED changes to solid green when the corresponding line card completes the initialization process and begins forwarding traffic.

If there are two controller cards, you can monitor phase 3 by viewing the M/S LEDs on the control cards. The LED on the active controller 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 controller 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 controller 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 226.) Figure 152 here to Figure 154 on page 222 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 960G Central Fabric Controller Boot Loader
Version 18.0.g.01
Created on Wed 04/24/2013 at 10:50 AM
Copyright Allied Telesis Inc., 2012

VxWorks Version 6.9 for Freescale QorIQ P2040
BSP version 6.9
Copyright 1984-2011 Wind River Systems, Inc.

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

*****
* 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 1.7
Starting Application Software Loading
Attaching to Flash File System ... done.

/tffs/ - Volume is OK
Boot album is (current, attempt 1): 'cfc960_6.18.0.0.tar'
Checking Album's integrity... done
    
```

Figure 152. Switch Initialization Messages



```
VxWorks Version 6.9 for Freescale QorIQ P2040
  BSP version 6.9/1
  Copyright Wind River Systems, Inc., 1984-2002

Memory Size: 2044 MB

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

System Time is 2013-10-01 12:58:09.004
Last reset occurred due to a power interruption.
System initializing...
deleting directory /tffs/trash

Initialization completed successfully

User Access Verification

Username:
```

Figure 154. Switch Initialization Messages (Continued)

## Chapter 10

# Verifying the Hardware Operations of the Chassis

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This chapter describes how to verify the operations of the chassis and how to run the Easy Startup application. The chapter contains the following sections:

- “Using the LEDs to Verify the Chassis” on page 224
- “Using Local Management to Verify the Chassis” on page 226
- “Running the Easy Startup Application” on page 230

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**Note**

Allied Telesis recommends using both the LEDs and local management to confirm the initial operations of the chassis, controller cards, and Ethernet 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 controller 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, AT-SBxPWRSYS2, 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, AT-SBxPWRSYS2, or AT-SBxPWRPOE1 AC Power Supply” on page 266 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 System Power Supply” on page 268 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 controller 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 controller card.

---

### Note

If all the LEDs on the controller 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 controller 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 controller 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 controller card. (If the chassis has two controller 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 270.

---

**Note**

The SBx Status LED for an AT-SBx81XLEM Line Card is initially solid amber. To make the card operational, you have to specify its preferred load file, as explained in “Specifying the Preferred Load File for AT-SBx81XLEM Line Cards” on page 243.

---

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 274 and “Fiber Optic Transceivers” on page 278 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 18 on page 40. 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 276 for troubleshooting suggestions.
8. If the LEDs indicate that the chassis components are operating normally, you should perform the procedure in the next section to establish a management session with the chassis and use the command line commands to confirm the hardware operations.

## 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 controller card. The section has the following procedure:

- ❑ “Starting a Local Management Session” on page 226
- ❑ “Entering the Management Software Commands” on page 227

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-SBx31CFC960 Controller Fabric Card to the Console RS-232 port on the front panel of the AT-SBx31CFC960 Card, as shown in Figure 155. If the chassis has two controller 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.

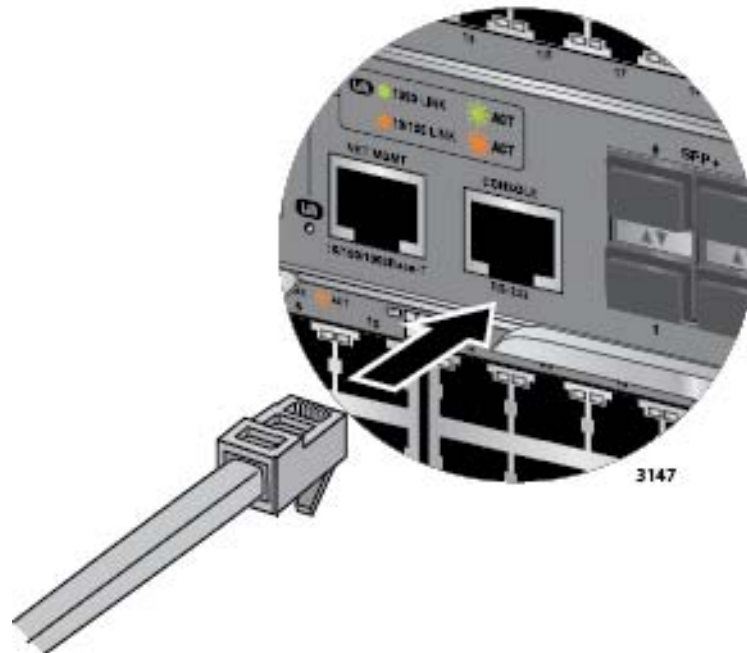


Figure 155. Connecting the Management Cable to the Console RS-232 Port

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. To display the status of the power supplies, enter the SHOW PSU command.

An example of the status information is shown in Figure 156 on page 228. 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, AT-SBxPWRSYS2, or AT-SBxPWRPOE1 AC Power Supply” on page 266 or “AT-SBxPWRSYS1 DC System Power Supply” on page 268 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 156. SHOW PSU Command

2. 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 157. 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-Onl i ne

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

Figure 157. SHOW FANMODULE Command

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

An example of the status information is shown in Figure 158 on page 229. 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 270 or “AT-SBx31CFC960 Controller Fabric Card” on page 280 for troubleshooting suggestions.

## SHOW CARD

```
--- Card Information ---
```

Slot	Prov Card Type	State	Faults
0	GE24RJ	UP-UP-Onl i ne	-
1	GE24RJ	UP-UP-Onl i ne	-
2	GE24RJ	UP-UP-Onl i ne	-
3	GE24RJ	UP-UP-Onl i ne	-
4	CFC960	UP-UP-Onl i ne (Acti ve)	-
5	-	-	-

Figure 158. SHOW CARD Command

**Note**

If a controller card has a state of UP-UP-DEGRADED and a fault of Minor, you might not of removed the battery insulator when you installed the controller card in the chassis. (Refer to Figure 72 on page 139.) For troubleshooting information, refer to “AT-SBx31CFC960 Controller Fabric Card” on page 280.

**Note**

The Initial state of the AT-SBx81XLEM Line Card is “DOWN-DOWN-Offline.” To make the card operational, you have to specify its preferred load file, as explained in “Specifying the Preferred Load File for AT-SBx81XLEM Line Cards” on page 243.

- 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 276 for troubleshooting suggestions.

- If the components of the chassis are operating normally, do one of the following:
  - You may continue to manage the chassis with the command line interface through the Console RS-232 port. For instructions, refer to the *Software Reference for SwitchBlade x3100 Series Switches* on the Allied Telesis web site.
  - You may run the Easy Startup application to configure the switch for remote Telnet or SNMP management. For instructions, refer to “Running the Easy Startup Application” on page 230.

## Running the Easy Startup Application

---

The AT-SBx31CFC960 Controller Fabric Card has an Easy Startup application that lets you configure some of the basic management parameters of the controller card with a web browser. The application lets you assign an IP address configuration to the card and configure the Telnet server and SNMP so that you can immediately begin to remotely configure the chassis from a management workstation on your network. Here are the parameters and features you can configure with the application:

- ❑ Release activation and feature licenses - The application determines whether the AlliedWareNSP management software on the controller card requires release activation or feature licenses and, if necessary, prompts for the licenses.

---

### Note

The Easy Startup application does not display the release activation license prompt for a factory-shipped controller card because the management software is pre-activated and does not require a license.

---

For further information about licenses, contact Allied Telesis technical support.

- ❑ Security-officer user account - The application lets you create a new security-officer user account with a username and password to replace the default account that comes with the management card.
- ❑ IP address configuration - You need to assign an IP address configuration to the controller card to manage the chassis remotely with Telnet or SNMP, or implement any of the features in Table 27 on page 84. The chassis uses the IP address configuration to identify itself to other network devices. The management card can have only one IP address configuration, which consists of an IP address, subnet mask, and default gateway.
- ❑ Management access method - The Easy Startup application lets you specify the manner in which the management card is to access your network to support remote Telnet and SNMP management, and the features in Table 27 on page 84. There are two management access methods. The first method is the NET MGMT port on the front panel of the card. If you select this method, you need to connect the port to a switch or router on your network after performing the Easy Startup application.

The second management access method is referred to as in-band management. Here, the management card communicates with

your network from one of the ports on an Ethernet line card in the chassis. If you select this management access method, you have to identify the slot number of the Ethernet line card and the port number from which the management card is to communicate with your network. You may specify only one Ethernet line card and port, but it can be any card or port in the chassis. You also have to specify whether your management workstation uses tagged or untagged VLAN packets.

- ❑ Telnet status - The application lets you enable or disable the Telnet server on the management card. You should enable the server if you want to remotely manage the chassis with that application.

---

**Note**

If you disable Telnet, you can still manage the chassis using the Console port or SNMP.

---



---

**Note**

You might still need to enable Telnet even if you do not intend to use it because there are other network management applications, such as AlliedWare NMS, that use Telnet to access the system.

---

- ❑ SNMP Configuration - You may use the Easy Startup application to specify an SNMP community string for remote SNMP management. You may also specify the IP address of the management station on your network from where you plan to manage the chassis with SNMP. You may specify only one community name and IP address.

Please review the following guidelines before running the application:

- ❑ The application is performed through the NET MGMT port on the active controller card in the chassis. If the chassis has two controller cards, you can identify the active controller card by examining the M/S LEDs. The LEDs are green on the active card and amber on the standby card.
- ❑ Your computer must have a JavaScript-capable web browser.
- ❑ The controller card has the default address 192.168.1.1 and subnet mask 255.255.255.0.
- ❑ The Easy Startup application has a simple DHCP server that can automatically assign your computer the IP address 192.168.1.2 and subnet mask 255.255.255.0 when you run the application. Your computer has to have a DHCP client. If it does not have a DHCP client, you have to manually set the IP address on your computer prior to running the application.
- ❑ The Easy Startup application is only available when the controller card is in its default configuration. It is automatically disabled after

you complete the application or begin to configure the parameters from the command line. If you want to rerun the application, you have to return the chassis to its default configuration with the PURGE DATABASE ALL command.

- ❑ The web server and simple DHCP server on the controller card are only available with the Easy Startup application. They are automatically disabled after you complete the application or begin to configure the switch parameters from the command line.

To run the Easy Startup application, perform the following procedure:

1. Connect the Ethernet port on your computer to the NET MGMT port on the active controller card with a network cable.
2. Power on your computer. If your computer is already on, power it off and on again so that it loses its old IP address and accepts the new IP address from the simple DHCP server on the controller card.
3. Do one of the following:
  - ❑ If your computer is configured to automatically obtain its IP configuration from a DHCP server, it should automatically receive the IP address 192.168.1.2 from the controller card, in which case you may go to step 4.
  - ❑ If your computer is configured with a static IP address, you need to change it to 192.168.1.2, with the subnet mask 255.255.255.0, or activate the DHCP client, if it has one. Refer to the documentation that comes with your computer of instructions on how to change the IP address.
4. Start the web browser on your computer.
5. Enter the IP address 192.168.1.1 in the URL field of the browser and press the Return key.
6. Follow the instructions on your screen to use the Easy Startup application to configure the basic parameters of the chassis.

If you do not see the introductory web page of the Easy Startup application, check the following:

- ❑ Verify that the network cable is securely connected to the network port on your computer and the NET MGMT port on the controller card. (The Easy Startup application is not supported on the Console port.)
- ❑ If the chassis has two controller cards, check that your computer is connected to the NET MGMT port on the active controller card. You can identify the active controller card by examining the M/S LEDs. The LEDs are green on the active card and amber on the standby card.



- ❑ Check that the IP address on your computer is 192.168.1.2. If it is not that value, you need to change it.
- ❑ Verify that your web browser is JavaScript-capable.
- ❑ The application is only available when the parameter settings of the chassis and cards are at their default settings.

After you have performed the Easy Startup application, perform the following steps.

7. Disconnect your computer from the NET MGMT port.
8. Wait thirty seconds for the controller card to initialize its new settings.
9. If you specified the NET MGMT port as the management interface for the controller card, you should connect it to a port on a switch or router. (If you selected in-band management over a network interface as the management interface, you should not connect the NET MGMT port to a network device.)
10. To continue managing the chassis, you may establish either a local management session, as explained in “Starting a Local Management Session” on page 226, or a remote Telnet or SNMP session. For information on how to start a remote session, refer to the Software Reference for SwitchBlade x3100 Series Switches.



## Chapter 11

# Configuring the AT-SBx81XLEM Card

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This chapter contains instructions on how to perform the initial configuration of the AT-SBx81XLEM Line Card. The chapter contains the following sections:

- ❑ “Introduction to Configuring the AT-SBx81XLEM Line Card” on page 236
- ❑ “Obtaining the Load File for the AT-SBx81XLEM Line Card” on page 238
- ❑ “Assigning an IP Address to the AT-SBx31CFC960 Controller Card” on page 240
- ❑ “Copying the AT-SBx81XLEM Load File to the Controller Card” on page 242
- ❑ “Specifying the Preferred Load File for AT-SBx81XLEM Line Cards” on page 243
- ❑ “Starting a Management Session on the AT-SBx81XLEM Line Card” on page 246
- ❑ “Adding VLANs to the Backplane Trunks on AT-SBx81XLEM Cards” on page 248
- ❑ “Adding VLANs to the Backplane Trunks on AT-SBx31CFC960 Controller Cards” on page 251

## Introduction to Configuring the AT-SBx81XLEM Line Card

---

This chapter contains instructions on how to configure the AT-SBx81XLEM Line Card for the AT-SBx3112 Chassis. These additional steps are required because the AT-SBx81XLEM Line Card, which is part of the SwitchBlade x8100 product line, and the SwitchBlade x3100 product line use different management software. The AT-SBx81XLEM Line Card uses AlliedWare Plus software and the SwitchBlade x3100 product line uses AlliedWareNSP software.

Once integrated into the chassis, the line card can forward network traffic over the backplane to other line cards, through the controller card. However, it functions as a separate network switch in the chassis and has to be managed separately from the other devices.

Here are descriptions of the procedures in this chapter:

- ❑ “Obtaining the Load File for the AT-SBx81XLEM Line Card” on page 238 - The AT-SBx81XLEM Line Card requires a special load file with a modified version of the AlliedWare Plus management software to function in a SwitchBlade x3100 chassis. The file does not come with the line card. This section explains how to obtain it from the Allied Telesis ‘web site and store it on a TFTP server on your network.
- ❑ “Assigning an IP Address to the AT-SBx31CFC960 Controller Card” on page 240 - You have to assign the controller card an IP address before you can copy the load file from your TFTP server to the file system in the controller card. You can skip this procedure if the controller card already has an IP address.
- ❑ “Copying the AT-SBx81XLEM Load File to the Controller Card” on page 242 - The instructions in this section explain how to copy the load file from your TFTP server to the file system in the controller card.
- ❑ “Specifying the Preferred Load File for AT-SBx81XLEM Line Cards” on page 243 - This section explains how to designate the special load file for the AT-SBx81XLEM Line Card as its preferred load file, and how to reboot the card.
- ❑ “Starting a Management Session on the AT-SBx81XLEM Line Card” on page 246 - This section explains how to begin a management session on the line card with the TELNET CARD command.
- ❑ “Adding VLANs to the Backplane Trunks on AT-SBx81XLEM Cards” on page 248 - In its default configuration, the AT-SBx81XLEM Line Card can forward untagged network packets over the backplane to other line cards, but not tagged packets. To configure the card to forward tagged packets, you have to add tagged VLANs to the backplane static trunk on the card, as

explained in this section.

- “Adding VLANs to the Backplane Trunks on AT-SBx31CFC960 Controller Cards” on page 251 - Before the controller card can forward tagged packets over the backplane from the AT-SBx81XLEM Line Card to other cards in the chassis, you have to add tagged VLANs to a static port trunk on the controller card.

You have to perform the procedures in the order listed above.

## Obtaining the Load File for the AT-SBx81XLEM Line Card

The management software for the AT-SBx81XLEM Line Card is stored in a file called the load file. It contains a version of the AlliedWare Plus management software that is modified to operate in the SwitchBlade x3112 Chassis. The file does not come with the line card. You have to copy it from the Allied Telesis web site to a TFTP server on your network.

To obtain the load file for the AT-SBx81XLEM Line Card from the Allied Telesis web site, perform the following procedure:

1. Open a web browser on your workstation.
2. Enter the following address in the URL field of your web browser to access the Software Downloads site at the Allied Telesis web site:

<http://www.alliedtelesis.com/services-and-support/support/software>

The introductory Software Downloads window is shown in Figure 159.

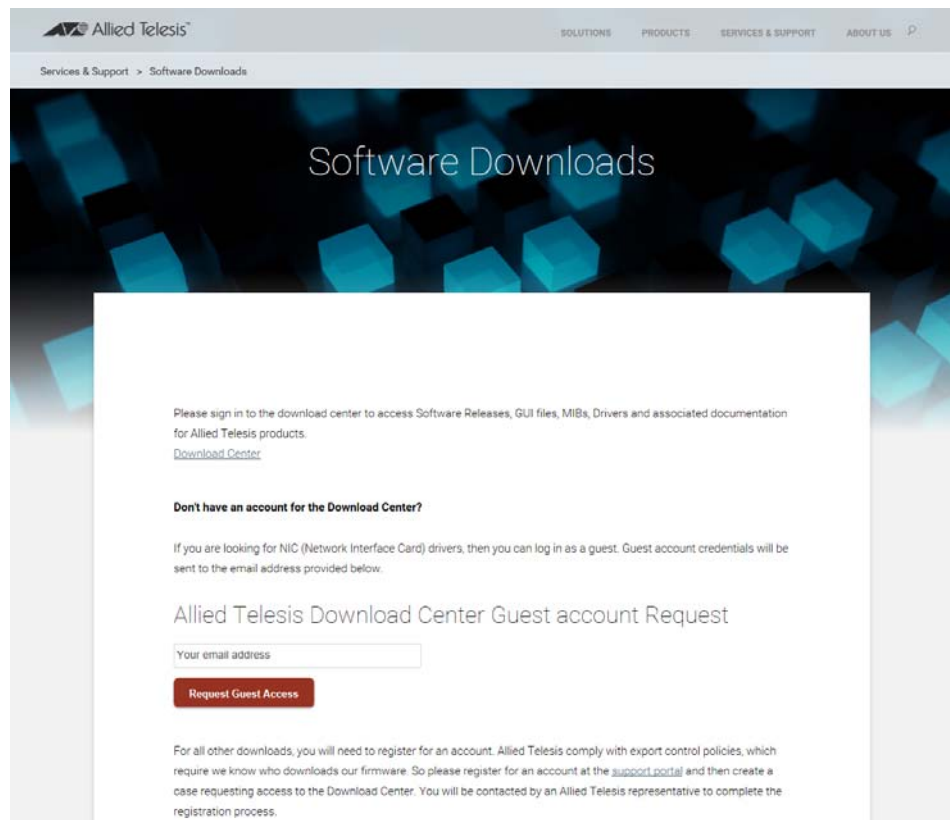


Figure 159. Introductory Software Downloads Window

3. If you already have an account, click the **Download Center** link. (If you do not have an account, click the **support portal** link and follow the prompts to open an account.)

The login window is shown in Figure 160.

Figure 160. Software Downloads Login Window

4. Enter your login name and password. They are case-sensitive.
5. Select **Allied Telesis** from the My Products heading.
6. Select **SwitchBlade x3100 Series** from the Product Lines list.
7. From the list of load files in the Current Releases tab, click the load file for the AT-SBx81XLEM Line Card.
8. Save the file on the TFTP server on your network.

The load file for the AT-SBx81XLEM Line Card is now stored on your TFTP server.

9. Go to “Assigning an IP Address to the AT-SBx31CFC960 Controller Card” on page 240

## Assigning an IP Address to the AT-SBx31CFC960 Controller Card

---

The procedure in this section explains how to assign an IP address to the MGMT interface on the active controller card in the chassis. You have to assign it an IP address before you can copy the line card load file from your TFTP server to its file system.

The controller card has two management interfaces. One is the MGMT interface, which is the NET MGMT port on the front panel of the controller card. The other management interface is the in-band interface, which allows management communication with the controller card through the line cards in the chassis. For instructions on how to configure the inband interface, refer to the Software Reference for SwitchBlade x3100 Series Switches.

If the controller card already has an IP address, skip this procedure and go to “Copying the AT-SBx81XLEM Load File to the Controller Card” on page 242.

To assign an IP address to the MGMT interface on the controller card, perform the following procedure:

1. Start a local management session on the AT-SBx31CFC960 Controller Card in the chassis. For instructions, refer to “Starting a Local Management Session” on page 226.
2. Use the SET IP INTERFACE command to assign an IP address to the MGMT interface on the active controller card. The format of the command is shown here:

```
ADD IP INTERFACE=MGMT IPADDRESS=IP_address
subnetmask=subnet_mask
```

This example of the command sets the IP address to 149.132.44.23 and the subnet mask to 255.255.255.0:

```
manager SEC>> add ip interface=mgmt
ip address=149. 132. 44. 23 subnetmask=255. 255. 255. 0
```

3. If necessary, use the SET SYSTEM GATEWAY command to assign a default gateway address to the MGMT interface. Here is the format of the command:

```
SET SYSTEM GATEWAY=IP_address
```

This example sets the default gateway to 149.132.44.142:

```
manager SEC>> set system gateway=149. 132. 44. 142
```



4. To confirm the IP address configuration of the active controller card, enter the `SHOW IP INTERFACE MGMT` command.
5. If it the NET MGMT port on the active controller card is not connected to a device on your network, such as a switch or router, connect it now.
6. Go to “Obtaining the Load File for the AT-SBx81XLEM Line Card” on page 238.

## Copying the AT-SBx81XLEM Load File to the Controller Card

---

This section contains the procedure for copying the load file for the AT-SBx81XLEM Line Card from your TFTP server to the file system in the controller card. The procedure assumes that you have already copied the load file from the Allied Telesis web site to your TFTP server and assigned an IP address to the controller card, as explained earlier in this chapter. To copy the file to the controller card, perform the following procedure:

1. If the TFTP server on your network is not already enabled, activate it now.
2. Start a local or remote management session on the AT-SBx31CFC960 Controller Card in the chassis. For instructions on starting a local management session, refer to “Starting a Local Management Session” on page 226.
3. Use the GET FILE command to copy the file from the TFTP server to the file system in the controller card. The format of the command is shown here:

```
GET FILE=software_filename TFTP SERVER=IP_address
```

The “*software\_filename*” variable is the name of the load file to copy from the TFTP server to the controller card. The “*IP\_address*” variable is the IP address of your TFTP server. This example of the command assumes that the name of the load file is “SBx81LIFv2s-5.4.6-2.1.rel” and the IP address of the TFTP server is 149.132.44.55:

```
manager SEC>> get file=SBx81LIFv2s-5.4.6-2.1.rel tftp
server=149.132.44.55
```

4. If you want to monitor the file transfer, enter the SHOW TRANSFER command.

```
manager SEC>> show transfer
```

Here is an example of the confirmation message the controller card displays when the transfer is complete:

```
Info (033012): Successfully transferred file:
SBx81LIFv2s-5.4.6-2.1.rel
```

The load file for the AT-SBx81XLEM Line Card is now stored in the file system of the AT-SBx31CFC960 Controller Card.

5. Go to the “Specifying the Preferred Load File for AT-SBx81XLEM Line Cards” on page 243.

## Specifying the Preferred Load File for AT-SBx81XLEM Line Cards

---

This section contains the procedure for specifying the preferred load file for AT-SBx81XLEM Line Cards, with the SET CARD PREFLOAD command. It also explains how to reboot the cards and verify their status. This procedure assumes that you obtained the file from the Allied Telesis web site and copied it to the file system in the controller card, as explained earlier.

To specify the preferred load file for the AT-SBx81XLEM Line Card, perform the following procedure:

1. Start a local or remote management session on the AT-SBx31CFC960 Controller Card in the chassis. For instructions on starting a local management session, refer to “Starting a Local Management Session” on page 226.
2. Enter the SHOW SYSTEM RELEASE command to display the version number of the active AlliedWareNSP management software on the controller cards. If the version is v6.21.0.0 or later, continue with the next step. If the version number is older, do not continue. You must upgrade the AlliedWareNSP management software on the controller cards.
3. Enter the SHOW FILES command to display a list of the files in controller card’s flash file system.
4. Examine the list for a file with the prefix “SBx81LIFv2s”. This is the load file for AT-SBx81XLEM Line Cards.
5. Enter the SET CARD PREFLOAD command in this format:

```
set card=slots prefload=filename
```

The “slots” variable specifies the chassis slot numbers with AT-SBx81XLEM Line Cards. The “filename” variable is the filename of the preferred load file displayed in step 3. This example sets the preferred load files for the AT-SBx81XLEM Line Cards in chassis slots 2 and 3.

```
manager SEC>> set card=2,3 prefload=SBx81LIFv2s-5.4.6-2.1.rel
```

6. Enter the SHOW CARD SOFTWARE command to verify that the load file has been set for the AT-SBx81XLEM Line Cards.

Figure 161 shows an example of the command. The Prov Type for AT-SBx81XLEM Line Cards is “AWPLUS.” In the example, slots 2 and 3 have AT-SBx81XLEM Line Cards.

```
officer SEC>> show card software
```

```
--- Card Information ---
```

Slot	Prov Type	Preferred Load	Runni ng Load
0	GE24RJ	x31sma_6.21.0.0.tar	6.21.0.0
1	GE24RJ	x31sma_6.21.0.0.tar	6.21.0.0
2	AWPLUS	SBx81LI Fv2s-5.4.6-2.1.rel	-
3	AWPLUS	SBx81LI Fv2s-5.4.6-2.1.rel	-
4	CFC960	cfc960_6.21.0.0.tar	cfc960_6.21.0.0.tar
5	CFC960	cfc960_6.21.0.0.tar	cfc960_6.21.0.0.tar

Figure 161. SHOW CARD SOFTWARE Command

7. Enable the AT-SBx81XLEM Line Cards with the ENABLE CARD command. This example of the command enables the cards in slots 2 and 3:

```
manager SEC>> enable card=2,3
```

8. Wait one to two minutes for the AT-SBx81XLEM Line Cards to load their operating system files from the controller card and initialize their default settings.
9. Check the status of the AT-SBx81XLEM Line Cards by inspecting their corresponding SBx Status LEDs on the controller card. (If the chassis has two controller cards, you may use the LEDs on either the active or inactive card.) The line cards are operating normally when their LEDs are solid green. For example, if there are AT-SBx81XLEM Line Cards in slots 2 and 3 of the chassis, the SBx Status 2 and 3 LEDs should be solid green. For troubleshooting suggestions, refer to “Ethernet Line Cards” on page 270.
10. Enter the SHOW CARD command to verify that the card has not encountered any faults. Figure 162 on page 245 shows an example of the command.

```
officer SEC>> show card
```

```
--- Card Information ---
```

Slot	Prov Card Type	State	Faults
0	GE24RJ	UP-UP-Onl i ne	-
1	GE24RJ	UP-UP-Onl i ne	-
2	AWPLUS	UP-UP-Onl i ne	-
3	AWPLUS	UP-UP-Onl i ne	-
4	CFC960	UP-UP-Onl i ne (Acti ve)	-
5	CFC960	UP-UP-Onl i ne (Inacti ve)	-

Figure 162. SHOW CARD Command

This completes the procedure for designating the load file for AT-SBx81XLEM Line Cards and rebooting the cards. The cards are now operational. However, in their default configurations the cards do not forward tagged VLAN traffic over the chassis backplane. To configure the logical backplane trunks on the cards to forward tagged VLAN traffic, start with step 3 in “Starting a Management Session on the AT-SBx81XLEM Line Card” on page 246.

## Starting a Management Session on the AT-SBx81XLEM Line Card

---

The procedure in this section explains how to start a management session on the AT-SBx81XLEM Line Card with the TELNET CARD command from the AT-SBx31CFC960 Controller Card. You can manage only one card at a time. You can also manage the card directly with the Secure Shell (SSH) protocol by assigning it an IP address.

---

### Note

The initial management session of the card must be performed with the TELNET CARD command, as explained in this procedure.

---

If you are continuing directly from the previous procedure, start with step 3. To start a management session on the card, perform the following procedure:

1. Start a local or remote management session on the AT-SBx31CFC960 Controller Card in the chassis. For instructions, refer to “Starting a Local Management Session” on page 226.
2. If you do not know the slot numbers of slots in the chassis with AT-SBx81XLEM Line Cards, enter the SHOW CARD command to display a list of the cards.

Figure 161 on page 244 shows an example of the command. The AT-SBx81XLEM Line Card has “AWPLUS” as the Prov Type value.

3. Enter the TELNET CARD command in this format:

```
tel net card slot
```

The “slot” variable is the slot number of the AT-SBx81XLEM Line Card you want to manage. You can manage only one card at a time. This example of the command starts a management session on the card in slot 2:

```
manager SEC>> tel net card 2
```

The card displays the following AlliedWare Plus login prompt:

```
awpl us l ogi n:
```

4. Enter the manager username. The default is “manager”. The username is case-sensitive.
5. When prompted, enter the password for the card. The default is “friend”.

The card displays the User Exec mode prompt.

```
awpl us>
```

The manager session with the card is now started.

- To confirm the version number of the load file of the AlliedWare Plus management software on the card, enter the SHOW SYSTEM command in the Privileged Executive Mode. Refer to Figure 163. The version number is displayed in the Software Version field.

```
awpl us> enable
awpl us# show system

System Status
-----
Board      ID   Bay   Board Name                Rev   Serial number
-----
Expansion  447           AT-SBx81XLEM/XS8        A-0   1234567890
Blade     446           AT-SBx81XLEM            A-0   1234567891
-----
RAM: Total: 1013296 kB Free: 887652 kB
Flash: 912.9MB Used: 64.7MB Available: 848.2MB
-----
Environmental Status : Normal
Uptime                : 0 days 00:28:02
Bootloader version    : 5.0.7
Current software      : SBx81LI Fv2s-5.4.6-2.1.rel
Software version      : 5.4.6-2.1
Build date            : Thu Nov 10 03:57:12 UTC 2016
Current boot config: flash:/default.cfg (file exists)
```

Figure 163. SHOW SYSTEM Command

- Use the AlliedWare Plus commands to configure the features on the card. For instructions on how to configure its backplane static trunk, refer to “Adding VLANs to the Backplane Trunks on AT-SBx81XLEM Cards” on page 248. For all other instructions, refer to the Software Reference for SwitchBlade x8106 and x8112 Series Switches.
- After configuring the features, enter the COPY RUNNING-CONFIG STARTUP-CONFIG in the Privileged Exec mode to save your changes.
- To end your management session with the card, enter the LOGOUT command in the User Exec or Privileged Exec mode.

The command prompt for the AlliedWareNSP management software on the AT-SBx31CFC960 Controller Card is displayed.

- To manage a different AT-SBx81XLEM Line Card, repeat the procedure starting with step 2.

## Adding VLANs to the Backplane Trunks on AT-SBx81XLEM Cards

As explained in “Backplane Static Trunk” on page 57, the AT-SBx81XLEM Line Card has four logical backplane ports that are grouped into a static trunk called “sa1”. The ports of the trunk are number port1.0.21 to port1.0.24. The card uses the trunk to forward network traffic over the backplane in the chassis to other line cards, through the AT-SBx31CFC960 Controller Card.

In its default configuration the trunk forwards only untagged VLAN traffic over the backplane. For it to forward tagged VLAN traffic you have to add the appropriate VLANs to the card and trunk, using AlliedWare Plus commands from a management session of the card. If there are multiple AT-SBx81XLEM Cards in the chassis, you have to configure each one separately because they function as independent devices.

Here is an example of the steps required to configure the AT-SBx81XLEM Line Card to forward tagged VLAN traffic over the backplane in the chassis. The example adds two VLANs to the card. The details of the VLANs are listed here:

- ❑ Chassis slot number of the AT-SBx81XLEM Line Card: 2
- ❑ Name of tagged VLANs: Sales and Production
- ❑ Sales VID: 25
- ❑ Production VID: 26
- ❑ Tagged ports: 1 to 5 (port1.0.1 to port1.0.5)

The procedure manages the line card through the controller card. You can also manage the card directly with SSH by assigning it an IP address.

To add the VLANs to the card and static backplane trunk, perform the procedure in Table 31:

Table 31. Example of Adding Tagged VLANs to the Backplane Trunk on the AT-SBx81XLEM Line Card

	<p>Start a local or remote management session on the AT-SBx31CFC960 Controller Card in the chassis. For directions on how to start a local session, refer to “Starting a Local Management Session” on page 226.</p>
--	---



Table 31. Example of Adding Tagged VLANs to the Backplane Trunk on the AT-SBx81XLEM Line Card (Continued)

manager SEC>>> tel net card 2	Start a management session on the AT-SBx81XLEM Line Card in slot 2 with the TELNET CARD command.
Member2 Login: manager Password: *****	Enter the username and password for the AlliedWare Plus manager account on the card. The default values are “manager” and “friend”, respectively. The username and password are case-sensitive.
awpl us> enable	Enter the Privileged Executive mode from the User Executive mode.
awpl us# configure terminal	Enter the Global Configuration mode.
awpl us(config)# vlan database	Enter the VLAN Configuration mode.
awpl us(config-vlan)# vlan 25 name Sales	Add the Sales VLAN.
awpl us(config-vlan)# vlan 26 name Production	Add the Production VLAN.
awpl us(config-vlan)# exit	Return to the Global Configuration mode.
awpl us(config)# interface port1.0.1-port1.0.5	Enter the Port Interface mode for port1.0.1 to port1.0.5. (The port number prefix is always “port1.0” for the AT-SBx81XLEM Card because it is operating as an independent device in the chassis.)
awpl us(config-if)# switchport mode trunk	Designate the ports as tagged (trunk) VLAN ports.
awpl us(config-if)# switchport trunk allowed vlan 25-26	Add the ports to the Sales and Production VLANs.
awpl us(config-if)# exit	Return to the Global Configuration mode.
awpl us(config)# interface sa1	Enter the Interface mode for VLAN sa1, This is the backplane static trunk of the logical backplane ports 1.0.21 to 1.0.24 on the line card.

Table 31. Example of Adding Tagged VLANs to the Backplane Trunk on the AT-SBx81XLEM Line Card (Continued)

awpl us(config-if)# swi tchport trunk al l owed vl an 25-26	Add the backplane trunk to the Sales and Production VLANs.
awpl us(config-if)# exi t	Return to the Global Configuration mode.
awpl us(config)# exi t	Return to the Privileged Executive mode.
awpl us# show vl an al l	Confirm the addition and configurations of the new VLANs.
awpl us# copy runni ng-confi g startup-confi g	Save your changes in the card's configuration file.
	For instructions on how to configure other features on the card, refer to the Software Reference for SwitchBlade x8106 and x8112 Series Switches.
awpl us# l ogout manager SEC>>>	End the management session of the AT-SBx81XLEM Line Card. The command prompt for the AlliedWareNSP software on the controller card is displayed again.
	To configure the backplane static trunk on another AT-SBx81XLEM Line Card in the chassis, repeat this procedure starting with step 2.
	After configuring the backplane static trunks on the other AT-SBx81XLEM Line Cards in the chassis, go to "Adding VLANs to the Backplane Trunks on AT-SBx31CFC960 Controller Cards" on page 251.

## Adding VLANs to the Backplane Trunks on AT-SBx31CFC960 Controller Cards

---

The following procedure explains how to add tagged VLANs to the backplane static trunks on the AT-SBx31CFC960 Controller Card. This procedure is required for AT-SBx81XLEM Line Cards.

Before the AT-SBx81XLEM Line Card can forward tagged VLAN traffic over the backplane in the chassis to other line cards, you have to add the VLANs to the backplane static trunks on the cards themselves. This is explained in the previous procedure, “Adding VLANs to the Backplane Trunks on AT-SBx81XLEM Cards” on page 248.

You must also add the VLANs to static backplane trunks on the controller card. The controller card has a static backplane trunk for each line card slot. A trunk consists of two ports per controller card. A trunk has two ports when the chassis has one controller card and four ports when there are two controller cards. The logical port numbers on the trunks are listed in Table 32. For example, the backplane trunk from the controller cards to line card slot 3 consists of logical ports 4.10 and 4.11 on the controller card in slot 4 and ports 5.10 and 5.11 for the controller card in slot 5.

You cannot delete the backplane static trunks or add or remove ports from them.

Table 32. Port Numbers of the Backplane Static Trunks on the Controller Card

Chassis Slot Number	Port Numbers of the Backplane Static Trunk for the Controller Card in		Trunk Name
	Slot 4	Slot 5	
0	4.4, 4.5	5.4, 5.5	Slot00LAG
1	4.6, 4.7	5.6, 5.7	Slot01LAG
2	4.8, 4.9	5.8, 5.9	Slot02LAG
3	4.10, 4.11	5.10, 5.11	Slot03LAG
6	4.16, 4.17	5.16, 5.17	Slot06LAG
7	4.18, 4.19	5.18, 5.19	Slot07LAG
8	4.20, 4.21	5.20, 5.21	Slot08LAG
9	4.22, 4.23	5.22, 5.23	Slot09LAG

Table 32. Port Numbers of the Backplane Static Trunks on the Controller Card (Continued)

Chassis Slot Number	Port Numbers of the Backplane Static Trunk for the Controller Card in		Trunk Name
	Slot 4	Slot 5	
10	4.24, 4.25	5.24, 5.25	Slot10LAG
11	4.26, 4.27	5.26, 5.27	Slot11LAG

Here is an example of how to add tagged VLANs to a backplane static trunk on the controller card. The example assumes there are two controller cards in the chassis. The example details are listed here:

- ❑ Chassis slot number of the AT-SBx81XLEM Line Card: 2
- ❑ Name of tagged VLANs: Sales and Production
- ❑ Sales VID: 25
- ❑ Production VID: 26

To add the VLANs to the static backplane trunks on the controller card, perform the procedure in Table 33.

Table 33. Example of Adding Tagged VLANs to a Backplane Trunk on AT-SBx31CFC960 Controller Cards

	Start a local or remote management session on the AT-SBx31CFC960 Controller Card in the chassis. For directions on how to start a local session, refer to “Starting a Local Management Session” on page 226.
manager SEC>> create vl an=Sal es vi d=25 forwardi ngmode=std	Add the Sales VLAN to the controller cards.
manager SEC>> add vl an=25 i nterface=l ag: [SI ot03LAG] frame=tagged	Add the backplane static trunk to the Sales VLAN.
manager SEC>> create vl an=Producti on vi d=26 forwardi ngmode=std	Add the Production VLAN to the controller cards.
manager SEC>> add vl an=26 i nterface=l ag: [SI ot03LAG] frame=tagged	Add the backplane static trunk to the Production VLAN.

Table 33. Example of Adding Tagged VLANs to a Backplane Trunk on AT-SBx31CFC960 Controller Cards

manager SEC>> show vl an	Confirm the addition and configuration of the new VLANs.
	For instructions on how to configure other features on the chassis, refer to the Software Reference for SwitchBlade x3100 Series Switches.



## Chapter 12

# Upgrading to the AT-SBx31CFC960 Card from the AT-SBx31CFC Card

---

This chapter explains how to upgrade the AT-SBx3112 Chassis to the AT-SBx31CFC960 Controller Fabric Card from the AT-SBx31CFC Controller Card. The chapter contains the following sections:

- ❑ “Guidelines” on page 256
- ❑ “Checking the Backplane Version” on page 257
- ❑ “Upgrading the Controller Fabric Cards” on page 259

## Guidelines

---

Here are the guidelines to upgrading the AT-SBx3112 Chassis to the AT-SBx31CFC960 Controller Fabric Card from the older AT-SBx31CFC Card:

- ❑ This procedure is disruptive to network operations because it requires powering off the chassis.
- ❑ The AlliedWareNSP management software comes pre-installed on the AT-SBx31CFC960 Controller Fabric Card.
- ❑ The AT-SBx31CFC960 Controller Fabric Card does not support versions earlier than 6.18.0 of the AlliedWareNSP management software.
- ❑ Versions 6.18.0 and later of the AlliedWareNSP management software are not supported on the AT-SBx31CFC Controller Fabric Card. You have to use the AT-SBx31CFC960 Controller Fabric Card to upgrade the chassis to the AlliedWareNSP management software.
- ❑ You can transfer the configuration file on the AT-SBx31CFC Controller Card to the new controller card so that the controller and Ethernet line cards maintain their configuration settings after the upgrade. However, you have to edit the configuration file with a text editor before loading it onto the new controller card.
- ❑ The text editor that you use to edit the configuration file must be capable of handling ACSII text and must not insert any special or hidden characters into the text file.



## Checking the Backplane Version

The first step to upgrading the AT-SBx3112 Chassis from AT-SBx31CFC to AT-SBx31CFC960 Controller Fabric Cards is to determine the version of the backplane in the unit. This step is important because early versions of the backplane cannot support two operational AT-SBx31CFC960 Cards at the same time. If you were to install two new controllers in a chassis with this type of backplane, one of the controller cards would not function, which would reduce the backplane bandwidth to 20Gbps from 40Gbps for each Ethernet line card chassis slot.

You can determine the backplane type by examining the serial number of the chassis. The number is provided on a label on the back panel of the unit. Refer to Figure 164.

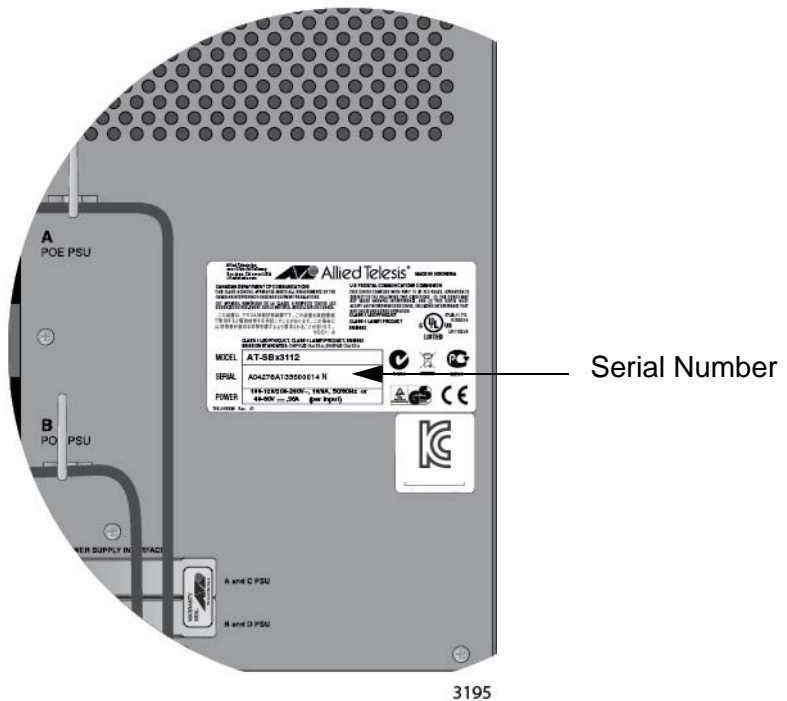


Figure 164. Serial Number

You can also view the serial number by entering the `SHOW SYSTEM` command from a local or remote management session. Refer to Figure 165 on page 258.

```
SHOW SYSTEM
```

```
--- System Information -----  
. .  
Identifying Information  
Shelf Serial Number ..... A04276A133500001 ← Serial  
Shelf CLEI Code ..... <unknown>      Number  
Shelf MAC ..... EC: CD: 6D: 4F: 87: 66
```

Figure 165. Viewing the Serial Number with the SHOW SYSTEM Command

To determine the backplane version, examine the underlined numbers shown here in the serial number:

A04276A133500001 N

If the underlined portion of the serial number is 133 or higher, the chassis has the new backplane and supports two operational AT-SBx31CFC960 Cards. You may continue to “Upgrading the Controller Fabric Cards” on page 259.

If the underlined portion of the serial number is 132 or lower, the chassis has the older backplane and supports only one operational AT-SBx31CFC960 Card. For further assistance, contact Allied Telesis technical support.

## Upgrading the Controller Fabric Cards

---

To upgrade the chassis from AT-SBx31CFC to AT-SBx31CFC960 Controller Fabric Cards, perform the following procedure:

1. Start a local or remote management session with the active AT-SBx31CFC Controller Card in the chassis.

---

**Note**

If the chassis is using DHCP relay, perform step 2. Otherwise, go to step 3.

---

2. If the chassis is using DHCP relay, do the following:
  - a. Enter the SHOW DHCPRELAY INTERFACE command to view the status of the DHCP relay filtering option on the ports. Here is the command:

```
show dhcprel ay i nterface=*.*
```

- b. Examine the output of the command to determine if the filtering option is enabled (ON) on any of the ports. If filtering is disabled (OFF) on all the ports, go to step 3.
  - c. Write down the port numbers on which the filtering option is enabled.
  - d. Use the SET DHCPRELAY INTERFACE to disable filtering on those ports on which it is enabled. This example of the command disables filtering on port 1.2:

```
set dhcprel ay i nterface=1.2 fi lter=off
```

3. Backup the configuration file on the AT-SBx31CFC Card to a network server with the BACKUP CONFIG command. This example of the command backs up the configuration file to a TFTP server with the IP address 149.135.78.12 and assigns it the filename engineering\_chassis.cfg:

```
backup confi g fi le=engi neeri ng_chassi s. cfg tftp
server=149. 135. 78. 12
```

---

**Note**

Do not use the companion BACKUP DATABASE command to backup the configuration. It creates a binary file that cannot be edited.

---

4. Power off the AT-SBx3112 Chassis.
5. Remove the AT-SBx31CFC Card from the chassis. If there are two controller cards, remove both cards.
6. Install the new AT-SBx31CFC960 Cards. For instructions, refer to “Installing the AT-SBx31CFC960 Controller Fabric Card” on page 138.
7. Power on the chassis. For instructions, refer to Chapter 9, “Powering On the Chassis” on page 185.
8. Wait two to three minutes for the controller and line cards to complete the initialization process. To monitor the process, refer to “Monitoring the Initialization Process” on page 218.
9. Perform the Easy Startup application to assign an IP address to the active master AT-SBx31CFC960 Controller Card. For instructions, refer to “Running the Easy Startup Application” on page 230.
10. After performing the Easy Startup application, start a local or remote management session on the chassis.
11. Enter the SHOW FILES command to display the files on the active master AT-SBx31CFC960 Controller Fabric Card.
12. Verify that the controller card has the following load files:
  - x31sma\_6.18.0.0.tar
  - cfc960\_6.18.0.0.tar

The “xsma” file contains the load files for the Ethernet line cards. The “cfc960” file is the management software for the controller cards. The numbers in the filenames are the software version numbers. The versions must be 6.18.0 or higher.

13. Do one of the following:
  - If the controller card has both load files and they are the version you want the chassis to use, continue with the next step to restore the previous configuration to the unit.
  - If the controller card is missing a file or you want the chassis to use a different version of the management software, obtain the appropriate load files from the Allied Telesis web site, upload them to the controller card with the GET FILE command, and designate them as the preferred load files with the SET CARD command. For instructions, refer to Software Reference for SwitchBlade x3100 Series Switches. Afterwards, continue with the next step to restore the previous configuration to the chassis.

---

**Note**

The AT-SBx31CFC960 Controller Fabric Card does not support versions earlier than 6.18.0 of the AlliedWareNSP management software.

---

14. With a text editor, make the following changes to the configuration file that you downloaded from the AT-SBx31CFC Card and saved on your network server in step 3:

- a. Change all occurrences of “CFC200” to “CFC960”. Here are two examples:

```
SET PROFILE=AUTOPROV CFC960 ADMINSTATE=up
CREATE CARD=4 CFC960 PROFILE=AutoProv
```

- b. Change the version numbers of the preferred tar load files in the SET CARD commands to the version of the AlliedWareNSP management software on the controller card: Here are two examples:

```
SET CARD=4-5 PREFLOAD=CFC960_6.18.0.0.tar
SET CARD=0-2,6-10 PREFLOAD=x31sma_6.18.0.0.tar
```

---

**Note**

Do not make any other changes to the file.

---

15. Upload the edited configuration file from your network server to the active master AT-SBx31CFC960 Card with the RESTORE CONFIG command. Allied Telesis recommends specifying an output file for the command with the OUTPUT option so that you can check to see if the controller card encounters any errors when it performs the commands in the edited configuration file. This example of the command uploads a configuration file titled engineering\_chassis.cfg from a TFTP server with the IP address 149.135.78.12 and creates an output file called results.txt:

```
restore config file=engineering_chassis.cfg tftp
server=149.135.78.12 output=results.txt
```

After the controller card receives the file, it writes it to flash memory and resets.

16. Wait two to three minutes for the controller and line cards to complete the initialization process. To monitor the process, refer to “Monitoring the Initialization Process” on page 218.

---

**Note**

If in step 15 you included the OUTPUT option with the RESTORE CONFIG command to create an output file, perform step 17. If you did not include the option, go to step 18.

---

17. If in step 15 you included the OUTPUT option with the RESTORE CONFIG command to create an output file, do the following:
  - a. Use the PUT FILE command to download the output file created by the OUTPUT option in step 15 to a network server. This example of the command downloads an output file called results.txt from the controller card to a TFTP server:

```
put file=results.txt tftp server=149.135.78.12
```
  - b. Open the file with a word processor or text editor and examine the output for error messages. If there are no error messages, continue with this procedure. If there are error messages, contact Allied Telesis technical support for assistance.
18. Verify the hardware operations of the unit by performing the instructions in Chapter 10, "Verifying the Hardware Operations of the Chassis" on page 223.
19. From a local or remote management session of the chassis, enter the SHOW SYSTEM command and check the state of the "High Speed Backplane" parameter. An example is shown in Figure 166 on page 282. The parameter should display "Yes" to indicate that the backplane in the unit supports two AT-SBx31CFC960 Controller Cards. If the parameter displays "No," the chassis has an old backplane and does not support two controller cards. If you see this, contact Allied Telesis technical support or your sales representative for assistance.
20. From a local or remote management session, use the appropriate SHOW commands to confirm the configuration settings of the controller and Ethernet line cards. For instructions, refer to *Software Reference for SwitchBlade x3100 Series Switches*.

---

**Note**

If the chassis was previously using the DHCP relay filtering option, continue with this procedure to reactivate it on the ports. If the chassis was not using the filtering option, the upgrade is complete.

---

21. Before reactivating the DHCP relay filtering option on the ports, wait for the longest IP address lease on the network to expire. This information is available on the DHCP server. For example, you should wait 12 hours if that is the longest lease time.
22. After waiting the longest lease time, use the SET DHCPRELAY INTERFACE command to reactivate the DHCP relay filtering option on those ports you noted in step 2c. This example of the command enables filtering on port 1.2:

```
set dhcprelay interface=1.2 filter=on
```

This completes the upgrade procedure.





## Chapter 13

# 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, AT-SBxPWRSYS2, or AT-SBxPWRPOE1 AC Power Supply” on page 266
- ❑ “AT-SBxPWRSYS1 DC System Power Supply” on page 268
- ❑ “Ethernet Line Cards” on page 270
- ❑ “Twisted Pair Ports” on page 274
- ❑ “Power Over Ethernet” on page 276
- ❑ “Fiber Optic Transceivers” on page 278
- ❑ “AT-SBx31CFC960 Controller Fabric Card” on page 280
- ❑ “AT-SBxFAN12 Fan Module” on page 284
- ❑ “Local (Out-of-Band) Management Session” on page 285
- ❑ “Power Supply Interfaces (Opto-couplers)” on page 286

## AT-SBxPWRSYS1, AT-SBxPWRSYS2, or AT-SBxPWRPOE1 AC Power Supply

---

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 the power supply is installed in the correct chassis slot. The AT-SBxPWRPOE1 Power Supply uses chassis slots A and B and the AT-SBxPWRSYS1 and AT-SBxPWRSYS2 Power Supplies use chassis slots C and D.
- ❑ 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 chassis 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. You do not have to power off the chassis to replace a failed power supply or install a new power supply.

---

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 286.



---

**Caution**

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

---

## AT-SBxPWRSYS1 DC System Power Supply

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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 power supply is installed in the correct chassis slot. The AT-SBxPWRSYS1 DC Power Supply has to be installed in chassis slot C or D.
- ❑ 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 329.
- ❑ 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 AT-SBxPWRSYS1 DC Power Supply is hot swappable. If the chassis contains two power supplies and one unit fails, you do not have to power off the operational power supply when you 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, 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 286.



**Caution**

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

---

## Ethernet Line Cards

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A quick and easy way to check the overall health of SwitchBlade x3100 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 chassis slot. The LEDs are numbered 0 to 11, just like the chassis slots. The cards in the slots are operating normally when the LEDs are green. The Ethernet line card in chassis slot 8, 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 chassis 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 load file stored in its flash memory is not the same version as its corresponding load file on the controller card. You may be able to correct the problem by specifying the load file on the controller card as the preferred file with the SET CARD PREFLOAD command. For instructions, refer to "Replacing Load Files on Ethernet Line Cards" on page 271.
- ❑ If the controller card does not have a load file for the card, it is running a version of the AlliedWareNSP software that does not support the card or the load file is missing from the file system in the controller card. Upgrade and/or update the management software files on the controller card.

Here are some other steps to try:

- ❑ Check that the card is completely installed in the chassis 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 chassis 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 chassis slot. If it works in the new chassis 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 management software and the SHOW CARD command, as shown in Figure 158 on page 229.

## Replacing Load Files on Ethernet Line Cards

This section contains the procedure for replacing the operating system load files on Ethernet line cards with the copy of the load file on the controller card. You might need to perform this procedure on line cards that fail to come online when you power on the chassis for the first time or install new line cards in an existing chassis.

---

### Note

For instructions on how to specify the load file for AT-SBx81XLEM Line Cards, refer to Chapter 11, “Configuring the AT-SBx81XLEM Card” on page 235.

---

The Ethernet line cards come with their operating system software stored in a file in their permanent flash memories. The file is referred to as the line card load file. The different SwitchBlade x3100 line card models use the same load file. The controller card also maintains a copy of the file in its permanent flash memory.

An Ethernet line card will not come online in the chassis if its load file is more than one version older than the Switchblade x3112 Management Software operating system on the controller card. This is to prevent the line cards and controller cards from operating with incompatible versions of the operating systems. For example, a line card with version R6.20.0.0 for the line card load file will not come online in a chassis with a controller card that has R6.18.0.0. Instead, the controller card places the card in a failed state.

If you encounter this problem, you can resolve it with the SET CARD PREFLOAD command. You use the command to instruct a line card to replace its load file in permanent, flash memory with the specified load file on the controller card, the next time it boots up.

The command has two variables. One is the chassis slot number of the Ethernet line card whose load file you want to replace, and the other is the

name of the line card load file in flash memory on the controller card.

The command does not immediately replace the load file on the line card. Rather, the file is replaced the next time the card reboots.

Once performed on a chassis slot, the command becomes part of the slot's configuration. When a line card or the chassis is reset, the controller card automatically compares the versions of the load file on a line card with the file specified in the command and, if they do not match, downloads the load file in its file system to the line card. This can be useful if you need to replace a line card with another card because it insures that the replacement card operates with the correct load file.

You can replace a newer version of the load file on a line card with an older version from the controller card, so long as the older version supports the card. For example, assume you install the AT-SBx31GC40 Line Card with the R6.20.0.0 load file into a chassis with a controller card with R6.18.0.0 of the load file. Since R6.18.0.0 supports that line card, you could replace the new version on the line card with the older version on the controller card. (Of course, you can also resolve the issue by updating the Switchblade x3112 Management Software management system on the controller card.)

Here is the command sequence to replacing the load file on Ethernet line cards:

1. **SHOW FILES** command - You use this command to display the files in the file system on the controller card to determine the name of its copy of the line card load file. The different SwitchBlade x3100 line cards use the same load file. The filename format is "x31sma\_6.nn.n.n.tar". Here is an example: x31sma\_6.21.0.0.tar.
2. **DISABLE CARD** command. You have to disable a line card before replacing its load file.
3. **SET CARD PREFLOAD** command. This command instructs the controller card to send its version of the line card load file to the designated line card the next time the card boots up. The controller card sends its copy of the load file only if the controller card and line card have different versions of the file.
4. **ENABLE CARD** command. This command enables and reboots the line card. The card receives the line card load file from the controller card, stores it in permanent memory, and reboots again, loads the new load file from the controller card, and stored it in its permanent storage. At this point the line card and controller card have the same load file.

Here is an example of the commands. The example assumes the following:

- The Ethernet line card whose load file needs to be replaced is in



slot 2.

- ❑ The filename of the line card load file in the file system on the controller card is x31sma\_6.21.0.0.tar.

To replace the line card load file for the line card in slot 2, perform the following procedure:

1. Start a local or remote management session on the chassis.
2. Issue the SHOW FILES command to view the files in the file system on the controller card, and note the name of the line card load file. In this example, the filename is x31sma\_6.21.0.0.tar.
3. Issue the SET CARD PREFLOAD command to instruct the controller card to send its load file to the line card the next time the line card reboots. The format of the command is shown here:

```
SET CARD slot PREFLOAD filename.tar
```

The “slot” variable is the slot number of the line card whose load file needs to be replaced, and the “filename” variable is the name of the load file on the controller card. Here is the command for this example:

```
set card 2 prefl oad x31sma_6. 21. 0. 0. tar. tar
```

4. Enter the ENABLE CARD command to enable and reboot the card. The format of the command is shown here:

```
ENABLE CARD slot
```

The “slot” variable is the slot number of the line card to be rebooted.

Here is the command for this example:

```
enabl e card 2
```

5. Wait one to two minutes for the controller card to transfer its line card load file to the designated line card and for the card to reboot.

At this point the line card should now be online.

6. Enter the SHOW CARD command to confirm that the line card has successfully come online.
7. To replace the load file on other line cards, repeat this procedure starting with step 3.

## Twisted Pair Ports

---

The ports on the AT-SBx31GT24, AT-SBx31GP24, and AT-SBx31GT40 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 the L/A LEDs on the card are off, try pressing the eco-friendly button on the active master controller 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 18 on page 64 and Table 19 on page 65 to verify the appropriate categories of twisted-pair cables for the 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 Twisted Pair Ports” on page 160.

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, AT-SBxPWRSYS2, or AT-SBxPWRPOE1 AC Power Supply” on page 266.
- ❑ 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 19 on page 65.
- ❑ Try replacing the twisted-pair cable, as explained in “Guidelines to Cabling Twisted Pair Ports” on page 160.
- ❑ 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 transceiver 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-SBx31CFC960 Controller Fabric Card

---

If the chassis has one controller card and it fails, all network operations stop. The Ethernet line cards do not forward network traffic until the controller card is replaced.

If the chassis has two controller cards and one fails, the Ethernet line cards continue to forward traffic, but the traffic bandwidth of each line card chassis slot is reduced from 40 to 20Gbps, which may result in slower network operations.

The M/S LED on the controller card in a chassis that has only one controller card should be solid green to indicate normal operations. If the LED is flashing amber, wait one or two minutes for the card to complete the initialization process and check the LED again. If it has not changed to solid green, the card may have encountered a problem completing the initialization process. To resolve the problem, you might try moving the controller card to the other chassis slot, slot 4 or 5, to see if it works in the other chassis slot, or connecting a terminal or PC with a terminal emulator program to the Console RS232 port to watch for error messages.

If the chassis has two controller cards, the M/S LEDs should be solid green on one card and solid or flashing amber on the other card. If both LEDs are flashing amber, wait one or two minutes for the cards to complete the initialization process and check the LEDs again. If both LEDs are still flashing amber, the cards may have encountered a problem completing the initialization process. Try replacing the cards.

Fault Condition 1: If all the LEDs on the controller card are off, try the following:

- ❑ Press the eco-friendly button on the active master control card to verify that the LEDs on the cards are on.
- ❑ Check that the card is completely installed in the chassis slot and that the front plate is flush with the front of the chassis.

Fault Condition 2: If the controller card has a state of Up-Up-Degraded when you perform the SHOW CARD command in “Using Local Management to Verify the Chassis” on page 226, you might not have removed the battery insulator when you installed the card. (Refer to Figure 72 on page 139.) To confirm this, enter the SHOW CARD with the chassis slot number of the controller card to display additional information: For example, to display information about the controller card in chassis slot 4, you enter:

```
show card 4
```

The card still has the battery insulator if the Card Fault section of the window includes an “RTC Battery” fault. To resolve the problem, remove



the controller card from the unit and remove the insulator. The controller card is hot-swappable and can be removed while the chassis is powered on. For instructions, refer to “Replacing the AT-SBx31CFC960 Controller Fabric Card” on page 315.

**Fault Condition 3:** If an SFP or SFP+ transceiver in one of the transceiver slots on the front panel of the controller card cannot establish a link with the port on its local or remote counterpart, try the following:

- ❑ Check that the fiber optic transceiver is firmly inserted into the transceiver slot on the controller 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 the 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.
- ❑ Try replacing the fiber optic cable.
- ❑ 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.

**Fault Condition 4:** 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 controller cards, verify that the management cable is connected to the active master control card. You can identify 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 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 226.
- ❑ Check to be sure that the terminal emulator application is compatible with a VT-100 terminal.

Fault Condition 5: If the chassis has two AT-SBx31CFC960 Controller Cards but the performance of the Ethernet line cards is slow or the SHOW CARD command indicates that the inactive controller cards is not in the Up-Up state, the chassis might have an old backplane that does not support two controller cards. To determine whether this is the problem, try the following:

- ❑ Examine the LEDs for chassis slots 4 and 5 in the SBx Linecard Status LEDs on the controller cards. The LEDs, which display the states of the controller cards, should be solid or flashing green. If one of the LEDs is solid amber, the corresponding controller card is not functional. Try the next step.
- ❑ Start a local or remote management session with the switch, issue the SHOW SYSTEM command, and examine the state of the “High Speed Backplane” parameter. An example is shown in Figure 166. If the parameter displays “Yes,” the backplane in the chassis supports two AT-SBx31CFC960 Controller Cards. If the parameter displays “No,” the chassis has an old backplane and does not support two controller cards. If you see this, contact Allied Telesis technical support or your sales representative for assistance.

SHOW SYSTEM

```

--- System Information -----
.
.
Identifying Information
Shelf Serial Number ..... A042600009
Shelf CLEI Code ..... <unknown>
Shelf MAC ..... EC: CD: 6D: 4F: 87: 66
High Speed Backplane ..... Yes ← Backplane Status
    
```

Figure 166. Verifying the Backplane Version with the SHOW SYSTEM Command

Fault Condition 6: The controller card has an onboard battery that 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 73 on page 140. The only way to remedy the problem is to remove the controller card from the chassis and remove the battery insulator. For instructions, refer to “Replacing the AT-SBx31CFC960 Controller Fabric Card” on page 315.

## 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 controller card and the RS-232 port on the terminal or personal computer.
- ❑ If the chassis has two controller cards, verify that the management cable is connected to the active master controller card. You can discern the active master card by examining the M/S LED. The LED is solid green on the active master controller 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 226.
- ❑ 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 9 on page 30.

Each power supply interface supports two power units. The top interface supports the power supplies in chassis slots A and C. The bottom interface supports the supplies in chassis 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 chassis slots in the front panel and that the power supplies are powered on. (The Power LED on an interface is off when the chassis 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, AT-SBxPWRSYS2, or AT-SBxPWRPOE1 AC Power Supply” on page 266 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.

## Chapter 14

# Replacing Modules

---

This chapter contains the procedures on how to replace modules in the chassis. The chapter contains the following sections:

- ❑ “Replacing the AT-SBxPWRSYS1, AT-SBxPWRSYS2 AC, or AT-SBxPWRPOE1 Power Supply” on page 288
- ❑ “Replacing the AT-SBxPWRSYS1 DC Power Supply” on page 294
- ❑ “Replacing Ethernet Line Cards” on page 306
- ❑ “Replacing Expansion Modules in AT-SBx81XLEM Line Cards” on page 309
- ❑ “Replacing the AT-SBx31CFC960 Controller Fabric Card” on page 315
- ❑ “Replacing the AT-SBxFAN12 Fan Module” on page 318

## Replacing the AT-SBxPWRSYS1, AT-SBxPWRSYS2 AC, or AT-SBxPWRPOE1 Power Supply

---

This section contains the procedure for removing or replacing the AT-SBxPWRSYS1, AT-SBxPWRSYS2, or AT-SBxPWRPOE1 AC Power Supply in the AT-SBx3112 Chassis.

---

**Note**

The illustrations in the procedure show the AT-SBxPWRSYS1 AC Power Supply. The procedure is the same for all AC power supplies.

---

---

**Note**

Allied Telesis recommends creating a backup copy of the database file of the chassis with the BACKUP DATABASE FILE command before removing or replacing a power supply. For instructions, refer to the Software Reference for SwitchBlade x3100 Series Switches.

---

---

**Note**

The power supplies are hot swappable.

---

To remove the AT-SBxPWRSYS1, AT-SBxPWRSYS2, or AT-SBxPWRPOE1 Power Supply in the chassis, perform the following procedure:

1. Disconnect the AC power cord for the power supply from the AC power source and the corresponding AC socket on the back panel of the chassis. The figure in Figure 167 on page 289 shows the removal of the power cord from connector D, which corresponds to chassis slot D on the front panel.





Figure 167. Disconnecting the AC Power Cord from the AC Socket on the Back Panel

2. Lift the locking hand on the power supply. Refer to Figure 168 on page 290.



Figure 168. Lifting the Locking Handle on the Power Supply

3. Carefully pull on the locking handle to slide the power supply from the chassis. Refer to Figure 169 on page 291.



**Warning**

The power supply is heavy. Use both hands to hold the module as you remove it from the chassis.



Figure 169. Removing the Power Supply from the Chassis

4. Do one of the following:
  - To install a new power supply, refer to Chapter 6, “Installing the Power Supplies” on page 115.
  - If you are not installing a new power supply, continue with the rest of this procedure to install a blank power supply slot cover.
5. Place the locking handle on the power supply slot cover in the up position and slide the cover into the empty power supply slot. Refer to Figure 170 on page 292.



Figure 170. Installing a Blank Power Supply Slot Cover

6. Lower the locking handle to secure the black power supply slot cover in the chassis slot. Refer to Figure 171 on page 293.



Figure 171. Lowering the Locking Handle on the Power Supply Slot Cover

## Replacing the AT-SBxPWRSYS1 DC Power Supply

---

This section contains the procedure for removing an AT-SBxPWRSYS1 DC Power Supply from the AT-SBx3112 Chassis.

---

**Note**

Allied Telesis recommends creating a backup copy of the database file of the chassis with the `BACKUP DATABASE FILE` command before removing or replacing a power supply. For instructions, refer to the Software Reference for SwitchBlade x3100 Series Switches.

---

To remove an AT-SBxPWRSYS1 DC Power Supply from the chassis, perform the following procedure:

1. Turn off the circuit breaker to the AT-SBxPWRSYS1 DC Power Supply.
2. Turn off the On/Off switch on the front panel of the power supply. Refer to Figure 123 on page 194.
3. Use a #2 screwdriver to loosen the screw on the locking handle. Refer to Figure 172 on page 295.

---

**Note**

Do not lift the locking handle yet.

---

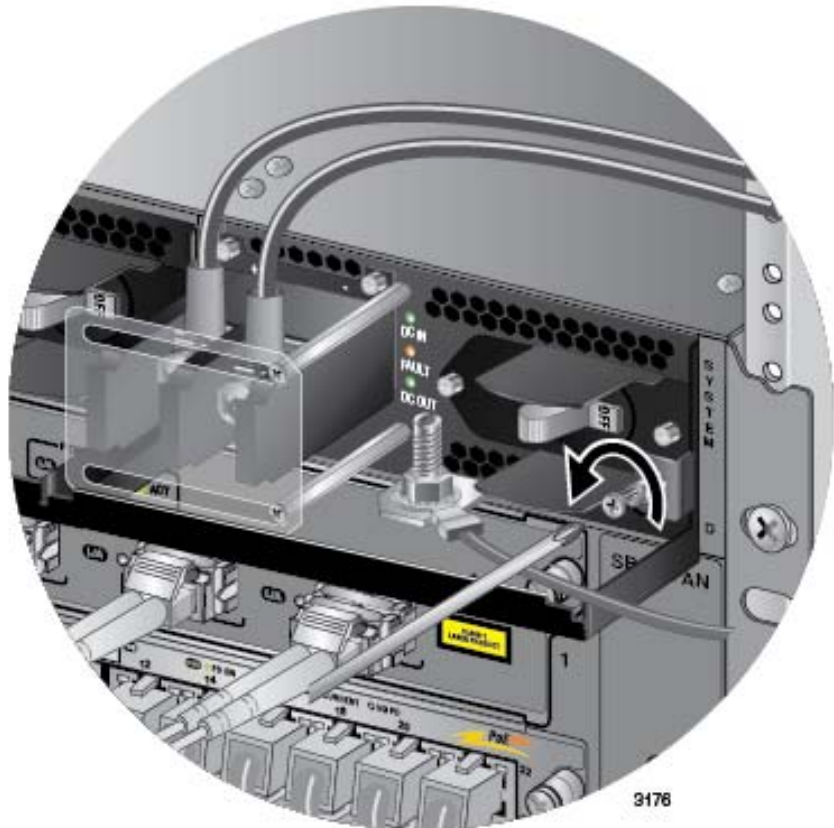


Figure 172. Loosening the Screw on the Locking Handle

---

**Note**

If the power wires are connected to the terminal block with the right angle terminals, go to step 5.

---

4. Use a #1 screwdriver to loosen the two screws that secure the plastic cover over the terminal block and slide the cover to the right. You may need to slightly lift the locking handle to access the bottom screw. Refer to Figure 173 on page 296.

The plastic cover may not be present if the lead wires are connected to the terminal block with the right angle terminals. If this is the case, you may skip this step.

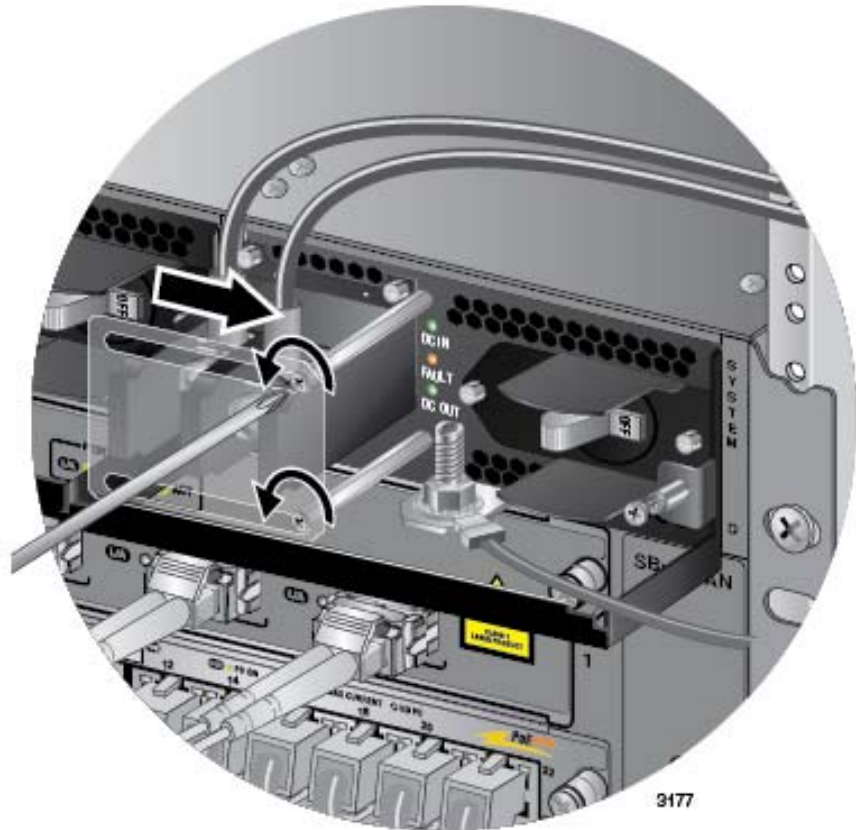


Figure 173. Opening the Plastic Window on the Terminal Block

5. Use a #3 screwdriver to remove the negative (-) lead wire from the terminal block. The negative lead wire is on the right. Refer to Figure 174 on page 297.



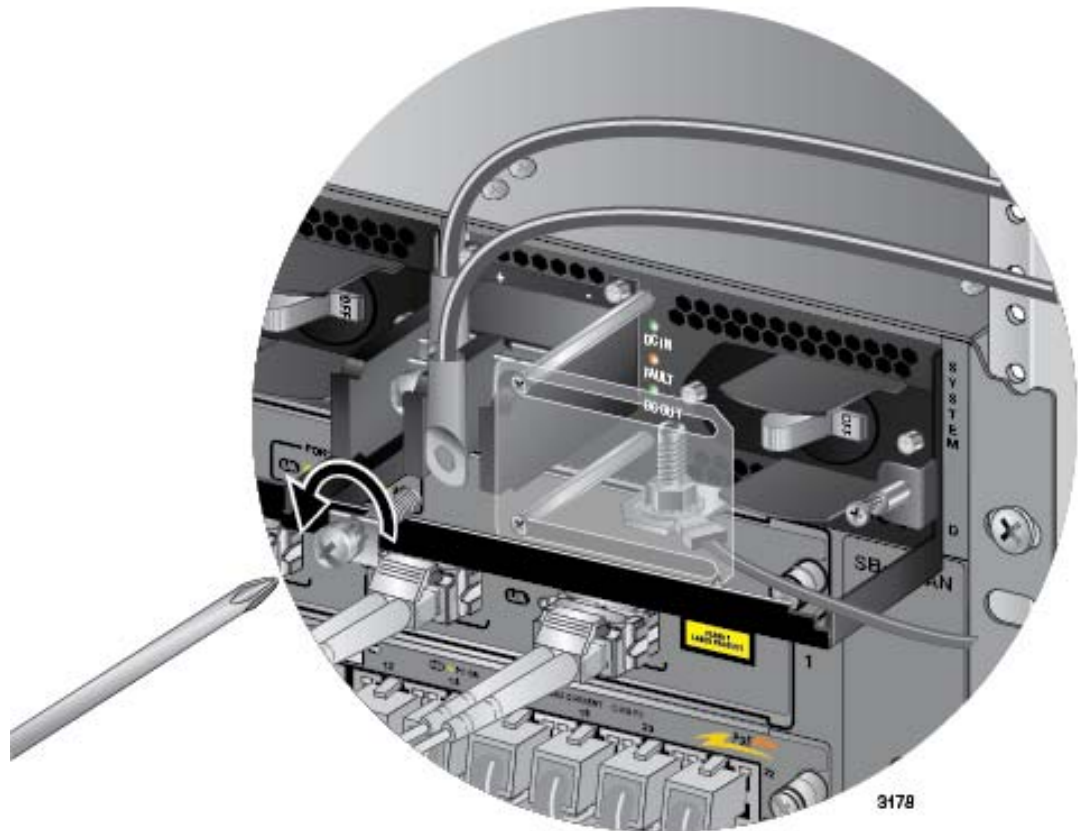


Figure 174. Removing the Negative Lead Wire

6. Use a #3 screwdriver to remove the positive (+) lead wire from the terminal block. Refer to Figure 175 on page 298.

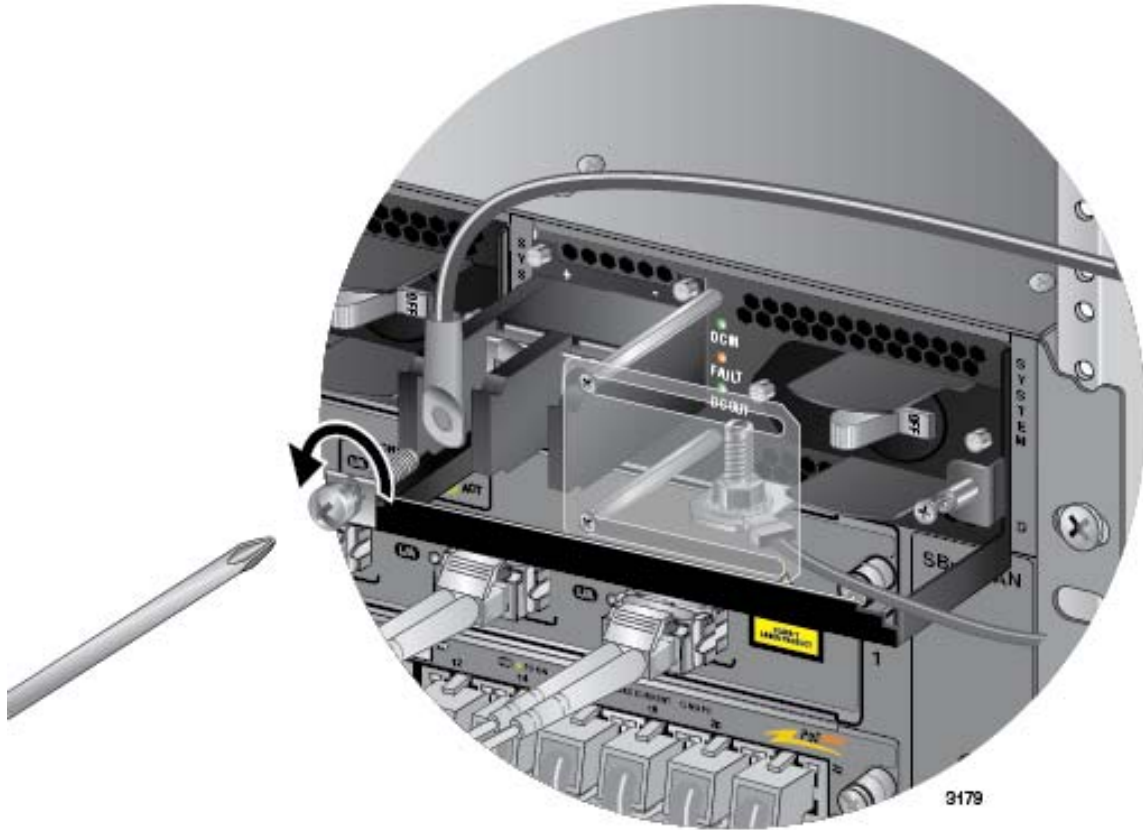


Figure 175. Removing the Positive Lead Wire

7. Reinstall the two screws on the negative (-) and positive (+) terminals. Refer to Figure 176 on page 299.

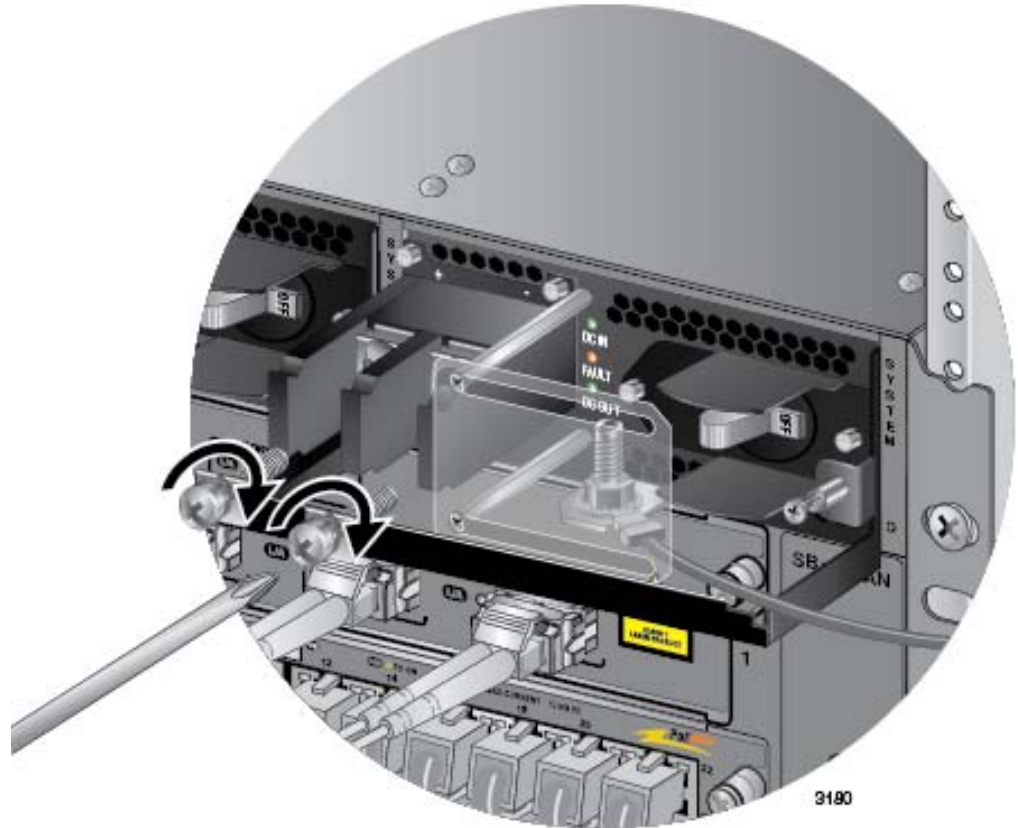


Figure 176. Reinstalling the Screws on the Positive and Negative Terminals

8. Slide the plastic cover to the left and lightly tighten the two screws to secure it in place. Refer to Figure 177 on page 300.



**Caution**

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

The plastic cover may not be present if the lead wires were connected to the terminal block with the right angle terminals. If this is the case, you may either skip this step or reinstall the plastic cover on the power supply.

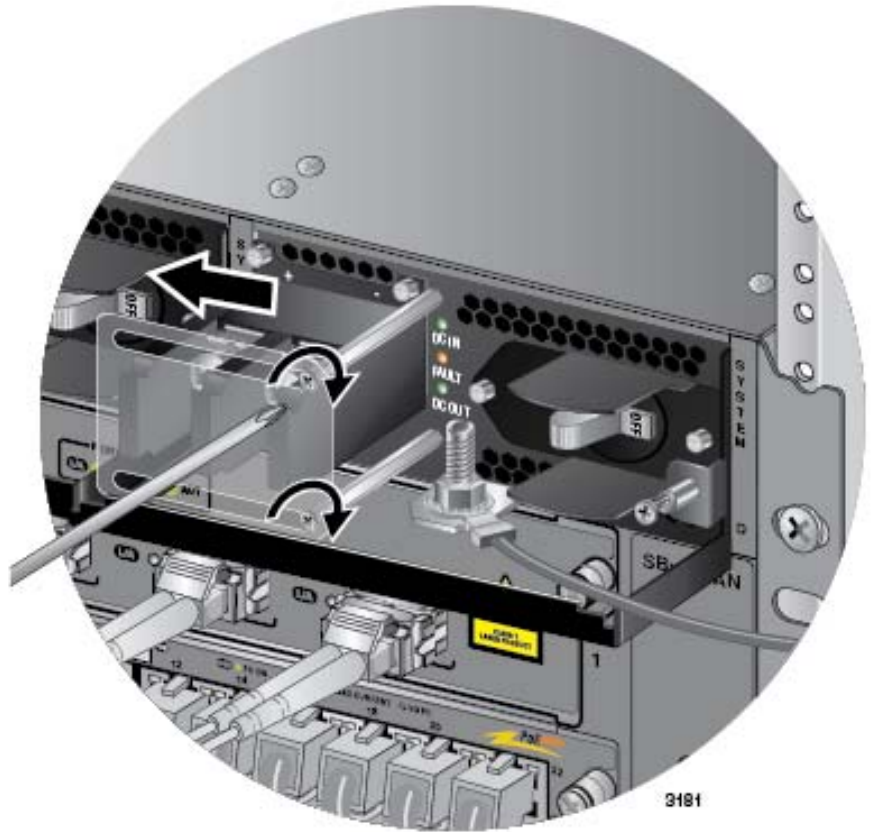


Figure 177. Closing the Plastic Cover

9. Use an 8 mm wrench to remove the grounding wire from the grounding post. Refer to Figure 178 on page 301.

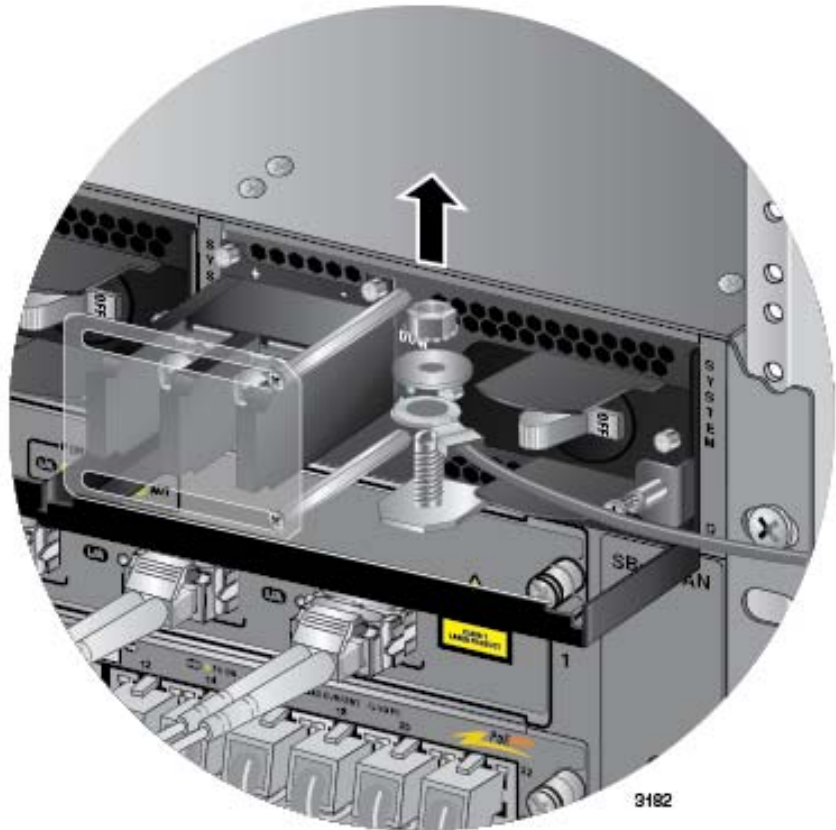


Figure 178. Removing the Grounding Wire

10. Reinstall the nut and washer on the grounding post. Refer to Figure 179 on page 302.

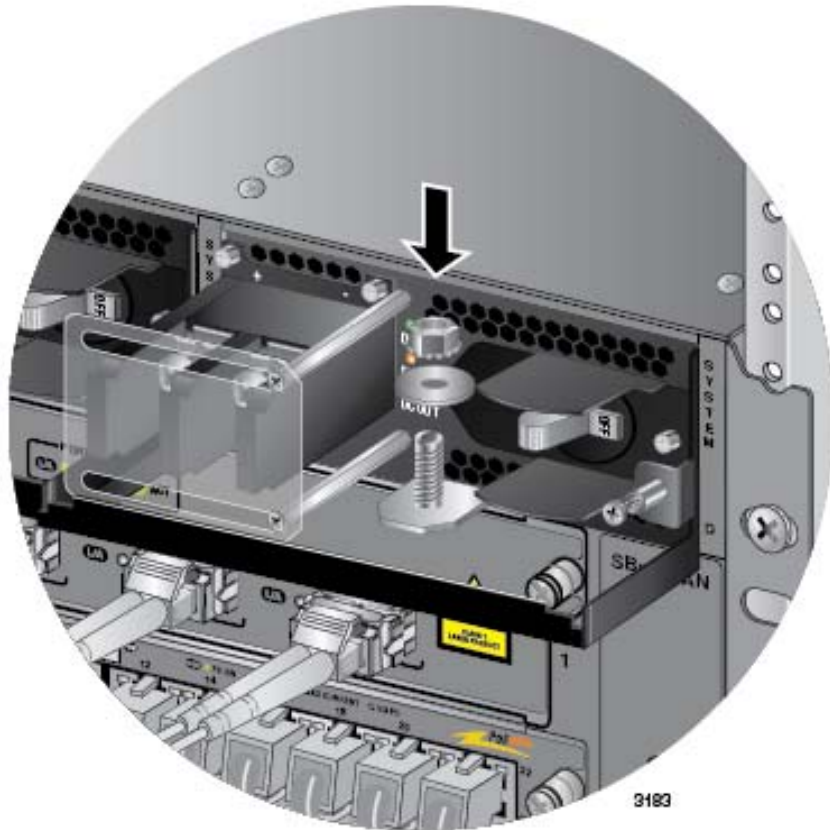


Figure 179. Reinstalling the Nut and Washer on the Grounding Post

11. Lift the locking handle and slide the power supply from the chassis. Refer to Figure 180 on page 303.



**Warning**

The power supply is heavy. Use both hands to hold the module as you remove it from the chassis.

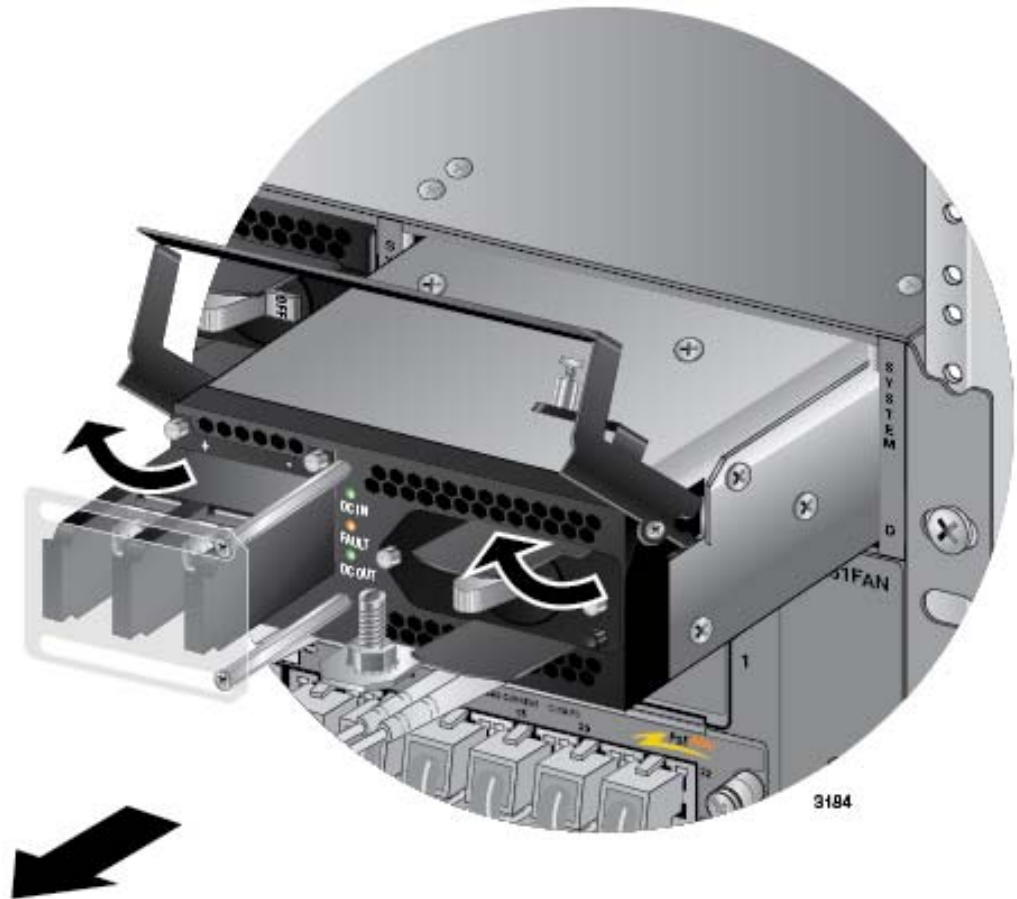


Figure 180. Lifting the Locking Handle and Removing the Power Supply

12. Do one of the following:

- To install a new power supply, refer to Chapter 6, “Installing the Power Supplies” on page 115.
- If you are not installing a new power supply, continue with this procedure to install a blank power supply slot cover.

13. Place the locking handle on the blank power supply slot cover in the up position and slide the cover into the empty power supply slot. Refer to Figure 181 on page 304.

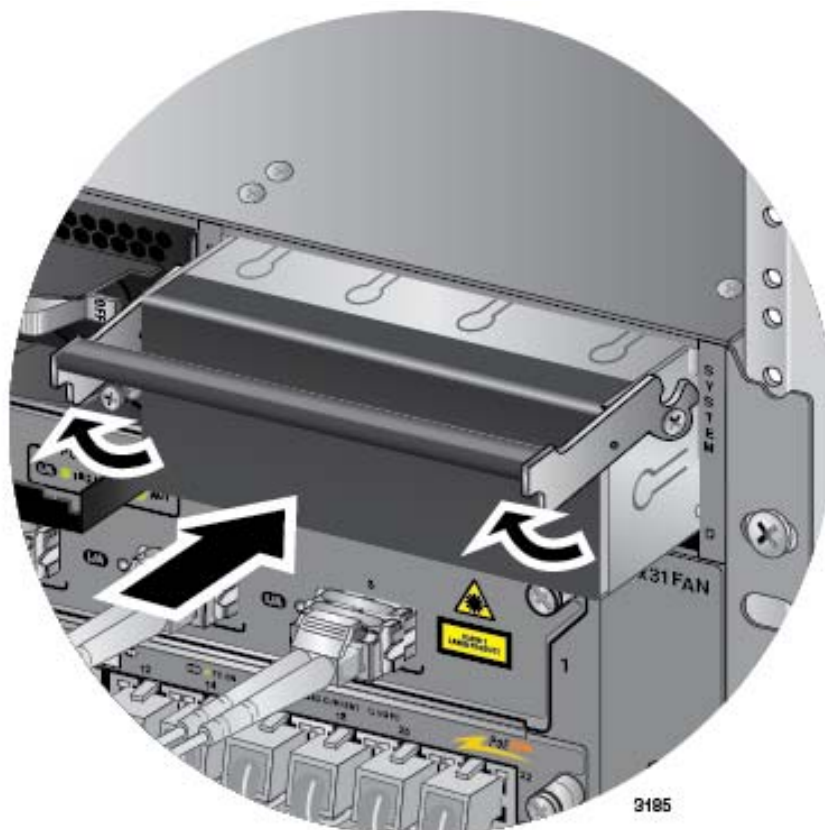


Figure 181. Installing a Blank Power Supply Slot Cover

14. Lower the locking handle to secure the blank power supply slot cover to the chassis slot. Refer to Figure 182 on page 305.



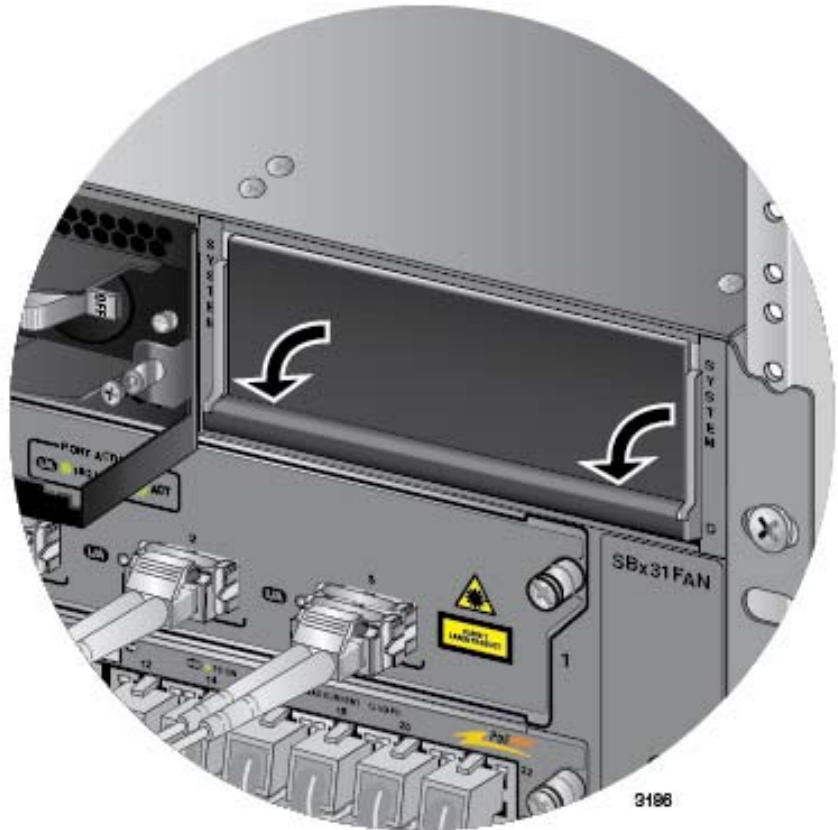


Figure 182. Lowering the Locking Handle on the Power Supply Slot Cover

## Replacing Ethernet Line Cards

---

This section contains the procedure for replacing Ethernet line cards in the chassis.

---

**Note**

Please review “Guidelines to Handling the Controller and Line Cards” on page 136 before performing this procedure.

---

This procedure requires the following tool:

- #2 Phillips-head screwdriver (not provided)

The Ethernet line cards are hot swappable and can be removed while the chassis is powered on.

To remove an Ethernet line card from the chassis, perform the following procedure:

---

**Note**

Steps 1 to 3 are optional. They explain how to use the DISABLE CARD command to disable an Ethernet line card so that the controller card does not generate an alarm when you remove it.

---

1. Start a management session on the chassis. For instructions on how to start a local management session, refer to “Starting a Local Management Session” on page 226.
2. At the command prompt, enter the DISABLE CARD command with the chassis slot number of the card you want to remove. For example, to disable the Ethernet line card in chassis slot 1, you enter:

```
di sabl e card=1
```

3. Log off to end your management session.
4. Label and remove the cables from the Ethernet line card.
5. If the line card has fiber optic transceivers, install dust covers on the ports.
6. If the line card has transceivers, label and remove the transceivers.
7. Use a #2 Phillips-head screwdriver to loosen the two screws on the faceplate of the card.

8. Carefully pull on the screws to disconnect the line card from the connector on the backplane.
9. Carefully slide the card from the chassis.




---

**Caution**

Keep the card level as you slide it out of the chassis. You might damage the components on the top or bottom of the card if you slide it out at an angle. Refer to Figure 69 on page 137.\

---

If the new Ethernet line card is the same model as the card it is replacing, perform these additional steps:

1. Install the new line card. For instructions, refer to “Installing the Ethernet Line Cards” on page 152.
2. Start a management session on the chassis. For instructions on how to start a local management session, refer to “Starting a Local Management Session” on page 226.
3. At the command prompt, enter the ENABLE CARD command with the chassis slot number of the new card. For example, to enable the Ethernet line card in chassis slot 1, you enter:

```
enabl e card=1
```

4. Log off to end your management session.
5. Connect the network cables to the new line card. For instructions, refer to Chapter 8, “Installing Transceivers and Cabling Ports” on page 159.

If the new Ethernet line card is a different model than the card it is replacing, perform these additional steps:

1. Install the new line card. For instructions, refer to “Installing the Ethernet Line Cards” on page 152.
2. Start a management session on the chassis. For instructions on how to start a local management session, refer to “Starting a Local Management Session” on page 226.
3. At the command prompt, enter the DESTROY CARD command to delete the old card’s configuration from the database. For example, to destroy the card configuration for chassis slot 1, you enter:

```
destroy card=1
```

4. At the command prompt, enter the ENABLE CARD command to enable the chassis slot with the new card. For example, to enable the Ethernet line card in chassis slot 1, you enter:

```
enable card=1
```

5. Log off to end your management session.
6. Connect the network cables to the new line card. For instructions, refer to Chapter 8, “Installing Transceivers and Cabling Ports” on page 159.

If you are not replacing the line card at this time, you should cover the chassis slot with a blank cover. For instructions, refer to “Installing the Blank Slot Covers” on page 156.

If you do not plan to install the removed line card in another chassis slot, store the card in an anti-static bag and return it to its shipping container.

## Replacing Expansion Modules in AT-SBx81XLEM Line Cards

---

This section contains the procedure for replacing expansion modules in AT-SBx81XLEM Line Cards.

---

**Note**

Please review “Guidelines to Handling the Controller and Line Cards” on page 142 before performing this procedure.

---



---

**Caution**

The expansion modules are not hot-swappable. You must remove the AT-SBx81XLEM Line Card from the chassis to service a module. Installing or replacing a module while the line card is installed in the chassis will damage the devices.

---

This procedure requires the following tools:

- #2 Phillips-head screwdriver (not provided)
- Flat-head screwdriver (not provided)

The illustrations in the procedure show the AT-SBx81XLEM/XS8 Expansion Module. The procedure is the same for all modules.

To replace an expansion module in the AT-SBx81XLEM Line Card, perform the following procedure:

1. Remove the AT-SBx81XLEM Line Card from the chassis by performing steps 1 to 6 in “Replacing Ethernet Line Cards” on page 306.
2. Place the line card on a level, secure surface.
3. With a Phillips-head screwdriver, remove the two screws that secure the expansion module to the line card. Refer to Figure 183 on page 310.

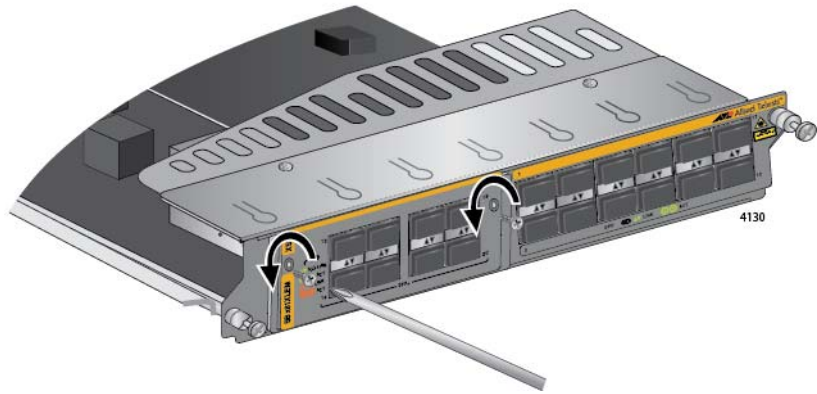


Figure 183. Removing the Screws from the Expansion Module

4. With your thumb and forefinger, pull out the retaining pin on the side of the line card and turn it clockwise one quarter turn until it remains in the retracted position. Refer to Figure 184.

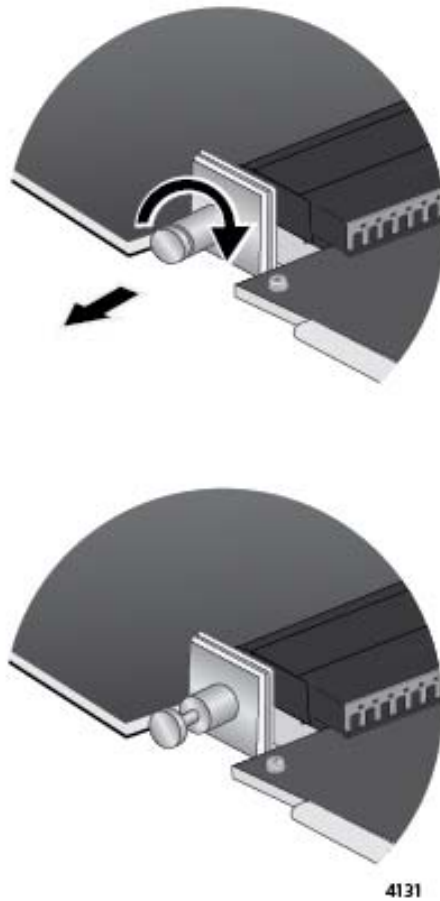


Figure 184. Retracting the Retaining Pin on the AT-SBx81XLEM Line Card

5. Lift the front of the line card and carefully insert the tip of a flathead screwdriver into the slot beneath the expansion module on the bottom panel. Gently twist the screwdriver to disconnect the module from the connector in the line card. Refer to Figure 185.

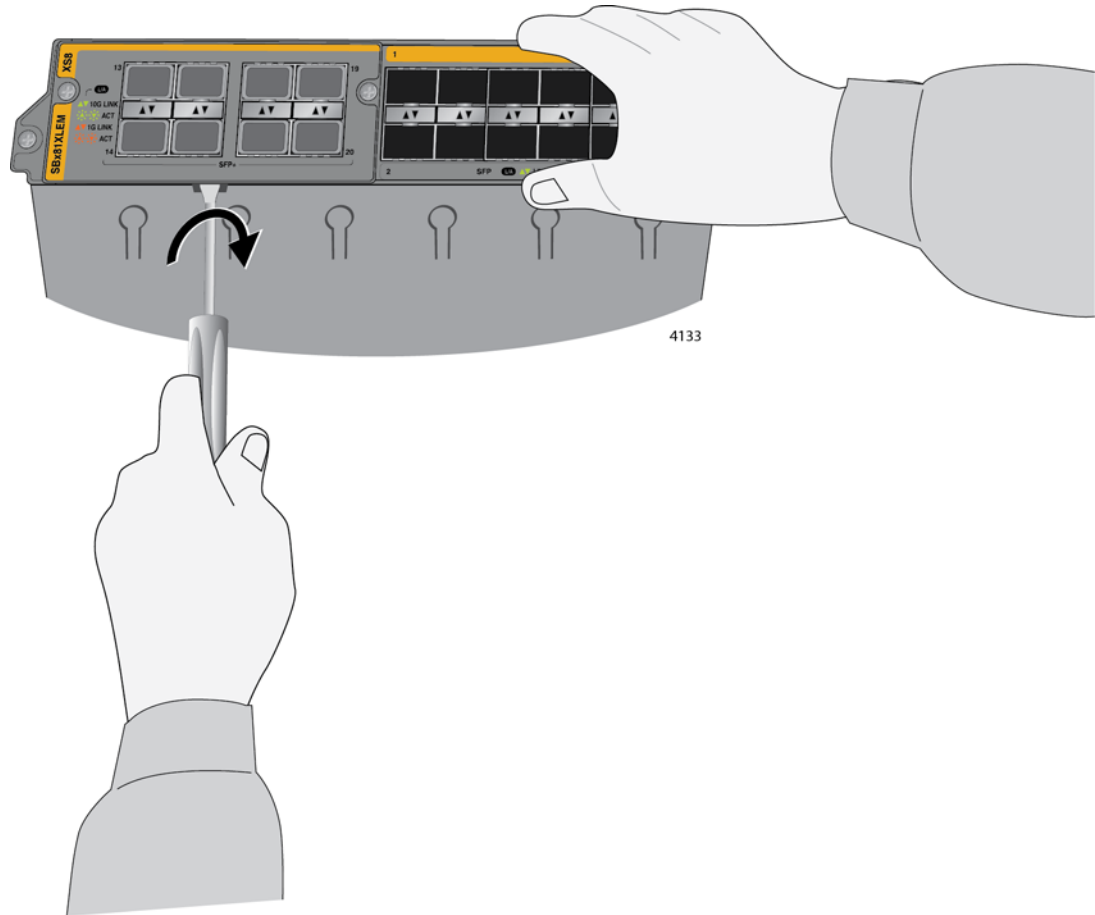


Figure 185. Disconnecting the Expansion Module from the AT-SBx81XLEM Line Card

6. Slide the expansion module from the line card. Refer to Figure 186 on page 312.

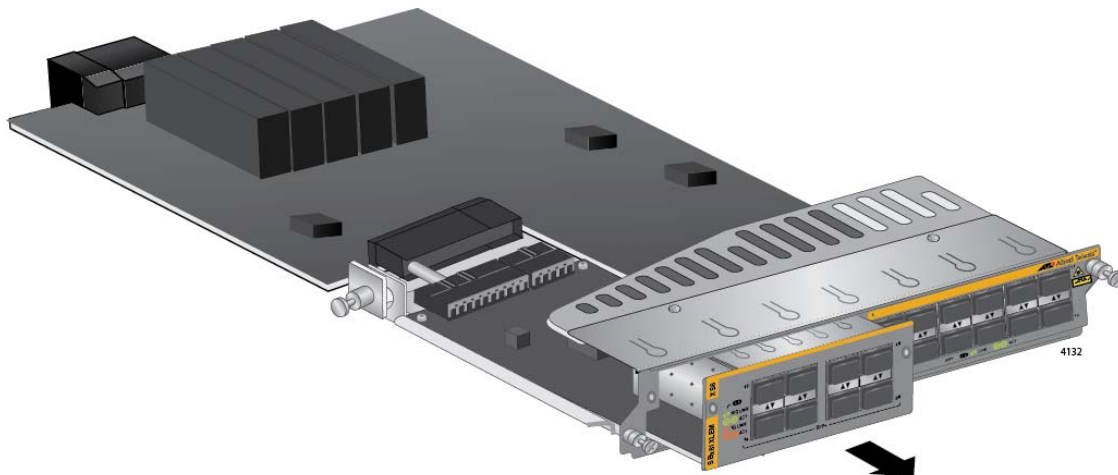


Figure 186. Sliding the Expansion Module from the AT-SBx81XLEM Line Card

7. If you are not installing the expansion module in another AT-SBx81XLEM Line Card, store it in an anti-static bag. Refer to Figure 187.



Figure 187. Storing the Expansion Module in an Anti-static Bag

8. Do one of the following:
  - To install a different expansion module in the line card, go to “Installing Expansion Modules in AT-SBx81XLEM Ethernet Line Cards” on page 144 and start with step 7.
  - To install the line card in the chassis without an expansion module, continue with this procedure.
9. Slide the blank slot cover that comes with the line card into the module slot on the card. Refer to Figure 188 on page 313.



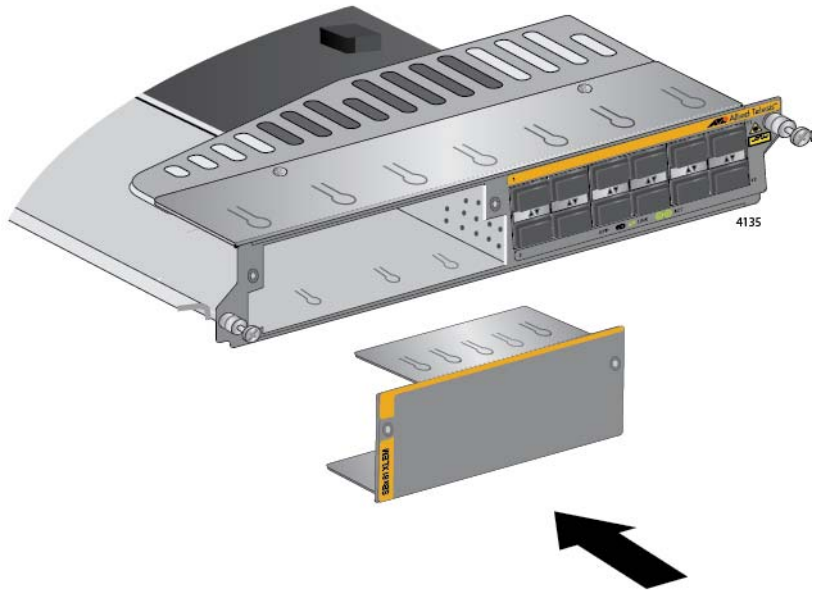


Figure 188. Sliding the Blank Slot Cover into the AT-SBx81XLEM Line Card

10. Secure the blank slot cover to the card with a Phillips-head screwdriver and the two screws removed in step 3. Refer to Figure 189.

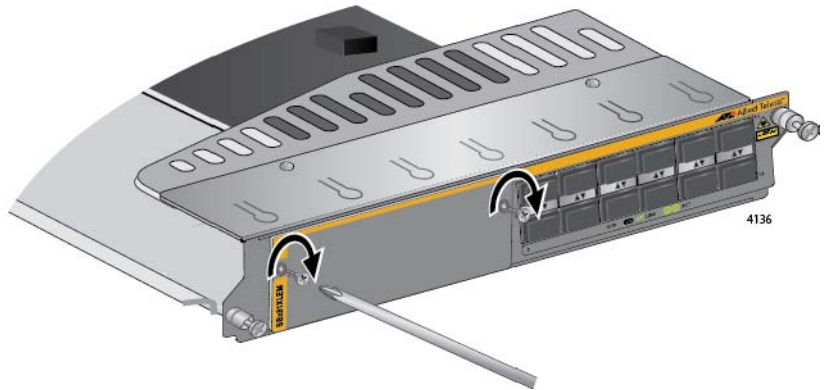


Figure 189. Securing the Blank Slot Cover

11. Turn the retaining pin on the side of the card a quarter turn to release it. Refer to Figure 190 on page 314.

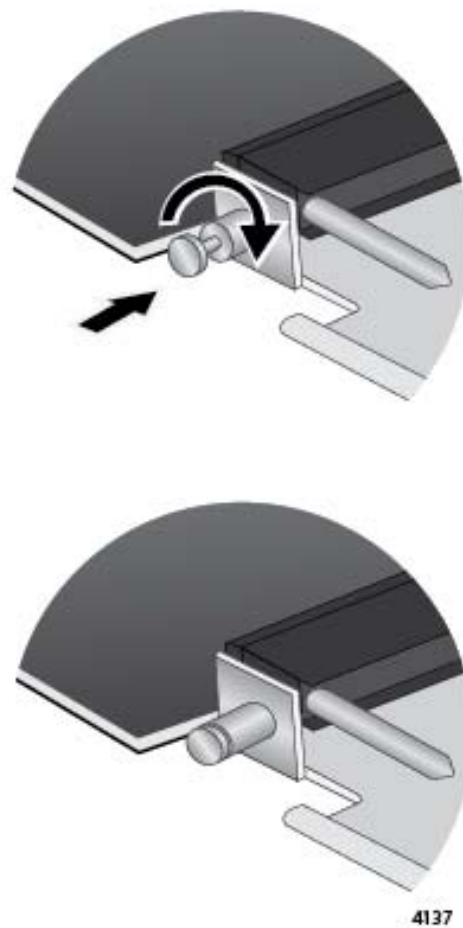


Figure 190. Releasing the Retaining Pin

12. To install the line card back in the chassis, go to “Installing the Ethernet Line Cards” on page 152 and start with step 5.

## Replacing the AT-SBx31CFC960 Controller Fabric Card

---

This section contains the procedure for replacing a controller card in the chassis.

---

**Note**

Please review “Guidelines to Handling the Controller and Line Cards” on page 136 before performing this procedure.

---

---

**Note**

Allied Telesis recommends creating a backup copy of the database file with the BACKUP DATABASE FILE command before removing or replacing a controller card. For instructions, refer to the Software Reference for SwitchBlade x3100 Series Switches.

---

This procedure requires the following tool:

- #2 Phillips-head screwdriver (not provided)

The controller card is hot swappable and can be removed while the chassis is powered on.

Here are the general steps if the chassis has only one controller card and the card has failed such that it is no longer responding to management commands and the Ethernet line cards have stopped forwarding traffic:

1. Power off the chassis.
2. Remove the failed controller card. For details, refer to the instructions later in this section.
3. Install the new controller card. You may install the new controller card in the same chassis slot as the failed card or in the other controller card slot. For instructions, refer to “Installing the AT-SBx31CFC960 Controller Fabric Card” on page 138.
4. Power on the chassis.
5. Wait two minutes for the controller and line cards to complete the initialization process.
6. Start a management session on the management card. For instructions, refer “Starting a Local Management Session” on page 226.

7. Verify that the management card has the desired version of the management software by performing the `SHOW SYSTEM` command, as explained in “Entering the Management Software Commands” on page 227. If necessary, update the software by referring to the Software Reference for SwitchBlade x3100 Series Switches.
8. Restore the configuration to the Ethernet line and controller cards by uploading the most recent backup database to the new controller card. If you do not have an archived copy of the backup database of the chassis, restore the configuration manually. For instructions, refer to Software Reference for SwitchBlade x3100 Series Switches.

Here are the general steps if the chassis has two controller cards and one cards fails:

1. If the chassis is powered off, power it on.

---

**Note**

You should not replace a controller card in a chassis that has two controller cards while the unit is powered off, especially if the failed controller card is in chassis slot 5. If you replace a failed controller card while the chassis is powered off, the Ethernet line cards might lose their configurations if the new controller card is designated as the active card when you power on the chassis.

---

2. If you just powered on the chassis, wait two minutes for the operational controller card to finish the initialization process. The M/S LED on the card changes to solid green at the completion of the initialization process.

---

**Note**

By waiting for the operational controller card to complete its initialization process, you ensure that it is the active card when you replace the failed controller card with a new card.

---

3. Start a management session on the chassis. For instructions on how to start a local management session, refer to “Starting a Local Management Session” on page 226.
4. At the command prompt, enter the `DISABLE CARD` command to disable the failed controller card: Here is the command:

```
di sabl e card=i nactcfc
```

5. Log off to end your management session.
6. Remove the failed controller card. For details, refer to the instructions later in this section.

7. Install the new controller card. For instructions, refer to “Installing the AT-SBx31CFC960 Controller Fabric Card” on page 138.
8. Start a management session on the chassis.
9. At the command prompt, enter the ENABLE CARD command to enable the new controller card: Here is the command:

```
enabl e card=i nactcfc
```

10. Log off to end your management session.

To remove a controller card from the chassis, perform the following procedure:

1. Disconnect the cables from the NET MGMT and Console ports on the controller card.
2. Disconnect the cables from the SFP and SFP+ transceivers in the transceiver slots in the controller card and remove the transceivers.
3. Use a #2 Phillips-head screwdriver to loosen the two screws on the faceplate of the card.
4. Carefully pull out the handles of the faceplate to disconnect the controller card from the connector on the backplane of the chassis.
5. Carefully slide the controller card from the chassis.



#### **Caution**

Keep the card level as you slide it out of the chassis. You might damage the components on the top or bottom of the card if you slide it out at an angle. Refer to Figure 69 on page 137.

---

6. Do one of the following:
  - For instructions on how to install a new controller card in the chassis, refer to “Installing the AT-SBx31CFC960 Controller Fabric Card” on page 138.
  - If you do not plan to immediately install another controller card in the chassis slot, cover the slot with a blank cover. For instructions, refer to “Installing the Blank Slot Covers” on page 156.
  - If you do not plan to immediately install the controller card in another chassis, continue with this procedure.
7. Store the controller card in an anti-static bag.
8. Return the card to its shipping container.

## Replacing the AT-SBxFAN12 Fan Module

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This section contains the procedures for replacing the AT-SBxFAN12 Fan Module. The module is located in the chassis slot on the right side of the front panel.



### Caution

Although the fan module is hot swappable and can be replaced while the chassis is powered on, the line cards and power supplies may overheat if the chassis is operated for more than one or two minutes without a fan module.

---



### Warning

The fan module has hazardous moving parts. Keep fingers away from moving fan blades.

---

---

### Note

Only an authorized service technician should replace the fan module.

---

### Removing the AT-SBxFAN12 Fan Module

To remove the fan module from the chassis, perform the following procedure:

---

### Note

Steps 1 to 3 are optional. They disable the fan module with the DISABLE FANMODULE command so that the controller card does not generate an alarm when you remove the old module.

---

1. Start a management session on the chassis. For instructions on how to start a local management session, refer to “Starting a Local Management Session” on page 226.
2. At the command prompt, enter the DISABLE FANMODULE command to disable the module.
3. Log off to end your management session.
4. If necessary, disconnect or reroute network cables that are blocking access to the fan module.
5. Use a #2 Phillips head screwdriver to loosen the screw at the base of the fan module. Refer to Figure 191 on page 319.



Figure 191. Loosening the Screw on the AT-SBxFAN12 Fan Module

6. Carefully pull on the handle to disconnect the fan module from the connector on the backplane of the chassis. Refer to Figure 192.

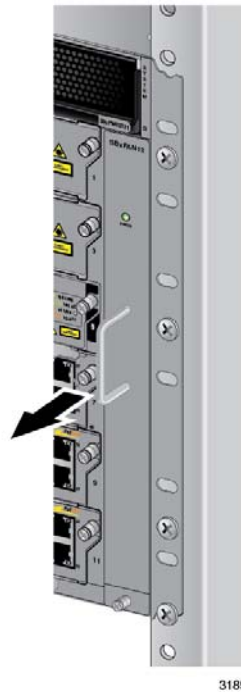


Figure 192. Loosening the AT-SBxFAN12 Fan Module from the Backplane Connector

7. Slowly pull the module out 25 mm (1 in.). Refer to Figure 193.



**Warning**

The fan module has hazardous moving parts. Keep fingers away from moving fan blades.

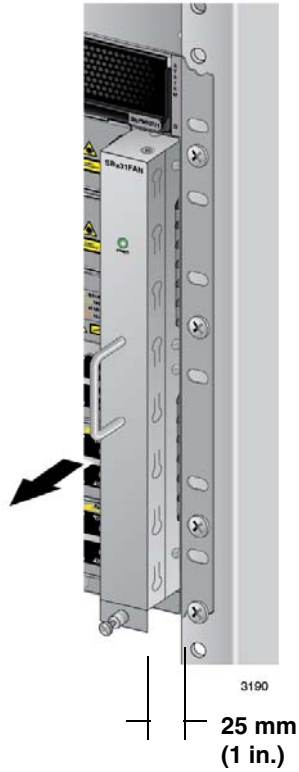


Figure 193. Withdrawing the AT-SBxFAN12 Fan Module 25 mm (1 in.) from the Chassis

8. Wait ten seconds for the fans to stop.
9. After the fans have stopped, slide the module from the chassis. Refer to Figure 194 on page 321.



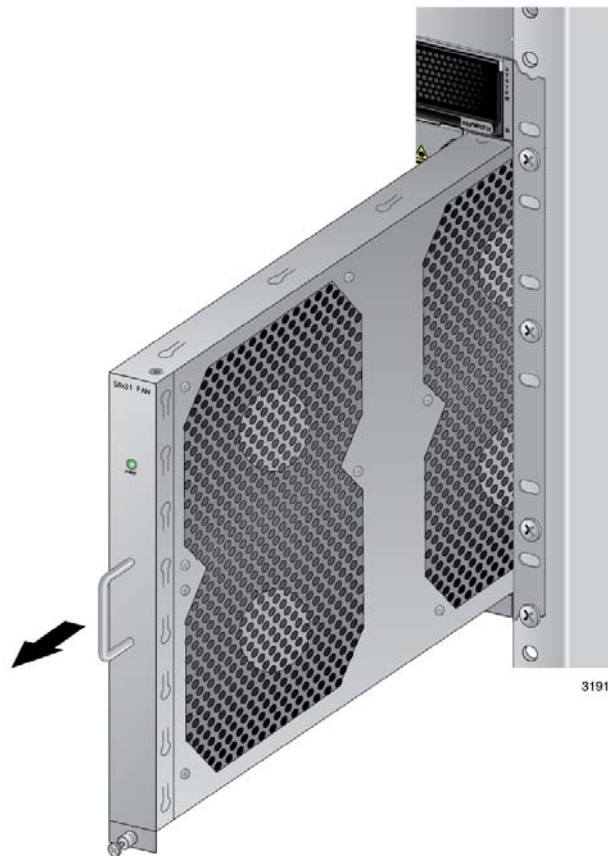


Figure 194. Removing the AT-SBxFAN12 Fan Module from the Chassis

### **Installing the New AT- SBxFAN12 Fan Module**

This procedure assumes that you have already removed the old fan module from the chassis and are continuing directly from the previous procedure, “Removing the AT-SBxFAN12 Fan Module” on page 318. To install the new fan module, perform the following procedure

1. Orient the new module with the LED and module name on top and carefully slide the module into the chassis slot. Refer to Figure 195 on page 322.

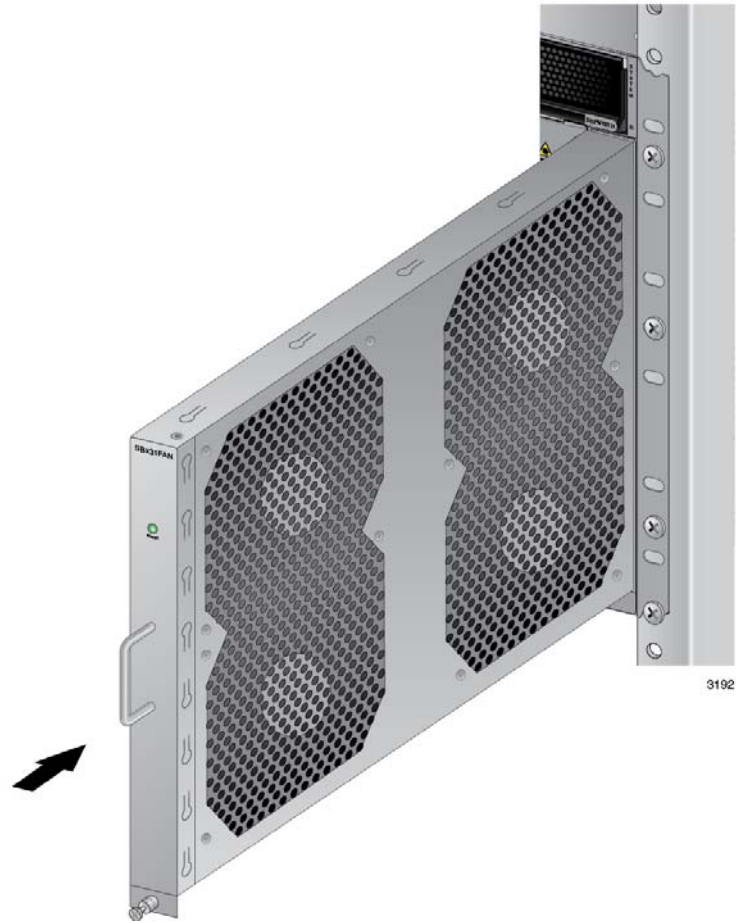


Figure 195. Installing a New AT-SBxFAN12 Fan Module

2. When you feel the fan module make contact with the connector on the backplane, gently push on the top and bottom of the faceplate to seat the module on the connector. Refer to Figure 196 on page 323.



Figure 196. Securing the AT-SBxFAN12 Fan Module on the Backplane Connector

3. With a #2 Phillips-head screwdriver, tighten the screw at the base of the module to secure the module to the chassis. Refer to Figure 197.



Figure 197. Tightening the Screw on the AT-SBxFAN12 Fan Module

4. Reconnect any network cables you may have disconnected to access the fan module.

---

**Note**

Perform steps 5 to 7 to enable the new fan module if you disabled the old module with the `DISABLE FANMODULE` command prior to removing it.

---

5. Start a management session on the chassis. For instructions, refer to “Starting a Local Management Session” on page 226.
6. At the command prompt, enter the `ENABLE FANMODULE` command to enable the module.
7. Log off to end your management session.

## Appendix A

# Technical Specifications

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The sections in the appendix are listed here:

- ❑ “Physical Specifications” on page 326
- ❑ “Environmental Specifications” on page 328
- ❑ “Power Specifications” on page 329
- ❑ “Safety and Electromagnetic Emissions Certifications” on page 333
- ❑ “Port Pinouts” on page 334

## Physical Specifications

### Dimensions (W x D x H)

Table 34. 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-SBxPWRSYS2 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-SBx81XLEM SFP Line Card AT-SBx31CFC960 Controller Fabric Card	20.67 x 31.32 cm x 4.06 cm (8.14 in x 12.33 in x 1.6 in)
AT-SBx81XLEM/Q2 Module AT-SBx81XLEM/XS8 Module	9.4 cm x 16.0 cm x 3.6 cm (3.7 in x 6.3 in x 1.4 in)

### Weight (Kilograms)

Table 35. 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 35. 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-SBx81XLEM SFP Line Card	1.2 kg (2.70 lb)
AT-SBx81XLEM/Q2 Expansion Module	0.2 kg (0.5 lb)
AT-SBx81XLEM/XS8 Expansion Module	0.3 kg (0.65 lb)
AT-SBx31CFC960 Controller Fabric Card	1.13 kg (2.50 lb)
AT-SBxPWRSYS1 AC System Power Supply	2.75 kg (6.05 lb) with power cord
AT-SBxPWRSYS2 AC System Power Supply	2.70 kg (6.00 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 36. 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 37. Acoustic Noise Test Components

Product	Quantity
AT-SBx3112 Chassis	1
AT-SBx31CFC960 Controller Fabric 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 38. AC Voltage and Frequency Requirements

AT-SBxPWRSYS1 AC Power Supply	100 - 120 / 200 - 240 VAC, 16/8A, 50/60 Hz, (per input)
AT-SBxPWRSYS2 AC System Power Supply	100 - 120 / 200 - 240 VAC, 18/8A, 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 39. DC Voltage Requirement

AT-SBxPWRSYS1 DC Power Supply	40 - 60V dc (-0% - +20%), 36A (maximum per input)
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### Typical power savings in eco-friendly mode (Watts)

Table 40. 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-SBx81XLEM (no expansion module)	0.14 W
AT-SBx81XLEM and AT-SBx81XLEM/Q2	0.17 W
AT-SBx81XLEM and AT-SBx81XLEM/XS8	0.20 W

**Maximum power consumption (Watts)**

Table 41. Maximum Power Consumption

AT-SBx31GT24	34.4 W
AT-SBx31GT40	53.9 W
AT-SBx31GP24	34.4 W
AT-SBx31GS24	56.3 W
AT-SBx31GC40	64.0 W
AT-SBx31XZ4	48.3 W
AT-SBx31XS6	54.8 W
AT-SBx81XLEM (no expansion module)	43.7 W
AT-SBx81XLEM and AT-SBx81XLEM/Q2	64.4 W
AT-SBx81XLEM and AT-SBx81XLEM/XS8	65.1 W
AT-SBx31CFC960	75.0 W

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

Table 42. Maximum Power Efficiency

AT-SBxPWRSYS1 AC	Up to 90%
AT-SBxPWRSYS2 AC	Up to 85%
AT-SBxPWRPOE1	Up to 90%
AT-SBxPWRSYS1 DC	Up to 90%

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

Table 43. 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

Table 43. Heat Dissipation

AT-SBx31GC40	272.8 BTU/hr
AT-SBx31XZ4	206.01 BTU/hr
AT-SBx31XS6	233.73 BTU/hr
AT-SBx81XLEM (no expansion module)	149.19 BTU/hr
AT-SBx81XLEM and AT-SBx81XLEM/Q2	219.8 BTU/hr
AT-SBx81XLEM and AT-SBx81XLEM/XS8	222.15 BTU/hr
AT-SBx31CFC960	225.91 BTU/hr
AT-SBxPWRSYS1 AC	5118.21 BTU/hr
AT-SBxPWRSYS2 AC	5118.21 BTU/hr
AT-SBxPWRPOE1 AC	5118.21 BTU/hr
AT-SBxPWRSYS1 DC	5118.21 BTU/hr

Power supply heat dissipation is calculate at 80% power efficiency.

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

Table 44. 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 45. 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 46. PoE Mode

IEEE 802.3af / IEEE 802.3at:	Alternative Mode A
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## Safety and Electromagnetic Emissions Certifications

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### Safety and Electromagnetic Emissions:

Table 47. 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 198 illustrates the pin layout for RJ-45 and RJ point 5 ports.

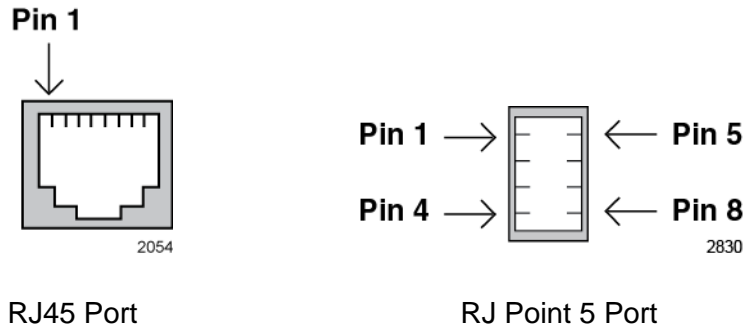


Figure 198. Pin Numbers for the RJ-45 and Point 5 Ports (Front View)

Table 48 lists the pin signals when a twisted-pair port is operating in the MDI configuration.

Table 48. MDI Pin Signals (10Base-T or 100Base-TX)

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

Table 49 lists the port pin signals for the MDI-X configuration.

Table 49. MDI-X Pin Signals (10Base-T or 100Base-TX)

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

Table 50 lists the port pin signals when a 10/100/1000Base-T port is operating at 1000Mbps.

Table 50. 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-

