SwitchBlade x3112

Access Edge Chassis Switch

AT-SBx31CFC

Controller Fabric Card (R17.2.1)

AT-SBx3112 Chassis

AT-SBx31GT24 Line Card

AT-SBx31GT40 Line Card

AT-SBx31GP24 PoE Line Card

AT-SBx31GS24 SFP Line Card

AT-SBx31GC40 SFP CSFP BiDi Line Card

AT-SBx31XZ4 XFP Line Card

AT-SBx31XS6 SFP+ Line Card

AT-SBxPWRSYS1 and AT-SBxPWRSYS2 System Power Supplies

AT-SBxPWRPOE1 PoE Power Supply

Installation Guide

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

613-002222 Rev. A

Electrical Safety and Emissions Standards

This product meets the following standards.

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

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

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

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

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

Immunity: EN55024

Electrical Safety: EN60950-1 (TUV), UL 60950-1 ($_{C}UL_{US}$), EN60825

Safety Agency Approvals: $_{C}UL_{US}$, TUV, C-TICK, CE

 Laser Safety EN60825

Translated Safety Statements

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

Contents

Figures

Tables

Preface

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

Note

This version of the installation guide applies to release 17.2.1 or later of the management software for the AT-SBx31CFC Controller Fabric Card. 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**.

Safety Symbols Used in this Document

This document uses the following conventions.

Note
Notes provide additional information.

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

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

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

Warning
Fan warnings inform you of danger from hazardous moving fan blades.

Contacting Allied Telesis

If you need assistance with this product, you may contact Allied Telesis technical support by going to the Support & Services section of the Allied Telesis web site at **www.alliedtelesis.com/support**. 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.
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- Hardware warranty information — Learn about Allied Telesis warranties and register your product online.
- Replacement Services — Submit a Return Merchandise Authorization (RMA) request via our interactive support center.
- Documentation — View the most recent installation and user guides, software release notes, white papers, and data sheets for your products.
- Software Downloads — Download the latest software releases for your managed products.

For sales or corporate information, go to **www.alliedtelesis.com/purchase**.

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:

Note
This version of the installation guide applies to release 17.2.1 or later of the management software for the AT-SBx31CFC Controller Fabric Card. 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**.

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.

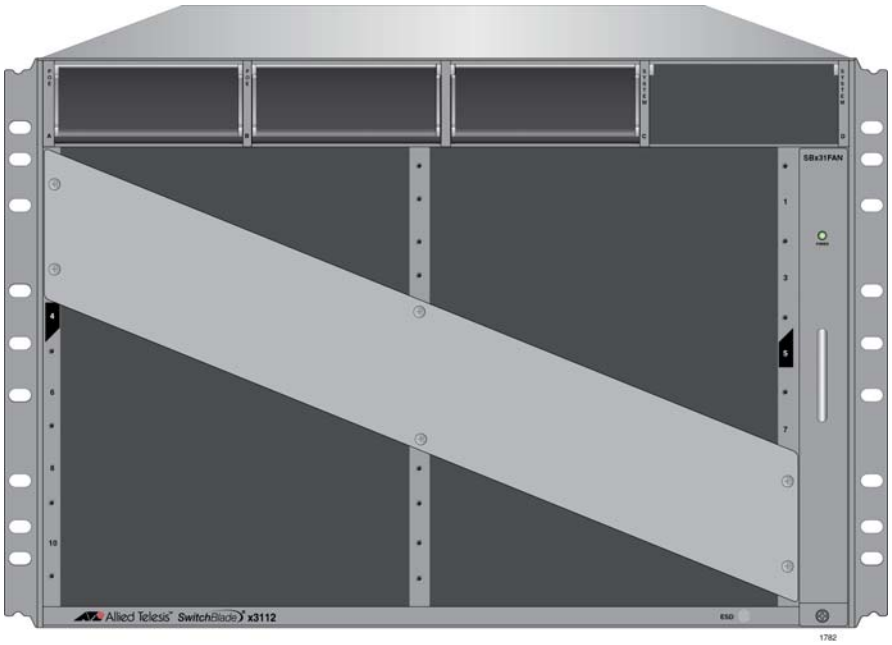


Figure 1. AT-SBx3112 Chassis

The chassis has slots for the following components:

- Ten Ethernet line cards
- Two AT-SBx31CFC 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.

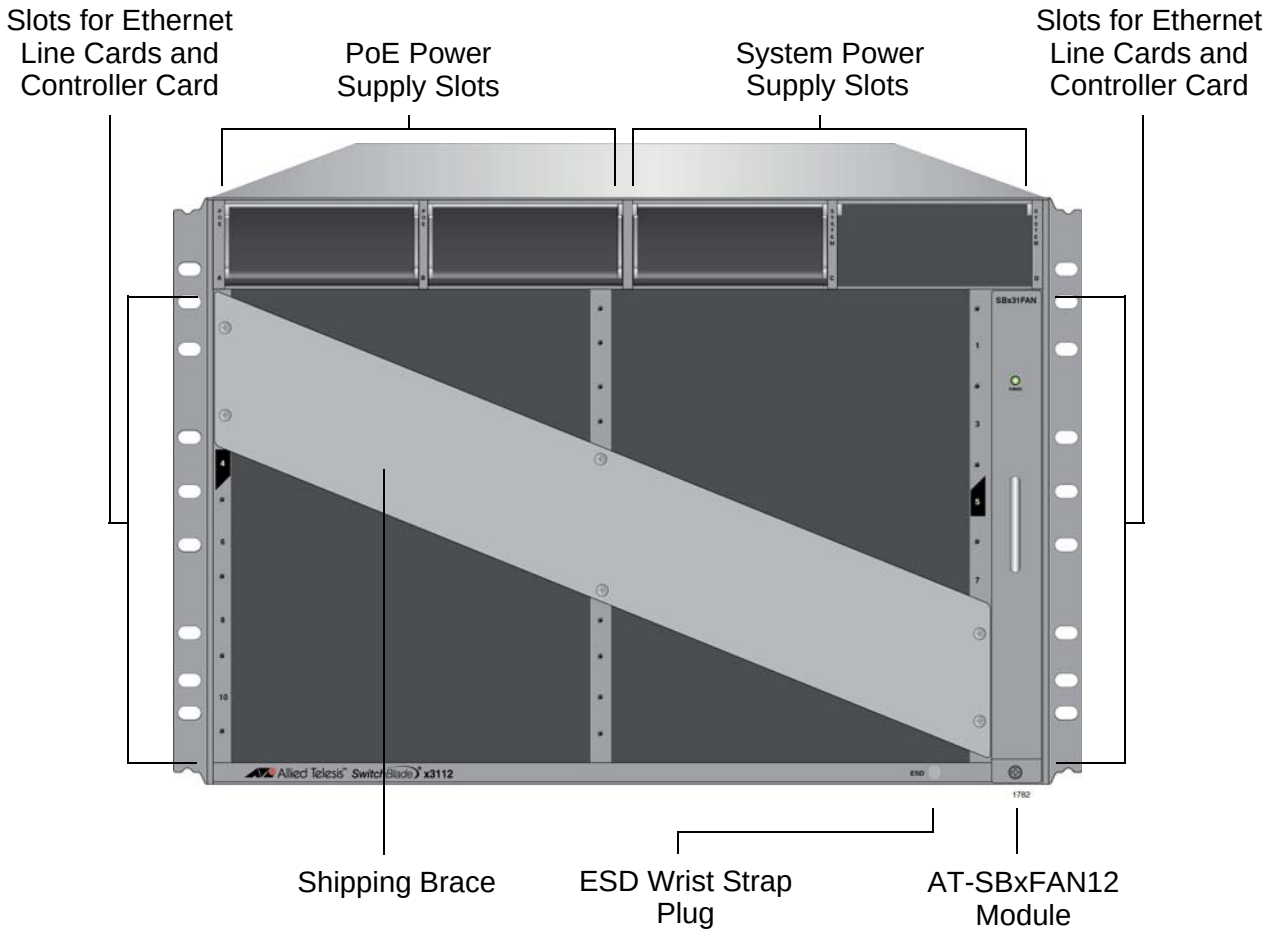


Figure 2. Front View of the AT-SBx3112 Chassis

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.

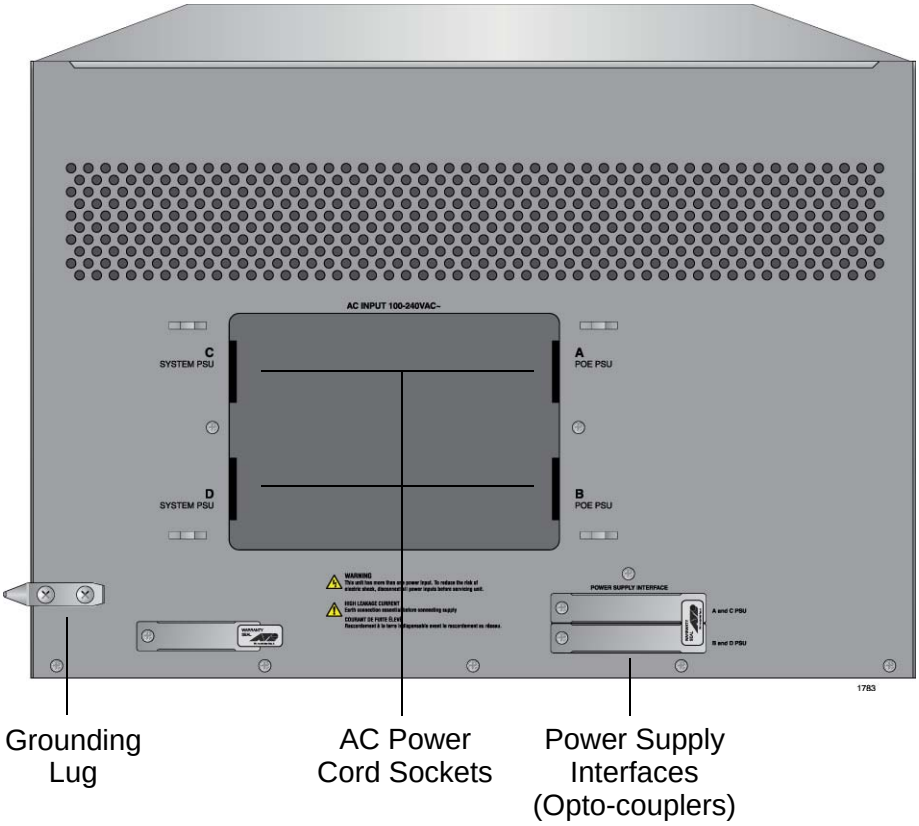


Figure 3. Rear View of the AT-SBx3112 Chassis

Figure 4 is an example of a fully populated chassis.

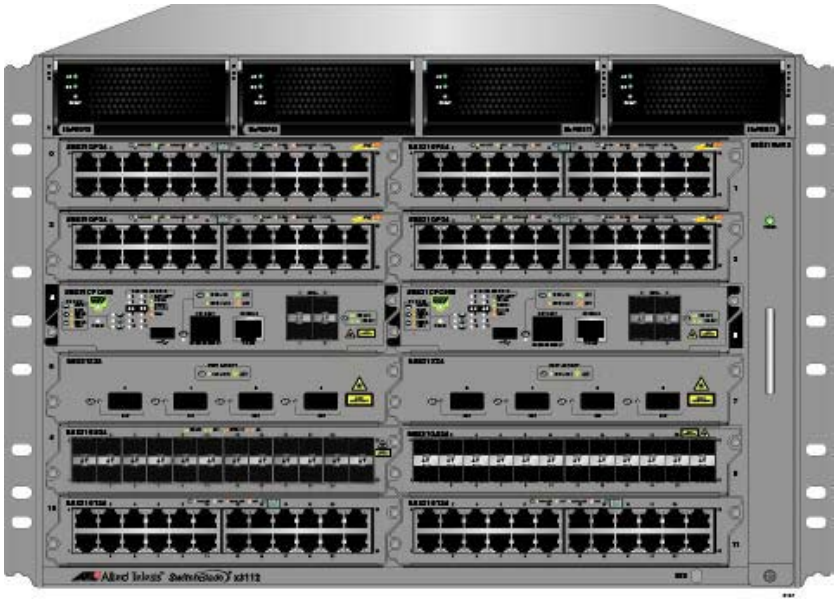


Figure 4. AT-SBx3112 Chassis with Line Cards, Controller Cards, and Power Supplies

Slots for the Ethernet Line and Controller Cards

The chassis has slots for ten Ethernet line cards and two AT-SBx31CFC 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.

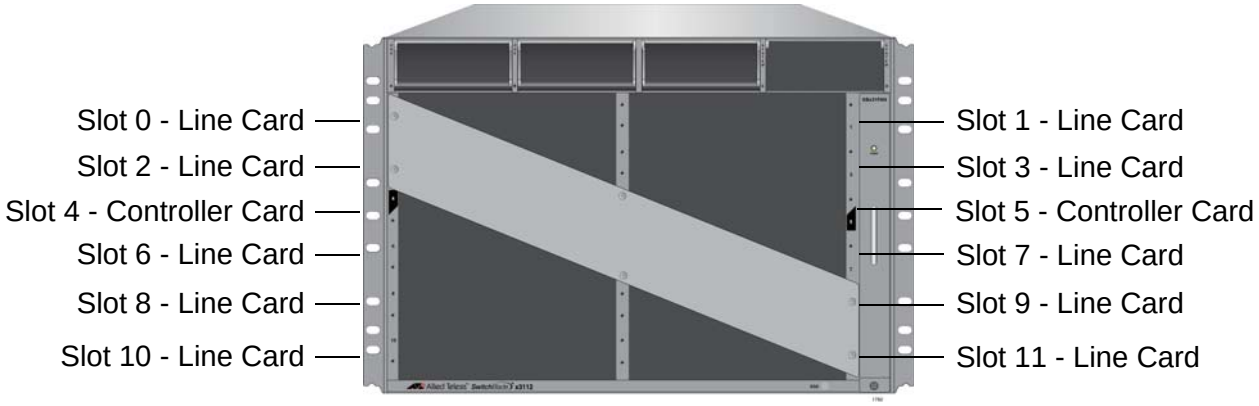


Figure 5. Slots for the Ethernet Line and Controller Cards

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-SBx31CFC 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:

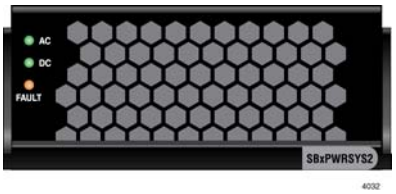
- Management redundancy.
- Higher backplane bandwidth for the Ethernet line cards.

For more information on the controller card, refer to Chapter 3, “Overview of the AT-SBx31CFC Controller Fabric Card” on page 61.

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.

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.

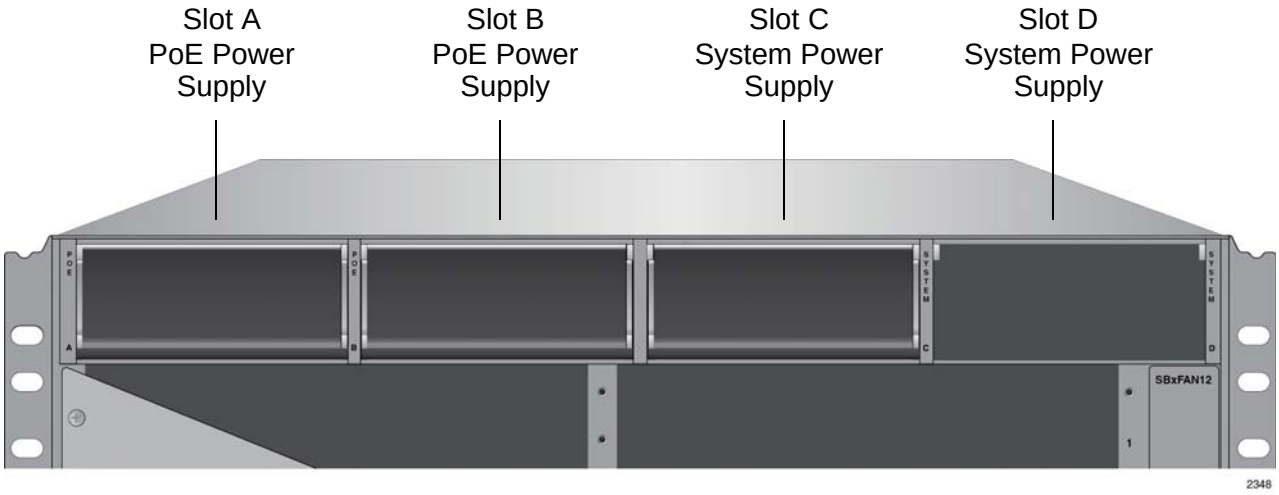


Figure 7. Power Supply Slots

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.
- The AT-SBxPWRSYS2 AC System Power Supply was added to the management software in R17.2.1. It will work with earlier releases, but Allied Telesis recommends updating the software on controller cards that have 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 and 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 58.

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-SBx31CFC 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.

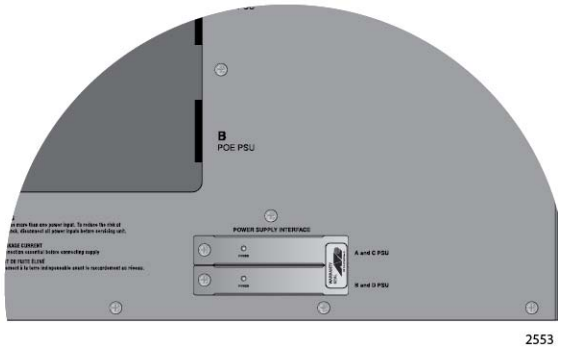


Figure 9. Power Supply Interfaces (Opto-couplers)

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	The possible states of the LED are listed here: - The corresponding power supply slots of the interface are empty. - The power supplies in the power supply slots are powered off or have failed. - The power supplies in the power supply slots are powered on and functioning normally, but the power supply interface has failed.

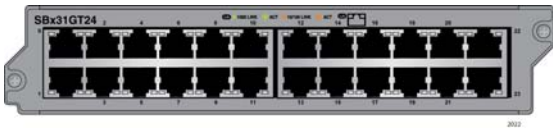
Chapter 2

Overview of the Ethernet Line Cards

The sections in this chapter describe the Ethernet line cards for the AT-SBx3112 Chassis:

Ethernet Line Cards

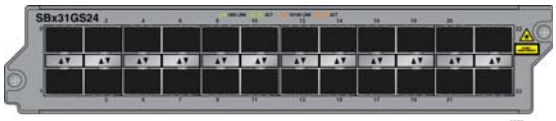
The Ethernet line cards are shown in Figure 10.



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 slots for 100 or 1000Mbps, fiber optic or twisted pair SFP transceivers.

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

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

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

Figure 10. Ethernet Line Cards

AT-SBx31GT24 Line Card

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

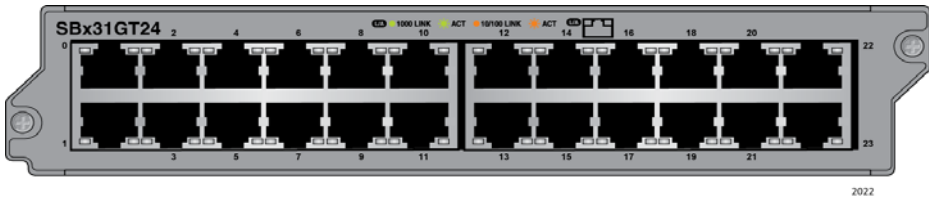


Figure 11. AT-SBx31GT24 Line Card

Here are the main features of the line card:

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

The cable requirements for the ports on the AT-SBx31GT24 Line Card are listed in Table 13 on page 54.

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 12 on page 34 and described in Table 6 on page 34.

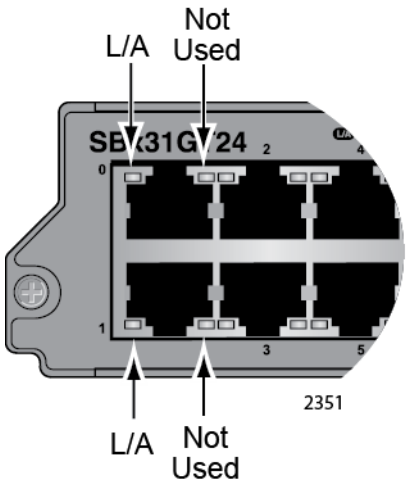


Figure 12. Port LEDs on the AT-SBx31GT24 Line Card

Table 6. 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 controller card.
Right LED	-	This LED is not used.

AT-SBx31GT40 Line Card

The AT-SBx31GT40 Line Card, shown in Figure 13, is a Gigabit Ethernet switch.

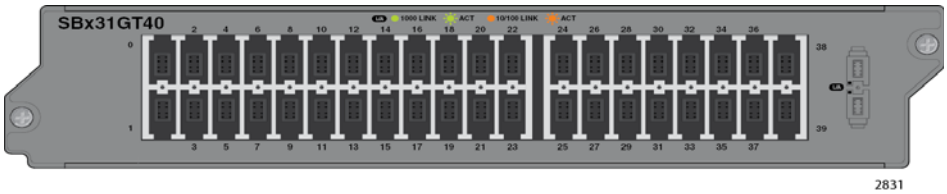


Figure 13. AT-SBx31GT40 Line Card

Here are the main features of the line card:

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

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

The cable requirements for the ports on the AT-SBx31GT40 Line Card are listed in Table 13 on page 54.

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 14.

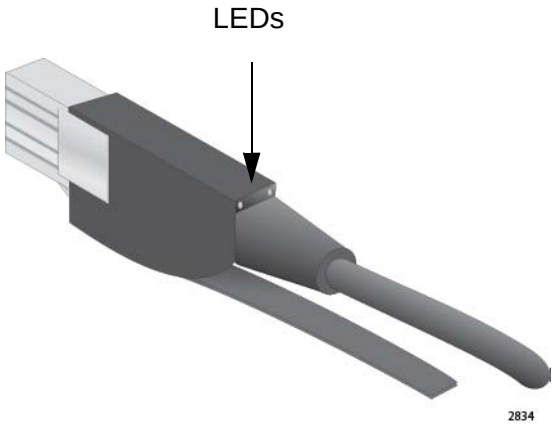


Figure 14. Port LEDs on an RJ Point 5 Cable Connector for the AT-SBx31GT40 Line Card

Only the left LED on a connector is active. Refer to Figure 15. It displays link and activity status information about a port, as described in Table 7 on page 37. The right LED is not used.

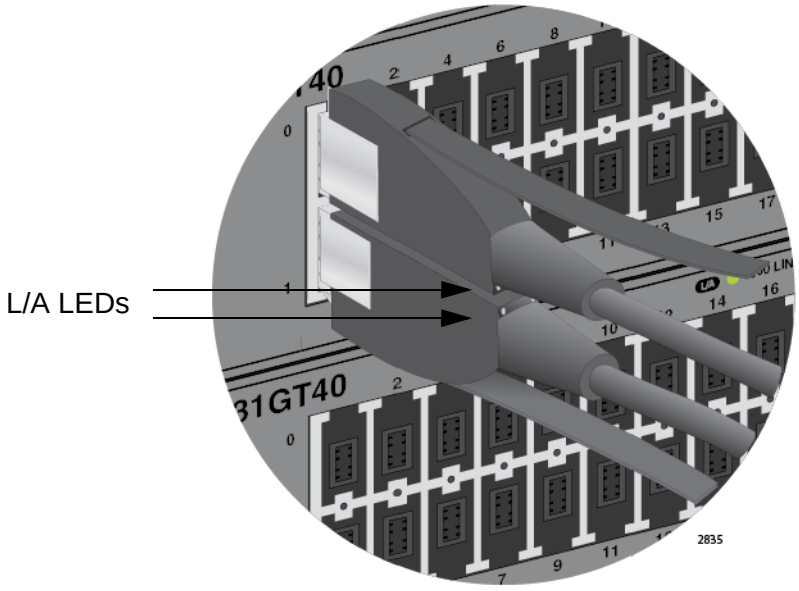


Figure 15. Link/Activity LED on an RJ Point 5 Cable Connector for the AT-SBx31GT40 Line Card

Table 7. 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 controller card.
Right LED	-	This LED is not used.

AT-SBx31GP24 PoE Line Card

The AT-SBx31GP24 PoE Line Card, shown in Figure 16, is a Gigabit Ethernet switch with Power over Ethernet Plus (PoE+) on all the ports.

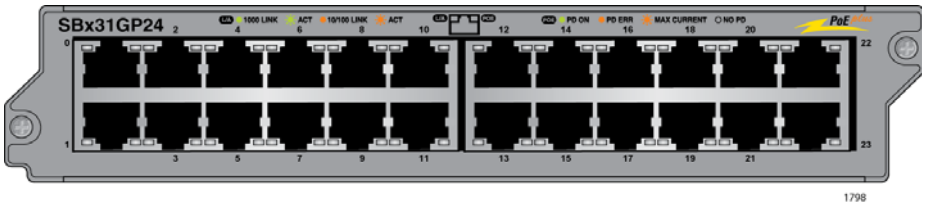


Figure 16. AT-SBx31GP24 PoE Line Card

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-SBx31CFC Controller Fabric Cards
- Hot swappable

The cable requirements of the PoE ports on the AT-SBx31GP24 Ethernet Line Card are given in Table 14 on page 55.

LEDs

Each port on the AT-SBx31GP24 PoE Line Card has two LEDs. The LEDs are shown in Figure 17 and described in Table 8.

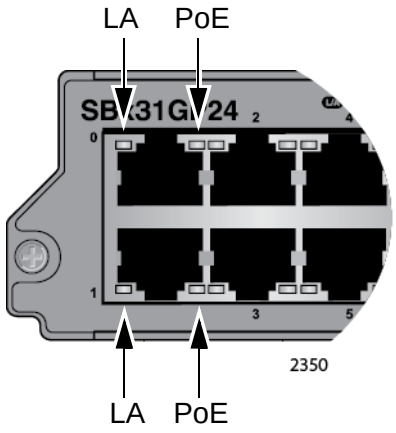


Figure 17. Port LEDs on the AT-SBx31GP24 PoE Line Card

Table 8. 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 controller 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 8. Port LEDs on the AT-SBx31GP24 PoE Line Card (Continued)

LED	State	Description
PoE	Off	This LED state can result from the following conditions: ❒ The port is not connected to a PD. ❒ The PD is powered off. ❒ The port is disabled in the management software. ❒ PoE is disabled on the port. ❒ The LEDs on the Ethernet line cards are turned off. To turn on the LEDs, use the eco-friendly button.

AT-SBx31GS24 SFP Line Card

The AT-SBx31GS24 SFP Line Card, shown in Figure 18, is a Gigabit Ethernet switch.

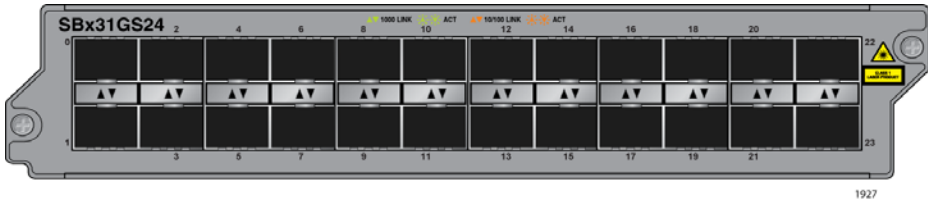


Figure 18. AT-SBx31GS24 SFP Line Card

Here are the main features of the line card:

- 24 slots for small form-factor pluggable (SFP) transceivers
- Supports 100Base-FX or 1000Base-SX/LX fiber optic transceivers
- Supports 100Base-BX or 1000Base-LX bidirectional (BiDi) fiber optic transceivers
- Supports 10/100/1000Base-T or 1000Base-T twisted pair transceivers
- Port Link/Activity (L/A) LEDs
- 32K entry MAC address table
- 16 Mb buffer memory
- Jumbo frame support:
  - 10240 octets for tagged and untagged traffic between ports on the same line card
  - 10232 octets for untagged traffic between ports on different line cards
  - 10236 octets for tagged traffic between ports on different line cards
- Non-blocking full-wire speed switching on all packet sizes, with two AT-SBx31CFC 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 19 on page 42 and described in Table 9 on page 42.

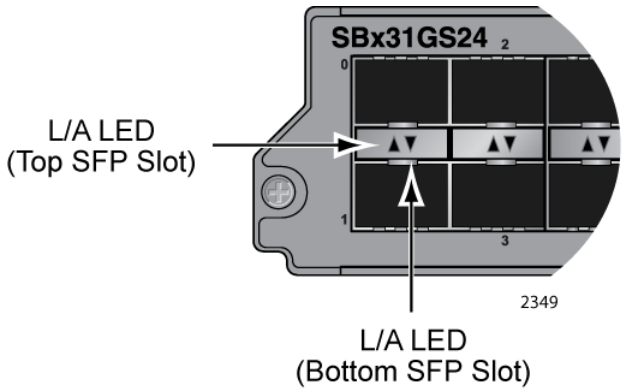


Figure 19. Port LEDs on the AT-SBx31GS24 SFP Line Card

Table 9. 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: ❒ The transceiver slot is empty. ❒ The SFP transceiver has not established a link to a network device. ❒ The LEDs on the Ethernet line cards are turned off. To turn on the LEDs, use the eco-friendly button.

AT-SBx31GC40 Line Card

The AT-SBx31GC40 Line Card, shown in Figure 20, is a Gigabit Ethernet switch.

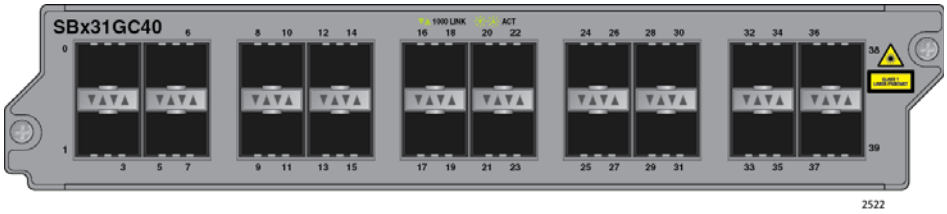


Figure 20. AT-SBx31GC40 Line Card

Here are the main features of the line card:

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

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

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

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

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

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

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

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 21 on page 45 illustrates the port numbers for the first two slots when they contain CSFP transceivers.

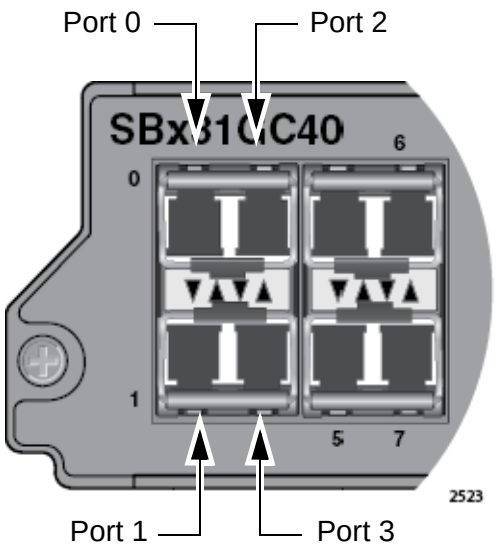


Figure 21. Port Numbers for Slots with CSFP Transceivers

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

The port number of an SFP module depends on whether the module is installed in a slot in the top or bottom row of the line card. An SFP module in a slot in the top row is assigned the lower of the two port numbers of a slot. For example, the port number of an SFP module installed in the first slot in the top row is port number 0 because it is the lower of the two port numbers of the slot. To configure the transceiver, you have to specify port 0 in the management software. The switch marks the unused port number of the slot, in this case port number 2, as masked or eclipsed to prevent you from using it to manage the transceiver.

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

Figure 22 on page 46 illustrates the port numbers for the first four slots when they contain standard SFP transceivers.

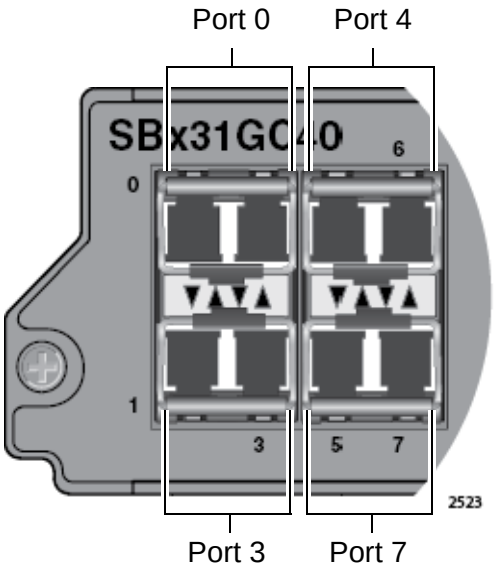


Figure 22. Port Numbers for Slots with Standard SFP Transceivers

LEDs

The AT-SBx31GC40 Line Card has two LEDs for each slot. The LEDS, which display link and activity information, are located between the slots, in sets of four. The first and third LEDs of each set are for the bottom slot and the second and fourth LEDs are for the top slot, as shown in Figure 23.

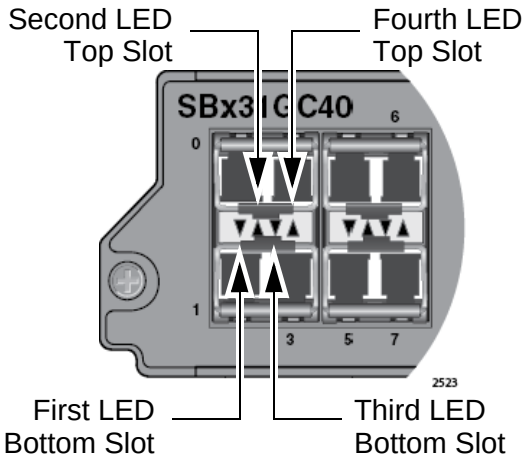


Figure 23. LEDs for the AT-SBx31GC40 Line Card

When a slot contains a CSFP transceiver, both slot LEDS are active. Each LED displays link and activity status information for its respective BiDi connector on a module. As an example, if the first top and bottom slots of the line card contain CSFP transceivers, the first LED between the slots displays link and activity status for port 1, which is the left-hand fiber connector on the bottom transceiver. The second LED displays the same information for port 0, the left-hand fiber connector on the top transceiver.

The third and fourth LEDs display the same information for ports 3 and 2, the right-hand connectors on the bottom and top transceivers, respectively. See Figure 24.

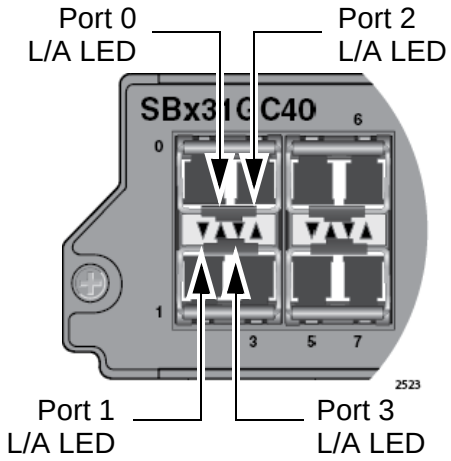


Figure 24. LEDs for the AT-SBx31GC40 Line Card, with CSFP Transceivers

When a slot has a standard SFP, only one LED of a pair is active. The other LED is not used. The active LED is different depending on whether the slot containing the transceiver is in the top or bottom row. When an SFP transceiver is installed in a slot in the top row, the first LED is active and the second inactive. When an SFP transceiver is installed in a slot in the bottom row, the first LED is inactive and the second active. See Figure 25.

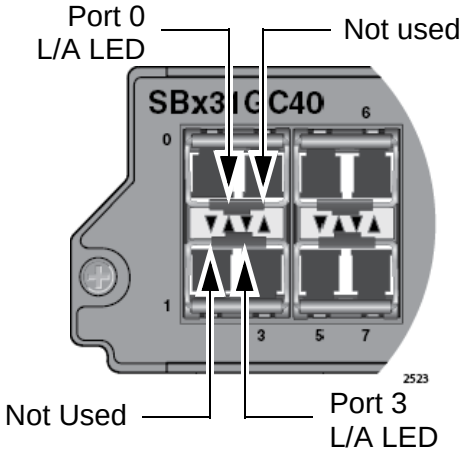


Figure 25. LEDs for the AT-SBx31GC40 Line Card, with SFP Transceivers

The LED states are described in Table 10 on page 48.

Table 10. Transceiver Slot LEDs on the AT-SBx31GC40 Line Card

LED	State	Description
L/A	Solid Green	The SFP transceiver or CSFP transceiver fiber port has established a link with a network device.
	Flashing Green	The SFP transceiver or CSFP transceiver fiber port is transmitting or receiving data.
	Off	This LED state can result from the following conditions: ❒ The transceiver slot is empty. ❒ The SFP transceiver or CSFP fiber port has not established a link to a network device. ❒ The LEDs on the Ethernet line cards are turned off. To turn on the LEDs, use the eco-friendly button.

AT-SBx31XZ4 XFP Line Card

The AT-SBx31XZ4 XFP Line Card, shown in Figure 26, is a 10 Gigabit Ethernet switch.

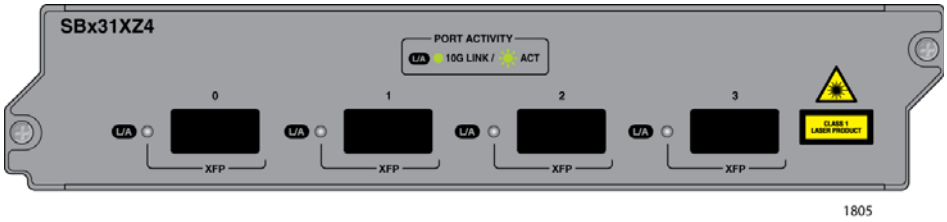


Figure 26. AT-SBx31XZ4 XFP Line Card

Here are the main features of the line card:

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

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

LEDs

Each XFP slot on the AT-SBx31XZ4 XFP Line Card has one LED. The LED is shown in Figure 27 on page 50 and described in Table 11 on page 50.

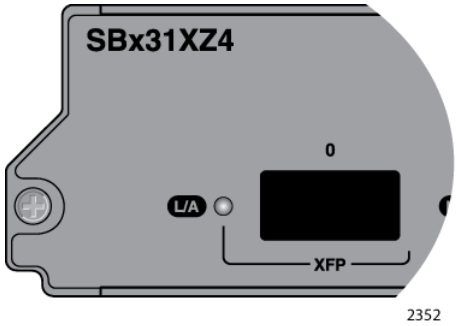


Figure 27. Transceiver Slot LEDs on the AT-SBx31XZ4 XFP Line Card

Table 11. 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 28, is a 10 Gigabit Ethernet switch.

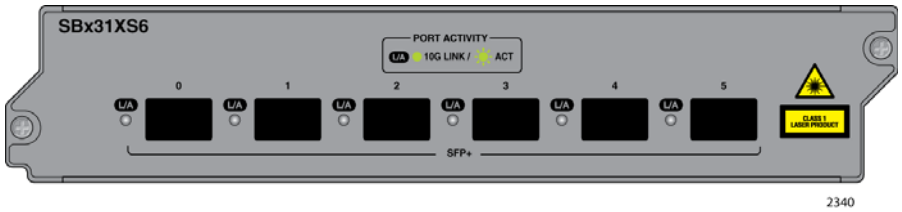


Figure 28. AT-SBx31XS6 Line Card

Here are the main features of the line card:

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

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

LEDs

The AT-SBx31XS6 Line Card has one LED for each SFP+ slot. The LED is shown in Figure 29 on page 52 and described in Table 12 on page 52.

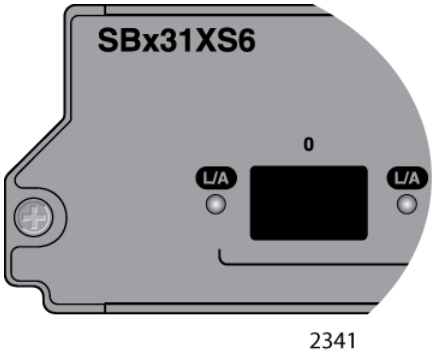


Figure 29. SFP+ Slot LEDs on the AT-SBx31XS6 Line Card

Table 12. 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.

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 270.

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.

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.

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

Maximum Distance

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

Cable Requirements

The cable requirements for the ports on the AT-SBx31GT24 and AT-SBx31GT40 Line Cards are listed in Table 13.

Table 13. 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 14 on page 55.

Table 14. Twisted Pair Cable for the AT-SBx31GP24 Line Card

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

Automatic MDIX Detection

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

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

Straight-through or Crossover Cabling

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

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

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

Port Pinouts

Refer to Table 40 on page 270 for the port pinouts of twisted-pair ports that operate at 10 or 100 Mbps in the MDI configuration and Table 41 on page 270 for the MDI-X configuration. For port pinouts when a twisted-pair port operates at 1000 Mbps, refer to Table 42 on page 271.

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 15. The AT-SBx31GP24 Line Card supports all five classes.

Table 15. 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 16 lists the maximum number of powered devices by class, for one or two power supplies. The numbers assume that the powered devices require the maximum amount of power for their classes.

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

Table 16. 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-SBx31CFC Controller Fabric Card

The sections in this chapter describe the AT-SBx31CFC Controller Fabric Card:

Note
For instructions on how to upgrade a chassis to the AT-SBx31CFC960 Controller Fabric Card from the AT-SBx31CFC Card, refer to the *SwitchBlade x3112 Chassis Switch and AT-SBx31CFC960 Controller Fabric Card Installation Guide*.

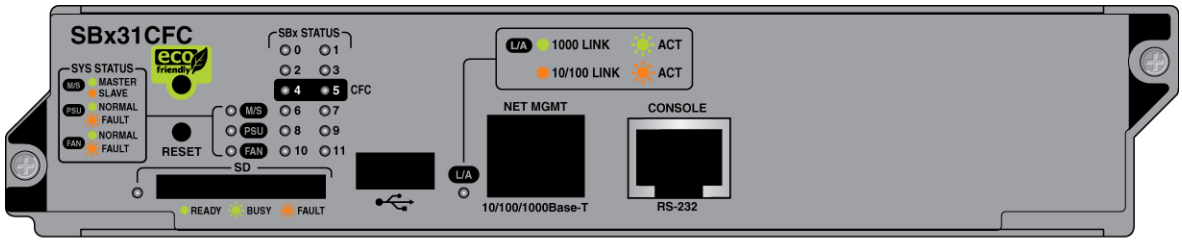
Controller Fabric Cards for the AT-SBx3112 Chassis

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 30.

AT-SBx31CFC Controller Fabric Card



AT-SBx31CFC960 Controller Fabric Card

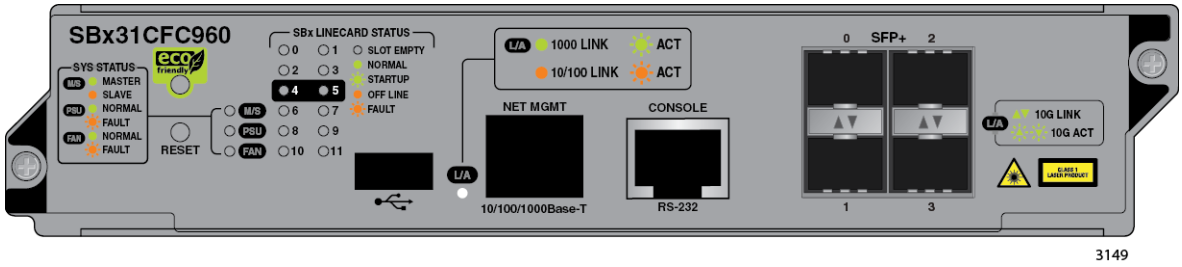


Figure 30. Controller Fabric Cards for the AT-SBx3112 Chassis

The main differences between the two cards are listed in Table 17.

Table 17. Differences Between the AT-SBx31CFC and AT-SBx31CFC960 Controller Fabric Cards

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

Table 17. 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. For information, refer to “SD Card Slot” on page 76.
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-SBx31CFC Controller Fabric Card, For information on the AT-SBx31CFC960 Card, refer to the *AT-SBx3112 Chassis Switch and AT-SBx31CFC960 Card Installation Guide*.

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.

Hardware Components on the AT-SBx31CFC Card

The hardware components on the faceplate of the AT-SBx31CFC Controller Fabric Card are identified in Figure 31 and briefly described in Table 18.

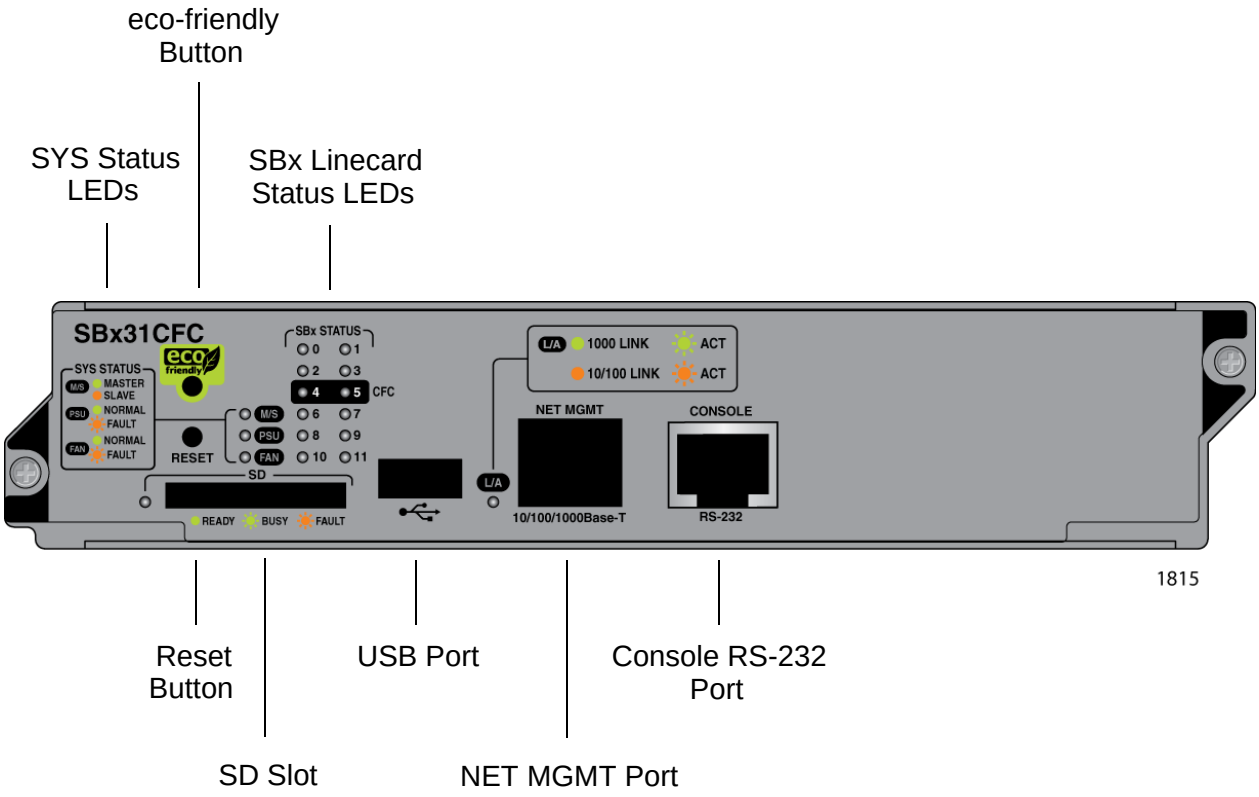


Figure 31. AT-SBx31CFC Controller Fabric Card

Table 18. Components on the AT-SBx31CFC 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 69.
eco-friendly Button	Turns the LEDs on and off. For more information, refer to “eco-friendly Button” on page 70.
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 71.

Table 18. Components on the AT-SBx31CFC Controller Fabric Card

Component	Description
Console RS-232 Port	Provides local management of the switch. The switch does not require an IP address configuration for local management. For more information, refer to “Console (RS-232) Port” on page 72.
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 73.
USB Port	Not supported at this time.
SD Card Slot	Stores backup copies of the master configuration and database files on the controller card on an SD card. For more information, refer to “SD Card Slot” on page 76.
Reset Button	Resets the controller and Ethernet line cards. For more information, refer to “Reset Button” on page 78.

Guidelines

Some of the functions of the controller card are listed here:

- 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 with Telnet, Secure Shell (SSH), and SNMP clients from workstations on your network.
- Management software — The controller card stores the operating 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.

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

Here are the guidelines for 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 backplane bandwidth from 200 to 40 0Gbps.
- The controller cards are installed in slots 4 and 5 in the chassis.

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 controller cards.
- Reset switch for resetting the chassis.
- SD card slot for data storage and retrieval.
- Console RS-232 for local management.
- NET MGMT port and inband interface for remote Telnet, SSH, or SNMP management.
- Hot swappable.

Dual Controller Cards

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 total backplane bandwidth for the Ethernet line cards from 200 to 400 Gbps.
- 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.

Here are the guidelines for 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 69.
- 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 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. After the inactive card has finished the initialization process, it joins with the active card in forwarding traffic on the backplane from the line cards. For more information, refer to “Monitoring the Initialization Process” on page 200.

SYS Status LEDs

The SYS (System) Status LEDs on the AT-SBx31CFC Controller Fabric Card display general status information about the card, power supplies, and fan module. The LEDs are defined in Table 19.

Table 19. SYS (System) Status LEDs

LED	State	Description
M/S	Solid Green	Indicates that the AT-SBx31CFC 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: ❒ The input AC voltage from a power source is not within the normal operating range of a power supply module. ❒ The output DC voltage from a power supply module to the line cards is not within the normal operating range. ❒ A power supply is experiencing high temperature. ❒ A power supply has failed. 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

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 2 watts in a system with 120 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

The SBx Linecard Status LEDs display general status information about the controller and Ethernet line cards in the slots of the chassis. There are twelve LEDs, number 0 to 11. LED 0 displays the status of the card in slot 0, LED 1 displays the status of the card in slot 1, and so on. 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 20.

Table 20. SBx Linecard Status LEDs

LEDs	State	Description
0 to 11	Off	Indicates that the slot is empty or the LEDs are turned off. To turn on the LEDs, use the eco-friendly button.
	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.

Console (RS-232) Port

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. The chassis does not need an IP address for local management.

Your initial management session with the switch must be a local management session. For instructions on how to start a local management session, refer to “Using Local Management to Verify the Chassis” on page 208 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 21. 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 21. 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 controller 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 controller card, from an NTP or SNTP server on your network or the Internet.

Table 21. Management Features Requiring Network Access (Continued)

Feature	Description
Syslog client	Used to send the event messages from the controller card to syslog servers on your network for storage.
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 controller 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 13 on page 54. For the port pinouts, refer to “Port Pinouts” on page 270.

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 port must be connected to a network device that also supports the feature. If the NET MGMT port is connected to a network device that does not support automatic MDIX detection, it defaults to MDIX. This may require the use of a crossover cable. Here are guidelines to choosing straight-through or crossover cabling for the port:

- You may use a straight-through cable to connect the port to a network device that operates at 1000 Mbps.
- You may use a straight-through or crossover cable to connect the port to a network device that supports automatic MDIX detection and that operates at 10 or 100 Mbps.

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

NET MGMT Port LED

The Network Management (NET MGMT) port on the AT-SBx31CFC Controller Fabric Card has one Status LED. The states of the LED are described in Table 22.

Table 22. 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.

SD Card Slot

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

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

An SD card is optional. The controller card can operate without a memory card.

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

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

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

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

SD Status LED

The SD Status LED on the controller card is described in Table 23 on page 77.

Table 23. SD Status LED

LEDs	State	Description
SD	Off	The SD slot is empty, the SD card is improperly installed, or the SD slot was deactivated in the management software.
	Solid Green	The SD card is properly installed in the slot and ready to transfer data.
	Flashing Green	The controller card is retrieving or storing data on the SD card.
	Flashing Amber	The controller card is detecting a problem with the SD card. The card may be installed improperly in the slot or there may be a problem with the card itself.

Caution

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

Reset Button

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-SBx31CFC 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 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.

Note
The available backplane bandwidth for each line card 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.

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

Chapter 4

Safety Precautions and Site Preparation

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

Reviewing Safety Precautions

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

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

Warning
Class 1 Laser product. ✍ L1

Warning
Do not stare into the laser beam. ✍ L2

Warning
To prevent electric shock, do not remove the cover. No user-serviceable parts inside. This unit contains hazardous voltages and should only be opened by a trained and qualified technician. To avoid the possibility of electric shock, disconnect electric power to the product before connecting or disconnecting the LAN cables. ✍ E1

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

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

Warning
Class I Equipment. This equipment must be earthed. The power plug must be connected to a properly wired earth ground socket outlet. An improperly wired socket outlet could place hazardous voltages on accessible metal parts. ✍ E4

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

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

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

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

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

Caution
Circuit Overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on over current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern. ↝ E21

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

Attention: Le remplacement de la batterie par une batterie de type incorrect peut provoquer un danger d'explosion. La remplacer uniquement par une batterie du même type ou de type équivalent recommandée par le constructeur. Les batteries doivent être éliminées conformément aux instructions du constructeur. ↝ E22

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

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

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

Warning
This unit might have more than one power cord. To reduce the risk of electric shock, disconnect all power cords before servicing the unit. E30

Note
If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra). E35

Caution
Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. E36

Warning
Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuits (e.g., use of power strips). E37

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

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

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 32 on page 87.

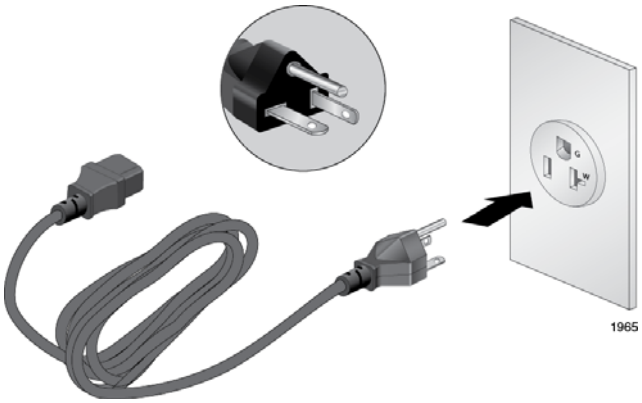


Figure 32. 100 - 125 VAC 125 V NEMA 5-20 Plug and Receptacle

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-SBx31CFC 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

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. 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 33 on page 92.

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 39 on page 99. You may use this additional space for other network equipment after the chassis is installed.

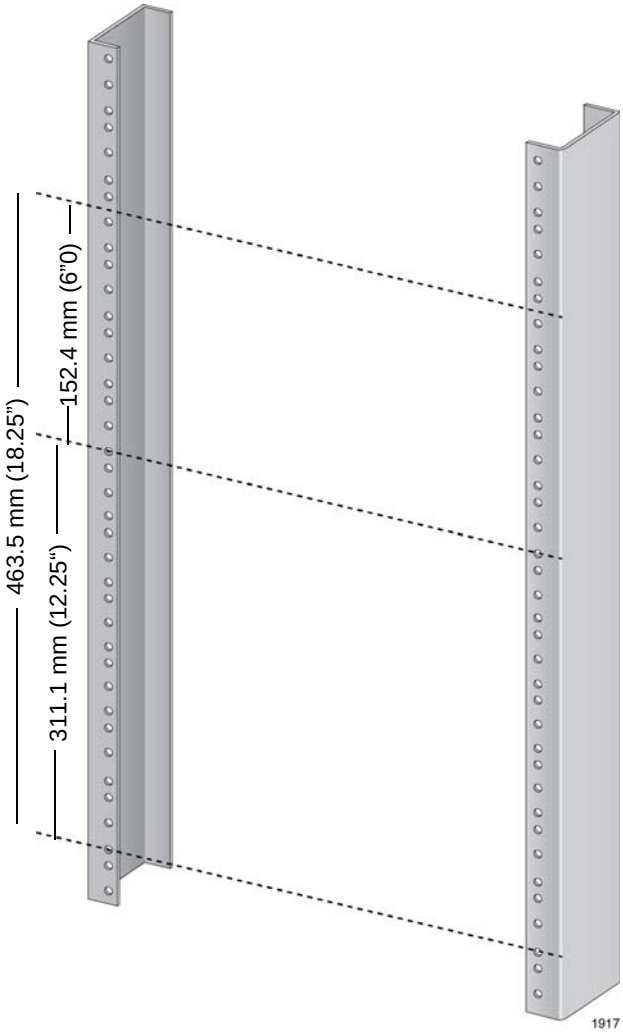


Figure 33. Reserving Vertical Rack Space

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 34 on page 93. 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).

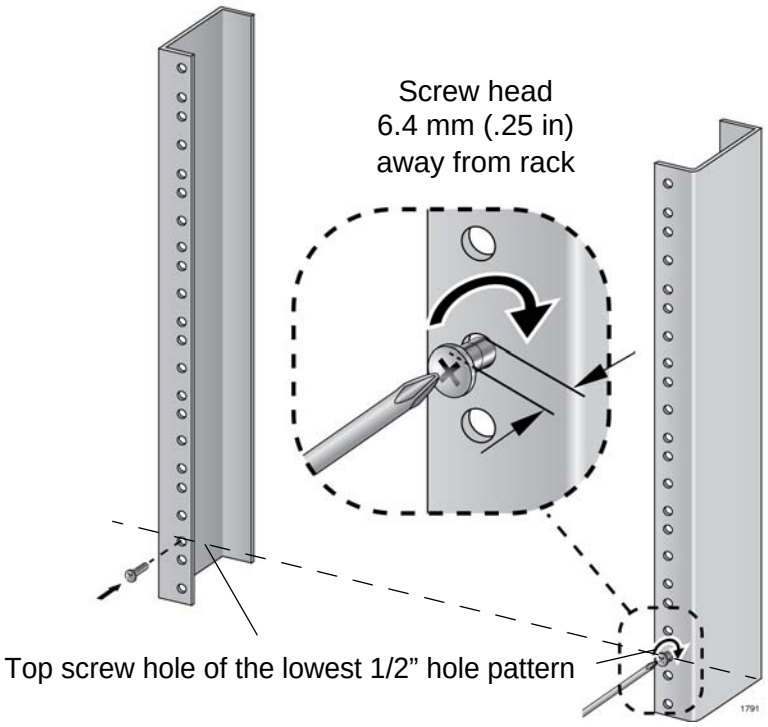


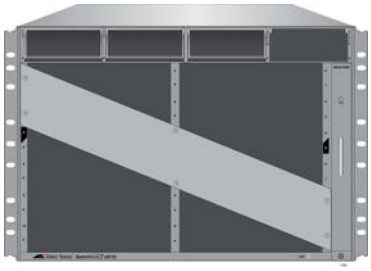
Figure 34. Rack Mounting Hole Locations

5. After installing the two screws in the equipment rack, go to “Unpacking the AT-SBx3112 Chassis” on page 94.

Unpacking the AT-SBx3112 Chassis

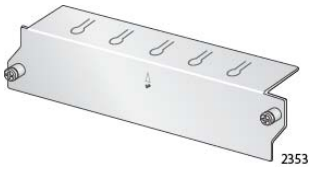
To unpack the AT-SBx3112 Chassis, perform the following procedure:

1. Remove all components from the shipping package.
2. Verify the contents of the shipping container by referring to Figure 35 here and Figure 36 on page 95. 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



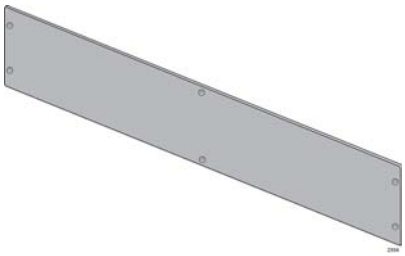
Ten blank line card slot covers

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 35. 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 36. AT-SBx3112 Chassis Items (Continued)

Adjusting the Equipment Rack Brackets

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

The different bracket positions are listed in Table 24 and illustrated in Figure 37 on page 97 and Figure 38 on page 97. 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 37 on page 97.
- The dimension (X) between the front panel and the rack rails is given for each rack mounting bracket position in Table 24.

Table 24. Front Panel to Rack Rail Dimensions

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

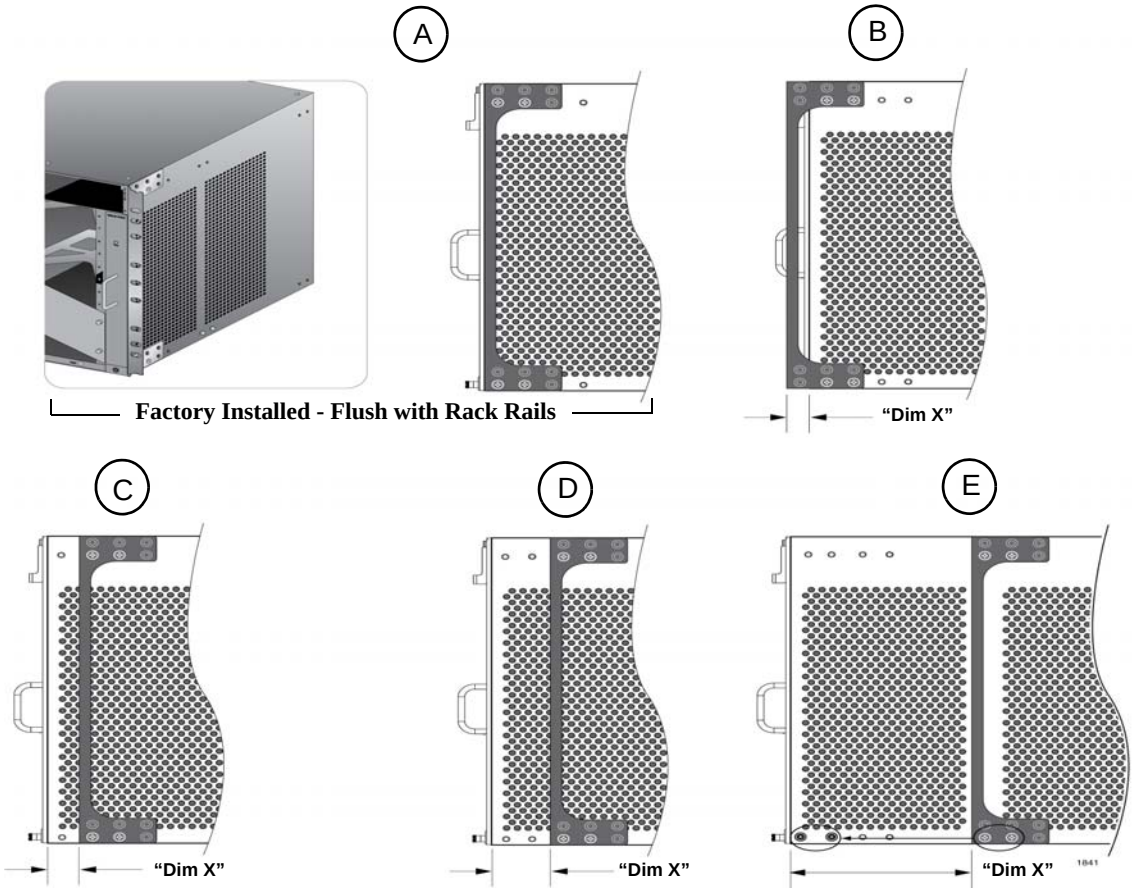


Figure 37. Rack Mounting Bracket Locations

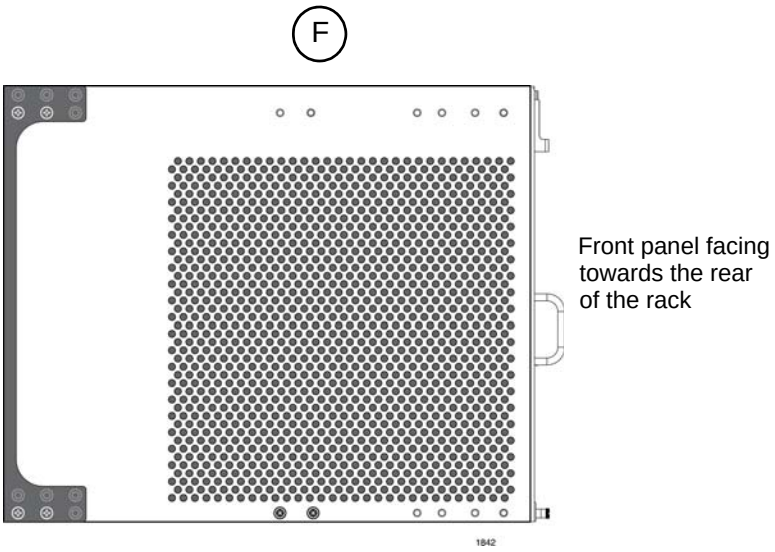


Figure 38. Rack Bracket Locations for Reverse Position of Chassis

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. 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 91.
- 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 96.

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 91. Refer to Figure 39.

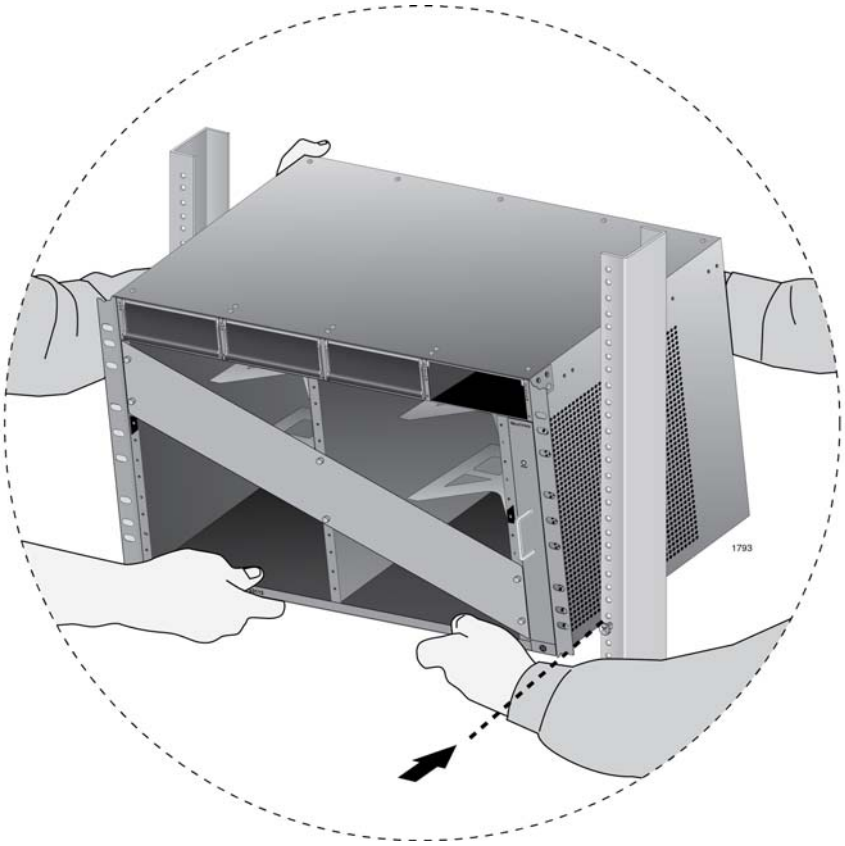


Figure 39. Lifting the AT-SBx3112 Chassis into the Equipment Rack

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 40 on page 100.

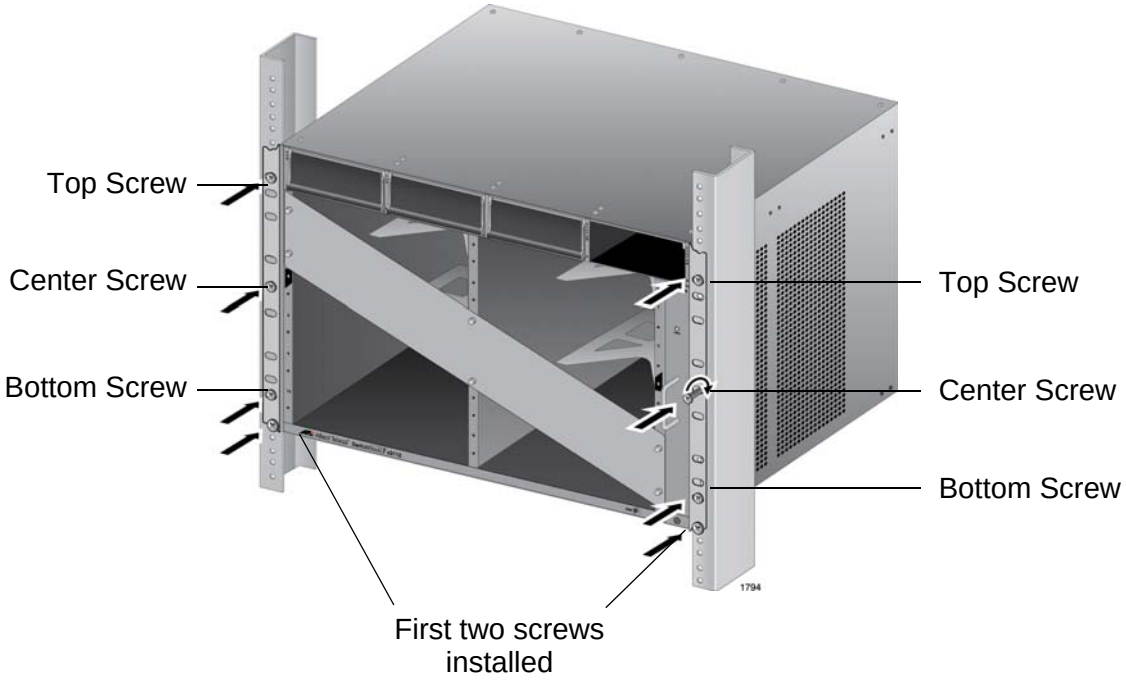


Figure 40. Installing the Rack Mount Screws

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 101.

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 41.

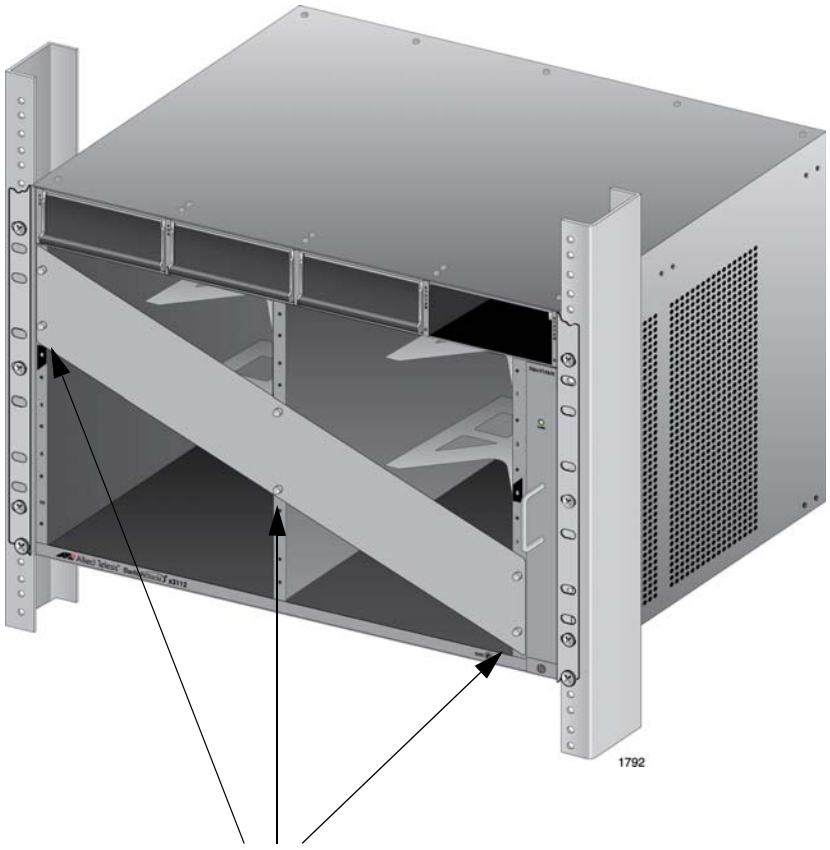


Figure 41. Removing the Shipping Brace

After removing the shipping plate, go to “Installing the Chassis Grounding Lug” on page 102.

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 42.

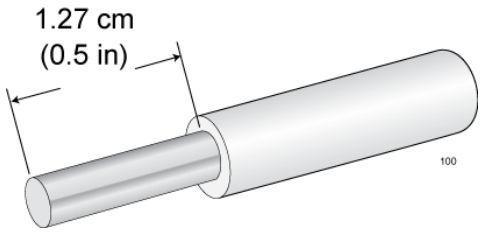


Figure 42. Stripping the Grounding Wire

2. Remove the two screws that secure the grounding lug to the rear panel of the chassis, as shown in Figure 43.

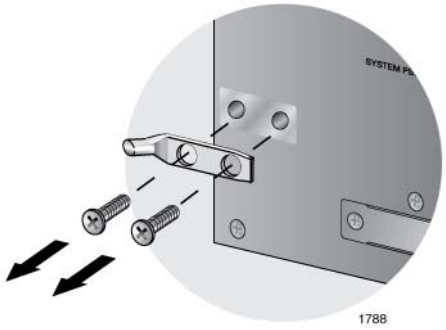


Figure 43. Removing the Grounding Lug

3. Insert one end of the grounding wire into the grounding lug, as shown in Figure 44, and use a crimping tool to secure the wire to the grounding lug.

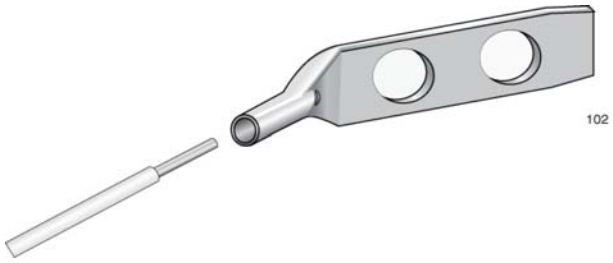


Figure 44. Attaching the Grounding Wire to the Grounding Lug

4. Install the grounding lug on the chassis, as shown in Figure 45. Allied Telesis recommends tightening the screws to 20 inch-lbs.

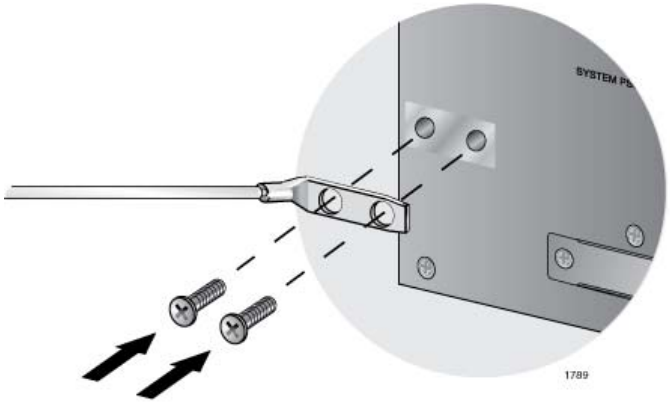


Figure 45. Installing the Grounding Lug and Wire

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 105.

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)

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 46. This ensures that ESD voltages safely flow to ground.

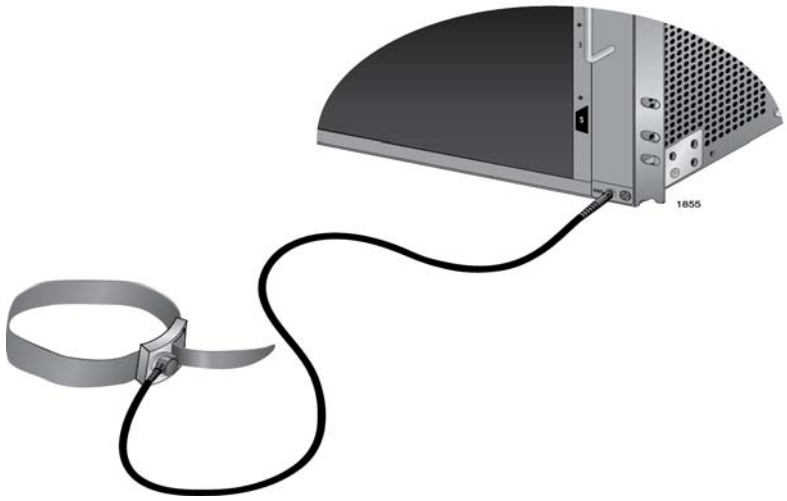


Figure 46. ESD Socket and Wrist Strap

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 106 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 47. The first system power supply should be installed in slot D, because the slot does not have a blank power supply panel.

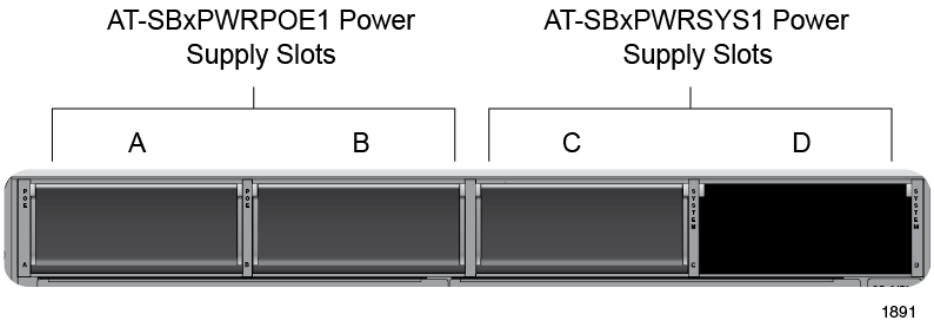


Figure 47. Power Supply Slots

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 48 on page 108.

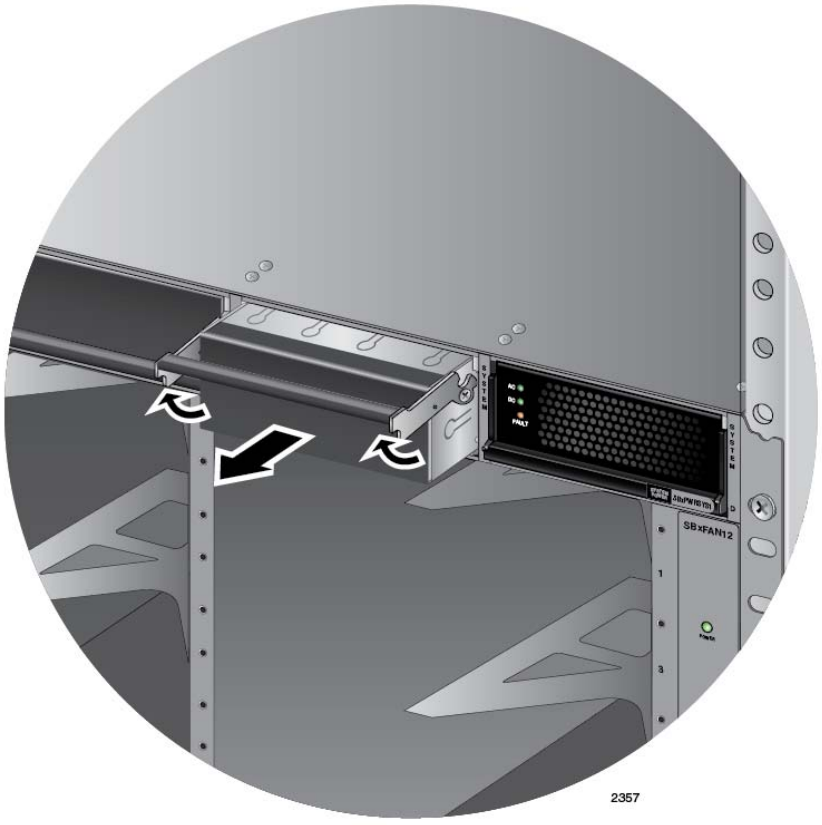


Figure 48. Removing the Blank Slot Cover from Power Supply Slot C

3. Remove the new power supply from the shipping package and verify the package contents, listed in Figure 49 on page 109.

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

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 169.

4. Move the locking handle on the power supply to the unlocked or up position. See Figure 50 on page 110.

Figure 50. Raising the Handle on the Power Supply

5. Align and insert the power supply into the power supply slot. Figure 51 shows the power supply being installed in slot D.

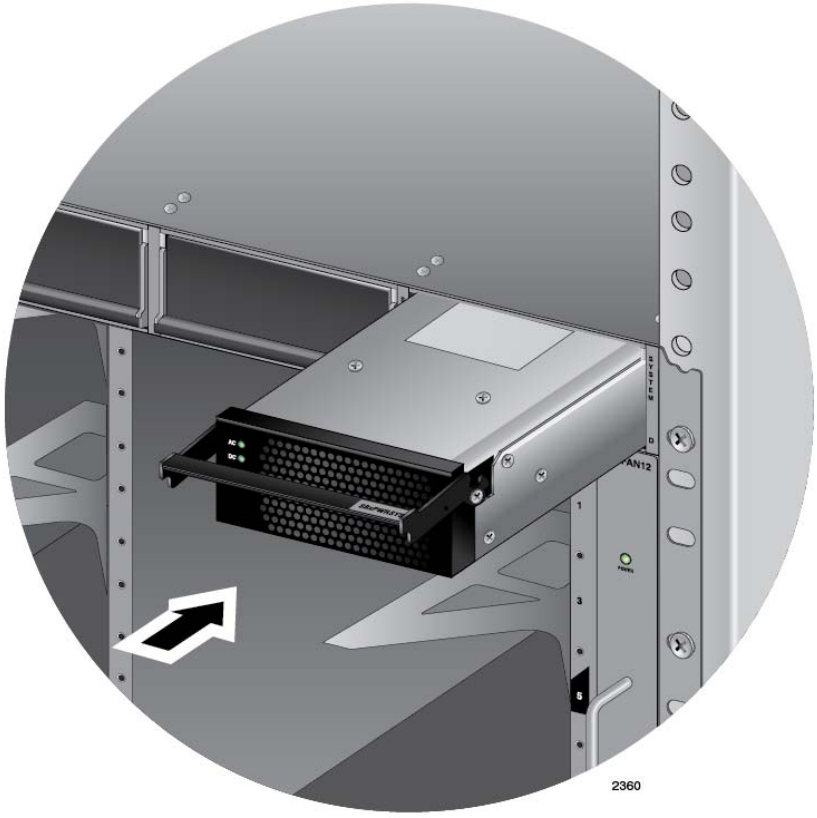


Figure 51. Inserting the AT-SBxPWRSYS1 or AT-SBxPWRSYS2 AC Power Supply

6. Lower the power supply locking handle to secure the power supply to the chassis, as shown in Figure 52 on page 111.

Figure 52. 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 113.
   - ❒ Otherwise, go to Chapter 7, “Installing the AT-SBx31CFC Card and Ethernet Line Cards” on page 127.

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 169.

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 106 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 47 on page 107.

2. Raise the handle on the blank panel covering the selected slot and slide the panel from the chassis, as shown in Figure 53 on page 114.

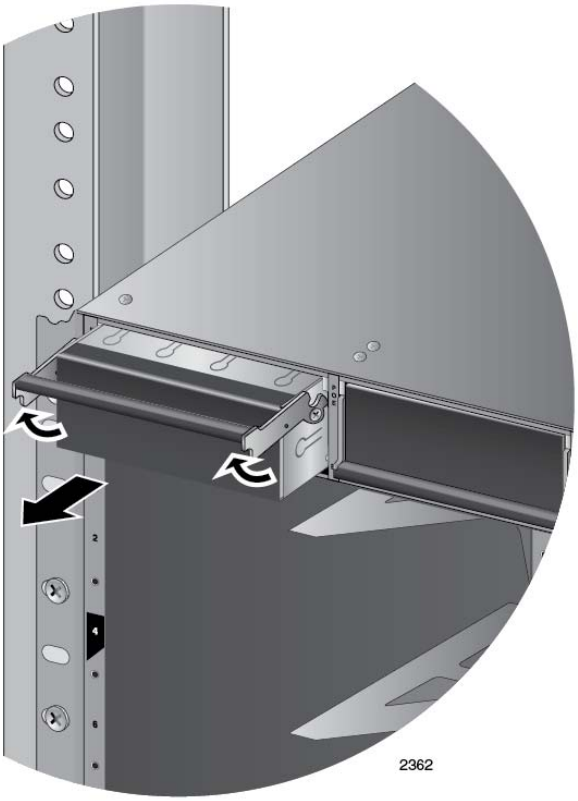


Figure 53. Removing the Blank Slot Cover from Power Supply Slot A

3. Remove the power supply from the shipping package and verify that the shipping package contains the items listed in Figure 54 on page 115.

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

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

Note
The tie wrap is used to secure the power cord to the chassis, as explained in “Powering on the AT-SBxPWRPOE1 AC PoE Power Supply” on page 172.

4. Raise the locking handle on the AT-SBxPWRPOE1 AC Power Supply, as shown Figure 55 on page 116.

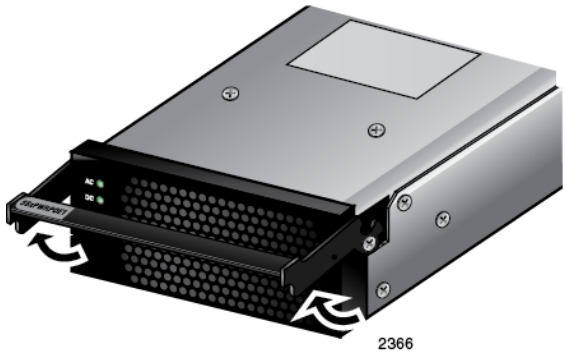


Figure 55. Raising the Handle on the AT-SBxPWRPOE1 AC Power Supply

5. Align and insert the AT-SBxPWRPOE1 Module into slot A or B. Figure 56 shows the power supply being installed in slot A.

Caution

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

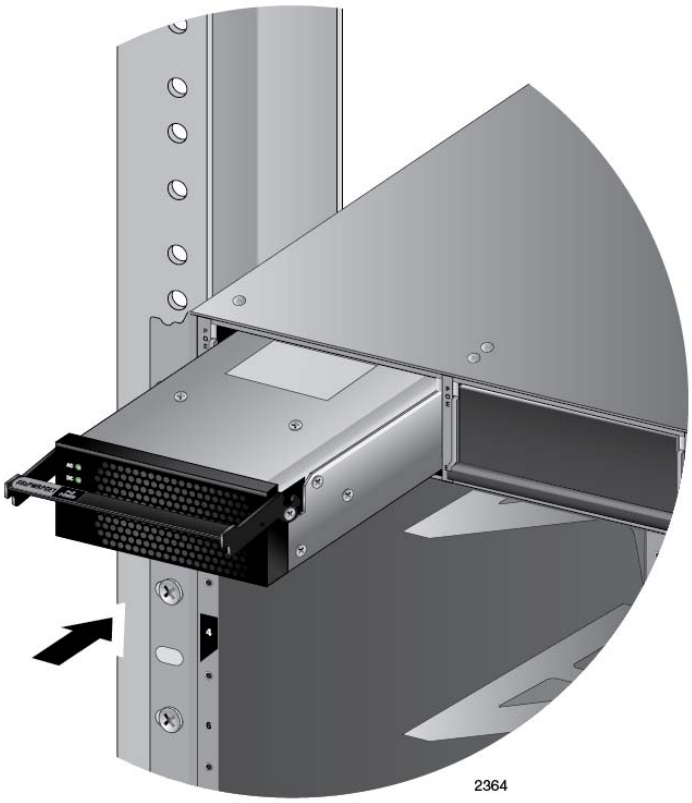


Figure 56. Inserting the AT-SBxPWRPOE1 AC Power Supply

6. Lower the locking handle of the power supply module to secure the module in the slot, as shown in Figure 57.

Figure 57. Locking the Handle on the AT-SBxPWRPOE1 AC 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 AT-SBxPWRPOE1 Power Supplies, go to Chapter 7, “Installing the AT-SBx31CFC Card and Ethernet Line Cards” on page 127.

Note

Retain the tie wrap that comes with the power supply. You will use it to secure the power cord to the chassis when you power on the unit in “Powering on the AT-SBxPWRPOE1 AC PoE Power Supply” on page 172.

Installing the AT-SBxPWRSYS1 DC System Power Supply

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 106 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 47 on page 107. 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 58 on page 120.

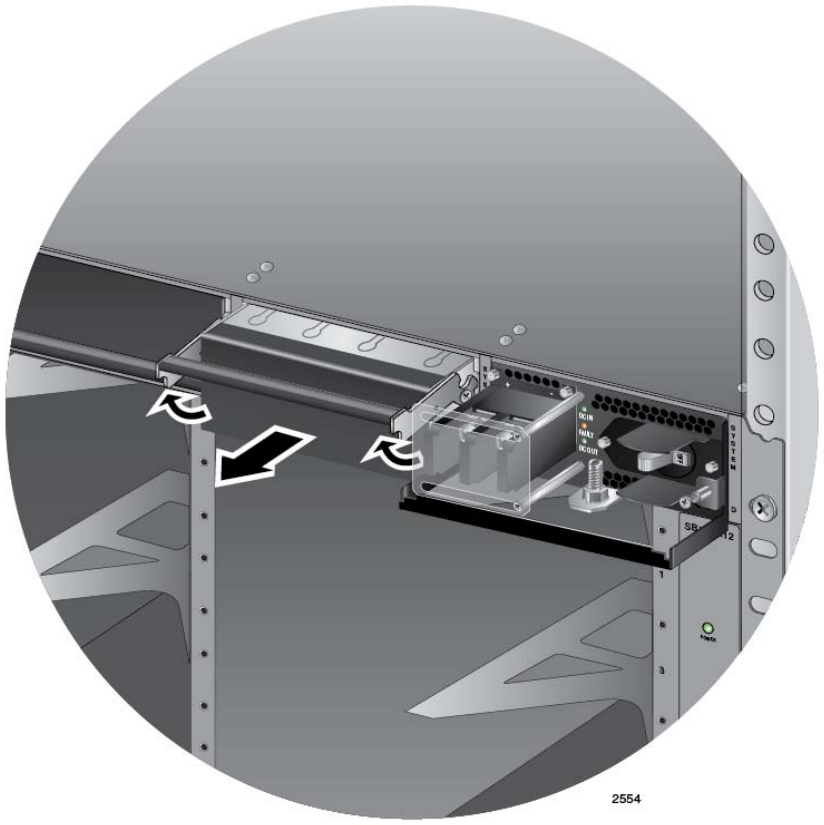
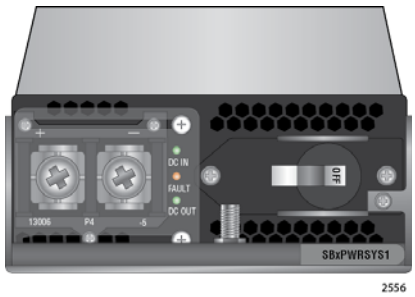


Figure 58. Removing the Blank Slot Cover from Power Supply Slot C

3. Remove the power supply from the shipping package and verify that the shipping package contains the items listed in Figure 59 on page 121.

   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 59. Items Included with the AT-SBxPWRSYS1 DC System Power Supply Module

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

4. With a #2 Phillips-head screwdriver, loosen the handle locking screw on the power supply, as shown in Figure 60 on page 122.

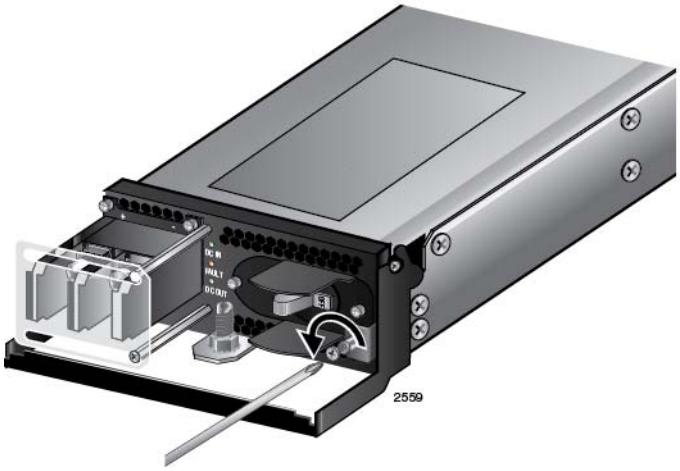


Figure 60. Loosening the Handle locking Screw on the AT-SBxPWRPOE1 DC System Power Supply

5. Raise the locking handle on the AT-SBxPWRPOE1 DC System Power Supply, as shown Figure 61.

Figure 61. 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 62 on page 123 shows the power supply installed in slot D.

Caution

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

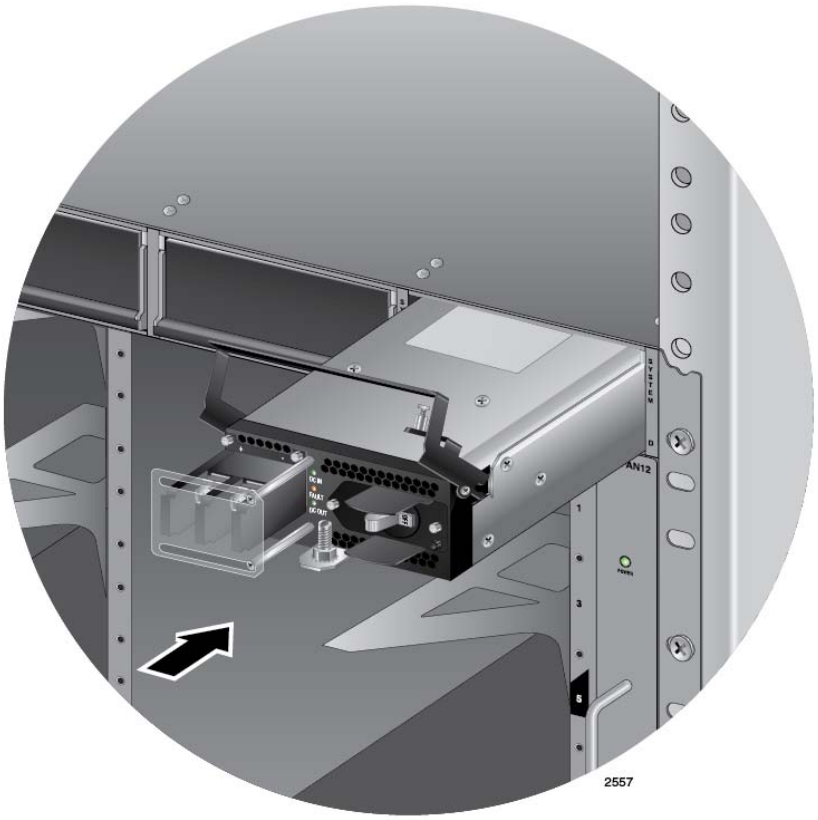


Figure 62. Inserting the AT-SBxPWRSYS1 DC System Power Supply

7. Lower the locking handle of the power supply module to secure the module in the slot, as shown in Figure 63.

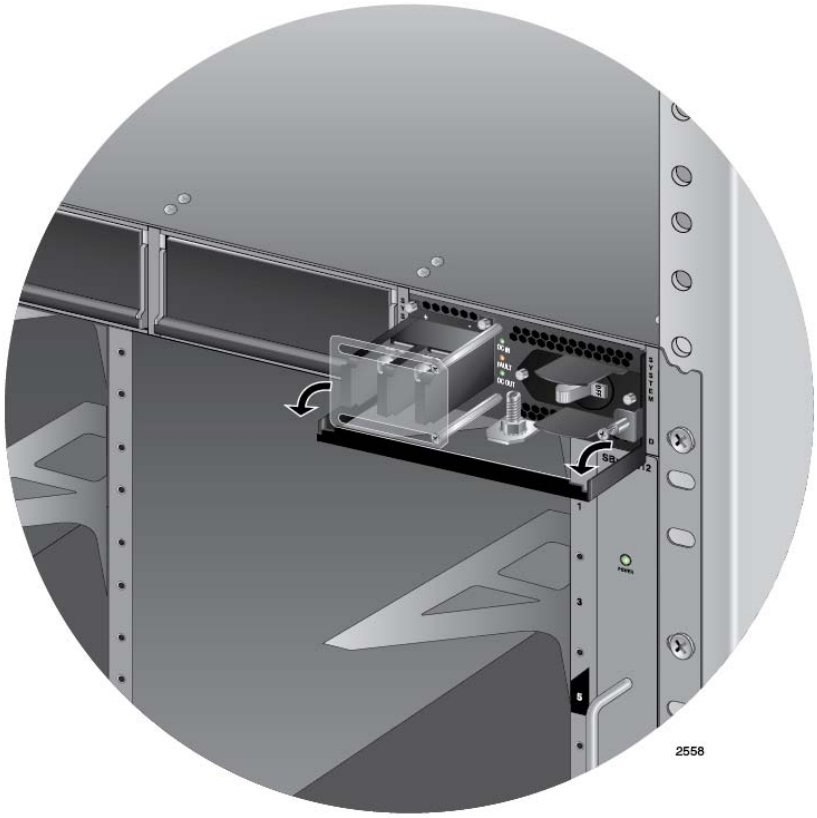


Figure 63. Locking the Handle on the AT-SBxPWRSYS1 DC System Power Supply

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 175.

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-SBx31CFC Card and Ethernet Line Cards” on page 127.

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 175.

Chapter 7

Installing the AT-SBx31CFC 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

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 106 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 64 on page 129.

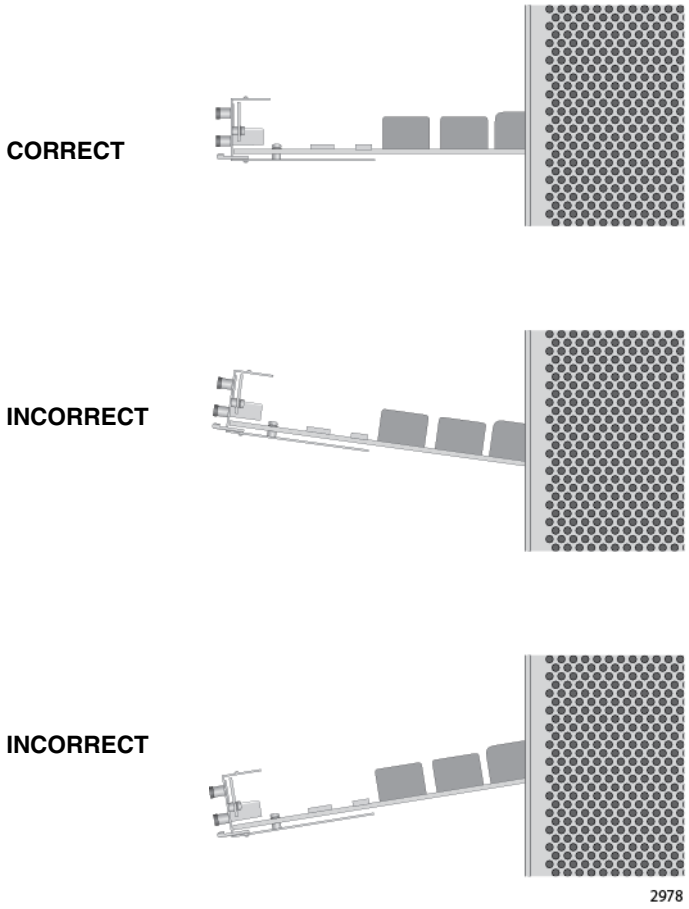


Figure 64. Aligning a Card in a Slot

Installing the AT-SBx31CFC Controller Fabric Card

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

Note
Please review "Guidelines to Handling the Controller and Line Cards" on page 128 before performing this procedure:

Note
For instructions on how to upgrade a chassis to the AT-SBx31CFC960 Controller Fabric Card from the AT-SBx31CFC Card, refer to the *SwitchBlade x3112 Chassis and AT-SBx31CFC960 Controller Fabric Card Installation Guide*.

This procedure requires the following tools:

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

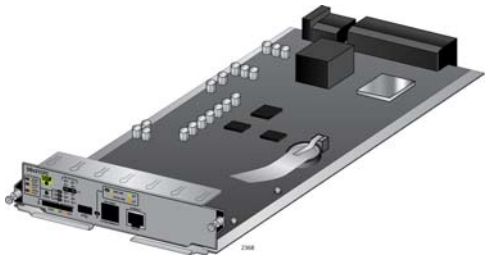
To install the AT-SBx31CFC Card, perform the following procedure:

1. Choose a slot in the chassis for the AT-SBx31CFC Controller Fabric card. Slots 4 and 5 are for the controller cards. Figure 65 identifies the slots in the chassis.

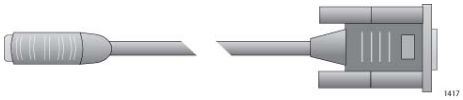
Figure 65. Slots 4 and 5 for the AT-SBx31CFC Card

2. Remove the new AT-SBx31CFC Card from the shipping package and verify the package contents, listed in Figure 66.

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



One AT-SBx31CFC 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 66. Items Included with the AT-SBx31CFC 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.

3. Carefully remove the controller card from the anti-static bag. Refer to Figure 67.

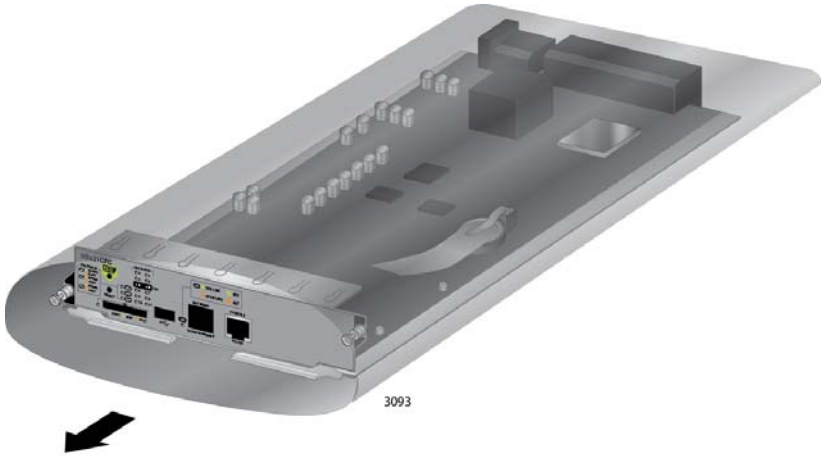


Figure 67. Removing the AT-SBx31CFC Controller Fabric Card from the Anti-static Bag

4. Move the locking handles on the front panel to the open position, as shown in Figure 68.

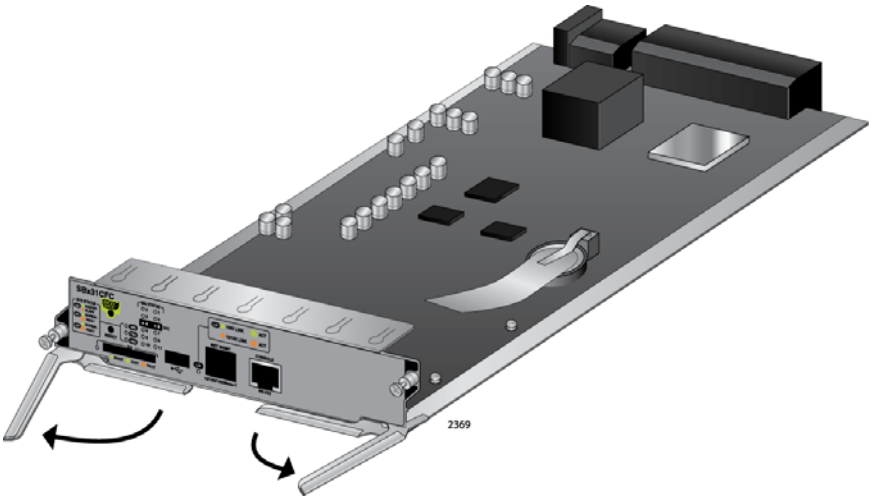


Figure 68. Opening the Locking Handles on the AT-SBx31CFC Controller Fabric Card

5. Remove the battery insulator tab on the controller card by sliding it out from between the battery and battery clip, as shown in Figure 69.

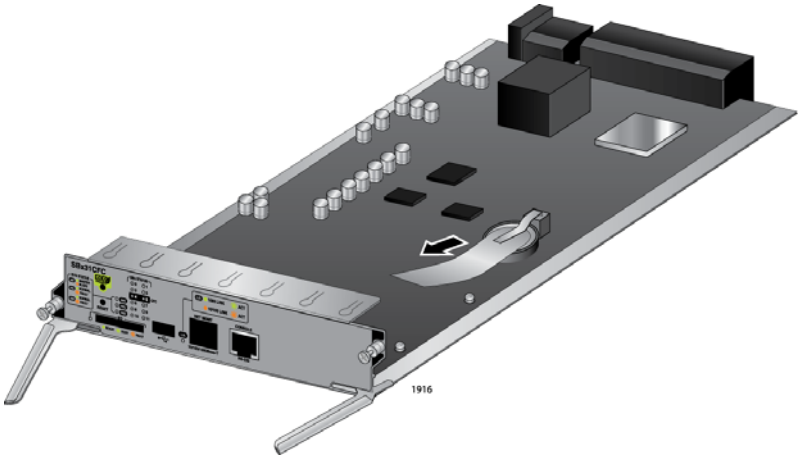


Figure 69. Removing the Battery Insulator

6. Align the edges of the AT-SBx31CFC Card with the internal chassis card guides in slot 4 or 5 of the AT-SBx3112 Chassis. Figure 70 on page 133 shows the AT-SBx31CFC Card aligned in slot 4.

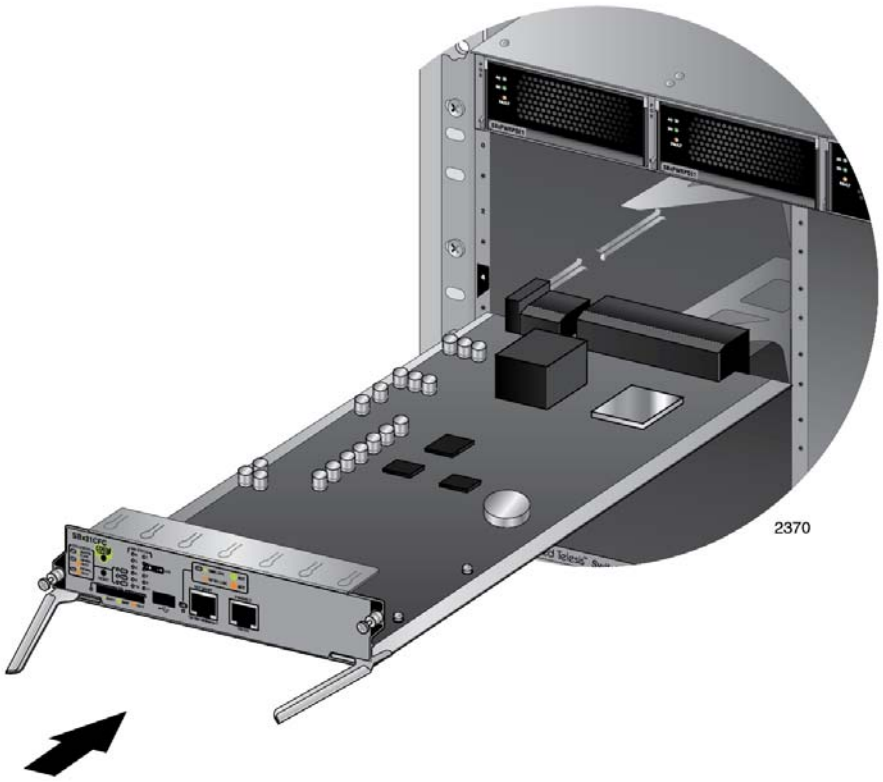


Figure 70. Aligning the AT-SBx31CFC Card in the Chassis Slot

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 64 on page 129.

Caution
Do not force the AT-SBx31CFC 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 of the controller card to secure it in the chassis. Refer to Figure 71 on page 134.

Figure 71. Closing the Locking Levers on the AT-SBx31CFC Controller Fabric Card

9. Finger tighten the two thumbscrews on the card to secure the card to the chassis. Refer to Figure 72 on page 135.

Figure 72. Tightening the Thumb Screws on the AT-SBx31CFC Card

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

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

11. if you have a second AT-SBx31CFC Controller Fabric Card, repeat this procedure to install it in the chassis.

12. Go to “Installing the Ethernet Line Cards” on page 136.

Installing the Ethernet Line Cards

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

Note
Please review “Guidelines to Handling the Controller and Line Cards” on page 128 before performing this procedure.

This procedure requires the following tools:

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

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

1. Choose a slot in the chassis for the Ethernet line card. You may install Ethernet line cards in slots 0 to 3 and 6 to 11. The slots are shown in Figure 73.

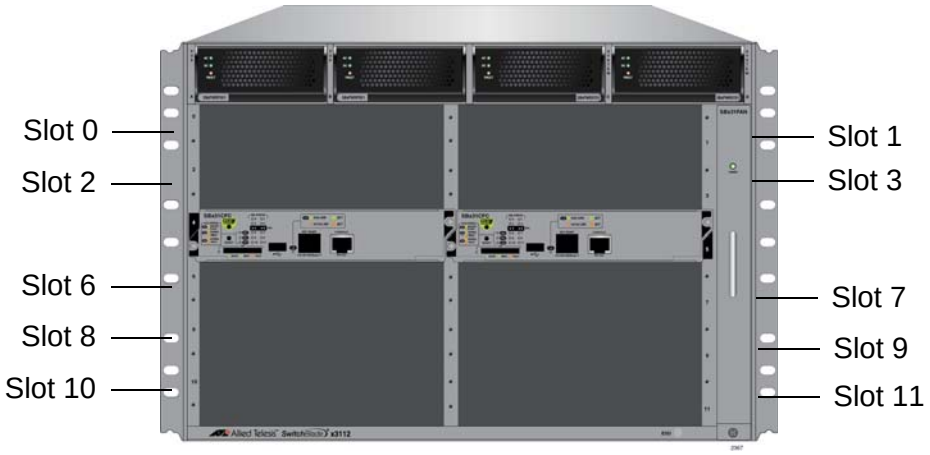


Figure 73. Slots 0 to 3 and 6 to 11 for the Ethernet Line Cards

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 74.

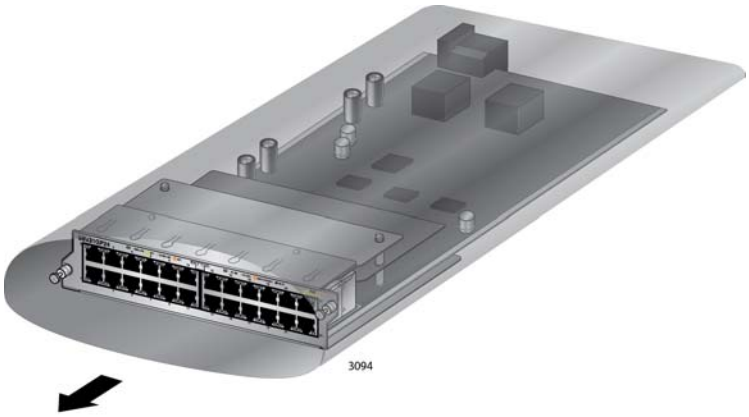


Figure 74. Removing an Ethernet Line Card from an Anti-static Bag

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

   Figure 75 shows an Ethernet line card aligned in slot 0.

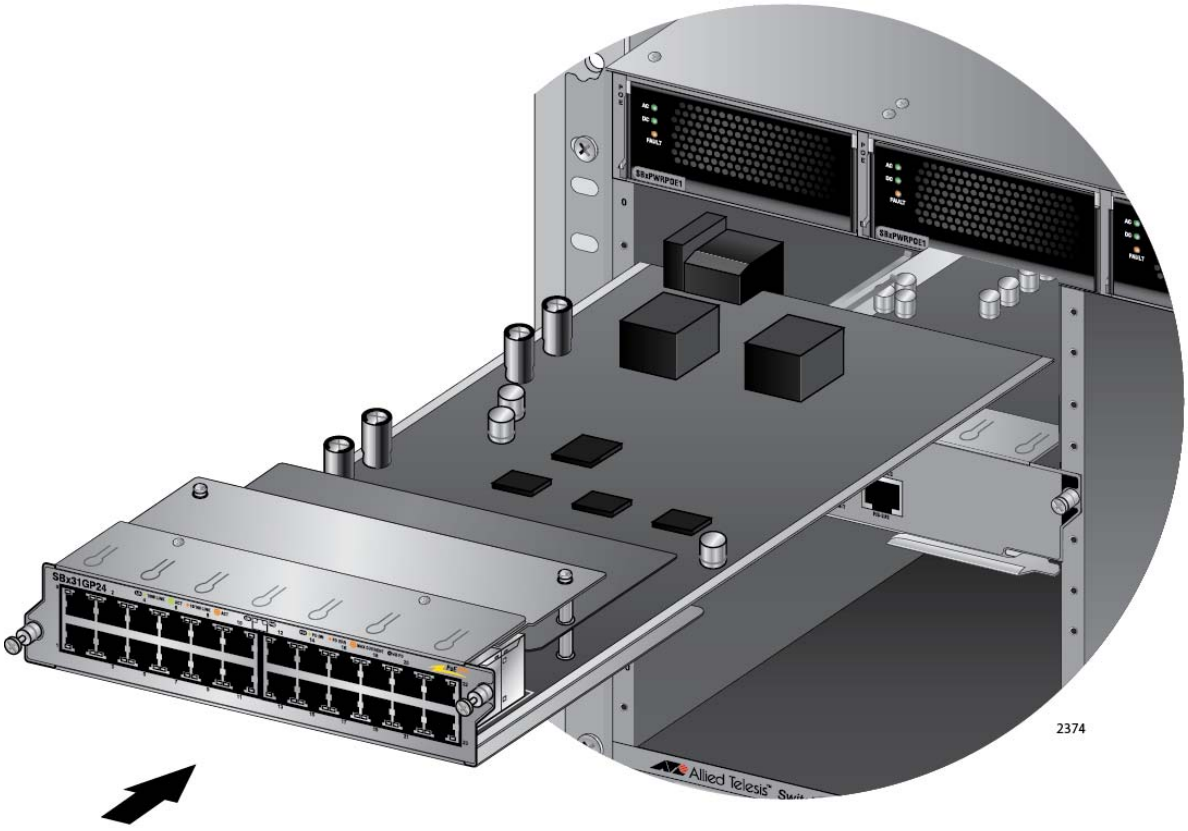


Figure 75. Aligning an Ethernet Line Card in a Chassis Slot

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 64 on page 129.

Caution

Do not force the line 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 76.

Figure 76. 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 77 on page 139.

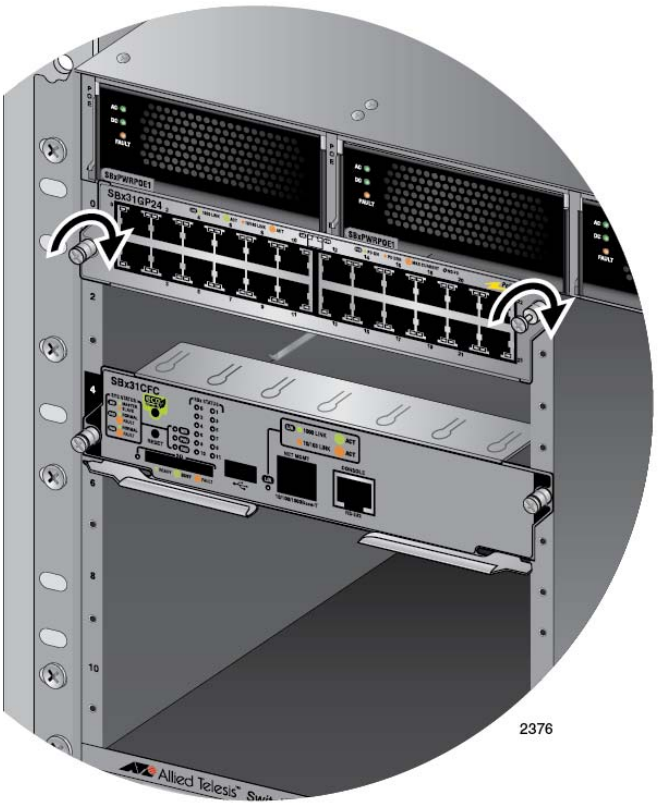


Figure 77. Tightening the Thumb Screws on an Ethernet Line Card

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 140.

Installing the Blank Slot Covers

After installing the AT-SBx31CFC 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 the Transceivers and Cabling the Ports” on page 143.

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 the blank slot cover over the unused slot, as shown in Figure 78. The up arrow on the panel must be pointing up.

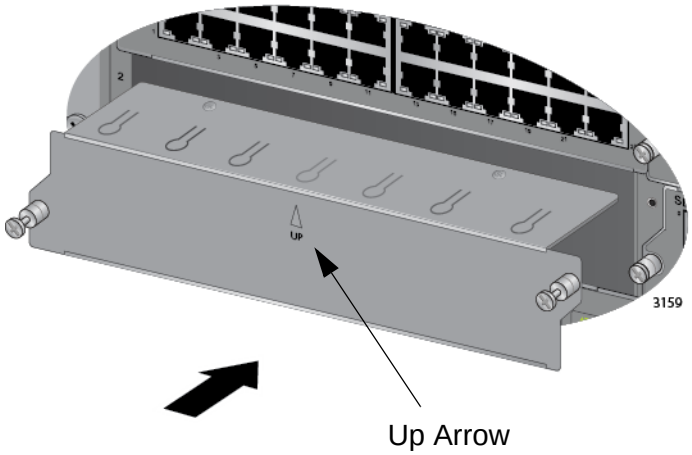


Figure 78. Installing a Blank Slot Cover

2. Finger tighten the two thumbscrews to attach the blank panel to the chassis, as shown in Figure 79 on page 141.

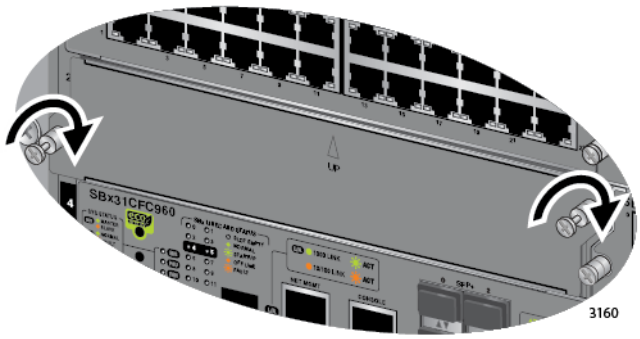


Figure 79. Tightening the Thumbscrews on a Blank Slot Cover

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 the Transceivers and Cabling the Ports” on page 143.

Chapter 8

Installing the Transceivers and Cabling the Ports

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

Guidelines to Cabling the Twisted Pair Ports on AT-SBx31GP24, AT-SBx31GT24, and AT-SBx31GT40 Line Cards

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

- The 10/100/1000Base-T twisted pair ports on AT-SBx31GT24 and AT-SBx31GP24 Line Cards have 8-pin RJ45 connectors.
- The 100/1000Base-T twisted pair ports on the AT-SBx31GT40 Line Card have 8-pin RJ point 5 connectors.
- The cable specifications for the 10/100/1000Base-T twisted pair ports on AT-SBx31GT24 and AT-SBx31GT40 Line Cards are listed in Table 13 on page 54.
- The cable specifications for the 10/100/1000Base-T twisted pair ports on the AT-SBx31GP24 Line Card are listed in Table 14 on page 55.
- 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 the 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 80.

Figure 80. 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 81 on page 146.
- 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.

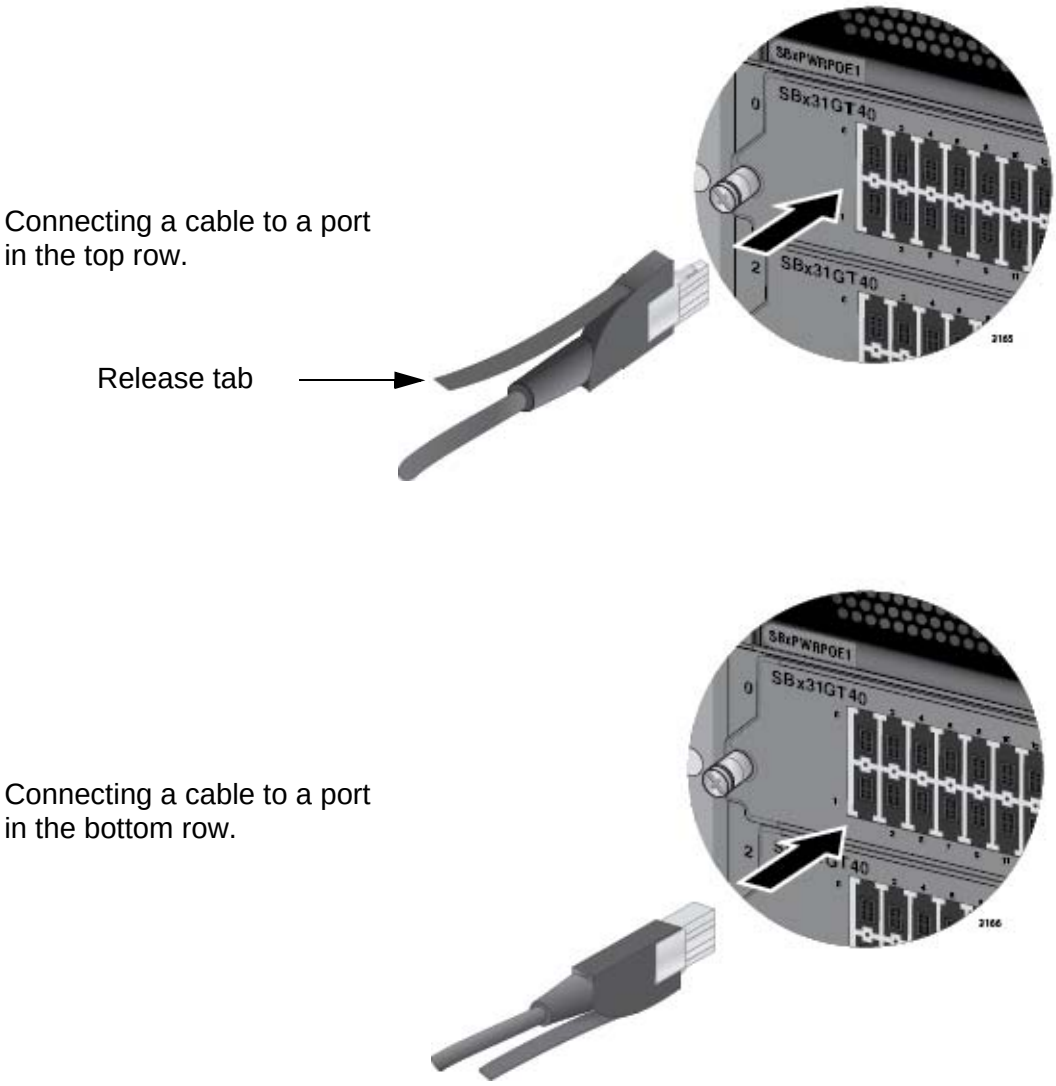


Figure 81. Connecting Cables to Ports on the AT-SBx31GT40 Line Card

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

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

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

Warning
Transceivers can be damaged by static electricity. Follow the procedure in “Protecting Against Electrostatic Discharge (ESD)” on page 106 to guard against ESD damage when unpacking and installing the devices.

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

Installing SFP Transceivers in the AT-SBx31GS24 Line Card

Please review the information in “Guidelines to Installing SFP, SFP+, CSFP, and XFP Transceivers” on page 147 before performing this procedure.

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

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

2. Remove the dust cover from the SFP slot chosen for the transceiver. Figure 82 shows the removal of the dust cover from transceiver slot 0 on the line card in chassis slot 0.

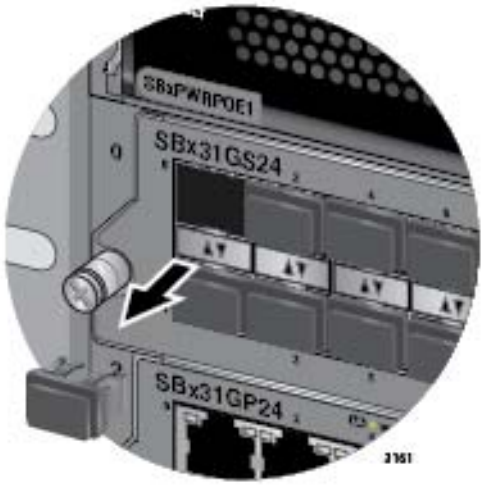


Figure 82. Removing the Dust Cover from an SFP Slot in the AT-SBx31GS24 Line Card

3. To install the transceiver in an SFP slot on the top row of the line card, orient the transceiver with the handle on top, as shown in Figure 83. To install it into a slot on the bottom row of the line card, orient it with the handle on the bottom.

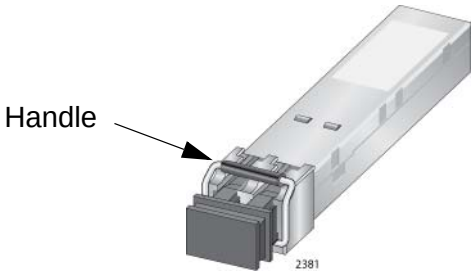


Figure 83. Handle on SFP Transceiver

4. Slide the transceiver into the slot until it clicks into place, as shown in Figure 84.

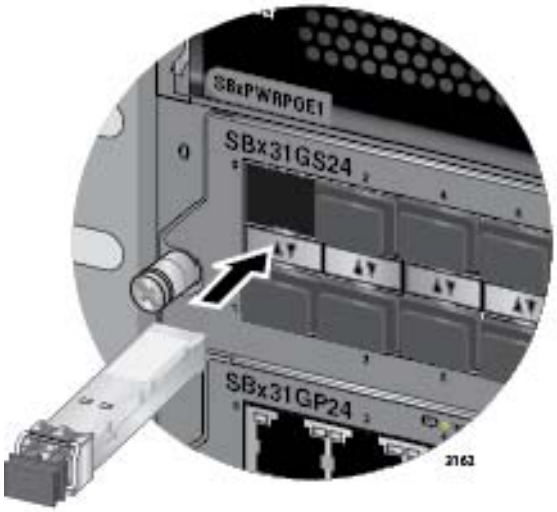


Figure 84. Inserting an SFP Transceiver in the AT-SBx31GS24 Line Card

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

5. Remove the protective cover from the SFP transceiver, as shown in Figure 85.

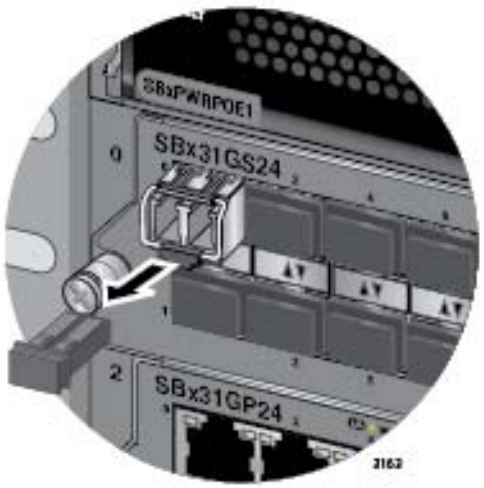


Figure 85. Removing the Dust Cover from the SFP Transceiver in the AT-SBx31GS24 Line Card

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

6. Connect the fiber optic cable to the port on the transceiver, as shown in Figure 86. The connector should snap into the port.

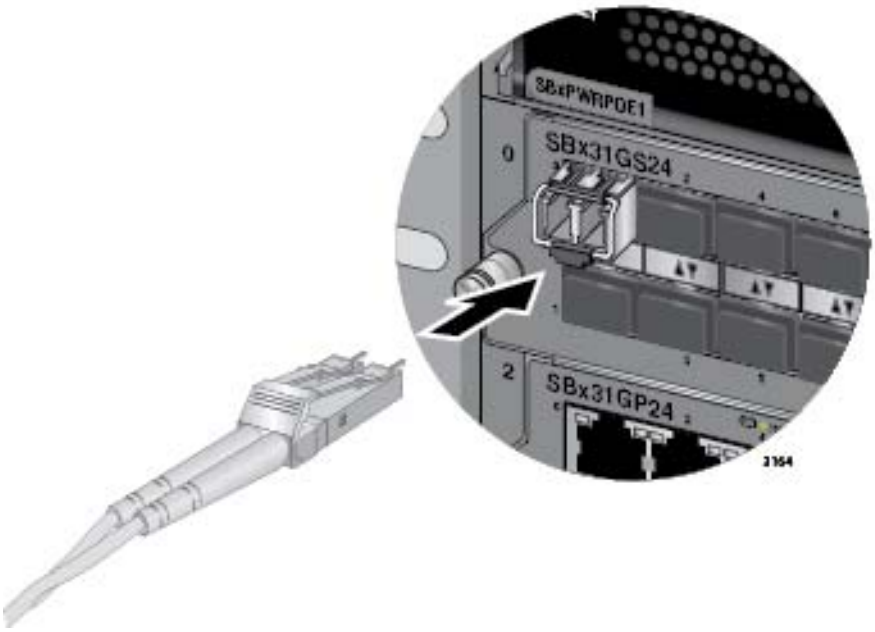


Figure 86. Attaching a Fiber Optic Cable to an SFP Transceiver in the AT-SBx31GS24 Line Card

7. Repeat this procedure to install additional SFP transceivers.

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

- To install and cable additional transceivers, go to the appropriate section in this chapter for instructions.
- After cabling all the ports in the chassis, go to Chapter 9, “Powering On the Chassis” on page 167.

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

Please review the information in “Guidelines to Installing SFP, SFP+, CSFP, and XFP Transceivers” on page 147 before performing this procedure.

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

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

2. Remove the dust cover from the slot chosen for the transceiver. Figure 87 shows the dust cover being removed from the first slot on the line card in slot 0 of the chassis.

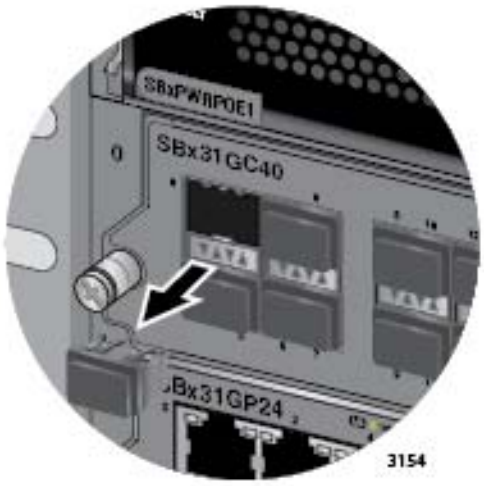


Figure 87. Removing the Dust Cover from a Transceiver Slot on the AT-SBx31GC40 Line Card

3. To install an SFP or a CSFP transceiver in a slot on the top row of the line card, orient it with the label on top, as shown in Figure 88 on page 152. To install it into a slot on the bottom row of the line card, orient it with the label on the bottom.

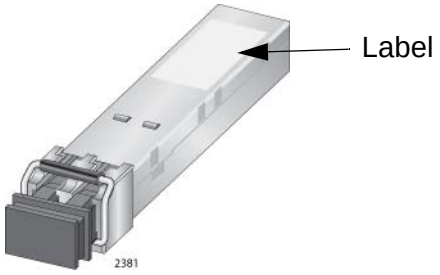


Figure 88. Labels on SFP and CSFP Transceivers

4. Slide the transceiver into the slot until it clicks into place, as shown in Figure 89.

Figure 89. Inserting an SFP or a CSFP Transceiver

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

5. Remove the protective cover from the ports on the transceiver, as shown in Figure 90 on page 153.

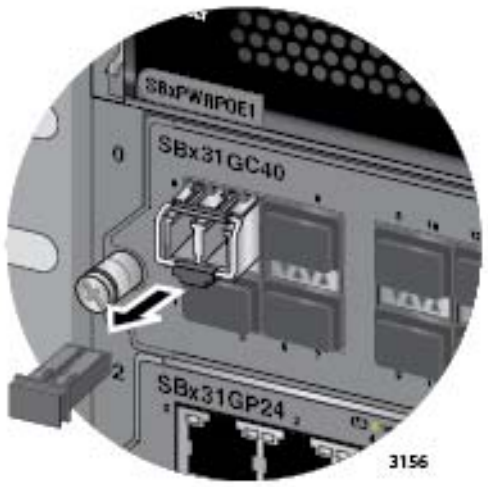
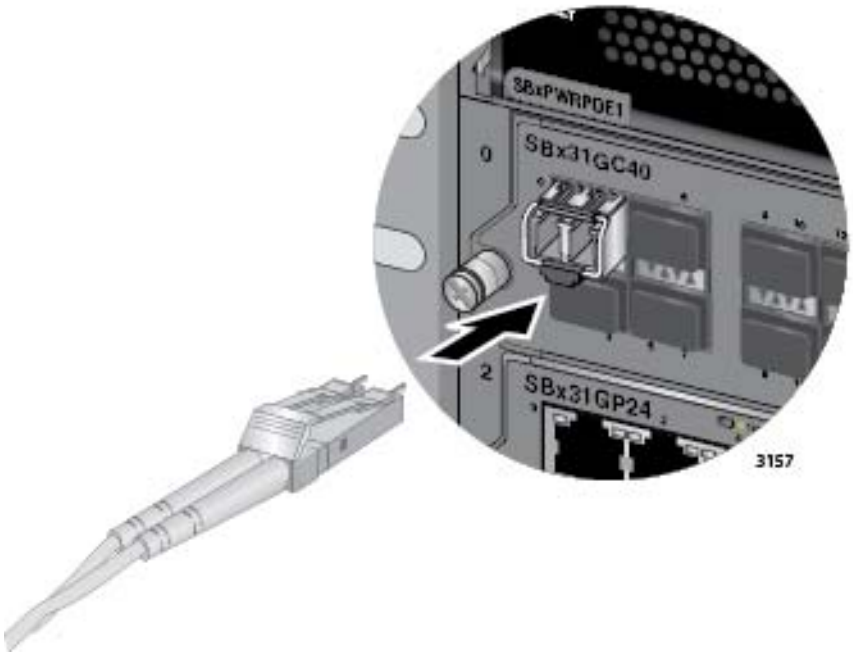


Figure 90. Removing the Dust Cover from an SFP or a CSFP Transceiver

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

6. Connect the fiber optic cables to the port on the transceiver, as shown in Figure 91 on page 154. The connectors should snap into the ports. If you are connecting only one cable to a CSFP transceiver, you may connect it to either port.

SFP Transceiver



CSFP Transceiver

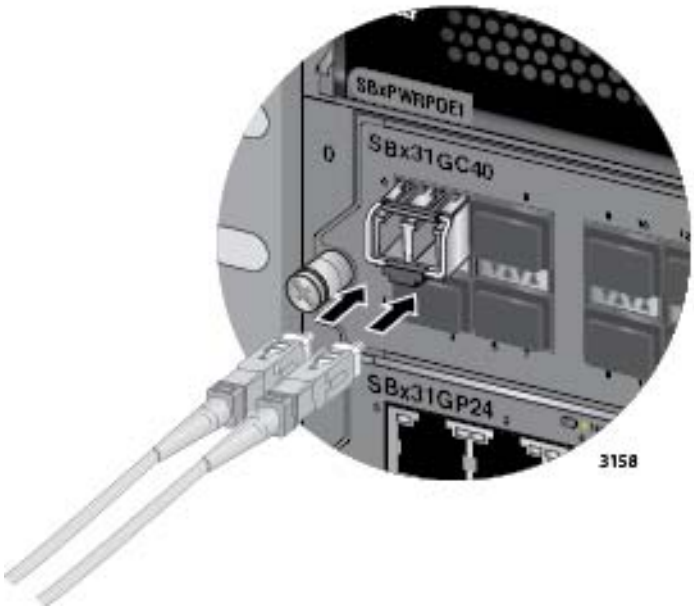


Figure 91. Attaching a Fiber Optic Cable

7. Repeat this procedure to install additional transceivers.

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 167.

Installing SFP+ Transceivers in the AT-SBx31XS6 Line Card

Please review the information in “Guidelines to Installing SFP, SFP+, CSFP, and XFP Transceivers” on page 147 before performing this procedure.

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

1. Remove the dust plug from the slot chosen for the SFP+ transceiver, as shown in Figure 92.

Figure 92. Removing a Dust Cover From an SFP+ Slot in the AT-SBx31XS6 Line Card

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

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

2. Orient the SFP+ transceiver with the handle on top, as shown in Figure 93.

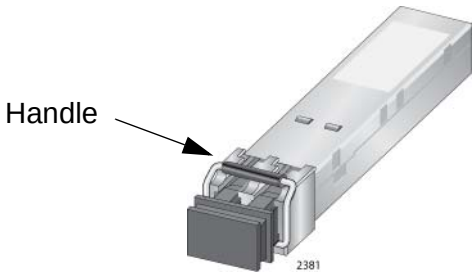


Figure 93. Handle on SFP+ Transceiver

3. Slide the transceiver into the slot until it clicks into place, as shown in Figure 94.

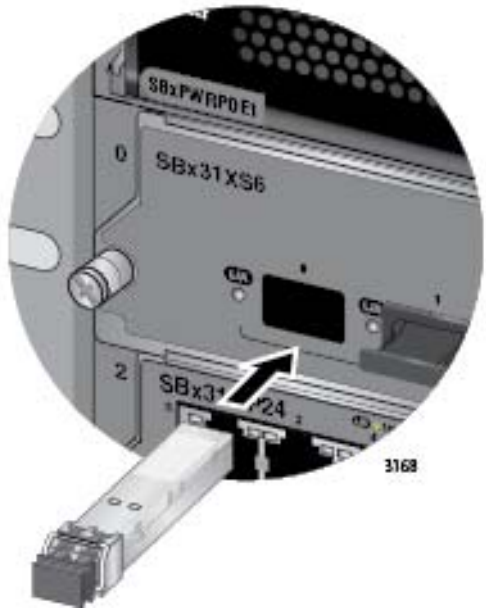


Figure 94. Installing an SFP+ Transceiver in the AT-SBx31XS6 Line Card

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

4. Remove the protective cover from the SFP transceiver, as shown in Figure 95 on page 157.

Figure 95. Removing the Dust Cover from an SFP+ Transceiver in the AT-SBx31XS6 Line Card

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

5. Connect the fiber optic cable to the port on the transceiver, as shown in Figure 96 on page 158. The connector should snap into the port.

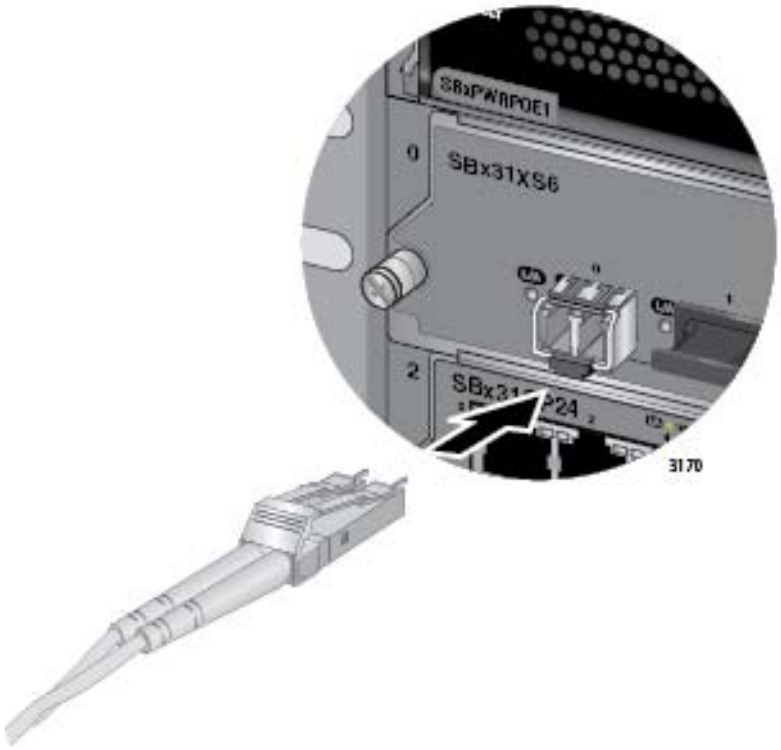


Figure 96. Attaching a Fiber Optic Cable to an SFP+ Transceiver in the AT-SBx31XS6 Line Card

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

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

- To install and cable additional transceivers, go to the appropriate section in this chapter for instructions.
- After cabling all the ports in the chassis, go to Chapter 9, “Powering On the Chassis” on page 167.

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

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

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

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

1. Remove the dust plug from the SFP+ slot chosen for the cable. Refer to Figure 92 on page 155.

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 97.

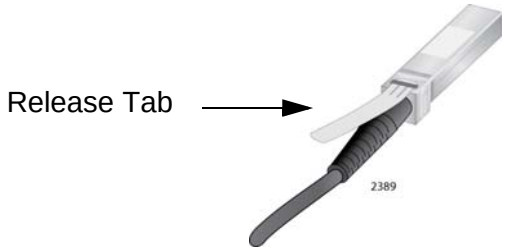


Figure 97. Release Tab on the AT-SBx31XS6 Line Card

3. Slide the connector into the slot until it clicks into place, as shown in Figure 98 on page 160.

Figure 98. Installing the AT-SP10TW Cable in the AT-SBx31XS6 Line Card

4. Install the other end of the cable into an SFP+ slot on another network device.

5. Repeat this procedure to install additional AT-SP10TW Cables.

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

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

- To install and cable additional transceivers, go to the appropriate section in this chapter for instructions.
- After cabling all the ports in the chassis, go to Chapter 9, “Powering On the Chassis” on page 167.

Installing XFP Transceivers in the AT-SBx31XZ4 Line Card

Please review the information in “Guidelines to Installing SFP, SFP+, CSFP, and XFP Transceivers” on page 147 before performing this procedure.

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

1. Remove the dust plug from the slot chosen for the transceiver, as shown in Figure 99.

Figure 99. Removing the Dust Cover From an XFP Slot on the AT-SBx31XZ4 Line Card

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

2. Remove the transceiver from its shipping container.
3. Orient the transceiver with the handle on top, as shown in Figure 100 on page 162.

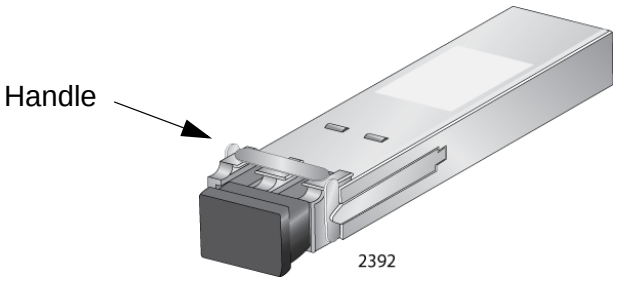


Figure 100. Handle on the XFP Transceiver

4. Slide the transceiver into the slot until it clicks into place, as shown in Figure 101.

Figure 101. 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 102 on page 163.

Figure 102. 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 103 on page 164. The connector should snap into the port.

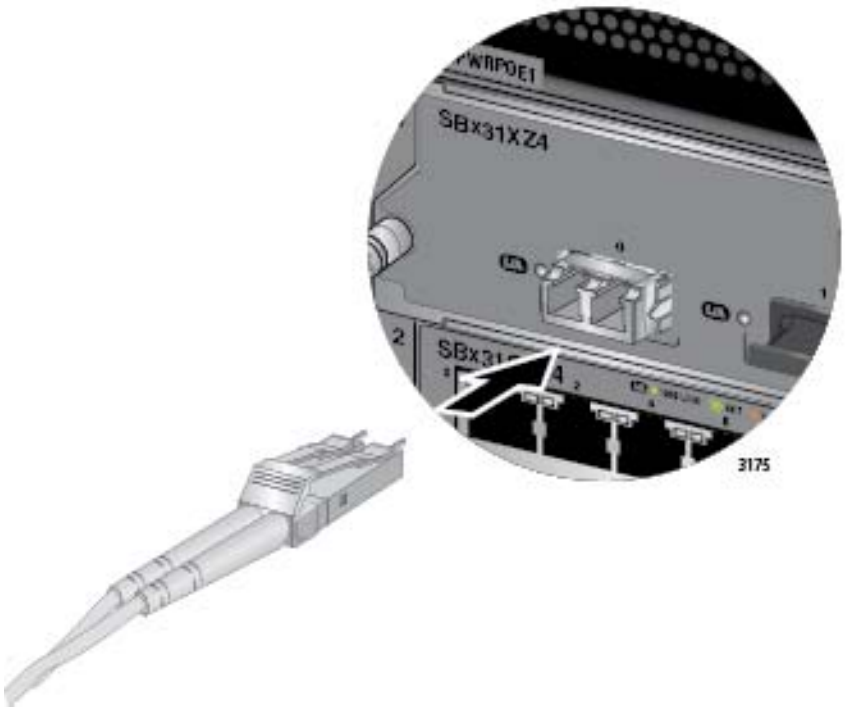


Figure 103. Attaching a Fiber Optic Cable to an XFP Transceiver in the AT-SBx31XZ4 Line Card

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 167.

Cabling the NET MGMT Port on the AT-SBx31CFC Card

The controller card must have access to your network to support the management features in Table 21 on page 73. 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, refer to the *Software Reference for SwitchBlade x3100 Series Switches*.)

Here are the guidelines to using the NET MGMT port:

- The cabling requirements of the port are the same as the ports on the AT-SBx31GT24 Line Card, in Table 13 on page 54.
- If the chassis has two AT-SBx31CFC Controller 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 controller 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 must 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 167.

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

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 102.

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 140.

3. Verify that dust plugs are installed in all empty SFP, SFP+, CSFP, and XFP slots on the Ethernet line cards.

4. Verify that dust covers are installed on all SFP, SFP+, CSFP, and XFP transceivers that do not have cables.

5. Verify that the chassis has at least one AT-SBx31CFC Control Card installed in slot 4 or 5.

6. Verify that the chassis has at least one AT-SBxPWRSYS1 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-SBx31CFC Controller Fabric Card, did you remove the battery insulator, shown in Figure 69 on page 132? 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 169
- “Powering on the AT-SBxPWRPOE1 AC PoE Power Supply” on page 172
- “Powering On the AT-SBxPWRSYS1 DC System Power Supply” on page 175

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 107.

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 104. The sockets correspond to the system power supplies in slots C and D on the front panel of the chassis.

Figure 104. 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 105 shows the AC power cord being connected to connector D for the power supply in slot D on the front panel.

Figure 105. 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 106 on page 171.

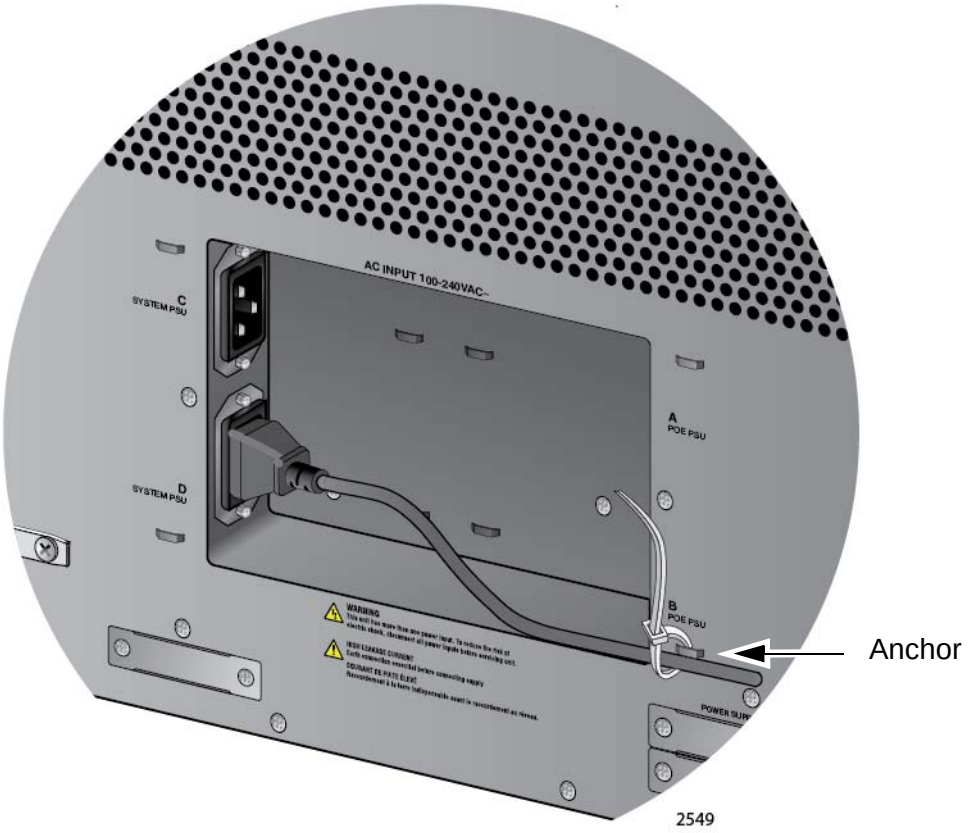


Figure 106. Securing the Power Cord for the AT-SBxPWRSYS1 or AT-SBxPWRSYS2 AC System Power Supply to an Anchor

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 172.
   - Otherwise, go to “Monitoring the Initialization Process” on page 200.

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 113. 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 104 on page 169. 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 107 shows the AC power cord being connected to connector A for the power supply in slot A on the front panel.

Figure 107. Connecting the AC Power Cord for the AT-SBxPWRPOE1 Power Supply

3. Use the twist tie that comes with the power supply to secure the cord to an anchor on the chassis, as shown in Figure 108.

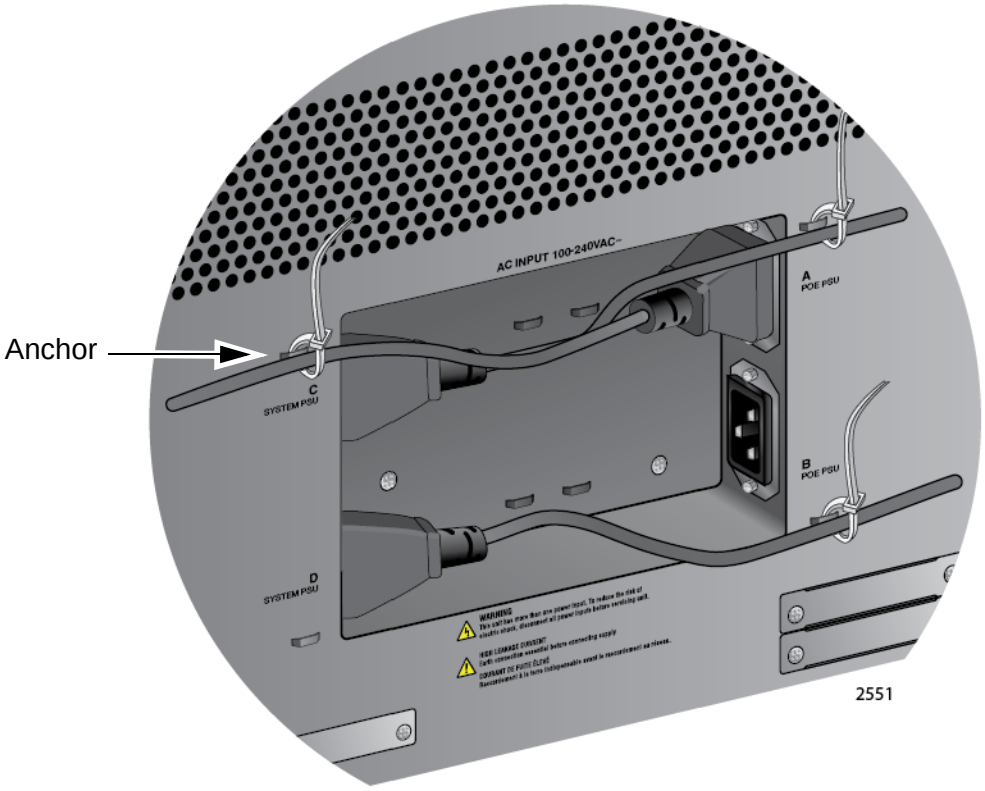


Figure 108. Securing the Power Cord for the AT-SBxPWRPOE1 Power Supply to an Anchor

4. Connect the power cord to an appropriate AC power source to power on the power supply.

5. If the chassis has two AT-SBxPWRPOE1 Power Supplies, repeat this procedure to power on the second power supply.

   Figure 109 on page 174 is an illustration of the power cords for a chassis with four power supplies.

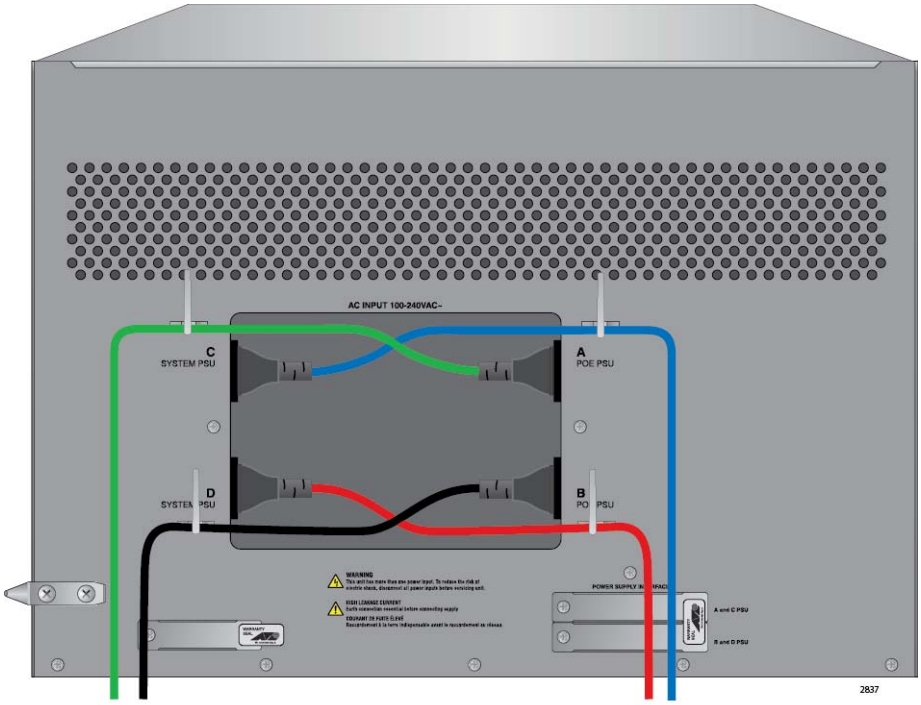


Figure 109. Dress and Secure AC Power Cords

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 169.
   - ❒ Otherwise, go to “Monitoring the Initialization Process” on page 200.

Powering On the AT-SBxPWRSYS1 DC System Power Supply

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 119.

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 177
- “Connecting the Grounding Wire with the Grounding Terminal” on page 177
- “Connecting the Grounding Wire with Bare Wire” on page 180
- “Choosing a Method for Attaching the Power Wires” on page 181
- “Connecting the DC Power Wires with the Straight Terminals” on page 182
- “Connecting the DC Power Wires with the Right Angle Terminals” on page 190
- “Connecting Bare DC Power Wires” on page 196

The components of the power supply are identified in Figure 110 on page

176.

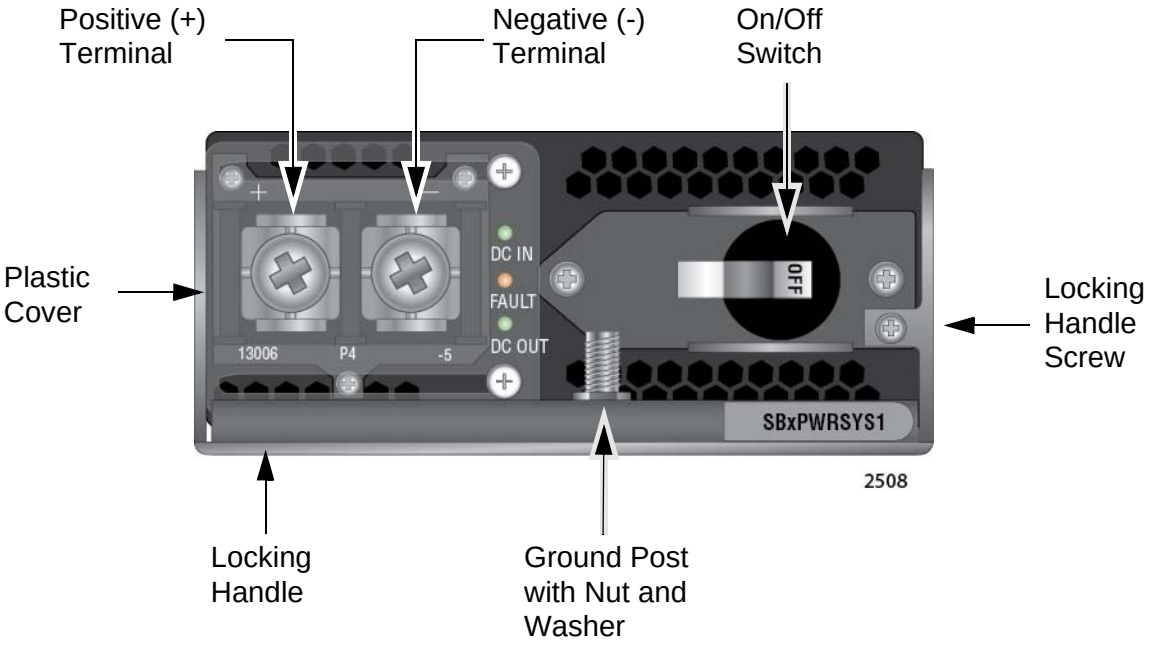


Figure 110. Components of the AT-SBxPWRSYS1 DC Power Supply

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 111, or bare wire.

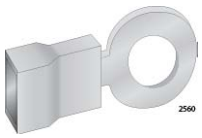


Figure 111. Grounding Wire Terminal

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 180

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 112.

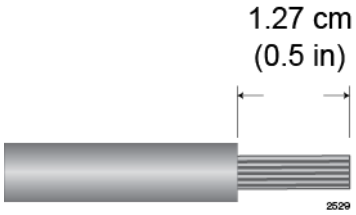


Figure 112. Stripping the Stranded Grounding Wire

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

2. Insert the grounding wire into the grounding terminal provided with the power supply and use a crimping tool to secure it to the grounding terminal. See Figure 113,

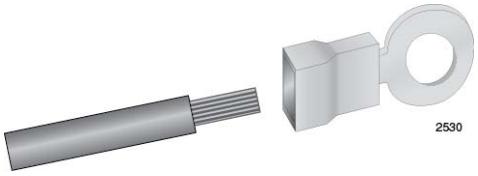


Figure 113. Attaching the Stranded Grounding Wire to the Grounding Terminal

3. Use an 8 mm wrench to remove the grounding post nut and washer, shown in Figure 114, from the power supply.

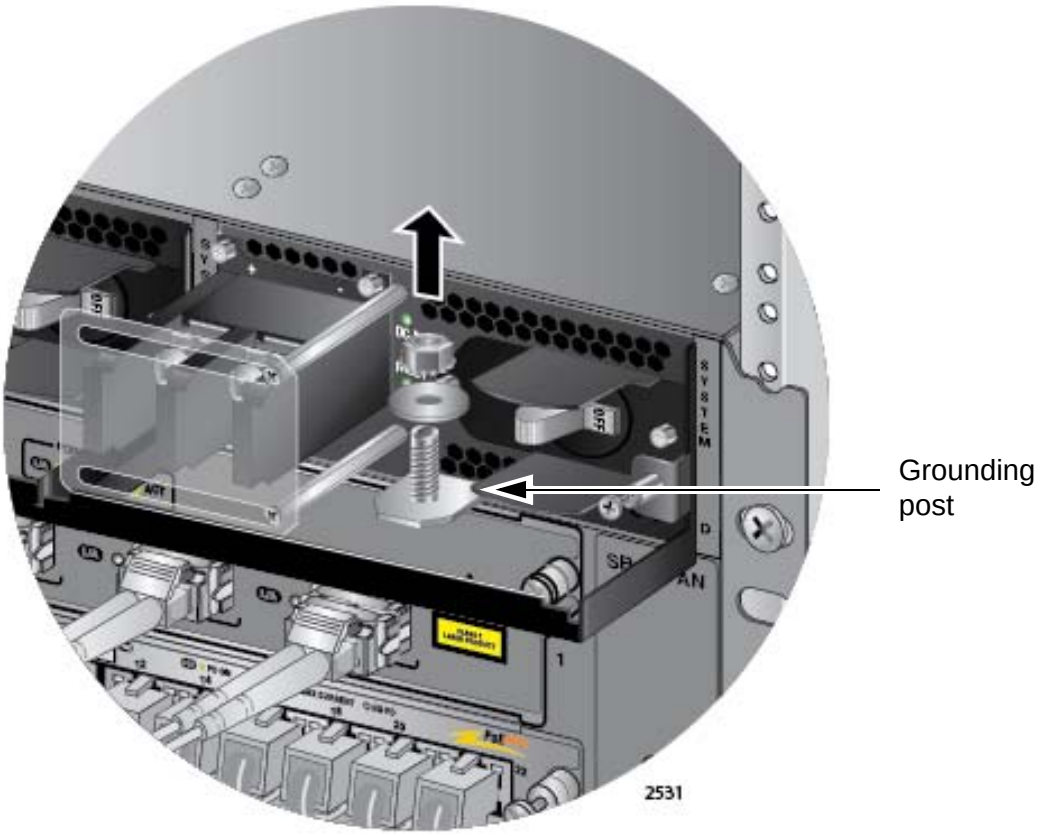


Figure 114. Removing the Nut and Washer from the Grounding Post

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 115 on page 179.

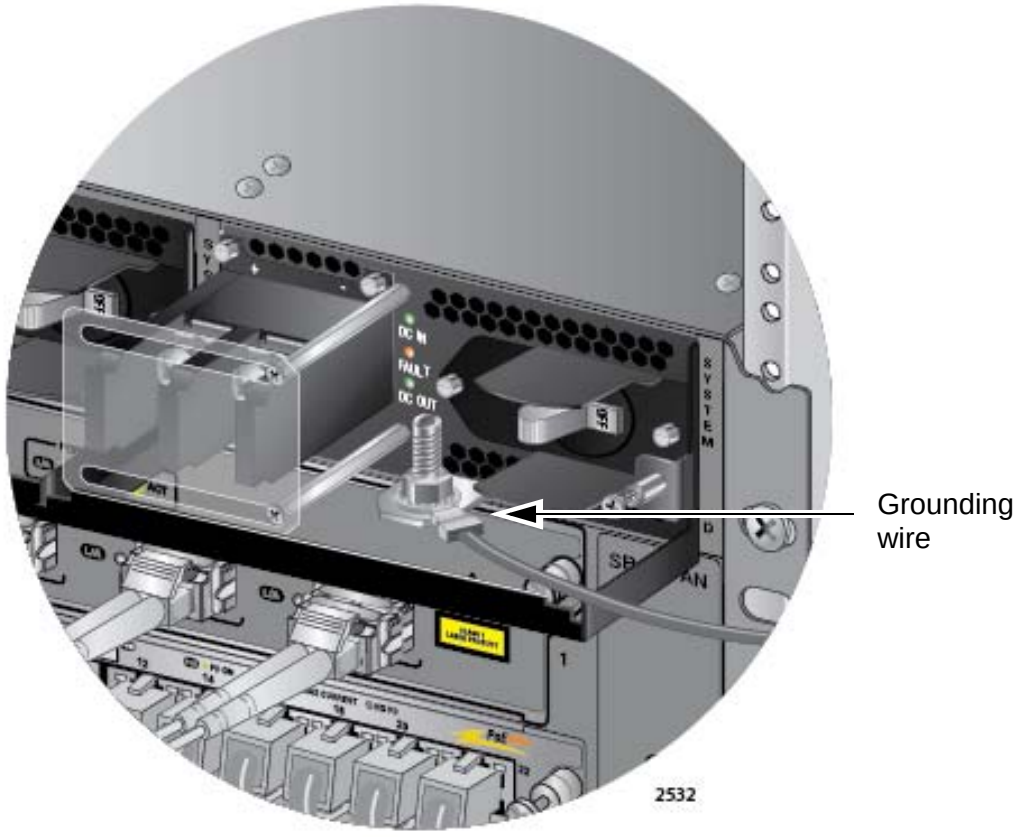


Figure 115. Installing the Grounding Wire

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

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

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

Connecting the Grounding Wire with Bare Wire

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

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

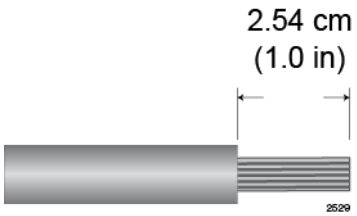


Figure 116. Stripping the solid or Stranded Grounding Wire

2. Use an 8 mm wrench to remove the grounding post nut and washer, shown in Figure 114 on page 178, 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 117.

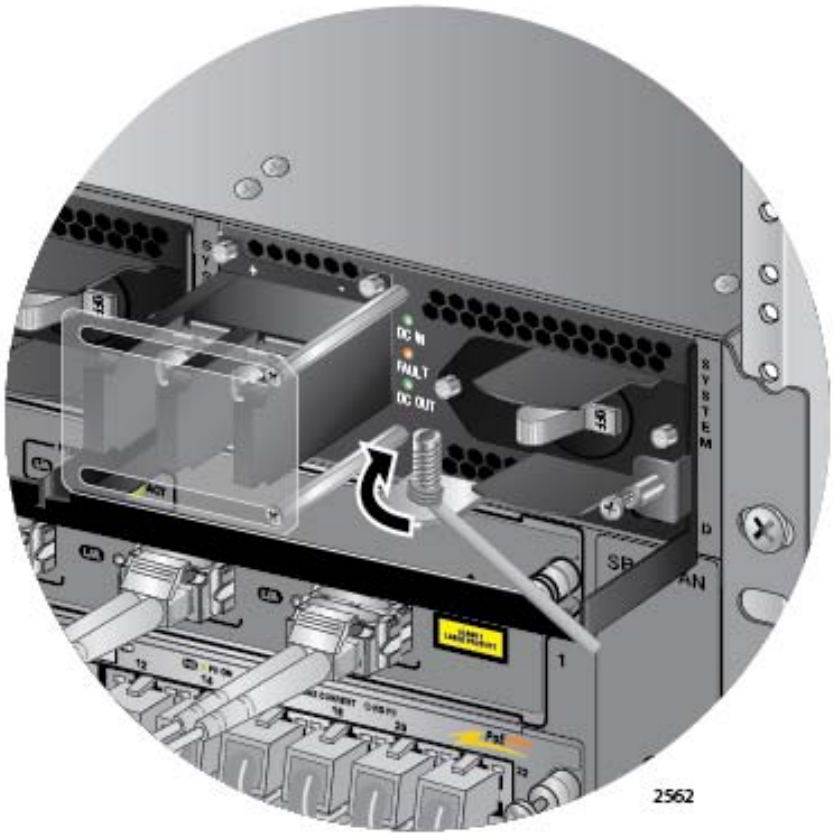


Figure 117. Attaching the Bare Grounding Wire to the Grounding Post

4. Secure the wire with the nut and washer removed in step 2, and an 8 mm wrench, as shown in Figure 118.

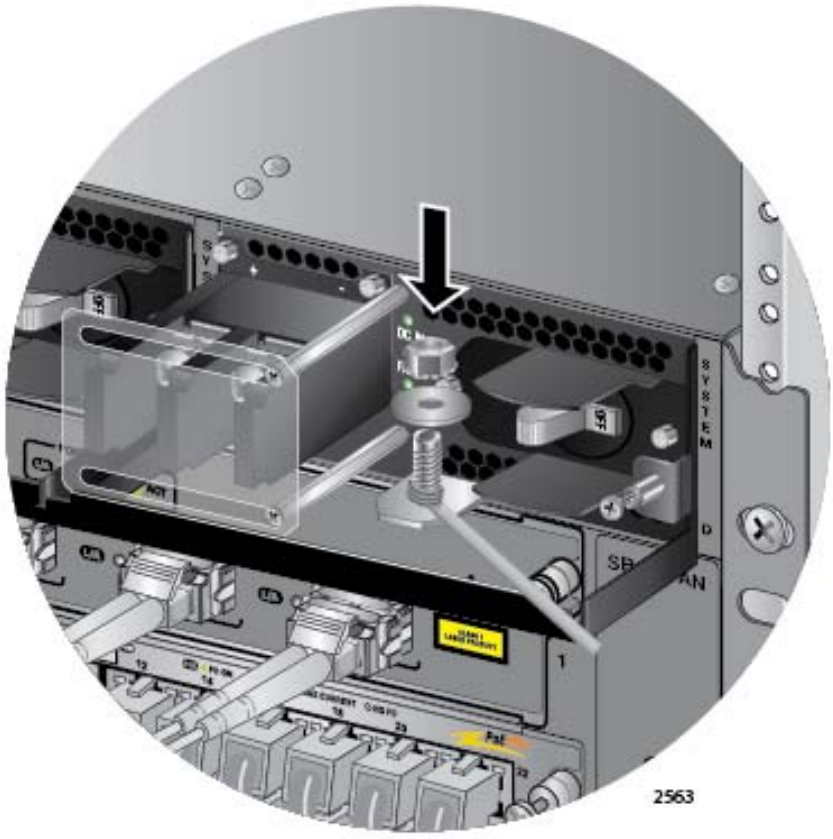
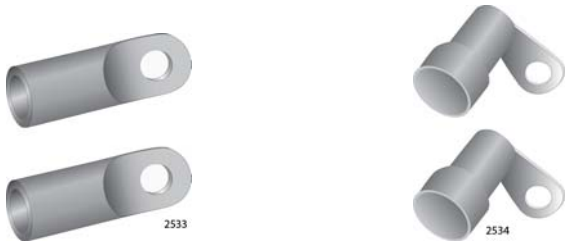


Figure 118. Securing the Bare Grounding Wire to the Grounding Post

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 119. 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 119. Power Wire Terminals

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

You may also install the wires using bare wires.

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

- ❒ “Connecting the DC Power Wires with the Straight Terminals” next
- ❒ “Connecting the DC Power Wires with the Right Angle Terminals” on page 190
- ❒ “Connecting Bare DC Power Wires” on page 196

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 120.

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

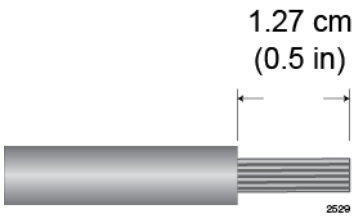


Figure 120. Stripping the Power Wires

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 121 on page 183.

Figure 121. 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 122.

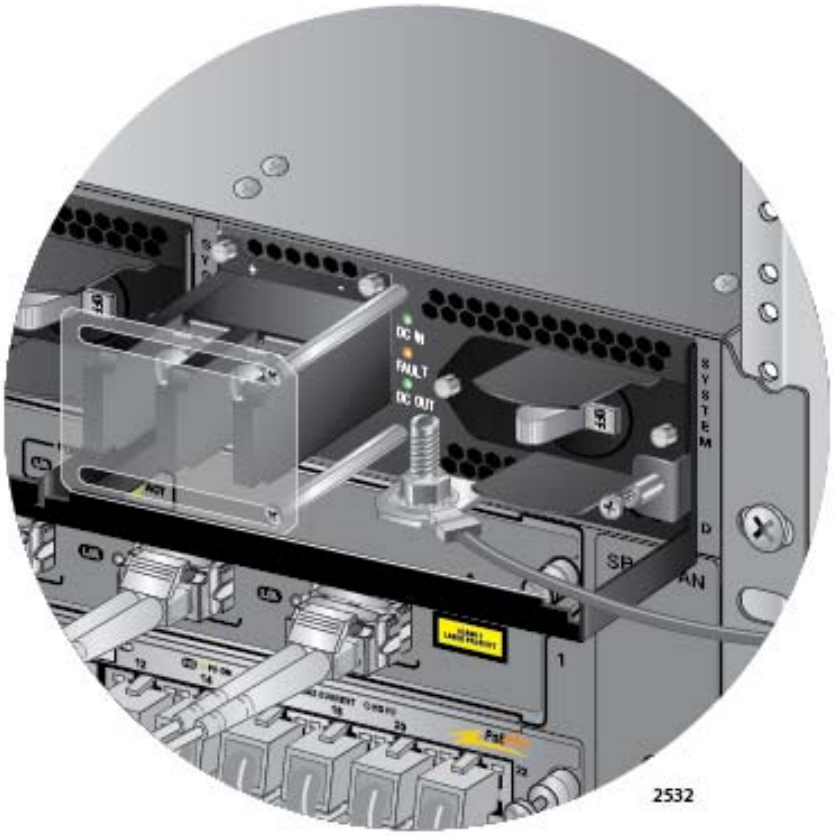


Figure 122. On/Off Switch On the AT-SBxPWRSYS1 DC Power Supply

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 123 on page 184. You may need to lift the locking handle slightly to access the bottom screw.

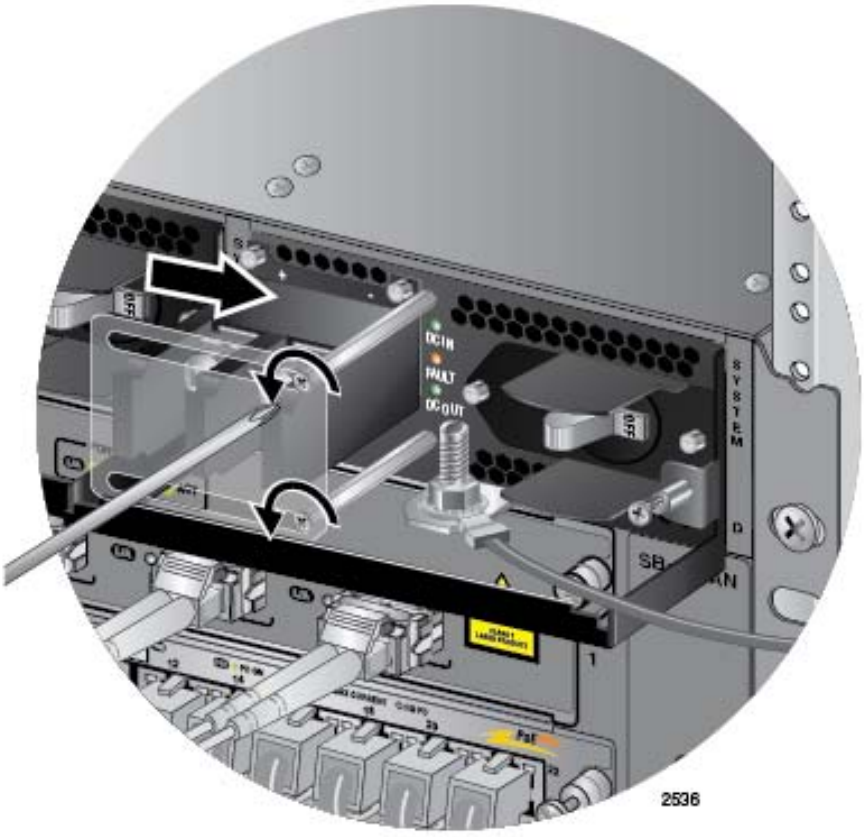


Figure 123. Opening the Plastic Cover

5. Use a #3 Phillips-head screwdriver to remove the two screws from the positive and negative terminals, as shown in Figure 124 on page 185.

Figure 124. 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 125 on page 186 shows the wires above the terminal block.

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

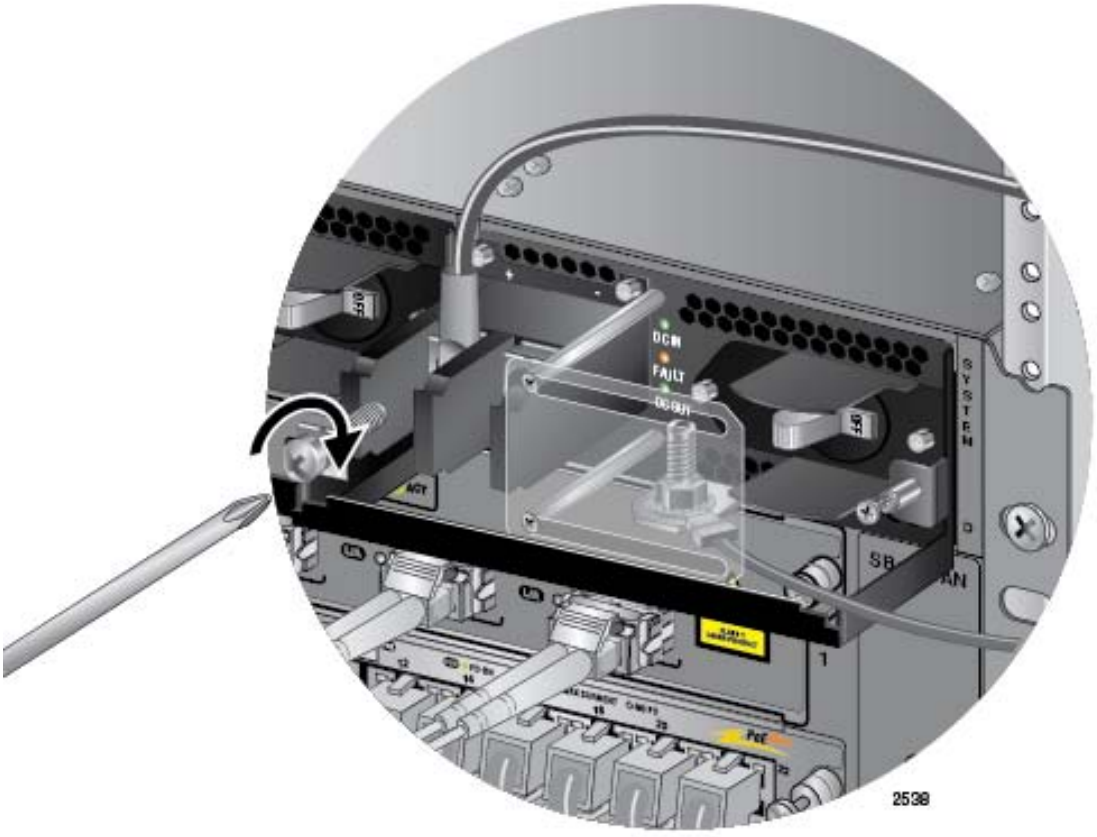


Figure 125. Connecting the Positive (+) Power Wire with a Straight Terminal

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 126 on page 187.

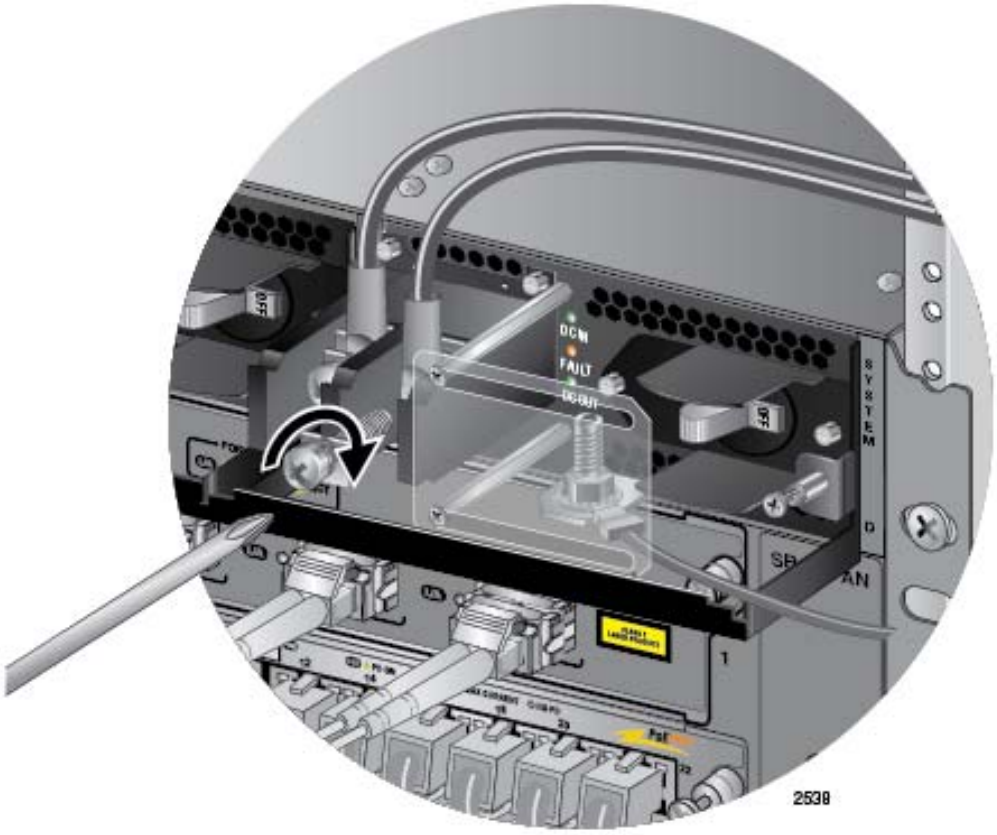


Figure 126. Connecting the Negative (-) Power Wire with a Straight Terminal

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 127 on page 188. You might need to lift the locking handle slightly to access the bottom screw.

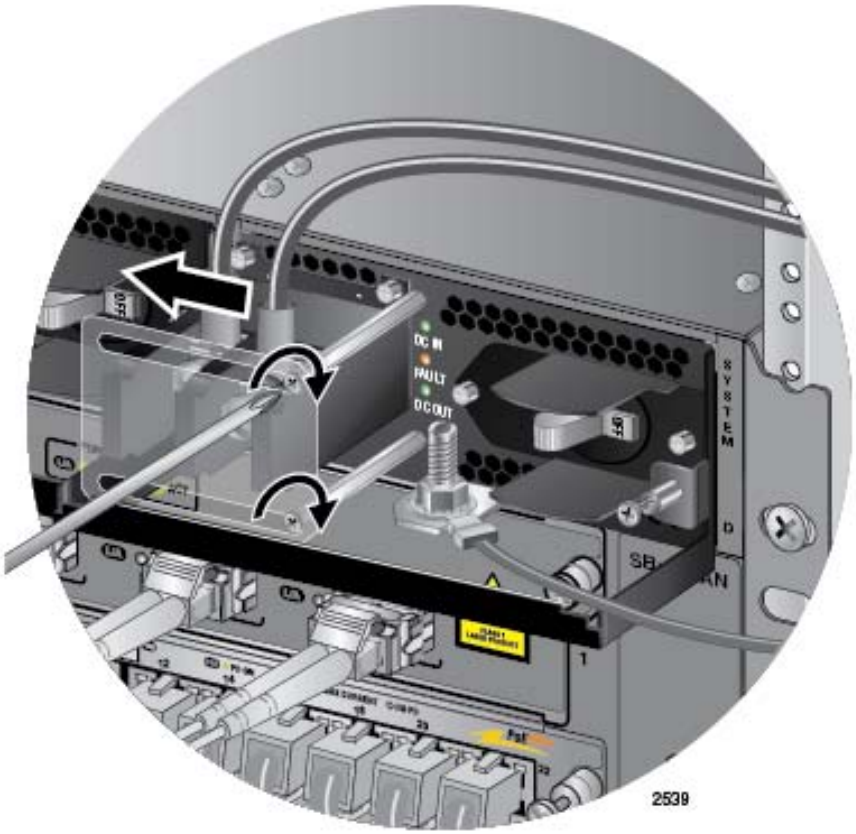


Figure 127. Closing the Plastic Cover over the Terminal Connectors

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 128 on page 189.

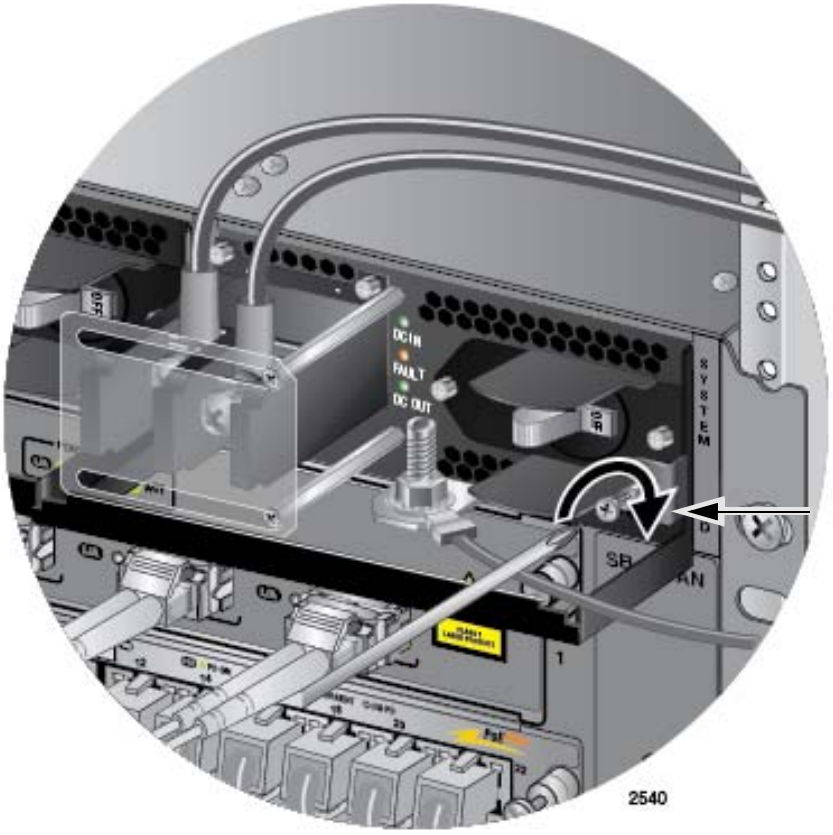


Figure 128. Tightening the Handle Locking Screw

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 122 on page 183.

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 200.

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 129.

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

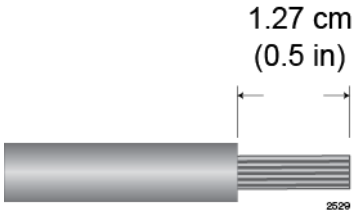


Figure 129. Stripping the Power Wires

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 130.

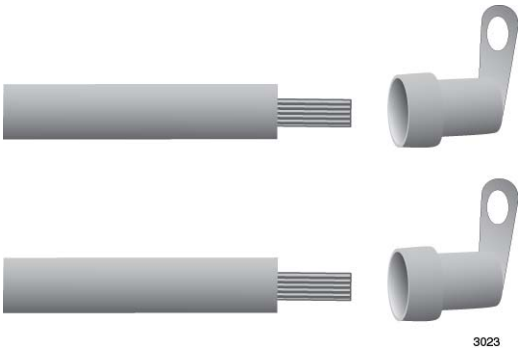


Figure 130. Attaching the Power Wires to the Right Angle Terminals

3. Verify that the On/Off switch on the AT-SBxPWRSYS1 DC Power Supply is in the Off position. Refer to Figure 122 on page 183.

4. 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 131. You may need to lift the locking handle slightly to access the bottom screw.

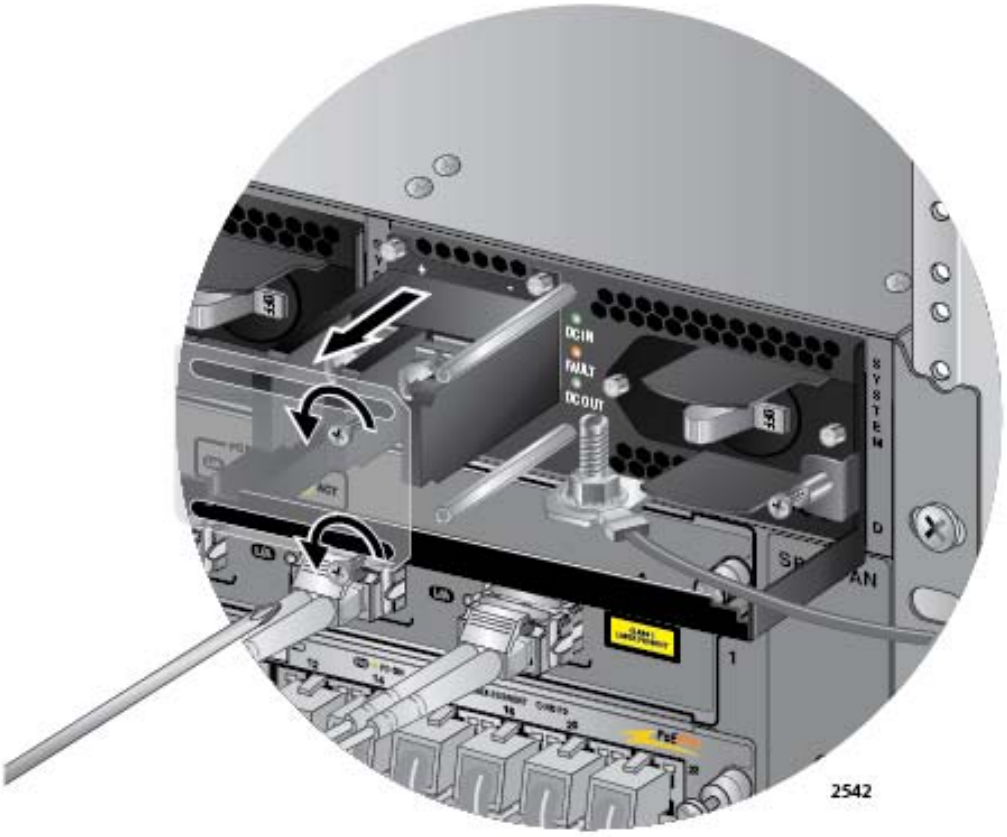


Figure 131. Removing the Plastic Cover

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

5. Use a #3 Phillips-head screwdriver to remove the two screws from the positive and negative terminals, as shown in Figure 132 on page 192.

Figure 132. 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 133 on page 193.

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

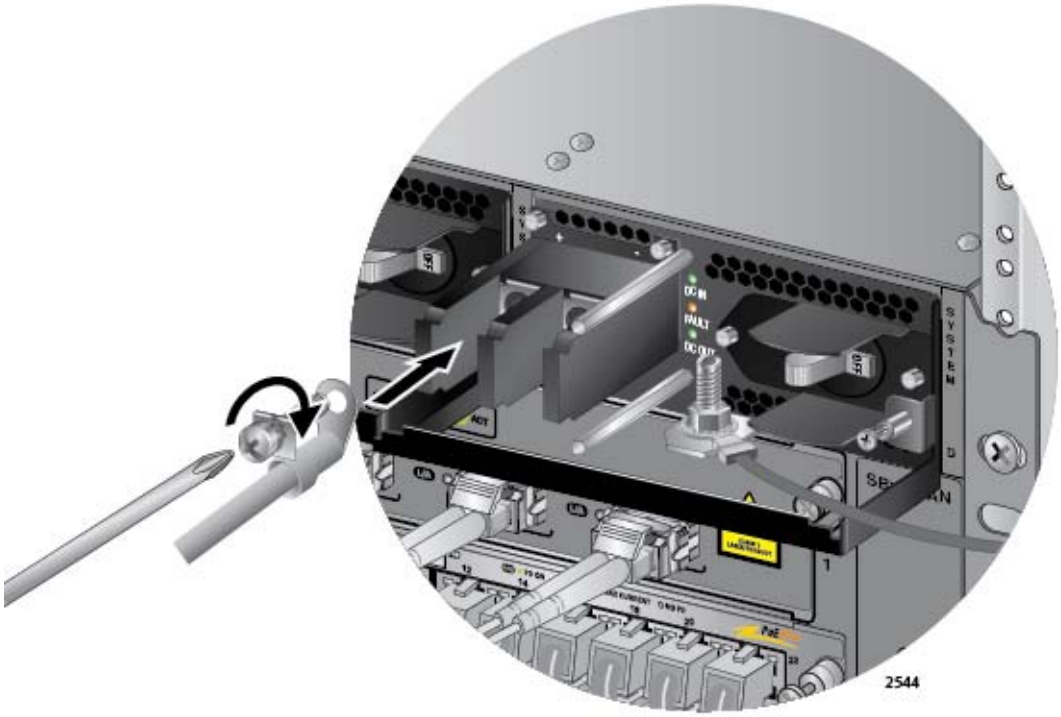


Figure 133. Connecting the Positive (+) Power Wire with a Right Angle Terminal

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 134 on page 194.

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

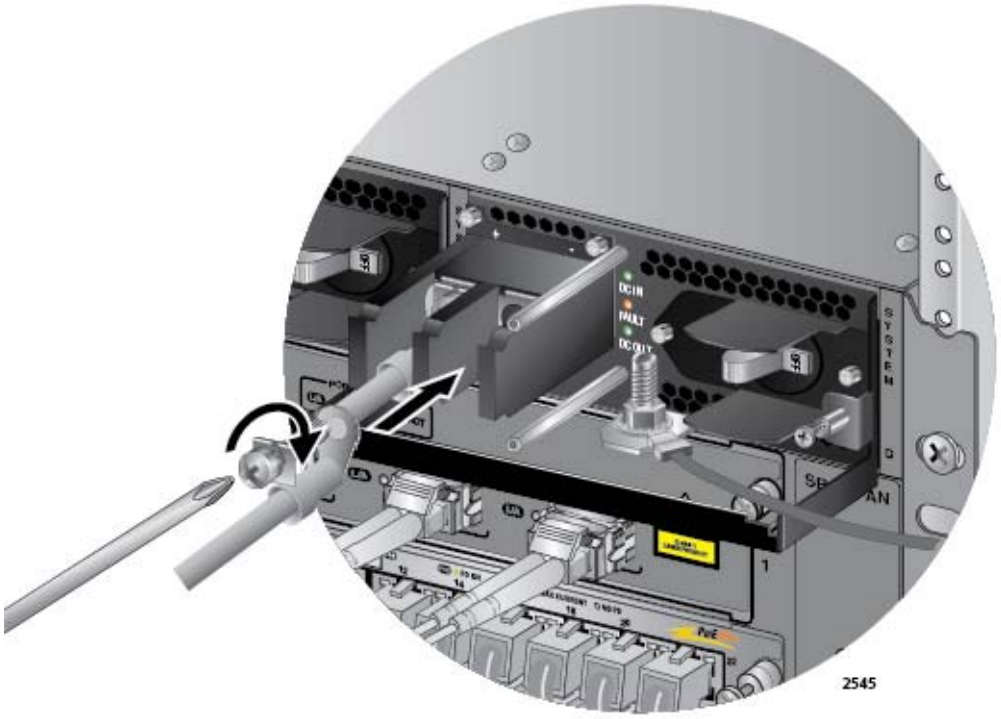


Figure 134. Connecting the Negative (-) Power Wire with a Right Angle Terminal

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. E12

8. With a #2 Phillips-head screwdriver, tighten the handle locking screw to secure the power supply to the chassis. See Figure 135 on page 195.

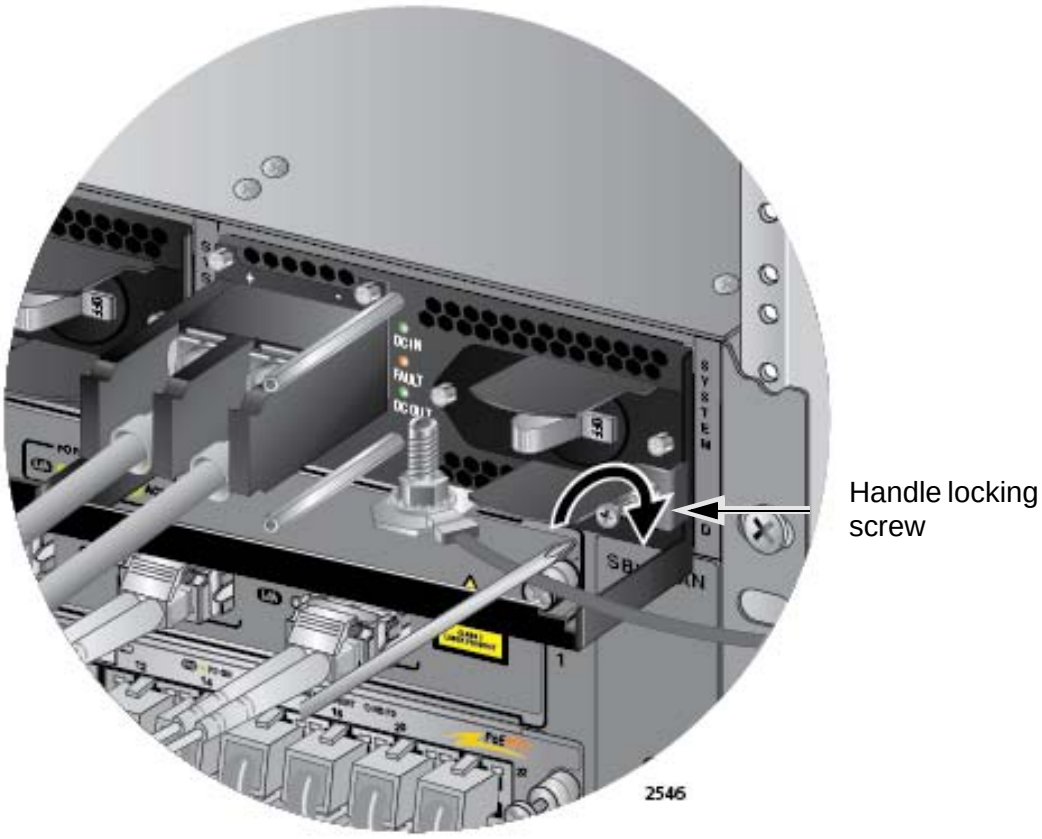


Figure 135. Tightening the Handle Locking Screw

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 122 on page 183.

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 122 on page 183.

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 200.

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 136.

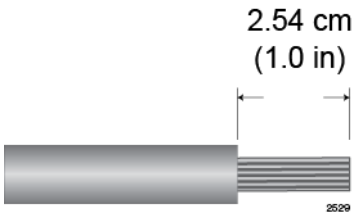


Figure 136. Stripping Solid or Stranded DC Power Wires

2. Verify that the On/Off switch on the AT-SBxPWRSYS1 DC Power Supply is on the Off position. Refer to Figure 122 on page 183.

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 123 on page 184. 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 124 on page 185.

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 137 on page 197 shows the wire above the terminal block. Allied Telesis recommends tightening the screw to 30 to 40 inch-lbs.

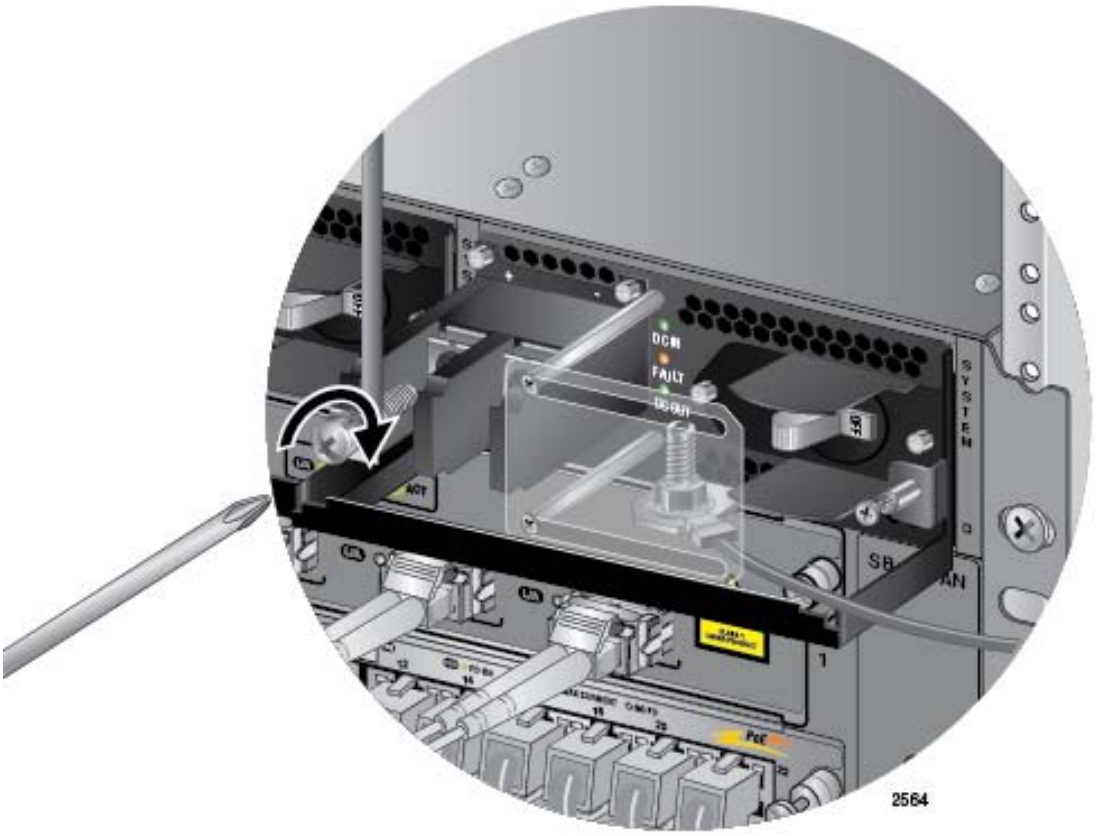


Figure 137. Connecting the Positive Wire

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 138 on page 198. The negative terminal is on the right.

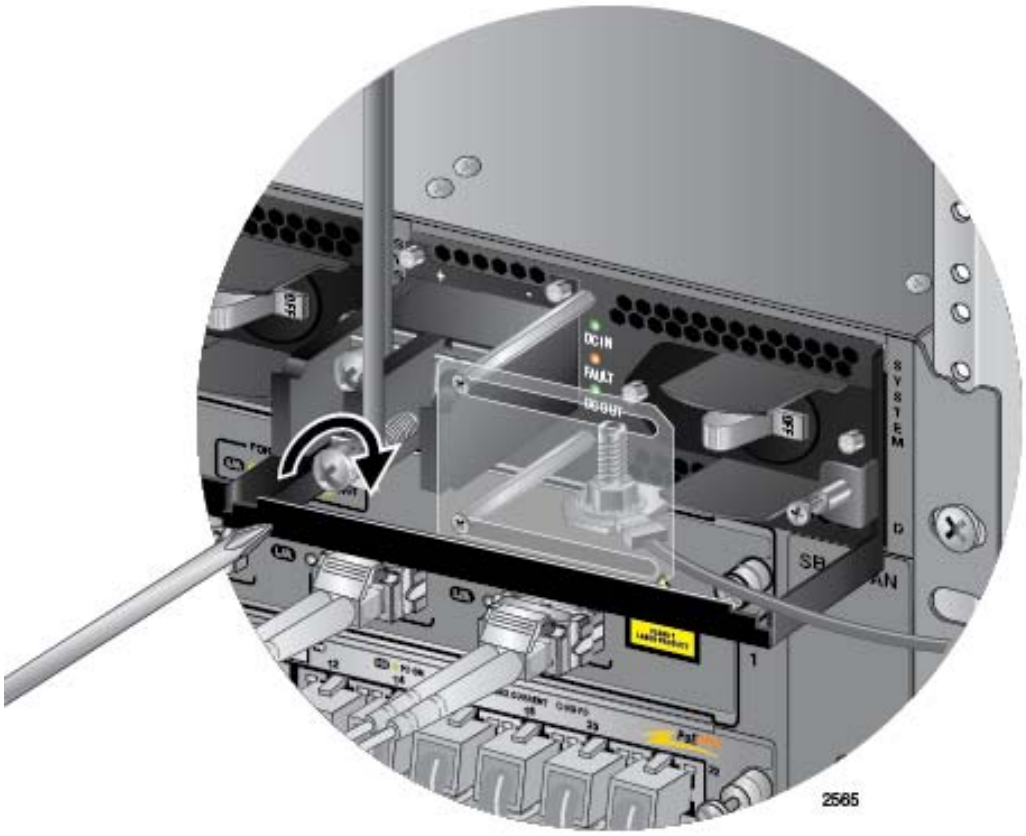


Figure 138. Connecting the Negative Lead Wire

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 127 on page 188. 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 128 on page 189.

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 122 on page 183.

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 200.

Monitoring the Initialization Process

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

- Configuration 1: Chassis with one control card.

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

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

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

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

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

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

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

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

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

Table 25. Switch Initialization Phases

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

Using the LEDs to Monitor the Initialization Process

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

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

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

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

Using the Console Port to Monitor the Initialization Process

Another way to monitor the initialization process of the chassis is to connect a terminal or PC with a terminal emulator program to the Console port on the control card and watch the status messages. (The settings for the terminal or terminal emulator program are found in “Starting a Local Management Session” on page 208.) Figure 139 here and Figure 140 on page 203 illustrate the messages. The chassis has completed phase 1 when it displays the “Username” prompt. To monitor phases 2 and 3, log in to the switch and use the SHOW CARD command. For instructions, refer to the Software Reference for SwitchBlade x3100 Series Switches.

```
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@

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

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

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


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


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


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

Figure 139. Switch Initialization Messages

```
Loading vxWorks.bin.gz...(10152360 bytes)
Starting at 0x10000...
Attaching interface lo0...done

Adding 49667 symbols for standalone.

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

                        ;@ @@@@@@@@@@@@@@@@@@  ====
                      ,;@@@@ @@@@@@@@@@@@@@@@" ========
                     ;@@@@@@@@   @@@@@@@@" ,@ ========
                   ,;@@@@@@@@@@@ @@@@@@@" ,@@@ ========
                  ;@@@@@@@@@@@@@@@ @@@@;" ,@@@@@@ ====,
              ,;@@@@@@@@@@" ;@@@@@ @@"  @@@@@@@@@@@@"
             @@@@@@@@@@@"    "@@@@@ " @@@@@@@@@@@@@"

                          Allied Telesis, Inc.

ATI 200G Central Fabric Controller
    Version 15.1.0.GAMMA.20111109 (Customer-Release Build)
    Created on Wed 11/09/2011 at 06:19 PM
    Copyright Allied Telesis Inc., 2009

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

Memory Size: 511 MB

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

System Time is 2012-02-14 13:13:36.429
Last reset occurred due to a power interruption.
System initializing...
/tffs/  - Volume is OK

User Access Verification

Username:
```

Figure 140. Switch Initialization Messages (Continued)

Chapter 10

Verifying the Hardware Operations of the Chassis

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

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, or AT-SBxPWRPOE1 AC Power Supply: 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 214 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 216 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 it 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 2 of the chassis is operating normally when the SBx Status 2 LED is solid green. For troubleshooting suggestions, refer to “Ethernet Line Cards” on page 218.

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 220 and “Fiber Optic Transceivers” on page 224 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 17 on page 39 and described in Table 8 on page 39. 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 222 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 confirm the hardware operations with the command line commands.

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:

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

Starting a Local Management Session

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

1. Connect the RJ-45 end of the management card included with the AT-SBx31CFC Controller Fabric Card to the Console RS-232 port on the front panel of the AT-SBx31CFC Card, as shown in Figure 141. 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.

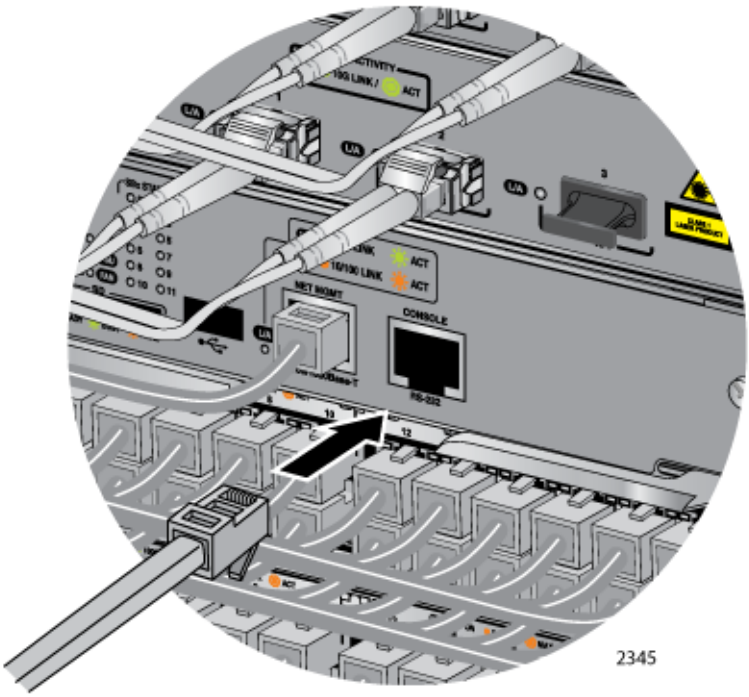


Figure 141. Connecting the Management Cable to the Console RS-232 Port

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 142. 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 214 or “AT-SBxPWRSYS1 DC System Power Supply” on page 216 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 142. 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 143. If the state of the fan module is something other than UP-UP-ONLINE, power off the chassis and contact your Allied Telesis representative for assistance. Do not operate the chassis without a fully operational fan unit.

```
SHOW FANMODULE


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

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

Figure 143. 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 144. 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 218 or “AT-SBx31CFC Controller Fabric Card” on page 226 for troubleshooting suggestions.

```
SHOW CARD


--- Card Information ---


      Prov
Slot  Card Type    State                  Faults
----  ---------    -------------------    ------
0     GE24RJ       UP-UP-Online           -
1     GE24RJ       UP-UP-Online           -
2     GE24RJ       UP-UP-Online           -
3     GE24RJ       UP-UP-Online           -
4     CFC200       UP-UP-Online (Active)  -
5     -            -                      -
```

Figure 144. 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 67 on page 131.) For troubleshooting information, refer to “AT-SBx31CFC Controller Fabric Card” on page 226.

4. 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 222 for troubleshooting suggestions.

5. If the components of the chassis are operating normally, you are ready 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.

Chapter 11
Troubleshooting

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

> **Note**
> If you are unable to resolve a hardware problem with 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

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 slot in the chassis. The AT-SBxPWRPOE1 Power Supply uses slots A and B and the AT-SBxPWRSYS1 and AT-SBxPWRSYS2 Power Supplies use 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 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 controller 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 230.

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

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 slot in the chassis. The AT-SBxPWRSYS1 DC Power Supply has to be installed in 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 266.
- 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 controller 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 230.

Caution

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

Ethernet Line Cards

A quick and easy way to check the overall heath of the Ethernet line cards in the chassis is by examining the SBx STATUS LEDs on the controller card. (If the chassis has two controller cards, you may use the LEDs on either card.) There are twelve LEDs, numbered 0 to 11. A solid green LED indicates that the card in the corresponding slot is operating normally. The Ethernet line card in slot 2 of the chassis, for example, is operating properly when the SBx STATUS LED 2 on the controller card is solid green.

If you suspect a problem with an Ethernet line card or controller 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 controller 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 controller card. If the LED is flashing amber, the card is initializing its management software. Wait one to two minutes for the card to complete the process. If the LED does not change to green, try installing the line card in a different slot. If the problem remains, the card cannot complete the initialization process. Try installing the card in another chassis with a different controller card.
- If the card's status LED in the SBx STATUS LEDs on the controller card is solid amber, the card might not be able to boot up because the controller card does not have its load file. This can happen if a line card requires a newer version of the management software than what is currently on the controller card. To correct the problem, update the management software on the controller card to the latest release.
- A line card may not boot properly if the load file has not be set correctly with the SET CARD PREFLOAD command on the active master controller card.

Here are some other steps to try:

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

```
officer SEC>> restart card 2

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

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

```
Command has been submitted

officer SEC>>
```

- Try installing the card in a different slot. If it works in the new slot, the problem is with the previous slot.
- Try installing the card in a different chassis. If it works in the new chassis, the problem is with the previous chassis. If the problem persists, the problem is with the card.
- You can obtain card status information with the SwitchBlade x3112 Management Software and the SHOW CARD command, as shown in Figure 144 on page 211.

Twisted Pair Ports

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

- If all of the L/A LEDs on the card are off, try pressing the eco-friendly button on the active master 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 13 on page 54 and Table 14 on page 55 to verify the appropriate categories of twisted-pair cables for the AT-SBx31GT24 and AT-SBx31GP24 Line Cards, respectively.
- Verify that the twisted-pair cable is not faulty by replacing it with a known good cable.
- Make sure that the operating parameters of the port on the line card and the parameters of the end node are compatible.
- Use the SHOW INTERFACE and ENABLE INTERFACE commands to be sure that the port is enabled.

If the L/A LED for a port is green, signalling a link to the network device, but link performance is poor or intermittent, the problem may be from a bad cable. Try replacing the cable, as explained in “Guidelines to Cabling the Twisted Pair Ports on AT-SBx31GP24, AT-SBx31GT24, and AT-SBx31GT40 Line Cards” on page 144.

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 Aut-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 on the ports. 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 card 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. The ports on the line card have two LEDs each. 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 controller 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 214.
- 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 14 on page 55.
- Try replacing the twisted-pair cable, as explained in “Guidelines to Cabling the Twisted Pair Ports on AT-SBx31GP24, AT-SBx31GT24, and AT-SBx31GT40 Line Cards” on page 144.
- 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 controller card to turn on the LEDs.
- Check that the fiber optic transceiver is firmly inserted into the slot on the line card.
- Check that both ends of the fiber optic cable are securely connected to the ports on the transceiver and end node.
- Verify that the end node is powered on and operating properly.
- Review the operating specifications of the fiber optic transceiver and end node to verify that the devices have the same speed and duplex mode.
- Check that the operating specifications, including wavelength and maximum operating distance, of the transceiver are compatible with the fiber optic port on the end node.
- Make sure that you are using the appropriate type of fiber optic cable and that the cable length does not exceed the allowed maximum distance. The cable specifications for the transceivers are provided in the installation instructions that ship with the modules.
- Use a fiber optic tester to test 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.
- 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, than the port on the remote network device must transmit at 1310 nm and receive at 1550 nm.

AT-SBx31CFC 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 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 controller card slot, slot 4 or 5, to see if it works in the new 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 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 “Entering the Management Software Commands” on page 209, you might not of removed the battery insulator when you installed the card. (Refer to Figure 69 on page 132.) To confirm this, enter the SHOW CARD with the slot number of the controller card to display additional information: For example, to display information about the controller card in 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-SBx31CFC Controller Fabric Card” on page 253.

Fault Condition 3: 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 208.
- Check to be sure that the terminal emulator application is compatible with a VT-100 terminal.

Fault Condition 4: 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 69 on page 132. 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-SBx31CFC Controller Fabric Card” on page 253.

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 controller 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 controller 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 208.
- 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 controller card to obtain status information from the power supplies. The interfaces are shown in Figure 3 on page 22.

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

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

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

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

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

1. Check that there are power supplies in the corresponding slots in the front panel and that the power supplies are powered on. (The Power LED on an interface is off when the slots are empty or the power supplies are not powered on.)

2. Inspect the LEDs on the power supplies to check for a fault condition, If there is a fault condition, go to “AT-SBxPWRSYS1, AT-SBxPWRSYS2, or AT-SBxPWRPOE1 AC Power Supply” on page 214 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 controller 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 12

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

This section contains the procedure for removing 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. You do not have to power off the chassis to replace a power supply.

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

1. Disconnect the AC power cord for the failed power supply from the AC power source and the corresponding AC socket on the back panel of the chassis. The figure in Figure 145 on page 233 shows the removal of the power cord from connector D, which corresponds to slot D on the front panel.

Figure 145. 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 146 on page 234.

Figure 146. 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 147 on page 235.

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

Figure 147. 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 105.
   - If you are not installing a new power supply, continue with the rest of this procedure to install a blank slot cover.

5. Place the locking handle on the slot cover in the up position and slide the cover into the empty power supply slot. Refer to Figure 148 on page 236.

Figure 148. Installing a Blank Power Supply Slot Cover

6. Lower the locking handle to secure the slot cover in the slot. Refer to Figure 149 on page 237.

Figure 149. 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.

Note
The power supply is hot swappable. If the unit has two AT-SBxPWRSYS1 DC Power Supplies and one of the units has failed, you do not have to power off the operational power supply to replace the failed unit.

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 110 on page 176.
3. Use a #2 screwdriver to loosen the screw on the locking handle. Refer to Figure 150 on page 239.

Note
Do not lift the locking handle yet.

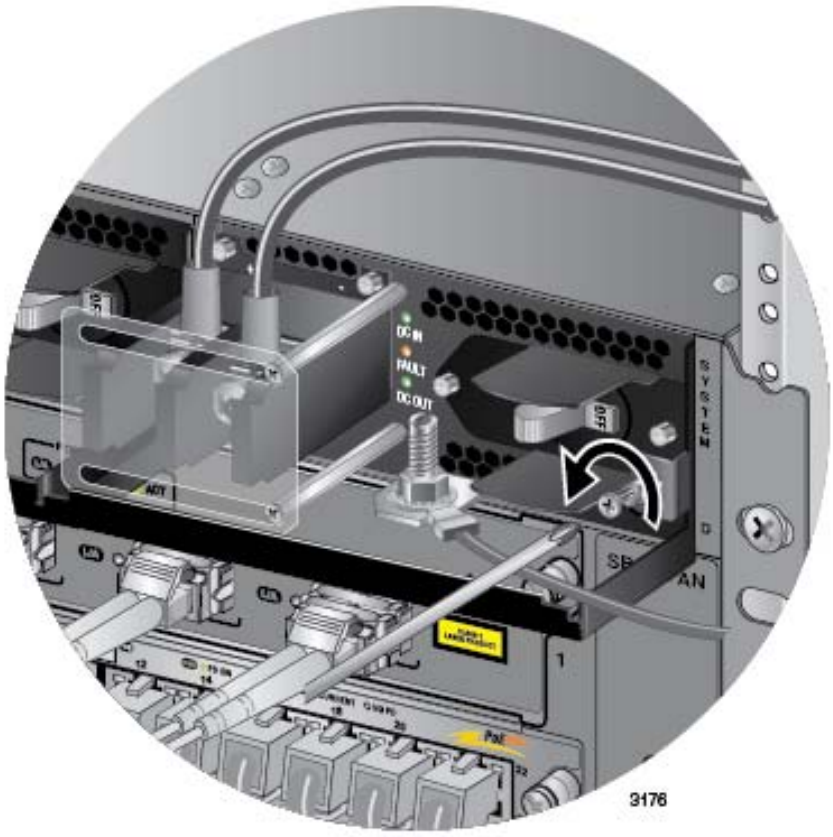


Figure 150. Loosening the Screw on the Locking Handle

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 151 on page 240.

   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.

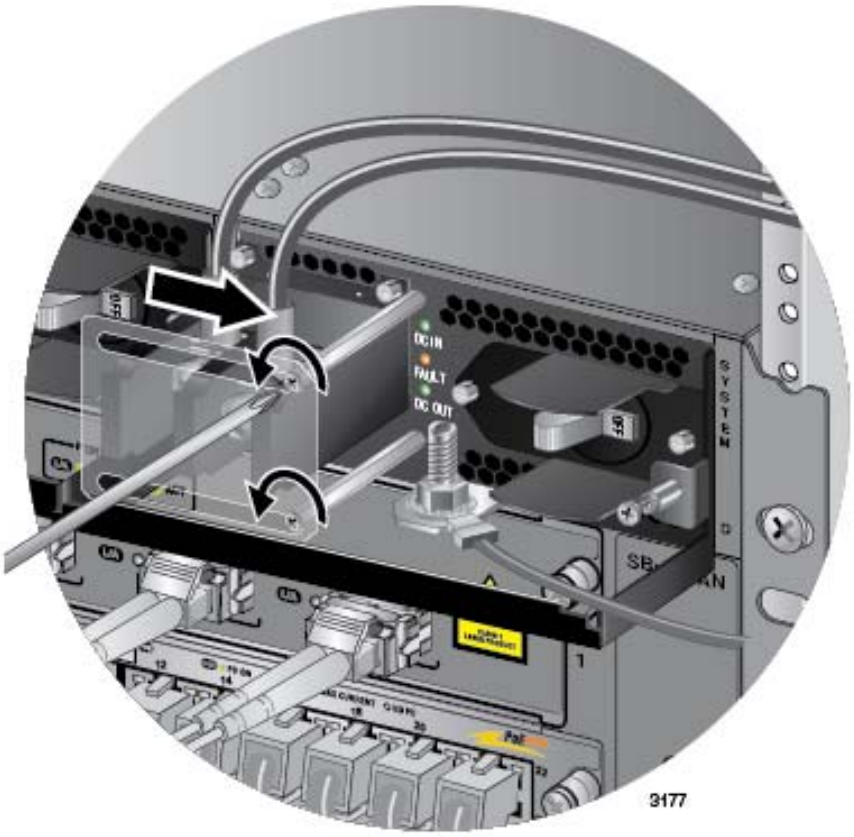


Figure 151. Opening the Plastic Window on the Terminal Block

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 152 on page 241.

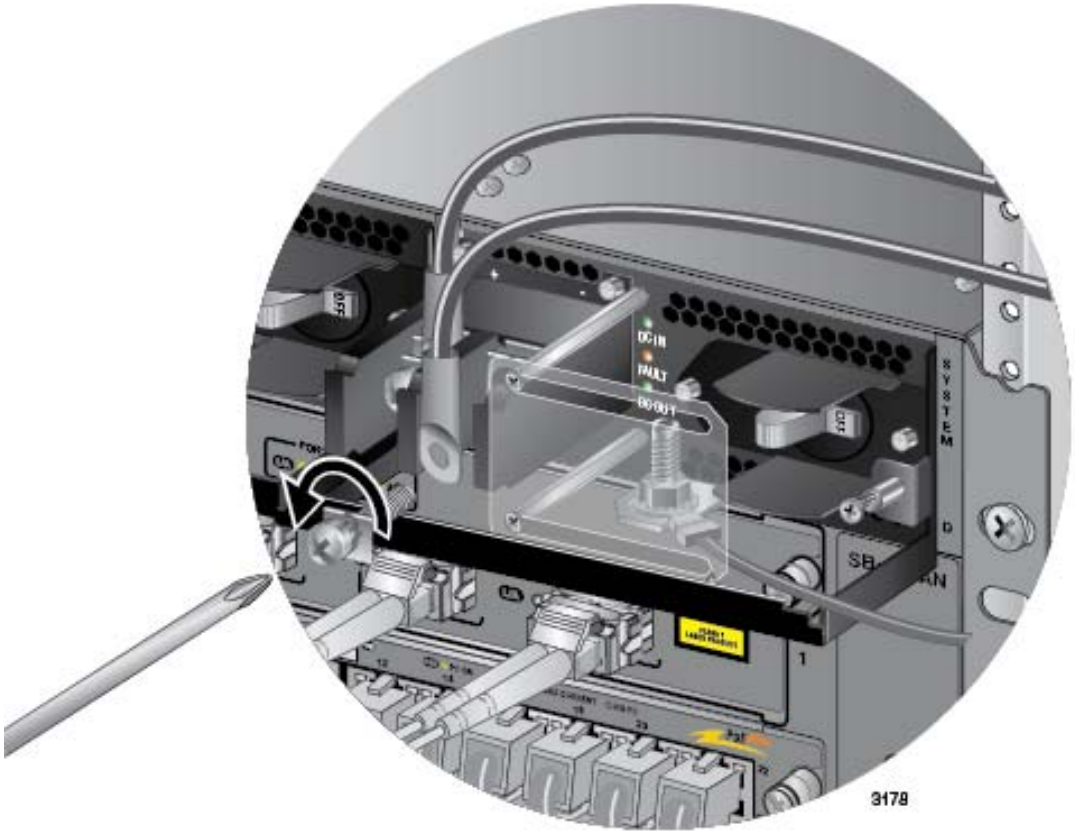


Figure 152. Removing the Negative Lead Wire

6. Use a #3 screwdriver to remove the positive (+) lead wire from the terminal block. Refer to Figure 153 on page 242.

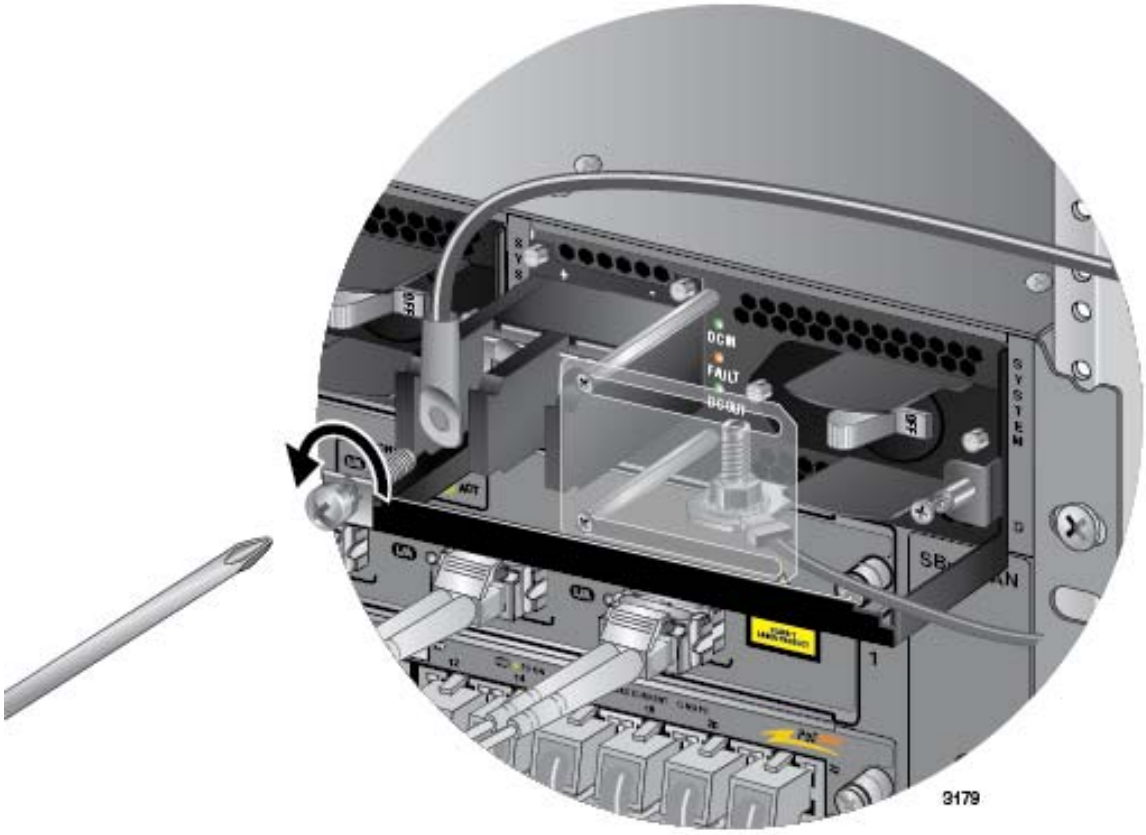


Figure 153. Removing the Positive Lead Wire

7. Reinstall the two screws on the negative (-) and positive (+) terminals. Refer to Figure 154 on page 243.

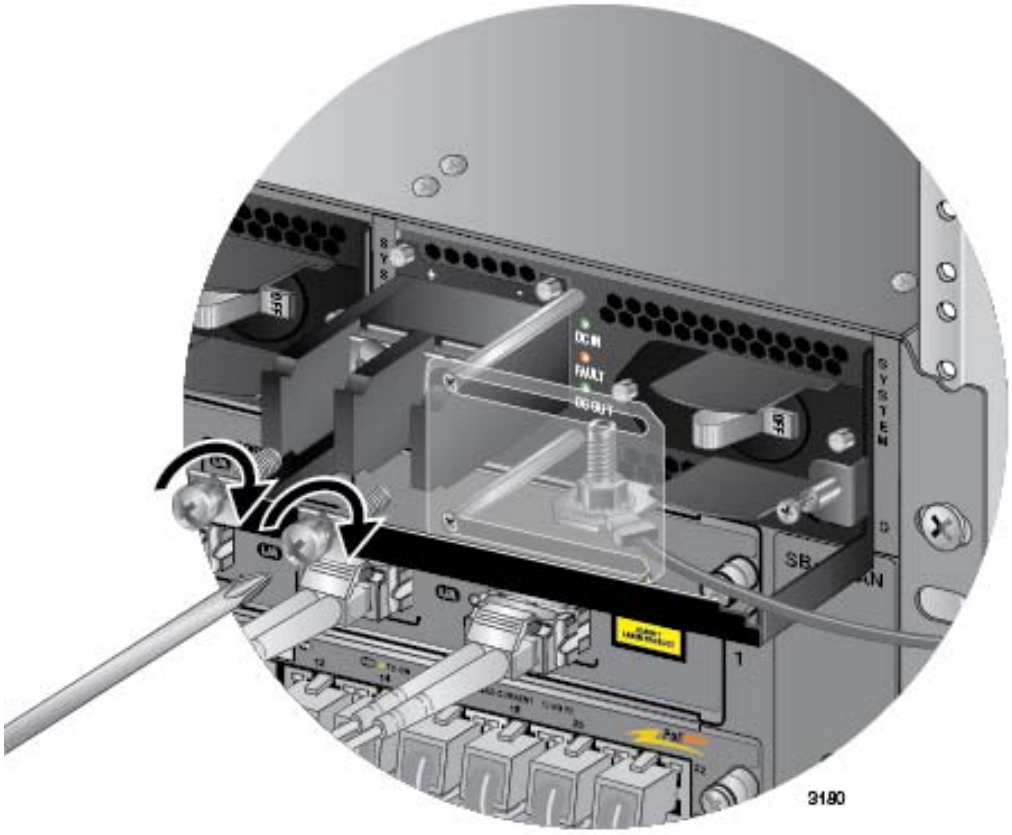


Figure 154. Reinstalling the Screws on the Positive and Negative Terminals

8. Slide the plastic cover to the left and lightly tighten the two screws to secure it in place. Refer to Figure 155 on page 244.

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.

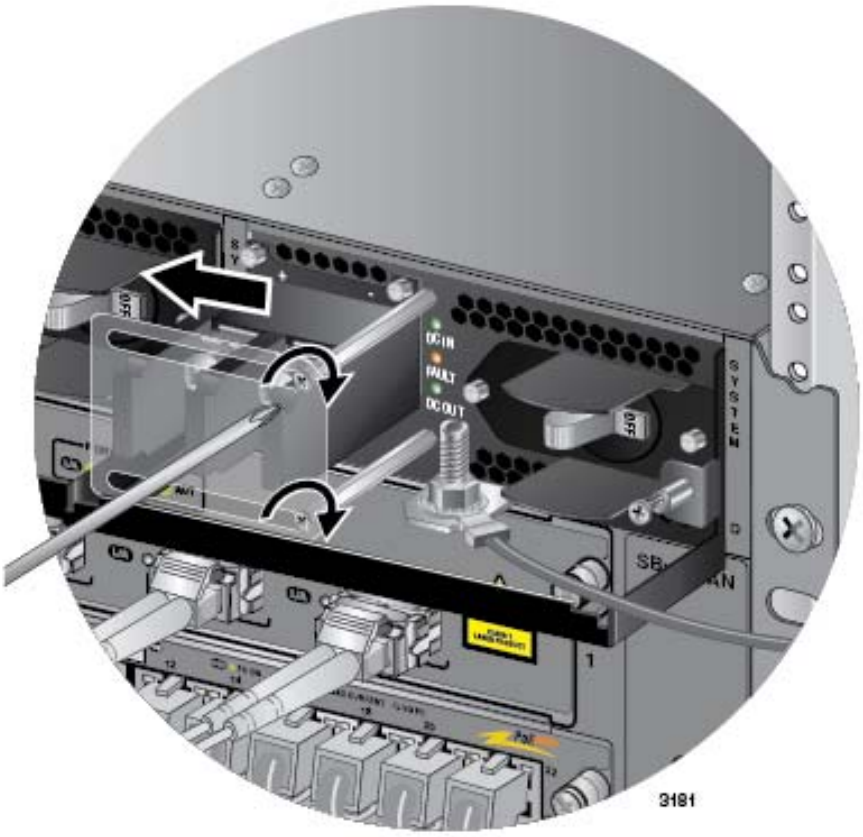


Figure 155. Closing the Plastic Cover

9. Use an 8 mm wrench to remove the grounding wire from the grounding post. Refer to Figure 156 on page 245.

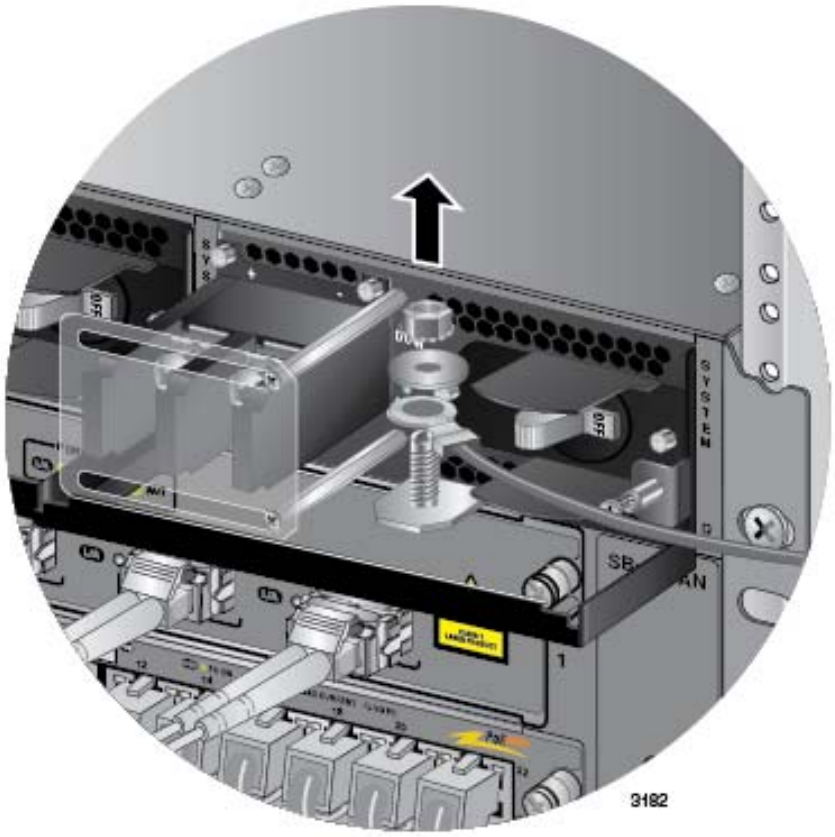


Figure 156. Removing the Grounding Wire

10. Reinstall the nut and washer on the grounding post. Refer to Figure 157 on page 246.

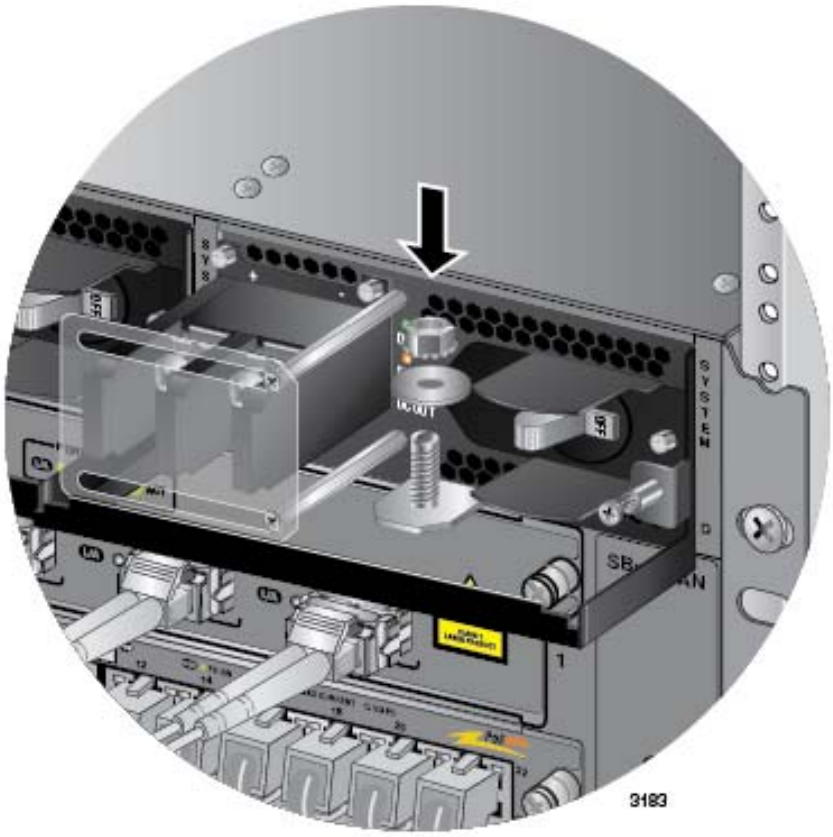


Figure 157. Reinstalling the Nut and Washer on the Grounding Post

11. Lift the locking handle and slide the power supply from the chassis. Refer to Figure 158 on page 247.

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

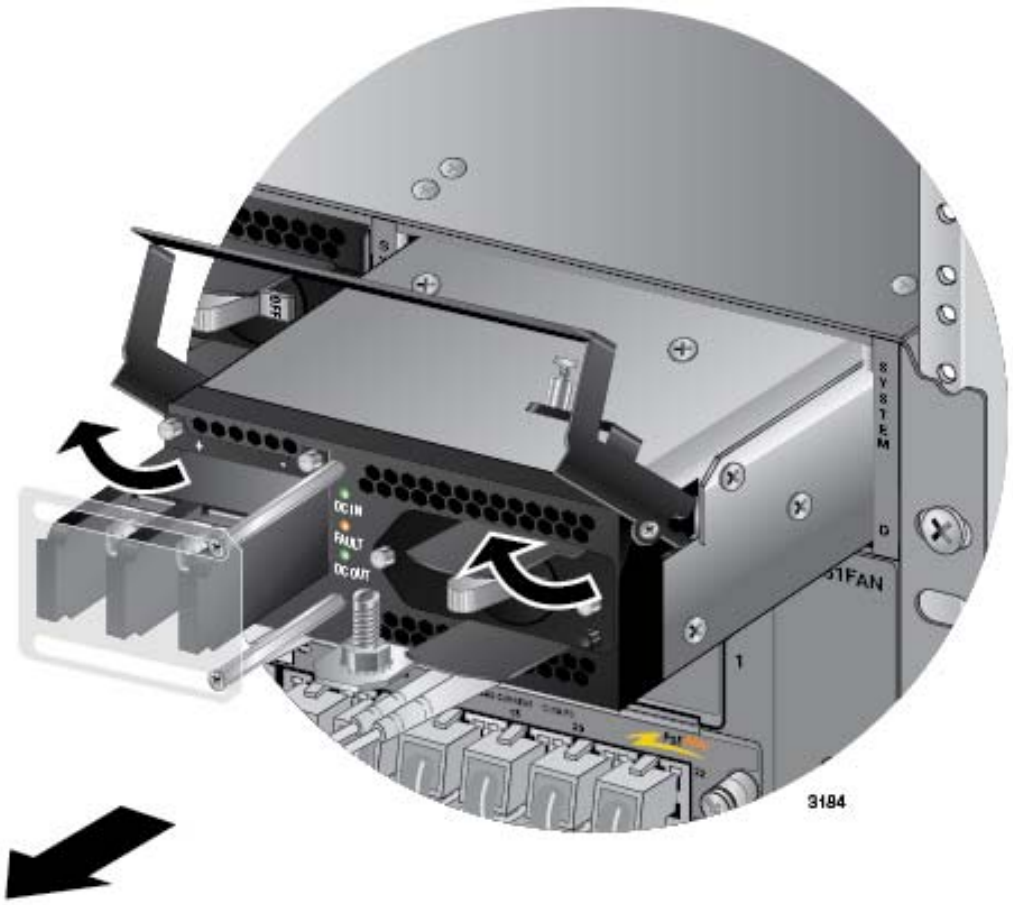


Figure 158. Lifting the Locking Handle and Removing the Power Supply

12. Do one of the following:

    - To install a new power supply, refer to Chapter 6, “Installing the Power Supplies” on page 105.
    - If you are not installing a new power supply, continue with this procedure to install a blank slot cover.

13. Place the locking handle on the slot cover in the up position and slide the cover into the empty power supply slot. Refer to Figure 159 on page 248.

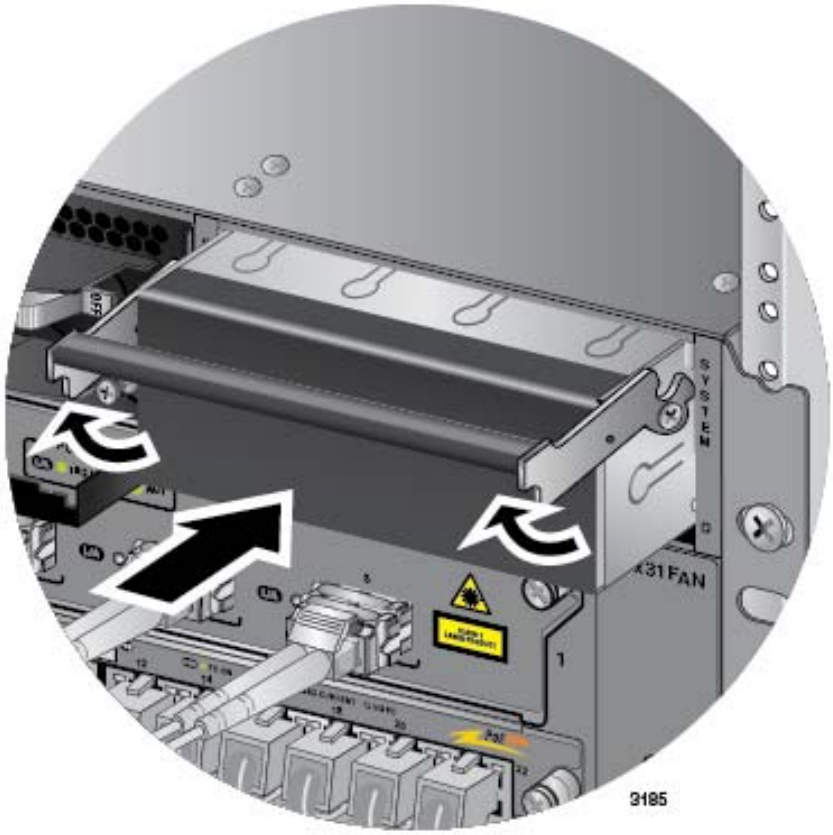


Figure 159. Installing a Blank Power Supply Slot Cover

14. Lower the locking handle to secure the slot cover to the slot. Refer to Figure 160 on page 249.

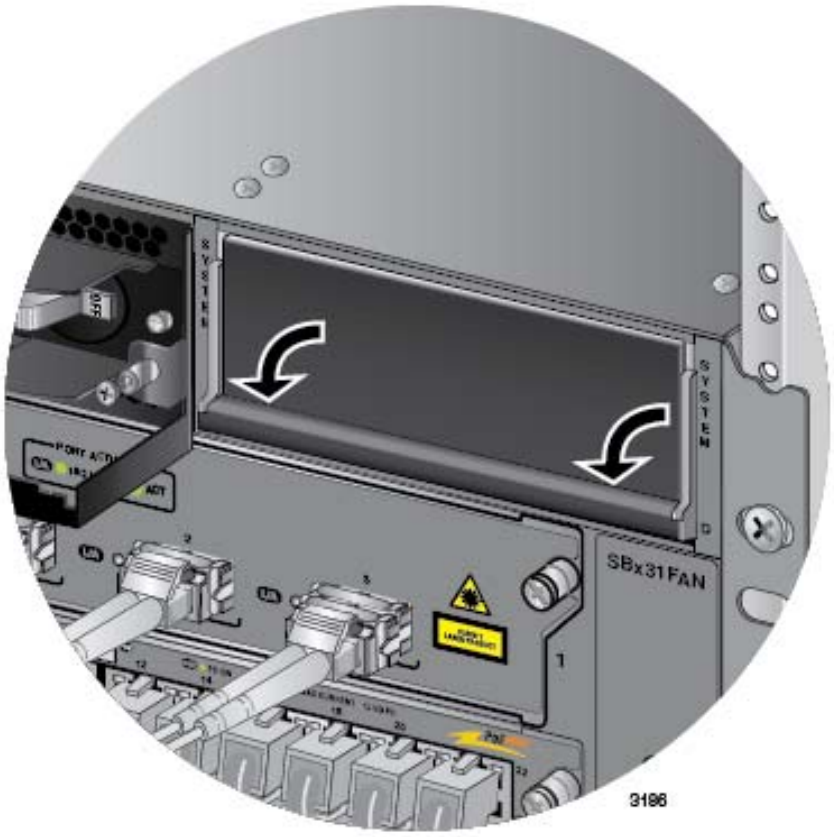


Figure 160. Lowering the Locking Handle on the Power Supply Slot Cover

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 128 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 208.
2. At the command prompt, enter the DISABLE CARD command with the slot number of the card you want to remove. For example, to disable the Ethernet line card in slot 1, you enter:

```
disable 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 64 on page 129.\

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 136.

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 208.

3. At the command prompt, enter the ENABLE CARD command with the slot number of the new card. For example, to enable the Ethernet line card in slot 1, you enter:

```
enable 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 the Transceivers and Cabling the Ports” on page 143.

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 136.

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 208.

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 slot 1, you enter:

```
destroy card=1
```

4. At the command prompt, enter the ENABLE CARD command to enable the slot with the new card. For example, to enable the Ethernet line card in 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 the Transceivers and Cabling the Ports” on page 143.

If you are not replacing the line card at this time, you should cover the slot with a blank cover. For instructions, refer to “Installing the Blank Slot Covers” on page 140.

If you do not plan to install the removed line card in another slot or chassis, store the card in an anti-static bag and return it to its shipping container.

Replacing the AT-SBx31CFC 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 128 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 slot as the failed card or in the other controller card slot. For instructions, refer to “Installing the AT-SBx31CFC Controller Fabric Card” on page 130.
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 208.

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 209. 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 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 208.

4. At the command prompt, enter the DISABLE CARD command to disable the failed controller card: Here is the command:

```
disable card=inactcfc
```

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-SBx31CFC Controller Fabric Card” on page 130.

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:

```
enable card=inactcfc
```

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. Use a #2 Phillips-head screwdriver to loosen the two screws on the faceplate of the card.

3. Carefully pull out the handles of the faceplate to disconnect the controller card from the connector on the backplane of the chassis.

4. 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 64 on page 129.

5. Do one of the following:

   - For instructions on how to install a new controller card in the chassis, refer to “Installing the AT-SBx31CFC Controller Fabric Card” on page 130.
   - If you do not plan to immediately install another controller card in the slot, cover the slot with a blank cover. For instructions, refer to “Installing the Blank Slot Covers” on page 140.
   - If you do not plan to immediately install the controller card in another chassis, continue with this procedure.

6. Store the controller card in an anti-static bag.

7. Return the card to its shipping container.

Replacing the AT-SBxFAN12 Fan Module

This section contains the procedures for replacing the AT-SBxFAN12 Fan Module. The module is located in the 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 208.
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 161 on page 257.

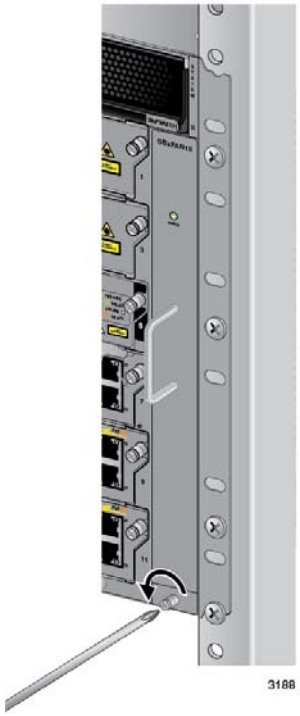


Figure 161. Loosening the Screw on the AT-SBxFAN12 Fan Module

6. Carefully pull on the handle to disconnect the fan module from the connector on the backplane of the chassis. Refer to Figure 162.

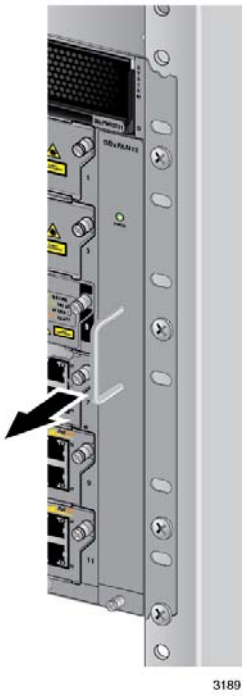


Figure 162. Loosening the AT-SBxFAN12 Fan Module from the Backplane Connector

7. Slowly pull the module out 25 mm (1 in.). Refer to Figure 163.

Warning
The fan module has hazardous moving parts. Keep fingers away from moving fan blades.

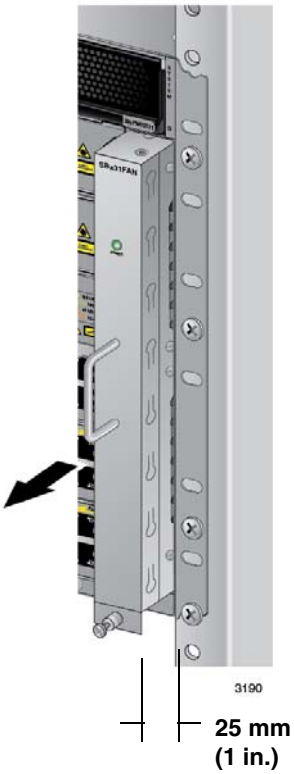


Figure 163. Withdrawing the AT-SBxFAN12 Fan Module 25 mm (1 in.) from the Chassis

8. Wait ten seconds for the fans to stop.

9. After the fans have stopped, slide the module from the chassis. Refer to Figure 164 on page 259.

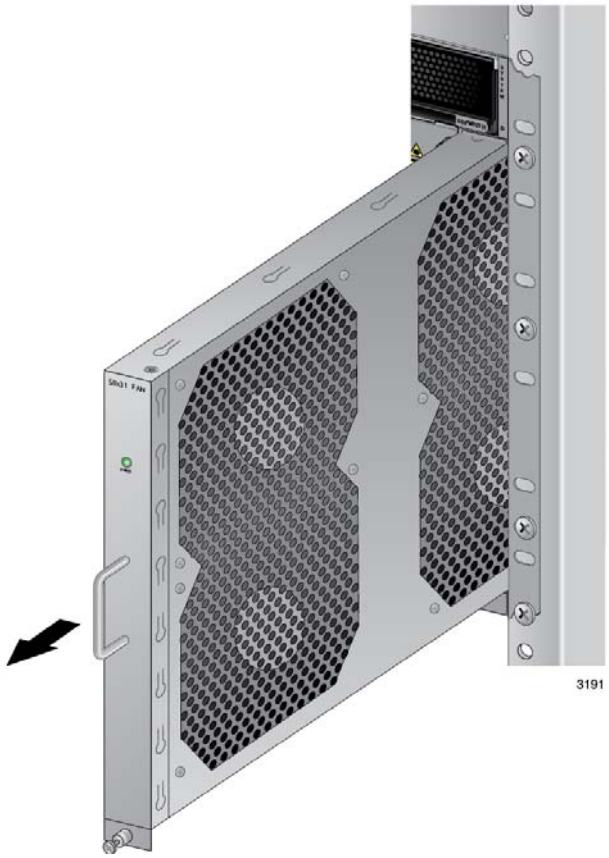


Figure 164. Removing the AT-SBxFAN12 Fan Module from the Chassis

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 256. 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 slot in the chassis. Refer to Figure 165 on page 260.

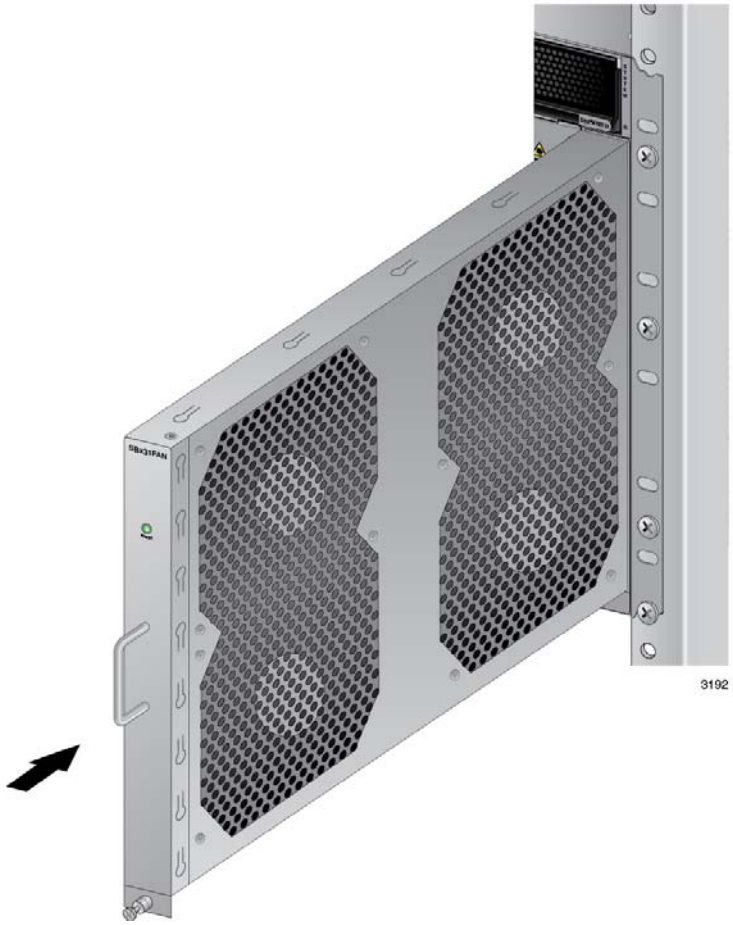


Figure 165. Installing a New AT-SBxFAN12 Fan Module

2. When you feel the fan module make contact with the connector on the backplane, gently press on the top and bottom of the faceplate to seat the module on the connector. Refer to Figure 166 on page 261.

Figure 166. 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 167.

Figure 167. 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 208.
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

Physical Specifications

Dimensions (W x D x H)

Table 26. Product Dimensions

AT-SBx3112 Chassis	48.03 cm x 38.79 cm x 31.01 cm 18.91 in x 15.27 in x 12.21 in)
AT-SBxPWRSYS1 AC System Power Supply	10.16 cm x 32.21 cm x 4.34 cm (4.00 in x 12.68 in x 1.71 in)
AT-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-SBx31CFC Controller Fabric Card	20.67 x 31.32 cm x 4.06 cm (8.14 in x 12.33 in x 1.6 in)

Weight (Kilograms)

Table 27. Product Weights

AT-SBx3112 Chassis	17.77 kg (39.10 lb) with 3 PSU and 10 Line Card blank panels

Table 27. Product Weights (Continued)

AT-SBx31GT24 Line Card	0.93 kg (2.05 lb)
AT-SBx31GT40 Line Card	1.04 kg (2.30 lb)
AT-SBx31GP24 PoE Line Card	1.06 kg (2.34 lb)
AT-SBx31GS24 SFP Line Card	1.06 kg (2.34 lb)
AT-SBx31GC40 Line Card	1.11 kg (2.45 lb)
AT-SBx31XZ4 XFP Line Card	0.82 kg (1.80 lb)
AT-SBx31XS6 SFP+ Line Card	1.06 kg (2.34 lb)
AT-SBx31CFC Controller Fabric Card	1.09 kg (2.04 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 28. Environmental Specifications

Operating Temperature	-0° C to 40° C (32° F to 104° F)
Storage Temperature	-25° C to 70° C (-13° F to 158° F)
Operating Humidity	5% to 90% non-condensing
Storage Humidity	5% to 95% non-condensing
Operating Altitude Range	Up to 3,000 m (9,843 ft)
Acoustic Noise	75.7 dB

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

Table 29. Acoustic Noise Test Components

Product	Quantity
AT-SBx3112 Chassis	1
AT-SBx31CFC 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 30. 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 31. DC Voltage Requirement

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

Typical power savings in eco-friendly mode (Watts)

Table 32. Typical Power Savings in eco-friendly Mode

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

Maximum power consumption (Watts)

Table 33. Maximum Power Consumption

AT-SBx31GT24	34.4 W
AT-SBx31GT40	53.9 W

Table 33. Maximum Power Consumption (Continued)

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-SBx31CFC	48.3 W

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

Table 34. Maximum Power Efficiency

AT-SBxPWRSYS1 AC	Up to 90%
AT-SBxPWRSYS2 AC	Up to 85%
AT-SBxPWRPOE1	Up to 90%
AT-SBxPWRSYS1 DC	Up to 90%

Heat dissipation (British Thermal Units/hour)

Table 35. Heat Dissipation

AT-SBx31GT24	146.72 BTU/hr
AT-SBx31GT40	183.74 BTU/hr
AT-SBx31GP24	146.72 BTU/hr
AT-SBx31GS24	240.13 BTU/hr
AT-SBx31GC40	272.8 BTU/hr
AT-SBx31XZ4	206.01 BTU/hr
AT-SBx31XS6	233.73 BTU/hr
AT-SBx31CFC	206.01 BTU/hr
AT-SBxPWRSYS1 AC	5118.21 BTU/hr
AT-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 36. Available Power Over Ethernet with One PoE Power Supply

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

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

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

PoE Mode

Table 38. PoE Mode

IEEE 802.3af / IEEE 802.3at:	Alternative Mode A

Safety and Electromagnetic Emissions Certifications

Safety and Electromagnetic Emissions:

Table 39. Safety and Electromagnetic Emissions

EMI/RFI	FCC Class A, EN55022 Class A, EN61000-3-2, EN61000-3-3, CISPR Class A, VCCI Class A, AS/NZS Class A
Immunity	EN55024
Electrical Safety	EN60950-1 (TUV), UL60950-1 ($_{c}UL_{us}$), EN60825
Safety Agency Approvals	$_{c}UL_{us}$, TUV, C-TICK, CE

Port Pinouts

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

Figure 168 illustrates the pin layout for RJ-45 and RJ point 5 ports.

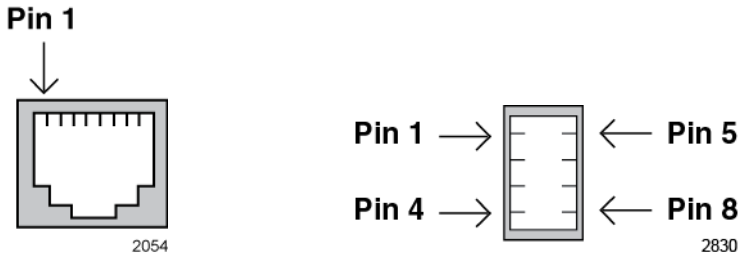


Figure 168. Pin Numbers for the RJ-45 and Point 5 Ports (Front View)

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

Table 40. MDI Pin Signals (10Base-T or 100Base-TX)

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

Table 41 lists the port pin signals for the MDI-X configuration.

Table 41. MDI-X Pin Signals (10Base-T or 100Base-TX)

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

Table 42 lists the port pin signals when a 10/100/1000Base-T port is operating at 1000Mbps.

Table 42. 1000Base-T Connector Pinouts

Pin	Pair	Signal
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-