SwitchBlade x908 GEN2 (SBx908 GEN2) Switch

Advanced Layer 3+ Modular Switch
AlliedWare Plus™ v5.4.9-2

SBx908 GEN2 Chassis

XEM2-8XSTm Ethernet Line Card

XEM2-12XT Ethernet Line Card

XEM2-12XTm Ethernet Line Card

XEM2-12XS Ethernet Line Card

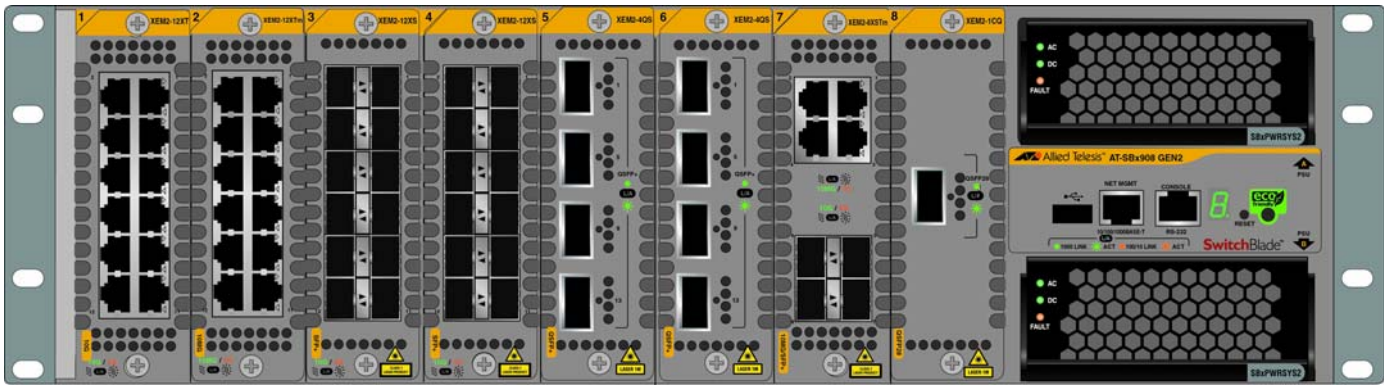
XEM2-4QS Ethernet Line Card

XEM2-1CQ Ethernet Line Card

FAN08 Fan Module

SBxPWRSYS2 AC Power Supply

SBxPWRSYS1-80 DC Power Supply



Installation Guide for Virtual Chassis Stacking

613-002595 Rev. D

Electrical Safety and Emissions Standards

This product meets the following standards.

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

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

RFI Emissions: FCC Class A, CISPR 22 Class A, EN55032 Class A, VCCI Class A, ICES-003 Class A, RCM

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

EMC (Immunity): EN55024, EN61000-3-2, EN61000-3-3

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

 Laser Safety EN60825

RoHS: RoHS6

Translated Safety Statements

Important: Safety statements that have the symbol are translated into multiple languages in the *Translated Safety Statements* document at **www.alliedtelesis.com/library**.

Remarque: Les consignes de sécurité portant le symbole sont traduites dans plusieurs langues dans le document *Translated Safety Statements,* disponible à l'adresse **www.alliedtelesis.com/library**.

Contents

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Preface

This guide contains the installation instructions for the SBx908 GEN2 advanced modular, Layer 3 Ethernet switch. The instructions explain how to build a virtual stack of up to four units with the Virtual Chassis Stacking (VCStack) feature. For instructions on how to install the switch as a stand-alone device, refer to the SBx908 GEN2 Installation Guide for Stand-alone Switches.

This preface contains the following sections:

Document Conventions

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.

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.
- USA and EMEA phone support — Select the phone number that best fits your location and customer type.
- Hardware warranty information — Learn about Allied Telesis warranties and register your product online.
- Replacement Services — Submit a Return Merchandise Authorization (RMA) request via our interactive support center.
- Documentation — View the most recent installation and user guides, software release notes, white papers, and data sheets for your products.
- Software Downloads — Download the latest software releases for your managed products.

For sales or corporate information, go to **www.alliedtelesis.com/purchase** and select your region.

Chapter 1
Overview

The chapter contains the following sections:

Overview

The SBx908 GEN2 Switch is an advanced Layer 3+ modular switch. The main features are listed here.

SBx908 GEN2 Chassis

The chassis has the following hardware features:

- 3RU height
- Eight slots for XEM2 Ethernet line cards
- Each line card slot has 160Gbps connectivity over the backplane.
- The unit supports two power supplies for primary and redundant power.
- The chassis comes with two pre-installed brackets for a standard 19-inch equipment rack.
- The unit comes with two pre-installed fan modules, providing front-to-back airflow.
- The line cards, power supplies, and fan modules are hot-swappable.

XEM2 Ethernet Line Cards

The XEM2 Ethernet line cards are listed here:

- XEM2-8XSTm Card features four 100Mbps and 1/2.5/5/10Gbps twisted pair ports with RJ-45 connectors and four ports for 1Gbps SFP or 10Gbps SFP+ transceivers.
- XEM2-12XT Card features 12 100Mbps and 1/10Gbps, twisted pair ports with RJ-45 connectors.
- XEM2-12XTm Card features 12 100Mbps and 1/2.5/5/10Gbps, twisted pair ports with RJ-45 connectors.
- XEM2-12XS Card features 12 ports for 1Gbps SFP or 10Gbps SFP+ transceivers.
- XEM2-4QS Card features four ports for 40Gbps QSFP+ transceivers.
- XEM2-1CQ Card features one port for a 100Gbps QSFP28 transceiver.

Ethernet line cards are ordered separately. Refer to the product data sheet on the Allied Telesis web site for a list of approved transceivers.

Management Software and Interfaces

Here are the management software and interfaces:

- AlliedWare Plus management software
- Command line interface, available locally through the Console port or remotely over the network.

- Web browser interface available remotely over the network.

The AlliedWare Plus management software comes pre-installed on the chassis.

Management Methods

You can manage the switch as follows:

- Command line interface accessed locally through the Console port or remotely using Telnet or Secure Shell.
- Web browser interface accessed remotely using HTTP.
- Remote access with SNMPv1, v2c, or v3.

Management Panel

The pre-installed management panel has the following features:

- Console RS-232 port for local management (no IP address required),
- USB 2.0 port for storing backup copies of system configuration files, transferring management software among units, and other management functions.
- An eco-friendly button for turning off the system LEDs to reduce power consumption.
- Network management port for initial configuration and maintenance access to the switch.
- Switch reset button.

Power Supplies

The chassis has slots for two power supplies. A single power supply can support a full chassis. Adding a second power supply provides power redundancy. Power supplies are ordered separately. Refer to“Power Supplies” on page 43.

SBx908 GEN2 Chassis

The front panel of the SBx908 GEN2 Chassis is shown in Figure 1.

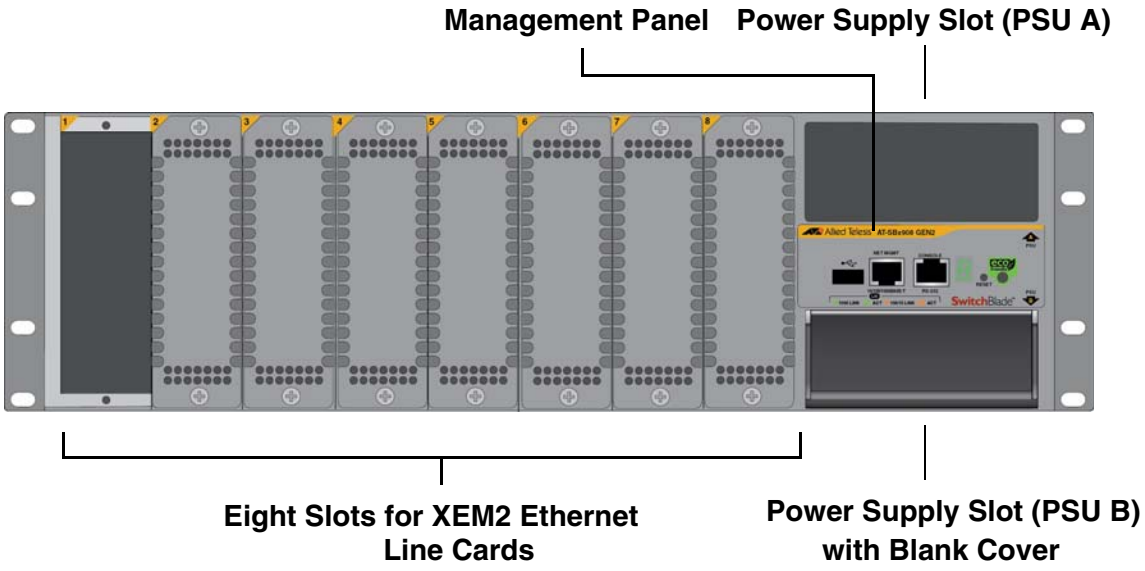


Figure 1. Front Panel of the SBx908 GEN2 Chassis

Note
The switch comes with slot covers on line card slots 2 to 8. Do not remove the slot covers 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 line card slot covers.

The rear panel is shown in Figure 2.

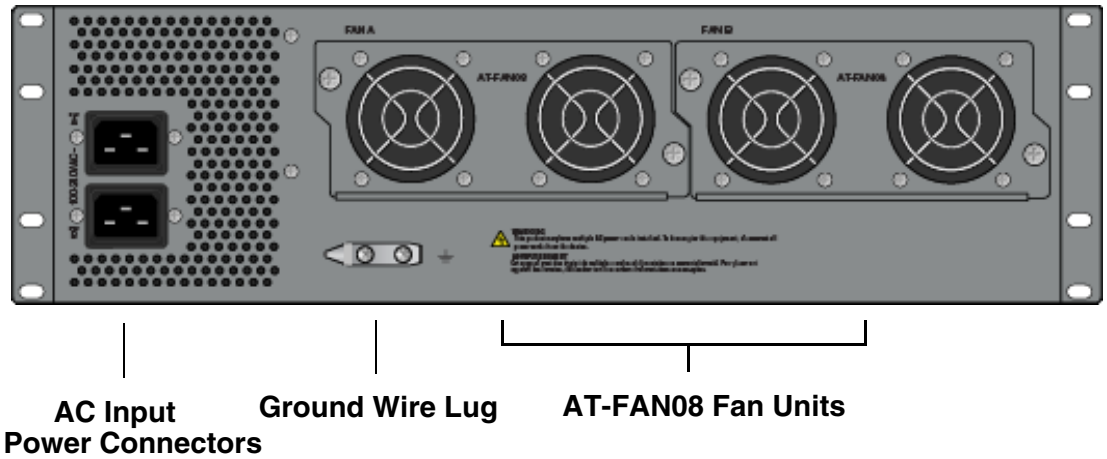


Figure 2. Rear Panel of the SBx908 GEN2 Chassis

XEM2 Ethernet Line Cards

The XEM2 Ethernet line cards are shown in Figure 3 and briefly described in Table 1.

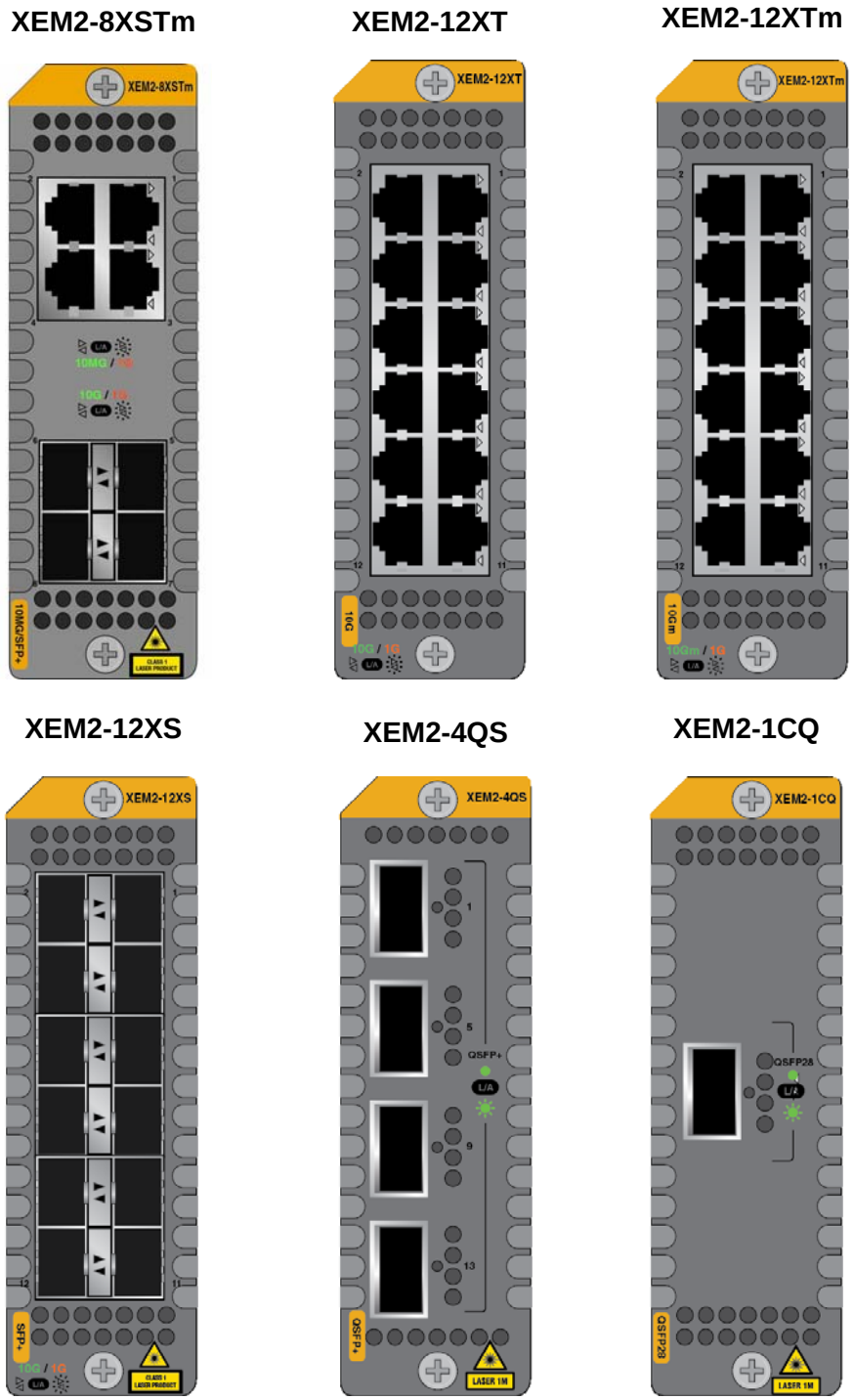


Figure 3. XEM2 Ethernet Line Cards

Table 1. XEM2 Series Line Cards

Line Card	Description
XEM2-8XSTm	Four twisted pair ports (1-4) with RJ-45 connectors that support the following speeds: - 100Mbps - 1/2.5/5/10Gbps Four ports (5-8) that support the following types of transceivers and cables: - 1Gbps SFP - 10Gbps SFP+ - 10Gbps one meter SP10TW1, three meter SP10TW3, and seven meter SP10TW7 direct connect twinax cables
XEM2-12XT	12 twisted pair ports with RJ-45 connectors that support the following speeds: - 100Mbps - 1/10Gbps
XEM2-12XTm	12 twisted pair ports with RJ-45 connectors that support the following speeds: - 100Mbps - 1/2.5/5/10Gbps
XEM2-12XS	12 ports that support the following types of transceivers and cables: - 1Gbps SFP - 10Gbps SFP+ - 10Gbps one meter SP10TW1, three meter SP10TW3, and seven meter SP10TW7 direct connect twinax cables
XEM2-4QS	Four ports for 40Gbps QSFP+ transceivers or 40Gbps QSFPCU direct connect cables.

Table 1. XEM2 Series Line Cards (Continued)

Line Card	Description
XEM2-1CQ	One port for the 100Gbps QSFP28 transceiver.

Please review the following:

- The XEM2-8XSTm Card requires AlliedWare Plus v5.4.9-2 or later.
- The 100Mbps port speed on the XEM2-12XT Card requires AlliedWare Plus v5.4.9-0 or later.
- The XEM2-12XTm Card requires AlliedWare Plus v5.4.9-0 or later.

For more information, refer to “Software and Hardware Releases” on page 48.

XEM2-8XSTm Line Card

The XEM2-8XSTm Line Card is shown in Figure 4.

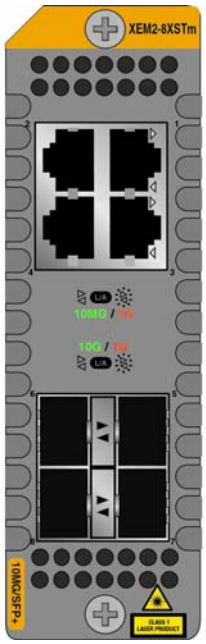


Figure 4. XEM2-8XSTm Line Card

Twisted Pair Ports

The XEM2-8XSTm Card has four twisted pair ports and four SFP ports. The specifications for the twisted pair ports are listed in Table 2.

Table 2. Twisted Pair Ports on the XEM2-8XSTm Line Card

Specification	Description
Port Speed	The ports support the following speeds: - 100Mbps - 1/2.5/5/10Gbps The ports do not support 10Mbps. You can set port speed with Auto-Negotiation or manually. The default is Auto-Negotiation.
Duplex Mode	Full-duplex only.

Table 2. Twisted Pair Ports on the XEM2-8XSTm Line Card (Continued)

Specification	Description
Cabling	Minimum cable requirements are: - 100Mbps - Standard TIA/EIA 568-B-compliant Category 3 unshielded cabling. - 1/2.5/5Gbps - Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) unshielded cabling. - 10Gbps -Standard TIA/EIA 568-C-compliant Category 6a unshielded cabling.
Maximum Distance	100 meters (328 feet)
Connector	8-pin RJ-45

Twisted Pair Port LEDs

Each port has a single LED that displays link and activity information. The states of LEDs are described in Table 3.

Table 3. Link and Activity LEDs for the Twisted Pair Ports on the XEM2-8XSTm Line Card

State	Description
Solid Green	The port has established a 2.5Gbps, 5Gbps, or 10Gbps link to a network device.
Flashing Green	The port is transmitting or receiving data at 2.5Gbps, 5Gbps, or 10Gbps.
Solid Amber	The port has established a 100Mbps or 1Gbps link to a network device.
Flashing Amber	The port is transmitting or receiving data at 100Mbps or 1Gbps.
Off	Possible causes of this state are listed here: - The port has not established a link with another network device. - The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.

Transceiver Ports

The XEM2-8XSTm Card also has four transceiver ports that support the following types of 1Gbps SFP transceivers, 10Gbps SFP+ transceivers and 10Gbps direct connect cables:

- 1Gbps SX or LX SFP fiber optic transceivers
- 10Gbps SR or LR SFP+ fiber optic transceivers
- 10Gbps one meter SP10TW1, three meter SP10TW3, and seven meter SP10TW7 direct connect twinax cables

Guidelines about the SFP+ transceiver ports are listed here:

- The ports do not support 100Mbps transceivers.
- The ports support full-duplex mode only.
- You can set the port speeds with Auto-Negotiation or manually. The default is Auto-Negotiation.

SFP and SFP+ transceivers are purchased separately. For a list of supported transceivers, refer to the SBx908 GEN2 Series data sheet on the Allied Telesis web site.

Transceiver Port LEDs

The ports have link and activity LEDs. The states of the LEDs are described in Table 4.

Table 4. Link and Activity LEDs for the SFP Ports on the XEM2-8XSTm Line Card

State	Description
Solid Green	The transceiver in the slot has established a 10GBase link to a network device.
Flashing Green	The transceiver is transmitting or receiving data at 10GBase.
Solid Amber	The transceiver has established a 1GBase link to a network device.
Flashing Amber	The transceiver is transmitting or receiving data at 1GBase.
Off	Possible causes of this state are listed here: - The transceiver has not established a link with another network device. - The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.

XEM2-12XT Line Card

The XEM2-12XT Line Card is shown in Figure 5.

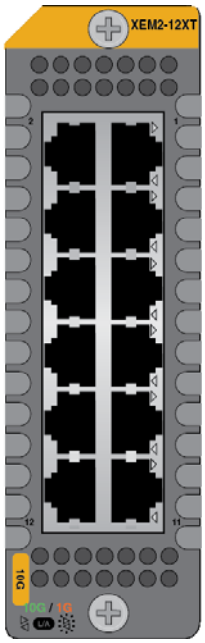


Figure 5. XEM2-12XT Line Card

Twisted Pair Ports

The XEM2-12XT Card has 12 twisted pair ports with standard 8-pin RJ-45 ports. The specifications of the ports are listed in Table 5.

Table 5. Twisted Pair Ports on the XEM2-12XT Line Card

Specification	Description
Port Speed	The ports support the following speeds: - 100Mbps[1] - 1/10Gbps The ports do not support 10Mbps. You can set port speed with Auto-Negotiation or manually. The default is Auto-Negotiation.
Duplex Mode	Full-duplex only

Table 5. Twisted Pair Ports on the XEM2-12XT Line Card (Continued)

Specification	Description
Cabling	Minimum cable requirements are: - 100Mbps - Standard TIA/EIA 568-B-compliant Category 3 unshielded cabling. - 1Gbps - Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) unshielded cabling. - 10Gbps -Standard TIA/EIA 568-C-compliant Category 6a unshielded cabling.
Maximum Distance	100 meters (328 feet)
Connector	8-pin RJ-45

1. Requires AlliedWare Plus v5.4.9-0 or later.

LEDs

Each port has a single LED that displays link and activity information. The states of LEDs are described in Table 6.

Table 6. Link and Activity LEDs on the XEM2-12XT Line Card

State	Description
Solid Green	The port has established a 10GBase link to a network device.
Flashing Green	The port is transmitting or receiving data at 10GBase.
Solid Amber	The port has established a 100Mbps or 1GBase link to a network device.
Flashing Amber	The port is transmitting or receiving data at 100Mbps or 1GBase.
Off	Possible causes of this state are listed here: - The port has not established a link with another network device. - The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.

XEM2-12XTm Line Card

The XEM2-12XTm Line Card is shown in Figure 6.

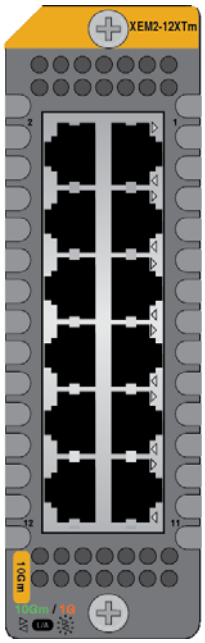


Figure 6. XEM2-12XTm Line Card

Twisted Pair Ports

The XEM2-12XTm Card has 12 twisted pair ports with standard 8-pin RJ-45 ports. The specifications of the ports are listed in Table 7.

Table 7. Twisted Pair Ports on the XEM2-12XTm Line Card

Specification	Description
Port Speed	The ports support the following speeds: - 100Mbps - 1/2.5/5/10Gbps The ports do not support 10Mbps. You can set port speed with Auto-Negotiation or manually. The default is Auto-Negotiation.
Duplex Mode	Full-duplex only.

Table 7. Twisted Pair Ports on the XEM2-12XTm Line Card (Continued)

Specification	Description
Cabling	Minimum cable requirements are: - 100Mbps - Standard TIA/EIA 568-B-compliant Category 3 unshielded cabling. - 1/2.5/5Gbps - Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) unshielded cabling. - 10Gbps -Standard TIA/EIA 568-C-compliant Category 6a unshielded cabling.
Maximum Distance	100 meters (328 feet)
Connector	8-pin RJ-45

LEDs

Each port has a single LED that displays link and activity information. The states of LEDs are described in Table 8.

Table 8. Link and Activity LEDs on the XEM2-12XTm Line Card

State	Description
Solid Green	The port has established a 2.5Gbps, 5Gbps, or 10Gbps link to a network device.
Flashing Green	The port is transmitting or receiving data at 2.5Gbps, 5Gbps, or 10Gbps.
Solid Amber	The port has established a 100Mbps or 1Gbps link to a network device.
Flashing Amber	The port is transmitting or receiving data at 100Mbps or 1Gbps.
Off	Possible causes of this state are listed here: - The port has not established a link with another network device. - The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.

XEM2-12XS Line Card

The XEM2-12XS Line Card is shown in Figure 7.

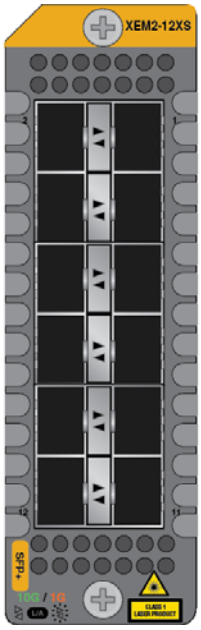


Figure 7. XEM2-12XS Line Card

Transceiver Ports

The XEM2-12XS Card has twelve transceiver ports that support the following types of 1Gbps SFP transceivers, 10Gbps SFP+ transceivers and 10Gbps direct connect cables

- 1Gbps SX or LX SFP transceivers
- 10Gbps SR or LR fiber optic transceivers
- 10Gbps one meter SP10TW1, three meter SP10TW3, and seven meter SP10TW7 direct connect twinax cables with SFP+ transceiver-style connectors
- 1Gbps SPTX transceivers with RJ-45 ports for twisted pair cable
- 1Gbps/10Gbps SP10T transceivers with RJ-45 ports for twisted pair cable

Guidelines about the SFP+ transceiver ports are listed here:

- The card does not support 100Mbps transceivers.
- The card supports full-duplex mode only.
- You can set the port speeds with Auto-Negotiation or manually. The default is Auto-Negotiation.

SFP or SFP+ transceivers must be purchased separately. For a list of supported transceivers, refer to the SBx908 GEN2 Series data sheet on the Allied Telesis web site.

LEDs

The ports have link and activity LEDs. The states of the LEDs are described in Table 9 on page 34.

Table 9. Link and Activity LEDs on the XEM2-12XS Line Card

State	Description
Solid Green	The transceiver in the slot has established a 10GBase link to a network device.
Flashing Green	The transceiver is transmitting or receiving data at 10GBase.
Solid Amber	The transceiver has established a 1GBase link to a network device.
Flashing Amber	The transceiver is transmitting or receiving data at 1GBase.
Off	Possible causes of this state are listed here: - The transceiver has not established a link with another network device. - The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.

XEM2-4QS Line Card

The XEM2-4QS Line Card is shown in Figure 8.

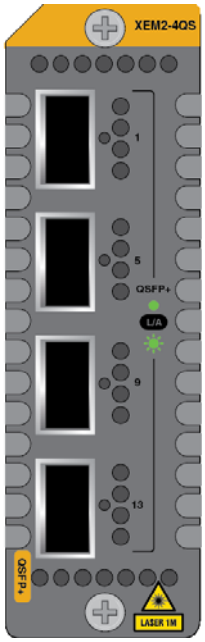


Figure 8. XEM2-4QS Line Card

Transceiver Ports

The XEM2-4QS Line Card has four ports that support the following types of 40Gbps QSFP+ transceiver:

- QSFPSR4 transceiver - Has a maximum operating distance of 150m (492 ft). Requires 12-strand OM4 fiber optic cable.
- QSFPLR4 transceiver - Has an operating range of 2m (6.6 ft) to 10km (6.2 mi). Requires single-mode fiber optic cable.
- QSFP1CU and QSFP3CU direct connect cables in lengths of 1 and 3 meters, respectively

LEDs

The LED states for the ports are described in Table 10.

Table 10. Link and Activity LEDs on the XEM2-4QS Line Card

State	Description
Solid Green	The transceiver has established a 40GBase link to a network device.
Flashing Green	The transceiver is transmitting or receiving data.

Table 10. Link and Activity LEDs on the XEM2-4QS Line Card (Continued)

State	Description
Off	Possible causes of this state are listed here: - The slot is empty. - The transceiver has not established a link to a network device. - The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.

Note

The eight line card slots in the SBx908 GEN2 Switch are divided into four slot groups, with each group consisting of two slots:

- ❒ Group 1 - Line card slots 1 and 2
- ❒ Group 2 - Line card slots 3 and 4
- ❒ Group 3 - Line card slots 5 and 6
- ❒ Group 4 - Line card slots 7 and 8

The bandwidth of a card slot group with two XEM2-4QS Line Cards is slightly less than line-rate when all the traffic packets are 193 bytes or less in size. This limitation is likely to occur only in lab-test scenarios and can be avoided by not installing two XEM2-4QS Line Cards in the same card slot group.

XEM2-1CQ Line Card

The XEM2-1CQ Line Card is shown in Figure 9.

Figure 9. XEM2-1CQ Line Card

Transceiver Port

The XEM2-1CQ Line Card has one transceiver port that supports the following 100Gbps transceivers:

- QSFP28SR4 transceiver - Has a maximum operating distance of 70m (230 ft) or 100m (328 ft) with 12-strand OM3 or OM4 fiber optic cable, respectively. Requires an MPO pluggable optical connector.
- QSFP28LR4 transceiver - Has an operating range of 2m (6.6 ft) to 10km (6.2 mi). Requires single-mode fiber optic cable with a duplex LC connector.

LED

The LED states for the transceiver port on the XEM2-1CQ Line Card are described in Table 11.

Table 11. Link and Activity LED on the XEM2-1CQ Line Card

State	Description
Solid Green	The transceiver has established a link to a network device.

Table 11. Link and Activity LED on the XEM2-1CQ Line Card (Continued)

State	Description
Flashing Green	The transceiver is transmitting or receiving data.
Off	Possible causes of this state are listed here: - The port is empty. - The transceiver has not established a link to a network device. - The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.

Management Panel

The components on the management panel are identified in Figure 10.

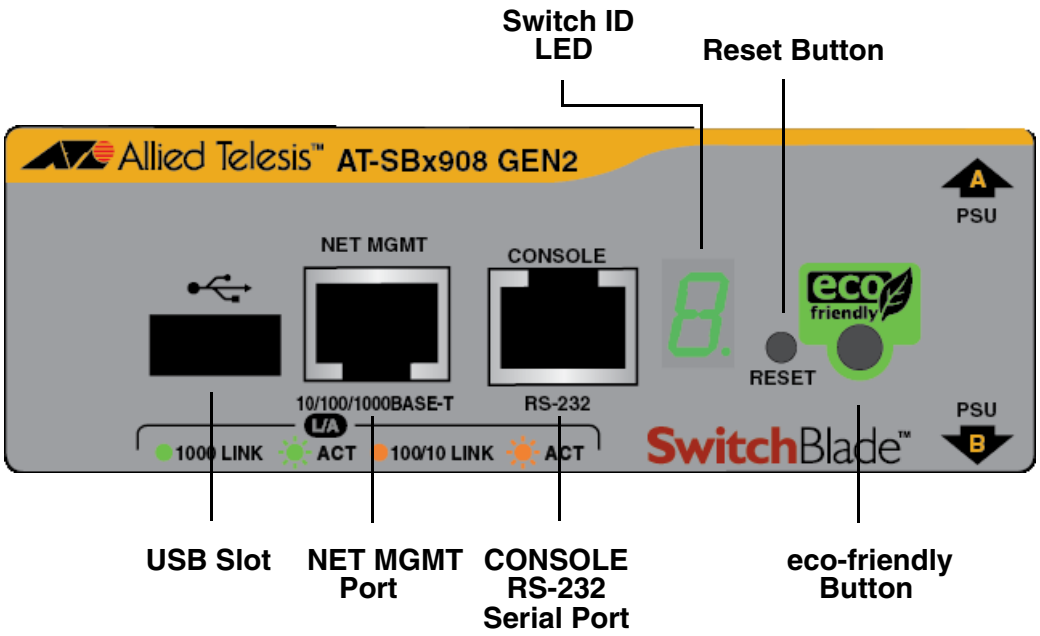


Figure 10. Management Panel

Note
The management panel is not field-replaceable.

USB Port

You can use the USB port with a flash drive to perform the following management functions:

- Provide a centralized network backup location for Allied Telesis Management Framework.
- Store backup copies of configuration files.
- Transfer configuration files between switches that are to have similar configurations.
- Store or transfer log files.
- Store or transfer debug files (for example, the output of the SHOW TECH-SUPPORT command).
- Boot the AlliedWare Plus operating system and master configuration file from flash drive.

Using a flash drive with the switch is optional.

NET MGMT Ethernet Management Port

The switch uses the NET MGMT port as a separate routed eth0 interface. The interface is not part of the switching matrix of the Ethernet line cards, but the switch can route traffic in or out of the port from the line cards. Here are the guidelines:

- The port should only be used for initial configuration and maintenance access to the switch.
- The port has a standard 8-pin RJ-45 connector and operates at 10, 100, or 1000 Mbps in either half- or full-duplex mode.
- The default setting for the port is Auto-Negotiation, which sets the speed and duplex mode automatically. You may disable Auto-Negotiation and configure the port manually.
- The wiring configuration of the NET MGMT port is set automatically with automatic MDIX detection. You may disable automatic MDIX detection and set the wiring configuration manually.
- The port is referred to as eth0 in the management software.

The minimum cable requirements for the port are listed here:

- 10 or 100Mbps: Standard TIA/EIA 568-B-compliant Category 3 shielded or unshielded cabling with 100 ohm impedance and a frequency of 16 MHz.
- 1000Mbps: 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.

For instructions on how to configure the NET MGMT port, refer to the Software Reference for SwitchBlade x908 Gen2 Switch.

The Network Management (NET MGMT) port has one Status LED, described in Table 12.

Table 12. NET MGMT Port LED

State	Description
Solid Green	The port has established a 1000 Mbps link with 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.
Flashing Amber	The port is transmitting or receiving data at 10 or 100 Mbps.

Table 12. NET MGMT Port LED (Continued)

State	Description
Off	The port has not established a link to a network device.

Console (RS-232) Port

You can use the Console Port to conduct local management sessions of the switch. Local management sessions require a terminal or PC with a terminal emulation program, and the management cable that comes with the switch.

Local management sessions are not conducted over a network. Consequently, the switch does not need an Internet Protocol (IP) address for this type of management.

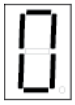
Because the switch does not come with a default IP address, your initial management session must be a local management session. For instructions on how to start a local management session, refer to “Starting a Local Management Session” on page 157 or the Software Reference for SwitchBlade x908 Gen2 Switch.

Switch ID LED

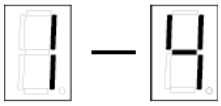
The Switch ID LED, shown in Figure 11, displays the ID number of the switch. The states of the LED when the switch is not operating in the low power mode are shown in Figure 11.

The chassis is booting up.

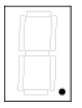
The chassis has encountered a fault condition.



The chassis is operating as a stand-alone switch, with the ID number 1.



The chassis is a member of a VCStack and has an ID number in the range of 1 to 4.



The dot in the lower right corner flashes when the switch accesses USB memory.

Figure 11. Switch ID LED

The switch displays the letter “F” for fault on the ID LED if it detects one of the following problems:

- A cooling fan has failed.
- The internal temperature of the switch has exceeded the normal operating range and the switch may shut down.

Note
You can use the SHOW SYSTEM ENVIRONMENT command in the command line interface to identify the source of the problem.

eco-friendly Button

You use the eco-friendly button on the management panel to turn the LEDs on or off. You can turn off the LEDs when you are not using them to monitor the control and Ethernet line cards, to conserve electricity. When the LEDs are off, the overall power consumption of the switch is slightly reduced by approximately 2 watts.

The button controls all the port LEDs on the Ethernet line cards and management panel, except for the L/A LED for the NET MGMT port. The button does not control the LEDs on power supply systems.

Reset Button

Pressing the Reset button resets all the Ethernet line cards in the switch. You might perform this function if the switch and line cards are experiencing a problem.

Caution
The Ethernet line cards do not forward network traffic for about three minutes while they initialize the AlliedWare Plus operating system and configure their parameter settings. Some network traffic may be lost.

Note
To reset individual line cards, use the REBOOT or RELOAD command in the AlliedWare Plus operating system.

Power Supplies

The power supply units for the chassis are the SBxPWRSYS2 AC and SBxPWRSYS1-80 DC Power Supplies. Refer to Figure 12.

SBxPWRSYS2 AC Power Supply

SBxPWRSYS1-80 DC Power Supply

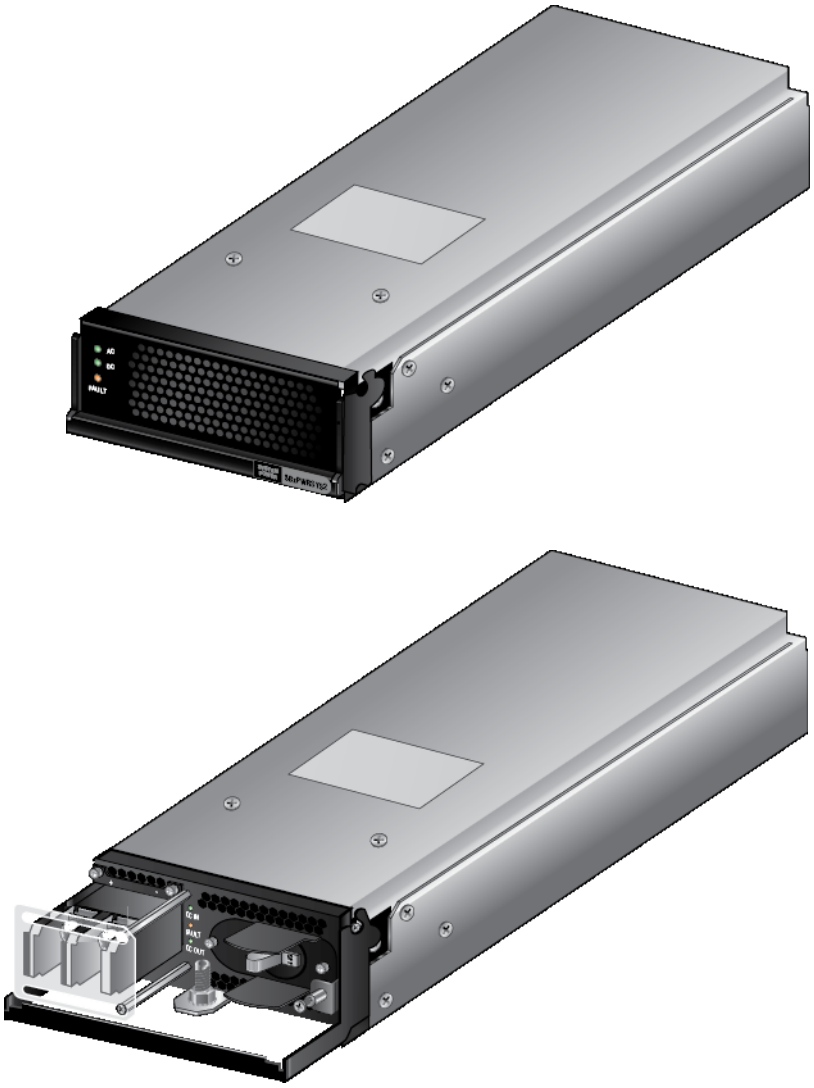


Figure 12. SBxPWRSYS2 and SBxPWRSYS1-80 Power Supplies

Here are the power supply guidelines:

- The SBxPWRSYS2 AC Power Supply uses the AC connectors on the back panel of the switch and is intended for AC environments.
- The SBxPWRSYS1-80 Power Supply has DC power connectors on its front panel and is intended for DC environments.
- You can install either one or two power supplies in the chassis. A single power supply can power a fully equipped chassis.

- Installing a second power supply adds power redundancy. If a power supply fails or loses power, the second power supply continues to power the system, thus preventing a disruption to network operations.
- The power supplies are installed in the PSU A and PSU B slots in the front panel of the chassis. If you are installing only one power supply, Allied Telesis recommends installing it in PSU A slot because that slot does not come with a blank slot cover.
- The switch does not come with power supplies. They must be purchased separately.
- The power supplies are field-replaceable and hot-swappable. You do not have to power off the switch to replace them.

Caution

The SBxPWRSYS2 and SBxPWRSYS1-80 Power Supplies are not compatible with each other. Do not install both types of power supplies in the same chassis.

FAN08 Units

The cooling unit for the chassis is the FAN08 Fan module. Refer to Figure 13.

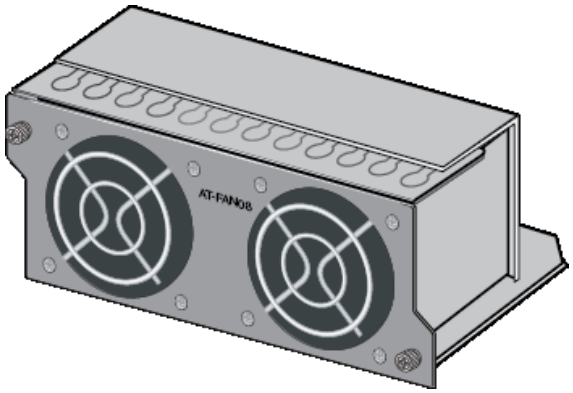


Figure 13. FAN08 Module

The chassis comes with two pre-installed fan modules in FAN A and FAN B slots on the rear panel. The air flow is from the front to the back of the chassis, with the fans drawing air out of the device.

The fan module has two fans. The switch automatically adjusts the speeds of the fans, depending on its internal temperature.

The FAN08 modules are field-replaceable and hot-swappable. You do not have to power off the switch to replace them.

Specifying Ports in the Command Line Interface

The individual ports on the switches in a stack are specified in the command line interface with the PORT parameter. The format of the parameter is shown in Figure 14.

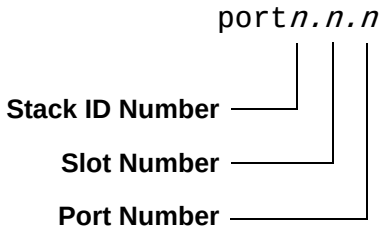


Figure 14. PORT Parameter in the Command Line Interface

The three parts of the PORT parameter are described in Table 13.

Table 13. PORT Parameter Format

Number	Description
Stack ID Number	Designates the switch's ID number. The number, which can be from 1 to 4, identifies the switch in a VCStack. A switch displays its ID number on the Switch ID LED on its management panel. If the Switch ID LED is displaying 0 (zero), VCStack is disabled and the switch is functioning as a stand-alone device. The ID number for a stand-alone switch is 1.
Slot Number	Designates the slot number with the line card whose ports you want to configure. For the SBx908 GEN2 Switch this value can be 1 to 8.
Port Number	Designates a port number on an SBx908 GEN2 Ethernet line card.

Here is an example of the PORT parameter on a switch in a stack. It uses the INTERFACE command to enter the Port Interface mode for ports 15 and 17 on the line card in slot 2 in a switch with the ID number 3:

```
awplus> enable
awplus# configure terminal
awplus(config)# interface port3.2.15,port3.2.17
```

For instructions on the command line interface and the PORT parameter, refer to the *Software Reference for SBx908 GEN2 Switch, AlliedWare Plus Operating System*.

Software and Hardware Releases

Software releases of the AlliedWare Plus operating software for the SBx908 GEN2 Switch are listed in Table 14.

Table 14. Software and Hardware Releases

Software Version	Hardware
v5.4.7A-1	SBx908 GEN2 Chassis XEM2-12XT Line Card XEM2-12XS Line Card XEM2-4QS Line Card FAN08 Fan Module SBxPWRSYS2 AC Power Supply SBxPWRSYS1-80 DC Power Supply
v5.4.8-0.2	XEM2-1CQ Line Card VCStack Feature
v5.4.9-0	XEM2-12XTm Line Card XEM2-12XT Line Card: Adds 100Mbps port speed
v5.4.9-2	XEM2-8XSTm Line Card

Chapter 2

Virtual Chassis Stacking

The sections in this chapter are listed here:

Note
For more information on VCStack, refer to the *Stacking Introduction and Stacking Commands* chapters in the *Software Reference for SBx908 GEN2 Series Switches, AlliedWare Plus Operating System* from **www.alliedtelesis.com**.

Overview

The Virtual Chassis Stacking (VCStack) feature lets you build a virtual stack of up to four SBx908 GEN2 Series switches. The feature allows the switches to function as a single networking unit, with the following benefits:

- Simplifies management - You can manage the devices of the stack as a single unit, rather than individually. Your local and remote management sessions automatically give you management access to all the devices.
- Reduces IP addresses - A stack requires only one IP address for remote management access, reducing the number of IP addresses you have to assign to network devices. The one address gives you management access to all the units.
- Adds feature flexibility and resiliency - A stack gives you more flexibility in the available configurations of features. For instance, you can create port aggregators of ports from different switches in the stack, rather than from only one switch. If you distribute the ports of an aggregator across two or more switches in a stack, you increase its resiliency because the aggregator will continue to function, though at a reduced bandwidth, if one of the switches stops functioning.
- Reduces protocol requirements - Creating a stack might eliminate your need to configure some protocols, such as the Virtual Router Redundancy Protocol or Spanning Tree Protocol.

Stacking Guidelines

Here are general stacking guidelines:

- A stack can have two, three, or four switches.
- Stacking requires v5.4.8-0.2 or later of the AlliedWare Plus management software. Instructions later in this guide explain how to view the version number of the operating software on the switches.
- The VCStack feature comes standard with the AlliedWare Plus operating software. No additional software or license is required.
- The default setting for the VCStack feature on the SBx908 GEN2 Switch is disabled. Enabling it requires rebooting the switch. Instructions later in this guide explain how to enable the feature and reboot the unit.
- All the switches in a stack must have the same optional features licenses. If you purchased optional features, you should install them on the switches before assembling the stack.

Stack Trunk

The switches of a stack are connected with a physical network link called a stack trunk. Here are the trunk guidelines:

- Trunk ports can be 10Gbps, 40Gbps, or 100Gbps.
- There are no default trunk ports.
- A stack can have only one trunk, but, as explained here, a trunk can have more than one network link.
- You designate trunk ports with the STACKPORT command in the AlliedWare Plus operating system.
- Trunk ports can be on any XEM2 Line Card in any card slot in the chassis. This differs from other stacking products where trunk ports are often pre-defined.
- You cannot view or change the parameter settings of trunk ports.
- If you are using fiber optic transceivers for the trunk, the transceivers must be from Allied Telesis. Transceivers from other network equipment providers might not operate properly as part of a trunk link. For a list of supported transceivers, refer to the Allied Telesis web site.
- A stack of SBx908 GEN2 Switches cannot contain other stacking products, such as x600 or x610 Series switches.
- Figure 15 on page 53 illustrates the basic trunk configurations for stacks of two, three, or four switches. The example shows the XEM2-4QS Line Card, but the topology is the same for all line cards.

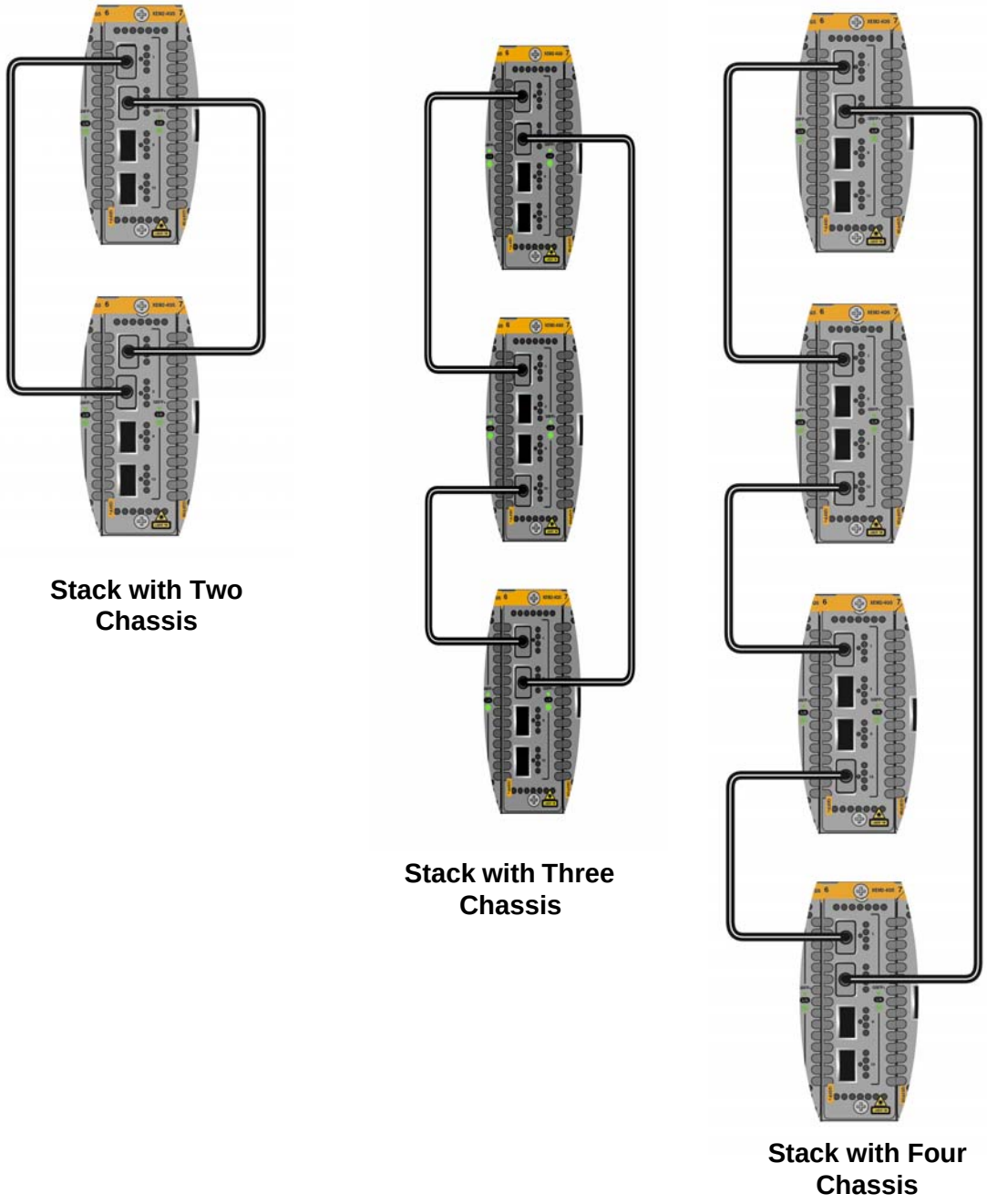


Figure 15. Example Trunks for Stacks of Two, Three, or Four Switches

- The trunk configuration is referred to as a ring because the last switch in the stack is connected to the first switch, creating a loop. This is the recommended configuration. It adds resiliency to the stack because it enables a trunk to continue functioning even if a link fails.

- You can omit the link from the last to first switches to create a linear trunk. An example of a stack with three switches in a linear trunk is shown in Figure 16. This trunk topology is not recommended.

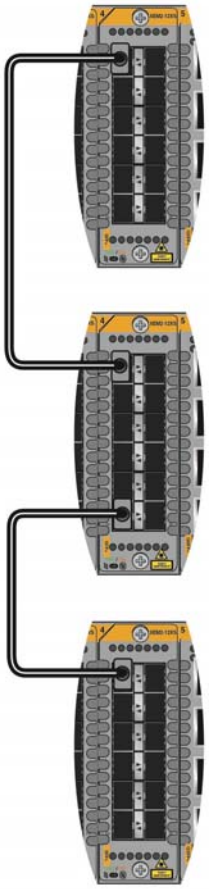


Figure 16. Stack of Three Switches with a Linear Trunk

- You can increase the bandwidth and resiliency of trunks by increasing the number of physical links between switches. The example in Figure 17 uses ports on XEM2-12XS Line Cards to build a stack of three switches, with a trunk of three links from switch-to-switch.

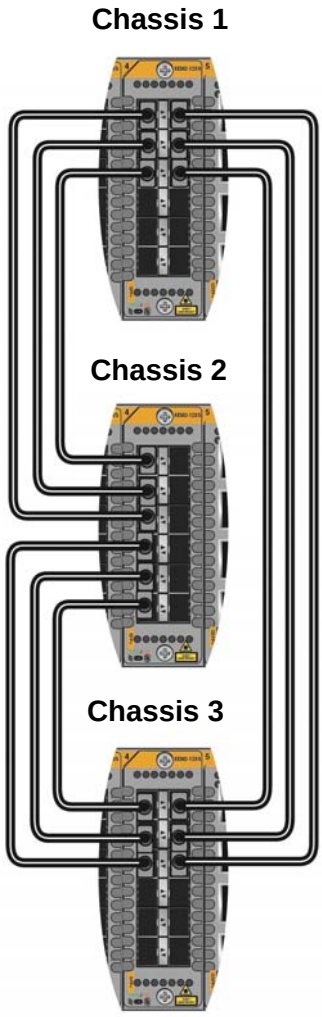


Figure 17. Example of a Trunk with Multiple Links Between Switches

- You can further improve the resiliency of trunks by distributing the ports onto multiple cards in the switches. This makes it possible for trunks to continue functioning, though at reduced bandwidths, even if line cards with trunk ports fail. The example in Figure 18 is a stack of three switches with a trunk of two links from switch-to-switch, on different line cards.

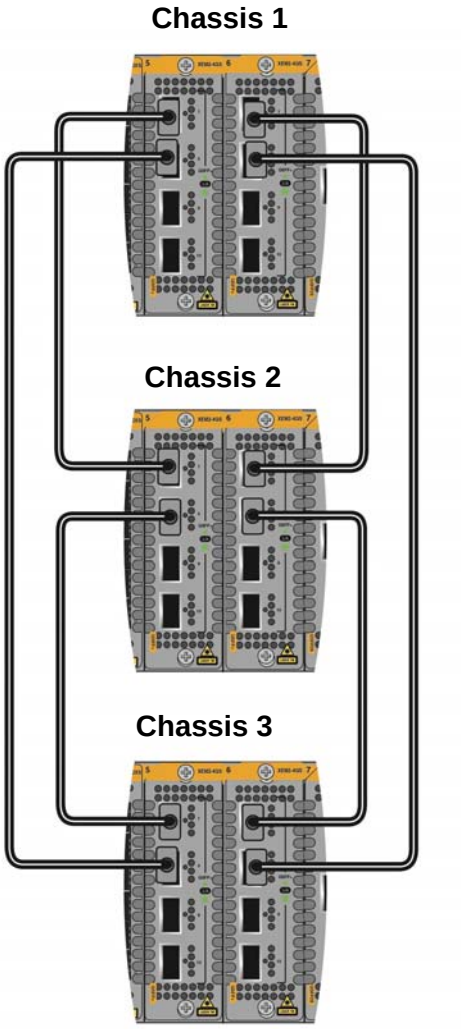


Figure 18. Example of a Stack Trunk of Ports on Multiple Line Cards

- Table 15 lists the maximum number of trunk ports that a switch can support at one time. The number varies by line card. For example, a switch can have a maximum of eight trunk ports when a trunk is build with ports on XEM2-12XS Line Cards.

Table 15. Maximum Number of Trunk Ports Per Switch

Ethernet Line Card	Maximum Number of Trunk Ports Per Switch	Guidelines
XEM2-8XSTm	4	1, 2
XEM2-12XT	8	1
XEM2-12XTm	8	1
XEM2-12XS	8	2
XEM2-4QS	4	
XEM2-1CQ	2	

The guidelines are listed here:

1. Trunks of twisted pair ports on XEM2-8XSTm, XEM2-12XT, or XEM2-12XTm Line Cards have to operate at 10Gbps. They cannot be used as trunk ports at lower speeds.
2. Trunks of SFP+ ports on XEM2-8XSTm, or XEM2-12XS Line Cards have to use 10Gbps SFP+ transceivers. They cannot be used as trunk ports at lower speeds.

- Figure 19 on page 58 is an example of a trunk that exceeds the permitted number of ports per switch. The trunk uses XEM2-4QS Line Cards, which, as listed in Table 15, can have a maximum of four trunk ports per switch. The two switches have six stacking ports each, making for an unsupported trunk. To bring the example into compliance with the rule, you would have to remove two trunk ports from each switch.

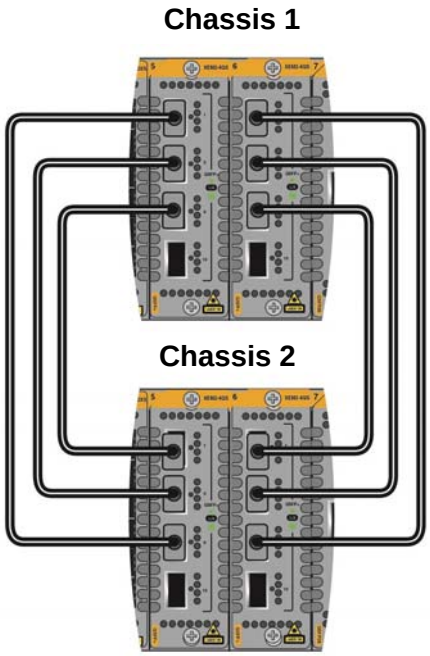


Figure 19. Unsupported Trunk with Too Many Stacking Ports

- You can use any line card in the chassis for the trunk. Furthermore, as stated earlier, the ports of the trunk can be from different cards in a chassis, so long as all the cards are the same model.

- With stacks of three or four switches, the number of physical links in the trunk has to be the same on all switches. The example in Figure 20 is a stack of three chassis with a valid trunk of two links between chassis 1 and 2, chassis 2 and 3, and chassis 3 and 1.

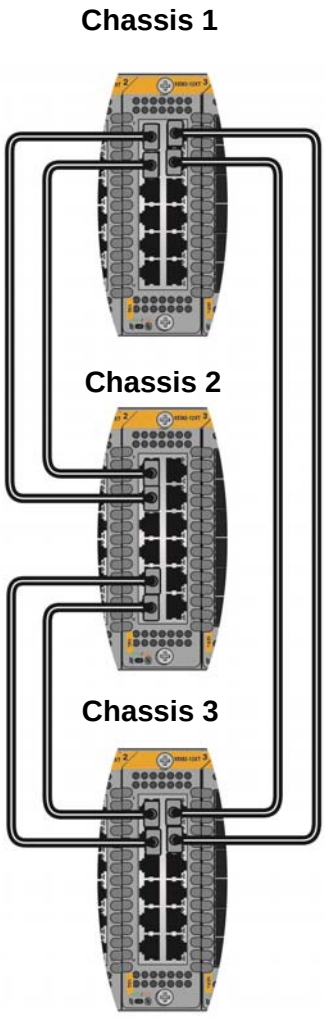


Figure 20. Stack with Three Chassis

- Figure 21 is an example of an unsupported trunk because the units do not have the same number of trunk links. There are two links between chassis 1 and 2 and chassis 2 and 3, but only one link between chassis 1 and 3.

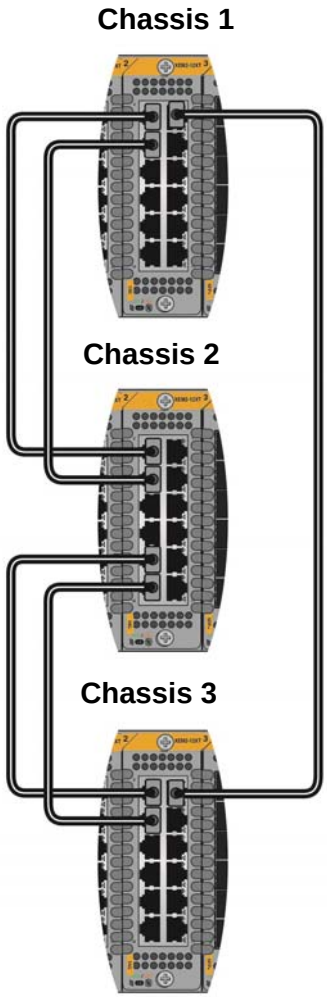


Figure 21. Unsupported Trunk Because Switches Have Different Numbers of Trunk Links

- A trunk cannot have ports from different line card models. The trunk for the three switches in Figure 22 is unsupported because it has ports from XEM2-4QS and XEM2-12XT Line Cards.

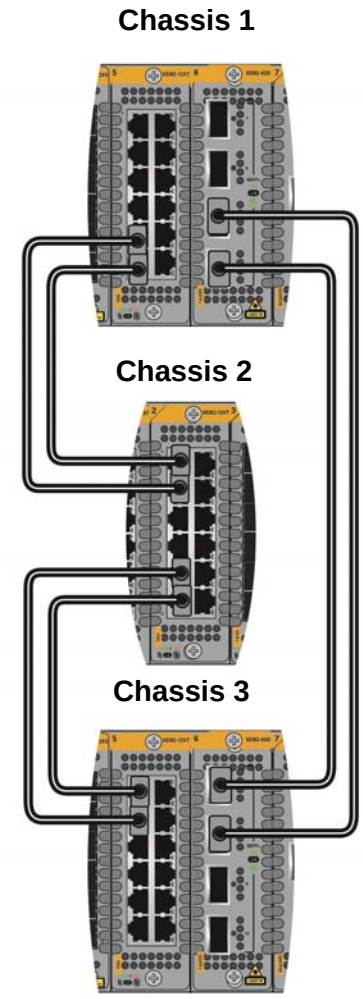


Figure 22. Unsupported Trunk with Different Ethernet Line Card Models

- The XEM2-12XS Line Card supports both 1Gbps SFP and 10Gbps SFP+ transceivers. However, trunk links require 10Gbps SFP+ transceivers. Trunks are not supported with 1Gbps SFP transceivers.

- The XEM2-8XSTm Line Card has four twisted pair ports and four SFP+ ports. When building a trunk with the ports on this line card, you can use either the twisted pair or SFP+ ports, but not both. Figure 23 is an example of a trunk of SFP+ ports on XEM2-8XSTm Line Cards for a stack of three switches.

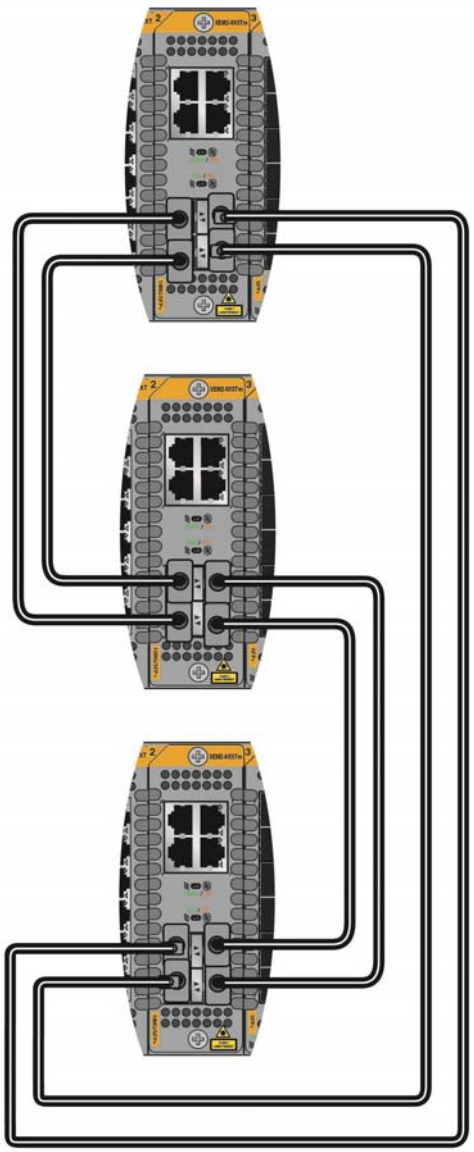


Figure 23. Example of a Stack Trunk of Ports on XEM2-8XSTm Line Cards

- The XEM2-12XS Line Card supports 10Gbps SP10TW direct connect twinax cables in addition to fiber optic transceivers. You can use direct connect cables for trunk links when switches are physically close together, such as in the same equipment rack or adjacent racks. However, you cannot build a trunk with both direct connect cables and fiber optic transceivers. A trunk can have either one or the other, but not both. The example trunk of XEM2-12XS Line Cards in Figure 24 is unsupported because it uses both types of cables.

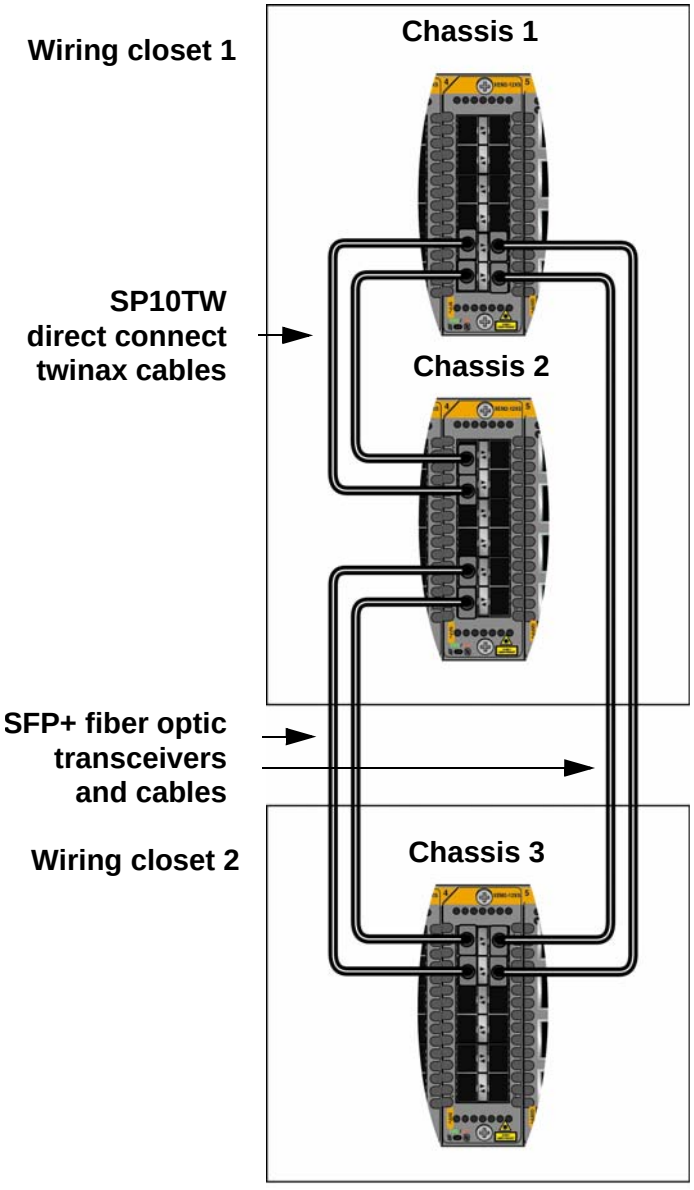


Figure 24. Unsupported Trunk with Both Direct Connect and Fiber Optic Cables on XEM2-12XT Line Cards

- The XEM2-4QS Line Card also supports QSFPICU and QSFP3CU direct connect cables. As with the XEM2-12XT Line Card, you can build stack trunks using XEM2-4QS Line Cards with either direct connect cables or fiber optic transceivers, but not both. Figure 25 is an example of an unsupported trunk on XEM2-4QS Line Cards because it uses both direct connect and fiber optic cables.

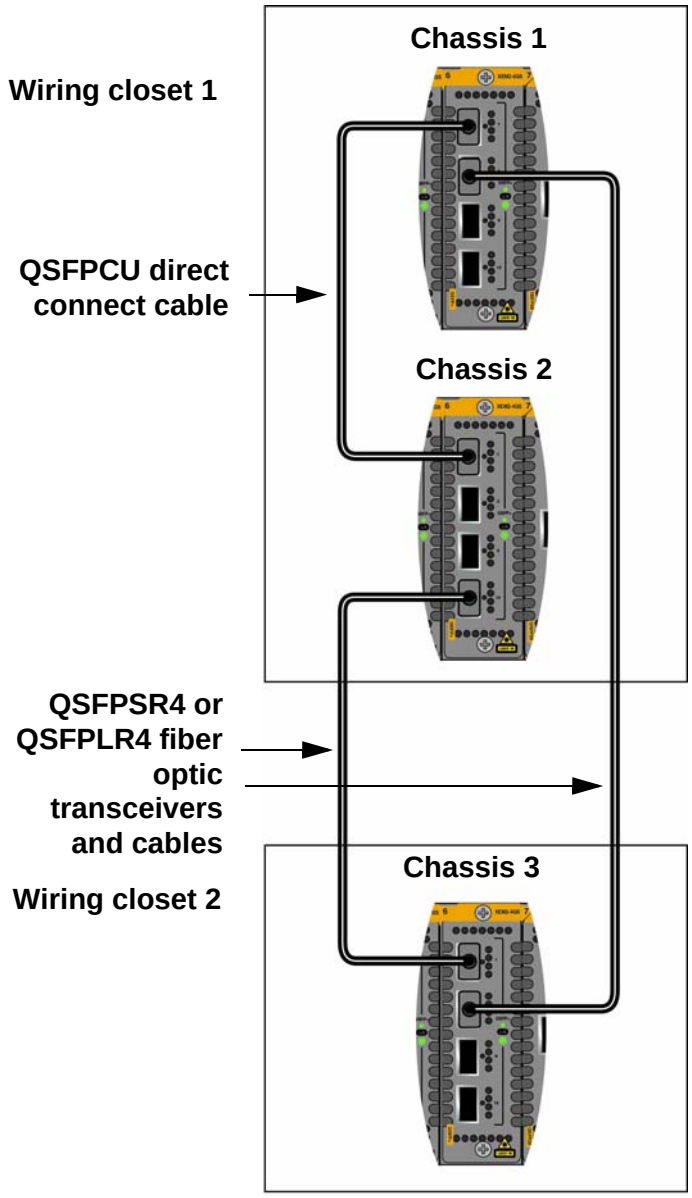


Figure 25. Unsupported Trunk with Both Direct Connect and Fiber Optic Cables on XEM2-4QS Line Cards

- You can use XEM2-1CQ Line Cards for a stack trunk. But since the card has only one 100Gbps transceiver port, each switch has to have two cards for the trunk. Figure 26 is an example of a stack trunk of four switches with the line card.

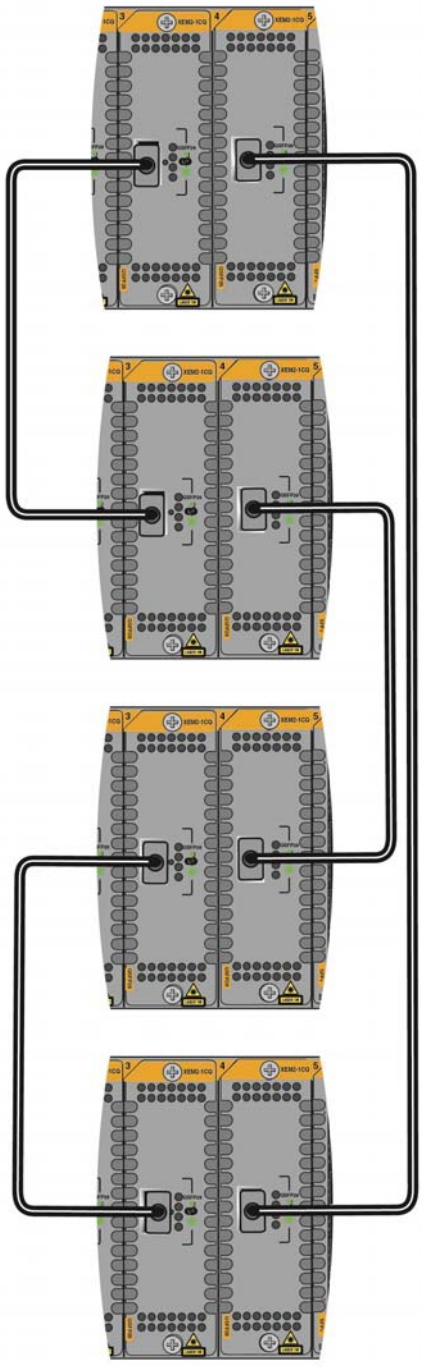


Figure 26. Example of a Stack Trunk with XEM2-1CQ Line Cards

- In stacks of four chassis, no switch can have trunk links to more than two other chassis. The trunk example in Figure 27 is unsupported because chassis 1 has trunk links to all three of the other switches.

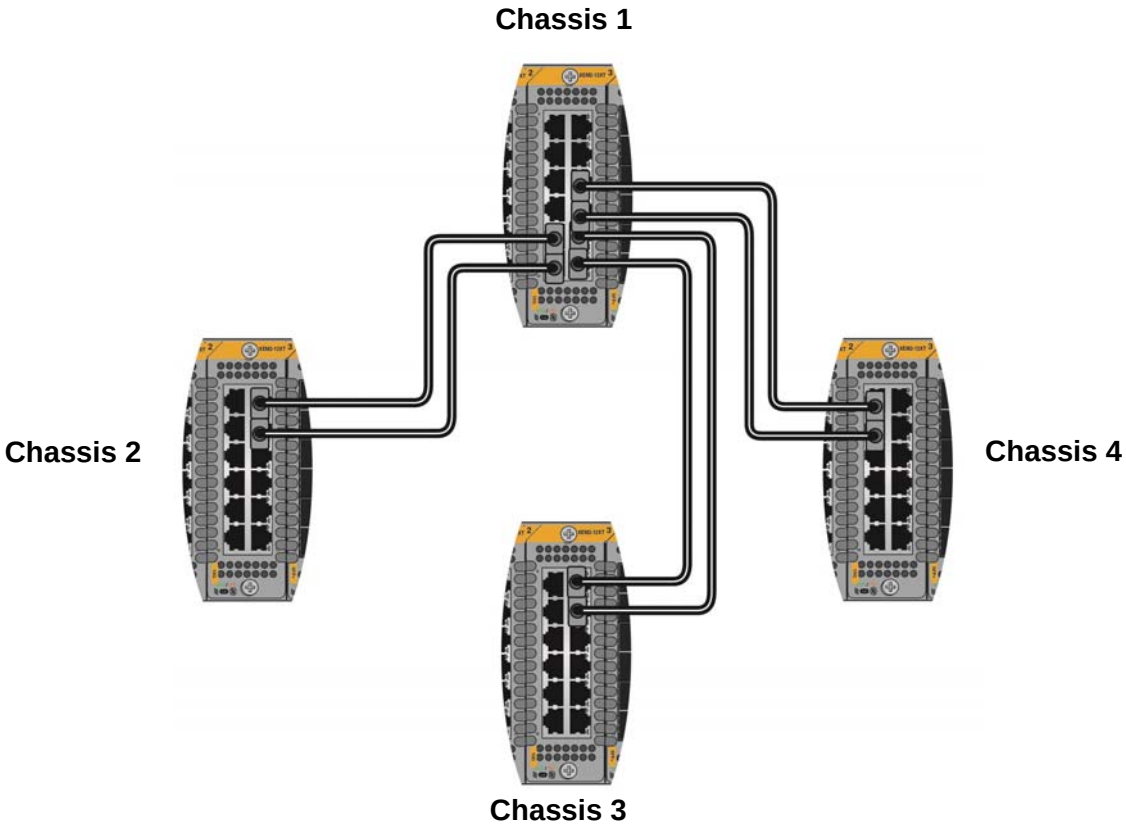


Figure 27. Unsupported Trunk Because a Chassis is Connected to Three Other Chassis

- Trunk links must be direct connections between ports on the line cards. A trunk cannot have any intermediary network devices, such as media converters, routers, or other Ethernet switches. Figure 28 is an example of an unsupported trunk because it has intermediary network devices, in this case media converters.

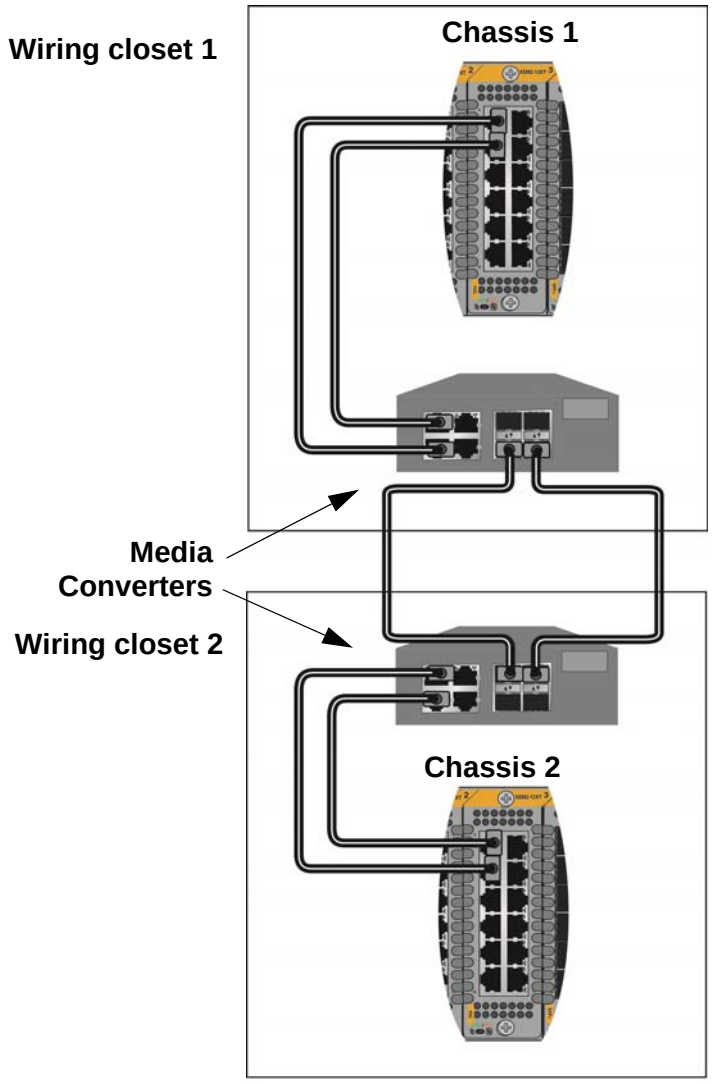


Figure 28. Unsupported Trunk with Intermediary Network Devices

Master and Member Switches

A stack has a master switch. A stack can have only one master switch at a time. Its main functions are listed here:

- Coordinate and monitor stack operations.
- Verify that the switches are using the same version of management software. It automatically downloads its management software over the stacking cables to switches with different software versions.
- Verify that the switches have different ID numbers. It automatically assigns new ID numbers to resolve situations where two or more switches have the same ID number.
- Verify that the stacking transceivers that connect the switches together are cabled correctly.

The other switches are called member switches. There can be up to three member switches in addition to the master switch. A member switch can automatically transition to the master role if the current master switch is removed from the stack or powered off. This ensures continued operations of the stack even if the master switch stops operating.

Selection of the Master Switch

The switches select the master switch during the initialization process that they perform whenever they are powered on or reset. The master switch is selected on the following parameters:

- Stack priority numbers
- MAC addresses

The stack priority number is an adjustable value of 0 to 255, where the lower the number, the higher the priority. Typically, the switch with the lowest priority number (highest priority) becomes the master switch of a stack. The default priority value is 128.

If the switches have the same priority values, the selection of the master switch is based on their MAC addresses. As with the priority value, the lower the MAC address, the higher the priority. The switch with the lowest MAC address becomes the master switch.

If you power on the stack for the first time without adjusting the priority values, the master switch is selected based on the MAC addresses if the units are powered on simultaneously. If you power on the switches one at a time, the master switch is the first switch to be powered on.

After the stack is established and operating, you may, if you choose, change the priority settings on the individual units and so control which switch will be the master switch after subsequent power cycles and resets.

Switch ID Numbers

Each switch must be assigned an ID number. The range is 1 to 4. The default is 1. The ID numbers are displayed on the ID LEDs on the front panels of the units. You use the ID numbers to identify the individual ports and switches when you configure the devices with the commands in the management software. For further information, refer to “Specifying Ports in the Command Line Interface” on page 46.

The ID numbers are also used to identify the parameter settings that are stored in the configuration file. When the stack is reset or power cycled, the ID numbers identify the devices to which the parameter settings belong.

Instructions in Chapter 6, “Configuring Switches for Stacking” on page 149 explain how to set the ID numbers.

Caution

You should not change the ID numbers of the switches after you start to configure the parameter settings. Otherwise, the parameter settings might be applied to the wrong devices when you reset or power cycle the stack. E79

The switches do not use the ID numbers to select the master switch. The selection of the master switch is based on the priority numbers and MAC addresses, as previously explained.

Optional Feature Licenses

The SBx908 GEN2 Series switches comes with the AlliedWare Plus™ operating system and a base set of features that are available as soon as you install the devices. Additional features and capabilities might be included with the operating system, but they can only be used after they are unlocked with optional feature licenses from Allied Telesis. Contact your authorized reseller or distributor for a list of optional features licenses for this product.

Here are the guidelines to feature licenses for a stack of SBx908 GEN2 Series switches:

- The VCStack feature is part of the base features of the switch and does not require an optional feature license.
- You can install feature licenses while the switches are operating as stand-alone units or as a stack.
- When ordering feature licenses for the switches of a stack, you must order one license for each switch.
- Switches can form a stack even if they have different feature licenses. However, the additional features are only available on those switches with the necessary licenses. The stack generates a warning message if it detects that the switches do not have the same optional feature licenses.

Planning the Stack

Here are factors to consider when planning a stack:

- How many SBx908 GEN2 Chassis will be in the stack? The maximum is four chassis.
- Which line cards will have the trunk ports?
- How many trunk links will there be between switches? The maximum number varies by Ethernet line card. Refer to Table 15 on page 57.
- Which ports on the line cards will be the trunk links? Refer to “Stack Trunk” on page 52.
- Do all the switches have the same version of the AlliedWare Plus management software, preferably v5.4.8-0.2 or later? Instructions in Chapter 6, “Configuring Switches for Stacking” on page 149 explain how to verify this information.
- Have you selected ID numbers, in the range of 1 to 4, for the switches? Refer to “Switch ID Numbers” on page 69.

Stacking Worksheet

The worksheet in Table 16 is here to assist you in configuring and maintaining a stack.

Table 16. Stacking Worksheet

Switch	Location	ID	Priority	Firmware Version Number[1]	Trunk: Slots, Line Cards, and Ports
Master		1	1		
Member		2	2		
Member		3	3		
Member		4	4		

1. AlliedWare Plus version number.

The table columns are described in Table 17.

Table 17. Stacking Worksheet Columns

Column	Description
Location	You use this column to write down the physical locations of the devices, such as their buildings or equipment rooms. The information can be useful in locating the switches of the stack if they are in different locations.

Table 17. Stacking Worksheet Columns (Continued)

Column	Description
ID	Each switch in a stack has to have a unique ID number, in the range of 1 to 4. They display the numbers on the ID LEDs on the front panels and you use the numbers to configure the individual ports. Allied Telesis recommends assigning the ID 1, the default value, to the master switch. You should decide ahead of time, before beginning the configuration procedures, the ID assignments of the switches.
Priority	When the switches of a stack are reset or powered on, they perform an initialization process that involves, in part, choosing the master switch. The selection is based on their priority numbers and MAC addresses. The former is an adjustable parameter with a range of 0 to 255 and a default value of 128. The lower the value, the higher the priority. Thus, the switch with the lowest value becomes the stack master. If switches have the same priority number, the master is selected based on their MAC addresses. Again, as with priority numbers, the lower the MAC address, the higher the priority. Allied Telesis recommends setting each switch's priority value to match its ID value. This is to ensure that the switch you have chosen to be the master unit will indeed function in that role. Additionally, it will make it possible for you to know the order in which the switches assume the master role if the primary master should fail or be powered off.
Firmware Version Number	This column is for writing down the version numbers of the AlliedWare Plus management software on the switches. The switches might not be able to form the stack if they have different versions. The configuration instructions explain how to view the version numbers. If they have different versions, you should update them to the most recent release prior to building the stack.

Table 17. Stacking Worksheet Columns (Continued)

Column	Description
Trunk: Slots, Line Cards, and Ports	This column is for the ports of the trunk. If you have not yet chosen them, you should do so before beginning the configuration procedures. Allied Telesis recommends using the same ports as trunk ports on all the switches of the stack. Although this is not mandatory, it can make managing and troubleshooting the stack easier. Refer to “Stack Trunk” on page 52.

Table 18 is an example of a completed worksheet for the stack of three switches in Figure 18 on page 56.

Table 18. Example of a Completed Stacking Worksheet

Switch	Location	ID	Priority	Firmware Version Number	Trunk: Slots, Line Cards, and Ports
Master	Bldg 2 rm 104	1	1	5.4.9-2	slot 5 XEM2-4QS ports 1, 5 slot 6 XEM2-4QS ports 1, 5
Member	Bldg 3 rm 215	2	2	5.4.9-2	slot 5 XEM2-4QS ports 1, 5 slot 6 XEM2-4QS ports 1, 5
Member	Bldg 4 rm 106	3	3	5.4.9-2	slot 5 XEM2-4QS ports 1, 5 slot 6 XEM2-4QS ports 1, 5
Member		4	4		

Chapter 3

Beginning the Installation

The chapter contains the following sections:

Hardware Installation Overview

Table 19 lists the general steps to installing the switch hardware.

Table 19. Hardware Installation Procedures

Step	Description	Procedure
1	Review safety precautions.	“Reviewing Safety Precautions” on page 77
2	Choose locations for the switches.	“Choosing a Site for the Chassis” on page 82
3	Unpack the hardware.	“Unpacking the Chassis” on page 83 “Unpacking SBxPWRSYS2 AC Power Supplies” on page 88 “Unpacking SBxPWRSYS1-80 DC Power Supplies” on page 89
4	Install the hardware.	“Adjusting the Equipment Rack Brackets” on page 93 “Installing the Chassis in an Equipment Rack” on page 97 “Installing the Chassis Grounding Wire” on page 98 “Installing SBxPWRSYS2 AC Power Supplies” on page 101 “Installing SBxPWRSYS1-80 DC Power Supplies” on page 105 “Installing Ethernet Line Cards” on page 109 “Installing Blank Line Card Slot Covers” on page 113 “Installing the Blank Power Supply Slot Cover” on page 115 “Installing the Power Cord Retaining Clips” on page 117

Reviewing Safety Precautions

Please review the following safety precautions before beginning the installation procedure.

Note
Safety statements that have the symbol are translated into multiple languages in the *Translated Safety Statements* document at **www.alliedtelesis.com/library**.

Warning
Class 1 Laser product. L1

Warning
Laser Radiation.
Class 1M Laser product.

Warning
Do not stare into the laser beam. L2

Warning
Do not look directly at the fiber optic ends or inspect the cable ends with an optical lens. L6

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 Temperatures. This product is designed for a maximum ambient temperature of 50° degrees C. E52

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

Warning
Only trained and qualified personnel are allowed to install or replace this equipment. E14

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 overcurrent 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
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

Note
Use dedicated power circuits or power conditioners to supply reliable electrical power to the device. E27

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
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 plugs. E44

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

Caution
The unit does not contain serviceable components. Please return damaged units for servicing. E42

Warning
The temperature of an operational SFP or SFP+ transceiver may exceed 70° C (158° F). Exercise caution when removing or handling transceivers with unprotected hands. E43

Warning
The grounding lug on the rear panel of the chassis is for supplemental grounding. The chassis must be supplied by a grounded three wire AC source through the power supply cord.

Choosing a Site for the Chassis

Observe these site requirements.

- ❒ The SBx908 Gen2 Chassis should be installed in a standard 19-inch equipment rack. It should not be installed on a table, desk, or wall.
- ❒ Check that the equipment rack is safely secured so that it will not tip over. Devices should be installed in the rack starting at the bottom, with the heavier devices near the bottom of the rack.
- ❒ The power outlet should be located near the chassis and be easily accessible.
- ❒ The site should allow for easy access to the ports on the front of the switch, so that you can easily connect and disconnect cables, and view the port LEDs.
- ❒ The site should allow for adequate air flow around the unit and through the cooling vents on the front and rear panels. (The ventilation direction is from front to back, with the fans on the back panel drawing the air out of the unit.)
- ❒ The site should not expose the chassis to moisture or water.
- ❒ The site should be a dust-free environment.
- ❒ The site should include dedicated power circuits or power conditioners to supply reliable electrical power to the network devices.
- ❒ Twisted pair cabling should not be exposed to sources of electrical noise, such as radio transmitters, broadband amplifiers, power lines, electric motors, or fluorescent fixtures.
- ❒ Switch ports are suitable for intra-building connections, or where non-exposed cabling is required.
- ❒ Do not install the chassis in a wiring or utility box because it might overheat and fail from inadequate airflow.
- ❒ The power cords included with SBxPWRSYS2 Power Supplies for 100-125 VAC installations have 20 Amp, 125 V NEMA 5-20P plugs that require NEMA 5-20R receptacles. Refer to Figure 29.

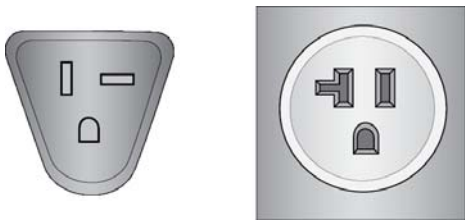


Figure 29. NEMA 5-20P Plug and Receptacle

Unpacking the Chassis

Figure 30 shows the contents of the shipping box.

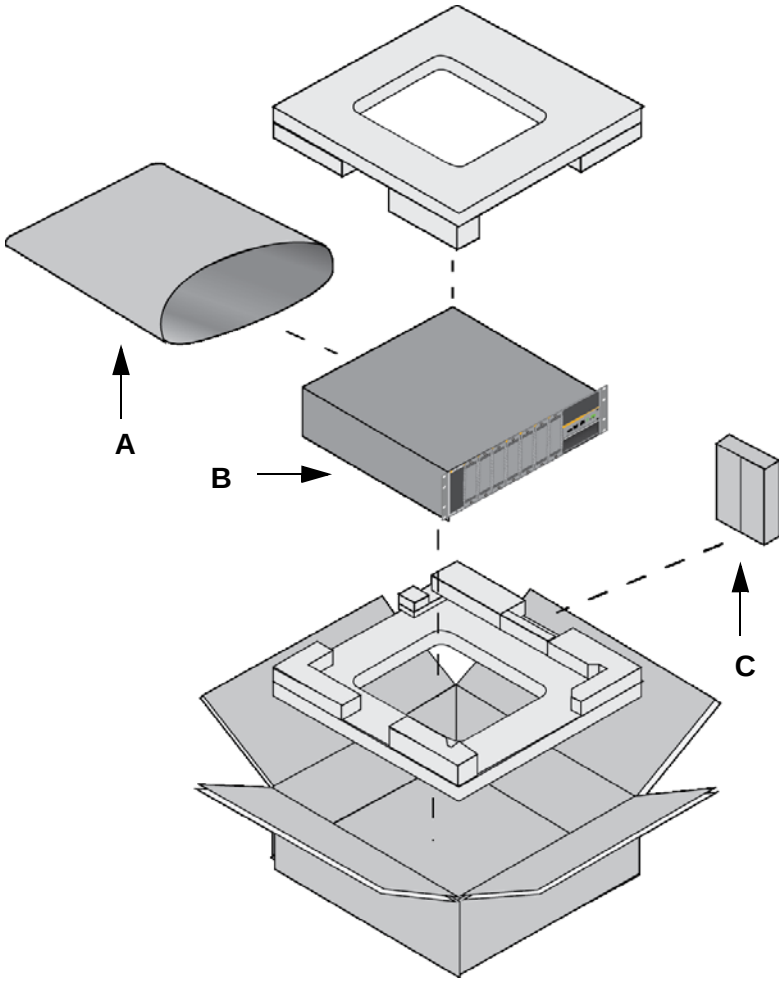


Figure 30. SBx908 Gen2 Switch Shipping Box

The items in the box are listed here:

- A - Protective bag
- B - SBx908 Gen2 Switch
- C - Accessory kit

To unpack the switch, perform the following procedure:

1. Lift the switch from the shipping box and place it on a level, secure table. Refer to Figure 31 on page 84.

Warning
The switch is heavy. Ask for assistance lifting the device out of the shipping box. You might injure yourself or damage the device if you lift it without assistance.

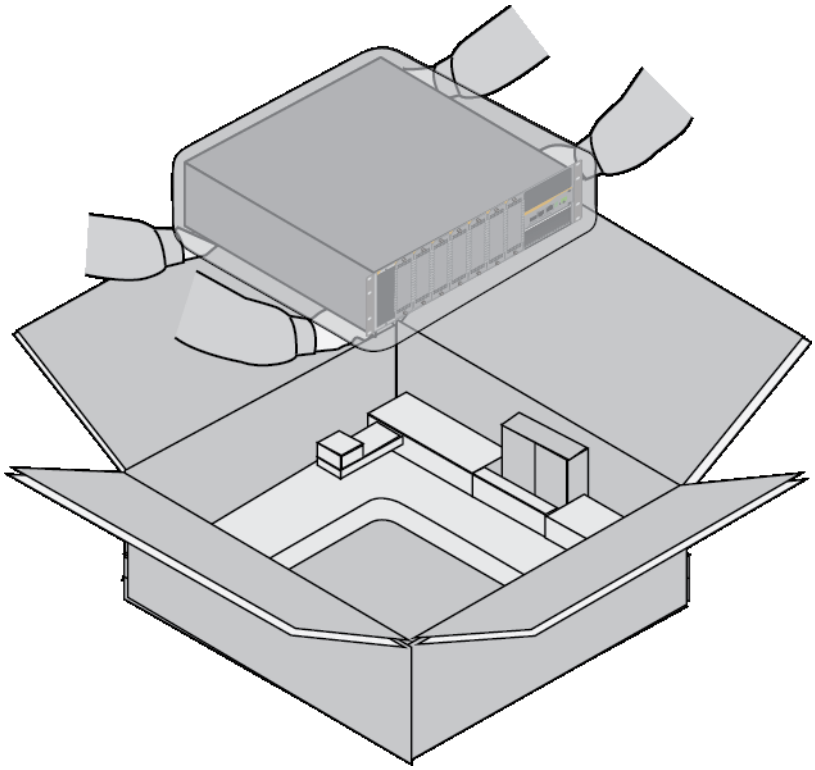


Figure 31. Lifting the Switch from the Shipping Box

2. Remove the switch from the protective shipping bag and place it on a level, secure table. Refer to Figure 32.

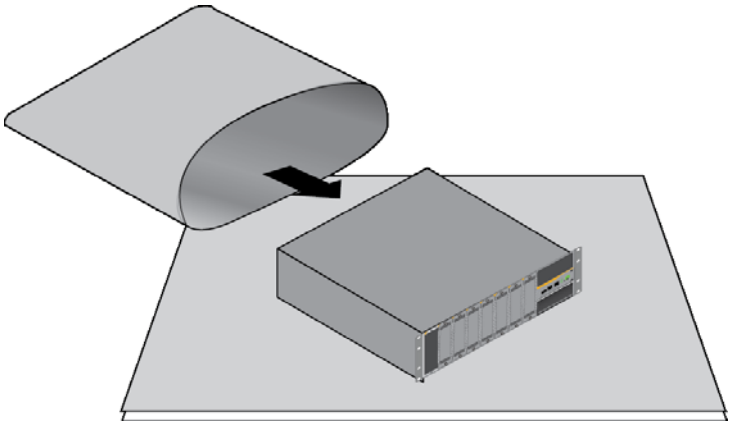
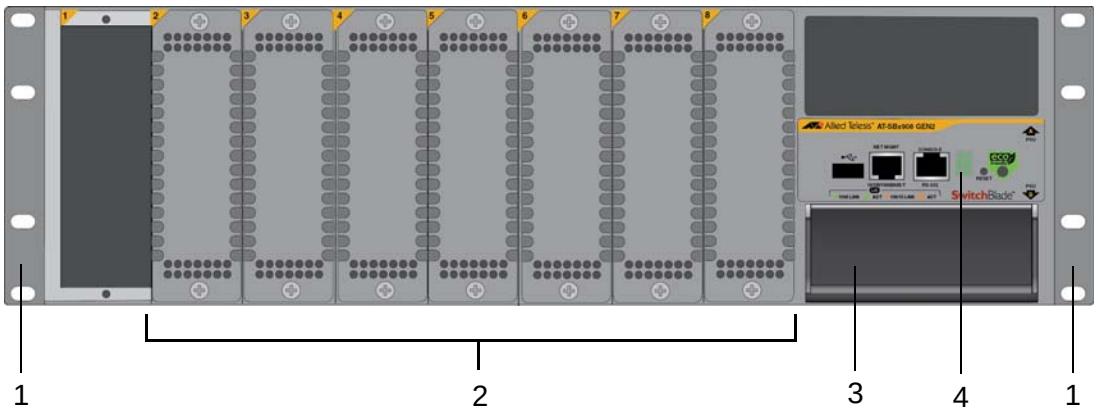
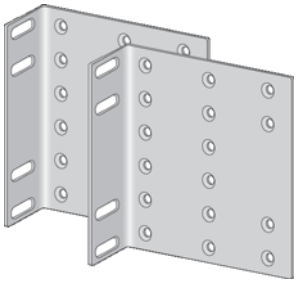


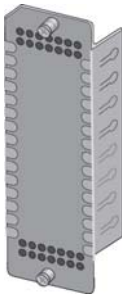
Figure 32. Removing the Switch from the Protective Shipping Bag.

3. Visually inspect the front panel of the switch for the pre-installed components shown in Figure 33.



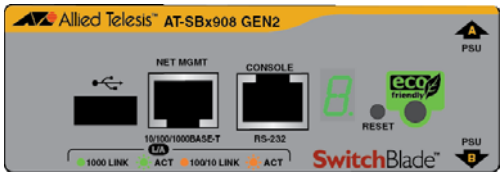


1. Two equipment rack brackets



2. Seven line card slot covers

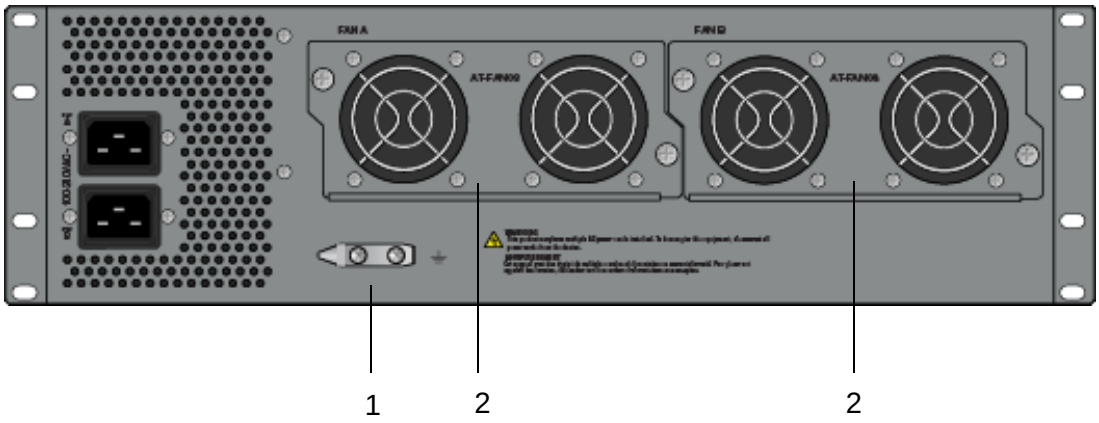
3. One blank panel in power supply slot B



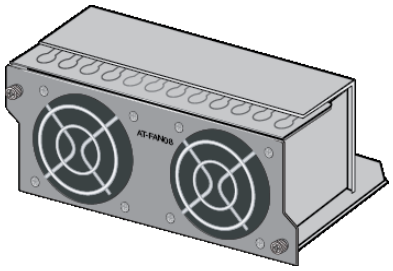
4. One management panel (Not field replaceable.)

Figure 33. Pre-installed Items on the Front and Side Panels

4. Visually inspect the rear panel for the pre-installed components shown in Figure 34 on page 86.



1. One ground wire lug



2. Two AT-FAN08 Fan Modules

Figure 34. Pre-installed Items on the Rear Panel

Note
You should retain the original packaging material in the event you need to return the unit to Allied Telesis.

Note
The product does not come with power supplies. Power supplies must be ordered separately.

5. Remove the accessory kit from the shipping box and verify its components, listed in Figure 35 on page 87.

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

Two power cord retaining clips

Figure 35. Accessory Kit

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

6. After unpacking the switch, do one of the following:

   - ❒ To unpack the power supplies, go to “Unpacking SBxPWRSYS2 AC Power Supplies” on page 88 or “Unpacking SBxPWRSYS1-80 DC Power Supplies” on page 89.
   - ❒ Otherwise, go to Chapter 4, “Installing the Chassis” on page 91.

Unpacking SBxPWRSYS2 AC Power Supplies

The SBxPWRSYS2 AC Power Supply shipping box should include the items in Figure 36.

One SBxPWRSYS2 Power Supply

One regional AC power supply cord

One tie wrap

Figure 36. Items in the Shipping Box for the SBxPWRSYS2 AC Power Supply

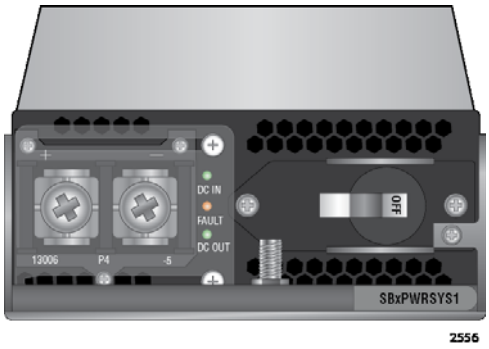
The tie wrap included with the power supply is not used with the SBx908 Gen2 chassis.

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

After unpacking the chassis and power supplies, go to Chapter 4, “Installing the Chassis” on page 91.

Unpacking SBxPWRSYS1-80 DC Power Supplies

The shipping box for the SBxPWRSYS1-80 DC Power Supply should include the items in Figure 37.



One SBxPWRSYS1-80 DC Power Supply

Two straight power wire ring lugs

One grounding wire ring lug

Two right angle power wire ring lugs

Figure 37. Items in the Shipping Box for the SBxPWRSYS1-80 DC Power Supply

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

After unpacking the chassis and power supplies, go to Chapter 4, “Installing the Chassis” on page 91.

Chapter 4

Installing the Chassis

The procedures in this chapter explain how to install the chassis in a standard 19-inch equipment rack. The procedures are listed here:

Tools and Material

You need to provide the following tools and material to install the chassis:

- ❒ #2 Phillips-head screwdriver
- ❒ Eight screws for a standard 19-inch equipment rack
- ❒ 10 AWG stranded grounding wire
- ❒ Wire insulation stripper
- ❒ Crimping tool

Adjusting the Equipment Rack Brackets

The chassis comes with two pre-installed equipment rack brackets. The default positions of the brackets align the front of the chassis with the front of the equipment rack. You can re-position the brackets on the sides of the chassis to have the device extend in front of the rack. Figure 38 here and Figure 39 on page 94 and Figure 40 on page 95 show the various bracket and chassis orientations. The first illustration in Figure 38 shows the default positions of the brackets.

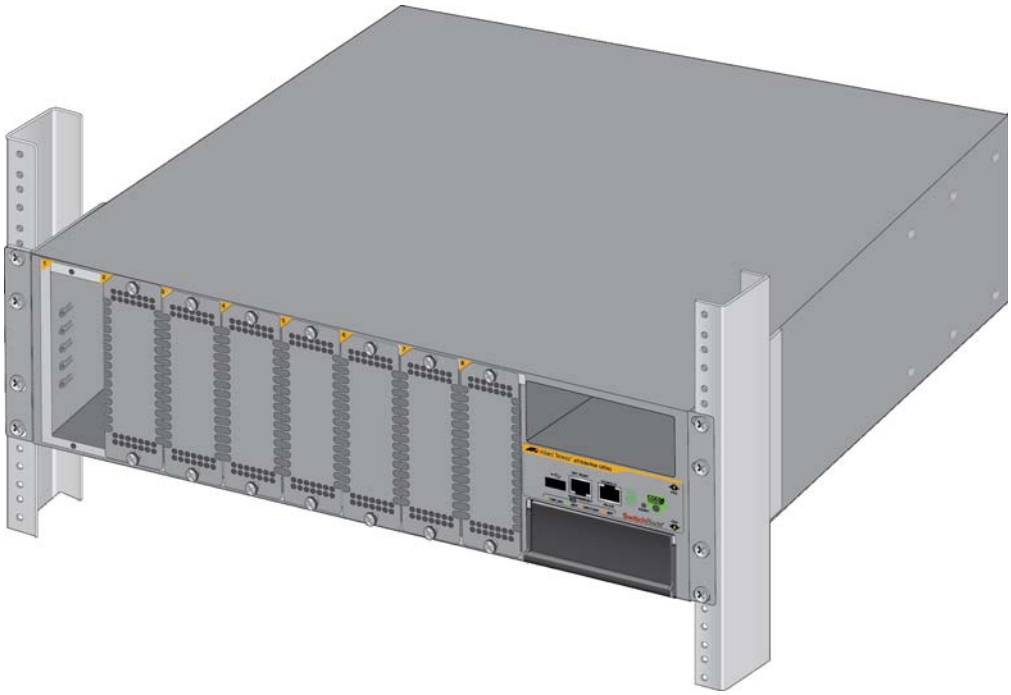


Figure 38. Chassis Orientations in the Equipment Rack

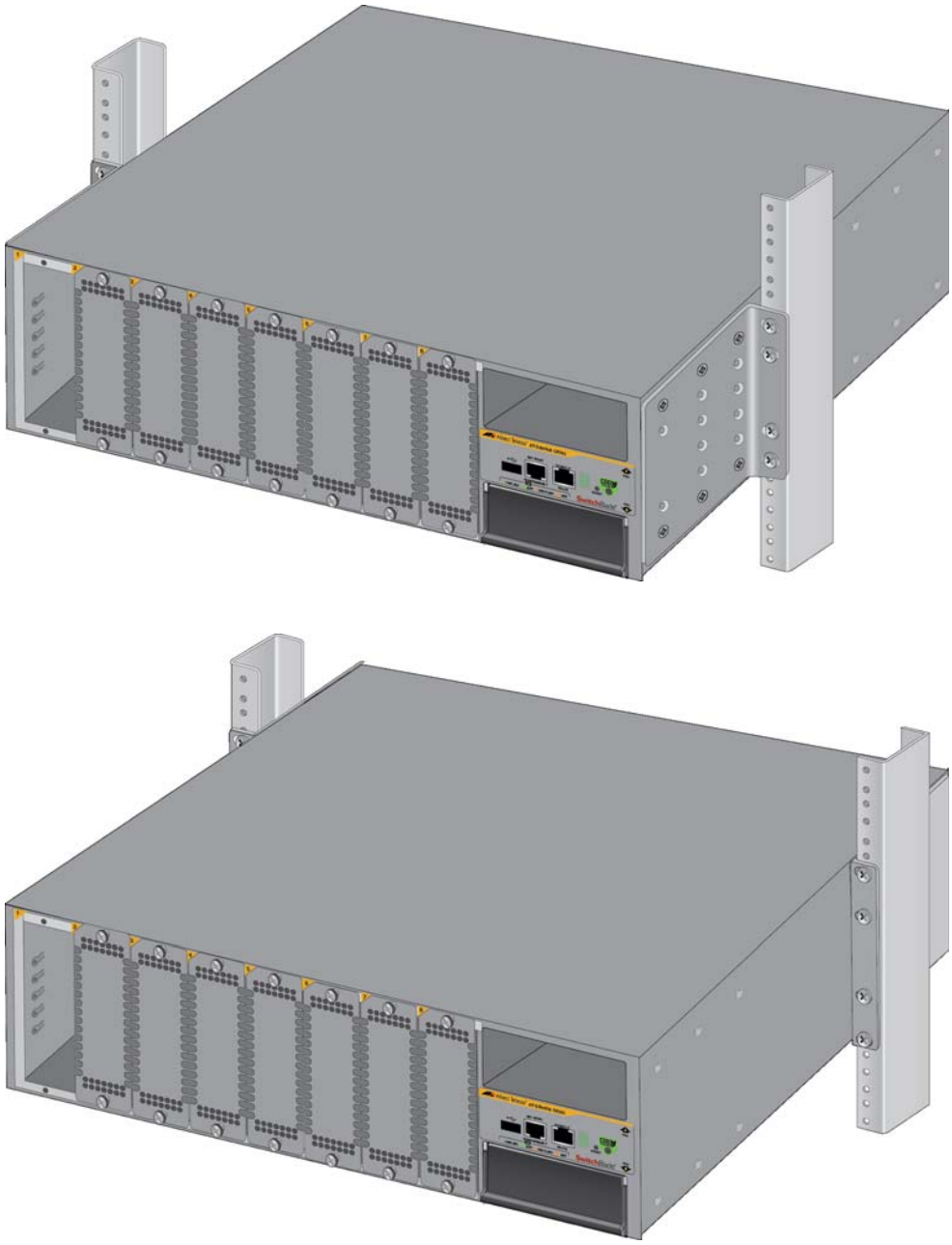


Figure 39. Chassis Orientations in the Equipment Rack

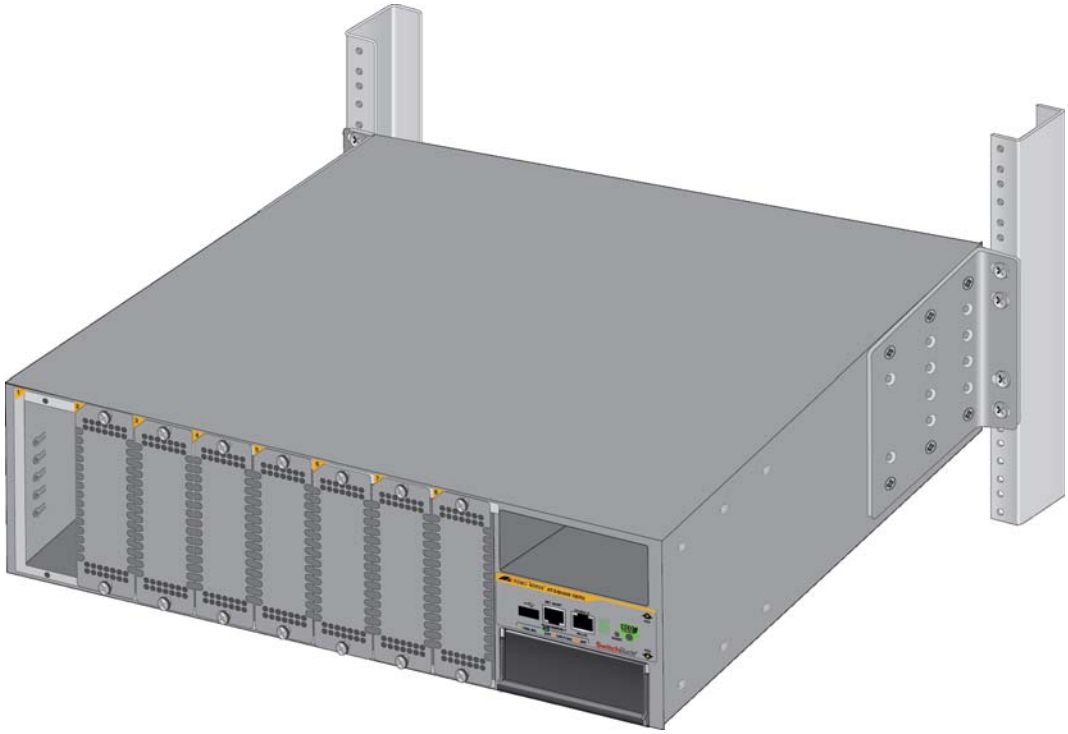


Figure 40. Chassis Orientations in the Equipment Rack

To change the positions of the brackets, use a #2 Phillips-head screwdriver to remove them from their default positions and secure them to the new locations. An example is shown in Figure 41 on page 96.

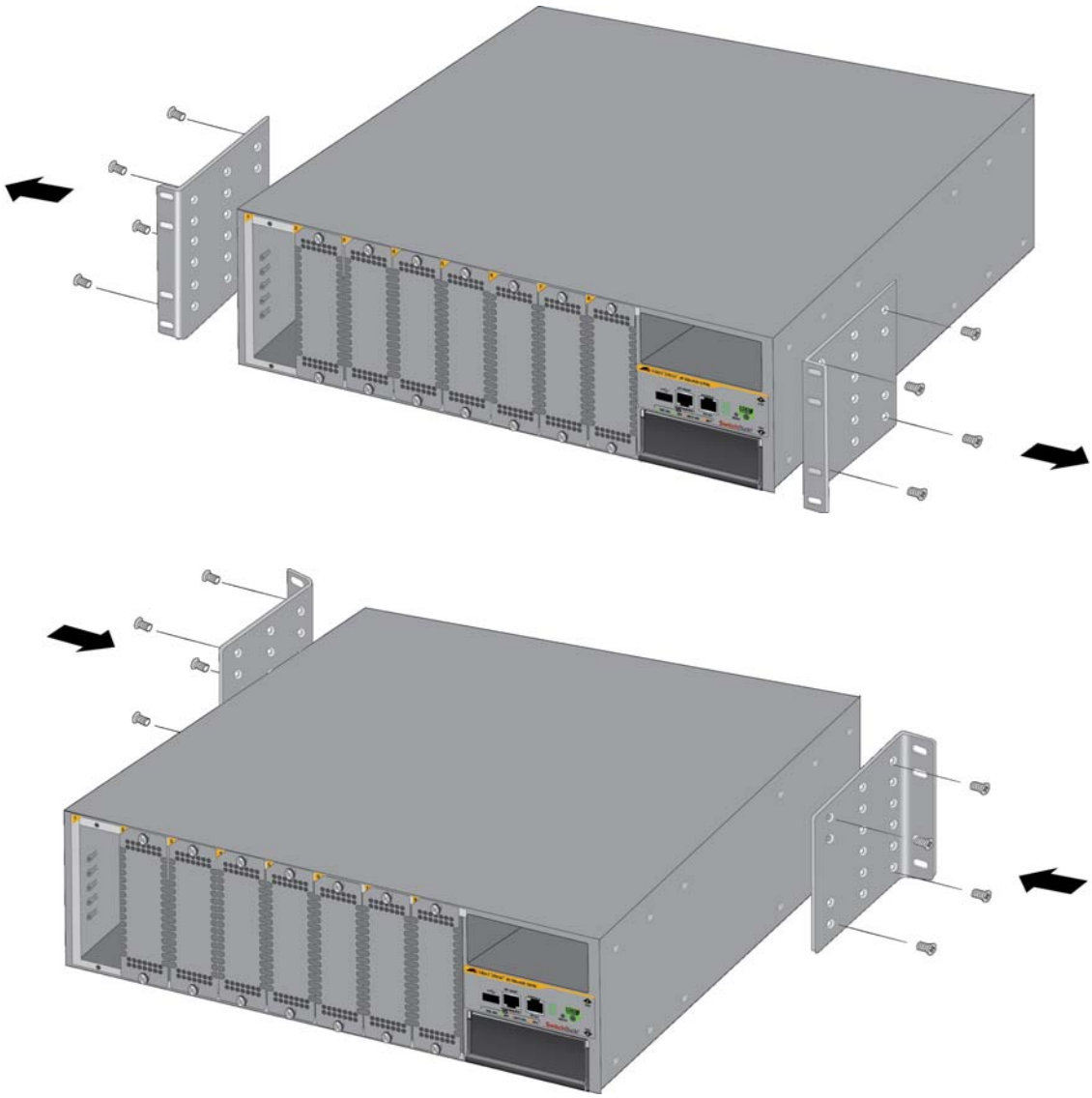


Figure 41. Example of Adjusting the Equipment Rack Brackets

Installing the Chassis in an Equipment Rack

This chassis is designed for a standard 19-inch equipment rack. Please review the installation guidelines in “Choosing a Site for the Chassis” on page 82 before installing the chassis.

Caution
The chassis may be heavy and awkward to lift. Allied Telesis recommends that you get assistance when mounting the chassis in an equipment rack. 28

To install the chassis, perform the following procedure:

1. Place the chassis on a level, secure surface.
2. If you want to reposition the brackets from their pre-installed positions, remove them using a #2 Phillips-head screwdriver and secure them in their new position. Refer to Figure 41 on page 96 for an example.
3. Have two other people hold the chassis in the equipment rack at the desired location while you secure it using eight standard equipment rack screws (not provided). Refer to Figure 42.

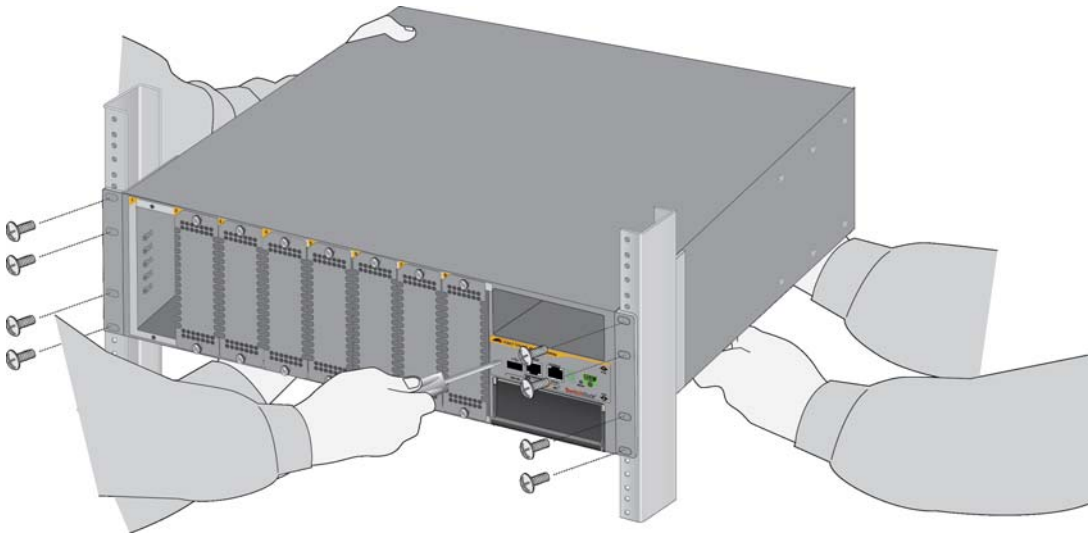


Figure 42. Securing the Chassis to the Equipment Rack

4. Go to “Installing the Chassis Grounding Wire” on page 98.

Installing the Chassis Grounding Wire

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

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

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

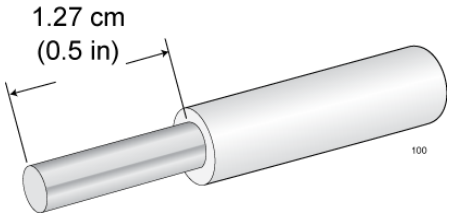


Figure 43. Stripping the Grounding Wire

2. Use a #2 Phillips-head screwdriver to remove the two screws that secure the grounding lug to the rear panel of the chassis. Refer to Figure 44 on page 99.

Figure 44. Removing the Grounding Lug from the Chassis

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

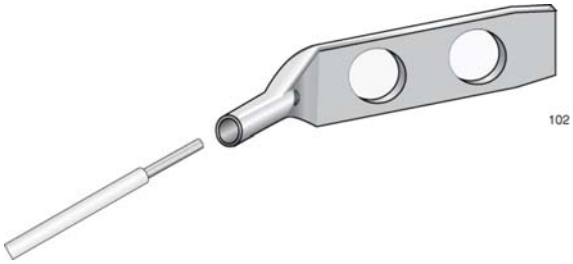


Figure 45. Attaching the Grounding Wire to the Grounding Lug

4. Install the grounding lug on the rear panel of the chassis. Refer to Figure 46 on page 100.

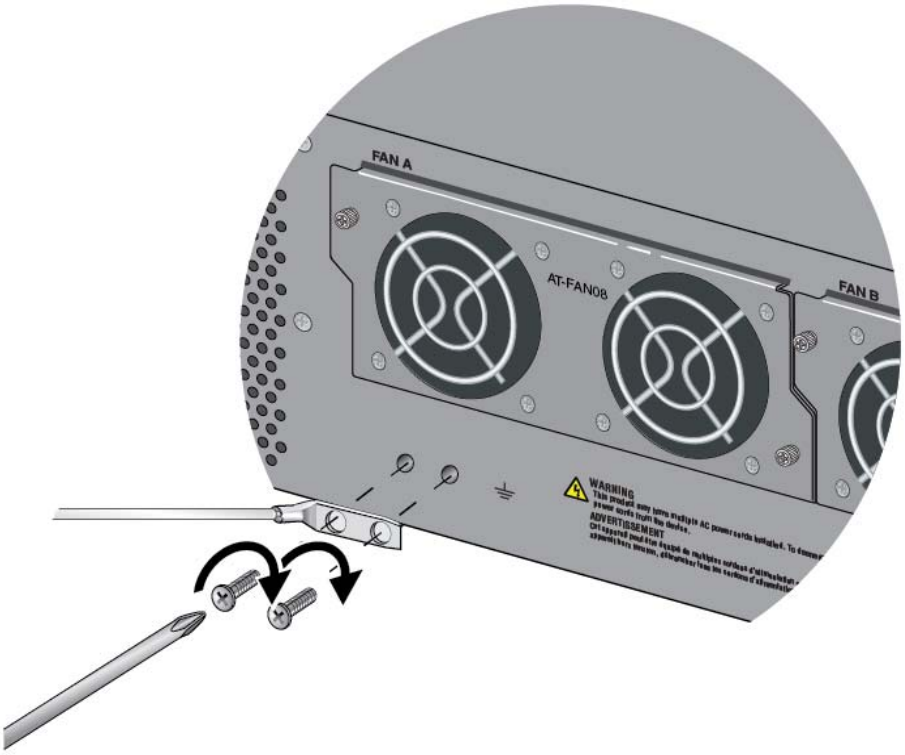


Figure 46. Installing the Grounding Lug and Wire

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

6. Go to “Installing SBxPWRSYS2 AC Power Supplies” on page 101 or “Installing SBxPWRSYS1-80 DC Power Supplies” on page 105.

Installing SBxPWRSYS2 AC Power Supplies

This section contains the procedure for installing SBxPWRSYS2 AC Power Supplies in the chassis. For a list of the components that come with the power supply, refer to “Unpacking SBxPWRSYS2 AC Power Supplies” on page 88.

Warning
The power supply is heavy. Use both hands to lift it. You might injure yourself or damage the equipment if you drop it.

Caution
The device can be damaged by static electricity. Be sure to follow proper anti-static precautions when installing the device. Allied Telesis recommends using a properly grounded wrist strap or other personal anti-static device and an anti-static mat.

To install power supplies in the chassis, perform the following procedure:

1. Choose a slot for the power supply. The power supply slots are labeled PSU A and PSU B

   If you are installing only one power supply, you may install it in either slot. Allied Telesis recommends PSU A because that slot does not come with a blank power supply panel.

2. If there is already a power supply in PSU A, lift the handle on the blank power supply panel in PSU B and slide the panel from the slot. Refer to Figure 47 on page 102.

Figure 47. Removing the Blank Power Supply Panel from Power Supply Slot B

3. Lift the handle on the SBxPWRSYS2 AC Power Supply. Refer to Figure 48.

Figure 48. Lifting the Locking Handle on the SBxPWRSYS2 Power Supply

4. Carefully align the power supply in the slot and slide it into the slot until it makes contact with the connector inside the chassis. Refer to Figure 49 on page 103.

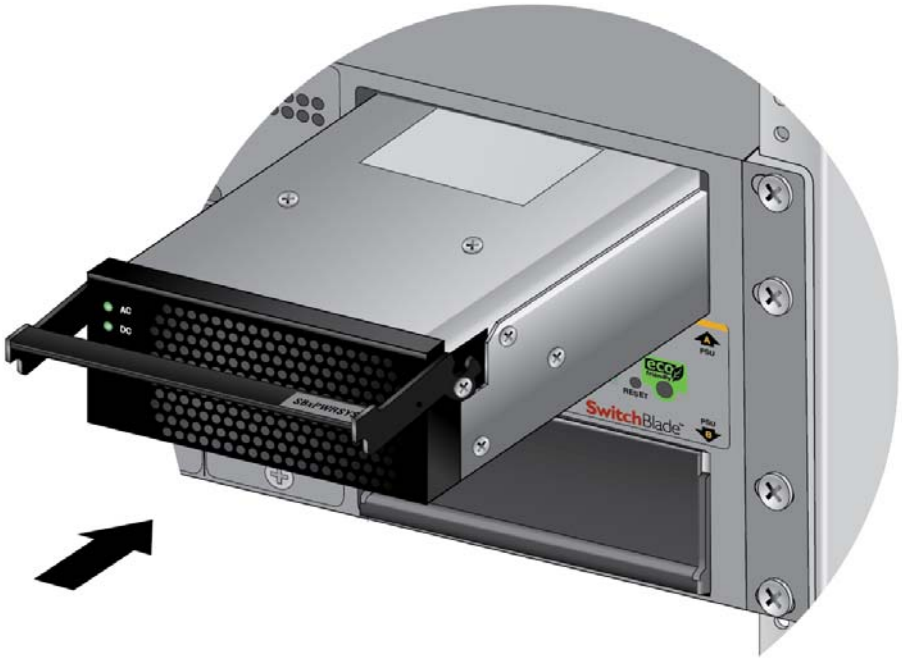


Figure 49. Sliding the SBxPWRSYS2 AC Power Supply into the Chassis

5. Gently press on the faceplate of the power supply to seat the unit on the connector on the backplane of the chassis, and lower the locking handle to secure the unit in the chassis. Refer to Figure 50.

Figure 50. Lowering the Locking Handle on the SBxPWRSYS2 AC Power Supply

6. Visually inspect the power supply to be sure that its faceplate is flush against the front panel of the chassis and the locking handle is fully down.

7. If necessary, repeat this procedure to install a second power supply.

8. After installing the power supplies, go to “Installing Ethernet Line Cards” on page 109.

Installing SBxPWRSYS1-80 DC Power Supplies

This section contains the installation procedure for SBxPWRSYS1-80 DC Power Supplies. For a list of the components that come with the power supply, refer to “Unpacking SBxPWRSYS1-80 DC Power Supplies” on page 89.

Warning
The power supply is heavy. Use both hands to lift it. You might injure yourself or damage the equipment if you drop it.

Caution
The device can be damaged by static electricity. Be sure to follow proper anti-static precautions when installing the device. Allied Telesis recommends using a properly grounded wrist strap or other personal anti-static device and an anti-static mat.

To install SBxPWRSYS1-80 DC Power Supplies in the chassis, perform the following procedure:

1. Choose a slot for the power supply. The power supply slots are labeled PSU A and PSU B

   If you are installing only one power supply, you may install it in either slot. Allied Telesis recommends PSU A because that slot does not come with a blank power supply panel.

2. If there is already a power supply in PSU A, lift the handle on the blank power supply panel in PSU B and slide the panel from the slot. Refer to Figure 47 on page 102.

3. Verify that the On/Off switch on the power supply is in the Off position. Refer to Figure 51 on page 106.

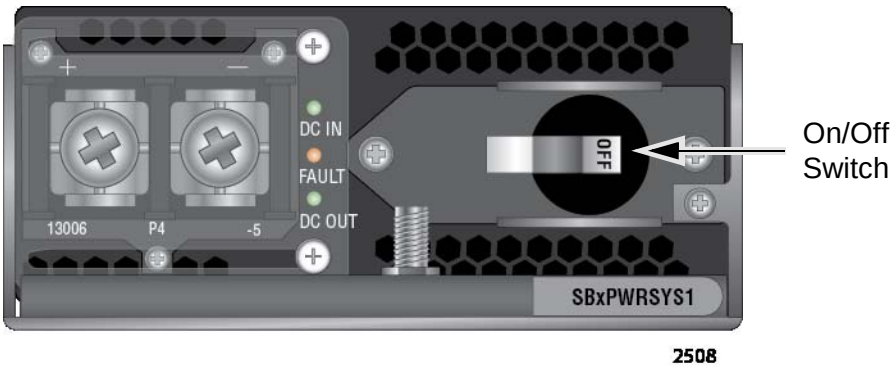


Figure 51. On/Off Switch on the SBxPWRSYS1-80 DC Power Supply

4. With a #2 Phillips-head screwdriver, loosen the handle locking screw on the power supply, as shown in Figure 52.

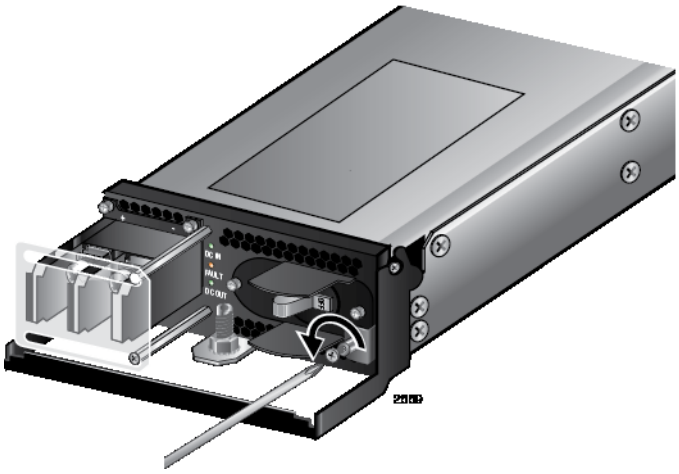


Figure 52. Loosening the Handle locking Screw on the SBxPWRSYS1-80 DC Power Supply

5. Lift the handle on the SBxPWRSYS1-80 DC Power Supply. Refer to Figure 53 on page 107.

Figure 53. Lifting the Locking Handle on the SBxPWRSYS1-80 DC Power Supply

6. Carefully align the power supply in the slot and slide it into the slot until it makes contact with the connector inside the chassis. Refer to Figure 54.

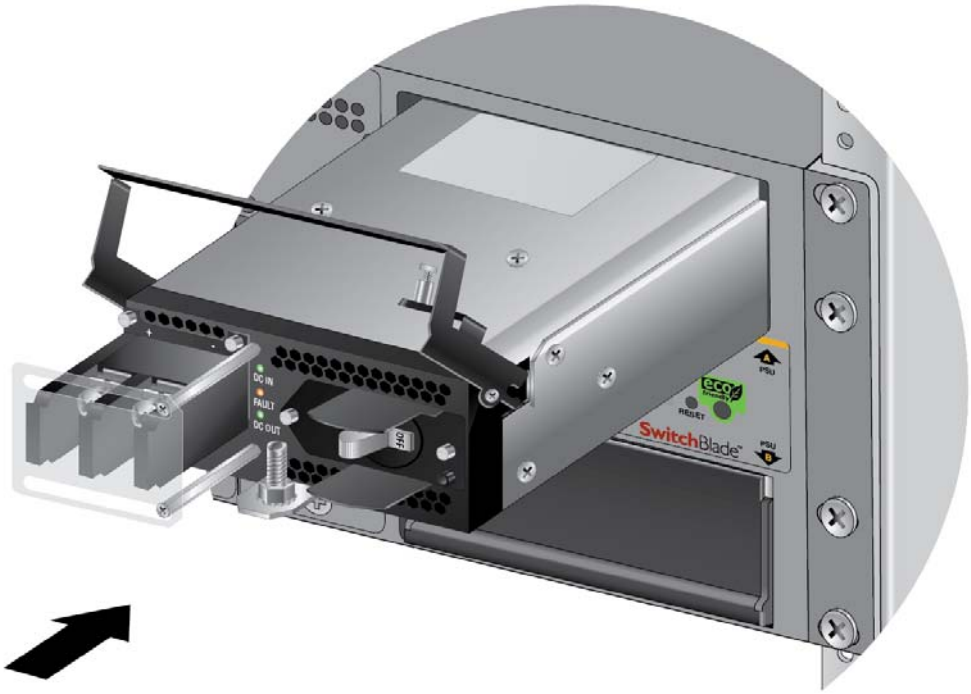


Figure 54. Inserting the SBxPWRSYS1-80 DC Power Supply

7. Gently press on the faceplate of the power supply to seat the unit on the connector on the backplane of the chassis, and lower the locking handle to secure the unit in the chassis. Refer to Figure 55 on page 108.

Figure 55. Lowering the Locking Handle on the SBxPWRSYS1-80 DC Power Supply

8. Visually inspect the power supply to be sure that its faceplate is flush against the front panel of the chassis and the locking handle is fully down.

> **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 connect the positive and negative wires.

9. If necessary, repeat this procedure to install a second power supply.

10. After installing the power supplies, go to “Installing Ethernet Line Cards” on page 109.

Installing Ethernet Line Cards

This section contains the procedure for installing Ethernet line cards in the chassis. The illustrations show the XEM2-12XT Line Card. The procedure is the same for all line card models.

Caution
The device can be damaged by static electricity. Be sure to follow proper anti-static precautions when installing the device. Allied Telesis recommends using a properly grounded wrist strap or other personal anti-static device and an anti-static mat.

To install Ethernet line cards, perform the following procedure:

1. Choose a slot in the chassis for the card. You can install cards in slots 1 to 8.

2. If the slot is covered with a blank panel, use a #2 Phillips-head screwdriver to loosen the two captive screws on the panel and remove it from the chassis. Refer to Figure 56.

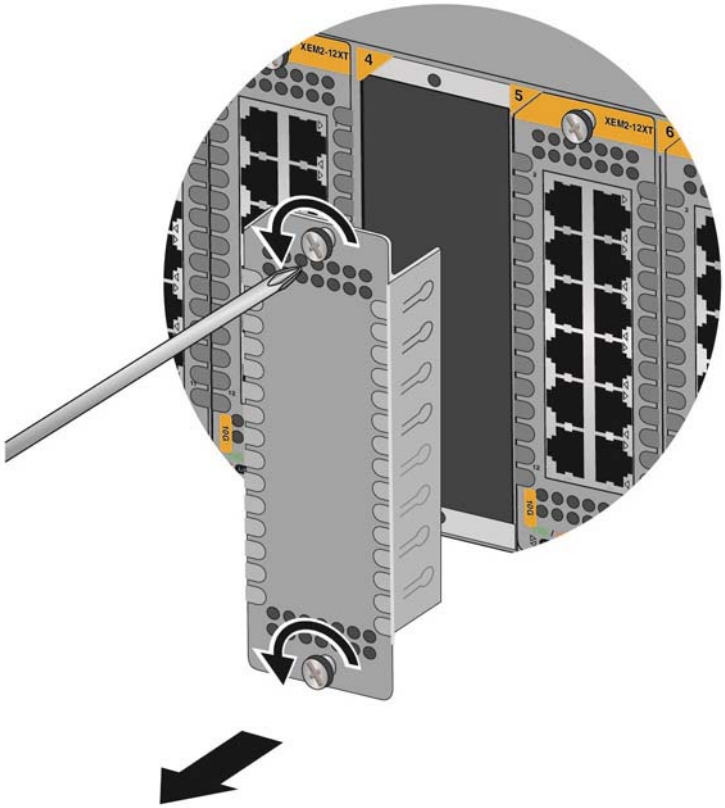


Figure 56. Removing a Blank Line Card Cover

3. Carefully remove the new Ethernet line card from its shipping container and anti-static bag. Refer to Figure 57.

Figure 57. Removing the Ethernet Line Card from the Anti-static Bag

4. Position the line card with the notch on the faceplate in the upper left corner, as shown in Figure 58 on page 111, and carefully slide it into the slot. The slot in the chassis has top and bottom flanges that fit into grooves on the top and bottom of the card.

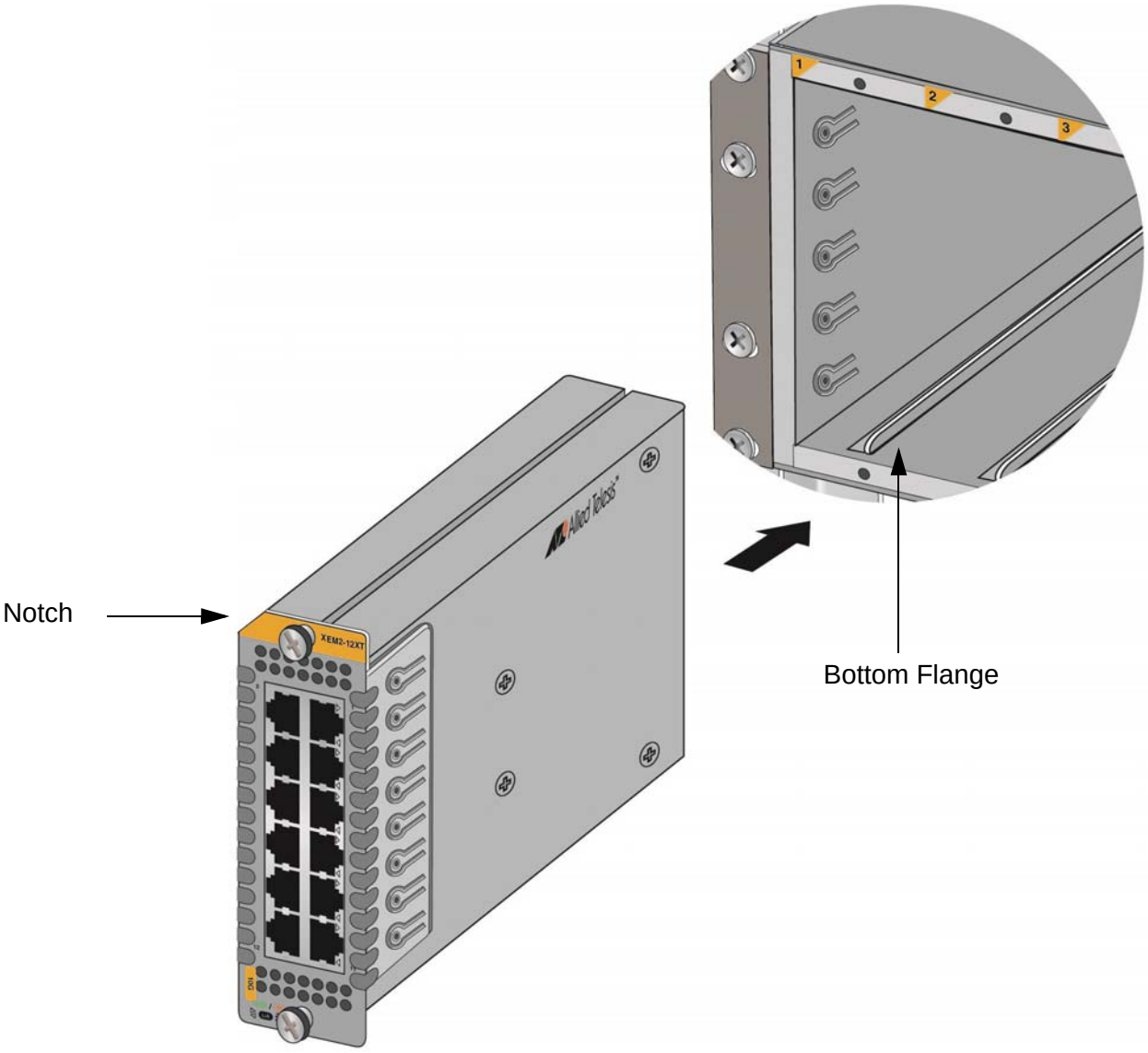


Figure 58. Sliding the Ethernet Line Card into the Slot

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

5. When you feel the line card make contact with the connector on the backplane of the chassis. gently press on the top and bottom of the faceplate to seat the card on the connector. Refer to Figure 59 on page 112.

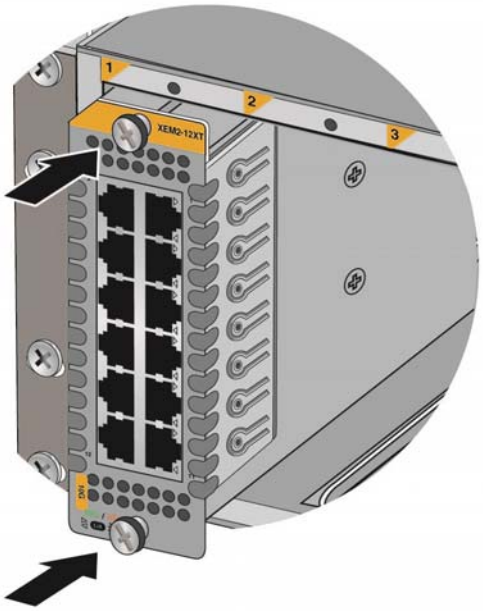


Figure 59. Seating an Ethernet Line Card in the Chassis

6. Visually inspect the line card to verify that its faceplate is flush against the front panel of the chassis.

7. Tighten the two captive screws on the card to secure it in the chassis. Refer to Figure 60.

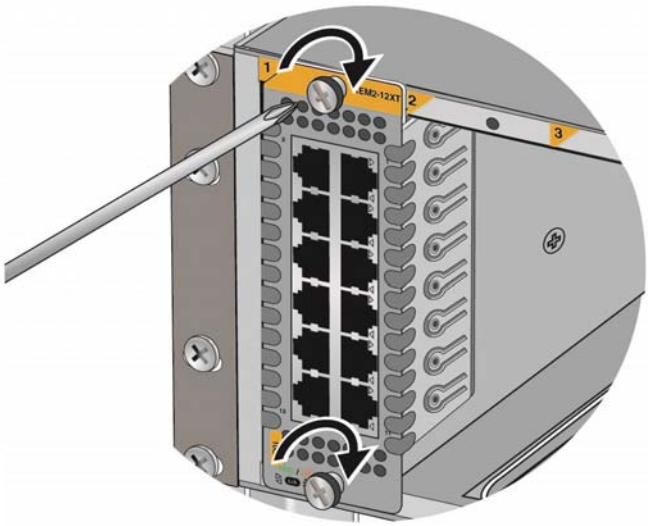


Figure 60. Tightening the Two Captive Screws on the Ethernet Line Card

8. Repeat this procedure to install additional cards.

9. After installing the line cards, go to “Installing Blank Line Card Slot Covers” on page 113.

Installing Blank Line Card Slot Covers

After installing the Ethernet line cards, inspect slots 1 to 8 for empty slots. Empty slots need to be covered with the blank slot covers that come with the chassis. Do one of the following:

- If there are no empty, uncovered line card slots, go to “Installing the Blank Power Supply Slot Cover” on page 115.
- If there are empty, uncovered line card slots, perform the following procedure.

To install blank slot covers, perform the following procedure:

1. Position the blank slot cover with the notch in the upper left and slide it into the empty slot. Refer to Figure 61.

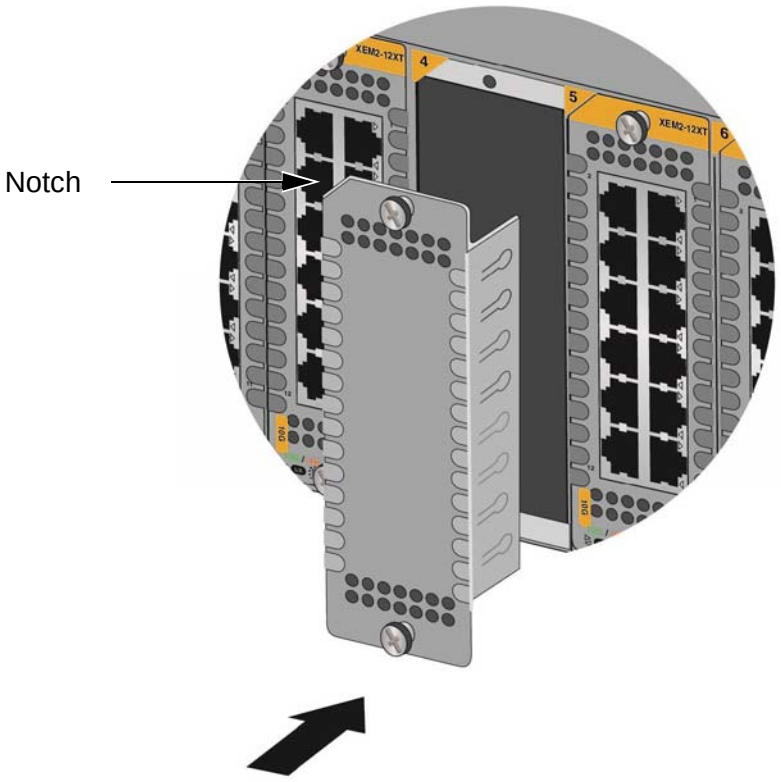


Figure 61. Installing a Blank Slot Cover

2. Tighten the two captive screws with a #2 Phillips-head screwdriver to secure the cover to the chassis. Refer to Figure 62 on page 114.

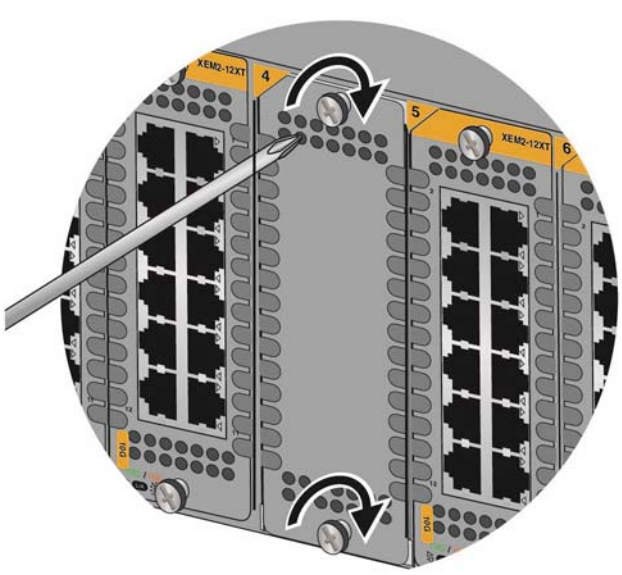


Figure 62. Tightening the Captive Screws on a Blank Slot Cover

3. Repeat this procedure to install additional blank slot covers.
4. Go to “Installing the Blank Power Supply Slot Cover” on page 115

Installing the Blank Power Supply Slot Cover

If you installed only one power supply in the chassis, check that the empty power supply slot is covered with the blank power supply slot cover included with the chassis. Do one of the following:

- ❒ If the chassis has two power supplies or if the empty power supply is already covered, go to “Installing the Power Cord Retaining Clips” on page 117.
- ❒ If a power supply slot is uncovered, continue with the procedure in this section.

To install the bank power supply slot cover, perform the following procedure:

1. Lift the locking handle on the bank power supply slot cover. Refer to Figure 63.

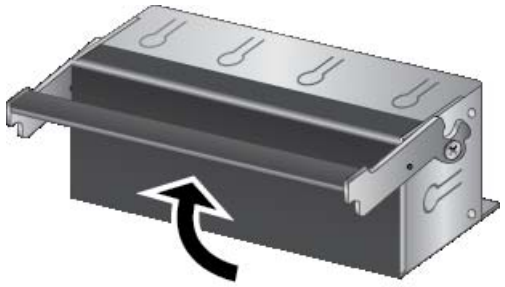


Figure 63. Lifting the Locking Handle on the Blank Power Supply Slot Cover

2. Align the cover in the empty power supply slot and carefully slide it into the slot. Figure 64 on page 116 shows the cover being installed in the PSU B slot.

Figure 64. Aligning the Blank Power Supply Cover in the Slot

3. Lower the locking handle on the blank power supply slot cover to secure the cover in the chassis. Refer to Figure 65.

Figure 65. Lowering the Locking Handle on the Blank Power Supply Slot Cover

4. Go to “Installing the Power Cord Retaining Clips” on page 117.

Installing the Power Cord Retaining Clips

The chassis comes with two power cord retaining clips in the accessory kit. They are used to prevent the power cords for the SBxPWRSYS2 AC power supply from being accidentally disconnected from the unit. To install a power cord retaining clip, press in the sides and insert the ends into the holes above and below the AC connector. Repeat to install the second power cord retaining clip. Refer to Figure 66.

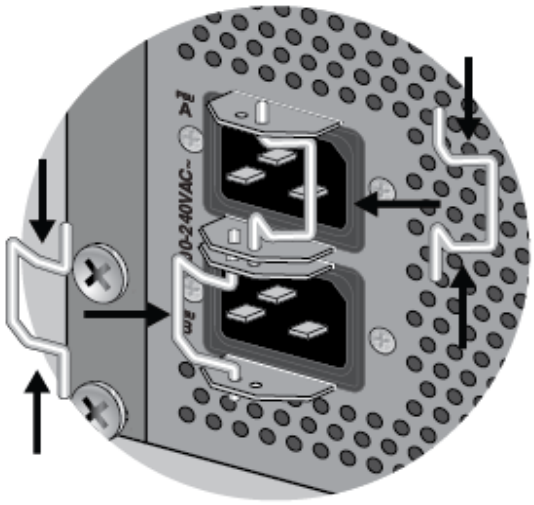


Figure 66. Installing the Power Cord Retaining Clips

Note
The power cord retaining clips are not used with the SBxPWRSYS1-80 DC power supply.

Verifying the Installation

Please perform the following procedure after installing a chassis:

1. Verify that the chassis has at least one power supply in slot PSU A or B.

2. If the chassis has only one power supply, verify that the empty power supply slot on the front panel is covered with a blank panel. For instructions, refer to “Installing the Blank Power Supply Slot Cover” on page 115.

3. If the chassis has SBxPWRSYS2 AC Power Supplies, verify that you installed the power cord retaining clips on the AC power connectors on the rear panel of the chassis. For instructions, refer to “Installing the Power Cord Retaining Clips” on page 117.

4. Verify that the grounding lug on the back panel of the chassis is properly grounded. For instructions, refer to “Installing the Chassis Grounding Wire” on page 98.

5. Verify that all empty line card slots on the front panel of the chassis are covered with slot covers. If there are open slots, perform the procedure “Installing Blank Line Card Slot Covers” on page 113.

If the chassis has SBxPWRSYS1-80 DC Power Supplies, perform the procedures in Chapter 5, “Wiring the SBxPWRSYS1-80 DC Power Supply” on page 119.

Repeat the procedures in this chapter to install the other switches of the stack. Afterwards, go to Chapter 6, “Configuring Switches for Stacking” on page 149.

Chapter 5

Wiring the SBxPWRSYS1-80 DC Power Supply

This chapter contains the following procedures:

Introduction

The procedures in this chapter explain how to attach the ground and power wires to the SBxPWRSYS1-80 DC Power Supplies. If you have not installed the power supplies, refer to “Installing SBxPWRSYS1-80 DC Power Supplies” on page 105 for instructions.

The power supply unit has a ground connection and positive and negative DC terminals. You may install the ground and power lead wires with the terminal lugs that come with the unit or with bare wire. 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 wiring procedures for the SBxPWRSYS1-80 DC Power Supply:

- ❒ “Choosing a Method for Attaching the Grounding Wire” on page 122
- ❒ “Connecting the Grounding Wire with the Grounding Terminal” on page 123
- ❒ “Connecting the Grounding Wire with Bare Wire” on page 128
- ❒ “Introduction to Attaching the Power Wires” on page 131
- ❒ “Connecting the DC Power Wires with the Straight Terminals” on page 132
- ❒ “Connecting the DC Power Wires with the Right Angle Terminals” on page 139
- ❒ “Connecting Bare DC Power Wires” on page 145

The components on the power supply are identified in Figure 67.

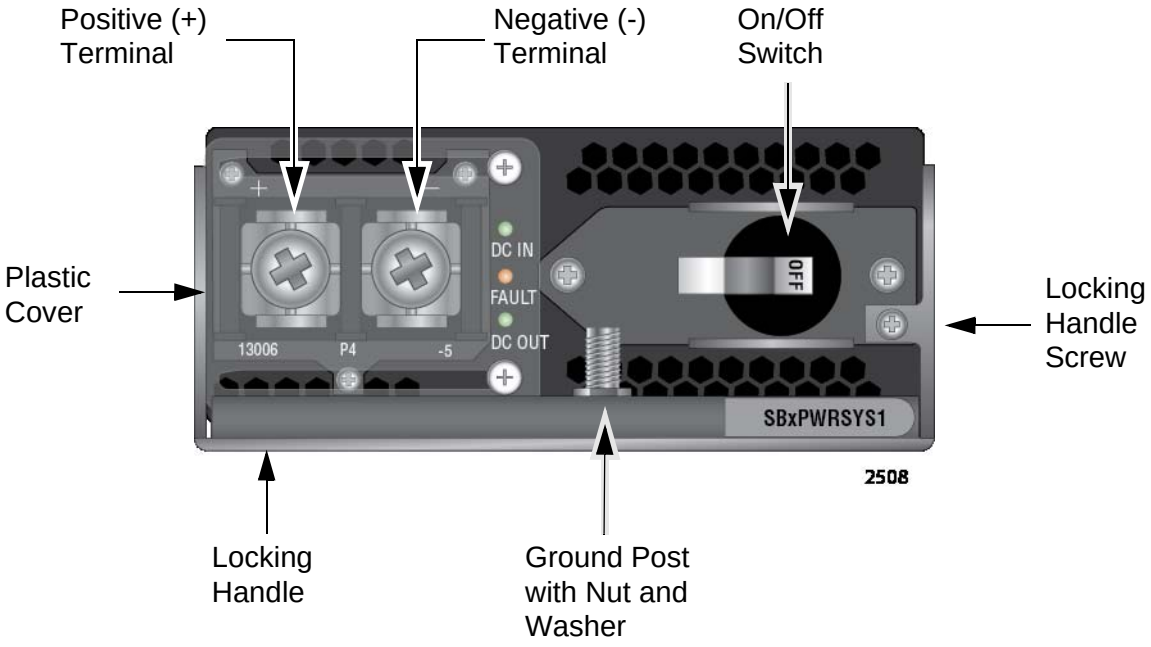


Figure 67. Components on the SBxPWRSYS1-80 DC Power Supply

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 68, or bare wire.

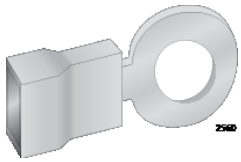


Figure 68. Grounding Wire Terminal

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 128

Connecting the Grounding Wire with the Grounding Terminal

To attach a grounding wire with the grounding terminal provided with 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 69.

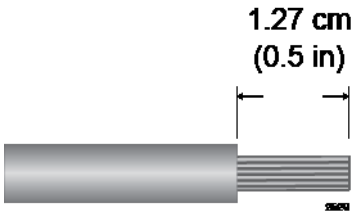


Figure 69. Stripping the Stranded Grounding Wire

Note
You must use stranded wire when using the grounding 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 70,

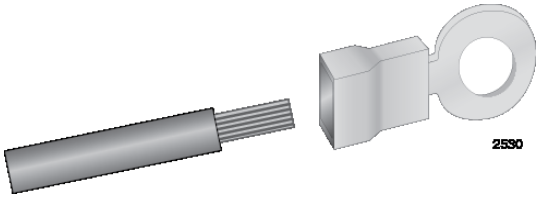


Figure 70. Attaching the Stranded Grounding Wire to the Grounding Terminal

3. Verify that the On/Off switch on SBxPWRSYS1-80 DC Power Supply is in the Off position. Refer to Figure 71 on page 124.

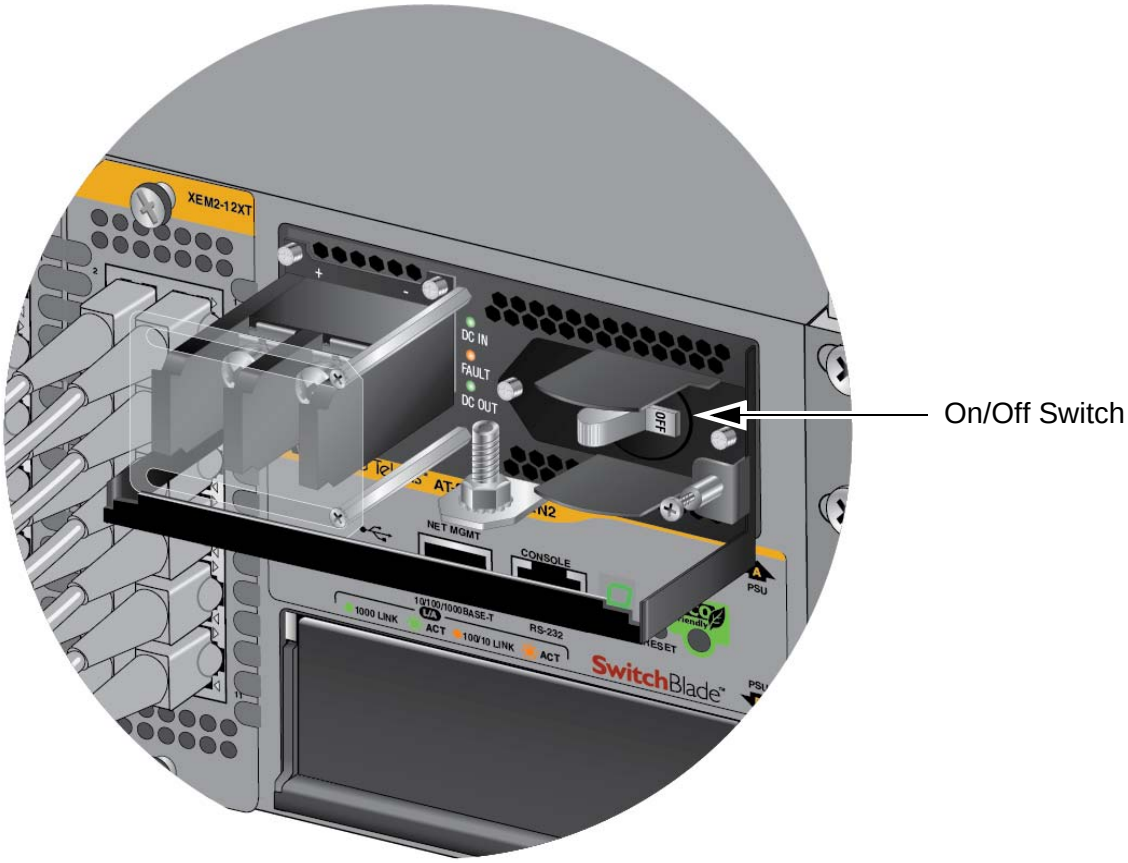


Figure 71. On/Off Switch on the SBxPWRSYS1-80 DC Power Supply

4. Use an 8 mm wrench to remove the grounding post nut and washer, shown in Figure 72 on page 125, from the power supply.

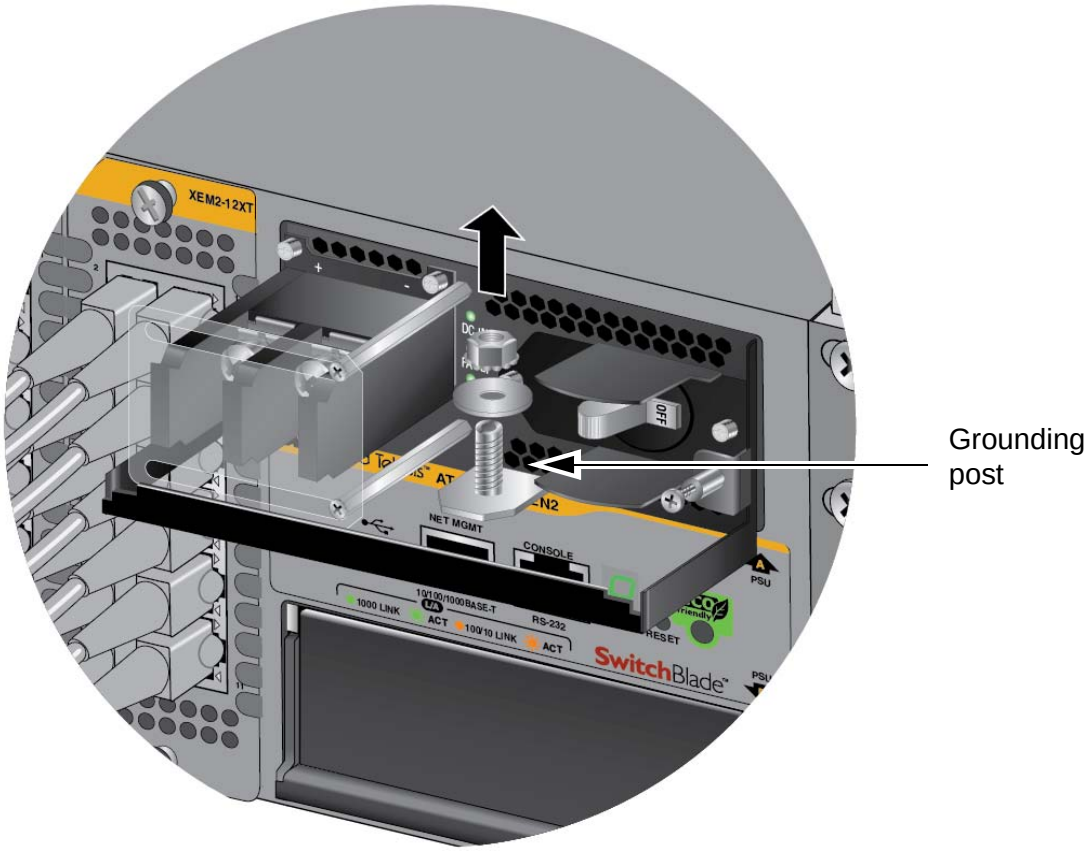


Figure 72. Removing the Nut and Washer from the Grounding Post

5. Attach the grounding lug and wire to the grounding post. Refer to Figure 73 on page 126.

   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.

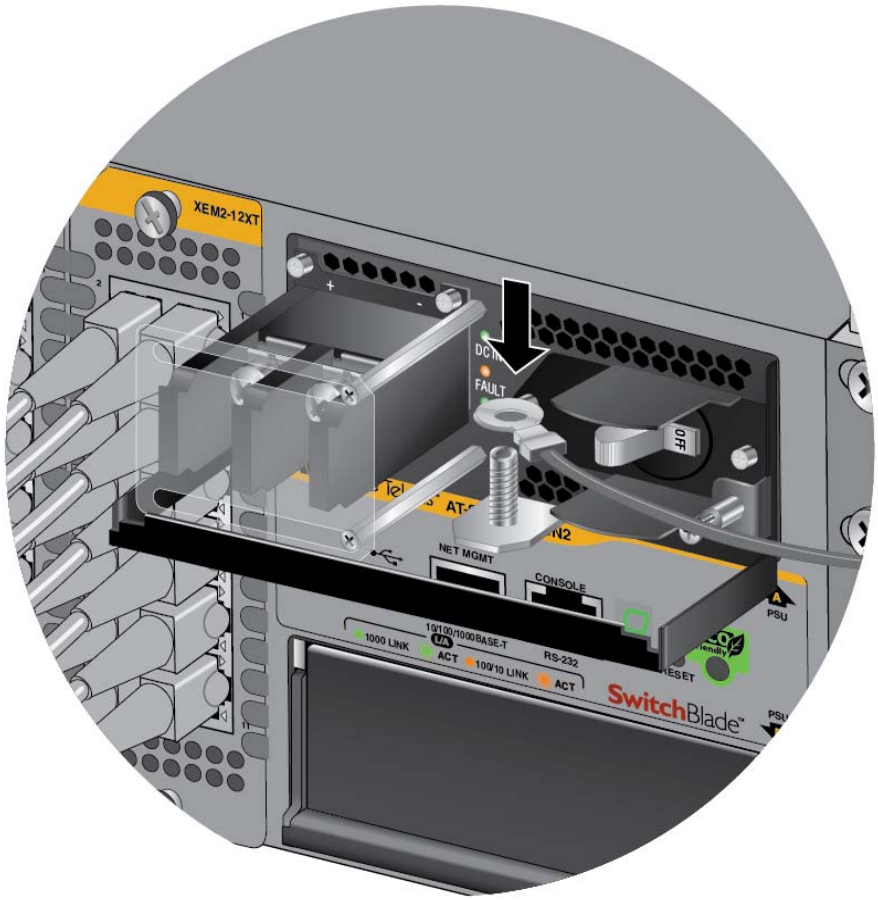


Figure 73. Attaching the Grounding Lug and Wire to the Grounding Post

6. Secure the grounding wire with the nut and washer removed in step 4, with an 8 mm wrench. Refer to Figure 74 on page 127.

   Allied Telesis recommends tightening the nut and washer to 26 inch-lbs.

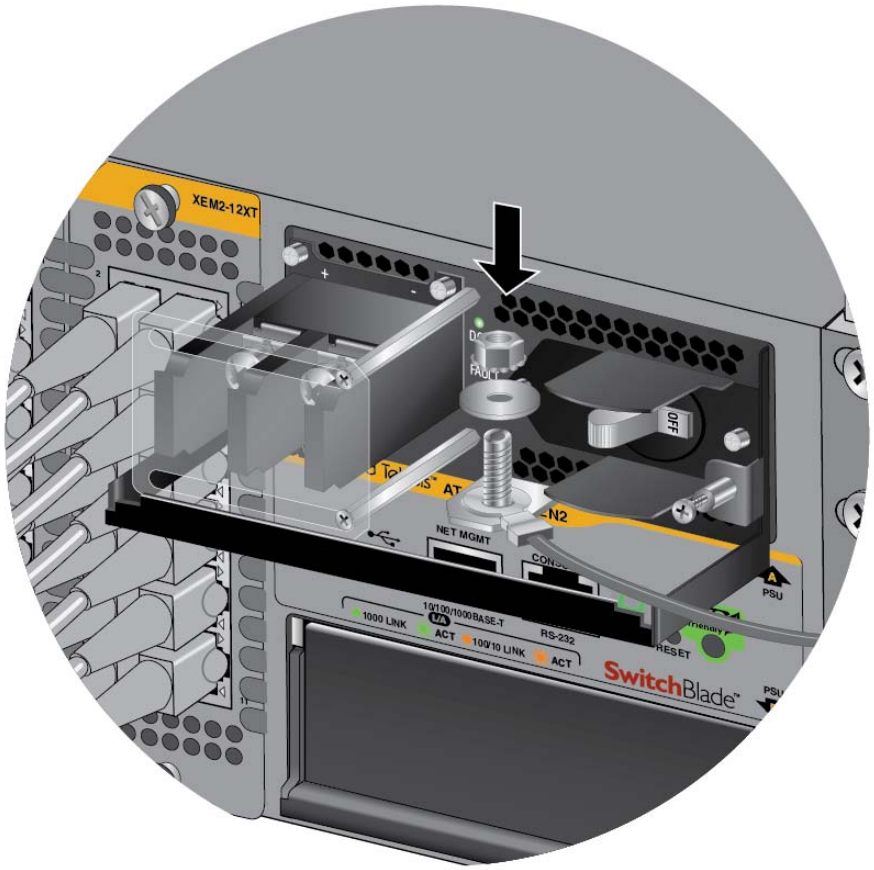


Figure 74. Securing the Grounding Wire

7. 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 works with a positive grounded or negative grounded DC system. E13

8. After connecting the grounding wire, go to “Introduction to Attaching the Power Wires” on page 131.

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 75.

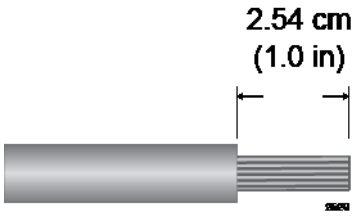


Figure 75. Stripping the solid or Stranded Grounding Wire

2. Verify that the On/Off switch on SBxPWRSYS1-80 DC Power Supply is in the Off position. Refer to Figure 71 on page 124.

3. Use an 8 mm wrench to remove the grounding post nut and washer, shown in Figure 72 on page 125, from the grounding post on the power supply.

4. Wrap the grounding wire clockwise around the base of the grounding post, as shown in Figure 76 on page 129.

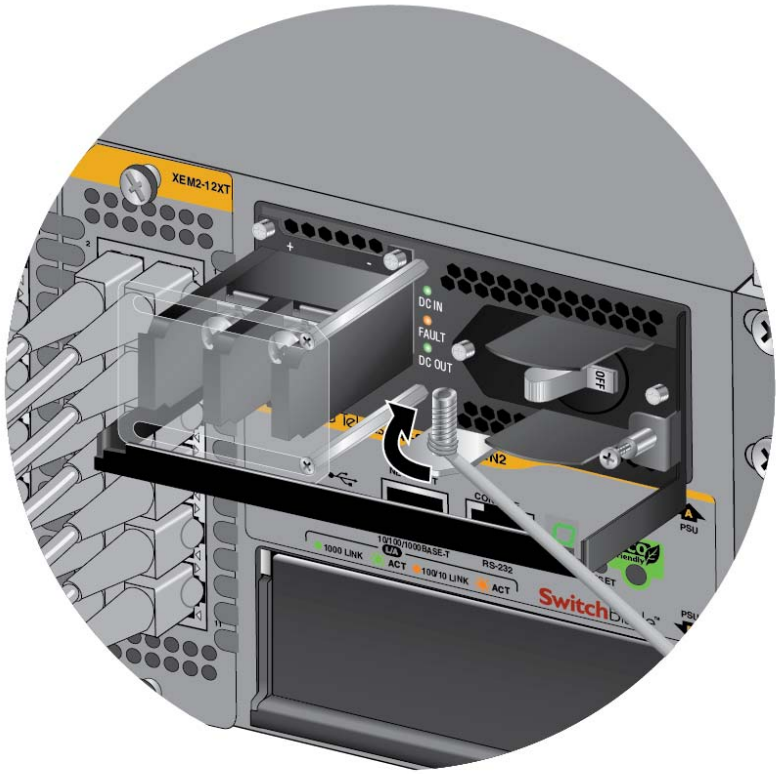


Figure 76. Attaching the Bare Grounding Wire to the Grounding Post

5. Secure the wire with the nut and washer removed in step 2, and an 8 mm wrench, as shown in Figure 77 on page 130.

   Allied Telesis recommends tightening the nut and washer to 26 inch-lbs.

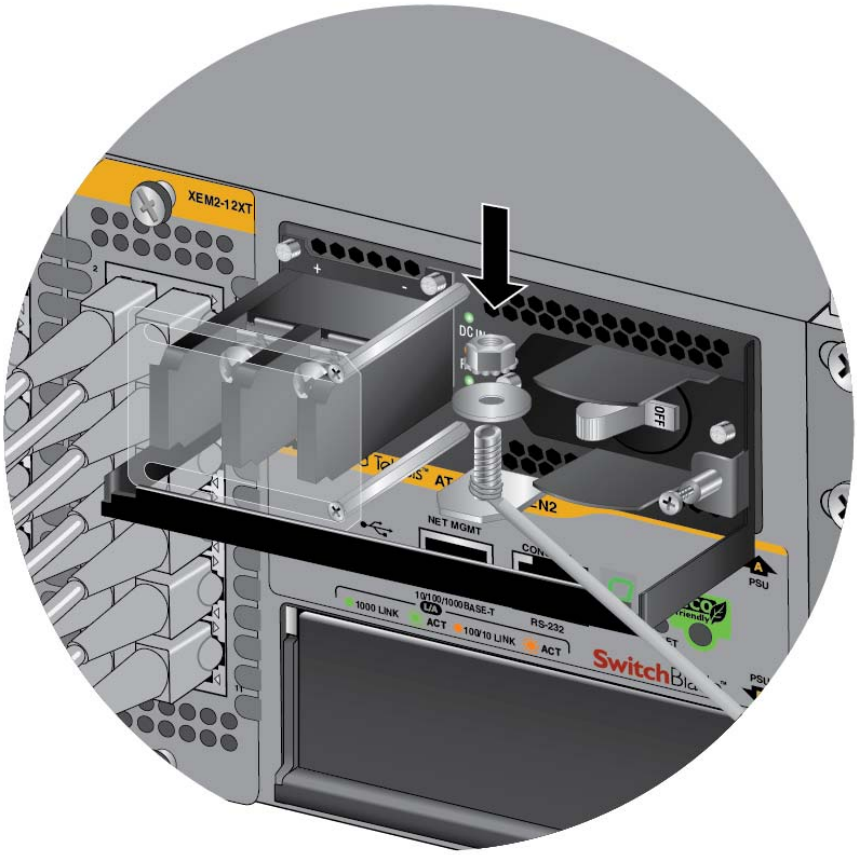
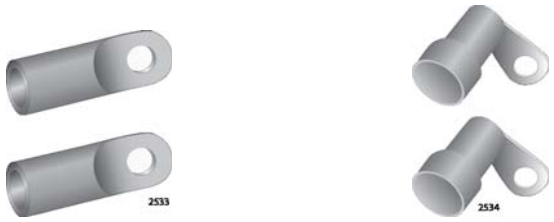


Figure 77. Securing the Bare Grounding Wire to the Grounding Post

6. After connecting the grounding wire, go to “Introduction to Attaching the Power Wires” on page 131.

Introduction to Attaching the Power Wires

The SBxPWRSYS1-80 DC Power Supply comes with the two sets of power wire terminals, shown in Figure 78. 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 78. Power Wire Terminals

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

You can also install the wires using bare wires.

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

- ❒ “Connecting the DC Power Wires with the Straight Terminals” on page 132
- ❒ “Connecting the DC Power Wires with the Right Angle Terminals” on page 139
- ❒ “Connecting Bare DC Power Wires” on page 145

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 79 on page 132.

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

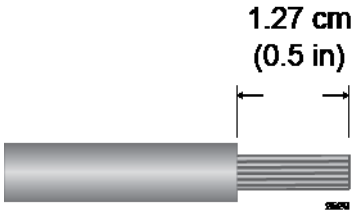


Figure 79. Stripping the Power Wires

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 80.

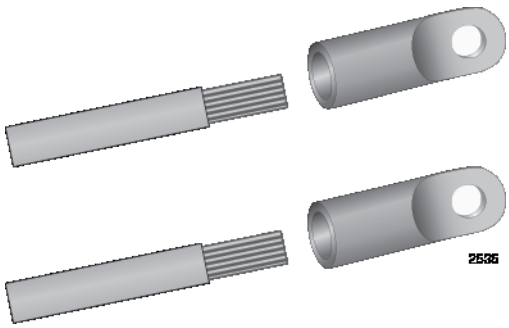


Figure 80. Attaching the Power Wires to the Straight Terminal Lugs

3. Verify that the On/Off switch on SBxPWRSYS1-80 Power Supply is in the Off position. Refer to Figure 71 on page 124.

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 81 on page 133. You may need to lift the locking handle slightly to access the bottom screw.

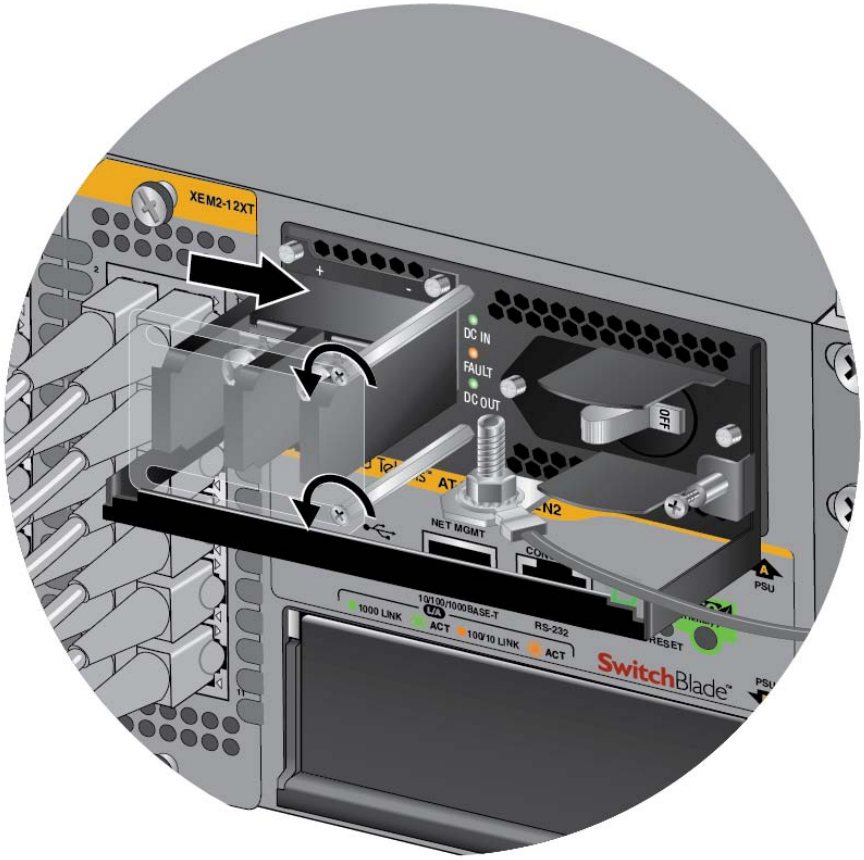


Figure 81. Opening the Plastic Cover

5. Use a #3 Phillips-head screwdriver to remove the two screws from the positive and negative terminals, as shown in Figure 82 on page 134.

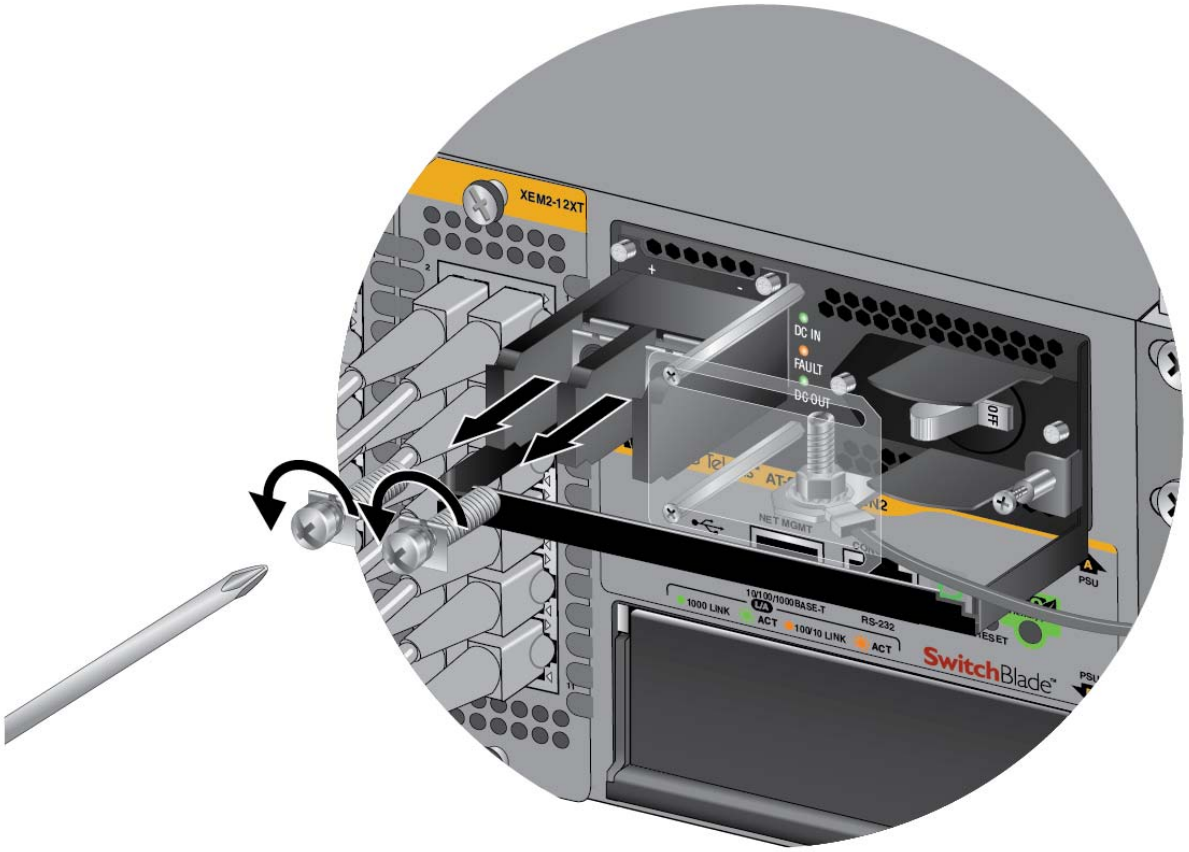


Figure 82. Removing the Terminal Screws

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 83 on page 135 shows the positive wire above the terminal block.

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

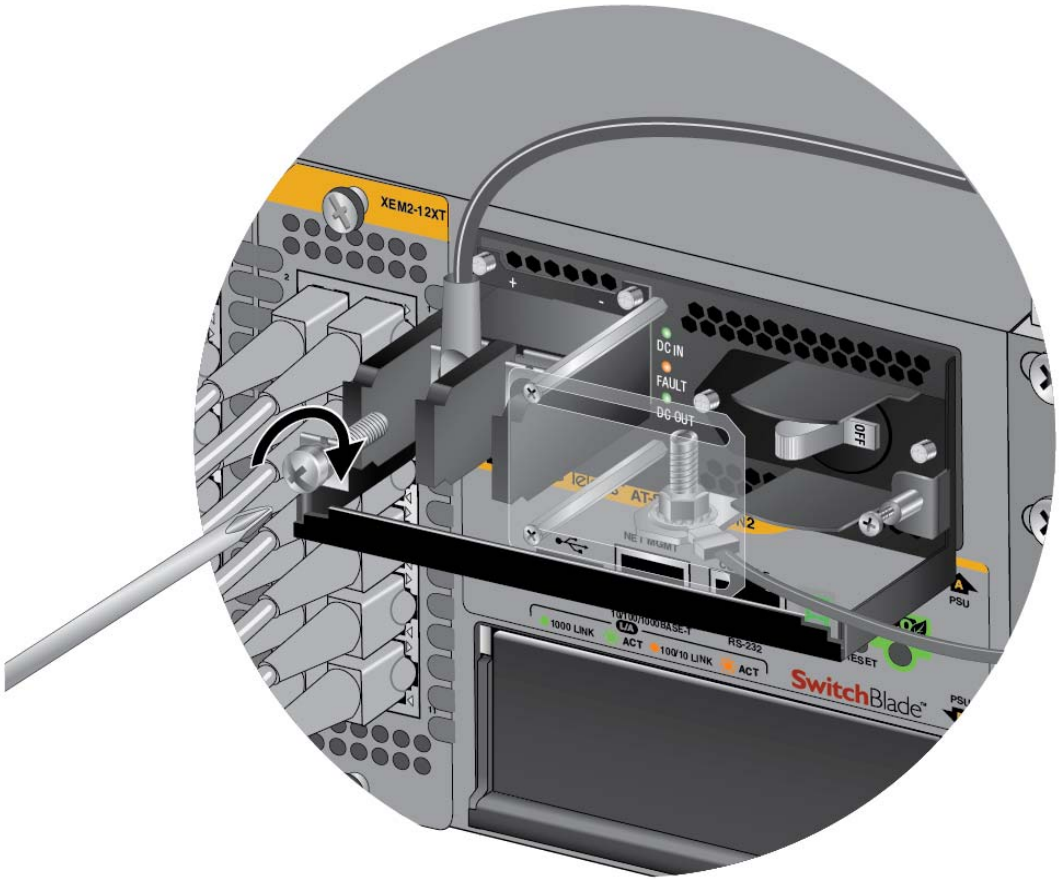


Figure 83. Connecting the Positive (+) Power Wire with a Straight Terminal

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 step 5. The negative terminal is on the right. You may attach the terminals with the wires either above or below the terminal block. Figure 84 on page 136 shows the wires above the terminal block.

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

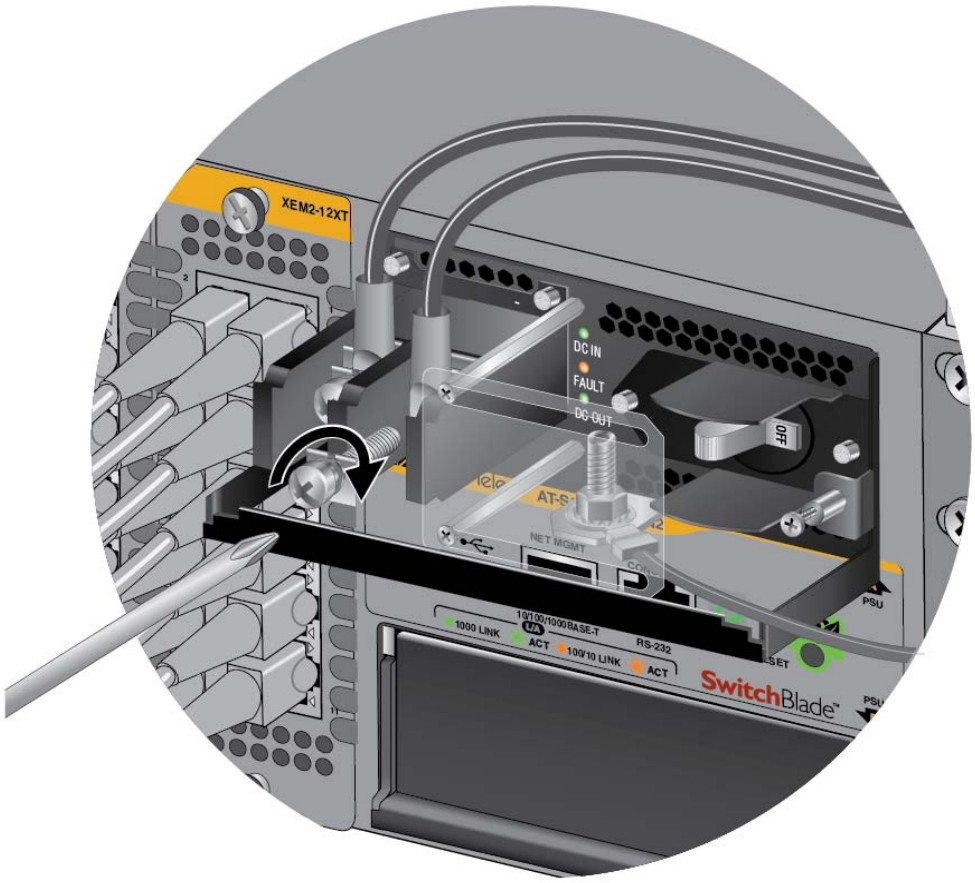


Figure 84. Connecting the Negative (-) Power Wire with a Straight Terminal

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 85 on page 137. 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.

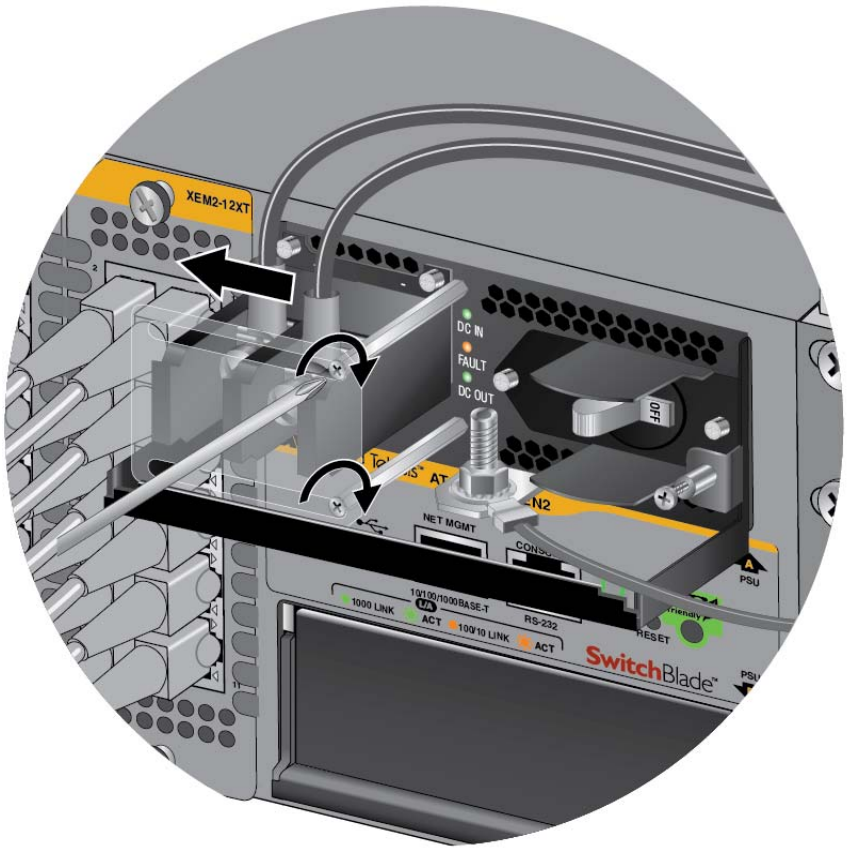


Figure 85. Closing the Plastic Cover over the Terminal Connectors

9. With a #2 Phillips-head screwdriver, tighten the handle locking screw to secure the power supply to the chassis. See Figure 86 on page 138.

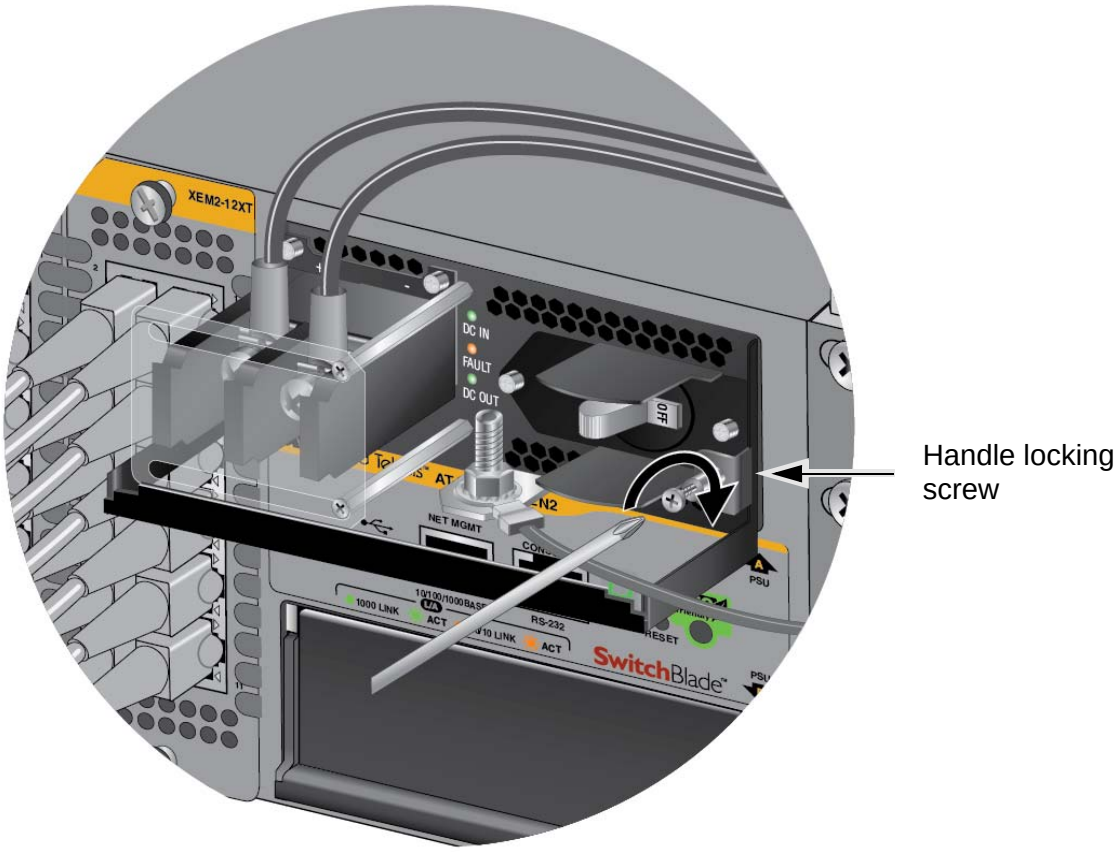


Figure 86. Tightening the Handle Locking Screw

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. If you have two SBxPWRSYS1-80 DC Power Supplies for the switch, repeat this procedure to install the second power supply.

13. Turn the DC circuit breaker(s) on.

14. Turn the On/Off switch(es) on the SBxPWRSYS1-80 DC Power Supply(ies) to the On position. See Figure 71 on page 124.

15. Wait three minutes for the switch to initialize its management software. Afterwards, go to Chapter 6, “Configuring Switches for Stacking” on page 149.

Connecting the DC Power Wires with the Right Angle Terminals

To use the right angle terminals to connect the DC power wires to the positive and negative terminals on the SBxPWRSYS1-80 DC Power Supply, perform the following procedure:

1. Prepare adequate lengths of two stranded 8 AWG power wires by stripping them as shown in Figure 79 on page 132.

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

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 87.

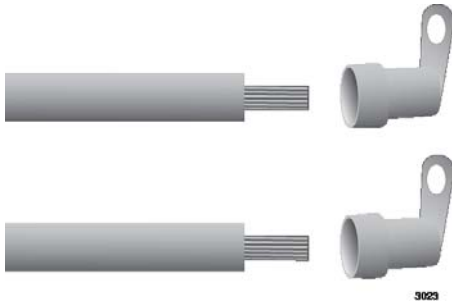


Figure 87. Attaching the Power Wires to the Right Angle Terminal Lugs

3. Verify that the On/Off switch on SBxPWRSYS1-80 DC Power Supply is in the Off position. Refer to Figure 71 on page 124.

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 88 on page 140. You may need to lift the locking handle slightly to access the bottom screw.

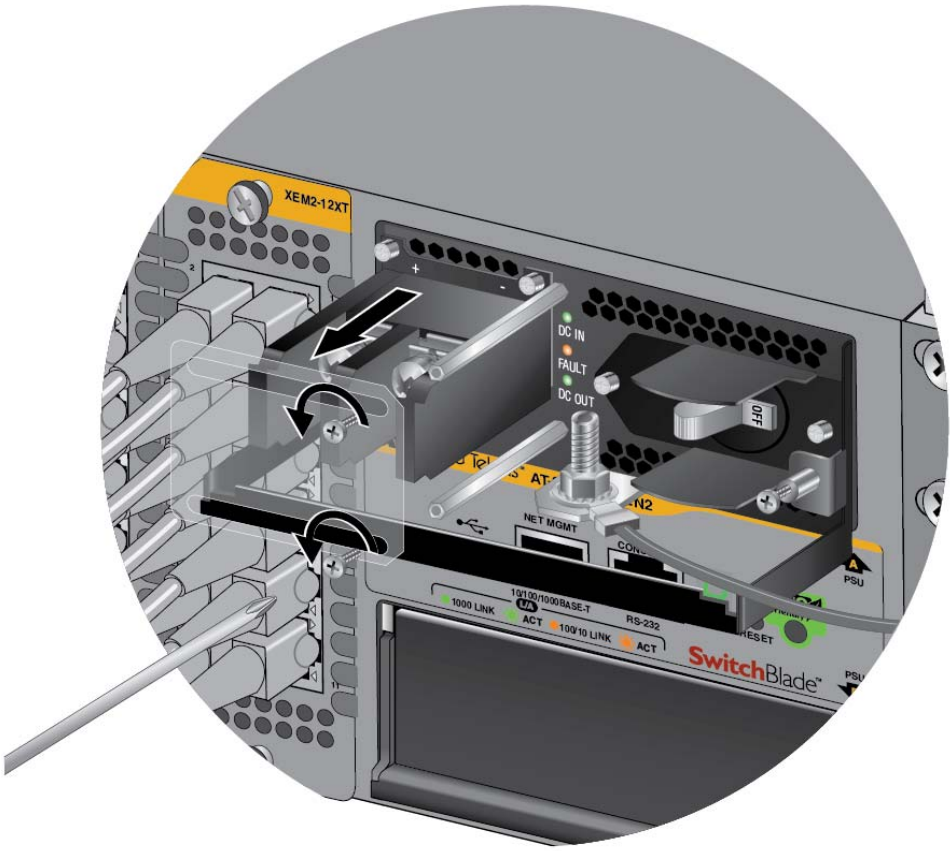


Figure 88. Removing the Plastic Cover

5. Use a #3 Phillips-head screwdriver to remove the two screws from the positive and negative terminals, as shown in Figure 89 on page 141.

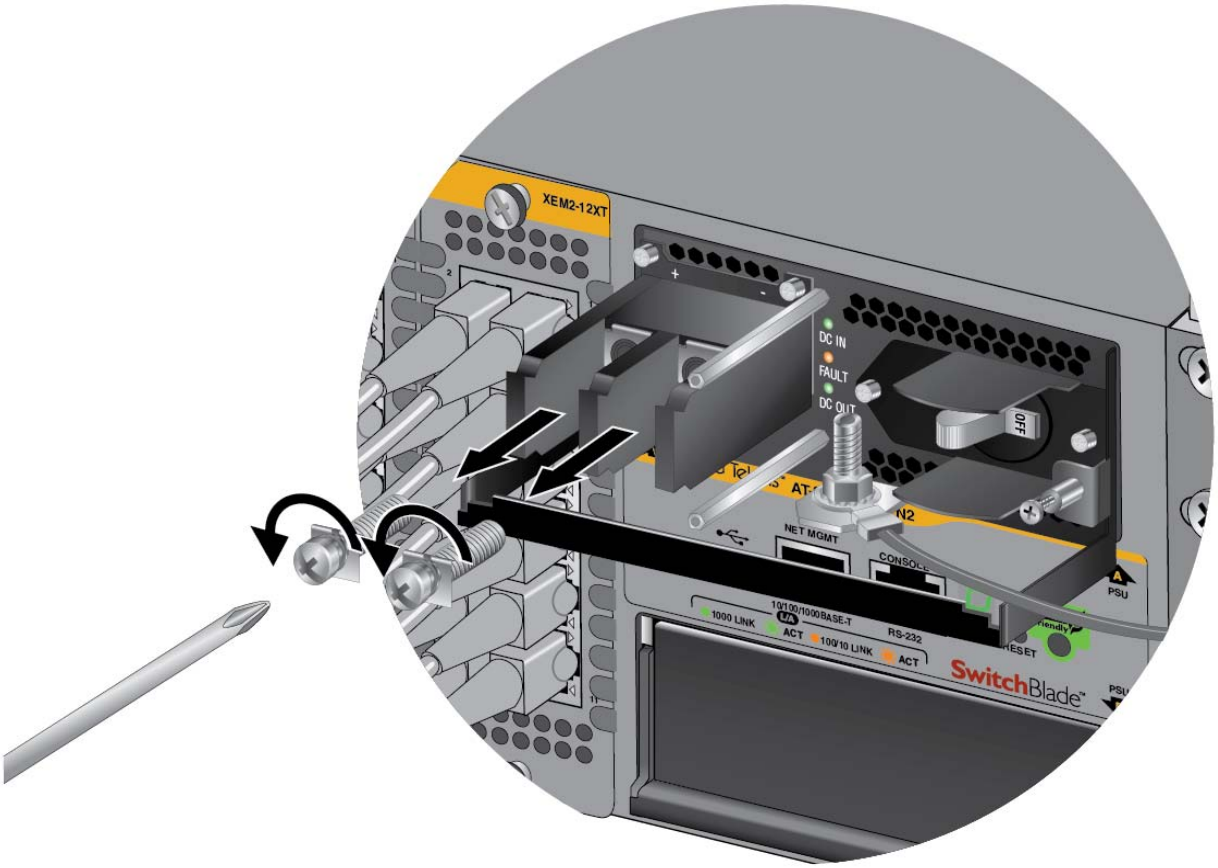


Figure 89. Removing the Terminal Screws

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 90 on page 142.

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

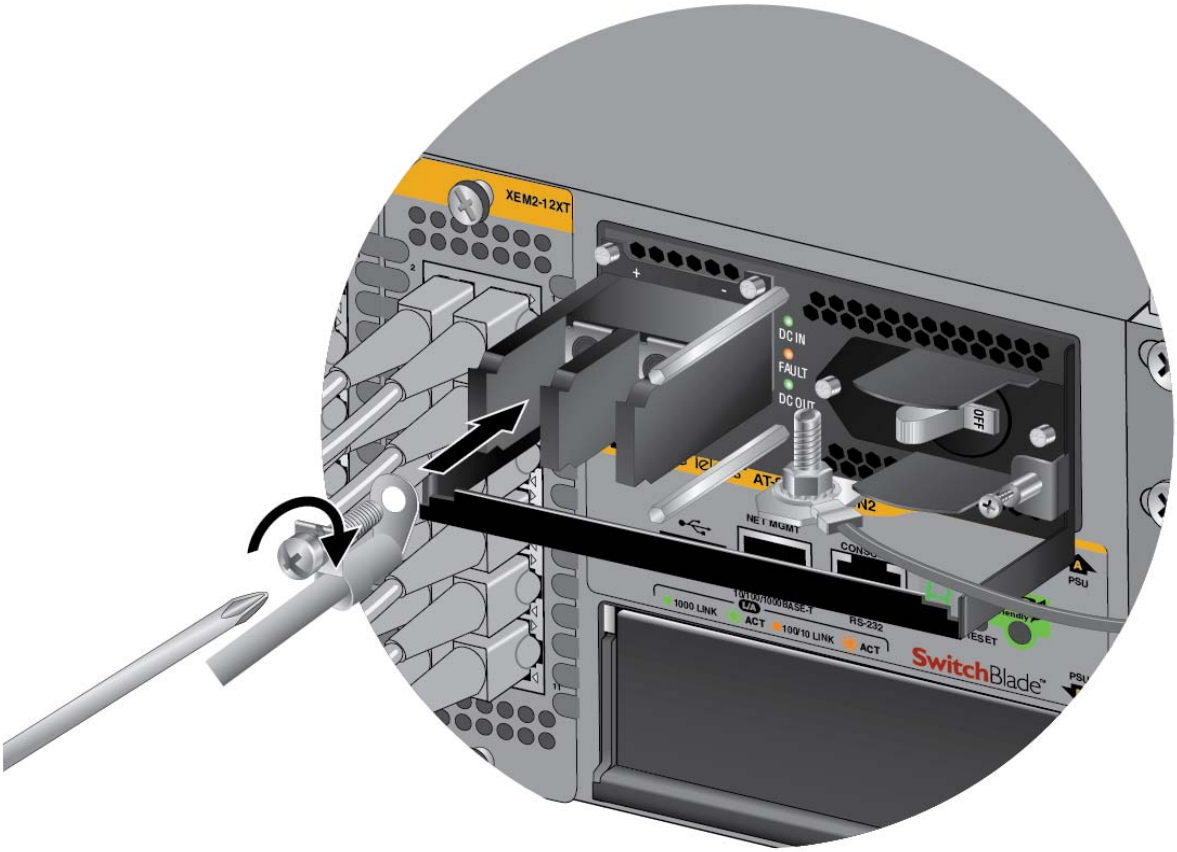


Figure 90. Connecting the Positive (+) Power Wire with a Right Angle Terminal

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 91 on page 143.

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

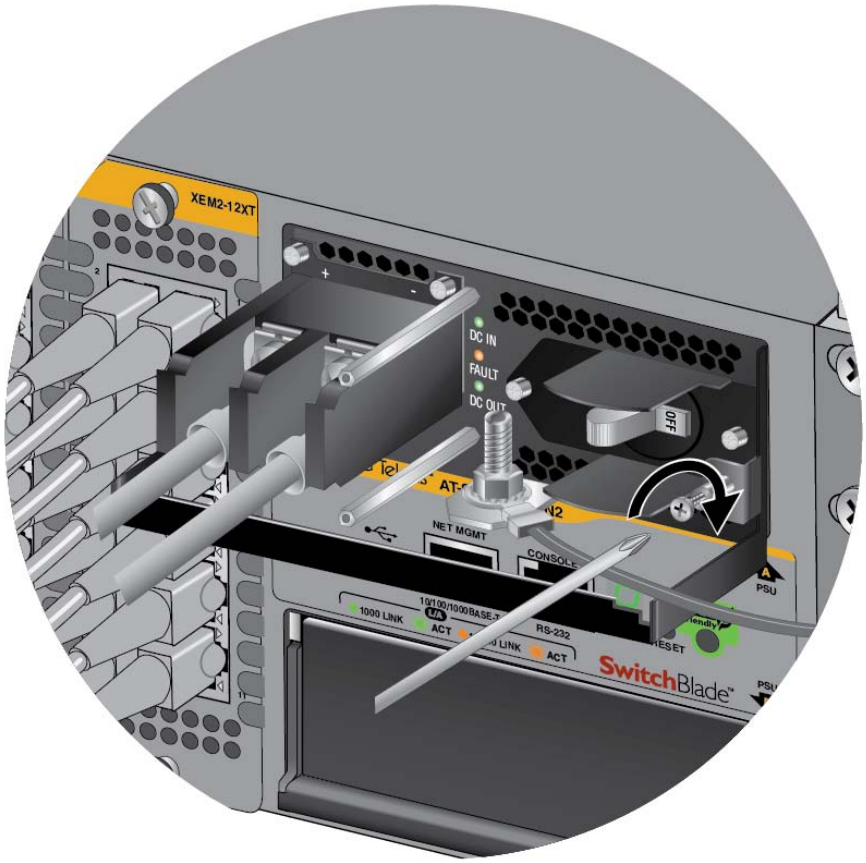


Figure 91. Connecting the Negative (-) Power Wire with a Right Angle Terminal

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 92 on page 144.

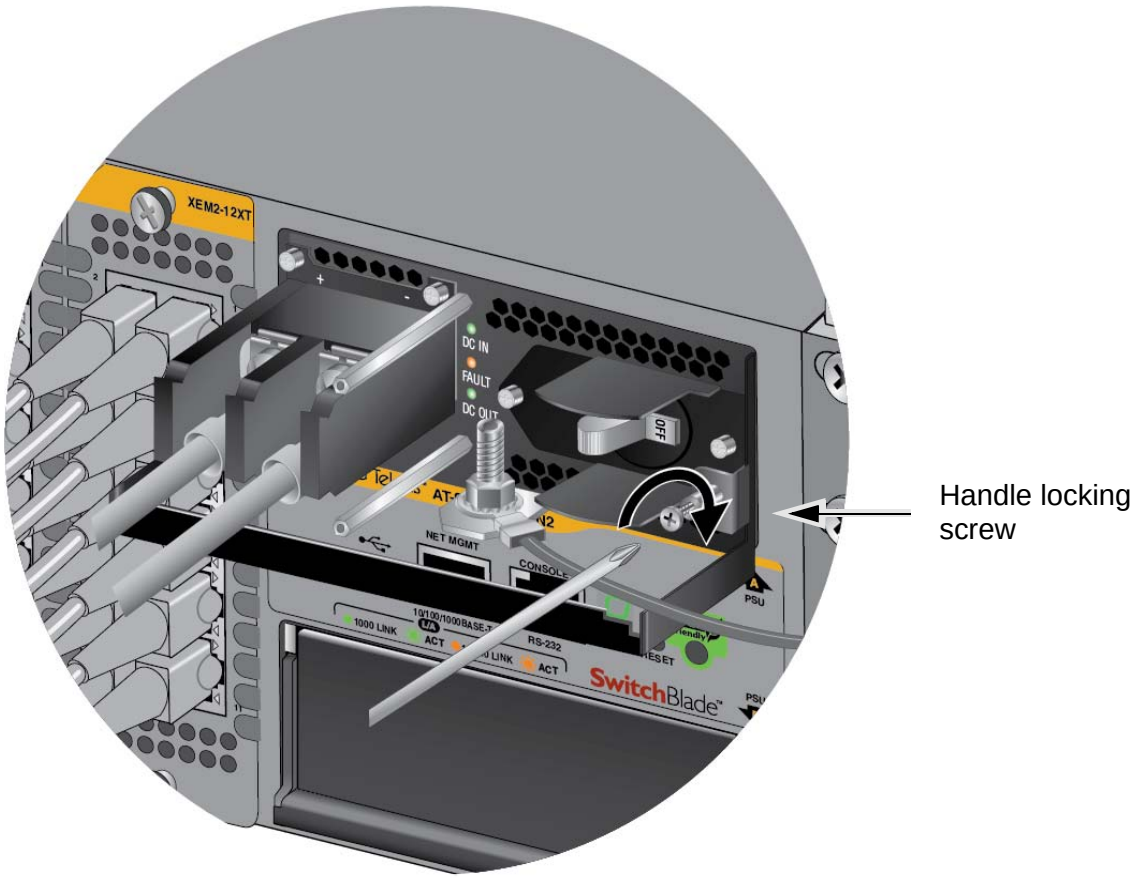


Figure 92. Tightening the Handle Locking Screw

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.

10. Connect the power wires to the circuit breaker.

11. If you have two SBxPWRSYS1-80 Power Supplies for the switch, repeat this procedure to install the second power supply.

12. Repeat the procedures in this chapter to wire the DC connectors on the SBxPWRSYS1-80 DC Power Supplies on other switches for the stack.

13. Go to “Configuring the Master Switch” on page 160 or “Configuring Member Switches” on page 166.

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 93.

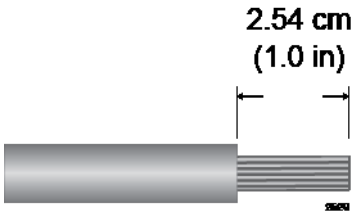


Figure 93. Stripping Solid or Stranded DC Power Wires

2. Use a #1 Phillips-head screwdriver to loosen the two screws on the plastic cover over the positive and negative terminals on the power supply and slide the cover to the right, as shown in Figure 81 on page 133. You may need to lift the locking handle slightly to access the bottom screw.

3. Use a #3 Phillips-head screwdriver to remove the two screws from the positive and negative terminals, as shown in Figure 82 on page 134.

4. Wrap the positive lead wire clockwise around one of the terminal screws and secure the screw and wire to the positive terminal connection on the terminal block with a #3 Phillips-head screwdriver. The positive terminal is on the left.

   You may attach the wire to the terminal so that it extends either above or below the terminal block. Figure 94 on page 146 shows the wire above the terminal block. Allied Telesis recommends tightening the screw to 30 to 40 inch-lbs.

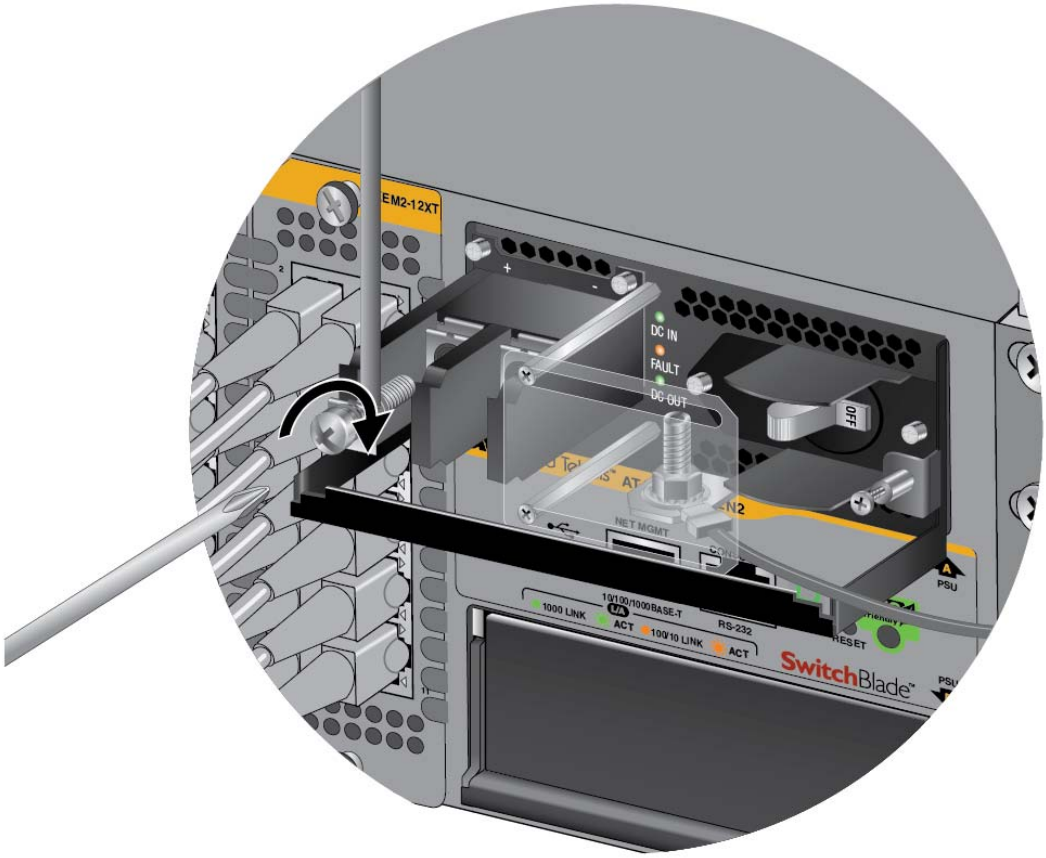


Figure 94. Connecting the Positive Wire With Bare Wire

5. Wrap the negative lead wire clockwise around the remaining terminal screw and secure the screw and wire to the negative terminal connection on the terminal block with a #3 Phillips-head screwdriver, as shown in Figure 95 on page 147. The negative terminal is on the right.

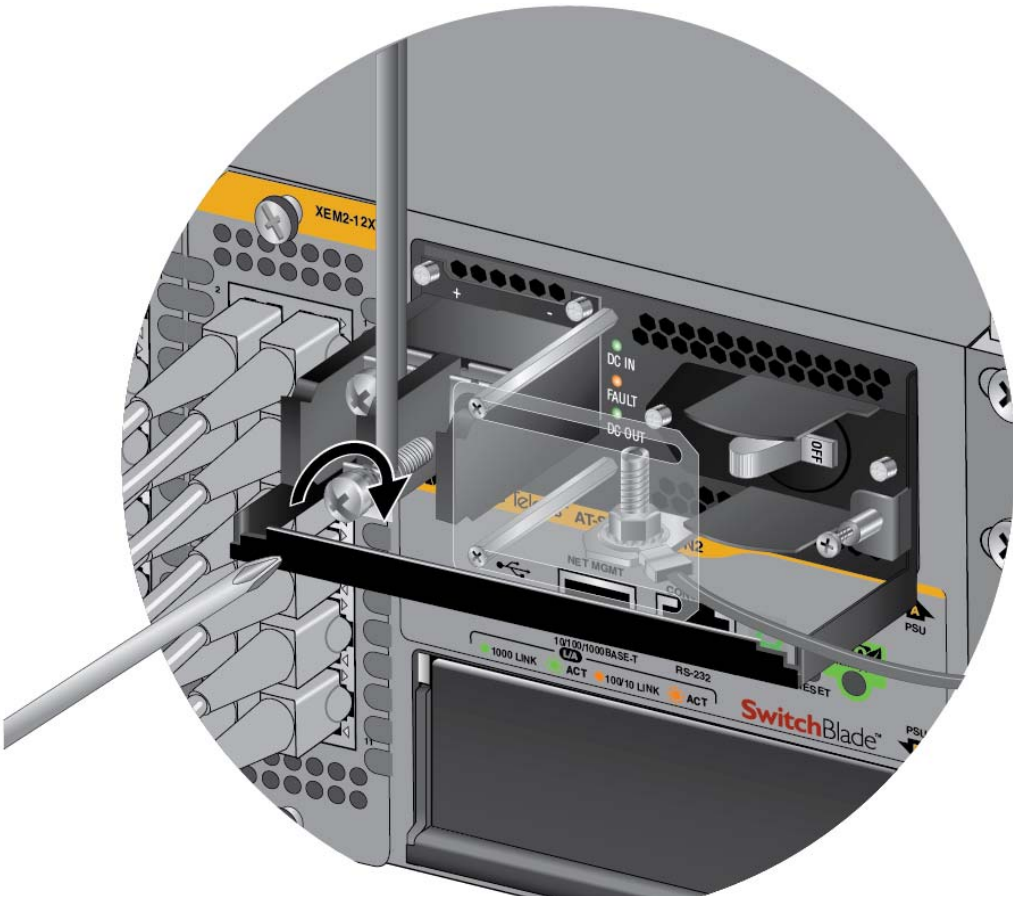


Figure 95. Connecting the Negative Lead Wire with Bare Wire

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

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

6. Slide the plastic cover to the left and lightly tighten the two screws with a #1 Phillips-head screwdriver to secure the cover. See Figure 85 on page 137. You might need to lift the locking handle slightly to access the bottom screw.

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

7. With a #2 Phillips-head screwdriver, tighten the handle locking screw to secure the power supply to the chassis. See Figure 92 on page 144.

8. Before attaching the power wires from the power supply to the circuit breaker in the wiring closet, check that the circuit breaker is off.

9. Connect the power wires to the circuit breaker.

10. If you have two SBxPWRSYS1-80 DC Power Supplies for the switch, repeat this procedure to install the second power supply.

11. Repeat the procedures in this chapter to wire the DC connectors on the SBxPWRSYS1-80 DC Power Supplies on other switches for the stack.

12. Go to “Configuring the Master Switch” on page 160 or “Configuring Member Switches” on page 166.

Chapter 6

Configuring Switches for Stacking

This chapter contains the following procedures:

Introduction

This chapter contains instructions on how to configure switches for stacking with VCStack. Please review the following information before performing the instructions:

- ❒ The procedures should be performed in the order presented here.
- ❒ The procedures should be performed on each switch, individually.
- ❒ The procedures include designating the trunk ports for the switches. If you have not already chosen the trunk ports, select them before continuing. For background information, refer to “Stacking Guidelines” on page 51.
- ❒ If you have already connected network cables to the trunk ports on the XEM2 Line Cards, remove them before continuing. Trunk ports should not be cabled yet.

Note
Cabling trunk ports before activating the VCStack feature may result in loops in your network topology, which can cause poor network performance.

Command Summary

This section briefly describes the commands for configuring the master and member switches for stacking. For further instructions, refer to the *Software Reference for x950 Switch, AlliedWare Plus Operating System*. After reviewing the commands. go to “Configuring the Master Switch” on page 160 to start the configuration procedures.

STACKPORT

You use this command to designate the ports of the stack trunk. The command has to be performed after you have enabled the stacking feature with the STACK ENABLE command. Additionally, it has to be performed from the Interface mode of the selected ports. In this example, ports 1 to 4 on the line card in slot 4 on the master switch with ID 1 are designated as ports of the stack trunk:

```
awplus(config)# interface port1.4.1-1.4.4
awplus(config-if)# stackport
```

This example configures ports 1 and 2 on the line cards in slots 3 and 4 on the member switch with ID 2 as trunk ports:

```
awplus(config)# interface port2.3.1-2.3.2,port2.4.1-
2.4.2
awplus(config-if)# stackport
```

STACK ENABLE

This command is used to activate the VCStack feature. It is located in the Global Configuration mode. Activating the VCStack feature requires resetting the switch. You must perform this command before designating the ports of the stack trunk with the STACKPORT command. Here is the command:

```
awplus(config)# stack enable
```

STACK PRIORITY

This command is used to assign priority numbers to switches. They use the numbers to select the master switch of the stack. The lower the number the higher the priority. The unit with the lowest number becomes the master. If they have the same priority value, they use their MAC addresses to determine the master. As with priority numbers, the lower the MAC address, the higher the priority. A switch can have only one priority number.

Allied Telesis recommends making a switch’s priority and ID numbers the same. This is not required, but it can make managing and troubleshooting a stack easier.

The format of the command, which is in the Global Configuration mode, is shown here:

```
stack switch_ID priority priority_number
```

The variables are defined here:

- switch_ID - This is the ID number of the switch. The range is 1 to 8. You can specify only one ID number.
- priority_number - This is the new priority number for the switch. You can specify only one number. The range is 0 to 255. The default is 128.

This example assigns the priority 1 to the switch with ID 1:

```
awplus(config)# stack 1 priority 1
```

This example assigns the priority 2 to the switch with ID 2:

```
awplus(config)# stack 2 priority 2
```

STACK RENUMBER

Every switch in a stack has to have a unique ID number. The range is 1 to 4. The default is 1. The master switch will use the default value. The value is set with this command. You use this command in the following procedures to set the ID numbers of the member switches. Here is the command format.

```
stack current_switch_ID renumber new_switch_ID
```

The variables are defined here:

- current_switch_ID - This is the current ID number of the switch. You can specify only one ID number. The default is 1.
- new_switch_ID - This is the new ID number for the switch. You can specify only one number. The range is 1 to 8. The default is 1.

Changing the ID number requires resetting the switch.

This example changes the switch's ID from the default ID 1 to 2:

```
awplus(config)# stack 1 renumber 2
```

SWITCH PROVISION

To ensure that the first power-on of the stack is successful, Allied Telesis recommends configuring the units such that the units know about each other prior to forming the stack. This involves using the SWITCH PROVISION command to add the member switches as provisioned units on the master, and the master switch as a provisioned unit on the member switches. Here is the format of the command:

```
switch switch_ID provision sbx908gen2
```

This example adds a provisioned switch to the current switch and assigns it the ID 2:

```
awplus(config)# switch 2 provision sbx908gen2
```

This example adds a provisioned switch to the current switch and assigns it the ID 1. You use this command to add the master switch as a provisioned switch on a member switch:

```
awplus(config)# switch 1 provision sbx908gen2
```

Powering On SBxPWRSYS2 AC Power Supplies

The procedure in this section explains how to power on SBxPWRSYS2 AC Power Supplies. If you have not installed the power supplies, refer to “Installing SBxPWRSYS2 AC Power Supplies” on page 101 for instructions.

Before powering on the chassis, review the information in “Power Specifications” on page 224 for the power specifications of the switches.

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

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

Caution
If the chassis has two SBxPWRSYS2 Power Supplies, you should power them on within 90 seconds of each other. Otherwise, the switch might restart its operating software, which will delay the completion of the initialization process of the management software.

For instructions on wiring SBxPWRSYS1-80 DC Power Supplies, refer to Chapter 5, “Wiring the SBxPWRSYS1-80 DC Power Supply” on page 119.

To power on a switch, perform the following procedure:

1. Connect the AC power cord included with the power supply to the AC power connector on the rear panel of the chassis. If the chassis has two power supplies, you may power them on one at a time or simultaneously. Refer to Figure 96 on page 155.

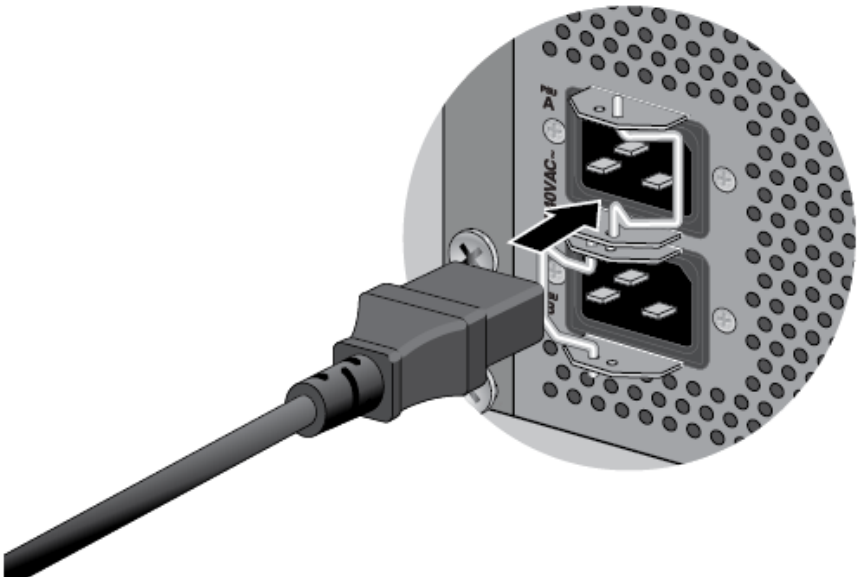


Figure 96. Connecting the AC Power Cord

2. Move the retaining clip over the power cord to secure the cord to the chassis. Refer to Figure 97.

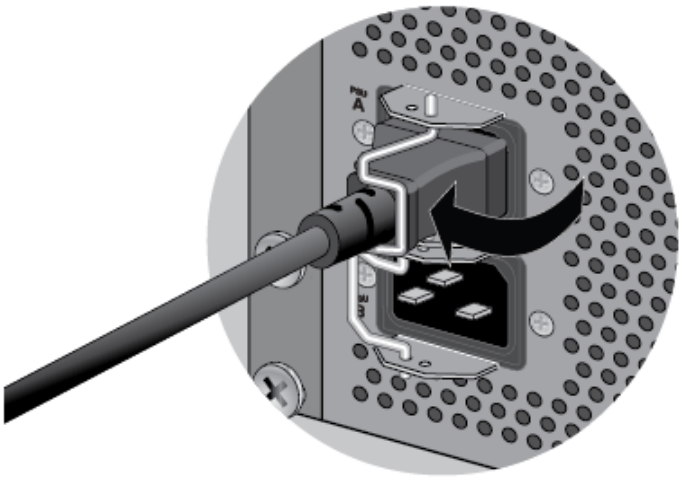


Figure 97. Securing the Power Cord with the Retaining Clip

3. Connect the power cord to an appropriate AC power source. Refer to Figure 98 on page 156.

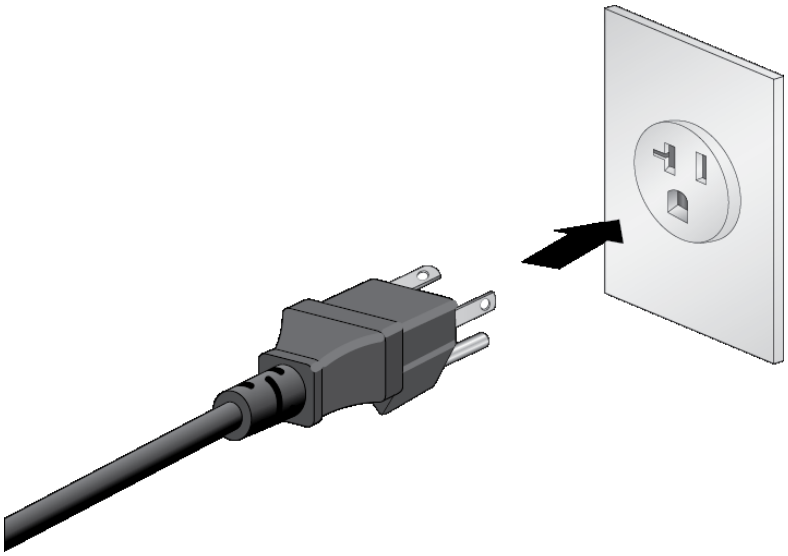


Figure 98. Connecting the Power Cord to an AC Power Source

Note
The illustration shows the North American power cord. Your power cord may be different.

Note
The power cords included with SBxPWRSYS2 Power Supplies for 100-125 VAC installations have 20 Amp, 125 V NEMA 5-20P plugs. The plugs require NEMA 5-20R receptacles. Refer to Figure 29 on page 82.

4. If the switch has two power supplies, repeat this procedure to connect a power cord to the second power supply.

5. Wait two minutes for the switch to initialize its management software. Afterwards, go to “Configuring the Master Switch” on page 160 or “Configuring Member Switches” on page 166.

Starting a Local Management Session

To start a local management session on the switch, perform the following procedure. If the switch is powered off, start with step 1. If the switch is already powered on, start with step 3:

Note
The initial management session has to be a local session because the AlliedWare Plus operating software does not come with a default IP address.

1. Power on the switch by doing one of the following:
   - ❒ If the switch has an AC power supply, connect the AC power cord to the power supply on the back panel and to an AC power source. if the switch has two power supplies, you need to power on only one of them for this procedure. Refer to “Powering On SBxPWRSYS2 AC Power Supplies” on page 154.
   - ❒ If the switch has the SBxPWRSYS1-80 DC Power Supply, power on the DC circuit and the On/Off switch on the power supply. (If you have not wired the DC connector on the power supply yet, refer to Chapter 5, “Wiring the SBxPWRSYS1-80 DC Power Supply” on page 119.)
2. Wait three minutes for the switch to initialize the management software.
3. Connect the RJ-45 end of the management card included with the switch to the Console RS-232 port on the management panel. Refer to Figure 99 on page 158.

Figure 99. Connecting the Management Cable to the Console RS-232 Port

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

5. Configure the VT-100 terminal or terminal emulation program as follows:

   - Baud rate: 9600 bps
   - Data bits: 8
   - Parity: None
   - Stop bits: 1
   - Flow controller: None

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

6. Press Enter. You are prompted for a user name and password.

7. 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 when the User Exec mode prompt, shown in Figure 100. is displayed.

```
awplus>
```

Figure 100. User Exec Mode Prompt

Note
The User Exec mode is the first level in the command mode interface. For complete information on the modes and commands, refer to the *Software Reference for SBx908 GEN2 Series Switches, AlliedWare Plus Operating System* from **www.alliedtelesis.com**.

8. Go to “Configuring the Master Switch” on page 160 or “Configuring Member Switches” on page 166.

Configuring the Master Switch

This section contains the following procedures for configuring the master switch of the stack:

Note
The procedures require reseting the switch. Some network traffic will be lost if the unit is already connected to an active network.

You need to know the following to perform these procedures:

- ❒ How many member switches will be in the stack?
- ❒ Which ports will be the stack trunk on the master and member switches? Managing and troubleshooting the stack will be easier if the switches use the same ports for the stack trunk. Refer to “Stack Trunk” on page 52 and “Stacking Worksheet” on page 72.

The procedures should be performed in the order presented here.

General Steps for the Master Switch

Here are the general steps to configuring the master switch for stacking:

1. Start a local management session on the switch. Refer to “Starting a Local Management Session” on page 157.
2. View the hardware status and management software version number with the SHOW SYSTEM ENVIRONMENT and SHOW VERSION commands in the Privilege Exec mode.
3. Enable the VCStack feature with the STACK ENABLE command in the Global Configuration mode.
4. Assign the master switch the priority 1 with the STACK PRIORITY command in the Global Configuration mode. This is to ensure its selection as the master switch during the first power-on of the stack.
5. Designate the ports of the stack trunk on the master switch with the STACKPORT command in the port Interface mode.
6. Add the member switches as provisioned units to the master switch, with the SWITCH PROVISION command. This step is to ensure that the master switch already knows about the member switches during the first power-on of the stack.

7. Designate the ports of the stack trunk on the provisioned member switches, with the STACKPORT command in the port Interface mode.
8. Save your changes with the WRITE command in the Privilege Exec mode.
9. Reboot the switch with the REBOOT command.
10. Start a new local management session.
11. Verify the changes with the SHOW STACK and SHOW RUNNING-CONFIG command.

Configuring the Master Switch

To configure the master switch for stacking, perform the procedure in Table 20.

Table 20. Configuring the Master Switch

Step	Description and Command
1	Power on the master switch and wait two minutes for it to initialize its management software: - If the switch has AC power supplies, refer to “Powering On SBxPWRSYS2 AC Power Supplies” on page 154. - If the switch has the SBxPWRSYS1-80 DC Power Supply, power on the DC circuit and the On/Off switch on the power supply. For instructions on wiring the DC connector, refer to Chapter 5, “Wiring the SBxPWRSYS1-80 DC Power Supply” on page 119.
2	Start a local management session on the switch. Refer to “Starting a Local Management Session” on page 157.
3	Move to the Privileged Exec mode with the ENABLE command. `awplus> enable`
4	Verify that the hardware components are operating correctly by entering the SHOW SYSTEM ENVIRONMENT command. All components should have an “Ok” status.
5	Verify that the XEM2 Line Cards are operating properly by entering the SHOW CARD command. The cards should have an “Online” state.

6	Display the version number of the AlliedWare Plus operating software on the master switch by entering the SHOW VERSION command. The VCStack feature requires version 5.4.8-0 or later. Write down the version number in the worksheet in Table 16 on page 72. After viewing the version numbers on all the switches, you will compare them to confirm they all have the same version. Switches with different versions will have to be updated.
	`awplus# show version`
	`AlliedWare Plus (TM) 5.4.8-0`

Table 20. Configuring the Master Switch (Continued)

Step	Description and Command

7	Move to the Global Configuration mode with the CONFIGURE TERMINAL command.
	
	`awplus# configure terminal`
	`Enter configuration commands, one per line. End with CNTL/Z.`

8	Activate VCStack on the switch with the STACK ENABLE command.
	
	`awplus(config)# stack enable`
	`% Automatically enabling ‘stack virtual-mac’ to minimize disruption form failovers.`
	`% Please check that the new MAC 0000.cd37.0431 is unique within the network.`
	`% Save the config and restart the system for this change to take effect.`

9	Assign priority 1 to the switch with the STACK PRIORITY command. This is to ensure that this switch is selected as the master switch when the stack is powered-on.
	
	`awplus(config)# stack 1 priority 1`
	`% Warning: Stacking is currently disabled.`

10	Enter the port Interface modes of the ports that will be the stack trunk on the master switch. If you filled out the worksheet on Table 16 on page 72, refer there for the stacking ports. The example command here assumes the trunk ports are ports 1 to 4 on the line card in slot 4. Be sure to modify the command to specify the ports of the stack trunk on your master switch. `awplus(config)# interface port1.4.1-1.4.4`

11	Designate the ports as stacking ports with the STACKPORT command.
	
	`awplus(config-if)# stackport`
	`% Save the config and restart the system for this change to take effect.`

12	Return to the Global Configuration mode. `awplus(config-if)# exit`

13	Add the member switches as provisioned switches to the master switch, with the SWITCH PROVISION command. Assign each provisioned switch a unique ID number in the range of 2 to 8. Adding the member switches as provisioned units makes it possible for the master switch to know about them during the first power-on of the stack. The following examples add three provisioned member switches to the master switch, with the IDs 2 to 4:
	
	`awplus(config)# switch 2 provision sbx908gen2`
	`awplus(config)# switch 3 provision sbx908gen2`
	`awplus(config)# switch 4 provision sbx908gen2`

Table 20. Configuring the Master Switch (Continued)

Step	Description and Command
14	Enter the port Interface modes of the ports that will be the stack trunk on the provisioned member switches. If you filled out the worksheet on Table 16 on page 72, refer there for the stacking ports. The example command here assumes that the member switches will use ports 1 and 4 on line cards in slot 4 of their chassis. Be sure to modify the command to specify the ports of your stack trunk. `awplus(config)# interface port2.4.1-2.4.4,port3.4.1-3.4.4,port4.4.1-4.4.4`

15	Designate the ports on the provisioned member switches as stacking ports with the STACKPORT command.
	
	`awplus(config-if)# stackport`
	`% Save the config and restart the system for this change to take effect.`

16	Return to the Global Configuration mode. `awplus(config-if)# exit`
17	Return to the Privileged Exec mode. `awplus(config)# exit`

18	Save your changes with the WRITE command. If this is the first management session, the switch adds the configuration file DEFAULT.CFG to flash memory, for storing your configuration changes. If you do not save your changes, they will be discarded and you will have to reenter them when you reboot the switch in the next step.
	
	`awplus# write`
	`Building configuration ...`
	`[OK]`

19	Restart the switch with the REBOOT command.
	
	`awplus# reboot`
	`reboot system? (y/n):`
	`awplus#`

20	Type “Y” for yes.
21	Wait two minutes for the switch to initialize its management software.
22	Check the ID LED in the management panel on the front panel: - If the ID LED is displaying the number 1, VCStack is now enabled on the master switch. Go to “Verifying the Master Switch,” next. - If the ID LED is displaying “0,” VCStack is still disabled. Repeat this procedure. Be sure to issue the WRITE command to save your change before resetting the switch.

Verifying the Master Switch

Perform the steps in Table 21 to confirm the configuration of the master switch.

Table 21. Verifying the Master Switch

Step	Description and Command
1	Start a new local management session on the master switch.
2	Move to the Privileged Exec mode with the ENABLE command. `awplus> enable`

3	Enter the SHOW STACK command. Here is an example of the display:
	
	`awplus# show stack`
	`Virtual Chassis Stacking summary information`
	`ID Pending ID  MAC address  Priority  Status  Role`
	`1  -  e01a.ba56.c208  1  Ready  Active Master`
	`2  -  -  -  -  Provisioned`
	`3  -  -  -  -  Provisioned`
	`4  -  -  -  -  Provisioned`
	`Operational Status  Standalone unit`
	`Stack MAC address  0000.ab56.d4a8 (Virtual MAC)`
	
	Check the display for the following:
	- Switch ID 1 is the master switch.
	- The master switch should have the priority 1. If it does not, repeat “Configuring the Master Switch” on page 161. Be sure to perform the STACK PRIORITY command and save your changes with the WRITE command.
	- The other ID entries are for provisioned member switches. There should be one entry for each member switch that will be in the stack. Their fields are empty because the master switch is not yet part of a stack. If the table does not include these fields, repeat “Configuring the Master Switch” on page 161. Be sure to perform the SWITCH PROVISION command and save your changes with the WRITE command.
	- The Operational Status should be Standalone Unit, indicating that stacking is enabled, but that the unit is operating as a stack of one switch. If the status is Stacking Hardware Disabled, the stacking feature is disabled. Repeat “Configuring the Master Switch” on page 161. Be sure to perform the STACK ENABLE command and to save your changes with the WRITE command.

Table 21. Verifying the Master Switch (Continued)

Step	Description and Command

4	Enter the SHOW RUNNING-CONFIG command to display the running configuration of the master switch:
	`awplus# show running-config`
	Use the display to confirm that you designated the correct trunk ports for the master and member switches. The ports should be designated with INTERFACE PORT and STACKPORT commands. In the following example, the stack trunk will consist of ports 1 to 4 on the line cards in slot 4 on the master (port1) and member switches:
	`interface port1.4.1-1.4.4`
	`stackport`
	`.`
	`interface port2.4.1-2.4.4`
	`stackport`
	`.`
	`interface port3.4.1-3.4.4`
	`stackport`
	`.`
	`interface port4.4.1-4.4.4`
	`stackport`

5	Go to “What to Do Next” on page 165.

What to Do Next

After configuring the master switch, do the following:

1. Power off the switch, as follows:
   - ❒ For AC power supplies, disconnect the AC power cords from the AC power sources.
   - ❒ For SBxPWRSYS1-80 DC Power Supplies, power off the On/Off switch on the power supplies. Refer to Figure 67 on page 121.
2. Configure the member switches. Refer to “Configuring Member Switches” on page 166.
3. After configuring the master and member switches, cable the ports of the stack trunk. Refer to Chapter 7, “Cabling XEM2 Line Card Ports” on page 177.
4. Power on the master and member switches of the stack. Refer to “Powering on the Stack” on page 174.
5. Verify the stack by referring to “Verifying the Stack” on page 175.
6. Cable the networking ports. Refer to Chapter 7, “Cabling XEM2 Line Card Ports” on page 177.

Configuring Member Switches

Here are the procedures for configuring the member switches of the stack.

Note
The procedures require resetting member switches twice. Some network traffic will be lost if they are already connected to an active network.

The procedures should be performed in the order presented here.

General Steps for Member Switches

The procedure for configuring member switches for stacking is divided into two parts. The general steps to Part I are listed here:

1. Start a local management session on the switch.
2. View the hardware status and management software version number with the SHOW SYSTEM ENVIRONMENT and SHOW VERSION commands in the Privilege Exec mode.
3. Enable the VCStack feature with the STACK ENABLE command in the Global Configuration mode.
4. Assign the ID number of the member switch with the SWITCH RENUMBER command in the Global Configuration mode.

Note
Changing a member switch’s ID does not delete the default ID 1 from the switch’s configuration. Instead, the switch retains it as a provisioned switch, which becomes the provisioned master switch.

5. Save your changes with the WRITE command in the Privilege Exec mode.
6. Restart the switch with the REBOOT command.

Here are the general steps to Part II:

1. Start a new local management session on the member switch.

2. Assign the member switch a priority number equal to its ID number, with the STACK PRIORITY command in the Global Configuration mode.
3. Designate the ports of the stack trunk for the member switch, with the STACKPORT command in the port Interface mode.
4. Designate the ports of the stack trunk for the provisioned master switch (ID 1), with the STACKPORT command in the port Interface mode.
5. Save your changes with the WRITE command in the Privilege Exec mode.
6. Restart the switch with the REBOOT command.
7. Start a new local management session.
8. Verify the changes with the SHOW STACK DETAIL command.

Configuring a Member Switch - Part I

The instructions for configuring a member switch are divided into two parts. Part I has you do the following:

- ❒ View the hardware status and management software version number.
- ❒ Enable VCStack.
- ❒ Set the switch ID number.

To configure a member switch, perform the procedure in Table 22.

Table 22. Configuring a Member Switch - Part I

Step	Description and Command
1	Power on a member switch and wait two minutes while it initializes the management software: - If the switch has AC power supplies, refer to “Powering On SBxPWRSYS2 AC Power Supplies” on page 154. - If the switch has the SBxPWRSYS1-80 DC Power Supply, power on the DC circuit and the On/Off switch on the power supply. For instructions on wiring the DC connector, refer to Chapter 5, “Wiring the SBxPWRSYS1-80 DC Power Supply” on page 119.
2	Start a local management session. Refer to “Starting a Local Management Session” on page 157.

Table 22. Configuring a Member Switch - Part I (Continued)

Step	Description and Command
3	Enter the ENABLE command to move from the User Exec mode to the Privileged Exec mode. `awplus> enable`
4	Verify that the hardware components are operating correctly by entering the SHOW SYSTEM ENVIRONMENT command. All components should have an “Ok” status.
5	Verify that the XEM2 Line Cards are operating properly by entering the SHOW CARD command. The cards should have an “Online” state.

6	Display the version number of the AlliedWare Plus operating software by entering the SHOW VERSION command. The VCStack feature requires version 5.4.8-0 or later. Write down the version number from the master switch in the worksheet in Table 16 on page 72. After viewing the version numbers on all the switches, you will compare them to confirm they all have the same version. Switches with different versions will have to be updated.
	
	`awplus# show version`
	`AlliedWare Plus (TM) 5.4.8-0`

7	Move to the Global Configuration mode with the CONFIGURE TERMINAL command.
	
	`awplus# configure terminal`
	`Enter configuration commands, one per line. End with CNTL/Z.`

8	Activate VCStack on the switch with the STACK ENABLE command.
	
	`awplus(config)# stack enable`
	`% Automatically enabling ‘stack virtual-mac’ to minimize disruption form failovers.`
	`% Please check that the new MAC 0000.cd37.0431 is unique within the network.`
	`% Save the config and restart the system for this change to take effect.`

9	Set the ID number of the member switch with the STACK RENUMBER command. If you are using the worksheet on Table 16 on page 72, refer there for the ID numbers. This example assigns the ID number 2 to the member switch.
	
	`awplus(config)# stack 1 renumber 2`
	`% Warning: Stacking is currently disabled.`
	`% Warning: the new ID will not become effective until the stack-member reboots.`
	`% Warning: the boot configuration may now be invalid.`

10	Return to the Privileged Exec mode. `awplus(config)# exit`

Table 22. Configuring a Member Switch - Part I (Continued)

Step	Description and Command

11	Enter the WRITE command to save your changes. If this is the first management session, the switch adds the configuration file DEFAULT.CFG to flash memory to store your configuration changes.
	
	`awplus# write`
	`Building configuration ...`
	`[OK]`

12	Restart the switch with the REBOOT command.
	
	`awplus# reboot`
	`reboot system? (y/n):`
	`awplus#`

13	Type “Y” for yes.
14	Wait two minutes for the switch to initialize its management software.
15	Check the ID LED on the front panel and do one of the following: - If the ID LED is displaying the correct ID number for the member switch, go to “Configuring a Member Switch - Part II,” next. - If the ID LED is displaying an incorrect number, repeat this procedure. Be sure to correctly enter the STACK RENUMBER command and to save your changes with the WRITE command. - If the ID LED is displaying “0,” VCStack is still disabled. Repeat this procedure. Be sure to perform the STACK ENABLE command and to issue the WRITE command.

Configuring a Member Switch - Part II

This section contains instructions to the second part to configuring member switches. The instructions explain how to do the following:

- Set the priority number. Refer to “Master and Member Switches” on page 68.
- Designate the ports of the stack trunk of the member switch. Refer to “Stack Trunk” on page 52.
- Designate the ports of the stack trunk of the provisioned master switch.

To perform Part II of configuring a member switch, perform the procedure in Table 23 on page 170.

Table 23. Configuring the Member Switch - Part II

Step	Description and Command
1	Start a new local management session on the member switch. Refer to “Starting a Local Management Session” on page 157.
2	Enter the ENABLE command to move from the User Exec mode to the Privileged Exec mode. `awplus> enable`

3	Move to the Global Configuration mode with the CONFIGURE TERMINAL command.
	
	`awplus# configure terminal`
	`Enter configuration commands, one per line. End with CNTL/Z.`

4	Assign a priority value to the switch equal to its ID number, with the STACK PRIORITY. This example assigns priority 2 to a member switch with the ID 2: `awplus(config)# stack 2 priority 2`
5	Enter the port Interface modes of the ports to be the stack trunk on the member switch. If you filled out the worksheet in Table 16 on page 72, refer there for the ports. The example command here assumes the switch has the ID 2 and will be using ports 1 to 4 on a line card in slot 4 for the stack trunk. Be sure to modify the command with the ports you selected for the stack trunk. `awplus(config)# interface port2.4.1-2.4.4`

6	Designate the ports as the stack trunk with the STACKPORT command.
	
	`awplus(config-if)# stackport`
	`% Save the config and restart the system for this change to take effect.`

7	Enter the port Interface modes of the ports to be the stack trunk on the provisioned master switch (ID 1). If you filled out the worksheet in Table 16 on page 72, refer there for the ports. The example here assumes the master switch will be using ports 1 to 4 on a line card in slot 4 for the stack trunk. Be sure to modify the command with the ports you selected for the stack trunk. `awplus(config-if)# interface port1.4.1-1.4.4`

8	Designate the ports as the stack trunk with the STACKPORT command.
	
	`awplus(config-if)# stackport`
	`% Save the config and restart the system for this change to take effect.`

9	Return to the Global Configuration mode. `awplus(config-if)# exit`

Table 23. Configuring the Member Switch - Part II (Continued)

Step	Description and Command
10	Return to the Privileged Exec mode. `awplus(config)# exit`

11	Save your changes with the WRITE command.
	
	`awplus# write`
	`Building configuration ...`
	`[OK]`

12	Restart the switch.
	
	`awplus# reboot`
	`reboot system? (y/n):`

13	Type “Y” for yes.
14	Wait two minutes for the switch to initialize its management software.
15	Go to “Verifying a Member Switch” on page 171.

Verifying a Member Switch

Perform the steps in Table 24 to confirm the configuration of a member switch.

Table 24. Verifying the Configuration of a Member Switch

Step	Description and Command
1	Start a local management session. Refer to “Starting a Local Management Session” on page 157.
2	Move to the Privileged Exec mode. `awplus> enable`

Table 24. Verifying the Configuration of a Member Switch (Continued)

Step	Description and Command

3	Enter the SHOW STACK DETAIL command.
	`awplus# show stack detail`
	In the display, examine the entry that has the same ID number as the member switch you are currently configuring. Here is an example for a member switch with the ID 2:
	`Stack member 2:`
	`----------`
	`ID 2`
	`MAC address e01a:ea20:8011`
	`Last role change Thur Nov 23 21:15:20 2018`
	`Product type AT-SBx908 GEN2`
	`Role Active Master`
	`Status Ready`
	`Priority 2`
	`Host name awplus`
	`S/W version auto synchronization On`
	`Resiliency link status Not configured`
	`Stack port2.4.1 status Down`
	`Stack port2.4.2 status Down`
	`Stack port2.4.3 status Down`
	`Stack port2.4.4 status Down`
	`.`
	`.`
	Examine the entry for the following items:
	- The “Priority” value should be the same as the switch’s ID number. If they are not the same, repeat “Configuring a Member Switch - Part II” on page 169. Be sure to perform the STACK PRIORITY command and save your changes with the write command.
	- The “Stack port status” fields at the bottom of the entry should identify the designated stack ports for the member switch. If they identify the wrong ports, repeat “Configuring a Member Switch - Part II” on page 169. (The status of the ports is Down because the stack ports are not cabled yet.)

5	Go to “What to Do Next,” next.

What to Do Next

After configuring a member switch, do the following:

1. Power off the switch by doing one of the following:
   - ❒ For AC power supplies, disconnect the AC power cords from the AC power sources.
   - ❒ For SBxPWRSYS1-80 DC Power Supplies, power off the On/Off switch on the power supplies. Refer to Figure 67 on page 121.
2. Repeat these procedures to configure the other member switches.

3. If you have not already configured the master switch, perform “Configuring the Master Switch” on page 160.

4. After configuring all the switches, confirm that they are all powered off.

5. Do all the switches have the same version of the AlliedWare Plus operating software? If you filled out Table 16 on page 72, refer there for the version numbers. If they have different versions, update them before continuing, Refer to the *Software Reference for SwitchBlade x908 GEN2 Series Switches* for instructions.

6. Cable the stacking ports on the master and member switches. Refer to Chapter 7, “Cabling XEM2 Line Card Ports” on page 177.

7. Power on the stack. Refer to “Powering on the Stack” on page 174.

8. Verify the switch formed the stack. Refer to “Verifying the Stack” on page 175.

9. Cable the networking ports on the switches. Refer to Chapter 7, “Cabling XEM2 Line Card Ports” on page 177.

Powering on the Stack

After configuring the master and member switches of the stack with the previous procedures in this chapter, you are ready to cable the ports of the stack trunk and power on the stack for the first time. (If you want to monitor the power-on sequence, connect a terminal or PC with a terminal emulator program to the Console port on any switch).

To power on the stack for the first time, perform the following procedure:

1. Verify that the master and all member switches are powered off.
2. Cable the ports of the stack trunk on the switches. Refer to Chapter 7, “Cabling XEM2 Line Card Ports” on page 177.
3. Power on the switches at the same time or within thirty seconds of each other:
   - ❒ If the switches have AC power supplies, refer to “Powering On SBxPWRSYS2 AC Power Supplies” on page 154.
   - ❒ If the switches have SBxPWRSYS1-80 DC Power Supplies, power on the DC circuits and the On/Off switches on the power supplies. For instructions on wiring the DC connector, refer to Chapter 5, “Wiring the SBxPWRSYS1-80 DC Power Supply” on page 119.

   Refer to “Power Specifications” on page 224 for the power specifications of the switches.

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

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

4. Wait three minutes for the switches to form the stack.
5. Go to “Verifying the Stack” on page 175.

Verifying the Stack

To verify the stack, perform the following procedure:

1. Start a local management session on any switch in the stack. Refer to “Starting a Local Management Session” on page 157.

2. From the User Exec mode, enter the SHOW STACK command:

```
awplus> show stack
```

   An example of the command for a stack of four switches is shown in Figure 101.

```
awplus> show stack
Virtual Chassis Stacking summary information
ID    Pending ID     MAC address       Priority   Status   Role
1     -              e01a:ea20:8011    1          Ready    Active Master
2     -              e01a:ea20:8012    2          Ready    Backup Member
3     -              e01a:ea20:8050    3          Ready    Backup Member
4     -              e01a:ea20:8029    4          Ready    Backup Member
Operational Status                     Normal operations
Stack MAC address                      0015:774f:ed30
```

Figure 101. SHOW STACK Command

   Review the following items:

   - The command should list all of the switches in the stack. If the list is incomplete, refer to Chapter 9, “Troubleshooting” on page 213.
   - The Operational Status field should be “Normal operations” to indicate that all the stacking ports are operating normally.
   - If the Operational Status field is displaying “Not all stack ports are up,” one or more stacking ports are not being used or cannot establish links with their counterparts. For more information, refer to Chapter 9, “Troubleshooting” on page 213.

3. Go to Chapter 7, “Cabling XEM2 Line Card Ports” on page 177, to complete the installation.

Chapter 7

Cabling XEM2 Line Card Ports

This chapter contains the following procedures:

Cabling Twisted Pair Ports

Here are the guidelines to cabling twisted pair ports on the XEM2-8XSTm, XEM2-12XT and XEM2-12XTm Line Cards:

- Minimum cable requirements are:
  - 100Mbps - Standard TIA/EIA 568-B-compliant Category 3 unshielded cabling.
  - 1/2.5/5Gbps - Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) unshielded cabling.
  - 10Gbps - Standard TIA/EIA 568-C-compliant Category 6a unshielded cabling.
- The connectors on the cables should fit snugly into the ports, and the tabs should lock the connectors into place.
- 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 ports must be set to Auto-Negotiation, the default setting, to operate at 1Gbps or higher.
- The ports support full-duplex only.
- Do not attach cables to ports of static or LACP port trunks until after configuring the trunks on the switch. Otherwise, the ports will form network loops that can adversely affect network performance.

Guidelines to Handling Fiber Optic or Twisted Pair Transceivers

Please review the following guidelines before installing fiber optic or twisted pair transceivers in XEM2 line cards:

- Transceivers are hot-swappable. You can install them while the switch is powered on.
- For a list of supported transceivers, refer to the product data sheet on the Allied Telesis web site.
- The operational specifications and fiber optic cable requirements are provided in the documents included with the transceivers.
- You should install transceivers in XEM2 line cards before connecting their fiber optic cables.
- Fiber optic transceivers are dust sensitive. Always keep the plug in the optical bores when a fiber optic cable is not installed, or when you store the transceiver. When you do remove the plug, keep it for future use.
- Repetitive removal or insertion of a transceiver can lead to premature failure.
- 100Gbps transceivers for the XEM2-1CQ line card have handles. Use the handles when installing or removing transceivers. An example is shown in Figure 102.

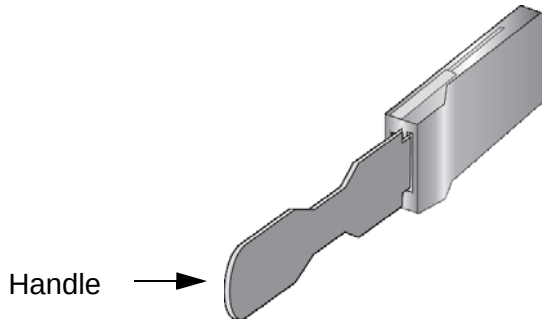


Figure 102. Handle on 100Gbps Transceivers for the XEM2-1CQ Line Card

Caution
Transceivers can be damaged by static electricity. Be sure to observe all standard electrostatic discharge (ESD) precautions, such as wearing an antistatic wrist strap, to avoid damaging the devices. E92

Installing and Cabling Fiber Optic Transceivers

Table 25 lists the types of fiber optic transceivers that are supported by the XEM2 line cards. Refer to the product datasheet for a list of approved transceivers.

Table 25. XEM2 Line Cards and Fiber Optic Transceivers

Ethernet Line Card	Fiber Optic Transceiver
XEM2-8XSTm	1Gbps SX or LX SFP 10Gbps SR or LR SFP+
XEM2-12XS	1Gbps SX or LX SFP 10Gbps SR or LR SFP+
XEM2-4QS	40Gbps QSFP+
XEM2-1CQ	100Gbps SR or LR QSFP28

Please review “Guidelines to Handling Fiber Optic or Twisted Pair Transceivers” on page 179 before performing the procedure.

Your transceivers may look different than those shown in the following illustrations.

Warning
The temperature of an operational transceiver can exceed 70° C (158° F). Exercise caution when removing or handling transceivers with unprotected hands.–E43

To install a fiber optic transceiver in an Ethernet line card, perform the following procedure:

1. Select a port in the XEM2 line card for the transceiver.
2. If the selected port has a dust cover, remove it.
3. Remove the transceiver from its shipping container and store the packaging material in a safe location.
4. Orient the transceiver and slide it into the port until it clicks into place. The correct orientation depends on the line card and transceiver:
   - ❒ XEM2-8XSTm or XEM2-12XS Line Card - To install a transceiver in an odd numbered port, position its handle on the right. To install a transceiver in an even numbered port, position its handle on the left. Refer to Figure 103 on page 181.

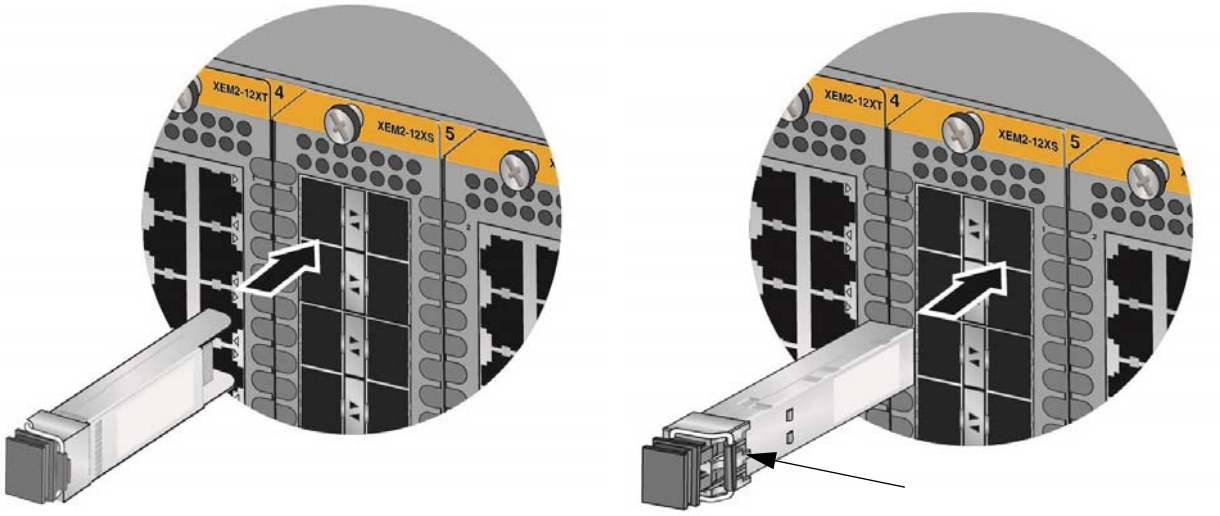


Figure 103. Installing an SFP Transceiver in the XEM2-12XS Line Card

- XEM2-4QS Line Card - Figure 104 shows an QSFPLR4 transceiver being installed in an XEM2-4QS Line Card.

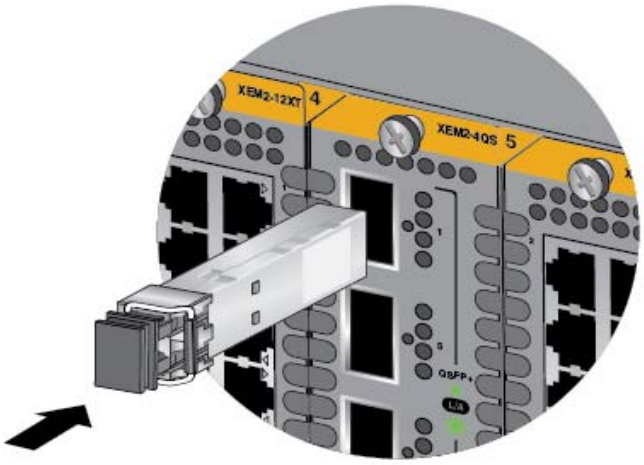


Figure 104. Installing a Fiber Optic Transceiver in the XEM2-4QS Line Card

- XEM2-1CQ line card - Position the 100Gbps QSFP28 transceiver's handle on the right. Refer to Figure 105 on page 182.

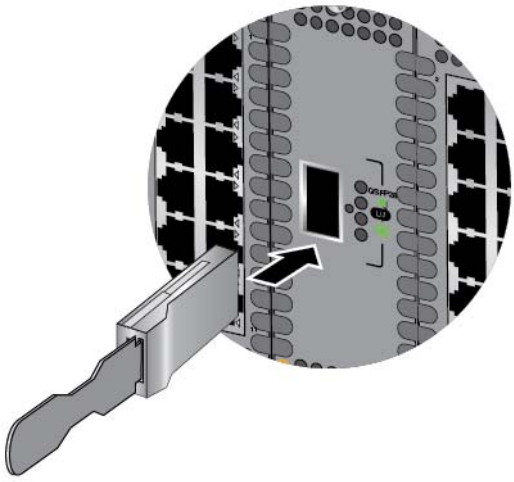


Figure 105. Installing an 100Gbps QSFP28 Transceiver in the XEM2-1CQ Line Card

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 additional transceivers.

5. If the fiber optic connector on the transceiver has a dust cover, remove the cover.
6. Connect the fiber optic cable to the connector on the transceiver. The cable is keyed such that it can connect to the transceiver only one way.
7. Repeat this procedure to install additional transceivers.

Installing Direct Connect Cables

The XEM2-8XSTm, XEM2-12XS, and XEM2-4QS line cards support direct connect cables, which offer an economical way to add 10Gbps or 40Gbps connections over short distances. Refer to Table 26.

Table 26. XEM2 Line Cards and Direct Connect Cables

XEM2 Line Card	Direct Connect Cable
XEM2-8XSTm XEM2-12XS	SP10TW1 - 1 meter SP10TW3 - 3 meters SP10TW7 - 7 meters
XEM2-4QS	QSFP1CU - 1 meter QSFP3CU - 3 meters

To install direct connect cables, perform the following procedure:

1. Select a port in the XEM2 Line Card for the direct connect cable.
2. If the selected port has a dust cover, remove the cover.
3. Remove the transceiver from its shipping container and store the packaging material in a safe location.
4. Orient the transceiver and slide it into the port until it clicks into place. The correct orientation depends on the line card and transceiver:
   - ❒ XEM2-8XSTm or XEM2-12XS Line Card - To install a SP10TW direct connect cable in an odd numbered port, position the transceiver with the release tab on the right. To install a cable in an even numbered port, position the release tab on the left. Refer to Figure 106 on page 184. Slide the connector into the port until it clicks into place.

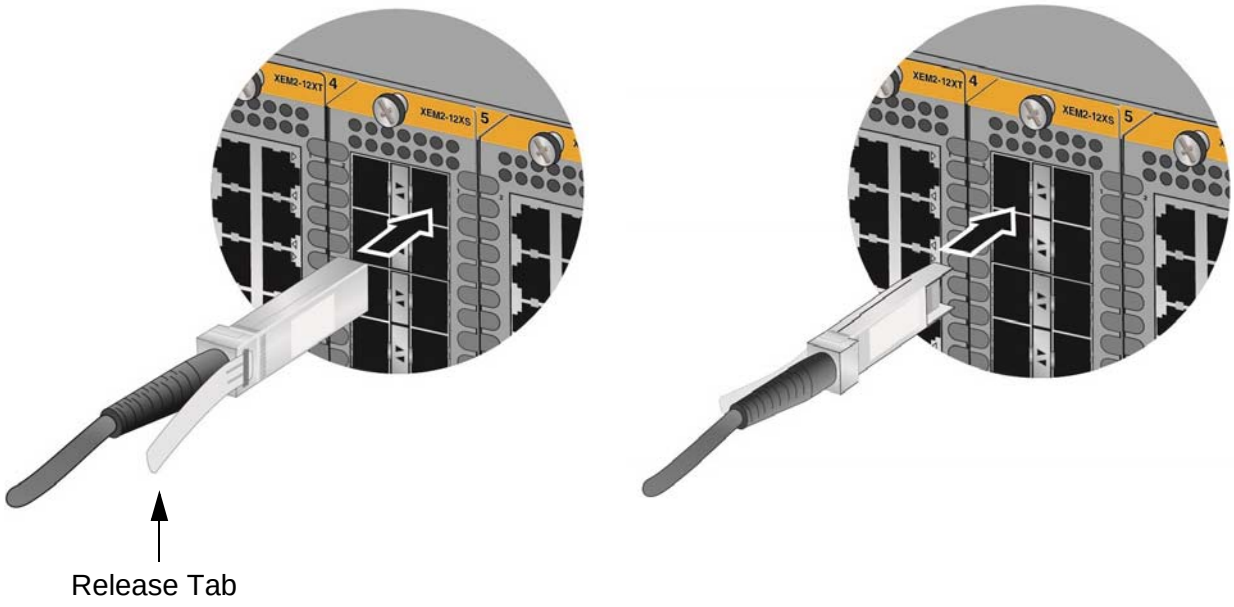


Figure 106. Installing SP10TW Cables in the XEM2-12XS Line Card

- ❒ XEM2-4QS Line Card - Orient the connector on the QSFPCU Cable with the release tab on the left side and slide it into the port until it clicks into place. Refer to Figure 107.

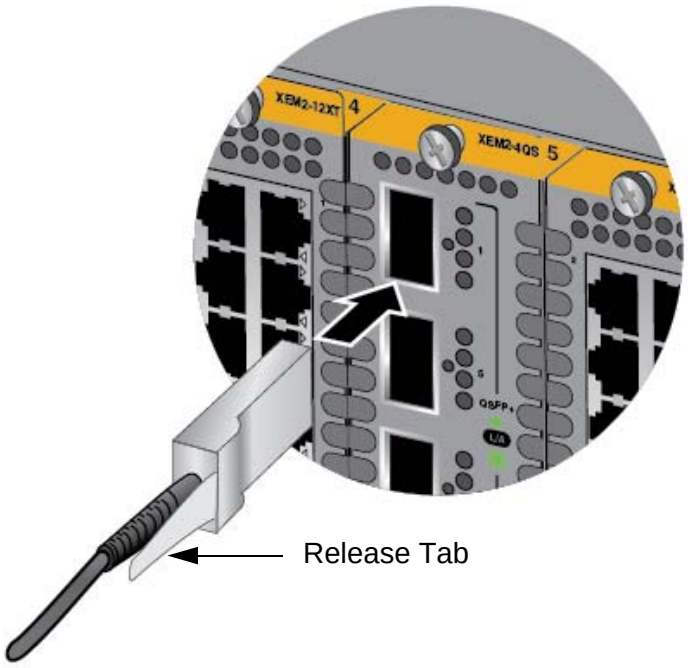


Figure 107. Sliding the QSFPCU Cable into the Port

5. Connect the other end of the cable into a compatible port on another network device.

6. Repeat this procedure to install additional direct connect cables.

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

Chapter 8

Replacing Modules

This chapter contains the following procedures:

Replacing SBxPWRSYS2 AC Power Supplies

This section contains the procedure for removing or replacing SBxPWRSYS2 AC Power Supplies in the SBx908 Gen2 Switch. The illustrations show the removal of the power supply from slot PSU A. The procedure is the same for removing a power supply from slot PSU B.

Note
Allied Telesis recommends saving a backup copy of the configuration file in the switch before removing or replacing power supplies. For instructions, refer to the Software Reference for SwitchBlade x908 Gen2 Switches.

Caution
If you are installing the SBxPWRSYS2 AC Power Supply in an active, operational switch, you should connect the AC power cord to the switch before installing the power supply. Attaching the power cord after installing the SBxPWRSYS2 AC Power Supply might cause the unit to restart its operating system, resulting in a temporary interruption of network operations.

To remove power supplies from the switch, perform the following procedure:

1. Disconnect the AC power cord for the power supply from the AC power source. Refer to Figure 108.

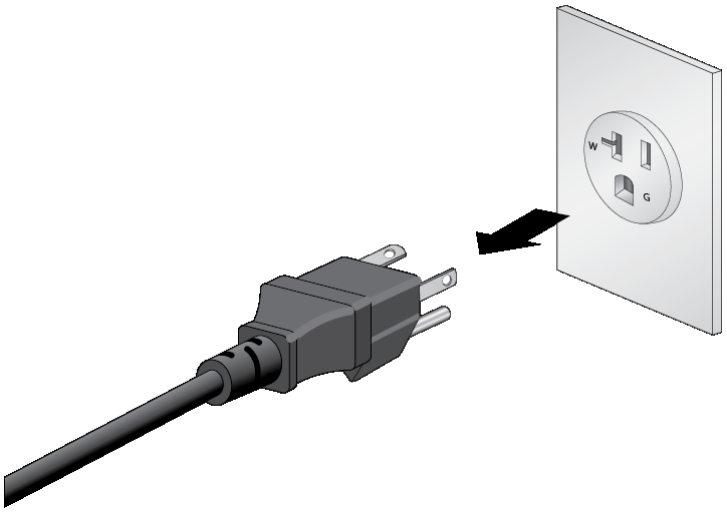


Figure 108. Disconnecting the AC Power Cord from the Power Source

2. Move the retaining clip from the appropriate power cord on the rear panel of the chassis, and disconnect the cord. Refer to Figure 109.

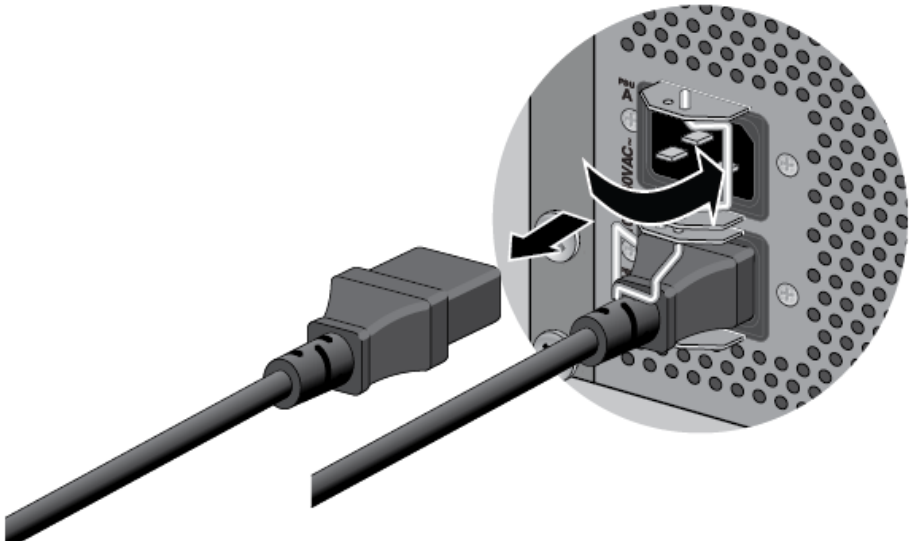


Figure 109. Disconnecting the AC Power Cord from the Chassis

3. Lift the locking hand on the power supply. Refer to Figure 110.

Figure 110. Lifting the Locking Handle on the SBxPWRSYS2 AC Power Supply

4. Carefully pull on the locking handle to slide the power supply from the chassis. Refer to Figure 111 on page 190.

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

Figure 111. Removing the SBxPWRSYS2 AC Power Supply

5. Do one of the following:

   - ❒ To install a new power supply, refer to “Installing SBxPWRSYS2 AC Power Supplies” on page 101 for instructions.
   - ❒ If you are not installing a new power supply in the switch, cover the empty PSU slot with the blank panel, as explained in “Installing the Blank Power Supply Slot Cover” on page 115.

Replacing SBxPWRSYS1-80 DC Power Supplies

To replace an SBxPWRSYS1-80 DC Power Supply, perform the following procedure:

1. Turn off the circuit breaker to the SBxPWRSYS1-80 DC Power Supply.
2. Turn off the On/Off switch on the front panel of the power supply. Refer to Figure 51 on page 106.
3. Use a #2 screwdriver to loosen the screw on the locking handle. Refer to Figure 112.

Note
Do not lift the locking handle yet.

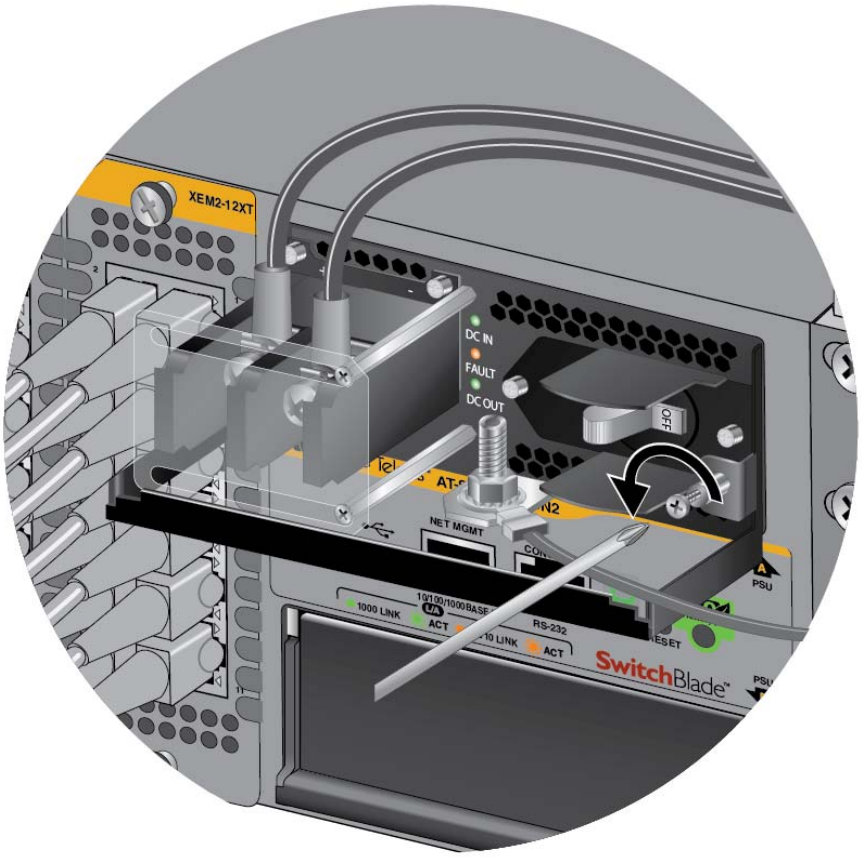


Figure 112. Loosening the Screw on the Locking Handle

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 113

   The plastic cover might not be present if you used the right angle terminals to connect the lead wires to the terminal block. If this is the case, skip this step.

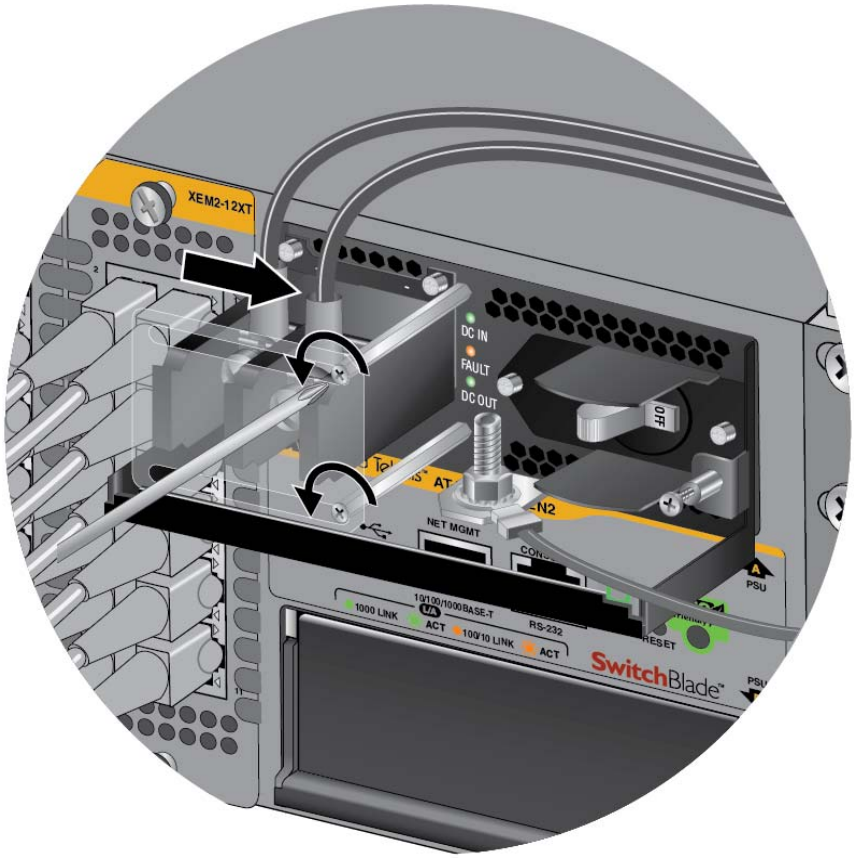


Figure 113. Opening the Plastic Window over the Terminal Block

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 114 on page 193.

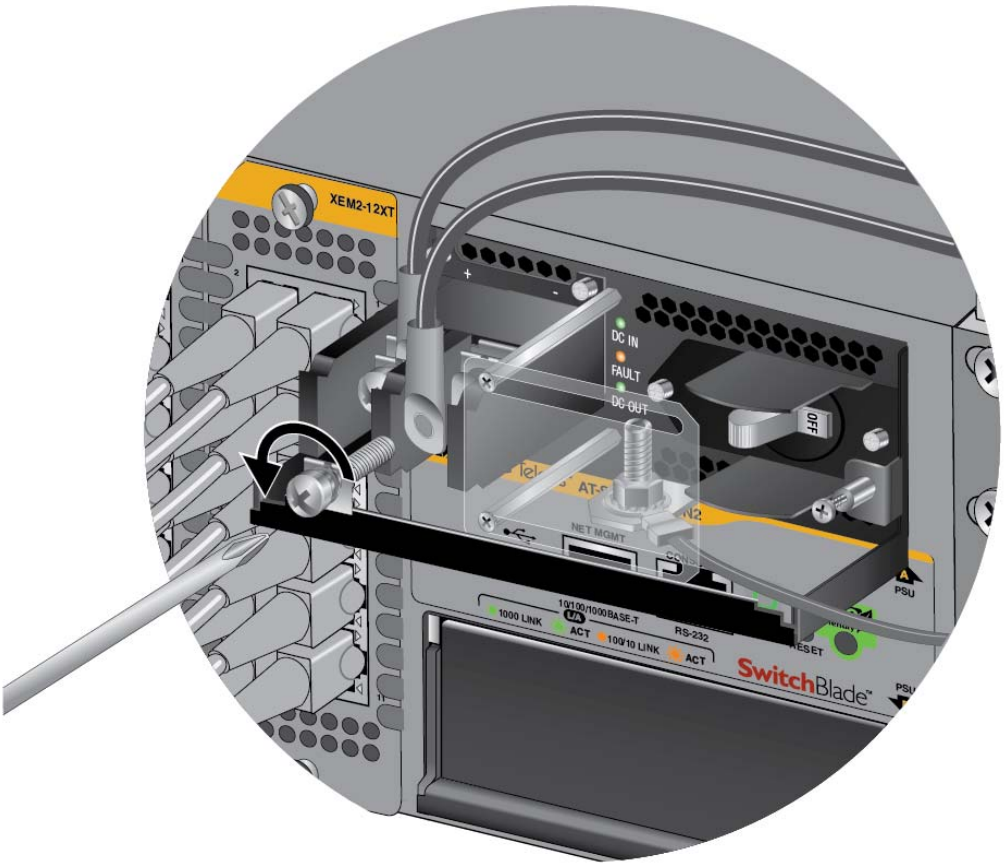


Figure 114. Removing the Negative Lead Wire

6. Use a #3 screwdriver to remove the positive (+) lead wire from the terminal block. Refer to Figure 115 on page 194.

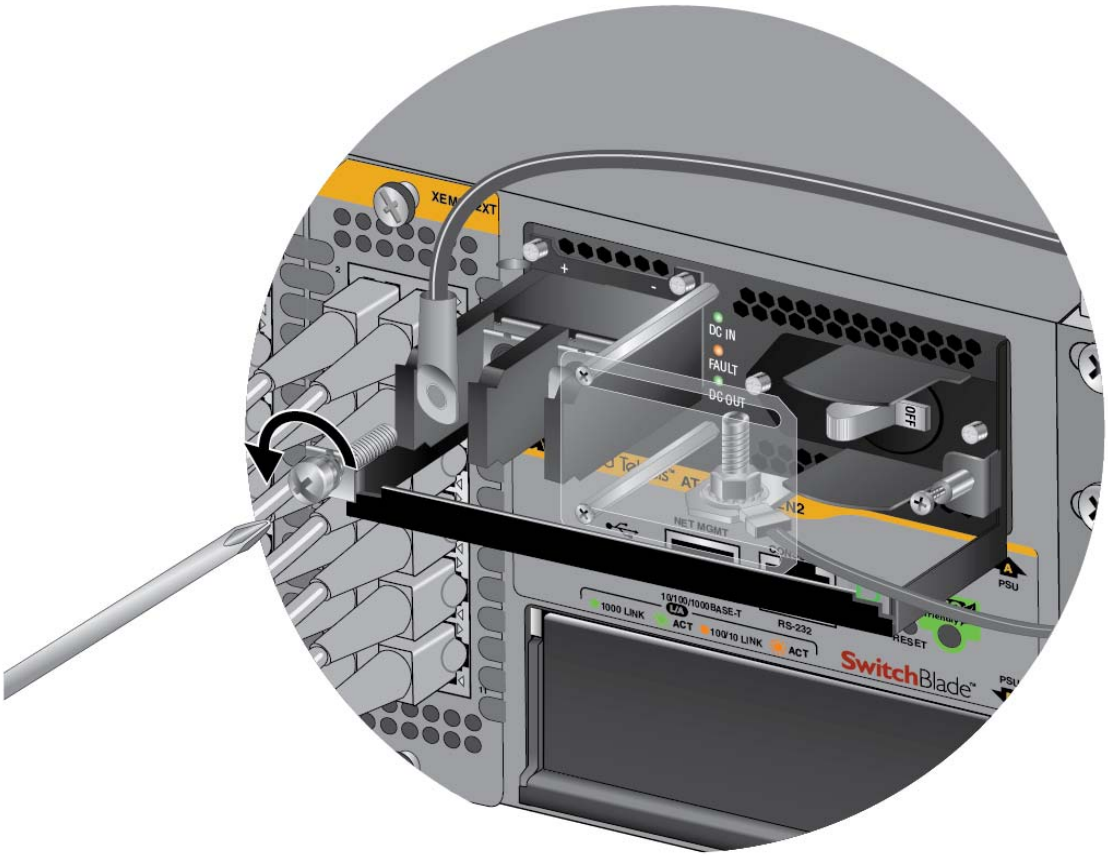


Figure 115. Removing the Positive Lead Wire from the Terminal Block

7. Reinstall the two screws on the negative (-) and positive (+) terminals. Refer to Figure 116 on page 195.

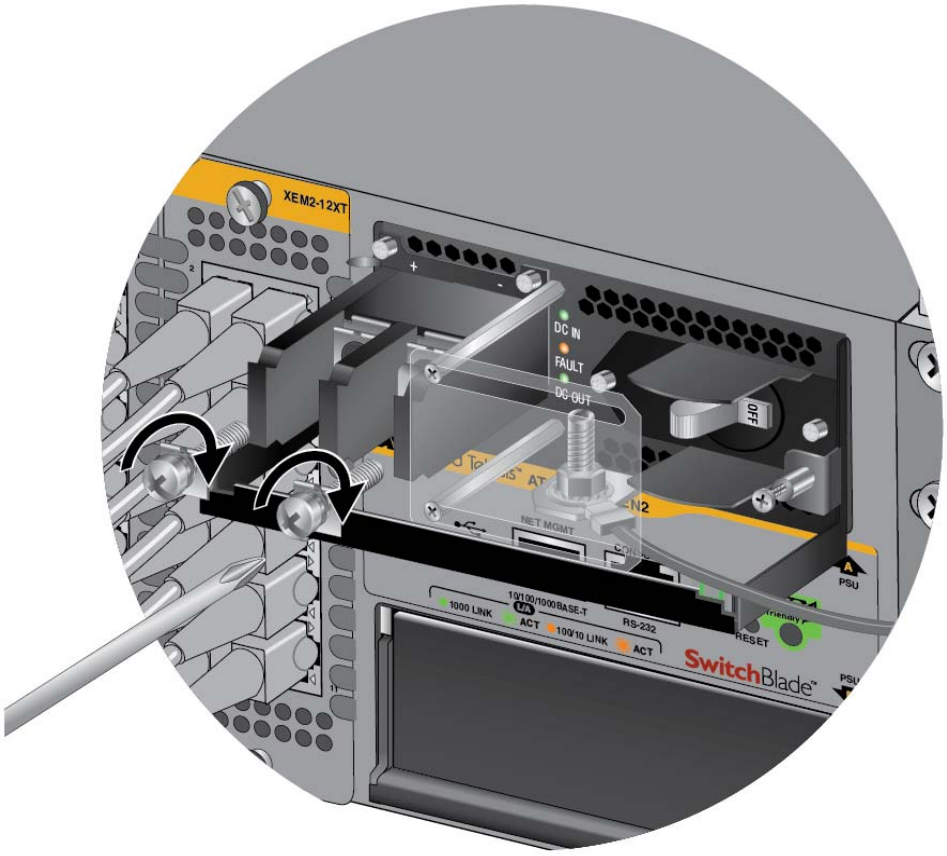


Figure 116. Reinstalling the Screws on the Positive and Negative Terminals

8. Slide the plastic cover to the left and lightly tighten the two screws to secure it in place. Refer to Figure 117 on page 196.

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

The plastic cover might 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.

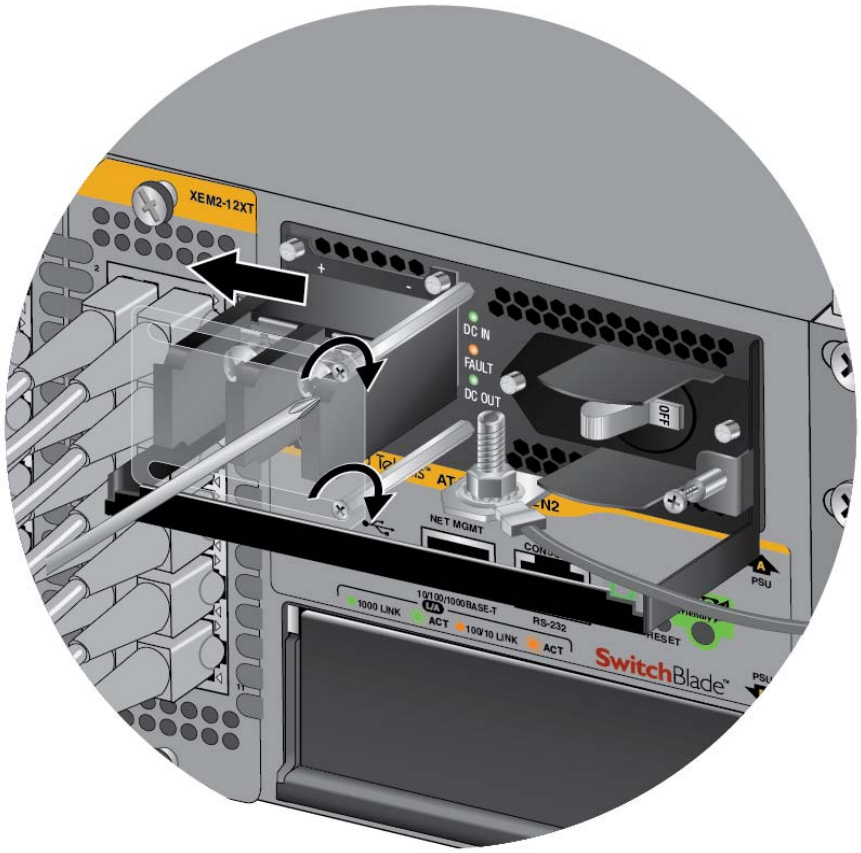


Figure 117. Closing the Plastic Cover

9. Use an 8 mm wrench to remove the grounding wire from the grounding post. Refer to Figure 118 on page 197.

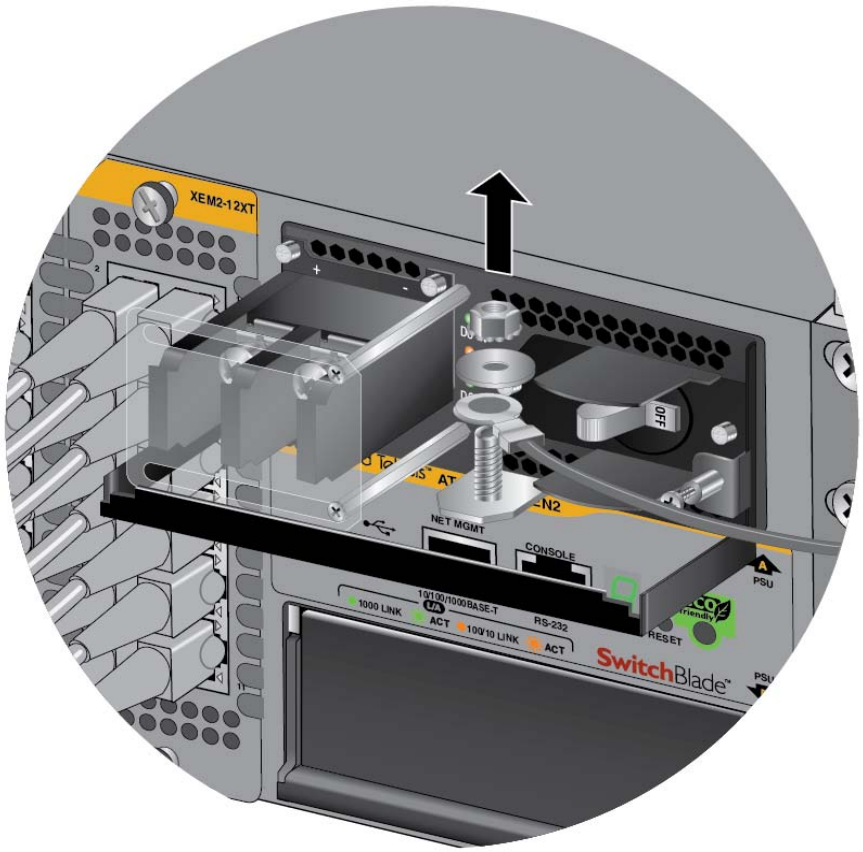


Figure 118. Removing the Grounding Wire

10. Reinstall the nut and washer on the grounding post. Refer to Figure 119 on page 198.

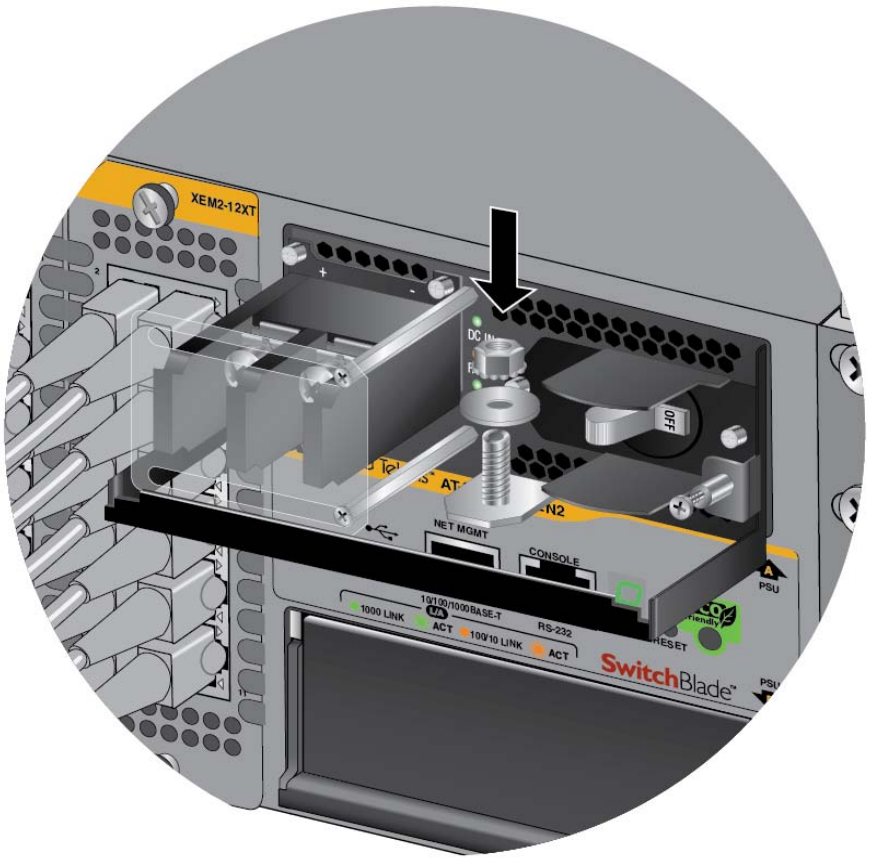


Figure 119. Reinstalling the Nut and Washer on the Grounding Post

Note
If you did not perform step 3 to loosen the retaining screw on the power supply, perform the step before continuing.

11. Lift the locking handle and slide the power supply from the chassis. Refer to Figure 120 on page 199.

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

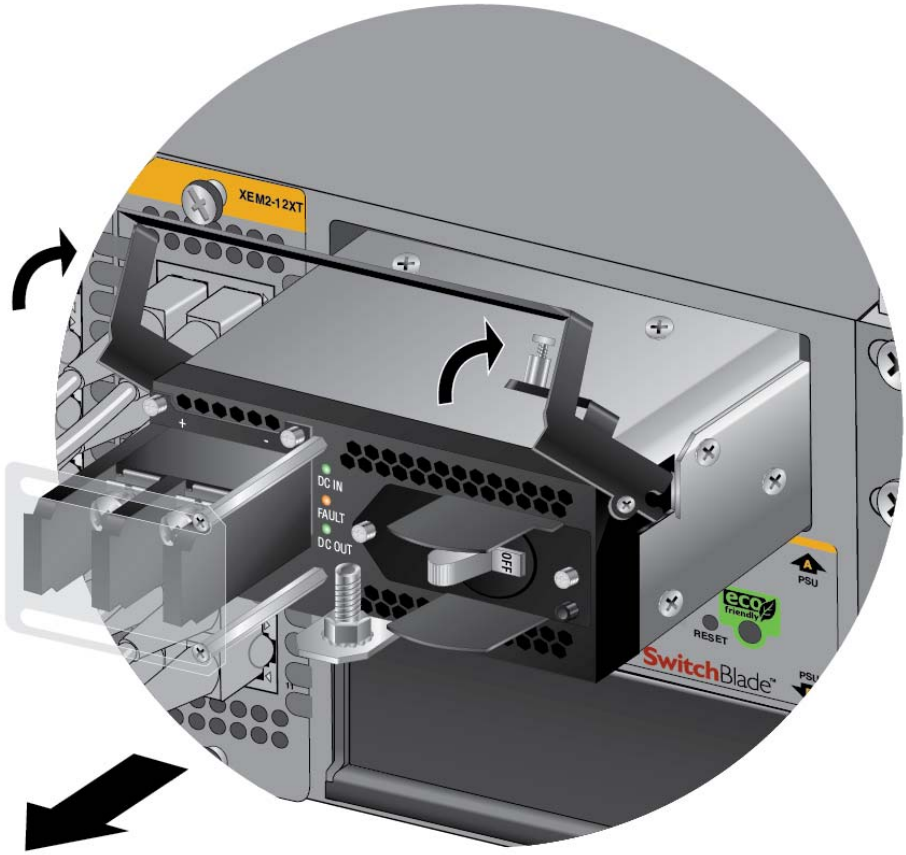


Figure 120. Lifting the Locking Handle and Removing the Power Supply

12. Do one of the following:

    - ❒ To install a new power supply, refer to “Installing SBxPWRSYS2 AC Power Supplies” on page 101 or “Installing SBxPWRSYS1-80 DC Power Supplies” on page 105.
    - ❒ If you are not installing a new power supply, continue with this procedure to install the blank power supply slot cover.

13. Place the locking handle on the blank power supply slot cover in the up position and slide the cover into the empty power supply slot. Refer to Figure 121 on page 200.

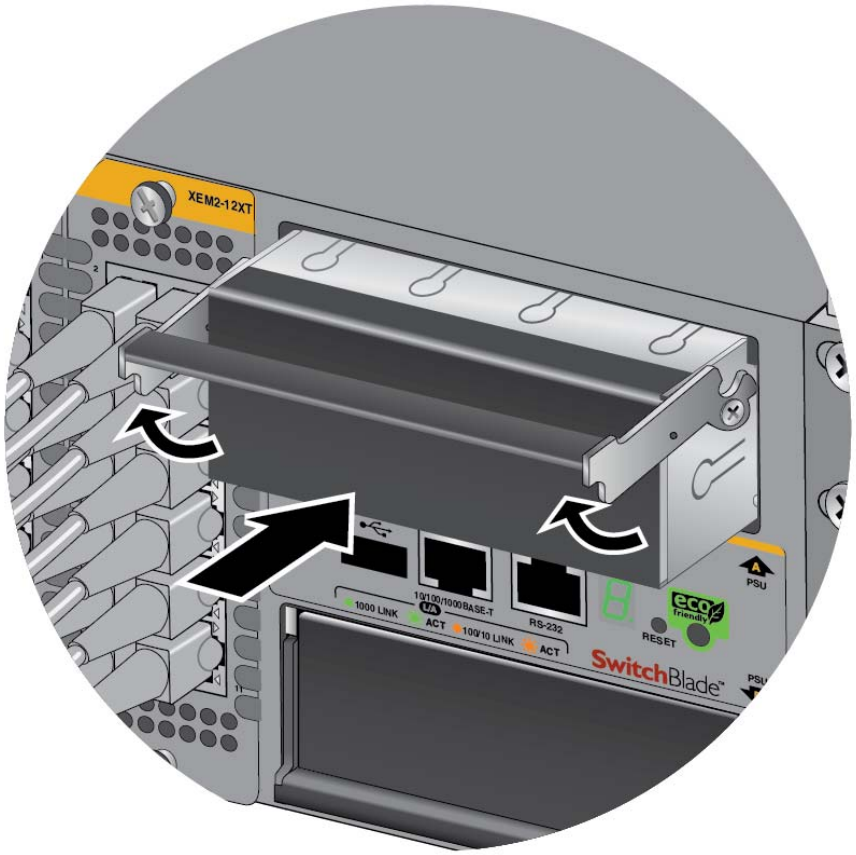


Figure 121. Installing the Blank Power Supply Slot Cover

14. Lower the locking handle to secure the slot cover to the slot. Refer to Figure 122 on page 201.

Figure 122. Lowering the Locking Handle on the Power Supply Slot Cover

Replacing XEM2 Line Cards

This section contains the procedure for replacing XEM2 Ethernet line cards in the SBx908 Gen2 Switch. Please review the guidelines in Table 27 before performing the procedure:

Table 27. Hot-swapping Guidelines for XEM2 Line Cards

XEM2 Line Card	Description
XEM2-8XSTm XEM2-12XT XEM2-12XS XEM2-4QS	No reset of the switch is required when hot-swapping cards in the following situations: - Installing a card in an unused line card slot that was not provisioned for any card. - Installing a card in a line card slot that was provisioned for it or one of the other cards. - Replacing a card with the same model (for example, replacing an XEM2-12XT Card with another XEM2-12XT Card). - Replacing a card with a different model (for example, replacing an XEM2-12XS Card with an XEM2-4QS Card). Resetting the switch is required when installing one of these cards in a line card slot that was used by or provisioned for the XEM2-1CQ Card.
XEM2-1CQ	No reset of the switch is required when hot-swapping XEM2-1CQ Card in the following situations: - Replacing the XEM2-1CQ Card with another XEM2-1CQ Card. - Installing the XEM2-1CQ Card in a line card slot that was provisioned for it with the SWITCH BAY PROVISION command. (The switch, however, must be reset after the provisioning command.)

Table 27. Hot-swapping Guidelines for XEM2 Line Cards (Continued)

XEM2 Line Card	Description
XEM2-1CQ (Continued)	You must reset the switch after hot-swapping the card under these conditions: - Installing the XEM2-1CQ Card in a line card slot that was not provisioned for it. - Replacing one of the other cards with the XEM2-1CQ Card. - Replacing the XEM2-1CQ Card with one of the other cards. - Provisioning a line card slot for the XEM2-1CQ Card with the SWITCH BAY PROVISION command. The provision is not implemented until the switch is reset.

Here are additional hot-swapping guidelines:

- Allied Telesis recommends saving a backup copy of the switch's configuration file before removing or replacing XEM2 Line Cards. For instructions, refer to the Software Reference for SwitchBlade x908 GEN2 Switches.
- When hot-swapped, XEM2 Line Cards might require up to thirty seconds to become fully operational.
- Remember to save the switch's configuration with the WRITE FILE command after issuing the SWITCH BAY PROVISION command to provision a line card slot for a card.
- AlliedWare Plus alerts you with critical log messages on the console and in the buffered log if you need to reset the switch after hot-swapping line cards. (The buffered log is displayed with the SHOW LOG command.) Here are examples of the messages. The first example is from replacing an XEM2-1CQ Card with an XEM2-12XT Card:

  Console Message:

  ```
  23:22:28 awplus HSL[996]: Stack member 1 must be rebooted to configure for XEM2-12XT, disabling XEM.
  ```

  Buffered log:

  ```
  2018 May 15 23:22:28 local6.crit awplus HSL[996]: Stack member 1 must be rebooted to configure for XEM2-12XT, disabling XEM.
  ```

The next example is from replacing an XEM2-12XT Card with an XEM2-1CQ Card:

Console Message:

```
23:26:02 awplus HSL[996]: Stack member 1 must be
rebooted to configure for XEM2-1CQ, disabling
XEM.
```

Buffered log:

```
2018 May 15 23:26:02 local6.crit awplus HSL[996]:
Stack member 1 must be rebooted to configure for
XEM2-1CQ, disabling XEM.
```

This procedure requires a #2 Phillips-head screwdriver (not provided). The illustrations show the XEM2-12XT line card. The procedure is the same for all cards.

To remove an XEM2 Line Card from the switch, perform the following procedure:

1. Label and remove the cables from the line card.
2. If the line card has fiber optic transceivers, install dust covers on the ports.
3. If the line card has transceivers or direct connect cables, label and remove them.

Warning
The temperature of an operational transceiver may exceed 70° C (158° F). Exercise caution when removing or handling transceivers with unprotected hands. E43

Note
100Gbps transceivers for the XEM2-1CQ Line Card have handles. Use the handles when installing or removing transceivers.

4. Use a #2 Phillips-head screwdriver to loosen the two screws on the faceplate of the card. Refer to Figure 123 on page 205.

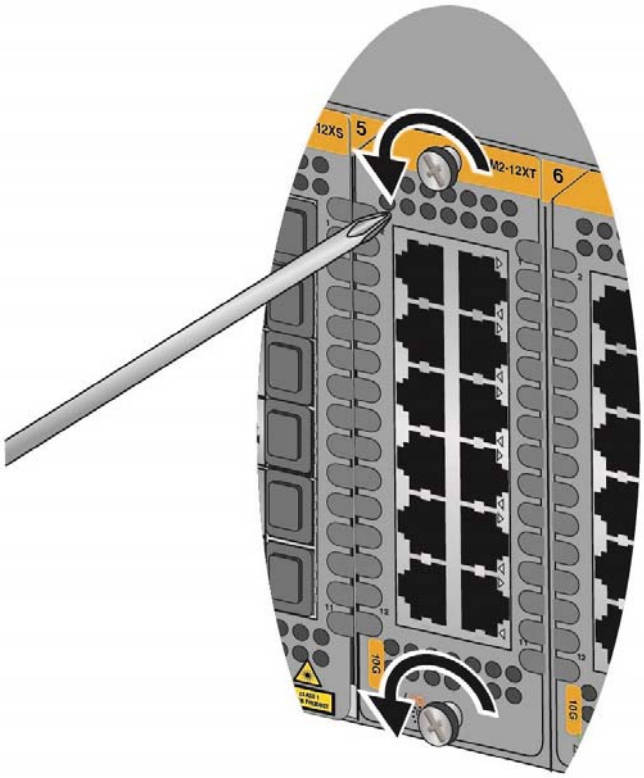


Figure 123. Loosening the Screws on the Ethernet Line Card

5. Carefully pull on the screws on the faceplate to disconnect the line card from the connector on the backplane in the chassis. Refer to Figure 124 on page 206.

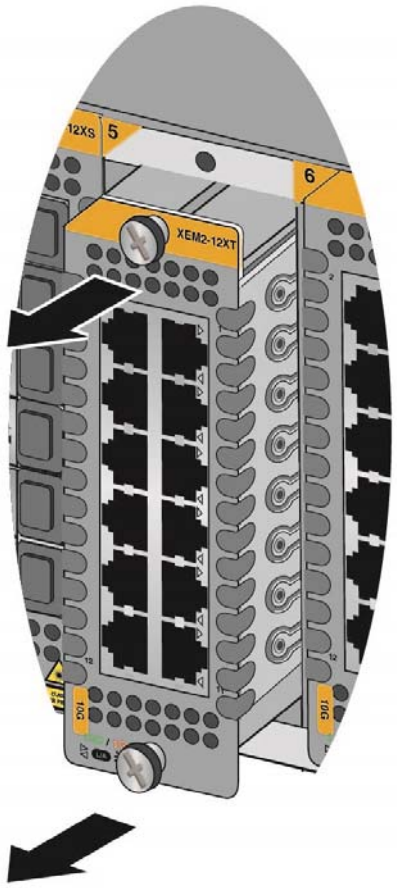


Figure 124. Disconnecting an Ethernet Line Card from the Chassis

6. Carefully slide the card from the chassis. Refer to Figure 125 on page 207.

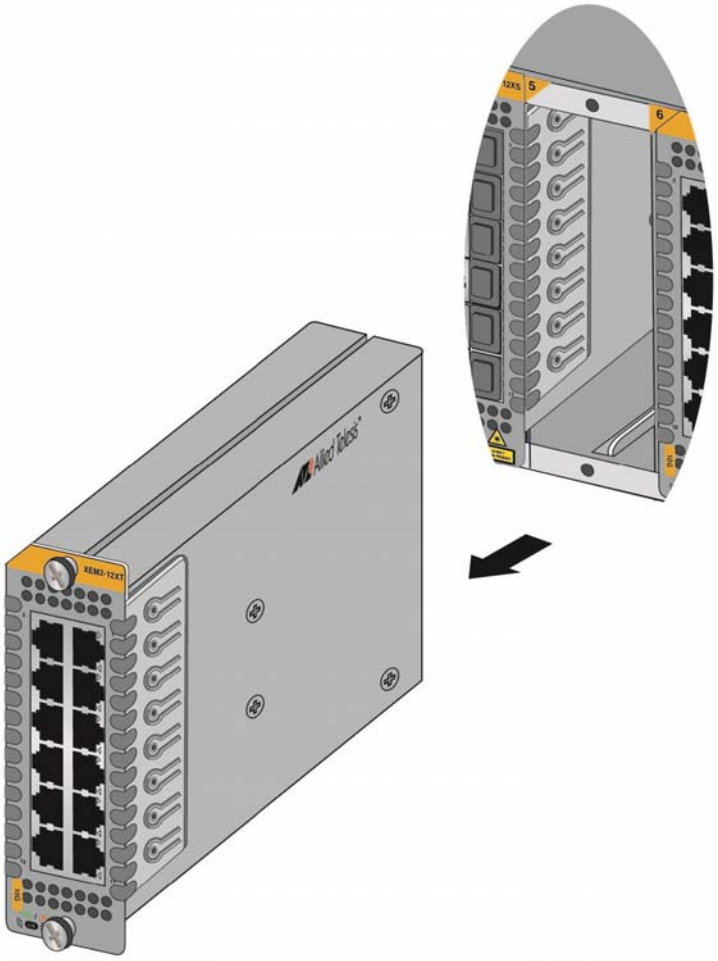


Figure 125. Sliding an Ethernet Line Card from the Chassis

7. If you are not installing the line card in another slot or chassis, return it to its anti-static bag and shipping container. Refer to Figure 126 on page 208.

Figure 126. Placing the Ethernet Line Card in its Anti-static Bag

8. For instructions on how to install the card in another slot in either the same or a different chassis, refer to “Installing Ethernet Line Cards” on page 109.

9. If you are not planning to install another line card in the slot now, cover it with a blank cover. For instructions, refer to “Installing Blank Line Card Slot Covers” on page 113.

Replacing FAN08 Modules

This section contains the procedure for replacing FAN08 Modules in the SBx908 Gen2 Switch. The procedures are listed here:

- ❒ “Removing FAN08 Modules,” next
- ❒ “Installing FAN08 Modules” on page 210

Removing FAN08 Modules

This procedure requires the following tool:

- ❒ #2 Phillips-head screwdriver (not provided)

The illustrations show the removal of the fan module from the Fan A slot on the back panel. The procedure is the same for removing the module from the Fan B slot.

To remove an FAN08 Module from the chassis, perform the following procedure:

1. Use a #2 Phillips-head screwdriver to loosen the two screws on the faceplate of the fan module. Refer to Figure 127.

Figure 127. Loosening the Screws on the FAN08 Module

2. Carefully pull on the screws on the faceplate to disconnect the line card from the connector on the backplane in the chassis. Refer to Figure 128 on page 210.

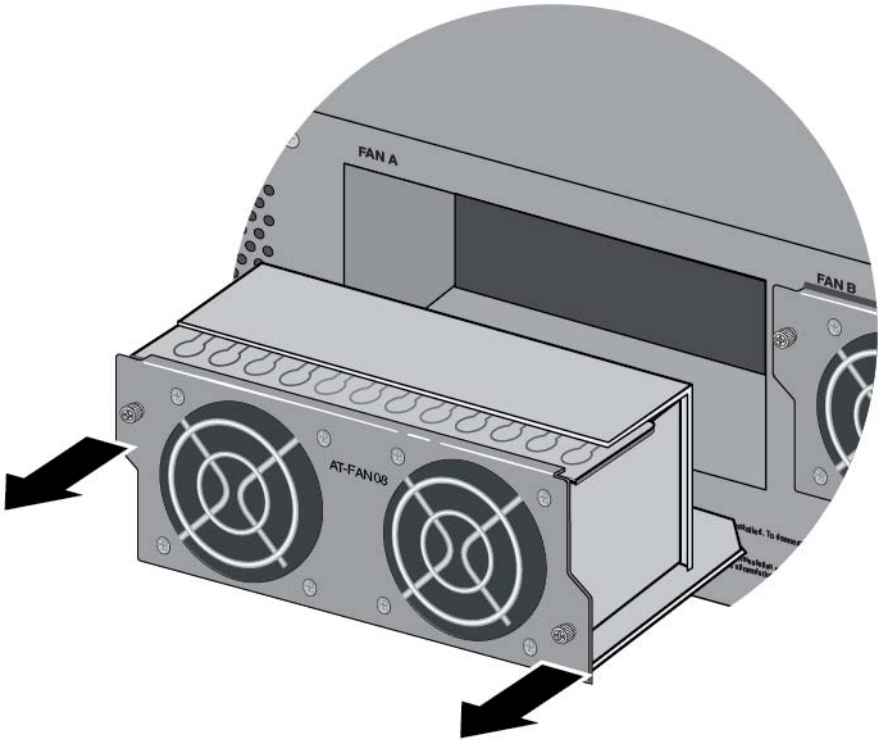


Figure 128. Disconnecting the FAN08 Module from the Chassis

3. Continue with the next procedure to install a new FAN08 Module.

Installing FAN08 Modules

This procedure requires the following tool:

- ❒ #2 Phillips-head screwdriver (not provided)

The illustrations show the installation of the fan module in Fan A slot on the back panel. The procedure is the same for installing the module in the Fan B slot.

To install an FAN08 Module, perform the following procedure:

1. Align the FAN08 Module in the slot as shown in Figure 129 on page 211.

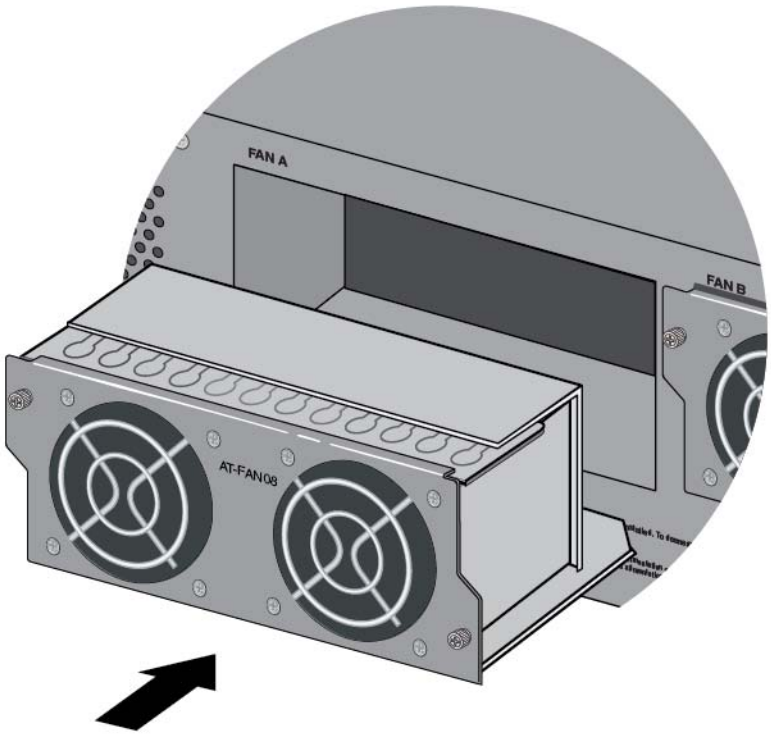


Figure 129. Aligning the FAN08 Module in the Chassis Slot

2. When you feel the module make contact with the connector inside the chassis, gently press on both sides to seat the module on the connector. Refer to Figure 130.

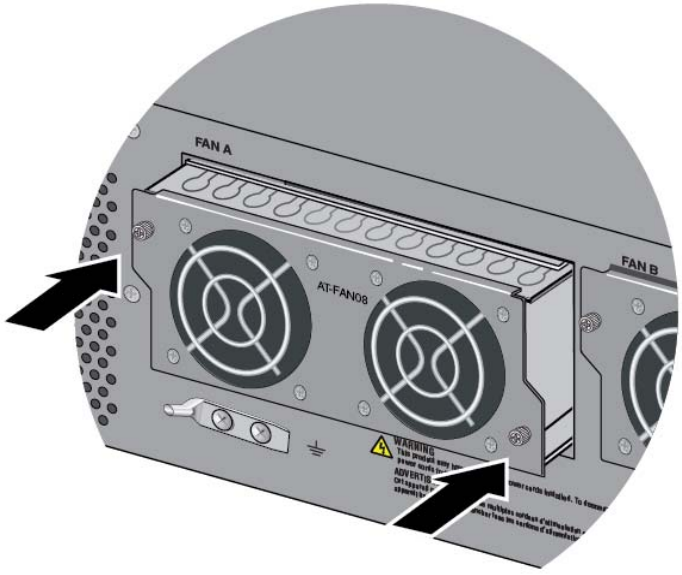


Figure 130. Seating the FAN08 Module on the Connector in the Chassis

3. Tighten the two screws on the module to secure it in the chassis. Refer to Figure 131.

Figure 131. Tightening the Two Captive Screws on the FAN08 Module

Chapter 9
Troubleshooting

This chapter contains suggestions on how to troubleshoot problems with the switch.

> **Note**
> For further assistance, please contact Allied Telesis Technical Support at **www.alliedtelesis.com/support**.

Problem 1: All the port LEDs and Switch ID LED are off, and the fans are not operating.

Solutions: The unit is not receiving power. If the switch has SBxPWRSYS2 AC Power Supplies, try the following:

- ❒ Verify that the power cord is securely connected to the power source and the AC connector on the back panel of the switch.
- ❒ Verify that the power outlet has power by connecting another device to it.
- ❒ Try connecting the unit to another power source.
- ❒ Try a different power cord.
- ❒ Verify that the voltage from the power source is within the required levels for your region. The power requirements for the switch are listed in “Power Specifications” on page 224.

If the switch has SBxPWRSYS1-80 Power Supplies, examine the LEDs on the power supplies. The power supplies are operating normally when the DC IN and DC OUT LEDs are solid green and the Fault LED is off. Possible fault conditions and their solutions are described here:

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

- ❒ Verify that the On/Off switch on the power supply is in the On position.
- ❒ Verify that the DC circuit breaker is on.
- ❒ Verify that the positive and negative power wires are correctly and securely connected to the terminal block on the power supply and circuit breaker.

- ❒ Verify that the DC circuit break has power by attaching another device to it.
- ❒ Verify that the power from the DC circuit break is within the required levels of the power supply. Refer to “Power Specifications” on page 224.
- ❒ If the switch is still operating, use the SHOW SYSTEM ENVIRONMENT command in the User Exec or Privileged Exec mode to determine if the power supply has overheated and shutdown. The Status column in the display provides the states of the switch modules. Components that have an “Ok” status are operating normally.

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

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

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

Problem 2: All of the port LEDs are off even though the ports are connected to active network devices.

Solution: The switch may be operating in the low power mode. To toggle on the LEDs, press the eco-friendly button on the front panel of the switch. You may also toggle the LEDs off and on with the ECOFRIENDLY LED and NO ECOFRIENDLY LED commands in the command line interface.

Problem 3: A twisted pair port on the XEM2-8XSTm, XEM2-12XT, or XEM2-12XTm Ethernet Line Card is connected to an active network device but the LINK/ACT LED is off.

Solutions: The port is unable to establish a link to the device. Try the following:

- ❒ Verify that the network device connected to the twisted pair port is powered on and is operating properly.
- ❒ Verify that the network device operates at a speed supported by the card. The twisted pair ports on the XEM2-12XT Card support 100Mbps and 1/10Gbps. The ports on the XEM2-8XSTm and XEM2-12XTm Cards support 100Mbps and 1/2.5/5/10Gbps. The cards do not support 10Mbps devices.
- ❒ Try connecting another network device to the twisted pair port with

a different cable. If the twisted pair port is able to establish a link, then the problem is with the cable or the other network device.

- ❒ Verify that the twisted pair cable does not exceed 100 meters (328 feet).
- ❒ Verify that you are using the appropriate category of twisted pair cable. Refer to Table 5 on page 29 and Table 7 on page 31.
- ❒ Verify that the port is connected to the correct twisted pair cable.

Note
A 1GBase/10GBase connection may require five to ten seconds to establish a link.

Problem 4: The LINK/ACT LED for an SFP, SFP+, or QSFP+ transceiver is off.

Solutions: The fiber optic port on the transceiver is unable to establish a link to a network device. Try the following:

- ❒ Verify that the line card supports the transceiver by referring to the line card's description in Chapter 1, "Overview" on page 19.
- ❒ Verify that the remote network device connected to the fiber optic port is operating properly.
- ❒ Verify that the fiber optic cable is securely connected to the port on the transceiver and to the port on the remote network device.
- ❒ Check that the transceiver is fully inserted in the slot.
- ❒ Verify that the operating specifications of the fiber optic ports on the transceiver and remote network device are compatible.
- ❒ Verify that the correct type of fiber optic cabling is being used.
- ❒ Verify that the port is connected to the correct fiber optic cable.
- ❒ Try connecting another network device to the fiber optic port using a different cable. If the port is able to establish a link, then the problem is with the cable or with the other network device.
- ❒ Use the switch's software to verify that the port is enabled.
- ❒ If the remote network device is a managed device, use its management firmware to determine whether its port is enabled.
- ❒ Test the attenuation of both directions on the fiber optic cable with a fiber optic tester to determine whether the optical signal is too weak (sensitivity) or too strong (maximum input power).

Problem 5: A line card is not forwarding traffic on its ports.

Solution: The version of the AlliedWare Plus management software on the switch might not support the card. The minimum software requirements are listed here:

- XEM2-8XSTm Card - v5.4.9-2
- XEM2-12XTm Card - v5.4.9-0
- XEM2-1CQ Card - v5.4.8-0.2

All other cards require v5.4.7A-1 or later. To view the version number of the management software, use the SHOW VERSION command.

Problem 6: The XEM2-1CQ Line Card is not forwarding traffic after it is hot-swapped in the chassis.

Solution: You have to reboot the switch after hotswapping XEM2-1CQ Line Cards

Problem 7: The SHOW STACK command is not displaying all the switches in the stack.

Solutions: The switches are unable to form the stack. Try the following:

- The switch might have an earlier version of the management software that does not support the stacking feature. The feature requires v5.4.8-0.2 or later. To view the version number, use the SHOW VERSION command.
- Review the information in “Stacking Guidelines” on page 51 to verify that the trunk complies with all rules and restrictions.
- If the trunk is using fiber optic transceivers, verify that they are fully inserted into the transceiver slots.
- Verify that the transceivers are from Allied Telesis.
- Verify that the fiber optic cables are securely connected to the ports on the transceivers.
- Verify that VCStack is activated on all the switches. Refer to “Verifying the Master Switch” on page 164 and “Verifying a Member Switch” on page 171.
- Verify that the AlliedWare Plus management software in the chassis supports the cards that are being used for the trunk. Refer to Table 14 on page 48. To view the AlliedWare Plus version number, use the SHOW VERSION command.

Problem 8: You performed the NO STACKPORT command on a port to remove the stacking function, but the port is still not forwarding regular Ethernet network traffic.

- You have to reboot the switch after performing the NO

STACKPORT command.

Problem 9: The switch functions intermittently.

Solutions: Check the hardware status through the management software:

- Use the SHOW SYSTEM ENVIRONMENT command in the Privileged Exec mode to verify that the input voltage from the power source to the switch is stable and within the approved operating range. The unit will shut down if the input voltage fluctuates above or below the approved operating range.
- Use the SHOW SYSTEM ENVIRONMENT command in the Privileged Exec mode to verify that the fan is operating correctly.
- Verify that the location of the switch allows for adequate airflow. The unit will shut down if it is overheating.

Problem 10: The Switch ID LED on the front panel is flashing the letter “F.”

Solutions: One or more of the following problems has occurred:

- A cooling fan has failed.
- The internal temperature of the switch has exceeded the normal operating range and the switch might shut down.

Appendix A
Technical Specifications

This appendix contains the following sections:

Physical Specifications

Dimensions (H x W x D)

Table 28 lists the product dimensions. The chassis dimensions are also shown in Figure 132 and Figure 133 on page 221.

Table 28. Product Dimensions

SBx908 Gen2 Chassis	13.3 x 44.1 x 47.3 cm (5.22 x 17.34 x 18.64 in.) (H x W x D)
SBxPWRSYS2 AC Power Supply System	4.34 x 10.16 x 32.21 cm (1.71 x 4.00 x 12.68 in.)
SBxPWRSYS1-80 DC Power Supply System	4.34 x 10.16 x 32.21 cm (1.71 x 4.00 x 12.68 in.)
XEM2-8XSTm Line Card XEM2-12XT Line Card XEM2-12XTm Line Card XEM2-12XS Line Card XEM2-4QS Line Card XEM2-1CQ Line Card	4.0 x 13.0 x 16.6 cm (1.57 x 5.11 x 6.53 in.)
FAN08 Fan Module	6.91 x 16.46 x 8.64 cm (2.72 x 6.48 x 3.40 in.)

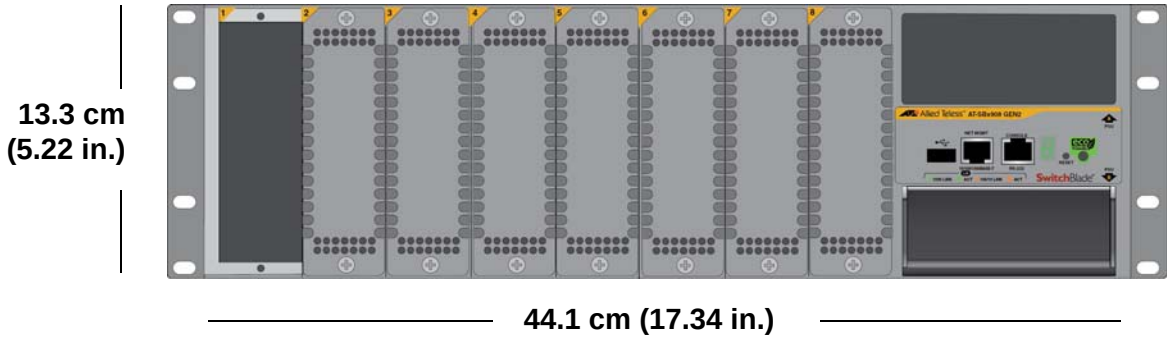
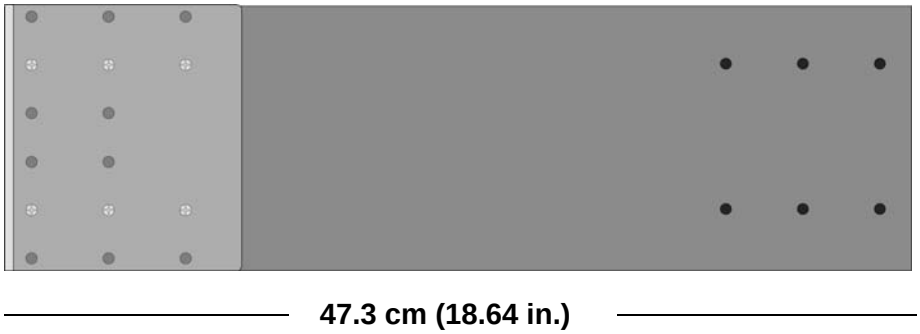


Figure 132. Switch Height and Width



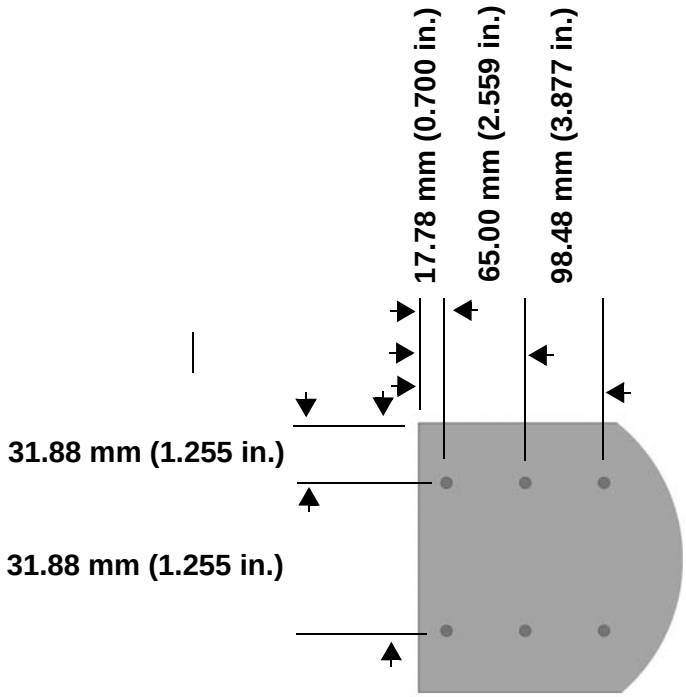


Figure 133. Switch Depth and Locations of Bracket Holes

Weights

Table 29 lists the weights of the components.

Table 29. Product Weights

SBx908 Gen2 Chassis	15.81 kg (34.85 lb.)
SBxPWRSYS2 AC Power Supply System	2.70 kg (6.05 lb.) with power cord
SBxPWRSYS1-80 DC Power Supply System	1.9 kg (4.2 lb)
XEM2-8XSTm Line Card	0.70 kg (1.54 lb.)
XEM2-12XT Line Card	0.75 kg (1.65 lb.)
XEM2-12XTm Line Card	1.04 kg (2.3 lb.)
XEM2-12XS Line Card	0.75 kg (1.65 lb.)
XEM2-4QS Line Card	0.66 kg (1.45 lb.)
XEM2-1CQ Line Card	0.62 kg (1.37 lb.)
FAN08 Fan Module	0.72 kg (1.60 lb.)

Ventilation

Table 30 lists the ventilation requirements.

Table 30. Ventilation Requirements

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

Environmental Specifications

Table 31 lists the environmental specifications of the switches.

Table 31. Environmental Specifications

Operating Temperature Range	0° C to 50° C (32° F to 122° F)
Storage Temperature Range	-25° C to 70° C (-13° F to 158° F)
Operating Humidity Range	5% to 90% noncondensing
Storage Humidity Range	5% to 95% noncondensing
Maximum Operating Altitude	3,000 m (9,843 ft)

Power Specifications

This section contains the maximum power consumption values, input voltages, and heat dissipation values.

AC Voltage, Frequency Requirements (Volts, Hertz)

Table 32 lists the AC voltage and frequency requirements.

Table 32. AC Voltage and Frequency Requirements

SBxPWRSYS2 AC Power Supply	100 - 120 / 200 - 240 VAC 12/6A 50/60 Hz (per input)

DC Voltage Requirements

Table 33 lists the DC voltage requirements.

Table 33. DC Voltage Requirements

SBxPWRSYS1-80 DC Power Supply	40 - 60V dc (-0% - +20%), 36A (maximum per input)

Maximum Power Consumption

Table 34 lists the maximum power consumptions.

Table 34. Maximum Power Consumption (Watts)

XEM2-8XSTm Line Card	17.78 W
XEM2-12XT Line Card	39.73 W
XEM2-12XTm Line Card	29.83 W
XEM2-12XS Line Card	30.31 W
XEM2-4QS Line Card	16.14 W
XEM2-1CQ Line Card	6.71 W

Typical Power Savings in eco-friendly Mode

Table 35 lists the typical power savings in eco-friendly mode.

Table 35. Typical Power Savings in eco-friendly Mode (Watts)

XEM2-8XSTm Line Card	0.08 W
XEM2-12XT Line Card	0.11 W
XEM2-12XTm Line Card	0.10 W
XEM2-12XS Line Card	0.13 W
XEM2-4QS Line Card	0.11 W
XEM2-1CQ Line Card	0.02 W

Maximum Power Supply Efficiency

Table 36 on page 225 lists the maximum power supply efficiency.

Table 36. Maximum Power Supply Efficiency (Based on 100V Input Voltage)

SBxPWRSYS2 AC Power Supply	Up to 85%
SBxPWRSYS1-80 DC Power Supply	Up to 90%

Heat Dissipation

Table 37 lists the heat dissipation.

Table 37. Heat Dissipation (British Thermal Units/Hour)

XEM2-8XSTm Line Card	60.69 BTU/hr
XEM2-12XT Line Card	135.58 BTU/hr
XEM2-12XTm Line Card	101.81 BTU/hr
XEM2-12XS Line Card	103.43 BTU/hr
XEM2-4QS Line Card	55.08 BTU/hr
XEM2-1CQ Line Card	22.90 BTU/hr
SBxPWRSYS2 AC Power Supply	5118.21 BTU/hr
SBxPWRSYS1-80 DC Power Supply	5118.21 BTU/hr

Certifications

Table 38 lists the product certificates.

Table 38. Product Certifications

EMI (Emissions)	FCC Class A CISPR 22 Class A EN55032 Class A VCCI Class A ICES-003 Class A RCM
EMC (Immunity)	EN55024 EN61000-3-2 EN61000-3-3
Electrical and Laser Safety	UL 60950-1 ($_{C}UL_{US}$) EN60825-1 (TUV)
RoHS	RoHS6

Pin Signals for RJ-45 Twisted Pair Ports

Figure 134 illustrates the pin layout of the RJ-45 connectors on the following line cards:

- AT-XEM2-8XSTm
- AT-XEM2-12XT
- AT-XEM2-12XTm

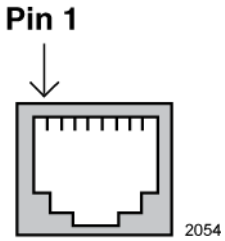


Figure 134. Pin Layout (Front View) of Twisted Pair Ports

Table 39 lists the pin signals at 100Mbps.

Table 39. Pin Signals on RJ-45 Twisted Pair Ports at 100Mbps

Pin	MDI Signal	MDI-X Signal
1	TX+	RX+
2	TX-	RX-
3	RX+	TX+
4	Not used	Not used
5	Not used	Not used
6	RX-	TX-
7	Not used	Not used
8	Not used	Not used

Table 40 lists the pin signals at 1/2.5/5/10Gbps.

Table 40. Pin Signals on Twisted Pair Ports at 1/2.5/5/10Gbps

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-

Pin Signals for the RJ-45 Style Serial Console Port

Table 41 lists the pin signals of the RJ-45 style serial Console port on the management panel.

Table 41. RJ-45 Pin Signals for the Console Port on the Management Panel

Pin	Signal
1	Looped to pin 8.
2	Looped to pin 7.
3	Transmit Data
4	Ground
5	Ground
6	Receive Data
7	Looped to pin 2.
8	Looped to pin 1.

Pin Signals for the NET MGMT Port

Table 42 lists the pin signals for 10 and 100Mbps.

Table 42. RJ-45 Pin Signals for 10 or 100Mbps for the NET MGMT Port on the Management Panel

Pin	MDI Signal	MDI-X Signal
1	TX+	RX+
2	TX-	RX-
3	RX+	TX+
4	Not used	Not used
5	Not used	Not used
6	RX-	TX-
7	Not used	Not used
8	Not used	Not used