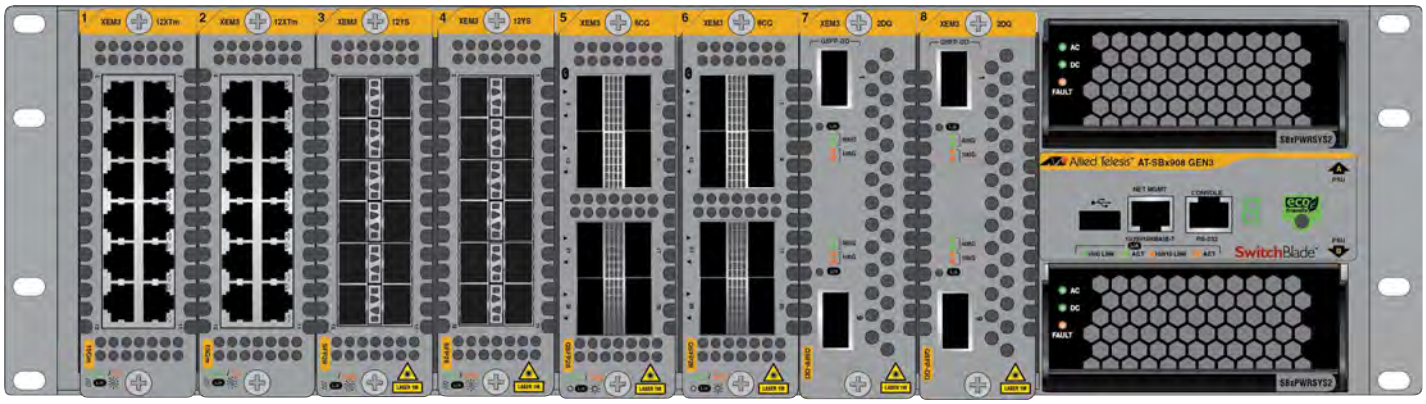
SBx908 GEN3 Switch

Stackable Layer 3+ Modular Switch
AlliedWare Plus™

Switch	Ethernet Modules	Power Supply	Fan Module
SBx908 GEN3	XEM3-12XTm XEM3-12YS XEM3-8CQ XEM3-2DQ	SBxPWRSYS2 (AC)	FAN08



Installation Guide

613-003287 Rev. A

Electrical Safety and Emissions Standards

This product meets the following standards.

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

Industry Canada
CAN ICES (A)/ NMB (A)

RFI Emissions: FCC 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): EN55035, EN61000-3-2, EN61000-3-3

Electrical Safety: UL 62368-1 ($_{C}UL_{US}$), EN62368-1 (TUV),

Laser Safety EN60825-1

Laser Emissions Safety Compliance

The transceivers in the XEM3 Modules are Class 1 or Class 1M Laser Products. Below are the warning labels.

Class 1 Laser Warning Label

LASER RADIATION:
DO NOT EXPOSE TO USERS OF TELESCOPIC OPTICS.
CLASS 1M LASER PRODUCT

Class 1M Warning Label

Power Supply Safety Compliance

Warning
This unit has more than one power input. To reduce the risk of electric shock, disconnect all power inputs before servicing unit.

Avertissement
Cet appareil possede plusieurs entrées d’alimentation. Pour réduire le risque de choc électrique, débranchez toutes les entrées d’alimentation avant toute intervention sur l’appareil.

Restriction of Hazardous Substances Compliance

RoHS: RoHS6

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Preface

This guide contains the hardware installation instructions for the SBx908 GEN3 Stackable Layer 3+ Ethernet Modular Switch. The instructions explain how to install the switch as a standalone unit or in a VCStack configuration.

This preface contains the following sections:

- ❒ “How to Use This Installation Guide” on page 14
- ❒ “Document Conventions” on page 16
- ❒ “Translated Safety Statements” on page 17

How to Use This Installation Guide

Installing a Standalone Switch

Here are the steps and procedures to installing the switch as a standalone unit:

Step 1. Review the Hardware Overview

- ❒ Chapter 1, “SBx908 GEN3 Hardware Overview” on page 21

Step 2. Install the Hardware

- ❒ Chapter 2, “Beginning the Installation” on page 49
- ❒ Chapter 3, “Installing the SBx908 GEN3 Modular Switch” on page 61
- ❒ Chapter 4, “Installing SBxPWRSYS2 (AC) Power Supplies” on page 71
- ❒ Chapter 5, “Installing XEM3 Ethernet Modules” on page 79
- ❒ Chapter 6, “Cabling the Networking Ports” on page 87

Step 3. Power On and Verify the Switch

- ❒ Chapter 7, “Powering On the SBx908 GEN3 Modular Switch” on page 101
- ❒ Chapter 8, “Verifying a Standalone Switch” on page 107

Installing a VCStack

Here are the steps and procedures to building a VCStack:

Step 1. Review the Hardware and VCStack Overviews

- ❒ Chapter 1, “SBx908 GEN3 Hardware Overview” on page 21
- ❒ Chapter 9, “Virtual Chassis Stacking Overview” on page 121
- ❒ Chapter 10, “VCStack Commands Overview” on page 145

Step 2. Install the Hardware

- ❒ Chapter 2, “Beginning the Installation” on page 49
- ❒ Chapter 3, “Installing the SBx908 GEN3 Modular Switch” on page 61
- ❒ Chapter 4, “Installing SBxPWRSYS2 (AC) Power Supplies” on page 71
- ❒ Chapter 5, “Installing XEM3 Ethernet Modules” on page 79

Note
Do not attach network cables to the XEM3 Modules until after you have configured the switches for VCStack.

Step 3. Configure the Master and Member Switches

- ❒ Chapter 11, “Configuring Switches for VCStack” on page 151

Step 4. Cable the Stacking Ports

- ❒ Chapter 6, “Cabling the Networking Ports” on page 87

Note
After configuring the switches for VCStack, you should cable only the stacking ports to verify that the switches can form the stack. You should cable the networking ports only after verifying the stack.

Step 5. Power On and Verify the Stack

- ❒ Chapter 12, “Powering On and Verifying the Stack” on page 177

Step 6. Cable the Networking Ports

- ❒ Chapter 6, “Cabling the Networking Ports” on page 87

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.

Warning
Laser warnings inform you that an eye or skin hazard may exist due to the presence of a laser product.

Translated Safety Statements

Important: Safety statements with the ✍ symbol are translated into multiple languages in **Translated Safety Statements** at **alliedtelesis.com/library/search**.

- Übersetzte Sicherheitshinweise

  Wichtig: Sicherheitshinweise mit dem ✍-Symbol werden in **Translated Safety Statements** bei **alliedtelesis.com/library/search** in mehrere Sprachen übersetzt.

- Declaraciones de seguridad traducidas

  Importante: Las declaraciones de seguridad con el símbolo ✍ se traducen a varios idiomas en **Translated Safety Statements** en **alliedtelesis.com/library/search**.

- Consignes de sécurité traduites

  Important: Les déclarations de sécurité avec le symbole ✍ sont traduites en plusieurs langues en **Translated Safety Statements** sur **alliedtelesis.com/library/search**.

- Dichiarazioni di sicurezza tradotte

  Importante: Le dichiarazioni di sicurezza con il simbolo ✍ sono tradotte in più lingue in **Translated Safety Statements** su **alliedtelesis.com/library/search**.

- Översatta säkerhetsförklaringar

  Viktig: Säkerhetsföreskrifter med ✍-symbolen översätts till flera språk på **Translated Safety Statements** vid **alliedtelesis.com/library/search**.

Section I

Hardware Overview and Installation

The chapters in this section contain hardware overview and installation instructions:

- Chapter 1, “SBx908 GEN3 Hardware Overview” on page 21
- Chapter 2, “Beginning the Installation” on page 49
- Chapter 3, “Installing the SBx908 GEN3 Modular Switch” on page 61
- Chapter 4, “Installing SBxPWRSYS2 (AC) Power Supplies” on page 71
- Chapter 5, “Installing XEM3 Ethernet Modules” on page 79
- Chapter 6, “Cabling the Networking Ports” on page 87

Note
Refer to “How to Use This Installation Guide” on page 14 before beginning the installation.

Chapter 1

SBx908 GEN3 Hardware Overview

The chapter contains the following sections:

- “SBx908 GEN3 Modular Switch” on page 22
- “XEM3 Ethernet Modules” on page 24
- “XEM3-12XTm Module” on page 27
- “XEM3-12YS Module” on page 29
- “XEM3-8CQ Module” on page 34
- “XEM3-2DQ Module” on page 36
- “Management Panel” on page 38
- “Power Supply” on page 43
- “FAN08 Units” on page 45
- “Specifying Ports in the Command Line Interface” on page 46

Note
XEM3 Modules are ordered separately. Refer to the product data sheet on the Allied Telesis web site for the complete list of related products.

SBx908 GEN3 Modular Switch

The SBx908 GEN3 Modular Switch Stackable Layer 3+ Ethernet Modular Switch has the following basic hardware features:

- 3RU height
- Eight slots for XEM3 Modules
- Two power supply slots for AC power supplies for primary and redundant power.
- Two pre-installed FAN08 Fan Modules for front-to-back airflow.
- Two pre-installed brackets for installation in a standard 19-inch equipment rack.

Note
XEM3 Modules, power supplies, and fan modules are hot-swappable.

The front panel of the SBx908 GEN3 Modular Switch is shown in Figure 1.

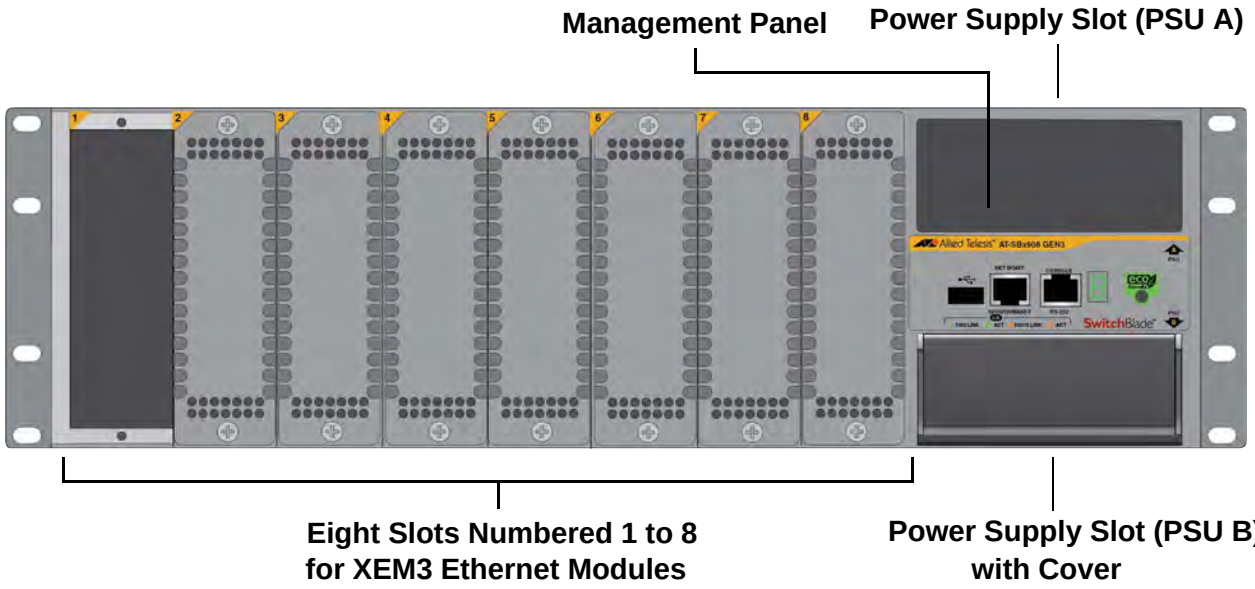


Figure 1. Front Panel of the SBx908 GEN3 Modular Switch

Caution
The switch comes with covers on XEM3 module slots 2 to 8. Do not remove the covers until after the switch is installed in the equipment rack. Lifting the switch into the equipment rack without the covers might bend the switch, causing misalignment of the module slots and guides.

The rear panel is shown in Figure 2.

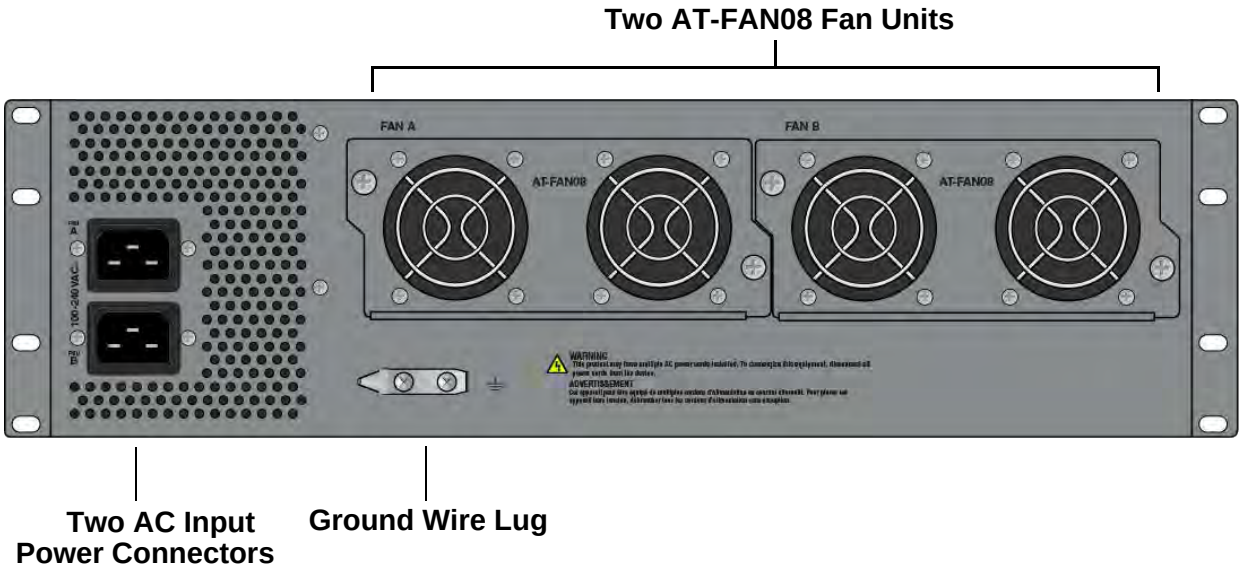


Figure 2. Rear Panel of the SBx908 GEN3 Modular Switch

XEM3 Ethernet Modules

The four XEM3 Modules are shown in Figure 3 and briefly outlined in Table 1 on page 25.

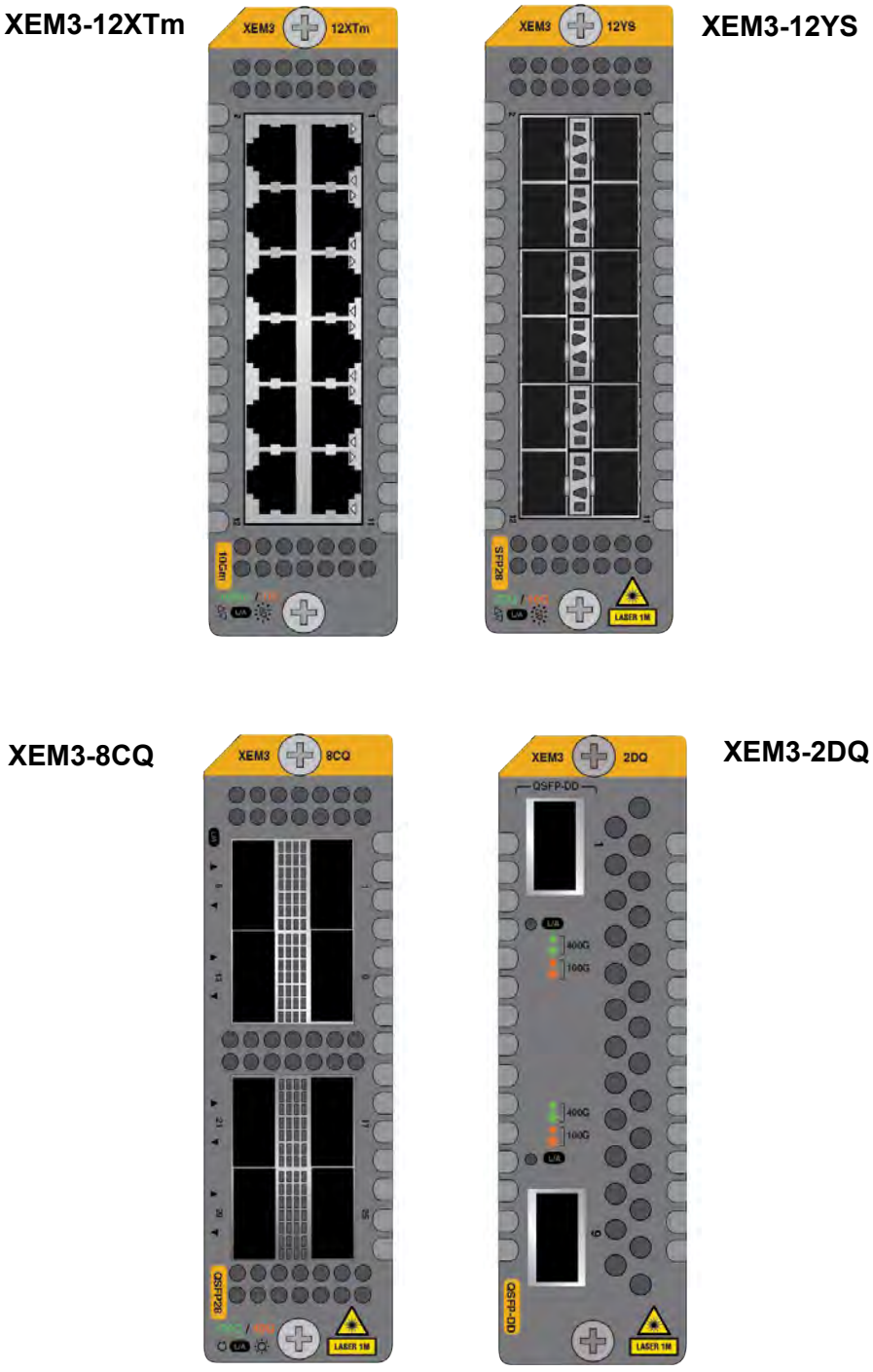


Figure 3. XEM3 Ethernet Modules

Table 1. XEM3 Ethernet Modules

XEM3 Ethernet Modules	Speeds	Descriptions
XEM3-12XTm	1G/2.5G/ 5G/10G	Twelve copper ports with RJ-45 connectors, and distances up to 100 meters (328 feet).
XEM3-12YS	Twelve SFP28[1] ports that support the following types of fiber optic transceivers and cables.	
	1G SFP	- AT-SP MMF and SMF fiber optic transceiver series - AT-SPBD bi-directional, single fiber strand transceiver series - AT-SPTXc copper port transceiver series
	10G SFP+	- AT-SP10 MMF and SMF fiber optic transceiver series - AT-SP10BD bi-directional, single fiber strand transceiver series - AT-SP10TW1 one-meter direct connect twinax cable - AT-SP10TW3 three-meter direct connect twinax cable
	25G SFP28	- AT-SP25 fiber optic transceiver series - AT-SP25TW1 one-meter direct connect twinax cable - AT-SP25TW3 three-meter direct connect twinax cable
	10G AT-SP10TM	AT-SP10TM multi-speed copper port transceiver series

Table 1. XEM3 Ethernet Modules (Continued)

XEM3 Ethernet Modules	Speeds	Descriptions
XEM3-8CQ	Eight ports that support the following types of fiber optic transceivers and cables:	
	40G QSFP	- AT-QSFP fiber optic transceiver series - AT-QSFP1CU one-meter direct connect copper cable - AT-QSFP3CU three-meter direct connect copper cable
	100G QSFP28	- AT-QSFP28 fiber optic transceiver series - AT-QSFP28-1CU one-meter direct connect copper cable - AT-QSFP28-3CU three-meter direct connect copper cable
XEM3-2DQ	Two ports that support the following types of fiber optic transceivers and direct connect copper cables.	
	100G QSFP28	- AT-QSFP28 fiber optic transceiver series - AT-QSFP28-1CU one-meter direct connect copper cable - AT-QSFP28-3CU three-meter direct connect copper cable
	400G QSFPDD	- AT-QSFPDD-1CU one-meter direct connect cable - AT-QSFPDD-2.5CU two-and-1/2-meter direct connect cable

1. The SFP28 ports on the XEM3-12YS Module are backwards compatible with SFP and SFP+ transceivers.

XEM3-12XTm Module

The XEM3-12XTm Module is shown in Figure 4.

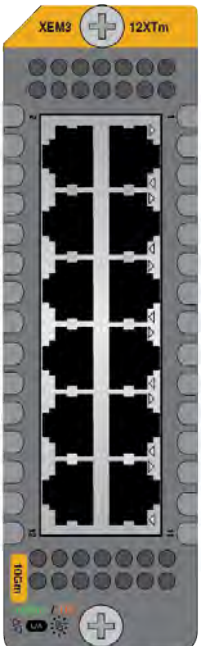


Figure 4. XEM3-12XTm Module

Copper Ports

The XEM3-12XTm Module has twelve copper ports with standard 8-pin RJ-45 ports. The specifications of the ports are listed in Table 2.

Table 2. Copper Ports on the XEM3-12XTm Module

Specifications	Descriptions
Port Speeds	The ports support the following speeds: - 1/2.5/5/10G The module can set port speed automatically with Auto-Negotiation or you can set port speed manually. The default is Auto-Negotiation. The module does not support 10M or 100M.
Duplex Mode	Full-duplex only.

Table 2. Copper Ports on the XEM3-12XTm Module (Continued)

Specifications	Descriptions
Cable requirements	Minimum cable requirements are: - 1/2.5/5G - Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) unshielded cabling. - 10G -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 one link/activity LED. Refer to Table 3.

Table 3. Port Link/Activity LEDs on the XEM3-12XTm Module

States	Descriptions
Solid Green	The port has established a 2.5G, 5G, or 10G link with a network device.
Flashing Green	The port is transmitting or receiving data at 2.5G, 5G, or 10G. (See Note.)
Solid Amber	The port has established a 1G link with a network device.
Flashing Amber	The port is transmitting data at 1G. (See Note.)
Off	Possible causes of this state are listed here: - The port has not established a link with another network device. For more information, refer to “Copper Ports on the XEM3-12XTm Module” on page 185. - The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.

Note
The port LEDs do not flash for 1G or 2.5G ingress traffic.

XEM3-12YS Module

The XEM3-12YS Module is shown in Figure 5.

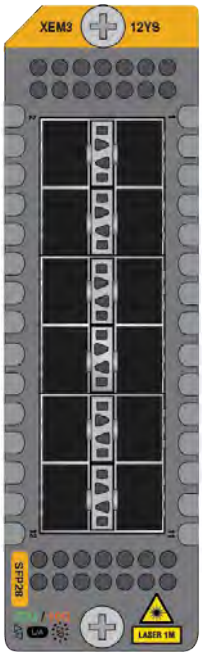


Figure 5. XEM3-12YS Module

Transceiver Ports

Table 4 lists the types of transceivers and cables supported in the twelve SFP28 ports.

Table 4. XEM3-12YS Module Supports These 1G, 10G, and 25G Transceivers

Speeds	Transceivers and Direct Attach Cables
1G SFP	- AT-SP MMF and SMF fiber optic transceiver series - AT-SPBD bi-directional transceiver series - AT-SPTXc copper port 100 meter transceiver series
10G SFP+	- AT-SP10 MMF and SMF fiber optic transceiver series - AT-SP10BD bi-directional transceiver series - One-meter AT-SP10TW1 and three-meter AT-SP10TW3 direct connect twinax cable series

Table 4. XEM3-12YS Module Supports These 1G, 10G, and 25G Transceivers (Continued)

Speeds	Transceivers and Direct Attach Cables
25G SFP28	- AT-SP25 fiber optic transceiver series - AT-SP25TW1 one-meter direct connect twinax cable - AT-SP25TW3 three-meter direct connect twinax cable
10G AT-SP10TM	- AT-SP10TM multi-speed copper port transceiver series

General port guidelines are listed here:

- The module does not support speeds of 10M or 100M.
- The module supports full-duplex mode only.
- You can set the port speeds with Auto-Negotiation or manually. The default is Auto-Negotiation.
- The module supports 1G and 10G speeds on the AT-SP10TM transceiver.

Transceiver Guidelines

Fiber optic and copper transceivers can be adversely affected by high temperatures. They may experience excessive error rates or, in extreme cases, be damaged.

This section contains guidelines for the placement of transceivers in XEM3-12YS Modules. They illustrate the preferred placements of transceivers so as to prevent exposing them to high temperatures.

Note
In addition to the recommendations presented here, Allied Telesis also recommends maintaining the ambient temperature of the chassis' installation site as low as possible. Furthermore, you should regularly check the operational temperatures of all transceivers in the chassis with the SHOW SYS PLUG command in the AlliedWare Plus operating system. Transceivers that do not return a temperature do not contain a temperature sensor, and are usually not temperature sensitive.

Note
As a general rule, transceiver temperatures should be maintained below 70°C (158°F).

SP10TW Series Direct Attach Cables

SP10TW Series direct attach cables can be installed in all transceiver slots in XEM3-12YS Modules. Refer to Figure 6 for an example.

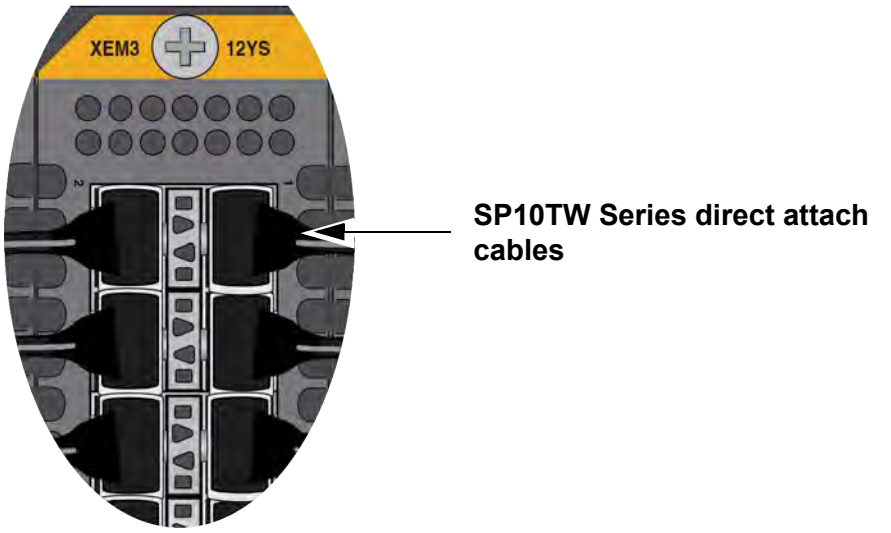


Figure 6. XEM3-12YS Module with SP10TW Series Direct Attach Cables

Fiber Optic Transceivers

For fiber optic transceivers with maximum operating distances less than or equal to 10 km, the horizontal and vertical adjoining slots may contain SP10TW Series direct attach cables or should be empty. An example is illustrated in Figure 7.

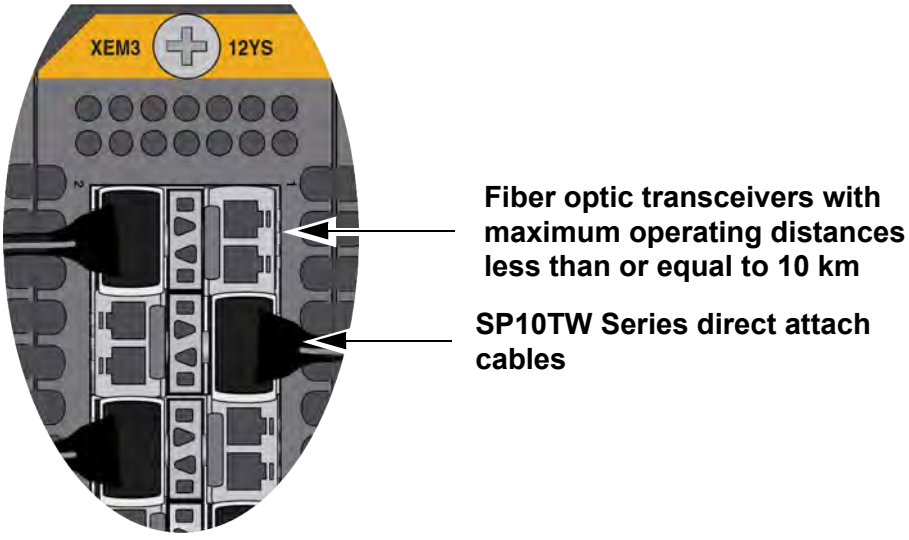


Figure 7. XEM3-12YS Module with Fiber Optic Transceivers, with Maximum Operating Distances Less Than or Equal to 10 km

For fiber optic transceivers with maximum operating distances greater than 10 km, the horizontal and vertical adjoining slots should be empty. An example is shown in Figure 8.

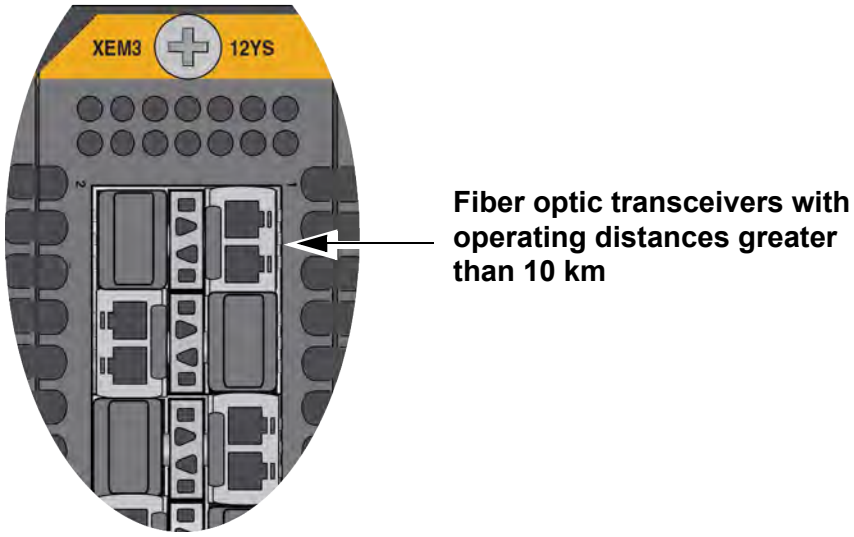


Figure 8. XEM3-12YS Module with Fiber Optic Transceivers, with Maximum Operating Distances Greater Than 10 km

AT-SP10TM Transceivers

For AT-SP10TM transceivers, the horizontal and vertical adjoining slots should also be empty. An example is shown in Figure 9.

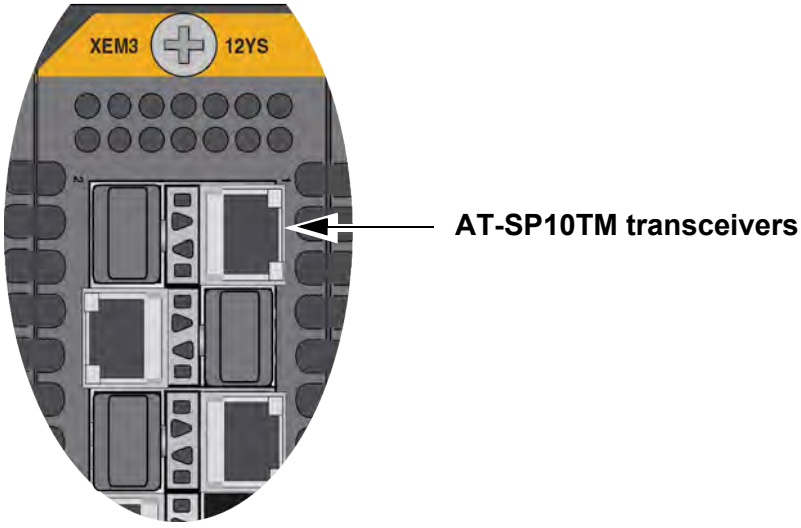


Figure 9. XEM3-12YS Module with AT-SP10TM Transceivers

LEDs

Each port in the XEM3-12YS Module has one link/activity LED. Refer to Table 5.

Table 5. Port Link/Activity LEDs on the XEM3-12YS Module

States	Descriptions
Solid Green	The transceiver in the port has established a 25G link with a network device.
Flashing Green	The transceiver is transmitting or receiving data at 25G.
Solid Amber	The transceiver has established a 1G or 10G link with a network device.
Flashing Amber	The transceiver is transmitting or receiving data at 1G or 10G.
Off	Possible causes of this state are listed here: - The port is empty. - The transceiver has not established a link with another network device. For more information, refer to “Fiber Optic Ports on the XEM3-2DQ, XEM3-8CQ, and XEM3-12YS Modules” on page 187. - The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.

XEM3-8CQ Module

The XEM3-8CQ Module is shown in Figure 10.

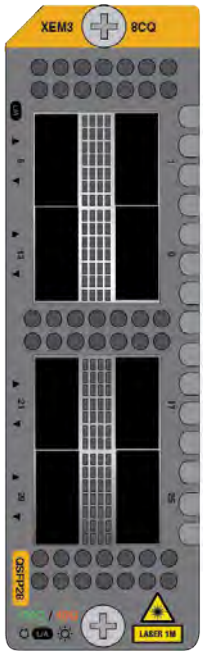


Figure 10. XEM3-8CQ Module

Transceiver Ports

The XEM3-8CQ Module has eight ports that support 40G QSFP+ and 100G QSFP28 transceivers and cables. Refer to Table 6.

Table 6. XEM3-8CQ Module Supports 40G and 100G Transceivers and Direct Connect Cables

Speeds	Transceivers
40G QSFP+	- AT-QSFP fiber optic transceiver series - AT-QSFP1CU one-meter direct connect copper cable - AT-QSFP3CU three-meter direct connect copper cable
100G QSFP28	- AT-QSFP28 fiber optic transceiver series - AT-QSFP28-1CU one-meter direct connect copper cable - AT-QSFP28-3CU three-meter direct connect copper cable

Port Numbering

The eight ports on the XEM3-8CQ Module are numbered in increments of four: 1, 5, 9, 13, 17, 21, 25, and 29. The numbering scheme is for future support of 4-port breakout cables.

Note
AlliedWare Plus V5.5.5-0.2 does not support breakout cables in the XEM3-8CQ Module. Refer to the product's data sheet for further information.

LEDs

Table 7 describes the LED states for the ports on the XEM3-8CQ Module.

Table 7. Port Link/Activity LEDs on the XEM3-8CQ Module

States	Descriptions
Solid Green	The transceiver has established a 100G link with a network device.
Flashing Green	The transceiver is transmitting or receiving data at 100G.
Solid Amber	The transceiver has established a 40G link with a network device.
Flashing Amber	The transceiver is transmitting or receiving data at 40G.
Off	Possible causes of this state are listed here: - The port does not have a transceiver. - The transceiver has not established a link with a network device. For more information, refer to "Fiber Optic Ports on the XEM3-2DQ, XEM3-8CQ, and XEM3-12YS Modules" on page 187. - The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.

XEM3-2DQ Module

The XEM3-2DQ Module is shown in Figure 11.

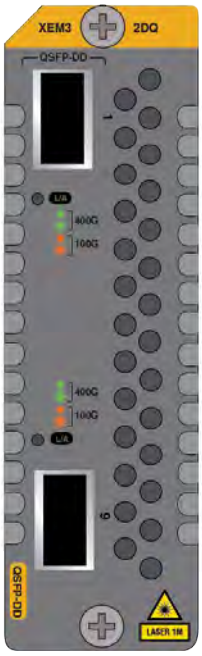


Figure 11. XEM3-2DQ Module

Note
AlliedWare Plus V5.5.5-0.2 does not support the XEM3-2DQ Module. Refer to the product's data sheet for further information.

Transceiver Port

The XEM3-2DQ Module supports the fiber optic transceivers and direct connect cables listed in Table 8.

Table 8. XEM3-2DQ Module Supports 100G and 400G Fiber Optic Transceivers and Direct Connect Cables

Speeds	Transceivers
100G QSFP28	- AT-QSFP28 fiber optic transceiver series - AT-QSFP28-1CU one-meter direct connect copper cable - AT-QSFP28-3CU three-meter direct connect copper cable series

Table 8. XEM3-2DQ Module Supports 100G and 400G Fiber Optic Transceivers and Direct Connect Cables (Continued)

Speeds	Transceivers
400G QSFPDD	- AT-QSFPDD-1CU one-meter direct connect cable - AT-QSFPDD-2.5CU two-and-½-meter direct connect cable

LEDs

Each port on the XEM3-2DQ Module has one LED. Refer to Table 9.

Table 9. Port Link/Activity LEDs on the XEM3-2DQ Module

States	Descriptions
Solid Green	The transceiver has established a 400G link with a network device.
Flashing Green	The transceiver is transmitting or receiving data at 400G.
Solid Amber	The transceiver has established a 100G link with a network device.
Flashing Amber	The transceiver is transmitting or receiving data at 100G.
Off	Possible causes of this state are listed here: - The port does not have a transceiver. - The transceiver has not established a link with a network device. For more information, refer to “Fiber Optic Ports on the XEM3-2DQ, XEM3-8CQ, and XEM3-12YS Modules” on page 187. - The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.

Management Panel

Figure 12 identifies the components on the management panel.

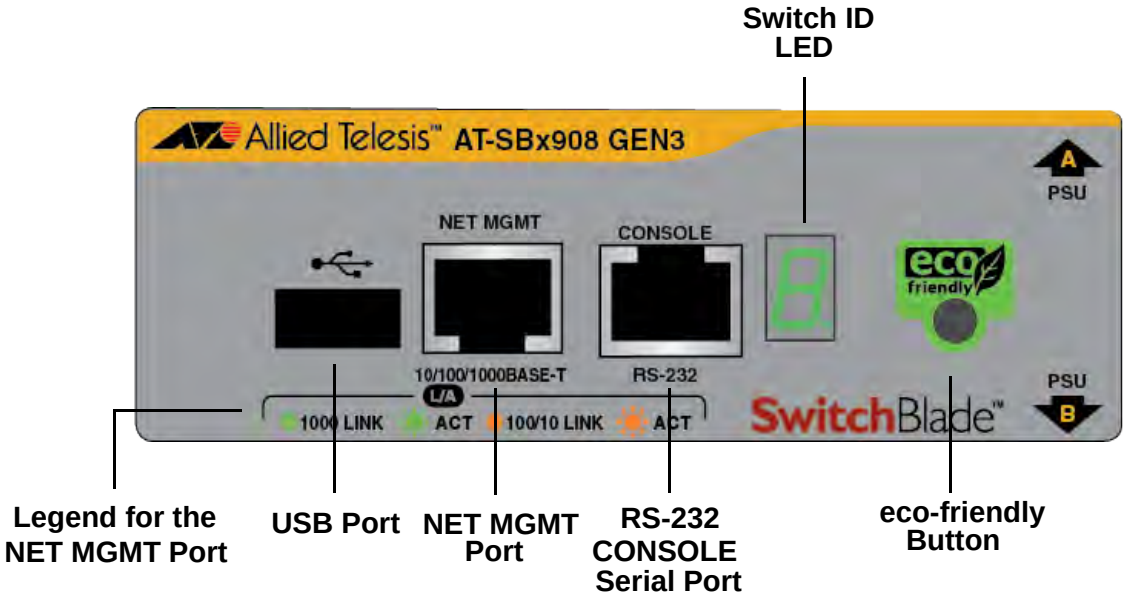


Figure 12. Management Panel

Note
The management panel is not field-replaceable.

USB Port

The USB port on the management panel supports a USB storage device. Table 10 lists several of the management functions and commands in the AlliedWare Plus management software that use the USB port.

Table 10. Functions and Command Examples of the USB Port

Functions	AlliedWare Plus Commands
File and Configuration Management	
Configure the switch with a configuration file on the USB storage device the next time it boots.	BOOT CONFIG-FILE
Direct the switch to the USB storage device for the AlliedWare Plus operating system the next time it boots.	BOOT SYSTEM
Copy files to or from the USB storage device, or create duplicate files on the storage device.	COPY

Table 10. Functions and Command Examples of the USB Port (Continued)

Functions	AlliedWare Plus Commands
Save debug files on the USB storage device to diagnose and troubleshoot network issues.	COPY DEBUG MOVE DEBUG
Save the running-configuration file on the USB storage device. The file contains the switch's current configuration, including commands not yet saved in the startup-configuration file.	COPY RUNNING-CONFIG
Save the startup-configuration file on the USB storage device. The file contains the switch's currently saved configuration settings.	COPY STARTUP-CONFIG
Save autoboot.txt files on the USB storage device. The switch uses the files to restore a release file and/ or configuration file to its file system.	CREATE AUTOBOOT
Save a directory file on the USB storage device. The file contains a list of all the visible files in the switch's directory file system.	DIR
Close all open files and stop all management actions on the USB storage device. You should always perform this command before removing a storage device from the port, to prevent corrupting data files.	UNMOUNT
Logging	
Save syslog messages in a file on the USB storage device.	LOG EXTERNAL
Delete the syslog file on the USB storage device.	CLEAR LOG EXTERNAL
Copy the buffered log onto the USB storage device.	COPY BUFFERED-LOG
Copy the permanent log onto the USB storage device.	COPY PERMANENT-LOG
Local RADIUS Server	
Create a set of local RADIUS server users from MAC addresses in the local FDB, and copy the file to the USB storage device.	COPY FDB-RADIUS-USERS (to file)
Copy the local RADIUS server user data to a file on the USB storage device.	COPY LOCAL-RADIUS-USER-DB (to file)

Table 10. Functions and Command Examples of the USB Port (Continued)

Functions	AlliedWare Plus Commands
DHCP Snooping	
Designate the USB storage device as the location of the file where the switch writes the dynamic entries in the DHCP snooping database.	IP DHCP SNOOPING DATABASE
Trigger	
Configure a trigger that the switch performs when the USB storage device is inserted or removed in the USB port.	TYPE USB
VCStack	
Delete files from all members in a stack, including the USB storage device.	DELETE STACK-WIDE FORCE

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 XEM3 Modules, but the switch can route traffic in or out of the port from the modules. Here are the guidelines:

- The port should only be used for initial configuration and maintenance access to the switch.
- The NET MGMT port has a standard 8-pin RJ-45 connector and operates at 100M or 1G 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 command line interface of the management software.

Note
The legend for the NET MGMT port on the faceplate includes 10M. However, the port does not support that speed.

The minimum cable requirements for the port are listed here:

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

- 1G: 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 GEN3 Switch*.

The NET MGMT port has one Status LED, described in Table 11.

Table 11. NET MGMT Port LED

States	Descriptions
Solid Green	The port has established a 1G link with a network device.
Flashing Green	The port is transmitting or receiving data at 1G.
Solid Amber	The port has established a 100M link with a network device.
Flashing Amber	The port is transmitting or receiving data at 100M.
Off	The port has not established a link with a network device.

Console (RS-232) Port

The Console Port is used to conduct local management sessions with the switch. Local management sessions are not conducted over the network, and so do not need an Internet Protocol (IP) address. The sessions require a terminal or PC with a terminal emulation program, and a management cable. For instructions, refer to “Starting a Local Management Session” on page 109 or the *Software Reference for SwitchBlade x908 GEN3 Switch.*

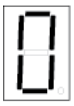
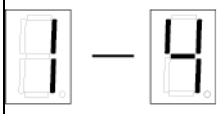
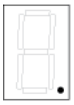
Switch ID LED

The Switch ID LED displays the ID number of the switch. Table 12 lists the states of the LED when the switch is not operating in the low power mode.

Table 12. Switch ID LED

States	Descriptions
	The switch is booting up.

Table 12. Switch ID LED (Continued)

States	Descriptions
	The switch has encountered a fault condition. Examples include: ❒ A cooling fan has failed. ❒ The internal temperature of the switch exceeds the normal operating range. The switch may shut down. If the switch displays a fault condition on the LED, you can use the SHOW SYSTEM ENVIRONMENT command in the command line interface to identify the problem. For more information, refer to “Switch ID LED on the Management Panel” on page 189.
	The VCStack feature is disabled on the switch. The switch is operating as a standalone device with the ID number 1.
	The VCStack feature is enabled on the switch The switch has a stack ID number of 1 to 4.
	A dot in the lower right corner flashes when the switch is accessing USB memory.

eco-friendly Button

The eco-friendly button on the management panel turns the LEDs on or off on the XEM3 Modules. You may turn off the LEDs when you are not using them to monitor the switch, to conserve electricity. When the LEDs are off, the overall power consumption of the switch is slightly reduced by approximately 2 watts. The button does not control the L/A LED for the NET MGMT port on the management panel or the LEDs on the power supplies.

Power Supply

The SBxPWRSYS2 (AC) is the power supply for the switch. Refer to Figure 13.

Figure 13. SBxPWRSYS2 (AC) Power Supply

For the specifications of the power supply, refer to “Power Specifications of the SBxPWRSYS2 (AC) Power Supply” on page 216.

The power supply guidelines are listed here:

- The SBxPWRSYS2 (AC) Power Supply uses the AC connectors on the back panel of the switch and is intended for AC environments.
- A single power supply can provide sufficient power for a fully equipped switch.
- Installing a second power supply adds power redundancy. If a power supply fails or loses power, the second power supply continues to power the switch, thereby 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 switch. 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 power supply slot cover.
- The switch does not come with power supplies. They are ordered separately.
- Power supplies are field-replaceable and hot-swappable. If the switch has two power supplies and one fails, you can replace the failed unit without powering off the switch.

LEDs on the SBxPWRSYS2 (AC) Power Supply

Table 11 defines the LEDs on the SBxPWRSYS2 (AC) Power Supply.

Table 13. SBxPWRSYS2 (AC) Power Supply LEDs

LED	State	Description
AC	Green	The power supply is powered on. The input AC power from an AC power source to the power supply is within the normal operating range.
	Off	The power supply is powered off or has experienced a fault condition. See the FAULT LED.
DC	Green	The power supply is operating normally. The output DC power from the power supply to the switch is within the normal operating range.
	Off	The power supply is powered off or has experienced a fault condition. See the FAULT LED.
FAULT	Off	Possible causes of this state are: - The power supply is operating normally. - The power supply is powered off. - The AC power source is powered off.
	Amber	The AC power supply shutdown. For more information, refer to “SBxPWRSYS2 (AC) Power Supply” on page 190.

FAN08 Units

The cooling unit for the switch is the FAN08 Fan Module. Refer to Figure 14.

Figure 14. FAN08 Module

The switch comes with two pre-installed fan modules in FAN A and FAN B slots on the rear panel:

- The airflow direction of the switch is from front-to-back, with the fan units drawing air out of the switch.
- Each FAN08 Fan Module has four fans. Two fans are piggybacked directly behind the front fans, for back-to-back fan operation.
- The AlliedWare Plus management software automatically adjusts the speed of the fans, depending on the internal temperature of the switch.
- The FAN08 Module is field-replaceable and hot-swappable. You do not have to power off the switch to replace a fan module.

Specifying Ports in the Command Line Interface

The individual ports on the XEM3 Modules in the switch are identified in the command line interface with the PORT parameter. The format of the parameter is shown in Figure 15.

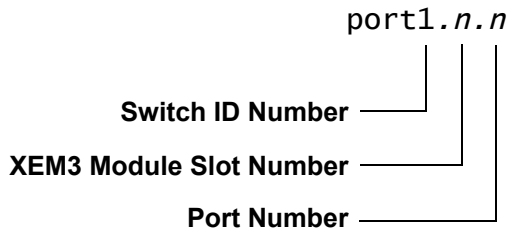


Figure 15. PORT Parameter in the Command Line Interface

The three parts of the PORT parameter are described in Table 14.

Table 14. PORT Parameter Format

Number	Description
Switch ID Number	Identifies the switch's ID number. The ID number of standalone switches is 1. (The Switch ID LED on the management panel of a standalone switch displays "0" to signify that the VCStack feature is disabled. However, the switch's ID number is 1.) When the switch is a member of a VCStack, this number is its unique member number, from 1 to 4.
XEM3 Module Slot Number	Identifies the slot number in the switch containing the XEM3 Module whose ports you want to configure. The slots in the SBx908 GEN3 Modular Switch are numbered 1 to 8 from left to right.
Port Number	Identifies a port number on an XEM3 Module.

Here is an example of the PORT parameter on a standalone switch. It enters the Port Interface modes for ports 3 and 5 on the XEM3 Module in slot 2 in the switch with the ID 1:

```
awplus> enable
awplus# configure terminal
awplus(config)# interface port1.2.3,port1.2.5
```

When specifying a range of ports, omit the PORT keyword from the last port number. This example enters the port interface mode for ports 2 to 4 on the XEM3 Module in slot 6 in the switch:

```
awplus> enable
awplus# configure terminal
awplus(config)# interface port1.6.2-1.6.4
```

For further instructions, refer to the *Software Reference for SBx908 GEN3 Modular Switch, AlliedWare Plus Operating System*.

Software and Hardware Releases

Software releases of the AlliedWare Plus management software for the SBx908 GEN3 Modular Switch are listed in Table 15. For instructions on updating the AlliedWare Plus management software, refer to the *Software Reference for SwitchBlade x908 GEN3 Switch* on the Allied Telesis web site.

Table 15. Software and Hardware Releases for the SBx908 GEN3 Modular Switch

Software Version	Support	Hardware
V5.5.5-0.2	Yes	❒ SBx908 GEN3 Modular Switch ❒ XEM3-12XTm Module ❒ XEM3-12YS Module ❒ XEM3-8CQ Module ❒ FAN08 Fan Module ❒ VCStack ❒ SBxPWRSYS2 (AC) Power Supply
	No	❒ XEM3-2DQ Module ❒ Four port breakout cables for the XEM3-8CQ Module ❒ SBxPWRSYS1-80 (DC) Power Supply

Note
AlliedWare Plus V5.5.5-0.2 supports stacks of two switches. Later versions may support stacks of more switches. Refer to the product's data sheet or contact your Allied Telesis sales representative for further information.

Chapter 2

Beginning the Installation

The chapter contains the following sections:

- “Reviewing Safety Precautions” on page 50
- “Unpacking the SBx908 GEN3 Modular Switch” on page 55
- “Unpacking the SBxPWRSYS2 (AC) Power Supply” on page 60

Reviewing Safety Precautions

Please review the following safety precautions before performing the installation procedures.

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

Warning
Class 1 Laser product. ✍ L1

Warning
Laser Radiation:
Do Not Expose To Users of Telescopic Optics.
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.

Unpacking the SBx908 GEN3 Modular Switch

To unpack the SBx908 GEN3 Modular Switch, perform the following procedure:

1. Place the shipping box on a stable, strong table or on the floor.
2. Open the top of the shipping box.

   Figure 16 shows the contents of the shipping box.

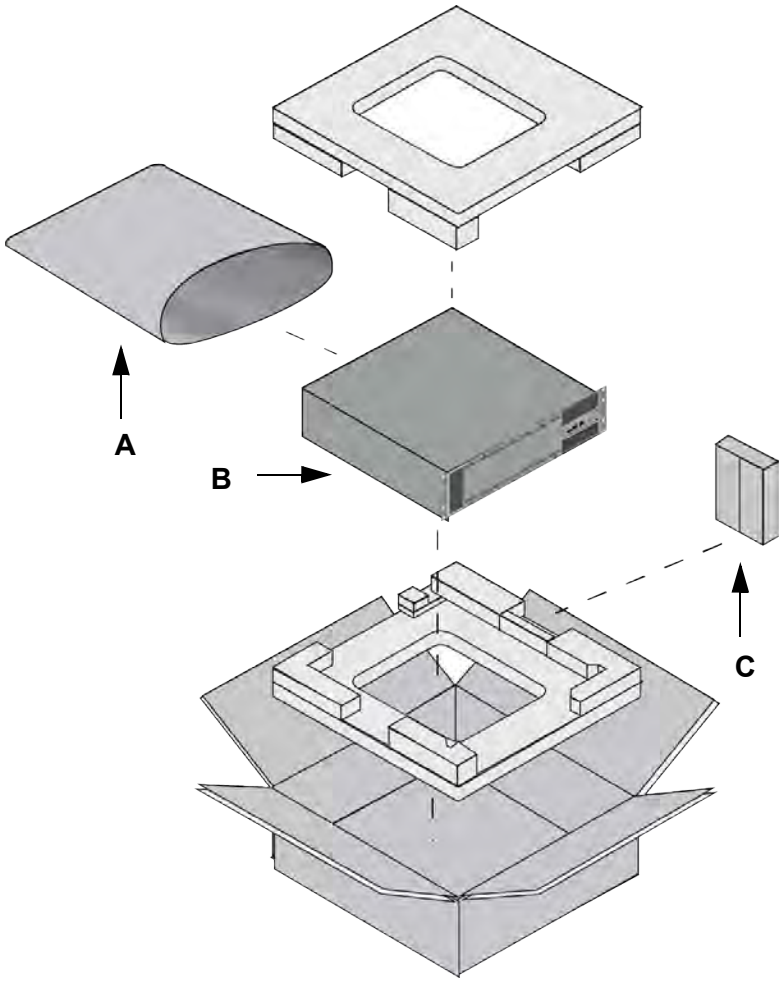


Figure 16. SBx908 GEN3 Modular Switch Shipping Box

The items in the box are listed here:

- A - Protective bag
- B - SBx908 GEN3 Modular Switch
- C - Accessory kit

3. Carefully lift the switch from the shipping box and place it on a level, secure table. Refer to Figure 17.

Warning
The device is heavy. Always ask for assistance before moving or lifting the device to avoid injuring yourself or damaging the equipment. E122

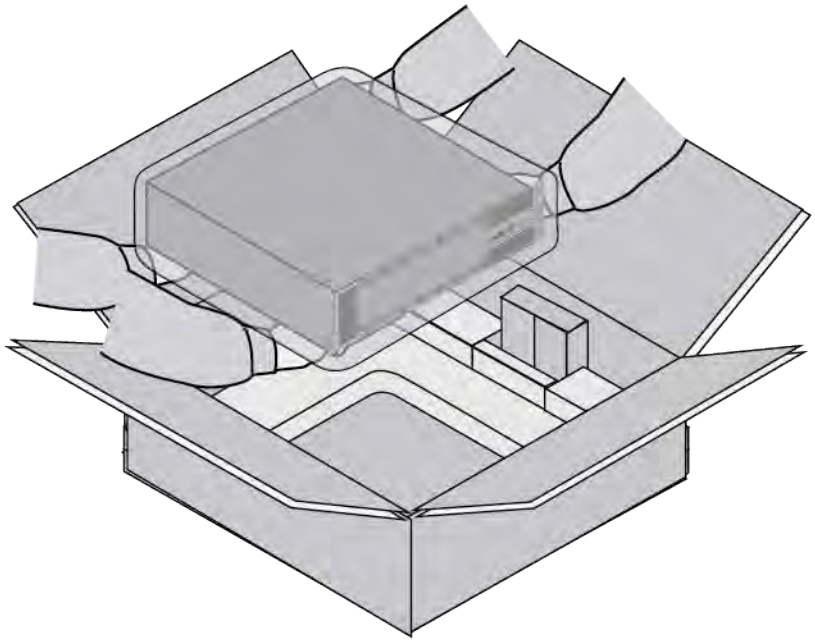


Figure 17. Lifting the Switch from the Shipping Box

4. Remove the switch from the protective shipping bag and place it on a level, secure table. Refer to Figure 18.

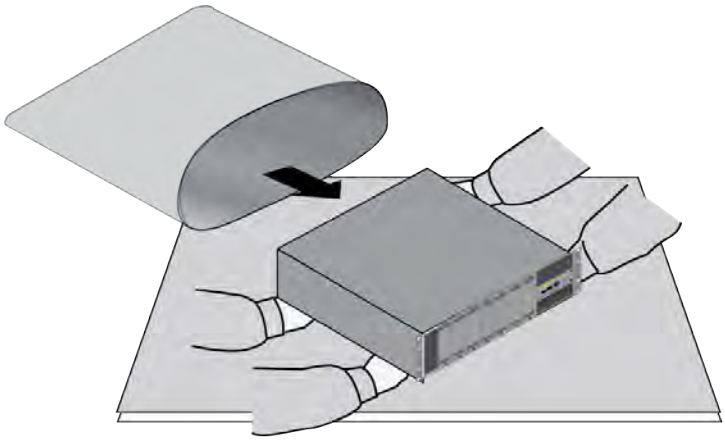
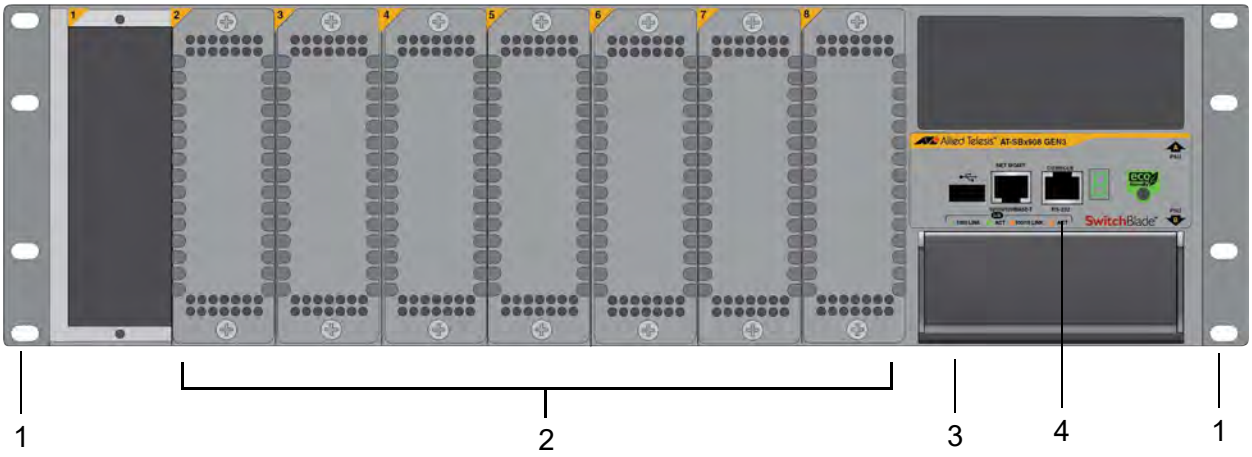
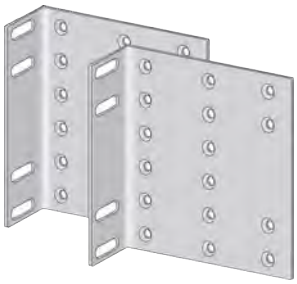


Figure 18. Removing the Switch from the Protective Shipping Bag.

5. Visually check the switch for any signs of damage that may have occurred during shipment.

6. Check the front panel for the pre-installed components in Figure 19.

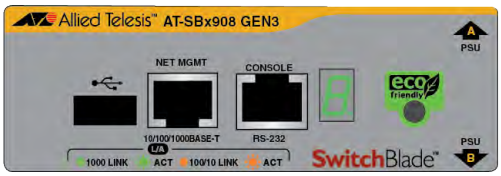




1. Two equipment rack brackets

2. Seven module slot covers

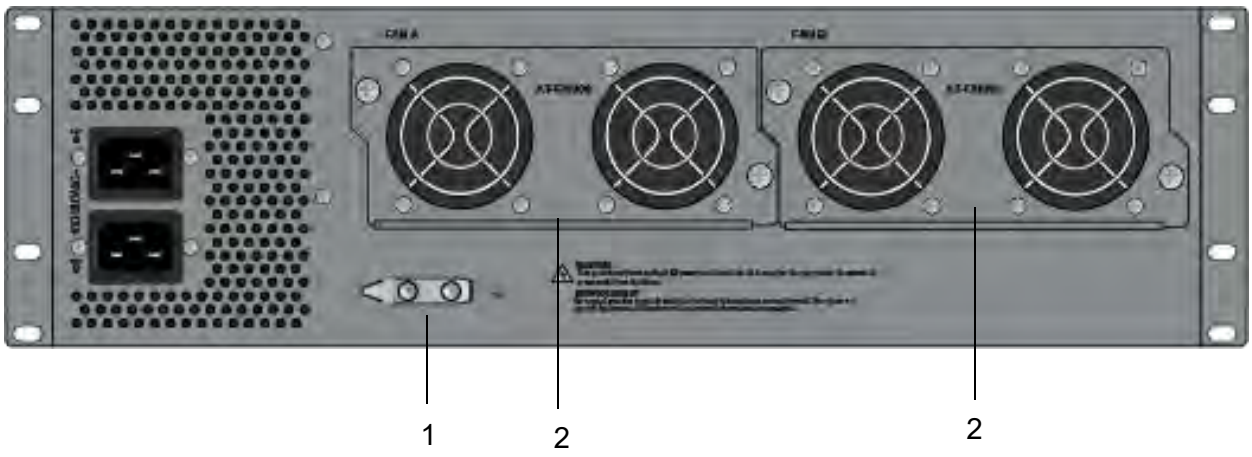
3. One power supply slot cover in slot B



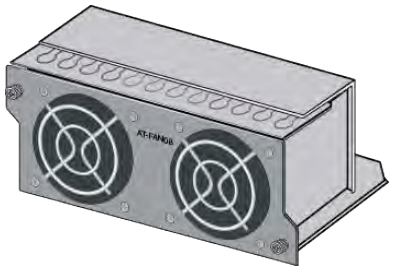
4. One management panel (Not field replaceable.)

Figure 19. Pre-installed Items on the Front and Side Panels of the Switch

7. Check the rear panel for the pre-installed components in Figure 20.



1. One ground wire lug



2. Two AT-FAN08 Fan Modules

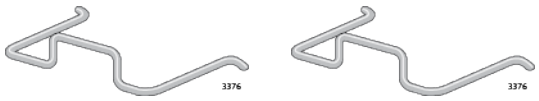
Figure 20. Pre-installed Items on the Rear Panel of the Switch

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 are ordered separately.

Note
Each FAN08 Fan Module has four fans. Two fans are piggybacked directly behind the front fans, for back-to-back fan operation.

8. Remove the accessory kit from the shipping box and verify its components, shown in Figure 21.



Two AC power cord retaining clips

Figure 21. Accessory Kit Items

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

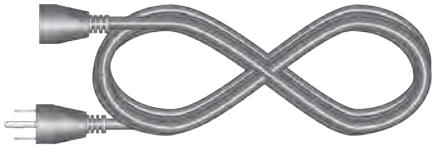
9. After unpacking the SBx908 GEN3 Modular Switch, do one of the following:

   - To unpack the power supply, go to “Unpacking the SBxPWRSYS2 (AC) Power Supply” on page 60.
   - Otherwise, go to Chapter 3, “Installing the SBx908 GEN3 Modular Switch” on page 61.

Unpacking the SBxPWRSYS2 (AC) Power Supply

Figure 22 lists the contents of the SBxPWRSYS2 (AC) Power Supply shipping box.

One SBxPWRSYS2 (AC) Power Supply



One AC power supply cord

One tie wrap

Figure 22. Contents of the SBxPWRSYS2 (AC) Power Supply Shipping Box

Note
The tie wrap included with the power supply is not used with the SBx908 GEN3 Modular Switch.

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

After unpacking the switch and power supplies, go to Chapter 3, “Installing the SBx908 GEN3 Modular Switch” on page 61.

Chapter 3

Installing the SBx908 GEN3 Modular Switch

The procedures in this chapter explain how to install the SBx908 GEN3 Modular Switch in a standard 19-inch equipment rack. The procedures are listed here:

- ❒ “Tools and Material” on page 62
- ❒ “Choosing a Site for the Switch” on page 63
- ❒ “Installation Option” on page 64
- ❒ “Adjusting the Equipment Rack Brackets” on page 65
- ❒ “Installing the Switch in an Equipment Rack” on page 67
- ❒ “Installing the Grounding Wire” on page 68

Tools and Material

Here are the tools and material required to install the SBx908 GEN3 Modular Switch:

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

Choosing a Site for the Switch

Observe these site requirements for the SBx908 GEN3 Modular Switch.

- ❒ The switch should be installed in a standard 19-inch equipment rack. It should not be installed on a table, desk, or wall.
- ❒ Verify 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 switch 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. The ventilation direction in the switch is from front to back, with the fans on the back panel drawing air out of the unit.
- ❒ The site should not expose the switch 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.
- ❒ Copper cabling should not be exposed to sources of electrical noise, such as radio transmitters, broadband amplifiers, power lines, electric motors, or fluorescent fixtures.
- ❒ XEM3 Module ports are suitable for intra-building connections, or where non-exposed cabling is required.
- ❒ Do not install the switch in a wiring or utility box. It might overheat and fail from inadequate airflow.
- ❒ The power cord included with the SBxPWRSYS2 (AC) Power Supply for 100-120VAC installations have 20 Amp, 125 V NEMA 5-20P plugs that require NEMA 5-20R receptacles. Refer to Figure 23.

Figure 23. NEMA 5-20P Plug and Receptacle

Installation Option

The switch must be installed horizontally in a standard 19-inch equipment rack. Refer to Figure 24.

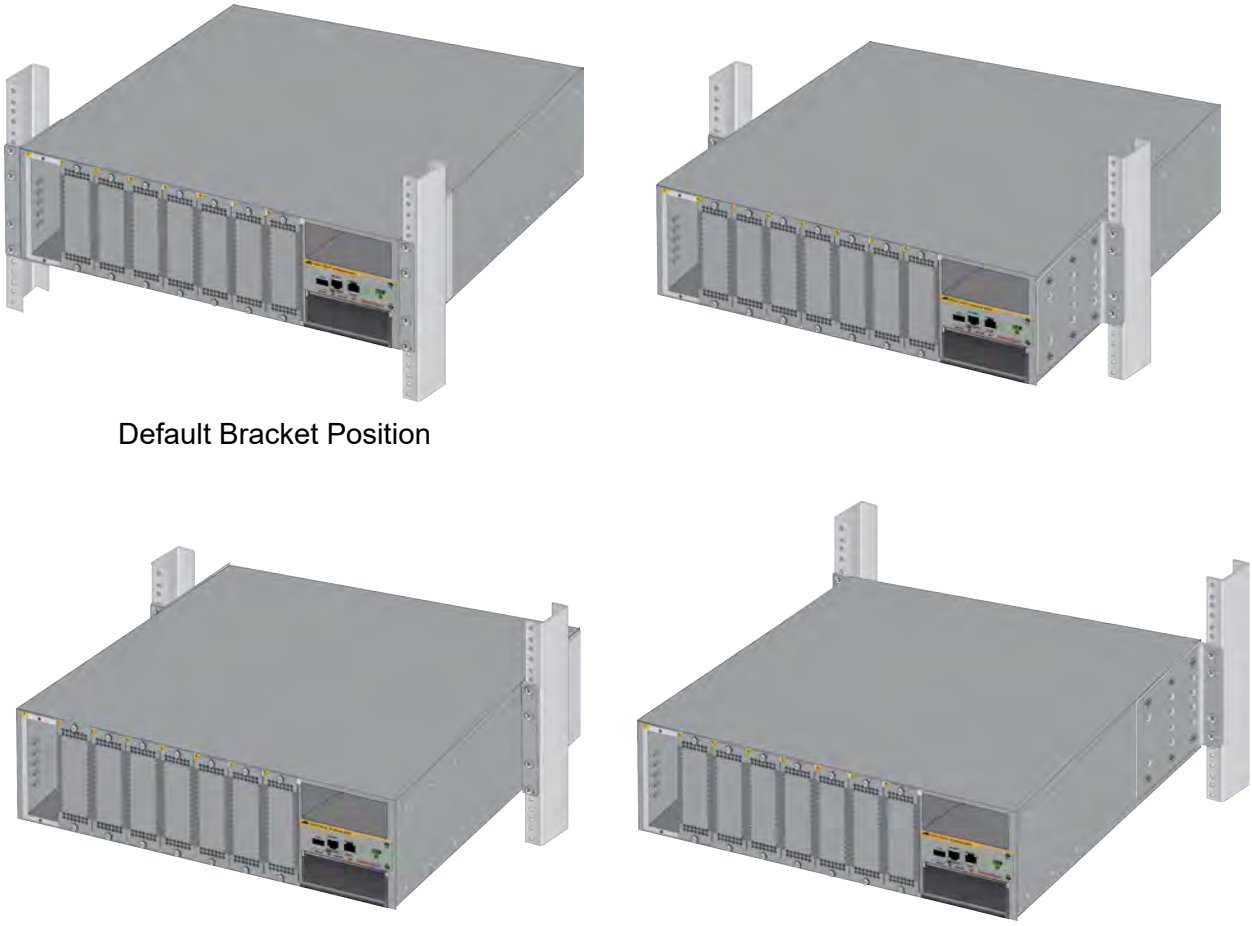
Figure 24. Horizontal Installation in an Equipment Rack

Do not install the switch vertically in an equipment rack. Refer to Figure 25.

Figure 25. Vertical Installation in Equipment Rack Not Supported

Adjusting the Equipment Rack Brackets

The switch comes with two pre-installed equipment rack brackets. The default positions of the brackets align the front of the switch with the front of the equipment rack. You can reposition the brackets on the sides of the switch to have the device extend in front of the rack. Figure 26 shows the possible orientations of the brackets and switch. The first illustration shows the default positions of the brackets.



Default Bracket Position

Figure 26. Switch 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 in the new locations. An example is shown in Figure 27.

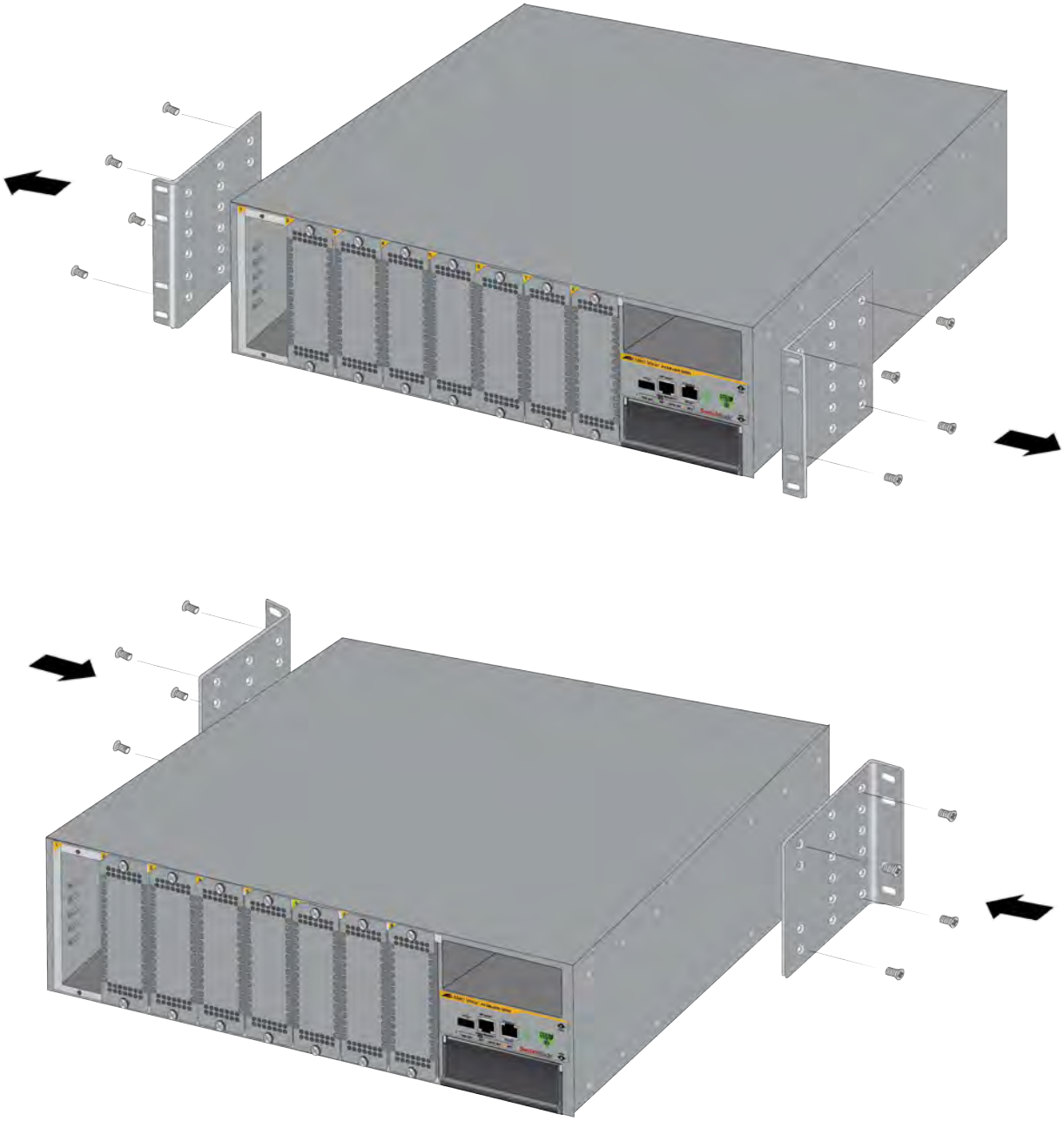


Figure 27. Example of Adjusting the Equipment Rack Brackets on the Switch

Installing the Switch in an Equipment Rack

This switch is designed for a standard 19-inch equipment rack. Please review the installation guidelines in “Choosing a Site for the Switch” on page 63 and “Installation Option” on page 64 before installing the switch.

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

To install the SBx908 GEN3 Modular Switch in an equipment rack, perform the following procedure:

1. Place the switch 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 27 on page 66 for an example.
3. Have two people hold the switch in the equipment rack at the desired location while you secure it using eight standard equipment rack screws (not provided). Refer to Figure 28.

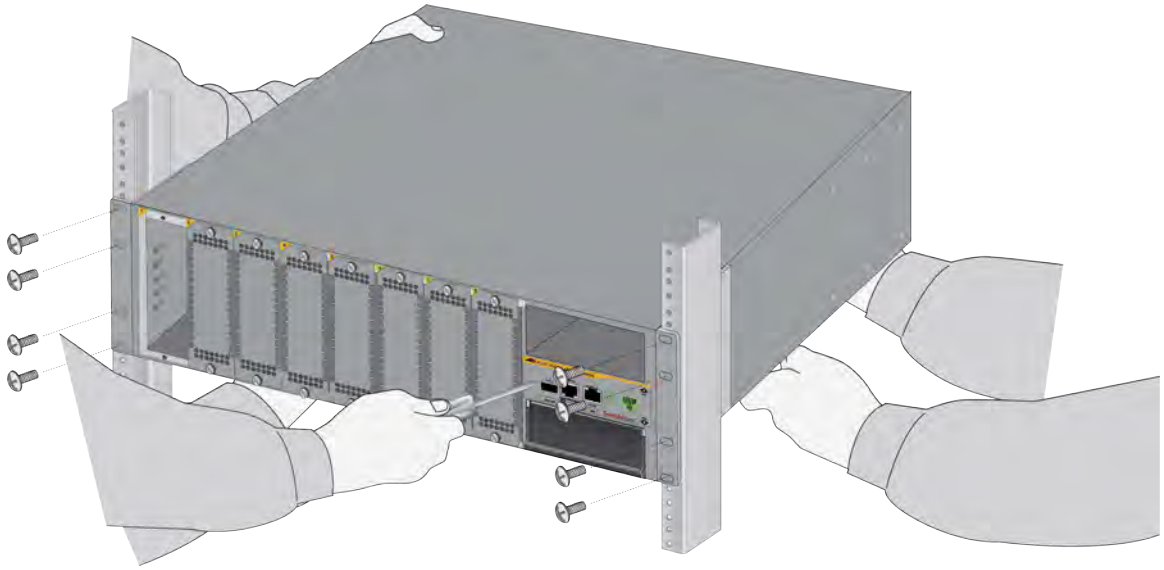


Figure 28. Securing the Switch in the Equipment Rack

4. Go to “Installing the Grounding Wire” on page 68.

Installing the Grounding Wire

This procedure explains how to connect a grounding wire to the switch.

Note
The switch requires a permanent connection to a good earth ground for the modules and power supplies.

The procedure requires the following items:

- ❒ Grounding lug (pre-installed on the rear panel of the switch)
- ❒ #2 Phillips-head screwdriver (not provided)
- ❒ Crimping tool (not provided)
- ❒ 10 AWG stranded grounding wire (not provided)

To connect the switch 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 29.

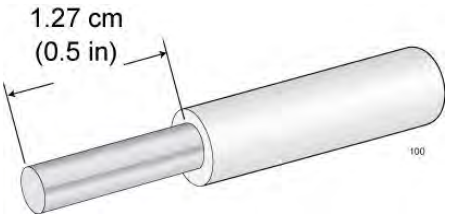


Figure 29. Stripping the Grounding Wire

2. Use a #2 Phillips-head screwdriver to remove the two screws that secure the grounding lug to the rear panel of the switch, and remove the grounding lug. Refer to Figure 30 on page 69.

Figure 30. Removing the Grounding Lug from the Switch

3. Insert one end of the grounding wire into the grounding lug, as shown in Figure 31, and use a crimping tool to secure the wire to the grounding lug.

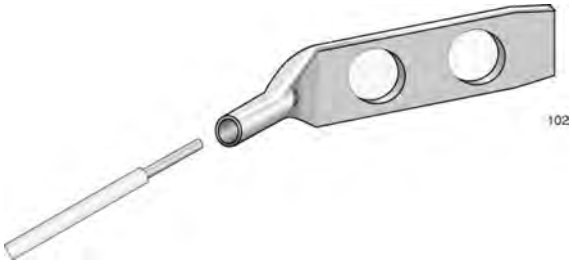


Figure 31. Attaching the Grounding Wire to the Grounding Lug

4. Reinstall the grounding lug on the rear panel of the switch with the two screws removed in step 2. Refer to Figure 32.

Figure 32. Installing the Grounding Lug and Wire on the Switch

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

6. Go to Chapter 4, “Installing SBxPWRSYS2 (AC) Power Supplies” on page 71.

Chapter 4

Installing SBxPWRSYS2 (AC) Power Supplies

The procedures in this chapter explain how to install SBxPWRSYS2 (AC) Power Supplies in the switch. The procedures are listed here:

- ❒ “Installing the SBxPWRSYS2 (AC) Power Supply” on page 72
- ❒ “Installing the Power Supply Slot Panel” on page 77

Installing the SBxPWRSYS2 (AC) Power Supply

This section contains the procedure for installing the SBxPWRSYS2 (AC) Power Supply. You can install up to two power supplies in the switch. A single power supply can fully power the switch. Installing two power supplies adds power redundancy. For background information, refer to “Power Supply” on page 43. For a list of the components included with the power supply, refer to “Unpacking the SBxPWRSYS2 (AC) Power Supply” on page 60.

Warning
The device is heavy. Use both hands to lift it. You might injure yourself or damage the equipment if you drop it. E94

Caution
The device can be damaged by static electricity. Be sure to observe standard electrostatic discharge (ESD) precautions, such as wearing an anti-static wrist strap, to avoid damaging the device. E92

To install the power supply in the switch, perform the following procedure:

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

   Note
   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 power supply slot panel.

2. If there is already a power supply in PSU A, lift the handle on the power supply slot panel in PSU B and slide it from the switch. Refer to Figure 33.

Figure 33. Removing the Slot Panel from Power Supply Slot B

3. Lift the handle on the SBxPWRSYS2 (AC) Power Supply. Refer to Figure 34.

Figure 34. Lifting the Locking Handle on the SBxPWRSYS2 (AC) 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 switch. Refer to Figure 35.

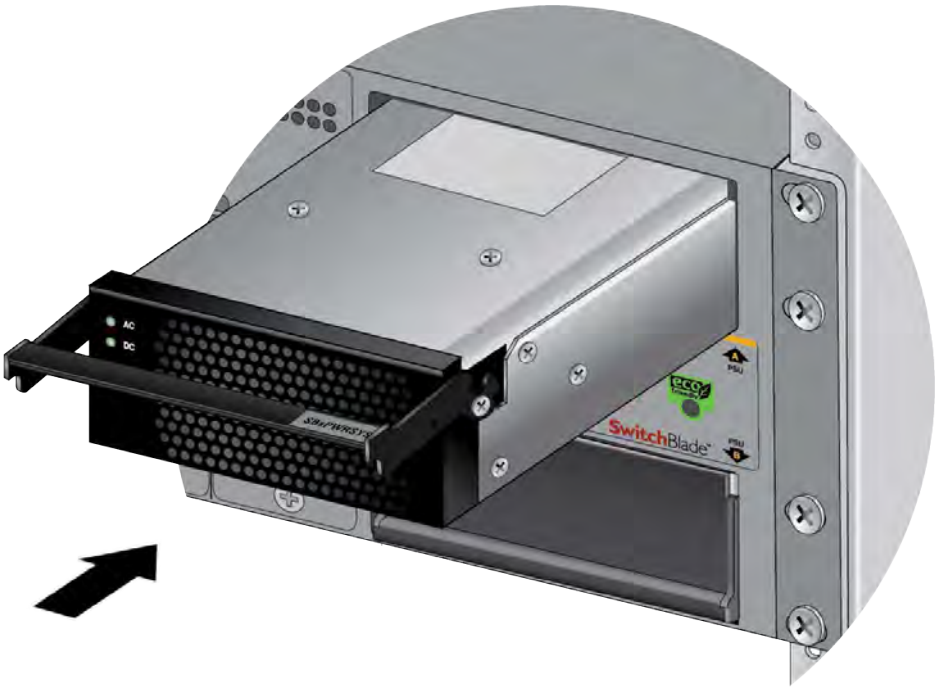


Figure 35. Sliding the SBxPWRSYS2 (AC) Power Supply into the Switch

5. Gently press on the faceplate of the power supply to seat it on the connector on the backplane in the switch, and lower the locking handle to secure it in the switch. Refer to Figure 36.

Figure 36. Lowering the Locking Handle on the SBxPWRSYS2 (AC) Power Supply

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

7. To install the AC power cord retaining clip included with the switch, press in the sides of a retaining clip and insert the ends into the holes above and below the AC connector on the rear panel. Refer to Figure 37.

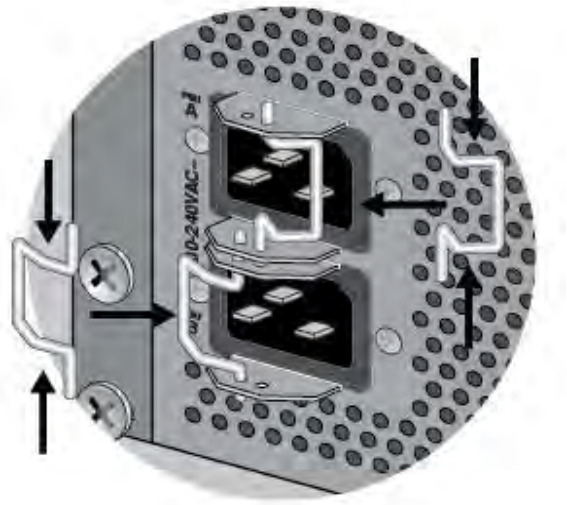


Figure 37. Installing the AC Power Cord Retaining Clips

8. Do one of the following:

   - ❒ If you purchased two SBxPWRSYS2 (AC) Power Supplies for the switch, repeat this procedure to install the second power supply.
   - ❒ If you installed only one power supply and the second power supply slot is not covered, go to “Installing the Power Supply Slot Panel” on page 77.
   - ❒ After installing the power supplies, go to Chapter 5, “Installing XEM3 Ethernet Modules” on page 79.

Installing the Power Supply Slot Panel

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

- ❒ If the switch has two power supplies or if the empty power supply is already covered, go to Chapter 5, “Installing XEM3 Ethernet Modules” on page 79.
- ❒ If a power supply slot is uncovered, perform the procedure in this section.

To install the power supply slot panel, perform the following procedure:

1. Lift the locking handle on the power supply slot panel. Refer to Figure 38.

Figure 38. Lifting the Locking Handle on the Power Supply Slot Panel

2. Align the panel in the empty power supply slot and carefully slide it into the empty power supply slot. Figure 39 on page 78 shows the panel being installed in the PSU B power supply slot.

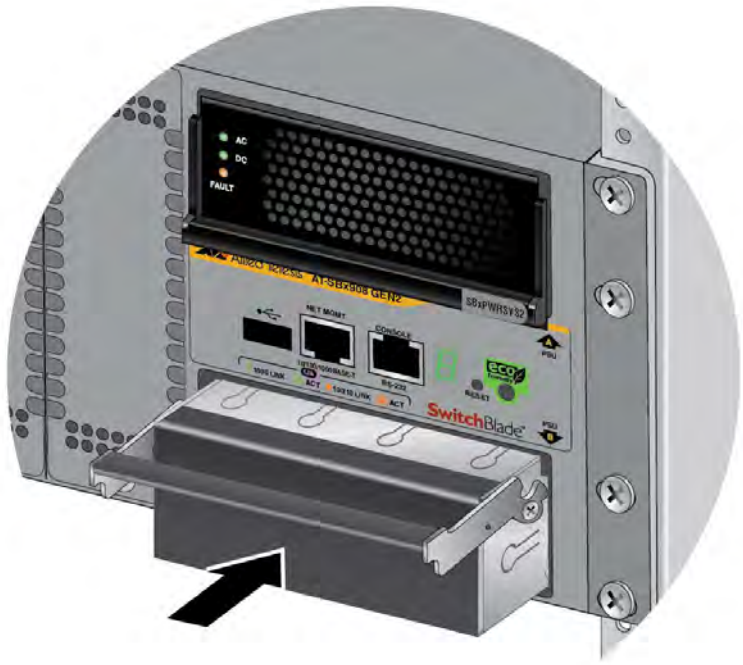


Figure 39. Aligning the Power Supply Slot Panel

3. Lower the locking handle on the power supply slot panel to secure it in the switch. Refer to Figure 40.

Figure 40. Lowering the Locking Handle on the Power Supply Slot Panel

4. Go to Chapter 5, “Installing XEM3 Ethernet Modules” on page 79.

Chapter 5

Installing XEM3 Ethernet Modules

The procedures in this chapter explain how to install XEM3 Ethernet Modules in the switch. The procedures are listed here:

- “Installing XEM3 Ethernet Modules” on page 80
- “Installing XEM3 Module Slot Panels” on page 84

Installing XEM3 Ethernet Modules

This section contains the procedure for installing XEM3 Ethernet Modules in the switch. The illustrations show the XEM3-12XTm Module. The procedure is the same for all XEM3 Modules.

Caution
The device can be damaged by static electricity. Be sure to observe all standard electrostatic discharge (ESD) precautions when installing the device, such as wearing an anti-static wrist strap.

To install XEM3 Modules in the switch, perform the following procedure:

1. Select a slot in the switch for the module. You can install XEM3 Modules in slots 1 to 8.
2. If the slot is covered with a slot panel, use a #2 Phillips-head screwdriver to loosen the two captive screws on the panel and remove it from the switch. Refer to Figure 41.

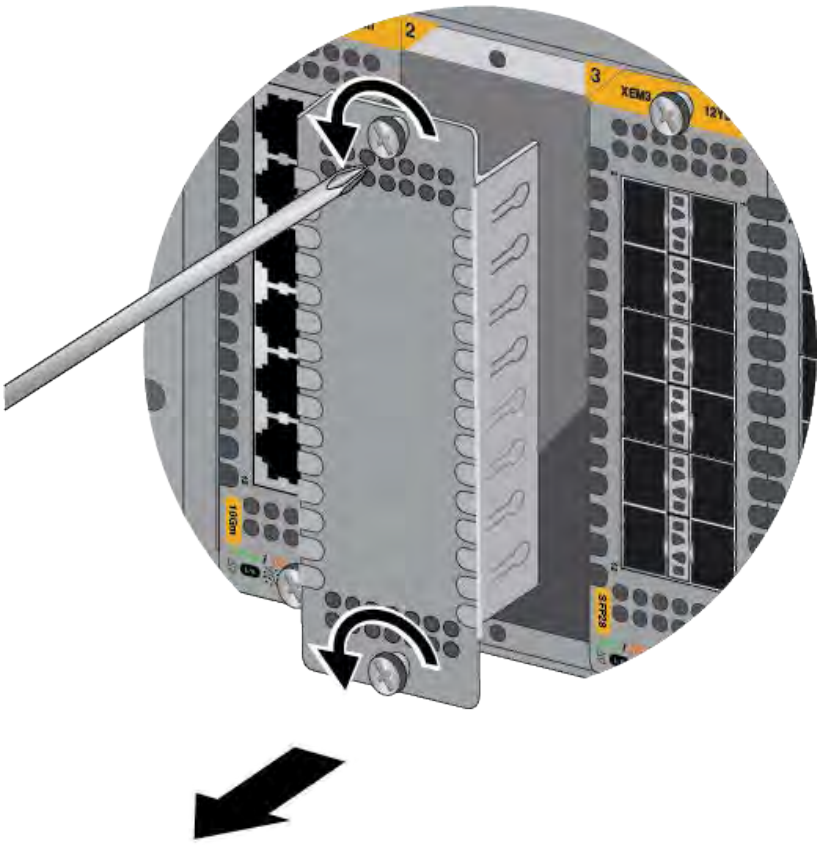


Figure 41. Removing an XEM3 Module Slot Panel

3. Carefully remove the XEM3 Module from its shipping container and anti-static bag. Refer to Figure 42.

Figure 42. Removing the XEM3 Module from the Anti-static Bag

4. Position the XEM3 Module with the notch on the faceplate in the upper left corner. Refer to Figure 43. The chassis slot has top and bottom flanges that fit into grooves on the top and bottom of the module. Carefully slide the module into the slot.

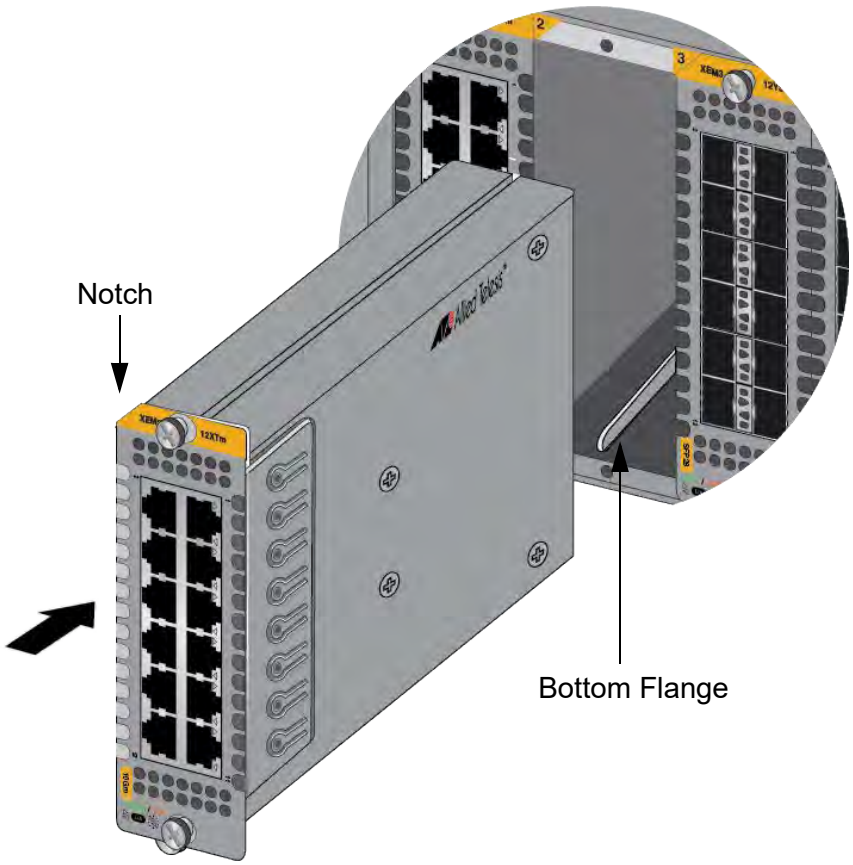


Figure 43. Sliding an XEM3 Module into a Slot

Caution
Do not force the module into the slot. If there is resistance, remove it and try again.

5. When you feel the XEM3 Module make contact with the connector on the backplane of the switch. gently press on the top and bottom of the faceplate to seat it on the connector. Refer to Figure 44.

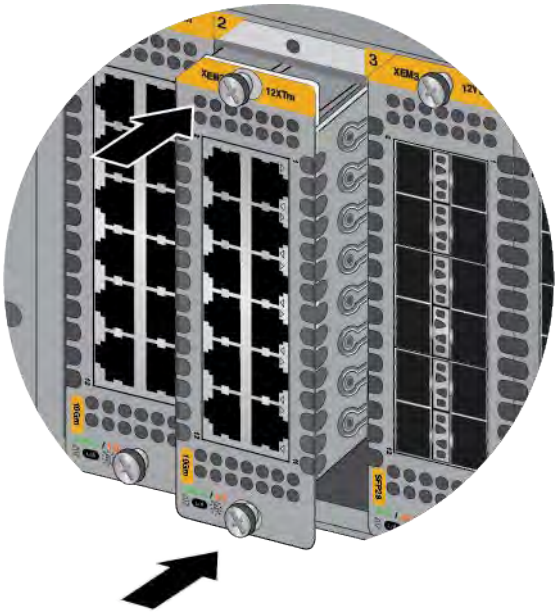


Figure 44. Seating an XEM3 Module in the Switch

6. Visually inspect the XEM3 Module to verify that its faceplate is flush against the front panel of the switch.

7. Tighten the two captive screws on the XEM3 Module to secure it in the switch. Refer to Figure 45.

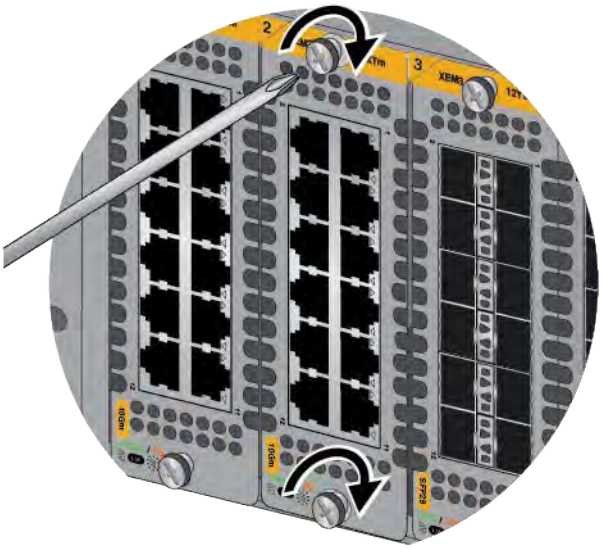


Figure 45. Tightening the Two Captive Screws on the XEM3 Module

8. Repeat this procedure to install additional XEM3 Modules.
9. If there are empty slots, go to “Installing XEM3 Module Slot Panels” on page 84.
10. If there are no empty slots, do one of the following:
    - ❒ If you are installing a standalone switch, go to Chapter 6, “Cabling the Networking Ports” on page 87.
    - ❒ If you are installing a VCStack, repeat this procedure to install XEM3 Modules in the other switches of the stack, and then go to Chapter 11, “Configuring Switches for VCStack” on page 151.

Installing XEM3 Module Slot Panels

After installing the XEM3 Modules, inspect slots 1 to 8 for empty slots. Empty slots need to be covered with module slot panels included with the product. This ensures proper airflow and cooling inside the switch and protects against outside objects entering the switch and causing damage. If there are empty module slots, perform the following procedure.

If there are no empty slots, do one of the following:

- If you are installing a standalone switch, go to Chapter 6, “Cabling the Networking Ports” on page 87.
- If you are installing a VCStack, repeat the previous procedure to install XEM3 Modules in the other switches of the stack, and afterwards go to Chapter 11, “Configuring Switches for VCStack” on page 151.

To install XEM3 Module slot panels in empty module slots, perform the following procedure:

1. Position the slot panel with the notch in the upper left and slide it into the empty module slot. Refer to Figure 46.

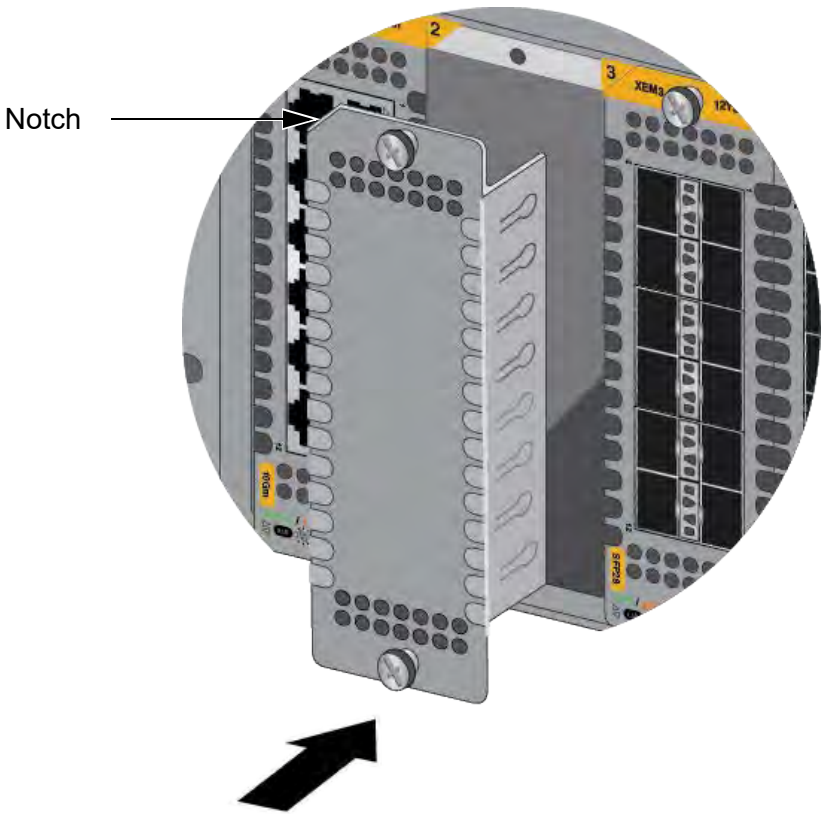


Figure 46. Installing an XEM3 Module Slot Panel

2. Tighten the two captive screws on the slot panel with a #2 Phillips-head screwdriver to secure it in the switch. Refer to Figure 47.

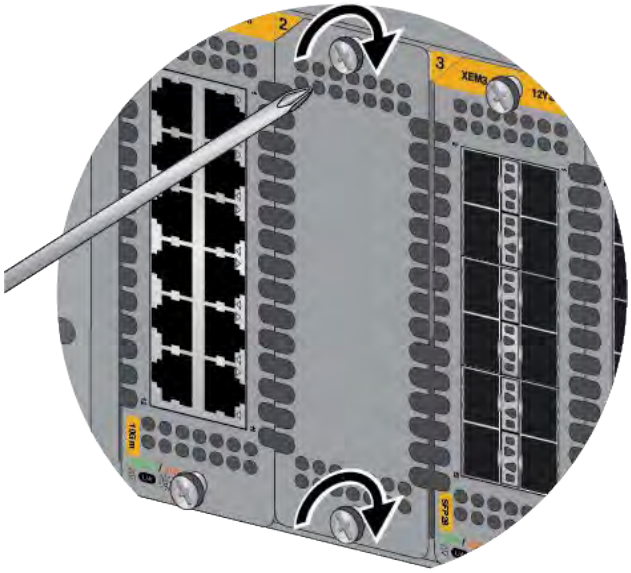


Figure 47. Tightening the Captive Screws on an XEM3 Module Slot Panel

3. Repeat this procedure to install additional slot panels.

4. Do one of the following:

   - ❒ If you are installing a standalone switch, go to Chapter 6, “Cabling the Networking Ports” on page 87.
   - ❒ If you are installing a VCStack, repeat the previous procedure to install XEM3 Modules in the other switches of the stack, and afterwards go to Chapter 11, “Configuring Switches for VCStack” on page 151.

Chapter 6

Cabling the Networking Ports

This chapter contains the following procedures:

- “Cabling Copper Ports” on page 88
- “Guidelines to Handling Fiber Optic and Copper Port Transceivers” on page 89
- “Installing and Cabling Fiber Optic Transceivers” on page 91
- “Installing Direct Attach Cables” on page 95

Cabling Copper Ports

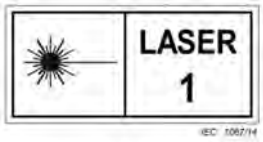
This section applies to the copper ports on the XEM3-12XTm Module. Here are the cabling guidelines:

- Minimum cable requirements are:
  - 1G/2.5G/5G - Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) unshielded cabling.
  - 10G -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 support full-duplex only.
- Do not attach cables to ports of static or LACP port trunks on the switch until after you have configured the ports for the trunks. Otherwise, the ports will form network loops that can adversely affect network performance.

Guidelines to Handling Fiber Optic and Copper Port Transceivers

Review the following guidelines before installing fiber optic or copper port transceivers in XEM3-12YS, XEM3-8CQ, or XEM3-2DQ Modules:

- 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 XEM3 Modules 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.
- Transceivers for the XEM3 Modules are Class 1 or Class 1M Laser Products. Refer to Figure 48 for the warning labels.



Class 1 Laser Warning Label

LASER RADIATION:
DO NOT EXPOSE TO USERS OF TELESCOPIC OPTICS.
CLASS 1M LASER PRODUCT

Class 1M Warning Label

Figure 48. Warning Labels for Class 1 and Class 1M Laser Products

Warning
40G QSFP+, 100G QSFP28, and 400G QSFPDD transceivers can become extremely hot. Always use their handles, shown in Figure 49, when installing or removing them to protect your hands from injury.

Figure 49. Example of a Handle on 40G, 100G, and 400G Transceivers

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

Installing and Cabling Fiber Optic Transceivers

Table 1 on page 25 lists the types of fiber optic transceivers and direct attach copper cables that the XEM3 Modules support. Refer to the product data sheet for a list of approved transceivers.

Please review “Guidelines to Handling Fiber Optic and Copper Port Transceivers” on page 89 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 XEM3 Module, perform the following procedure:

1. Select a port in the XEM3 Module 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 slot port it clicks into place. The correct orientation depends on the module and transceiver:
   - XEM3-12YS Module - For odd numbered ports, position the transceiver with the handle on the right. For even numbered ports, position the transceiver with the handle on the left. Refer to Figure 50 on page 92.

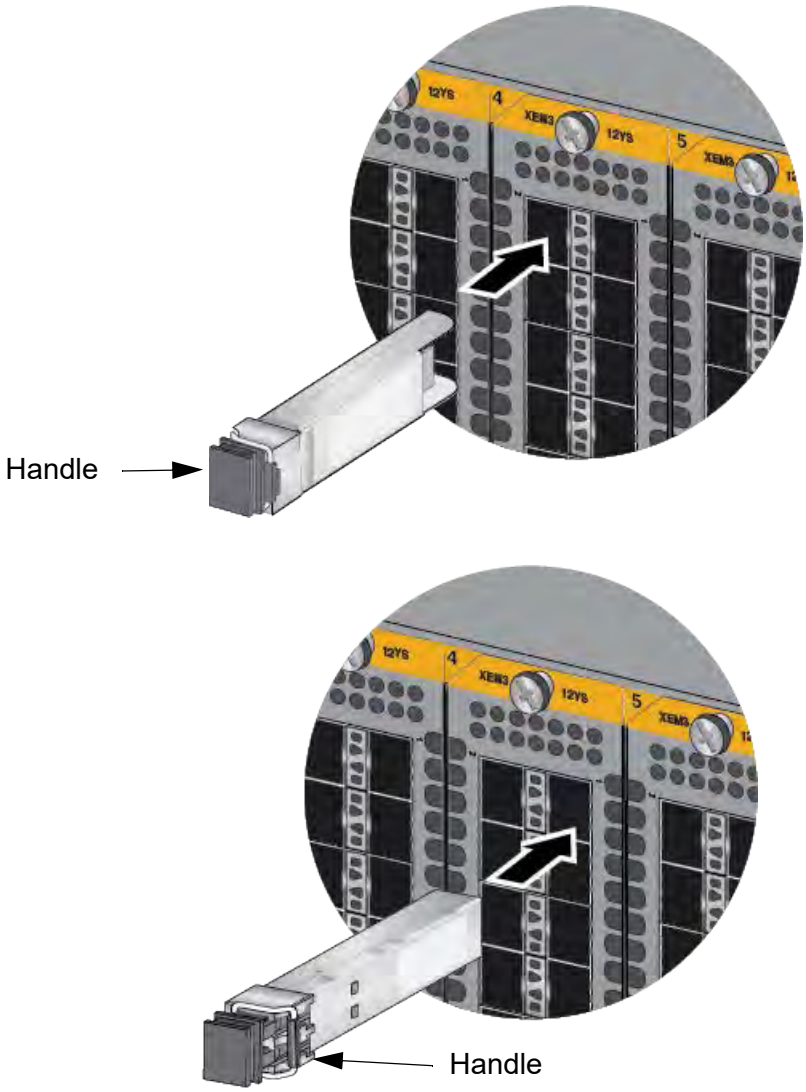


Figure 50. Example of Installing SFP Transceivers in the XEM3-12YS Module

- ❒ XEM3-8CQ Module - For all ports, orient the transceiver with the handle on the right side. Slide the connector into the slot until it clicks into place. Figure 51 illustrates installing QSFPLR4 transceivers in the XEM3-8CQ Module.

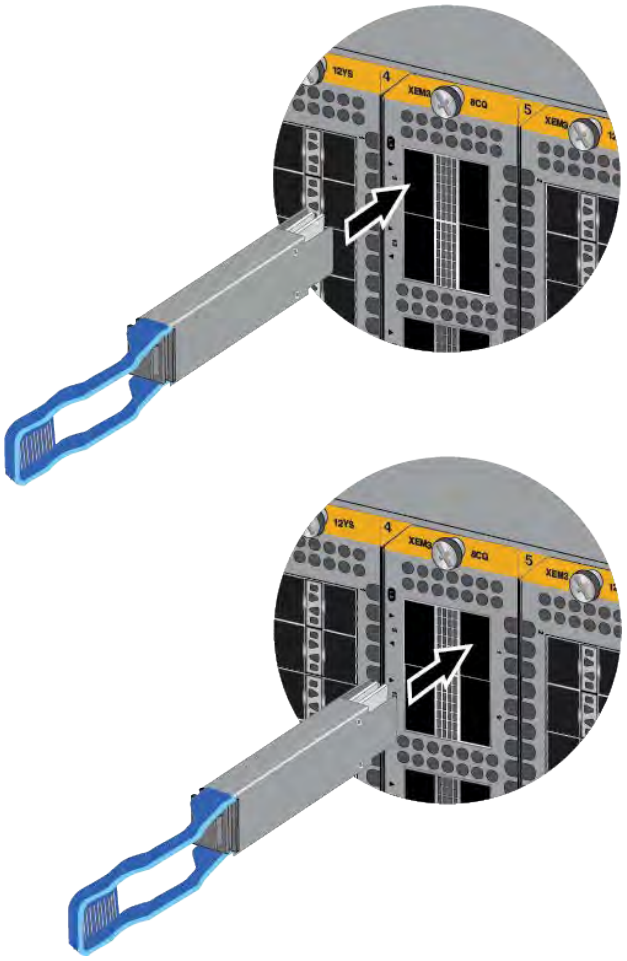


Figure 51. Examples Installing Fiber Optic Transceivers in the XEM3-8CQ Module

- ❒ XEM3-2DQ Module - For both ports, position the 100Gbps QSFP28 transceiver with the handle on the left side. Refer to Figure 52.

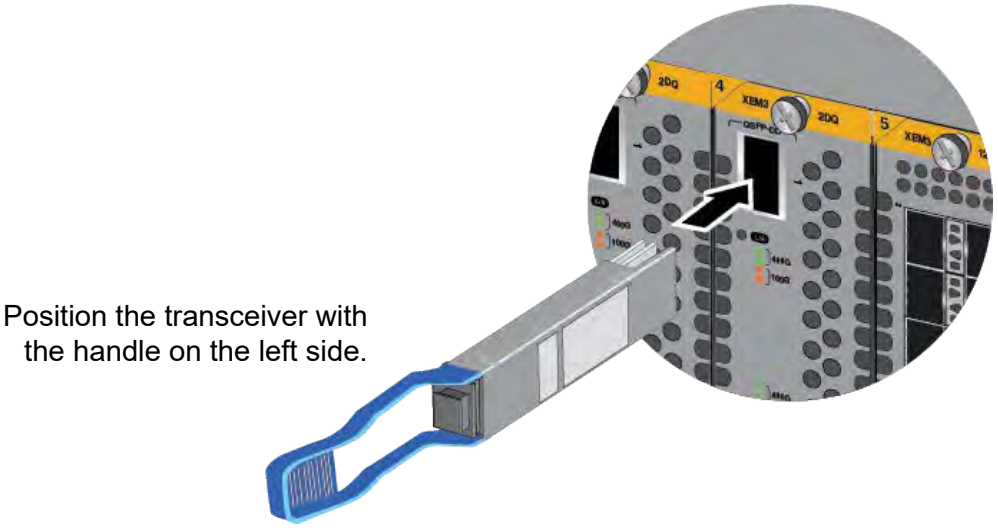


Figure 52. Example Installing an 100G QSFP28 Transceiver in the XEM3-2DQ Module

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 Attach Cables

The XEM3-12YS, XEM3-8CQ, and XEM3-2DQ Modules support direct attach cables. They offer an economical way to add 10G, 25G, 40G, 100G, and 400G connections over short distances using twinax, copper, or active optical cables. Refer to Table 16.

Table 16. Direct Attach Cables for XEM3 Modules

XEM3 Module	Speed	Direct Attach Cable
XEM3-12YS	10G	- SP10TW1: one-meter twinax direct attach cable - SP10TW3: three-meter twinax direct attach cable
	25G	- AT-SP25TW1: one-meter twinax optical cable - AT-SP25TW3: three-meter twinax direct attach cables
XEM3-8CQ	40G	- AT-QSFP1CU: one-meter copper direct attach cable - AT-QSFP3CU: three-meter copper direct attach cables
	100G	- AT-QSFP28-1CU: one-meter copper direct attach cable - AT-QSFP28-3CU: three-meter copper direct attach cable
XEM3-2DQ	100G	- AT-QSFP28-1CU: one-meter copper direct attach cable - AT-QSFP28-3CU: three-meter copper direct attach cables
	400G	- AT-QSFPDD-1CU: one-meter copper direct attach cable - AT-QSFPDD-2.5CU: two-and-½-meter copper direct attach cable

To install direct attach cables, perform the following procedure:

1. Select a slot in the XEM3 Module for the direct attach cable.
2. If the selected slot 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 slot until it clicks into place. The correct orientation depends on the module and transceiver:
   - ❒ XEM3-12YS Module - To install a SP10TW direct attach cable in an odd numbered slot, position the transceiver with the release tab on the right. To install a cable in an even numbered slot, position the release tab on the left. Refer to Figure 53. Slide the connector into the slot until it clicks into place.

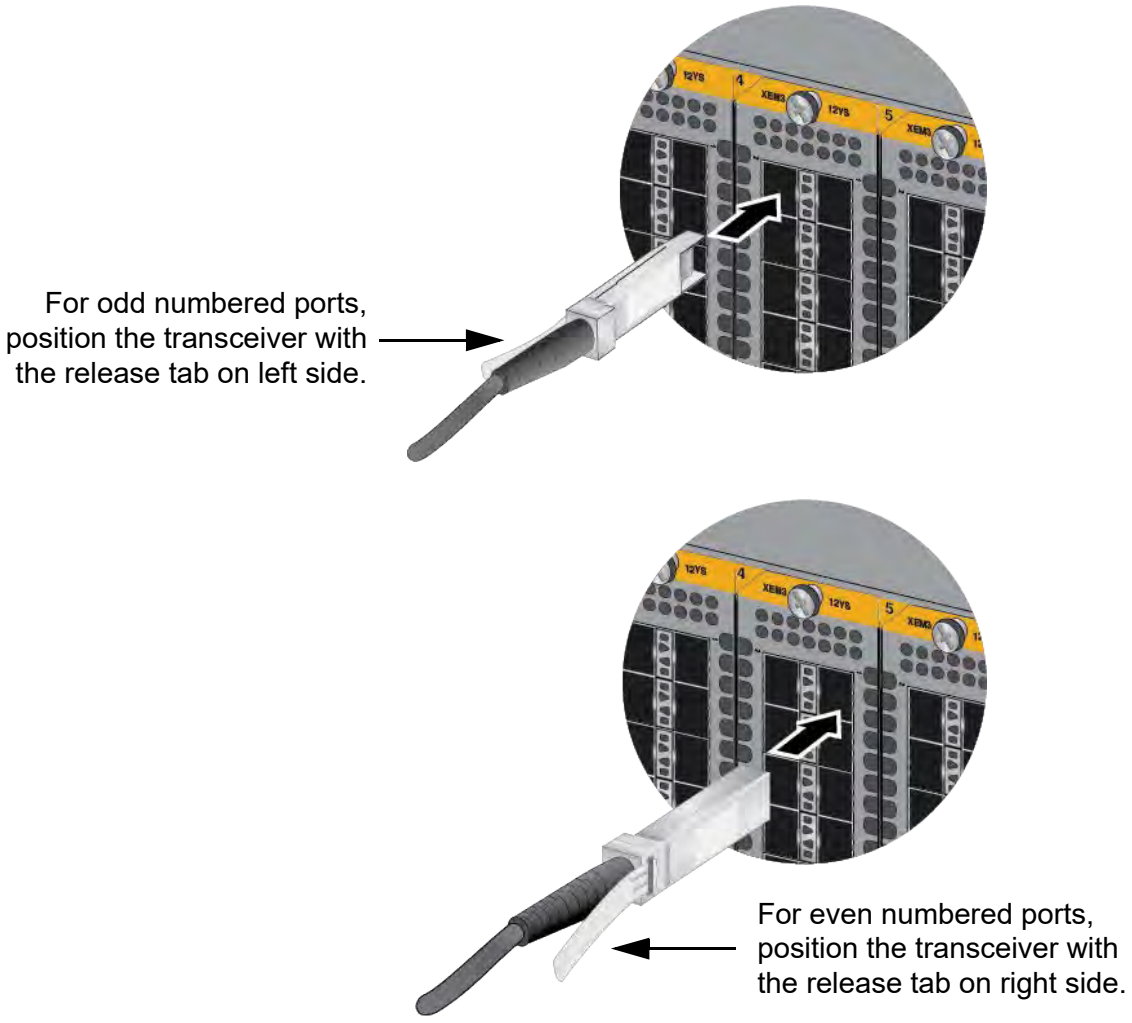


Figure 53. Installing SP10TW1 and SP10TW3 Direct Attach Cables in the XEM3-12YS Module

- XEM3-8CQ Module with QSFP1CU or QSFP3CU cables: For all ports, orient the connector with the handle on the right side. Slide the connector into the slot until it clicks into place. Refer to Figure 54.

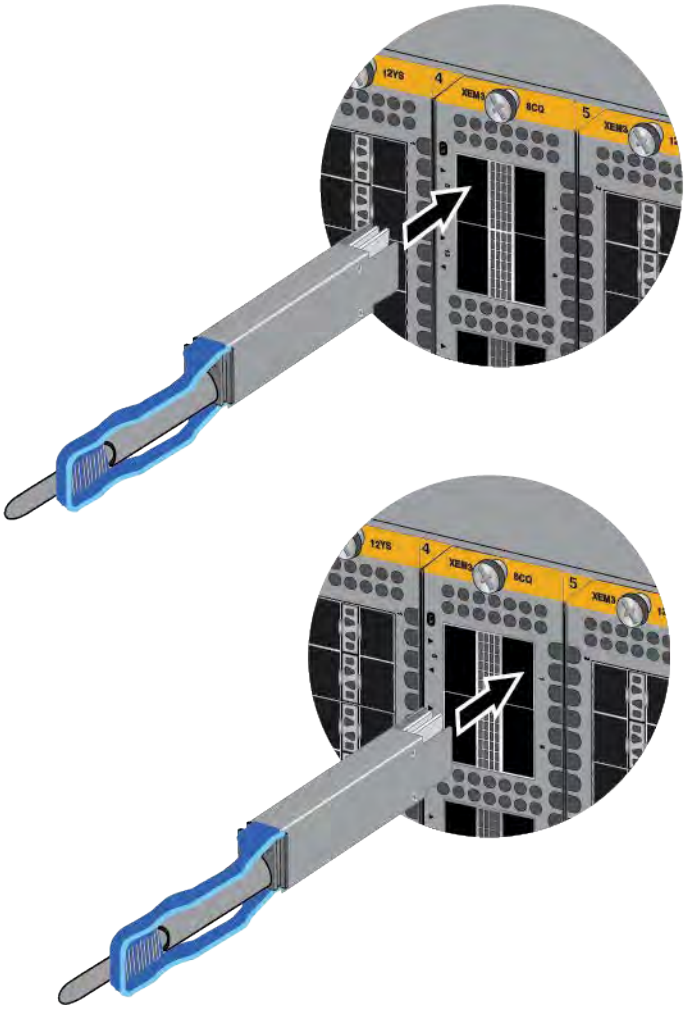


Figure 54. Installing QSFP1CU and QSFP3CU Direct Attach Cables in the XEM3-8CQ Module

- XEM3-2DQ Module with AT-QSFPDD-1CU and AT-QSFPDD-2.5CU cables: For both ports, position the transceiver with the handle on the left side. Slide the transceiver into the slot until it clicks into place. Refer to Figure 55.

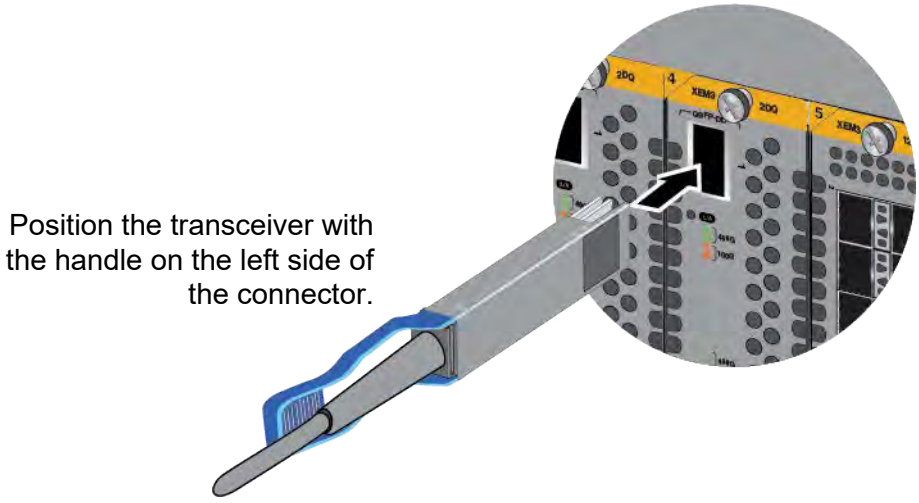


Figure 55. Installing AT-QSFPDD-1CU and AT-QSFPDD-2.5CU Cables in the XEM3-2DQ Module

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

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

Section II

Powering and Verifying a Standalone Switch

The chapters in this section are:

- Chapter 7, “Powering On the SBx908 GEN3 Modular Switch” on page 101
- Chapter 8, “Verifying a Standalone Switch” on page 107

Chapter 7

Powering On the SBx908 GEN3 Modular Switch

This chapter contains the following procedures:

- “Verifying the Hardware Installation” on page 102
- “Powering On the SBxPWRSYS2 (AC) Power Supply” on page 103
- “Monitoring the Initialization Processes” on page 106

Verifying the Hardware Installation

Perform the following procedure before powering on the switch:

1. Verify that the grounding lug on the back panel of the switch is properly grounded. For instructions, refer to “Installing the Grounding Wire” on page 68.

2. Verify that the switch has at least one SBxPWRSYS2 (AC) Power Supply in power supply slot PSU A or B in the front panel. The switch can have up to two power supplies. For installation instructions, “Installing the SBxPWRSYS2 (AC) Power Supply” on page 72.

3. If the switch has only one power supply, verify that the empty power supply slot on the front panel is covered with a power supply slot panel. For instructions, refer to “Installing the Power Supply Slot Panel” on page 77.

4. Verify that the power cord retaining clips are installed on the AC power connectors on the rear panel of the switch. For instructions, refer to “Installing the SBxPWRSYS2 (AC) Power Supply” on page 72.

5. If there are empty XEM3 Module slots on the front panel, verify that they are covered with slot panels. For instructions, refer to “Installing XEM3 Module Slot Panels” on page 84.

6. You may now power on the switch. Refer to “Powering On the SBxPWRSYS2 (AC) Power Supply” on page 103

Powering On the SBxPWRSYS2 (AC) Power Supply

The procedure in this section explains how to power on the SBxPWRSYS2 (AC) Power Supply. If you have not installed the power supply, refer to “Installing the SBxPWRSYS2 (AC) Power Supply” on page 72 for instructions.

Before powering on the switch, review the information in “Power Specifications of the SBxPWRSYS2 (AC) Power Supply” on page 216 for the power specifications of the switch.

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

To power on the 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 switch. If the switch has two power supplies, you may power them on one at a time or simultaneously. Refer to Figure 56.

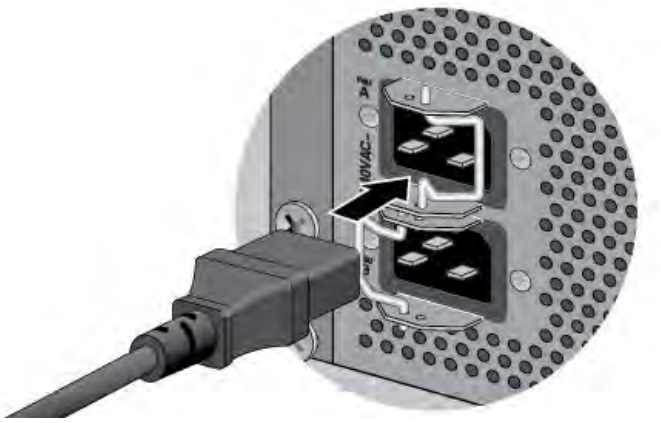


Figure 56. Connecting the AC Power Cord

2. Move the retaining clip over the power cord to secure the cord to the switch. Refer to Figure 57.

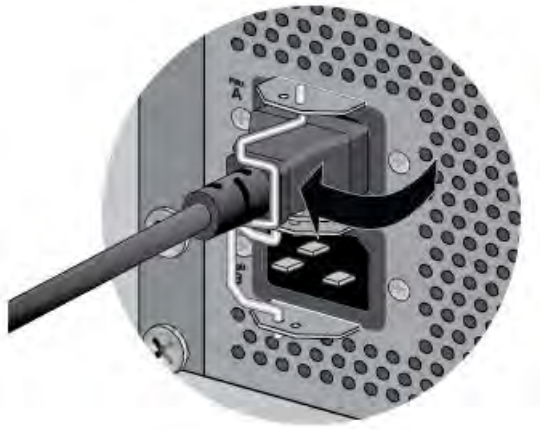


Figure 57. Securing the AC Power Cord with the Retaining Clip

3. Connect the power cord to an appropriate AC power source. Refer to Figure 58.

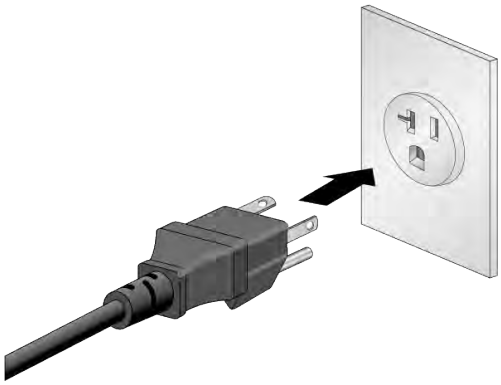


Figure 58. Connecting the Power Cord to an AC Power Source

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

Note
The power cords included with SBxPWRSYS2 (AC) Power Supply for 100-125 VAC installations have 20 Amp, 125 V NEMA 5-20P plugs. The plugs require NEMA 5-20R receptacles. Refer to Figure 23 on page 63.

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

5. Do one of the following:

   - To monitor the switch as it initializes the management software, go to “Monitoring the Initialization Processes” on page 106.
   - Wait three minutes for the switch to initialize its management software. Afterwards, go to Chapter 8, “Verifying a Standalone Switch” on page 107.

Monitoring the Initialization Processes

The switch takes approximately three minutes to initialize the AlliedWare Plus management software and load the default configuration. You can monitor the bootup sequence by connecting a terminal or computer that has a terminal emulator program to the Console port on the switch. (The settings of the Console port are provided in “Starting a Local Management Session” on page 109.) The switch displays a series of messages on the Console port as it initializes the various components of the management software.

After the switch has initialized its management software, go to Chapter 8, “Verifying a Standalone Switch” on page 107.

Chapter 8

Verifying a Standalone Switch

This chapter contains the following procedures:

- “Verifying the Status of the Switch” on page 108
- “Starting a Local Management Session” on page 109
- “Starting the First Management Session Through the NET MGMT Port” on page 112
- “Disabling VCStack” on page 114
- “Verifying Support for the XEM3 Modules” on page 117
- “Verifying the Switch with the AlliedWare Plus Commands” on page 118

Verifying the Status of the Switch

After powering on the SBx908 GEN3 Modular Switch and waiting three minutes for it to start the AlliedWare Plus management software, examine the ID LED on the front panel:

- If the ID LED is displaying “0”, the switch is operating as a standalone unit.
- If the ID LED is displaying the number “1” or higher, the VCStack feature is enabled on the unit. You should disable it if you plan to use the device as a standalone switch. For instructions, refer to “Disabling VCStack” on page 114.

Perform the following procedures:

1. Establish the first management session with the switch by performing one of the following procedures:
   - To start a local management session through the Console port, perform “Starting a Local Management Session” on page 109.
   - To start a remote session through the NET MGMT port on the management panel, refer to “Starting the First Management Session Through the NET MGMT Port” on page 112.
2. If the LED is displaying the number “1” or higher and you want to use the product as a standalone switch, perform “Disabling VCStack” on page 114 to disable VCStack.
3. Perform “Verifying Support for the XEM3 Modules” on page 117 to verify that the version of AlliedWare Plus management software on the switch supports all the XEM3 Modules.
4. Perform “Verifying the Switch with the AlliedWare Plus Commands” on page 118 to confirm that the hardware is operating correctly.
5. If you have not completed cabling the ports, go to Chapter 6, “Cabling the Networking Ports” on page 87.

Starting a Local Management Session

The section contains the procedure for starting a local management session with the switch through the Console port. The procedure requires the following items:

- Terminal, desktop computer, or laptop with either a USB port or DB-9 (D-sub 9-pin) female connector
- Terminal emulator, such as PuTTy
- Management cable

The connector on the management cable will depend on whether your computer has a USB port or DB-9 female connector:

- If your device has a USB port, you will need a USB-to-Serial converter that is compatible with its operating system. An example is the VT-Kit3 converter from Allied Telesis. Refer to Figure 59. The converter has two connectors. One is a standard USB 3.0 connector that connects to the USB port on your computer or laptop. The other is a nine-pin female RJ-45 connector that connects to the Console port on the switch with a standard, straight-through Ethernet cable.

VT-Kit3 Converter

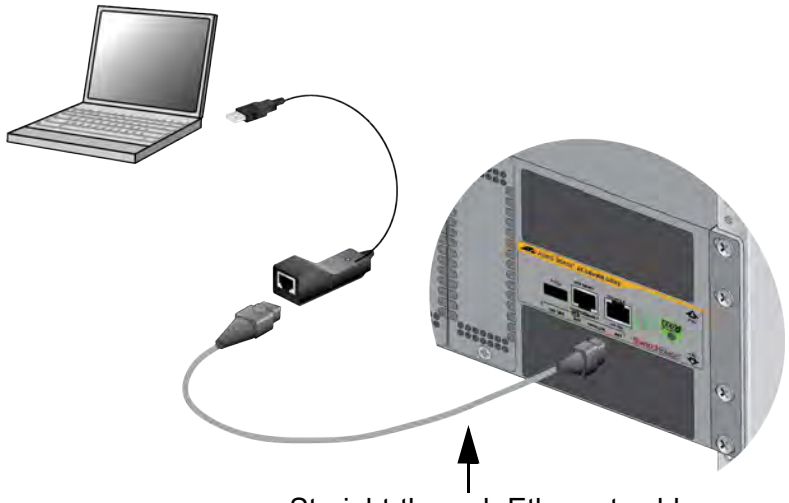


Figure 59. VT-Kit3 Converter

- If your device has a DB-9 female connector, you will need a serial management cable with a DB-9 male connector that connects to your computer and a nine-pin male RJ-45 connector that connects to the Console port on the switch. An example is illustrated in Figure 60 on page 110. The wiring requirements for the cable are provided in “Console Management Cable with DB-9 Female and RJ-45 Connectors” on page 222.

Figure 60. Serial Management Cable with RJ-45 and DB-9 Connectors

Note
The SBx908 GEN3 Modular Switch does not come with a management cable.

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

1. Power on the switch by connecting the AC power cord to the power supply on the rear panel and to an AC power source. For instructions, refer to Chapter 7, “Powering On the SBx908 GEN3 Modular Switch” on page 101.

2. Wait three minutes for the switch to start the AlliedWare Plus management software.

3. Connect your terminal, computer, or laptop to the Console port on the switch with your management cable. For an example using the VT-Kit3 management cable from Allied Telesis, refer to Figure 59 on page 109.

4. Start your terminal emulator.

5. Configure your terminal emulator as follows:

   - ❒ Baud rate: 115200
   - ❒ Data bits: 8
   - ❒ Parity: none
   - ❒ Stop bits: 1
   - ❒ Flow control: none

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

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

7. Enter the user name and password. The default values are “manager” and “friend” (without the quotes), respectively.

   Note
   User names and passwords are case sensitive.

8. If this is the first log on to the switch, the switch prompts you to change the logon password. The password can be up to 32 characters from the following four categories:

   - Uppercase letters: A to Z.
   - Lowercase letters: a to z
   - Digits: 0 to 9
   - Special symbols: all printable ACSII characters not included in the previous categories. The question mark (?) is excluded. It cannot be used in of a password.

   If the system requests a privilege level, enter 15, the highest level that provides full access.

   Note
   To change passwords or add users to the system, use the USERNAME command in the Global Configuration mode.

   The local management session starts when the User Exec mode prompt, shown in Figure 61. is displayed.

```
awplus>
```

Figure 61. 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 GEN3 Modular Switch Series, AlliedWare Plus Operating System* from **www.alliedtelesis.com**.

9. To use the switch as a standalone unit, VCStack should be disabled. Do one of the following:

   - If the Switch ID LED is displaying “0” (zero), VCStack is already disabled. Go to “Verifying Support for the XEM3 Modules” on page 117 or “Verifying the Switch with the AlliedWare Plus Commands” on page 118.
   - If the Switch ID LED is displaying the number “1” or higher, VCStack is enabled. To disable VCStack, go to “Disabling VCStack” on page 114.

Starting the First Management Session Through the NET MGMT Port

This section contains the procedure for starting the first management session with the switch through the NET MGMT port on the management panel. For a description of the port and its function, refer to “NET MGMT Ethernet Management Port” on page 40.

Note
This procedure requires a Secure Shell (SSH) client on your workstation.

To start the first management session through the NET MGMT port on the management panel, perform the following procedure:

1. Connect the NET MGMT port to a device on your network, such as a port on a Gigabit Ethernet switch. Refer to “NET MGMT Ethernet Management Port” on page 40 for cable requirements.
2. If the switch is powered off, power it on. For instructions, refer to Chapter 7, “Powering On the SBx908 GEN3 Modular Switch” on page 101.
3. Wait three minutes for the switch to start the AlliedWare Plus management software.
4. Start the SSH client on your workstation.
5. Enter the IP address of the switch in the SSH client. Review the following:
   - The switch has a DHCP client. Its default state is enabled. If your network has a reachable DHCP server and you have already cabled the ports on the XEM3 Modules, the switch will use the IP address assigned to it by the server.
   - If the switch does not receive a response from a DHCP server, it uses the default address 169.254.42.42/16.
6. Press Enter. You are prompted for the user name and password.
7. Enter the switch’s user name and password. The default values are “manager” and “friend” (without the quotes), respectively.

Note
User names and passwords are case sensitive.

8. If this is the first log on to the switch, the switch prompts you to change the logon password. The password can be up to 32 characters from the following four categories:

   - Uppercase letters: A to Z.
   - Lowercase letters: a to z
   - Digits: 0 to 9
   - Special symbols: all printable ACSII characters not included in the previous categories. The question mark (?) is excluded. It cannot be used in of a password.

   If the system requests a privilege level, enter 15, the highest level that provides full access.

   Note
   To change password or add users to the system, use the USERNAME command in the Global Configuration mode.

9. The management session starts when the User Exec mode prompt is displayed. Refer to Figure 61 on page 111.

10. To use the switch as a standalone unit, VCStack should be disabled. Do one of the following:

    - If the Switch ID LED is displaying “0” (zero), VCStack is already disabled. Go to “Verifying Support for the XEM3 Modules” on page 117 or “Verifying the Switch with the AlliedWare Plus Commands” on page 118.
    - If the Switch ID LED is displaying the number “1” or higher, VCStack is enabled. To disable VCStack, go to “Disabling VCStack” on page 114.

Disabling VCStack

The procedure in this section explains how to disable the VCStack feature so that you can use the unit as a standalone switch. You will probably not need to perform this procedure because the default setting for VCStack is disabled.

A simple way to determine whether VCStack is enabled or disabled is by viewing the Switch ID LED on the management panel:

- If the LED is “0” (zero), VCStack is disabled. You can skip this procedure and go to “Verifying Support for the XEM3 Modules” on page 117 or “Verifying the Switch with the AlliedWare Plus Commands” on page 118.
- If the LED is “1” or higher, VCStack is enabled and needs to be disabled to use the switch as a standalone unit. If this is the case, perform the following procedure.

Caution

You have to reset the switch after disabling the VCStack feature. Some network traffic may be lost if the device is already connected to a live network. E89

If the switch is powered off, start with step 1. If the switch is powered on, start with step 3:

1. Power on the SBxPWRSYS2 (AC) Power Supplies. Refer to Chapter 7, “Powering On the SBx908 GEN3 Modular Switch” on page 101.
2. Wait three minutes for the switch to start the AlliedWare Plus management software.
3. Start a management session on the switch. Refer to “Starting a Local Management Session” on page 109 or “Starting the First Management Session Through the NET MGMT Port” on page 112.
4. Enter the SHOW STACK command in the User Exec mode prompt to display the status of the VCStack feature. An example is shown in Figure 62.

```
awplus> show stack
Virtual Chassis Stacking summary information
ID    Pending ID   MAC address       Priority    Status    Role
1     -            eccd:6dd1:64a2    128         Ready     Active Master
Operational Status                   Stacking Hardware Disabled
Stack MAC address                    eccd:6dd1:64a2
awplus>
```

Figure 62. SHOW STACK Command

5. Review the following items:

   - If the Operational Status is “Stacking Hardware Disabled,” VCStack is already disabled on the switch. Go to “Verifying Support for the XEM3 Modules” on page 117 or “Verifying the Switch with the AlliedWare Plus Commands” on page 118.
   - If the Operational Status is “Standalone Unit,” VCStack is enabled on the unit. You need to disable it by performing the steps in the rest of this procedure to use the unit as a standalone switch. The status says “standalone” because the switch is functioning as a stack of one switch.

6. Move to the Global Configuration mode by entering the ENABLE and CONFIGURE TERMINAL commands. Refer to Figure 63.

```
awplus> enable
awplus# configure terminal
Enter configuration commands, one per line. End with CNTL/Z
awplus#
```

Figure 63. Moving to the Global Configuration Mode

7. To. disable VCStack on the switch, enter the NO STACK ENABLE command in this format:

   `no stack` *`id`* `enable`

   The ID parameter is the ID number of the switch, displayed on the Switch ID LED. Replace the parameter with whatever number is on the ID LED. For example, if the Switch ID LED number is 1, you would enter the command as follows:

   ```
   awplus(config)# no stack 1 enable
   ```

   This confirmation prompt in Figure 64 is displayed.

```
Warning; This will disable the stacking hardware on member-1.
Are you sure you want to continue? (y/n):
```

Figure 64. Confirmation Prompt for the NO STACK ENABLE Command

8. Type Y to disable VCStack on the switch or N to cancel the procedure.

   If you disabled VCStack, the switch displays the message in Figure 65.

```
awplus(config)#18:04:12 awplus VCS[2119]: Deactivating
Stacking Ports on stack member 1.
```

Figure 65. Disabling VCStack

9. Press the Return key to re-display the Global Configuration mode prompt.

10. Enter the EXIT command to return to the Privileged Exec mode. Refer to Figure 66.

```
awplus(config)# exit
awplus#
```

Figure 66. Returning to the Privileged Exec Mode

11. Enter the WRITE command to save your change in the configuration file. The switch displays the confirmation prompt in Figure 67.

```
awplus# write
Building configuration ...
[OK]
awplus#
```

Figure 67. Saving the Changes with the WRITE Command

    If this is the first management session, the switch automatically creates the Default.cfg configuration file to store your changes.

12. Enter the REBOOT command to reboot the switch.

13. At the confirmation prompt, type “Y” for yes.

14. Wait three minutes for the switch to restart the AlliedWare Plus management software. Afterwards, examine the Switch ID LED again. The switch is ready for network operations as a standalone unit when the Switch ID LED is displaying the ID number “0.” If the number is “1 or higher,” repeat this procedure, being sure to save the configuration change with the WRITE command in step 11.

15. Go to “Verifying Support for the XEM3 Modules” on page 117 or “Verifying the Switch with the AlliedWare Plus Commands” on page 118.

Verifying Support for the XEM3 Modules

After powering on the switch, you should verify that the version of the AlliedWare Plus management software on the unit supports all the installed XEM3 Modules. Older versions of the management software might not support all the modules. To confirm support for the XEM3 Modules, perform the following procedure. If the switch is powered off, start with step 1. Otherwise, start with step 3:

1. Power on the SBxPWRSYS2 (AC) Power Supplies in the switch. Refer to Chapter 7, “Powering On the SBx908 GEN3 Modular Switch” on page 101.
2. Wait three minutes for the switch to start the AlliedWare Plus management software.
3. Start a local management session on the switch. Refer to “Starting a Local Management Session” on page 109.
4. In the User Exec mode, enter either the SHOW SYSTEM or SHOW VERSION command.
5. Examine the Software Version field in the display. This is the version number of the AlliedWare Plus management software on the switch.
6. Refer to “Software and Hardware Releases” on page 48 to determine whether the management software version supports all the XEM3 Modules in the switch.
7. Do one of the following:
   - ❒ If the management software supports all the XEM3 Modules in the switch, go to “Verifying the Switch with the AlliedWare Plus Commands” on page 118.
   - ❒ If the management software is an older version that does not support all the XEM3 Modules in the switch, update the software by referring to the *Software Reference for SwitchBlade x908 GEN3 Switch Series* on the Allied Telesis web site.

Verifying the Switch with the AlliedWare Plus Commands

To confirm the hardware operations of the switch with the AlliedWare Plus management software, perform the following procedure:

1. Start a local management session on the switch. Refer to “Starting a Local Management Session” on page 109.

2. To display the overall status of the system, including the power supplies, fan modules, and XEM3 Modules, enter the SHOW SYSTEM ENVIRONMENT command in the User Exec or Privileged Exec mode.

3. Examine the Status column in the display. Components with status “Ok” or “Online” are operating normally.

   Note
   Each AT-FAN08 Module contains four fans. The SHOW SYSTEM ENVIRONMENT command will display the status of all eight fans in the two AT-FAN08 Modules in the switch.

4. To display the status of the individual ports on the XEM3 Modules, use the SHOW INTERFACE STATUS command in the Privileged Exec mode. If you are still in the User Exec mode, enter the ENABLE command to move to the Privileged Exec mode. An example is shown in Figure 68.

```
awplus> enable
awplus# show interface status
Port         Name         Status           Vlan   Duplex    Speed  Type
port1.0.1                 notconnect       1      auto      auto   1000BASE-T
port1.0.2                 notconnect       1      auto      auto   1000BASE-T
port1.0.3                 notconnect       1      auto      auto   1000BASE-T
port1.0.4                 notconnect       1      auto      auto   1000BASE-T
```

Figure 68. SHOW INTERFACE STATUS Command

For further information about the command line interface, refer to the *Software Reference for SwitchBlade x908 GEN3 Switch Series* on the Allied Telesis web site.

5. If you have not completed cabling the networking ports, go to Chapter 6, “Cabling the Networking Ports” on page 87.

Section III

Building a VCStack

The chapters in this section provide an overview to the VCStack feature, as well as the commands and procedures to configuring the switches of a stack:

- Chapter 9, “Virtual Chassis Stacking Overview” on page 121
- Chapter 10, “VCStack Commands Overview” on page 145
- Chapter 11, “Configuring Switches for VCStack” on page 151
- Chapter 12, “Powering On and Verifying the Stack” on page 177

Chapter 9

Virtual Chassis Stacking Overview

The sections in this chapter are listed here:

- “Overview” on page 122
- “Stacking Guidelines” on page 123
- “Stack Trunk Guidelines” on page 124
- “Master and Member Switches” on page 135
- “Optional Feature Licenses” on page 137
- “Planning the Stack” on page 138

Note
For more information on VCStack, refer to the *Stacking Introduction* and *Stacking Commands* chapters in the *Software Reference for SBx908 GEN3 Series Switches, AlliedWare Plus Operating System* from **www.alliedtelesis.com**.

Overview

The Virtual Chassis Stacking (VCStack) feature lets you build a virtual stack of multiple SBx908 GEN3 Switches that function as a single networking unit. VCStack has 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 feature configurations. 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, 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 the VCStack guidelines:

- Stacking on the SBx908 GEN3 Switch requires V5.5.5-0.2 or later of the AlliedWare Plus management software. Instructions in this guide explain how to view the version number of the operating software on the switch.
- The switches in the stack must have the same version of the AlliedWare Plus management software
- 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 GEN3 Switch is disabled. Enabling it requires rebooting the switch. Instructions later in this guide explain how to enable the feature and reboot the unit.
- The VCStack feature supports optional feature licenses. When ordering a feature license, you need to order the same number of licenses as there are switches in the stack, and install the licenses on each switch. You can install licenses while the switches are operating in standalone mode or as a stack. Refer to the product's data sheet for a list of optional feature licenses.

Note
AlliedWare Plus V5.5.5-0.2 supports stacks of two switches. Later versions may support stacks of more switches. Refer to the product's data sheet or contact your Allied Telesis sales representative for further information.

Stack Trunk Guidelines

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

- Trunk ports can be 10G, 25G, 40G, 100G, or 400G.
- Trunk ports must all be the same speed.
- There are no default trunk ports.
- The maximum number of trunk ports permitted per chassis varies by module and port speed. Refer to Table 17. For example, a trunk build with 10G ports on XEM3-12XTm Modules can have a maximum of eight ports per switch.

  Table 17. Maximum Number of Trunk Ports Per Switch

Ethernet Module	Port or Transceiver Speed	Maximum Number of Trunk Ports Per Switch
XEM3-12XTm	10G	8
XEM3-12YS	10G	8
	25G	8
XEM3-8CQ	40G	4
	100G	2
XEM3-2DQ	100G	2
	400G	2

  For example, a trunk built with 40G AT-QSFP fiber optic transceivers in XEM3-8CQ Modules can have a maximum of four ports per switch.

- A stack can have only one trunk, but a trunk can have more than one port per switch.
- The trunk must have the same number of ports on all the switches.
- Managing and troubleshooting the trunk will be easier and simpler if you use the same ports for it on all the switches in the stack, and if the ports are sequential (1, 2, 3, etc.). However, this is not mandatory.
- You designate the trunk ports with the STACKPORT command in the AlliedWare Plus operating system.

- XEM3 Modules with trunk ports can be in any of the slots in the switch.
- Once you designate a port as a trunk port, you cannot view or change its parameter settings.
- 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 in the trunk. For a list of supported transceivers, refer to the Allied Telesis web site.
- A stack of SBx908 GEN3 Switches cannot contain other stacking products, such as x530 or x540L Series switches.
- The XEM3-12YS Module supports 1G SFP, 10G SFP+, and 25G SFP28 transceivers. However, trunks do not support 1G ports. Consequently, you must use either 10Gbps SFP+ or 25G SFP28 transceivers to use ports on XEM3-12YS Modules for the trunk.
- The trunk can contain ports from different types of XEM3 Modules, provided the following rules are followed:
  - The port speeds are all the same.
  - The ports use the same type of cable (i.e., copper or fiber optic).

  An example of this type of trunk would be copper ports on the XEM3-12XTm Module and copper port plug-ins in the XEM3-12YS Module.

Figure 69 illustrates the basic trunk configurations for stacks of two, three, and four switches. The examples show the XEM3-12YS Module, but the trunk topology is the same for all modules.

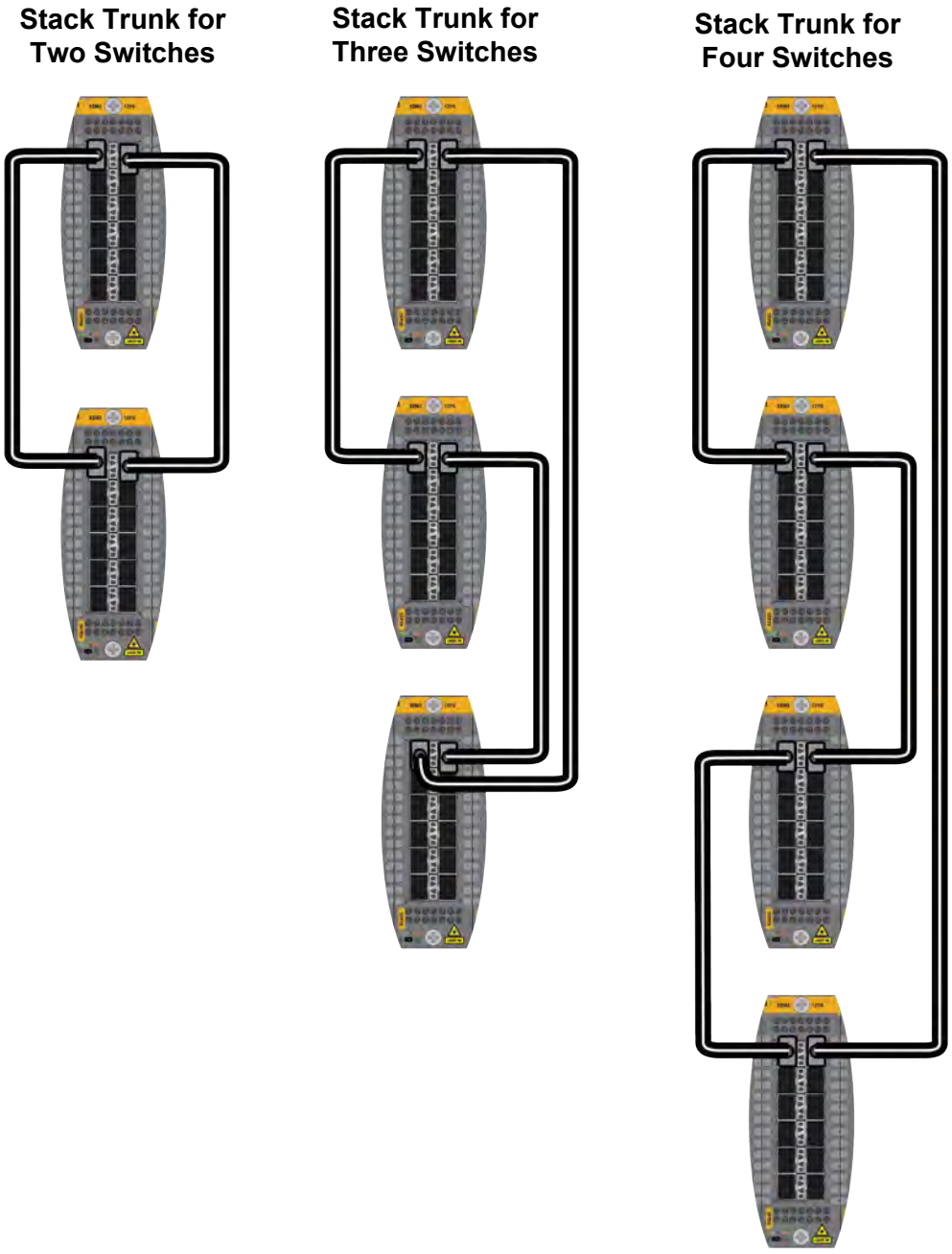


Figure 69. Example Trunks for Stacks of Two, Three, and Four Switches

The trunk configuration is referred to as a ring. The last switch in the stack has to be connected to the first switch, creating a loop. This is the recommended configuration because it adds resiliency to the stack by enabling the 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 of three switches with a linear trunk is shown in Figure 70. However, this trunk topology is not recommended.

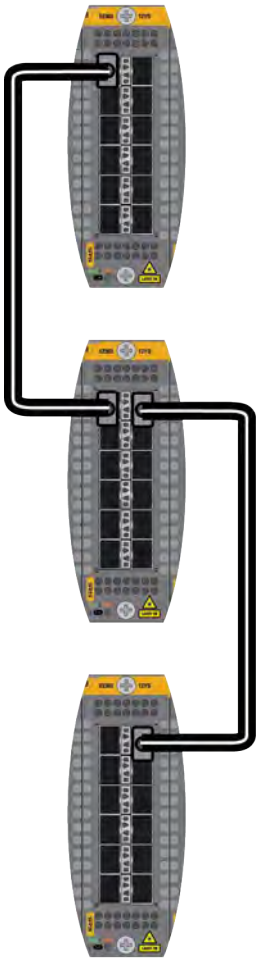


Figure 70. Stack of Three Switches with a Linear Trunk

You can increase the bandwidth and resiliency of the trunk by increasing the number of physical links between switches, up to the permitted maximum per module type. The example in Figure 71 uses ports on XEM3-12YS Modules to build a stack of three switches, with a trunk of three links from switch-to-switch.

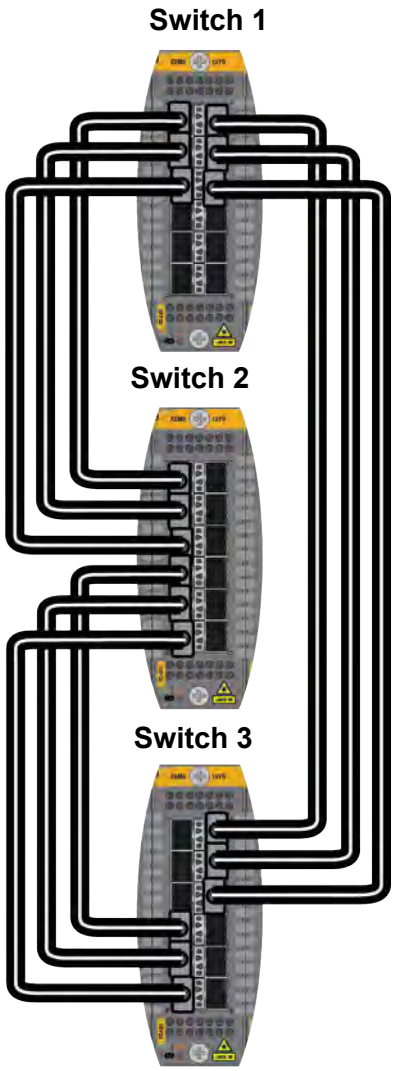


Figure 71. Example of a Trunk with Multiple Links Between Switches

You can further improve the resiliency of the trunk by distributing the ports onto multiple modules in the switches. This makes it possible for trunks to continue functioning, though at reduced bandwidths, even if modules with trunk ports fail. The example in Figure 72 is a stack of three switches with a trunk of three links from switch-to-switch, on different XEM3-12YS Modules.

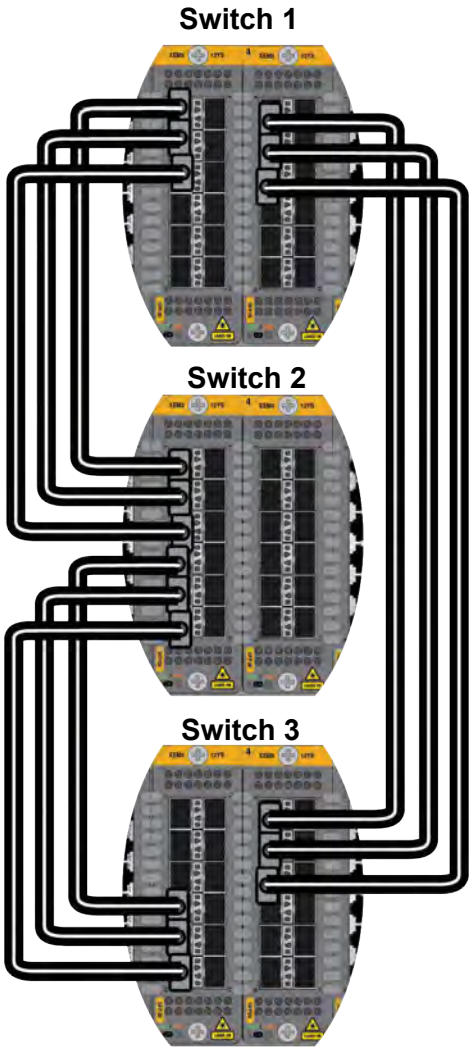


Figure 72. Example of a Stack Trunk of Ports on Multiple XEM3 Modules

A trunk can consist of both fiber optic and direct connect cables on XEM3 Modules that support both types of cables, provided that the ports are operating at the same speed. The example in Figure 73 illustrates a stack of three switches that are linked with a trunk consisting of XEM3-12YS Modules with both types of cables.

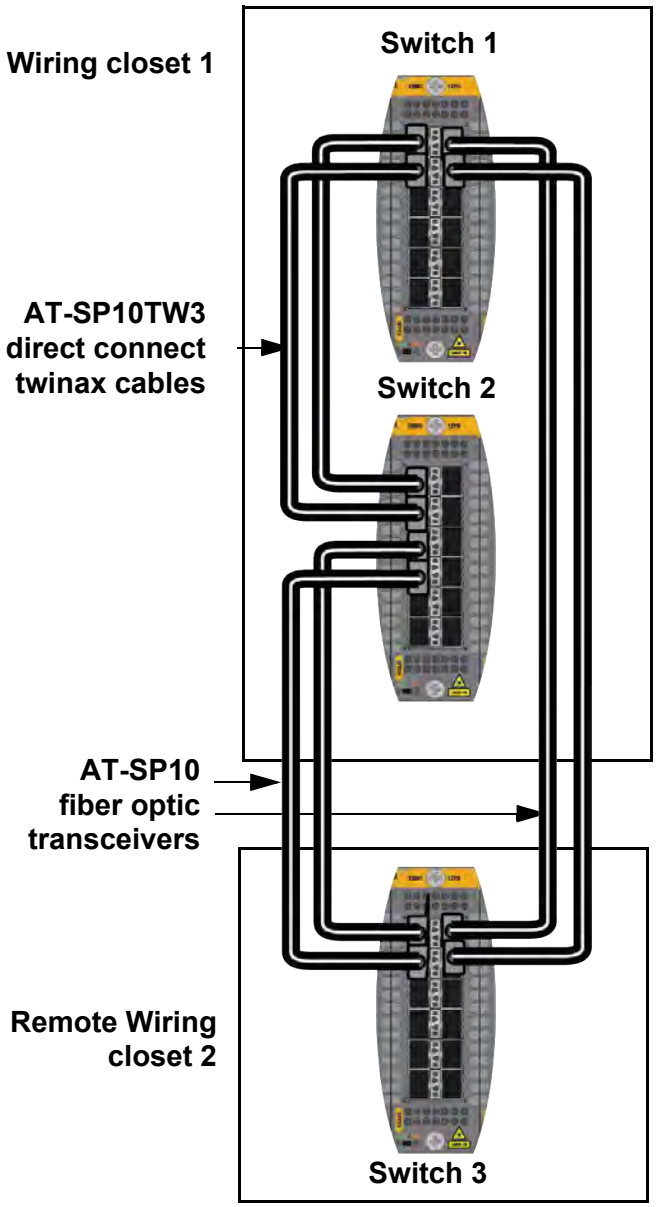


Figure 73. Trunk Consisting of Both Fiber Optic and Direct Connect Cables

Figure 74 is an example of an invalid trunk because it exceeds the permitted number of trunk ports per switch. The stack has two switches. The trunk consists of 400G AT-QSFP56DD fiber optic transceivers in XEM3-2DQ Modules. As listed in Table 17, XEM3-2DQ Modules can have a maximum of two trunk ports per switch. The two switches have four trunk ports each, making it an invalid trunk. To bring the example into compliance with the rule, you would use only two ports for the trunk in each switch.

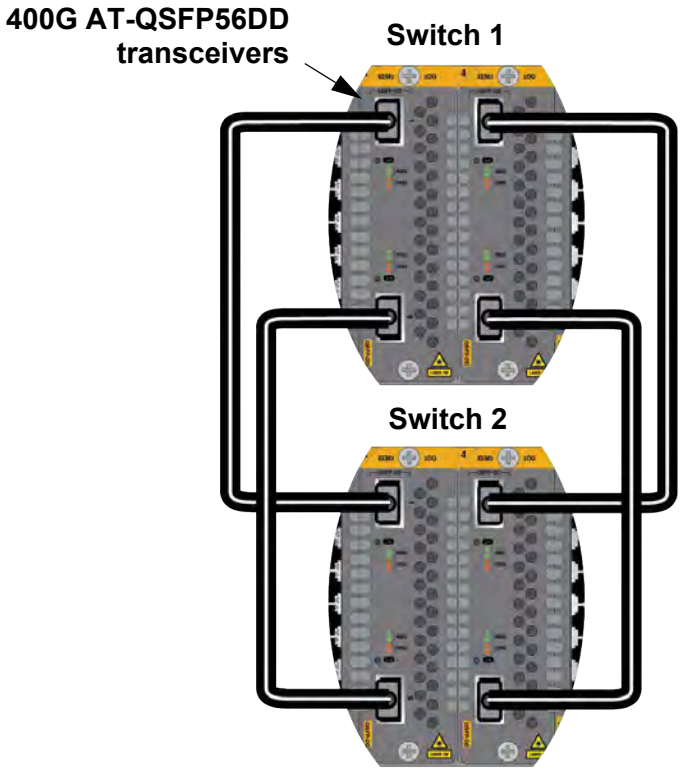


Figure 74. Invalid Trunk - Too Many Trunk Ports

With stacks of three or four switches, the number of ports in the trunk has to be the same on all the switches. The trunk in Figure 75 is invalid because the units do not have the same number of trunk links. There are three links between switches 1 and 2 and switches 2 and 3, but only one link between switches 1 and 3.

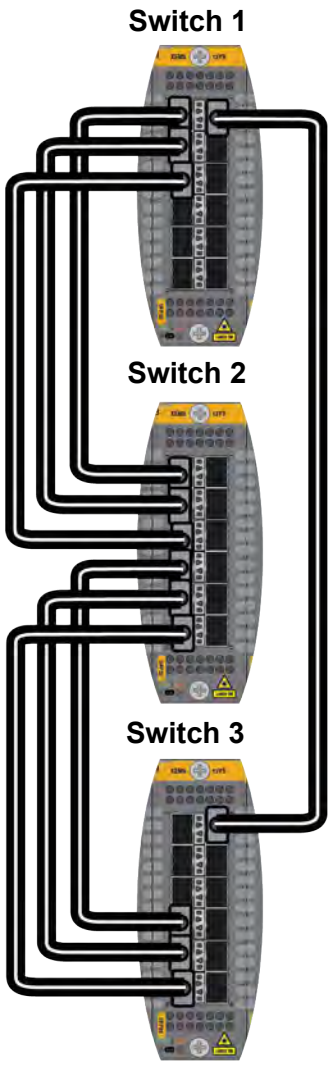


Figure 75. Invalid Trunk - Unequal Number of Trunk Links Between Switches

In stacks of four switches, no switch can have trunk links to more than two other chassis. The trunk example in Figure 76 is invalid because switch 1 has trunk links to three switches.

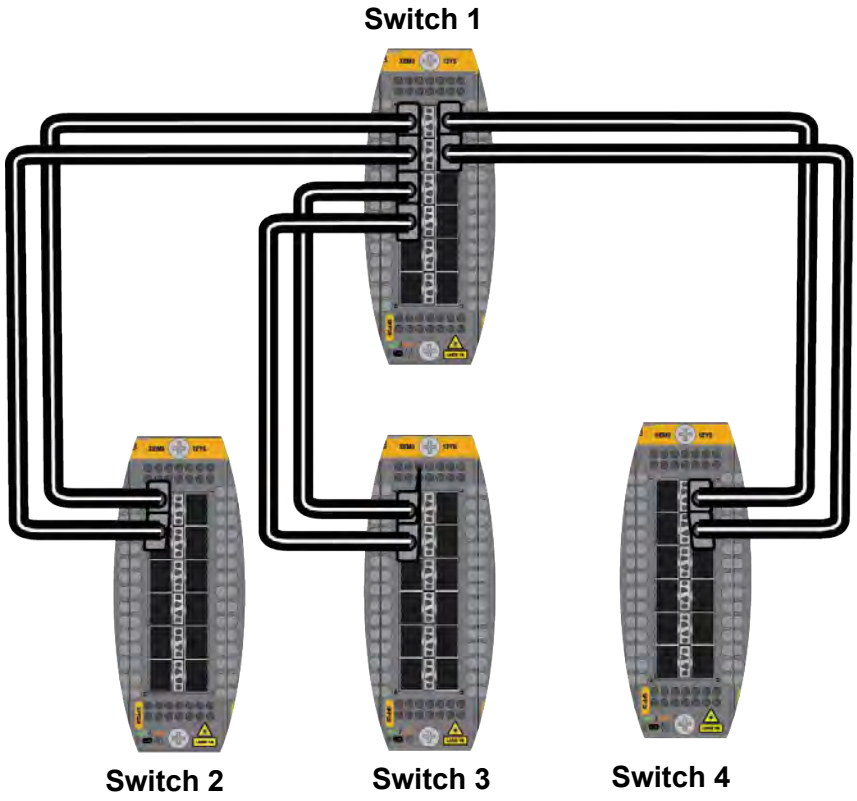


Figure 76. Invalid Trunk - Switch is Connected to Three Other Switches

Trunk links must be direct connections between ports on the modules. A trunk cannot contain intermediate network devices, such as media converters, routers, or other Ethernet switches. Figure 77 is an example of an invalid trunk because it contains media converters.

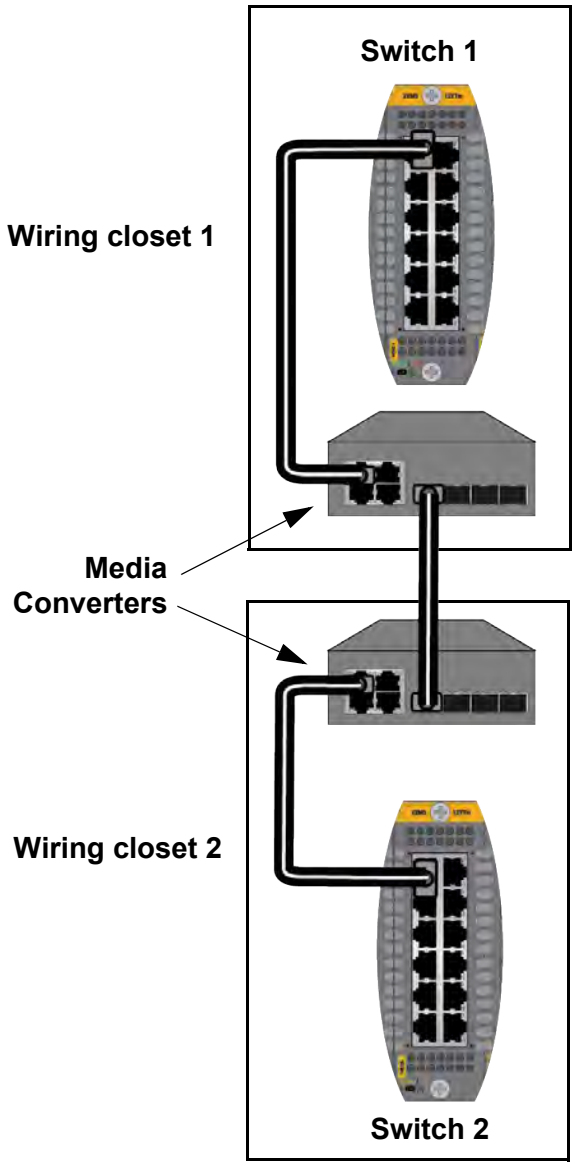


Figure 77. Invalid Trunk - Intermediate Network Devices

Master and Member Switches

A stack has a master switch. A stack can have only one master switch at a time. Here are its main functions:

- Coordinate and monitor stack operations.
- Verify that the switches are using the same version of the AlliedWare Plus 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 active master switch is removed from the stack or powered off. This ensures continued operations of the stack even if the master switch stops operating.

Priority Numbers

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

- Switch priority numbers
- MAC addresses

The switch 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 switches have the same priority value, 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 their 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 change the priority settings on the individual units and so control which switch will be the master switch after subsequent power cycles or 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 switches and ports when configuring the devices with the commands in the AlliedWare Plus management software. This is explained in “Configuring the Master Switch” on page 161 and “Configuring the Member Switches” on page 168.

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 11, “Configuring Switches for VCStack” on page 151 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 their 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 GEN3 Series 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 have to be 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 GEN3 Switches:

- The VCStack feature is part of the base features of the switch. It does not require an optional feature license.
- You can install feature licenses while the switches are operating as standalone 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 will only be available on those switches with the licenses. The stack generates a warning message when reset or powered on, if it detects that the switches have different optional feature licenses.

Planning the Stack

Building a stack requires planning. Here are factors to consider before installing any hardware:

- How many SBx908 GEN3 Switches will be in the stack? The maximum number depends on the version of the AlliedWare Plus management software. AlliedWare Plus V5.5.5-0.2 supports stacks of two switches. Later versions may support stacks of more switches. Refer to the product's data sheet or contact your Allied Telesis sales representative for further information.
- Where will the switches be located?
- Which switch will be the master switch? Refer to "Master and Member Switches" on page 135
- What will be their priority numbers? Refer to "Priority Numbers" on page 135.
- What will be their ID numbers? Refer to "Switch ID Numbers" on page 136.
- Which XEM3 Modules will be installed in the switches and what will be their slot assignments?
- Which transceivers will be installed in XEM3-12YS, XEM3-8CQ, and XEM3-2DQ Modules? Refer to the product's datasheet for the list of supported transceivers.
- Which ports will be the stack trunk? Refer to "Stack Trunk Guidelines" on page 124.

The following two worksheets are provided to assist you in planning, building, and maintaining your stack of SBx908 GEN3 Switches. Before installing or configuring any of the devices, you should copy and fill out the worksheets for each switch that will be in the stack:

- Table 18, "Worksheet 1: General Switch Information" on page 139 - Use this worksheet to record general information about the switch, such as its master or member role in the stack, stack ID number, priority number, and location.
- Table 19, "Worksheet 2: XEM3 Modules and Ports" on page 140 - Use this worksheet to record the XEM3 Modules to be installed in the switch and the network devices connected to the ports. At a minimum, you should record which modules and ports will be the stack trunk. You will need this information when configuring the switches.

Table 18. Worksheet 1: General Switch Information

Parameter	Value
Location:	
Switch Role in Stack:	Master or Member (Circle one.)
Switch ID Number:	1 2 3 4 (Circle one.)
Priority Number:	1 2 3 4 (Circle one.)
Number of Switches in the Stack:	1 2 3 4 (Circle one.)
AlliedWare Plus Version Number: (Minimum V5.5.5-0.2)	
Optional Feature Licenses:	

Note
AlliedWare Plus V5.5.5-0.2 supports stacks of two switches. Later versions may support stacks of more switches. Refer to the product's data sheet or contact your Allied Telesis sales representative for further information.

Table 19. Worksheet 2: XEM3 Modules and Ports

Slot	XEM3 Modules and Ports
Switch ID Number and Role (Master or Member)	
1	XEM3-12XTm XEM3-12YS XEM3-8CQ XEM3-2DQ (Circle one.) Port 1: Port 7: Port 2: Port 8: Port 3: Port 9: Port 4: Port 10: Port 5: Port 11: Port 6: Port 12:
2	XEM3-12XTm XEM3-12YS XEM3-8CQ XEM3-2DQ (Circle one.) Port 1: Port 7: Port 2: Port 8: Port 3: Port 9: Port 4: Port 10: Port 5: Port 11: Port 6: Port 12:
3	XEM3-12XTm XEM3-12YS XEM3-8CQ XEM3-2DQ (Circle one.) Port 1: Port 7: Port 2: Port 8: Port 3: Port 9: Port 4: Port 10: Port 5: Port 11: Port 6: Port 12:
4	XEM3-12XTm XEM3-12YS XEM3-8CQ XEM3-2DQ (Circle one.) Port 1: Port 7: Port 2: Port 8: Port 3: Port 9: Port 4: Port 10: Port 5: Port 11: Port 6: Port 12:

Table 19. Worksheet 2: XEM3 Modules and Ports (Continued)

Slot	XEM3 Modules and Ports				
5	XEM3-12XTm	XEM3-12YS	XEM3-8CQ	XEM3-2DQ	(Circle one.)
	Port 1:		Port 7:		
	Port 2:		Port 8:		
	Port 3:		Port 9:		
	Port 4:		Port 10:		
	Port 5:		Port 11:		
	Port 6:		Port 12:		
6	XEM3-12XTm	XEM3-12YS	XEM3-8CQ	XEM3-2DQ	(Circle one.)
	Port 1:		Port 7:		
	Port 2:		Port 8:		
	Port 3:		Port 9:		
	Port 4:		Port 10:		
	Port 5:		Port 11:		
	Port 6:		Port 12:		
7	XEM3-12XTm	XEM3-12YS	XEM3-8CQ	XEM3-2DQ	(Circle one.)
	Port 1:		Port 7:		
	Port 2:		Port 8:		
	Port 3:		Port 9:		
	Port 4:		Port 10:		
	Port 5:		Port 11:		
	Port 6:		Port 12:		
8	XEM3-12XTm	XEM3-12YS	XEM3-8CQ	XEM3-2DQ	(Circle one.)
	Port 1:		Port 7:		
	Port 2:		Port 8:		
	Port 3:		Port 9:		
	Port 4:		Port 10:		
	Port 5:		Port 11:		
	Port 6:		Port 12:		

The table columns are described in Table 20.

Table 20. Stacking Worksheet Columns

Column	Description
Location	Use this row to write down the physical location of the switch, such as the building or equipment room. The information can be useful in locating switches if they are in different locations.
Switch Role in Stack	Use this row to indicate whether the switch will be the master or a member of the stack.
Switch ID Number	Use this row to specify the unique ID to be assigned the switch. The range is 1 to 4. Allied Telesis recommends assigning the ID 1, the default value, to the master switch. Refer to “Switch ID Numbers” on page 136.
Priority Number	Use this row to specify the priority value to be assigned the switch. The range is 0 to 255. The default value is 128. Allied Telesis recommends setting the priority value to the same value as switch ID number. For example, the switch with the ID 1 should be assigned the priority number 1, the switch with ID 2 should be assigned priority value 2, and so on. Refer to “Priority Numbers” on page 135.
Number of Switches in the Stack	Use this row to indicate the number of switches that will be in the stack. AlliedWare Plus V5.5.5-0.2 supports stacks of two switches. Later versions may support stacks of more switches. Refer to the product’s data sheet or contact your Allied Telesis sales representative for further information.
AlliedWare Plus Firmware Version Number	Use this row to write down the version number of the AlliedWare Plus management software on the switch. (You will display the version number when configuring the switches.) The switches might not be able to form the stack if they have different versions. If they have different versions, you should update them to the most recent release prior to building the stack.

Table 20. Stacking Worksheet Columns (Continued)

Column	Description
Optional Feature Licenses	Use this row to enter any optional feature licenses purchased for the switch. All switches in a stack must have the same feature licenses or they may not be able to form the stack. The VCStack feature does not require a feature license. It comes standard with the AlliedWare Plus management software.

Table 21 is an example of a completed Worksheet 1 for the master switch for a stack of two switches.

Table 21. Example - Worksheet 1: General Information

Parameter	Value
Location:	Building 3, floor 2, rm 208a
Switch Role:	(Master) or Member (Circle one.)
Switch ID Number:	(1) 2 3 4 (Circle one.)
Priority Number:	(1) 2 3 4 (Circle one.)
Number of Switches in Stack:	1 (2) 3 4 (Circle one.)
AlliedWare Plus Version Number: (Minimum V5.5.5-0.2)	V5.5.5-0.2
Optional Feature Licenses:	None.

Table 22. Example - Worksheet 2: XEM3 Modules and Ports

Slot	XEM3 Modules and Ports
Switch ID number and Role 1 - Master	
1	XEM3-12XTm XEM3-12YS XEM3-8CQ XEM3-2DQ (Circle one.) Port 1: Stack Trunk Port Port 2: Stack Trunk Port Port 3: Fl-3,cube 316 Port 4: Fl-3,cube 317 Port 5: Fl-3,cube 318 Port 6: Fl-3,cube 319 Port 7: Fl-3,cube 310 Port 8: Fl-3,rm 32 Port 9: Fl-3,rm 33 Port 10: Fl-3,rm 35 Port 11: Fl-3,area-1 Port 12: Fl-3,area-2
2	XEM3-12XTm XEM3-12YS XEM3-8CQ XEM3-2DQ (Circle one.) Port 1: Flr-2,svr-rm 220-sys5 Port 2: Flr-2,printer-30a Port 7: none Port 8: none

Chapter 10

VCStack Commands Overview

This chapter briefly describes the basic commands to configuring the master and member switches for stacking. For further instructions, refer to the following documents on the Allied Telesis website:

- *Software Reference for SBx908 GEN3 Switch, AlliedWare Plus Operating System*
- *Virtual Chassis Stacking (VCStack): Feature Overview and Configuration Guide*

After reviewing the commands, go to Chapter 11, “Configuring Switches for VCStack” on page 151 to start the configuration procedures.

Here are the stacking commands:

- “STACK ENABLE Command” on page 146
- “STACKPORT Command” on page 147
- “STACK PRIORITY Command” on page 148
- “STACK RENUMBER Command” on page 149
- “SWITCH PROVISION Command” on page 150

STACK ENABLE Command

This command is used to activate the VCStack feature on the switch. The default setting for the VCStack feature is disabled. The command is located in the Global Configuration mode of the AlliedWare Plus management software. 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
```

STACKPORT Command

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 module 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
```

In this example, ports 1 and 2 on the modules in slots 3 and 4 on the member switch with ID 2 are designated as members of the stack trunk:

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

STACK PRIORITY Command

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 simpler and easier.

The command is located in the Global Configuration mode. Here is its format:

`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 4. 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 Command

You use this command to assign unique ID numbers to the switches in a stack. The AlliedWare Plus management software uses the ID numbers to identify the individual switches in the stack. The range is 1 to 4. The default is 1. The master switch will use the default value. You will 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 4.

Note
Changing the ID number requires resetting the switch. The new ID assignment is not implemented until the switch is reset.

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

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

This example changes the switch's ID from the default ID 1 to 3:

```
awplus(config)# stack 1 renumber 3
```

SWITCH PROVISION Command

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 sbx908gen3
```

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

```
awplus(config)# switch 2 provision sbx908gen3
```

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 sbx908gen3
```

Chapter 11

Configuring Switches for VCStack

This chapter contains the following procedures:

- “Introduction” on page 152
- “Powering On SBxPWRSYS2 (AC) Power Supplies” on page 153
- “Starting a Local Management Session” on page 156
- “Starting the First Management Session Through the NET MGMT Port” on page 159
- “Configuring the Master Switch” on page 161
- “Configuring the Member Switches” on page 168

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 123.
- If you have already connected network cables to the trunk ports on the XEM3 Modules, remove them before continuing. Trunk ports should be cabled only after all switches are configured for stacking.
- Allied Telesis recommends filling out the worksheets in “Planning the Stack” on page 138 before configuring the switches.

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

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 the SBxPWRSYS2 (AC) Power Supply” on page 72 for instructions.

Before powering on the chassis, review the information in “Power Specifications of the SBxPWRSYS2 (AC) Power Supply” on page 216 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 (AC) 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.

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 78 on page 154.

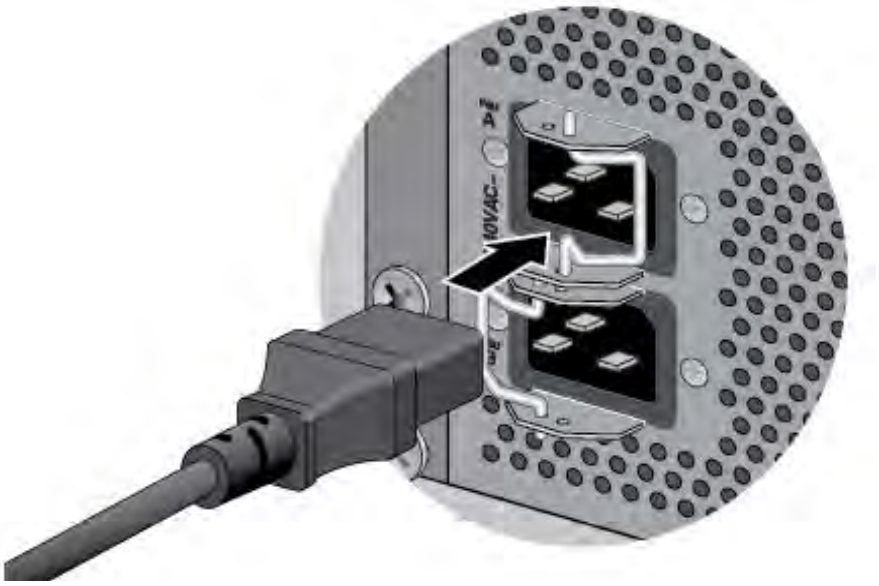


Figure 78. Connecting the AC Power Cord

2. Move the retaining clip over the power cord to secure the cord to the chassis. Refer to Figure 79.

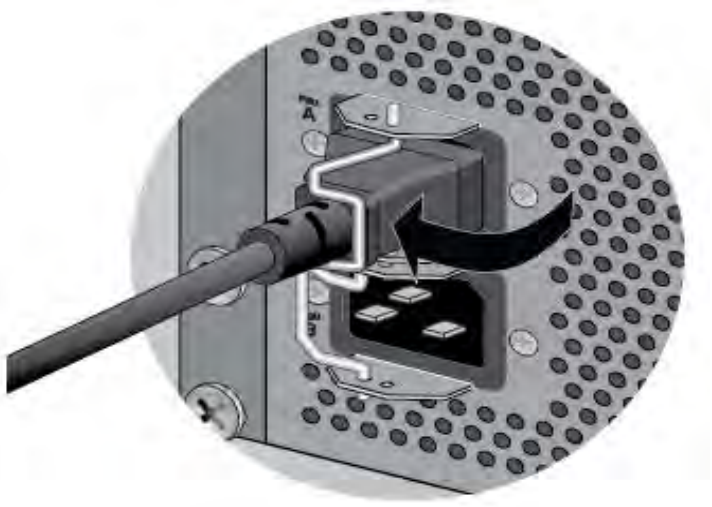


Figure 79. Securing the Power Cord with the Retaining Clip

3. Connect the power cord to an appropriate AC power source. Refer to Figure 80 on page 155.

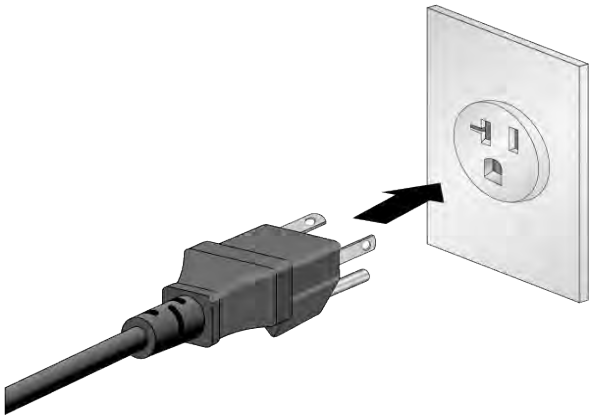


Figure 80. Connecting the Power Cord to an AC Power Source

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 23 on page 63.

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 start the AlliedWare Plus management software. Afterwards, go to “Configuring the Master Switch” on page 161 or “Configuring the Member Switches” on page 168.

Starting a Local Management Session

The section contains the procedure for starting a local management session with the switch through the Console port.

Note
The first management session with the switch cannot be conducted through the XEM3 Modules because their ports are not yet members of any VLANs.

The procedure requires the following items:

- Terminal, desktop computer, or laptop with either a USB port or DB-9 (D-sub 9-pin) female connector
- Terminal emulator, such as PuTTy
- Management cable

The connector on the management cable will depend on whether your computer has a USB port or DB-9 female connector:

- If your device has a USB port, you will need a USB-to-Serial converter that is compatible with its operating system. An example is the VT-Kit3 converter from Allied Telesis. Refer to Figure 81. The converter has two connectors. One is a standard USB 3.0 connector that connects to the USB port on your computer or laptop. The other is a nine-pin female RJ-45 connector that connects to the Console port on the switch with a standard, straight-through Ethernet cable.

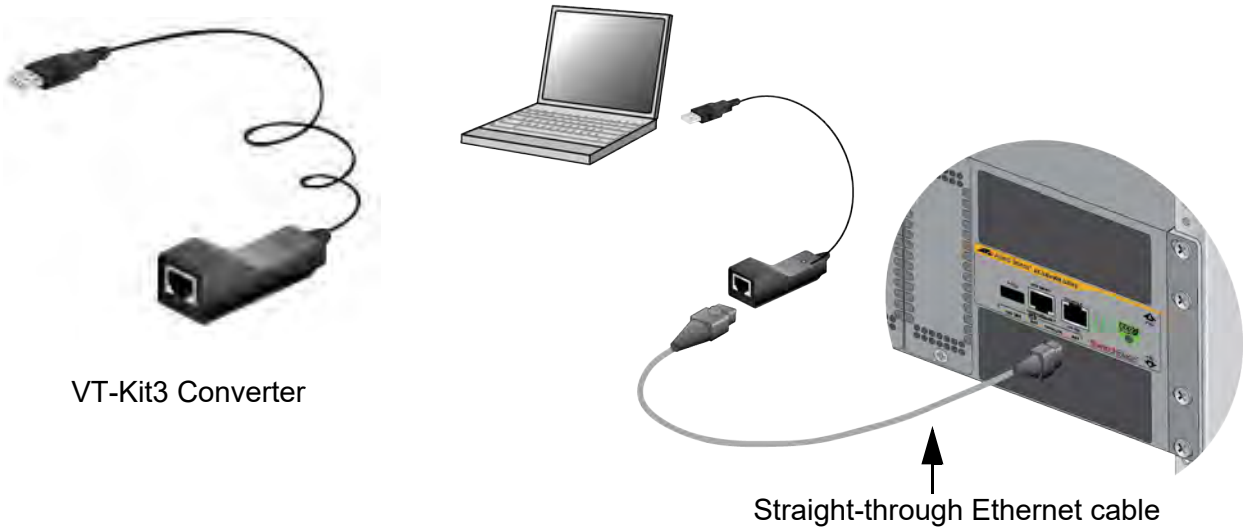


Figure 81. VT-Kit3 Converter

- If your device has a DB-9 female connector, you will need a serial management cable with a DB-9 male connector that connects to your computer and a nine-pin male RJ-45 connector that connects to the Console port on the switch. An example is illustrated in Figure 82. The wiring requirements of the cable are provided in “Console Management Cable with DB-9 Female and RJ-45 Connectors” on page 222.

Figure 82. Serial Management Cable with RJ-45 and DB-9 Connectors

Note
The SBx908 GEN3 Switch does not come with a management cable.

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

1. Power on the switch by connecting the AC power cord to the power supply on the rear 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 153.
2. Wait three minutes for the switch to initialize the AlliedWare Plus management software.
3. Connect your terminal, computer, or laptop to the Console port on the switch with your management cable. For an example using the VT-Kit3 management cable from Allied Telesis, refer to Figure 81 on page 156.
4. Start your terminal emulator.
5. Configure the VT-100 terminal or terminal emulation program as follows:
   - Baud rate: 115200 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.

8. If this is the first log on to the switch, the switch prompts you to change the logon password. The password can be up to 32 characters from the following four categories:
   - Uppercase letters: A to Z.
   - Lowercase letters: a to z
   - Digits: 0 to 9
   - Special symbols: all printable ACSII characters not included in the previous categories. The question mark (?) is excluded. It cannot be used in of a password.

   If the system requests a privilege level, enter 15, the highest level that provides full access.

   The local management session starts when the User Exec mode prompt, shown in Figure 83. is displayed.

```
awplus>
```

Figure 83. 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 GEN3 Series Switches, AlliedWare Plus Operating System* from **www.alliedtelesis.com**.

9. Go to “Configuring the Master Switch” on page 161 or “Configuring the Member Switches” on page 168.

Starting the First Management Session Through the NET MGMT Port

This section contains the procedure for starting the first management session with the switch through the NET MGMT port on the management panel. For a description of the port and its function, refer to “NET MGMT Ethernet Management Port” on page 40.

Note
This procedure requires a Secure Shell (SSH) client on your workstation.

To start the first management session through the NET MGMT port on the management panel, perform the following procedure:

1. Connect the NET MGMT port to a device on your network, such as a port on a Gigabit Ethernet switch. Refer to “NET MGMT Ethernet Management Port” on page 40 for cable requirements.
2. If the switch is powered off, power it on. For instructions, refer to “Powering On SBxPWRSYS2 (AC) Power Supplies” on page 153.
3. Wait three minutes for it to initialize the AlliedWare Plus management software.
4. Start the SSH client on your workstation.
5. Enter the IP address of the switch in the SSH client. Review the following:
   - The switch has a DHCP client. Its default state is enabled. If your network has a reachable DHCP server, the switch will use the IP address assigned to it by the server.
   - If the switch does not receive a response from a DHCP server, it uses the default address 169.254.42.42/16.
6. Press Enter. You are prompted for the user name and password.
7. Enter the switch’s user name and password. The default values are “manager” and “friend” (without the quotes), respectively.

Note
User names and passwords are case sensitive.

8. If this is the first log on to the switch, the switch prompts you to change the logon password. The password can be up to 32 characters from the following four categories:

   - Uppercase letters: A to Z.
   - Lowercase letters: a to z
   - Digits: 0 to 9
   - Special symbols: all printable ACSII characters not included in the previous categories. The question mark (?) is excluded. It cannot be used in of a password.

   If the system requests a privilege level, enter 15, the highest level that provides full access.

9. The management session starts when the User Exec mode prompt is displayed. Refer to Figure 83 on page 158.

10. Do one of the following:

    - To configure the master switch, go to “Configuring the Master Switch” on page 161.
    - To configure a member switch, go to “Configuring the Member Switches” on page 168.

Configuring the Master Switch

The following sections contain the following procedures for configuring and verifying the master switch of the stack:

- ❒ “General Steps for the Master Switch,” next
- ❒ “Configuring the Master Switch” on page 162
- ❒ “Verifying the Master Switch” on page 165
- ❒ “What to Do Next” on page 167

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

You will need to provide the following information when configuring the master switch:

- ❒ Which ports will be the stack trunk on the master switch?
- ❒ How many member switches will be in the stack?

Note
Allied Telesis recommends filling out the worksheets in “Worksheet 1: General Switch Information” on page 139 and “Worksheet 2: XEM3 Modules and Ports” on page 140 for each switch to be in the stack before configuring the devices.

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 management session on the switch. Refer to “Starting a Local Management Session” on page 156. or “Starting the First Management Session Through the NET MGMT Port” on page 159.
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. The default setting for the VCStack feature is disabled.

4. Assign the master switch the priority 1 with the STACK PRIORITY command in the Global Configuration mode. This ensures 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 ensures that the master switch knows about the member switches during the first power-on of the stack.

7. Save your changes with the WRITE command.

8. Reboot the switch with the REBOOT command.

9. Start a new local management session.

10. Verify your changes with the SHOW STACK and SHOW RUNNING-CONFIG commands.

Configuring the Master Switch

To configure the master switch for stacking, perform the following procedure:

1. Power on the master switch and wait two minutes for it to start the AlliedWare Plus management software. For instructions, refer to “Powering On SBxPWRSYS2 (AC) Power Supplies” on page 153.

2. Start a management session on the switch. Refer to “Starting a Local Management Session” on page 156 or “Starting the First Management Session Through the NET MGMT Port” on page 159.

3. Enter the ENABLE command to move to the Privileged Exec mode.

   ```
   awplus> enable
   ```

4. Enter the SHOW SYSTEM ENVIRONMENT command to verify that the hardware components are operating properly. All components should have an “Ok” status.

   ```
   awplus# show system environment
   ```

5. Enter the SHOW CARD command to verify that the XEM3 modules are operating properly. The cards should have an “Online” state.

   ```
   awplus# show card
   ```

6. Enter the SHOW VERSION command to display the version number of the AlliedWare Plus operating software on the switch. The VCStack feature requires V5.5.5-0.2 or later. If you are using the worksheets in “Planning the Stack” on page 138, write down the version number for

the master switch. 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) 5.5.5-0.2
```

7. Enter the CONFIGURE TERMINAL command to move to the Global Configuration mode.

```
awplus# configure terminal
Enter configuration commands, one per line. End with
CNTL/Z.
```

Note
The next two steps activate the VCStack and assign the switch the priority 1 so that it is selected as the master switch when the stack is powered on.

8. Enter the STACK ENABLE command to activate VCStack on the switch.

```
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. Enter the STACK PRIORITY command to assign priority 1 to the switch. This ensures 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.
```

Note
The next two steps use the STACKPORT command to designate the ports of the stack trunk on the master switch.

10. With the INTERFACE command, enter the port Interface modes of the ports that will be the stack trunk on the master switch. If you filled out the worksheets in “Planning the Stack” on page 138, refer there for the stacking ports. The example assumes the trunk ports are ports 1 to 4 on the line card in slot 8:

```
awplus(config)# interface port1.8.1-1.8.4
awplus(config-if)#
```

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. Enter the EXIT command to return to the Global Configuration mode.

```
awplus(config-if)# exit
```

> **Note**
> The next step uses the SWITCH PROVISION command to add the member switches as provisioned switches to the master switch.

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 4. The following command examples add three provisioned member switches to the master switch, with the IDs 2 to 4:

```
awplus(config)# switch 2 provision sbx908gen3
awplus(config)# switch 3 provision sbx908gen3
awplus(config)# switch 4 provision sbx908gen3
```

> **Note**
> The next steps save your changes on the master switch and reboot it. Rebooting the switch activates your changes.

14. Enter the EXIT command to return to the Privileged Exec mode.

```
awplus(config)# exit
awplus#
```

15. Enter the WRITE command to save your changes. If this is the first management session, the switch creates the configuration file DEFAULT.CFG in flash memory to store your configuration changes.

```
awplus# write
Building configuration ...
[OK]
```

> **Note**
> If you do not save your changes, the switch will discard them when you reboot the switch in the next step, and you will have to reenter them.

16. Enter the REBOOT command to restart the switch, and enter “Y” for yes.

```
awplus# reboot
reboot system? (y/n):Y
awplus#
```

17. Wait two minutes for the switch to start the AlliedWare Plus management software.

18. 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 following steps to confirm the configuration of the master switch.

1. Start a new management session on the master switch. Refer to “Starting a Local Management Session” on page 156 or “Starting the First Management Session Through the NET MGMT Port” on page 159.

2. Move to the Privileged Exec mode with the ENABLE command.

```
awplus> enable
awplus#
```

> **Note**
> The next two steps verify that the provisioned member switches were added to the switch.

3. Enter the SHOW STACK command to view the stack configuration on the master switch. Figure 84 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)
awplus#
```

Figure 84. Example SHOW STACK Command for the Master Switch

4. 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 162. Be sure to perform the STACK PRIORITY command and save your changes with the WRITE command.
   - The other ID entries are for the provisioned member switches. The example in Figure 84 shows three provisioned member switches. There should be one entry for each member switch that will be in your stack. Their fields are empty because the master switch is not yet part of the stack. If the table does not include those fields, repeat “Configuring the Master Switch” on page 162. Be sure to add the member switches with 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 162. Be sure to perform the STACK ENABLE command and to save your changes with the WRITE command.

   Note
   The next step verifies the assignments of the trunk ports.

5. 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 on the master switch. The ports should be designated with INTERFACE PORT and STACKPORT commands. In the example in Figure 85, the stack trunk will consist of ports 1 to 4 on the line card in slot 8 on the master switch (port1):

   ```
   interface port1.8.1-1.8.4
     stackport
   ```

   Figure 85. Example of the SHOW RUNNING-CONFIG Command

6. Go to “What to Do Next” on page 167.

What to Do Next

After configuring the master switch, do the following:

1. Power off the switch by disconnecting the AC power cords from the AC power sources.
2. Configure the member switches. Refer to “Configuring the Member Switches” on page 168.
3. After configuring the master and member switches, cable the ports of the stack trunk. Refer to Chapter 6, “Cabling the Networking Ports” on page 87.
4. Power on the master and member switches of the stack. Refer to “Powering on the Stack” on page 178.
5. Verify the stack by referring to “Verifying the Stack” on page 179.
6. Cable the networking ports. Refer to Chapter 6, “Cabling the Networking Ports” on page 87.

Configuring the Member Switches

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

- ❒ “General Steps for Member Switches” on page 168
- ❒ “Configuring a Member Switch - Part I” on page 169
- ❒ “Configuring a Member Switch - Part II” on page 171
- ❒ “Verifying a Member Switch” on page 173
- ❒ “What to Do Next” on page 174

Note
The procedures require resetting member switches twice. Some network traffic may 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 member 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 number 1 from the switch’s configuration. Instead, the switch retains it as a 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. Save your changes with the WRITE command in the Privilege Exec mode.
5. Restart the switch with the REBOOT command.
6. Start a new local management session.
7. 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's ID number.

To configure a member switch, perform the following procedure.

1. Power on a member switch and wait two minutes for it to initialize the AlliedWare Plus management software. For instructions, refer to "Powering On SBxPWRSYS2 (AC) Power Supplies" on page 153.
2. Start a management session. Refer to "Starting a Local Management Session" on page 156 or "Starting the First Management Session Through the NET MGMT Port" on page 159.
3. Enter the ENABLE command to move from the User Exec mode to the Privileged Exec mode.

   ```
   awplus> enable
   awplus#
   ```

4. Enter the SHOW SYSTEM ENVIRONMENT command to verify that the hardware components are operating correctly. All components should have an "Ok" status.

   ```
   awplus# show system environment
   ```

5. Enter the SHOW CARD command to verify that the XEM3 Modules are operating properly. The cards should have an “Online” state.

   ```
   awplus# show card
   ```

6. Enter the SHOW VERSION command to display the version number of the AlliedWare Plus management software on the switch. The VCStack feature requires V5.5.5-0.2 or later. If you are using the worksheets in “Planning the Stack” on page 138, write down the version number in the worksheet for this member switch. 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 need to be updated.

   ```
   awplus# show version
   AlliedWare Plus (TM) 5.5.5-0.2
   ```

7. Enter the CONFIGURE TERMINAL command to move to the Global Configuration mode.

   ```
   awplus# configure terminal
   Enter configuration commands, one per line. End with
   CNTL/Z.
   ```

8. Enter the STACK ENABLE command to activate VCStack on the member switch.

```
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 an ID number to the member switch with the STACK RENUMBER command. Every switch in a stack must have a unique ID number. If you are using the worksheets in “Planning the Stack” on page 138, 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
    awplus#
    ```

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. Enter the REBOOT command and type “Y” for yes to restart the switch.

```
awplus# reboot
reboot system? (y/n):y
awplus#
```

13. Wait two minutes for the switch to restart the AlliedWare Plus management software.

14. 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 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 the instructions to the second part of configuring member switches. The instructions explain how to do the following:

- Set the priority number. For background information, refer to “Master and Member Switches” on page 135.
- Designate the ports of the stack trunk. For background information, refer to “Stack Trunk Guidelines” on page 124.

To perform Part II of configuring a member switch, perform the following procedure:

1. Start a new management session. Refer to “Starting a Local Management Session” on page 156 or “Starting the First Management Session Through the NET MGMT Port” on page 159.

2. Enter the ENABLE command to move from the User Exec mode to the Privileged Exec mode.

```
awplus> enable
awplus#
```

3. Enter the CONFIGURE TERMINAL command to move to the Global Configuration mode.

```
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 “Planning the Stack” on page 138, 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 8 for the stack trunk. Be sure to modify the command with the ports you selected for the stack trunk.

```
awplus(config)# interface port2.8.1-2.8.4
```

6. Enter the STACKPORT command to designate the ports as the stack trunk on the member switch.

```
awplus(config-if)# stackport
% Save the config and restart the system for this change
to take effect.
```

7. Enter the EXIT command twice to return to the Privileged Exec mode.

```
awplus(config-if)# exit
awplus(config)# exit
awplus#
```

8. Save your changes with the WRITE command.

```
awplus# write
Building configuration ...
[OK]
```

9. Enter the REBOOT command and type “Y” for yes to restart the switch.

```
awplus# reboot
reboot system? (y/n):y
awplus#
```

10. Wait two minutes for the switch to restart the AlliedWare Plus management software.

11. Go to “Verifying a Member Switch,” next.

Verifying a Member Switch

Perform the following steps to confirm the configuration of a member switch.

1. Start a new management session on the member switch. Refer to “Starting a Local Management Session” on page 156 or “Starting the First Management Session Through the NET MGMT Port” on page 159.

2. Move to the Privileged Exec mode with the ENABLE command.

   ```
   awplus> enable
   awplus#
   ```

3. Enter the SHOW STACK command to view the stack configuration on the member switch. Figure 86 is an example.

```
awplus# show stack
Virtual Chassis Stacking summary information
ID Pending ID  MAC address       Priority   Status    Role
1  -           -                 1          -         Provisioned
2  -           e01a.ba56.874a    2          Ready     Active Master

Operational Status                 Standalone unit
Stack MAC address                  0000.ab56.d4a8 (Virtual MAC)
awplus#
```

Figure 86. Example of the SHOW STACK Command on a Member Switch

Note
The member switch being configured will have the role of Active Master because the stack has not formed yet.

4. Check the display for the following:

   - Switch ID 1 will be the master switch. However, since the stack trunk has not been cabled yet, it is listed as Provisioned on the member switch.
   - Verify that the Priority value of the member switch matches its ID number. In the example in Figure 86 on page 173, the switch with ID 2 has the priority value 2. If they do not match, repeat “Configuring a Member Switch - Part II” on page 171. Be sure to perform the STACK PRIORITY 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 a Member Switch - Part I" on page 169. Be sure to perform the STACK ENABLE command and to save your changes with the WRITE command.

Note
The next step verifies the assignments of the trunk ports.

5. Enter the SHOW RUNNING-CONFIG command to display the running configuration of the member switch:

```
awplus# show running-config
```

Use the display to confirm that you designated the correct trunk ports on the member switch. The ports should be designated with INTERFACE PORT and STACKPORT commands. The example in Figure 87 is for a member switch with the ID 2. Its stack trunk consists of ports 1 to 4 on the line card in slot 8:

```
interface port2.8.1-2.8.4
  stackport
```

Figure 87. Example of the SHOW RUNNING-CONFIG Command

6. Go to "What to Do Next" on page 167.

What to Do Next

After configuring a member switch, do the following:

1. Power off the switch by disconnecting the AC power cords from the AC power sources.
2. Repeat these procedures to configure the other member switches. A stack can have one master switch and up to three member switches.
3. If you have not already configured the master switch, perform "Configuring the Master Switch" on page 161.
4. After configuring all the master and member 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 the tables in "Planning the Stack" on page 138, 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 6, “Cabling the Networking Ports” on page 87. For examples of trunk cable configurations, refer to “Stack Trunk Guidelines” on page 124.

7. Power on the stack. Refer to “Powering on the Stack” on page 178.

   Note
   The stack may take from five to ten minutes to form the stack.

8. Verify the switch formed the stack. Refer to “Verifying the Stack” on page 179.

9. Cable the networking ports on the switches. Refer to Chapter 6, “Cabling the Networking Ports” on page 87.

Chapter 12

Powering On and Verifying the Stack

This chapter contains the following procedures:

- “Powering on the Stack” on page 178
- “Verifying the Stack” on page 179

Powering on the Stack

After configuring the master and member switches of the stack with the procedures in the previous chapter, you may 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 in the stack.)

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 6, “Cabling the Networking Ports” on page 87.
3. Power on the switches at the same time or within thirty seconds of each other. Refer to “Powering On the SBxPWRSYS2 (AC) Power Supply” on page 103.

   Refer to “Power Specifications of the SBxPWRSYS2 (AC) Power Supply” on page 216 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

Note
The stack may take from five to ten minutes to form the stack.

4. Go to “Verifying the Stack” on page 179.

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 109.

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 88.

```
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 88. 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 13, “Troubleshooting” on page 183.
   - 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 cannot establish links with their counterparts. For more information, refer to Chapter 13, “Troubleshooting” on page 183.

3. Go to Chapter 6, “Cabling the Networking Ports” on page 87, to complete the installation.

Section IV

Troubleshooting and Replacing Modules

This section contains the following chapters:

- Chapter 13, “Troubleshooting” on page 183
- Chapter 14, “Replacing Chassis Modules” on page 197

Chapter 13
Troubleshooting

This chapter contains recommendations on troubleshooting problems with the switch. The sections are:

- ❒ “XEM3 Modules” on page 184
- ❒ “Copper Ports on the XEM3-12XTm Module” on page 185
- ❒ “Fiber Optic Ports on the XEM3-2DQ, XEM3-8CQ, and XEM3-12YS Modules” on page 187
- ❒ “Switch ID LED on the Management Panel” on page 189
- ❒ “SBxPWRSYS2 (AC) Power Supply” on page 190
- ❒ “VCStack” on page 195

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

XEM3 Modules

Problem: An XEM3 Module is unable to establish links on any of its ports to local or remote devices. Refer to Table 23 for possible causes and solutions.

Table 23. General XEM3 Module Causes and Solutions

Cause	Solution
The XEM3 Module is not properly installed in the slot in the chassis.	Verify that the front panel of the module is flush against the front panel of the chassis. If necessary, remove the module and reinstall it with the instructions in “Installing XEM3 Ethernet Modules” on page 80.
The version of AlliedWare Plus on the chassis does not support the module.	To view the version number of AlliedWare Plus on the switch, use the SHOW SYSTEM command in the User Exec or Privileged Exec mode. Then refer to “Software and Hardware Releases” on page 48 to learn if the firmware version on the switch supports the module.
The module is an XEM2 Module.	Verify that it is not an XEM2 Module by examining the name on its faceplate. The SBx908 GEN3 chassis does not support XEM2 Modules.
There is a technical problem with the XEM3 Module slot.	Try installing the module in a different XEM3 Module slot in the chassis.
The chassis has insufficient power because of extreme heat or cold, causing a power derating by the power supply.	Refer to Table 27 on page 190 for recommendations on resolving temperature issues.
All port LEDs are off even though the ports are connected to active network devices.	The switch might be operating in the low power mode. To toggle on the LEDs, press the eco-friendly button on the management panel of the switch, or enter the ECOFRIENDLY LED command to turn off the LEDs or NO ECOFRIENDLY LED command to turn them on, in the command line interface.

Copper Ports on the XEM3-12XTm Module

Problem: A copper port on the XEM3-12XTm Module is unable to establish a stable link to an active remote device, or the link is intermittent. Refer to Table 24 for possible causes and solutions.

Note
A module port may require five to ten seconds to establish a link.

Table 24. XEM3-12XTm Module

Cause	Solution
The copper cable is not securely connected to the module port or remote device.	Verify that the cable is securely connected to both the module port and remote device.
The remote device is not powered on or operating correctly.	Verify the operations of the remote device by referring to its documentation.
The remote device operates at a speed not supported by the module.	Refer to the documentation included with the remote device to determine its supported speeds. The XEM3-12XTm Module supports 1G/2.5G/5G/10G. It does not support 10M or 100M.
The Ethernet cable may be faulty or exceed 100 meters (328 feet).	Try connecting the module port and remote device with a different cable, or test the cable and replace it, if necessary.
The switch port is connected to the remote device with the wrong category of cable.	Verify that you are using the appropriate category of copper cable by referring to Table 2 on page 27.
The copper cable is routed near sources of electromagnetic emissions, such as heavy machinery.	Reroute the cable away from sources of electromagnetic emissions.
The remote device is connected to the wrong module port.	Verify which module port is connected to the cable from the remote device. If necessary, change the port assignment of the cable.

Table 24. XEM3-12XTm Module (Continued)

Cause	Solution
The port may have been blocked by a spanning tree protocol because of a loop in the network topology.	View the spanning tree status of the ports on the switch with the SHOW SPANNING-TREE BRIEF command in the User Exec or Privileged Exec mode. If necessary, restructure the network links to eliminate unnecessary loops.

Fiber Optic Ports on the XEM3-2DQ, XEM3-8CQ, and XEM3-12YS Modules

Problem: A fiber optic port on an XEM3 Module is unable to establish a link to a remote device, or the link is intermittent. Refer to Table 25 for possible causes and solutions.

Table 25. XEM3 Fiber Optic Modules

Cause	Solution
The fiber optic transceiver is not fully inserted in the module port.	Verify that the transceiver is completely and securely inserted in the port in the module.
The fiber optic cable is not securely connected to the transceiver in the module port or to the port in the remote device.	Verify that the cable is securely connected to the ports on both the XEM3 Module and remote device.
The remote device is not powered on or operating correctly.	Verify the operations of the remote device by referring to its documentation.
The XEM3 Module does not support the transceiver.	Refer to the following tables for the types of supported transceivers: ❒ The XEM3-12YS Module - Table 4 on page 29 ❒ The XEM3-8CQ Module - Table 6 on page 34 ❒ The XEM3-2DQ Module - Table 8 on page 36 For lists of supported transceivers, refer to the product data sheet.
The operating specifications of the fiber optic transceiver in the XEM3 Module and the fiber optic port in the remote device are not compatible.	Verify that the operating specifications of the fiber optic ports on the transceiver and remote network device are compatible by referring to their documentation.
The fiber optic cable may be faulty or poor quality.	Test the attenuation on the fiber optic cable with a fiber optic tester to determine whether the optical signal is too weak (sensitivity). Replace the cable, if necessary.

Table 25. XEM3 Fiber Optic Modules (Continued)

Cause	Solution
The optical signal may be too strong, blinding the transceiver,	Test the attenuation on the fiber optic cable with a fiber optic tester to determine if the optical signal is too strong (maximum input power). Refer to the transceiver's data sheet for its operating specifications.
The XEM3 Module port is connected to the remote device with the wrong type of fiber optic cable.	Verify that you are using the correct type of fiber optic cable by referring to the documentation included with the transceiver.
The port on the fiber optic module or on the remote device is disabled.	The AlliedWare Plus commands for disabling and enabling ports on the modules in the SBx908 GEN3 switch are SHUTDOWN and NO SHUTDOWN, respectively. The commands are in the Interface Configuration mode in the command line interface.
The fiber optic transceivers are bidirectional and are transmitting and receiving on the same frequencies.	When using bidirectional transceivers, select transceivers that transmit and receive on opposite frequencies. For example, if the transceiver in the XEM3 Module transmits at 1310nm and receives at 1550nm, the transceiver in the remote device must transmit at 1550nm and receive at 1310nm. Refer to the transceiver data sheets to determine their operating frequencies.
The remote device is connected to the wrong module port.	Verify which XEM3 Module port is connected to the cable to the remote device. If necessary, change the cable's port assignment.
The port is blocked by a spanning tree protocol because of a loop in the network topology.	View the spanning tree status of the ports on the switch with the SHOW SPANNING-TREE BRIEF command in the User Exec or Privileged Exec mode. If necessary, restructure the network links to eliminate unnecessary loops.

Switch ID LED on the Management Panel

Problem: The Switch ID LED on the front of the switch is flashing the letter “F” for Fault. Refer to Table 26 for possible causes and solutions.

Table 26. Switch ID LED Causes and Solutions

Cause	Solution
One or more fans in a FAN08 Module in the chassis rear panel have failed.	View the status of the fans in the FAN08 Modules with the SHOW SYSTEM ENVIRONMENT command in the User Exec or Privileged Exec mode of the command line interface. If the fan status is Failed, replace the FAN08 Module.
The chassis is overheating or experiencing extreme cold.	Refer to Table 27 on page 190 for causes and solutions to temperature related problems.

SBxPWRSYS2 (AC) Power Supply

The SBxPWRSYS2 (AC) Power Supply displays normal operations on its LEDs as follows:

- ❒ AC: Green
- ❒ DC: Green
- ❒ FAULT: Off

Note
The power supply is hot swappable. If the chassis has two power supplies and one fails, the remaining functional unit can continue to power the switch while you replace the failed unit. For instructions, refer to “Replacing the SBxPWRSYS2 (AC) Power Supply” on page 198.

Problem 1: The LEDs on the SBxPWRSYS2 (AC) Power Supply are displaying the following:

- ❒ AC: Green
- ❒ DC: Green
- ❒ FAULT: Amber

This indicates a fault condition that, if not resolved, may cause the power supply to shutdown. Possible causes and solutions are listed in Table 27:

Table 27. SBxPWRSYS2 (AC) Power Supply - Temperature

Cause	Solution
The power supply is overheating because of inadequate ventilation.	Verify that the installation site provides adequate ventilation around all sides of the chassis. If necessary, increase ventilation around the chassis.
The power supply is overheating because an internal fan has failed.	View the status of the internal fans of the SBxPWRSYS2, AC Power Supply with the SHOW SYSTEM ENVIRONMENT command in the User Exec or Privileged Exec mode of the command line interface. If the fan status is Failed, replace the power supply. Refer to “Replacing the SBxPWRSYS2 (AC) Power Supply” on page 198.

Table 27. SBxPWRSYS2 (AC) Power Supply - Temperature (Continued)

Cause	Solution
The power supply is overheating because one or more fans in one of the FAN08 Modules in the chassis rear panel have failed.	View the status of the fans in the FAN08 Modules with the SHOW SYSTEM ENVIRONMENT command in the User Exec or Privileged Exec mode of the command line interface. If the FAN08 fan status is Failed, replace the fan module by referring to “Replacing FAN08 Modules” on page 206
The power supply is experiencing extreme cold.	Verify that the installation site provides adequate heat to protect against extreme cold.

Problem 2: The LEDs on the SBxPWRSYS2 (AC) Power Supply are as follows:

- ❒ AC: Off
- ❒ DC: Off
- ❒ FAULT: Amber

This indicates that the SBxPWRSYS2 (AC) Power Supply is receiving power, but has shutdown because of a fault condition. Possible causes and solutions are listed in Table 28:

Table 28. SBxPWRSYS2 (AC) Power Supply - Shutdown

Cause	Solution
The SBxPWRSYS2 (AC) Power Supply overheated or experienced extreme cold.	Refer to Table 27 on page 190 for causes and solutions to temperature related problems.
The input AC current from the AC power source to the power supply is outside the supported operating range. For the specifications of the power supply, refer to “Power Specifications of the SBxPWRSYS2 (AC) Power Supply” on page 216	Connect the SBxPWRSYS2 (AC) Power Supply to a different power source: ❒ If the power supply works with the new power source, than the problem is with the first AC power source. ❒ If the power supply does not work with the new power source, than it has a technical problem and should be replaced.

Table 28. SBxPWRSYS2 (AC) Power Supply - Shutdown (Continued)

Cause	Solution
The SBxPWRSYS2 (AC) Power Supply has failed.	If the switch has two power supplies and is still operating, use the SHOW SYSTEM ENVIRONMENT command in the User Exec or Privileged Exec mode in the command line interface to view the power supply status. If the status is Failed, replace the power supply.

Problem 3: The LEDs on the SBxPWRSYS2 (AC) Power Supply are as follows:

- ❒ AC: Off
- ❒ DC: Off
- ❒ FAULT: Off

This indicates that the power supply is not receiving power or has completely shutdown from a fault condition. Possible causes and solutions are listed in Table 29:

Table 29. SBxPWRSYS2 (AC) Power Supply - Power Off

Cause	Solution
The AC power source is turned off.	Verify that the AC power source is powered on.
The AC power source has failed.	Try testing the AC power source by connecting another device to it, or connect the SBxPWRSYS2 (AC) Power Supply to a different power source.
The SBxPWRSYS2 (AC) Power Supply is not fully inserted into the power supply slot in the front panel of the switch.	Verify that the front panel of the power supply is flush against the front panel of the switch. If necessary, remove the module and repeat the procedure “Installing the SBxPWRSYS2 (AC) Power Supply” on page 72.

Table 29. SBxPWRSYS2 (AC) Power Supply - Power Off (Continued)

Cause	Solution
The AC power cord is not securely connected to the AC power source or the SBxPWRSYS2 (AC) Power Supply.	Confirm that the AC power cord is securely connected to the AC power source and to the AC connector on the rear panel of the chassis. If the chassis has only one SBxPWRSYS2 (AC) Power Supply, confirm that the AC power cord is connected to the correct AC connector on the rear panel of the chassis. Repeat the procedure “Powering On the SBxPWRSYS2 (AC) Power Supply” on page 103.
The SBxPWRSYS2 (AC) Power Supply has failed or shutdown because of extreme environmental conditions.	Review the causes and solutions in Table 28 on page 191.

Problem 4: The SBxPWRSYS2 (AC) Power Supply is supplying only partial power to the switch components. Possible causes and solutions are listed in Table 30:

Table 30. SBxPWRSYS2 (AC) Power Supply - Partial Power

Cause	Solution
The power supply is overheating. The power supply provides full power from 0°C to 50°C. It derates linearly to 50% of full rating up to 70°C.	Refer to Table 27 on page 190 for causes and solutions to temperature related problems.
The external AC power source is failing.	Connect the SBxPWRSYS2 (AC) Power Supply to a different AC power source: ❒ If the power supply works with the new power source, than the problem is with the first AC power source. ❒ If the AC power supply does not work with the new power source, than it has a technical problem and should be replaced.

Table 30. SBxPWRSYS2 (AC) Power Supply - Partial Power (Continued)

Cause	Solution
SBxPWRSYS2 (AC) Power Supply is failing.	If the switch is still operating, use the SHOW SYSTEM ENVIRONMENT command in the User Exec or Privileged Exec mode in the command line interface to view the power supply status. If the status is failed, replace the power supply. Alternatively, connect the SBxPWRSYS2 (AC) Power Supply to a different power source. If the power supply works with the new power source, than the problem is with the first AC power source, not the power supply. If the AC power supply does not work with the new power source, than it has a technical problem and should be replaced.

VCStack

Problem: The Switch ID LED is displaying 0 (zero).

Solutions: This indicates that VCStack is disabled on the switch.

- To configure a master switch, refer to “General Steps for the Master Switch” on page 161.
- To configure a member switch, refer to “General Steps for Member Switches” on page 168.

Problem: 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 switches might have an earlier version of the management software that does not support VCStack, or they might have different versions. You can view the version number with the SHOW VERSION command.
- The stack may have too many switches. AlliedWare Plus V5.5.5-0.2 supports a maximum of two switches in a stack. If necessary, remove switches from the stack.
- Review the information in “Stack Trunk Guidelines” on page 124 to verify that the trunk complies with all rules and restrictions.
- If the trunk is using fiber optic transceivers, verify that they are fully and securely inserted into the ports.
- Verify that the transceivers are from Allied Telesis.
- Verify that the fiber optic cables are securely connected to the ports on the transceivers.
- Display the running configurations and confirm the ports of the stack trunk. They are identified by the STACKPORT command. In this example from a running configuration, ports 9 to 10 are the stack trunk:

  ```
  interface port2.0.9-2.0.10
   stackport
  ```

- If necessary, repeat the STACKPORT command. For information, refer to “STACKPORT Command” on page 147. Afterwards, save your changes and reboot the switch.

Problem: A port removed from a stack trunk with the NO STACKPORT command is not forwarding regular Ethernet traffic.

- Display the running configuration to verify that the port is no longer part of the stack trunk.

- You have to reboot the switch whenever you add or remove ports from stack trunks with the STACKPORT and NO STACKPORT commands. Be sure to save the change to the configuration file with the WRITE command before rebooting the unit.

Chapter 14

Replacing Chassis Modules

This chapter contains the following procedures:

- “Replacing the SBxPWRSYS2 (AC) Power Supply” on page 198
- “Replacing XEM3 Modules” on page 201
- “Replacing FAN08 Modules” on page 206

Replacing the SBxPWRSYS2 (AC) Power Supply

This section contains the procedure for removing or replacing the SBxPWRSYS2 (AC) Power Supply in the SBx908 GEN3 Chassis. The illustrations show the removal of the power supply from slot PSU A. The procedure is the same for slot PSU B.

Note
Allied Telesis recommends saving a backup copy of the configuration file in the chassis before removing or replacing a power supply. For instructions, refer to the Software Reference for SwitchBlade x908 GEN3 Switch*, AlliedWare Plus Operating System.*

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

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

1. Disconnect the AC power cord for the power supply from the AC power source. Refer to Figure 89.

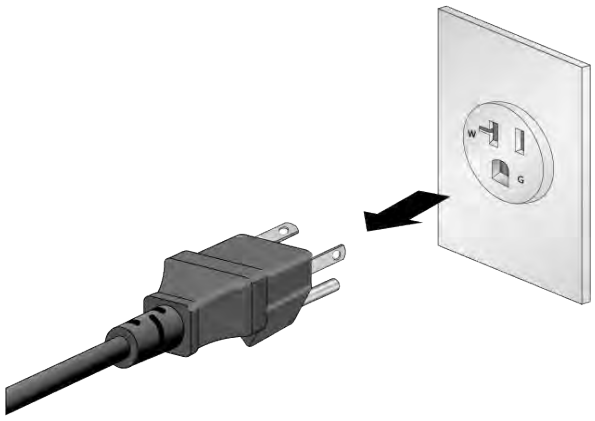


Figure 89. Disconnecting the AC Power Cord from the Power Source

2. Move the retaining clip from the corresponding power cord on the rear panel of the chassis, and disconnect the cord. Refer to Figure 90.

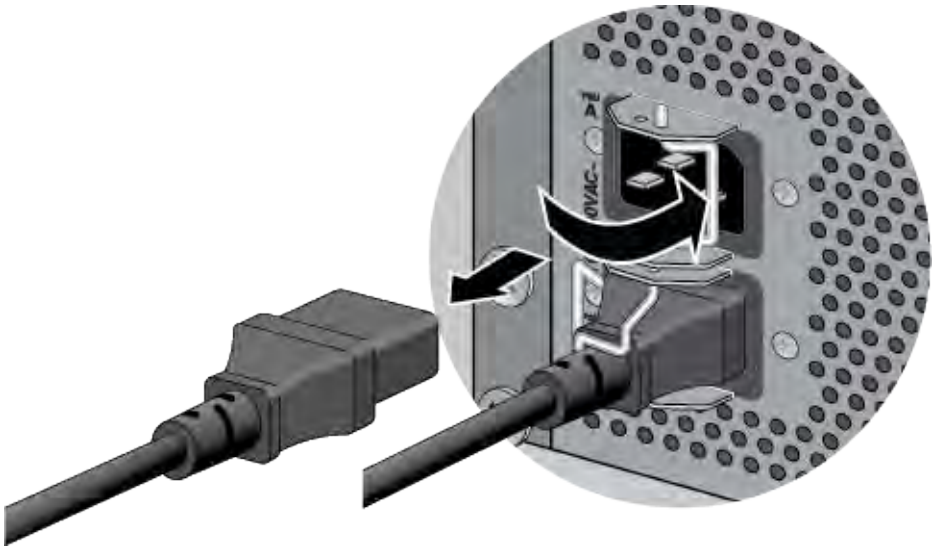


Figure 90. Disconnecting the AC Power Cord from the Chassis

3. Lift the locking hand on the power supply. Refer to Figure 91.

Figure 91. 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 92.

Caution
The device is heavy. Use both hands to lift it. You might injure yourself or damage the device if you drop it. E94

Figure 92. Removing the SBxPWRSYS2 (AC) Power Supply from the chassis

5. Do one of the following:

   - To install a new power supply, refer to “Installing the SBxPWRSYS2 (AC) Power Supply” on page 72 for instructions.
   - If you are not installing a new power supply in the chassis, cover the empty PSU slot with the blank panel. Refer to “Installing the Power Supply Slot Panel” on page 77.

This completes the procedure for removing or replacing the SBxPWRSYS2 (AC) Power Supply.

Replacing XEM3 Modules

This section contains the procedure for replacing XEM3 Ethernet modules in the SBx908 GEN3 chassis.

Note
You do not need to power off or reset the chassis when installing or replacing XEM3 modules. The chassis supports hot-swapping. This means that modules are not damaged when installed or replaced while the switch is powered on.

When you hot-swap an XEM3 module in a chassis slot, one of the following actions is automatically performed by the AlliedWare Plus management software:

- The module is assigned its corresponding default configuration, or:
- The module is assigned the slot's current configuration.

Here are the rules that determine the action taken by the AlliedWare Plus management software:

- Chassis slots that have not been previously used or provisioned are assigned the default configurations for the XEM3 Modules.
- Chassis slots retain their current configurations when modules are replaced with the same modules. For example, a chassis slot with an XEM3-2DQ Module retains its current configuration if the module is replaced with another XEM3-2DQ Module.
- Chassis slots also retain their current configurations when modules are replaced with modules that have the same number of ports. For example, a chassis slot will retain its current configuration if you replace an XEM3-12YS Module with an XEM3-12XTm Module.
- Chassis slots are also assigned default configurations for XEM3 Modules that replace modules with different numbers of ports. For example, if you install the XEM3-2DQ Module, which has two ports, in a slot previously used or provisioned for the XEM3-8CQ Module, which has eight ports, the chassis slots would be assigned the default configuration of the XEM3-2DQ Module.
- XEM3 configurations are assigned to chassis slots and not to the modules themselves. If you move an XEM3 Module to a different chassis slot, its configuration does not follow it to the new slot.
- Chassis slots can have only one configuration at a time. For example, if you install an XEM3-8CQ Module in a slot that previously had an XEM3-12XTm Module, the previous configuration is discarded.

Here are guidelines to removing or replacing XEM3 modules:

- You do not need to reset the switch after hot-swapping XEM3 modules. The AlliedWare Plus management software will automatically assign them their default configurations or the current configurations of the chassis slots, according to the rules above.
- Allied Telesis recommends saving a backup copy of the switch's configuration file before removing or replacing XEM3 modules. For instructions, refer to the *Software Reference for SwitchBlade x908 GEN3 Switches*.
- When hot-swapped, XEM3 modules may require up to thirty seconds to become fully operational.
- As with all configuration settings, you have to issue the WRITE FILE command to save provisioned configurations in the switch's configuration file.

This procedure requires a #2 Phillips-head screwdriver (not provided). The illustrations show the XEM3-12XTm module. The procedure is the same for all modules. To remove an XEM3 module from the chassis, perform the following procedure:

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

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

Warning
100G and 400G transceivers 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 module. Refer to Figure 93 on page 203.

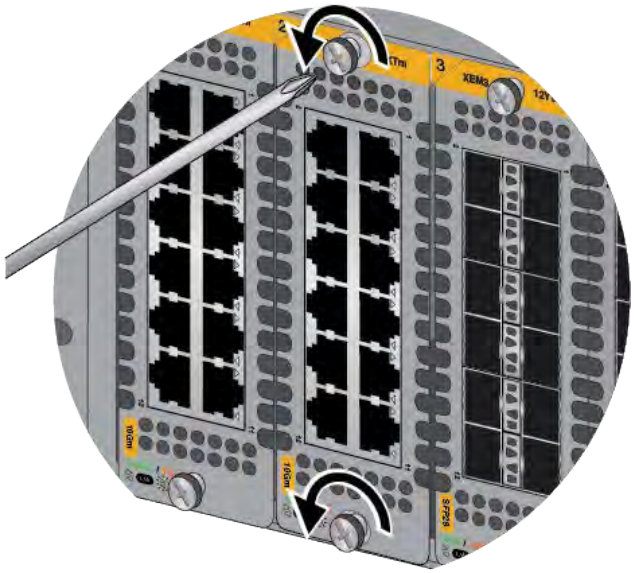


Figure 93. Loosening the Screws on an Ethernet Module

5. Carefully pull on the screws on the faceplate to disconnect the module from the connector on the backplane in the chassis. Refer to Figure 94.

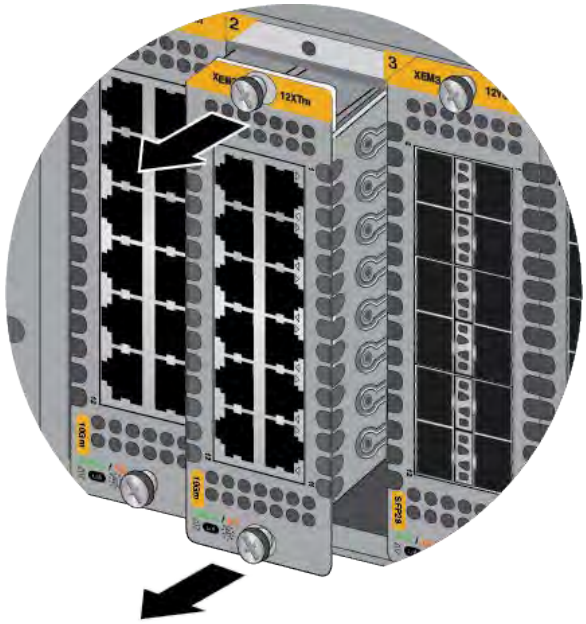


Figure 94. Disconnecting an Ethernet Module from the Chassis

6. Carefully slide the module from the slot. Refer to Figure 95.

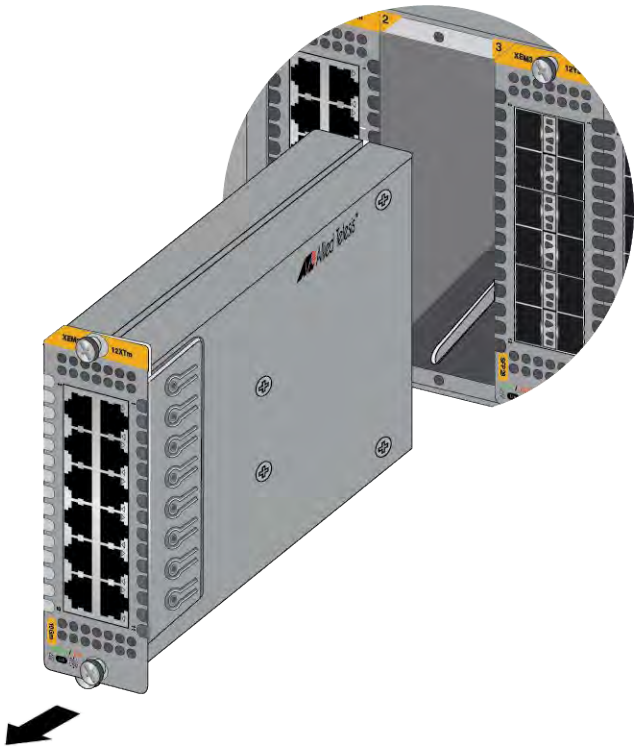


Figure 95. Sliding an Ethernet Module from a Chassis Slot

7. If you are not installing the module in another chassis slot, return it to its anti-static bag and shipping container. Refer to Figure 96.

Figure 96. Placing the Ethernet Module in its Anti-static Bag

8. For instructions on how to install the module in another slot in either the same or a different chassis, refer to “Installing XEM3 Ethernet Modules” on page 80.

9. If you are not installing another module in the chassis slot, cover it with a blank cover. Refer to Figure 97.

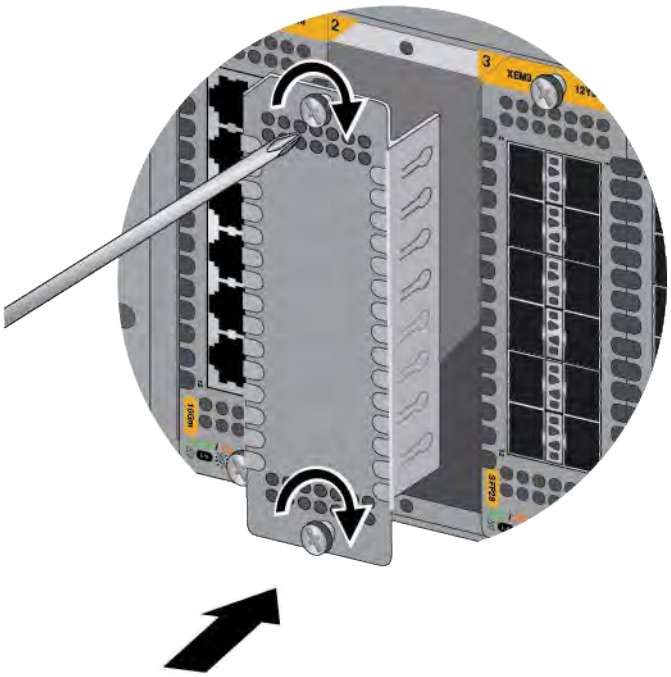


Figure 97. Installing a Blank Cover on a Module Slot

Replacing FAN08 Modules

This section contains the procedure for replacing FAN08 modules in the SBx908 GEN3 Chassis.

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 the 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 98.

Figure 98. Loosening the Screws on the FAN08 Module

2. Carefully pull on the screws on the faceplate to disconnect the module from the connector on the backplane in the chassis, and slide the module from the chassis. Refer to Figure 99.

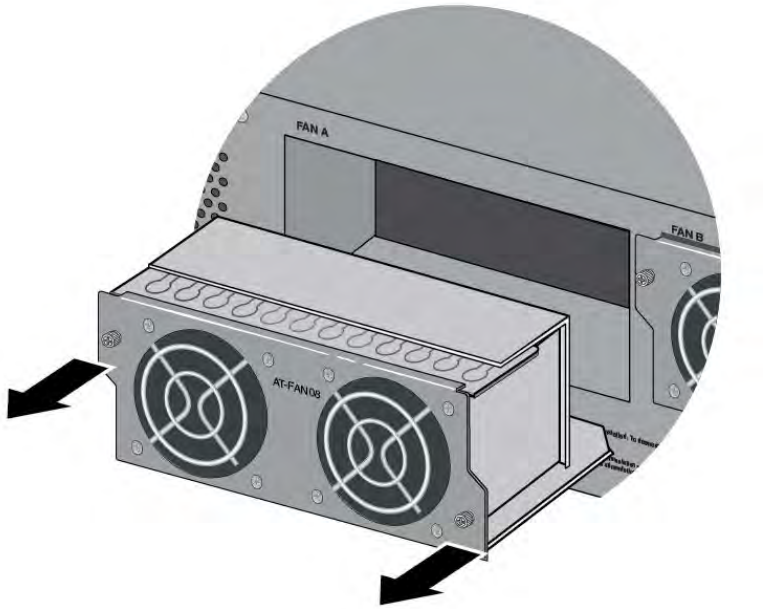


Figure 99. Disconnecting and Removing the FAN08 Module from the Chassis

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 the FAN08 module, perform the following procedure:

1. Align the FAN08 module in the slot as shown in Figure 100 on page 208.

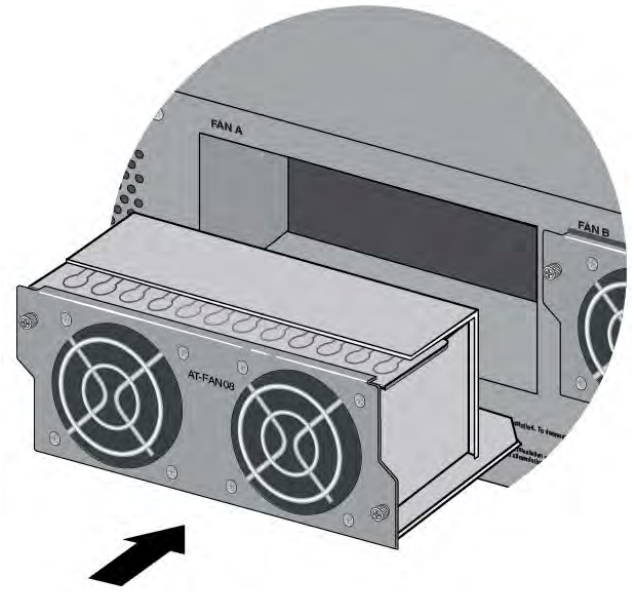


Figure 100. Aligning the FAN08 Module in the Chassis

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 internal connector. Refer to Figure 101.

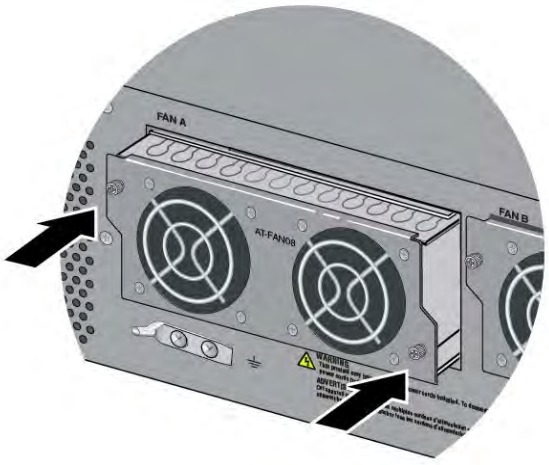


Figure 101. Seating the FAN08 Module on the Internal Connector in the Chassis

3. Tighten the two screws on the FAN08 module to secure it in the chassis. Refer to Figure 102.

Figure 102. Tightening the Two Captive Screws on the FAN08 Module

Appendix A
Technical Specifications

This appendix contains the following sections:

- ”Physical Dimensions and Weights” on page 212
- ”Environmental Specifications” on page 215
- ”Power Specifications of the SBxPWRSYS2 (AC) Power Supply” on page 216
- ”Power Specifications of the XEM3 Ethernet Modules” on page 217
- ”Certifications” on page 218
- ”Pin Signals of the RJ-45 Copper Ports on the XEM3-12XTm Module” on page 219
- ”Pin Signals on the RJ-45 Style Serial Console Port” on page 221
- ”Console Management Cable with DB-9 Female and RJ-45 Connectors” on page 222
- ”Pin Signals of the NET MGMT Port” on page 223

Physical Dimensions and Weights

Dimensions

Table 31 lists the product dimensions. The switch's dimensions are also shown in Figure 103 and Figure 104.

Table 31. Product Dimensions (H x W x D)

SBx908 GEN3 Switch	13.3 x 44.1 x 47.3 cm (5.22 x 17.34 x 18.64 in.)
SBxPWRSYS2 (AC) Power Supply	4.34 x 10.16 x 32.21 cm (1.71 x 4.00 x 12.68 in.)
XEM3-12XTm Module XEM3-12YS Module XEM3-8CQ Module XEM3-2DQ Module	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.)

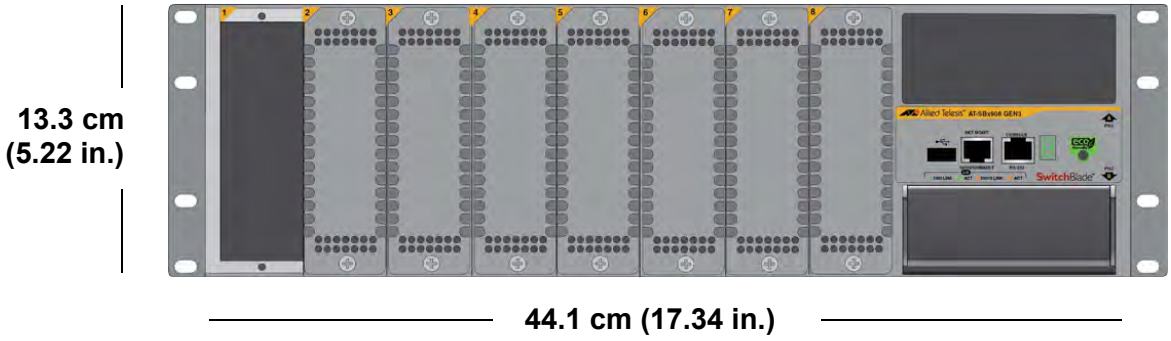


Figure 103. Switch Height and Width

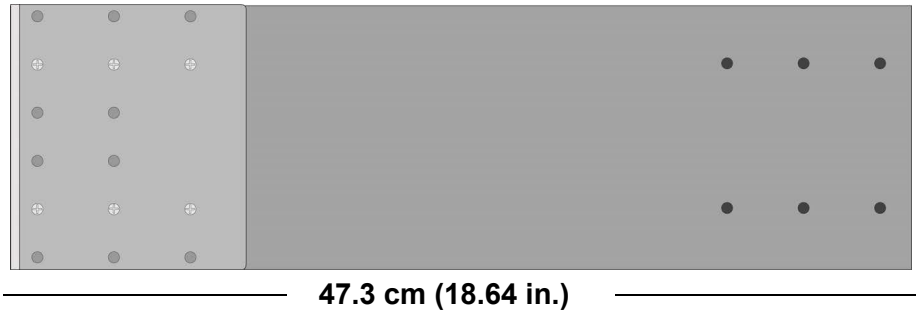


Figure 104. Switch Depth

Figure 105 identifies the locations of the bracket holes.

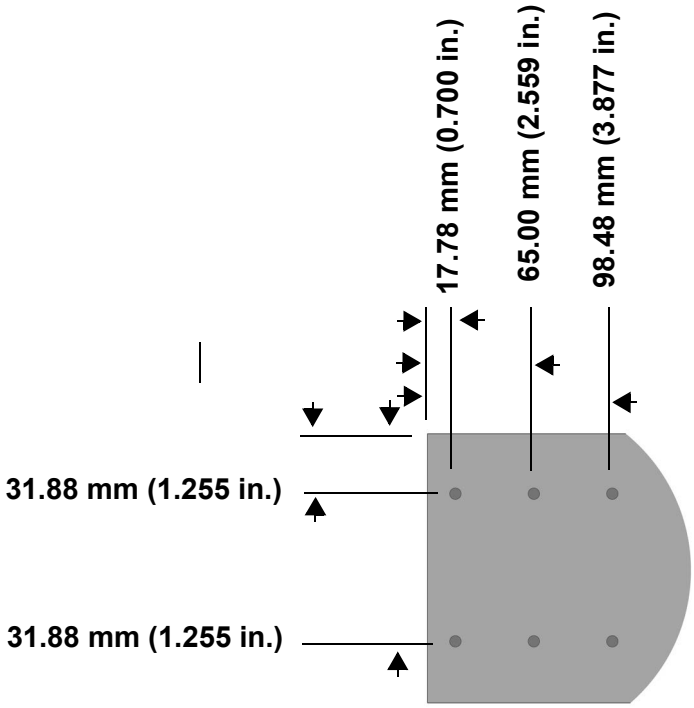


Figure 105. Locations of Bracket Holes

Weights

Table 32 lists the weights of the components.

Table 32. Product Weights

SBx908 GEN3 Switch	15.81 kg (34.85 lb.)
SBxPWRSYS2 (AC) Power Supply System	2.70 kg (6.05 lb.) with power cord
XEM3-12XTm Module	1.09 kg (2.40 lb.)
XEM3-12YS Module	1.76 kg (3.88 lb.)
XEM3-8CQ Module	1.09 kg (2.40 lb.)
XEM3-2DQ Module	1.09 kg (2.40 lb.)
FAN08 Fan Module	0.72 kg (1.60 lb.)

Ventilation

Table 33 lists the ventilation requirements.

Table 33. Ventilation Requirements

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

Environmental Specifications

Table 34 lists the environmental specifications of the chassis.

Table 34. Environmental Specifications

Operating Temperature Range for these modules and transceivers: - XEM3-12XTm Module - XEM3-12YS Module - XEM3-8CQ Module with QSFP+ transceivers	0° C to 50°C (32°F to 122°F)
Operating Temperature Range for these modules and transceivers: - XEM3-8CQ Module with QSFP28 transceivers - XEM3-2DQ Module with QSFP-DD DAC cables	0° C to 45°C (32°F to 113°F)
Operating Temperature Range for this module and transceiver: - XEM3-2DQ Module with QSFP-DD optical transceivers	0° C to 40°C (32°F to 104°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)

Note
The lowest operating temperature range takes precedent when the chassis contains modules with different operating temperature ranges. For example, the operating temperature range of a chassis with both XEM3-12XTm and XEM3-2DQ Modules with QSFP-DD optical transceivers would be 0° C to 40°C (32°F to 104°F).

Power Specifications of the SBxPWRSYS2 (AC) Power Supply

Table 35 lists the power specifications of the SBxPWRSYS2 (AC) Power Supply.

Table 35. Power Specifications of the SBxPWRSYS2 (AC) Power Supply

AC power requirements	100-120V/200-240V~, 50/60Hz, 12A/6A per input (X2)
Maximum power supply efficiency[1]	Up to 85%
Heat dissipation	5118.21 BTU/hr (British Thermal Units/Hour)

1. Based on 100V input voltage.

The SBxPWRSYS2 (AC) Power Supply provides continuous full rating from -20° to +50°C (-4° to +122°F). It derates 2.5% per +1°C up to +70°C (158°F).

Power Specifications of the XEM3 Ethernet Modules

Maximum Power Consumptions

Table 36 lists the maximum power consumptions.

Table 36. Maximum Power Consumptions (Watts)

XEM3-12XTm Module	750W
XEM3-12YS Module	710W
XEM3-8CQ Module	1139W
XEM3-2DQ Module	840W

Heat Dissipation

Table 37 lists the heat dissipation.

Table 37. Heat Dissipation

XEM3-12XTm Module	160.36 BTU/hr
XEM3-12YS Module	139.73 BTU/hr
XEM3-8CQ Module	320.70 BTU/hr
XEM3-2DQ Module	201.61 BTU/hr

Certifications

Table 38 lists the product certificates.

Table 38. Product Certifications

EMI (Emissions)	FCC Class A EN55032 Class A VCCI Class A ICES-003 Class A RCM
EMC (Immunity)	EN55035 EN61000-3-2 EN61000-3-3
Electrical and Laser Safety	UL 62368-1 ($_{C}$UL$_{US}$), EN62368-1, and EN60825-1 (TUV)
RoHS	RoHS6

Pin Signals of the RJ-45 Copper Ports on the XEM3-12XTm Module

Figure 106 illustrates the pin layout of the RJ-45 connectors on the XEM3-12XTm Module.

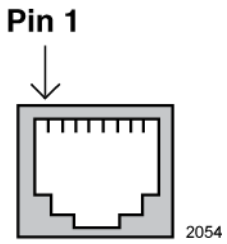


Figure 106. Pin Layout (Front View) of the Copper Ports on the XEM3-12XTm Module

Table 39 lists the pin signals at 100M.

Table 39. Pin Signals on the RJ-45 Copper Ports at 100M

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 1G/2.5G/5G/10G.

Table 40. Pin Signals on the RJ-45 Copper Ports at 1G/2.5G/5G/10G

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 on 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 of 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.

Console Management Cable with DB-9 Female and RJ-45 Connectors

Figure 107 and Table 42 show the pin-outs for a Console port management cable with DB-9 female and RJ-45 connectors.

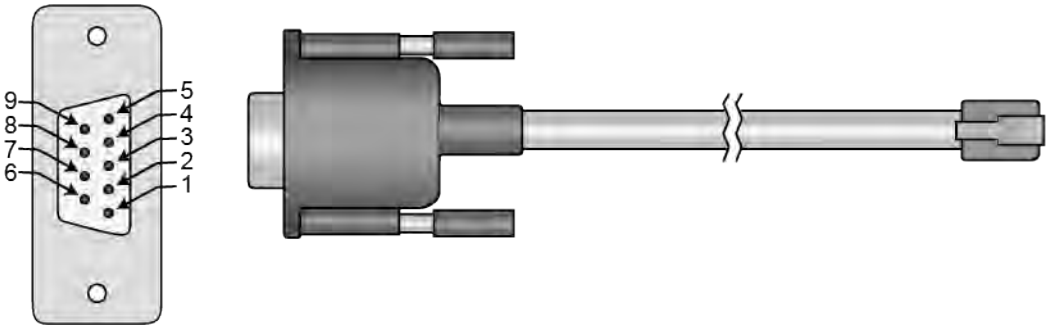


Figure 107. Console Port Management Cable with DB-9 Female and RJ-45 Connectors

Table 42. Pin-outs of Console Port Management Cable with DB-9 Female and RJ-45 Connectors

DB-9 Female Connector Pins	RJ-45 Connector Pins
1	4
2	3
3	6
4	7
5	5
6	2
7	8
8	1
9	NC

Pin Signals of the NET MGMT Port

Table 43 lists the pin signals of the NET MGMT port at 100M on the Management Panel.

Table 43. RJ-45 Pin Signals of the NET MGMT Port at 100M

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 44 lists the pin signals of the NET MGMT port at 1G.

Table 44. Pin Signals for the NET MGMT Port at 1G

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-

Note
The legend for the NET MGMT port on the faceplate includes 10M. However, the port does not support that speed.