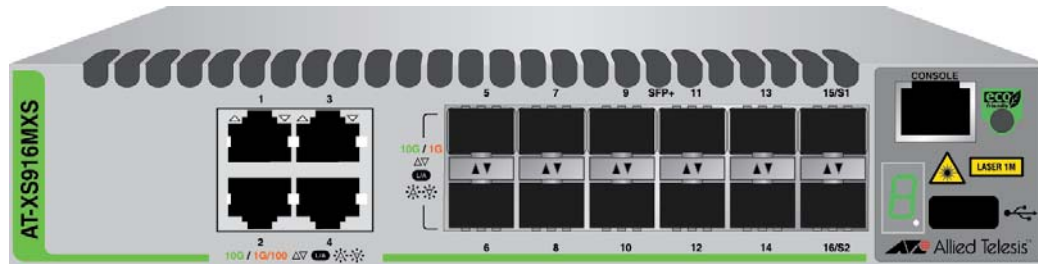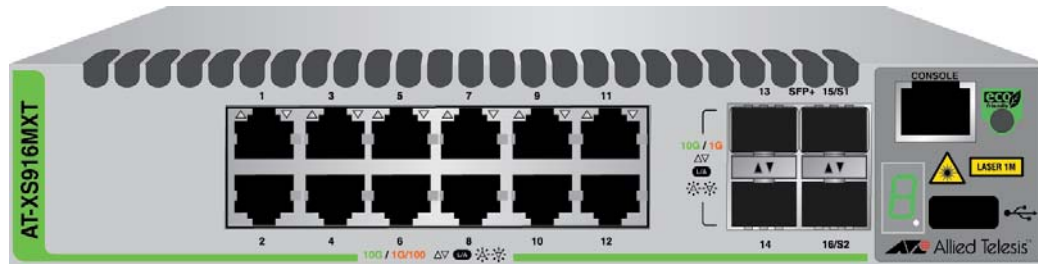# XS900MX Series

Stackable 10Gigabit Ethernet Switches
AlliedWare Plus™ Version 5.4.8

❑ AT-XS916MXT

❑ AT-XS916MXS

Installation Guide for VCStack™

Electrical Safety and Emissions Standards

This section contains the following:

❒ "US Federal Communications Commission"

❒ "Industry Canada"

❒ "Emissions, Immunity and Electrical Safety Standards" on page 4

❒ "Translated Safety Statements" on page 4

US 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

Radiated Energy

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Emissions, Immunity and Electrical Safety Standards

RFI Emissions   FCC Class A, EN55022 Class A, EN61000-3-2, EN61000-3-3, VCCI 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. ↝ E70

EMC (Immunity)   EN55024

Electrical Safety   UL 60950-1 ($_C$UL$_{US}$), CSA-C22 No. 60950-1 ($_C$UL$_{US}$), EN60950-1 (TUV), EN60825-1 (TUV)

Warning

Laser Safety: EN60825 ↝ L7

Translated Safety Statements

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

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

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Preface

This guide contains the installation instructions for the XS900MX Series of Layer 3 10 Gigabit Ethernet switches. This preface contains the following sections:

❒ "Document Conventions" on page 14

❒ "Contacting Allied Telesis" on page 15

> **Note**
> This guide explains how to install two XS900MX Switches in a stack with the Virtual Chassis Stack (VCStack^{TM}) feature. For instructions on how to install the switches as stand-alone units, see the *XS900MX Series Installation Guide for Stand-alone Switches*.

Document Conventions

This document uses the following conventions:

Note
Notes provide additional information.

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

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

Contacting Allied Telesis

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

❒ 24/7 Online Support — Enter our interactive support center to search for answers to your product questions in our knowledge database, to check support tickets, to learn about Return Merchandise Authorizations (RMA), or to contact Allied Telesis technical experts.

❒ USA and EMEA phone support — Select the phone number that best fits your location and customer type.

❒ Hardware warranty information — Learn about Allied Telesis warranties and register your product online.

❒ Replacement Services — Submit a RMA request via our interactive support center.

❒ Documentation — View the most recent installation and user guides, software release notes, white papers, and data sheets for your products.

❒ Software Downloads — Download the latest software releases for your managed products.

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

Chapter 1
Overview

This chapter contains the following sections:

❒ "Front Panels" on page 18

❒ "Features" on page 19

❒ "Management Panel" on page 21

❒ "100Mbps and 1/10Gbps Twisted Pair Ports" on page 22

❒ "1Gbps SFP and 10Gbps SFP+ Ports" on page 23

❒ "15/S1 and 16/S2 Default Trunk Ports" on page 24

❒ "eco-friendly Button" on page 25

❒ "LEDs" on page 26

❒ "USB Port" on page 30

❒ "Console Port" on page 31

❒ "Power Supply" on page 32

❒ "Specifying Ports in the Command Line Interface" on page 33

> **Note**
> This guide explains how to install switches in a stack with the Virtual Chassis Stacking (VCStack^{TM}) feature. For instructions on how to install the devices as stand-alone switches, refer to the *XS900MX Series Installation Guide for Stand-alone Switches*.

Front Panels

The front panel of the AT-XS916MXT Switch is shown in Figure 1.

100Mbps and 1/10Gbps Twisted Pair Ports

1Gbps SFP and 10Gbps SFP+ Ports

Default Trunk Ports

Management Panel
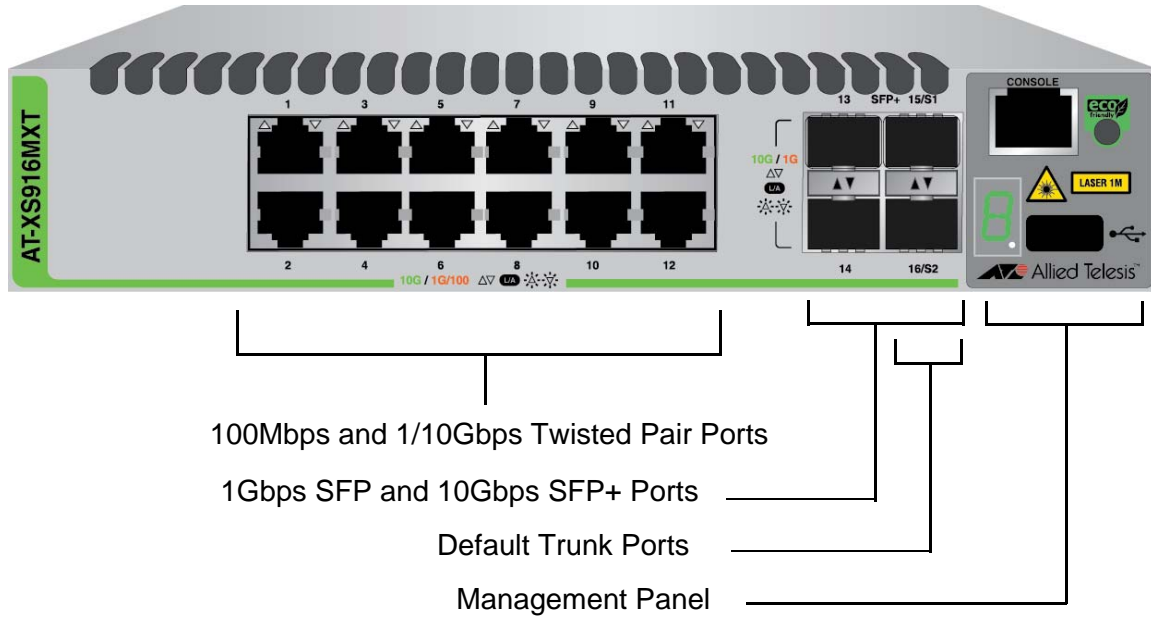
Figure 1. AT-XS916MXT Switch Front Panel

The front panel of the AT-XS916MXS Switch is shown in Figure 2.

100Mbps and 1/10Gbps Twisted Pair Ports

1Gbps SFP and 10Gbps SFP+ Ports

Default Trunk Ports

Management Panel
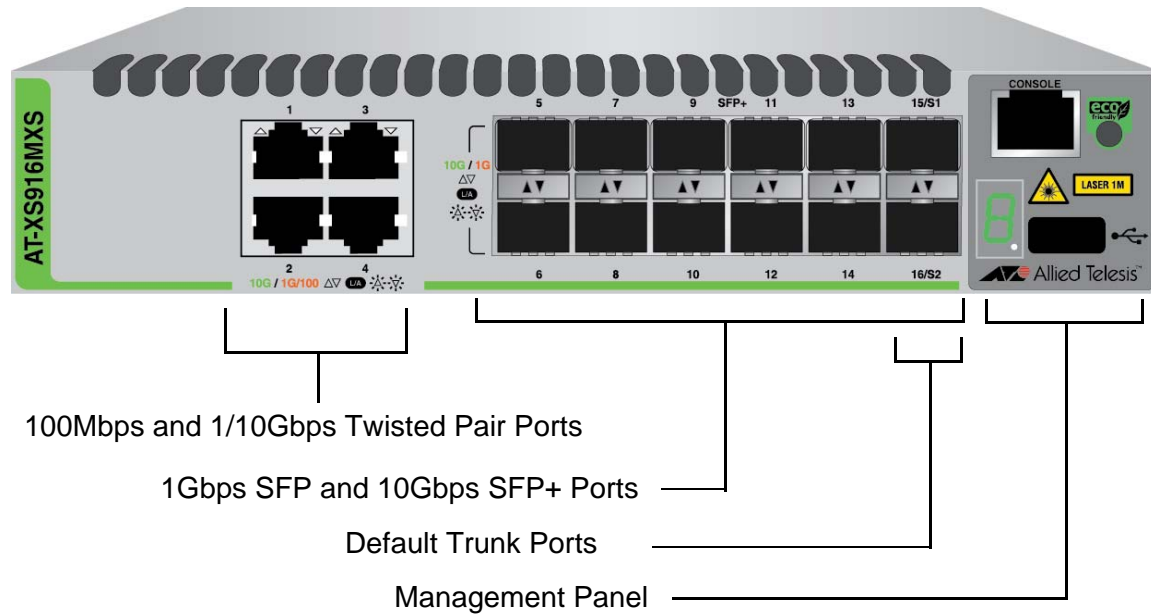
Figure 2. AT-XS916MXS Switch Front Panel

Features

The XS900MX Switches and their features are listed in this section:

XS900MX Models

Here are the model names:

❒ AT-XS916MXT

❒ AT-XS916MXS

100Mbps and 1/10Gbps Twisted Pair Ports

Here are the basic features of the 100Mbps and 1/10Gbps twisted pair ports:

❒ Four ports on the AT-XS916MXS Switch and twelve ports on the AT-XS916MXT Switch

❒ 100Base-TX, 1000Base-T, and 10GBASE-T compliant

❒ IEEE 802.3u Auto-Negotiation compliant

❒ Auto-MDI/MDIX

❒ 100 meters (328 feet) maximum operating distance

❒ IEEE 802.3x flow control in full-duplex mode

❒ IEEE 802.3ab 1000Base-T

❒ IEEE 802.3an 10GBase-T

❒ Jumbo frames up to 9KB

❒ RJ-45 connectors

SFP/SFP+ Ports

Here are the basic features of the SFP/SFP+ ports:

❒ 12 SFP/SFP+ ports on the AT-XS916MXS Switch has and four ports on the AT-XS916MXT Switch

❒ Support 1Gbps SFP or 10Gbps SFP+ transceivers.

❒ Ports 15/S1 and 16/S2 can be used as regular networking ports or trunk ports for the VCStack feature.

Refer to "1Gbps SFP and 10Gbps SFP+ Ports" on page 23 and "15/S1 and 16/S2 Default Trunk Ports" on page 24.

LEDs

Here are the port LEDs:

❒ Link/activity LEDs for the twisted pair ports and SFP/SFP+ ports

❒ Switch ID number LED

❒ eco-friendly button turns off the LEDs to conserve electricity

Installation Options

Here are the installation options for the switches:

❒ Desk or tabletop

❒ 19-inch equipment rack

❒ Wall

MAC Address Table

Here are the basic features of the MAC address tables of the switches:

❒ Storage capacity of 16,000 dynamic MAC address entries

❒ Storage capacity of 256 static MAC address entries

❒ Automatic learning and aging

Management Software and Interfaces

Here are the management software and interfaces:

❒ AlliedWare Plus Management Software

❒ Command line interface

Management Methods

Here are the methods for managing the switches:

❒ Local management through the Console port

❒ Remote Telnet and Secure Shell management

❒ SNMPv1, v2c, and v3

Management Panel

Figure 3 identifies the components in the management panels on the XS900MX Series switches.
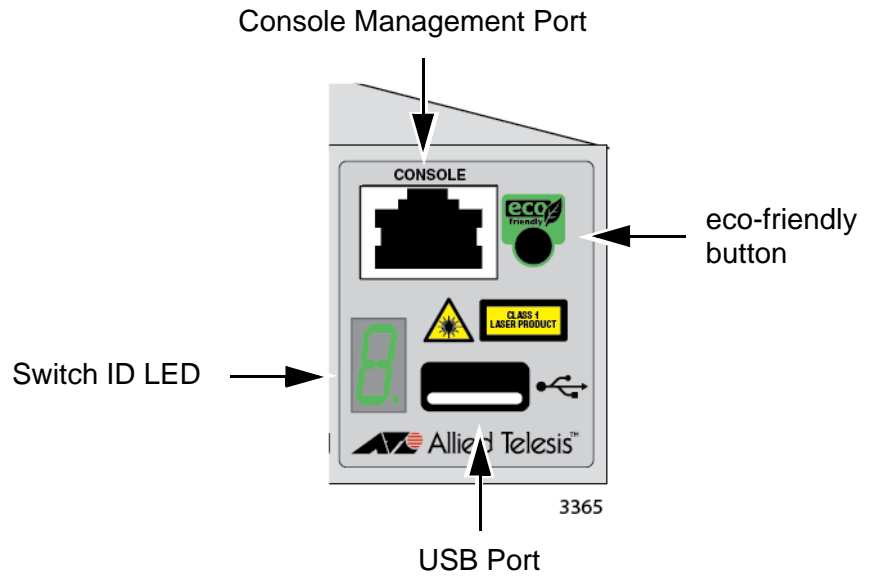
Figure 3. Management Panel

100Mbps and 1/10Gbps Twisted Pair Ports

The AT-XS916MXT and AT-XS916MXS Switches have twelve and four 100/1000/10GBASE-T ports, respectively.

Speed   The ports can operate at 100Mbps, 1Gbps, or 10Gbps. The speeds can be set manually using the management software or automatically with Auto-Negotiation (IEEE 802.3u), the default setting.

Duplex Mode   The twisted pair ports operate in full-duplex mode. You cannot change the duplex mode of a port manually.

Wiring Configuration   The wiring configuration of a port operating at 100 Mbps can be MDI or MDI-X. The wiring configurations of a switch port and a network device connected with straight-through twisted pair cabling have to be opposite, such that one device is using MDI and the other MDI-X. For instance, a switch port has to be set to MDI-X if it is connected to a network device set to MDI.

The switch has the auto-MDI/MDI-X detection feature (IEEE 802.3ab-compliant) so that the switch automatically negotiates with network devices to establish their proper settings.

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

Port Pinouts   See Table 20 on page 146 and Table 21 on page 146 for the port pinouts of the twisted pair ports.

Cable Requirements   The minimum cable requirements for the ports are listed here.

- ❒ 100Mbps: Standard TIA/EIA 568-B-compliant Category 3 shielded or unshielded cabling.

- ❒ 1000Mbps: Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) shielded or unshielded cabling.

- ❒ 10Gbps: Standard TIA/EIA 568-B-compliant shielded Category 6a cabling

1Gbps SFP and 10Gbps SFP+ Ports

The XS916MX Switches have ports for 1Gbps SFP or 10Gbps SFP+ transceivers.The AT-XS916MXT Switch has four ports and the AT-XS916MXS Switch has twelve ports. Transceivers are used to connect the switches to other network units over large distances, build high-speed backbone networks between network devices, or connect high-speed devices, such as servers, to your network.

Examples of 1Gbps SFP transceivers include:

❐ AT-SPSX and AT-SPEX transceivers using multi-mode fiber optic cable, for distances up to 550 meters and two kilometers, respectively.

❐ AT-SPLX10 and AT-SPLX40 transceivers using single-mode fiber optic cable, for distances up to 10 and 40 kilometers, respectively.

Examples of 10Gbps SFP+ transceivers include:

❐ AT-SP10SR, LR, ER, and ZR series of short or long distance transceivers using multi-mode or single mode fiber optic cable.

❐ AT-SP10LRM Long Reach Multimode transceiver for OM1 multi-mode fiber optic links up to 220 meters.

❐ AT-SP10TW1 and AT-SP10TW3 Direct Attach Cables in lengths of one and three meters, respectively.

Note
Industrial (-40 to 85° C) temperature transceivers are available.

Note
SFP/SFP+ transceivers are purchased separately.

Note
The XS916MX Switches do not support the AT-SP10TW7 Direct Attach Cable.

15/S1 and 16/S2 Default Trunk Ports

The 15/S1 and 16/S2 ports can be used as regular networking ports or as trunk ports for a stack of two switches, with the VCStack feature. The switches of a VCStack function as a single virtual unit. They synchronize their actions so that switching operations, like spanning tree protocols, virtual LANs, and static port trunks, span across all the units and ports. Two advantages of stacks are:

❑ You can manage multiple units simultaneously, which can simplify network management.

❑ You have more flexibility with some of the features. For instance, a static port trunk on a stand-alone switch has to consist of ports from the same switch. In contrast, a static trunk on a stack may consist of ports from different switches in the same stack.

In order to use ports 15/S1 and 16/S2 or any of the SFP/SFP+ ports for a stack trunk, you have to use the following approved transceivers:

❑ AT-StackXS/1.0 (1 meter) stacking transceiver and cable

❑ AT-SP10TW1 (1 meter) Direct Attach Cable

❑ AT-SP10TW3 (3 meter) Direct Attach Cable

Note
Stacking cables are purchased separately.

Note
The XS916MX Switches do not support the AT-SP10TW7 Direct Attach Cable as a stacking cable for the VCStack feature.

A stacking transceiver has two SFP transceiver-style connectors and one or three meters of cable. An example is shown in Figure 4.

Figure 4. Stacking Transceiver

The default settings for ports 15/S1 and 16/S2 are trunk ports for VCStack. You can use the ports as regular networking ports by disabling VCStack or selecting other ports for the trunk. When the ports are operating as regular networking ports, they support the same SFP/SFP+ transceivers as the other SFP/SFP+ ports. Refer to "1Gbps SFP and 10Gbps SFP+ Ports" on page 23.

eco-friendly Button

The eco-friendly button on the front panel of the switch is used to toggle the port LEDs on or off. You might turn off the LEDs to conserve electricity when you are not monitoring the device. You can also toggle the LEDs with the ECOFRIENDLY LED and NO ECOFRIENDLY LED commands in the Global Configuration mode of the command line interface. The switch is said to be operating in a low power mode when the LEDs are turned off.

Operating the switch in the low power mode with the LEDs turned off does not interfere with the network operations of the device.

The management software on the switch has a command that blinks the LEDs so that you can quickly and easily identify a specific unit among the devices in an equipment rack. It is the FINDME command. The command works on the switch even if you turned off the LEDs with the eco-friendly button or NO ECOFRIENDLY LED command.

The Switch ID LED is always on, but it displays different information depending on whether the LEDs are on or off. When the LEDs are on, the ID LED displays the ID number of the switch. When the switch is operating in the low power mode with the LEDs off, the ID LED indicates whether the switch is a stand-alone unit or the master or member switch of a VCStack, as detailed in Figure 9 on page 29.

Note
Before checking or troubleshooting the network connections to the ports on the switch, you should always check to be sure that the LEDs are on by either pressing the eco-friendly button or issuing the ECOFRIENDLY LED and NO ECOFRIENDLY LED commands in the Global Configuration mode of the command line interface.

LEDs

This section describes the functions of the LEDs.

LEDs for the Twisted Pair Ports

Each twisted pair port has one status LED that displays link and activity information. Refer to Figure 5.

Link/activity LED for the Top Port

Link/activity LED for the Bottom Port
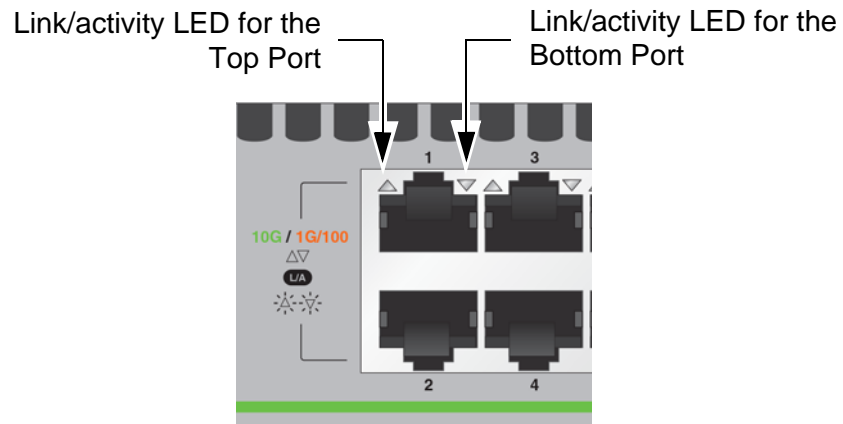
Figure 5. Link/activity LEDs for the Twisted Pair Ports

The Port LEDs are described in Table 1.

Table 1. Link/activity LEDs for the Twisted Pair Ports

LED	State	Description
L/A LED	Solid Green	A port has established a 10Gbps link to a network device.
	Flashing Green	A port is transmitting or receiving data at 10Gbps.
	Solid Amber	A port has established a 100Mbps or 1Gbps link to a network device.
	Flashing Amber	A port is transmitting or receiving data at 100Mbps or 1Gbps.
	Off	A port has not established a link with another network device or the LEDs are turned off. To turn on the LEDs, use the eco-friendly button.

LEDs for the SFP/SFP+ Ports

The LEDs for the SFP/SFP+ ports are located between the ports, as shown in Figure 6 on page 27. Each port has one LED. The left LED is for the top port and the right LED is for the bottom port.

Link/activity LED for the
Top Port

Link/activity LED for the
Bottom Port
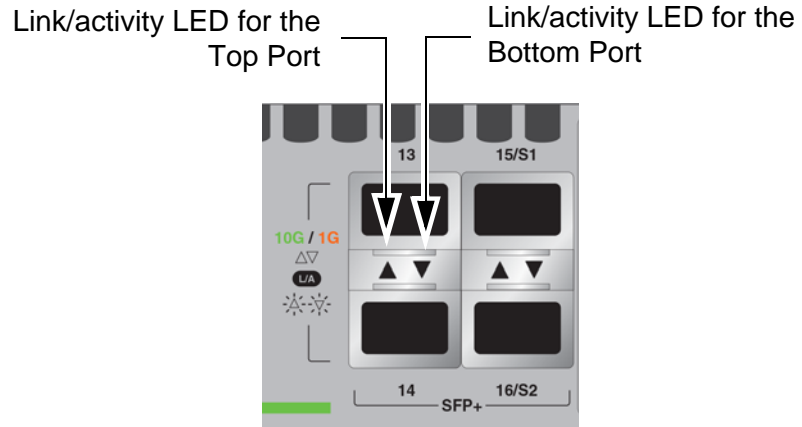
Figure 6. Link/activity LEDs for the SFP/SFP+ Ports

The LEDs are described in Table 2.

Table 2. Link/activity LEDs for the SFP/SFP+ Ports

LED	State	Description
L/A LED	Off	The port is empty, the SFP transceiver has not established a link to a network device, or the LEDs are turned off. To turn on the LEDs, use the eco-friendly button.
	Solid Amber	The SFP transceiver has established a 1Gbps link to a network device.
	Flashing Amber	The SFP transceiver is receiving or transmitting data at 1Gbps.
	Solid Green	The SFP+ transceiver has established a 10Gbps link to a network device.
	Flashing Green	The SFP+ transceiver is receiving or transmitting data at 10Gbps.

Switch ID LED   The Switch ID LED, shown in Figure 7 on page 28, displays the ID number of the switch. A stand-alone switch has the ID number 0. Switches in a VCStack have the number 1 or 2. You use switch IDs to identify the switches and ports in the command line interface of the AlliedWare Plus management software. Refer to "Specifying Ports in the Command Line Interface" on page 33.
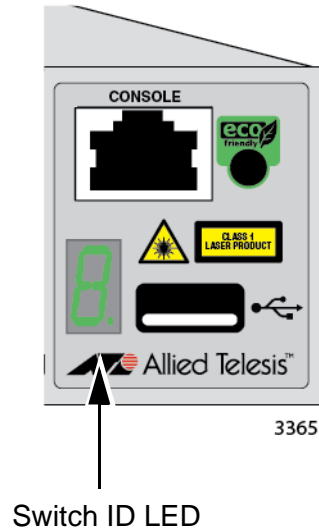
Switch ID LED

Figure 7. Switch ID LED

The states of the LED when the switch is not operating in the low power mode are shown in Figure 8.

 The switch is booting up.

 The switch has encountered a fault condition.

 The switch is operating as a stand-alone unit.

 The switch has an ID number of 1 or 2 as part of a VCStack.

 The dot in the lower right corner flashes when the switch accesses USB memory.
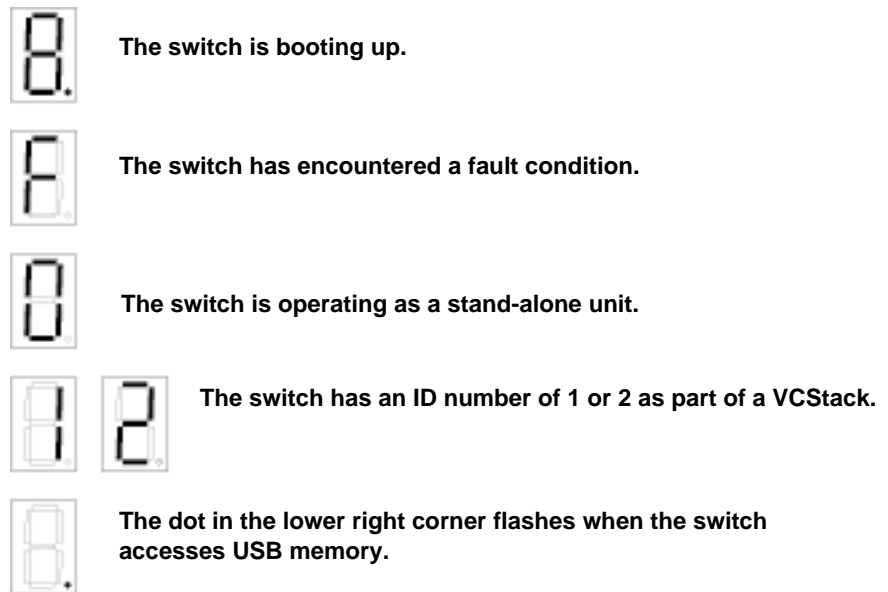
Figure 8. Switch ID LED Not in Low Power Mode

The switch displays the letter "F" for fault on the ID LED if it encounters one of the following problems:

❑ A cooling fan has failed.

❑ The internal temperature of the switch has exceeded the normal operating range and the switch may shut down.

Note

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

The states of the LED when the switch is operating in the low power mode are shown in Figure 9.

The switch is the master switch of a VCStack.

The switch is operating as a stand-alone unit.

The switch is a member switch of a VCStack.

2667

Figure 9. Switch ID LEDs in Low Power Mode

USB Port

The management panel has a USB port for storing configuration files on flash drives, restoring configuration files to switches whose settings have been lost or corrupted, or configuring replacement units. You can also use the port and flash drives to update the management firmware on the switch.

The port is USB2.0 compatible.

Console Port

The Console port is used to conduct management sessions with the switch to configure its features and parameter settings. This type of management uses serial RS-232 and is commonly referred to as local or out-of-band management because it is not conducted over your network. To perform local management, you must be at the location of the switch and must use the management cable included with the switch.

To establish a local management session with the switch, connect a terminal or a personal computer with a terminal emulation program to the Console port, which has an RJ-45 style (8P8C) connector, using the provided management cable. The cable has RJ-45 style (8P8C) and DB-9 (D-sub 9-pin) connectors.

The Console port has the following settings:

- ❏ Default baud rate: 9600 bps (Range is 9600 to 115200 bps)
- ❏ Data bits: 8
- ❏ Parity: None
- ❏ Stop bits: 1
- ❏ Flow control: None

Note
These settings are for a DEC VT100 or ANSI terminal, or an equivalent terminal emulation program.

Power Supply

The XS900MX series switches come with one AC power supply. The back panels have one AC connector. The power supply is not field-replaceable; refer to "Technical Specifications" on page 143 for the input voltage range.

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

> **Note**
> The switches are powered on or off by connecting or disconnecting the power cords.

Specifying Ports in the Command Line Interface

The PORT parameter in the command line interface in the management software is used to specify individual ports on the switch. Figure 10 shows its format.

$$port1.0.n$$

Stack ID ⎯⎯⎯⎯

Module ID ⎯⎯⎯⎯
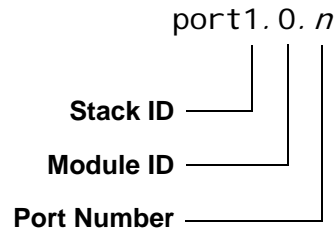
Port Number ⎯⎯⎯⎯

Figure 10. PORT Parameter in the Command Line Interface

The three parts of the PORT parameter are described in Table 3.

Table 3. PORT Parameter Format

Number	Description
Stack ID	Designates the switch's ID number. The ID number for a switch in a stack is 1 or 2. The ID number is displayed on the Switch ID LED. You can also view the ID number with the SHOW STACK command in the command line interface.
Module ID	Designates the module number of a port. This value is always 0 (zero) for XS900MX Switches because they do not support modules.
Port Number	Designates a port number or range.

Here is an example of the PORT parameter. It uses the INTERFACE command to enter the Port Interface mode for ports 15 and 16 on the switch with ID 2:

```
awplus> enable
awplus# configure terminal
awplus(config)# interface port2.0.15,port2.0.16
```

For instructions on the command line interface and the PORT parameter, refer to the *Software Reference for XS916MX Series Switches, AlliedWare Plus Operating System*.

Chapter 2
Virtual Chassis Stacking

The sections in this chapter are:

- ❐ "Overview" on page 36
- ❐ "General Stacking Guidelines" on page 37
- ❐ "Stack Trunk" on page 38
- ❐ "Master and Member Switches" on page 43
- ❐ "Stacking Worksheet" on page 45

Note
For more information on the VCStack feature, refer to the *Stacking Introduction and Stacking Commands* chapters in the *Software Reference for XS900MX Series Switches, AlliedWare Plus Operating System* from **www.alliedtelesis.com/support**.

Overview

The Virtual Chassis Stack (VCStack) feature allows you to connect two XS900MX Series switches into virtual switch so that the devices function as a single networking unit. Brief descriptions of the benefits of VCStack are given here:

❑ 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 both the devices.

❑ Reduces IP addresses - A stack requires only one IP address for remote management access, thereby reducing the number of IP addresses you have to assign to network devices. The one address gives you management access to both units.

❑ Adds feature flexibility and resiliency - A stack gives you more flexibility in the available configurations of features. For instance, you can create port aggregators of ports from different switches in the stack, rather than from only one switch. If you distribute the ports of an aggregator across both switches in a stack, you increase its resiliency because the aggregator will continue to function, though at a reduced bandwidth, if one of the switches stops functioning.

❑ Reduces protocol requirements - Creating a stack might eliminate your need to configure some protocols, such as the Virtual Router Redundancy Protocol or Spanning Tree Protocol.

Note
The following descriptions of VCStack apply to AlliedWare Plus v5.4.7-1 or later. Earlier versions of the management software have different rules and restrictions.

General Stacking Guidelines

Here are the general guidelines to planning a stack:

- ❏ A stack can have two XS900MX Switches.

- ❏ The two XS900MX Switches of a stack can be the same model or different models (i.e., AT-XS916MXT and AT-XS916MXS Switches).

- ❏ The switches are connected together with a trunk, consisting of two ports per switch.

- ❏ The default trunk ports are the SFP/SFP+ ports 15/S1 and 16/S2.

- ❏ If you prefer, you can use any two SFP/SFP+ or twisted pair ports as the trunk instead of the default trunk ports.

- ❏ To use SFP/SFP+ ports for the trunk, you have to use Allied Telesis approved stacking transceivers. Refer to "Default 15/S1 and 16/S2 Ports" on page 38.

- ❏ The switches must have the same version of the AlliedWare Plus operating software, preferably v5.4.7 or greater.

- ❏ Stacking comes as a standard feature with the switch. It does not require any additional software or license.

- ❏ XS900MX Switches cannot be stacked with other stacking switches, such as x530 or x550 Switches.

- ❏ If you purchase an optional feature for a stack, you need to purchase two licenses (one for each switch) and install the licenses on the switches before cabling the stack.

Note
The XS900MX Switches do not support the AT-SP10TW7 Direct Attach Cable.

Stack Trunk

The two switches on a stack are connected by a trunk, consisting of two ports per switch. You can choose from the following three options for the ports of the trunk:

❑ Default 15/S1 and 16/S2 ports: These are the default trunk ports. There are no configuration steps to perform when using the default ports for the trunk. You simply cable the trunk ports and power on the switches of the stack. The default trunk ports can be used as regular networking ports when VCStack is disabled or when other ports are designated as the trunk. Refer to "Default 15/S1 and 16/S2 Ports" on page 38.

❑ Any two SFP/SFP+ ports: You can use any two SFP/SFP+ ports instead of the default 15/S1 and 16/S2 as the trunk. This does require, however, additional configuration steps. There is no advantage to using two other SFP/SFP+ ports instead of the default ports for the trunk, but the option is available to you. Refer to "SFP/SFP+ Ports" on page 40.

❑ Any two twisted pair ports: You can use any two twisted pair ports for the trunk. The advantage to using twisted pair ports is that the trunk can be up to 100 meters. In contrast, a trunk of two SFP/SFP+ ports can be either one or three meters. Using twisted pair ports as the trunk does require additional configuration steps. Refer to "Trunk of Twisted Pair Ports" on page 41.

Default 15/S1 and 16/S2 Ports

Ports 15/S1 and 16/S2 are the default trunk ports for the switch. You must use the following approved stacking cables to use these ports as the trunk:

❑ AT-StackXS/1.0 stacking cable (one meter)

❑ AT-SP10TW1 Direct Attach Cable (one meter)

❑ AT-SP10TW3 Direct Attach Cables (three meters)

Here are the trunk guidelines.

❑ Only the approved cables listed above will work in ports 15/S1 and 16/S2 when the ports are functioning as trunk ports.

❑ The cables must be from Allied Telesis. Similar cables from other network equipment providers might result in unpredictable behavior.

❑ The trunk cables must crossover to different ports. That is, port 15/S1 on one switch must connect to port 16/S2 on the second switch.

❑ Because of the cable lengths, the two switches must be in the same equipment rack or adjacent racks.

❑ Stacking transceivers are purchased separately.

❒ Ports 15/S1 and 16/S2 function as regular network ports when VCStack is disabled or other ports as designated as the trunk ports.

Note
The XS900MX Switches do not support the AT-SP10TW7 Direct Attach Cable.

⚠ **Caution**
The stack will not function if the connections to the S1 and S2 slots do not crossover on the switches. The switches will operate instead as stand-alone devices. ↝ E78

A stacking cable has two SFP+ transceiver-style connectors and comes in lengths of one or three meters. An example is shown in Figure 11.

Figure 11. Stacking Cable

Figure 12 is an example of a stack trunk of the default ports.
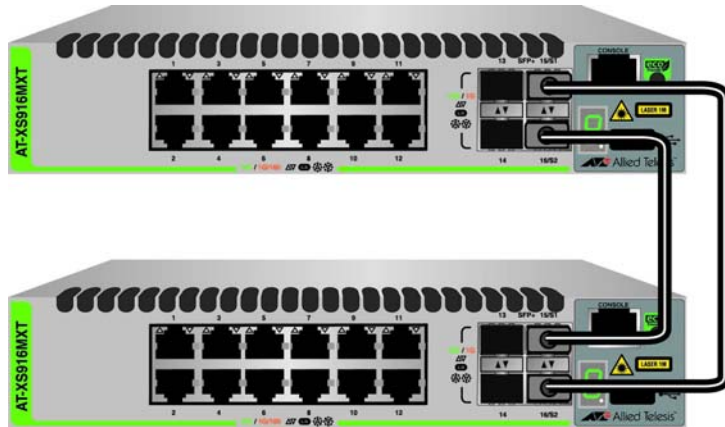
Figure 12. Trunk of Default Ports 15/S1 and 16/S2

A stack can have both switch models. An example is shown in Figure 13.
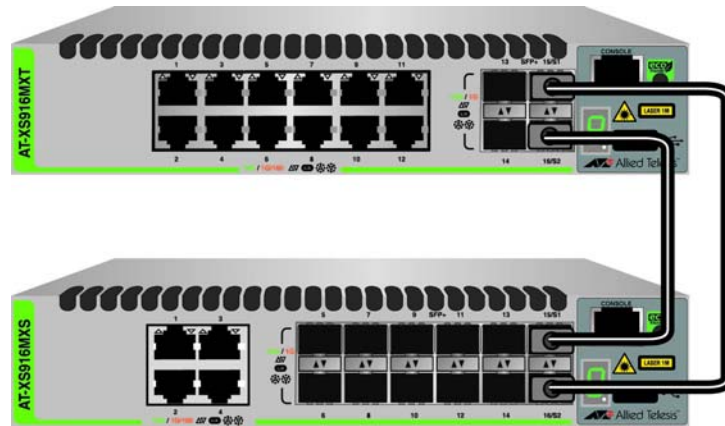
Figure 13. Trunk of Default Ports 15/S1 and 16/S2 with Both Switch Models

SFP/SFP+ Ports   You can use any two SFP/SFP+ ports as the trunk port, instead of the default trunk ports 15/S1 and 16/S2. However, using non-default ports for the trunk requires a series of configuration steps. They involve designating the ports as the trunk and removing the trunking function from the default ports. This is explained in Chapter 8, "Stacking with Non-default Trunk Ports" on page 105. These steps are not required when using the default ports for the trunk.

The guidelines for using non-default ports as the trunk are the same as for the default ports. For example, you have to use approved stacking cables, there can only be two ports, and the switches must be in the same or adjacent equipment racks. Please refer to "Default 15/S1 and 16/S2 Ports" on page 38 for the guidelines. Here are two additional guidelines:

□   The two SFP/SFP+ ports must be consecutive.

□   The ports must be the same on both switches.

Figure 14 on page 41 is an example of a trunk of SFP/SFP+ ports 5 and 6.
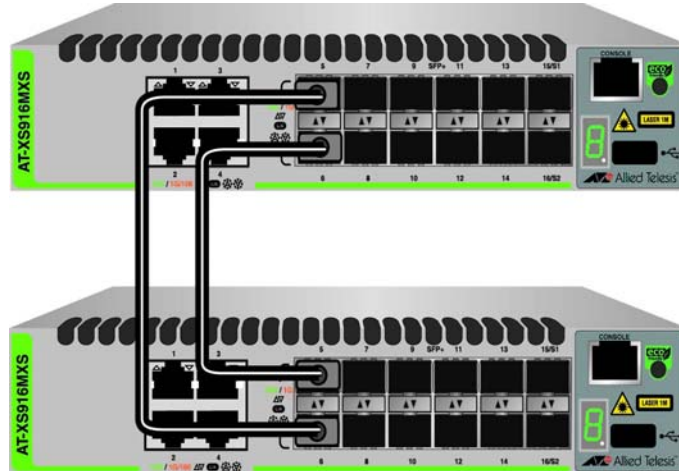
Figure 14. Example Trunk of Two SFP/SFP+ Ports

A stack with a trunk of SFP/SFP+ ports can have both models. The example in Figure 15 uses ports 13 and 14 for the trunk.
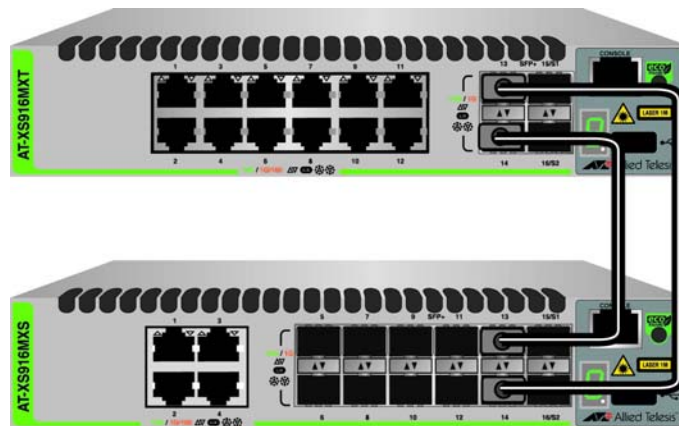
Figure 15. Example Trunk of Two SFP/SFP+ Ports with Both Switch Models

Trunk of Twisted Pair Ports

If want to build a stack but prefer to use all the SFP/SFP+ ports as regular networking ports, you can use two twisted pair ports for the trunk instead. The advantage to this type of trunk is that the two switches can be physically further apart. Here are the guidelines:

- ❑ You can use any two twisted pair ports on the switches for the trunk.
- ❑ The two ports must be consecutive (for example, ports 1 and 2).
- ❑ The trunk ports must be the same on both switches.
- ❑ The ports must operate at 10Gbps.

□ The cabling must crossover on the ports. For example, if ports 1 and 2 are the trunk, port 1 on one switch must crossover to port 2 on the second switch and port 2 must crossover to port 1.

□ The twisted pair cables must be Category 6a or better.

□ The maximum cable length is 100 meters (328 feet).

□ The connections between twisted pair stacking ports must be direct; there cannot be any intervening network devices, such as switches, routers, or media converters.

An example of a stack trunk of twisted pair ports 1 and 2 is shown in Figure 16.
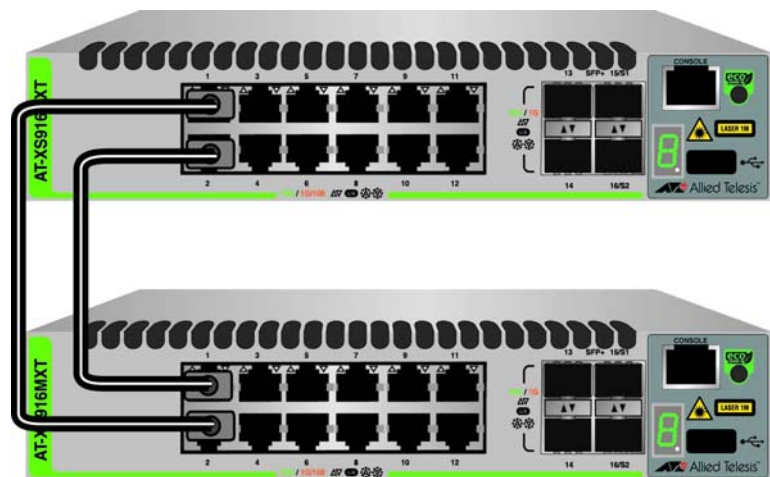
Figure 16. Example Trunk of Twisted Pair Ports

Figure 17 is an example of a trunk of twisted pair ports for a stack with both switch models.
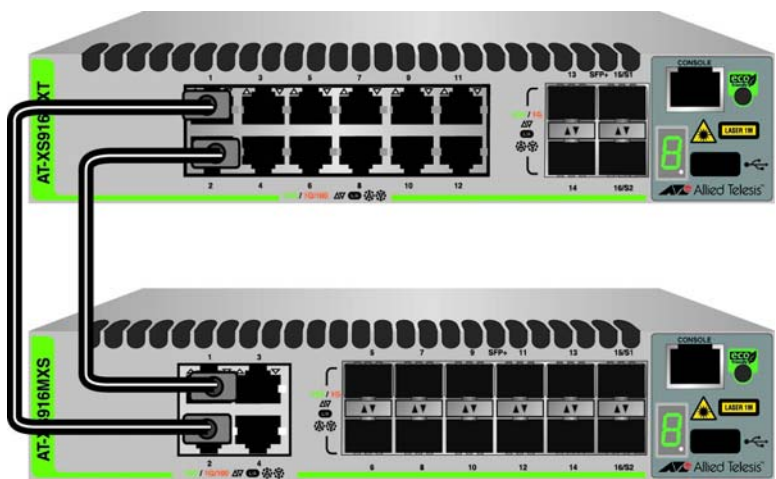
Figure 17. Example Trunk of Twisted Pair Ports for a Stack with Both Switch Models

Master and Member Switches

The stack has one master switch. The functions of the master switch include:

❏ Coordinating and monitoring stack operations.

❏ Verifying that the switches are using the same version of management software. It automatically downloads its management software over the stacking cables to switches with different software versions.

❏ Verifying 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.

❏ Verifying that the stacking transceivers that connect the switches together are cabled correctly.

The other switch is called a member switch. There can be only one member switch in addition to the master switch. The member switch automatically transitions to the master role if the current master switch is removed from the stack or powered off.

Selection of the Master Switch

The switches of a stack select the master switch by comparing the following numbers whenever the stack is reset or powered on:

❏ Stack priority numbers

❏ MAC addresses

The stack priority number is an adjustable value from 0 to 255, where the lower the number, the higher the priority. The switch with the lowest priority number (highest priority) becomes the master switch of a stack. The default priority value is 128.You can adjust the value before or after you assemble the stack, or leave the setting at the default value.

If the switches have the same priority value, they select the master switch by comparing 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, they select the master switch using 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. This is explained in Chapter 7, "Stacking with the Default Trunk Ports" on page 91.

ID Numbers   Each switch must be assigned a unique ID number. The ID number can be 1 or 2; the default is 1. The ID numbers are displayed on the ID LEDs on the front panels of the units. You can assign the ID number yourself or, if you plan to use the default ports 15/S1 and 16/S2 for the trunk, you can let the switches assign them automatically.

You use the ID numbers to identify the individual switches and ports when configuring the devices with the commands in the management software. For further information, refer to "Specifying Ports in the Command Line Interface" on page 33.

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.

⚠️ **Caution**
You should not change the ID numbers of the switches after you have assembled the stack and started to configure the parameter settings. Otherwise, the parameter settings might be applied to the wrong devices when you reset or power cycle the stack. ⚭ E79

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

Stacking Worksheet

Configuring and maintaining a stack will be easier if you use the worksheet in Table 4.

Table 4. Stacking Worksheet

Switch	Switch Model[1]/ Location	ID	Priority	AW+[2] Version Number	Trunk Ports	Trunk Cables[3]
Master		1	1			
Member		2	2			

1. AT-XS916MXT and AT-XS916MXS Switches
2. AlliedWare Plus
3. AT-StackXS/1.0 stacking cable, AT-SP10TW1 or AT-SP10TW3 Direct Attach Cable, or twisted pair cable.

The table columns are described in Table 5.

Table 5. Stacking Worksheet Columns

Column	Description
Location	You use this column to write down the physical locations of the devices, such as their buildings or equipment rooms. The information can be useful in locating the switches of the stack if they are in different locations.
ID	Each switch in a stack has to have a unique ID number of 1 or 2. They display the numbers on the ID LEDs on the front panels and you use the numbers to configure the individual ports. Allied Telesis recommends assigning the ID 1, the default value, to the master switch. The member switch should be assigned the ID 2.

Table 5. Stacking Worksheet Columns (Continued)

Column	Description
Priority	The switches use their priority numbers to select the master switch of the stack when they are powered on or reset. The priority value has a range of 0 to 255. The default of 128. The lower the value, the higher the priority. The switch with the lowest value becomes the stack master. If the switches have the same priority number, they use their MAC addresses to select the master. The lower the MAC address, the higher the priority. If you are not going to use default ports 15/S1 and 16/S2 for the trunk and instead use non-default ports, Allied Telesis recommends setting each switch's priority value to match its ID value. This is to insure that the switch you want to be the master unit will be selected for that role.
AW+ Version Number	This column is for the version numbers of the AlliedWare Plus management software on the two switches. The switches must have the same version. Otherwise, they might not be able to form a stack. You should update them to the most recent release before building the stack if they have different versions. Allied Telesis recommends AlliedWare Plus v5.4.7-1 or later. Chapter 6, "What to Do First" on page 81 has instructions on how to view the version number.
Trunk Ports	This column is for the ports of the trunk. The default ports are 15/S1 and 16/S2. If you have not yet chosen the ports yet, you should do so before beginning the configuration procedures. Refer to "Stack Trunk" on page 38.
Trunk Cables	This column identifies the trunk cable. Options are listed here: - AT-StackXS/1.0 stacking cables - AT-SP10TW1 or AT-SP10TW3 Direct Attach Cables - Twisted pair cables

Chapter 3
Beginning the Installation

The chapter contains the following sections:

Reviewing Safety Precautions

Review the following safety precautions before beginning the installation procedure.

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

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

⚠ **Warning**
Class 1 Laser product. ↜ L1

⚠ **Warning**
Do not stare into the laser beam. ↜ L2

⚠ **Warning**
Do not look directly at the fiber optic cable 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. ∞ E57

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

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. ∾ 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

Note

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

⚠️ **Caution**

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

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

⚠️ **Caution**

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

⚡ **Warning**

When you remove an SFP module from this product, the case temperature of the SFP may exceed 40° C (158° F). Exercise caution when handling with unprotected hands. ⬿ E43

⚠️ **Caution**

You have to reset the switch to disable the VCStack feature. Some network traffic may be lost if the device is already connected to a live network. ⬿ E75

⚠️ **Caution**

Disabling the VCStack feature requires resetting the switch. If the switch is already connected to a live network, some network traffic may be lost. ⬿ E75A

⚡ **Warning**

Switches should not be stacked on top of one another on a table or desktop because that could present a personal safety hazard if you need to move or replace switches. ⬿ E76

⚡ **Warning**

A transceiver can be damaged by static electricity. Be sure to observe all standard electrostatic discharge (ESD) precautions, such as wearing an antistatic wrist strap, to avoid damaging the device. ⬿ E77

Choosing a Site for the Switch

Observe these requirements when planning the installation of the switch.

❑ If you plan to install the switch in an equipment rack, check to be sure that the rack is safely secured so that it will not tip over. Devices in a rack should be installed starting at the bottom, with the heavier devices near the bottom of the rack.

❑ If you plan to install the switch on a table, check to be sure that the table is level and stable.

❑ 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 and through the cooling vents on the front and rear panels. (The ventilation direction in units that have a cooling fan is from front to back, with the fan on the back panel drawing the air out of the unit.)

❑ Do not install the switch in a wiring or utility box because the switch overheats and fails from inadequate airflow.

❑ 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.

❑ The site should not expose the twisted pair cabling to sources of electrical noise, such as radio transmitters, broadband amplifiers, power lines, electric motors, and fluorescent fixtures.

❑ Switch ports are suitable for intra-building connections, or where non-exposed cabling is required.

❑ Do not place objects on top of the switch.

⚠ **Warning**
Switches should not be stacked on top of one another on a table or desktop because that could present a personal safety hazard if you need to move or replace switches. ☞ E76

Unpacking the Switch

The XS900MX Switches come with the components listed in Figure 18.

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

AC power cord

Management cable, with RJ-45 (8P8C) and DB-9 (D-sub 9-pin) connectors.

Power cord retainer clip
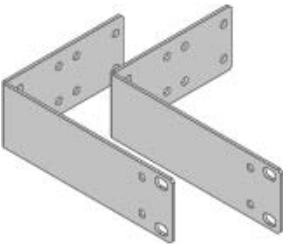
Two AT-RKMT-J14 equipment rack brackets

Two handles

Four M3x6mm screws
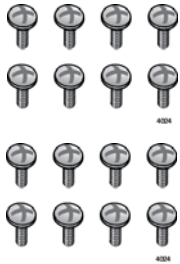
Sixteen M4x6mm screws
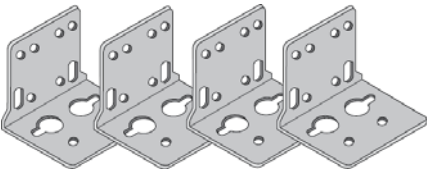
Four AT-RKMT-J24 wall brackets

Four 6mmx4mmx29.6mm anchors

Four M4x32mm screws for wood or concrete walls

Figure 18. XS900MX Switch Components

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

Installing the Power Cord Retaining Clip

The power cord retaining clip that comes with the switch protects the power cord from being accidentally unplugged from the unit.

To install the power cord retaining clip, position the "u" part facing down, press in the sides, and insert the ends of the clip into the holes in the retaining bracket on the AC connector on the switch. See Figure 19.
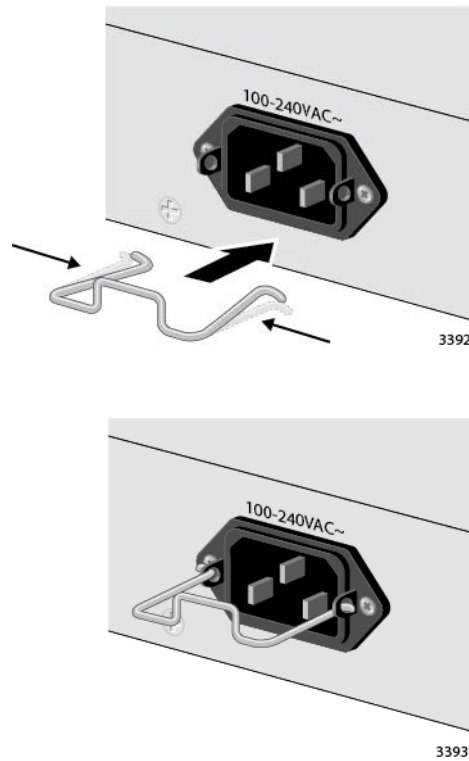
Figure 19. Installing the Retaining Clip

Chapter 4

Installing the Switch on a Table or in an Equipment Rack

This chapter contains the instructions for installing the switch on a table or in an equipment rack. The procedures in this chapter are listed here:

Installing the Switch on a Table or Desktop

This section contains the procedure for installing the switch on a table.

> **Note**
> The rubber feet on the bottom of the chassis should be left on for table installation.

> ⚠ **Warning**
> Switches should not be stacked on a table or desktop. They could present a physical safety hazard if you need to move or replace switches. ⟿ E91

To install the chassis on a table, perform the following procedure:

1. Review the information in "Choosing a Site for the Switch" on page 52 to verify that the selected site is suitable for the unit.

2. Check to be sure that the table is strong enough to support the weight of the switch.

3. Lift the chassis onto the table.

4. Check to be sure that all of the appropriate components are included in the shipping container. Refer to "Unpacking the Switch" on page 53.

5. After unpacking the switch, go to Chapter 6, "What to Do First" on page 81.

Overview to Installing the Switch in an Equipment Rack

You can install XS900MX Switches in a 19-inch equipment rack two ways. One way is with the AT-RKMT-J14 brackets that come with the switch. Refer to Figure 20.
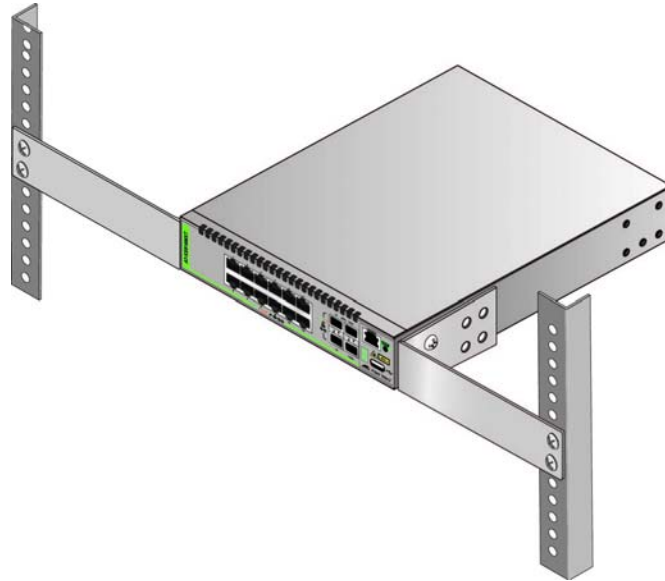
Figure 20. AT-RKMT-J14 Brackets and Switch

For installation instructions, refer to "Installing the Switch in an Equipment Rack with AT-RKMT-J14 Brackets" on page 59.

You can also install the switch in an equipment rack with the optional AT-RKMT-J15 bracket. Refer to Figure 21.
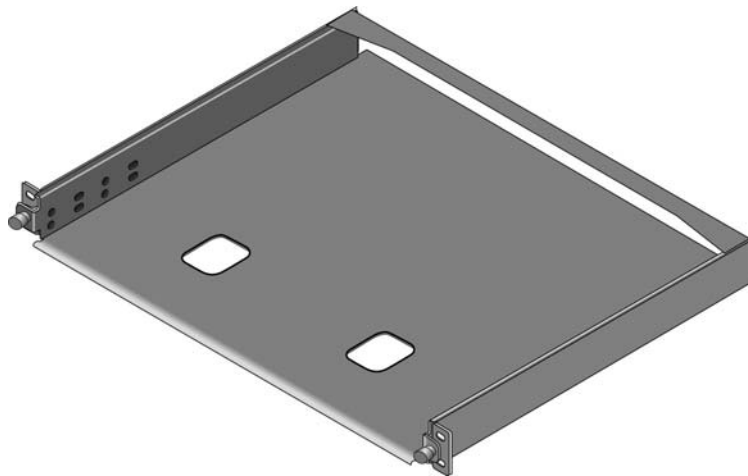
Figure 21. AT-RKMT-J15 Bracket

The bracket lets you install two switches side-by-side. Refer to Figure 22.
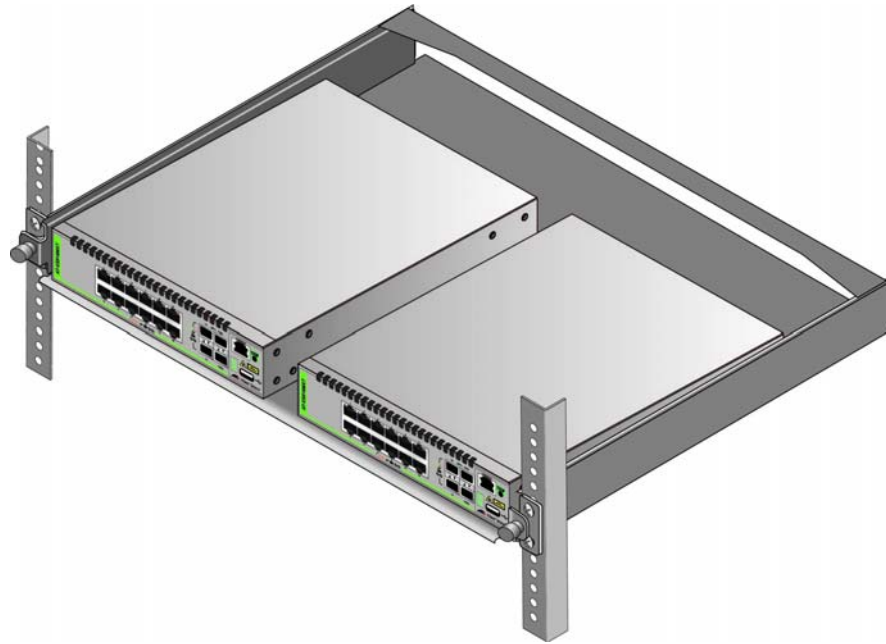
Figure 22. AT-RKMT-J15 Bracket with Switches

Note
The AT-RKMT-J15 Bracket is purchased separately.

For installation instructions refer, to "Installing the Switch in an Equipment Rack with the AT-RKMT-J15 Bracket" on page 64.

Installing the Switch in an Equipment Rack with AT-RKMT-J14 Brackets

This section contains the procedure for installing XS900MX Switches in a standard 19-inch equipment rack, with the AT-RKMT-J14 Brackets included with the units.

Required Items   The following items are required to install the switch in an equipment rack with the AT-RKMT-J14 Brackets:

- ❒ Two AT-RKMT-J14 equipment rack brackets (included with the switch)
- ❒ Eight M4x6mm bracket screws (included with the switch)
- ❒ Four M3x6mm screws (included with the switch)
- ❒ Two bracket handles (included with the switch)
- ❒ Cross-head screwdriver (not provided)
- ❒ Four standard equipment rack screws (not provided)

Switch Orientations in the Equipment Rack   The switch has two sets of four screw holes on the left and right sides, for attaching the AT-RKMT-J14 Brackets. Refer to Figure 23.

Bracket Holes
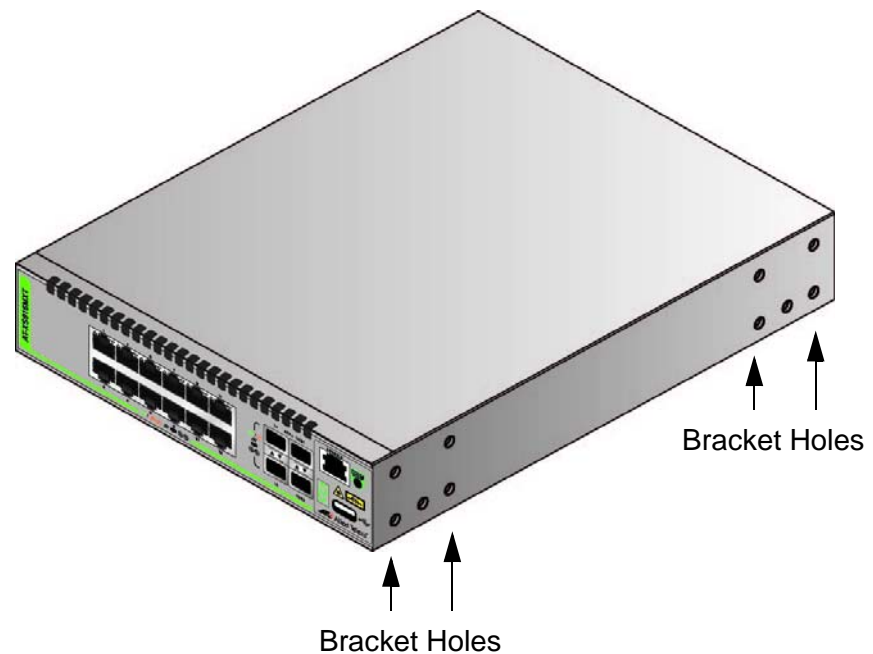
Bracket Holes

Figure 23. Bracket Holes for AT-RKMT-J14 Brackets

The brackets also have two sets of four holes. Refer to Figure 24.
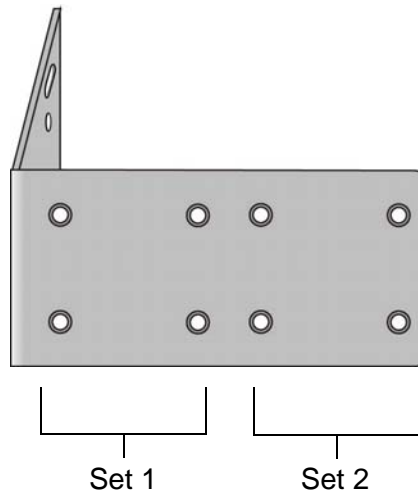
Figure 24. AT-RKMT-J14 Bracket Holes

You can use the different sets of holes on the switch and brackets to install the switch in the equipment rack in a variety of orientations. You can install it with the front panel flush with, extending in front of, or recessed behind the front of the equipment rack. The illustrations in Figure 25 show the switch orientations with the front panel facing the front of the equipment rack.
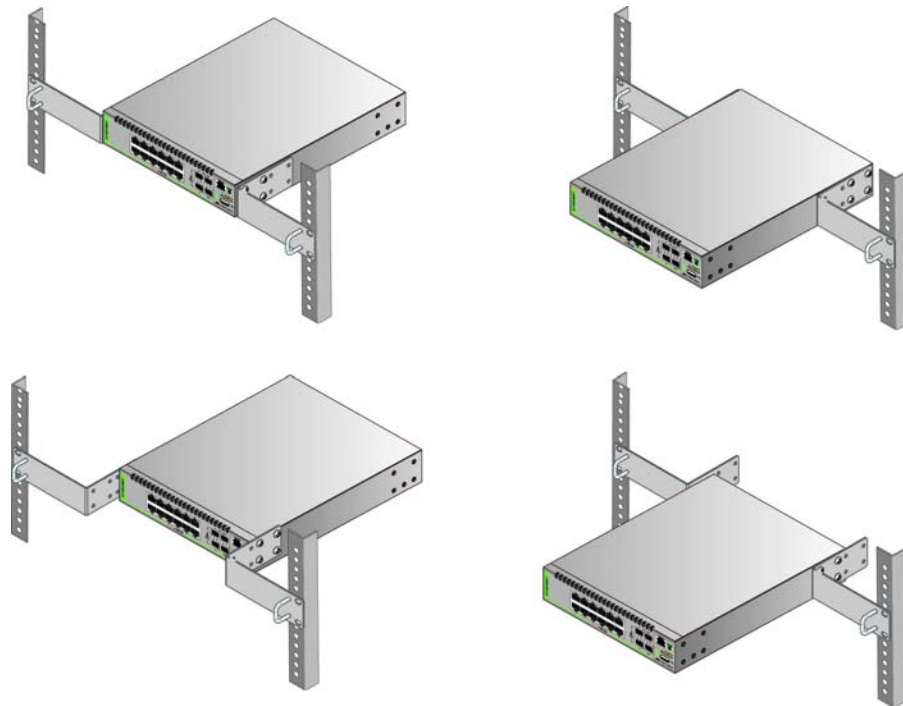
Figure 25. Switch Orientations with the Front Panel Facing the Front of the Equipment Rack

You can also orient the switch with the rear panel facing the front of the equipment rack. Refer to Figure 26.
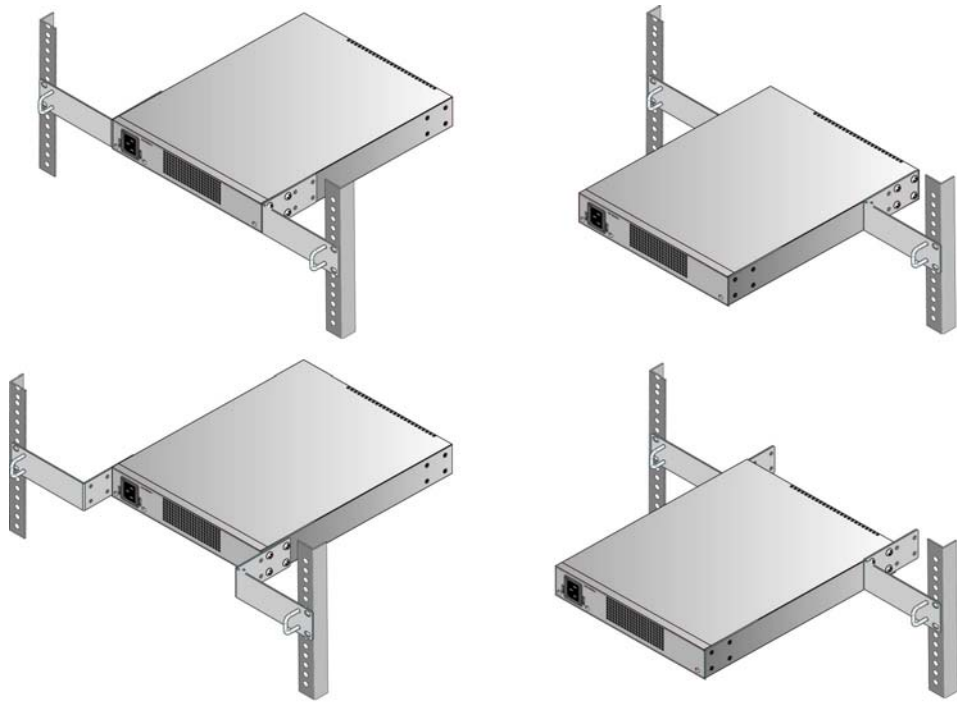
Figure 26. Switch Orientations with the Rear Panel Facing the Front of the Equipment Rack

Installing the Switch

If you have not chosen an orientation for the switch in the equipment rack, review "Switch Orientations in the Equipment Rack" on page 59.

Please review the information in "Choosing a Site for the Switch" on page 52 before installing the switch in an equipment rack.

⚠️ **Caution**

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

To install the switch in a 19-inch equipment rack with the AT-RKMT-J14 Brackets, perform the following procedure:

1. Attach the two handles to the AT-RKMT-J14 Brackets using the four M3x6mm screws included with the switch. Refer to Figure 27 on page 62.
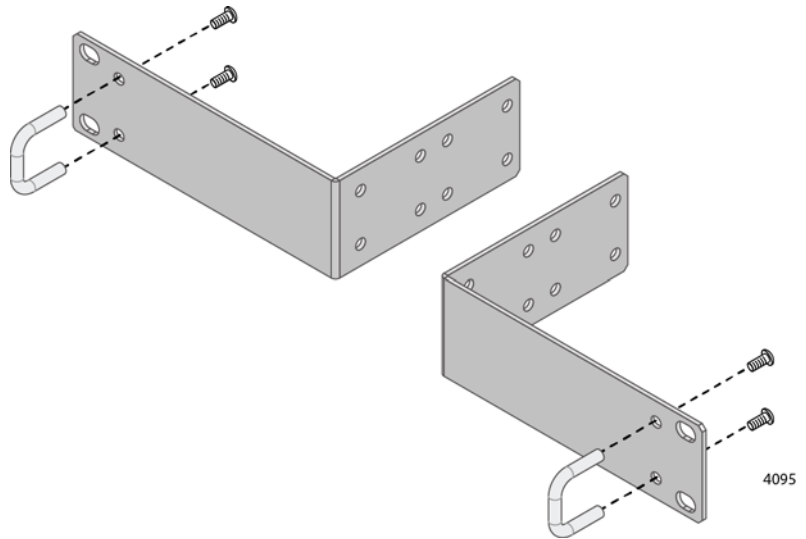
Figure 27. Attaching the Handles to the AT-RKMT-J14 Brackets

2. Place the switch on a level, secure surface.

3. Attach the two brackets to the sides of the switch in the selected position, using the eight M4x6mm screws included with the unit. (Refer to Figure 25 on page 60 and Figure 26 on page 61.) The illustration in Figure 28 shows the installation of the brackets such that the front panel of the switch is even with the front of the equipment rack.
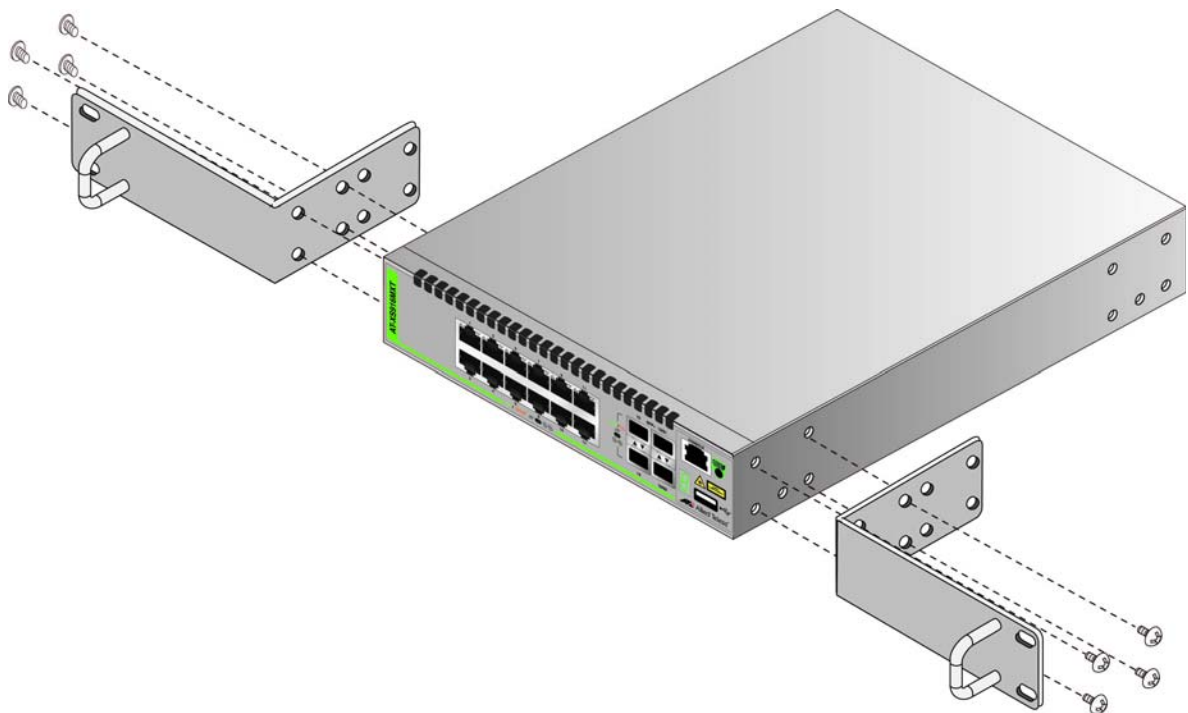
Figure 28. Attaching the AT-RKMT-J14 Brackets to the Switch

4. Have another person hold the switch at the desired location in the equipment rack while you secure it using four standard equipment rack screws (not provided). Refer to Figure 29.
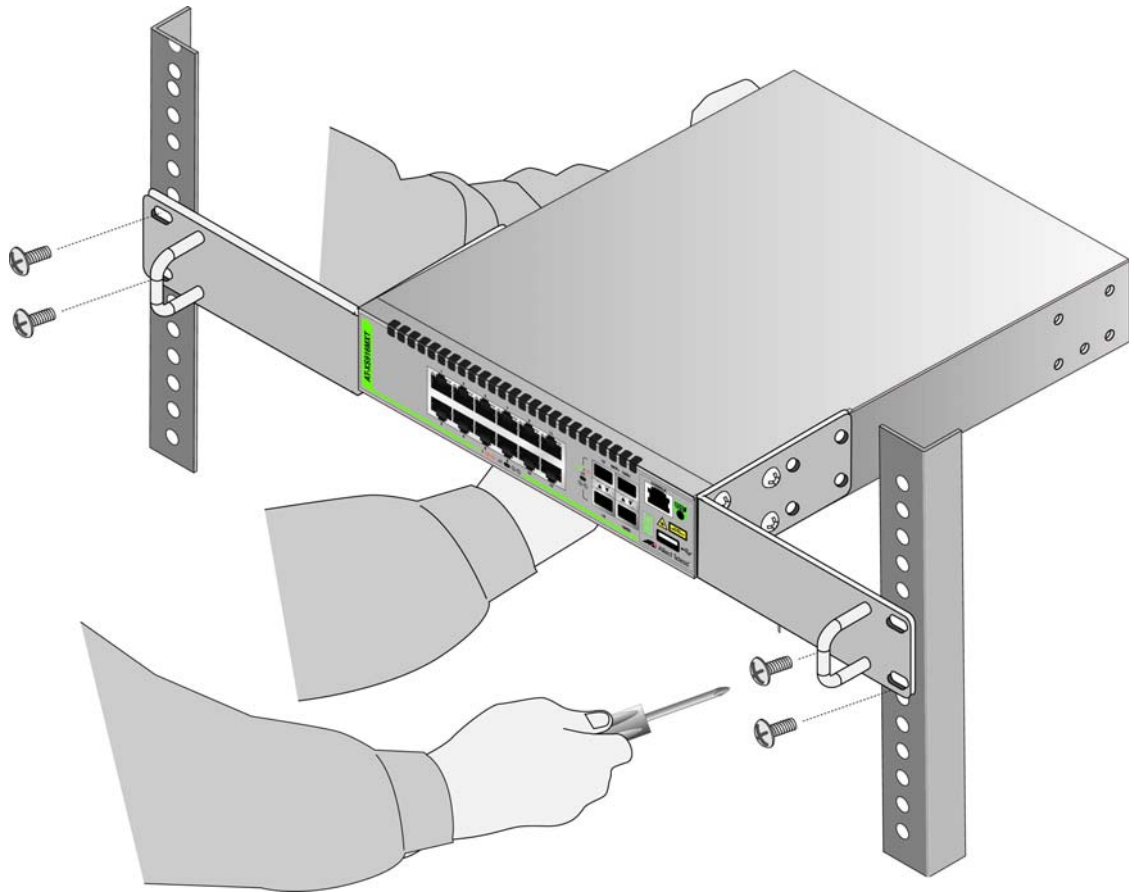
Figure 29. Installing the Switch in an Equipment Rack

5. Go to Chapter 6, "What to Do First" on page 81.

Installing the Switch in an Equipment Rack with the AT-RKMT-J15 Bracket

This section contains the procedure for installing XS900MX Switches in a standard 19-inch equipment rack, with the optional AT-RKMT-J15 Bracket.

Required Items

The following items are required to install the switch in an equipment rack with the AT-RKMT-J15 Bracket:

- ❏ One AT-RKMT-J15 equipment rack bracket (sold separately)
- ❏ Four M4x6mm bracket screws (included with the switch)
- ❏ Cross-head screwdriver (not provided)
- ❏ Flat-head screwdriver (not provided)
- ❏ Four standard equipment rack screws (not provided)

Installing the Switch

To install the switch in a 19-inch equipment rack with the AT-RKMT-J15 Bracket, perform the following procedure:

1. Have another person hold the AT-RKMT-J15 Bracket at the desired location in the equipment rack while you secure it using four standard equipment rack screws (not provided). Refer to Figure 30.
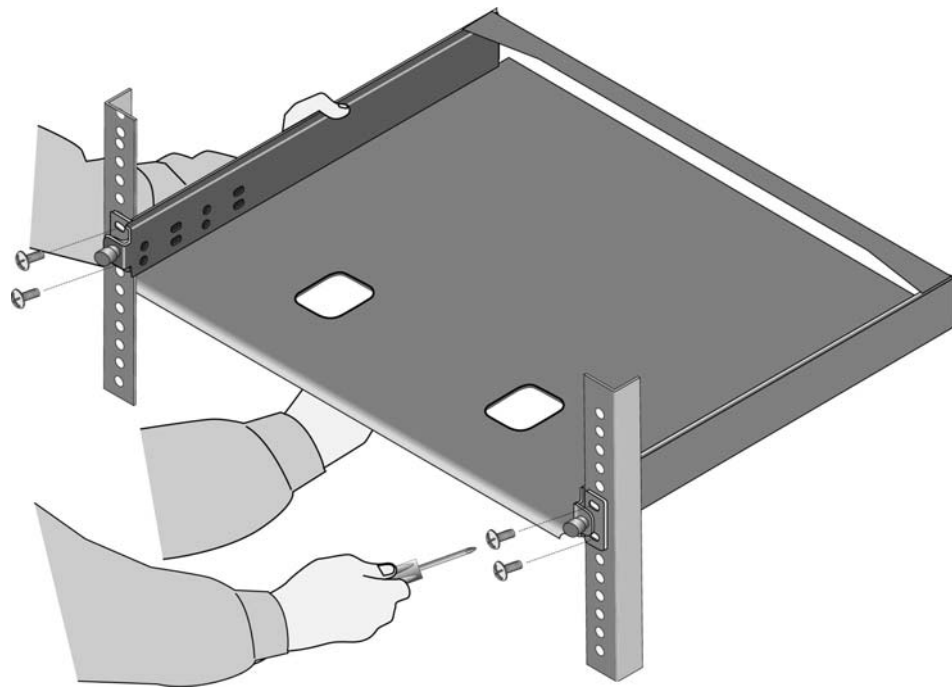
Figure 30. Installing the AT-RKMT-J15 Bracket in the Equipment Rack

2. Loosen the two thumbscrews on the front of the bracket. Refer to Figure 31.
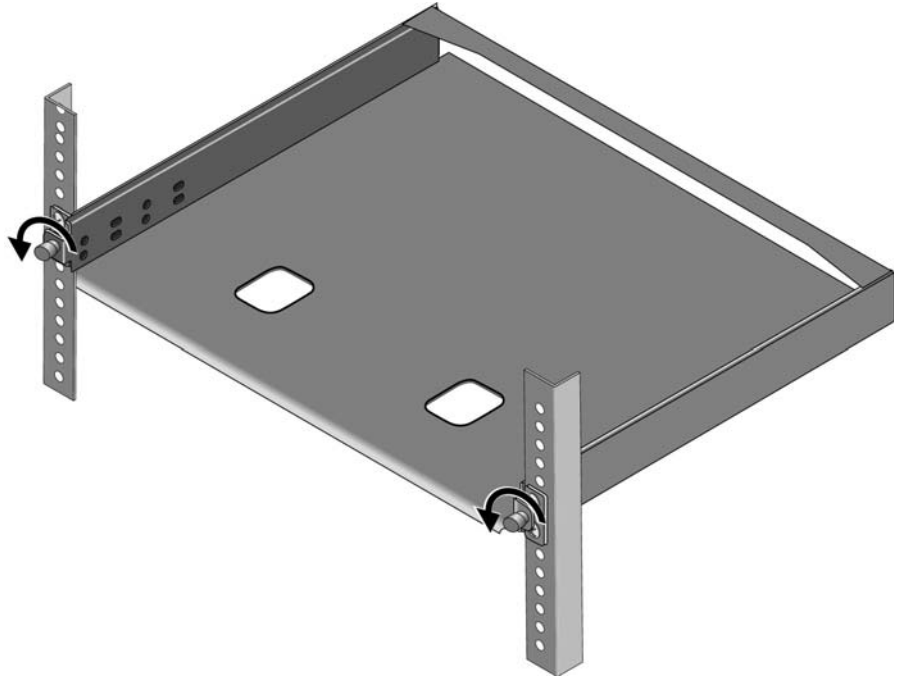
Figure 31. Loosening the Two Thumbscrews on the Front of the AT-RKMT-J15 Bracket

3. Slide out the bracket tray. Refer to Figure 32.
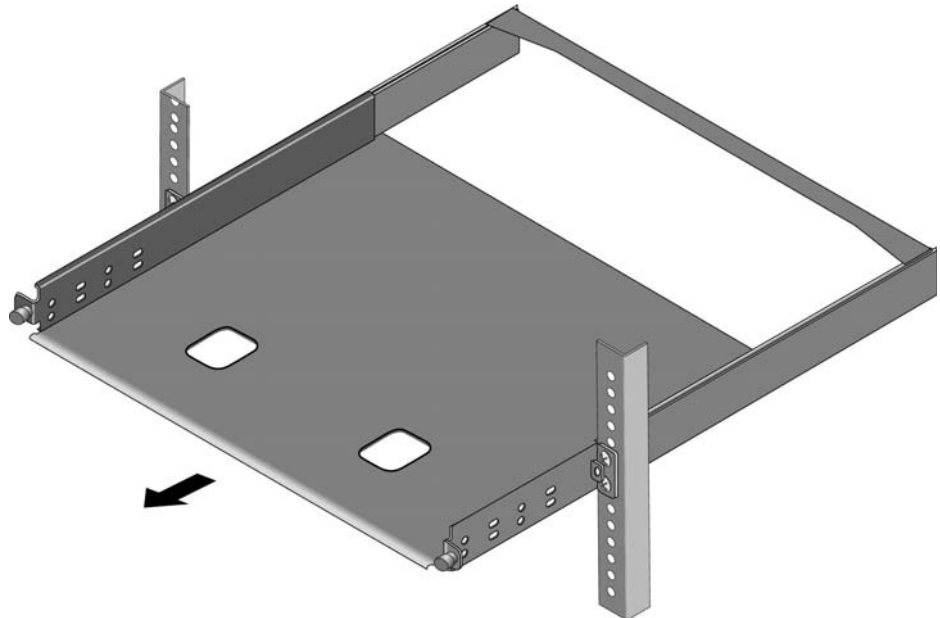
Figure 32. Sliding Out the Tray from the AT-RKMT-J15 Bracket

Note

Steps 4 to 6 remove the plastic feet from the bottom of the switch. You must remove the plastic feet to install the switch in the AT-RKMT-J15 Bracket.

4. Place the switch upside-down on a table. Refer to Figure 33.
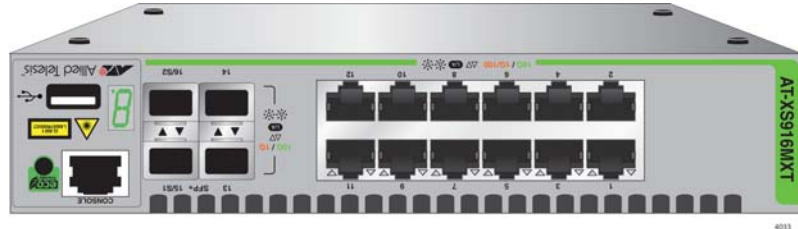
Figure 33. Turning the Switch Upside Down

5. Use a small flat-head screwdriver to pry the four plastic feet from the bottom of the switch. Refer to Figure 34.
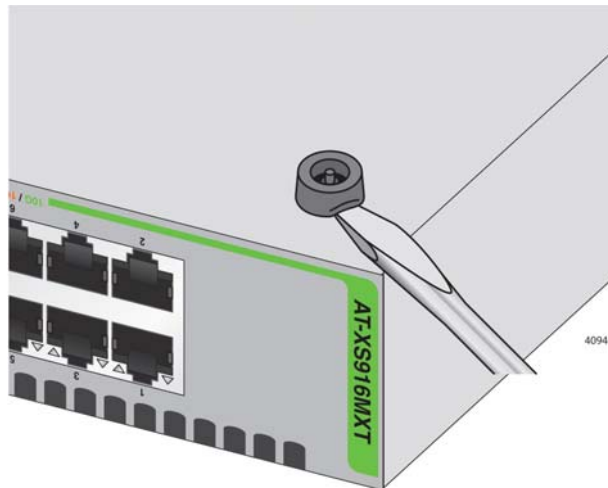
Figure 34. Removing the Plastic Feet from the Bottom Panel of the Switch

6. Turn the switch over so that it is right-side up.

7. Place the switch in the left or right side of the bracket, with its front panel facing the front of the bracket. If you are installing only one switch, you can install it on either side. Refer to Figure 35 on page 67.
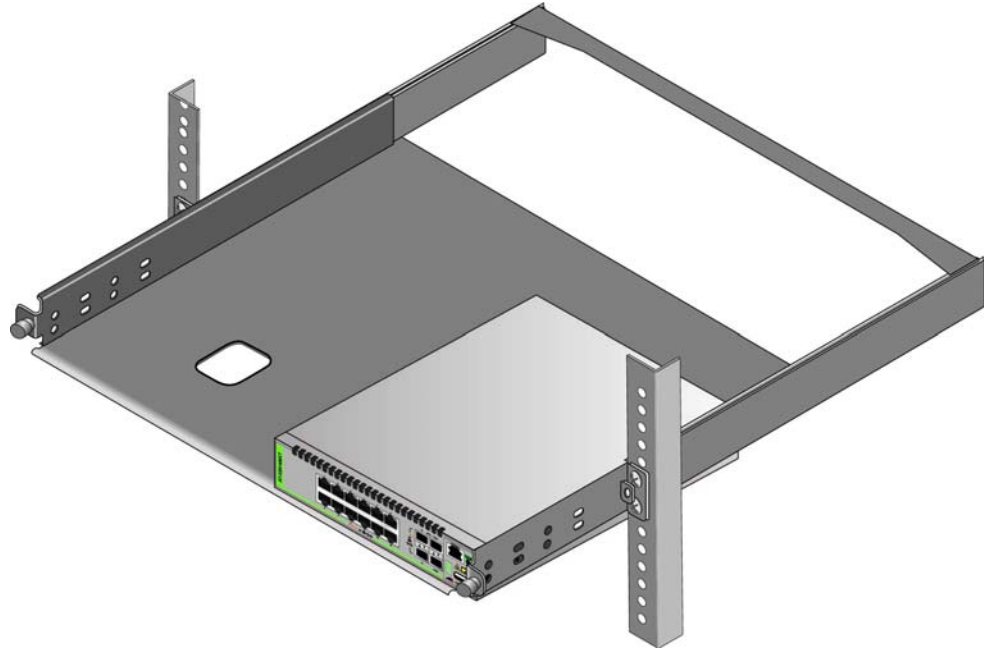
Figure 35. Placing a Switch in the AT-RKMT-J15 Bracket

8. Install two M4x6mm screws included with the switch to secure the switch to the bracket. Refer to Figure 36.
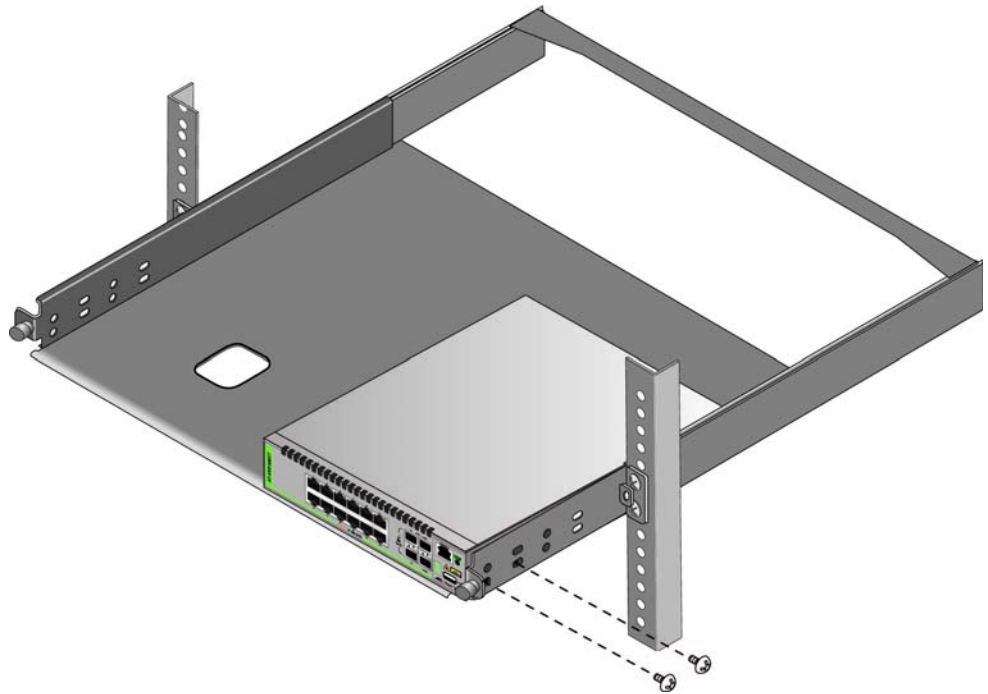
Figure 36. Securing the Switch to the AT-RKMT-J15 Bracket

9. To install a second switch in the bracket, repeat steps 4 to 8.

10. Slide in the bracket tray. Refer to Figure 37.
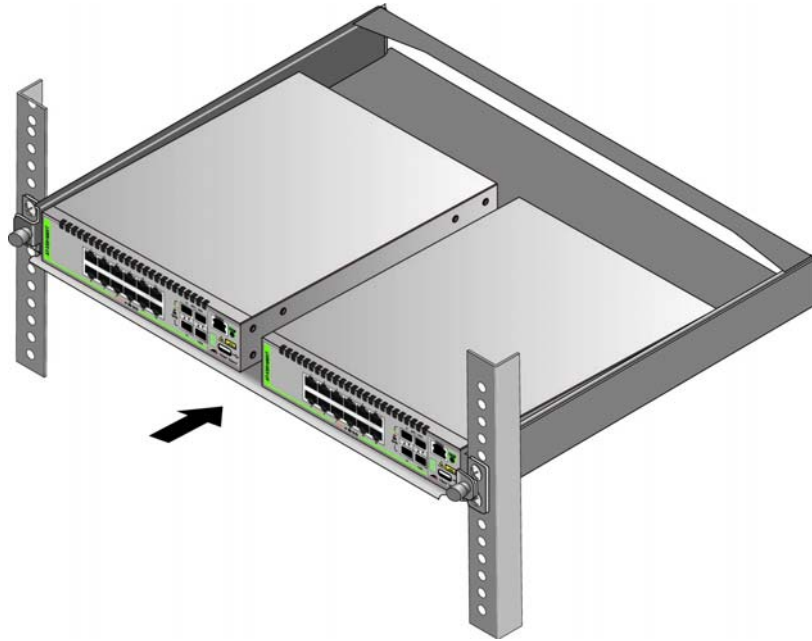
Figure 37. Sliding in the Bracket Tray

11. Tighten the two thumbscrews to secure the tray to the bracket. Refer to Figure 38.
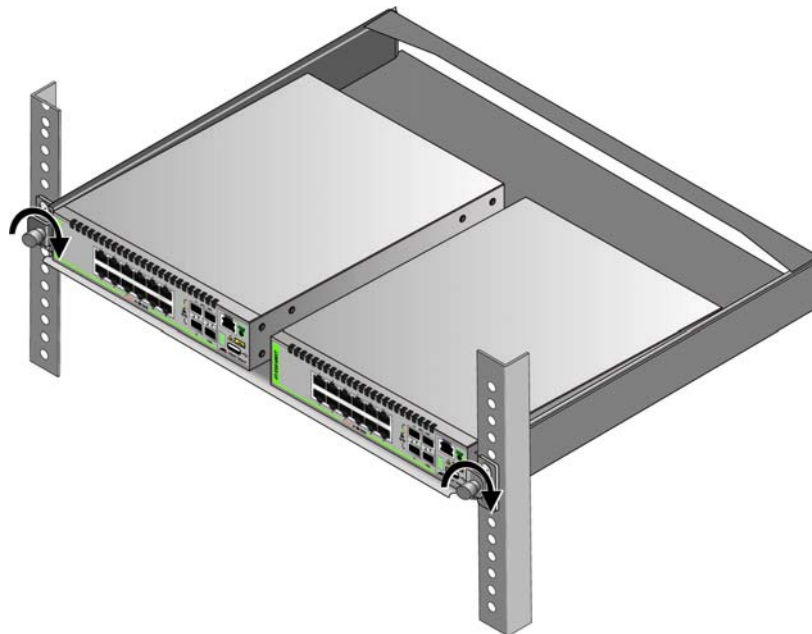
Figure 38. Tightening the Two Thumbscrews on the AT-RKMT-J15 Bracket

12. Go to Chapter 6, "What to Do First" on page 81.

Chapter 5
Installing the Switch on a Wall

The procedures in this chapter are listed here:

❐ "Switch Orientations on a Wall" on page 70
❐ "Installation Guidelines" on page 71
❐ "Plywood Base for a Wall with Wooden Studs" on page 73
❐ "Installing a Plywood Base" on page 75
❐ "Installing the Switch on a Plywood Base" on page 76
❐ "Installing the Switch on a Concrete Wall" on page 78

Switch Orientations on a Wall

You can install the switch on a wall with the front panel on the left or right, as shown in Figure 39. Do not install it with the front panel on the top or bottom.

Figure 39. Positioning the Switch on the Wall

Installation Guidelines

Here are the guidelines to installing the switch on a wall:

❒ You can install the switch on a wall with wooden studs or a concrete wall.

❒ If you are installing the switch on a wall with wooden studs, you should use a plywood base to support the switch. For more information, refer to "Plywood Base for a Wall with Wooden Studs" on page 73. A plywood base is not required for a concrete wall.

❒ You should not install the switch on a wall that has metal studs. Metal studs may not be strong enough to safely support the device.

❒ Do not install the switch on sheetrock or similar material. Sheetrock is not strong enough to safely support the device.

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

Warning
The device should be installed on a wall by a qualified building contractor. Serious injury to yourself or others or damage to the equipment may result if it is not properly fastened to the wall. ⌇ E105

Tools and Material

Here are the required tools and material for installing the switch on a wall:

❒ Four AT-BRKT-J24 wall brackets and sixteen screws (included with the switch)

❒ Cross-head screwdriver (not provided)

❒ Stud finder for a wooden wall, capable of identifying the middle of wall studs and hot electrical wiring (not provided)

❒ Drill and 1/4" carbide drill bit for a concrete wall (not provided)

❒ Plywood base if you are installing the switch on a wall with wooden studs (not provided.) Refer to "Plywood Base for a Wall with Wooden Studs" on page 73 for illustrations.

❒ Four screws to attach the plywood base to the wall (not provided)

❒ Four 6mmx4mmx29.6mm anchors (included with the switch)

❒ Four M4x32mm screws to attach the switch to the wall (included with the switch)

⚠️ **Caution**

The supplied screws and anchors might not be appropriate for all walls. A qualified building contractor should determine the hardware requirements for your wall prior to installing the switch. ⤶ E88

Plywood Base for a Wall with Wooden Studs

If you are installing the switch on a wall that has wooden studs, Allied Telesis recommends using a plywood base for the device. (A plywood base is not required for a concrete wall.) Refer to Figure 40.

Wall Studs
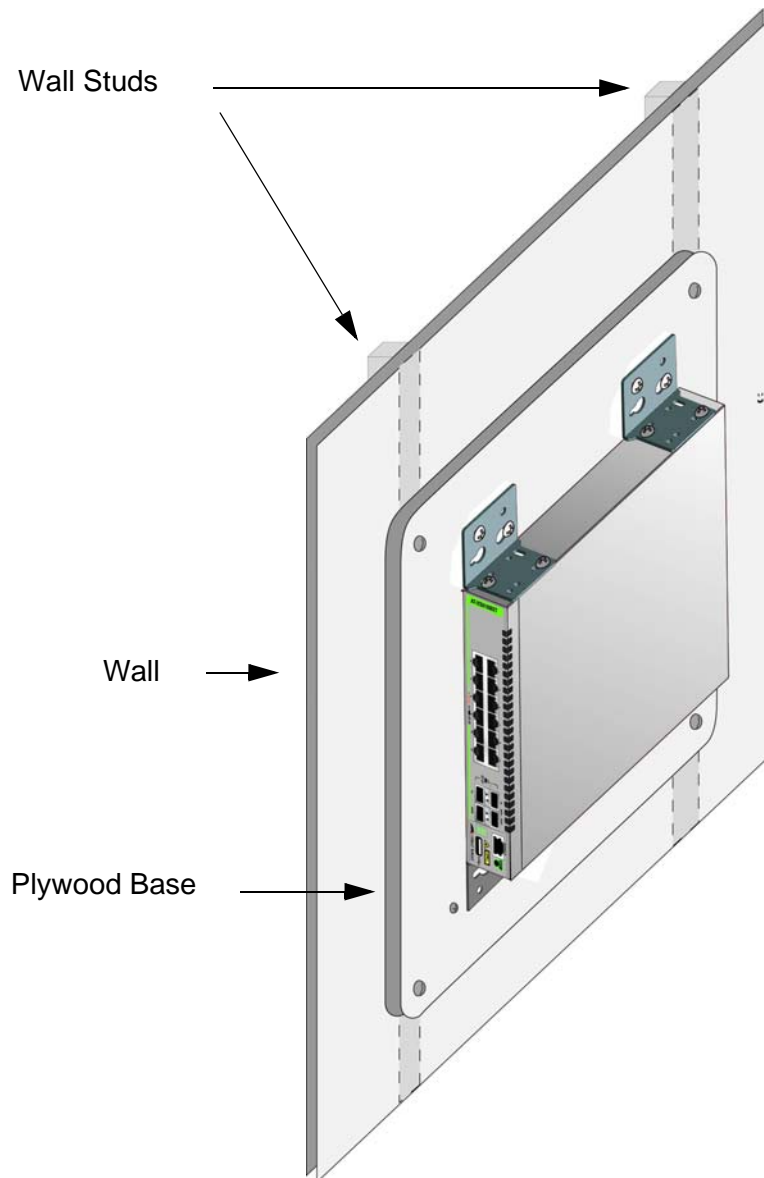
Wall

Plywood Base

Figure 40. Switch on the Wall with a Plywood Base

The plywood base should be mounted to two studs in the wall. The recommended minimum dimensions of the plywood base for the switch are listed here:

❒ Width: 55.9 centimeters (22 inches)

❒ Height: 35.6 centimeters (14 inches)

❒ Thickness: 2.5 centimeters (1 inch)

The dimensions assume the wall studs are 41 centimeters (16 inches) apart. You might need to adjust the width of the base if the distance between the studs in your wall is different than the industry standard.

You should install the plywood base on the wall and then install the switch on the base. Refer to Figure 41.

Wall Studs

Wall

Plywood Base

Step 1: Install the plywood base on the wall.

Step 2: Install the switch on the plywood base.
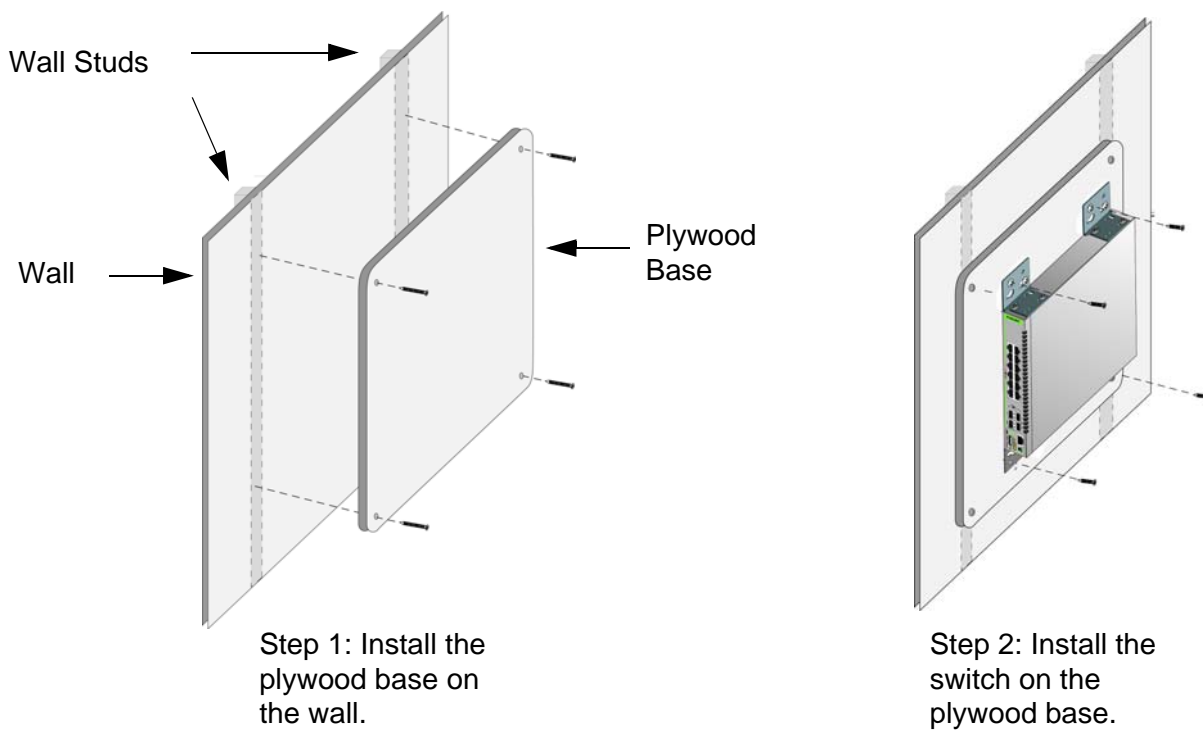
Figure 41. Steps to Installing the Switch with a Plywood Base

Installing a Plywood Base

A plywood base is recommended when installing the switch on a wall that has wooden studs. Refer to "Plywood Base for a Wall with Wooden Studs" on page 73. Consult a qualified building contractor for installation instructions for the plywood base. The installation guidelines are listed here:

❒ You should use a stud finder to identify the middle of studs and hot electrical wiring in the wall.

❒ You should attach the base to two wall studs with a minimum of four screws.

❒ The selected wall location for the base should provide sufficient space from other devices or walls so that you can access the front and back panels, and for adequate air flow for ventilation.

Installing the Switch on a Plywood Base

This procedure assumes that the plywood base for the switch is already installed on the wall. Please review "Reviewing Safety Precautions" on page 48 and "Choosing a Site for the Switch" on page 52 before performing this procedure. Allied Telesis recommends a minimum of two people for this procedure.

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

⚠️ **Warning**
The device should be installed on the wall by a qualified building contractor. Serious injury to yourself or others or damage to the equipment may result if it is not properly fastened to the wall. ⌇ E105

To install the switch on the plywood base, perform the following procedure:

1. Place the switch on a table.

2. Install the four AT-BRKT-J24 wall brackets to the sides of the unit, with the sixteen M4x6mm screws included with the switch. Refer to Figure 42.
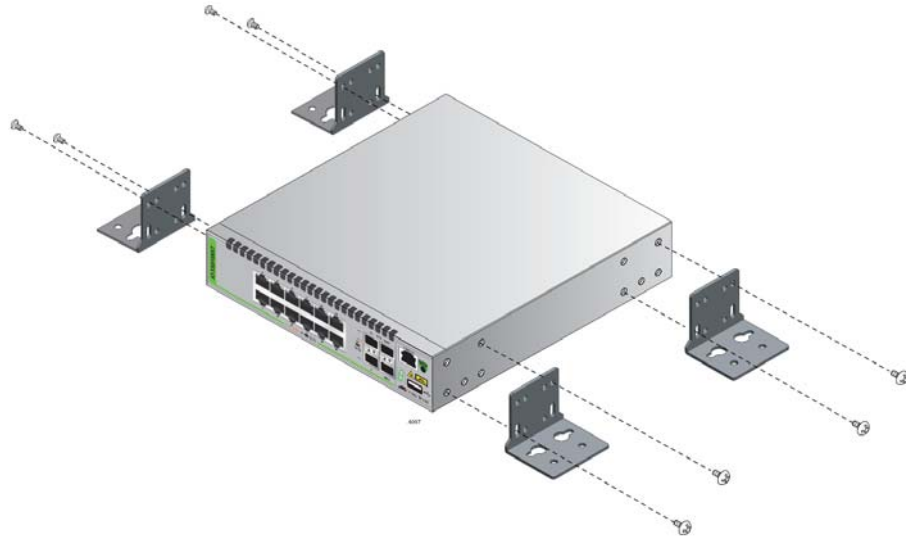
Figure 42. Installing the Wall Brackets

3. After attaching the brackets, have another person hold the switch on the plywood base on the wall while you secure it with four screws (not included with the switch). Refer to Figure 43.

   Please follow these guidelines as you position the switch on the wall:

   ❒ Position it so that the front panel is either on the left or right. Refer to Figure 39 on page 70. Do not install it with the front panel facing up or down.

   ❒ Leave sufficient space from other devices or walls so that you can access the front and back panels, and for adequate air ventilation.
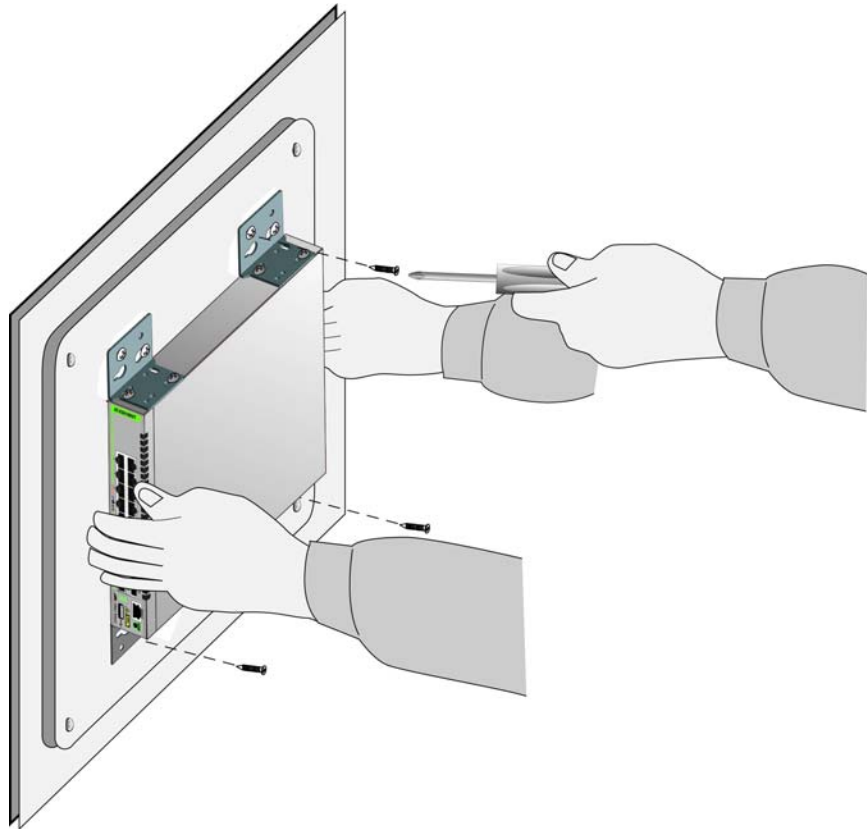
Figure 43. Securing the Switch to the Plywood Base

4. Go to Chapter 6, "What to Do First" on page 81.

Installing the Switch on a Concrete Wall

This section contains the instructions for installing the switch on a concrete wall. Please review the information in the following sections before performing the procedure:

❑ "Switch Orientations on a Wall" on page 70

❑ "Installation Guidelines" on page 71

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

⚠ **Warning**
The device should be installed on the wall by a qualified building contractor. Serious injury to yourself or others or damage to the equipment may result if it is not properly fastened to the wall. ⌒ E105

To install the switch on a concrete wall, perform the following procedure:

1. Place the switch on a table.

2. Install the four AT-BRKT-J24 wall brackets to the sides of the unit, with the sixteen M4x6mm screws included with the switch. Refer to Figure 42 on page 76.

3. Have another person hold the switch on the concrete wall at the selected location for the device while you use a pencil or pen to mark the wall with the locations of the four screw holes in the four brackets (one screw per bracket). Refer to Figure 44 on page 79.

   Please follow these guidelines as you position the switch on the wall:

   ❑ Position the switch so that the front panel is either on the left or the right. Refer to Figure 39 on page 70. Do not install the switch with the front panel facing up or down.

   ❑ Leave sufficient space from other devices or walls so that you can access the front and back panels, and for adequate air ventilation.
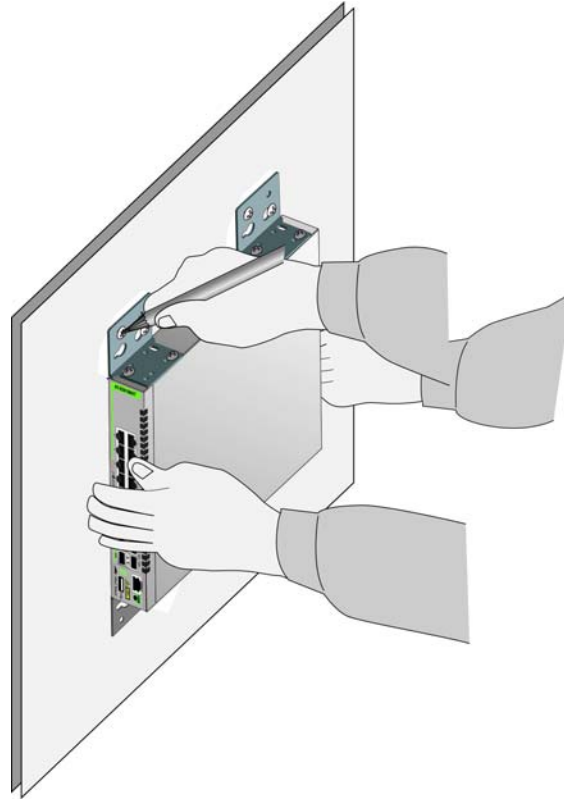
Figure 44. Marking the Locations of the Bracket Holes on a Concrete Wall

4. Place the switch on a table or desk.

5. Use a drill and 1/4" carbide drill bit to pre-drill the holes you marked in step 3. Please review the following guidelines:

    ❐ Prior to drilling, set the drill to hammer and rotation mode. The modes break up the concrete and clean out the hole.

    ❐ Allied Telesis recommends cleaning out the holes with a brush or compressed air.

6. Insert the four provided anchors into the holes.

7. Have another person hold the switch at the selected wall location while you secure it to the wall with the four M4x32mm screws. Refer to Figure 45 on page 80.
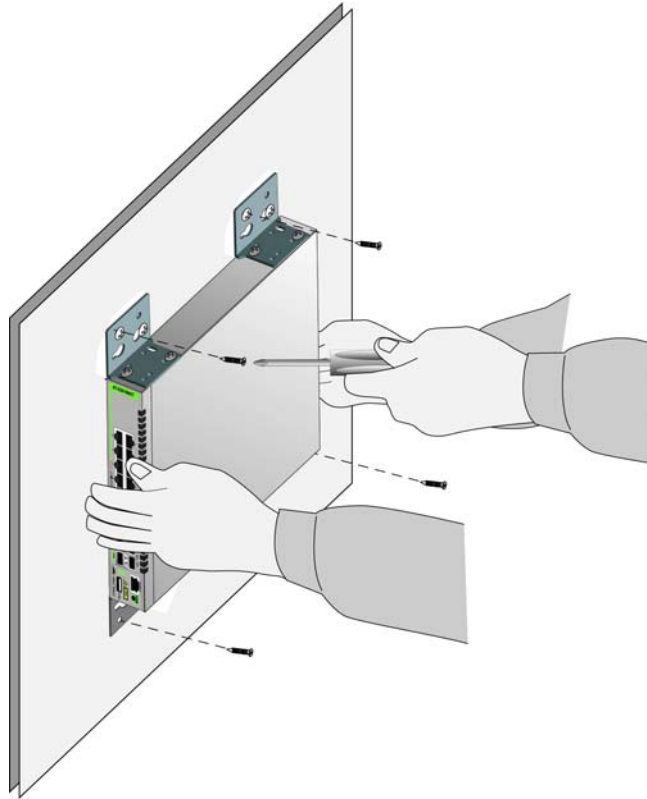
Figure 45. Installing the Switch on a Concrete Wall

8.   Go to Chapter 6, "What to Do First" on page 81.

Chapter 6

What to Do First

The procedures in this chapter are:

Introduction

There are a couple steps you should perform on both switches before you cable the trunk ports and build the stack:

❐ The first is verify that VCStack is enabled on the switches. In all likelihood, it already is because that is its default setting. As explained in "Verifying the Status of VCStack" on page 85, checking its status is easy. You power on a switch and watch to see what number is displayed on the Switch ID LED. If the LED displays the number 0, VCStack is disabled. If it displays is 1 or higher, VCStack is enabled. In the small chance that the feature is disabled, you can find instructions for enabling it in "Activating VCStack" on page 89.

❐ Another important step is displaying the version numbers of the AlliedWare Plus management software on the switches. This is important because switches that have different versions might not be able to form a stack. Performing this step requires a local management session. Instructions for this are in "Starting a Local Management Session" on page 86. From there you go to "Displaying the AlliedWare Plus Version Number" on page 88. You should add the version numbers to the "Stacking Worksheet" on page 45.

Once you have verified the VCStack status and confirmed the version numbers of the AlliedWare Plus management software, do one of the following:

❐ To build the stack using the default 15/S1 and 16/S2 ports for the trunk, go to Chapter 7, "Stacking with the Default Trunk Ports" on page 91.

❐ To build the stack using other ports for the trunk, go to Chapter 8, "Stacking with Non-default Trunk Ports" on page 105.

Powering on a Switch

To power on a switch, perform the following procedure:

1. If you have not installed the power cord retaining clip, go to "Installing the Power Cord Retaining Clip" on page 54.

2. Connect the power cord to the AC connector on the back panel.
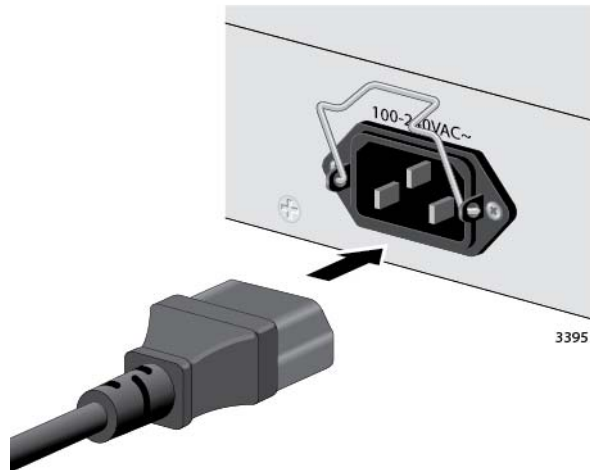
Figure 46. Plugging in the AC Power Cord

3. Lower the retaining clip to secure the power cord to the switch. See Figure 47.
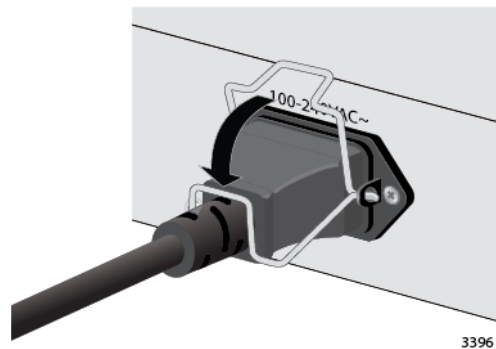
Figure 47. Lowering the Retaining Clip

4. Connect the power cord to an appropriate AC power source. Refer to Figure 48 on page 84.
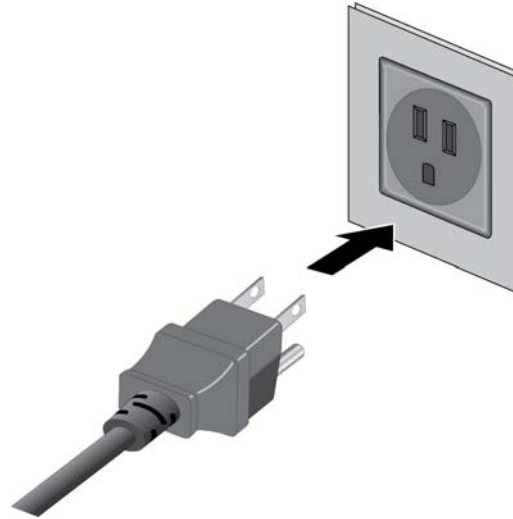
Figure 48. Connecting the Power Cord to an AC Power Source

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

Note
Refer to "Power Specifications" on page 144 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

5. Wait two minutes for the switch to initialize its AlliedWare Plus management software.

Verifying the Status of VCStack

The first step to building a stack is to verify that VCStack is enabled on the switches. If it is disabled, you will need to enable it with the instructions in this chapter.

To determine the status of VCStack, perform the following procedure:

1. Power on the switch. Refer to "Powering on a Switch" on page 83.

2. Wait two minutes for the switch to initialize the AlliedWare Plus management software.

3. If the Switch ID LED is displaying the number 1 or higher (the default is 1), VCStack is already enabled on the switch. Do the following:

   ❐ Go to "Starting a Local Management Session" on page 86.
   ❐ Afterwards, perform "Displaying the AlliedWare Plus Version Number" on page 88.

4. If the Switch ID LED is displaying "0," the VCStack feature is disabled. Do the following:

   ❐ Go to "Starting a Local Management Session" on page 86.
   ❐ Perform "Displaying the AlliedWare Plus Version Number" on page 88.
   ❐ Perform "Activating VCStack" on page 89.

Starting a Local Management Session

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

1. Connect the RJ-45 connector on the management cable to the Console port on the front panel of the switch, as shown in Figure 49.
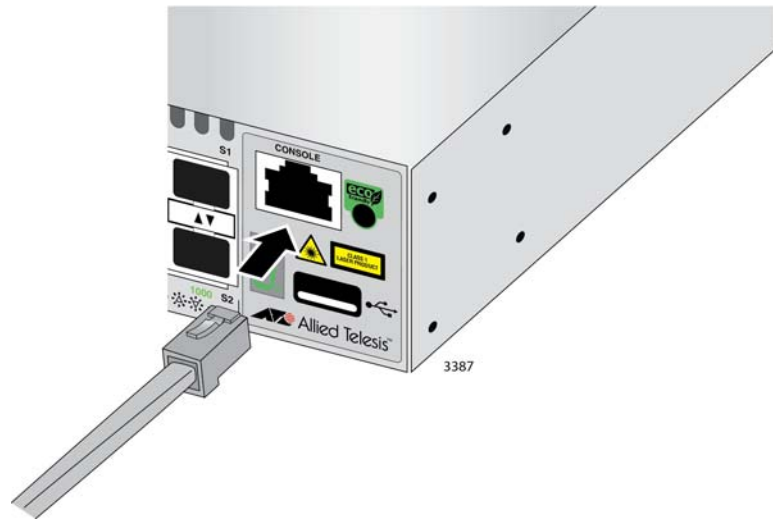
Figure 49. Connecting the Management Cable to the Console Port

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

3. Configure the terminal or terminal emulator program as follows:

   ❑ Baud rate: 9600 bps (The baud rate of the Console Port is adjustable from 1200 to 115200 bps. The default is 9600 bps.)

   ❑ Data bits: 8

   ❑ Parity: None

   ❑ Stop bits: 1

   ❑ Flow control: None

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

4. Press Enter.

   You are prompted for a user name and password.

5. If this is the initial management session of the switch, enter "manager" as the user name and "friend" as the password. The user name and password are case sensitive.

    The local management session starts when the User Exec mode prompt, shown in Figure 50, is displayed.

```
awplus>
```

Figure 50. User Exec Mode Prompt

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 XS900MX Series Switches, AlliedWare Plus Operating System* from **www.alliedtelesis.com/support**.
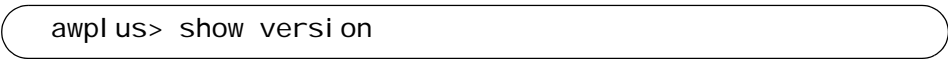
Displaying the AlliedWare Plus Version Number

Before building the stack, you should first determine whether the switches have the same version of the AlliedWare Plus management software. If they have different versions, Allied Telesis recommends upgrading both switches to the latest version. For instructions. refer to the *Software Reference for XS900MX Series Switches, AlliedWare Plus Operating System*.

To view the AlliedWare Plus version number, perform the following procedure:

1. Start a local management session on the switch. Refer to "Starting a Local Management Session" on page 86.

2. Display the version number with the SHOW VERSION command. Refer to Figure 51.

```
awplus> show version
```

Figure 51. SHOW VERSION Command

3. Write down the version number in the Stacking Worksheet in Table 4 on page 45.

4. Do one of the following:

   ❑ If the Switch ID LED is displaying 0, perform "Activating VCStack," next.

   ❑ Otherwise, power off the switch by disconnecting the power cord from the AC power source.

5. Repeat the procedures in this chapter on the second switch.

6. After performing the procedures on both switches, verify that both units are powered off.

7. Go to Chapter 7, "Stacking with the Default Trunk Ports" on page 91 or Chapter 8, "Stacking with Non-default Trunk Ports" on page 105.

Activating VCStack

If you determined in "Verifying the Status of VCStack" on page 85 that VCStack is disabled, perform the following procedure to enable it:

1. Start a local management session. Refer to "Starting a Local Management Session" on page 86.

2. Enter the ENABLE command to move from the User Exec mode to the Privileged Exec mode, as shown in Figure 52.

```
awplus> enable
awplus#
```

Figure 52. Moving to the Privileged Exec Mode with the ENABLE Command

3. Enter the CONFIGURE TERMINAL command to move to the Global Configuration mode, as shown in Figure 53.

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

Figure 53. Moving to the Global Configuration Mode with the CONFIGURE TERMINAL Command

4. Enter the STACK ENABLE command to activate VCStack on the switch, as shown in Figure 54 on page 89:

```
awplus(config)# stack enable
% The device needs to be restarted for this change to take effect.
awplus(config)#
```

Figure 54. Activating VCStack with the STACK ENABLE Command

5. Enter the EXIT command to return to the Privileged Exec mode, as shown in Figure 55.

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

Figure 55. Returning to the Privileged Exec Mode with the EXIT Command

6. Enter the WRITE command to save your change, as shown in
    Figure 56.

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

Figure 56. Saving the Change with the WRITE Command

If this is the initial management session of the switch, the switch
automatically creates in flash memory a new configuration file called
DEFAULT.CFG to store your configuration change. You can change
the name of the file or designate a different file after creating the stack.

7. Restart the switch with the REBOOT command, as shown in
    Figure 57.

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

Figure 57. Rebooting the Switch with the REBOOT Command

8. Type "Y" for yes.

9. Wait two minutes for the switch to initialize its management software.

10. Check the ID LED and do one of the following:

    ❒   If the ID LED is displaying the number 1 or higher, VCStack is now
        enabled on the switch. Power off the switch by disconnecting the
        power cord and repeat the procedures in this chapter on the
        second switch. Afterwards, go to Chapter 7, "Stacking with the
        Default Trunk Ports" on page 91 or Chapter 8, "Stacking with Non-
        default Trunk Ports" on page 105.

    ❒   If the ID LED is still displaying "0," repeat this procedure. If the
        procedure was not successful, it might be because you did not
        issue the WRITE command in Step 6 to save your change.

Chapter 7

Stacking with the Default Trunk Ports

This chapter contains the following procedures:

Introduction

This chapter explains how to initially power on a stack when the switches are using default ports 15/S1 and 16/S2 for the trunk. If the stack is using other trunk ports, refer to Chapter 8, "Stacking with Non-default Trunk Ports" on page 105.

> **Note**
> Switches that are using the default ports 15/S1 and 16/S2 for the trunk do not require any configuration procedures prior to powering on the stack.

You can control the ID number assignments of the switches yourself or let the switches assign them automatically, depending on how you initially power on the stack. This is explained in the following procedures:

❒ "Powering On the Switches Individually" on page 94 - Perform this procedure if you want to control the assignment of the ID numbers to the switches of the stack. The numbers are assigned in the order in which you power on the units. You can also use this procedure to select the initial master switch. The first switch powered on becomes the master switch.

❒ "Powering On the Switches Simultaneously" on page 96 - Perform this procedure if you want the switches to assign the ID numbers and select the master switch automatically.

⚠ **Caution**
You should not change the ID numbers of the switches after you begin to configure the parameter settings. Otherwise, the stack might assign configuration settings to the wrong units. ✍ E79

Cabling the Default 15/S1 and 16/S2 Trunk Ports

Before powering on the stack, you need to cable the default 15/S1 and 16/S2 trunk ports. The ports support the following cables as trunk cables:

❒ AT-StackXS/1.0 (1 meter) stacking transceiver and cable

❒ AT-SP10TW1 (1 meter) Direct Attach Cable

❒ AT-SP10TW3 (3 meter) Direct Attach Cable

Note
The XS900MX Switches do not support the AT-SP10TW7 Direct Attach Cable.

Instructions for installing the cables are found in "Installing AT-StackXS/1.0, AT-SP10TW1, or AT-SP10TW3 Cables" on page 136.

When cabling the ports, be sure that the ports crossover. Port 15/S1 on one switch has to connect to port 16/S2 on the second switch, and port 16/S2 has to connect to port 15/S1.

After cabling the trunk ports, go to "Powering On the Switches Individually" on page 94 to assign the switch ID numbers yourself or "Powering On the Switches Simultaneously" on page 96 to let the switches assign the numbers.

Powering On the Switches Individually

This procedure explains how you can control the assignment of the ID numbers of the switches by powering on the units one at a time. The first switch is assigned ID number 1 and the second unit ID number 2. After the ID numbers are assigned, the switches retain them even when you power off or reset the stack.

During the first power-on sequence, the first switch to be powered on becomes the initial master switch of the stack. However, if you do not change the priority values of the units, the next time you reset or power cycle the stack, the units use their MAC addresses to select the master switch. This might result in the other switch becoming the master switch. However, this does not change their ID number assignments, the configuration of the switches, or the manner in which you manage the stack.

This procedure assumes the following:

- ☐ This is the first power-on of the stack.
- ☐ You verified that VCStack is enabled on the switches, as explained in Chapter 6, "What to Do First" on page 81.
- ☐ You verified that both switches have the same version of the AlliedWare Plus management software. Refer to "Displaying the AlliedWare Plus Version Number" on page 88.
- ☐ You cabled the 15/S1 and 16/S2 ports with stacking transceivers. Refer to "Installing AT-StackXS/1.0, AT-SP10TW1, or AT-SP10TW3 Cables" on page 136.
- ☐ The ID numbers are set to the default 1.
- ☐ The switches are powered off.

If you want to monitor the power-on sequence, you can connect a terminal or computer with a terminal emulator program to the Console port on the switch you intend to power on first. The messages are found in "Monitoring the Initialization Processes" on page 101.

Before powering on the switch, refer to "Power Specifications" on page 144 for the power specifications.

To power on the switches, perform the following procedure:

1. Power on the switch you want assigned ID number 1. Refer to "Powering on a Switch" on page 83.

Note
Refer to "Power Specifications" on page 144 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

2. Wait two minutes for the switch to initialize its management software.

    The switch should be displaying the number 1 on its ID LED.

3. Power on the second switch.

4. Wait four minutes for the new switch to join the stack as a member.

    As the new switch boots up, the first switch, which has the ID number 1 and at this point is the master switch of the stack, notifies the new switch that its current ID number is already being used and that it should change its number to the next available number, which is 2. The new switch responds by automatically changing its ID number to 2 and reboots. So the new switch is actually booting up twice, once with the default ID number 1 and again with its new ID number 2, which is why it takes four minutes before it becomes a full member of the stack.

    At this point, the stack is operational.

    The switches save their ID numbers in special files in flash memories. They retain the numbers even when reset or powered off.

5. To continue with the installation, go to "Verifying the Stack" on page 98.

Powering On the Switches Simultaneously

If you want the switches of the stack to use their MAC addresses to automatically assign the ID numbers during the initial power-on sequence, and to select the master switch themselves, power them on simultaneously. Here are the steps the switches perform:

❐ They initialize their management software and compare their MAC addresses.

❐ The switch with the lowest address is designated as the master switch of the stack.

❐ The master switch assigns itself the ID number 1.

❐ The master switch assigns the ID number2 to the other switch.

❐ The other switch resets and initialize its management software again, with its new ID number 2.

This procedure assumes the following:

❐ This is the first power-on of the stack.

❐ You verified that VCStack is enabled on the switches, as explained in Chapter 6, "What to Do First" on page 81.

❐ You verified that both switches have the same version of the AlliedWare Plus management software. Refer to "Displaying the AlliedWare Plus Version Number" on page 88.

❐ You cabled the 15/S1 and 16/S2 ports with stacking transceivers. Refer to "Installing AT-StackXS/1.0, AT-SP10TW1, or AT-SP10TW3 Cables" on page 136.

❐ The ID numbers are set to the default 1.

❐ The switches are powered off.

If you want to monitor the power-on sequence, you can connect a terminal or computer with a terminal emulator program to the Console port on any of the switches. The messages are found in "Monitoring the Initialization Processes" on page 101.

To have the switches automatically assign the ID numbers, perform the following procedure:

1. Power on all the switches in the stack at the same time. Refer to "Powering on a Switch" on page 83.

> **Note**
> Refer to "Power Specifications" on page 144 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

2. Wait four minutes for the switches to select the master switch and assign the ID numbers.

    At this point, the stack is operational. The switches save their ID numbers in special files in flash memories. They retain the numbers even when reset or powered off.

3. To continue with the installation, go to "Verifying the Stack" on page 98.

Verifying the Stack

To verify stack operations, perform the following procedure:

1. Start a local management session on either switch. Refer to "Starting a Local Management Session" on page 86.

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

awplus> show stack

The command lists the switches in the stack. An example is shown in Figure 58.

```
awplus> show stack
Virtual Chassis Stacking summary information

ID     Pending ID      MAC address       Priority    Status    Role
1      -               eccd:6dc1:ed30    128         Ready     Active Master
2      -               eccd:6dc1:65ab    128         Ready     Backup Member

Operational Status                       Normal operations

Stack MAC address      eccd:6dc1:ed30

awplus(config)#
```

Figure 58. SHOW STACK Command

Here are things to check:

❒ The command should list both switches. If the list has only one switch, refer to Chapter 10, "Troubleshooting" on page 139.

❒ The Operational Status field should display "Normal operations," indicating that all trunk ports are linked to their counterparts. If not all trunk ports are linked up, the field displays "Not all stack ports are up."

❒ The priority values will be 128, the default value, if you have not changed them.

❒ There is no relationship between ID numbers and the master switch. Consequently, the active master in the SHOW STACK command might not be the switch with the ID number 1.

3. Do one of the following:

❒ If you want to change the priority values of the switches, go to "Setting the Priority Numbers" on page 99. This step is optional.

❒ Otherwise, go to Chapter 9, "Cabling the Networking Ports" on page 131, to complete with the installation.

Setting the Priority Numbers

This procedure is optional. It explains how to configure the priority settings of the switches. Changing the priority settings protects the stack configuration should you ever power on the stack with a new member switch that has a lower MAC address than an existing master or member switch.

This procedure assumes you are continuing directly on from the previous procedure.

To set the priority values of the switches, perform the following procedure:

1. Use the CONFIGURE TERMINAL command to move from the Privileged Exec mode to the Global Configuration mode, as shown in Figure 59.

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

Figure 59. Moving to the Global Configuration Mode with the CONFIGURE TERMINAL Command

2. Use the STACK PRIORITY command to set the priority numbers. The command has this format:

```
stack ID_number priority priority
```

The ID_NUMBER parameter is the ID number of the switch whose priority value you are setting. The range is 1 to 2. The PRIORITY parameter is the new priority value for the switch. The range is 0 to 255. The default is 128.

Here are some examples. To assign the priority value 1 to the switch with the ID number 1, you enter this command:

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

To set the priority value to 2 on the switch with the ID number 2, you enter:

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

3. After setting the priority values, enter the EXIT command to return to the Privileged Exec mode, as shown in Figure 60 on page 100.

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

Figure 60. Returning to the Privileged Exec Mode

4. Enter the WRITE command to save your change in the configuration file. The switch displays the confirmation prompt in Figure 61.

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

Figure 61. Saving the Priority Values with the WRITE Command

5. To end the management session, enter the EXIT command.

6. Go to Chapter 9, "Cabling the Networking Ports" on page 131, to continue with the installation.

Monitoring the Initialization Processes

You may monitor the initialization sequence of the stack by connecting a terminal or computer that has a terminal emulator program to the Console port on any switch in the stack. You will see the messages in Figure 62 here to Figure 64 on page 103.

```
Bootloader loaded
Press <Ctrl+B> for the Boot Menu

Reading filesystem...
Loading flash:xs900mx.rel...
Verifying release... OK
Booting...
Starting base/first...                                    [  OK  ]
Mounting virtual filesystems...                           [  OK  ]


              _____  ____
         /\ \            / /_____\
        /   \ \_     __/ /| _____ |
       /     \ |     | / | _____ |
      /       \ \  / /     \ ___ /
     /_____/\____\ \/ /_____/


Allied Telesis Inc.
AlliedWare Plus (TM) v5.4.7-1
Current release filename: xs900mx-main-.rel
Built: Wed Oct 28 06:23:09 UTC 2015
Mounting static filesystems...                            [  OK  ]
Checking flash filesystem...                              [  OK  ]
Mounting flash filesystem...                              [  OK  ]
Checking for last gasp debug output...                    [  OK  ]
Checking NVS filesystem...                                [  OK  ]
Mounting NVS filesystem...                                [  OK  ]
Starting base/arm_sysctl...                               [  OK  ]
Starting base/dbus...                                     [  OK  ]
Starting base/syslog...                                   [  OK  ]
Starting base/loopback...                                 [  OK  ]
Starting base/poe_done...                                 [  OK  ]
Starting base/sysctl...                                   [  OK  ]
```

Figure 62. Switch Initialization Messages

```
Starting base/portmapper...                                [   OK   ]
Received event syslog.done
Starting base/reboot-stability...                          [   OK   ]
Checking system reboot stability...                        [   OK   ]
Starting base/cron...                                      [   OK   ]
Starting base/apteryx...                                   [   OK   ]
Starting base/appmond...                                   [   OK   ]
Starting base/clockcheck...                                [   OK   ]
Starting hardware/openhpi...                               [   OK   ]
Starting hardware/timeout...                               [   OK   ]
Starting base/inet...                                      [   OK   ]
Starting base/modules...                                   [   OK   ]
Received event modules.done
Received event board.inserted
Received event apteryx.done
Starting network/kermond...                                [   OK   ]
Starting hardware/plugman...                               [   OK   ]
Starting hardware/hardware-done...                         [   OK   ]
Received event hardware.done
Starting network/startup...                                [   OK   ]
Starting base/external-media...                            [   OK   ]
Starting network/stackd...                                 [   OK   ]
Starting network/election.timeout...                       [   OK   ]
Starting network/corosync...                               [   OK   ]
Received event network.enabled


Initializing HA processes:
atmfd, auth, cntrd, epsr, hostd, hsl, imi
imiproxyd, lacp, lldpd, loopprot, mstp, nsm, ripd
rmon, sflowd, udldd


Received event network.initialized


10:43:34 awplus-1 HPI: HOTSWAP Pluggable 1.0.27 hotswapped in: 2127931-2
10:43:34 awplus-1 HPI: HOTSWAP Pluggable 1.0.28 hotswapped in: 2127931-2
10:43:42 awplus-1 VCS[1151]: Member 2 (eccd.6ddf.4423) has joined the stack
10:43:43 awplus-1 VCS[1151]: Member 1 (eccd.6ddf.441c) has become the Active
Master
Received event vcs.elected-master
10:43:43 awplus VCS[1151]: Stack Virtual MAC is 0000.cd37.097f
```

Figure 63. Switch Initialization Messages (Continued)

```
Assigning Active workload to HA processes:
hsl, nsm, authd, epsrd, lacpd, lldpd, loopprotd
mstpd, rmond, sflowd, imi, imiproxyd


00:01:04 awplus VCS[904]: Duplicate stack member 1 detected for
eccd:6dc1.1a60 and eccd:6dc1.19ff
00:01:04 awplus VCS[904]: Automatically renumbering stack member 1
(eccd:6dc1.1a60), selecting unused member-ID...


Received event network.activated


Loading default configuration
Warning: flash:/default.cfg does not exist, loading factory defaults.
..
done!
Received event network.configured
00:01:22 awplus VCS[904]: Renumbering stack member 1 (eccd:6dc1.1a60) to ID2
00:01:22 awplus VCS[904]: Automatically rebooting stack member 2
(eccd:6dc1.1a60) due to duplicate member-ID
00:01:33 awplus VCS[904]: Member 2 (eccd:6dc1.1a60) has joined the stack
00:01:33 awplus VCS[904]: Please configure 'stack virtual-mac' to minimize
network disruption from failovers
00:01:34 awplus VCS[827]: All users returned to config mode while switch
synchronization is in progress.
00:01:42 awplus VCS[819]: Insertion event on unit 2.0 has been completed.
00:01:54 awplus VCS[827]: Configuration update completed for port2.0.1-
2.0.50


awplus login:
```

Figure 64. Switch Initialization Messages (Continued)

Chapter 8

Stacking with Non-default Trunk Ports

This chapter contains the following sections:

Introduction

This chapter explains how to build a stack with two trunk ports other than the default ports 15/S1 and 16/S2. As explained in "Stack Trunk" on page 38, you can use the default ports for the trunk or choose the ports yourself. Directions on how to use the default ports are provided in Chapter 7, "Stacking with the Default Trunk Ports" on page 91.

Here are the procedures to building a stack with non-default trunk ports:

1. "Verifying the Status of VCStack" on page 85.

2. "Displaying the AlliedWare Plus Version Number" on page 88.

3. "Configuring the Master Switch" on page 110.

4. "Configuring the Member Switch" on page 118.

5. "Cabling the Trunk Ports" on page 126.

6. "Powering on the Stack" on page 127

7. "Verifying the Stack" on page 129

The procedures should be performed in the order above. Allied Telesis recommends reviewing "Command Summary" on page 107 before performing procedures 3 and 4.

You need to select the following before configuring the switches:

❐ Which switch will be the master switch? It can be either switch. Refer to "Master and Member Switches" on page 43.

❐ Which two ports on each switch will be the trunk ports? Refer to "Stack Trunk" on page 38.

Allied Telesis recommends using the "Stacking Worksheet" on page 45 during the procedures.

> **Note**
> If you have already connected network cables to the trunk ports, disconnect them before continuing. Cabling the trunk ports before configuring the switches may result in loops in your network topology, which can cause poor network performance.

Command Summary

The following sections briefly describe the commands for configuring the master and member switches for stacking with non-default trunk ports. For further instructions, refer to the *Software Reference for XS900MX Switch, AlliedWare Plus Operating System*. After reviewing the commands, go to "Configuring the Master Switch" on page 110 to begin the configuration procedures.

STACKPORT This command is used to designate the ports of the stack trunk. After you enter the command, the designated ports stop functioning as regular Ethernet ports and function instead as the stack trunk. You do not have to perform this command for the default trunk ports because they are already defined as trunk ports.

The command is performed in the Interface mode of the selected ports. In this example, the ports 1 and 2 on the switch are designated as the stack trunk:

```
awplus(config)# interface port1.0.1-1.0.2
awplus(config-if)# stackport
```

To remove the stacking function from ports and return them to regular Ethernet networking ports, use the NO version of the command. You must use this command to remove the stacking function from the default trunk ports before designating other ports as the trunk. This example removes the stacking function from the default stacking ports 15 and 16:

```
awplus(config)# interface port1.0.15-1.0.16
awplus(config-if)# no stackport
```

STACK ENABLE This command is used to enable the VCStack feature on the switch. You will probably not have to perform this command because the feature is enabled by default. However, if for any reason the feature was disabled, you can enable it by entering the command in the Global Configuration mode, as shown here:

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

To disable stacking to use the switch as a stand-alone unit, enter the NO version of the command, shown here:

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

STACK PRIORITY This command is used to assign priority numbers to the switches of the stack. The switches use the numbers to select the master switch. 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 settings a switch's priority number to match its ID number. For example, the switch with ID 1 should be assigned priority 1 and switch with ID 2 should be assigned priority 2. This is not required, but it can make managing and troubleshooting the stack easier.

The command is found in the Global Configuration mode and has the following 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 8. You can specify only one ID number.

- ❐ priority_number - This is the new priority number for the switch. You can specify only one number. The range is 0 to 255. The default is 128.

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

awplus(config)# stack 1 priority 1

STACK RENUMBER

Every switch in a stack has to have a unique ID number. The range is 1 to 4. The default is 1. The master switch should use the default value. The number is set on the member switches with the STACK RENUMBER command. Here is the 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.

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

Changing the ID number requires resetting the switch.

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

awplus(config)# stack 1 renumber 2

SWITCH PROVISION

The master and member switches have to know about each other before you power on the stack for the first time. This involves using the SWITCH PROVISION command to add the member switches as provisioned units to the master switch. Here is the format of the command:

```
switch switch_ID provision xs900-16
```

This example adds a provisioned member switch with the ID 2 to the master switch:

```
awplus(config)# switch 2 provision xs900-16
```

Configuring the Master Switch

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

❒ "General Steps for the Master Switch," next

❒ "Configuring the Master Switch - Part I" on page 111

❒ "Configuring the Master Switch - Part II" on page 113

❒ "Verifying the Master Switch" on page 115

❒ "What to Do Next" on page 117

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

Perform the procedures in the order presented here.

General Steps for the Master Switch

The procedure for configuring the master switch is divided into two parts. Here are the general steps to Part I:

1. Assign the master switch the priority 1 with the STACK PRIORITY command in the Global Configuration mode. This ensure that it becomes the master switch during the first power-on of the stack.

2. Remove the stacking function from the default stacking ports 15/S1 and 16/S2 with the NO STACKPORT command.

3. Designate the new trunk ports with the STACKPORT command.

Here are the general steps to Part II:

1. Add the member switch as a provisioned unit to the master switch, with the SWITCH PROVISION command. This step is to ensure that the master switch knows about the member switch during the first power-on of the stack.

2. Remove the stacking function from the default stacking ports 15/S1 and 16/S2 on the provisioned member switch with the NO STACKPORT command.

3. Designate the new trunk ports on the provisioned member switch with the STACKPORT command.

4. Save your changes with the WRITE command in the Privilege Exec mode.

5. Reboot the switch with the REBOOT command.

6. Start a new local management session.

7. Verify the changes with the SHOW STACK and SHOW RUNNING-CONFIG command.

Configuring the Master Switch - Part I

To configure the master switch for a stack trunk of ports other than the default trunk ports, perform the procedure in Table 6.

Table 6. Configuring the Master Switch - Part I

Step	Description and Command
1	Power on the master switch and wait two minutes for it to initialize the management software. Refer to "Powering on a Switch" on page 83.
2	Start a local management session. Refer to "Starting a Local Management Session" on page 86.
3	Move to the Privileged Exec mode with the ENABLE command. `awplus> enable`
Step 4 displays the version number of the AlliedWare Plus management software.	

4	Display the version number of the AlliedWare Plus operating software on the switch by entering the SHOW VERSION command. Write down the version number in the worksheet in Table 4 on page 45. After viewing the version numbers on both switches, compare them to confirm they all have the same version. Switches with different versions have to be updated.
	
	`awplus# show version`
	`AlliedWare Plus (TM) 5.4.7`

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

Steps 6 and 7 enable the VCStack feature, if needed.	
6	Examine the System ID LED on the front panel of the switch. If it is displaying "0", VCStack is disabled. Perform step 7 to enable it. If the LED is displaying the number "1" or greater, skip step 7 and go to step 8.

Table 6. Configuring the Master Switch - Part I (Continued)

Step	Description and Command

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

Step 8 assigns priority 1 to the switch with the STACK PRIORITY command, so that it functions as the master unit of the stack.	
8	Assign priority 1 to the switch with the STACK PRIORITY. `awplus(config)# stack 1 priority 1`
Steps 9 and 10 remove ports 15/S1 and 16/S2 from the trunk so that they function as regular networking ports.	

9	Enter the Interface modes for the default trunk ports 15/S1 and 16/S2:
	
	`awplus(config)# interface port1.0.15-1.0.16`
	`% port1.0.15 is currently configured as a stack-port. Use caution`
	`when altering its config.`
	`% port1.0.16 is currently configured as a stack-port. Use caution`
	`when altering its config.`

10	Remove the ports from the trunk with the NO STACKPORT command:
	
	`awplus(config-if)# no stackport`
	`% Save the config and restart the system for this change to take`
	`effect.`

Steps 11 and 12 designate the new trunk ports.	
11	Enter the Interface mode of the two ports to be the trunk. If you filled out the Stacking Worksheet in Table 4 on page 45, refer there for the ports. This example assumes ports 1 and 2 are to be the new trunk. Be sure to modify the command for the two ports you have selected for the trunk: `awplus(config-if)# interface port1.0.1-1.0.2`

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

Table 6. Configuring the Master Switch - Part I (Continued)

Step	Description and Command
Steps 13 to 16 save your changes.	
13	Return to the Global Configuration mode with the EXIT command: `awplus(config-if)# exit`
14	Return to the Privileged Exec mode. `awplus(config)# exit`

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

16	Go to "Configuring the Master Switch - Part II," next.

Configuring the Master Switch - Part II

In Part II, you add the member switch as a provisioned unit to the master switch and designate its trunk ports. Adding the member switch as a provisioned device ensures that the master switch knows about it during the first stack power-on. The procedure assumes you are continuing directly from the previous procedure.

Table 7. Configuring the Master Switch - Part II

Step	Description and Command
Steps 1 and 2 add the member switch as a provisioned switch on the master switch.	

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

2	Add the member switch to the master switch as a provisioned switch with the ID 2, with the SWITCH PROVISION command: `awplus(config)# switch 2 provision xs900-16`

Table 7. Configuring the Master Switch - Part II (Continued)

Step	Description and Command
Steps 3 and 4 remove the stacking function from the default trunk ports 15/S1 and 16/S2 on the provisioned member switch.	
3	Enter the port Interface modes of the default trunk ports 15/S1 and 16/S2 on the provisioned member switch: `awplus(config)# interface port2.0.15-2.0.16`

4	Remove the ports from the trunk with the NO STACKPORT command:
	
	`awplus(config-if)# no stackport`
	`% Save the config and restart the system for this change to take effect.`

Steps 5 and 6 designate the new trunk ports on the provisioned member switch.	
5	Enter the Interface modes of the ports to be the stack trunk on the provisioned member switch. If you filled out the Stacking Worksheet on Table 4 on page 45, refer there for the stacking ports. This example assumes ports 1 and 2 are the trunk on the provisioned member switch. Be sure to modify the command for the two ports you selected for the trunk: `awplus(config)# interface port2.0.1-2.0.2`

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

Steps 7 to 13 save your changes on the master switch and reboot it.	
7	Return to the Global Configuration mode. `awplus(config-if)# exit`
8	Return to the Privileged Exec mode. `awplus(config)# exit`

9	Enter the WRITE command to save your changes.
	
	`awplus# write`
	`Building configuration ...`
	`[OK]`

Table 7. Configuring the Master Switch - Part II (Continued)

Step	Description and Command

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

11	Type "Y" for yes.
12	Wait two minutes for the switch to initialize the management software.
13	Go to "Verifying the Master Switch" on page 115.

Verifying the Master Switch

Perform the steps in Table 8 to confirm the configuration of the master switch.

Table 8. Verifying the Master Switch

Step	Description and Command
1	Start a new local management session on the master switch. Refer to "Starting a Local Management Session" on page 86.
2	Move to the Privileged Exec mode with the ENABLE command. `awplus> enable`

Table 8. Verifying the Master Switch (Continued)

Step	Description and Command
3	Enter the SHOW STACK command. Here is an example: ``` 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 Operational Status Standalone unit Stack MAC address e01a.ba56.c208 ``` Check the display for the following: - Switch ID 1 is the master switch. This is the switch you are currently configuring. - The master switch should have the priority 1. If it does not, repeat "Configuring the Master Switch - Part I" on page 111. Be sure to perform the STACK PRIORITY command and to save your changes with the WRITE command. - Switch ID 2 is the provisioned member switch. Its fields are empty because the master switch is not yet part of a stack. If the table does not include the member switch, repeat "Configuring the Master Switch - Part II" on page 113. Be sure to perform the SWITCH PROVISION command and to 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 - Part I" on page 111. Be sure to perform the STACK ENABLE command and save your changes with the WRITE command.
4	Enter the SHOW RUNNING-CONFIG command to display the running configuration of the master switch. ``` awplus# show running-config ``` Use the display to confirm the trunk ports for the master and provisioned member switches. The ports are identified with INTERFACE PORT and STACKPORT commands. In the following example, ports 1 and 2 on the master and member switches are the stack trunk: ``` interface port1.0.1-1.0.2 stackport . interface port2.0.1-2.0.2 stackport ```
5	Go to "What to Do Next" on page 117.

What to Do Next   After configuring the master switch, do the following:

1. Power off the switch by disconnecting its AC power cord from the AC power sources. Refer to Figure 65 on page 117.
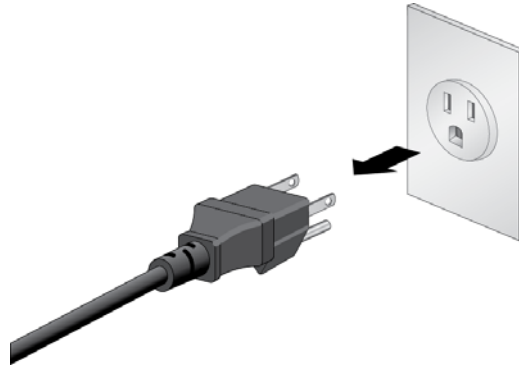
Figure 65. Powering Off the Switch

2. Go to "Configuring the Member Switch" on page 118.

3. After configuring the master and member switches, cable the trunk ports on both switches. Refer to "Cabling the Trunk Ports" on page 126.

Note

When cabling the trunk ports, remember to crossover the cables. For example, if ports 1 and 2 are the trunk, port 1 on one switch has to connect to port 2 on the second switch.

---

4. Power on the master and member switches of the stack. Refer to "Powering on the Stack" on page 127.

5. Verify the stack by referring to "Verifying the Stack" on page 129.

6. Cable the networking ports. Refer to Chapter 9, "Cabling the Networking Ports" on page 131.

Configuring the Member Switch

Here are the procedures for configuring the member switch.

> **Note**
> The procedures require resetting the switch twice. Some network traffic will be lost if the device is already connected to an active network.

Perform the procedures in the order presented here.

General Steps for the Member Switch

The procedure for configuring the member switch 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. Assign the ID number 2 to the member switch with the SWITCH RENUMBER command in the Global Configuration mode.

> **Note**
> Changing a member switch's ID does not delete the default ID 1 from its configuration. The member switch retains it as the provisioned master switch.

3. Save your changes with the WRITE command in the Privilege Exec mode.

4. Restart the switch with the REBOOT command.

The general steps in Part II are listed here:

1. Start a new local management session.

2. Assign the member switch the priority number 2 with the STACK PRIORITY command in the Global Configuration mode.

3. Remove stacking from the default trunk ports 15/S1 and 16/S2 on the member switch with the NO STACKPORT command.

4. Designate the new trunk ports on the member switch with the STACKPORT command in the port Interface mode.

5. Remove stacking from the default trunk ports 15/S1 and 16/S2 on the provisioned master switch with the NO STACKPORT command.

6. Designate the new trunk ports on the provisioned master switch with the STACKPORT command in the port Interface mode.

7. Save your changes with the WRITE command in the Privilege Exec mode.

8. Restart the switch with the REBOOT command.

9. Start a new local management session.

10. Verify the changes with the SHOW STACK DETAIL command.

Configuring the Member Switch - Part I

Perform the procedure in Table 9 to perform the first part of configuring the member switch:

Table 9. Configuring the Member Switch - Part I

Step	Description and Command
1	Power on the member switch and wait two minutes as it initializes the AlliedWare Plus management software. Refer to "Powering on a Switch" on page 83.
2	Start a local management session. Refer to "Starting a Local Management Session" on page 86.
3	Enter the ENABLE command to move from the User Exec mode to the Privileged Exec mode. `awplus> enable`
4	Enter the SHOW VERSION command to display the version number of the AlliedWare Plus operating software on the member switch. Write down the version number in the Stacking Worksheet in Table 4 on page 45. After viewing the version numbers on both switches, compare them to confirm they have the same version. Switches with different versions will have to be updated.

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

Table 9. Configuring the Member Switch - Part I (Continued)

Step	Description and Command
Step 6 and 7 enable VCStack, if necessary.	
6	Examine the System ID LED on the front panel of the switch. If it is displaying "0", VCStack is disabled. Perform step 7 to enable it. If the LED is displaying the number "1" or greater, skip step 7 and go to step 8.

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

Steps 8 to 14 set the member switch's ID number, save your changes, and reboot the unit.	

8	Set the ID number to 2 on the member switch with the STACK RENUMBER command:
	
	`awplus(config)# stack 1 renumber 2`
	`% Warning: the new ID will not become effective until the stack-`
	`member reboots.`
	`% Warning: the boot configuration may now be invalid.`

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

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

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

12	Type "Y" for yes.
13	Wait two minutes for the switch to initialize its management software.

Table 9. Configuring the Member Switch - Part I (Continued)

Step	Description and Command
Step 14 verifies your changes.	
14	Check the ID LED on the front panel and do one of the following: - If the ID LED is displaying 2, go to "Configuring the Member Switch - Part II," next. - If the ID LED is displaying "0" or a different number, repeat this procedure, being sure to enter the STACK RENUMBER command and save your changes with the WRITE command.

Configuring the Member Switch - Part II

Perform the procedure in Table 10 to perform the second part to configuring the member switch.

Table 10. Configuring the Member Switch - Part II

Step	Description and Command
1	Start a new local management session on the member switch. Refer to "Starting a Local Management Session" on page 86.
2	Enter the ENABLE command to move from the User Exec mode to the Privileged Exec mode. `awplus> enable`
Steps 3 and 4 set the member switch's priority value to 2, to match its ID number.	

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

4	Assign the switch the priority value 2 with the STACK PRIORITY: `awplus(config)# stack 2 priority 2`
Steps 5 and 6 remove default trunk ports 15/S1 and 16/S2 from the trunk.	

5	Enter the port Interface modes of the default trunk ports 15/S1 and 16/S2 on the member switch:
	
	`awplus(config)# interface port2.0.15-2.0.16`
	`% port2.0.15 is currently configured as a stack-port. Use caution when altering its config.`
	`% port2.0.16 is currently configured as a stack-port. Use caution when altering its config.`

Table 10. Configuring the Member Switch - Part II (Continued)

Step	Description and Command

6	Remove the ports from the trunk with the NO STACKPORT command:
	
	`awplus(config-if)# no stackport`
	`% Save the config and restart the system for this change to take effect.`

Steps 7 and 8 designate the new trunk ports on the member switch.	
7	Enter the Interface modes of the new trunk ports on the member switch. If you filled out the Stacking Worksheet in Table 4 on page 45, refer there for the ports. The example command here assumes the member switch will be using ports 1 and 2 for the trunk. Be sure to modify the command with the ports you selected for the trunk. `awplus(config-if)# interface port2.0.1-2.0.2`

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

Steps 9 and 10 remove default ports 15/S1 and 16/S2 from the trunk on the provisioned master switch (ID 1) on the member switch. (Note: You do not add the master switch as a provisioned switch on the member switch because the latter retained the ID 1 in its configuration when you changed its ID from 1 to 2.)	
9	Enter the port Interface modes of the default trunk ports 15/S1 and 16/S2 on the provisioned master switch: `awplus(config)# interface port1.0.15-1.0.16`

10	Remove the ports from the trunk with the NO STACKPORT command:
	
	`awplus(config-if)# no stackport`
	`% Save the config and restart the system for this change to take effect.`

Steps 11 and 12 designate the new trunk ports on the provisioned master switch.	
11	Enter the Interface modes of the new trunk ports on the provisioned master switch. Refer to the Stacking Worksheet in Table 4 on page 45. The example command here assumes the master switch will be using ports 1 and 2 for the trunk. Be sure to modify the command with the ports you selected for the trunk. `awplus(config-if)# interface port1.0.1-1.0.2`

Table 10. Configuring the Member Switch - Part II (Continued)

Step	Description and Command

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

Steps 13 to 18 save your changes and reboot the switch.	
13	Return to the Global Configuration mode. `awplus(config-if)# exit`
14	Return to the Privileged Exec mode. `awplus(config)# exit`

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

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

17	Type "Y" for yes.
18	Wait two minutes for the switch to initialize its management software.
19	Go to "Verifying the Member Switch," next.

Verifying the Member Switch   Perform the steps in Table 11 to confirm the configuration of the member switch.

Table 11. Verifying the Member Switch

Step	Description and Command
1	Start a local management session. Refer to "Starting a Local Management Session" on page 86.
2	Move to the Privileged Exec mode. `awplus> enable`

Table 11. Verifying the Member Switch (Continued)

Step	Description and Command

3	Enter the SHOW STACK DETAIL command. Examine the display for Stack member 2:
	
	`awplus# show stack detail`
	`.`
	`.`
	`Stack member 2:`
	`-------------------------------------------------------------`
	`ID                                2`
	`MAC address                       e01a:ea20:8011`
	`Last role change                  Thur Nov 23 21:15:20 2018`
	`Product type                      AT-XS916-MXT`
	`Role                              Active Master`
	`Status                            Ready`
	`Priority                          2`
	`Host name                         awplus`
	`S/W version auto synchronization  On`
	`Resiliency link status            Not configured`
	`Stack port2.0.1 status            Down`
	`Stack port2.0.2 status            Down`
	`.`
	`.`
	
	Examine the entry for the following:
	
	- The "Priority" value should be 2, the same as the switch's ID number. If they are not the same, repeat "Configuring the Member Switch - Part II" on page 121. Be sure to perform the STACK PRIORITY command and save your changes with the WRITE command.
	
	- The "Stack port status" fields, the last two lines, should identify the trunk ports. If they identify the wrong ports, such as the default ports 15 and 16, repeat "Configuring the Member Switch - Part II" on page 121. (The status of the ports is Down because the ports are not cabled yet.)

5	Go to "What to Do Next," next.

What to Do Next   After configuring the member switch, do the following:

1. Power off the switch by disconnecting its AC power cord from the AC power source. Refer to Figure 65 on page 117.

2. If you have not configured the master switch, perform "Configuring the Master Switch" on page 110.

3. After configuring the master and member switches, cable the trunk ports on both switches. Refer to "Cabling the Trunk Ports" on page 126.

> **Note**
> When cabling the trunk ports, remember to crossover the cables. For example, if ports 1 and 2 are the trunk, port 1 on one switch has to connect to port 2 on the second switch.

4. Power on the master and member switches, as explained in "Powering on the Stack" on page 127.

5. Verify that the switches formed the stack by performing "Verifying the Stack" on page 129.

6. Cable the networking ports, as explained in Chapter 9, "Cabling the Networking Ports" on page 131.

Cabling the Trunk Ports

After configuring the master and member switches, cable the trunk ports. If you are using two SFP/SFP+ ports for the trunk, you have to use the following cables:

- ❐ AT-StackXS/1.0 (1 meter) stacking transceiver and cable
- ❐ AT-SP10TW1 (1 meter) Direct Attach Cable
- ❐ AT-SP10TW3 (3 meter) Direct Attach Cable

Note
The XS900MX Switches do not support the AT-SP10TW7 Direct Attach Cable.

Instructions for installing the cables are found in "Installing AT-StackXS/1.0, AT-SP10TW1, or AT-SP10TW3 Cables" on page 136.

If the trunk consists of two twisted pair ports, the cables must be Standard TIA/EIA 568-B-compliant shielded Category 6a cabling or better. The maximum distance is 100 meters (328 feet). For instructions, refer to "Cabling Twisted Pair Ports" on page 132.

When cabling the ports, be sure that the ports crossover. For example, if you are using ports 1 and 2 for the trunk, port 1 on one switch must crossover to port 2 on the other switch, and port 2 must connect to port 1.

After cabling the trunk ports, go to "Powering on the Stack" on page 127.

Powering on the Stack

Please verify the following before powering on the stack for the first time:

- ❒ If you are using SFP/SFP+ ports for the trunk, are you using approved stacking cables? Refer to "Default 15/S1 and 16/S2 Ports" on page 38.

- ❒ If you are using twisted pair ports as the trunk, are you using Standard TIA/EIA 568-B-compliant shielded Category 6a cabling or better?

- ❒ Did you verify that both switches have the same version of the AlliedWare Plus management software? If they have different versions, upgrade both to the most recent version before powering on the stack.

- ❒ Do you have optional features or licenses to install on the switches? If so, install them before powering on the units as a stack.

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

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

1. Verify that the master and member switches are powered off.

2. Cable the ports of the stack trunk on the two switches. Refer to "Cabling the Trunk Ports" on page 126.

3. Power on both switches at the same time. Refer to "Powering on a Switch" on page 83.

Note

Refer to "Power Specifications" on page 144 for the power specifications of the switches.

⚠ **Warning**

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

Note

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

4. Wait three minutes for the switches to form the stack.

5. Go to "Verifying the Stack" on page 129.

Verifying the Stack

To verify the stack, perform the following procedure:

1. Start a local management session on either the master or member switch. Refer to "Starting a Local Management Session" on page 86.

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 66.

```
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:ea20:8023   2          Ready    Backup Member

Operational Status                   Normal operations

Stack MAC address                    e01a:ea20:8011
```

Figure 66. SHOW STACK Command

Review the following items:

❏ The command should list both switches. If only one switch is listed, refer to Chapter 10, "Troubleshooting" on page 139.

❏ 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," trunk ports are not being used or cannot establish links with their counterparts. For more information, refer to Chapter 10, "Troubleshooting" on page 139.

3. Go to Chapter 9, "Cabling the Networking Ports" on page 131, to complete the installation.

Chapter 9
Cabling the Networking Ports

This chapter contains the following procedures:

❐ "Cabling Twisted Pair Ports" on page 132

❐ "Installing SFP/SFP+ Transceivers" on page 133

❐ "Installing AT-StackXS/1.0, AT-SP10TW1, or AT-SP10TW3 Cables" on page 136

Cabling Twisted Pair Ports

Here are the guidelines to cabling the 100Mbps and 1/10Gbps twisted pair ports:

❑ The cable specifications for the twisted pair ports are listed in "Cable Requirements" on page 22.

❑ The connectors on the cables should fit snugly into the ports, and the tabs should lock the connectors into place.

❑ The setting for the wiring configurations of the ports is auto-MDI/MDI-X. You cannot change the wiring configurations manually.

❑ The default speed setting for the ports is Auto-Negotiation. This setting is appropriate for ports connected to network devices that also support Auto-Negotiation.

❑ The default speed setting of Auto-Negotiation is not appropriate for ports connected to 100Base-TX network devices that do not support Auto-Negotiation and have fixed speeds. For those switch ports, disable Auto-Negotiation and set the port's speed manually to match the speeds of the network devices.

❑ The ports must be set to Auto-Negotiation, the default setting, to operate at 1Gbps or 10Gbps.

❑ The default duplex mode setting for the ports is Auto-Negotiation. This setting is appropriate for ports connected to network devices that also support Auto-Negotiation for duplex modes.

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

❑ Do not attach cables to ports of static or LACP port trunks until after you have configured the trunks on the switch. Otherwise, the ports will form network loops that can adversely affect network performance.

Installing SFP/SFP+ Transceivers

This section contains guidelines and the procedure for installing SFP/SFP+ transceivers.

Here are general installation guidelines for SFP/SFP+ transceivers:

- ❒ SFP/SFP+ transceivers are hot-swappable. You can install them while the chassis is powered on.

- ❒ Install a transceiver before connecting its fiber optic cable.

- ❒ 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.

- ❒ Unnecessary removal and insertion of a transceiver can lead to premature failure.

⚠️ **Warning**
A transceiver 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 device. ☞ E77

To install SFP/SFP+ transceivers, perform the following procedure:

1. Remove the dust plug from a transceiver slot on the switch. See Figure 67.

Figure 67. Removing the Dust Plug from an SFP/SFP+ Slot

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

3. Position the transceiver.

    For a top slot, position the transceiver with the handle on top. For a bottom slot, position the transceiver with the handle beneath the module.

4. Slide the transceiver into the slot until it clicks into place. See Figure 68.
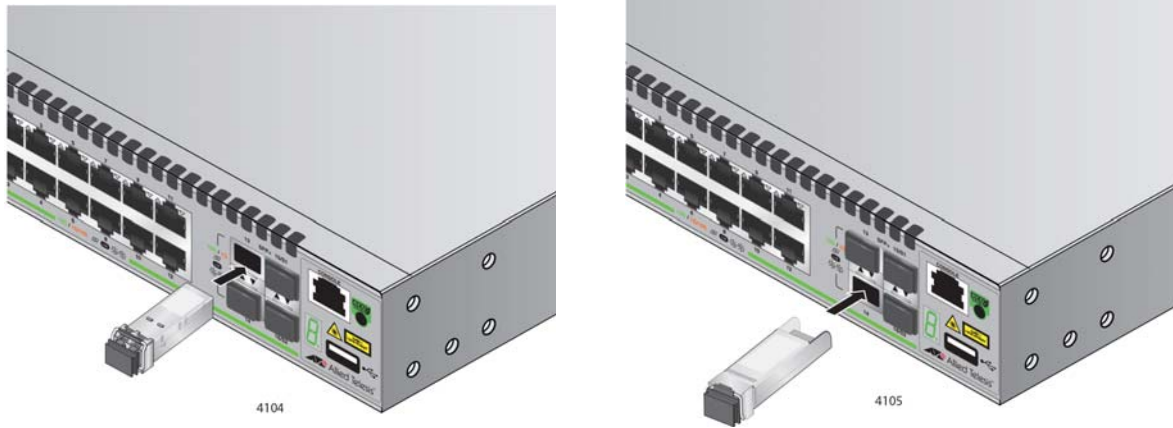

Figure 68. Installing an SFP/SFP+ Transceiver

Note
If you are ready to attach the fiber optic cable to the transceiver, continue with the next step. Otherwise, repeat Step 1 to Step 4 to install another SFP transceiver in the switch.

5. Remove the dust cover from the transceiver. Refer to Figure 69.
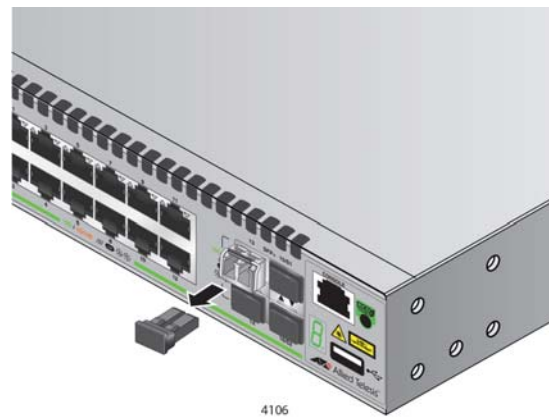
Figure 69. Removing the Dust Cover from an SFP Transceiver

6. Verify the position of the handle on the SFP transceiver.

   For a top slot, the handle is in the upright position. Refer to Figure 70. For a bottom slot, the handle should be in the down position.

SFP Handle

4107

Figure 70. Positioning the SFP Handle in the Upright Position

7. Connect the fiber optic cable to the transceiver. Refer to Figure 71.

   The connector on the cable should fit snugly into the port, and the tab should lock the connector into place.

4108
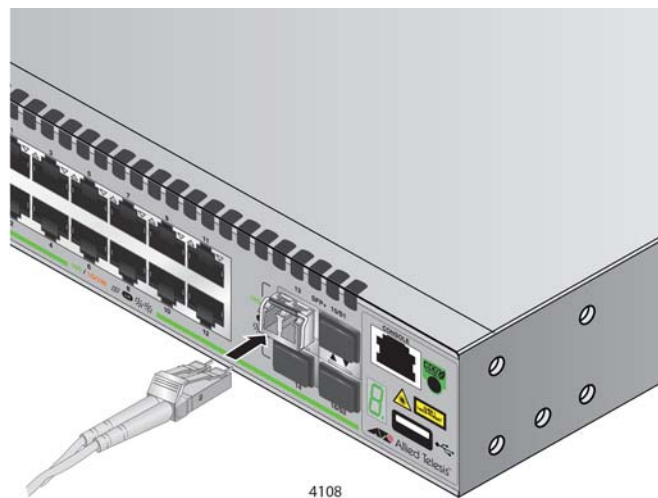
Figure 71. Connecting a Fiber Optic Cable to an SFP Transceiver

8. Repeat this procedure to install additional transceivers.

Installing AT-StackXS/1.0, AT-SP10TW1, or AT-SP10TW3 Cables

To install AT-StackXS/1.0, AT-SP10TW1, or AT-SP10TW3 cables, perform the following procedure:
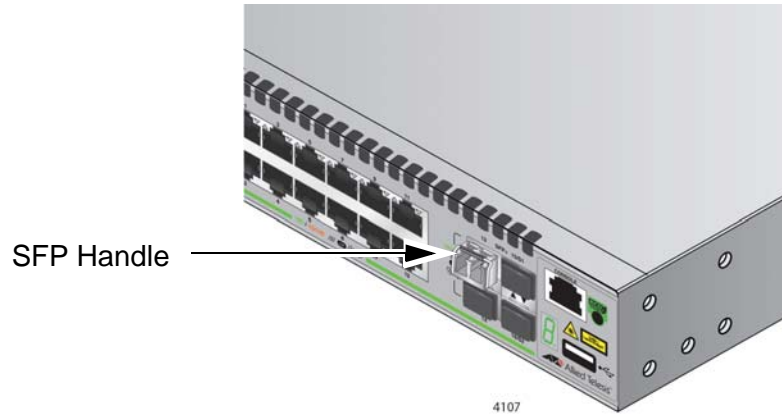
1. Select a port for the transceiver.

1. If the port has a dust cover, remove the cover. Refer to Figure 67 on page 133.

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

3. Remove the dust cap from one end of the transceiver, as shown in Figure 72.
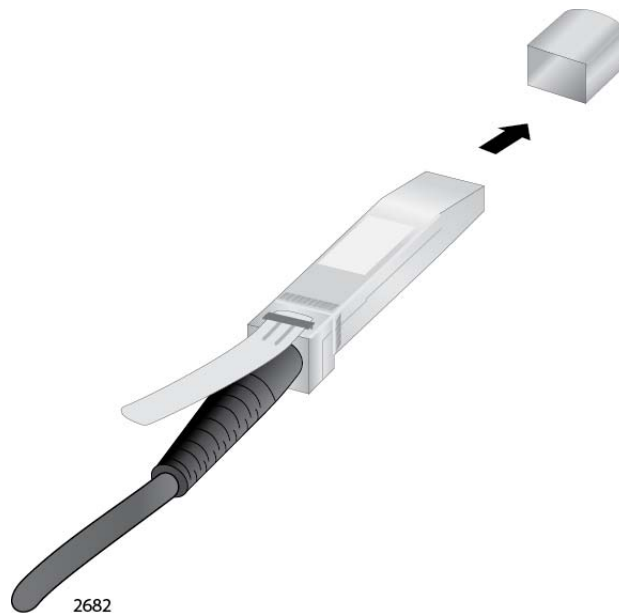
Figure 72. Removing the Dust Cover from the Transceiver

4. To install the transceiver in a port in the top row, position the transceiver with the Allied Telesis label facing up. To install the transceiver in a port in the bottom row, position the transceiver with the label facing down. Refer to Figure 73 on page 137.
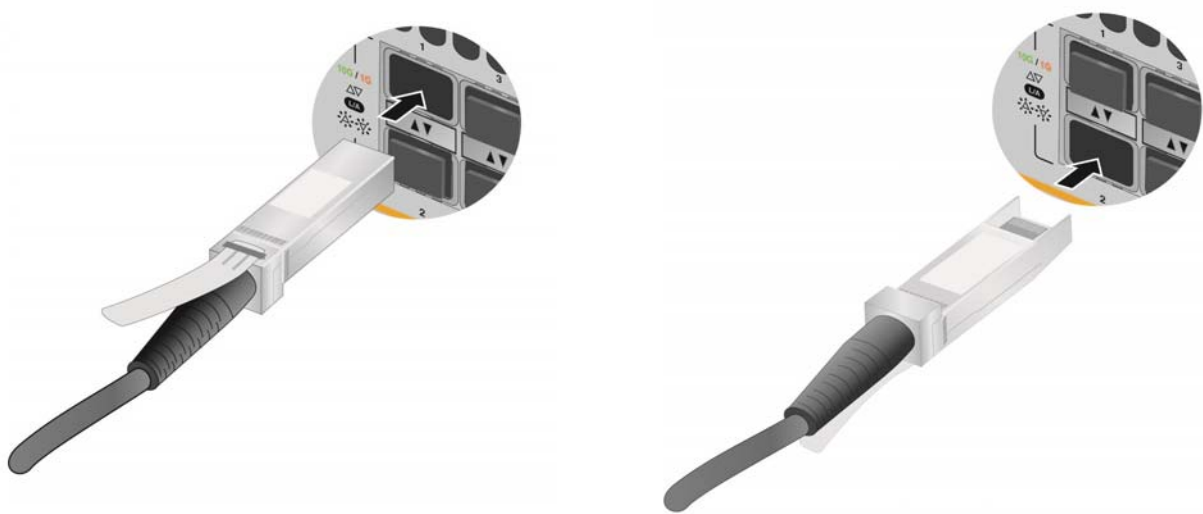
Figure 73. Installing AT-SP10TW Cables

5. Slide the transceiver into the port until it clicks into place.

6. Connect the other end of the cable into an SFP+ port on another network device.

> **Note**
> If you are using the cable as trunk cables for VCStack, remember that the cables must crossover to different ports. For example, it you are using the default trunk ports 15/S1 and 16/S2, port 15/S1 on one switch must crossover to port 16/S2 on the second switch.

7. Repeat this procedure to install additional transceivers.

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

Chapter 10
Troubleshooting

This chapter contains suggestions on how to troubleshoot the switch if a problem occurs.

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

Problem 1: The Switch ID LED on the front of the switch is off.

Solutions: The unit is not receiving power. Try the following:

- ❒ Verify that the power cord is securely connected to the power source and to the AC connector on the back panel of the switch.
- ❒ Verify that the power outlet has power by connecting another device to it.
- ❒ Try connecting the unit to another power source.
- ❒ Try a different power cord.
- ❒ Verify that the voltage from the power source is within the required levels for your region.

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

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

Problem 3: The SHOW STACK command is displaying only one switch.

Solutions: The two switches cannot form a stack. Here are general items to check:

- ❒ Verify that both switches have the same version of AlliedWare Plus. Refer to "Displaying the AlliedWare Plus Version Number" on page 88.
- ❒ Verify that VCStack is activated on the switches. Refer to Chapter 6, "Verifying the Status of VCStack" on page 85.

If you are using default trunk ports 15/S1 and 16/S2 ports or other SFP/SFP+ ports as the trunk, try the following:

❑ If you are using SFP/SFP+ ports for the trunk, verify that you are using approved stacking transceivers. Refer to "Default 15/S1 and 16/S2 Ports" on page 38.

❑ Verify that the stacking transceivers are properly cabled. They must cross over to different ports. Refer to "Stack Trunk" on page 38.

❑ Verify that the transceivers are fully inserted in the ports.

Problem 4: A twisted pair port on the switch is connected to a network device, but the port's LINK/ACT LED is off.

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

❑ Verify that the port is connected to the correct twisted pair cable. This is to eliminate the possibility that the port is connected to the wrong network device.

❑ Verify that the network device connected to the twisted pair port is powered on and is operating properly.

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

❑ Verify that the twisted pair cable does not exceed 100 meters (328 feet).

❑ Verify that you are using the appropriate category of twisted pair cable. The cable types are listed in "Cable Requirements" on page 22.

Note
A 1000Base connection may require five to ten seconds to establish a link.

Problem 5: The LINK/ACT LED for an SFP transceiver is off.

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

❑ Verify that the remote network device connected to the fiber optic port is operating properly.

❑ Verify that the fiber optic cable is securely connected to the port on the SFP module and to the port on the remote network device.

❑ Check that the transceiver is fully inserted in the port.

❐ Check to be sure that the transceiver is not installed in port S1 or S2 in the switch. Those ports do not support SFP or SFP+ transceivers when VCStack is enabled.

❐ Verify that the operating specifications of the fiber optic ports on the transceiver and remote network device are compatible.

❐ Verify that the correct type of fiber optic cabling is being used.

❐ Verify that the port is connected to the correct fiber optic cable. This is to eliminate the possibility that the port is connected to the wrong remote network device.

❐ Try connecting another network device to the fiber optic port using a different cable. If the port is able to establish a link, then the problem is with the cable or with the other network device.

❐ Use the switch's management software to verify that the port is enabled.

❐ If the remote network device is a managed device, use its management firmware to determine whether its port is enabled.

❐ Test the attenuation of both directions on the fiber optic cable with a fiber optic tester to determine whether the optical signal is too weak (sensitivity) or too strong (maximum input power).

Problem 6: Network performance between a twisted pair port on the switch and a network device is slow.

Solution: There might be a duplex mode mismatch between the port and the network device. This can occur when a twisted pair port using Auto-Negotiation is connected to a remote device that has a fixed speed of 10 or 100 Mbps and a fixed duplex mode of full-duplex. If this is the cause of the problem, adjust the duplex mode of the port on the network device or switch so that both ports are using the same duplex mode. You can use either the LEDs or management software on the switch to determine the duplex mode settings of the ports. The LEDs are described in Table 1 on page 26.

Problem 7: The switch functions intermittently.

Solutions: Check the system hardware status through the management software:

❐ Use the SHOW SYSTEM ENVIRONMENT command in the Privileged Exec mode to verify that the input voltage from the power source to the switch is stable and within the approved operating range. The unit will shut down if the input voltage fluctuates above or below the approved operating range.

❐ Use the SHOW SYSTEM ENVIRONMENT command in the Privileged Exec mode to verify that the fan is operating correctly.

❐ Verify that the location of the switch allows for adequate airflow. The unit will shut down if it is in danger of overheating.

Problem 8: The Switch ID LED on the front of the switch is flashing the letter "F."

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

❏   A cooling fan has failed.

❏   The input voltage on the power supply is outside the normal operating range.

❏   The internal temperature of the switch has exceeded the normal operating range, and the switch might shut down.

Contact your Allied Telesis sales representative for assistance.

Appendix A
Technical Specifications

This appendix contains the following sections:

Physical Specifications

Dimensions (H x W x D)

Table 12. Product Dimensions

AT-XS916MXT	4.3 cm x 21 cm x 32.3 cm (1.7 in. x 8.3 in. x 12.7 in.)
AT-XS916MXS	4.3 cm x 21 cm x 32.3 cm (1.7 in. x 8.3 in. x 12.7 in.)

Weights

Table 13. Product Weights

AT-XS916MXT	2.8 kg (6.1 lb.)
AT-XS916MXS	2.7 kg (5.9 lb.)

Ventilation

Table 14. Ventilation Requirements

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

Environmental Specifications

Table 15. Environmental Specifications

Operating Ambient Temperature	0° C to 50° C (32° F to 122° F)
Storage Temperature	-25° C to 70° C (-13° F to 158° F)
Operating Humidity	5% to 90% noncondensing
Storage Humidity	5% to 95% noncondensing
Maximum Operating Altitude	3,000 m (6,562 ft)

Power Specifications

Input Voltages

Table 16. Input Voltages

AT-XS916MXT	Voltage: 100-240 VAC, 1.0A Frequency: 47-63 Hz
AT-XS916MXS	Voltage: 100-240 VAC, 1.0A Frequency: 47-63 Hz

Maximum Power Consumption

Table 17. Maximum Power Consumption

AT-XS916MXT	78 watts
AT-XS916MXS with 60 watts power supply	51 watts
AT-XS916MXS with 100 watts power supply	53 watts

Heat Dissipation (British Thermal Units/hour)

Table 18. Heat Dissipation

AT-XS916MXT	270 BTU/h
AT-XS916MXS with 60 watts power supply	170 BTU/h
AT-XS916MXS with 100 watts power supply	180 BTU/h

Certifications

Table 19. Product Certifications

RFI Emissions	FCC Class A, EN55022 Class A, EN61000-3-2, EN61000-3-3, VCCI Class A, RCM
EMC (Immunity)	EN55024
Electrical and Laser Safety	UL 60950-1 ($_C$UL$_{US}$), CSA-C22 No. 60950-1 ($_C$UL$_{US}$), EN60950-1 (TUV), EN60825-1 (TUV)

RJ-45 Twisted Pair Port Pinouts

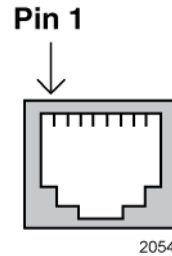Figure 74 illustrates the pin layout of the RJ-45 connectors and ports.

Figure 74. RJ-45 Socket Pin Layout (Front View)

Table 20 lists the pin signals for 10 and 100 Mbps.

Table 20. Pin Signals for 10 and 100 Mbps

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

The pin signals for a port operating at 1000 Mbps are shown in Table 21.

Table 21. Pin Signals for 1000 Mbps

Pinouts	Pair
1	Pair 1 +
2	Pair 1 -
3	Pair 2 +
4	Pair 3 +

Table 21. Pin Signals for 1000 Mbps (Continued)

Pinouts	Pair
5	Pair 3 -
6	Pair 2 -
7	Pair 4 +
8	Pair 4 -

RJ-45 Style Serial Console Port Pinouts

The pin signals of the RJ-45 style serial Console port are listed in Table 22.

Table 22. RJ-45 Style Serial Console Port Pin Signals

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