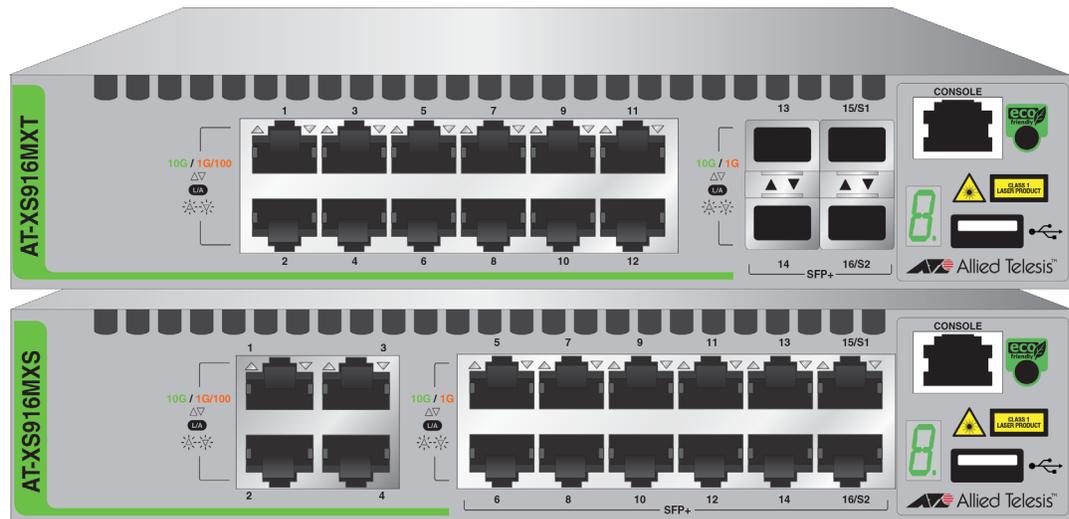


XS9 | 6MX Series

10 GIGABIT ETHERNET SWITCHES

- AT-XS916MXT
- AT-XS916MXS



Installation Guide for VCStack™

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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 (CUL_{US}), CSA-C22 No. 60950-1 (CUL_{US}), EN60950-1 (TUV), EN60825-1 (TUV)



Warning

Laser Safety: EN60825 ⚡ L7

Translated Safety Statements

Important: The ⚡ indicates that translations of the safety statement are available in the PDF document “**Translated Safety Statements**” posted on the Allied Telesis website at alliedtelesis.com/support.

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Preface

This guide contains the stacking installation instructions for the XS916MX Series of Layer 2+ 10 Gigabit Ethernet switches. This preface contains the following sections:

- “Document Conventions” on page 12
- “Contacting Allied Telesis” on page 13

Note

This guide explains how to install the switches in a stack with the Virtual Chassis Stack (VCStack™). For instructions on how to install the switches as stand-alone units, see the *XS916MX 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 RMAs, and to contact Allied Telesis technical experts.
- ❑ USA and EMEA phone support — Select the phone number that best fits your location and customer type.
- ❑ Hardware warranty information — Learn about Allied Telesis warranties and register your product online.
- ❑ Replacement Services — Submit a Return Merchandise Authorization (RMA) request via our interactive support center.
- ❑ Documentation — View the most recent installation and user guides, software release notes, white papers, and data sheets for your products.
- ❑ Software Downloads — Download the latest software releases for your managed products.

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

Chapter 1

Overview

This chapter contains the following sections:

- “Features” on page 16
- “Front Panels” on page 18
- “Management Panel” on page 19
- “100/1000/10000Base-T and Twisted Pair Ports” on page 20
- “SFP/SFP+ Slots” on page 22
- “Stacking Slots” on page 23
- “eco-friendly Button” on page 24
- “LEDs” on page 25
- “USB Port” on page 29
- “Console Port” on page 30
- “Power Supply” on page 31

Note

This guide explains how to install the switches as stand-alone units. For instructions on how to install them in a stack configuration with Virtual Chassis Stacking (VCStack™), see the *AT-XS916MX Series Installation Guide for VCStack*.

Features

The AT-XS916MX series switches and their features are listed in this section:

AT-XS916MX Models

Here are model names of the AT-XS916MX Series switches:

- AT-XS916MXT
- AT-XS916MXS

100/1000/10000 Mbps Twisted Pair Ports

Here are the basic features of the 100/1000/10000 Mbps twisted pair ports:

- 4 or 12 ports per switch
- 100Base-TX, 1000Base-T, 1000Base-SX, 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+ Slots

The AT-XS916MX series switch has two SFP/SFP+ slots: S1 and S2 Stacking Slots. For more information, see “SFP/SFP+ Slots” on page 22.

S1 and S2 Stacking Ports

The S1 and S2 slots are stacking ports for the VCStack feature. You can use the slots to build a stack of two switches. For more information, see the “Stacking Slots” on page 23.

LEDs

Here are the port LEDs:

- Link/activity LEDs for the twisted pair ports
- Link/activity LEDs for SFP/SFP+ slots
- 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

Front Panels

The front panels of the AT-XS916MX Series switches are shown in Figure 1 and Figure 2.

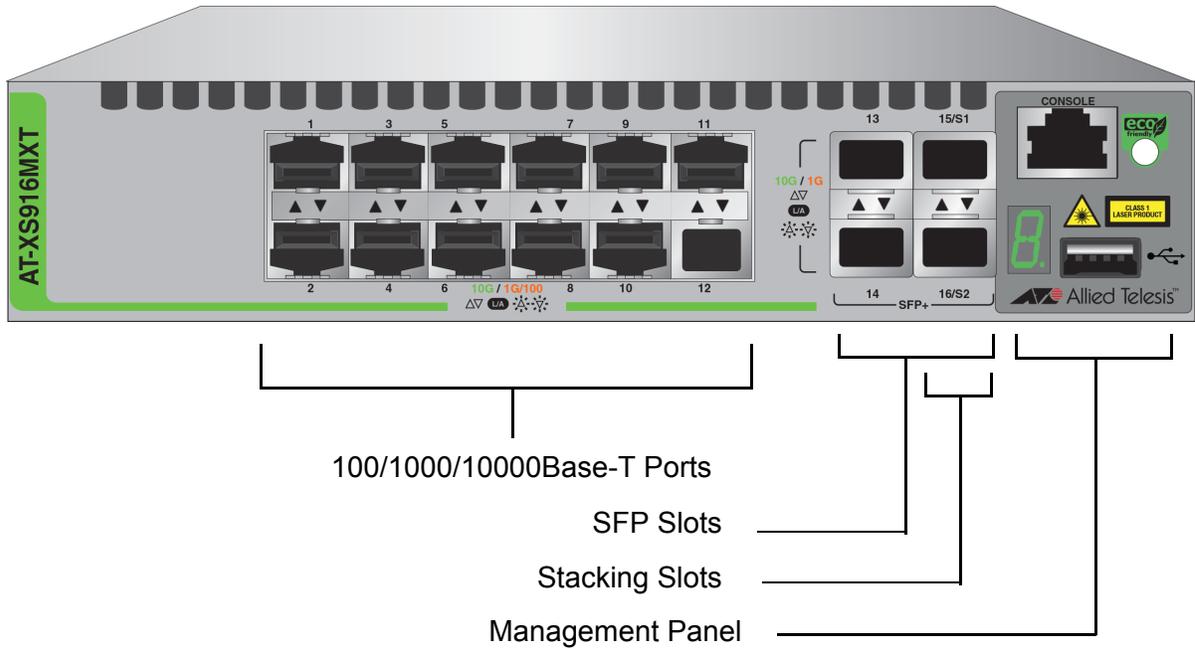


Figure 1. AT-XS916MXT Switch Front Panel

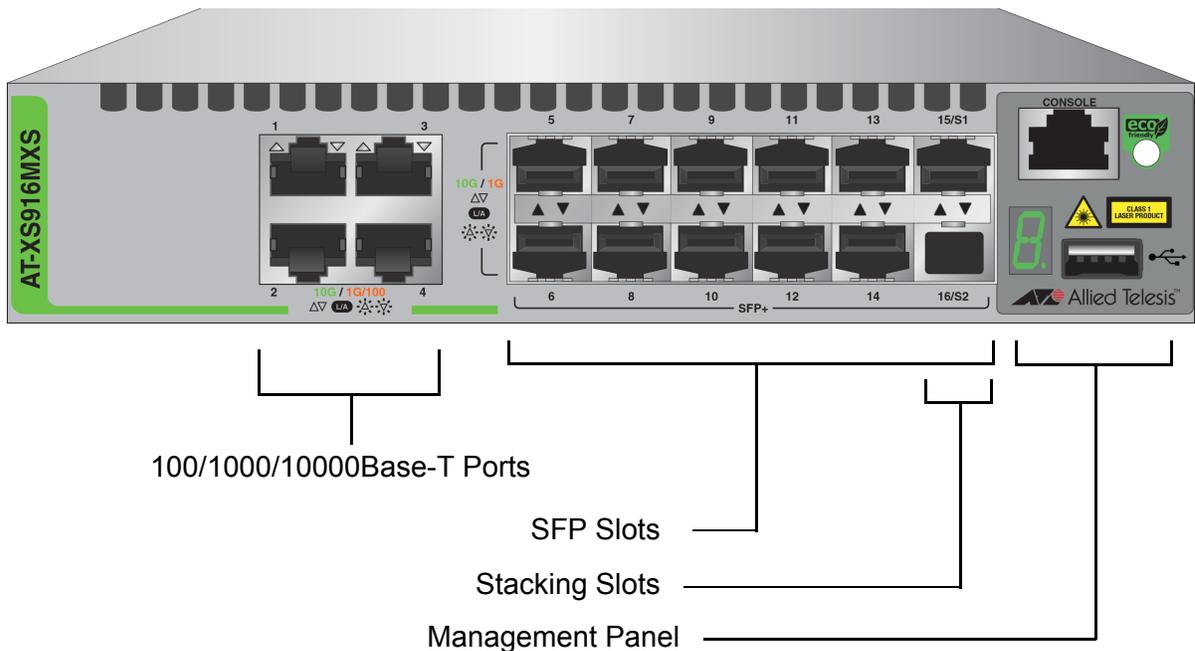


Figure 2. AT-XS916MXS Switch Front Panel

Management Panel

Figure 3 identifies the components in the management panels on the AT-XS916MX Series switches.

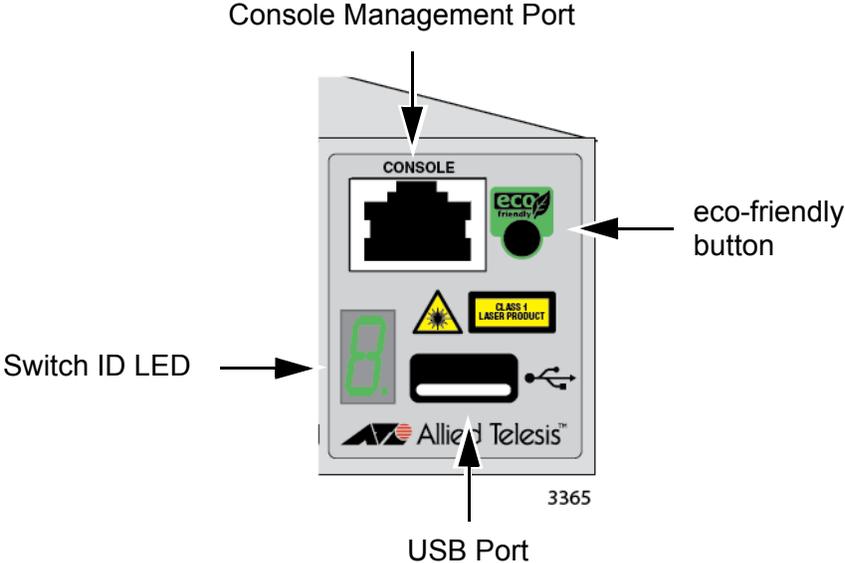


Figure 3. AT-XS916MX Series Management Panel

100/1000/10000Base-T and Twisted Pair Ports

The AT-XS916MXT series switches have 4 or 12 100/1000/10000Base-T ports.

Speed The ports can operate at 100 or 1000 Mbps, or 10 Gbps. The speeds may 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 14 on page 94 and Table 15 on page 94 for the port pinouts of the 100/1000/10000Base-T twisted pair ports.

Cable Requirements

The cable requirements of the ports are given in Table 1.

Table 1. Twisted Pair Cable for the 100/1000/10000Base-T Ports

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

SFP/SFP+ Slots

The AT-XS916MX series switch has two SFP/SFP+ slots. You may use the transceivers to connect switches to other network devices over large distances, build high-speed backbone networks between network devices, or connect high-speed devices, such as servers, to your network.

Here is a list of supported pluggable transceivers:

- ❑ AT-SP10SR/I
- ❑ AT-SP10LR
- ❑ AT-SP10LR/I
- ❑ AT-SP10LRM
- ❑ AT-SP10LR20/I
- ❑ AT-SP10LR40/I
- ❑ AT-SP10ZR80/I
- ❑ AT-SP10ER40/I
- ❑ AT-SPTXa
- ❑ AT-SPSX
- ❑ AT-SPSX2
- ❑ AT-SPEX
- ❑ AT-SPLX10
- ❑ AT-SPLX40
- ❑ AT-SP10TW
- ❑ AT-StackXS/1.0

Note

SFP/SFP+ transceivers must be purchased separately.

Stacking Slots

The S1 and S2 slots on the front panel of the switch are used with special stacking transceivers to create a VCStack of two switches.

Here is a list of supported stacking transceivers:

- ❑ AT-SP10TW
- ❑ AT-StackXS/1.0

Note

Stacking cables must be purchased separately.

The stacking transceiver AT-SP10TW is shown in Figure 4 as an example. It has two SFP transceiver-style connectors and one meter of twinax cable.



Figure 4. Stacking Transceiver

The switches of a VCStack act 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. The two main 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.

Note

The stacking slots may be used as regular networking ports.

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 28.

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

The twisted pair ports on the AT-XS916MX series switch has one status LED that displays link and activity information. The LEDs are shown in Figure 5.

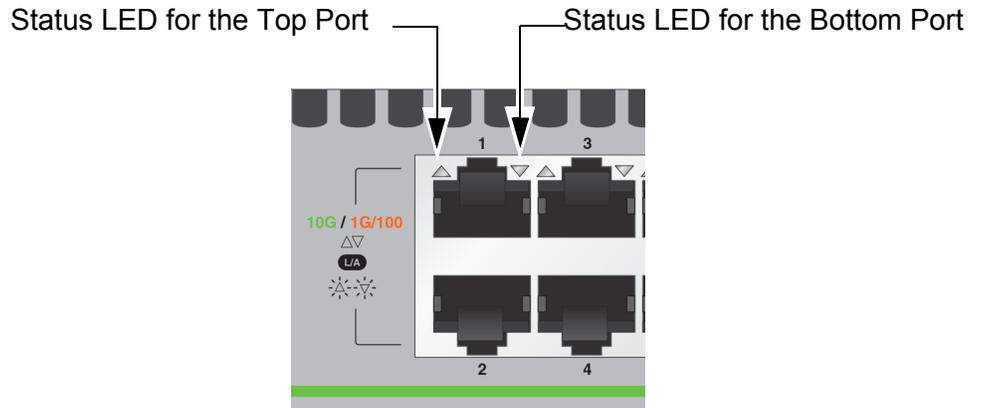


Figure 5. LEDs for the Twisted Pair Ports on the AT-XS916MX Series Switch

The Port LEDs are described in Table 2.

Table 2. LEDs on the Twisted Pair Ports on the AT-XS916MX Series Switch

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 100 or 1000 Mbps link to a network device.
	Flashing Amber	A port is transmitting or receiving data at 100 or 1000 Mbps.
	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 Slots

The LEDs for the SFP slots are located between the slots, as shown in Figure 6 on page 26. Each SFP slot has one LED. The left-hand LED is for the top slot and the right-hand LED is for the bottom slot.

Status LED for the Top Port Status LED for the Bottom Port

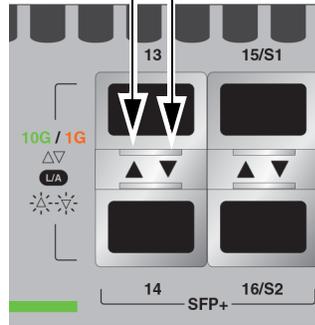


Figure 6. SFP Slot LEDs

The LEDs are described in Table 3.

Table 3. SFP Slot LEDs on the AT-XS916MX Series Switch

LED	State	Description
L/A LED	Off	The slot 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/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/SFP+ transceiver has established a 10Gbps link to a network device.
	Flashing Green	The SFP transceiver is receiving or transmitting data at 10Gbps.

LEDs for the Stacking Slots

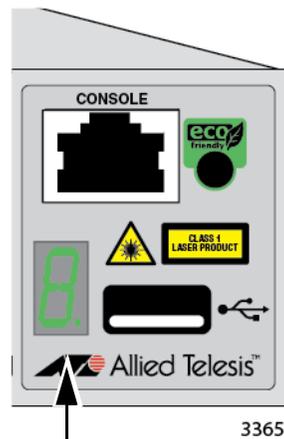
Slots S1 and S2 are stacking slots for the VCStack feature. You can use the slots to build a virtual switch of two switches. For background information, refer to the *AT-XS916MX Series Installation Guide for VCStack*. Table 4 on page 27 defines the LED states when the slots contain stacking transceivers.

Table 4. S1 and S2 Slot LEDs

LED	State	Description
Link/Activity	Off	The slot is empty, the stacking 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 green	The stacking transceiver has established a link to another switch in the stack.
	Flashing green	The stacking transceiver is receiving or transmitting packets.

Switch ID LED

The Switch ID LED, shown in Figure 7, displays the ID number of the switch. A stand-alone switch has the ID number 0. Switches in a VCStack have the numbers 1 to 2. Chapter 7, “Powering On the Stack” on page 67 has the procedure for verifying and, if necessary, changing the ID number of the switch.



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 on page 28.

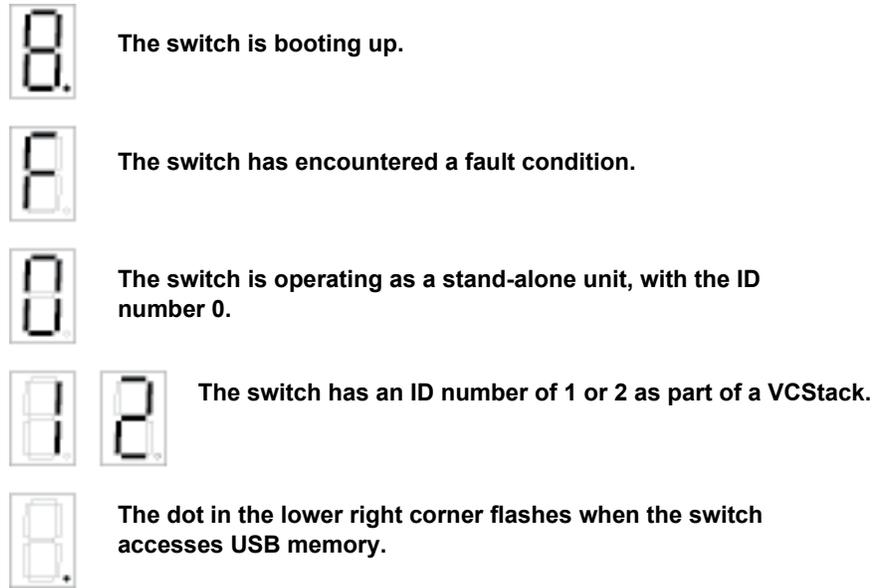


Figure 8. Switch ID LED Not in Low Power Mode

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.

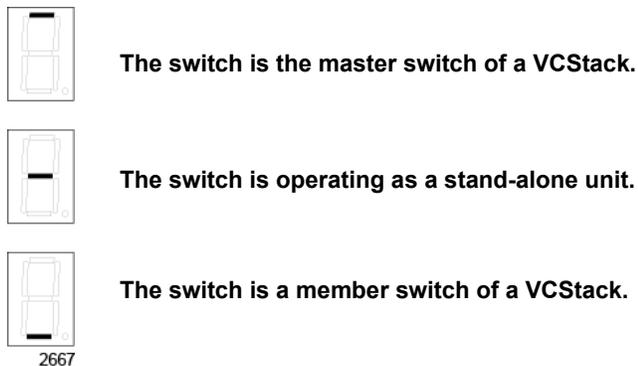


Figure 9. Switch ID LEDs in Low Power Mode

USB Port

The management panel has a USB port. You may use the port to store configuration files on flash drives and to restore configuration files to switches whose settings have been lost or corrupted, or to quickly configure replacement units. You may also use the port and flash drives to update the management firmware on the switches.

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 is set to the following specifications:

- 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 AT-XS916MX 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 91 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.

Chapter 2

Virtual Chassis Stacking

The sections in this chapter are:

- “Overview” on page 34
- “Stacking Slots and Transceivers” on page 35
- “Stacking Port Topologies” on page 36
- “Master and Member Switches” on page 38
- “Specifying Ports in the Command Line Interface” on page 40

Note

For more information on the VCStack feature, refer to the *Stacking Introduction and Stacking Commands* chapters in the *Software Reference for AT-XS916MX Series Switches, AlliedWare Plus Operating System* from www.alliedtelesis.com/support.

Overview

The Virtual Chassis Stack (VCStack) feature allows you to connect up to two AT-XS916MX Series switches to form a virtual switch so that the devices function as a single networking unit. The benefits of the VCStack feature are:

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

Stacking Slots and Transceivers

The AT-XS916MX Series Switches come with two stacking slots. The slots are labeled “S1” and “S2”.

Here is a list of supported stacking transceivers:

- ❑ AT-SP10TW
- ❑ AT-StackXS/1.0

Note

Stacking transceivers must be purchased separately.

The stacking transceiver is shown in Figure 10. It has two SFP+ transceiver-style connectors and one meter of twinax cable.



Figure 10. Stacking Transceiver

Stacking Port Topologies

The switches of a stack are connected with the S1 and S2 ports and AT-SP10TW transceiver, shown in Figure 10 on page 35.

There are two wiring configurations. The first topology is called the linear topology. In this topology, the switches are connected with a single pathway. The connections must cross over to different stacking slots on the switches. Slot S1 on one switch must be connected to slot S2 on the next switch.

Figure 11 is an example of a stack of two switches in the linear topology. The stacking transceiver connects the S1 slot on the top switch to the S2 slot on the bottom switch.

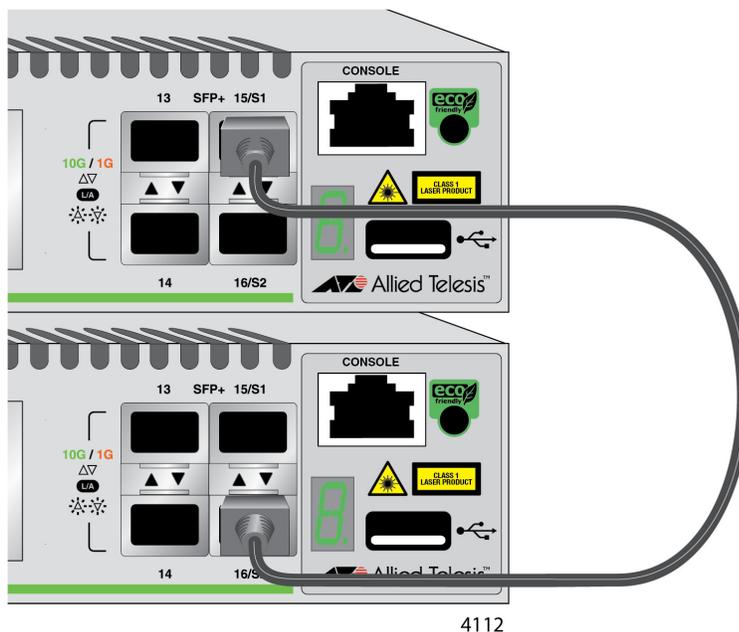


Figure 11. Stack of Two Switches in the Linear Topology



Caution

The stack will not function if the connections to the S1 and S2 slots do not cross over on the switches. The switches will not form a stack and instead will operate as stand-alone devices. ⚡ E78

The second topology is called the ring topology. It is similar to the linear topology, except that the unused stacking slots on the end switches of the stack are connected to form a physical loop. This topology is more resilient than the linear topology because there are two pathways through the stack. If one pathway fails, the switches can maintain communications through the alternate pathway. The example in Figure 12 shows a ring topology of two switches.

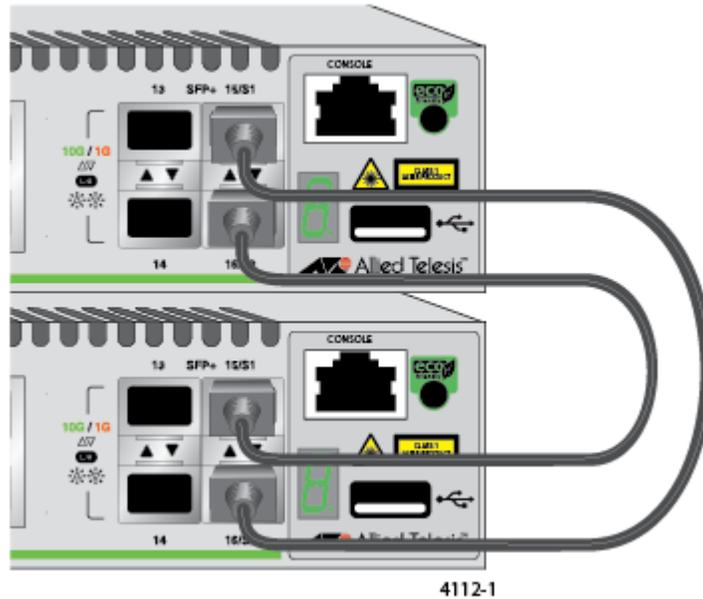


Figure 12. Stack of Two Switches in the Ring Topology

The topologies are the same in terms of network speed and performance. However, the ring topology is the recommended wiring configuration because of the secondary path through the stacking ports. The two pathways protect the switches of the stack against the loss of communications due to a failure of a stacking port, cable, or switch.

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. A member switch can automatically transition to the master role if the current master switch is removed from the stack or powered off.

Selection of the Master Switch

The devices compare the following numbers to choose the master switch when the stack is reset or powered on:

- ❑ Stack priority numbers
- ❑ MAC addresses

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

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

If you power on the stack for the first time without adjusting the priority values, the master switch is selected based on the MAC addresses if the units are powered on simultaneously. If you power on the switches one at a time, the master switch is the first switch to be powered on. This is explained in Chapter 7, “Powering On the Stack” on page 67.

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

ID Numbers

Each switch must be assigned an ID number. The ID number can be 1 or 2, and the default is 1. The ID numbers are displayed on the ID LEDs on the front panels of the units. You may assign the numbers yourself or you can let the master switch assign the numbers automatically, as explained in Chapter 7, “Powering On the Stack” on page 67.

You use the ID numbers to identify the individual ports and switches when you configure the devices with the commands in the management software. For further information, refer to “Specifying Ports in the Command Line Interface” on page 40.

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 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. *see* E79

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

Specifying Ports in the Command Line Interface

The command line interface in the management software on the switch has a parameter that you use to specify the individual ports. The parameter is the PORT parameter, and Figure 13 shows its format.

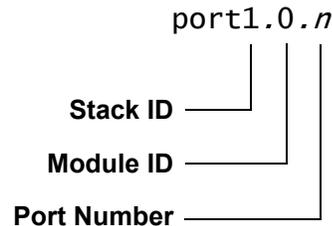


Figure 13. PORT Parameter in the Command Line Interface

The first number is the switch's ID number. The ID numbers of switches in a stack are displayed on their ID LEDs. You can also view the ID numbers with the `SHOW STACK` command in the command line interface.

The module ID value is used with multi-module products. This value does not apply to the AT-XS916MX Series switches and should always be 0.

The third value is a port number on the switch. You may specify only one port number in a PORT parameter, but you may specify more than one PORT parameter in many of the commands where the parameter is supported.

Here is an example of the PORT parameter. It uses the `INTERFACE` command to enter the Port Interface mode for ports 15 and 17 on the switch with ID 2:

```
awplus> enable
awplus# configure terminal
awplus(config)# interface port2.0.15,port2.0.17
```

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

Chapter 3

Beginning the Installation

The chapter contains the following sections:

- “Reviewing Safety Precautions” on page 42
- “Choosing a Site for the Switch” on page 46
- “Unpacking the Switch” on page 47

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/support.



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 (T_{mra}). ⚡ E35



Caution

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



Warning

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

**Warning**

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

**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. *see* E76

Unpacking the Switch

The AT-XS916MX series switch comes with the components listed in Table 5.

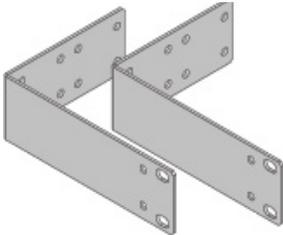
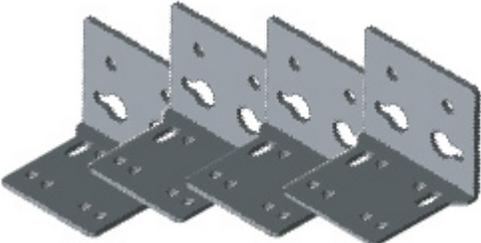
Note

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

Table 5. Components in the Shipping Box

Name	Item
AC power code	 <p>1570</p>
Management cable, with RJ-45 (8P8C) and DB-9 (D-sub 9-pin) connectors.	 <p>1417</p>
Power code retainer clip	 <p>3376</p>

Table 5. Components in the Shipping Box (Continued)

Name		Item
Rack mount bracket kit	2 X Bracket	
	2 X Handle	
	4 X M3x6mm screw	
	8 X M4x6mm screw	
Wall mount bracket kit	4 X Bracket	
	16 M4x6mm screw	

Note

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

Chapter 4

Installing the Switch

The procedures in this chapter are:

- “Installing the Switch on a Table” on page 50
- “Installing the Switch in an Equipment Rack” on page 51
- “Installing the Switch on a Wall” on page 54

Installing the Switch on a Table

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

Note

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



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. *See* E76

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

1. Review “Choosing a Site for the Switch” on page 46 to verify the suitability of the site for the switch.
2. Check to be sure that the table is strong enough to support the weight of the switch.
3. Lift the switch onto the table.
4. Go to Chapter 8, “Cabling the Networking Ports” on page 81 to connect the network cables.

Installing the Switch in an Equipment Rack

You can install one AT-XS916MX series switch in a row of the equipment rack or two AT-XS916MX series switches in one row of the equipment rack as shown in Figure 14.

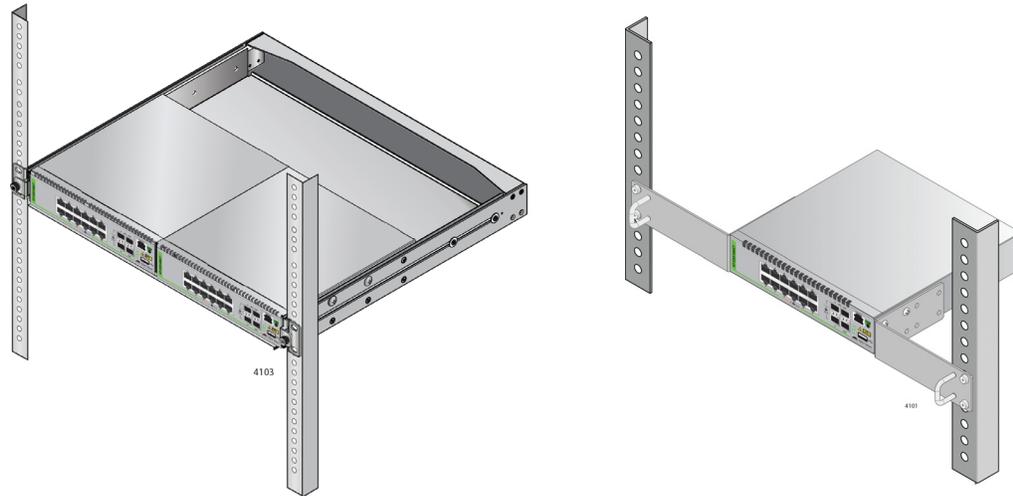


Figure 14. Rack Installation Options for the AT-XS916MX Series Switch

Installing Two Switches in One Row

To install two switches in one row of the equipment rack, use the AT-BRKT-J15 rack mount kit.

Here are the guidelines:

- You must purchase the AT-BRKT-J15 rack mount kit separately.
- For the instructions using the AT-BRKT-J15 rack mount kit, see *The AT-x230-10GP, AT-AR3050S, AT-AR4050S, and XS916MX Series Switches Rack Mount Installation Guide*.

Installing a Switch in One Row

To install the switch in one row of the equipment rack, you need the following items:

- Rack mount bracket kit, which comes with the switch
- Flat-head screwdriver
- Cross-head screwdriver

Note

You must provide flat-head and cross-head screwdrivers.

To install the switch in one row of the equipment rack, perform the following procedure.



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

1. Review “Choosing a Site for the Switch” on page 46 to verify the suitability of the site for the switch.
2. Place the unit upside down on a level, secure surface. See Figure 15.

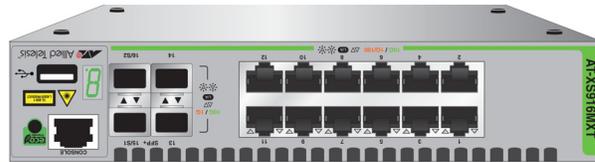


Figure 15. Turning the Switch Upside Down

3. Using a flat-head screwdriver, remove the rubber feet from the bottom of the switch. See Figure 16.

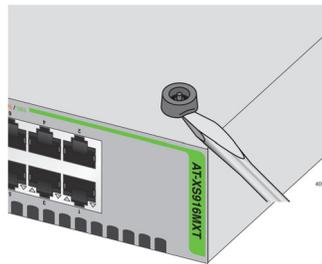


Figure 16. Removing the Rubber Feet

4. Turn the switch over.
5. Attach the handles to the brackets as shown in Figure 17.

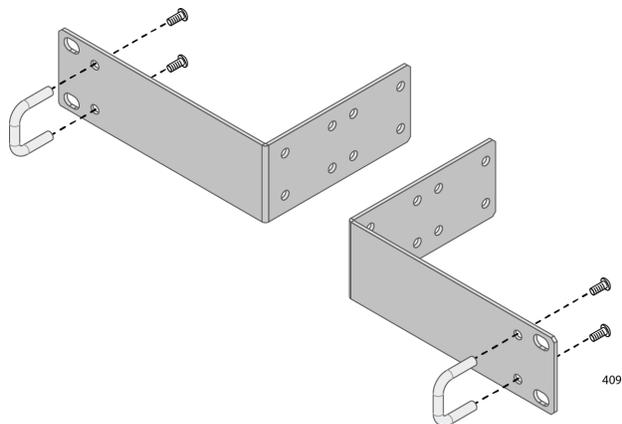


Figure 17. Attaching the Handles to the Brackets

6. Attach the two rack mount brackets to the sides of the switch with the eight bracket screws as shown in Figure 18.

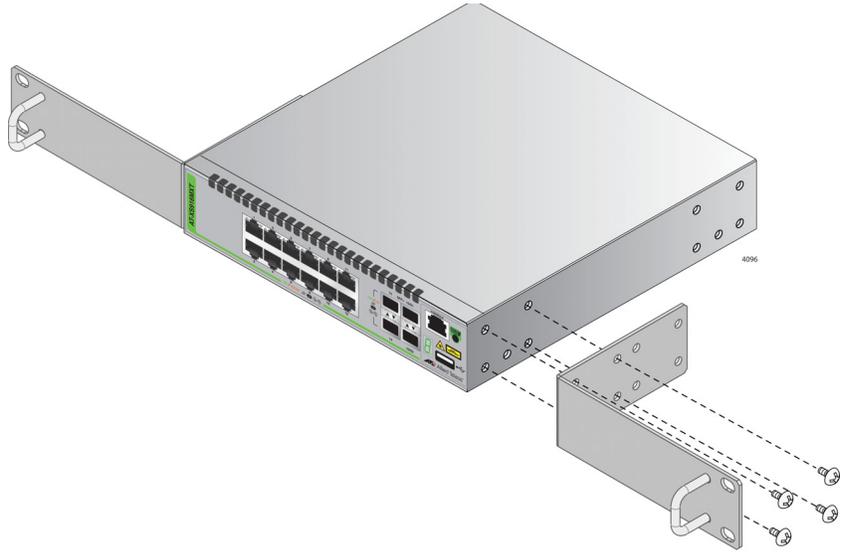


Figure 18. Installing the Brackets on the Switch

7. While another person holds the switch in the equipment rack, secure it with standard equipment rack screws as shown in Figure 19.

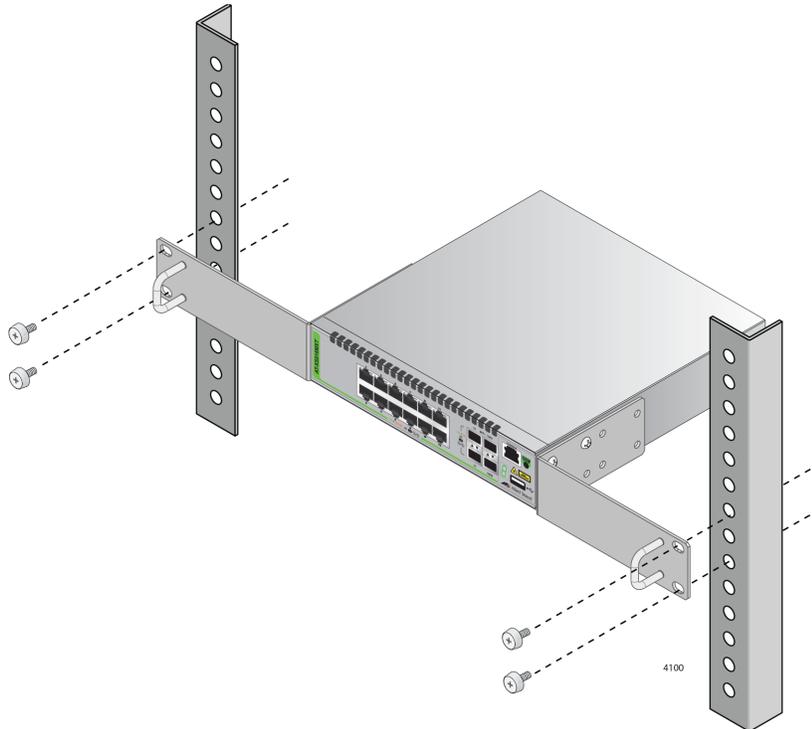


Figure 19. Mounting the Switch in an Equipment Rack

8. Go to Chapter 8, “Cabling the Networking Ports” on page 81, to connect the network cables to the ports on the switch.

Installing the Switch on a Wall

The AT-XS916MX series switch must be mounted on the wall in portrait orientation with the front panel facing left or right. See Figure 20.



Figure 20. Positions of the AT-XS916MX Series Switch on a Wall

What to Prepare for Wall Installation

You need the following items to install the switch on a wall:

- Wall mount bracket kit, which comes with the switch
- Flat-head screwdriver
- Cross-head screwdriver
- Drill

Note

You must provide flat-head and cross-head screwdrivers and a drill.

Installing the Switch on a Wall

To install the AT-XS916MX series switch on a wall, perform the following procedure:

1. Review “Choosing a Site for the Switch” on page 46 before performing this procedure.
2. Place the unit upside down on a level, secure surface. See Figure 21.

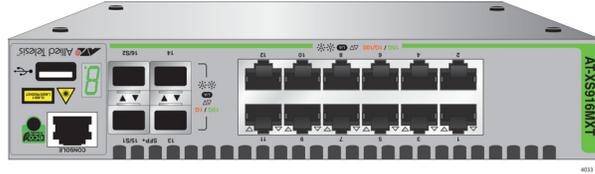


Figure 21. Turning the Switch Upside Down

3. Using a flat-head screwdriver, remove the rubber feet from the bottom of the switch. See Figure 22.

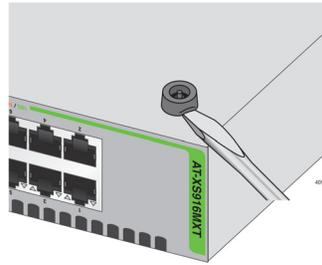


Figure 22. Removing the Rubber Feet

4. Attach each bracket to the switch using two screws, which should be installed diagonally as shown in Figure 23.

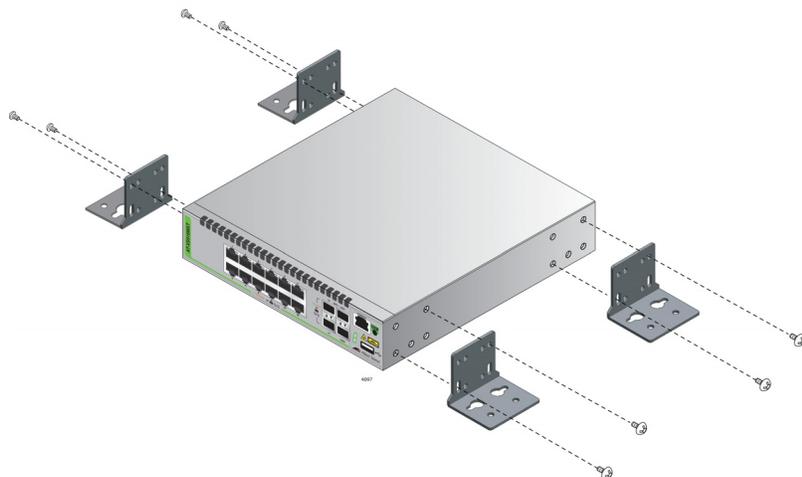


Figure 23. Attaching the Wall Brackets

5. Using a flat-head screwdriver, remove the rubber feet from the bottom of the switch. See Figure 24.

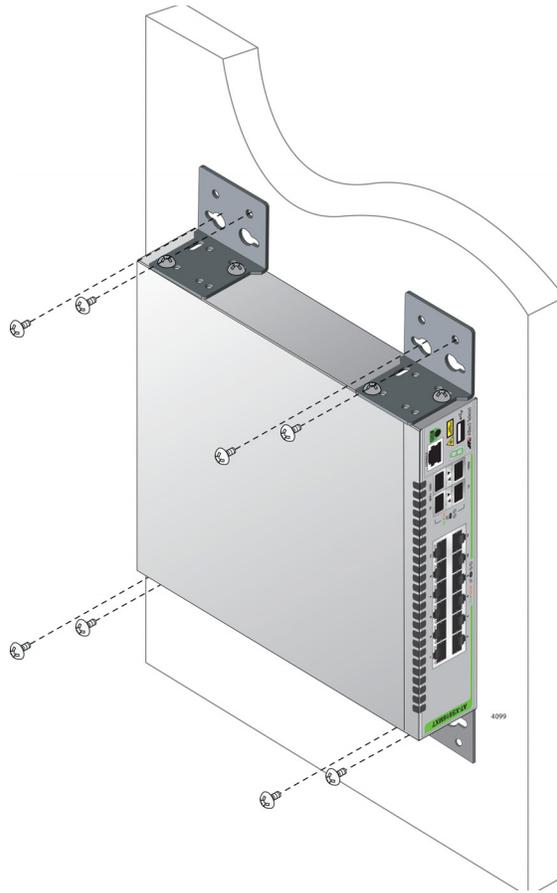


Figure 24. Installing the Switch on the Wall

Chapter 5

Verifying the Status of VCStack

The procedures in this chapter are:

- “Verifying the Status of VCStack” on page 58
- “Activating the VCStack Feature” on page 59

Verifying the Status of VCStack

Before you install the stacking transceivers to build the stack, you should first test the switches to determine whether the VCStack feature is enabled or disabled and enable it on any units where it is disabled. On new switches, the feature should be activated because that is the default setting. But on switches that were previously used as stand-alone units, the feature is probably disabled and needs to be enabled.

Testing the status of VCStack is simple. You power on a switch and watch the ID LED. If it displays the number 1 or 2, VCStack is already enabled. If the LED displays the number 0, the feature is disabled and needs to be enabled.

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

1. Power on one of the switches:

Connect a power cord to the power connector on the back panel and to an AC power source.

2. Wait one minute for the switch to initialize its management software.

3. View the ID LED and do one of the following:

- ❑ If the ID LED is displaying the number 1 or 2 (the default is 1), VCStack is already enabled on the switch. Power off the unit by disconnecting the power cord and test the other switch in the same manner. After testing all the switches, be sure the switches are powered off and go to Chapter 6, “Cabling the Stacking Ports” on page 63.
- ❑ If the ID LED is displaying “0,” the VCStack feature is disabled on the switch. You must enable it by performing the procedure in “Activating the VCStack Feature” on page 59.

Activating the VCStack Feature

Perform the following two procedures to activate the VCStack feature on switches that displayed the number “0” on their ID LEDs in the previous procedure. The tasks assume that you are continuing directly from the previous procedure and that the switch is powered on. The first procedure explains how to establish a local management session on the switch, and the second procedure explains how to active the VCStack feature.

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 25.

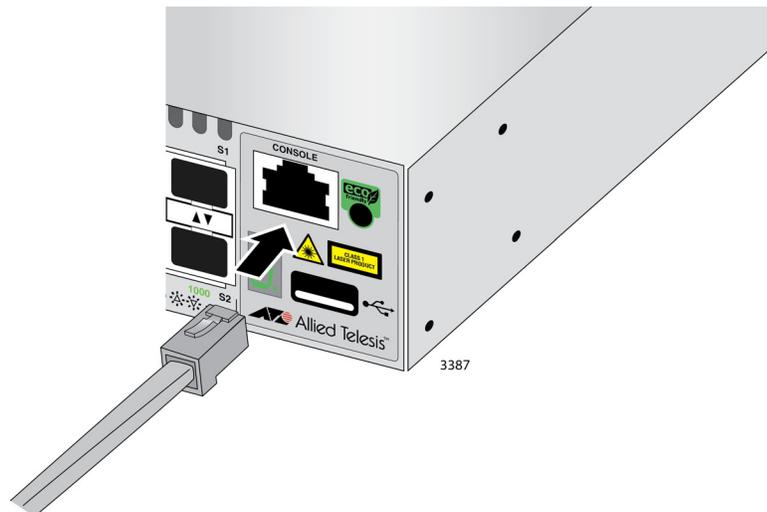


Figure 25. Connecting the Management Cable to the Console Port

2. Connect the other end of the cable to an RS-232 port on a terminal or PC 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 26, is displayed.

```
awplus>
```

Figure 26. 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 AT-XS916MX Series Switches, AlliedWare Plus Operating System* from www.alliedtelesis.com/support.

Activating VCStack

To activate the VCStack feature from the local management session, perform the following procedure:

1. Enter the ENABLE command to move from the User Exec mode to the Privileged Exec mode, as shown in Figure 27.

```
awplus> enable  
awplus#
```

Figure 27. Moving to the Privileged Exec Mode with the ENABLE Command

2. Enter the CONFIGURE TERMINAL command to move to the Global Configuration mode, as shown in Figure 28.

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

Figure 28. Moving to the Global Configuration Mode with the CONFIGURE TERMINAL Command

3. Enter the STACK ENABLE command to activate VCStack on the switch, as shown in Figure 29:

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

Figure 29. Activating VCStack with the STACK ENABLE Command

4. Enter the EXIT command to return to the Privileged Exec mode, as shown in Figure 30.

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

Figure 30. Returning to the Privileged Exec Mode with the EXIT Command

5. Enter the WRITE command to save your change, as shown in Figure 31.

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

Figure 31. Saving the Change with the WRITE Command

Note

If this is the initial management session of the switch, the WRITE command automatically creates, in flash memory, a new configuration file called DEFAULT.CFG in which it stores your configuration change. You may change the name of the file or designate a different file after you create the stack.

6. Restart the switch with the REBOOT command, as shown in Figure 32.

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

Figure 32. Rebooting the Switch with the REBOOT Command

7. Type “Y” for yes.
8. Wait one minute for the switch to initialize its management software.

9. Check the ID LED and do one of the following:
 - ❑ If the ID LED is displaying the number 1 or 2, 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 next switch. If there are no further switches to test, go to Chapter 6, “Cabling the Stacking Ports” on page 63.
 - ❑ 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 5 to save your change.

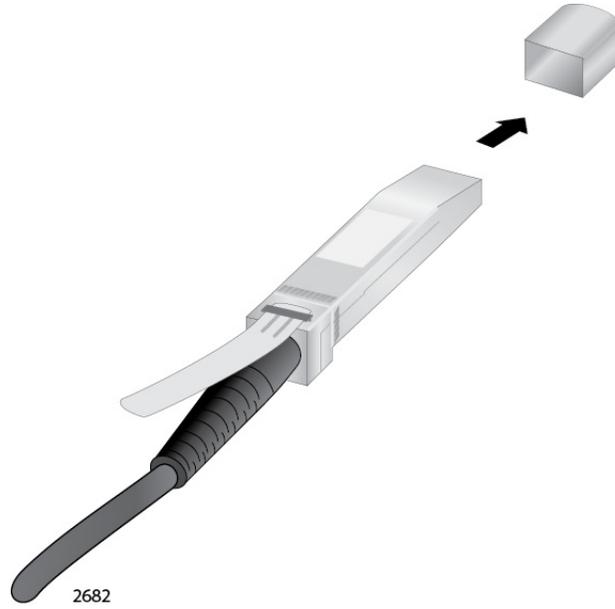


Figure 34. Removing the Dust Cover from the Transceiver

4. Position the transceiver with the release tab on top and slide the transceiver into the slot, as shown in Figure 35.

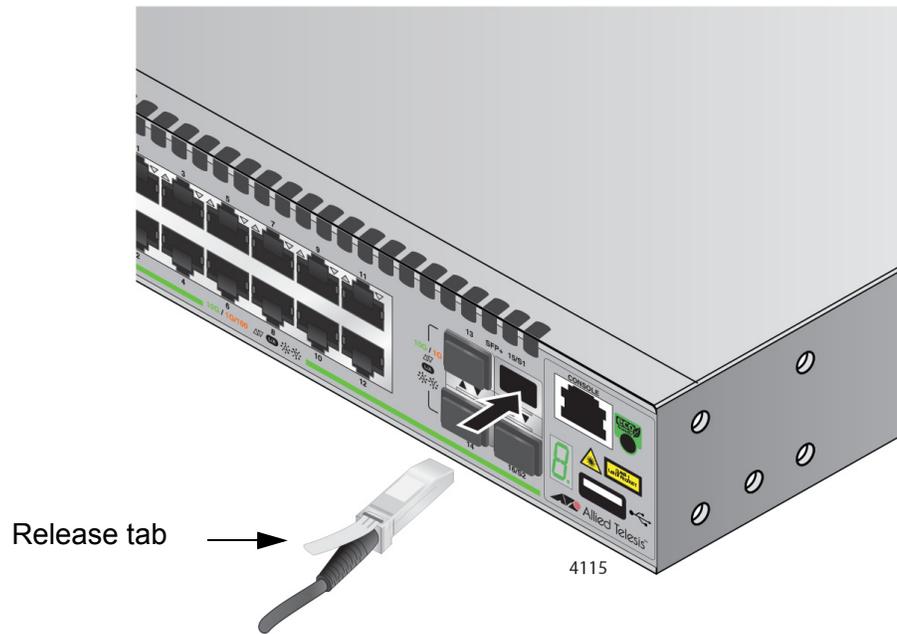


Figure 35. Installing the Transceiver in Slot S1

5. Remove the dust cover from the S2 slot in the next switch in the stack as shown in Figure 36.

Note

The cable must cross over to different slots on the switches. The stack will not work if you connect two S1 or S2 slots together.

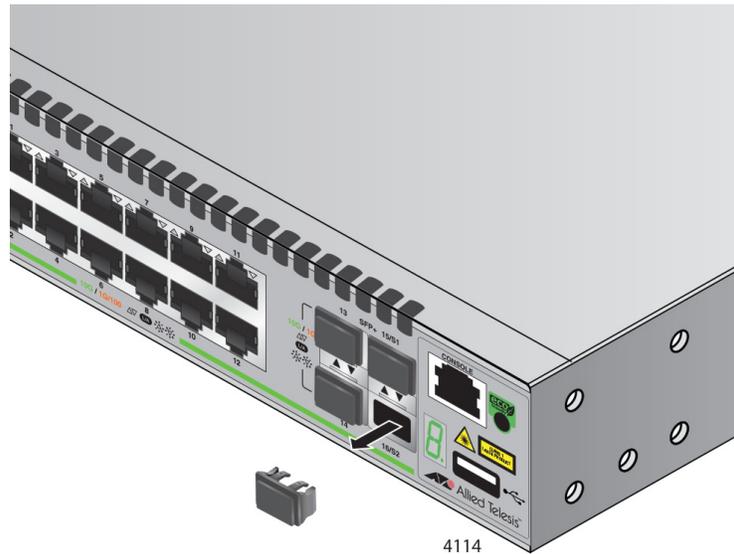


Figure 36. Removing the Dust Plug from the S2 Slot

6. Remove the dust cover from the connector on the other end of the transceiver.
7. Position the transceiver with the release tab on the bottom and slide it into the slot until it clicks into place, as shown in Figure 37 on page 66.

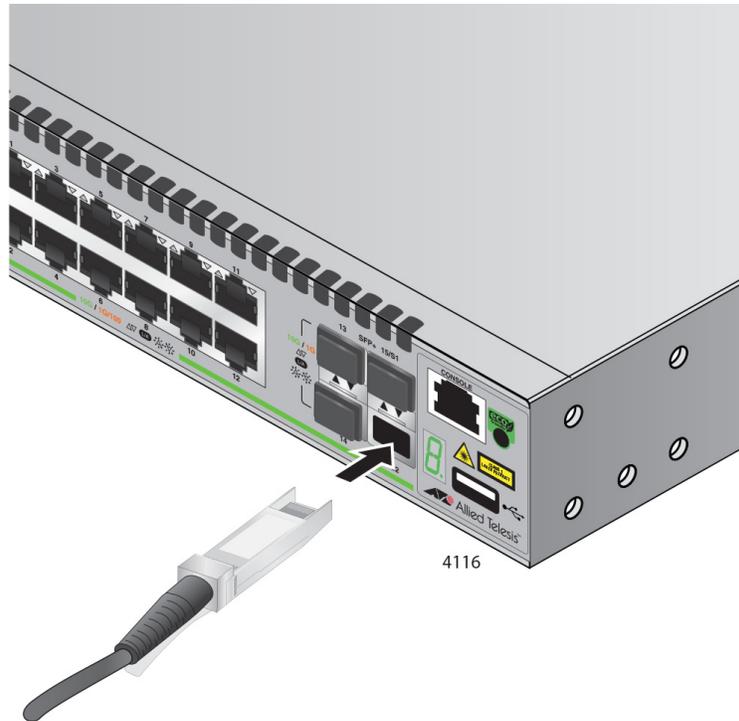


Figure 37. Installing the Transceiver in Slot S2

8. Repeat this procedure to connect additional switches to the stack with transceivers.
9. To create the redundant path with the ring topology shown in Figure 12 on page 37, connect a stacking cable to the empty stacking slots on the top and bottom switches.
10. After connecting the stacking cables to all the switches, go to Chapter 7, “Powering On the Stack” on page 67.

Chapter 7

Powering On the Stack

This chapter contains the following procedures:

- ❑ “Installing the Power Cord Retaining Clip” on page 68
- ❑ “Powering On the Switches Individually” on page 69
- ❑ “Powering On the Switches Simultaneously” on page 72
- ❑ “Verifying the Stack” on page 74
- ❑ “Monitoring the Initialization Processes” on page 77

Perform “Powering On the Switches Individually” on page 69 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. Otherwise, perform “Powering On the Switches Simultaneously” on page 72 to have the switches assign the numbers automatically. After the ID numbers are assigned, you may change them with the STACK RENUMBER command, described in the *Software Reference for AT-GS900MX Series Switches, AlliedWare Plus Operating System*.



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

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 38.

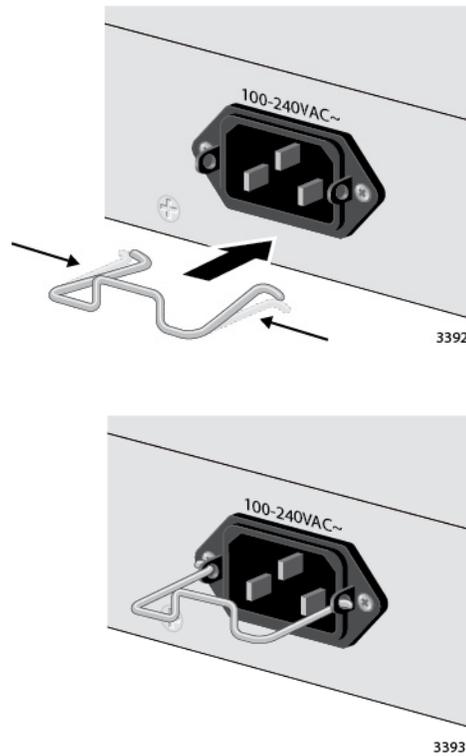


Figure 38. Installing the Retaining Clip

Go to either “Powering On the Switches Individually” on page 69 or “Powering On the Switches Simultaneously” on page 72.

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 during the initial power-on sequence. The first switch is assigned ID number 1, the next unit is assigned ID number 2. After the ID numbers are assigned, the switches retain their assignments even when you power off or reset the stack.

During the initial power-on sequence, the first switch to be powered on becomes the 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 a different switch being assigned that role. However, this does not affect 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 initial power-on sequence of the stack.
- You verified that VCStack is enabled on the switches, as explained in Chapter 5, “Verifying the Status of VCStack” on page 57.
- You connected the switches with stacking transceivers, as explained in Chapter 6, “Cabling the Stacking Ports” on page 63.
- The ID numbers are set to the default 1.
- All the switches are powered off.

If you want to monitor the power-on sequence, you may connect a terminal or PC 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 77.

Before powering on the switch, refer to “Power Specifications” on page 92 for the power specifications. To install the power cord retaining clip and power on the switch, perform the following procedure:

To power on the switches, perform the following procedure:

1. Power on the switch you want to be assigned ID number 1 by connecting its power cord to the AC connector on the back panel and to an appropriate power source. See Figure 39 on page 70. Refer to “Power Specifications” on page 92 for the power specifications of the switches.

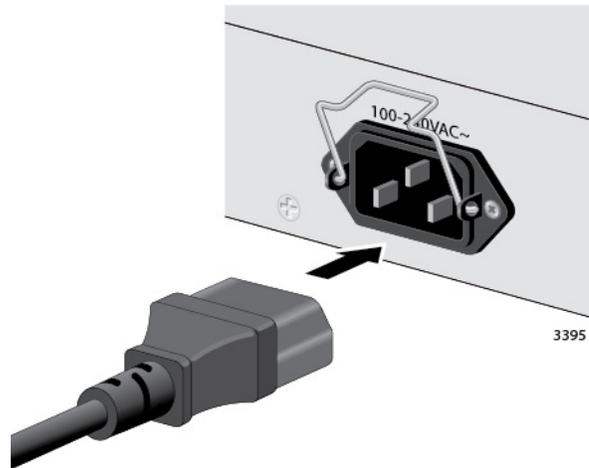


Figure 39. Plugging in the AC Power Cord



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 one minute for the switch to initialize its management software.
The switch should be displaying the number 1 on its ID LED.
3. Power on the switch to be assigned ID number 2.
4. Wait two 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 ID number 1 and again with its new ID number 2, which is why it takes two minutes before the device becomes a full member of the stack.

At this point, the stack is operational.

The ID numbers are automatically stored in special files in the flash memories of the switches and are retained by the devices even if you reset or power cycle the stack.

5. Secure the power cords to the switches by lowering the retaining clips. See Figure 40.

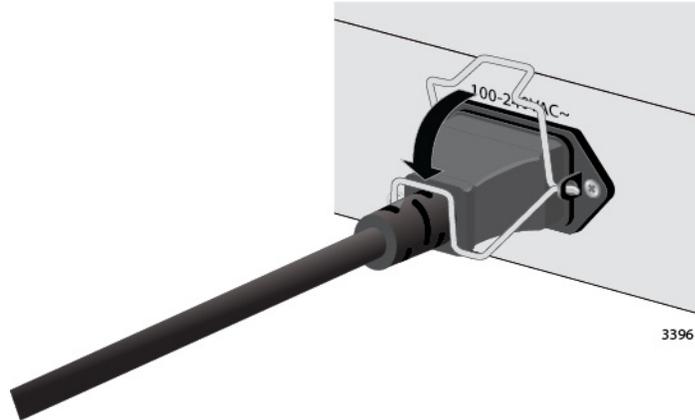


Figure 40. Lowering the Retaining Clip

6. To continue with the installation, go to “Verifying the Stack” on page 74.

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, all you have to do is power them on simultaneously, rather than one at a time as in the previous procedure. 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 ID numbers to the other switches.
- ❑ The other switches reset and initialize their management software again, with their new ID numbers.

This procedure assumes the following:

- ❑ This is the initial power-on sequence of the stack.
- ❑ You verified that VCStack is enabled on the switches, as explained in Chapter 5, “Verifying the Status of VCStack” on page 57.
- ❑ You connected the switches with stacking transceivers, as explained in Chapter 6, “Cabling the Stacking Ports” on page 63.
- ❑ All the switches are powered off.

If you want to monitor the power-on sequence, you may connect a terminal or PC 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 77.

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.

Connect the power cords to the connectors on the back panels and to the appropriate power sources, as shown in Figure 39 on page 70. Refer to “Power Specifications” on page 92 for the power specifications of the switches.



Warning

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

Note

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

2. Wait two or three minutes for the switches to select a master switch and to assign the ID numbers.

At this point, the stack is operational. The ID numbers are automatically stored in special files in the flash memories of the switches and are retained by the devices even if you reset or power cycle the stack.

3. To continue with the installation, go to “Verifying the Stack” on page 74.

Verifying the Stack

To verify stack operations, perform the following procedure:

1. Establish a local management session on any switch in the stack. For instructions, refer to “Starting a Local Management Session” on page 59.
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 41.

```
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 41. SHOW STACK Command

Here are some things to consider:

- The command should list the switches in the stack. If the list is incomplete, refer to Chapter 9, “Troubleshooting” on page 87.
 - The Operational Status field displays “Normal operations” when the switches are connected in the ring topology and “Not all stack ports are up” when the switches are connected in the linear topology.
 - The priority values will be 128, the default value, if you did not change them.
 - Given that there is no relationship between the ID numbers and the selection of the master switch, the active master in the SHOW STACK command might not have 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 75. The procedure is optional.

- ❑ Otherwise, go to Chapter 8, “Cabling the Networking Ports” on page 81, to continue 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 42.

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

Figure 42. 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 43 on page 76.

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

Figure 43. 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 44.

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

Figure 44. Saving the Priority Values with the WRITE Command

5. To end the management session, enter the EXIT command.
6. Go to Chapter 8, “Cabling the Networking Ports” on page 81, 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 45 here to Figure 47 on page 79.

```

Bootloader 3.1.3-devel loaded
Press <Ctrl+B> for the Boot Menu

Reading filesystem...
Loading flash:xs900-main-20151028-4.rel...
Verifying release... OK
Booting...
Starting base/first...           [ OK ]
Mounting virtual filesystems...  [ OK ]

      _____
     /         \
    /  \       / /_____ \
   /    \     / /| _____ |
  /      \   / / | _____ |
 /        \ / /  \ _____ /
/_____/ \ \ \ / /_____ /

Allied Telesis Inc.
Alliedware Plus (TM) v0.0.0
Current release filename: xs900-main-20151028-4.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 45. 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 46. 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 47. Switch Initialization Messages (Continued)

Chapter 8

Cabling the Networking Ports

This chapter contains the following procedures:

- “Cabling the Twisted Pair Ports” on page 82
- “Installing SFP/SFP+ Transceivers” on page 83

Cabling the Twisted Pair Ports

Here are the guidelines to cabling the 100/1000/10000Base-T twisted pair ports:

- ❑ The cable specifications for the twisted pair ports are listed in Table 1 on page 21.
- ❑ 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, you should disable Auto-Negotiation and set the port's speed manually to match the speeds of the network devices.
- ❑ The 100/1000/10000Base-T ports must be set to Auto-Negotiation, the default setting, to operate at 1000Mbps 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. You should 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 procedures for installing SFP/SFP+ transceivers.

Guidelines for SFP/SFP+ Transceivers

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

- ❑ SFP/SFP+ transceivers are hot-swappable. You may install them while the chassis is powered on.
- ❑ You should install a transceiver before connecting the 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.
- ❑ The S1 and S2 stacking slots can be used as SFP/SFP+ slots.



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. *see* E77

Installing SFP/ SFP+ Transceivers

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

1. Remove the dust plug from a transceiver slot on the switch. See Figure 48.

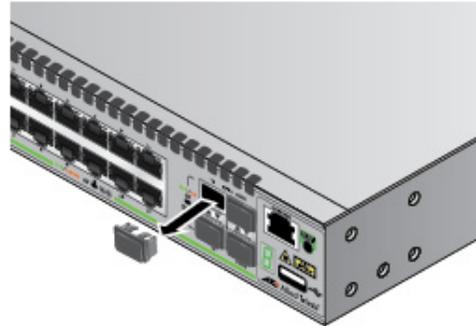


Figure 48. Removing the Dust Plug from an SFP/SFP+ Slot

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 49.

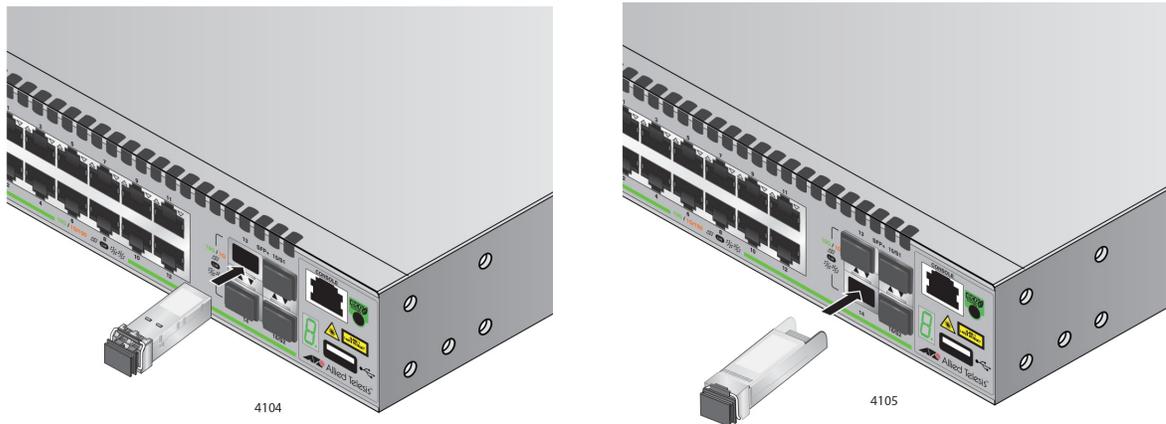


Figure 49. Installing an SFP/SFP+ Transceiver

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, as shown in Figure 50.

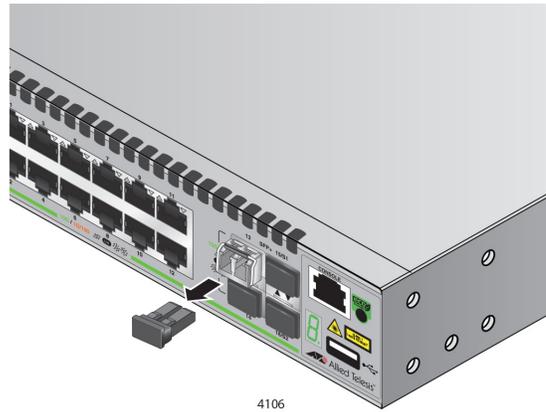


Figure 50. Removing the Dust Cover from an SFP Transceiver

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

For a top slot, the handle is in the upright position, as shown in Figure 51. For a bottom slot, the handle should be in the down position.

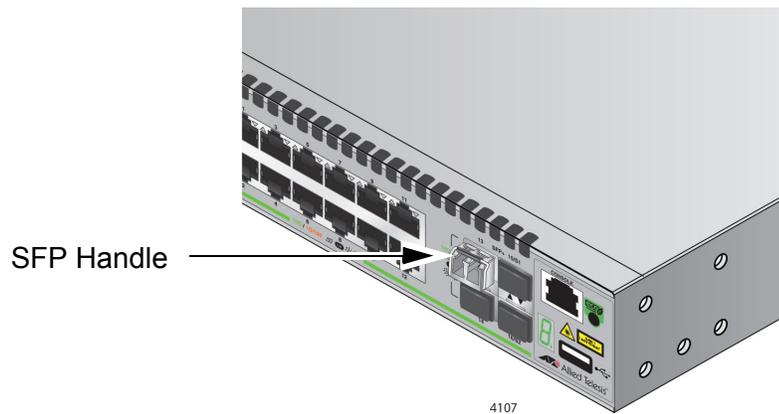


Figure 51. Positioning the SFP Handle in the Upright Position

7. Connect the fiber optic cable to the transceiver, as shown in Figure 52.

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

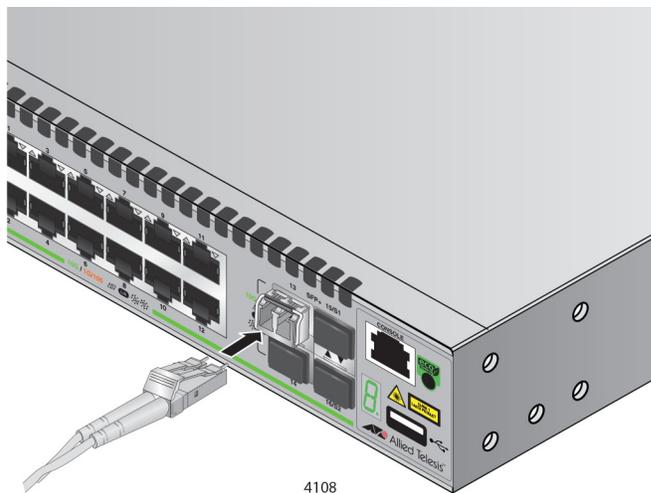


Figure 52. Connecting a Fiber Optic Cable to an SFP Transceiver

8. Repeat this procedure to install a second transceiver.
9. After installing the transceivers, go to Chapter 7, “Powering On the Stack” on page 67.

Chapter 9

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 of the port LEDs are off even though the ports are connected to active network devices.

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

Problem 3: The SHOW STACK command is not displaying all the switches in the stack.

Solutions: One or more switches cannot join the stack. Try the following:

- Verify that the stacking transceivers in the S1 and S2 slots of the switches are properly cabled. The stacking cables must cross over to different slots on the switches. For instructions, refer to Chapter 6, “Cabling the Stacking Ports” on page 63.
- Verify that the transceivers are fully inserted into the S1 and S2 slots.

- ❑ Verify that VCStack is activated on the switches. For instructions, refer to Chapter 5, “Verifying the Status of VCStack” on page 57.
- ❑ It could be that the switches have incompatible versions of the management software. When a stack forms or a new switch is added to an existing stack, the master switch downloads its management software to member switches that do not have the same version. If the master switch encounters a problem downloading the management software to a member switch, it does not allow the device to join the stack.

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 Table 1 on page 21 for the 100/1000/10000Base-T ports.

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 slot.
- ❑ Check to be sure that the transceiver is not installed in slot S1 or S2 in the switch.

- ❑ 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 2 on page 25.

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 may shut down.

Contact your Allied Telesis sales representative for assistance.

Appendix A

Technical Specifications

This appendix contains the following sections:

- "Physical Specifications"
- "Environmental Specifications" on page 92
- "Power Specifications" on page 92
- "Certifications" on page 93
- "RJ-45 Twisted Pair Port Pinouts" on page 94
- "RJ-45 Style Serial Console Port Pinouts" on page 95

Physical Specifications

Dimensions (H x W x D)

Table 6. 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 7. Product Weights

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

Ventilation

Table 8. Ventilation Requirements

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

Environmental Specifications

Table 9. 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 10. 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 11. 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 12. 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 13. 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 (cUL _{US}), CSA-C22 No. 60950-1 (cUL _{US}), EN60950-1 (TUV), EN60825-1 (TUV)

RJ-45 Twisted Pair Port Pinouts

Figure 53 illustrates the pin layout of the RJ-45 connectors and ports.

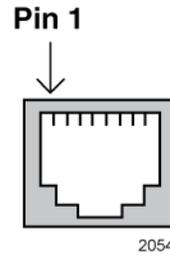


Figure 53. RJ-45 Socket Pin Layout (Front View)

Table 14 lists the pin signals for 10 and 100 Mbps.

Table 14. 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 15.

Table 15. Pin Signals for 1000 Mbps

Pinout	Pair
1	Pair 1 +
2	Pair 1 -
3	Pair 2 +
4	Pair 3 +

Table 15. Pin Signals for 1000 Mbps (Continued)

Pinout	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 16.

Table 16. 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

