

AT-IE510-28GSX

Industrial Ethernet Switch



Installation Guide

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Electrical Safety and Emissions Standards

U.S. Federal Communications Commission

Interference Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a controlled environment, such as a cabinet, hut or telecom closet. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The Federal Communications Commission warns that changes or modifications of the unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment and any assurances of safety or performance, and could result in violation of part 15 of the FCC Rules.

Industry Canada

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

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

This equipment complies with radio frequency exposure limits set forth by Industry Canada for a controlled environment.

Cet équipement est conforme aux limites d'exposition aux radio fréquences définies par Industrie Canada pour un environnement contrôlé.

European Union Restriction of the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment

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

Environmental Compliance

RoHS
China RoHS
WEEE

EMI Emissions

FCC Part 15B Class A
ICES-003 Class A
EN55032:2015 Class A
VCCI- Class A
EN61000-3-2:2006+A1:2009+A2:2009
EN61000-3-3:2008

EMC Immunity

EN55024:2010
EN61000-4-2:2009
EN61000-4-3:2006 + A2:2010
EN61000-4-4:2012
EN61000-4-5:2006
EN61000-4-6:2009
EN61000-4-8:2010
EN61000-4-11:2004

Electrical Safety

UL/EN/IEC60950-1
CSA 22.2:60950-1
2006/95/EC Low Voltage Directive

All Allied Telesis approved SFP modules

EN60825-1
EN60825-2
EN/IEC/UL60950-1
FCC CDRH registered

Translated Safety Statements

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

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Preface

This guide contains the installation instructions for the AT-IE510-28GSX Industrial Ethernet switch. It explains how to install the switch as a stand-alone unit, or multiple switches in a stack configuration with Virtual Chassis Stacking (VCStack™).

This preface contains the following sections:

- “Document Conventions” on page 14
- “Contacting Allied Telesis” on page 15

Note

The AT-IE510-28GSX switch requires AlliedWare Plus™ version 5.4.5 or later. The switch will not function with earlier versions of the management software.

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 with the high voltage symbol inform you that performing or omitting a specific action may result in bodily injury.



Warning

Warnings with the laser symbol inform you that an eye and skin hazard exists due to the presence of a Class 1 Laser device.



Warning

Warnings with the high temperature symbol inform you that a surface may be hot.

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 questions in our knowledge database, check support tickets, learn about Return Merchandise Authorizations (RMAs), and 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 an RMA request via our interactive support center.
- ❑ Documentation - View the most recent installation guides, user guides, software release notes, white papers and data sheets for your product.
- ❑ Software Updates - Download the latest software releases for your product.

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

Chapter 1

Overview

This chapter contains the following sections:

- ❑ “Feature Overview” on page 18
- ❑ “Front and Back Panels” on page 20
- ❑ “Management Panel” on page 21
- ❑ “SFP+ Slots” on page 22
- ❑ “Stacking Slots for VCStack” on page 23
- ❑ “Alarm Ports” on page 24
- ❑ “eco-friendly Button” on page 25
- ❑ “LEDs” on page 26
- ❑ “USB Port” on page 31
- ❑ “Console Port” on page 32
- ❑ “Power Supplies” on page 33
- ❑ “Specifying Ports in the Command Line Interface” on page 34

Note

The AT-IE510-28GSX switch requires AlliedWare Plus™ version 5.4.5 or later. The switch will not function with earlier versions of the management software.

Feature Overview

This section describes the features of the AT-IE510-28GSX switch.

SFP Slots

The basic features of the SFP slots on the switch are:

- Supports 100Base-FX and 1000Base-SX/LX SFP transceivers
- Supports single-port BiDi 1000Base-LX SFP transceivers
- Supports 1000Base-ZX SFP transceivers

SFP+ Slots

The basic features of the four SFP+ slots on the switch are:

- Supports 10Gbps, 10GBase-SR/LR fiber optic transceivers
- Supports 10Gbps AT-SP10TW direct connect twinax cables with SFP+ transceiver-style connectors
- Supports 1000Base-SX/LX SFP transceivers
- Supports single-port BiDi 1000Base-LX SFP transceivers
- Supports 1000Base-ZX SFP transceivers

The SFP+ slots do not support 100Mbps 100Base-FX transceivers.

Note

SFP+ slots 27 and 28 are initially configured as stacking slots for the VCStack feature. To use the switch as a stand-alone unit, disable the VCStack feature before using the slots. For instructions on how to disable VCStack, see “Disabling VCStack” on page 83.

Note

SFP and SFP+ transceivers must be purchased separately. For a list of supported transceivers, contact your Allied Telesis distributor or reseller.

Stacking Slots

Two of the SFP+ slots can be used to create a VCStack of up to four switches. The slots support any Allied Telesis SFP+ module. For information on virtual chassis stacking, see Chapter 2, “Virtual Chassis Stacking” on page 35.

Alarm Ports

The switch contains two alarm ports:

- Alarm input
- Alarm output

Each alarm port contains three contact points.

- LEDs** The port LEDs are:
- Link/activity LEDs for SFP and SFP+ slots
 - Stack ID number LED
 - eco-friendly button turns off the LEDs to conserve electricity

- Installation Options** The installation options for the switch are:
- 19-inch or 23-inch equipment rack
 - Wall mount

- MAC Address Table** The basic features of the MAC address tables of the switch are:
- 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** The management software and interfaces are:
- AlliedWare Plus Management Software
 - Command line interface
 - Web browser interface

- Management Methods** The methods for managing the switch are:
- Local management through the Console port
 - Remote Telnet and Secure Shell management
 - Remote HTTP and HTTPS web browser management
 - SNMPv1, v2c, and v3

- Power Supplies** The switch has two pre-installed DC power supplies. The power supplies are not field-replaceable.

Front and Back Panels

The front and back panels of the switch are shown in Figure 1 and Figure 2, respectively.

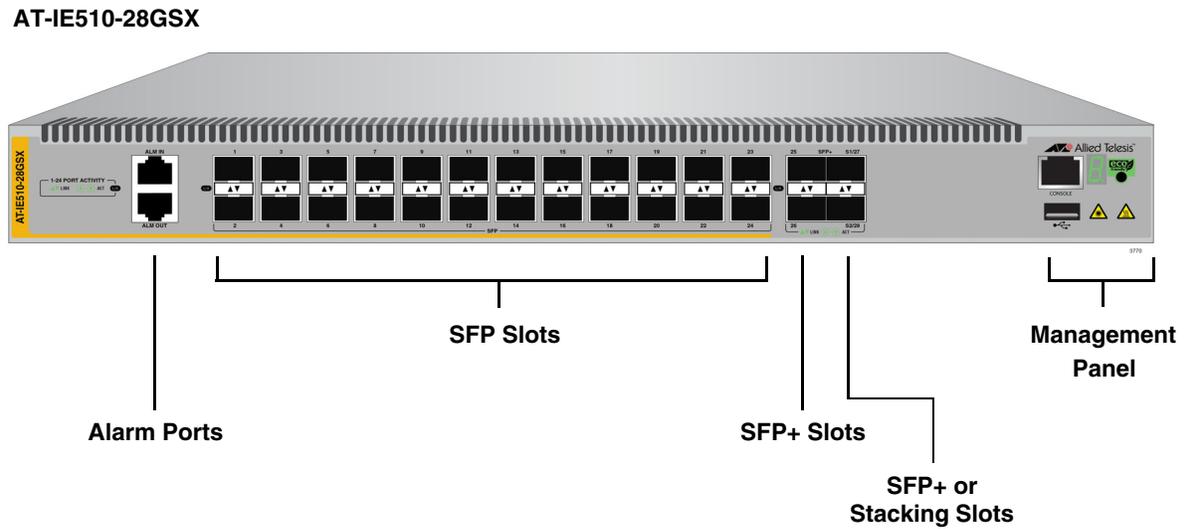


Figure 1. AT-IE510-28GSX Front Panel

Figure 2 shows the back panel of the switch.

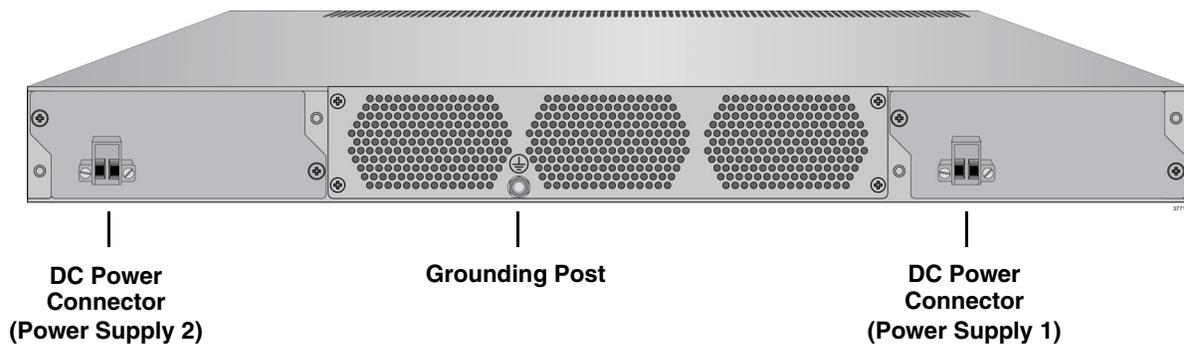


Figure 2. AT-IE510-28GSX Back Panel

Management Panel

Figure 3 identifies the components in the management panel on the switch.

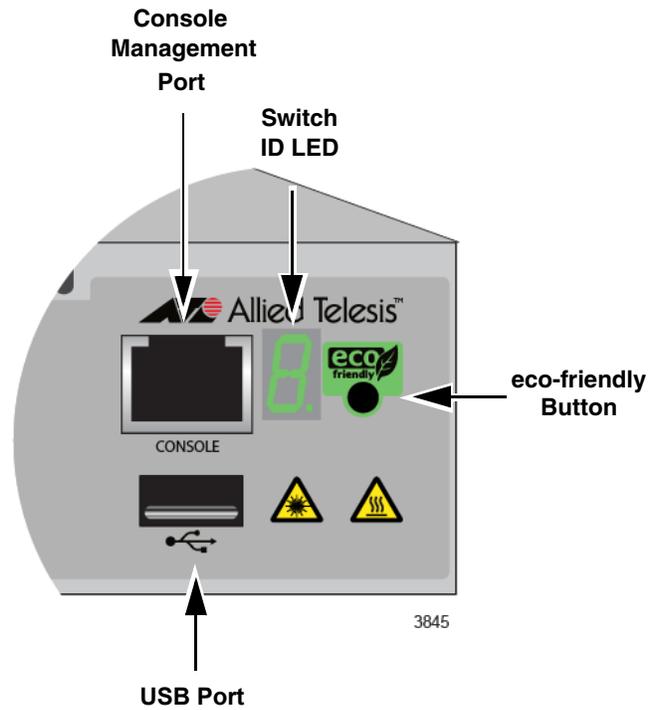


Figure 3. AT-IE510-28GSX Management Panel

SFP+ Slots

The switch has four SFP+ slots that support the following types of SFP 1000Mbps and SFP+ 10Gbps transceivers:

- ❑ 1000Base-SX/LX SFP transceivers
- ❑ Single-port BiDi 1000Base-LX SFP transceivers
- ❑ 1000Base-ZX SFP transceivers
- ❑ 10Gbps, 10GBase-SR/LR fiber optic transceivers
- ❑ 10Gbps AT-SP10TW direct connect twinax cables with SFP+ transceiver-style connectors

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.

The switches support a variety of short and long distance SFP and SFP+ modules. For a list of supported SFP modules, contact your Allied Telesis representative.

Stacking Slots for VCStack

The front panel of the switch contains four SFP+ slots. Slots 27 and 28 can be used to build a VCStack of up to four switches. 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 in how you configure 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

SFP+ slots 27 and 28 are initially configured as stacking slots for the VCStack feature. To use the switch as a stand-alone unit, disable the VCStack feature before using the slots. For instructions on how to disable VCStack, see “Disabling VCStack” on page 83.

Alarm Ports

The switch contains two alarm ports: One for alarm input and one for alarm output. Each alarm port contains three contact points.

The alarm ports use RJ-45 connectors. To connect either the alarm input or alarm output, use 24 to 18 AWG cable properly rated for the deployment environment. The maximum length of an alarm cable is two meters.

An alarm cable must be contained within the cabinet (for cabinet applications), or within the building. Do not expose an alarm cable to the outside environment.

See Appendix A, “Technical Specifications” on page 121 for a description of the alarm input and alarm output pinouts.

Alarm Input

You can connect an alarm input to a dry contact switch, such as a door switch. There are no polarity requirements if the port is connected to a non-powered mechanical switch. There is an internal isolated power supply that provides a maximum of 5V and 20mA through the contact.



Caution

Do not apply external power to any of the alarm input's leads.

Alarm Output

The alarm output consists of a relay contact that can handle 0.8A of current at a maximum voltage of 48V DC. You must provide a series resistance that will limit the current accordingly.

eco-friendly Button

You may turn off the port LEDs to conserve electricity when you are not monitoring the switch. The LEDs are toggled with the eco-friendly button on the front panel of the switch or 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 8 on page 30.

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 command line interface.

LEDs

Here are descriptions of the front panel LEDs.

SFP Slots LEDs

The LEDs for the SFP slots are located between the slots, as shown in Figure 4 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.

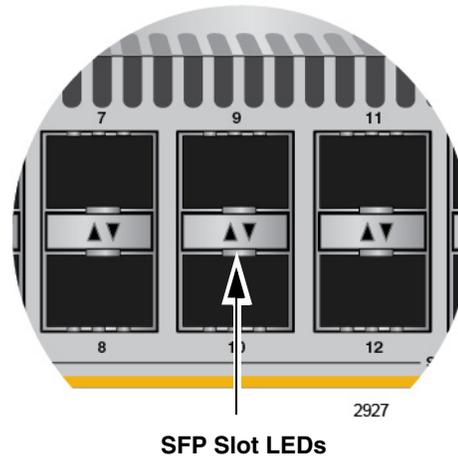


Figure 4. SFP Slot LEDs

The LEDs are described in Table 1.

Table 1. SFP Slot LEDs

LED	State	Description
Link/Activity	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 green	The SFP transceiver has established a link at 100 Mbps or 1000 Mbps to a network device.
	Flashing green	The SFP transceiver is receiving or transmitting packets to a network device.

SFP+ Slot LEDs

The LEDs for the SFP+ slots are located between the slots, as shown in Figure 5. 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.

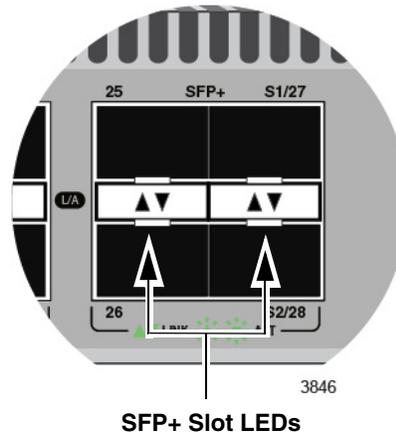


Figure 5. SFP+ Slot LEDs

The LEDs are described in Table 2.

Table 2. SFP+ Slot LEDs

LED	State	Description
Link/Activity	Off	The slot is empty, the SFP or 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 green	The SFP or SFP+ transceiver has established a link at 1000 Mbps or 10 Gbps to a network device.
	Flashing green	The SFP+ transceiver is receiving or transmitting packets to a network device at 10 Gbps. (The LED does not flash for activity at 1000 Mbps.).

Stacking Slots LEDs

SFP+ slots 27 and 28 may be used as stacking slots to build a VCStack of up to four switches. For background information, refer to Chapter 2, “Virtual Chassis Stacking” on page 35. Table 3 on page 28 defines the LED states when the VCStack feature is enabled on the switch.

Table 3. Stacking Slot LEDs

LED	State	Description
Link/Activity	Off	The slot is empty, the 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 transceiver has established a link at 10 Gbps to another switch in the stack.
	Flashing green	The transceiver is receiving or transmitting packets.

Switch ID LED

The Switch ID LED, shown in Figure 6, 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 4. Chapter 10, “Powering On the Stack” on page 105 has the procedure for verifying and, if necessary, changing the ID number of the switch.

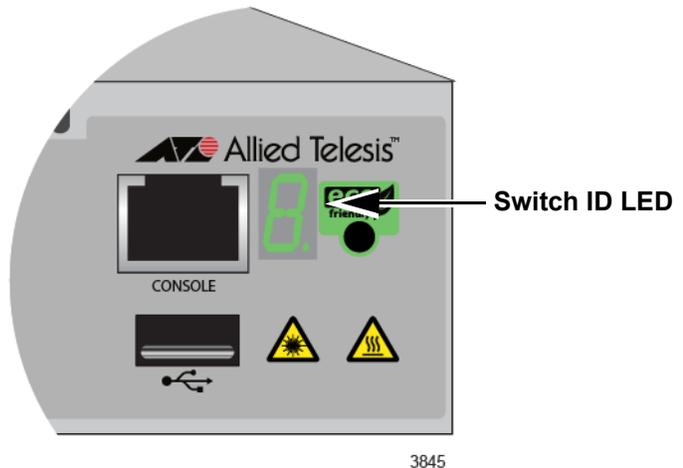


Figure 6. Switch ID LED

The states of the LED when the switch is not operating in the low power mode are shown in Figure 7.

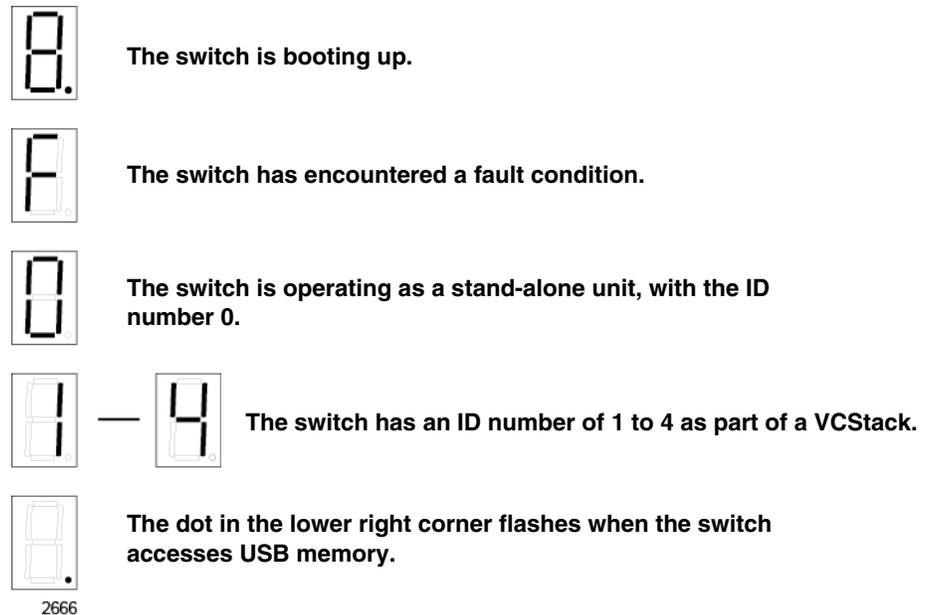


Figure 7. Switch ID LED

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

- An alarm has been triggered.
- A cooling fan has failed.
- The input voltage on one or both of the power supplies is outside the normal operating range. Refer to “Power Specifications” on page 122.
- The internal temperature of the switch has exceeded the normal operating range and the switch may shut down. Refer to “Environmental Specifications” on page 122

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 8 on page 30.



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 8. Switch ID LEDs in the 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 establish a management session 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 RJ-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 Supplies

The switch is powered on or off by connecting or disconnecting the power cords.

Please review the following information concerning the power supplies:

- ❑ The switch has two pre-installed DC power supplies.
- ❑ The pre-installed DC power supplies have separate connectors on the back panel. You can protect the network operations of the switch from a power circuit failure by connecting the power supplies to different circuits.
- ❑ The switch requires only one power supply for full operations. The second power supply provides power redundancy. It protects against interruptions to network operations in the event one power supply loses power or fails. Power redundancy is available only when both DC connectors on the switch are connected to power sources.
- ❑ The power supplies are not field replaceable.
- ❑ The DC supply wires should be routed from a DC load center containing appropriate overcurrent branch protection for each DC feed, as required by the cognizant local electrical authority.

Refer to “Power Specifications” on page 122 for the input voltage range.

**Warning**

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

**Warning**

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

see E30

Specifying Ports in the Command Line Interface

The command line interface in the management software uses the PORT parameter to specify the individual ports. The format of the PORT parameter is:

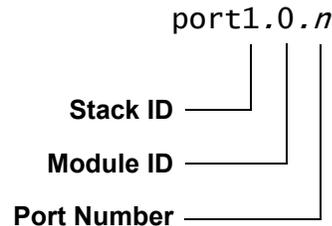


Figure 9. PORT Parameter in the Command Line Interface

The first number is the switch's ID number.

VCStack: 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.

Stand-alone: The ID number for stand-alone switches is not the value 0 displayed on the Switch ID LEDs. Rather, it is 1. Be sure to enter 1, not 0, as the ID number in the PORT parameter when configuring ports on stand-alone switches.

The module ID value is used with multi-module products. This value does not apply to the AT-IE510-28GSX switch and should always be 0.

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

Following is an example of the PORT parameter. This example uses the INTERFACE command to enter the Port Interface mode for ports 15 and 17 on a switch with ID 1:

```
awplus> enable
awplus# configure terminal
awplus(config)# interface port1.0.15,port1.0.17
```

For full instructions on the command line interface and the PORT parameter, refer to the AT-IE510-28GSX **Command Reference** on AlliedTelesis.com.

Chapter 2

Virtual Chassis Stacking

The sections in this chapter are:

- “Benefits of VCStack” on page 36
- “Stacking Slots” on page 37
- “Stacking Port Topologies” on page 38
- “Master and Member Switches” on page 42

Note

This chapter provides an overview of the Virtual Chassis Stacking (VCStack) feature, which allows you to connect up to four switches to form a virtual switch where the devices function as a single networking unit. To install the switch as a stand-alone unit, proceed to Chapter 3, “Beginning the Installation” on page 45.

Benefits of VCStack

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.

Note

For information on the VCStack feature, see the **VCStack Feature Overview and Configuration Guide** on AlliedTelesis.com.

Stacking Slots

The switch comes with two stacking slots. The slots are the last two SFP+ slots on the switches and are labeled “S1/27” and “S2/28” on the switch.

The slots have two functions. You can use them with the VCStack feature to build a stack of switches, or you can disable the VCStack feature and use them as additional networking slots.

The names of the slots depend on the status of the VCStack feature on the switch. When VCStack is enabled, the management software refers to the slots as “S1” and “S2”. When you disable VCStack to use the slots as regular networking ports, the slots are referred to as slots 27 and 28. For instructions on how to disable VCStack to use the switches as stand-alone units, refer to “Disabling VCStack” on page 83.

Stacking Port Topologies

There are two possible wiring topologies when you use the S1/27 and S2/28 slots to build a VCStack. The first topology is called the linear topology. In this topology the switches are connected with a single pathway. A transceiver in one switch is connected to a transceiver in the next switch, which is connected to the next switch, and so on. The connections must cross over to different stacking slots on the switches: The stacking transceiver in the S1 slot in one switch must connect to the stacking transceiver in the S2 slot in the next switch.

Figure 10 is an example of a stack of two switches in the linear topology. The transceiver in the S1 slot on the top switch is connected to the transceiver in the S2 slot on the bottom switch.

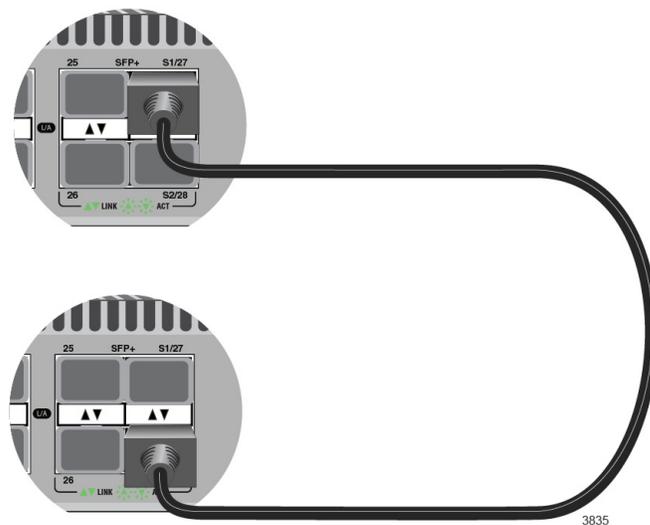


Figure 10. Stack of Two Switches in the Linear Topology

Note

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 operate as stand-alone devices.

The stack in Figure 11 has four switches in the linear topology.

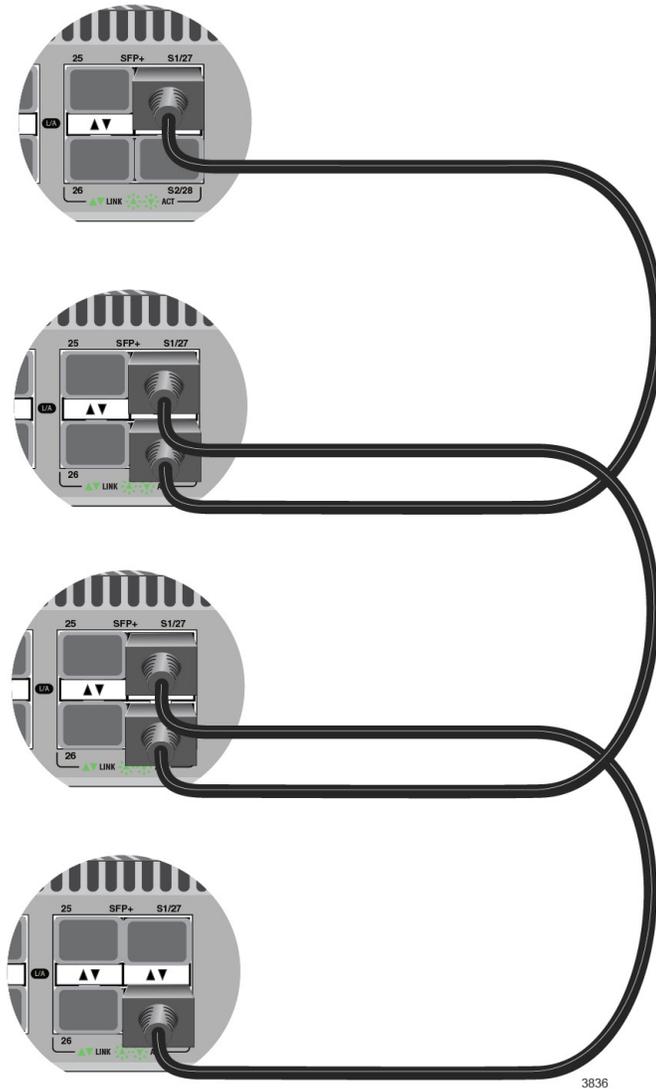


Figure 11. Stack of Four Switches in the Linear Topology

The second topology is called a ring topology. It is similar to the linear topology, except that the unused stacking ports 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.

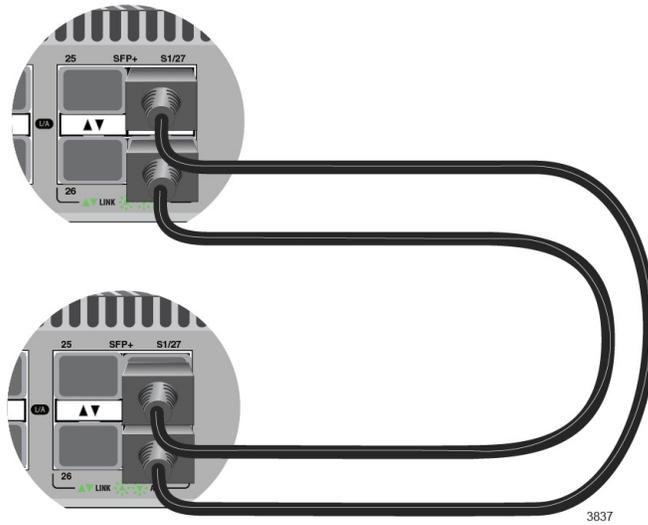


Figure 12. Stack of Two Switches in the Ring Topology

Figure 13 is an example of a stack of four switches in the ring topology.

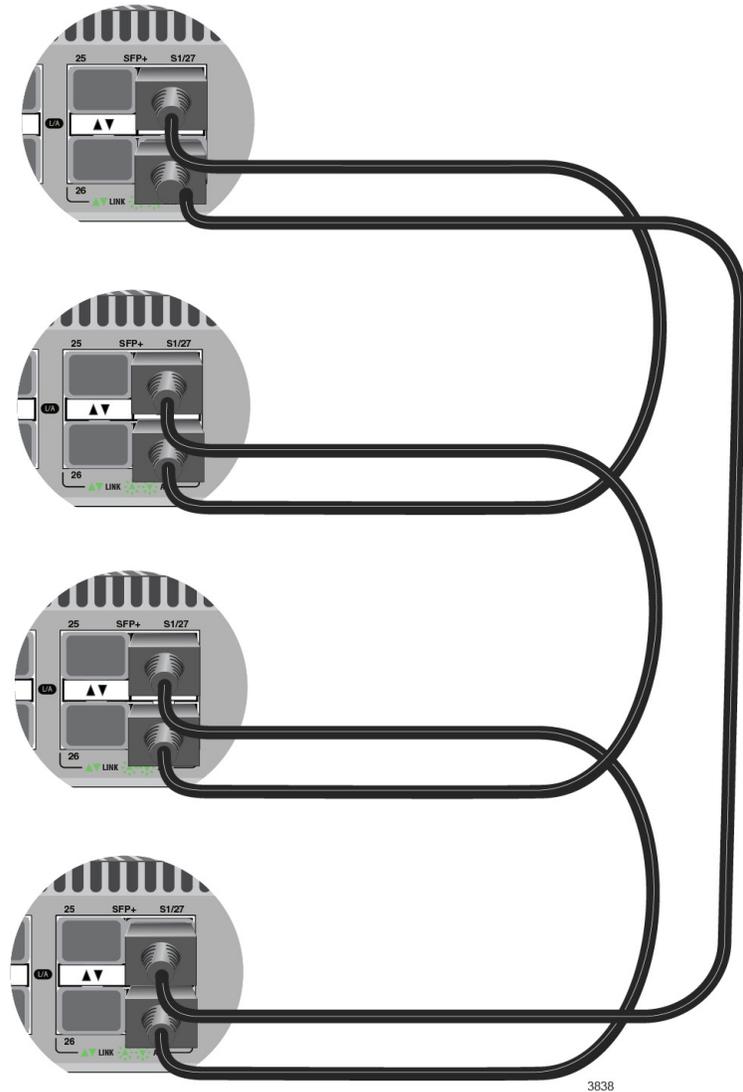


Figure 13. Stack of Four Switches in the Ring Topology

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

Selection of the Master Switch

The 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. Typically, the switch with the lowest priority number (highest priority) becomes the master switch of a stack. The default priority value is 128.

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

If you power on the stack for the first time without adjusting the priority values, the master switch is selected based on the MAC addresses if the units are powered on simultaneously. If you power on the switches one at a time, the master switch is the first switch to be powered on. This is explained in Chapter 10, “Powering On the Stack” on page 105.

After the stack is established and operating, you can change the priority settings on the individual units to 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 range is 1 to 4 and the default is 1. The ID numbers are displayed on the ID LEDs on the front panels of the units. You can assign the numbers yourself or you can let the master switch assign the numbers automatically. For more information on assigning ID numbers, see Chapter 10, “Powering On the Stack” on page 105.

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 34.

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.

Note

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.

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 explained in “Selection of the Master Switch” on page 42.

Chapter 3

Beginning the Installation

The chapter contains the following sections:

- ❑ “Reviewing Safety Precautions” on page 46
- ❑ “Choosing a Site for the Switches” on page 50
- ❑ “Planning a Stack” on page 51
- ❑ “Unpacking the Switch” on page 52

Reviewing Safety Precautions

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

Note

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



Warning

Class 1 Laser product.  L1



Warning

Laser Radiation.
Do not view directly with optical instruments.
Class 1M Laser product.

Rayonnement Laser.
Ne pas observer directement à l'aide d'instruments d'optique.
Appareil à Laser de classe 1M.



Warning

Do not stare into the laser beam.  L2



Warning

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



Warning

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

**Warning**

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

**Warning**

This equipment must be earthed. The ground lug on the switch must be connected to a properly earthed bonding point.

Note

Ground resistance from the building primary bonding point to earth should be less than 25 ohms.

**Caution**

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

**Warning**

When the unit is operational it will be hot. Exercise caution when handling with unprotected hands.

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.

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



Warning

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

Note

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



Warning

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

Note

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

Circuit breaker is used as a disconnection device. To de-energize the equipment, shut down the circuit breaker and then disconnect the input wire. ☞ E38

**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

Note

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

**Warning**

Operating Temperature. This product is designed for a maximum ambient temperature of 75 degrees C. ☞ E53

Note

Allied Telesis does not warrant against lightening or power surges causing damage to the device. Such damage will be the responsibility of the equipment owner.

Choosing a Site for the Switches

Observe these requirements when planning a stack installation.

- ❑ If you plan to install the switches 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.
- ❑ The power outlet should be located near the switches and be easily accessible.
- ❑ The site should allow for easy access to the ports on the front of the switches, so that you can easily connect and disconnect cables, and view the port LEDs.
- ❑ The site should allow for adequate air flow around the units and through the cooling vents on the front and rear panels. (The ventilation direction is from front to back, with the fan on the back panel drawing the air out of the unit.)
- ❑ The site should not expose the switches 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.



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.

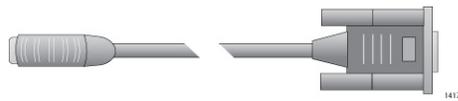
Planning a Stack

The guidelines to planning a stack are:

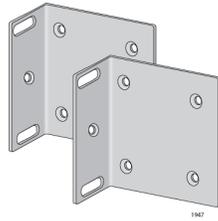
- ❑ A stack can have up to four AT-IE510-28GSX switches.
- ❑ Switches connected with Allied Telesis TwinAx cables should be installed in a 19-inch or 23-inch equipment rack and not be more than the length of the cable apart. The end switches must not be more than a cable length apart if you want to create the ring topology, shown in Figure 12 on page 40 and Figure 13 on page 41.
- ❑ The wiring topology of the stack may be either linear or ring. Both topologies offer the same in terms of speed, but the ring topology adds wiring redundancy.
- ❑ You can use combinations of Allied Telesis TwinAx cables and SFP+ modules with fiber optic cables when the individual switches of the stack are at various distances from each other.
- ❑ The AT-IE510-28GSX stack may not contain other stacking switches.
- ❑ The switches do not need any additional software for stacking.
- ❑ You may not install a networking device, such as a media converter or Ethernet switch, between two fiber optic stacking transceivers.
- ❑ All the switches must have the same licenses of optional features. If you install an optional feature on one switch, you must install it on all switches before assembling the stack.

Unpacking the Switch

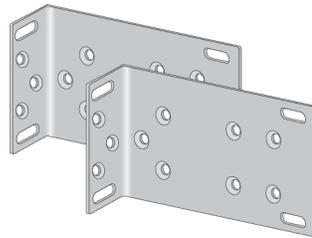
Figure 14 lists items that come with the switch. If any item is missing or damaged, contact your Allied Telesis sales representative for assistance.



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



Two wall mounting brackets



Two rack mounting brackets
(pre-installed on the switch)

Figure 14. Components of the Switch

Also included are four rubber feet and plastic push rivets; eight M3 bracket screws; and four #8 x 1.5-inch wood screws with plastic anchors.

Note

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

After checking the contents of the shipping containers, go to Chapter 4, “Mounting the Switch” on page 53.

Chapter 4

Mounting the Switch

The procedures in this chapter are:

- “Installing the Switch in an Equipment Rack” on page 54
- “Installing the Switch on a Wall Mount” on page 58
- “Inserting the Rubber Feet” on page 59

Installing the Switch in an Equipment Rack

You can install the switch in an equipment rack in four ways:

- Front mount in a 19-inch rack
- Mid mount in a 19-inch rack
- Front mount in a 23-inch rack
- Mid mount in a 23-inch rack

Installation guidelines may be found in “Choosing a Site for the Switches” on page 50.

The procedure to install the switch in an equipment rack requires the following items:

- Two equipment rack brackets (pre-installed on the switch)
- Ten M4 bracket screws (pre-installed with the brackets the switch)
- Flat-head screwdriver (not provided)
- Cross-head screwdriver (not provided)
- Four standard equipment rack screws (not provided)

Note

The unit comes with the brackets pre-mounted to install the switch as a mid mount in a 19-inch rack. If you are installing the switch in this configuration, you do not need to move the brackets.



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. *see* E28

To install the switch in an equipment rack:

1. Place the unit on a level, secure surface.
2. If you are installing the switch in a configuration other than mid mount in a 19-inch rack, remove the brackets from the sides of the switch. You do not need to remove the brackets if you are installing the switch as a mid mount in a 19-inch rack.
3. Attach the two rack mount brackets you removed to the sides of the switch in the desired configuration using the ten bracket screws you removed with the brackets. Figure 15, Figure 16, Figure 17 and Figure 18 illustrate the four possible bracket positions.



Figure 15. Attaching the Equipment Rack Brackets for a 19-Inch Rack, Mid Mount (Pre-installed bracket position)



Figure 16. Attaching the Equipment Rack Brackets for a 19-Inch Rack, Front Mount



Figure 17. Attaching the Equipment Rack Brackets for a 23-Inch Rack, Front Mount



Figure 18. Attaching the Equipment Rack Brackets for a 23-Inch Rack, Mid Mount

4. While another person holds the switch in the equipment rack, secure it using standard equipment rack screws (not provided), as shown in Figure 19.

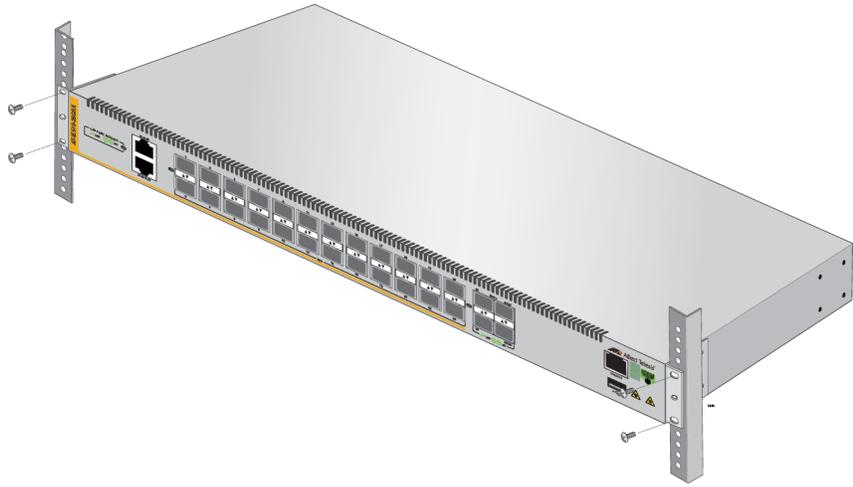


Figure 19. Mounting the Switch in an Equipment Rack

5. If you are installing a VCStack, repeat this procedure to install the remaining switches in the stack.

Installing the Switch on a Wall Mount

This section contains the procedure for installing the switch on a wall mount. The procedure requires the following items:

- ❑ Two wall mount brackets (included with the switch)
- ❑ Eight M3 bracket screws (included with the switch)
- ❑ Four #8 x 1.5" pan head wood screws with anchors (included with the switch)

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

1. Review the procedure in “Choosing a Site for the Switches” on page 50 to verify that the selected site is suitable for the unit.
2. Check to be sure that all of the appropriate components are included in the shipping container. Refer to “Unpacking the Switch” on page 52.
3. If necessary, mount a piece of ¾-inch plywood to the wall. The plywood must be securely mounted to the wall using appropriate methods based on the wall surface.
4. Remove the equipment rack brackets from the sides of the switch.
5. Attach the wall mount brackets to the unit with four screws, as shown in Figure 20.



Figure 20. Attaching the Wall Mount Brackets

6. Fasten the switch to the wall with #8 x 1.5" pan head wood screws.

Chapter 5

Wiring the DC Connectors

This chapter describes how to connect the grounding and power wires to the DC connectors on the back panel of the switch.

- ❑ “Required Materials and Tools” on page 62
- ❑ “Connecting the Grounding Wire” on page 63
- ❑ “Connecting the 48/60VDC or -48/-60VDC and RETURN Wires” on page 66
- ❑ “Monitoring the Switch Initialization Process” on page 71

Note

If you are creating a VCStack, do not power on the switch after wiring the connectors. Instead, go to Chapter 8, “Verifying the Status of VCStack” on page 89.

Required Materials and Tools

The procedure requires the following materials:

- ❑ One 12 AWG stranded grounding wire. The standard color for the wire is green with a yellow stripe.
- ❑ One 16 AWG minimum stranded power wire for the 48/60VDC or -48/-60VDC connection. The standard color for the wire is red.
- ❑ One 16 AWG minimum stranded power wire for the RETURN connection. The standard color for the wire is black.
- ❑ One ring lug suitable for a M4/#8 stud and 12 AWG wire. An example of a ring lug is shown in Figure 22.



Figure 22. Ring Lug

Note

The grounding and power wires should be stranded wires. Do not use solid wires.

This procedure requires the following tools:

- ❑ Crimping tool
- ❑ 7mm wrench or nut-driver
- ❑ 7mm, 15 in-lb torque wrench (optional)
- ❑ 3mm (0.125 in.) flat-head screwdriver
- ❑ 3mm (0.125 in.), 5 in-lb torque, flat-head screwdriver (optional)

Note

You must provide the wires, ring lug, and tools. They are not included with the switch.

Connecting the Grounding Wire

To connect the grounding wire to the grounding post, perform the following procedure:



Warning

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

1. Strip an adequate amount of insulation from one end of the ground cable, for the ring lug. The amount may vary depending on the type of ring lug, but 6.5mm (0.25 in) is typically sufficient. Refer to Figure 23.

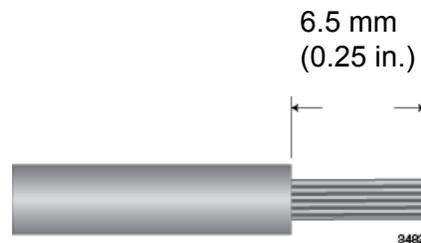


Figure 23. Stripping the Stranded Grounding Wire

2. Insert the grounding wire into the ring lug and use a crimping tool to secure it. Refer to Figure 24.

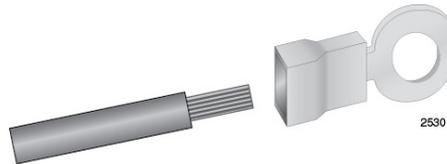


Figure 24. Attaching the Stranded Grounding Wire to the Ring Lug

3. Use a 7mm wrench to remove the top nut from the grounding post on the power supply. Refer to Figure 25.

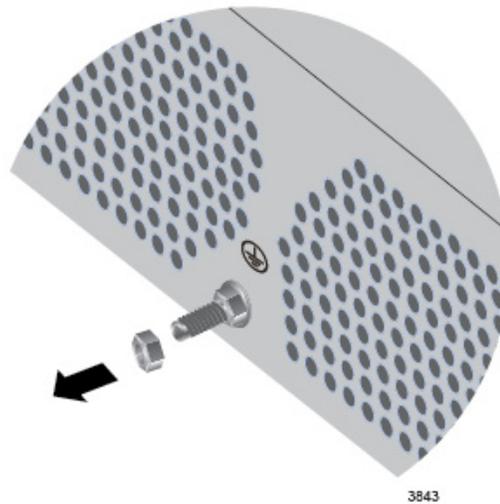


Figure 25. Removing the Nut from the Grounding Post

Note

Remove only the top nut from the grounding post. If necessary, use a second 7mm wrench to hold the bottom nut still while removing the top nut.

4. Attach the grounding lug and wire to the grounding post and secure them with the nut removed in Step 3 and a 7mm wrench. Allied Telesis recommends tightening the nut to 15 in-lbs. Refer to Figure 26.

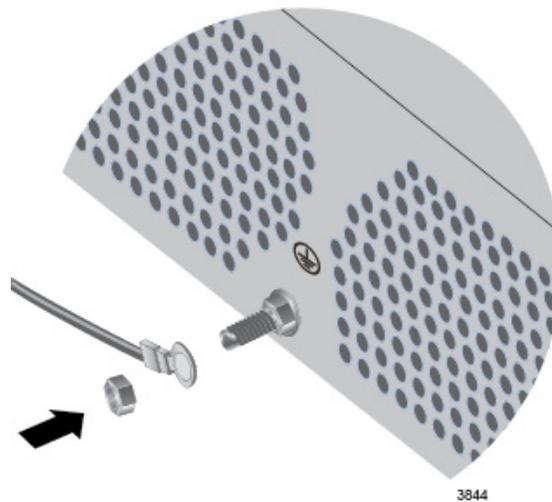


Figure 26. Installing the Grounding Wire

5. Connect the other end of the grounding wire to the building protective earth.
6. After installing the grounding wire, go to “Connecting the 48/60VDC or -48/-60VDC and RETURN Wires” on page 66.

Connecting the 48/60VDC or -48/-60VDC and RETURN Wires

The switch can use either 48/60VDC or -48/-60VDC. If you use positive voltage, the negative RETURN wires must be tied to earthed ground at the power plant. If you use negative voltage, the positive RETURN wires must be tied to earthed ground at the power plant.

After installing the grounding wire, connect the 48/60VDC or -48/-60VDC and RETURN wires by performing the following procedure:



Warning

As a safety precaution, install a circuit breaker with a minimum value of 10 Amps between the equipment and the DC power source.

Always connect the wires to the LAN equipment first before connecting the wires to the circuit breaker. Do not work with HOT leads to avoid the danger of physical injury from electrical shock. Always be sure that the circuit breaker is in the OFF position before connecting the wires to the breaker. ⚡ E9



Warning

The power input must be provided by a SELV source only, per IEC60950. Do not connect to a centralized DC battery bank. ⚡ E31

1. Use a 3mm flat-head screwdriver to loosen the two captive screws that secure the DC connector to the chassis. Refer to Figure 27.

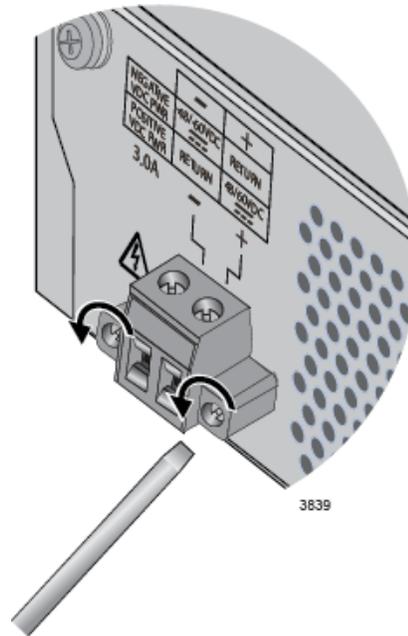


Figure 27. Loosening the Two Captive Screws on the DC Connector

2. Slide the DC connector from the chassis. Refer to Figure 28.

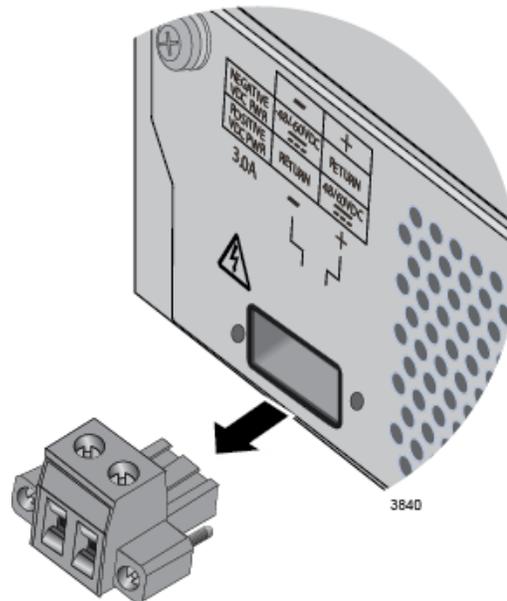


Figure 28. Removing the DC Connector

3. Use a 3mm (0.125 in.) flat-head screwdriver to loosen the two captive screws on the top of the DC connector. Refer to Figure 29.

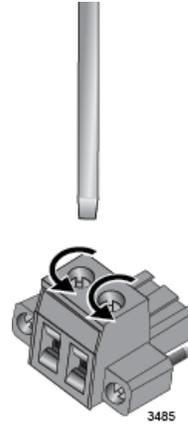


Figure 29. Loosening the Captive Screws on the DC Connector

4. Remove 6.5mm (0.25 in.) of insulation from one end of the red voltage wire and black RETURN wire. Refer to Figure 30.

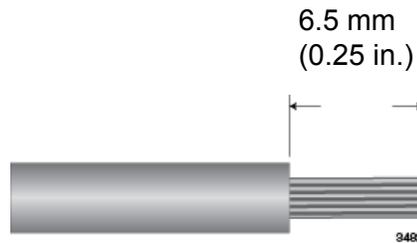


Figure 30. Stripping a Stranded Power Wire

5. Insert the black and red wires into the power connector according to Table 4. Secure them by tightening the captive screw with a flat-head screwdriver. Allied Telesis recommends tightening the screw to 5 in-lbs. Refer to Figure 31.

Table 4. Wire Connection Guide

	-	+
Negative Voltage	-48/-60 VDC (red)	RETURN (black)
Positive Voltage	RETURN (black)	48/60 VDC (red)

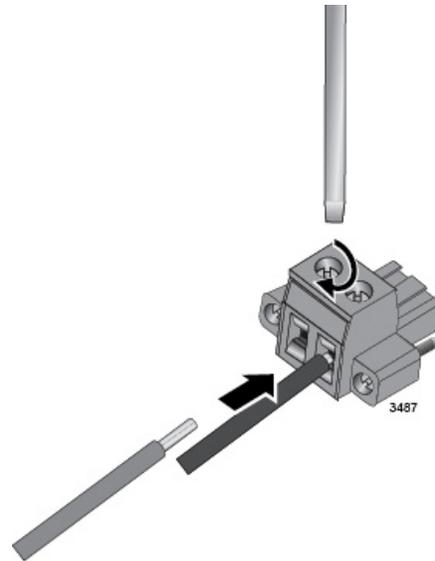


Figure 31. Inserting the Voltage and Return Wires

6. Slide the DC connector into the slot on the switch. Refer to Figure 32.

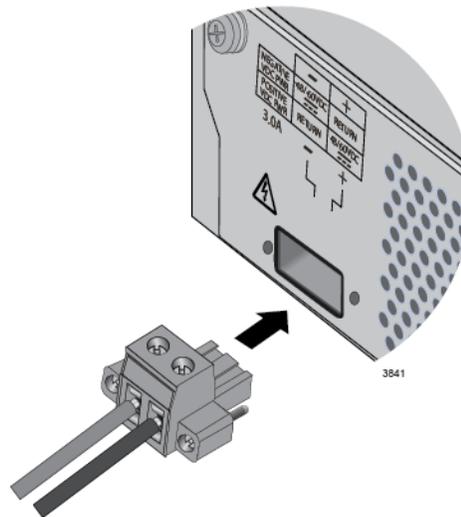


Figure 32. Sliding the DC Connector into the Switch

7. Tighten the two captive screws on the sides of the DC connector to secure the connector to the switch. Refer to Figure 33.

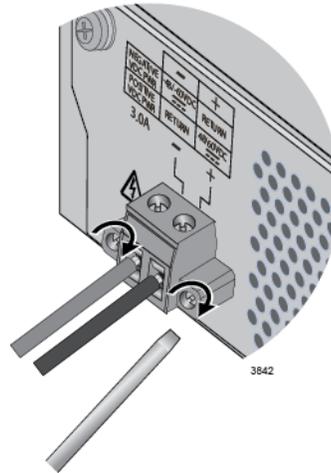


Figure 33. Securing the DC Connector to the Switch



Caution

Verify that the DC circuit is powered off before connecting the power wires from the switch to the circuit.

8. Connect the voltage and RETURN wires to the DC circuit.
9. Repeat this procedure to connect the power wires to the second DC power supply in the switch.
10. If you are installing a stand-alone switch, power on the DC circuits and go to “Monitoring the Switch Initialization Process” on page 71. If you are installing a VCStack, **do not power on the switch**. Go to Chapter 8, “Verifying the Status of VCStack” on page 89.

Monitoring the Switch Initialization Process

It takes about thirty seconds to initialize the management software. To monitor the initialization process, do one of the following:

- ❑ Watch the switch ID LED. It displays the number “8” for about the first 15 seconds and then the number “1.”
- ❑ Connect a terminal, or a computer that has a terminal emulator program, to the Console port on the switch. The bootup sequence is complete when the “awplus login” prompt appears.

After the switch is initialized, do one of the following:

- ❑ If you are installing a VCStack, go to Chapter 8, “Verifying the Status of VCStack” on page 89.
- ❑ If you are installing a stand-alone switch, go to Chapter 7, “Configuring the Switch for Stand-alone Operations” on page 79.

Chapter 6

Installing SFP and SFP+ Transceivers

This chapter contains the guidelines and procedures for installing SFP and SFP+ transceivers.

- “General Guidelines” on page 74
- “Installing SFP and SFP+ Modules” on page 75

General Guidelines

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

- ❑ SFP and SFP+ transceivers are hot-swappable. You may install them while the chassis is powered on.
- ❑ Slots 1 to 24 support 100Base and 1000Base transceivers.
- ❑ Slots 25 and 26 support 1000Base and 10GBase transceivers and direct connect TwinAx cables.
- ❑ Slots S1/27 and S2/28 support 1000Base and 10GBase transceivers and direct connect TwinAx cables when VCStack is disabled.
- ❑ Slots S1/27 and S2/28 support 10GBase transceivers and direct connect TwinAx cables when VCStack is enabled.
- ❑ Your Allied Telesis sales representative can provide you with a list of supported transceivers. For a list of supported types of transceivers, refer to “Feature Overview” on page 18.
- ❑ The operational specifications and fiber optic cable requirements of the transceivers are provided in the documents included with the devices.
- ❑ 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.



Caution

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.

Note

SFP+ slots 27 and 28 are initially configured as stacking slots for the VCStack feature. To use the switch as a stand-alone unit, disable the VCStack feature before using the slots. For instructions on how to disable VCStack, see “Disabling VCStack” on page 83.

Installing SFP and SFP+ Modules

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

1. Remove the dust plug from a transceiver slot on the switch. Refer to Figure 34.

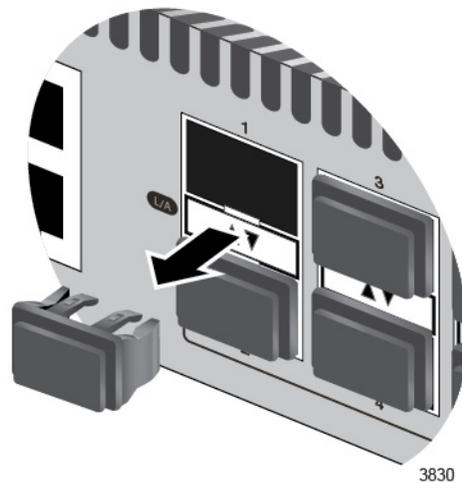


Figure 34. Removing the Dust Plug from a Transceiver Slot

2. Remove the transceiver from its shipping container and store the packaging material in a safe location.
3. If you are installing the transceiver in a top slot, position the transceiver with the Allied Telesis label facing up. If you are installing the transceiver in a bottom slot, position the transceiver with the label facing down.
4. Slide the transceiver into the slot until it clicks into place, as shown in Figure 35.

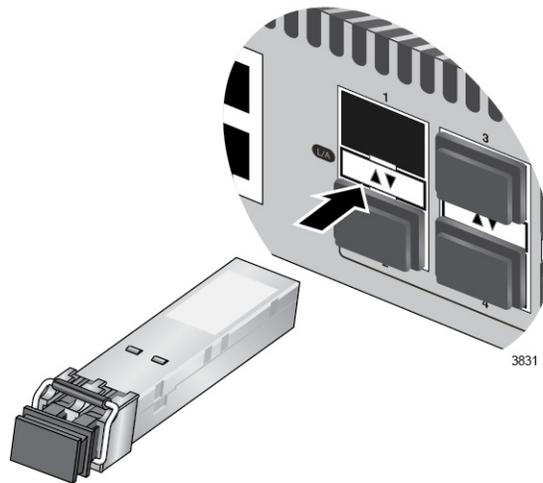


Figure 35. Installing a Transceiver

Note

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

5. Remove the dust cover from the transceiver, as shown in Figure 36.

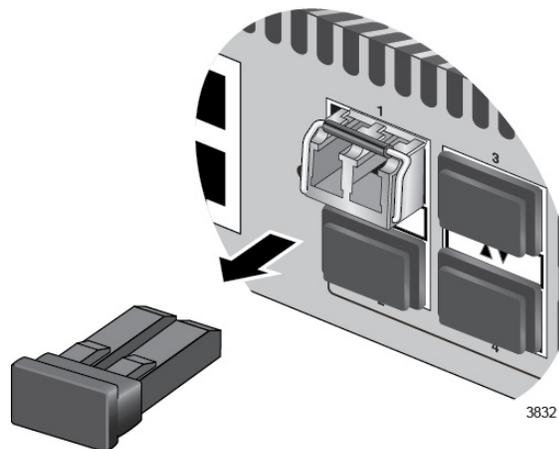


Figure 36. Removing the Dust Cover from a Transceiver

6. Verify the position of the handle on the transceiver. If the transceiver is in a top slot, the handle should be in the upright position, as shown in Figure 37 on page 77. If the transceiver is in a bottom slot, the handle should be in the down position.

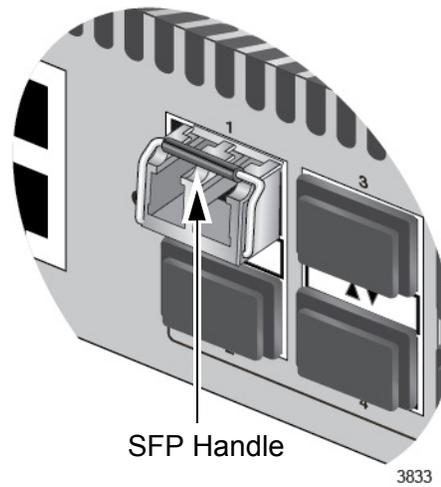


Figure 37. Positioning the SFP Handle in the Upright Position

7. Connect the fiber optic cable to the transceiver, as shown in Figure 38. The connector on the cable should fit snugly into the port, and the tab should lock the connector into place.

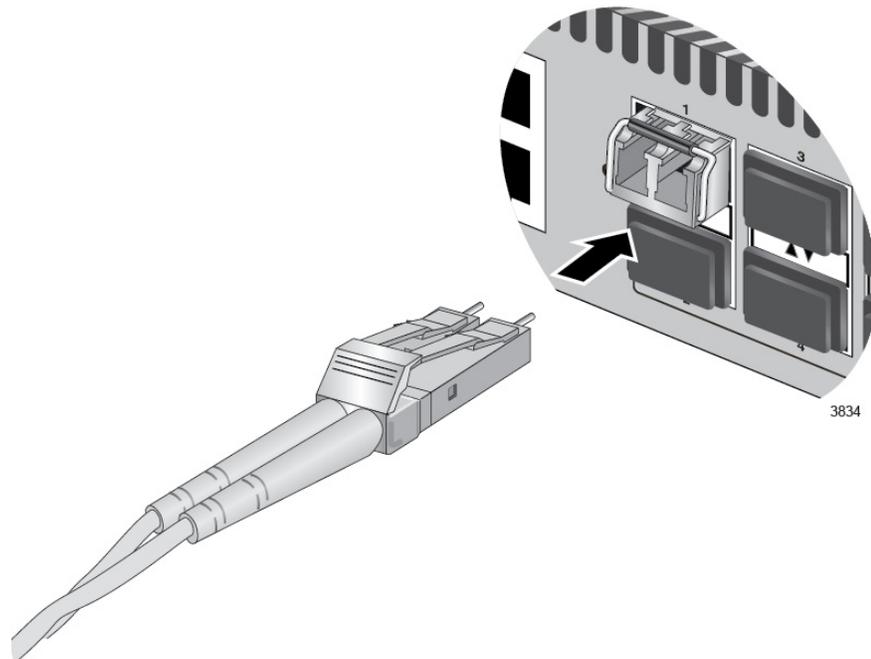


Figure 38. Connecting a Fiber Optic Cable to a Transceiver

8. Repeat this procedure to install additional transceivers.

Once all transceivers are installed the switch is ready for use.

Chapter 7

Configuring the Switch for Stand-alone Operations

This chapter contains the following procedures:

- ❑ “Determining the Status of the VCStack Feature” on page 80
- ❑ “Starting a Local Management Session” on page 81
- ❑ “Disabling VCStack” on page 83
- ❑ “Confirming the Status of the VCStack Feature” on page 86

Determining the Status of the VCStack Feature

After the switch has initialized its management software, examine the switch ID LED on the front panel and do one of the following:

- ❑ If the LED is displaying “0,” the VCStack feature is disabled and the switch is ready for network operations as a stand-alone unit. Go to Chapter 6, “Installing SFP and SFP+ Transceivers” on page 73, to continue with the installation.
- ❑ If the LED is displaying a number other than “0,” you need to disable the VCStack feature to use the switch as a stand-alone unit.

You can disable the VCStack feature from a local management session of the switch using the Console port. To start a local management session, go to “Starting a Local Management Session” on page 81.



Caution

You must reset the switch to disable the VCStack feature. If the switch is already connected to a live network, some network traffic may be lost.

Note

The initial management session of the switch must be from the Console port.

Starting a Local Management Session

This procedure requires a terminal or a terminal emulator program and the management cable that comes with the switch. 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 39.

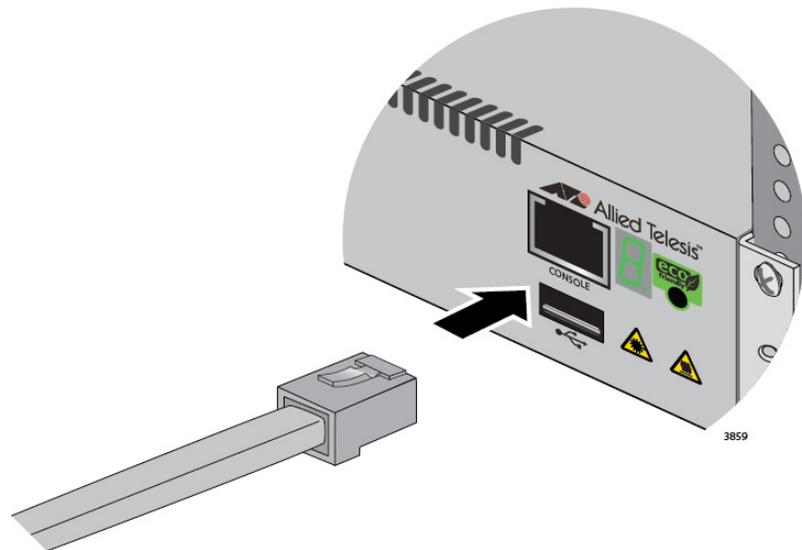


Figure 39. Connecting the Management Cable to the Console Port

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 40 is displayed.



```
awp1us>
```

Figure 40. 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 AT-IE510-28GSX **Command Reference** on AlliedTelesis.com.

Disabling VCStack



Caution

You must reset the switch to disable the VCStack feature. If the switch is already connected to a live network, some network traffic may be lost.

To disable the VCStack feature to use the switch as stand-alone unit, perform the following procedure:

1. Start a local management session. Refer to “Starting a Local Management Session” on page 81 for instructions.
2. Enter the SHOW STACK command to display the status of the VCStack feature. Figure 41 is an example of the command.

```
awplus> show stack
% Warning: Stacking is currently disabled
Virtual Chassis Stacking summary information

ID    Pending ID  MAC address          Priority  Status  Role
1     -            000c.2527.aba6      128     Ready   Active Master

Operational Status          Stacking hardware disabled
Stack MAC address           000c.2527.aba6
```

Figure 41. SHOW STACK Command

3. Review the following items:
 - ❑ If the Operational Status is “Stacking Hardware Disabled,” the VCStack feature is already disabled on the switch and the SFP+ stacking slots may be used with regular SFP or SFP+ transceivers.
 - ❑ If the Operational Status is “Standalone Unit,” as shown in Figure 41 on page 83, the VCStack feature is active on the unit. You must disable it by performing the steps in the rest of this procedure before you can use the SFP+ stacking slots with regular SFP or SFP+ transceivers. The reason the status says “standalone” is because the switch considers itself a stack of one switch.
4. Move to the Global Configuration mode by entering the ENABLE and CONFIGURE TERMINAL commands, as shown in Figure 42.

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

Figure 42. Moving to the Global Configuration Mode

5. To disable the VCStack feature on the switch, enter the NO STACK ENABLE command, which has this format:

```
no stack id enable
```

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

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

This confirmation prompt in Figure 43 is displayed.

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

Figure 43. Confirmation Prompt for the NO STACK ENABLE Command

6. Type Y to disable VCStack on the switch or N to cancel the procedure.
7. Enter the EXIT command to return to the Privileged Exec mode, as shown in Figure 44.

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

Figure 44. Returning to the Privileged Exec Mode

8. Enter the WRITE command to save your change in the configuration file. The switch displays the confirmation prompt in Figure 45.

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

Figure 45. Saving the Changes with the WRITE Command

9. Enter the REBOOT command to reboot the switch.
10. At the confirmation prompt, type "Y" for yes.

11. Wait for the switch to initialize its management software and afterwards examine the Switch ID LED. The switch is ready for normal network operations as a stand-alone unit when its ID number is “0.”

Refer to see the **VCStack Feature Overview and Configuration Guide** on AlliedTelesis.com instructions on how to configure the operating parameters. If the number is not “0,” repeat the procedures in this chapter.

Confirming the Status of the VCStack Feature

Another way to confirm that VCStack is disabled on the switch is by displaying the status of the last two SFP+ slots, slots 27 and 28, on the switch. If VCStack is disabled, you should be able to display the status of the slots even when they do not have transceivers. If VCStack is not disabled, the switch displays a message that it cannot find the slots. To view the status of the stacking slots, perform this procedure:

1. Start a management session on the switch. For directions, refer to “Starting a Local Management Session” on page 81.
2. Log on to the switch. The default user name is “manager” and the password is “friend”.
3. From either the User Exec mode or Privileged Exec mode, enter the SHOW INTERFACE command to display the status of one of the last two SFP+ slots on the switch. For example, enter this command to view the status of slot 27:

```
show interface port1.0.27
```

If VCStack is disabled, the switch displays the status of the designated slot. An example is shown in Figure 46.

```
awplus>show interface port1.0.27
Interface port1.0.27
  Scope: both
  Link is DOWN, administrative state is UP
  Thrash-limiting
    Status Not Detected, Action learn-disable, Timeout 1(s)
  Hardware is Ethernet, address is 0015.774f.ed30
  index 5051 metric 1 mru 1500
  configured duplex auto, configured speed auto, configured polarity auto
  <UP,BROADCAST,MULTICAST>
  SNMP link-status traps: Disabled
    input packets 0, bytes 0, dropped 0, multicast packets 0
    output packets 0, bytes 0, multicast packets 0 broadcast packets 0
  Time since last state change: 0 days 00:42:49
```

Figure 46. Status of a Stacking Slot When VCStack is Disabled

The switch displays the message in Figure 47 if VCStack is not disabled, in which case you need to disable it by performing the commands in “Disabling VCStack” on page 83.

```
awplus# show interface port1.0.27
%Can't find interface port1.0.27
awplus#
```

Figure 47. Status of a Stacking Slot When VCStack is Enabled

Once you have confirmed VCStack is disabled, go to Chapter 6, “Installing SFP and SFP+ Transceivers” on page 73, to continue with the installation.

Chapter 8

Verifying the Status of VCStack

The procedures in this chapter are:

- “Verifying the Status of VCStack” on page 90
- “Starting a Local Management Session” on page 91
- “Activating the VCStack Feature” on page 93

Verifying the Status of VCStack

Before cabling slots S1/27 and S2/28 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.

To test the status of VCStack, you simply power on a switch and watch the ID LED. If it displays a number from 1 to 4, 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.
2. Wait one minute for the switch to initialize its management software, or, see “Monitoring the Switch Initialization Process” on page 71 for instructions on how to watch the initialization process in action.
3. View the ID LED and do one of the following:
 - ❑ If the ID LED is displaying a number from 1 to 4 (1 is the default), VCStack is already enabled on the switch. Power off the DC circuit and test the remaining switches in the same manner. After testing all the switches, be sure the switches are powered off, then go to Chapter 9, “Cabling the Stacking Ports” on page 95.
 - ❑ 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 93.

Starting a Local Management Session

This procedure requires a terminal or a terminal emulator program and the management cable that comes with the switch. 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 48.

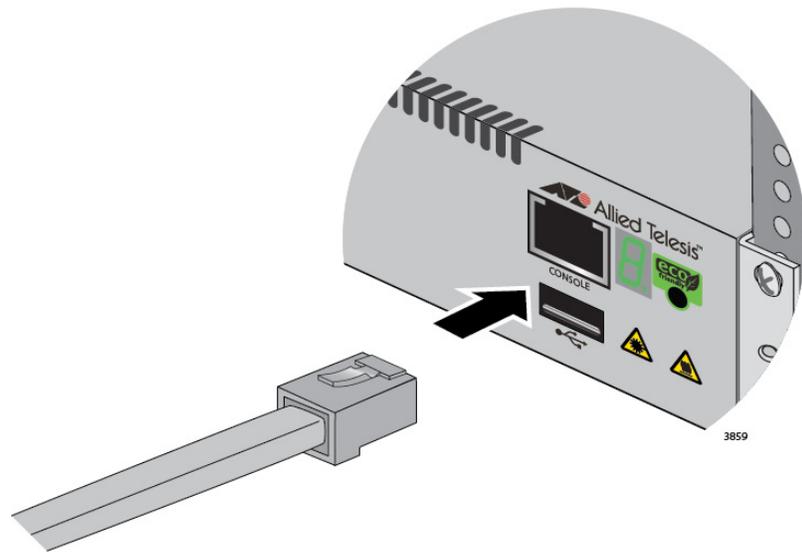


Figure 48. Connecting the Management Cable to the Console Port

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 49 is displayed.



Figure 49. 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 AT-IE510-28GSX **Command Reference** on AlliedTelesis.com.

Activating the VCStack Feature

When a switch displays the number “0” in its ID LED you must activate the VCStack feature to install a VCstack. The following procedures assume you have confirmed that the VCStack feature is disabled and that the switch is powered on.

To activate the VCStack feature, perform the following procedure:

1. Start a local management session. Refer to “Starting a Local Management Session” on page 91 for instructions.
2. Enter the ENABLE command to move from the User Exec mode to the Privileged Exec mode, as shown in Figure 50.

```
awplus> enable
awplus#
```

Figure 50. 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 51.

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

Figure 51. 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 52:

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

Figure 52. Activating VCStack with the STACK ENABLE Command

5. Enter the EXIT command to return to the Privileged Exec mode, as shown in Figure 53.

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

Figure 53. Returning to the Privileged Exec Mode with the EXIT Command

6. Enter the WRITE command to save your change, as shown in Figure 54.

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

Figure 54. 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.

7. Restart the switch with the REBOOT command, as shown in Figure 55.

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

Figure 55. Rebooting the Switch with the REBOOT Command

8. Type “Y” for yes.
9. Wait one minute 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, 2, 3, or 4, VCStack is now enabled on the switch. Power off the DC circuit and repeat the procedures in this chapter on the next switch. If there are no further switches to test, go to Chapter 9, “Cabling the Stacking Ports” on page 95.
 - ❑ 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 9

Cabling the Stacking Ports

This chapter contains the following procedures:

- “Cabling Switches with TwinAx Cables” on page 96
- “Cabling Switches with SFP+ Modules” on page 101

Cabling Switches with TwinAx Cables

You can use any Allied Telesis TwinAx cable to connect the switches in a stack. Allied Telesis provides the following TwinAx cables:

- ❑ AT-SP10TW1—1 meter SFP+ direct attach cable
- ❑ AT-SP10TW3—3 meter SFP+ direct attach cable
- ❑ AT-SP10TW7—7 meter SFP+ direct attach cable

Note

You must use a verified Allied Telesis TwinAx cable or SFP+ module to configure switches in a VCStack. Cables and modules from other vendors are not supported and will fail to create an active link.



Caution

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.

For guidelines on cabling switches, refer to “Planning a Stack” on page 51. To cable the switches of a stack with a TwinAx cable, perform the following procedure:

1. Remove the dust plug from the S1 slot on the top switch of the stack, as shown in Figure 56.

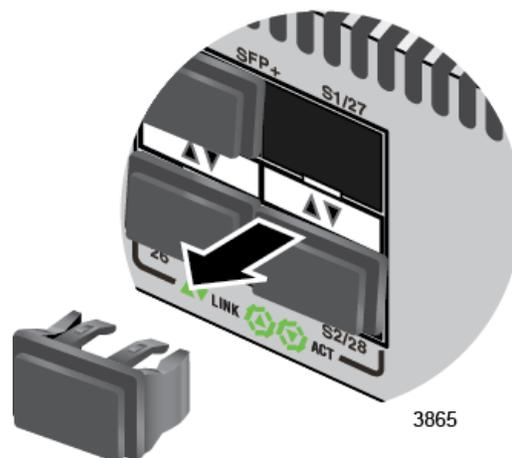


Figure 56. Removing the Dust Plug from the S1 Slot

2. Remove the cable from its shipping container and store the packaging material in a safe location.
3. Remove the dust cap from one end of the cable, as shown in Figure 57.

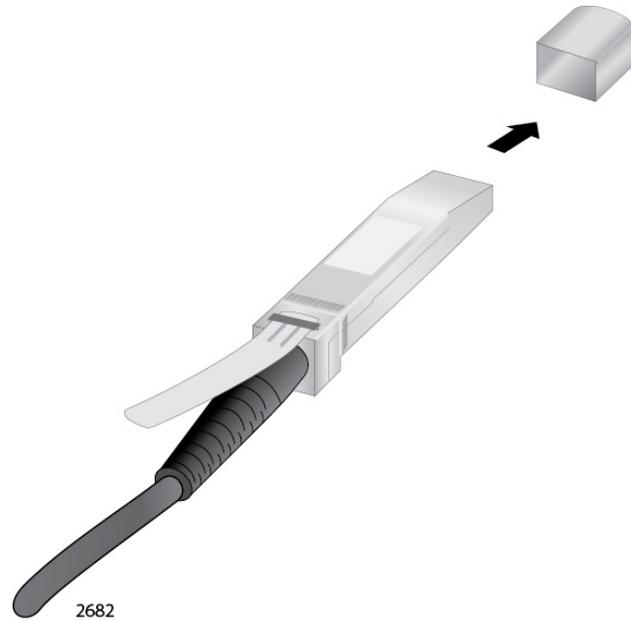


Figure 57. Removing the Dust Cover from a TwinAx Cable

4. Position the cable with the release tab on top and slide the cable into the slot, as shown in Figure 58.

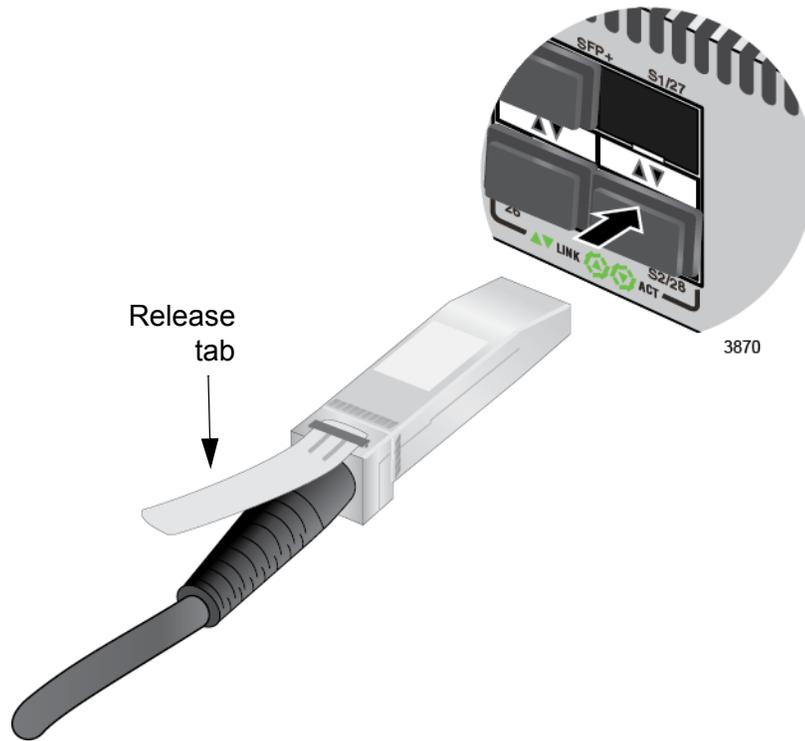


Figure 58. Installing a TwinAx Cable in Slot S1

5. Remove the dust cover from the S2 slot in the next switch in the stack as shown in Figure 59.

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.

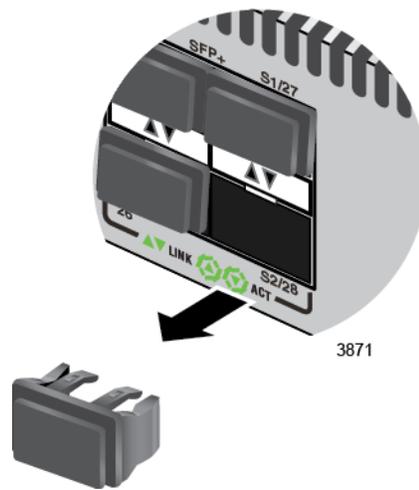


Figure 59. Removing the Dust Plug from the S2 Slot

6. Remove the dust cover from the connector on the other end of the cable.
7. Position the cable with the release tab on the bottom and slide it into the slot until it clicks into place, as shown in Figure 60.

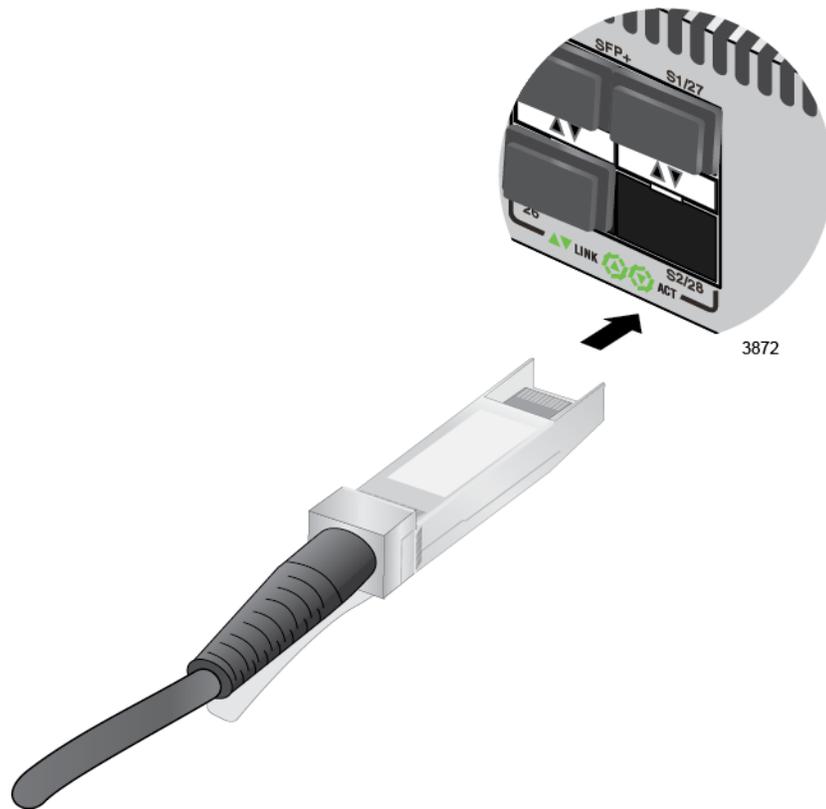


Figure 60. Installing a TwinAx Cable in Slot S2

8. Repeat this procedure to connect additional switches to the stack with TwinAx cables.
9. To create the redundant path with the ring topology shown in Figure 12 on page 40 and Figure 13 on page 41, connect a cable to the empty stacking slots on the top and bottom switches.
10. After connecting the cables to all of the switches, go to Chapter 10, “Powering On the Stack” on page 105.

Cabling Switches with SFP+ Modules

You can use any Allied Telesis 10G SFP+ module to connect the switches in a stack.

Note

You must use a verified Allied Telesis TwinAx cable or SFP+ module to configure switches in a VCStack. Cables and modules from other vendors are not supported and will fail to create an active link.

For guidelines on cabling switches, refer to “Planning a Stack” on page 51.

To cable switches with fiber optic transceivers, perform the following procedure:

1. Remove the dust cover from either the S1 or S2 slot on the switch.
2. To install the transceiver in the S1 slot, position it with the handle on top, as shown in Figure 61. To install it in the S2 slot, position it with the handle on the bottom.

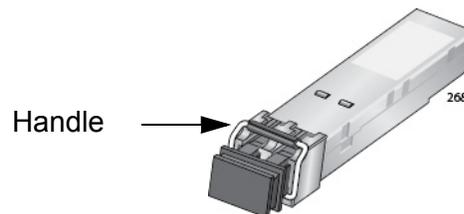


Figure 61. Handle on SFP+ Module

3. Slide the module into the slot until it clicks into place, as shown in Figure 62.

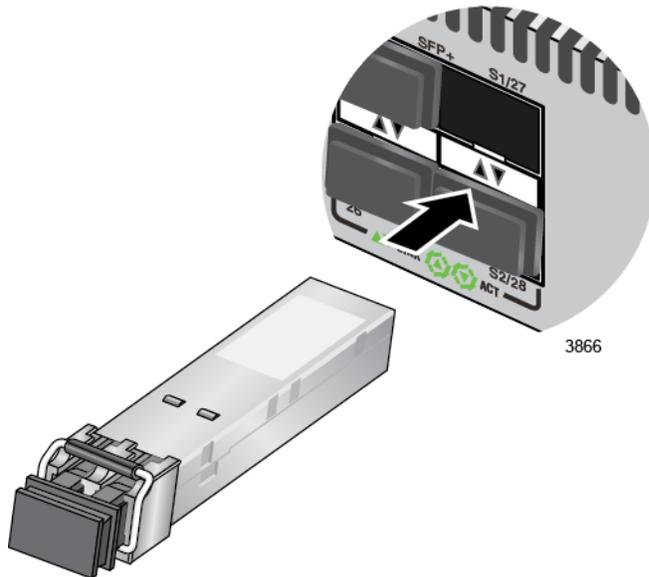


Figure 62. Installing an SFP+ Module

4. Remove the dust cover from the SFP+ module, as shown in Figure 63.

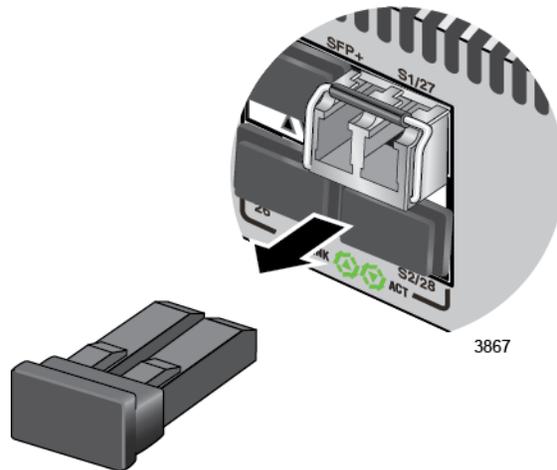


Figure 63. Removing the Dust Cover from an SFP+ Module

5. Verify the position of the handle on the SFP+ module. If the module is in the S1 slot, the handle should be in the upright position, as shown in Figure 64. If the transceiver is in the S2 slot, the handle should be in the down position.

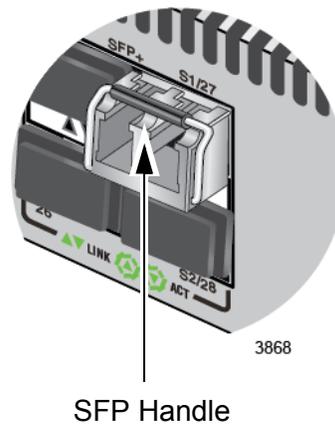


Figure 64. Positioning the Handle in the Upright Position

6. Connect the fiber optic cable to the SFP+ module, as shown in Figure 65. The connector on the cable should fit snugly into the port, and the tab should lock the connector into place.

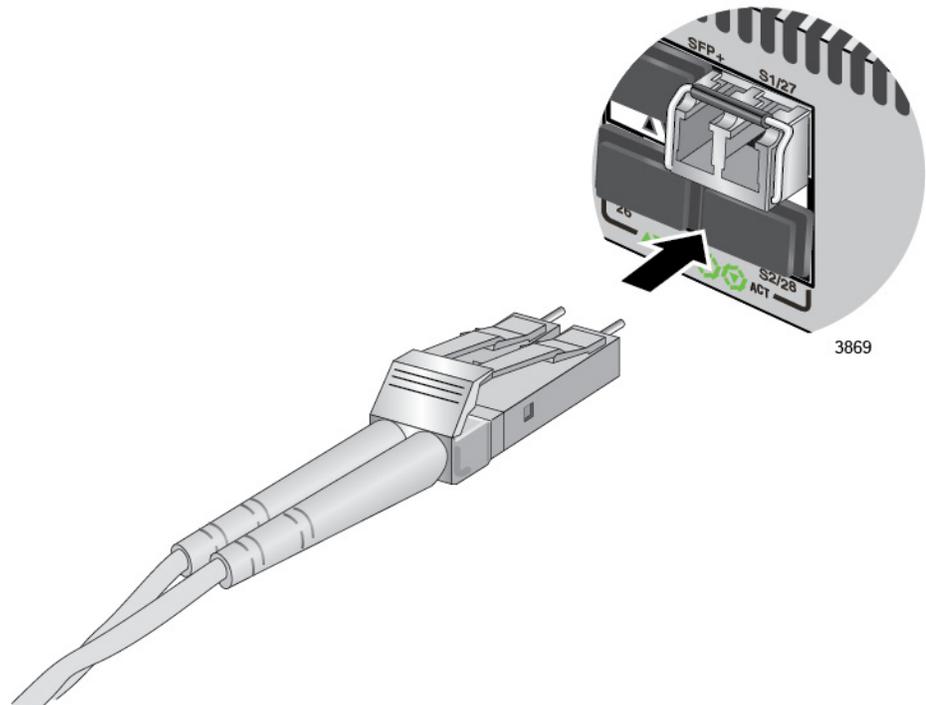


Figure 65. Connecting the Fiber Optic Cable to an SFP+ Module

7. Repeat this procedure if the switch is to have two stacking modules.

8. Repeat this procedure on the other switches of the stack. The connections must cross over such that an SFP+ module in slot 1 connects to an SFP+ module in slot 2.
9. After you connect the fiber optic cables to all of the switches, go to Chapter 10, “Powering On the Stack” on page 105.

Chapter 10

Powering On the Stack

This chapter contains the following procedures:

- ❑ “Powering On the Switches Individually” on page 106
- ❑ “Powering On the Switches Simultaneously” on page 108
- ❑ “Verifying the Stack” on page 110
- ❑ “Monitoring the Stack Initialization Processes” on page 113

Perform “Powering On the Switches Individually” on page 106 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 108 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 AT-IE510-28GSX **Command Reference** on AlliedTelesis.com.

Note

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.

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, and so on. This procedure is useful when the switches are installed in the same equipment rack and you want to number them in sequence, such as from top to bottom, to make them easy to identify. 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 8, “Verifying the Status of VCStack” on page 89.
- You connected the switches as explained in Chapter 9, “Cabling the Stacking Ports” on page 95.
- The ID numbers are set to the default 1.
- All the switches are powered off.
- The grounding and power wires are connected to the DC connectors on the back panels of the switches. For instructions, refer to Chapter 5, “Wiring the DC Connectors” on page 61.

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 Stack Initialization Processes” on page 113.

To power on the switches, perform the following procedure:

1. Power on the DC circuits on the switch you want to have ID number 1.

Consider the following items as you power on the switch:

- ❑ Connecting the two power cords to power sources that are on different circuits will provide power redundancy to the switch in the event a circuit fails.
- ❑ Refer to “Power Specifications” on page 122 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 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.

5. If there is a third switch, power it on and wait another two minutes for it to join the stack as a member with the ID number 3.
6. If there is a fourth switch, power it on and wait two minutes for it to join the stack as a member with the ID number 4.

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.

7. To continue with the installation, go to “Verifying the Stack” on page 110.

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 8, “Verifying the Status of VCStack” on page 89.
- You connected the switches as explained in Chapter 9, “Cabling the Stacking Ports” on page 95.
- All the switches are powered off.
- The grounding and power wires are connected to the DC connectors on the back panels of the switches. For instructions, refer to Chapter 5, “Wiring the DC Connectors” on page 61.

If you want to monitor the power-on sequence, connect a terminal or PC with a terminal emulator program to the Console port on any of the switches. The messages are found in “Monitoring the Stack Initialization Processes” on page 113.

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

1. Power on the DC circuits on all the switches in the stack at the same time.

Consider the following items as you power on the switches:

- Connecting the two power cords to power sources that are on different circuits will provide power redundancy to the switch in the event a circuit fails.
- Refer to “Power Specifications” on page 122 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 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 110.

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 91.
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 66.

```
awplus> show stack
Virtual Chassis Stacking summary information
ID      Pending ID  MAC address      Priority  Status  Role
1       -            0015:774f:ed30  128     Ready  Active Master
2       -            0015:774f:65ab  128     Ready  Member
3       -            0015:774f:d4a7  128     Ready  Member
4       -            0015:774f:c431  128     Ready  Member
Operational Status      Normal operations
Stack MAC address       0015:774f:ed30
awplus(config)#
```

Figure 66. SHOW STACK Command

Here are some things to consider:

- ❑ The command should list all the switches in the stack. If the list is incomplete, refer to Chapter 11, “Troubleshooting” on page 117.
 - ❑ The Operational Status field displays “Normal operations” when the switches are connected in the ring topology and “Ring topology is broken” when the switches are connected in the linear topology.
 - ❑ The priority values will be 128, the default value, if they have not been changed on the switches.
 - ❑ 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 111. The procedure is optional.

- ❑ Otherwise, go to Chapter 6, “Installing SFP and SFP+ Transceivers” on page 73, 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 67.

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

Figure 67. 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 4. The `PRIORITY` parameter is the new priority value for the switch. The range is 0 to 255. The default is 128.

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 68 on page 112.

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

Figure 68. 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 69.

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

Figure 69. Saving the Priority Values with the WRITE Command

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

Monitoring the Stack Initialization Processes

You can 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 messages similar to those in Figure 70 here to Figure 72 on page 115.

```

Bootloader 2.0.11 loaded
Press <Ctrl+B> for the Boot Menu

Reading filesystem...
Loading flash:x510-5.4.2a-20120727-1.re1...
Verifying release... OK
Booting...
Starting base/first...           [ OK ]
Mounting virtual filesystems...  [ OK ]

      _____
     /         \
    /           \
   /             \
  /               \
 /                 \
/                   \
/_____/\_____\/
\                   /
 \                 /
  \               /
   \             /
    \           /
     \         /
      \       /

Allied Telesis Inc.
Alliedware Plus (TM) v5.4.2A
Current release filename: x510-5.4.2a-20120727-1.re1
Original release filename: x510-5.4.2A-20120727-1.re1
Built: Fri Jul 27 04:11:42 NZST 2012 by: maker@maker04-build
Mounting static filesystems...           [ OK ]
Checking flash filesystem...             [ OK ]
Mounting flash filesystem...             [ OK ]
Checking NVS filesystem...               [ OK ]
Mounting NVS filesystem...               [ OK ]
Starting base/dbus...                    [ OK ]
Starting base/syslog...                  [ OK ]
Starting base/loopback...                [ OK ]
Starting base/poe_done...                 [ OK ]
Starting base/sysctl...                  [ OK ]

```

Figure 70. Switch Initialization Messages

```

Received event poefw.done
Starting base/portmapper... [ OK ]
Received event syslog.done
Starting base/reboot-stability... [ OK ]
Starting base/autofs-card... [ OK ]
Checking system reboot stability... [ OK ]
Starting base/cron... [ OK ]
Starting base/appmond... [ 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 hardware.done
Starting network/startup... [ OK ]
Starting network/stackd... [ OK ]
Starting network/election.timeout... [ OK ]
Received event network.enabled

Initializing HA processes:
openhpid, hostd, cntrd, nsm, auth, epsr, hsl
imiproxyd, irdpd, lldpd, loopprot, mstp, ospf6d, ripd
ripngd, rmon, sflowd, udldd, vrrpd, bgpd, imi
lacpd, ospfd, pdmd, pimd

Received event network.initialized
03:44:11 awplus-1 VCS[826]: No neighboring members found, unit may be in a
stand alone configuration
03:44:11 awplus-1 VCS[826]: Startup speed can be improved by adding 'no stack
1
enable' to configuration
Received event vcs.elected-master
03:44:11 awplus-1 VCS[826]: Member 1 (0015.774f.ed30) has become the Active
Master
Assigning Active workload to HA processes:
hsl, nsm, rmond, sflowd, vrrpd, irdpd, lacpd
lldpd, loopprotd, mstpd, authd, epsrd, imi, imiproxyd

```

Figure 71. Switch Initialization Messages (Continued)

```
Received event network.activated

Loading default configuration
warning: flash:/default.cfg does not exist, loading factory defaults.
..
done!
Received event network.configured
awplus login: 21:12:34 awplus VCS[734]: Duplicate member-ID 1 detected for
0015.774f.ed30 and 0011.2233.4455
21:12:34 awplus VCS[734]: Automatically renumbering member-1
(0015.774f.ed30), selecting unused member-ID...
21:12:52 awplus VCS[734]: Renumbering member-1 (0015.774f.ed30) to ID 2
21:12:52 awplus VCS[734]: Automatically rebooting stack member-2
(0015.774f.ed30) due to duplicate member-ID
21:14:02 awplus VCS[734]: Member 2 (0015.774f.ed30) has joined stack
21:14:02 awplus VCS[734]: Please configure 'stack virtual-mac' to minimize
network disruption from failovers
21:14:02 awplus IMI[743]: All users returned to config mode while switch
synchronization is in progress.
21:14:19 awplus NSM[738]: Insertion event on unit 2.0 has been completed
21:14:24 awplus IMI[743]: Configuration update completed for port2.0.1-
2.0.52
awplus login:
```

Figure 72. Switch Initialization Messages (Continued)

Chapter 11

Troubleshooting

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

Note

For further assistance, 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 DC connectors are wired correctly and the DC circuits are powered on. For instructions, refer to Chapter 5, “Wiring the DC Connectors” on page 61.
- ❑ Try connecting the unit to another power source.
- ❑ 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 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 9, “Cabling the Stacking Ports” on page 95.
- ❑ Verify that the transceivers are fully inserted into the S1 and S2 slots.
- ❑ Verify that the TwinAx direct connect cables or SFP+ transceivers in slots S1/27 and S2/28 are from Allied Telesis. The switches will

not form the stack if the cables or transceivers are from another vendor.

- ❑ Verify that VCStack is activated on the switches. For instructions, refer to Chapter 8, “Verifying the Status of VCStack” on page 89.
- ❑ 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: The LINK/ACT LED for an SFP or 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 or SFP+ module and to the port on the remote network device.
- ❑ Check that the transceiver is fully inserted in the slot.
- ❑ If you are using SFP+ slots 27 or 28, check that the VCStack feature is disabled on the switch. The VCStack feature has to be disabled before you can use the slots with regular SFP or SFP+ transceivers. For instructions, refer to “Disabling VCStack” on page 83.
- ❑ 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 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 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:

- ❑ An alarm has been triggered.
- ❑ A cooling fan has failed.
- ❑ The input voltage on one or both of the power supplies is outside the normal operating range.
- ❑ The internal temperature of the switch has exceeded the normal operating range and the switch may shut down.

Use the SHOW SYSTEM ENVIRONMENT command in the command line interface to identify the source of the problem, or contact your Allied Telesis sales representative for assistance.

Appendix A

Technical Specifications

This appendix contains the following sections:

- “Physical Specifications”
- “Environmental Specifications” on page 122
- “Power Specifications” on page 122
- “Certifications” on page 123
- “RJ-45 Style Serial Console Port Pinouts” on page 124
- “RJ-45 Style Alarm Port Pinouts” on page 125

Physical Specifications

Dimensions (H x W x D)

Table 5. Product Dimensions

AT-IE510-28GSX	4.4 cm x 44.0 cm x 30.0 cm (1.7 in. x 17.3 in. x 11.8 in.)
----------------	---------------------------------------------------------------

Weights

Table 6. Product Weights

AT-IE510-28GSX	4.8 kg (10.6 lb.)
----------------	-------------------

Ventilation

Table 7. Ventilation Requirements

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

Environmental Specifications

Table 8. Environmental Specifications

Operating Temperature	-40° C to 75° C (-40° F to 167° F)
Storage Temperature	-40° C to 85° C (-40° F to 185° F)
Operating Humidity	5% to 90% noncondensing
Storage Humidity	5% to 95% noncondensing
Maximum Operating Altitude	3,000 m (9,842 ft)
Maximum Nonoperating Altitude	4,000 m (13,100 ft)

Power Specifications

Maximum Power Consumption

Table 9. Maximum Power Consumption

AT-IE510-28GSX	74 watts per input
----------------	--------------------

Input Voltages

Table 10. Input Voltages

AT-IE510-28GSX	36Vdc to 72Vdc or -36Vdc to -72Vdc, 3.0A maximum
----------------	--------------------------------------------------

Alarm Contacts

Table 11. Alarm Contact Power Specifications

Alarm Input	5V, 20mA maximum
Alarm Output	48V DC, 0.8A maximum

Certifications

Table 12. Product Certifications

EMI Emissions	FCC Part 15B Class A ICES-003 Class A EN55032:2015 Class A VCCI- Class A EN61000-3-2:2006+A1:2009+A2:2009 EN61000-3-3:2008
EMC Immunity	EN55024:2010 EN61000-4-2:2009 EN61000-4-3:2006 + A2:2010 EN61000-4-4:2012 EN61000-4-5:2006 EN61000-4-6:2009 EN61000-4-8:2010 EN61000-4-11:2004
Electrical and Laser Safety	UL/E/IEC60950-1 CSA 22.2:60950-1 2006/95/EC Low Voltage Directive
All Allied Telesis approved SFP modules	EN60825-1 EN60825-2 EN/IEC/UL60950-1 FCC CDRH registered

RJ-45 Style Serial Console Port Pinouts

Table 13 lists the pin signals of the RJ-45 style serial Console port.

Table 13. 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

RJ-45 Style Alarm Port Pinouts

Alarm Input

Table 14 lists the pin signals of the RJ-45 style alarm input port.

Table 14. RJ-45 Style Alarm Input Port Pin Signals

Pin	Signal
1	Alarm input 1
2	Alarm input 1 return
3	Alarm input 2
4	Alarm input 2 return
5	Alarm input 3
6	Alarm input 3 return
7	No connection
8	No connection

Alarm Output

Table 15 lists the pin signals of the RJ-45 style alarm output port.

Table 15. RJ-45 Style Alarm Output Port Pin Signals

Pin	Signal
1	Alarm output 1
2	Alarm output 1 return
3	Alarm output 2
4	Alarm output 2 return
5	Alarm output 3
6	Alarm output 3 return
7	No connection
8	No connection

