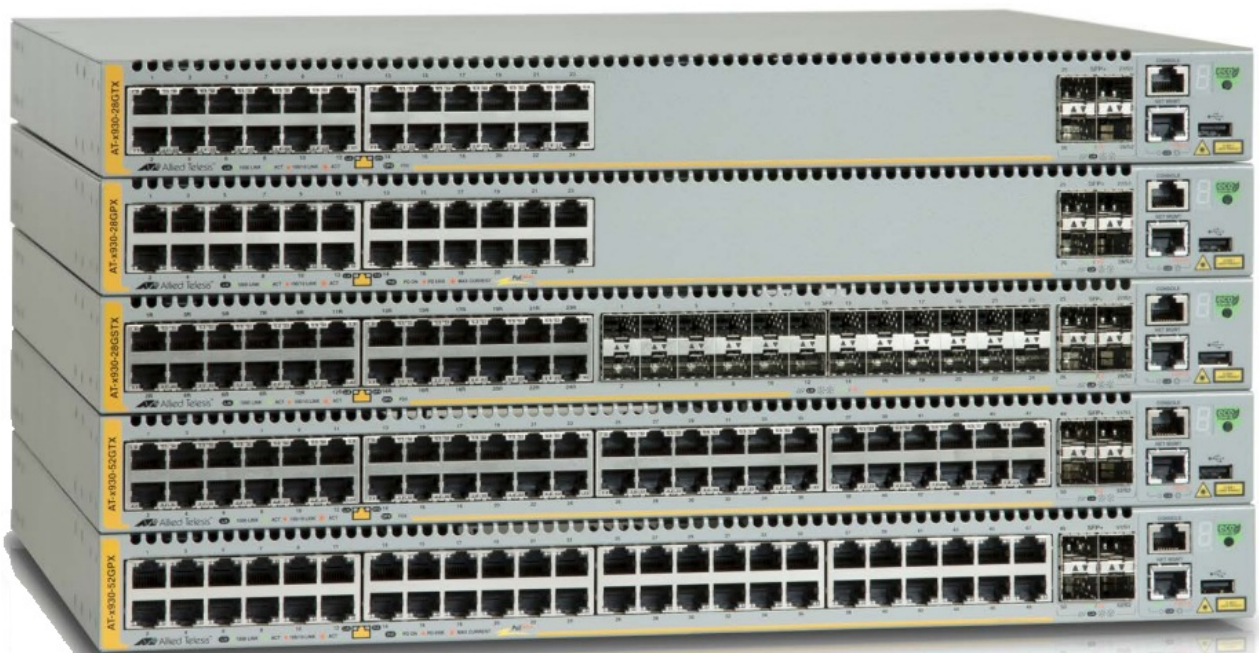


# Allied Telesis X930 Series Advanced Gigabit Layer 3 Stackable Switches Instructions

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**x930 Series**  
**Gigabit Layer 3 Ethernet Switches**  
AT-x930-28GTX  
AT-x930-28GPX  
AT-x930-28GSTX  
AT-x930-52GTX  
AT-x930-52GPX



**Installation Guide for Standalone  
Switches**

613-002100 Rev. D

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## X930 Series Advanced Gigabit Layer 3 Stackable Switches

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### Electrical Safety and Emissions Standards

This product meets the following standards.

#### U.S. Federal Communications Commission

##### Radiated Energy

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

**Note:** Modifications or changes not expressly approved of by the manufacturer or the FCC, can void your right to operate this equipment.

#### Industry Canada

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

RFI Emissions: FCC Class A, EN55022 Class A, EN61000-3-2, EN61000-3-3, VCCI Class A, C-TICK, CE


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

EMC (Immunity): EN55024



Laser Safety EN60825

## Translated Safety Statements

Important: Safety statements that have the  symbol are translated into multiple languages in the Translated Safety Statements document at [www.alliedtelesis.com/translated-safety-statements](http://www.alliedtelesis.com/translated-safety-statements).

## Preface

This guide contains the installation instructions for the x930 Series of Layer 3, Gigabit Ethernet switches. This preface contains the following sections:

“Document Conventions” on page 14

“Contacting Allied Telesis” on page 15

## Note

This guide explains how to install the switches as standalone units.

For instructions on how to build a stack with Virtual Chassis Stacking (VCStack™), refer to the x930 Series Installation Guide for Virtual Chassis Stacking.

## Document Conventions

This document uses the following conventions:

### Note

Notes provide additional information.



### Caution

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



### Warning

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

## Contacting Allied Telesis

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

- Helpdesk (Support Portal) – Log onto Allied Telesis 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.
- Software Downloads – Download the latest software releases for your product.
- Licensing – Register and obtain your License key to activate your product or feature.
- Product Documents – View the most recent installation guides, user guides, software release notes, white papers and data sheets for your product.
- Warranty – View a list of products to see if Allied Telesis warranty applies to the product you purchased and register your warranty.

To contact a sales representative or find Allied Telesis office locations, go to <https://www.alliedtelesis.com/us/en/contact>.

## Chapter 1 Overview

This chapter contains the following sections:

- “Models” on page 18
- “Front and Back Panels” on page 19
- “Features” on page 22
- “Management Panel” on page 26
- “Power Supplies” on page 27
- “10/100/1000Base-T Copper Ports” on page 31
- “Power Over Ethernet” on page 33
- “SFP Ports” on page 38
- “SFP+ Ports” on page 39
- “S1 and S2 SFP+ Ports” on page 40
- “Ethernet Management Port (NET MGMT)” on page 41
- “eco-friendly Button” on page 42
- “LEDs” on page 43
- “USB Port” on page 51
- “Console Port” on page 52
- “AT-StackQS and AT-x9EM/XT4 Cards” on page 53

#### **Note**

This guide explains how to install the switches as standalone units.

For instructions on how to build a stack with Virtual Chassis Stacking (VCStack™), refer to the x930 Series Installation Guide for Virtual Chassis Stacking.

## **Models**

Table 1 lists the models and basic features of the x930 Series of stackable Gigabit Layer 3 switches.

**Table 1. Models and Basic Features**

<b>Model</b>	<b>10/100/1000 Base-T Ports</b>	<b>SFP Ports</b>	<b>SFP+ Ports</b>	<b>PoE+</b>	<b>VCStack</b>
AT-x930-28GTX	24	0	4	No	Yes
AT-x930-28GPX	24	0	4	Yes	Yes
AT-x930-28GSTX	24	24	4	No	Yes
AT-x930-52GTX	48	0	4	No	Yes
AT-x930-52GPX	48	0	4	Yes	Yes

Additional information is listed here:

- The switches do not come with power supplies. Power supplies must be ordered separately. For more information, refer to “Power Supplies” on page 27.
- The power budgets of the AT-x930-28GPX and AT-x930-52GPX Switches for PoE+ powered devices depend on the number and types of power supplies installed in the units. For more information, refer to “Power Budget” on

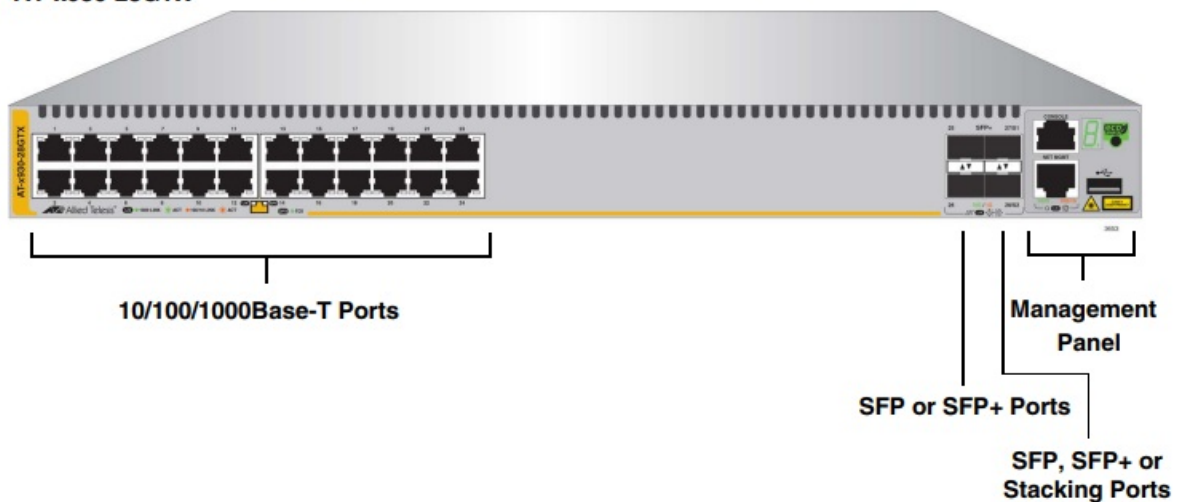
page 34.

- You may use the VCSStack feature to stack the switches with the S1 and S2 ports, the optional AT-StackQS card, or the 10/100/ 1000Mbps front panel ports. For more information, refer to the x930 Series Installation Guide for Virtual Chassis Stacking.
- The copper ports and SFP ports on AT-x930-28GSTX Switch are paired together. Only one port or slot in a pair is operational at a time. For more information, refer to “SFP Ports” on page 38.

## Front and Back Panels

The front panels of the x930 Series switches are shown in Figure 1 and Figure 2 on page 20.

**AT-x930-28GTX**



**AT-x930-28GPX**

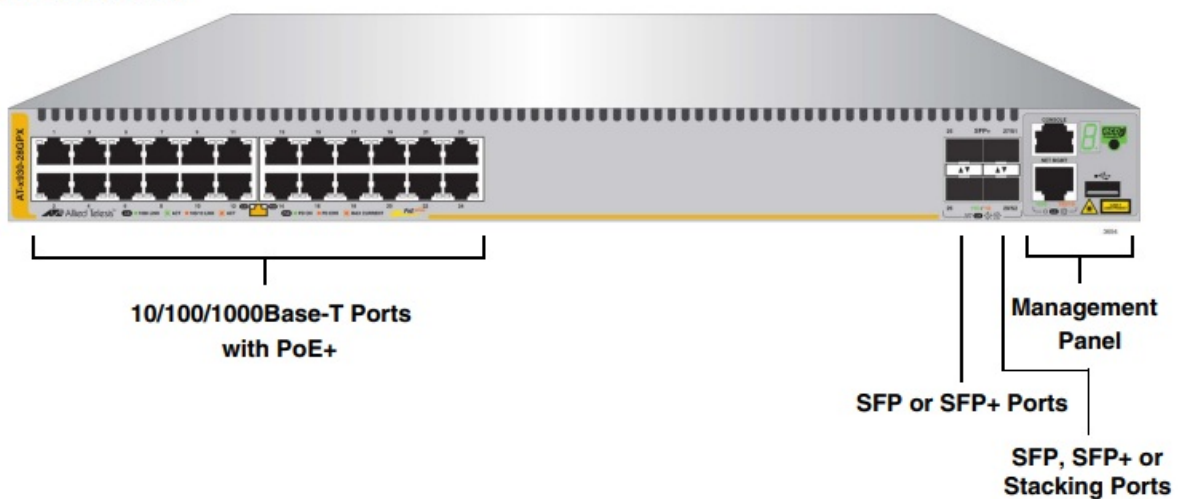
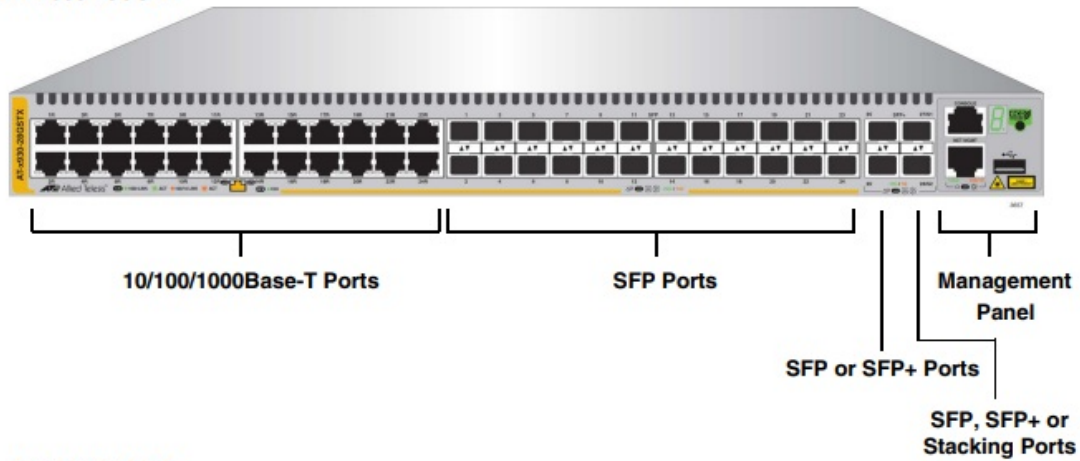
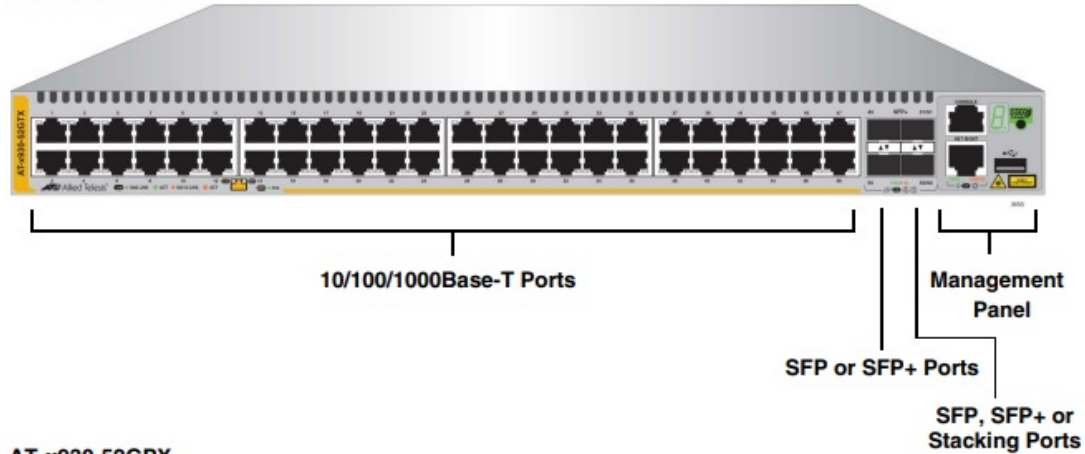


Figure 1. Front Panels of the AT-x930-28GTX and AT-x930-28GPX Switches

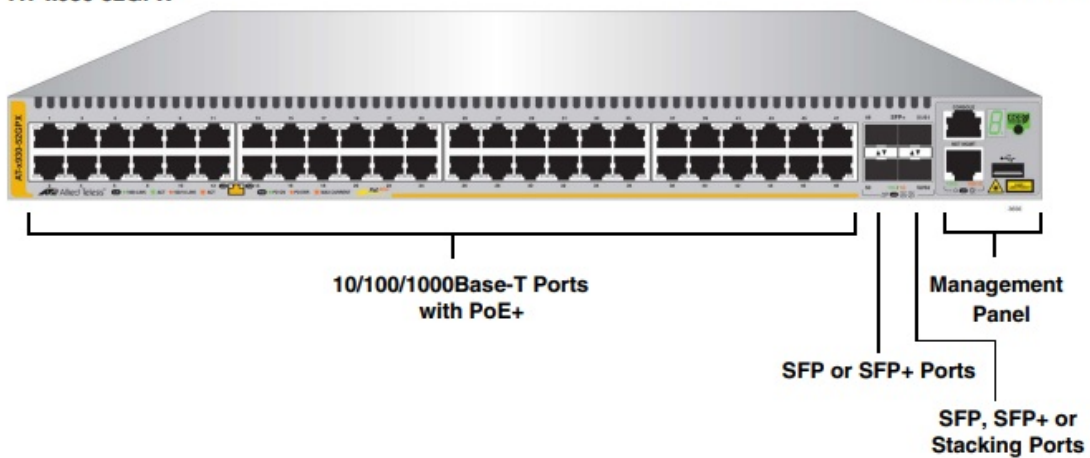
**AT-x930-28GSTX**



**AT-x930-52GTX**



**AT-x930-52GPX**



**Figure 2. Front Panels of the AT-x930-28GSTX, AT-x930-52GTX, and AT-x930-52GPX Switches**

Figure 3 shows the back panel of the non-PoE AT-x930-28GTX, AT-x93028GSTX, and AT-x930-52GTX Switches. The back panel has these preinstalled components:

- AT-FAN09ADP module
- AT-FAN09 fan module
- AT-PNL250 blank panel

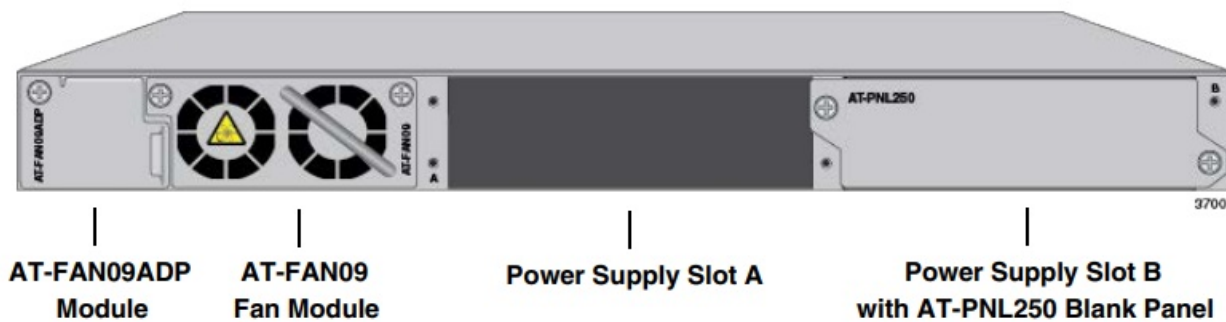


Figure 3. Back Panel of the AT-x930-28GTX, AT-x930-28GSTX, and AT-x930-52GTX Switches

Figure 4 shows the back panel of the PoE AT-x930-28GPX and AT-x93052GPX Switches. The back panel has these pre-installed components:

- AT-FAN09ADP module
- AT-FAN09 fan module
- AT-PNL800/1200 blank panel

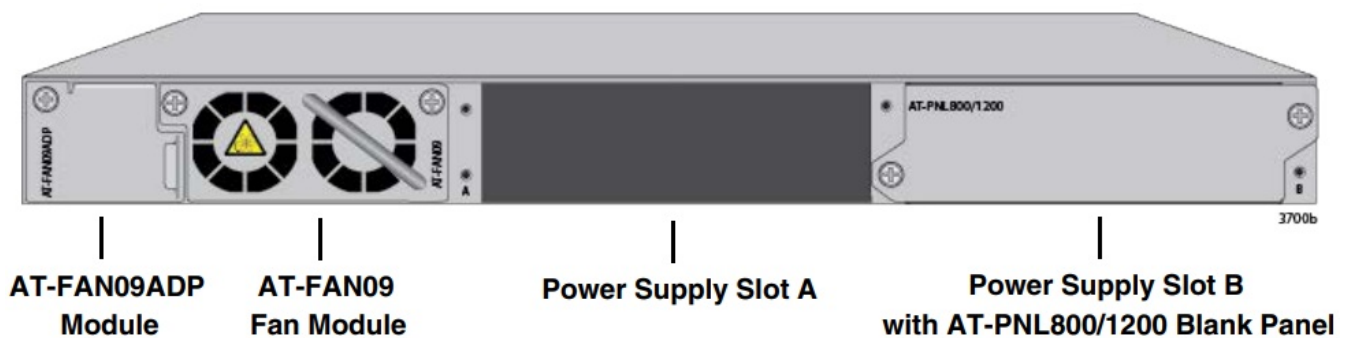


Figure 4. Back Panel of the AT-x930-28GPX and AT-x930-52GPX Switches

Here are the switches and their features:

x930 Models Here are the switches in the x930 Series:

- AT-x930-28GTX
- AT-x930-28GPX
- AT-x930-28GSTX
- AT-x930-52GTX
- AT-x930-52GPX

10/100/1000 Mbps Copper Ports

Here are the basic features of the 10/100/1000 Mbps copper ports:

- 24 or 48 ports per switch
- 10Base-T, 100Base-TX, and 1000Base-T compliant
- IEEE 802.3u Auto-Negotiation compliant

- Auto-MDI/MDIX
- 100 meters (328 feet) maximum operating distance
- IEEE 802.3x flow control in 10/100Base-TX full-duplex mode
- IEEE 802.3x backpressure in 10/100Base-TX half-duplex mode
- IEEE 802.3ab 1000Base-T
- Layer 2 and Layer 3 jumbo frames up to 13KB and 9KB, respectively
- RJ-45 connectors

### **Power Over Ethernet**

Here are the basic features of Power over Ethernet (PoE) on the copper ports on the AT-x930-28GPX and AT-x930-52GPX Switches:

- Supported on ports 1 to 24 on the AT-x930-28GPX Switch and ports 1 to 48 on the AT-x930-52GPX Switch
- Supports PoE (15.4 watts maximum) and PoE+ (30 watts maximum) at the switch ports
- Supports powered device classes 0 to 4
- Port prioritization
- Mode A wiring

### **SFP Ports**

The AT-x930-28GSTX Switch supports the following types of transceivers in its twenty four SFP ports:

- 100Base-FX, 1000Base-T, and 1000Base-SX/LX SFP transceivers
- Single-port BiDi 100Base-FX and 1000Base-LX SFP transceivers
- 1000Base-ZX SFP transceivers

#### **Note**

The SFP ports and copper ports on the AT-x930-28GSTX Switch are paired together. Only one port in a pair can be active at a time. For more information, refer to “SFP Ports” on page 38.

#### **Note**

SFP transceivers must be purchased separately. For a list of supported transceivers, refer to the product's data sheet on the Allied Telesis website.

### **SFP+ Ports**

The four SFP+ ports support the following types of transceivers:

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

#### **Note**

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

#### **Note**

The port support full-duplex mode only. They do not support half- duplex mode.

#### **Note**

SFP and SFP+ transceivers must be purchased separately. For a list of supported transceivers, refer to the

product's data sheet on the Allied Telesis web site.

### **Note**

SFP+ ports 27/S1 and 28/S2 on the 28-port switches and ports 51/ S1 and 52/S2 on the 52-port switches are initially configured as stacking ports for the VCSStack feature. You can use them as regular Ethernet ports by disabling VCSStack or by using other switch ports for the stack trunk. The configuration instructions are provided later in this guide, in Chapter 10, "Configuring the Switch for Standalone Operation" on page 125.

### **SFP+ S1 and S2 Stacking Ports**

SFP+ ports 27/S1 and 28/S2 on the 28-port switches and ports 51/S1 and 52/S2 on the 52-port switches can be used either as regular networking ports or as the trunk in the VCSStack feature to build a stack of up to eight switches. For instructions on the VCSStack feature, refer to the x930 Series Installation Guide for Virtual Chassis Stacking.

### **LEDs**

Here are the port LEDs:

- Link/activity and duplex mode LEDs for the copper ports on nonPoE switches
- Link/activity and PoE status LEDs for the copper ports on PoE switches
- Link/activity LEDs for SFP and SFP+ ports
- Stack ID number LED
- eco-friendly button turns off the LEDs to conserve electricity

### **Optional Expansion Cards**

Here are optional expansion cards:

- AT-StackQS Card – Contains two transceiver ports for building a VCSStack of up to eight switches. For more information, refer to the x930 Series Installation Guide for Virtual Chassis Stacking.
- AT-x9EM/XT4 Card – Contains four copper ports that operate at 1Gbps or 10Gbps.

### **Installation Options**

Here are the installation options for the switches:

- 19-inch equipment rack
- Desk or tabletop
- Wall

### **MAC Address Table**

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

- Storage capacity of 64K dynamic and static entries
- Automatic learning and aging

### **Management Software and Interfaces**

Here are the management software and interfaces:

- AlliedWare Plus Management Software
- Command line interface

- Web browser interface

## **Management Methods**

Here are the methods for managing the switches:

- Local management through the Console port
- Remote Telnet and Secure Shell management
- Remote HTTP and HTTPS web browser management
- SNMPv1, v2c, and v3
- Allied Telesis Autonomous Management Framework (AMF)
- AT-Vista Manager mini
- Autonomous Wireless Control (AWC)

## **Power Supplies**

Here are the power supplies:

- AT-PWR150
- AT-PWR250
- AT-PWR250-80
- AT-PWR800
- AT-PWR1200

## **Management Panel**

Figure 5 identifies the components in the management panel on the x930 Series switches.

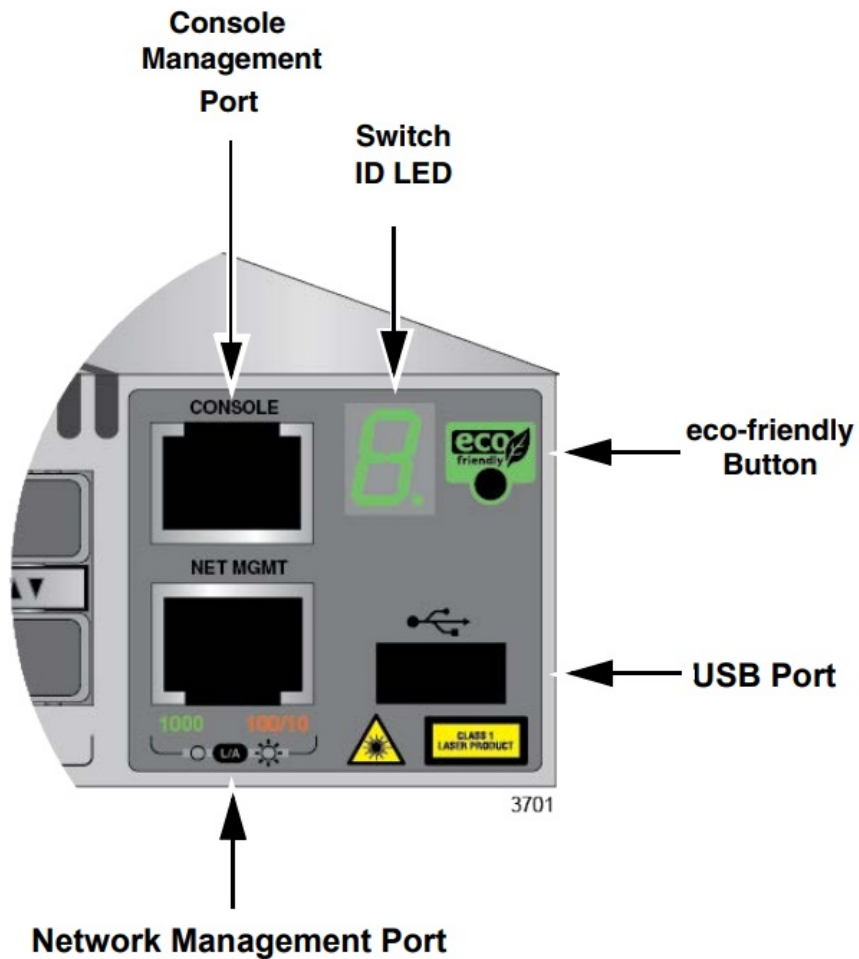


Figure 5. Management Panel

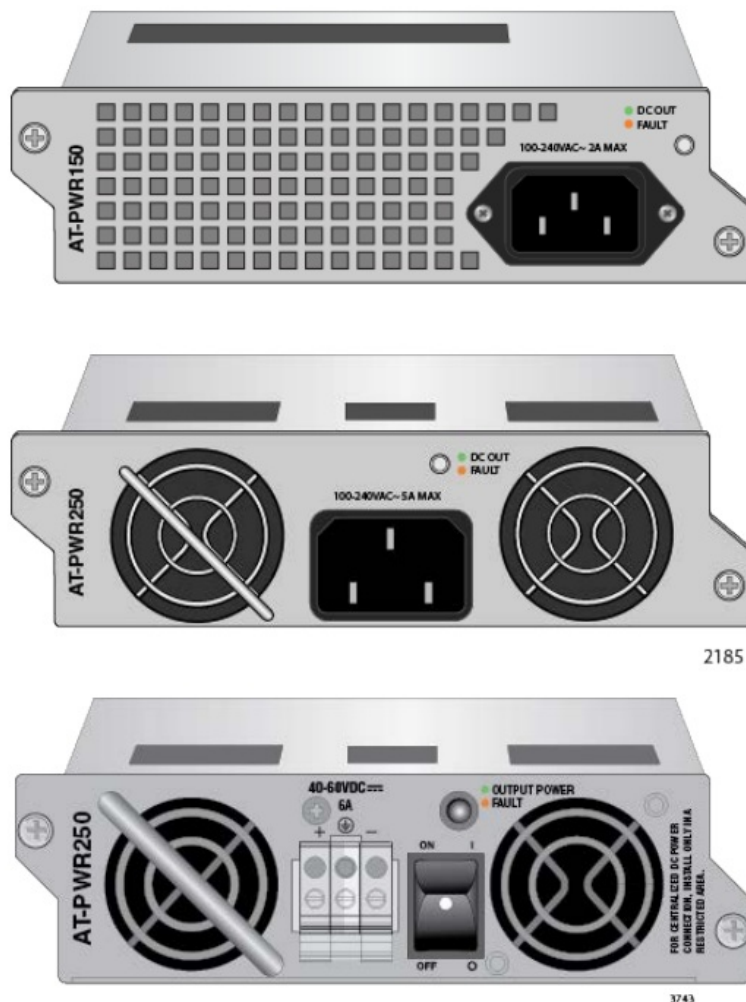
### Power Supplies

Here are the five power supplies for the x930 Switches:

- AT-PWR150
- AT-PWR250
- AT-PWR250-80
- AT-PWR800
- AT-PWR1200

### System-Only Power Supplies

The AT-PWR150, AT-PWR250, and AT-PWR250-80 Power Supplies are shown in Figure 6. They provide system power only. They are primarily intended for the non-PoE AT-x930-28GTX, AT-x930-28GSTX, and AT-x930-52GTX Switches. The AT-x930-28GTX and AT-x930-28GSTX Power Supplies have AC connectors. The AT-PWR250-80 Power Supply has a DC connector for DC wiring environments.



2185

3743

Figure 6. AT-PWR150, AT-PWR250, and AT-PWR250-80 Power Supplies

Here are the operating characteristics:

- The power supplies provide system power only. They do not support PoE+ devices.
- A single power supply can power an entire switch.
- Installing two power supplies adds power redundancy.
- The power supplies are not recommended for the PoE+ AT-x93028GPX and AT-x930-52GPX Switches because they do not supply power for PoE+ devices. You may install them into PoE+ switches, but the switches will not support powered devices.

### System and PoE+ Power Supplies

The AT-PWR800 and AT-PWR1200 Power Supplies provide both system power and power for PoE+ devices on AT-x930-28GPX and AT-x93052GPX Switches. Refer to Figure 7.



**Figure 7. AT-PWR800 and AT-PWR1200 Power Supplies**

A PoE+ switch with one AT-PWR800 Power Supply has the following power characteristics:

- Full system power
- 380 watts of PoE+ power

A PoE+ switch with two AT-PWR800 Power Supplies has these power characteristics:

- Full system power and redundant system power
- Either 740 watts of PoE+ power or 380 watts of active PoE+ power and 380 watts of redundant PoE+ power.

A PoE+ switch with one AT-PWR1200 Power Supply has the following power characteristics:

- Full system power
- 740 watts of power for PoE devices

A PoE+ switch with two AT-PWR1200 Power Supplies has these power characteristics:

- Full system power and redundant system power
- Either 1440 watts of PoE power or 740 watts of active PoE power and 740 watts of redundant PoE power.

#### **Guidelines**

Please review the following guidelines concerning power supplies:

- The x930 Series Switches do not come with power supplies. Power supplies must be ordered separately.
- If you install two power supplies in the switch, they must both be the same model. For example, you may install two AT-PWR800 Power Supplies or two AT-PWR1200 Power Supplies in a switch.

You may not install two different power supply models in the switch.

- The non-PoE AT-x930-28GTX, AT-x930-28GSTX, and AT-x93052GTX Switches require only one power supply for full operations.

Installing a second power supply adds power redundancy, which protects against interruptions to network operations in the event a power supply loses power or fails.


Power redundancy is available only when both AC or DC connectors on the switch are connected to power sources.

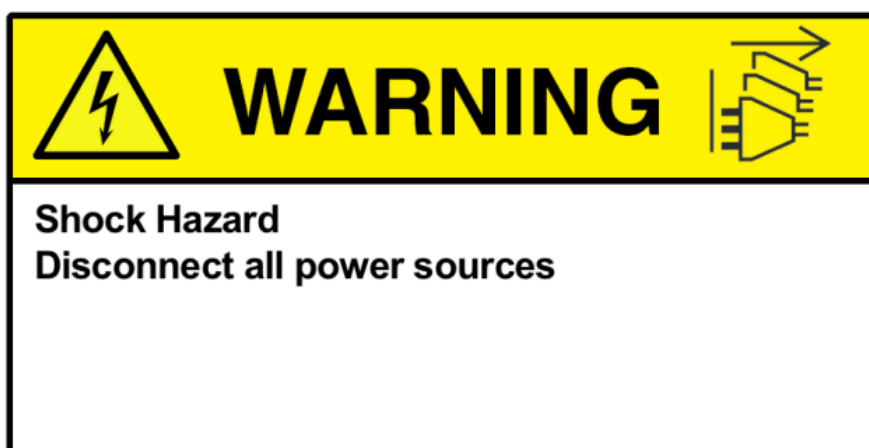
- The PoE AT-x930-28GPX and AT-x930-52GPX Switches also require only one power supply for network operations, excluding PoE+. The switches can continue to operate even if one power supply fails or loses power. Adding a second power supply in the PoE+ switches either increases the amount of power for powered devices or adds PoE+ redundancy. For further information, refer to “Power Budget” on page 34.
- You may install AT-PWR800 and AT-PWR1200 Power Supplies in non-PoE x930 Switches. The power supplies will provide system power only.
- The DC wires for the AT-PWR250-80 DC Power Supply 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 “Technical Specifications” on page 203 for the input voltage ranges.




#### Warning

Power cord is used as a disconnection device. To de-energize equipment, disconnect the power cord.  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.  E30

#### Note

The AT-PWR150, AT-PWR250, AT-PWR800, and AT-PWR1200 Power Supplies are powered on or off by connecting or disconnecting the power cords. The AT-PWR250-80 Power Supply is powered on or off with its On/Off power switch or by deactivating the DC circuit.

## 10/100/1000Base-T Copper Ports

The copper ports on the switches are described in this section.

### Speed

The ports can operate at 10, 100, or 1000 Mbps. The speeds may be set manually using the management software or automatically with AutoNegotiation (IEEE 802.3u), the default setting.

### Note

The ports must be set to Auto-Negotiation to function at 1000 Mbps and are not compatible with devices that are not IEEE 802.3u compliant.

### Duplex Mode

The copper ports can operate in either half- or full-duplex mode. The duplex mode of a port, like port speed, may be set manually using the management software or automatically with Auto-Negotiation (IEEE 802.3u), the default setting.

The speed and duplex mode settings of a port may be set independently of each other. For example, a port may be configured such that its speed is set manually while its duplex mode is established through AutoNegotiation.

### Note

A switch port should not use Auto-Negotiation to set its duplex mode if it is connected to a network device that does not support AutoNegotiation for 10 or 100 Mbps operation and has a fixed duplex mode of full-duplex. Otherwise, a duplex-mode mismatch may occur in which a switch port and a network device operate at different duplex modes. The duplex modes of switch ports that are connected to network devices that do not support Auto-Negotiation should be set manually through the management software.

### Wiring Configuration

The wiring configuration of a port operating at 10 or 100 Mbps can be MDI or MDI-X. The wiring configurations of a switch port and a network device connected with straight-through copper cabling have to be opposite, such that one device is using MDI and the other MDI-X. For instance, a switch port has to be set to MDI-X if it is connected to a network device set to MDI.

You may set the wiring configurations of the ports manually or let the switch configure them automatically with auto-MDI/MDI-X (IEEE 802.3abcompliant). This feature enables the switch to automatically negotiate with network devices to establish their proper settings.

The MDI and MDI-X settings do not apply when ports are operating at 1000 Mbps.

### Maximum Distance

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

### Cable Requirements

Here are the cable requirements:

- 10 or 100Mbps – Standard TIA/EIA 568-B-compliant Category 3 unshielded cabling
- 1000Mbps – Standard TIA/EIA 568-A-compliant Category 5 or TIA/ EIA 568-B-compliant Enhanced Category 5 (Cat 5e) unshielded cabling.

### Note

For the cable requirements for the ports on the AT-x930-28GPX and AT-x930-52GPX Switches for PoE devices, refer to “Cable Requirements” on page 32.

### Port Pinouts

Refer to Table 35 on page 210 and Table 36 on page 210 for the port pinouts of the 10/100/1000Base-T copper ports.

### Power Over Ethernet

The AT-x930-28GPX and AT-x930-52GPX Switches feature Power over Ethernet (PoE) on the 10/100/1000Base-T

ports. PoE is used to supply power to network devices over the same copper cables that carry the network traffic. The main advantage of PoE is that it can make it easier to install a network. The selection of a location for a network device is often limited by whether there is a power source nearby. This often limits equipment placement or requires the added time and cost of having additional electrical sources installed. But with PoE, you can install PoE-compatible devices wherever they are needed without having to worry about whether there are power sources nearby.

A device that provides PoE to other network devices is referred to as power sourcing equipment (PSE). The AT-x930-28GPX and AT-x93052GPX Switches act as PSE units by adding DC power to the network cable, thus functioning as a central power source for other network devices.

Devices that receive their power from a PSE are called powered devices (PD). Examples include wireless access points, IP telephones, webcams, and even other Ethernet switches.

The switch automatically determines whether or not a device connected to a port is a powered device. Ports that are connected to network nodes that are not powered devices (that is, devices that receive their power from another power source) function as regular Ethernet ports, without PoE.

The PoE feature remains activated on the ports but no power is delivered to the devices.

**PoE Standards**

The AT-x930-28GPX and AT-x930-52GPX Switches support these PoE standards:

- PoE (IEEE 802.3af): This standard provides up to 15.4 watts at the switch port to support powered devices that require up to 12.95 watts.
- PoE+ (IEEE 802.3at): This standard provides up to 30.0 watts at the switch port to support powered devices that require up to 25.5 watts.

**Powered Device Classes**

Powered devices are grouped into the five classes listed in Table 2 on page 34. The classes are based on the amount of power the devices require. The switches support all five classes.

Table 2. IEEE Powered Device Classes

Class	Maximum Power Output from a Switch Port	PD Power Range
0	15.4W	0.44W to 12.95W
1	4.0W	0.44W to 3.84W
2	7.0W	3.84W to 6.49W
3	15.4W	6.49W to 12.95W
4	30.0W	12.95W to 25.5W

**Power Budget**

The power budget defines the maximum amount of power the switch can supply to the powered devices on its ports. The higher the budget, the more PoE devices the switch can support at one time.

The power budgets for the AT-x930-28GPX and AT-x930-52GPX Switches depend on several factors. The first is the power supply model.

The power budgets of the five power supplies are listed in Table 3.

Table 3. Power Supply Budgets of the Power Supplies

Power Supply	Power Budget for PoE Devices
AT-PWR150	0 watts
AT-PWR250	0 watts
AT-PWR250-80	0 watts
AT-PWR800	380 watts
AT-PWR1200	740 watts

#### Note

The AT-PWR150, AT-PWR250 and AT-PWR250-80 Power Supplies are intended for the non-PoE AT-x930-28GTX, AT-x93028GSTX, and AT-x930-52GTX Switches. They are not intended for the AT-x930-28GPX and AT-x930-52GPX Switches because they do not provide power for PoE + devices. You may install them in the PoE+ switches, but the switches will not support PoE devices.

Another factor that determines the power budget of the switch is the number of PoE power supplies in the device. The power budget of a PoE switch that has only one PoE power supply is equal to the budget of the power supply. For example, a switch that has one AT-PWR1200 Power Supply has a power budget of 740W for powered devices.

A PoE switch with two AT-PWR800 or AT-PWR1200 Power Supplies has either redundant PoE power or nearly double the power budget. This is controlled by the power boost feature, which has a status of either enabled or disabled. When the power boost feature is enabled, a PoE switch with two power supplies actively uses the PoE power from both supplies to increase its available power budget. When the feature is disabled, the switch uses the PoE power of only one of its power supplies and keeps the other in reserve in case the primary power supply should fail or lose power. The default setting of power boost is disabled.

As an example, assume that a PoE switch has one AT-PWR1200 Power Supply, which has a power budget of 740W for powered devices. Thus, the switch would have a total power budget of 740W. Now assume the switch has two AT-PWR1200 Power Supplies. When the power boost mode is enabled, the switch uses the PoE power from both supplies, for a total power budget of 1440W. When the power boost mode is disabled, the switch has an active PoE power of 740W and a redundant budget of the same amount. The switch activates the redundant power budget only if the power supply providing the active power budget fails or loses power.

Table 4 lists the power budgets for the switch with one or two AT-PWR800 Power Supplies and the power boost mode.

Table 4. Power Budgets of the AT-PWR800 Power Supply

Number of Power Supplies in the Switch	State of Power Boost	Power Budget of the Switch	Redundant Power
One	NA	380 watts	0 watts
Two	Enabled	740 watts	0 watts
Two	Disabled	380 watts	380 watts

Table 5 lists the power budgets for the switch with one or two ATPWR1200 Power Supplies and the power boost mode.

Table 5. Power Budgets of the AT-PWR1200 Power Supply

Number of Power Supplies in the Switch	State of PowerBoost	Power Budget of the Switch	Redundant Power
One	NA	740 watts	0 watts
Two	Enabled	1440 watts	0 watts
Two	Disabled	740 watts	740 watts

The maximum number of PoE devices the switch can support at one time is determined by its power budget and the power requirements of the devices. The switch can supply power to all of the devices as long as their total power requirements is less than its power budget. If the switch determines that the power requirements of the devices exceed its power budget, it denies power to one or more ports using a mechanism referred to as port prioritization.

To determine whether the power requirements of the PoE devices you plan to connect to the switch exceed its power budget, refer to their documentation for their power requirements and add the requirements together. The switch should be able to power all of the devices simultaneously as long as the total is below its power budget. If the total exceeds the available power budget, you should consider reducing the number of PoE devices so that all of the devices receive power.

Otherwise, the switch powers a subset of the devices, based on port prioritization.

The switch can handle different power requirements on different ports. This enables you to connect different classes of PoE equipment to the ports on the switch.

### Port Prioritization

If the power requirements of the powered devices exceed the switch's power budget, the switch denies power to some ports based on a system called port prioritization. You may use this mechanism to ensure that powered devices critical to the operations of your network are given preferential treatment by the switch in the distribution of power should the demands of the devices exceed the available capacity.

There are three priority levels:

- Critical
- High
- Low

Ports set to the Critical level, the highest priority level, are guaranteed power before any of the ports assigned to the other two priority levels.

Ports assigned to the other priority levels receive power only if all the Critical ports are receiving power. Ports that are connected to your most critical powered devices should be assigned to this level. If there is not enough power to support all the ports set to the Critical priority level, power is provided to the ports based on port number, in ascending order.

The High level is the second highest level. Ports set to this level receive power only if all the ports set to the Critical level are already receiving power. If there is not enough power to support all of the ports set to the High priority level, power is provided to the ports based on port number, in ascending order.

The lowest priority level is Low. This is the default setting. Ports set to this level only receive power if all of the ports assigned to the other two levels are already receiving power. As with the other levels, if there is not enough power to support all of the ports set to the Low priority level, power is provided to the ports based on port number, in ascending order.

Power allocation is dynamic. Ports supplying power to powered devices may cease power transmission if the switch's power budget is at maximum usage and new powered devices, connected to ports with higher priorities, become active.

### Wiring Implementation

The IEEE 802.3af standard defines two methods for the delivery of DC power over copper cable from a switch to the powered devices. These methods, known as modes A and B, identify the wires within the cable that carry the

DC power from the switch to a powered device.

Copper cabling typically consists of eight wires. With 10Base-T and 100Base-TX devices, the wires connected to pins 1, 2, 3, and 6 on the RJ-45 connectors carry the network traffic while the wires connected to pins 4, 5, 7, and 8 are unused. With 1000Base-T devices, all eight wires are used to carry network data.

It takes four wires to deliver DC power to a PD. With Mode A, the power is delivered on pins 1, 2, 3, and 6. These are the same pins in 10Base-T and 100Base-TX devices that carry the network data. With mode B, the power is provided over the spare wires.

The ports on the AT-x930-28GPX and AT-x930-52GPX Switches deliver the power using pins 1, 2, 3, and 6, which corresponds to mode A in the IEEE 802.3af standard. Powered devices that comply with the IEEE 802.3af standard are required to support both power delivery methods.

Legacy devices that do not comply with the standard will work with the switch if they are powered on pins 1, 2, 3, and 6.

The twenty four ports on the AT-x930-28GSTX Switch support the following types of SFP transceivers:

- 100Base-FX, 1000Base-T, and 1000Base-SX/LX SFP transceivers
- Single-port BiDi 100Base-FX and 1000Base-LX SFP transceivers
- 1000Base-ZX SFP transceivers

The SFP ports are paired with the twenty four 10/100/1000Base-T copper ports. SFP port 1 is paired with copper port 1R, port 2 with copper port 2R, and so on. Only one port in a pair can be active at a time. For example, if you install a transceiver in SFP port 3 and connect it to an active network device, the switch deactivates copper port 3R.

Please review the following guidelines for using the SFP ports on the ATx930-28GSTX Switch:

- Each SFP port is paired with a copper port.
- You may not change the port pairings.
- Only one port in a pair can be active at a time.
- The copper port is the default active port of a pair.
- An SFP port automatically becomes active when you install and connect an SFP transceiver to an active network device.
- The switch automatically reactivates the copper port of a pair when the transceiver in the corresponding SFP port loses its link to a remote network device. For example, the switch reactivates copper port 4R if you disconnect the fiber optic cable from a transceiver in SFP port 4.
- The letter “R” in the numbering of the copper ports on the front of the switch refers to the “redundant” function of the ports. The copper ports are only available when their corresponding SFP ports are empty or the SFP transceivers have not established links with network devices.

### **SFP+ Ports**

The switches have four SFP+ ports 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
- 10Gbps AT-SP10TW1 and AT-SP10TW3 1- and 3-meter SFP+ direct attach cables

You may use the ports and 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, refer to the product's data sheet on the Allied Telesis website.

**Note**

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

**Note**

The ports support full-duplex mode only. They do not support halfduplex mode.

**Note**

SFP and SFP+ transceivers must be purchased separately.

**Note**

SFP+ ports 27/S1 and 28/S2 on the AT-x930-28GTX, AT-x93028GSTX, and AT-x930-28GPX Switches and ports 51/S1 and 52/S2 on the AT-x930-52GTX and AT-x930-52GPX Switches are initially configured as stacking ports for the VCStack feature. You can use them as regular Ethernet ports by disabling VCStack or by using other switch ports for the stack trunk. Refer to x930 Installation Guide for Virtual Chassis Stacking for more information.

**S1 and S2 SFP+ Ports**

SFP+ ports 27/S1 and 28/S2 on the front panels of the 28-port switches and 51/S1 and 52/S2 on the 52-port switches can be used either as regular Ethernet networking ports or as the trunk in a stack of up to eight switches with the VCStack feature. The switches of a VCStack act as a single virtual unit, synchronizing their actions so that switching operations, like spanning tree protocols, virtual LANs, and static port trunks, span across all of the units and ports. For more information, refer to x930 Installation Guide for Virtual Chassis Stacking.

**Note**

For a list of supported transceivers, refer to the product's data sheet on the Allied Telesis web site.

**Note**

The S1 and S2 ports are the default stack trunk ports if the switch does not contain the AT-StackQS Card. To use the ports as regular Ethernet networking ports, you must disable VCStack or use other switch ports for the stack trunk. The ports on the AT- StackQS Card are the default stack trunk ports if the card is installed.

**Ethernet Management Port (NET MGMT)**

The NET MGMT port in the management panel of the switch is a separate routed eth0 interface. The interface is not part of the switching matrix of the Ethernet line cards, but the CPU on the controller card can route traffic in or out of the port.

Here are the guidelines to using the port:

- The port should only be used for initial configuration and maintenance access to the chassis.
- The NET MGMT port has a standard RJ-45 8-pin connector and operates at 10, 100, or 1000 Mbps in either half- or full-duplex mode.
- The cable requirements for the port are the same as the ports on the AT-x930-28GTX Switch, listed in "Cable Requirements" on page 32. For the port pinouts, refer to "RJ-45 Copper Port Pinouts" on page 210.
- The default setting for the port is Auto-Negotiation, which sets the speed and duplex mode automatically. You may disable AutoNegotiation and configure the port manually.
- The wiring configuration of the NET MGMT port is set automatically with automatic MDIX detection. You may disable automatic MDIX detection and set the wiring configuration manually.
- The port is referred to as eth0 in the management software.

For instructions on how to configure the NET MGMT port, refer to the Software Reference for x930 Series Switches.

## NET MGMT LEDs

The Network Management (NET MGMT) port on the switch has two Status LEDs, described in Table 6.

Table 6. NET MGMT Port LED

LED	State	Description
Left LED	Solid Green	The port has a valid 1000 Mbps link.
	Flashing Green	The port is transmitting or receiving data at 1000 Mbps.
Right LED	Solid Amber	The port has a valid 10 or 100 Mbps link.
	Flashing Amber	The port is transmitting or receiving data at 10 or 100 Mbps.

### eco-friendly Button

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

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

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

The Switch ID LED is always on, but it displays different information depending on whether the LEDs are on or off. When the LEDs are on, the ID LED displays the ID number of the switch. When the switch is operating in the low power mode with the LEDs off, the ID LED indicates whether the switch is a standalone unit or the master or member switch of a VCStack, as detailed in Figure 14 on page 50.

### Note

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

## LEDs

Here are descriptions of the LEDs.

### LEDs for the Copper Ports

The copper ports on the AT-x930-28GTX, AT-x930-28GSTX, and ATx930-52GTX Switches have two LEDs that display link, activity and duplex mode information. The LEDs are shown in Figure 8.

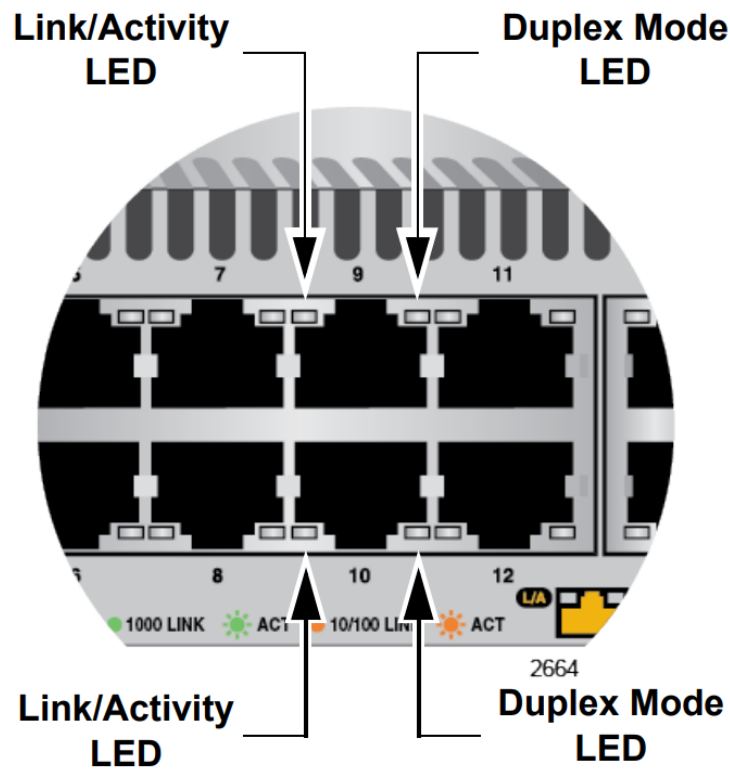


Figure 8. LEDs for the 10/100/1000Base-T Ports on the AT-x930-28GTX, AT-x930-28GSTX, and AT-x930-52GTX Switches  
The LEDs are described in Table 7 on page 44.

Table 7. LEDs on the 10/100/1000Base-T Ports on the AT-x930-28GTX, AT-x930-28GSTX and AT-x930-52GTX Switches

LED	State	Description
Link/ Activity LED	Solid Green	A port has established a 1000 Mbps link to a network device.
	Flashing Green	A port is transmitting or receiving data at 1000 Mbps.
	Solid Amber	A port has established a 10 or 100 Mbps link to a network device.
	Flashing Amber	A port is transmitting or receiving data at 10 or 100 Mbps.
	Off	A port has not established a link with another network device or the LEDs are turned off. To turn on the LEDs, use the eco-friendly button.
DuplexMode LED	Green	A port is operating in full duplex mode.
	Amber	A port is operating in half-duplex mode at 10 or 100 Mbps. ( Half-duplex mode does not apply to 1000 Mbps operation.)
	Flashing Amber	Collisions are occurring on a port operating at 10 or 100 Mbps.

The copper ports on the AT-x930-28GPX and AT-x930-52GPX Switches have two LEDs that display link, activity and PoE information. The LEDs are shown in Figure 9 on page 45.

**Note**

You can view the duplex mode information for the ports on the AT- x930-28GPX and AT-x930-52GPX Switches with the management software.

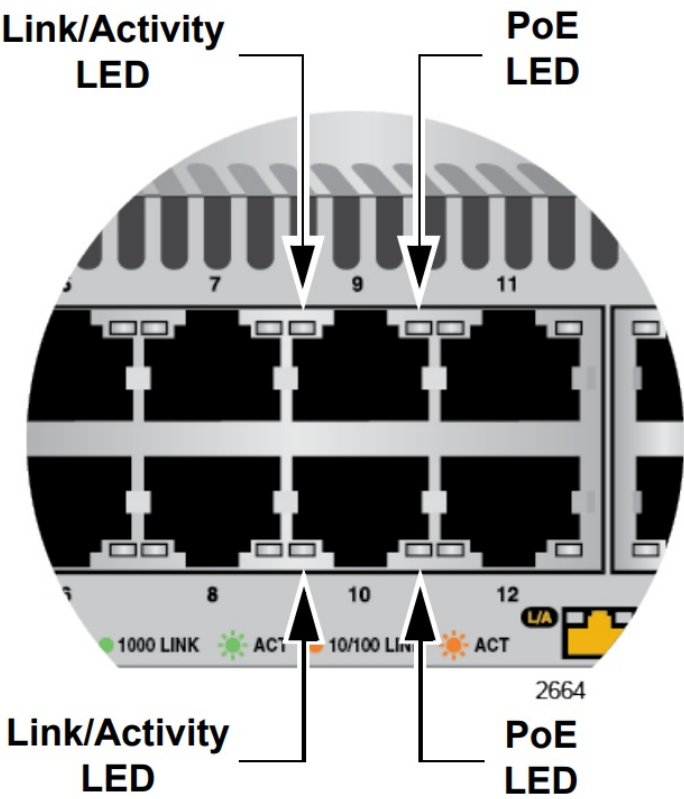


Figure 9. LEDs for the 10/100/1000Base-T Ports on the AT-x930-28GPX and AT-x930-52GPX Switches

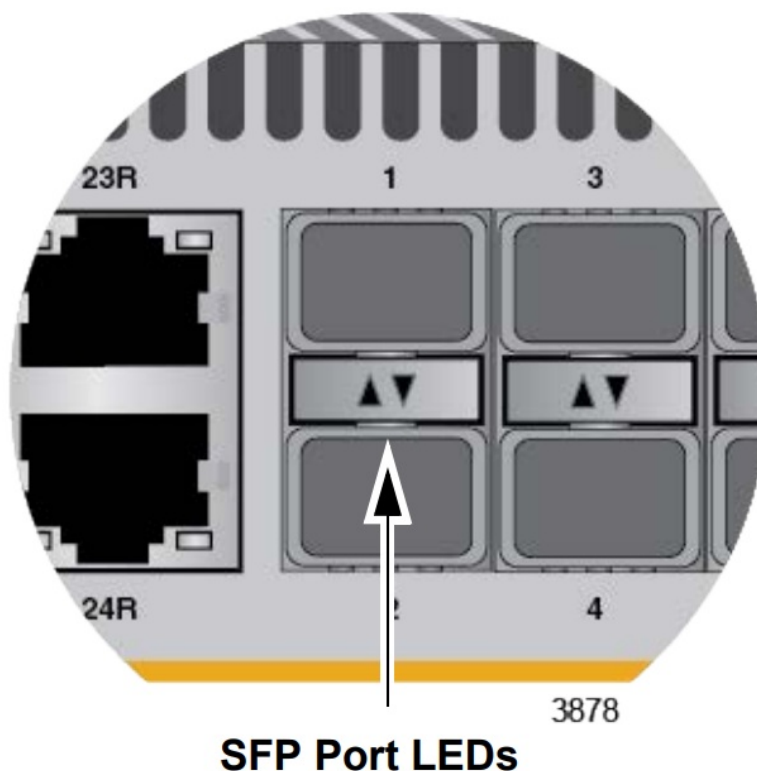
The LEDs are described in Table 8.

Table 8. LEDs on the 10/100/1000Base-T Ports on the AT-x930-28GPX and AT-x930-52GPX Switches

LED	State	Description
Link/ Activity LED	Solid Green	A port has established a 1000 Mbps link to a network device.
	Flashing Green	A port is transmitting or receiving data at 1000 Mbps.
	Solid Amber	A port has established a 10 or 100 Mbps link to a network device.
	Flashing Amber	A port is transmitting or receiving data at 10 or 100 Mbps.
	Off	A port has not established a link with another network device or the LEDs are turned off. To turn on the LEDs, use the eco-friendly button.
PoE	Green	The switch detects a powered device (PD) on the port and is delivering power to it.
	Solid Amber	The switch has shut down PoE+ on the port because of a fault condition.
	Flashing Amber	The switch detects a PD on the port but is not delivering power to it because it has reached its maximum power budget.
	Off	This LED state can result from the following conditions: <ul style="list-style-type: none"> <li>• The port is not connected to a PD.</li> <li>• The PD is powered off.</li> <li>• The port is disabled in the management software.</li> <li>• PoE is disabled on the port.</li> <li>• The LEDs on the Ethernet line cards are turned off. To turn on the LEDs, use the eco-friendly button.</li> </ul>

### LEDs for the SFP Ports

The LEDs for the twenty four SFP ports on the AT-x930-28GSTX Switch are located between the ports. Refer to Figure 10. Each SFP port has one LED. The left-hand LED is for the top port and the right-hand LED is for the bottom port.



**SFP Port LEDs**

**Figure 10. SFP Port LEDs**

The possible states of the LEDs for the SFP ports are described in Table 9.

Table 9. SFP Port LEDs on the AT-x930-28GSTX Switch

LED	State	Description
Link/Activity	Solid green	The SFP transceiver in the port has established a link at 1 000 Mbps to a network device.
	Flashing green	The SFP transceiver is receiving or transmitting packets to a network device at 1000 Mbps.
	Solid amber	The SFP transceiver in the port has established a link at 1 00 Mbps to a network device.
	Flashing amber	The SFP transceiver is receiving or transmitting packets to a network device at 100 Mbps.
	Off	The port is empty, the SFP transceiver has not established a link to a network device, or the LEDs are turned off. To turn on the LEDs, use the eco-friendly button.

The LEDs for the SFP+ ports are located between the ports, as shown in Figure 11. Each SFP+ port has one LED. The left LED is for the top port and the right LED is for the bottom port.



**SFP Port LEDs**

**Figure 11. SFP+ Port LEDs**

The LEDs are described in Table 10.

Table 10. SFP+ Port LEDs

LED	State	Description
Link/Activity	Solid green	The SFP+ transceiver in the port has established a link at 10 Gbps to a network device.
	Flashing green	The SFP+ transceiver is receiving or transmitting packets to a network device at 10 Gbps.
	Solid amber	The SFP transceiver in the port has established a link at 1 000 Mbps to a network device.
	Flashing amber	The SFP transceiver is receiving or transmitting packets to a network device at 1000 Mbps.
	Off	The port 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 cofriendly button.

#### LEDs for the Stacking Ports

SFP+ ports 27/S1 and 28/S2 on the 28-port switches and ports 51/S1 and 52/S2 on the 52-port switches may be used as stacking ports to build a VCS stack of up to eight switches at 10Gbps speeds or four switches at 1000M speeds. For background information, refer to Chapter 2, “Virtual Chassis Stacking” on page 57. Table 11 on page 49 defines the LED states when the ports are used to build a stack of switches.

Table 11. Stacking Port LEDs

LED	State	Description
Link/Activity	Off	The port is empty, the stacking transceiver has not established a link to a network device, or the LEDs are turned off. To turn on the LEDs, use the <code>cofriendly</code> button.
	Solid green	The stacking transceiver has established a 10Gbps link to another switch in the stack.
	Flashing green	The stacking transceiver is receiving or transmitting packets.
	Solid amber	The stacking transceiver in the port has established a link at 1Gbps to a network device.
	Flashing amber	The stacking transceiver is receiving or transmitting packets to a network device at 1Gbps.

### Switch ID LED

The Switch ID LED, shown in Figure 12, displays the ID number of the switch. A standalone switch has the ID number 0. Switches in a VCS stack have the numbers 1 to 8.

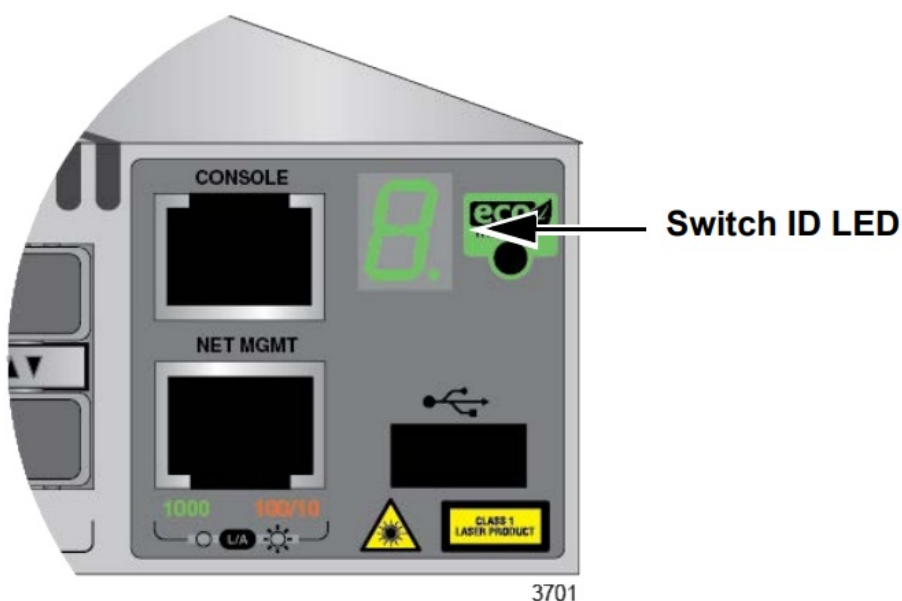


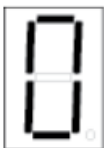




Figure 12. Switch ID LED

The states of the LED when the switch is not operating in the low power mode are shown in Figure 13.

	The switch is booting up.
	The switch has encountered a fault condition.
	The switch is operating as a standalone unit, with the ID number 0.
	The switch has an ID number of 1 to 8 as part of a VCStack.
 2666	The dot in the lower right corner flashes when the switch accesses USB memory.

**Figure 13. Switch ID LED**

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

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

**Note**

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

The states of the LED when the switch is operating in the low power mode are shown in Figure 14.


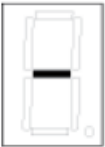
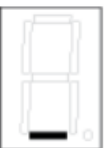
	The switch is the master switch of a VCStack.
	The switch is operating as a standalone unit.
 2667	The switch is a member switch of a VCStack.

Figure 14. 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 or 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 switch. The port is USB2.0 compatible.

### Console Port

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

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

To connect a laptop/desktop computer and a network device, such as a switch, you can use the AT-VT-Kit3 management cable. The cable is a USB-to-Serial converter with a USB-A male connector on one end and an RJ-45 female receptor on the other end.

### Note

To use the AT-VT-Kit3 management cable, you must install the driver software onto your Windows system. For installation instructions, refer to Allied Telesis Quick Installation Guide AT-VTKit3 Management Cable.

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.

This section describes the two optional cards for the x930 Series:

- AT-StackQS Card
- AT-x9EM/XT4 Card

### AT-StackQS Card

The AT-StackQS Card has two ports for 40Gbps transceivers and a bandwidth of 160Gbps. You install it in the back panel of the switch, replacing the AT-FAN09ADP Module. Refer to Figure 15.

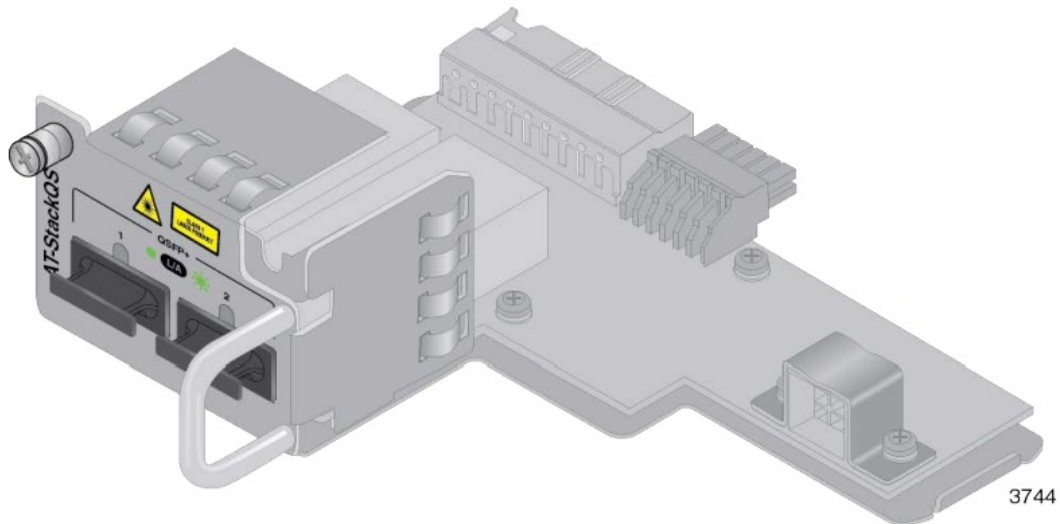


Figure 15. AT-StackQS Card

The card has three functions:

- The ports can be used as 40Gbps networking ports.
- The ports can be used as the stack trunk in a VCStack of up to eight switches. Refer to “Trunks of AT-StackQS Cards” on page 64.
- Each port can be converted from one 40Gbps port into four 10Gbps ports with breakout cables of 1 and 3 meters in length.

Refer to Figure 16.



Figure 16. Copper Breakout Cable

### Note

Breakout cables are supported in 26-port x930 Switches. They are not supported in 52-port switches.

Each transceiver port has one LED. The states of the LED are defined in Table 12.

Table 12. AT-StackQS Card LEDs

LED	State	Description
L/A (Link/ Activity)	Off	The port is not connected to another network device, the device is not powered on, or the LEDs are turned off. To turn on the LEDs, use the eco-friendly button.
	Solid green	The port has established a 40Gbps link to network device.
	Flashing green	The port is transmitting or receiving network packets.

The LED states for breakout cables are described in Table 13.

Table 13. AT-StackQS Card LEDs with 10Gbps Breakout Cables

State	Description
Solid Amber	At least one of the four ports on the breakout cable has established a 10Gbps link to a network device.
Flashing Amber	At least one of the four ports on the breakout cable is sending or receiving data.
Off	<p>Possible causes of this state are listed here:</p> <ul style="list-style-type: none"> <li>– The transceiver port is empty.</li> <li>– None of the ports on the breakout cable have established links to network devices.</li> <li>– The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.</li> </ul>

#### AT-x9EM/XT4 Card

This card adds four additional networking ports to the switch. The ports can operate at either 1Gbps or 10Gbps and have RJ-45 connectors for copper cables. Refer to Figure 17.

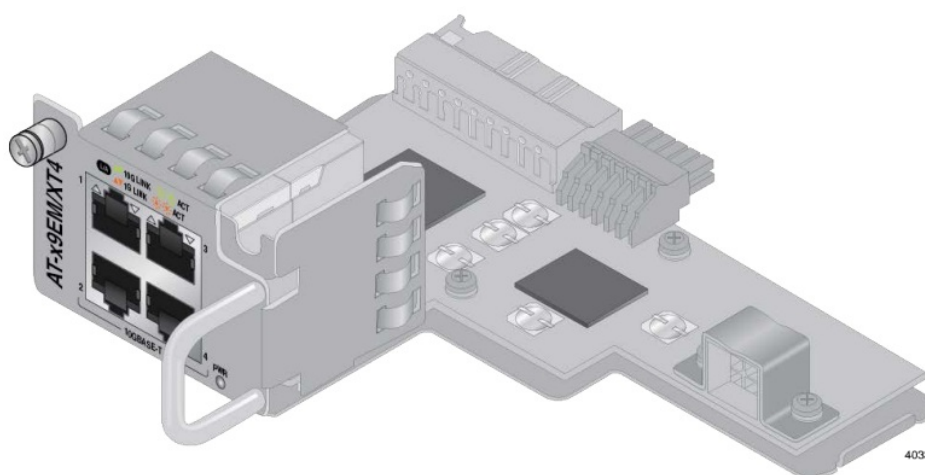


Figure 17. AT-x9EM/XT4 Card

#### Note

The card requires version 5.4.5-2 or later of the management software. The instructions in “Displaying the Hardware Status and AlliedWare Plus Version Number” on page 145 explain how to determine the version number of the software on the switch.

The cable requirements for the ports are given in Table 14.

Table 14. Copper Cables for the AT-x9EM/XT4 Card

Port Speed	Cable Type	Maximum Operating Distance
1Gbps	Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) shielded or unshielded cabling	100 m (328 ft)
10Gbps	Standard TIA/EIA-568-C.1 compliant Category 6a (Cat 6a) shielded or unshielded cabling	100 m (328 ft)

Each port has one LED. The states of the LED are defined in Table 15 on page 56.

Table 15. AT-x9EM/XT4 Card LEDs

LED	State	Description
L/A (Link/ Activity)	Off	The port is not connected to another network device, the device is not powered on, or the LEDs are turned off. To turn on the LEDs, use the eco-friendly button.
	Solid green	The port has established a 10Gbps link to a network device.
	Flashing green	The port is transmitting or receiving network traffic at 10Gbps.
	Solid amber	The port has established a 1Gbps link to a network device.
	Flashing amber	The port is transmitting or receiving network traffic at 1Gbps.

You can install only one AT-x9EM/XT4 Card in the switch. It replaces the AT-FAN09ADP Module in the back panel. The installation instructions are provided in Chapter 5, “Installing AT-StackQS and AT-x9EM/XT4 Cards” on page 103.

## Chapter 2 Beginning the Installation


The chapter contains the following sections:

- “Reviewing Safety Precautions” on page 58
- “Choosing a Site for the Switch” on page 63
- “Unpacking the Switch” on page 64

### 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](http://www.alliedtelesis.com/support).



#### Warning

Class 1 Laser product.  L1




#### Warning

Laser Radiation.  
Class 1M Laser product.



### Warning

Do not stare into the laser beam.  L2




### Warning

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



### Warning

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



### Warning

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




### Warning

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




### Warning

Class I Equipment. This equipment must be earthed. The power plug must be connected to a properly wired earth ground socket outlet. An improperly wired socket outlet could place hazardous voltages on accessible metal parts.


 E4

### Note

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





### Caution

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




### Warning

Operating Temperatures. All the switches are designed for a maximum ambient temperature of 45° C.  E52

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



### Warning

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




### Warning

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



### Caution

Circuit Overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.  E21




### Caution


Risk of explosion if battery is replaced by an incorrect type. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.




### Warning

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


**Warning**

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

**Note**


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

**Warning**


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

**Note**


If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (T<sub>mra</sub>).

 E35


**Caution**

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


**Warning**

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


**Warning**

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


**Warning**

This product may have multiple AC power cords installed. To deenergize this equipment, disconnect all power cords from the device.  E41


**Caution**

An Energy Hazard exists inside this equipment. Do not insert hands or tools into open chassis slots or plugs.  E44


**Warning**

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

**Caution**

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

**Warning**

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

**Choosing a Site for the Switch**

Observe these requirements when planning the installation of the switch.

- If you plan to install the switch in an equipment rack, check to be sure that the rack is safely secured so that it will not tip over.


Devices in a rack should be installed starting at the bottom, with the heavier devices near the bottom of the

rack.

- If you plan to install the switch on a table, check to be sure that the table is level and stable.
- The power outlet should be located near the switch and be easily accessible.
- The site should allow for easy access to the ports on the front of the switch, so that you can easily connect and disconnect cables, and view the port LEDs.
- The site should allow for adequate air flow around the unit and through the cooling vents on the front and rear panels. (The ventilation direction in units that have a cooling fan is from front to back, with the fan on the back panel drawing the air out of the unit.)
- The site should not expose the switch to moisture or water.
- The site should be a dust-free environment.
- The site should include dedicated power circuits or power conditioners to supply reliable electrical power to the network devices.
- Do not install the switch in a wiring or utility box because it will overheat and fail from inadequate airflow.



### **Warning**

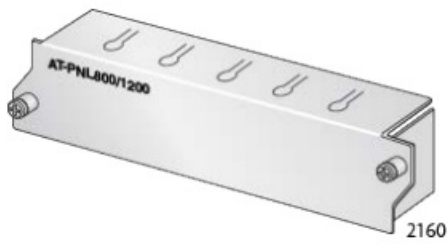
Switches should not be stacked on a table or desktop because that could present a personal safety hazard if you need to move or replace switches.  E91

### **Unpacking the Switch**

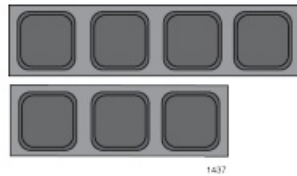
Figure 18 lists the items in the accessory kit that comes with the switch. If any item is missing or damaged, contact your Allied Telesis sales representative for assistance.



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



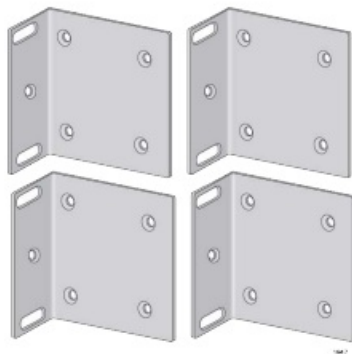
One AT-PNL800/1200 blank panel



Seven bumper feet



Sixteen bracket screws



Four equipment rack or wall mounting brackets

Figure 18. Accessory Kit

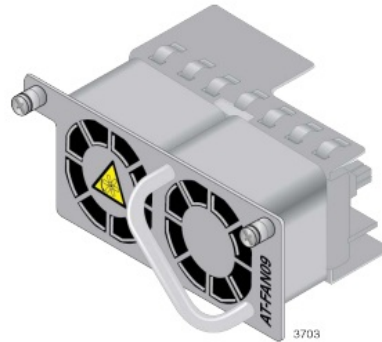
Figure 19 lists the items that come pre-installed in the switch.



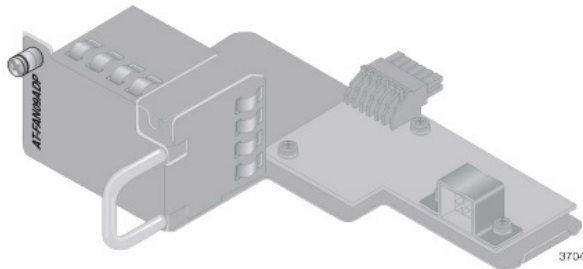
Four dust covers in the SFP+ slots on the front panel



One AT-PNL250 blank panel on the back panel



One AT-FAN09 Fan Module in the back panel



One AT-FAN09ADP Module in the back panel

Figure 19. Pre-installed Items

#### Note

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

#### Note

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

After unpacking the switch, go to Chapter 3, “Installing the Power Supplies” on page 67.

## Chapter 3 Installing the Power Supplies

The sections in this chapter are listed here:

- “Installing the Power Supplies” on page 68
- “Installing a Blank Power Supply Slot Cover” on page 74

### Installing the Power Supplies

This section contains the procedure for installing the power supplies in the switch. If you are planning to install the switch in an equipment rack, you may install the power supplies either before or after installing the device in the rack.



#### Caution

The device can be damaged by electrostatic discharge (ESD). Be sure to follow standard ESD protections procedures, such as wearing a wrist or foot strap, when installing the device.



### Caution

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

The illustrations in the following procedure show the AT-PWR800 Power Supply. The procedure is the same for all power supplies.

To install the power supplies, perform the following procedure:

1. Place the switch on a level, secure table or desk.

#### Note

If you are installing only one power supply, skip step 2.

2. Use a cross-head screwdriver to loosen the two captive screws on the blank panel covering power supply slot B on the back panel and remove it from the switch. Refer to Figure 20 on page 69.

#### Note

Allied Telesis recommends removing the blank panel from slot B even if you are installing only one power supply. You reinstall the panel later in the procedure.

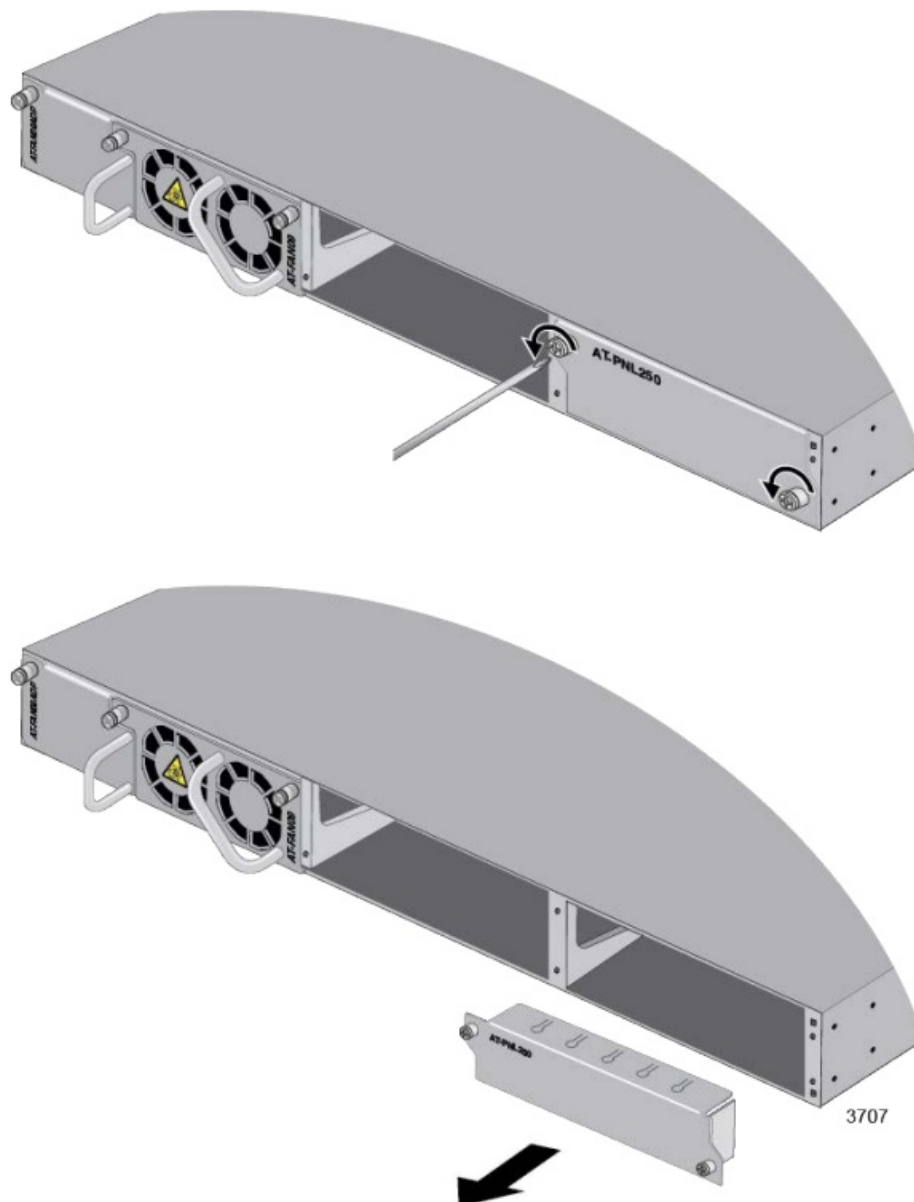


Figure 20. Removing the Blank Panel

3. Unpack the power supply from its shipping container.



### Caution

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

E94

4. Check the shipping container for the accessory items.

Refer to Table 16 on page 70 to determine the accessory items that come with your power supply.

Table 16. Accessory Items Included with the Power Supplies

Power Supply	One Power Cord Retaining Clip	One Power Cord
AT-PWR150	Yes	Yes
AT-PWR250	Yes	Yes
AT-PWR250-80	No	No
AT-PWR800	Yes	Yes
AT-PWR1200	No	Yes

### Power Cord Retaining Clip



### Power Cord



Figure 21. Power Supply Accessory Items

### Note

The power cord that comes with the AT-PWR1200 Power Supply for installations in North America has a 20 Amp, 125 V NEMA 5-20P plug that is only compatible with an NEMA 5-20R receptacle.

5. Slide the new power supply into slot A or B in the back panel of the switch. Refer to Figure 22 on page 71.  
Please review the following guidelines before installing the module:
  - The handle on the power supply should be on the left as you install the module in the switch. Refer to Figure 22 on page 71.
  - When installed, the AT-PWR1200 Power Supply extends 5.6 cm (2.2 in.) from the back panel of the chassis.
  - The power supply is fully installed in the slot when the tabs with the captive screws are flush with the back panel of the switch. Light pressure may be required to properly seat the module on the power connector inside the chassis.

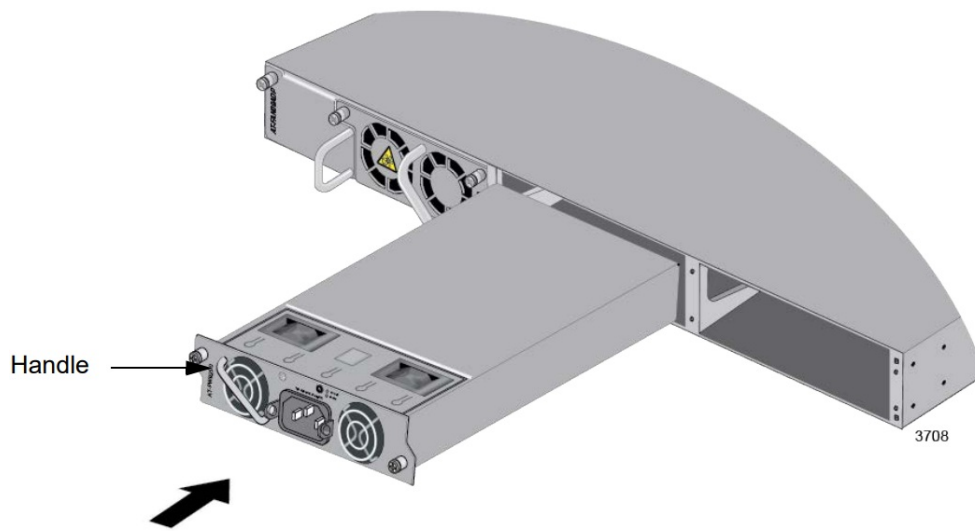


Figure 22. Installing a Power Supply



**Caution**

Do not use excessive force when seating the module, because this may damage the system or the module. If the module resists seating, remove it from the system, realign it, and try again. E47



**Caution**

The power supply is not hot-swappable. It might be damaged if it is installed in the switch while it is powered on. Refer to Figure 23 on page 72.

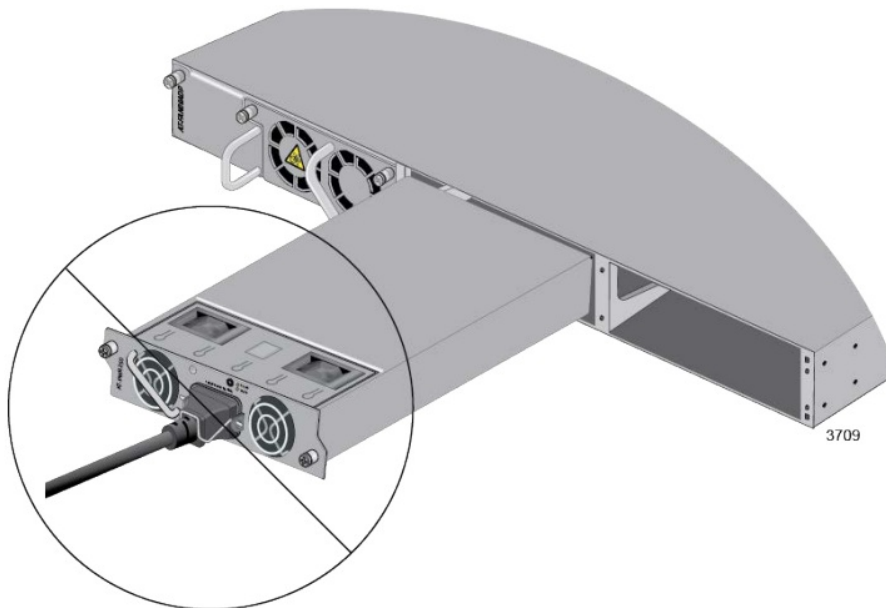


Figure 23. Improper Installation of a Power Supply

6. Secure the power supply to the switch by tightening the two captive screws with a cross-head screwdriver. Refer to Figure 24.

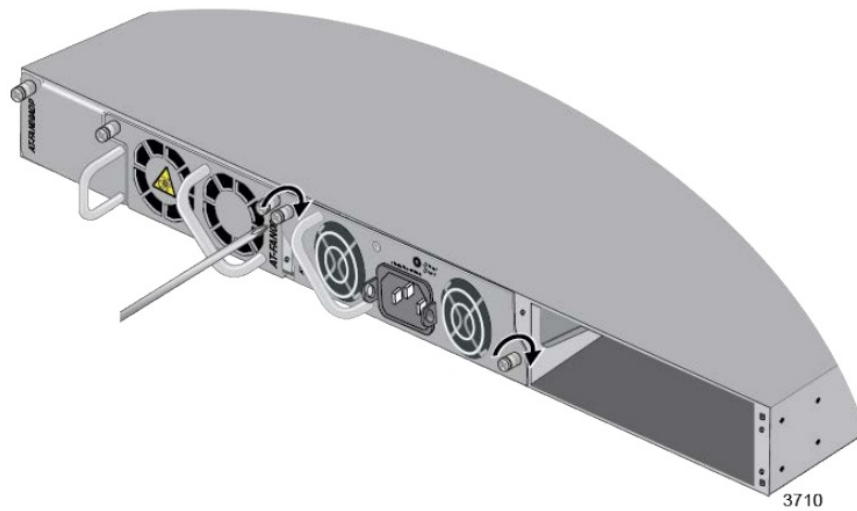


Figure 24. Tightening the Captive Screws on the Power Supply

7. If you installed the AT-PWR150, AT-PWR250, or AT-PWR800 Power Supply, install the power cord retaining clip on the AC plug. Press the sides of the clip inward and insert the two ends into the holes on the AC socket. Refer to Figure 25.

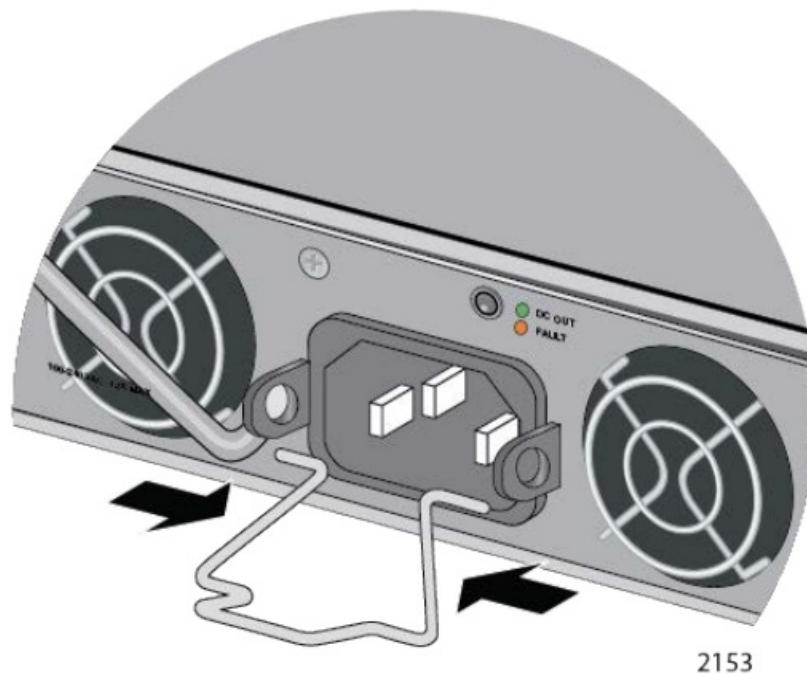


Figure 25. Installing the Power Cord Retaining Clip

**Note**

The AT-PWR250-80 and AT-PNL800/1200 Power Supplies do not come with a retaining clip.

8. To install a second power supply, repeat this procedure, starting with step 3.
9. If you installed only one power supply in the switch, perform the procedure in “Installing a Blank Power Supply Slot Cover” on page 74.
10. Do one of the following:
  - To install the switch on a table, go to Chapter 5, “Installing the Switch on a Table” on page 87.
  - To install the switch in an equipment rack, refer to Chapter 6, “Installing the Switch in an Equipment Rack” on page 89.
  - To install the switch on a wall, refer to Chapter 7, “Installing the Switch on a Wall” on page 95.

**Installing a Blank Power Supply Slot Cover**

If you installed only one power supply in the switch, perform this procedure to install a blank panel over the empty power supply slot.

To install a blank cover, perform the following procedure:

1. Position the appropriate blank panel over the slot.

Use the AT-PNL250 Blank Panel if the switch has only one ATPWR150, AT-PWR250, or AT-PWR250-80 Power Supply.

Use the AT-PNL800/1200 Blank Panel if the switch has only one AT-PWR800 or AT-PWR1200 Power Supply.

Refer to Figure 26.

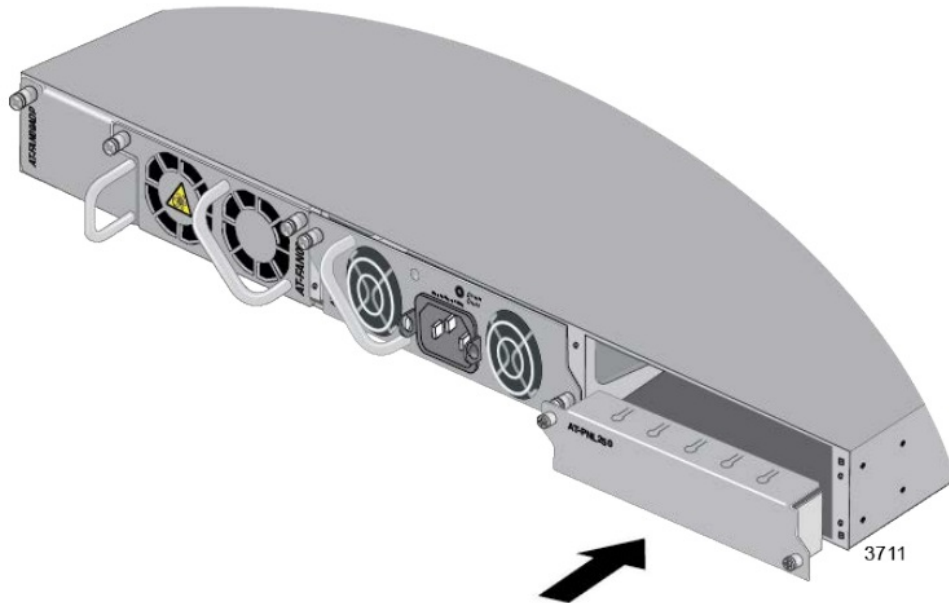


Figure 26. Installing a Blank Panel on a Power Supply Slot

2. Tighten the two captive screws with a cross-head screwdriver to secure the panel to the switch. Refer to Figure 27 on page 75.

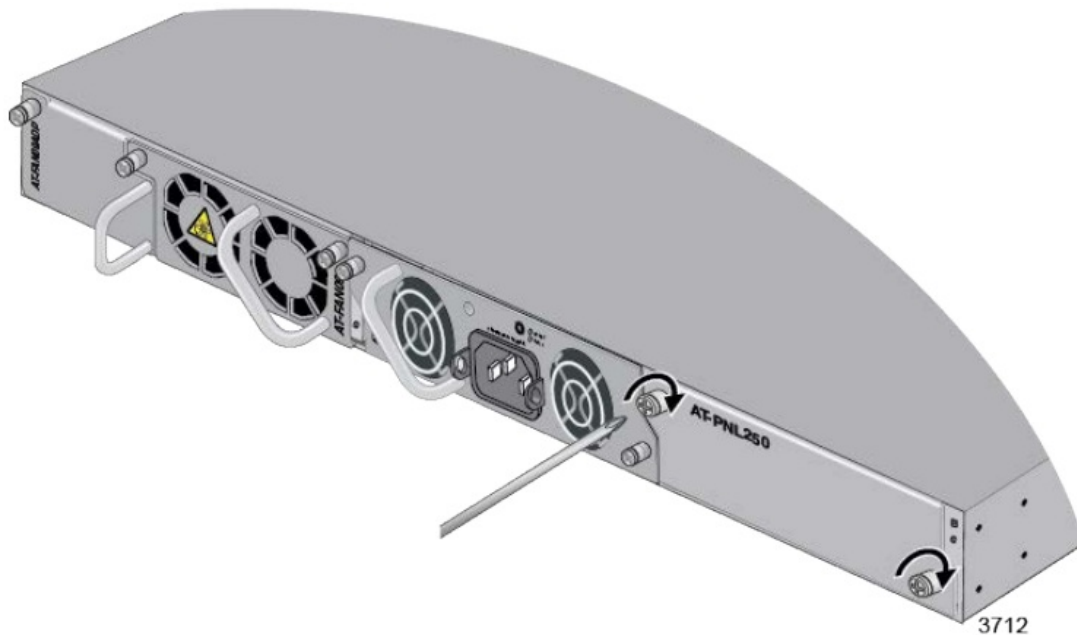


Figure 27. Tightening the Captive Screws on the Blank Panel for the Power Supply Slot

3. Do one of the following:

To install the switch on a table, go to Chapter 5, “Installing the Switch on a Table” on page 87.

To install the switch in an equipment rack, refer to Chapter 6, “Installing the Switch in an Equipment Rack” on

page 89.

To install the switch on a wall, refer to Chapter 7, “Installing the Switch on a Wall” on page 95.

## Chapter 4 Installing AT-StackQS and AT-x9EM/ XT4 Cards

This chapter contains the installation instructions for AT-StackQS and ATx9EM/XT4 Cards. For descriptions, refer to “AT-StackQS Card” on page 53 and “AT-x9EM/XT4 Card” on page 55. The sections are listed here:

- “Guidelines” on page 78
- “Installing the Card” on page 79


### Guidelines

Please observe the following guidelines when handling the AT-StackQS or AT-x9EM/XT4 Card.

- Wear an anti-static device when handling the card.



#### Caution

The device can be damaged by electrostatic discharge (ESD). Be sure to follow standard ESD protections procedures, such as wearing a wrist or foot strap, when installing the device.  E106

- Hold the card by its faceplate or edges.
- Never touch the electronic components on the top or bottom of the card.
- Do not remove the card from its anti-static bag until you are ready to install it in the switch.
- If you need to remove the card from the switch, immediately return it in its anti-static bag and packaging container.

### Installing the Card

This section contains the procedure for installing AT-StackQS and ATx9EM/XT4 Cards in x930 Switches. The illustrations show the ATStackQS Card. The procedure is the same for the AT-x9EM/XT4 Card.

#### Note

The card is hot-swappable. However, Allied Telesis recommends powering off the switch before installing the card because the installation procedure requires temporarily removing the AT-FAN09 Fan Module.

#### Note

If the switch is powered on, power it off by performing step 1. If the switch is already powered off, start with step 2.

To install the AT-StackQS or AT-x9EM/XT4 Card, perform the following procedure:


1. If the switch is powered on, power it off by doing one of the following:

For the AC AT-PWR150, AT-PWR250, AT-PWR800, or ATPWR1200 Power Supply, disconnect the power cord from the AC power source.

For the DC AT-PWR250-80 Power Supply, either turn Off the power switch on the power supply or power off the DC circuit.



#### 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

2. Place the switch on a table, with the back panel facing you.
3. Loosen the two captive screws on the AT-FAN09 Fan Module with a cross-head screwdriver. Refer to Figure 28.

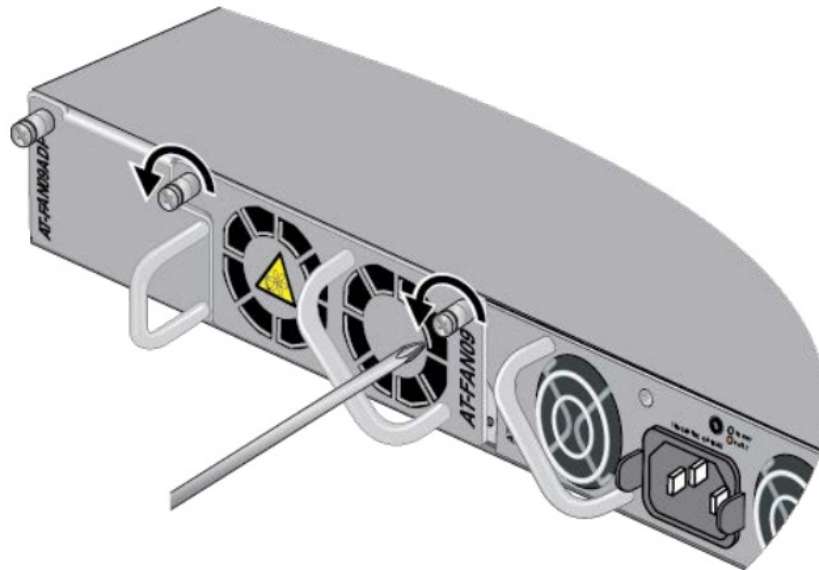


Figure 28. Loosening the Two Captive Screws on the AT-FAN09 Module

4. Carefully pull the AT-FAN09 Module from the switch. Refer to Figure 29.

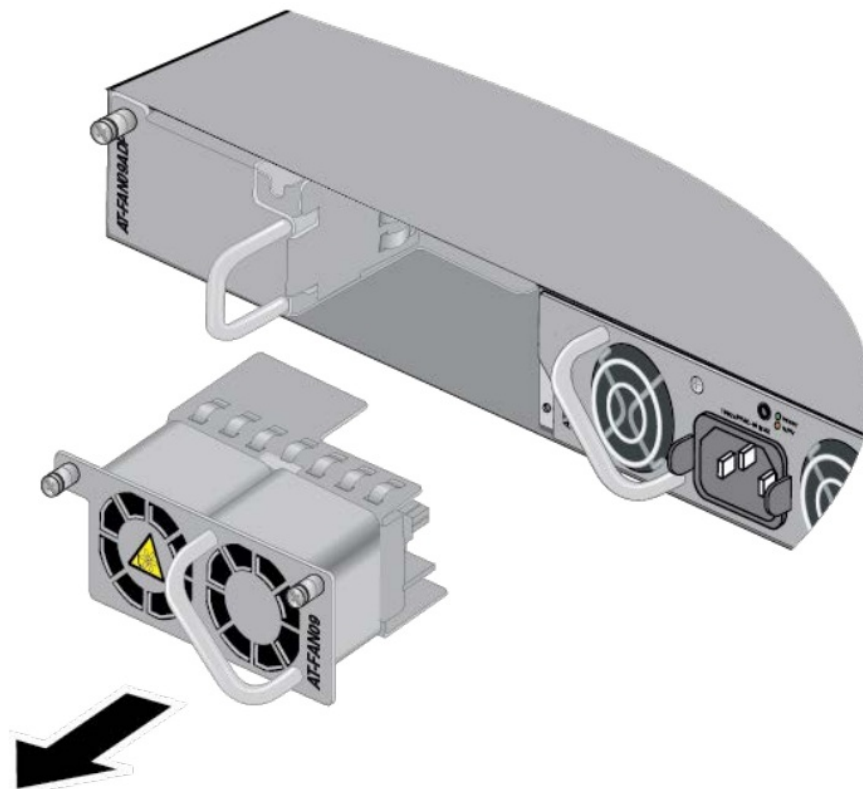


Figure 29. Removing the AT-FAN09 Module

5. Use a cross-head screwdriver to loosen the captive screw on the ATFAN09ADP Module. Refer to Figure 30.

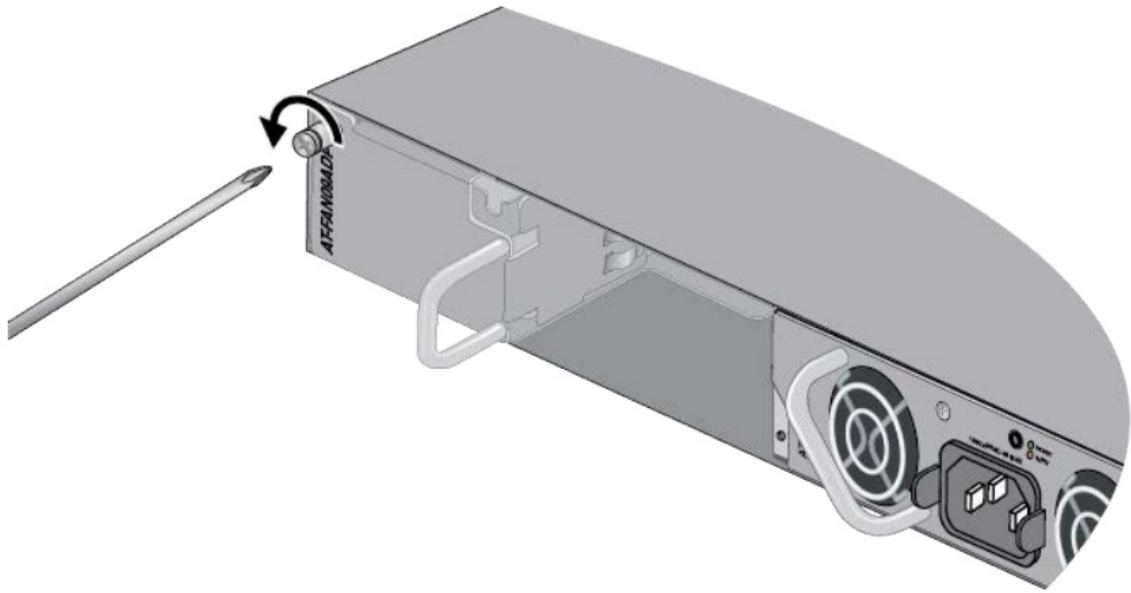


Figure 30. Loosening the Captive Screw on the AT-FAN09ADP Module

6. Carefully pull the AT-FAN09ADP Module from the switch. Refer to Figure 31.

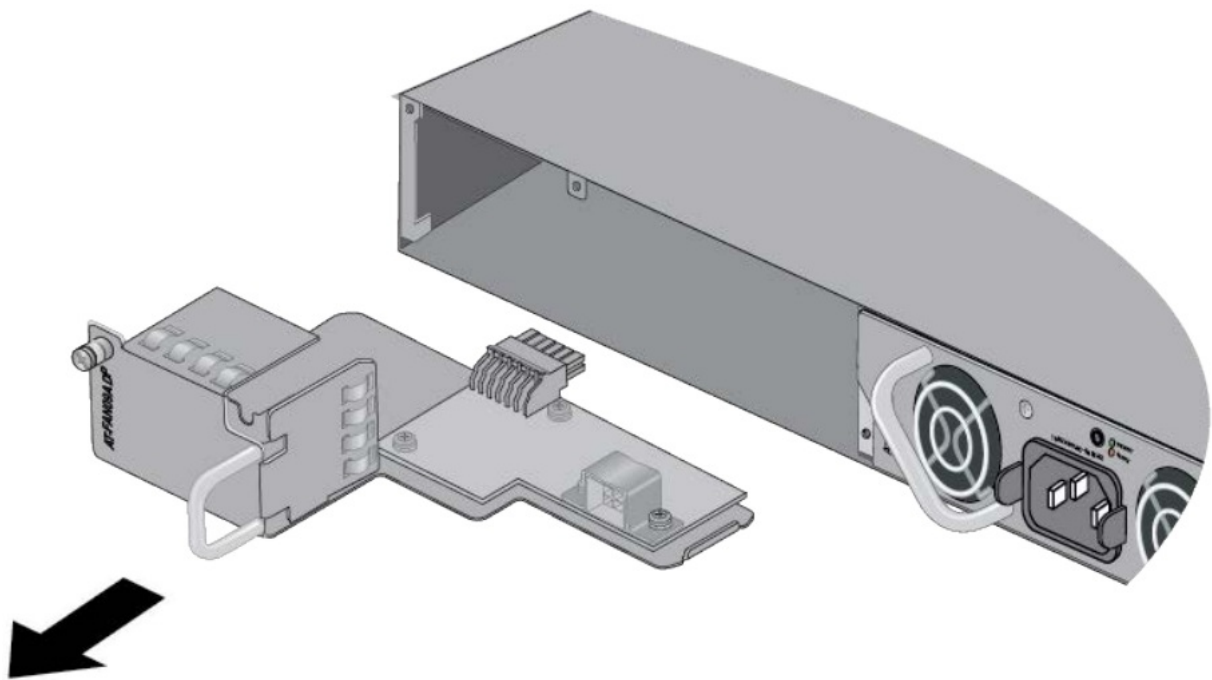
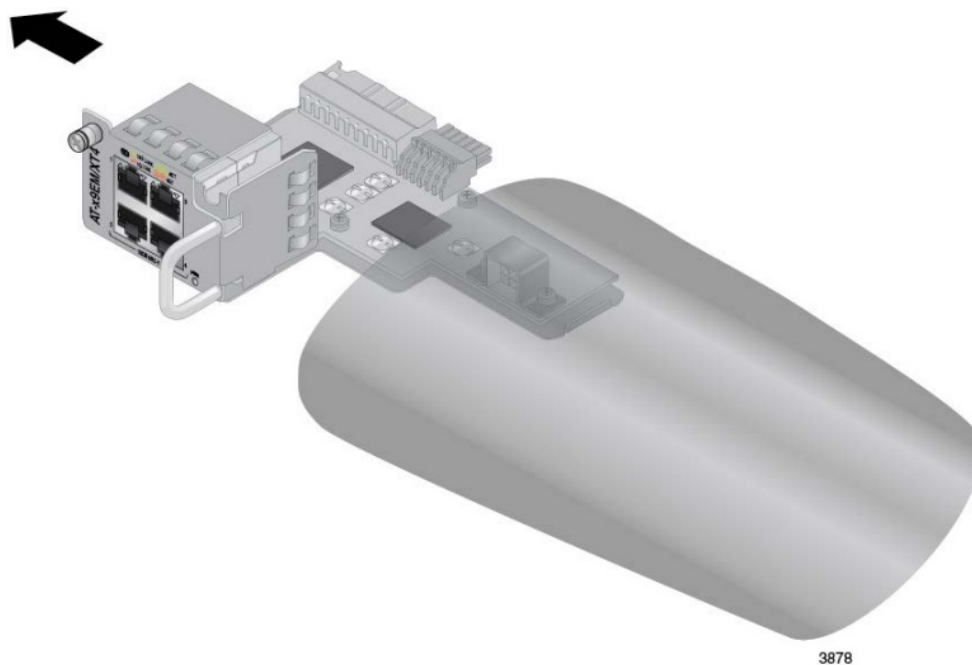


Figure 31. Removing the AT-FAN09ADP Module

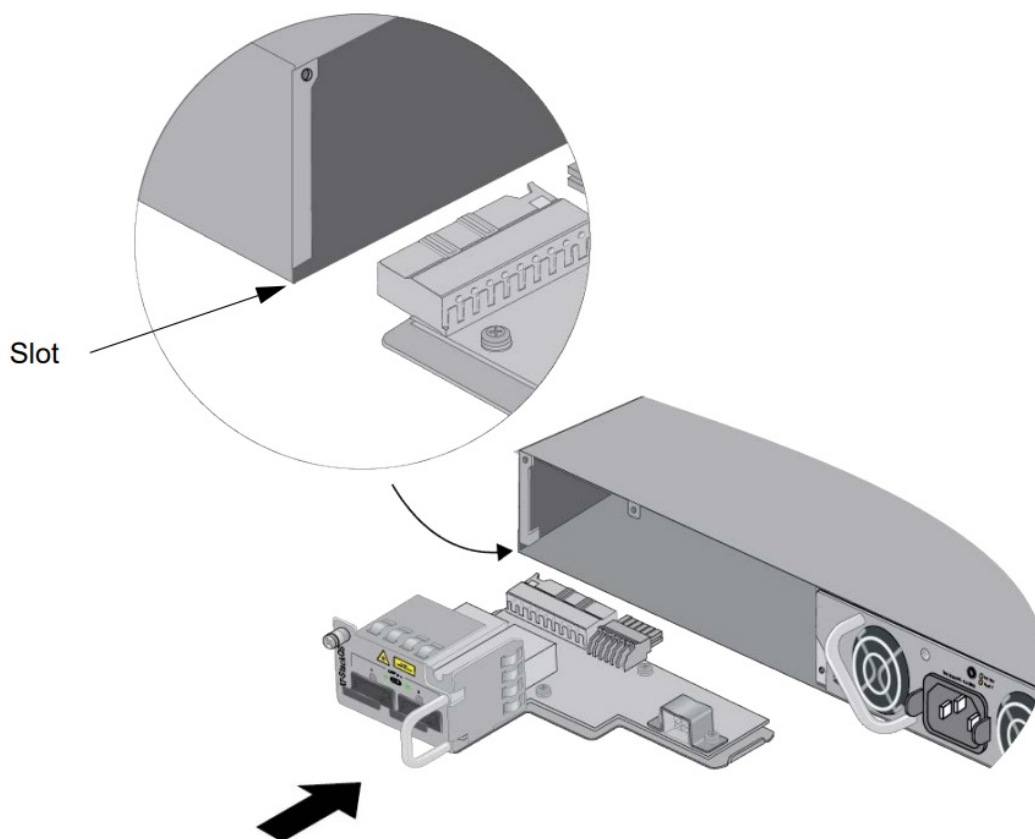
7. Remove the AT-StackQS or AT-x9EM/XT4 Card from the anti-static bag. Refer to Figure 32 on page 82.



**Figure 32. Removing the Card from the Anti-static Bag**

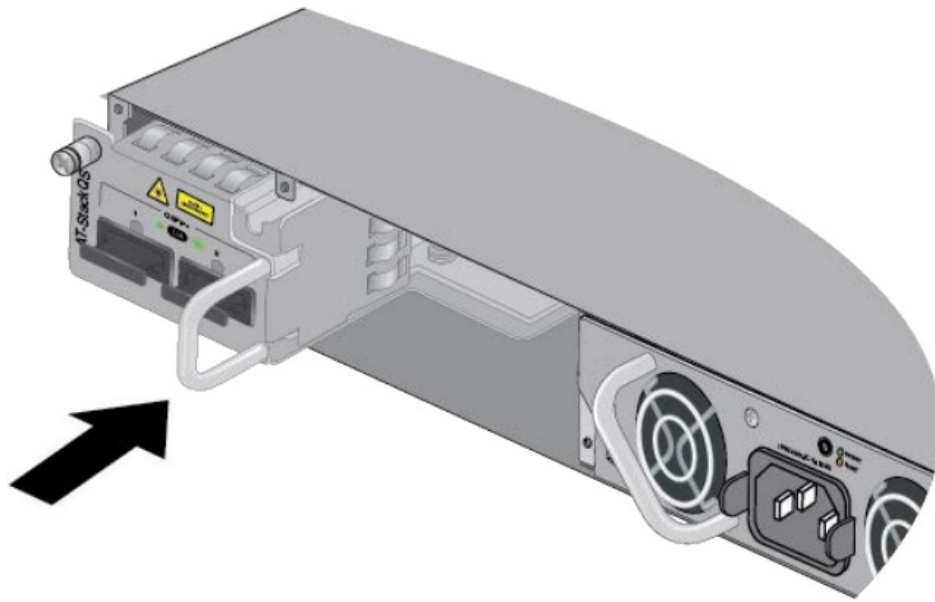
8. Carefully align the card in the slot and slide it into the switch. The left edge of the card fits into the slot in the bottom corner of the switch.

Refer to Figure 33 on page 83.



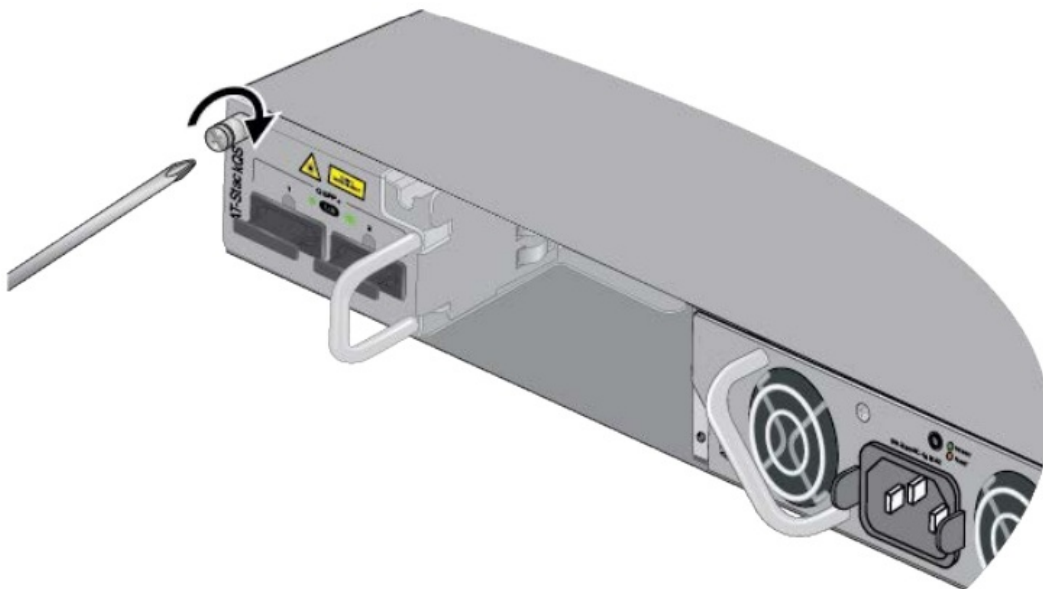
**Figure 33. Aligning the Card in the Slot**

9. When you feel the card make contact with the connector inside the switch, gently press on the handle to seat it on the connector. Refer to Figure 34.



**Figure 34. Seating the Card in the Switch**

10. Tighten the captive screw to secure the card in the switch. Refer to Figure 35.



**Figure 35. Tightening the Captive Screw on the Card**

11. Align the AT-FAN09 Module in the slot and carefully slide it into the switch. Refer to Figure 36.

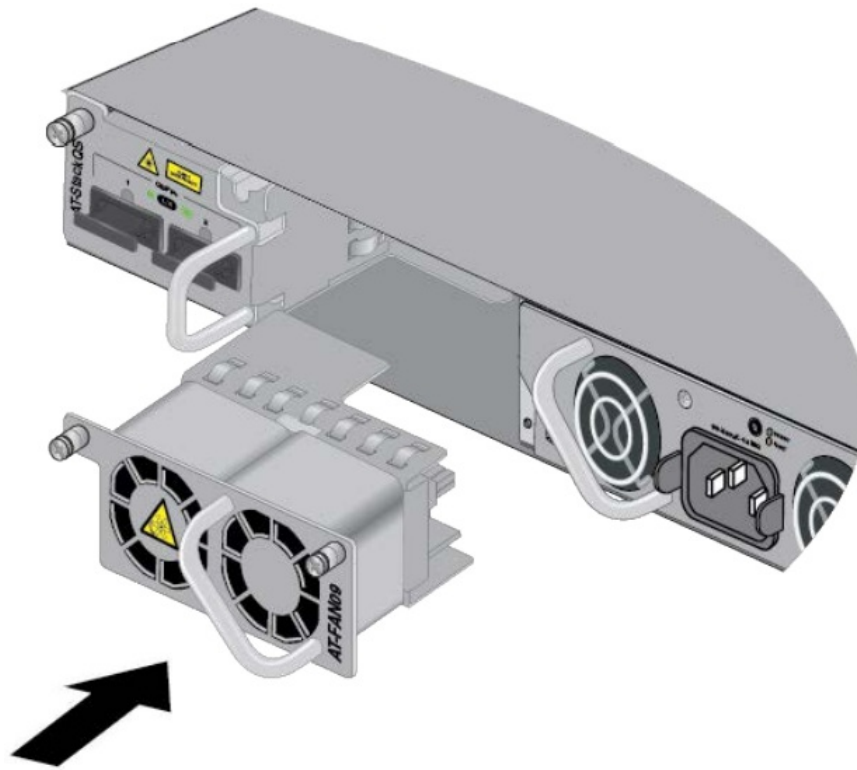


Figure 36. Aligning the AT-FAN09 Module in the Slot

12. Tighten the two captive screws on the AT-FAN09 Module to secure it to the switch. Refer to Figure 37 on page 85.

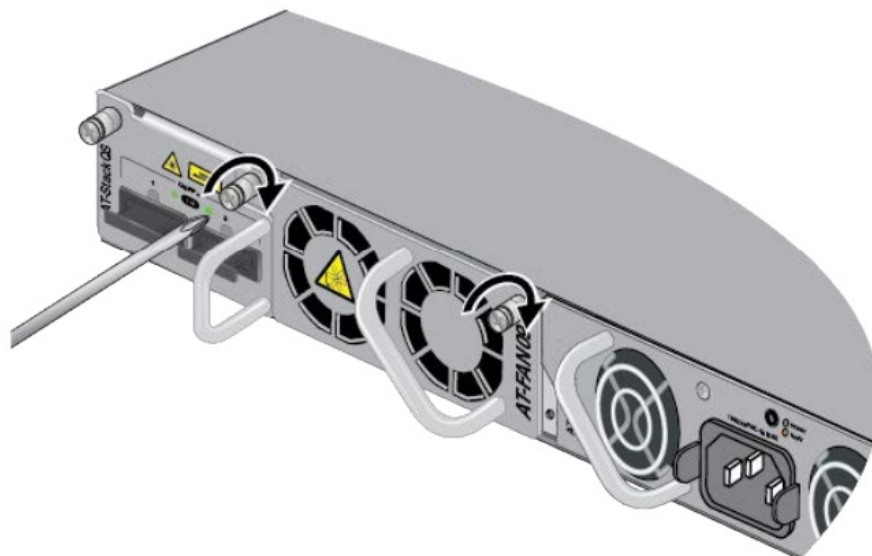
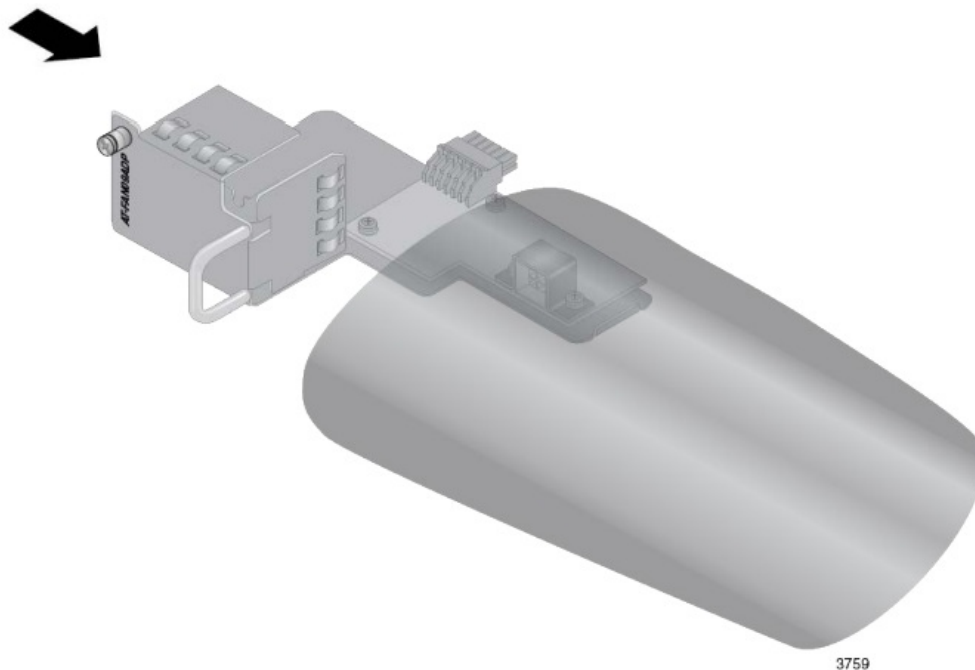


Figure 37. Tightening the Two Captive Screws on the AT-FAN09 Module

13. Store the AT-FAN09ADP Module in an anti-static bag and place it in a safe location. Refer to Figure 38.



**Figure 38. Storing the AT-FAN09ADP Module in an Anti-static Bag**

14. Do one of the following:

To install the switch on a table, go to Chapter 5, “Installing the Switch on a Table” on page 87.

To install the switch in an equipment rack, refer to Chapter 6, “Installing the Switch in an Equipment Rack” on page 89.


To install the switch on a wall, refer to Chapter 7, “Installing the Switch on a Wall” on page 95.

## Chapter 5 Installing the Switch on a Table

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



**Warning**

Switches should not be stacked on a table or desktop because that could present a personal safety hazard if you need to move or replace switches.  E91



**Warning**

The switch is heavy. Always ask for assistance when moving or lifting the device so as to avoid injuring yourself or damaging the equipment.

1. Review the procedure in “Choosing a Site for the Switch” on page 63 to verify that the selected site is suitable for the unit.
2. Check to be sure that the table or desk is strong enough to support the weight of the switch.
3. Check to be sure that all of the appropriate components are included in the shipping container. Refer to “Unpacking the Switch” on page 64.
4. Place the switch upside down on a level, secure table or desk.
5. Install the seven bumper feet to the bottom of the switch, as shown in Figure 39.

Three bumper feet should be installed along the front edge of the bottom panel and four feet along the rear edge.

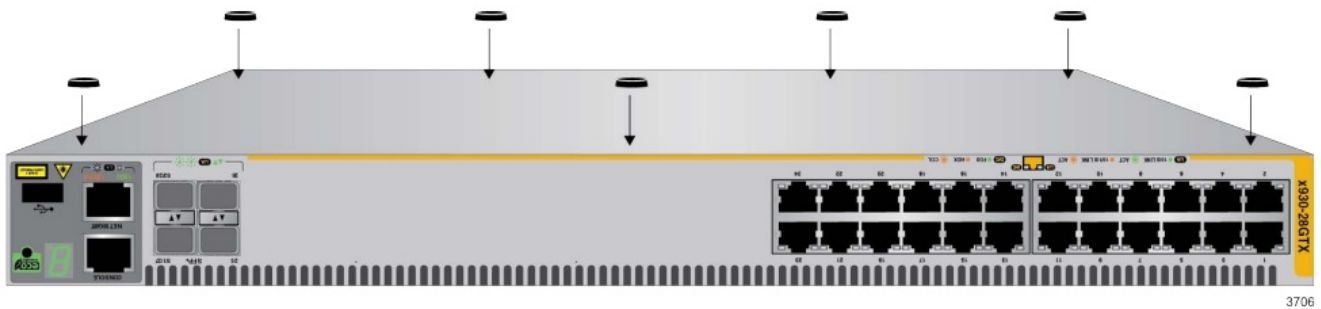


Figure 39. Installing the Bumper Feet

### Note

The bumper feet are only to be used if you are installing the switch on a table. Do not install the bumper feet if you are installing the switch in an equipment rack or on a wall.

6. Turn the chassis over.

7. Do one of the following:

If you have not installed the power supplies, go to Chapter 3, “Installing the Power Supplies” on page 67.

If the switch contains the AT-PWR250-80 DC Power Supply, go to Chapter 8, “Wiring the DC Connector on the AT-PWR250-80 Power Supply” on page 111.

Otherwise, go to Chapter 9, “Powering On the Switch” on page 115.

## Chapter 6 Installing the Switch in an Equipment Rack

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

- “Required Items” on page 90
- “Installing the Switch in an Equipment Rack” on page 91

### Required Items

This procedure requires the following items:

- Two equipment rack brackets (included with the switch)
- Eight bracket screws (included with the switch)
- Cross-head screwdriver (not provided)

### Note

The switch comes with four equipment rack brackets and sixteen screws. Two brackets and eight screws are used to install the unit in an equipment rack. The extra brackets and screws are for installing the device on a wall.

### Installing the Switch in an Equipment Rack

To install the switch in a 19-inch equipment rack, perform the following procedure:

Installation guidelines may be found in “Choosing a Site for the Switch” on page 63. Here is the procedure for installing the switch in a 19-inch equipment rack.



### Caution

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

**Note**

The x930 Series switches can be installed in an equipment rack with the AT-RKMT-SL01 Sliding Rack Mount Kit. For instructions, refer to the AT-RKMT-SL01 Sliding Rack Mount Kit Installation Guide.

1. Place the unit on a level, secure surface.
2. Attach two of the rack mount brackets to the sides of the switch using eight of the bracket screws included with the unit. Figure 40 on page 92 and Figure 41 on page 93 illustrate the four possible bracket positions.



Figure 40. Attaching the Equipment Rack Brackets

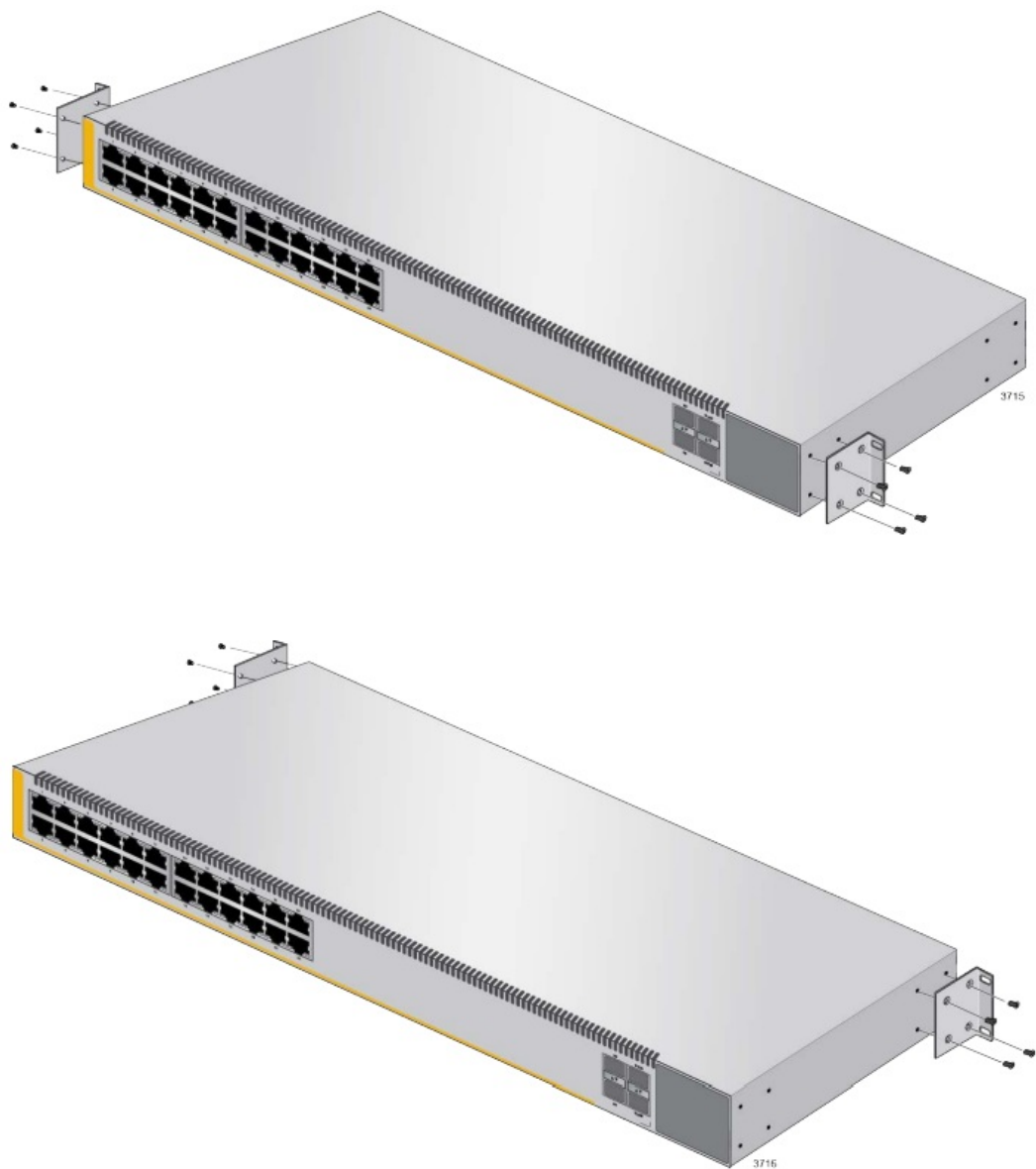


Figure 41. Attaching the Equipment Rack Brackets

3. Have two people hold the switch in the equipment rack while you secure it using standard equipment rack screws (not provided). Refer to Figure 42 on page 94.



Figure 42. Installing the Switch in an Equipment Rack

4. Do one of the following:

If you have not installed the power supplies, go to Chapter 3, “Installing the Power Supplies” on page 67.

If the switch contains the AT-PWR250-80 DC Power Supply, go to Chapter 8, “Wiring the DC Connector on the AT-PWR250-80 Power Supply” on page 111.

Otherwise, go to Chapter 9, “Powering On the Switch” on page 115.

## Chapter 7 Installing the Switch on a Wall

The procedures in this chapter are listed here:

- “Switch Orientation on the Wall” on page 96
- “Recommended Minimum Wall Area Dimensions” on page 97
- “Plywood Base for a Wall with Wooden Studs” on page 99
- “Installation Guidelines” on page 101
- “Installing the Plywood Base” on page 103
- “Installing the Switch on the Plywood Base” on page 104
- “Installing the Switch on a Concrete Wall” on page 107

### Switch Orientation on the Wall

You may install the switch on a wall with the front panel facing to the left or right, as shown in Figure 43. You may not install it with the front panel facing to the top or bottom.

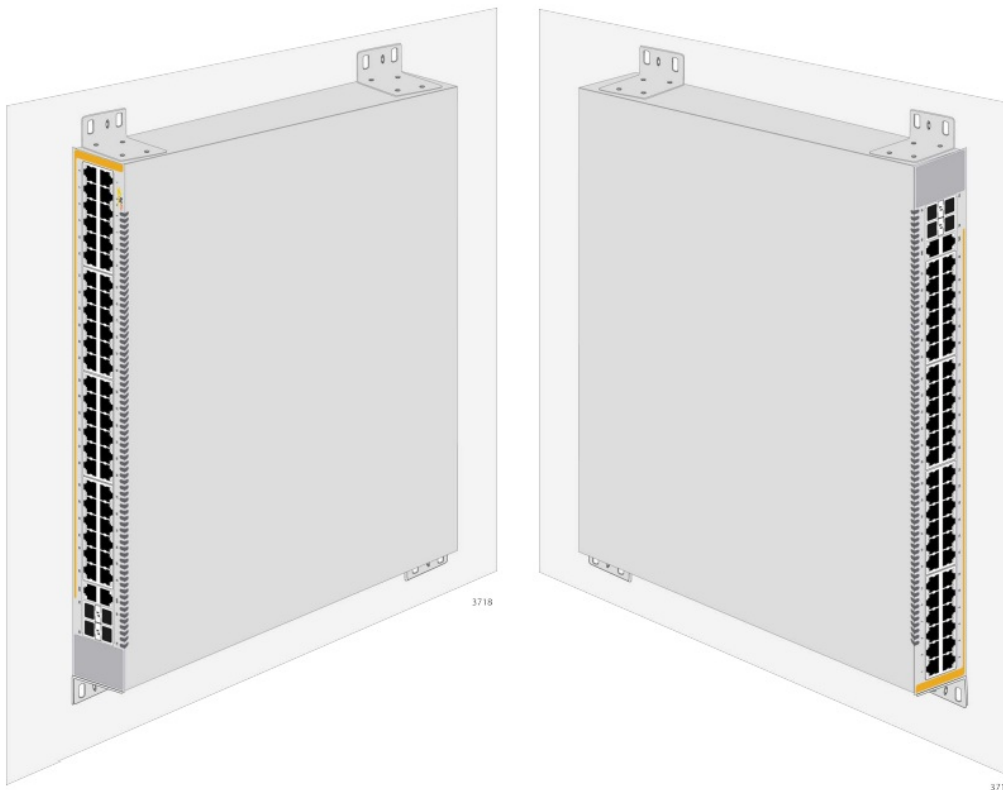


Figure 43. Positions of the Switch on the Wall

### Recommended Minimum Wall Area Dimensions

The recommended minimum dimensions for the reserved wall area for the switch are listed here:

Recommended Minimum Wall Area Dimensions

The recommended minimum dimensions for the reserved wall area for the switch are listed here:

- Width: 68.0 centimeters (27 inches)
- Height: 58.4 centimeters (23 inches)

You should position the switch in the reserved wall area such that the front panel has more space than the rear panel. This may make it easier for you to service and maintain the unit. Figure 44 and Figure 45 on page 98 illustrate the recommended positions of the switch in the reserved area when the front panel is on the left and right, respectively.

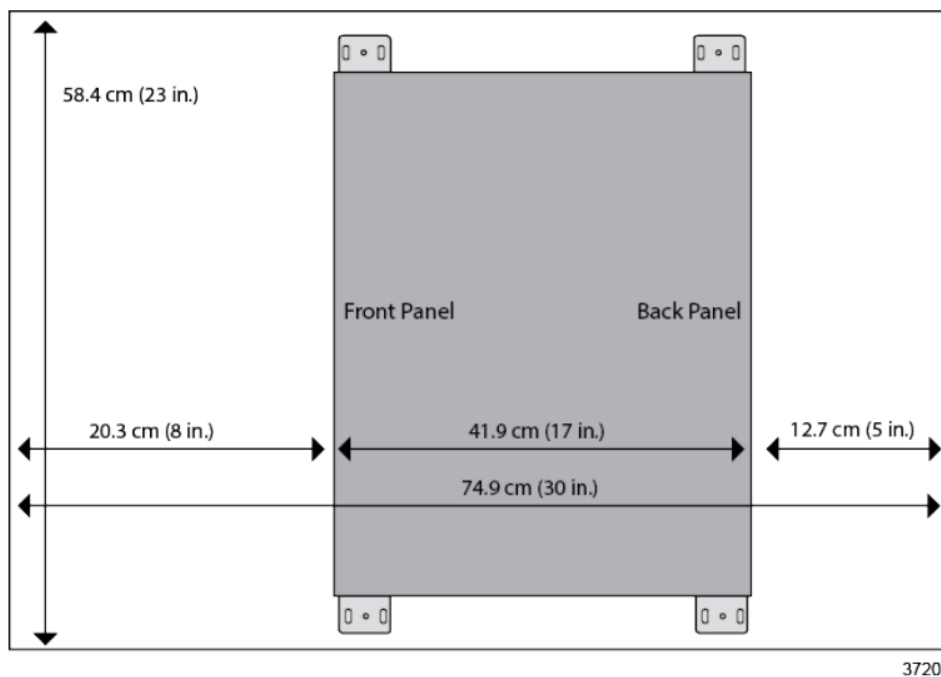
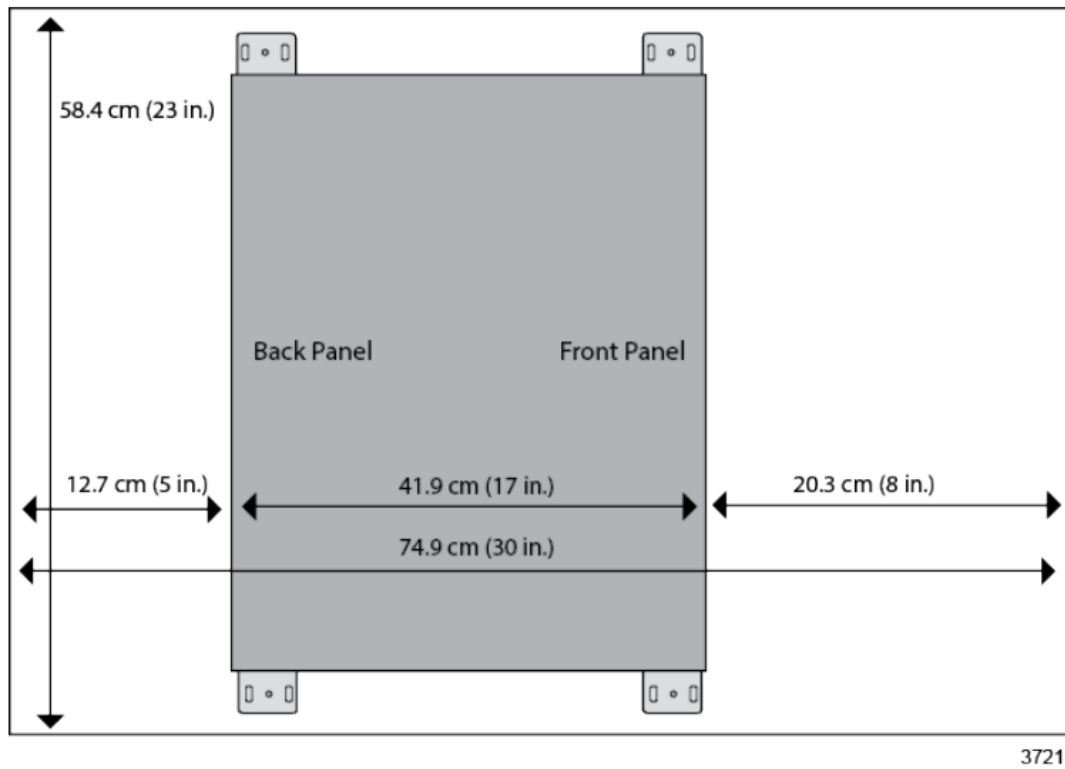


Figure 44. Minimum Wall Area Dimensions with the Front Panel on the Left

Figure 44. Minimum Wall Area Dimensions with the Front Panel on the Left



3721

Figure 45. Minimum Wall Area Dimensions with the Front Panel on the Right

#### Plywood Base for a Wall with Wooden Studs

If you are installing the switch on a wall that has wooden studs, Allied Telesis recommends using a plywood base to attach the device to the wall. (A plywood base is not required for a concrete wall.) Refer to Figure 46.

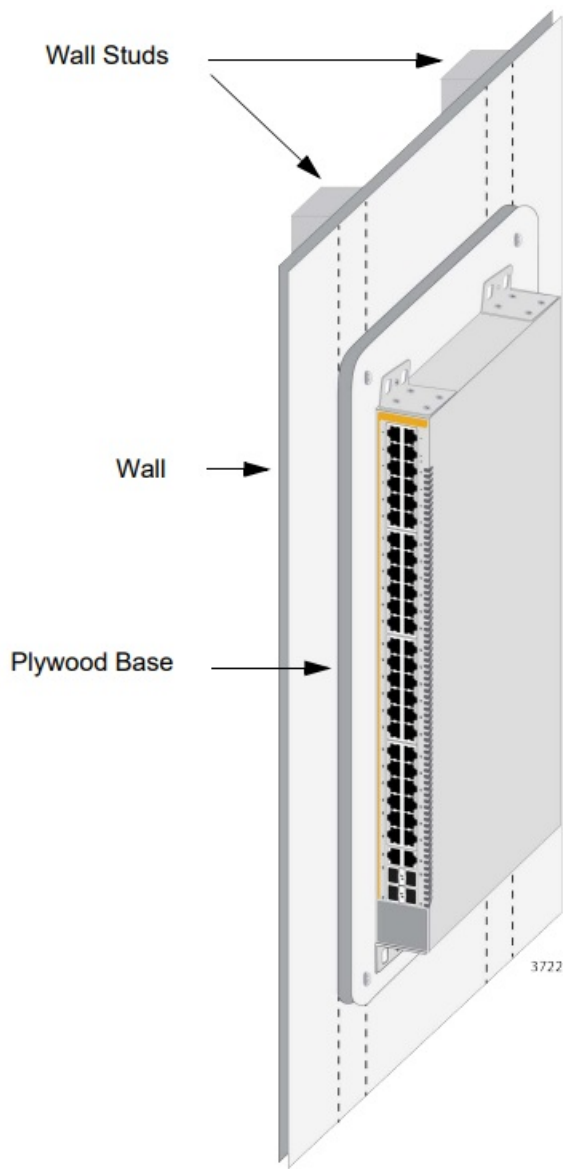


Figure 46. Switch on the Wall with a Plywood Base

The plywood base allows you to mount the switch on two wall studs. If you install the switch without the base, only one side of it would be attached to a stud. This is because the standard distance between two studs in a wall is 41 centimeters (16 inches) while the distance between the left and right brackets on the switch is 36.2 centimeters (14 1/4 inches). The recommended minimum dimensions of the plywood base are listed here:

- Width: 58.4 centimeters (23 inches)
- Height: 55.9 centimeters (22 inches)
- Thickness: 5.1 centimeters (2 inches)

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

You should install the plywood base to the wall and then install the switch on the base. Refer to Figure 47.

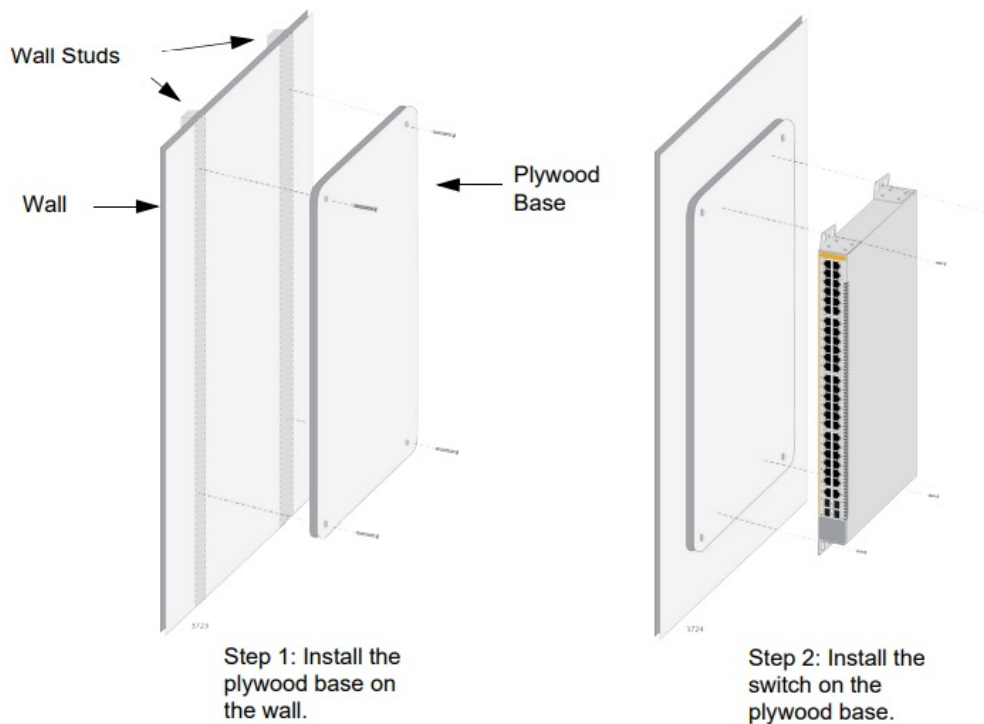


Figure 47. Steps to Installing the Switch with a Plywood Base

### Installation Guidelines

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

- You may install the switch on a wall that has wooden studs.
- You may install it on a concrete wall.
- If you are installing the switch on a wall with wooden studs, you should use a plywood base to support the switch. For more information, refer to “Plywood Base for a Wall with Wooden Studs” on page 99. A plywood base is not required for a concrete wall.
- You should not install the switch on a wall that has metal studs.  
Metal studs may not be strong enough to safely support the device.
- You should not install the switch only on sheetrock or similar material. Sheetrock is not strong enough to safely support the device.
- You should install the power supplies before installing the switch on the wall. For instructions, refer to Chapter 3, “Installing the Power Supplies” on page 67.



#### Warning

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



#### Warning

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

### Tools and Material


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

- Sixteen bracket screws (included with the switch)

- Four wall or equipment rack brackets (included with the switch)
- Four wall screws (included with the switch)
- Four anchors for a concrete wall (included with the switch)
- Cross-head screwdriver (not provided)
- Stud finder for a wooden wall, capable of identifying the middle of wall studs and hot electrical wiring (not provided)
- Drill and 1/4" carbide drill bit for a concrete wall (not provided)
- Plywood base if you are installing the switch on a wall with wooden studs (not provided.) Refer to "Plywood Base for a Wall with Wooden Studs" on page 99 for illustrations.
- Four screws and anchors for attaching the plywood base to the wall (not provided)



### **Caution**

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

### **Installing the Plywood Base**

A plywood base is recommended when installing the switch on a wall that has wooden studs. Refer to "Plywood Base for a Wall with Wooden Studs" on page 99. Consult a qualified building contractor for installation instructions for the plywood base. The installation guidelines are listed here:

- You should use a stud finder to identify the middle of studs and hot electrical wiring in the wall.
- You should attach the base to two wall studs with a minimum of four screws.
- The selected wall location for the base should adhere to the recommendations in "Choosing a Site for the Switch" on page 63 and "Recommended Minimum Wall Area Dimensions" on page 97.

### **Installing the Switch on the Plywood Base**

This procedure assumes that the plywood base for the switch is already installed on the wall. Please review "Reviewing Safety Precautions" on page 58 and "Choosing a Site for the Switch" on page 63 before performing this procedure. Allied Telesis recommends a minimum of three people for this procedure.




### **Warning**

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



### **Warning**

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

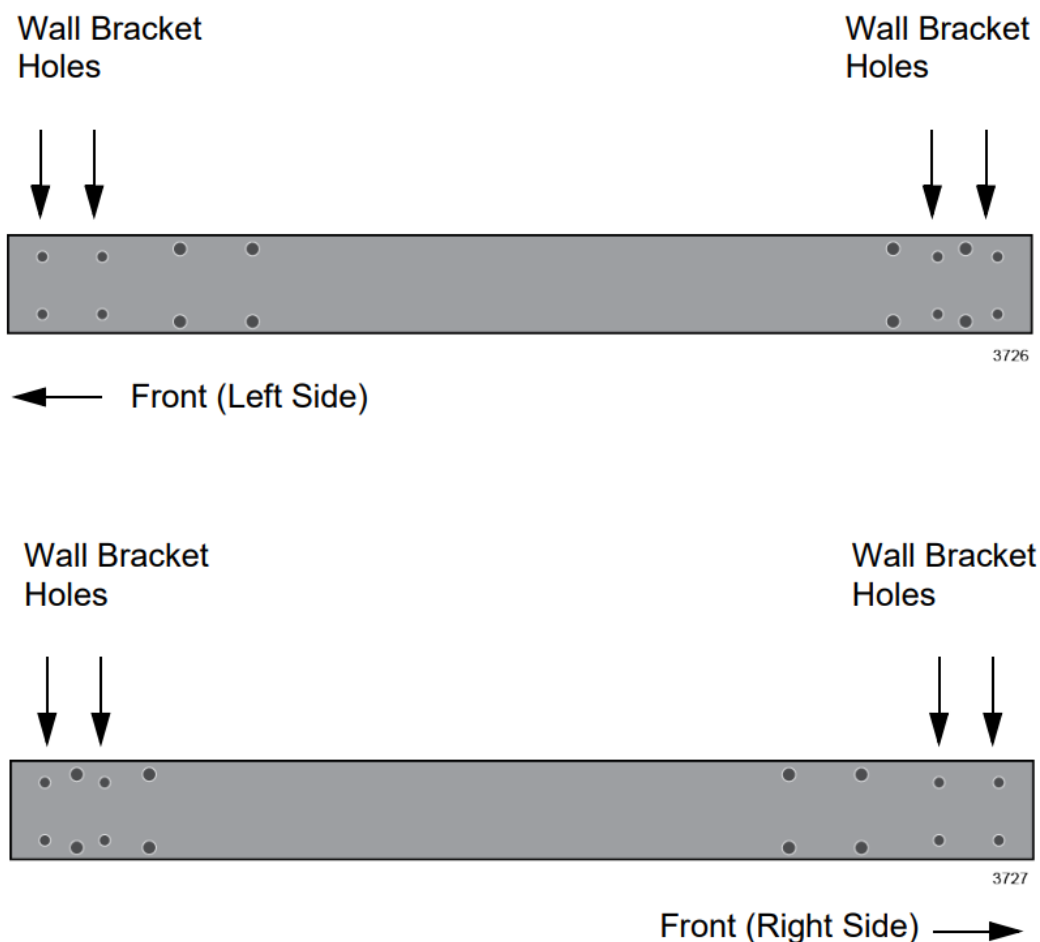
To install the switch on the plywood base, perform the following procedure:

1. Place the switch in a table.
2. Install the four brackets with the sixteen screws that come with the switch to the sides of the unit, as shown in Figure 48.



**Figure 48. Installing the Brackets to the Switch for Wall Installation**

The sides of the switch have two sets of holes. One set is for installing the switch on a wall with the brackets and the other set is for the ATRKMT-SL01 Rack Mounting Kit. The holes for the brackets are identified in Figure 49.



**Figure 49. Mounting Holes**

3. After attaching the brackets to the side of the switch, have two people hold the switch on the plywood base on the wall while you secure it with the four provided screws. Refer to Figure 50 on page 106.

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

Position the switch so that the front panel is either on the left or the right. Refer to Figure 43 on page 96. You may not install the switch with the front panel facing up or down.

Leave sufficient space from other devices or walls so that you can access the front and back panels. Refer to

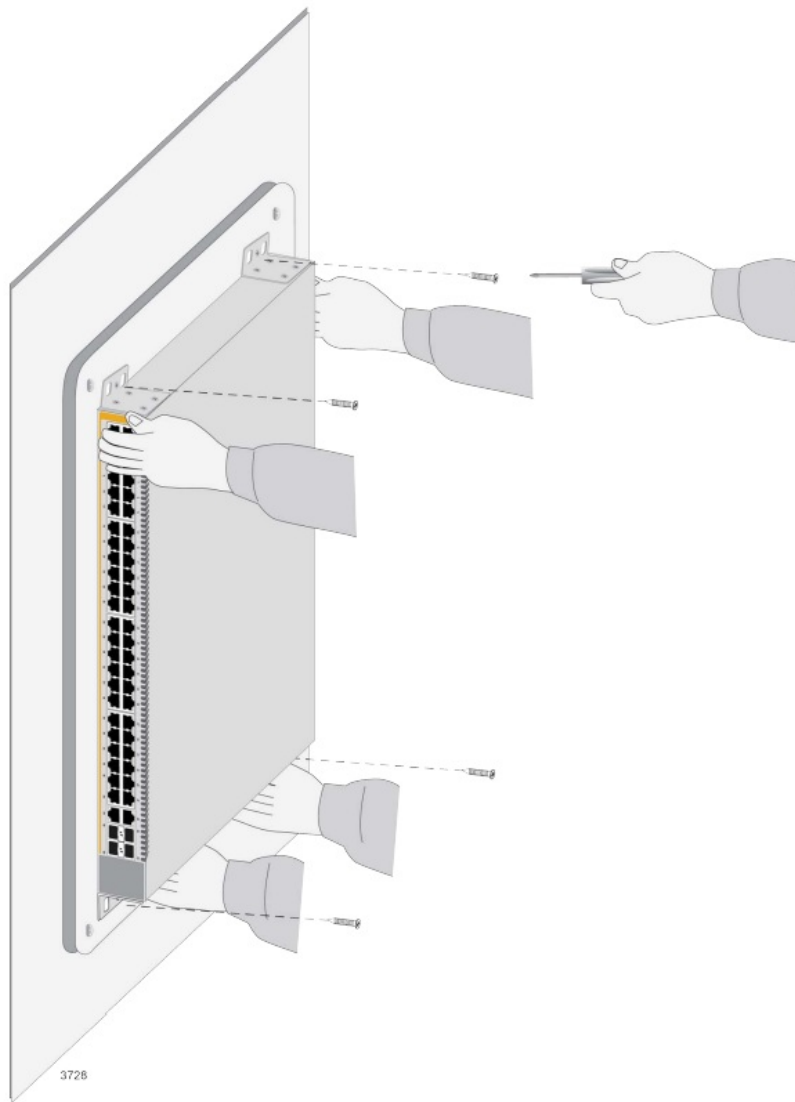


Figure 50. Securing the Switch to the Plywood Base

4. Do one of the following:

If the switch contains the AT-PWR250-80 DC Power Supply, go to Chapter 8, “Wiring the DC Connector on the AT-PWR250-80 Power Supply” on page 111.

Otherwise, go to Chapter 9, “Powering On the Switch” on page 115.

### Installing the Switch on a Concrete Wall

Allied Telesis recommends a minimum of three people for this procedure.

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



**Warning**

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



**Warning**

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

1. Place the switch in a table.
2. Install the four brackets with sixteen screws that come with the switch to the sides of the unit, as shown in Figure 48 on page 104 and Figure 49 on page 105.

3. Have two people hold the switch on the concrete wall at the selected location for the device while you use a pencil or pen to mark the wall with the locations of the four screw holes in the four brackets. Refer to Figure 51 on page 108.

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

Position the switch so that the front panel faces the left or the right.

Refer to Figure 43 on page 96. You may not install the switch with the front panel facing up or down.

Leave sufficient space from other devices or walls so that you can access the front and back panels. Refer to “Recommended Minimum Wall Area Dimensions” on page 97.

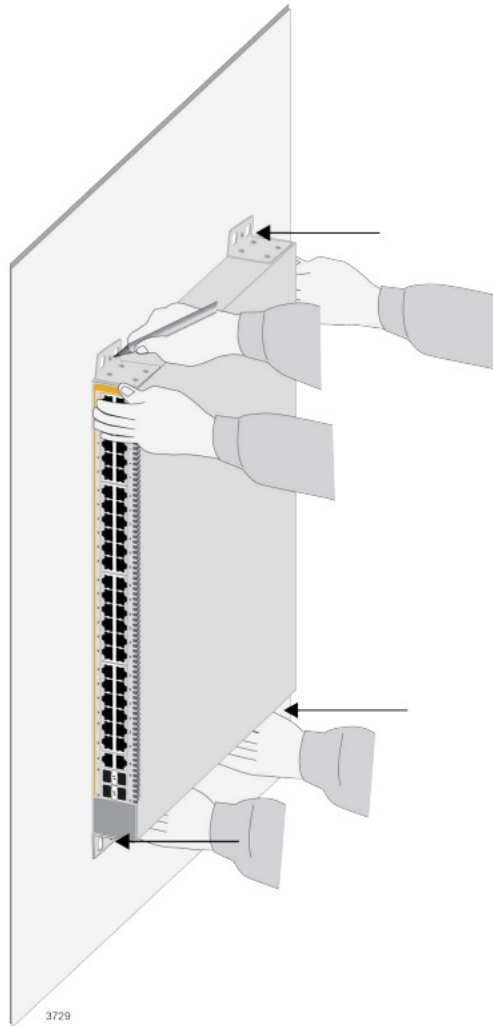


Figure 51. Marking the Locations of the Bracket Holes on a Concrete Wall

4. Place the switch on a table or desk.
5. Use a drill and 1/4" carbide drill bit to pre-drill the four holes you marked in step 3. Please review the following guidelines:
  - Prior to drilling, set the drill to hammer and rotation mode. The modes break up the concrete and clean out the hole.
  - Allied Telesis recommends cleaning out the holes with a brush or compressed air.
6. Insert the four anchors into the holes.
7. Have two people hold the switch at the selected wall location while you secure it with the four provided screws. Refer to Figure 52.

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

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

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

6. Insert the four anchors into the holes.
7. Have two people hold the switch at the selected wall location while you secure it with the four provided screws.  
Refer to Figure 52.

7. Have two people hold the switch at the selected wall location while you secure it with the four provided screws. Refer to Figure 52.

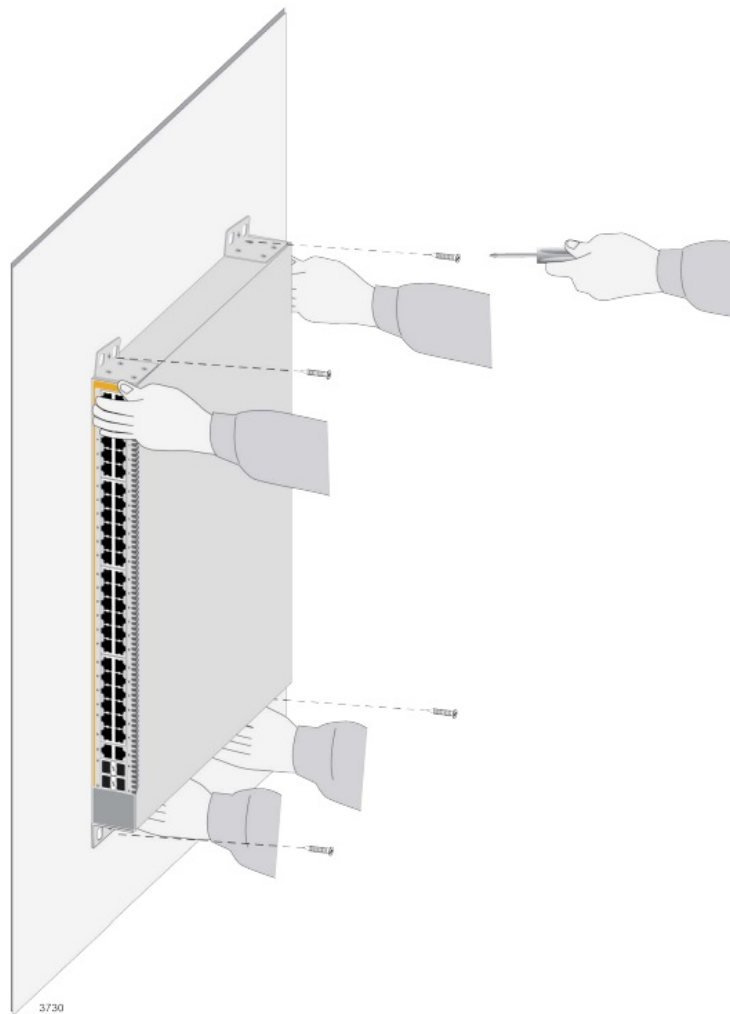


Figure 52. Installing the Switch on a Concrete Wall

8. Do one of the following:

If the switch contains the AT-PWR250-80 DC Power Supply, go to Chapter 8, “Wiring the DC Connector on the AT-PWR250-80 Power Supply” on page 111.


Otherwise, go to Chapter 9, “Powering On the Switch” on page 115.

## Chapter 8 Wiring the DC Connector on the ATPWR250-80 Power Supply

This chapter contains the procedure for wiring the DC connector on the AT-PWR250-80 DC power supply.




### Warning

As a safety precaution, install a circuit breaker with a minimum value of 15 Amps between the equipment and the DC power source.  E9




### Warning

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




### Warning

For centralized DC power connection, install only in a restricted access area.  E23



### Warning

This equipment must be installed in a Restricted Access location.  E45

## Note

A tray cable is required to connect the power source if the unit is powered by centralized DC power. The tray cable must be a UL listed Type TC tray cable and rated at 600 V and 90 degrees C, with three conductors, minimum 14 AWG. E24

To wire the DC connector on the AT-PWR250-80 DC Power Supply, perform the following procedure:

1. Power off the DC circuit to which the switch will be connected.
2. Verify that the On/Off switch on the power supply is in the Off position.

Refer to Figure 53.

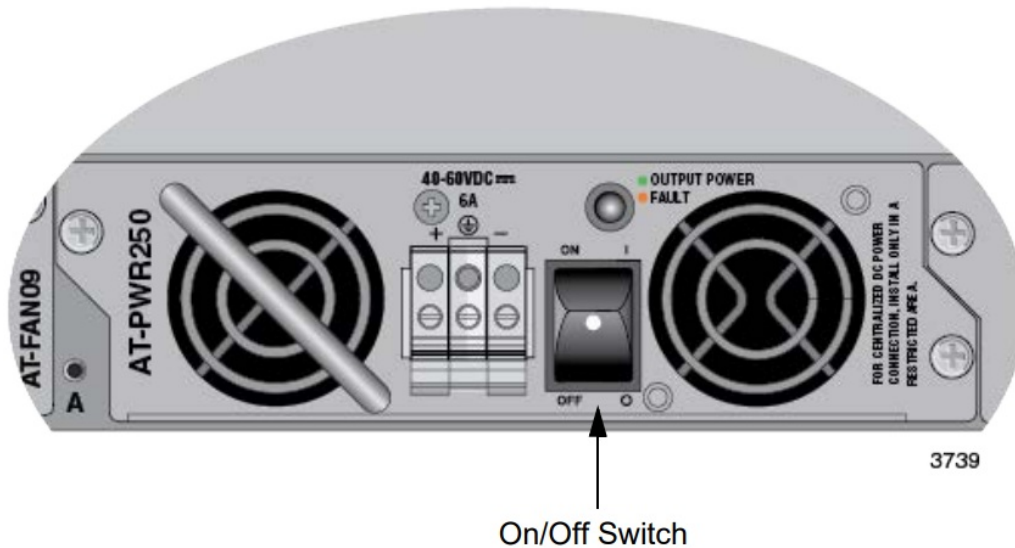


Figure 53. On/Off Switch on AT-PWR250-80 Power Supply

3. Use the legend above the terminal block to identify the terminals. The terminals are positive, power supply ground and negative, from left to right, as shown in Figure 54.

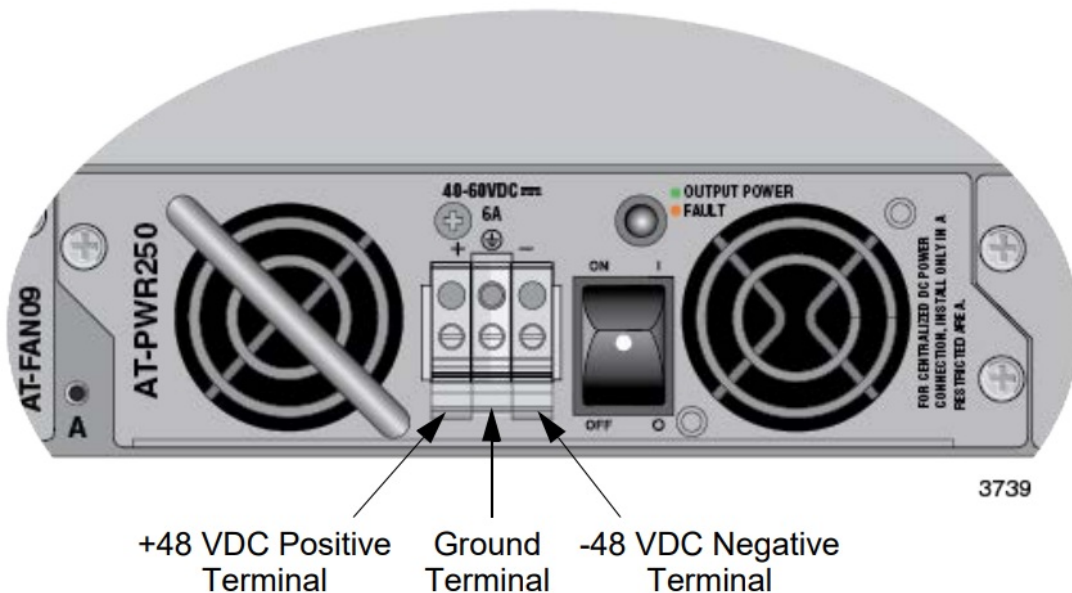


Figure 54. DC Terminal Block

4. With a 14-gauge wire-stripping tool, strip the three wires in the tray cable coming from the DC input power source to 8mm 1mm (0.31 in., 0.039 in.), as shown in Figure 55 on page 113.



## Warning

Do not strip more than the recommended amount of wire. Stripping more than the recommended amount can create a safety hazard by leaving exposed wire on the terminal block after installation. E10

8mm +/- 1mm  
(0.31 in. +/- 0.039 in.)

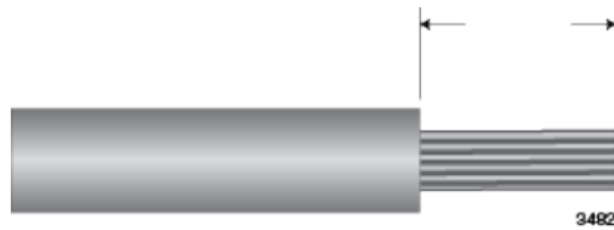


Figure 55. Stripped Wire

5. Insert the power supply ground wire into the middle connector of the DC terminal and tighten the connection with a flathead screwdriver.

Refer to Figure 56.



**Warning**

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

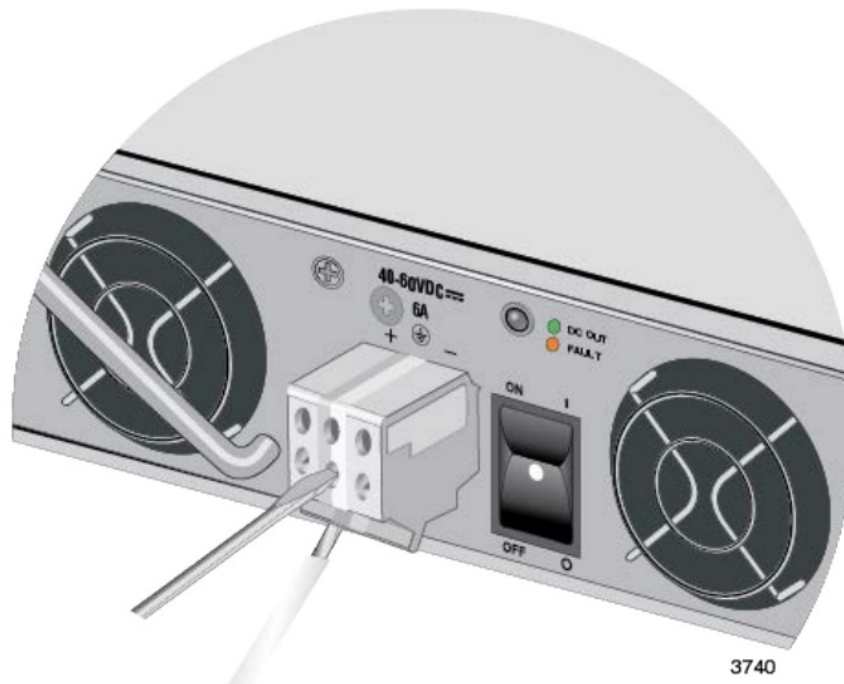


Figure 56. Connecting the Ground Wire to the DC Terminal Block

6. Connect the +48 VDC (RTN) feed wire to the terminal block marked + (plus).
7. Connect the -48 VDC feed wire to the terminal block marked - (minus).




**Warning**

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

8. Secure the tray cable near the rack framework using multiple cable ties to minimize the chance of the connections being disturbed by casual contact with the wiring. Use at least four cable ties, separated four inches apart. Locate the first one within six inches of the terminal block.

### Note

This system will work with a positive grounded or negative grounded DC system.  E13

9. Verify that the circuit breaker is in the OFF position.
10. Connect the supply-cable wires to the circuit breaker


### Note

Connect the supply-cable wires to the circuit breaker. Do not power on the switch at this time.

11. If the switch has two AT-PWR250-80 Power Supplies, repeat this procedure to wire the DC connector.
12. Go to Chapter 9, “Powering On the Switch” on page 115.



### Warning

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

## Chapter 9 Powering On the Switch

This chapter contains the following procedures:

- “Powering On AC Power Supplies” on page 116
- “Powering On the AT-PWR250-80 DC Power Supply” on page 120
- “Monitoring the Initialization Processes” on page 122


### Powering On AC Power Supplies

This section contains the procedure for powering on the AT-PWR250, T-PWR800, or AT-PWR1200 Power Supply. Please review the following items before you power on the device:

- Connecting the power cords of the switch with two power supplies to different circuits can protect the unit from a power circuit failure.
- If the switch has two power supplies, you may power them on at the same time or individually.
- Refer to “Power Specifications” on page 159 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

To power on the switch, perform the following procedure:

1. Raise the power cord retaining clip on the power supply. Refer to Figure 57 on page 117. (The AT-PWR1200 Power Supply does not have a retaining clip.)

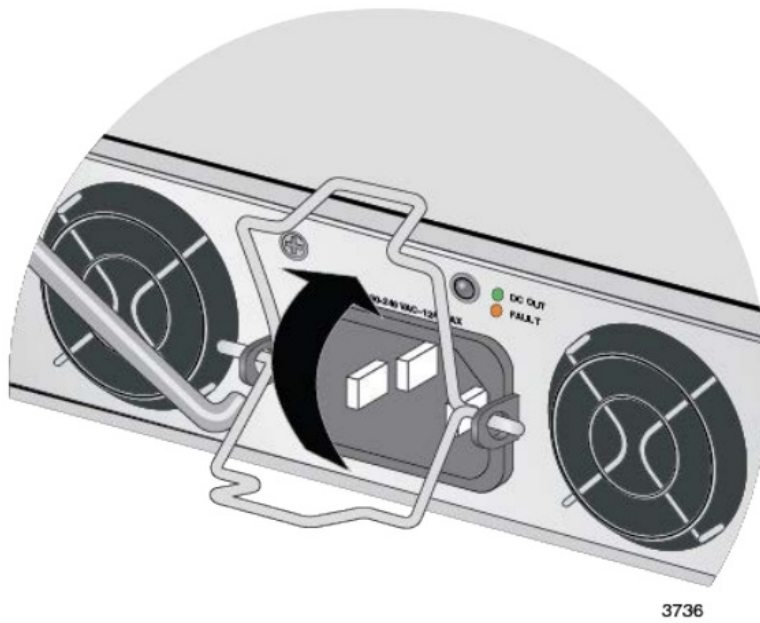


Figure 57. Raising the Power Cord Retaining Clip

2. Connect the AC power cord to the connector on the power supply and to an appropriate power source. Refer to Figure 58 on page 118.

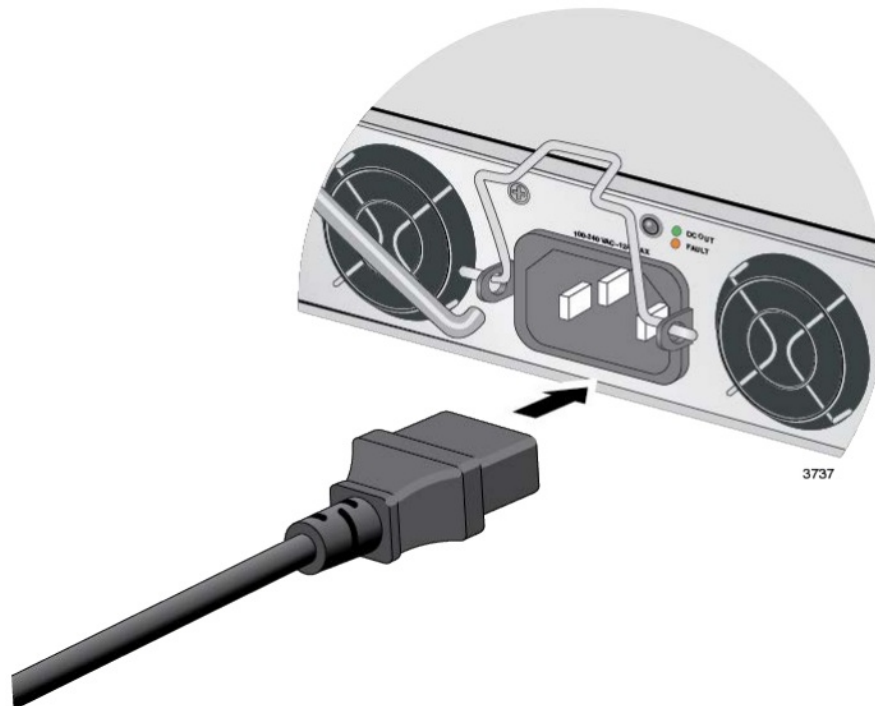


Figure 58. Connecting the AC Power Cord

3. Lower the power cord retaining clip to secure the cord to the switch.  
Refer to Figure 59 on page 119.



**Figure 59. Lowering the Power Cord Retaining Clip**

4. Examine the DC OUT/FAULT LED on the power supply. The module is operating normally when the LED is green. If the LED is amber or off, refer to Chapter 12, “Troubleshooting” on page 149 for troubleshooting suggestions.
5. If the switch has two AC power supplies, repeat this procedure to power on the second power supply.
6. Do one of the following:
  - To monitor the switch as it initializes the management software, go to “Monitoring the Initialization Processes” on page 122.
  - If you do not want to monitor the initialization process, wait two minutes for the switch to initialize its management software and then go to Chapter 10, “Configuring the Switch for Standalone Operation” on page 125.

### **Powering On the AT-PWR250-80 DC Power Supply**

This section contains the procedure for powering on the AT-PWR250-80 DC Power Supply. Please review the following items before powering on the device:

- This procedure assumes you have already wired the DC connector on the AT-PWR250-80 DC Power Supply. For instructions, refer to Chapter 8, “Wiring the DC Connector on the AT-PWR250-80 Power Supply” on page 111.
- If the switch has two power supplies, you may power them on at the same time or individually.
- Refer to “Power Specifications” on page 159 for the power specifications of the switches.

To power on the AT-PWR250-80 Power Supply, perform the following procedure:

1. Power on the DC circuit to which the power supply is connected.
2. Set the On/Off switch on the power supply to On. Refer to Figure 60.

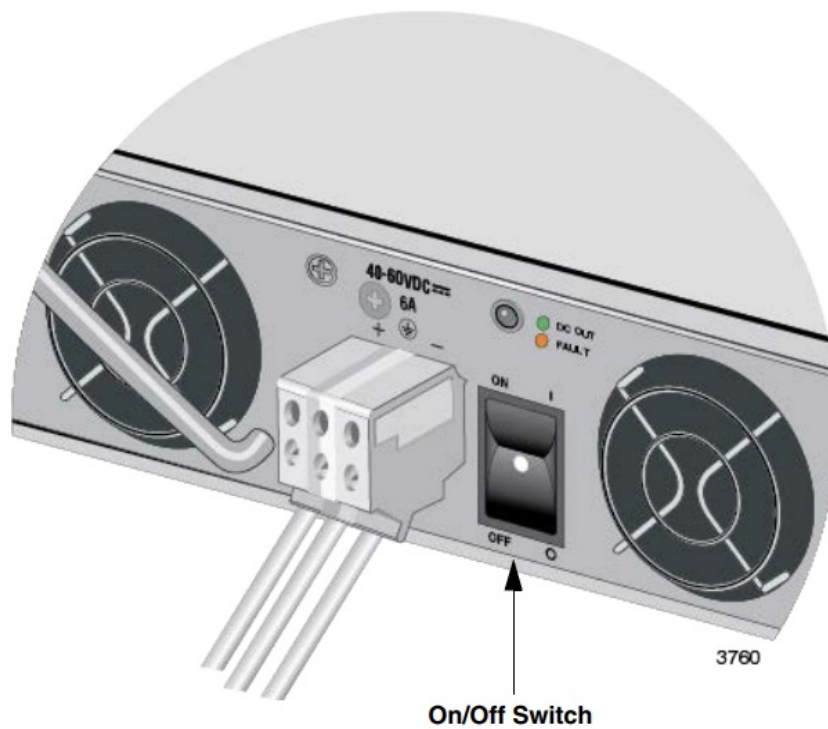


Figure 60. On/Off Switch on the AT-PWR250-80 DC Power Supply

3. Examine the DC OUT/FAULT LED on the power supply module. The module is operating normally when the LED is green. If the LED is amber or off, refer to Chapter 12, “Troubleshooting” on page 149 for troubleshooting suggestions.
4. If the switch has two AT-PWR250-80 Power Supplies, repeat this procedure to power on the second power supply.
5. Do one of the following:

To monitor the switch as it initializes the management software, go to “Monitoring the Initialization Processes” on page 122.

If you do not want to monitor the initialization process, wait two minutes for the switch to initialize its management software and then go to Chapter 10, “Configuring the Switch for Standalone Operation” on page 125.

### Monitoring the Initialization Processes

It takes about two minutes for the switch to initialize its management software programs and features, and load the default configuration. You may monitor the bootup sequence by connecting a terminal or computer that has a terminal emulator program, to the Console port on the master switch. You will see the messages in Figure 61 here to Figure 63 on page 124.

The diagram illustrates a transformation between two geometric shapes. On the left is a solid triangle. On the right is a dashed triangle. Arrows point from the solid triangle to the dashed triangle, indicating a transformation. The dashed triangle is a mirror image of the solid triangle across a vertical line.

### Figure 61. Switch Initialization Messages

```

Starting base/poe_done...           [ OK ]
Starting base/sysctl...             [ OK ]
Received event poefw.done
Starting base/portmapper...        [ OK ]
Received event syslog.done
Starting base/reboot-stability...   [ 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 base/external-mdeia...     [ OK ]
Starting network/stackd...          [ OK ]
Starting network/election.timeout... [ OK ]
Received event network.enabled

Initializing HA processes:
atmfd, auth, bgpd, cntrd, epsr, hostd, hsl
imiproxyd, irdpd, lacp, lldpd, loopprot, mstp, nsm
ospf6d, ospfd, pdmd, pim6d, ripd, ripngd
rmon, sflowd, udldd, vrrpd, imi

Received event network.initialized
17:50:25 awplus-1 VCS[2119]: No neighboring members found, unit may be in a
stand alone configuration
Received event vcs.elected-master
17:50:25 awplus-1 VCS[2119]: Startup speed can be improved by adding 'no
stack 1 enable' to configuration
03:44:11 awplus-1 VCS[2119]: Member 1 (eccd.edd1.64ab) has become the Active
Master
Assigning Active workload to HA processes:
hsl, authd, epsrd, irdpd, lacpd, loopprot
mstp, nsm, ospfd, ripd, rmond, sflowd, vrrpd
imi, imiproxyd

```

```

Received event network.activated

Loading default configuration
warning: flash:/default.cfg does not exist, loading factory defaults.
..
done!
Received event network.configured

awplus login:

```

After the switch has initialized its management software, go to Chapter 10, “Configuring the Switch for Standalone Operation” on page 125.

## Chapter 10 Configuring the Switch for Standalone Operation

This chapter contains the following procedures:

- “Determining the Status of the Switch” on page 126
- “Starting a Local Management Session” on page 127
- “Disabling VCStack” on page 129
- “Verifying Support for Hardware Options” on page 132

### **Determining the Status of the Switch**

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 already disabled and the switch is operating as a standalone unit. Do one of the following:
  - If the switch contains the optional AT-StackQS or AT-x9EM/XT4 Card, go to “Verifying Support for Hardware Options” on page 132.
  - If the switch does not contain the optional AT-StackQS or ATx9EM/XT4 Card, go to Chapter 11, “Cabling the Networking Ports” on page 133.
- If the LED is displaying the number “1” or higher, the VCStack feature is enabled on the unit. You need to disable it. For instructions, begin with “Starting a Local Management Session,” next.



#### **Caution**

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

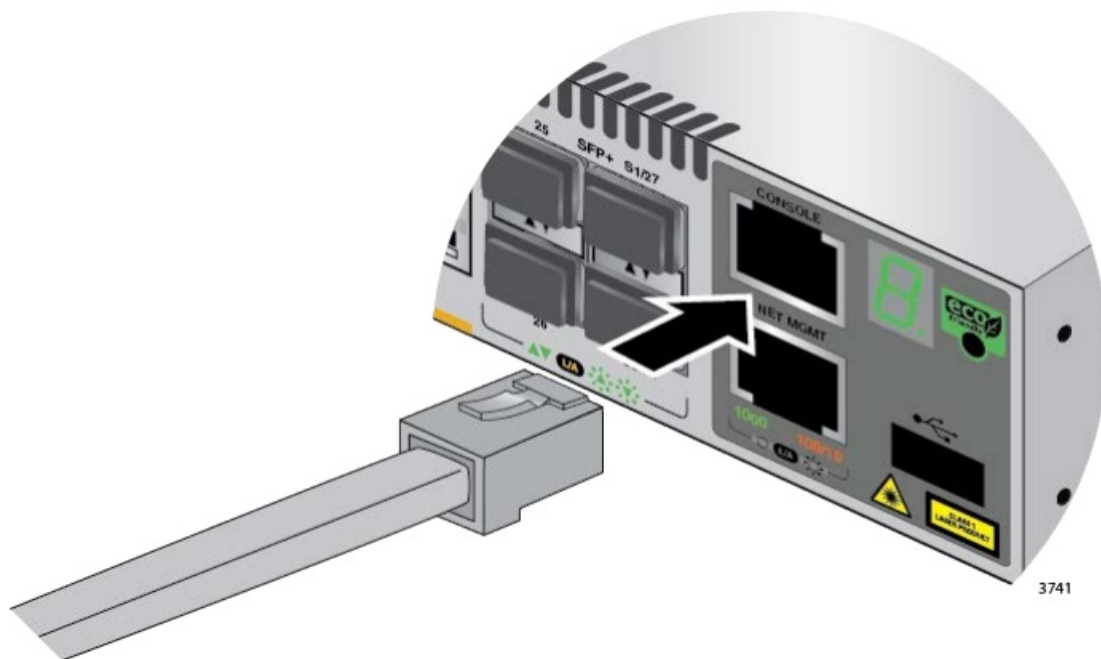
#### **Note**

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 64.



**Figure 64. 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. When prompted for a user name, go to “Disabling VCStack” on page 129.

**Disabling VCStack**

To disable the VCStack feature to use the switch as a standalone unit, perform the following procedure:

**Caution**

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

1. Start a local management session on the switch. For instructions, refer to “Starting a Local Management Session” on page 127.
2. When prompted, enter a user name and password to log on the switch.
  - 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 65. is displayed.

## Figure 65. User Exec Mode Prompt

### Note

The User Exec mode is the first level in the command mode interface. For complete information on the modes and commands, refer to the Software Reference for x930 Series Switches, AlliedWare Plus Operating System at [www.alliedtelesis.com](http://www.alliedtelesis.com).

- Enter the SHOW STACK command to display the status of the VCStack feature. Figure 66 is an example of the command.

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

Figure 66. SHOW STACK Command

- Review the following items:

If the Operational Status is “Stacking Hardware Disabled,” the VCStack feature is already disabled on the switch and the SFP+ S1 and S2 stacking slots may be used with regular SFP or SFP+ transceivers. Do one of the following:

- If the switch contains the optional AT-StackQS or AT-x9EM/XT4 Card, go to “Verifying Support for Hardware Options” on page 132.
- If the switch does not contain the optional AT-StackQS or ATx9EM/XT4 Card, go to Chapter 11, “Cabling the Networking Ports” on page 133.

If the Operational Status is “Standalone Unit,” as shown in Figure 66 on page 129, the VCStack feature is active on the unit. You must disable it by performing the steps in the rest of this procedure before using the SFP+ S1 and S2 stacking slots with regular SFP or SFP+ transceivers. The reason the status says “standalone” is because the switch is functioning as a stack of one switch.

- Move to the Global Configuration mode by entering the ENABLE and CONFIGURE TERMINAL commands, as shown in Figure 67.

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

Figure 67. Moving to the Global Configuration Mode

- 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 68 is displayed.

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

**Figure 68. Confirmation Prompt for the NO STACK ENABLE Command**

7. Type Y to disable VCSave on the switch or N to cancel the procedure.

The switch displays the message in Figure 69.

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

**Figure 69. Disabling VCSave.**

8. Press the Return key to re-display the Global Configuration mode prompt.
9. Enter the EXIT command to return to the Privileged Exec mode, as shown in Figure 70.

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

**Figure 70. Returning to the Privileged Exec Mode**

10. Enter the WRITE command to save your change in the configuration file. The switch displays the confirmation prompt in Figure 71.

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

**Figure 71. Saving the Changes with the WRITE Command**

If this is the initial management session, the switch automatically creates the Default.cfg configuration file and stores your change in the file.

11. Enter the REBOOT command to reboot the switch.
12. At the confirmation prompt, type "Y" for yes.
13. Wait two minutes for the switch to initialize its management software and afterwards examine the Switch ID LED again. The switch is ready for normal network operations as a standalone unit when its ID number is "0." If the number is not "0," repeat this procedure. Be sure to save the configuration change with the WRITE command in step 10.
14. Do one of the following:
  - If the switch contains the optional AT-StackQS or AT-x9EM/XT4 Card, go to "Verifying Support for Hardware Options" on page 132.
  - If the switch does not contain the optional AT-StackQS or ATx9EM/XT4 Card, go to Chapter 11, "Cabling the Networking Ports" on page 133.

### **Verifying Support for Hardware Options**

This section contains the procedure for viewing the version number of the management software on the switch. Allied Telesis recommends performing this procedure if you installed the optional AT-StackQS or ATx9EM/XT4 Module. The module requires version 5.4.5-2 or later of the management software.

To view the version number of the management software, perform the following procedure. If the switch is powered off, start with step 1. If the switch is already powered on, start with step 3:

1. Power on one of the switches by doing one of the following:

If the switch has an AC power supply, connect the AC power cord to the power supply on the back panel and to an AC power source. If the switch has two power supplies, you need to power on only one of them for this procedure.

If the switch has the DC AT-PWR250-80 Power Supply, power on the DC circuit and the On/Off switch on the power supply. (If you have not yet wired the DC connector on the power supply, refer to Chapter 8, “Wiring the DC Connector on the AT- PWR250-80 Power Supply” on page 111.)

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

3. Start a local management session on the switch. For instructions, refer to “Starting a Local Management Session” on page 127.

4. In the User Exec mode, enter either the SHOW SYSTEM or SHOW VERSION command.

5. Examine the Software Version field in the information the command displays on your screen and do one of the following:

If the field says “545-2” or later, the management software on the switch supports the AT-x9EM/XT4 Module. Go to Chapter 11, “Cabling the Networking Ports” on page 133.

If the field says “545” or “545-1”, the management software does not support the optional module. You must update the operating software on the switch to the latest release before you can use the module. For upgrade instructions, refer to the Software Reference for x930 Series Switches, AlliedWare Operating System from [www.alliedtelesis.com](http://www.alliedtelesis.com).

## Chapter 11 Cabling the Networking Ports

This chapter contains the following procedures:

- “Cabling Copper Ports” on page 134
- “Installing SFP or SFP+ Transceivers” on page 136
- “Specifying Ports in the Command Line Interface for Standalone Switches” on page 141
- “Installing AT-SP10TW Direct Connect Cables” on page 143
- “Cabling the AT-StackQS Card with AT-QSFPICU Cables” on page 145
- “Cabling the AT-StackQS Card with Fiber Optic Transceivers” on page 147

### Cabling Copper Ports

Here are the guidelines to cabling the 10/100/1000Base-T copper ports:

- The cable specifications for the ports are listed in “Cable Requirements” on page 32.
- The connectors on the cables should fit snugly into the ports, and the tabs should lock the connectors into place.
- The default setting for the wiring configurations is auto-MDI/MDI-X.  
The default setting is appropriate for switch ports that are connected to 10/100Base-TX network devices that also support auto-MDI/MDI-X.
- The default auto-MDI/MDI-X setting is not appropriate for switch ports that are connected to 10/100Base-TX network devices that do not support auto-MDI/MDI-X and have a fixed wiring configuration. For switch ports

connected to those types of network devices, you should disable auto-MDI/MDI-X and set the wiring configurations manually.

- The appropriate MDI/MDI-X setting for a switch port connected to a 10/100Base-TX network device with a fixed wiring configuration depends on the setting of the network device and whether the switch and network device are connected with straight-through or crossover cable. If you are using straight-through copper cable, the wiring configurations of a port on the switch and a port on a network device must be opposite each other, such that one port uses MDI and the other MDI-X. For example, if a network device has a fixed wiring configuration of MDI, you must disable auto-MDI/MDI-X on the corresponding switch port and manually set it to MDI-X. If you are using crossover copper cable, the wiring configurations of a port on the switch and a port on a network device must be the same.
- The default speed setting for the ports is Auto-Negotiation. This setting is appropriate for ports connected to network devices that also support Auto-Negotiation.
- The default speed setting of Auto-Negotiation is not appropriate for ports connected to 10/100Base-TX network devices that do not support Auto-Negotiation and have fixed speeds. For those switch ports, you should disable Auto-Negotiation and set the port's speed manually to match the speeds of the network devices.
- The 10/100/1000Base-T ports must be set to Auto-Negotiation, the default setting, to operate at 1000Mbps.
- The default duplex mode setting for the ports is Auto-Negotiation.  
This setting is appropriate for ports connected to network devices that also support Auto-Negotiation for duplex modes.
- The default duplex mode setting of Auto-Negotiation is not appropriate for ports connected to network devices that do not support Auto-Negotiation and have a fixed duplex mode. You should disable Auto-Negotiation on those ports and set their duplex modes manually to avoid the possibility of duplex mode mismatches. A switch port using Auto-Negotiation defaults to halfduplex if it detects that the end node is not using Auto-Negotiation, which can result in a mismatch if the end node is operating at a fixed duplex mode of full-duplex.
- Do not attach cables to ports of static or LACP port trunks until after you have configured the trunks on the switch. Otherwise, the ports will form network loops that can adversely affect network performance.

### **Installing SFP or SFP+ Transceivers**

Please review the following guidelines before installing SFP or SFP+ transceivers in the switch:

#### **Note**

Refer to the product's data sheet on the Allied Telesis web site for a list of supported transceivers.

Here are the guidelines:


- Ports 25 to 28 on 28-port x930 switches and ports 49 to 52 on 52port switches support 1000Mbps SFP and 10Gbps SFP+ transceivers. They do not support 100Mbps SFP transceivers.
- Ports 1 to 24 on the AT-x930-28GSTX Switch support 100/ 1000Mbps SFP transceivers. They do not support 10Gbps SFP+ transceivers.
- If you are using SFP+ ports S1 and S2 as the VCStack trunk, review the guidelines in "Trunks of Ports S1 and S2" on page 60 before performing this procedure.
- SFP and SFP+ transceivers are hot-swappable. You may install them while the switch is powered on.
- 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.



### Warning

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

### Note

SFP+ slots 27/S1 and 28/S2 on the 28-port switches and slots 51/S1 and 52/S2 on the 52-port switches are initially configured as stacking slots for the VCSocket feature. If you intend to use the switch as a standalone unit, you must disable the VCSocket feature before using the slots with standard SFP or SFP+ transceivers. For instructions, refer to Chapter 9, “Powering On the Switch” on page 115.

The illustrations in the procedure show the installation of a transceiver in port 25 of a 28-port switch. The procedure is the same for all SFP and SFP+ ports. The transceiver in the illustrations has a duplex LC connector. Your transceivers may have different connectors.

To install transceivers, perform the following procedure:

1. If the transceiver port has a dust plug, remove it. Refer to Figure 72.



**Figure 72. Removing the Dust Plug from an SFP 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 port until it clicks into place, as shown in Figure 73 on page 139.

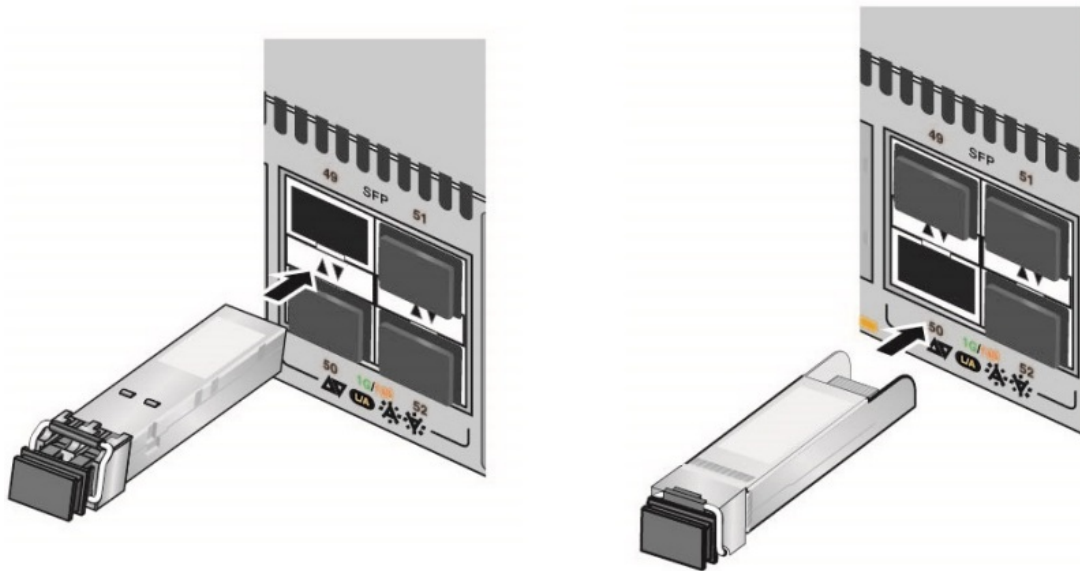
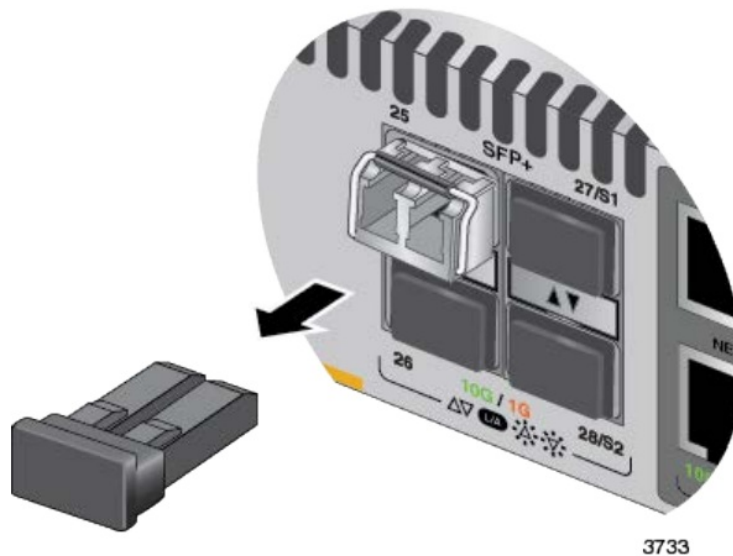


Figure 73. Installing an SFP+ Transceiver

**Note**

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

5. Remove the dust cover from the transceiver, as shown in Figure 74.



3733

Figure 74. Removing the Dust Cover from an SFP or SFP+ 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 75 on page 140. If the transceiver is in a bottom slot, the handle should be in the down position.

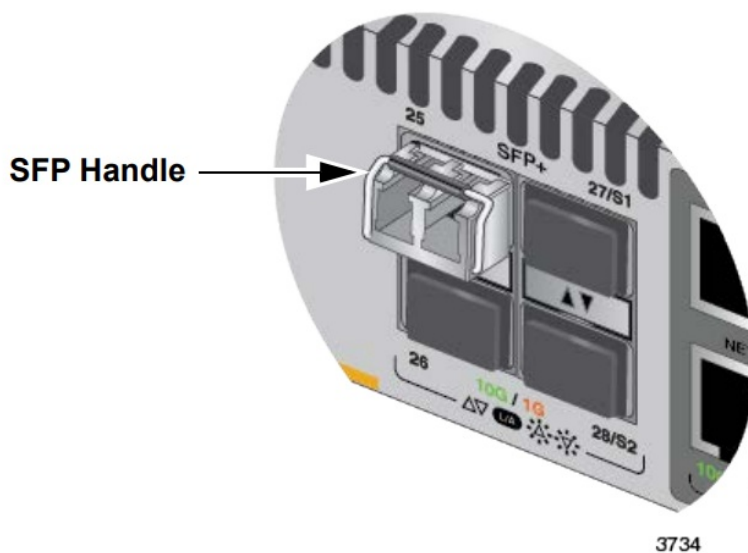


Figure 75. Positioning the SFP or SFP+ Handle in the Upright Position

7. Connect the fiber optic cable to the transceiver, as shown in Figure 76.

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

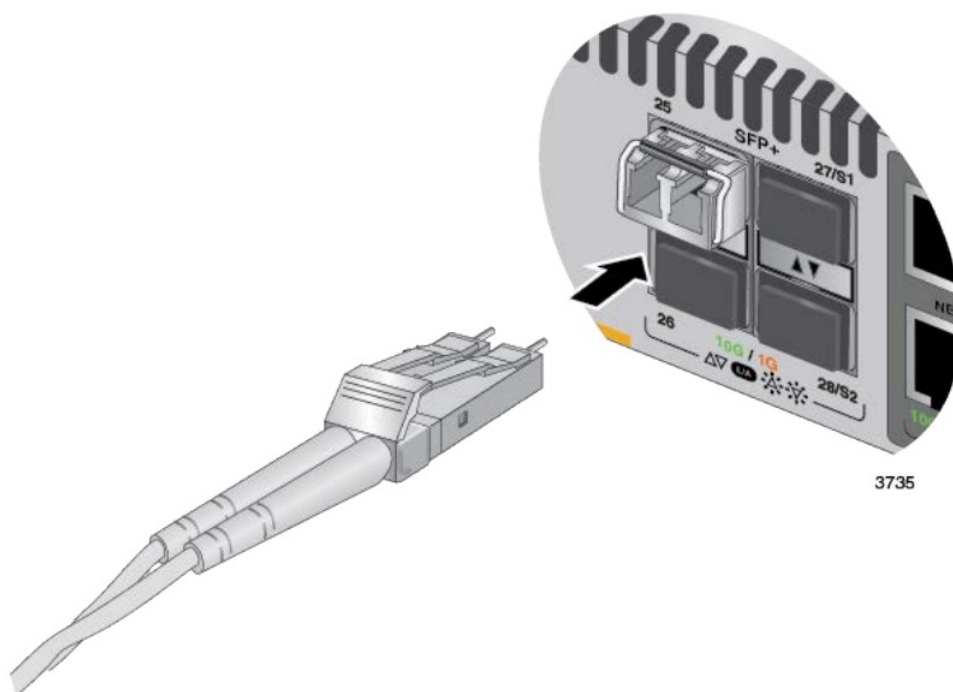
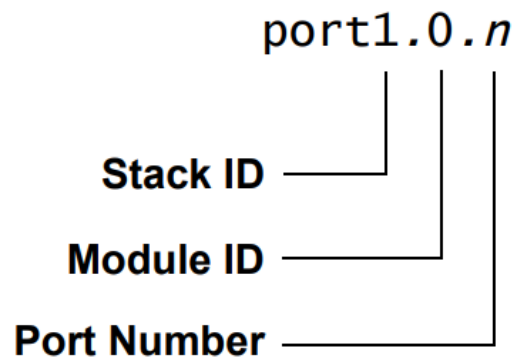


Figure 76. Connecting a Fiber Optic Cable to an SFP or SFP+ Transceiver

8. Repeat this procedure to install additional transceivers.

### Specifying Ports in the Command Line Interface for Standalone Switches

The individual ports on the switches of the stack are specified in the command line interface with the PORT parameter. The format of the parameter is shown in Figure 77.



**Figure 77. PORT Parameter in the Command Line Interface**

The three parts of the PORT parameter are described in Table 17.

Table 17. PORT Parameter Format

Number	Description
Stack ID	Designates the switch's ID number. You must always enter 1 for this value for a standalone switch. Do not enter 0 for the stack ID of a standalone switch even though that is the value on the Switch ID LED.
Module ID	Designates the module number of a port. The possible values are listed here: – Enter 0 for the module ID to designate a port on the front panel of the switch. – Enter 1 to designate a port on the optional AT-x9EM/XT4 Card.
Port Number	Designates a port number.

Here is an example of the PORT parameter on a standalone switch. It uses the INTERFACE command to enter the Port Interface mode for ports 15 and 17 on the front panel of the switch:

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

This example enters the Port Interface mode for ports 1 and 2 on the optional AT-x9EM/XT4 Card:

```
awplus> enable
awplus# configure terminal
awplus(config)# interface port1.1.1-port1.1.2
```

For instructions on the command line interface and the PORT parameter, refer to the Software Reference for x930 Series Switches, AlliedWare Plus Operating System.


### Installing AT-SP10TW Direct Connect Cables

This section contains the procedure for installing AT-SP10TW direct connect cables in SFP+ ports. Here are the guidelines:

- The cables are supported in ports 25 to 28 on 28-port x930 Switches and ports 49 to 52 on 52-port switches.
- The cables are hot-swappable. You may install them while the switch is powered on.

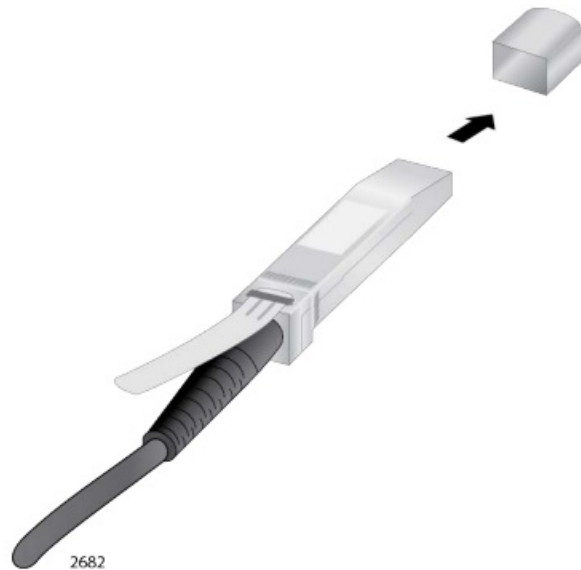
### Warning

A transceiver can be damaged by static electricity. Be sure to observe all standard electrostatic discharge (ESD)

precautions, such as wearing an anti-static wrist strap, to avoid damaging the device.  E92

To install AT-SP10TW direct connect cables, perform the following procedure:

1. If the SFP+ port has a dust cover, remove it. Refer to Figure 74 on page 139.
2. Remove the AT-SP10TW direct connect cable from its shipping container and store the packaging material in a safe location.
3. Remove the dust cap from a connector on the cable. Refer to Figure 78.



**Figure 78. Removing the Dust Cover from the AT-SP10TW Cable**

4. Slide the connector into the port. The release tab on the connector must be on top when installed in a top SFP+ port and on the bottom when installed in a bottom SFP+ port. Refer to Figure 79.



**Figure 79. Installing AT-SP10TW Cables**

5. Install the other end of the cable in a compatible port on another network device. To use SFP+ ports as the VCStack trunk, the connections must crossover on the switches. The connection on port S1 in one switch must crossover to port S2 in the next switch.
6. Repeat this procedure to cable other SFP+ ports.

### Cabling the AT-StackQS Card with AT-QSFPICU Cables

This section contains the procedure for cabling AT-StackQS Cards with copper AT-QSFPICU Cables. For installation instructions on installing the card, refer to Chapter 5, "Installing AT-StackQS and AT-x9EM/XT4 Cards" on page 103 To cable AT-StackQS Cards with AT-QSFPICU Cables, perform the following procedure:

1. Remove the dust cover from a port on the AT-StackQS Card. Refer to Figure 80.

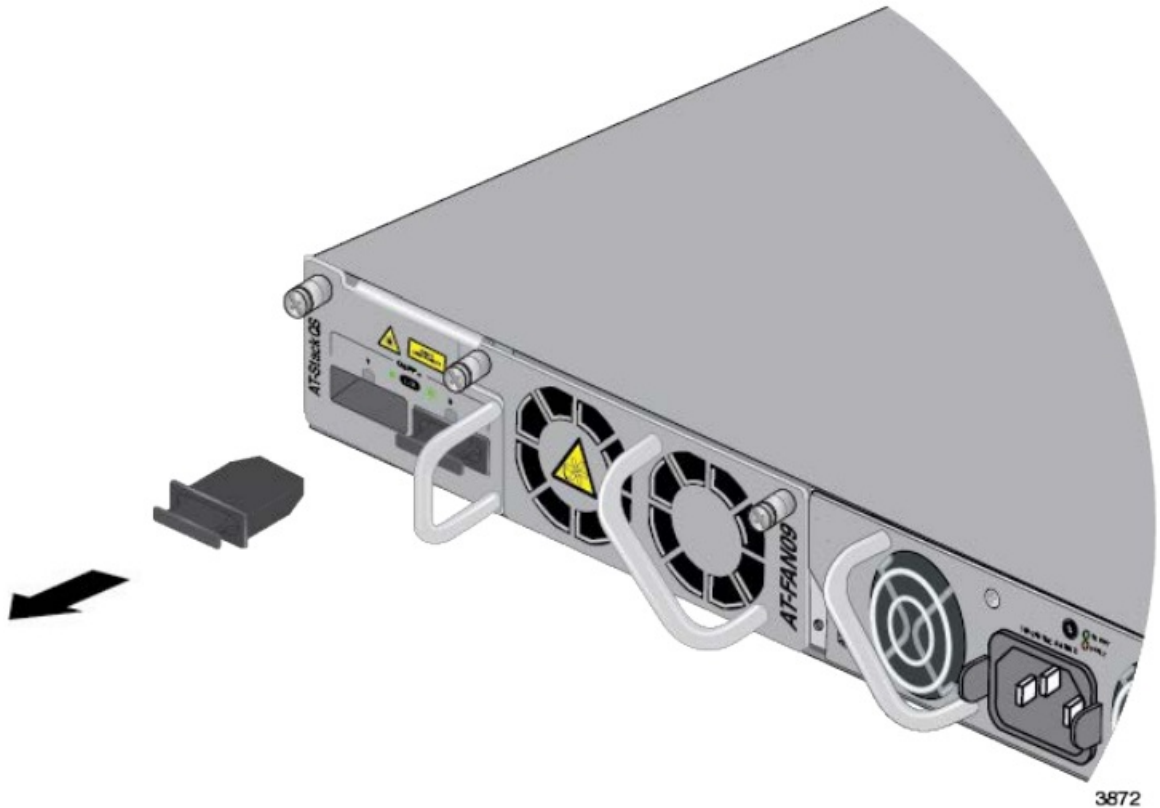


Figure 80. Removing the Dust Cover from Port 1

2. Slide the connector on the AT-QSFPICU Cable into the port until it clicks into place. Refer to Figure 81 on page 146.

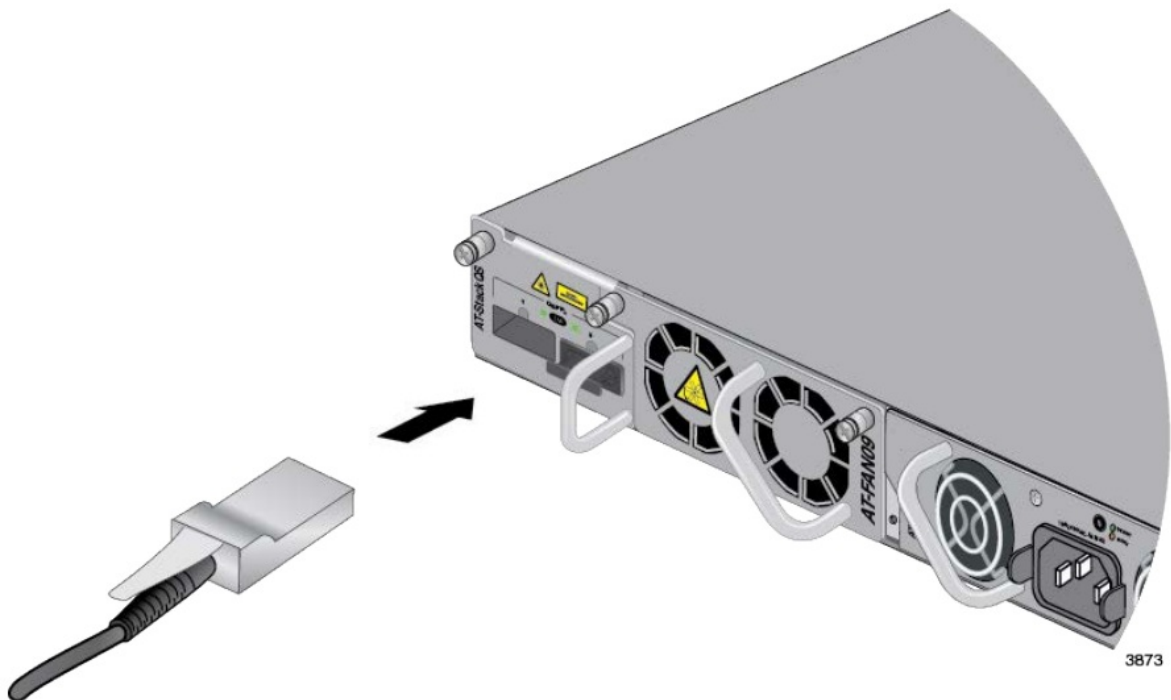


Figure 81. Installing the AT-QSFPICU Cable in Port 1

3. Install the other end of the cable into a compatible port on another networking device. If you are using the cards for the VCStack trunk, the connections must crossover on the switches. Port 1 on the card in one switch must

be connected to port 2 in the next switch.

4. Repeat this procedure to install and cable a transceiver in the second port.
5. If you are using the cards for the VCSStack trunk, install and cable cards in the other switches of the stack.
6. If you are using the cards for the VCSStack trunk, go to Chapter 12, “Building the Stack with AT-StackQS Cards” on page 159 after cabling all the switches.

### **Cabling the AT-StackQS Card with Fiber Optic Transceivers**

This section contains the procedure for cabling AT-StackQS Cards with AT-QSFPSR and AT-QSFPLR4 Transceivers. For instructions on installing the cards in switches, refer to Chapter 5, “Installing AT-StackQS and AT-x9EM/XT4 Cards” on page 103

If you are using the ports on the card for the VCSStack trunk, review the guidelines in “Trunks of AT-StackQS Cards” on page 64 before performing this procedure.

For the maximum operating distances and cable requirements of the transceivers, refer to the x930 Data Sheet on the Allied Telesis website for the list of supported transceivers for the AT-StackQS card.

The transceivers are hot-swappable. You can install them while the switches are powered on.

To cable the AT-StackQS Cards with fiber optic transceivers, perform the following procedure:

1. Remove the dust cover from one of the ports on the AT-StackQS Card.
2. Slide a transceivers into the port until it clicks into place.
3. Attach a fiber optic cable to the transceiver.
4. Repeat this procedure to install and cable a transceiver in the second port.
5. If you are using the cards for the VCSStack trunk, install and cable cards in the other switches of the stack. The connections must crossover on the switches. Port 1 on the card in one switch must be connected to port 2 in the next switch.
6. If you are using the cards for the VCSStack trunk, go to Chapter 12, “Building the Stack with AT-StackQS Cards” on page 159 after cabling all the switches.

## **Chapter 12 Troubleshooting**

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

### **Note**

For further assistance, please contact Allied Telesis Technical Support at [www.alliedtelesis.com/support](http://www.alliedtelesis.com/support).

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

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

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

If the switch has the DC AT-PWR250-80 Power Supply, try the following:

- Verify that the DC circuit is powered on.
- Verify that the On/Off switch on the power supply is in the On position.

- Verify that the positive, negative, and ground wires are properly connected to the AT-PWR250-80 Power Supply and DC circuit.

Refer to “Wiring the DC Connector on the AT-PWR250-80 Power Supply” on page 137.

- Try connecting the switch to another DC circuit.
- Try replacing the positive, negative, and ground wires.

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

**Solution:** The switch may be operating in the low power mode. To toggle on the LEDs, press the eco-friendly button on the front panel of the switch.

You may also toggle the LEDs off and on with the ECOFRIENDLY LED and NO ECOFRIENDLY LED commands in the command line interface.

**Problem 3:** A copper port on the switch is connected to a network device but the port’s LINK/ACT LED is off.

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

- Verify that the port is connected to the correct copper cable. This is to eliminate the possibility that the port is connected to the wrong network device.
- Verify that the network device connected to the port is powered on and is operating properly.
- Try connecting another network device to the port with a different cable. If the port is able to establish a link, then the problem is with the cable or the other network device.
- Verify that the copper cable does not exceed 100 meters (328 feet).
- Verify that you are using the appropriate category of copper cable.

The cable types are listed in “Cable Requirements” on page 32 for the 10/100/1000Base-T ports.

- Verify that the companion SFP port of the copper port is empty.

This applies only to the AT-x930-28GSTX Switch. For example, if copper port 2R is connected to an active network device but cannot establish a connection to it, verify that SFP port 2 is empty.

For more information, refer to “SFP Ports” on page 38.

#### **Note**

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

**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.
- Check that the transceiver is fully inserted in the port.
- 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 device.
- Verify that the operating specifications of the fiber optic ports on the transceiver and remote network device are compatible.
- Verify that the correct type of fiber optic cabling is being used.
- Verify that the port is connected to the correct fiber optic cable.

This is to eliminate the possibility that the port is connected to the wrong remote network device.

- Try connecting another network device to the fiber optic port using a different cable. If the port is able to establish a link, then the problem is with the cable or with the other network device.
- Use the switch’s management software to verify that the port is enabled.
- If the remote network device is a managed device, use its management firmware to determine whether its port is enabled.

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

**Problem 5:** Network performance between a copper port on the switch and a network device is slow.

**Solution:** There might be a duplex mode mismatch between the port and the network device. This can occur when a copper port using AutoNegotiation is connected to a remote device that has a fixed speed of 10 or 100 Mbps and a fixed duplex mode of full duplex. If this is the cause of the problem, adjust the duplex mode of the port on the network device or switch so that both ports are using the same duplex mode. You can use either the LEDs or management software on the switch to determine the duplex mode settings of the ports. The LEDs are described in Table 7 on page 44.

**Problem 6:** 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 7:** The Switch ID LED on the front of the switch is flashing the letter “F.”

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

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

Contact your Allied Telesis sales representative for assistance.

**Problem 8:** A port on the AT-x930-28GPX or AT-x930-52GPX Switch is not providing power to a PoE device.

**Solutions:** Try the following:

- Review the PD’s documentation to confirm that the device supports Mode A of the IEEE 802.3at standard. Mode A is one of two modes that define the connector pins that deliver the power from the port in the switch to the powered device. In Mode A, the power is carried on pins 1, 2, 3, and 6 on the RJ-45 port, the same pins that carry the network traffic. The second mode, Mode B, defines pins 4, 5, 7, and 8 as the power carriers. The AT-x93028GPX and AT-x930-52GPX Switches do not support Mode B. Most powered devices are designed to accept power by either mode, but some legacy devices may only support one mode. This can be verified by reviewing the device’s documentation or data sheet. Legacy devices that only support Mode B will not work with the switches.
- Check that the device’s power requirements do not exceed 30 W. This can be verified by reviewing the device’s documentation or data sheet.
- Verify that you are using the appropriate category of copper cable by referring to “Cable Requirements” on page 32.
- Use the management software on the switch to determine whether PoE is enabled on the port. The default setting for PoE is enabled.

- Use the management software on the switch to determine whether the PoE power setting for the port has been reduced to a value below the power requirements of the device.
- Try connecting the device to a different port on the switch.

**Problem 9:** One or more ports on the optional AT-StackQS or AT-x9EM/ XT Card cannot establish connections to network devices or do not forward traffic.

**Solutions:** Try the following:

- Verify that the switch has version 5.4.5-2 or later of the x930 operating system. Earlier versions of the management software do not support the card. For instructions, refer to “Verifying Support for Hardware Options” on page 132.
- Verify that you are using UTP or STP Cat. 5e for 1Gbps links and UTP or STP Cat. 6e cable for 10Gbps links.
- Verify that the port is connected to the correct copper cable. This is to eliminate the possibility that the port is connected to the wrong network device.
- Verify that the network device connected to the port is powered on and is operating properly.
- Try connecting another network device to the port with a different cable. If the port is able to establish a link, then the problem is with the cable or the other network device.
- Verify that the copper cable does not exceed 100 meters (328 feet).

## Appendix A Technical Specifications

This appendix contains the following sections:

- “Physical Specifications” on page 156
- “Environmental Specifications” on page 158
- “Power Specifications” on page 159
- “Certifications” on page 161
- “RJ-45 Copper Port Pinouts” on page 162
- “RJ-45 Style Serial Console Port Pinouts” on page 164

### Physical Specifications

#### Dimensions (H x W x D)

Table 18 lists the dimensions of the switches and power supplies.

Table 18. Product Dimensions

AT-x930-28GTX	4.4 cm x 44.0 cm x 42.0 cm (1.7 in. x 17.3 in. x 16.5 in.)
AT-x930-28GPX	4.4 cm x 44.0 cm x 42.0 cm (1.7 in. x 17.3 in. x 16.5 in.)
AT-x930-28GSTX	4.4 cm x 44.0 cm x 42.0 cm (1.7 in. x 17.3 in. x 16.5 in.)
AT-x930-52GTX	4.4 cm x 44.0 cm x 42.0 cm (1.7 in. x 17.3 in. x 16.5 in.)
AT-x930-52GPX	4.4 cm x 44.0 cm x 42.0 cm (1.7 in. x 17.3 in. x 16.5 in.)
AT-PWR150	4.2 cm x 14.8 cm x 25.2 cm (1.7 in. x 5.8 in. x 9.8 in.)
AT-PWR250	4.2 cm x 14.8 cm x 25.2 cm (1.7 in. x 5.8 in. x 9.8 in.)
AT-PWR250-80	4.2 cm x 14.8 cm x 25.2 cm (1.7 in. x 5.8 in. x 9.8 in.)
AT-PWR800	4.2 cm x 14.8 cm x 25.2 cm (1.7 in. x 5.8 in. x 9.8 in.)
AT-PWR1200	4.2 cm x 14.8 cm x 30.7 cm (1.7 in. x 5.8 in. x 12.1 in.)

The weights of the switches do not include the power supplies.

### Ventilation

Table 20 lists the ventilation requirements.

Table 20. Ventilation Requirements

Recommended Minimum Ventilation on All Sides	10 cm (4.0 in)
Operating Temperature	0° C to 45° C (32° F to 113° F)
Storage Temperature	-25° C to 70° C (-13° F to 158° F)
Operating Humidity	5% to 90% noncondensing
Storage Humidity	5% to 95% noncondensing
Maximum Operating Altitude	3,000 m (9,842 ft)
Maximum Nonoperating Altitude	4,000 m (13,100 ft)

### Power Specifications

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

#### Maximum Power Consumption

Table 22, Table 23, and Table 24 list the maximum power consumptions of the switches with the different power supplies.

Table 22. Maximum Power Consumption with the AT-PWR150, ATPWR250 or AT-PWR250-80 Power Supply

AT-x930-28GTX	83.6 watts
AT-x930-28GPX	83.8 watts
AT-x930-28GSTX	96.5 watts
AT-x930-52GTX	94.6 watts
AT-x930-52GPX	96.8 watts

Table 23. Maximum Power Consumption with the AT-PWR800 Power Supply

AT-x930-28GTX	83.8 watts
AT-x930-28GPX	564.2 watts
AT-x930-28GSTX	96.6 watts
AT-x930-52GTX	96.6 watts
AT-x930-52GPX	577.0 watts

Table 24. Maximum Power Consumption with the AT-PWR1200 Power Supply

AT-x930-28GTX	86.8 watts
AT-x930-28GPX	808.4 watts
AT-x930-28GSTX	97.9 watts
AT-x930-52GTX	98.5 watts
AT-x930-52GPX	880.0 watts

### Input Voltages

Table 25 lists the input voltages for the five power supplies.

Table 25. Input Voltages

AT-PWR150	100-240 VAC~, 2.0A maximum, 50/60 Hz
AT-PWR250	100-240 VAC~, 5.0A maximum, 50/60 Hz
AT-PWR250-80	40-60 VDC, 6.0A maximum
AT-PWR800	100-240 VAC~, 10.0A maximum, 50/60 Hz
AT-PWR1200	100-240 VAC~, 15.0-7A maximum, 50/60 Hz

### Certifications

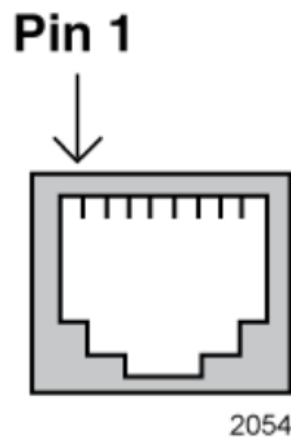
Table 26 lists the product certificates.

Table 26. Product Certifications

EMI (Emissions)	FCC Class A, EN55022 Class A, EN61000-3-2, EN61000-3-3, VCCI Class A, CISPR Class A, C-TICK, CE
EMC (Immunity)	EN55024
Electrical and Laser Safety	EN60950-1 (TUV), UL 60950-1 (CULUS), EN60825
Compliance Marks	CE, CULUS, TUV, C-Tick

**RJ-45 Copper Port Pinouts**

Figure 82 illustrates the pin layout of the RJ-45 connectors and ports on the front panel of the switch.



**Figure 82. RJ-45 Socket Pin Layout (Front View)**

Table 27 lists the pin signals for 10 and 100 Mbps.  
 Table 27. Pin Signals for 10 and 100 Mbps

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

Table 28 lists the pin signals when a port operating at 1000 Mbps.  
 Table 28. Pin Signals for 1000 Mbps

Pinout	Pair
1	Pair 1 +
2	Pair 1 –
3	Pair 2 +
4	Pair 3 +
5	Pair 3 –
6	Pair 2 –
7	Pair 4 +
8	Pair 4 –

### RJ-45 Style Serial Console Port Pinouts

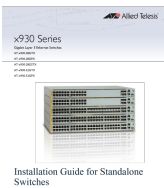
Table 29 lists the pin signals of the RJ-45 style serial Console port.

Table 29. 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.



## Documents / Resources

	<p><a href="#">Allied Telesis X930 Series Advanced Gigabit Layer 3 Stackable Switches</a> [pdf] Instructions X930 Series Advanced Gigabit Layer 3 Stackable Switches, X930 Series, Advanced Gigabit Layer 3 Stackable Switches, Gigabit Layer 3 Stackable Switches, 3 Stackable Switches, Stackable Switches, Switches</p>
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## References

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