

x530 Series

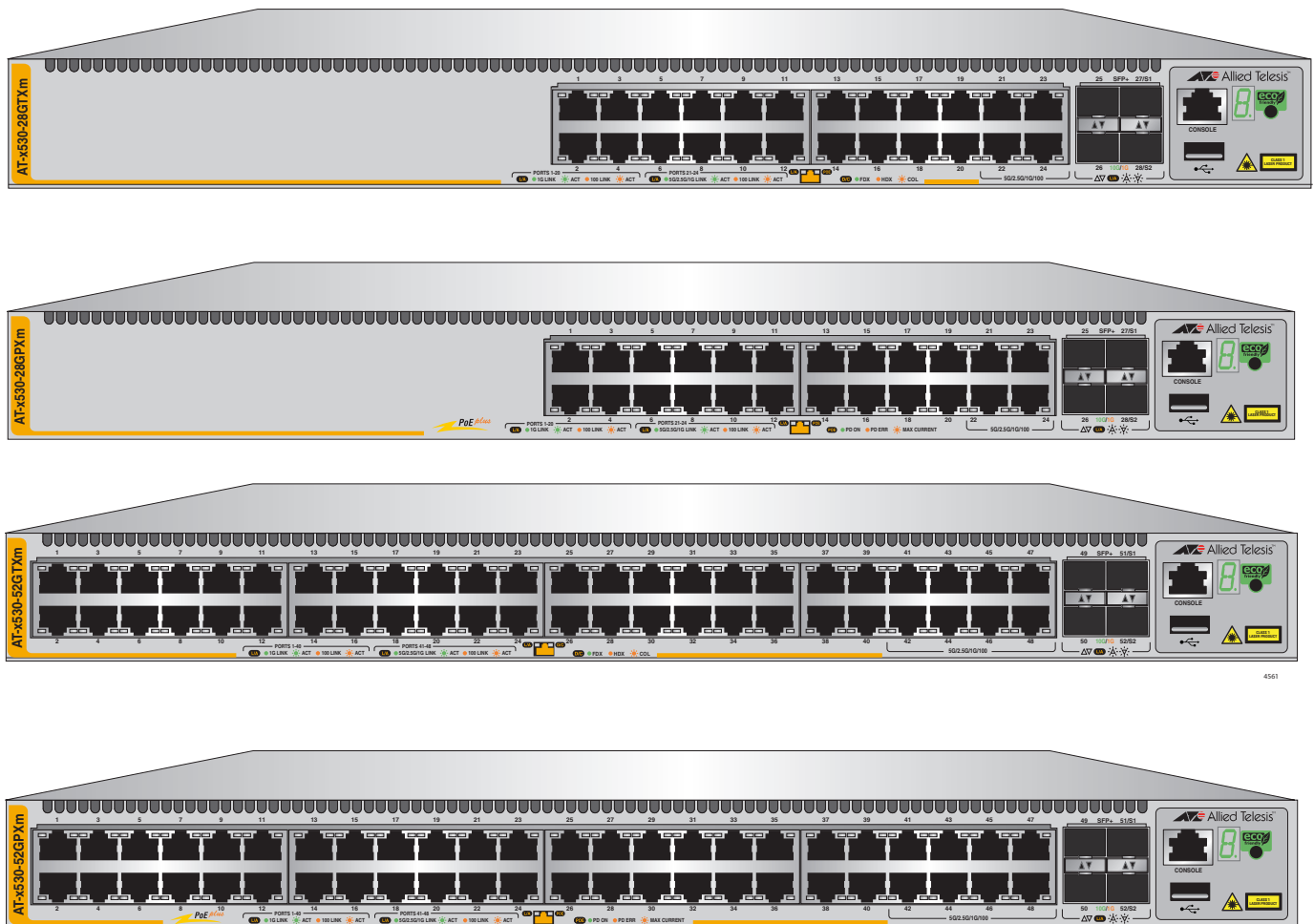
Stackable Gigabit Layer 3+ Ethernet Switches
AlliedWare Plus™ v5.4.9-2

AT-x530-28GTXm

AT-x530-28GPXm

AT-x530-52GTXm

AT-x530-52GPXm



Installation Guide for Virtual Chassis Stacking

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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.

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

RFI Emissions: FCC Class A, EN55032 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

Electrical Safety: EN60950-1 (TUV), UL 60950-1 (cUL_{US})



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/library.

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

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Preface

This guide contains the installation instructions for the x530 Series of stackable Gigabit, Layer 3+ 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 switches as a stack with Virtual Chassis Stacking (VCStack™). For instructions on how to install the devices as stand-alone switches, refer to the *x530 Series Installation Guide for Stand-alone Switches*.

Document Conventions

This document uses the following conventions:

Note

Notes provide additional information.



Caution

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



Warning

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

Contacting Allied Telesis

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

- ❑ 24/7 Online Support — Enter our interactive support center to search for answers to your product questions in our knowledge database, to check support tickets, to learn about Return Merchandise Authorizations (RMAs), and to contact Allied Telesis technical experts.
- ❑ USA and EMEA Phone Support — Select the phone number that best fits your location and customer type.
- ❑ Hardware Warranty Information — Learn about Allied Telesis warranties and register your product online.
- ❑ Replacement Services — Submit an RMA request via our interactive support center.
- ❑ Documentation — View the most recent installation and user guides, software release notes, white papers, and data sheets for your products.
- ❑ Software Downloads — Download the latest software releases for your managed products.

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

Chapter 1

Overview

This chapter contains the following sections:

- ❑ “Front and Rear Panels” on page 18
- ❑ “Management Panel” on page 20
- ❑ “Features” on page 21
- ❑ “Twisted Pair Ports” on page 25
- ❑ “Power Over Ethernet” on page 36
- ❑ “SFP+ Transceiver Ports” on page 40
- ❑ “eco-friendly Button” on page 42
- ❑ “VCStack Feature” on page 43
- ❑ “Switch ID LED” on page 44
- ❑ “USB Port” on page 46
- ❑ “Console Port” on page 47
- ❑ “Power Supply” on page 48
- ❑ “Designating Ports in the Command Line Interface for Stacks” on page 49
- ❑ “Software and Hardware Releases” on page 50

Note

This guide explains how to install switches as a stack with Virtual Chassis Stacking (VCStack™). For instructions on how to install the devices as stand-alone switches, refer to the *x530 Series Installation Guide for Stand-alone Switches*.

Front and Rear Panels

The front panels on the x530 Series switches are shown in Figure 1 through Figure 4 on page 19.

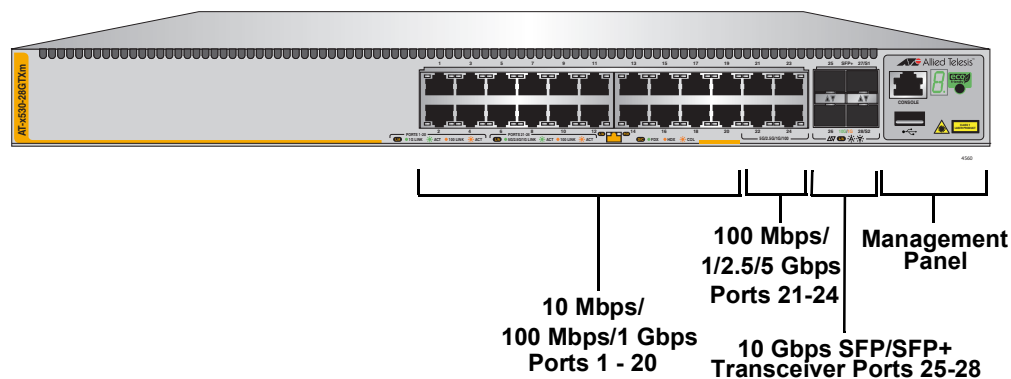


Figure 1. Front Panel of the AT-x530-28GTXm Switch

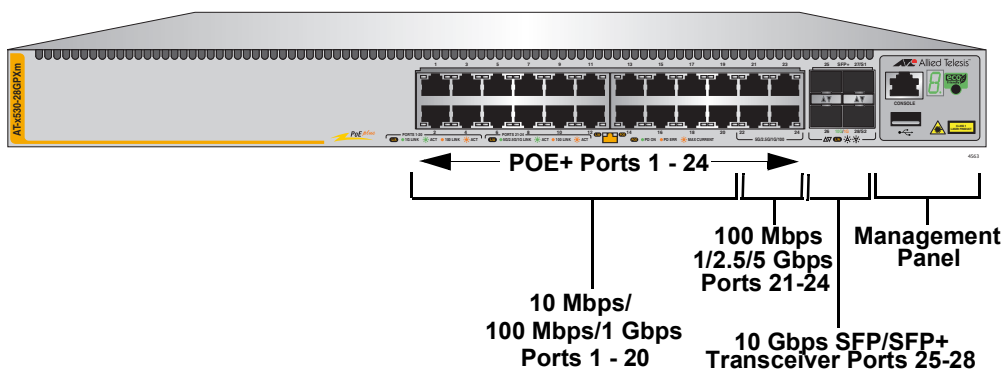


Figure 2. Front Panel of the AT-x530-28GPXm Switch

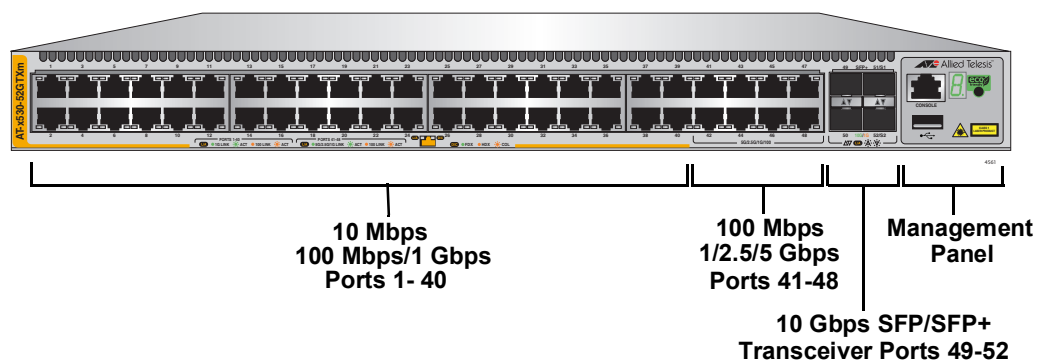


Figure 3. Front Panel of the AT-x530-52GTXm Switch

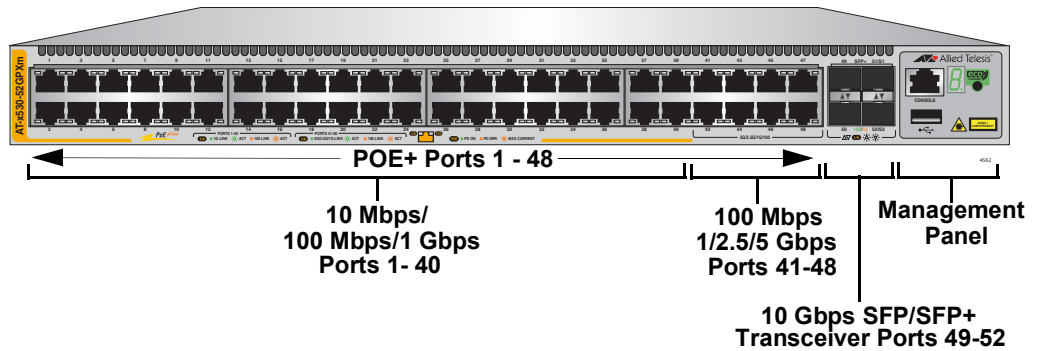


Figure 4. Front Panel of the AT-x530-52GPXm Switch

The back panels of the AT-x530-28GTXm, AT-x530-28GPXm, AT-x530-52GTXm, and AT-x530-52GPXm switches are shown in Figure 5

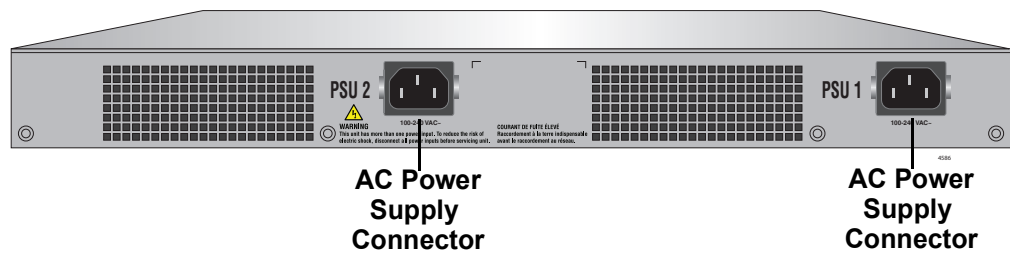


Figure 5. Back Panel of the AT-x530-28GTXm, AT-x530-28GPXm, AT-x530-52GTXm, and AT-x530-52GPXm Switches

Management Panel

Figure 6 identifies the components on the management panel.

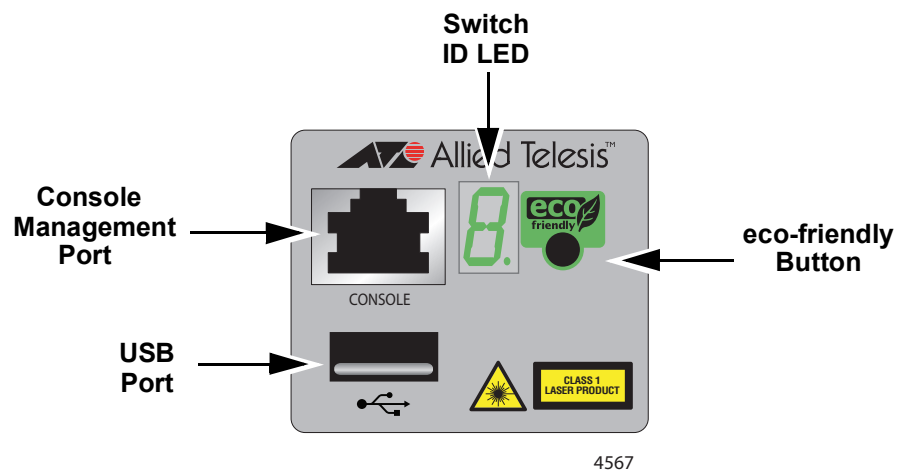


Figure 6. Management Panel

Features

The Allied Telesis x530 Series switches are stackable Gigabit, Layer 3+ Ethernet switches. The following sections list the features.

x530 Models Table 1 lists the basic features for each switch model.

Table 1. Basic Features

Feature	AT-x530-28GTXm	AT-x530-28GPXm (PoE+)	AT-x530-52GTXm	AT-x530-52GPXm (PoE+)
10 Mbps, 100 Mbps and 1 Gbps Twisted Pair Ports	20	-	40	-
10 Mbps, 100 Mbps and 1 Gbps PoE+ Twisted Pair Ports	-	20	-	40
100 Mbps and 1/2.5/5 Gbps Twisted Pair Ports	4	-	8	-
100 Mbps and 1/2.5/5 Gbps PoE+ Twisted Pair Ports	-	4	-	8
1 Gbps SFP and 10 Gbps SFP+ Transceiver Ports	4	4	4	4
VCStack	Yes	Yes	Yes	Yes

Both switch models come with two pre-installed power supplies. They are not field-replaceable.

Twisted Pair Ports

Table 2 lists the twisted pair ports features for each switch model.

Table 2. Twisted Pair Port Features

Feature	AT-x530-28GTXm	AT-x530-28GPXm (PoE+)	AT-x530-52GTXm	AT-x530-52GPXm (PoE+)
Ports 1 to 20 support 10 Mbps, 100 Mbps and 1 Gbps operation	Yes	Yes	-	-
Ports 21 to 24 support 100 Mbps and 1/2.5/5 Gbps operation	Yes	Yes	-	-
Ports 1 to 40 support 10 Mbps, 100 Mbps and 1 Gbps operation	-	-	Yes	Yes
Ports 41 to 48 support 100 Mbps and 1/2.5/5 Gbps operation	-	-	Yes	Yes
100 meters (328 feet) maximum operating distance per port	Yes	Yes	Yes	Yes
Auto-Negotiation for speed	Yes	Yes	Yes	Yes
Full-duplex mode only	Yes	Yes	Yes	Yes
MDI/MDI-X at 10 Mbps and 100 Mbps	Yes	Yes	Yes	Yes
Port Link/Activity (L/A) and Duplex/Collision (D/C) LEDs	Yes	-	Yes	-
Power over Ethernet (PoE+) supported on all ports	-	Yes	-	Yes
Port Link/Activity (L/A) and Power over Ethernet (PoE) LEDs	-	Yes	-	Yes

Power Over Ethernet

The basic features of PoE+ on the twisted pair ports of the AT-x530-28GPXm and AT-x530-52GPXm switches are:

- ❑ Supported on all ports.
- ❑ Supports PoE (15.4W maximum) and PoE+ (30W maximum) powered devices
- ❑ 740W maximum power budget (370W per power supply)
- ❑ Supports powered device classes 0 to 4
- ❑ Port prioritization
- ❑ Mode A wiring
- ❑ IEEE802.3af/at compliant

SFP+ Transceiver Ports

The four SFP+ transceiver ports in the AT-x530-28GTXm and AT-x530-28GPXm switches (ports 25-28), and AT-x530-52GTXm and AT-x530-52GPXm switches (ports 49-52) support the following types of transceivers:

Examples of SFP 1Gbps transceivers include:

- ❑ AT-SPSX and LR short and long distance transceivers using multi-mode or single mode fiber optic cable.
- ❑ AT-SPTX transceiver series with RJ-45 connector for twisted pair cable.
- ❑ AT-SPEX transceivers with a maximum distance of two kilometers with multi-mode fiber optic cable.

Examples of SFP+ 10 Gbps transceivers include:

- ❑ AT-SP10SR, LR, ER and ZR series of short or long distance transceivers using multi-mode or single mode fiber optic cable.
- ❑ AT-SP10TW series of direct attach cables in lengths of 1 meter and 3 meters.
- ❑ AT-SP10BD series of bidirectional transceivers for single mode fiber optic cable with maximum distances of 10 to 40 kilometers.
- ❑ AT-SP10T transceiver with RJ-45 connector for links up to 20 meters at 10Gbps with Category 6a or better twisted pair cable, or 100 meters at 1 Gbps.
- ❑ AT-SP10LRM Long Reach Multimode transceiver for OM1 multi-mode fiber optic links up to 220 meters.

Note

Industrial (-40 to 85° C) and extended (-40 to 105° C) temperature transceivers are available.

Note

For a current list of supported transceiver modules refer to the *x530 Series Data Sheet*

The following restrictions on SFP+ transceivers apply:

- ❑ 100 Mbps transceivers are not supported
- ❑ Supports full-duplex mode only

SFP and SFP+ transceivers must be purchased separately.

LEDs

The port LEDs are:

- ❑ Link/activity LEDs for the twisted pair ports on all switches
- ❑ Link/activity LEDs for the SFP and SFP+ transceiver ports on all switches
- ❑ Full/Half/Collision LEDs for the twisted pair ports on the AT-x530-28GTXm and AT-x530-52GTXm switches
- ❑ PoE+ LEDs for the twisted pair ports on the AT-x530-28GPXm and AT-x530-52GPXm switches
- ❑ Switch ID number LED

Installation Options

The installation options are:

- ❑ Desk or tabletop
- ❑ 19-inch equipment rack
- ❑ Wood or concrete wall

Management Software and Interfaces

The management software and interfaces are:

- ❑ AlliedWare Plus Management Software
- ❑ Command line interface (CLI)
- ❑ Web browser interface

Management Methods

The following methods are used for managing the switches:

- ❑ Local management through the Console port
- ❑ Remote Telnet or Secure Shell management
- ❑ Remote HTTP or HTTPS web browser management
- ❑ SNMPv1, v2c, and v3

Twisted Pair Ports

The specifications of the 24 twisted pair ports are listed in Table 3 for the AT-x530-28GTXm switch, Table 4 on page 26 for the AT-x530-28GPXm switch, Table 5 on page 27 for the AT-x530-52GTXm switch, and Table 6 on page 28 for the AT-x530-52GPXm switch.

Table 3. AT-x530-28GTXm Switch Twisted Pair Port Specifications

Specification	Description
Port Speed	Ports 1 - 20: 10 Mbps, 100 Mbps or 1 Gbps. Ports 21 - 24: 100 Mbps or 1/2.5/5 Gbps Ports 1 - 20: Set the port speed manually or with Auto-Negotiation at 10 Mbps and 100 Mbps. Ports 21 - 24: The port speed is set with Auto-Negotiation only, at 1 Gbps and higher. The default is Auto-Negotiation for all ports.
Duplex Mode	Ports 1 - 20: Full- or half-duplex mode at 10 Mbps and 100 Mbps. Full-duplex only at 1 Gbps. Supports Auto-Negotiation at 10 Mbps and 100 Mbps. Ports 21- 24: Full-duplex only at all speeds.
Maximum Distance	100 meters (328 feet).
Connector	8-pin RJ-45.

Table 4. AT-x530-28GPXm Switch Twisted Pair Port Specifications

Specification	Description
Port Speed	Ports 1 - 20: 10 Mbps, 100 Mbps or 1 Gbps. Ports 21 - 24: 100 Mbps or 1/2.5/5 Gbps Ports 1 - 20: Set the port speed manually or with Auto-Negotiation at 10 Mbps and 100 Mbps. Ports 21 - 24: The port speed is set with Auto-Negotiation only, at 1 Gbps and higher. The default is Auto-Negotiation for all ports.
Duplex Mode	Ports 1 - 20: Full- or half-duplex mode at 10 Mbps and 100 Mbps. Full-duplex only at 1 Gbps. Supports Auto-Negotiation at 10 Mbps and 100 Mbps. Ports 21- 24: Full-duplex only at all speeds.
Maximum Distance	100 meters (328 feet).
Power over Ethernet	PoE (15.4W maximum per port) and PoE+ (30W maximum per port).
Maximum Power Budget	740W (370W per power supply).
PoE Mode	Mode A.
Connector	8-pin RJ-45.

Table 5. AT-x530-52GTXm Switch Twisted Pair Port Specifications

Specification	Description
Port Speed	Ports 1 - 40: 10 Mbps, 100 Mbps or 1 Gbps. Ports 41 - 48: 100 Mbps or 1/2.5/5 Gbps Ports 1 - 40: Set the port speed manually or with Auto-Negotiation at 10 Mbps, and 100 Mbps. Ports 41 - 48: The port speed is set with Auto-Negotiation only, at 1 Gbps and higher. The default is Auto-Negotiation for all ports.
Duplex Mode	Ports 1 - 40: Full- or half-duplex mode at 100 Mbps. Full-duplex only at 1 Gbps. Supports Auto-Negotiation at 10 Mbps and 100 Mbps. Ports 41- 48: Full-duplex only at all speeds.
Maximum Distance	100 meters (328 feet).
Connector	8-pin RJ-45.

Table 6. AT-x530-52GPXm Switch Twisted Pair Port Specifications

Specification	Description
Port Speed	Ports 1 - 40: 10 Mbps, 100 Mbps or 1 Gbps. Ports 41 - 48: 100 Mbps or 1/2.5/5 Gbps Ports 1 - 40: Set the port speed manually or with Auto-Negotiation at 10 Mbps, and 100 Mbps. Ports 41 - 48: The port speed is set with Auto-Negotiation only, at 1 Gbps and higher. The default is Auto-Negotiation for all ports.
Duplex Mode	Ports 1 - 40: Full- or half-duplex mode at 100 Mbps. Full-duplex only at 1 Gbps. Supports Auto-Negotiation at 10 Mbps and 100 Mbps. Ports 41- 48: Full-duplex only at all speeds.
Maximum Distance	100 meters (328 feet).
Power over Ethernet	PoE (15.4W maximum per port) and PoE+ (30W maximum per port).
Maximum Power Budget	740W (370W per power supply).
PoE Mode	Mode A.
Connector	8-pin RJ-45.

Speed On AT-x530-28GTXm and AT-x530-28GPXm switches, ports 1 to 20 operate at 10 Mbps, 100 Mbps or 1 Gbps and Ports 21 - 24 operate at 100 Mbps or 1/2.5/5 Gbps. On AT-x530-52GTXm and AT-x530-52GPXm switches, ports 1 to 40 operate at 10 Mbps, 100 Mbps or 1 Gbps and Ports 41 - 48 operate at 100 Mbps or 1/2.5/5 Gbps. The ports must be set to Auto-Negotiation to operate at 1 Gbps or higher. 10 Mbps and 100 Mbps can be set with Auto-Negotiation or manually. Auto-Negotiation is the default setting.

Note

The ports must be set to Auto-Negotiation to function at 1/2.5/5 Gbps speeds and are not compatible with devices that are not IEEE 802.3u-compliant.

Duplex Mode

The twisted pair ports can operate in either half- or full-duplex mode at 10 Mbps and 100 Mbps and full-duplex only at higher speeds.

The duplex mode of a port operating at 10 Mbps and 100 Mbps, like port speed, can 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 can be set independently of each other. For example in the case of a 10 Mbps or 100 Mbps port, it can be configured such that its speed is set manually while its duplex mode is established through Auto-Negotiation.

Note

Switch ports default to half-duplex mode when connected to 10 Mbps or 100 Mbps network devices that do not support Auto-Negotiation. If a network device supports full-duplex only, a duplex mode mismatch can occur, resulting in poor network performance. To prevent this, disable Auto-Negotiation and set the duplex mode manually on ports connected to 100 Mbps devices that support full-duplex only.

**Twisted Pair
Cabling**

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

The wiring configurations of the ports can be set manually or automatically by the switch with auto-MDI/MDI-X (IEEE 802.3ab-compliant). 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 a speed of 1 Gbps or higher.

**Maximum
Distance**

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

Cable Requirements

The minimum twisted pair cable requirements are as follows:

- ❑ 10/100 Mbps ports: Standard TIA/EIA 568-B-compliant Category 3 unshielded cabling.
- ❑ 1/2.5/5 Gbps ports: Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) unshielded cabling.
- ❑ 10 Gbps ports: Standard TIA/EIA 568-C-compliant Category 6a unshielded cabling.

Port Pinouts

Refer to Figure 33 on page 173 for the port pinouts of the 100 Mbps and 1/2.5/5 Gbps twisted pair ports.

LEDs

Each twisted pair port has two LEDs that display the port status.

AT-x530-28GTXm and AT-x530-52GTXm

The AT-x530-28GTXm and AT-x530-52GTXm LEDs indicate Link/Activity (L/A) and Duplex/Collision (FDX/HDX/COL) information. These LEDs are shown in Figure 7.

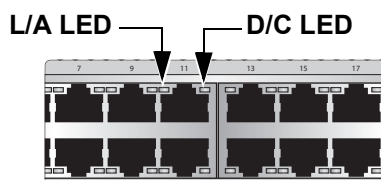


Figure 7. AT-x530-28GTXm and AT-x530-52GTXm Twisted Pair Ports LEDs

The states of the AT-x530-28GTXm LEDs are described in Table 7.

Table 7. AT-x530-28GTXm Twisted Pair Ports 1 - 24 LED Functions

LED	Ports	State	Description
L/A	1 - 20	Solid Green	The port has established a 1 Gbps link to a network device.
		Flashing Green	The port is transmitting or receiving data at 1 Gbps.
	21 - 24	Solid Green	The port has established a 1/2.5/5 Gbps link to a network device.
		Flashing Green	The port is transmitting or receiving data at 1/2.5/5 Gbps.
	1 - 24	Solid Amber	The port has established a 10 Mbps or 100 Mbps link to a network device.
		Flashing Amber	The port is transmitting or receiving data at 10 Mbps or 100 Mbps.
		Off	Possible causes of this state are: - The port has not established a link with another network device. - The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.
D/C	1 - 24	Solid Green	The port is operating in full-duplex mode.
		Solid Amber	The port is operating in half-duplex mode.
		Flashing Amber	The port is operating in half-duplex mode with collisions.

The states of the AT-x530-52GTXm LEDs are described in Table 8.

Table 8. AT-x530-52GTXm Twisted Pair Ports 1 - 48 LED Functions

LED	Ports	State	Description
L/A	1 - 40	Solid Green	The port has established a 1 Gbps link to a network device.
		Flashing Green	The port is transmitting or receiving data at 1 Gbps.
	41 - 48	Solid Green	The port has established a 1/2.5/5 Gbps link to a network device.
		Flashing Green	The port is transmitting or receiving data at 1/2.5/5 Gbps.
	1 - 48	Solid Amber	The port has established a 10 Mbps or 100 Mbps link to a network device.
		Flashing Amber	The port is transmitting or receiving data at 10 Mbps or 100 Mbps.
		Off	Possible causes of this state are: - The port has not established a link with another network device. - The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.
D/C	1 - 48	Solid Green	The port is operating in full-duplex mode.
		Solid Amber	The port is operating in half-duplex mode.
		Flashing Amber	The port is operating in half-duplex mode with collisions.

Note

See “SFP+ Transceiver Ports” on page 40 for a description of the LEDs for ports 25 to 28.

AT-x530-28GPXm and AT-x530-52GPXm

The AT-x530-28GPXm and AT-x530-52GPXm LEDs indicate Link/Activity (L/A) and PoE (PD ON/PD ERR/MAX CURRENT) information. These LEDs are shown in Figure 8.

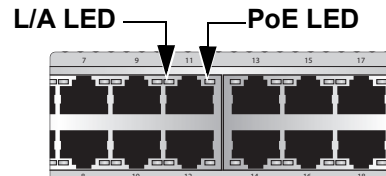


Figure 8. AT-x530-28GPXm and AT-x530-52GPXm Twisted Pair Ports LEDs

The states of the AT-x530-28GPXm LEDs are described in Table 9.

Table 9. AT-x530-28GPXm Twisted Pair Ports 1 - 24 LED Functions

LED	Ports	State	Description
L/A	1 - 20	Solid Green	The port has established a 1 Gbps link to a network device.
		Flashing Green	The port is transmitting or receiving data at 1 Gbps.
	21 - 24	Solid Green	The port has established a 1/2.5/5 Gbps link to a network device.
		Flashing Green	The port is transmitting or receiving data at 1/2.5/5 Gbps.
	1 - 24	Solid Amber	The port has established a 10 Mbps or 100 Mbps link to a network device.
		Flashing Amber	The port is transmitting or receiving data at 10 Mbps or 100 Mbps.
		Off	Possible causes of this state are: - The port has not established a link with another network device. - The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.

Table 9. AT-x530-28GPXm Twisted Pair Ports 1 - 24 LED Functions (Continued)

LED	Ports	State	Description
PoE	1 - 24	Solid Green	PD On - The switch is delivering power to a powered device connected to the port.
		Solid Amber	PD Error - The switch has shut down PoE on the port because of a fault condition.
		Flashing Amber	PD Max Current - The switch has detected a powered device on the port but is not delivering power to it because doing so would exceed its available power budget.
		OFF	No PD - This LED state can result from the following conditions: - The port is not connected to a powered device or the device is powered off. - The port is disabled in the management software. - PoE is disabled on the port. - The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.

Table 10. AT-x530-52GPXm Twisted Pair Ports 1 - 48 LED Functions

LED	Ports	State	Description
L/A	1 - 40	Solid Green	The port has established a 1 Gbps link to a network device.
		Flashing Green	The port is transmitting or receiving data at 1 Gbps.
	41 - 48	Solid Green	The port has established a 1/2.5/5 Gbps link to a network device.
		Flashing Green	The port is transmitting or receiving data at 1/2.5/5 Gbps.
	1 - 48	Solid Amber	The port has established a 10 Mbps or 100 Mbps link to a network device.
		Flashing Amber	The port is transmitting or receiving data at 10 Mbps or 100 Mbps.
		Off	Possible causes of this state are: - The port has not established a link with another network device. - The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.
PoE	1 - 48	Solid Green	PD On - The switch is delivering power to a powered device connected to the port.
		Solid Amber	PD Error - The switch has shut down PoE on the port because of a fault condition.
		Flashing Amber	PD Max Current - The switch has detected a powered device on the port but is not delivering power to it because doing so would exceed its available power budget.
		Off	No PD - This LED state can result from the following conditions: - The port is not connected to a powered device or the device is powered off. - The port is disabled in the management software. - PoE is disabled on the port. - The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.

Power Over Ethernet

The AT-x530-28GPXm and AT-x530-52GPXm switches features PoE on twisted pair ports 1 - 24 and 1 - 48 respectively. With PoE, the switch supplies DC power to network devices over the same twisted pair cables that carry the network traffic.

PoE can make it easier to install networks. The selection of a location for a network device can be 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. 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 network devices is referred to as *power sourcing equipment* (PSE). It functions 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 AT-x530-28GPXm and AT-x530-52GPXm switches automatically determines whether devices connected to their ports are powered devices. 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-x530-28GPXm and AT-x530-52GPXm switches support these PoE standards:

- ❑ PoE (IEEE 802.3af): This standard provides up to 15.4 watts at the switch port for powered devices that require up to 13.0 watts.
- ❑ PoE+ (IEEE 802.3at): This standard provides up to 30.0 watts at the switch port for powered devices that require up to 25.5 watts.

Powered Device Classes

Powered devices are grouped into the five classes listed in Table 11. The classes are based on the amount of power the devices require. The switch supports all five classes.

Table 11. IEEE Powered Device Classes

Class	Maximum Power Output from a Switch Port	PD Power Range
0	15.4W	0.44W to 13.0W
1	4.0W	0.44W to 3.84W
2	7.0W	3.84W to 6.49W
3	15.4W	6.49W to 13.0W
4	30.0W	13.0W to 25.5W

Power Budget

The AT-x530-28GPXm and AT-x530-52GPXm switches have two power supplies. Each power supply provides 370W for a total PoE of 740W. This is the total maximum amount of power that the switch can supply to powered devices on the PoE+ twisted pair ports. The number of powered devices that the switches can support at one time will depend on their power requirements. For instance, under normal operating conditions, the switches can support up to 12 Class 4 powered devices with the maximum 25.5W.

Port Prioritization

The power requirements of the PoE devices determine the maximum number of devices the switch can support at one time. So long as the total power requirements of the power devices is less than the power budget of the switch, the switch can supply power to all the devices. But if the total power requirements exceed the power budget, the switch 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 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.

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 must 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 can cease power transmission if the switch 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 delivering DC power over twisted pair cable by a switch to powered devices. These methods are known as Modes A and B, and identify the individual wires that carry the DC power within the cable from the switch to powered devices.

Twisted pair cabling typically consists of eight wires. With 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. At higher speeds, all eight wires are used to carry network data.

It takes four wires to deliver DC power to a powered device. With Mode A, 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, power is provided over the spare wires.

The ports on the AT-x530-28GPXm and AT-x530-52GPXm switches deliver power using Mode A.

Powered devices that comply with the IEEE 802.3af standard are required to support both Modes A and B. 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.

SFP+ Transceiver Ports

The x530 Series switches have four ports for 1G/10G SFP or SFP+ transceivers. They are:

- ❑ AT-x530-28GPXm and AT-x530-28GTXm ports 25 to 28
- ❑ AT-x530-52GPXm and AT-x530-52GTXm ports 49 to 52

SFP and SFP+ Transceivers

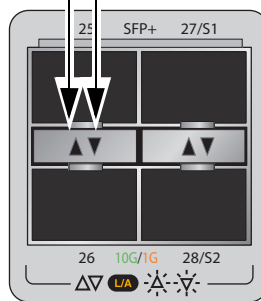
See “SFP+ Transceiver Ports” on page 23 for a description and guidelines of the SFP+ transceivers.

SFP or SFP+ transceivers must be purchased separately. For a list of supported transceivers, refer to the product data sheet on the Allied Telesis web site.

LEDs

Each transceiver port has one LED. The LEDs are located between the ports. Refer to Figure 9.

Top Transceiver Port LED **Bottom Transceiver Port LED**



4566

Figure 9. Link and Activity LEDs for the 1 Gbps/10 Gbps SFP/SFP+ Ports

The LEDs display link status and activity. The possible LED states are described in Table 12.

Table 12. Link and Activity Status LEDs for the 1 Gbps and 10 Gbps Ports

LED	Ports	State	Description
L/A	25-28 (49-52)	Solid Green	The transceiver has established a 10 Gbps link to a network device.
		Flashing Green	The transceiver is transmitting or receiving data in 10 Gbps.
		Solid Amber	The transceiver has established a 1 Gbps link to a network device.
		Flashing Amber	The transceiver is transmitting or receiving data in 1 Gbps.
		Off	Possible causes of this state are: - The port is empty. - The transceiver has not established a link to a network device. - A non-supported module is installed. - The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.

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 can 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 of the AlliedWare Plus management software.

The switch is operating in a low power mode when the LEDs are turned off. Operating the switch in the low power mode 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.

Note

Before checking or troubleshooting the network connections to the ports on the switch, you must 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 in the command line interface.

VCStack Feature

You can use the switches as stand-alone units or join up to eight units with the VCStack feature. The switches of a VCStack act as a single virtual unit. They synchronize their actions so that switching operations (such as spanning tree protocols, virtual LANs, and static port trunks) span across all of the units and ports. Two advantages of stacks are:

- ❑ You can manage multiple units simultaneously, which can simplify network management.
- ❑ You have more flexibility in how you configure some of the features. For instance, a static port trunk on a stand-alone switch can consist of ports from the same switch. In contrast, a static trunk on a stack can have ports from different switches in the same stack.

Note

This guide explains how to install switches as a stack with Virtual Chassis Stacking (VCStack™). For instructions on how to install the devices as stand-alone switches, refer to the *x530 Series Installation Guide for Stand-alone Switches*.

Switch ID LED

The switch ID LED, shown in Figure 10, displays the ID number of the switch. A stand-alone switch has the ID number 0. Switches in a VCStack have the numbers 1 to 8. Chapter 7, “Building the Trunk with Default 10 Gbps Stacking Ports” on page 109 has the procedure for setting the ID numbers of the switches in a stack.

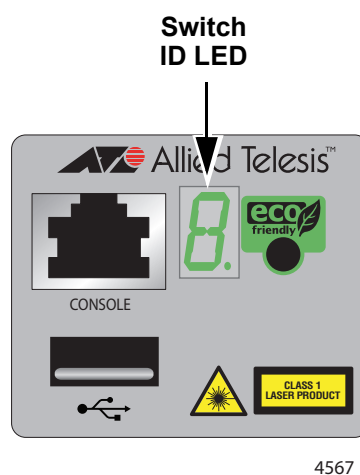
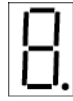


Figure 10. Switch ID LED

The states of the LED when the switch is not operating in the low power mode are shown in Figure 11.



The switch is booting up.



The switch has encountered a fault condition.



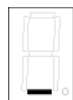
The switch is operating as a stand-alone unit.



The switch has an ID number of 1 to 8 as part of a VCSack.



The dot in the lower right corner flashes when the switch accesses USB memory.



When the eco-friendly mode is enabled, the front panel LEDs are in OFF mode. The horizontal segments will be lit up to show power status and mode of stacking:

Lower segment: Member
Middle segment: Standalone
Upper segment: Master
No segment illuminated: No Power

Figure 11. Switch ID LED Description

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 Simple Network Management Protocol (SNMP) or the command line management interface to determine the type of fault or faults.

USB Port

The USB port on the management panel is used for the following functions:

- ❑ Store configuration files on flash drives.
- ❑ Restore configuration files to switches that have lost or corrupted settings.
- ❑ Configure replacement units by downloading configuration files from a flash drive.
- ❑ Update the management firmware.

The port is USB 2.0-compatible.

Console Port

The Console port is an RS232 serial management port. You use the port to access the AlliedWare Plus management software on the switch to configure the feature settings or monitor status or statistics. This type of management is commonly referred to as local management because you have to be at the physical location of the switch and use the management cable included with the unit. The switch does not have to have an IP address for local management.

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

The Console port has the following settings:

- ☐ Default baud rate: 9,600 bps (range is 9,600 to 115,200 bps)
- ☐ Data bits: 8
- ☐ Parity: None
- ☐ Stop bits: 1
- ☐ Flow control: None

Note

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

Power Supply

The AT-x530-28GTXm, AT-x530-28GPXm, AT-x530-52GTXm, and AT-x530-52GPXm switches come with dual pre-installed AC power supplies. Refer to “Power Specifications” on page 172 for the input voltage ranges.



Warning

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

Note

Power supplies are not field-replaceable.

Designating Ports in the Command Line Interface for Stacks

The individual ports on the switches in a stack are specified in the command line interface with the PORT parameter. The format of the parameter is shown in Figure 12.

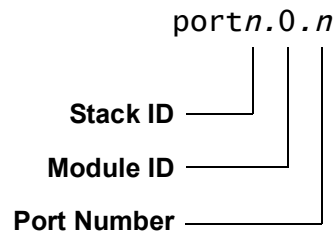


Figure 12. PORT Parameter in the Command Line Interface

The three parts of the PORT parameter are described in Table 13.

Table 13. PORT Parameter Format

Number	Description
Stack ID	Designates the switch's ID number, 1 to 8, displayed on the Switch ID LED.
Module ID	Designates the module number of a port. This value is always 0 (zero) for x550 Series switches because they do not support modules.
Port Number	Designates a port number.

Here is an example of the PORT parameter on a switch in a stack. It uses the INTERFACE command to enter the Port Interface mode for ports 1 and 7 in the switch with the ID number 2:

```
awplus> enable
awplus# configure terminal
awplus(config)# interface port2.0.1,port2.0.7
```

For instructions on the command line interface and the PORT parameter, refer to the *Software Reference for x530 Series Switches, AlliedWare Plus Operating System*.

Software and Hardware Releases

Software and hardware releases for the AlliedWare Plus operating software and AT-x530 Series switches are listed in Table 14.

Table 14. Software and Hardware Releases

Software Version	Hardware	VCStack
v5.4.8-2	AT-x530-28GPXm switch AT-x530-28GTXm switch	Allows stacks of up to four switches using the SFP/SFP+ transceiver ports for the stack trunk.
v5.4.9-2	Adds the following switches: AT-x530-52GPXm switch AT-x530-52GTXm switch	Allows stacks of up to eight switches using the SFP/SFP+ transceiver ports or the 1/2.5/5 Gbps ports for the stack trunk.

Chapter 2

Virtual Chassis Stacking

The following sections are discussed in this chapter:

- ❑ “Overview” on page 52
- ❑ “Stacking Guidelines” on page 53
- ❑ “Stack Trunks” on page 55
- ❑ “Stack Trunks of 5 Gbps” on page 60
- ❑ “Stack Trunks of 10 Gbps” on page 56
- ❑ “Invalid Stack Trunks” on page 64
- ❑ “Master and Member Switches” on page 66
- ❑ “Switch ID Numbers” on page 68
- ❑ “Optional Feature Licenses” on page 69
- ❑ “Planning the Stack” on page 70
- ❑ “Stacking Worksheet” on page 71

Note

For more information on VCStack, refer to the *Stacking Introduction and Stacking Commands* chapters in the *Software Reference for x530 Series Switches, AlliedWare Operating System* from www.alliedtelesis.com.

Overview

The VCStack feature is used to connect multiple x530 Series switches into a single, virtual networking unit. Some of the benefits of the VCStack feature are listed here:

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

Stacking Guidelines

This section lists the general guidelines to building a VCS stack of x530 Series switches. Stacking guidelines differ depending on the version of the AlliedWare Plus management software on the switches. (Instructions in Chapter 7, “Building the Trunk with Default 10 Gbps Stacking Ports” on page 109 and Chapter 8, “Building the Stack Trunk with 5 Gbps Multi-Speed Ports” on page 129 explain how to display the version numbers of the management software.)

- ❑ A stack can have up to eight x530 Series switches.
- ❑ Stacking is enabled by default on x530 Series switches.
- ❑ The switches of a stack must be connected with a stack trunk, consisting of a minimum of two ports per switch.
- ❑ The default stacking ports are:
 - AT-x530-28GTXm: 27 and 28
 - AT-x530-28GPXm: 27 and 28
 - AT-x530-52GTXm: 51 and 52
 - AT-x530-52GPXm: 51 and 52
- ❑ You can increase the bandwidth and resiliency of the stack trunk by also using these ports as stacking ports.
 - AT-x530-28GTXm: 25 and 26
 - AT-x530-28GPXm: 25 and 26
 - AT-x530-52GTXm: 49 and 50
 - AT-x530-52GPXm: 49 and 50
- ❑ Stack trunks can also be built with the four multi-speed 5 Gbps ports.
- ❑ Although ports 25 to 28 and 49 to 52 support 1 Gbps and 10 Gbps transceivers, stack trunks require 10 Gbps transceivers. Stack trunks are not supported with 1 Gbps transceivers.
- ❑ No additional software or licenses are required for stacking.
- ❑ The switches of a stack can be the same or different x530 Series models.
- ❑ A stack of x530 Series switches cannot contain other stacking switches, such as x600 or x610 Series switches.
- ❑ The switches of a stack must be connected with a stack trunk consisting of a minimum of two ports on each device.

- ❑ The links of a stack trunk must be direct connections between switches. You cannot install a networking device, such as a media converter or Ethernet switch, between two stacking ports.
- ❑ SFP+ transceivers and direct attach cables used for a stack trunk must be from Allied Telesis. Switches will not form a stack with transceivers from other network equipment providers. For a list of supported transceivers, refer to the product data sheet on the Allied Telesis web site.

Stack Trunks

Stack trunks connect the switches of a stack together. A stack trunk consists of two ports on each device. For switches with AlliedWare Plus v5.4.9 or later, you can choose the two ports of the trunk. Your choices are listed in Table 15:

Table 15. Default (10 Gbps) and Optional (5 Gbps) Trunk Ports

Switch	Optional Trunk Ports (5 Gbps twisted pair ports)	Additional Trunk Ports (SFP+ 10 Gbps SFP+ transceiver ports)	Default Trunk Ports (SFP+ 10 Gbps SFP+ transceiver ports)
AT-x530-28GPXm	21-24 ¹	25, 26	27/S1, 28/S2
AT-x530-28GTXm	21-24 ²	25, 26	27/S1, 28/S2
AT-x530-52GPXm	41-48 ¹	49, 50	51/S1, 52/S2
AT-x530-52GTXm	41-48 ²	49, 50	51/S1, 52/S2

1. PoE+ twisted pair ports.

2. Non-PoE+ twisted pair ports.

The guidelines are discussed in the following sections:

- ❑ “Stack Trunks of 5 Gbps” on page 60
- ❑ “Stack Trunks of 10 Gbps” on page 56

Note

The following discussions apply to AlliedWare Plus v5.4.9 or later. Earlier versions of the operating system have different trunk rules and restrictions.

Stack Trunks of 10 Gbps

You can build stack trunks with 10 Gbps SFP+ transceiver ports on the switches. The guidelines are described here:

- ❑ Stacks can have up to eight switches.
- ❑ For stacking ports, you can choose between four twisted pair ports at 10 Gbps.
 - AT-x530-28GTXm: 25 to 28
 - AT-x530-28GPXm: 25 to 28
 - AT-x530-52GTXm: 49 to 52
 - AT-x530-52GPXm: 49 to 52
- ❑ The following ports cannot be used in a stack trunk.
 - AT-x530-28GTXm: 1 to 20
 - AT-x530-28GPXm: 1 to 20
 - AT-x530-52GTXm: 1 to 40
 - AT-x530-52GPXm: 1 to 40
- ❑ SFP+ transceivers must be from Allied Telesis and be approved for use in the product. For a list of supported 10 Gbps SFP+ transceivers, refer to the product data sheet on the Allied Telesis web site.

Note

Transceivers are purchased separately.

- ❑ The 10 Gbps stacking ports and transceiver ports can be used as regular networking ports by disabling the stacking feature.
- ❑ A stack trunk can be either linear or ring. Ring is recommended because it adds redundancy. The stack can continue to function even if a trunk link fails. See Figure 13 on page 57.
- ❑ A stack trunk can have fiber optic or AT-SP10TW direct connect cables in the same stack. See Figure 15.

Figure 13 shows examples of stack trunks for two, three and four switches, using the default stacking ports 27 and 28.

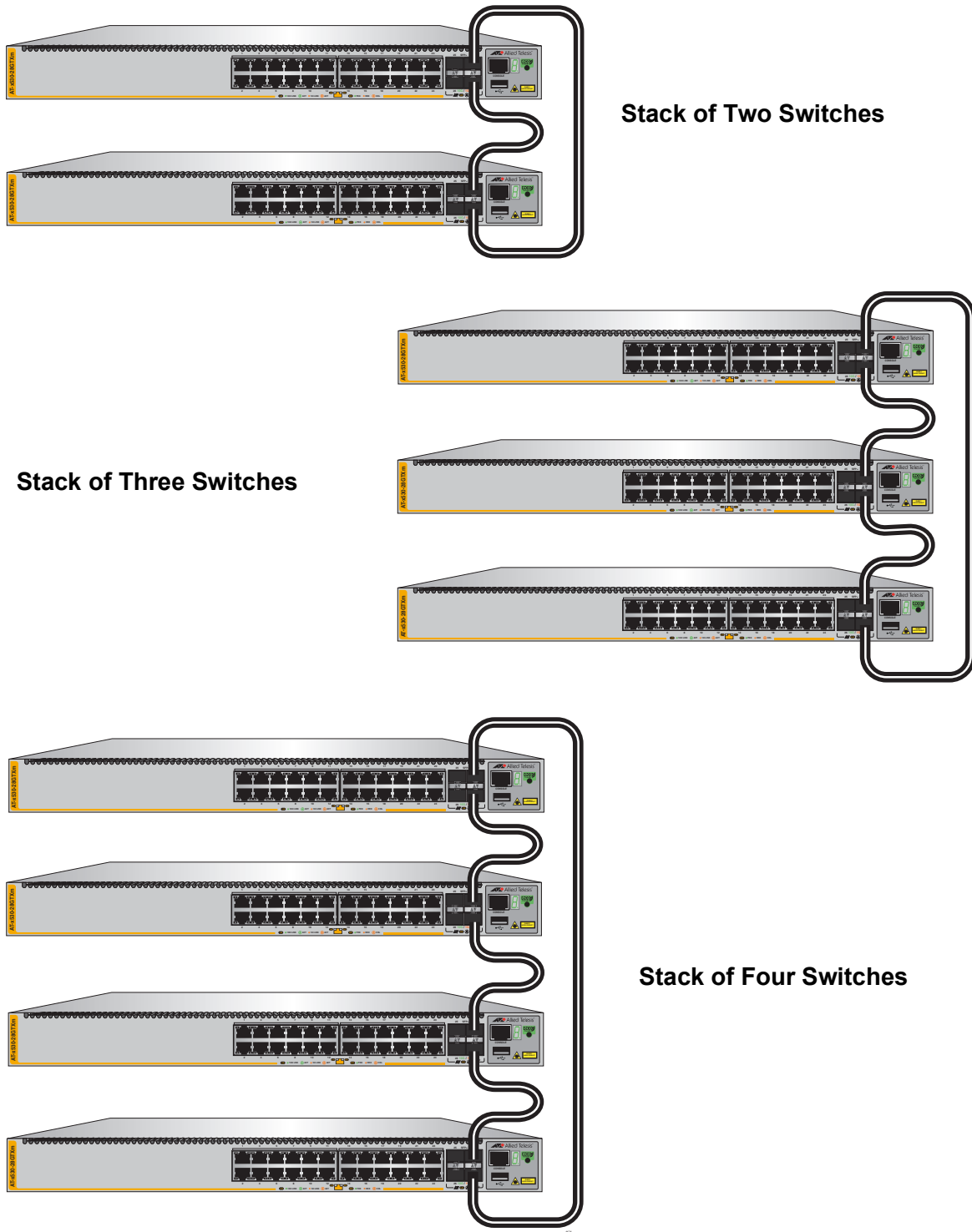
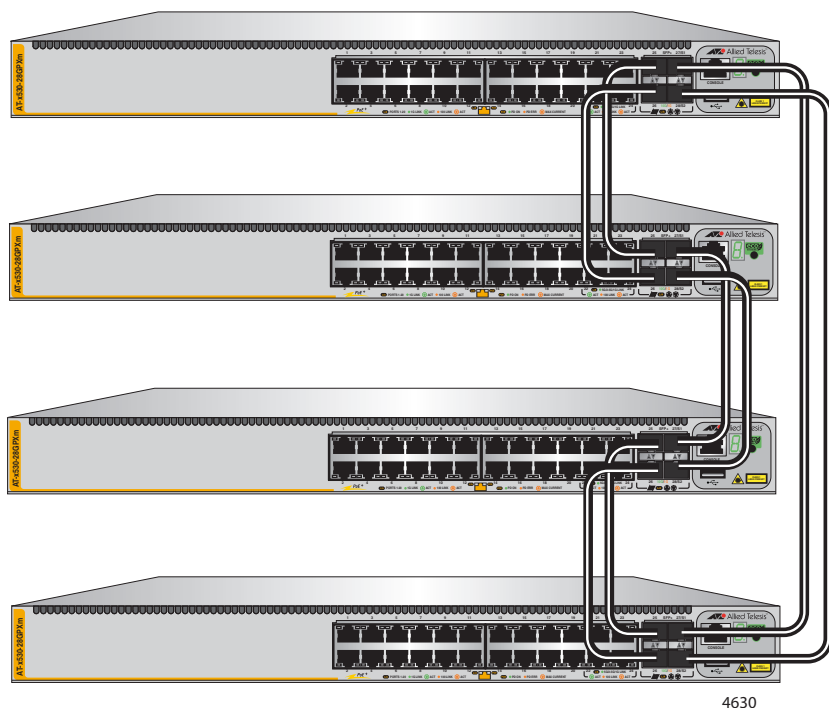
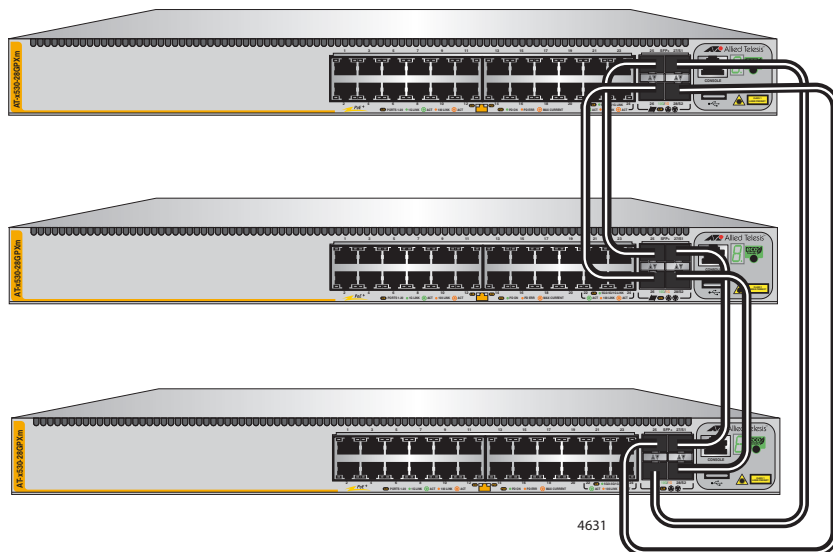


Figure 13. Stack Trunks of Ports 27 and 28

In stacks of three or more switches the amount of inter-switch network traffic might require a stacking trunk with greater bandwidth than that provided by the default ports 27 and 28 (or 51 and 52). For such situations ports 25 and 26 (or 49 and 50) can also be used as trunk ports. Figure 14 shows examples of stacks of three and four switches using all four SFP+ ports for the stack trunk.

Stack of Three Switches



Stack of Four Switches

Figure 14. Stack Trunks Using Ports 25 to 28

10 Gbps stack trunks can have both fiber optic transceivers and AT-SP10TW direct attach cables as shown in Figure 15. For example, a primary use-case would be a stack of four devices split between two buildings.

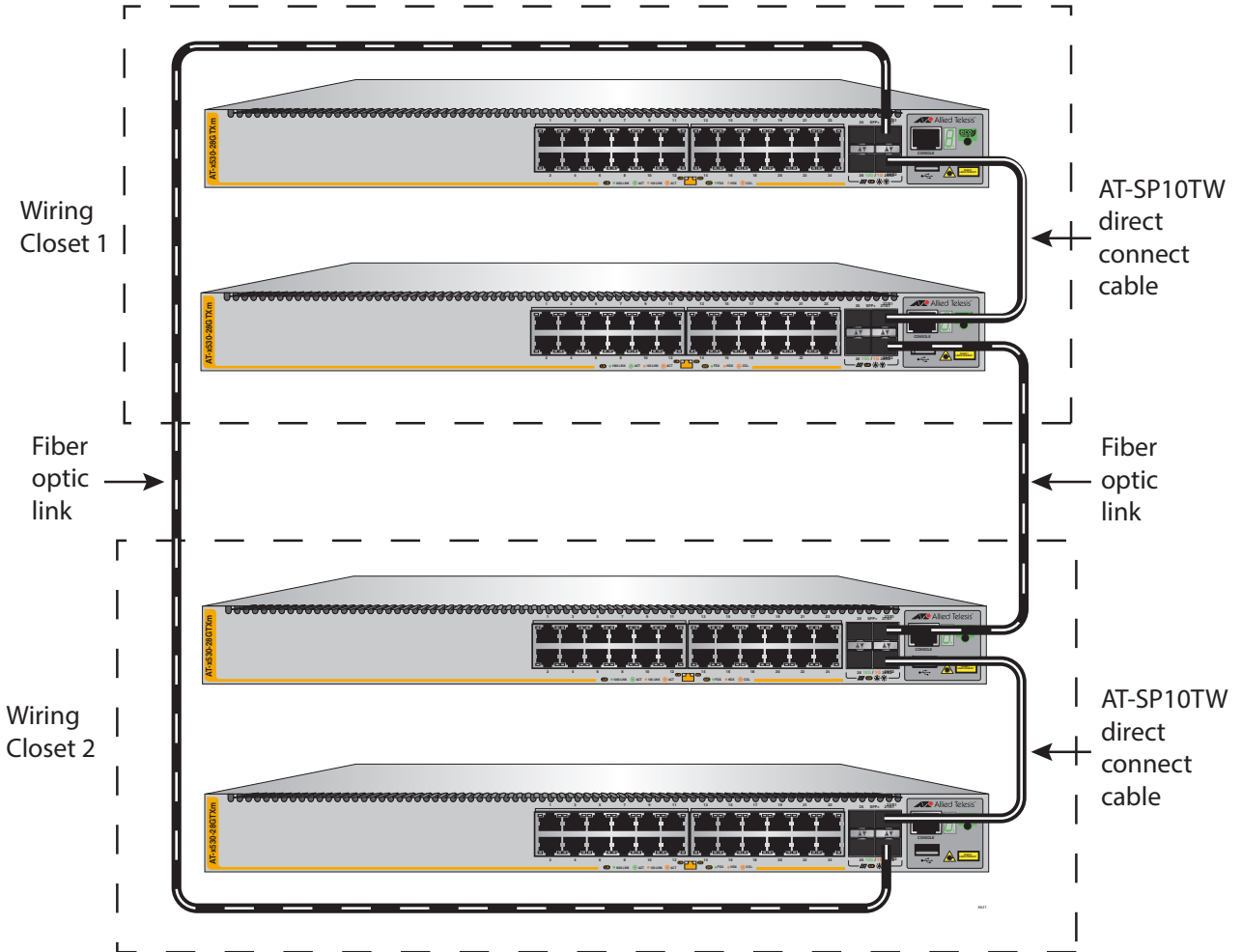


Figure 15. 10 Gbps Stack Trunk with Both Fiber Optic and AT-SP10TW Direct Connect Cables

Stack Trunks of 5 Gbps

The 10 Gbps SFP+ ports are not the only ports you can use for a trunk of a stack. If you prefer to use the 10 Gbps ports for other functions you can use the 5 Gbps ports for the trunk instead. You can use two, three or all four 5 Gbps ports per switch for a trunk. As with a trunk based on 10 Gbps SFP+ ports, the more 5 Gbps ports a trunk has, the greater its bandwidth.

The following rules and guidelines for a stack trunk of 5 Gbps ports are similar to stack trunks of 10 Gbps ports:

- ❑ Stacks can have up to eight switches.
- ❑ For stacking ports, you can choose between four twisted pair ports at 5 Gbps.
 - AT-x530-28GTxm: 21 to 24
 - AT-x530-28GPxm: 21 to 24
 - AT-x530-52GTxm: 41 to 48
 - AT-x530-52GPxm: 41 to 48
- ❑ The following ports cannot be used in a stack trunk.
 - AT-x530-28GTxm: 1 to 20
 - AT-x530-28GPxm: 1 to 20
 - AT-x530-52GTxm: 1 to 40
 - AT-x530-52GPxm: 1 to 40
- ❑ If you use only two or three of the 5 Gbps ports for a trunk, you should use the same ports on all the switches of a stack. This is not a requirement, but it can make managing and troubleshooting a stack easier. For example, you might designate ports 23 and 24 to be the stacking ports on all the switches.
- ❑ You designate the stack ports with the STACKPORT command.
- ❑ Once ports are designated as trunk ports, you cannot view or change their parameter settings.

A stack trunk can have fiber optic or AT-SP10TW direct connect cables in the same stack. A trunk of 5 Gbps ports for a stack of two switches can have two, three, or four links per switch. As mentioned previously, the more links in a trunk, the greater its bandwidth and resiliency. Examples are shown in Figure 16.

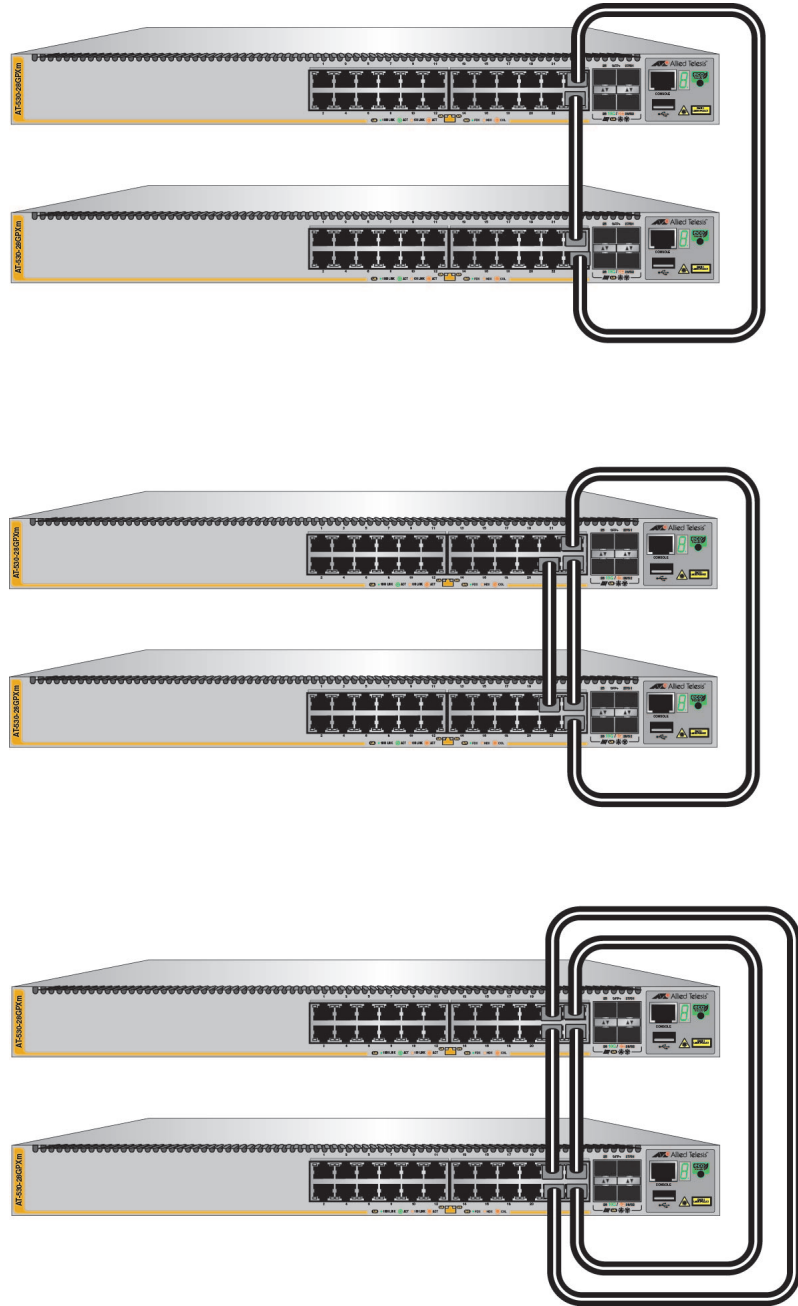


Figure 16. Trunks of 5 Gbps Ports for Stacks of Two Switches

A trunk of 5 Gbps ports for a stack of three switches can have two or four ports per switch. Refer to Figure 17.

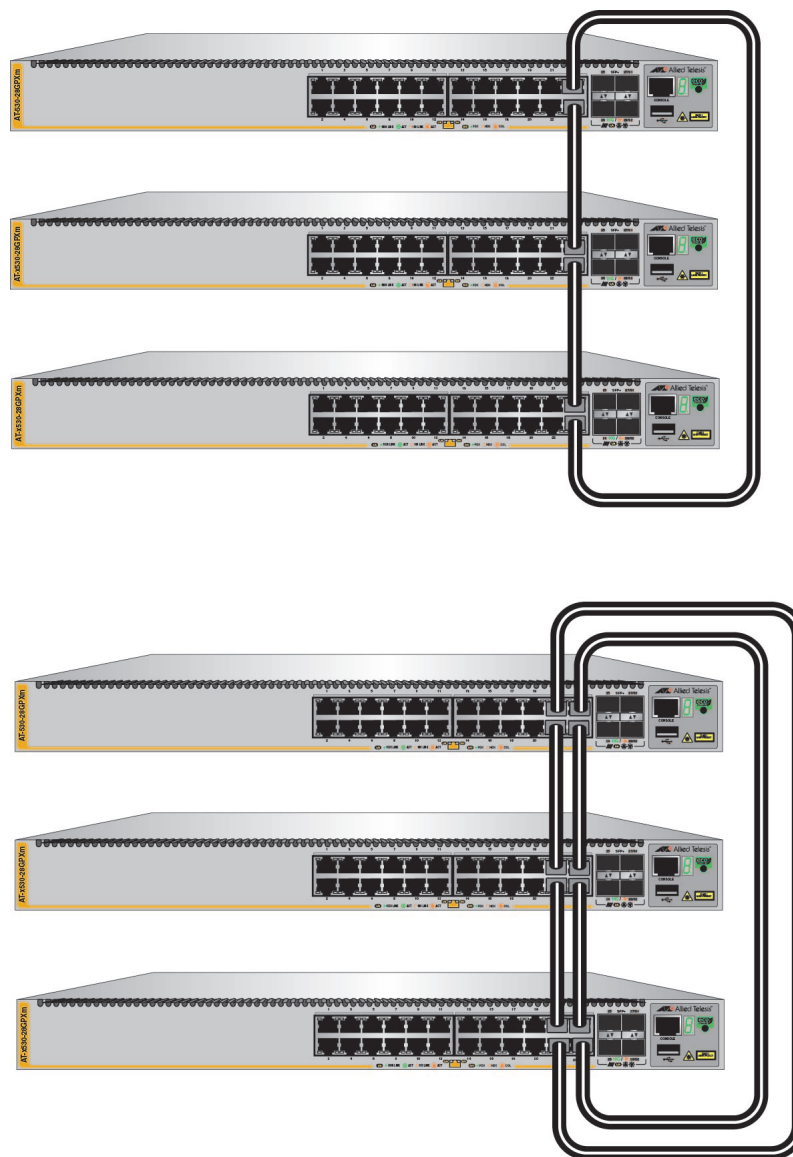


Figure 17. Trunks of 5 Gbps Ports for Stacks of Three Switches

A trunk of 5 Gbps ports for a stack of four switches can also have two or four ports per switch. Refer to Figure 18.

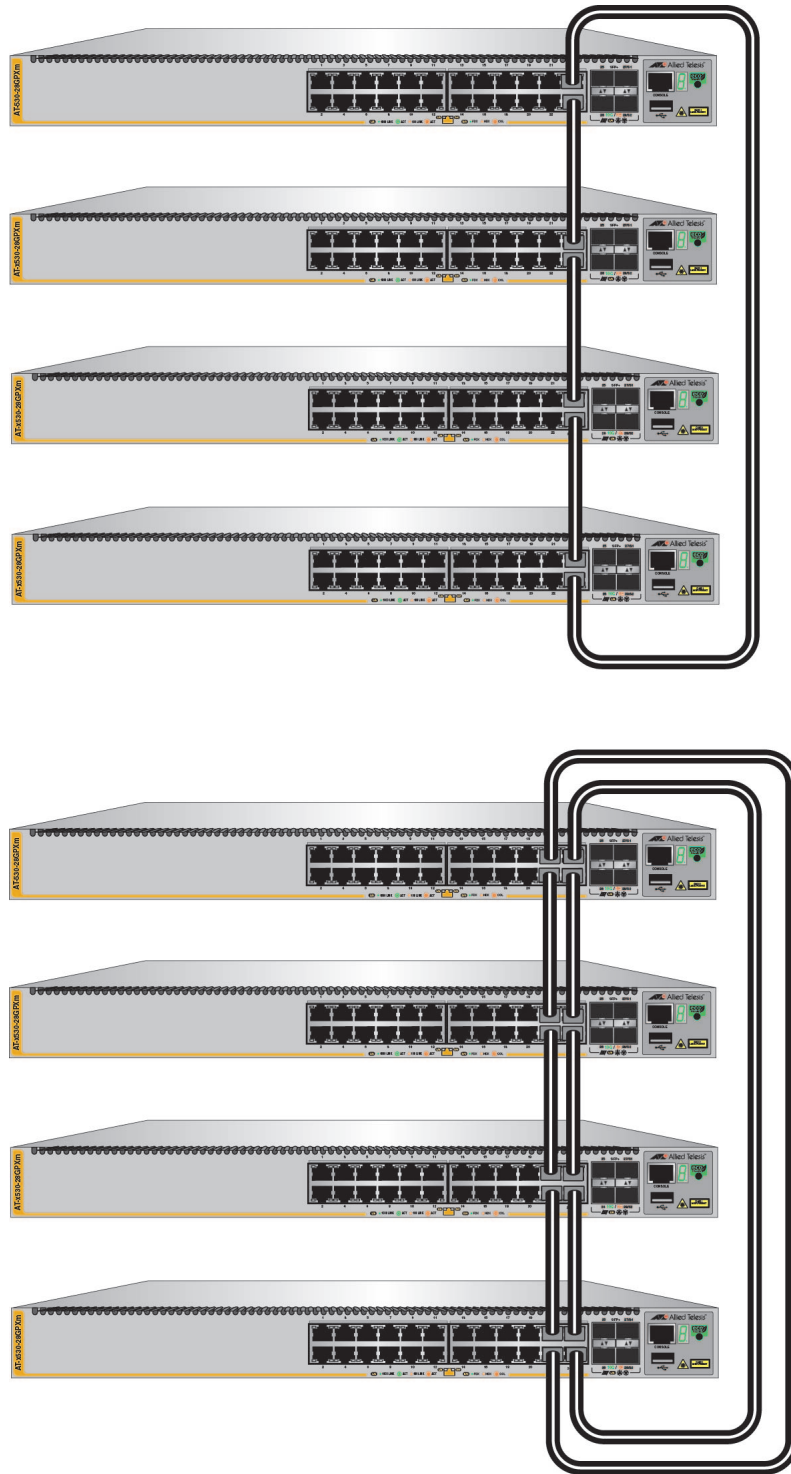


Figure 18. Trunks of 5 Gbps Ports for Stacks of Four Switches

Invalid Stack Trunks

Figure 19 through Figure 22 on page 65 show examples of different types of invalid stack trunks.

Example 1 Stack trunks must be direct links between trunk ports. There cannot be any intermediary networking devices, such as media converters, Ethernet switches, or routers, between trunk ports. Figure 19 is an example of this type of invalid trunk.

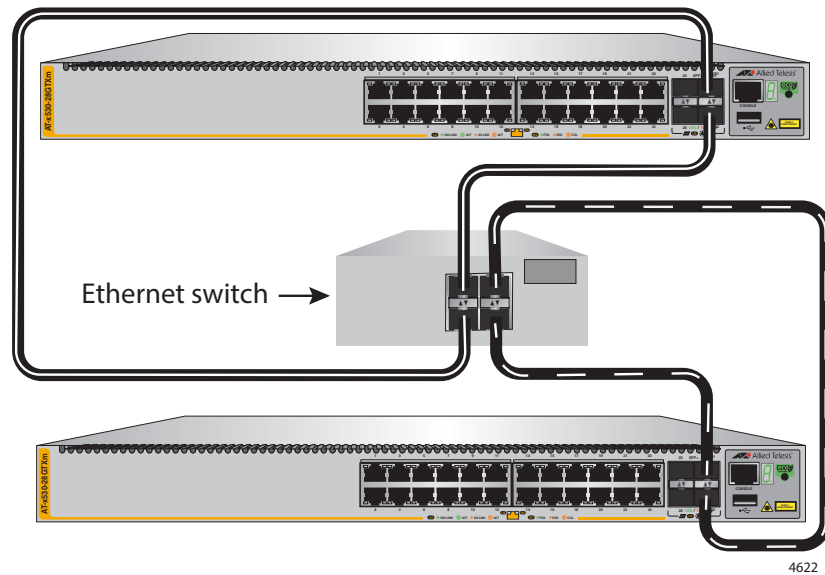


Figure 19. Invalid Stack Trunk with an Intermediary Networking Device

Example 2 Trunks must have a minimum of two ports used per switch. Figure 20 is an example of an invalid stack trunk with one port used per switch.

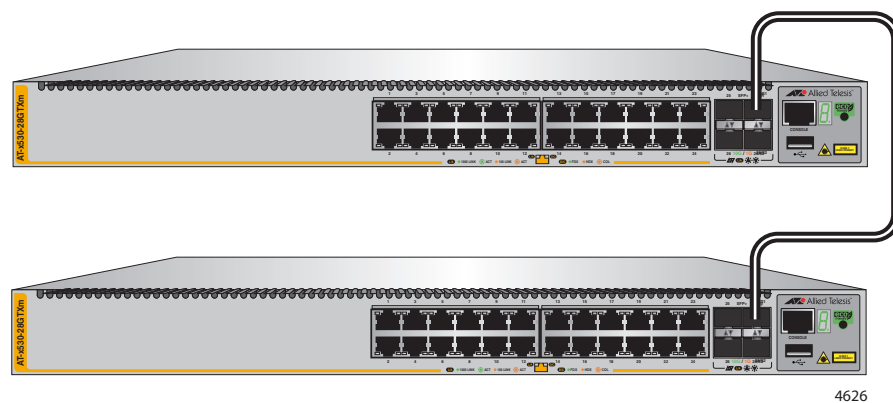


Figure 20. Invalid Stack Trunk with One Port Used Per Switch

Example 3 Trunks must have the same number of physical links between switches. Figure 21 is invalid because the top and middle switches are connected with two links while the top and middle switches are connected to the bottom switch with only one link each.

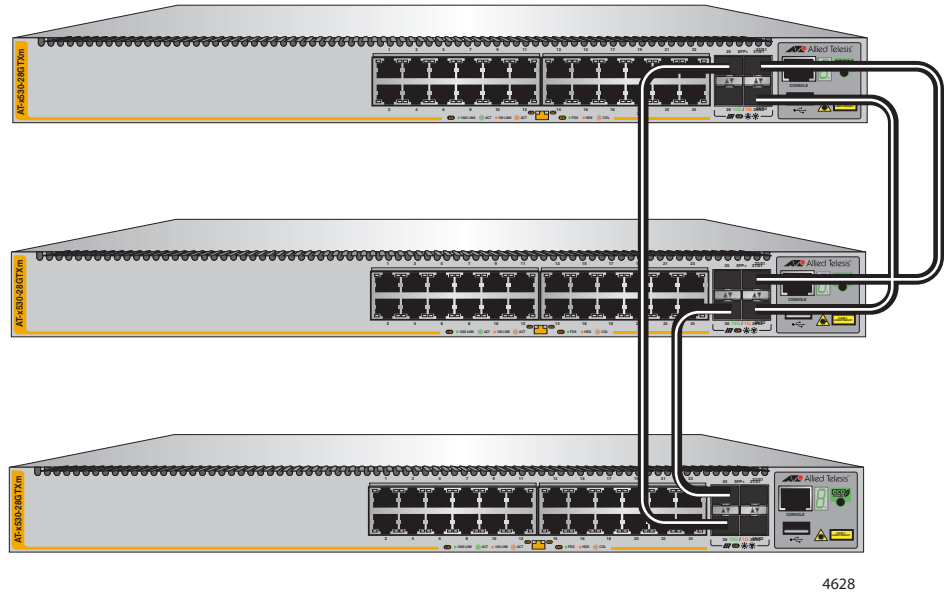


Figure 21. Invalid Stack Trunk with Different Numbers of Links

Example 4 Trunks cannot contain a combination of 1/2.5/5 Gbps and 10 Gbps links. Figure 22 shows an example of an invalid stack trunk because it uses both types of ports.

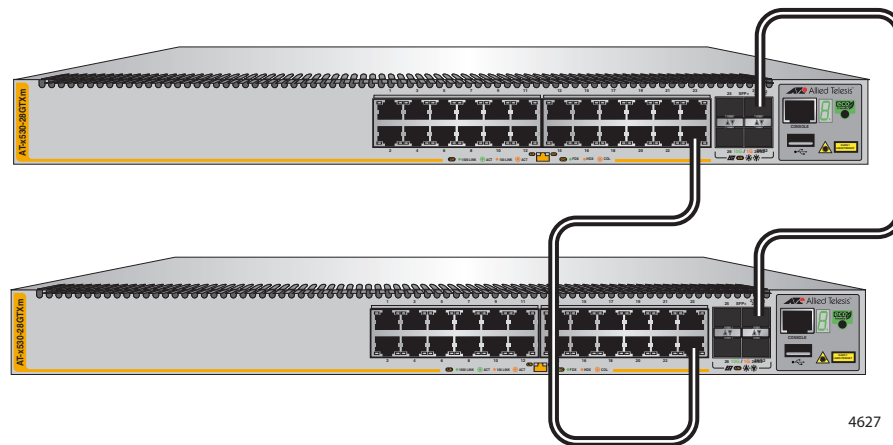


Figure 22. Invalid Stack Trunk with Different Port Types

Master and Member Switches

A stack has one master switch. The other switches are member switches. The main functions of the master switch are listed here:

- ❑ Coordinate and monitor stack operations.
- ❑ Configure the parameter settings of the switches using its configuration file in flash memory, whenever the stack is reset or powered on.
- ❑ Verify that the switches are using the same version of management software. It automatically downloads its management software to the member switch over the stacking cables if the member switch has a different version of the management software.
- ❑ Verify that the switches have different ID numbers. It automatically assigns new ID numbers to resolve situations where two or more switches have the same ID number.
- ❑ Verify that the stacking transceivers are from Allied Telesis and they are cabled correctly.

The parameter settings of the switches of the stack are stored in configuration files in the flash memories of the master and member switches. Each file contains all the settings for the switches in the stack. The switches update the files with the latest parameter settings whenever you issue the `WRITE` command to save your changes.

When you reset or power on the stack, the master switch uses the configuration file in its flash memory to restore its own parameter settings as well as the parameter settings of the member switches in the stack. A member switch uses its configuration file to restore parameter settings only if the master switch is removed or fails, and it becomes the new master switch of the stack.

Selection of the Master Switch

The switches of a stack select the master switch during the initialization process, which they perform whenever they are powered on or reset. The master switch is selected using the following parameters:

- ❑ Stack priority numbers
- ❑ MAC addresses

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

When switches have the same priority values, they compare their MAC addresses to select the master switch. As with the priority value, the lower the MAC address, the higher the priority. The switch with the lowest MAC address becomes the master switch.

If you power on the stack for the first time without adjusting the priority values, the master switch is selected based on the MAC addresses if the units are powered on simultaneously. If you power on the switches one at a time, the master switch is the first switch to be powered on.

You can set the priority values of the switches either before or after you build the stack. Changing the values after the stack is operating does not change the parameter settings of the stack or the ID numbers of the devices.

It should be noted that the master switch of a stack does not have to have the ID number 1. It can have any ID number.

Switch ID Numbers

Each switch in a stack must have a unique ID number. The possible ID numbers depend on the version number of the AlliedWare Plus management software. The ID numbers are 1 to 8 for the eight switches in a stack with AlliedWare Plus v5.4.9-2. The default is 1.

The ID numbers are displayed on the ID LEDs on the front panels of the units. You can assign the numbers yourself or let the master switch assign the numbers automatically when you initially power on the stack.

Use the ID numbers to identify the individual switches and ports when configuring the devices with the commands in the management software.

The ID numbers are also used to identify the parameter settings of the switches in the configuration files. When the stack is reset or power cycled, the master switch uses the ID numbers to identify the devices to which the parameter settings belong.



Caution

Do not change the ID numbers of the switches after configuring the parameter settings of the stack. Otherwise, the parameter settings might be applied to the wrong devices when you reset or power cycle the stack. *See* E79

The switches do not use the ID numbers to select the master switch. The selection of the master switch is based on their priority numbers and MAC addresses, as explained in “Selection of the Master Switch” on page 66.

Optional Feature Licenses

The x530 Series switches come with the AlliedWare Plus operating system and a base set of features that are available as soon as you install the devices. Allied Telesis offers additional features and capabilities for the switches. They come with the AlliedWare Plus operating system, but have to be unlocked before you can use them. Unlocking optional features requires licenses from Allied Telesis. For a list of optional feature licenses for the product, refer to its product sheet on the Allied Telesis web site.

Here are the guidelines to feature licenses for a stack of x530 Series switches:

- ❑ The VCSStack feature is part of the base features of the switch. It does not require an additional feature license.
- ❑ You can install feature licenses while the switches are operating as stand-alone units or a stack.
- ❑ When ordering feature licenses for the switches of a stack, you must order one license for each switch.
- ❑ The switches will form a stack even if they have different feature licenses. However, the additional features are only available on those switches that have the necessary licenses. The stack generates a warning message if it detects that the switches do not have the same feature licenses. To resolve the issue, you can use the REMOTE-LOGIN command to log onto the individual switches in a stack to install new licenses. For more information, refer to the *Software Reference for x530 Series Switches, AlliedWare Operating System* from **www.alliedtelesis.com**.

Planning the Stack

Here are factors to consider when planning a stack:

- ❑ How many x530 switches will be in the stack? The maximum is eight devices.
- ❑ Have you determined the required number of SFP+ transceivers or AT-SP10TW direct attach cables for the trunk? Refer to Figure 13 on page 57 and Figure 14 on page 58.
- ❑ Have you selected a master switch? This can be any switch. If the switches has different versions of the AlliedWare Plus management software, the master switch should have the most recent version. Refer to “Master and Member Switches” on page 66.
- ❑ Have you selected ID numbers, in the range of 1 to 8, for the switches? You can control the ID number assignments by the order in which you initially power on the switches, or you can have the switches assign the numbers automatically. Refer to “Switch ID Numbers” on page 68.

Stacking Worksheet

Configuring and maintaining a stack will be easier if you use the worksheet in Table 16.

Table 16. Stacking Worksheet

Switch	Switch Model/ Location	ID	Priority	AW+ Version Number	Trunk Ports
Master		1	1		
Member		2	2		
Member		3	3		
Member		4	4		

The worksheet columns are described in Table 17.

Table 17. Stacking Worksheet Columns

Column	Description
Location	Use this column to write down the physical locations of the devices, such as their buildings or equipment rooms. The information can be useful in locating the switches of the stack if they are in different locations.
ID	Each switch in a stack has to have a unique ID number, in the range of 1 to 4. They display the numbers on the ID LEDs on the front panels and you use the numbers to configure the individual ports. Allied Telesis recommends assigning the ID 1, the default value, to the master switch. You should decide ahead of time, before beginning the configuration procedures, the ID assignments of the switches.

Table 17. Stacking Worksheet Columns (Continued)

Column	Description
Priority	When the switches of a stack are reset or powered on, they perform an initialization process that involves, in part, choosing the master switch. The selection is based on their priority numbers and MAC addresses. The former is an adjustable parameter with a range of 0 to 255 and a default value of 128. The lower the value, the higher the priority. Thus, the switch with the lowest value becomes the stack master. If switches have the same priority number, the master is selected based on their MAC addresses. Again, as with priority numbers, the lower the MAC address, the higher the priority. Allied Telesis recommends setting each switch's priority value to match its ID value. This is to ensure that the switch you have chosen to be the master unit will indeed function in that role. Additionally, it will make it possible for you to know the order in which the switches assume the master role if the primary master should fail or be powered off.
AW+ Version Number	This column is for writing down the version numbers of the AlliedWare Plus management software on the switches. The switches might not be able to form the stack if they have different versions. The configuration instructions explain how to view the version numbers. If they have different versions, you should update them to the most recent release before building the stack.
Trunk Ports	This column is for the ports of the trunk. This will be the default ports 27 and 28 (51 and 52) or the optional trunk ports. Refer to Table 15 on page 55. If you have not chosen the ports yet, you should do so before beginning the configuration procedures.

Chapter 3

Beginning the Installation

The chapter contains the following sections:

- ❑ “Reviewing Safety Precautions” on page 74
- ❑ “Choosing a Site for the Switch” on page 78
- ❑ “Unpacking the Switch” on page 79

Reviewing Safety Precautions

Please review the following safety precautions before you begin to install the switches

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

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



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 user-serviceable parts inside. This unit contains hazardous voltages and should only be opened by a trained and qualified technician. To avoid the possibility of electric shock, disconnect electric power to the product before connecting or disconnecting the LAN cables.  E1



Warning

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

**Warning**

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

**Warning**

Class I Equipment. This equipment must be earthed. The power plug must be connected to a properly wired earth ground socket outlet. An improperly wired socket outlet could place hazardous voltages on accessible metal parts. ⚡ E4

Note

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

**Caution**

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

**Warning**

Operating Temperatures. This product is designed for a maximum ambient temperature of 50° C. ⚡ E52

Note

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

**Warning**

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

**Caution**

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



Caution

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

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



Warning

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



Warning

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

Note

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



Warning

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

Note

If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).  E35

**Caution**

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

**Warning**

Reliable earthing of rack-mounted equipment must be maintained. Particular attention must 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 de-energize this equipment, disconnect all power cords from the device.  E41

**Caution**

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

**Warning**

This equipment must 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.

- ☐ Before installing the switch in an equipment rack, check 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.
- ☐ Before installing the switch on a table, check that the table is level and stable.
- ☐ The power outlets 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 is from front to back.)
- ☐ The site must not expose the switch to moisture or water.
- ☐ The site must be a dust-free environment.
- ☐ The site must have 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 might overheat and fail from inadequate air flow.



Warning

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

Unpacking the Switch

The main items provided in the shipping box for the switch are:

- ❑ AT-x530-28GTXm, AT-x530-28GPXm, AT-x530-52GTXm, or AT-x530-52GPXm switch
- ❑ Accessory kit (refer to Figure 24 on page 80)

Note

Retain the original packaging material in case you need to return the unit to Allied Telesis.

Figure 23 shows the items provided in the shipping box for the switch.

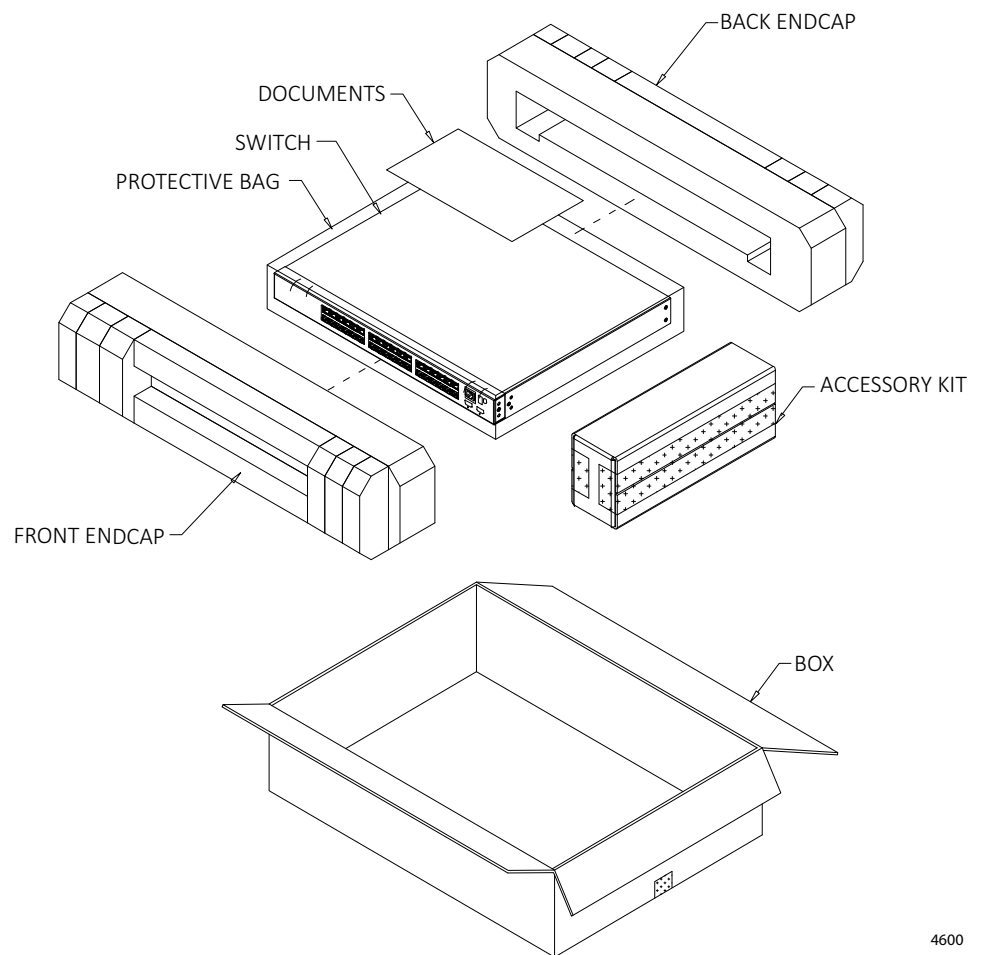


Figure 23. Switch Shipping Box

4600

Figure 24 lists the items that are included in the accessory kit. Contact your Allied Telesis sales representative for assistance if any item is missing or damaged. See “Tools and Material” on page 95 for a detailed list.

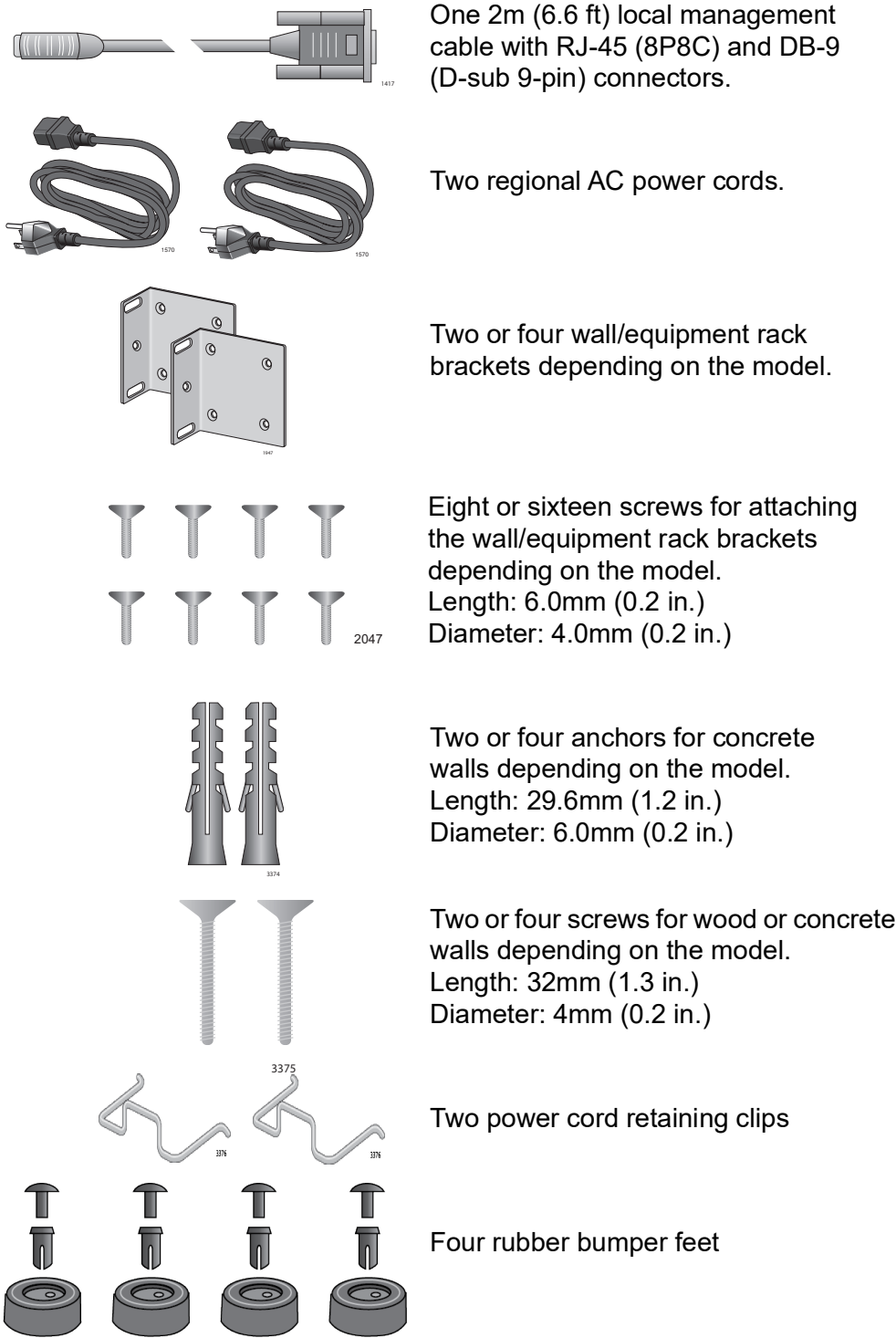


Figure 24. Accessory Kit Items

Chapter 4

Installing the Switch on a Table

This chapter contains the instructions for installing the switch on a table or desktop.



Warning

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



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.

The switch comes with four bumper feet in the accessory kit. The feet, which are reusable, are used when installing the switch on a table. If they are already assembled, disassemble them by removing the rivets and rivet housings from the bumper feet. Refer to Figure 25.

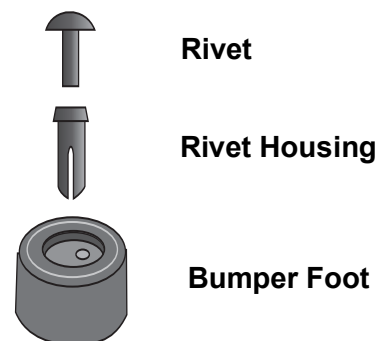


Figure 25. Parts of the Bumper Feet

The holes in the base of the switch for the bumper feet are shown in Figure 26 on page 82.

Note

Although you cannot stack the switches on top of each other, they can be placed next to each other.

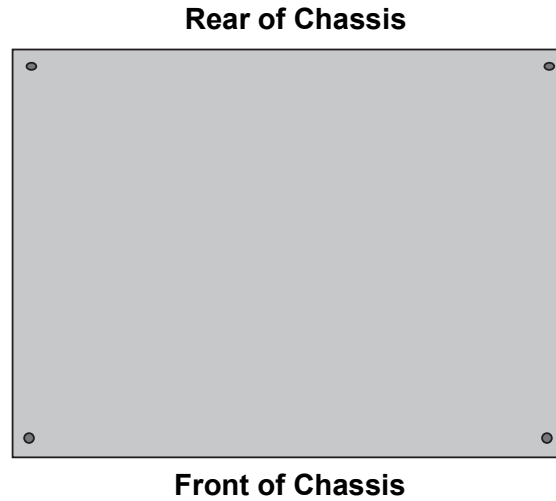


Figure 26. Holes for Bumper Feet

Note

The following procedure assumes that you have already reviewed the information and performed the procedures in Chapter 3, "Beginning the Installation" on page 73.

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

1. Place the switch upside down on a table.
2. Insert a rivet housing into a bumper foot. Refer to Figure 27.

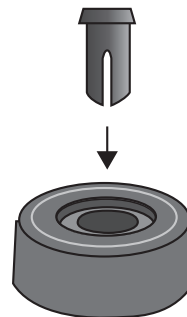


Figure 27. Inserting the Rivet Housing into the Bumper Foot

3. Place the bumper foot with rivet housing onto one of the holes in the base of the switch. Refer to Figure 28.

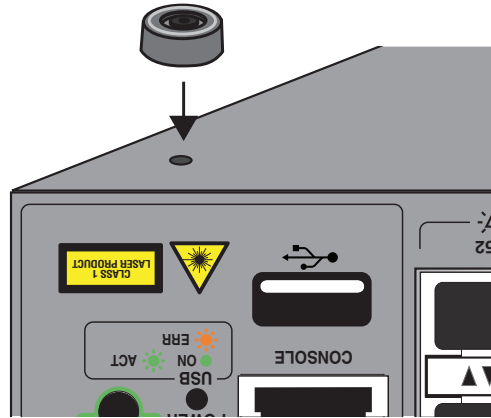


Figure 28. Placing the Bumper Foot on a Base Corner Hole

4. Insert the rivet to secure the bumper foot to the base. Refer to Figure 29.

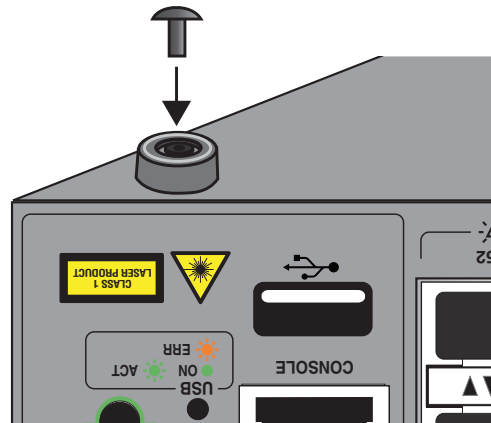


Figure 29. Inserting the Rivet into the Bumper Foot

5. Repeat steps 2 to 4 to install the remaining bumper feet.
6. Turn the switch over and place it on a flat, secure desk or table, leaving ample space around it for ventilation.
7. Install the other switches of the stack.
8. After installing the switches, go to Chapter 7, “Building the Trunk with the Default 10 Gbps Stacking Ports” on page 105 or Chapter 8, “Building the Stack Trunk with 5 Gbps Multi-Speed Ports” on page 123.

Chapter 5

Installing the Switch in an Equipment Rack

This chapter provides instructions for installing the switch in an equipment rack. This chapter contains the following section:

- ❑ “Beginning the Installation” on page 86
- ❑ “Removing the Bumper Feet” on page 88
- ❑ “Installing the Switch” on page 89

Beginning the Installation

This section contains the procedure for installing the switch in a standard 19-inch equipment rack using the brackets supplied with the unit.

Required Items

The following items are required to install the switch in an equipment rack:

- ❑ Two or four (depending on model) equipment rack brackets (included with the switch)
- ❑ Eight M4x6mm bracket screws (included with the switch)
- ❑ Cross-head screwdriver (not provided)
- ❑ Four standard equipment rack screws (not provided)

Switch Orientations in the Equipment Rack

The switch has two sets of four screw holes on the left and right sides, for attaching the brackets. Refer to Figure 30.

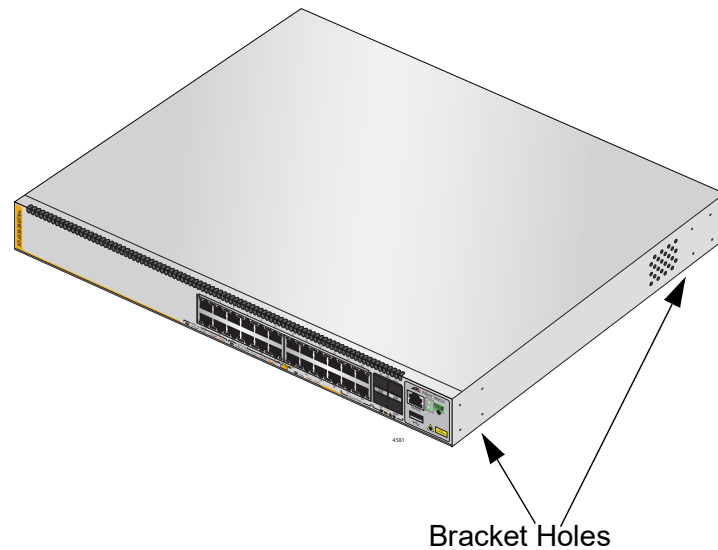


Figure 30. Bracket Holes on the Switch

You can use the different sets of holes on the switch to install the switch in the equipment rack in a variety of orientations. You can install it with the front panel flush with, extending in front of, or recessed behind the front of the equipment rack. Refer to Figure 31.



Figure 31. Switch Orientations in an Equipment Rack

Removing the Bumper Feet

The bumper feet included with the switch should not be used when installing the device in an equipment rack. If they are already installed, perform the following procedure to remove them:

1. Place the switch upside down on a level, secure surface.
2. Use a small flat-head screwdriver to pry the feet from the bottom of the switch. Refer to Figure 32.

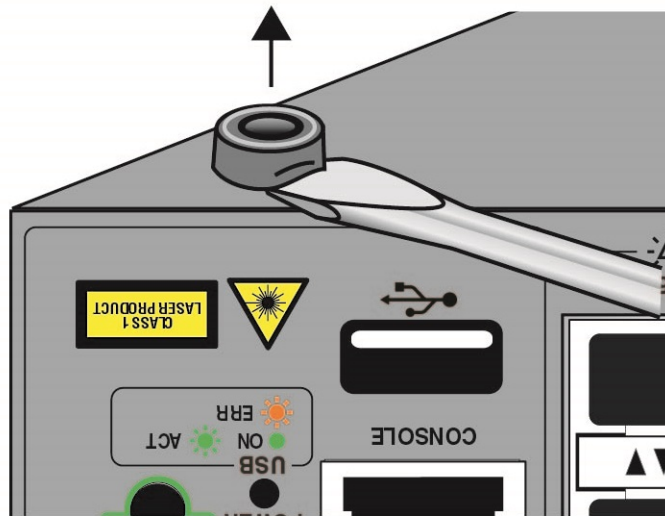


Figure 32. Removing the Bumper Feet

3. Turn the switch back over.
4. Go to “Installing the Switch” on page 89.

Installing the Switch

If you have not chosen an orientation for the switch in the equipment rack, review “Switch Orientations in the Equipment Rack” on page 86.

Please review the installation guidelines in “Choosing a Site for the Switch” on page 78 before installing the switch in an equipment rack.



Caution

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

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

1. Place the switch on a level, secure surface.
2. Attach the two brackets to the sides of the switch in the selected position, using the eight M4x6mm screws supplied with the unit. The illustration in Figure 33 shows the installation of the brackets such that the front panel of the switch is even with the front of the equipment rack.

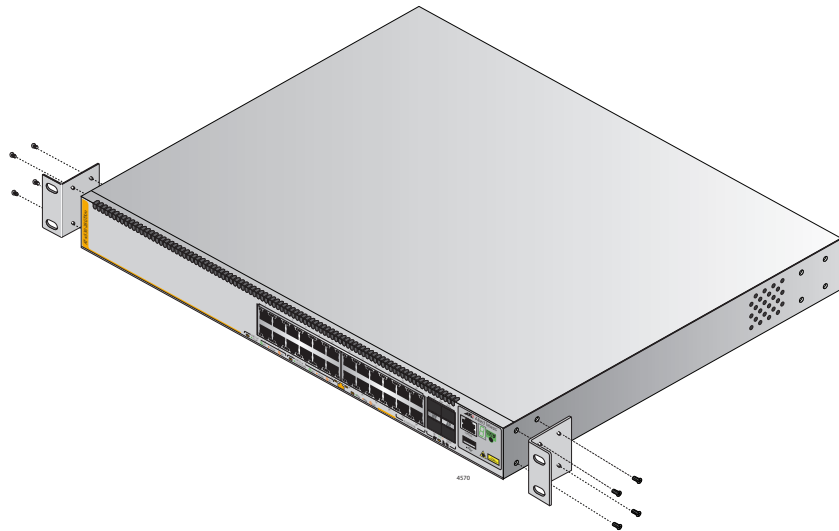


Figure 33. Example of Attaching the Brackets to the Switch

3. Have another person hold the switch at the desired location in the equipment rack while you secure it using four standard equipment rack screws (not provided). Refer to Figure 34.

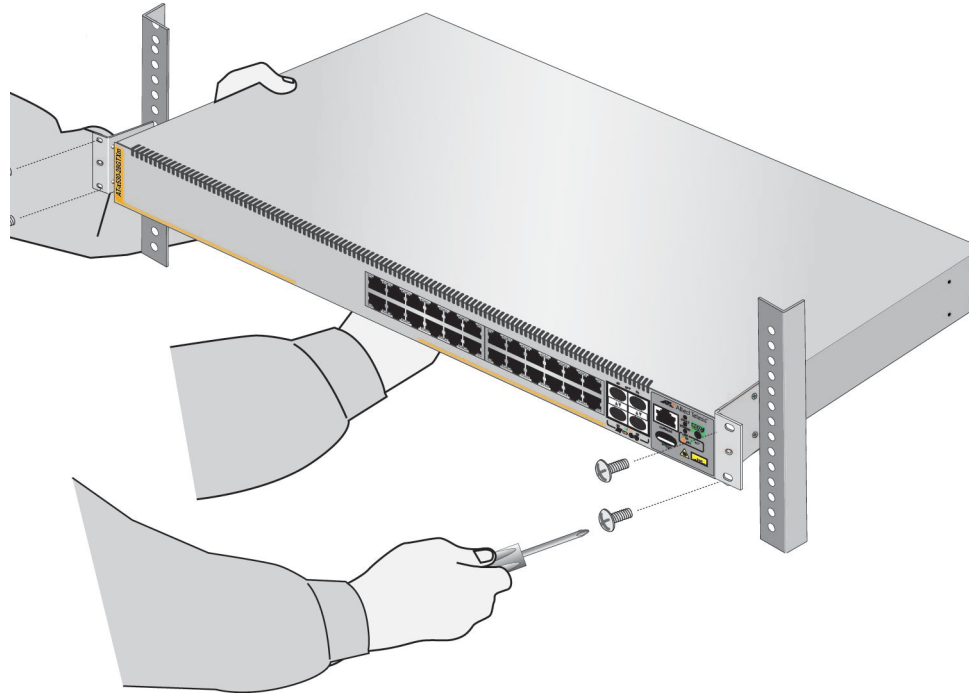


Figure 34. Installing the Switch in an Equipment Rack

4. Install the other switches of the stack.
5. After installing the switches, go to Chapter 7, “Building the Trunk with Default 10 Gbps Stacking Ports” on page 109 or Chapter 8, “Building the Stack Trunk with 5 Gbps Multi-Speed Ports” on page 129.

Chapter 6

Installing the Switch on a Wall

The procedures in this chapter are listed here:

- ❑ “Switch Orientations on a Wall” on page 92
- ❑ “Installation Guidelines” on page 94
- ❑ “Plywood Base for a Wall with Wooden Studs” on page 97
- ❑ “Installing a Plywood Base” on page 100
- ❑ “Installing the Switch on a Plywood Base” on page 101
- ❑ “Installing the Switch on a Concrete Wall” on page 106

Switch Orientations on a Wall

Install the switch on a wall with the front panel facing up, left or right, as shown in Figure 35. Do not install the switch with the front panel facing down.

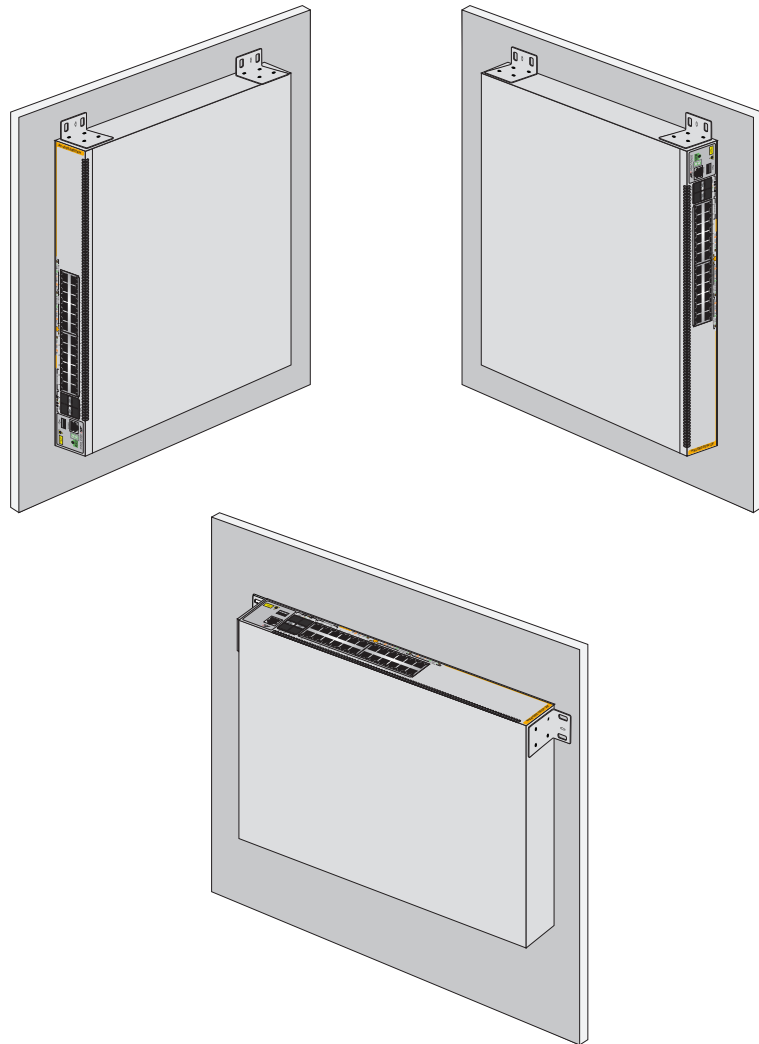


Figure 35. Positioning the AT-x530-28GTXm or AT-x530-52GTXm Switch on the Wall

Note

The AT-x530-28GTXm and AT-x530-52GTXm switches only require two brackets to mount. The AT-x530-28GPXm and AT-x530-52GPXm is heavier and requires four brackets.

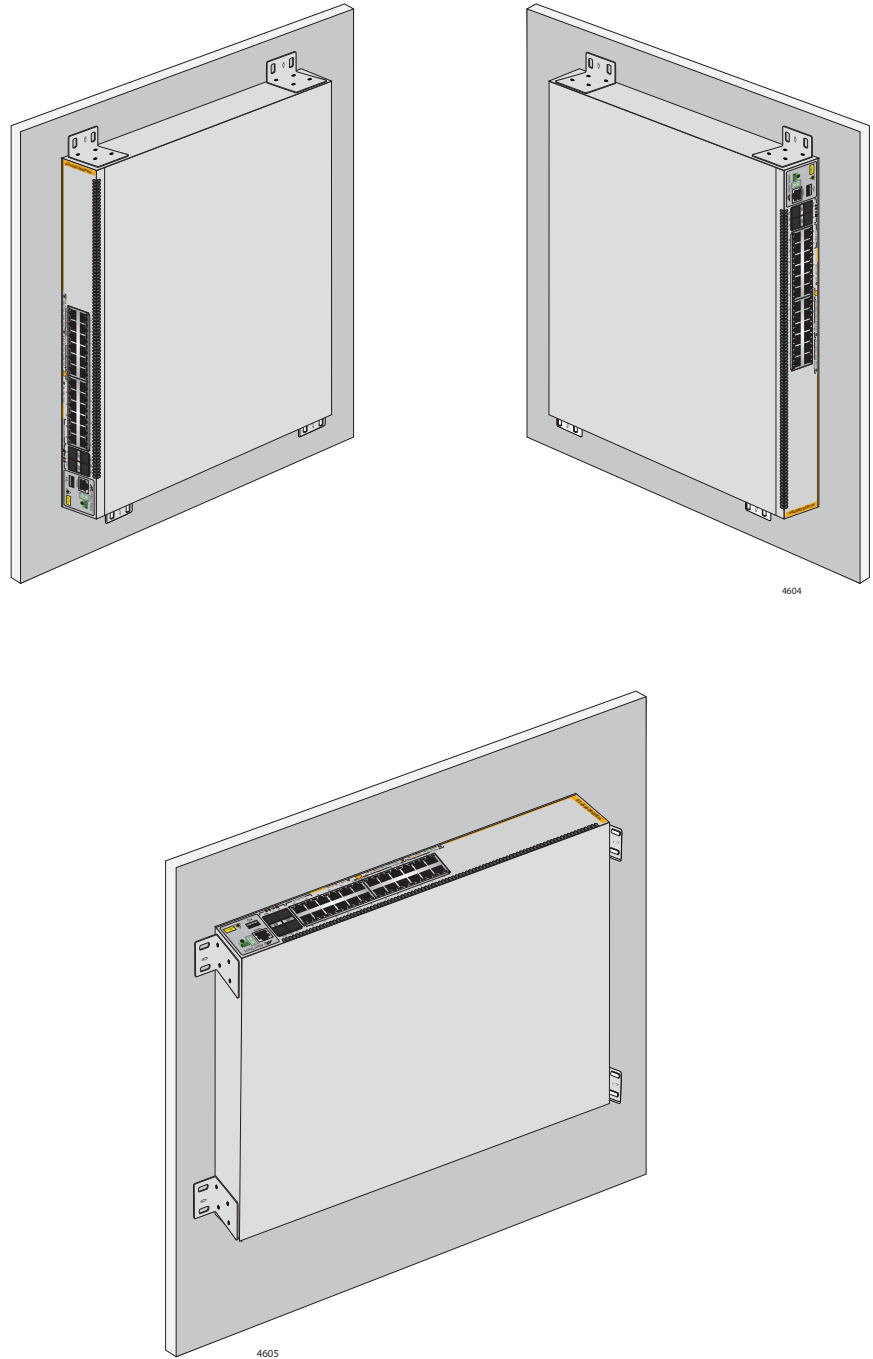


Figure 36. Positioning the AT-x530-28GPXm or AT-x530-52GPXm Switch on the Wall

Installation Guidelines

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

- ❑ Install the switch on a wall that has wooden studs or on a concrete wall.
- ❑ If you are installing the switch on a wall with wooden studs, use a plywood base to support the switch. For more information, refer to “Plywood Base for a Wall with Wooden Studs” on page 97. A plywood base is not required for a concrete wall.
- ❑ Do not install the switch on a wall that has metal studs. Metal studs may not be strong enough to safely support the device.
- ❑ Do not install the switch on sheetrock or similar material. Sheetrock is not strong enough to safely support the device.



Warning

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



Warning

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

Tools and Material

The following tools and material are required for installing the switch on a wall.

Included with switch:

- ❑ Wall/equipment rack brackets:
 - Two for the AT-x530-28GTXm and AT-x530-52GTXm
 - Four for the AT-x530-28GPXm and AT-x530-52GPXm
- ❑ Screws for attaching the wall/equipment rack brackets to the switch:
 - Eight for the AT-x530-28GTXm and AT-x530-52GTXm
 - Sixteen for the AT-x530-28GPXm and AT-x530-52GPXm

Length: 6 mm (0.2 in.) Diameter: 4 mm (0.2 in.)
- ❑ Anchors for concrete walls
 - Two for the AT-x530-28GTXm and AT-x530-52GTXm
 - Four for the AT-x530-28GPXm and AT-x530-52GPXm

Length: 29.6 mm (1.2 in.) Diameter: 6 mm (0.2 in.)
- ❑ Screws for wood or concrete walls:
 - Two for the AT-x530-28GTXm and AT-x530-52GTXm
 - Four for the AT-x530-28GPXm and AT-x530-52GPXm

Length: 32 mm (1.3 in.) Diameter: 4 mm (0.2 in.)
- ❑ Two power cord retaining clips
- ❑ Four rubber bumper feet

Not included with switch:

- ❑ Cross-head screwdriver.
- ❑ Stud finder for a wooden wall, capable of identifying the middle of wall studs and hot electrical wiring.
- ❑ Drill and 1/4-inch carbide drill bit (for a concrete wall).
Refer to “Installing the Switch on a Concrete Wall” on page 106.
- ❑ Plywood base (if you are installing the switch on a wall with wooden studs). Refer to “Plywood Base for a Wall with Wooden Studs” on page 97 for illustrations.
- ❑ Four screws for attaching the plywood base to the wall.



Caution

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

Plywood Base for a Wall with Wooden Studs

If you are installing the switch on a wall that has wooden studs, use a plywood base for the device. (A plywood base is not required for a concrete wall.) Refer to Figure 37.

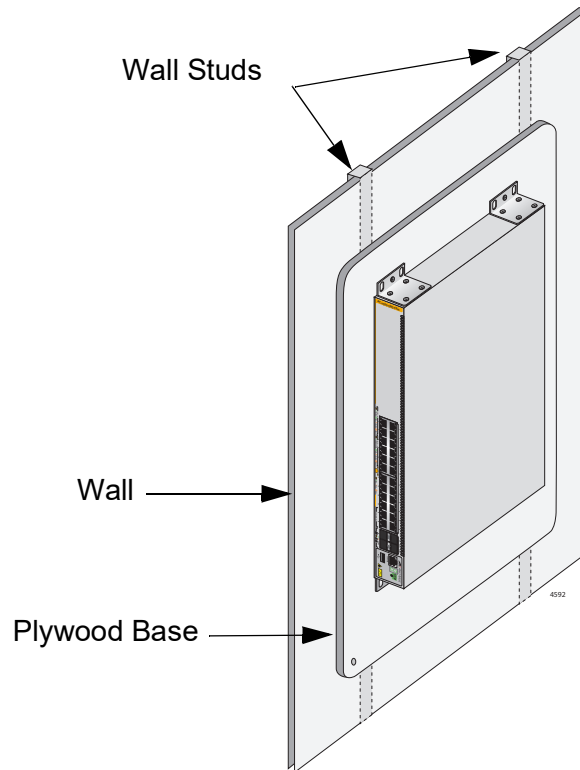


Figure 37. Switch on the Wall with a Plywood Base

Mount the plywood base to two studs in the wall. The recommended minimum dimensions of the plywood base for the switch is:

- ❑ Width: 55.9 centimeters (22 inches)
- ❑ Height: 61.0 centimeters (24 inches)
- ❑ Thickness: 2.5 centimeters (1 inch)

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

To install the switch on the wall:

1. Install the plywood base on the wall and then install the switch on the base. Refer to Figure 38.

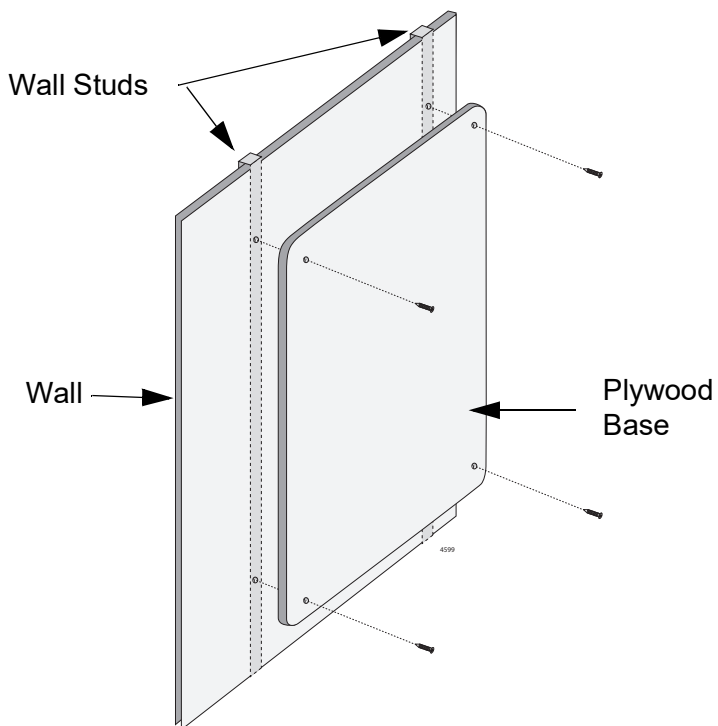


Figure 38. Installing the Plywood Base to the Wall

2. Install the switch on the plywood base. Refer to Figure 39.

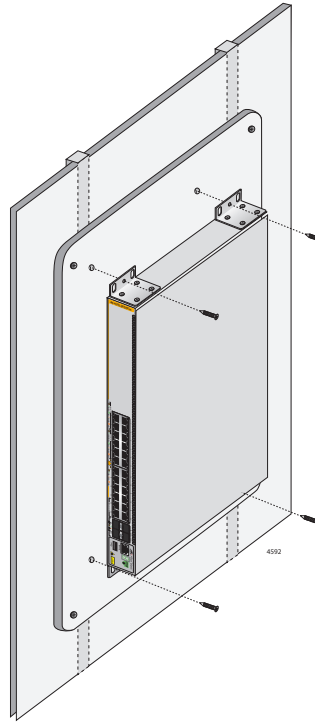


Figure 39. Installing the Switch on the Plywood Base

Installing a Plywood Base

A plywood base is recommended when installing the switch on a wall that has wooden studs. Refer to “Plywood Base for a Wall with Wooden Studs” on page 97. Consult a qualified building contractor for installation instructions for the plywood base. The installation guidelines are listed here:

- ❑ Use a stud finder to identify the middle of studs and hot electrical wiring in the wall.
- ❑ Attach the base to two wall studs with a minimum of four screws.
- ❑ The selected wall location for the base must provide sufficient space from other devices or walls so that you can access the front and back panels, and for adequate air flow for ventilation.

Installing the Switch on a Plywood Base

After the plywood base for the switch has been installed on the wall, install the switch. See “Reviewing Safety Precautions” on page 74 and “Choosing a Site for the Switch” on page 78 before performing this procedure. Allied Telesis recommends a minimum of two people for this procedure.



Warning

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



Warning

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

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

1. Place the switch on a table.
2. For the AT-x530-28GTXm or AT-x530-52GTXm switch, install two wall/equipment rack brackets to the sides of the unit with the eight M4x6mm screws included with the switch. Refer to Figure 40 on page 102. For the AT-x530-28GPXm or AT-x530-52GPXm switch, install four wall/equipment rack brackets to the sides of the unit with the 16 M4x6mm screws included with the switch. Refer to Figure 41 on page 103.

Note

The AT-x530-28GPXm and AT-x530-52GPXm switch requires four brackets to be installed due to its weight. Whereas, the AT-x530-28GTXm and AT-x530-52GTXm only requires two brackets because it is lighter.

Brackets positions
to install the switch with
the front panel on the left.



Brackets positions
to install the switch with
the front panel on the right.

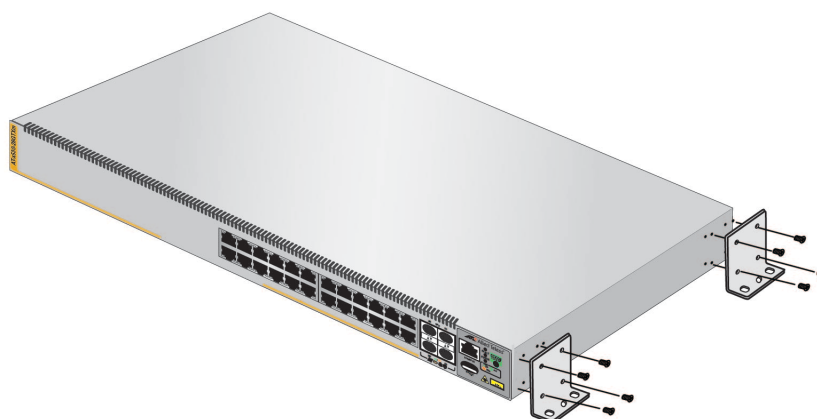


Figure 40. Installing Two Brackets on the AT-x530-28GTXm or AT-x530-52GTXm Switch

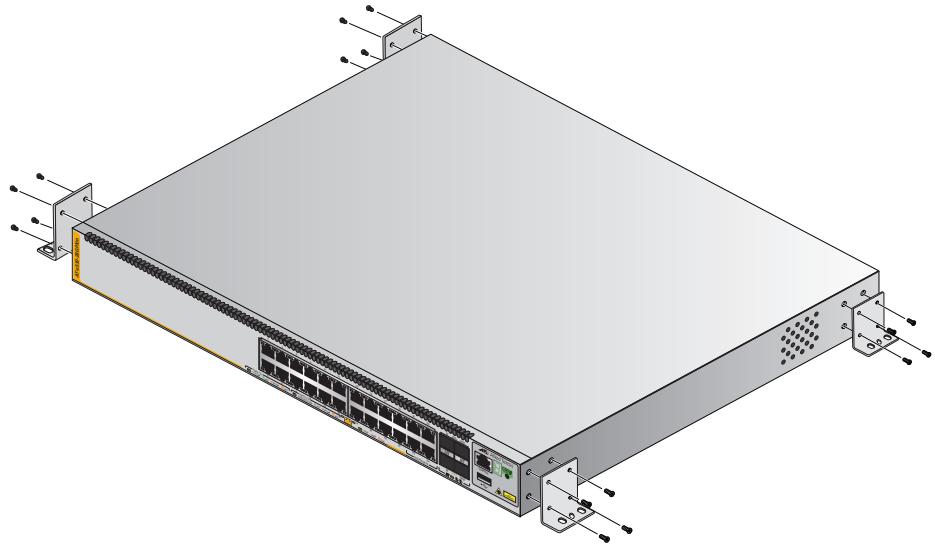


Figure 41. Installing Four Brackets on the AT-x530-28GPXm or AT-x530-52GPXm Switch

3. After attaching the brackets, have another person hold the switch on the plywood base on the wall while you secure it with the M4x32.3mm screws included with the switch. Refer to Figure 42 on page 104 for the AT-x530-28GTXm or AT-x530-52GTXm switch, Refer to Figure 43 on page 105 for the AT-x530-28GPXm or AT-x530-52GPXm switch.

Follow these guidelines as you position the switch on the wall:

- ☐ Position it so that the front panel is facing up, left or right. Refer to Figure 35. Do not install it with the front panel facing down.
- ☐ Provide sufficient space from other devices or walls so that you can access the front and back panels, and for adequate air flow for ventilation.

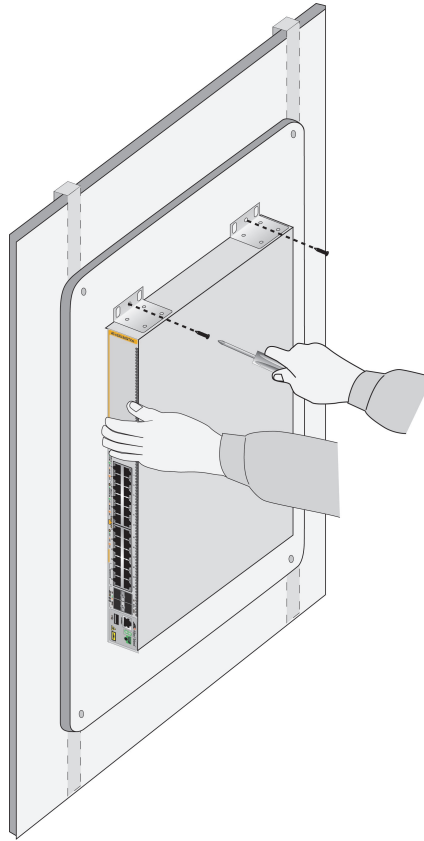


Figure 42. Securing the AT-x530-28GTXm or AT-x530-52GTXm Switch to the Plywood Base

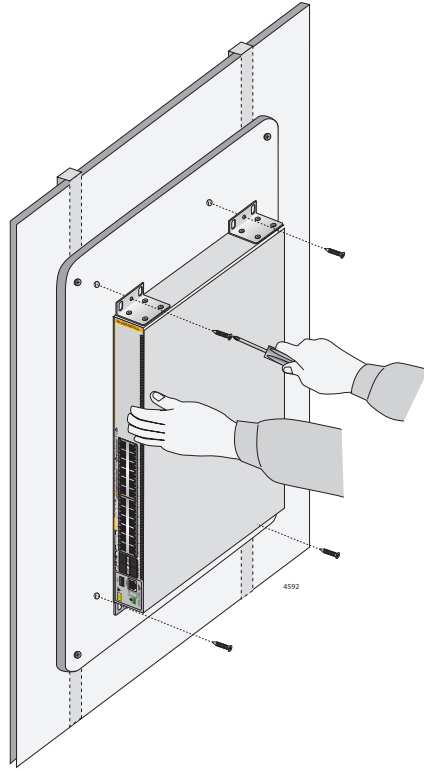


Figure 43. Securing the AT-x530-28GPXm or AT-x530-52GPXm Switch to the Plywood Base

4. Install the other switches of the stack.
5. Go to Chapter 7, “Building the Trunk with Default 10 Gbps Stacking Ports” on page 109 or Chapter 8, “Building the Stack Trunk with 5 Gbps Multi-Speed Ports” on page 129.

Installing the Switch on a Concrete Wall

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

- ❑ “Switch Orientations on a Wall” on page 92
- ❑ “Installation Guidelines” on page 94



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 can result if it is not properly fastened to the wall. *SW*
E105

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

1. Place the switch on a table.
2. For the AT-x530-28GTXm or AT-x530-52GTXm switch, install two wall/equipment rack brackets to the sides of the unit with the eight M4x6mm screws included with the switch. Refer to Figure 40 on page 102. For the AT-x530-28GPXm or AT-x530-52GPXm switch, install four wall/equipment rack brackets to the sides of the unit with the 16 M4x6mm screws included with the switch. Refer to Figure 41 on page 103.
3. After attaching the brackets, have another person hold the switch on the concrete wall at the selected location for the device while you use a pencil or pen to mark the wall with the locations of the four screw holes in the four brackets (one screw per bracket). Refer to Figure 44 on page 107.

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

- ❑ Position it so that the front panel is facing up, left or right. Refer to Figure 35 on page 92. Do not install the switch with the front panel facing down.
- ❑ Provide sufficient space from other devices or walls so that you can access the front and back panels, and for adequate air flow and ventilation.

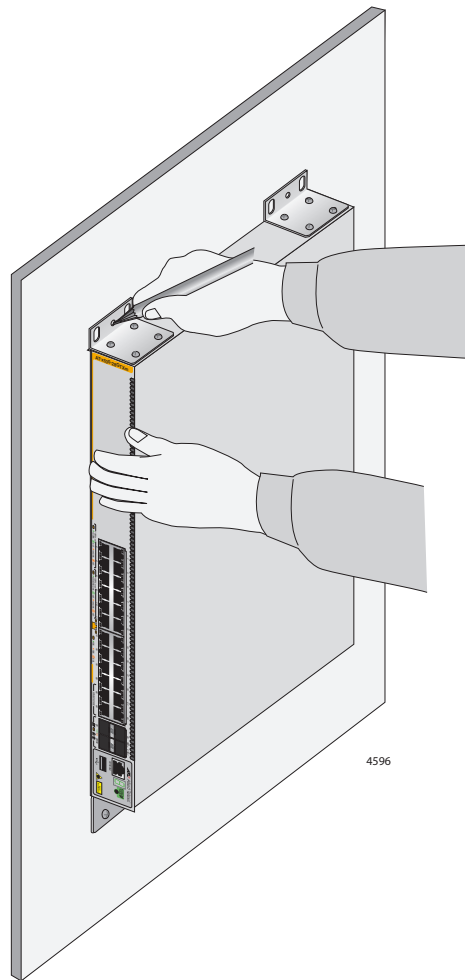


Figure 44. Marking the Locations of the Bracket Holes on a Concrete Wall

4. Place the switch on a table.
5. Use a drill and a 1/4-inch carbide drill bit to pre-drill the holes you marked in step 4. 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.
 - ☐ Clean out the holes with a brush or compressed air.
6. Insert the anchors into the holes.

7. Have another person hold the switch at the selected wall location while you secure it to the wall with the M4x32mm screws provided. Refer to Figure 45.

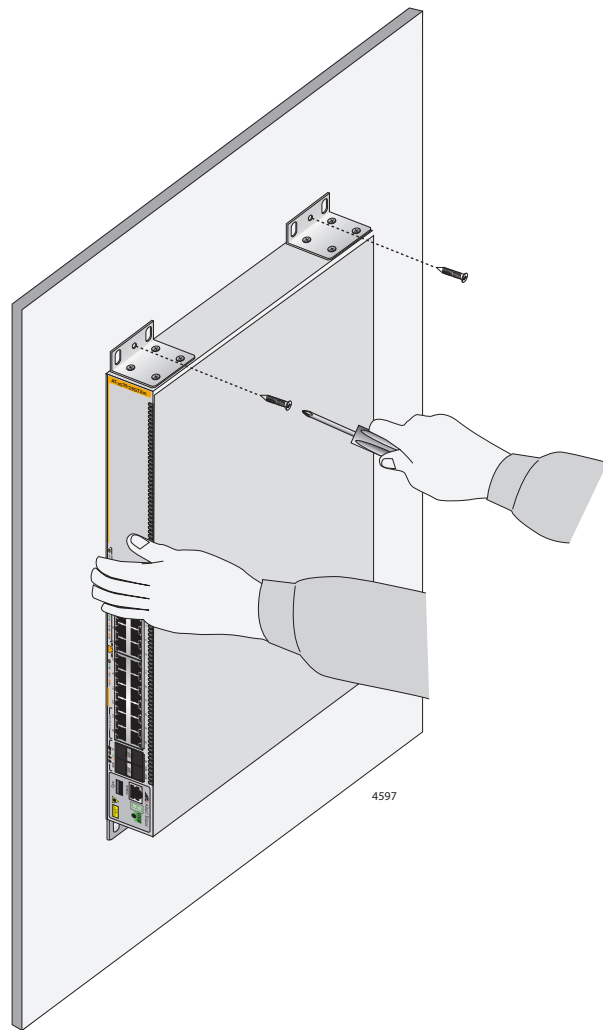


Figure 45. Installing the Switch on a Concrete Wall

8. Install the other switches of the stack.
9. Go to Chapter 7, “Building the Trunk with Default 10 Gbps Stacking Ports” on page 109 or Chapter 8, “Building the Stack Trunk with 5 Gbps Multi-Speed Ports” on page 129.

Chapter 7

Building the Trunk with Default 10 Gbps Stacking Ports

This chapter contains the following procedures:

- ❑ “Introduction” on page 110
- ❑ “Powering on a Switch” on page 122
- ❑ “Powering On the Switches Individually” on page 111
- ❑ “Powering On the Switches Simultaneously” on page 114
- ❑ “Starting a Local Management Session” on page 116
- ❑ “Verifying the Stack” on page 118
- ❑ “Adding Optional Ports the Stack Trunk” on page 119
- ❑ “Powering on a Switch” on page 122
- ❑ “Monitoring the Initialization Processes” on page 125

Introduction

This chapter contains instructions for building the stack using the default 10 Gbps stacking ports. The procedure does not require any configuration steps because the stacking feature is enabled by default. The default stacking ports are:

- ❑ Ports 27 and 28 on the AT-x530-28GTXm and AT-x530-28GPXm
- ❑ Ports 51 and 52 on the AT-x530-52GTXm and AT-x530-52GPXm

To build the stack, you cable the stacking ports and power on the switches.

There are two procedures:

- ❑ To control the assignment of the switch ID numbers yourself, perform “Powering On the Switches Individually” on page 111. The numbers are assigned in the order in which you power on the units.
- ❑ To have the switches assign the ID numbers automatically, perform “Powering On the Switches Simultaneously” on page 114.



Caution

Do not change the ID numbers of the switches after beginning to configure the parameter settings. Otherwise, the stack might assign configuration settings to the wrong units.

Note

To use the 5 Gbps multi-speed ports for the stack trunk instead of the default ports, refer to Chapter 8, “Building the Stack Trunk with 5 Gbps Multi-Speed Ports” on page 129. For background information, refer to “Stack Trunks” on page 55.

Powering On the Switches Individually

This procedure explains how you can control the assignment of the ID numbers of the switches by powering on the units one at a time during the initial power-on sequence. The first switch is assigned ID number 1, the next unit is assigned ID number 2, and so on. This procedure is useful when the switches are installed in the same equipment rack and you want to number them in sequence, such as from top to bottom, to make them easier to identify. After the ID number are assigned, the switches retain their assignments even if you power off or reset the stack.

During the first power on sequence, the first switch powered on becomes the master switch of the stack. If you do not change the priority values of the units, the next time you reset or power cycle the stack the units use their MAC addresses to select the master switch. This might result in a different switch being assigned that role. However, this does not affect their ID number assignments, the configuration of the switches, or the manner in which you manage the stack.

This procedure assumes the following:

- ❑ This is the initial power-on sequence of the stack.
- ❑ You cabled ports on the switches to form the stack trunk.
 - Ports 27 and 28 on the AT-x530-28GTXm and AT-x530-28GPXm
 - Ports 51 and 52 on the AT-x530-52GTXm and AT-x530-52GPXm

Note

For example, when cabling ports 27/S1 and 28/S2 (or 51/S1 and 53/S2) for the stack trunk, you can either connect the same ports together, for example, (27/S1 to 27/S1 and 28/S2 to 28/S2) or you can cross them over (27/S1 to 28/S2). The latter is recommended but not mandatory.

- ❑ The ID numbers are set to the default 1.
- ❑ All the switches are powered off.

To monitor the power on sequence, you can connect a terminal or computer with a terminal emulator program to the Console port on the switch you intend to power on first. The messages are found in “Monitoring the Initialization Processes” on page 125.

Before powering on the switch, refer to “Power Specifications” on page 172 for the power specifications.

To power on the stack for the first time and control the assignment of the ID numbers, perform the following procedure:

1. If you have not already cabled ports 27 and 28 (or 51 and 52), do so now. For background information, refer to “Stack Trunks” on page 55. For cabling instructions, refer to Chapter 9, “Cabling the Networking Ports” on page 155.
2. Power on the switch you want assigned ID number 1. Connect its power cord to the AC connector on the back panel and to an appropriate power source. Refer to “Powering on a Switch” on page 122.



Warning

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

Note

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

Note

Refer to “Power Specifications” on page 172 for the power specifications of the switches.

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

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

4. Power on the switch to be assigned ID number 2.
5. Wait two minutes for the new switch to join the stack as a member.

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

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

7. If there are additional switches, power each one on at a time and wait two minutes for the switch to join the stack as a member with the ID number 4, 5, 6, 7, and 8.

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

8. To continue with the installation, go to “Starting a Local Management Session” on page 116 and “Verifying the Stack” on page 118.

Powering On the Switches Simultaneously

If you want the switches of the stack to use their MAC addresses to automatically assign the ID numbers during the initial power on sequence, all you have to do is power them on simultaneously, rather than one at a time as in the previous procedure. Here are the steps the switches perform:

- ❑ They initialize their management software and compare their MAC addresses.
- ❑ The switch with the lowest address is designated as the master switch of the stack.
- ❑ The master switch assigns itself the ID number 1.
- ❑ The master switch assigns ID numbers to the other switches.
- ❑ The other switches reset and initialize their management software again, with their new ID numbers.

This procedure assumes the following:

- ❑ This is the first power on sequence of the stack.
- ❑ You cabled ports on the switches to form the stack trunk.
 - Ports 27 and 28 on the AT-x530-28GTXm and AT-x530-28GPXm
 - Ports 51 and 52 on the AT-x530-52GTXm and AT-x530-52GPXm

Note

For example, when cabling ports 27/S1 and 28/S2 (or 51/S1 and 53/S2) for the stack trunk, you can either connect the same ports together, for example, (27/S1 to 27/S1 and 28/S2 to 28/S2) or you can cross them over (27/S1 to 28/S2). The latter is recommended but not mandatory.

- ❑ The ID numbers are set to the default 1.
- ❑ All the switches are powered off.

To monitor the power-on sequence, you can connect a terminal or computer with a terminal emulator program to the Console port on any of the switches. The messages are found in “Monitoring the Initialization Processes” on page 125.

Before powering on a switch, refer to “Power Specifications” on page 172 for the power specifications of the switches.

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

1. If you have not already cabled the ports, do so now. For background information, refer to “Stack Trunks” on page 55, For cabling instructions, refer to Chapter 9, “Cabling the Networking Ports” on page 155.
2. Power on all the switches in the stack at the same time. Refer to “Powering on a Switch” on page 122.

Refer to “Power Specifications” on page 172 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

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

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

4. To continue with the installation, go to “Starting a Local Management Session” on page 116 and “Verifying the Stack” on page 118.

Starting a Local Management Session

This section contains the procedure for starting a local management session on a stack. You can perform the procedure on any switch in a stack.

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

1. Connect the RJ-45 connector of the management cable to the console port on the front panel of any switch in the stack. Refer to Figure 46.

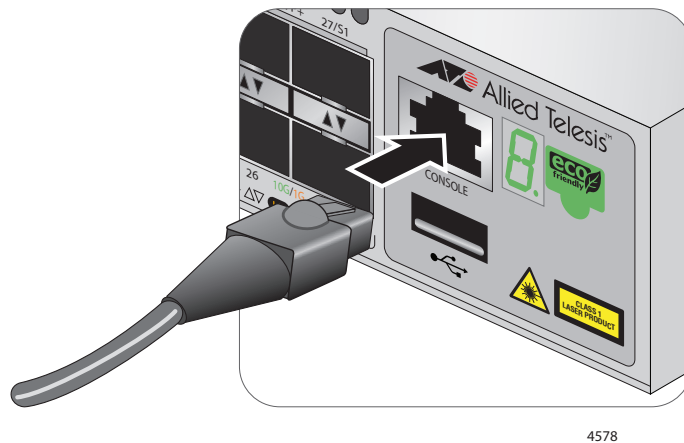


Figure 46. Connecting the Management Cable to the Console Port

2. Connect the other end of the cable to an RS-232 port on a terminal or computer with a terminal emulator program.
3. Configure the terminal or terminal emulator program as follows:
 - ☐ Default baud rate: 9,600 bps (range is 9,600 to 115,200 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, type a user name and password to log on to the switch. If this is the initial management session, 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 prompts:

```
awplus>
```

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 x530 Series Switches, AlliedWare Plus Operating System* at www.alliedtelesis.com.

6. Go to “Verifying the Stack” on page 118.

Verifying the Stack

To verify the stack, perform the following procedure:

1. Start a local management session on any switch in the stack. Refer to “Starting a Local Management Session” on page 116.
2. From the User Exec mode, type the SHOW STACK command:

```
awplus> show stack
```

The following example is from a stack of three switches:

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

ID	Pending ID	MAC address	Priority	Status	Role
1	-	e01a:ea20:8011	1	Ready	Active Master
2	-	e01a:ea20:8012	2	Ready	Member
3	-	e01a:ea20:8902	3	Ready	Member

```
Operational Status          Normal operations
```

Consider the following:

- ☐ The command should list all switches in the stack. If the list is incomplete, refer to Chapter 10, “Troubleshooting” on page 163.
 - ☐ The Operational Status field displays “Normal operations” when the switches are connected in the ring topology and “Not all stack ports are up” when the switches are connected in the linear topology.
 - ☐ The priority values will be 128, the default value, if you did not change them.
 - ☐ There is no relationship between the ID numbers and the selection of the master switch. Consequently, the active master in the SHOW STACK command might not have the ID number 1.
3. Do one of the following:
 - ☐ To add ports 25 and 26 to the stack trunk, go to “Adding Optional Ports the Stack Trunk” on page 119.
 - ☐ If you want to change the priority values of the switches, go to “STACK PRIORITY” on page 133. The procedure is optional.
 - ☐ Otherwise, go to Chapter 9, “Cabling the Networking Ports” on page 155 to complete with the installation.

Adding Optional Ports the Stack Trunk

This procedure explains how to add ports to the stack trunk.

- ❑ Ports 25 to 26 on the AT-x530-28GTXm and AT-x530-28GPXm. Refer to Table 18 on page 119.
- ❑ Ports 49 to 50 on the AT-x530-52GTXm and AT-x530-52GPXm. Refer to Table 19 on page 120

AT-x530-28GTXm and AT-x530-28GPXm

The procedure assumes the following:

- ❑ You performed the procedures earlier in this chapter to power on and verify the stack with ports 27 and 28 as the stack trunk.
- ❑ Ports 25 to 26 are not cabled. If there are cables connected to the ports, remove them before performing the procedure.

To add ports 25 and 26 to the stack trunk, perform the following procedure:

Table 18. Adding Ports 25 and 26 to the Stack Trunk

Step	Description and Command
1	Start a local management session on any switch in the stack. Refer to “Starting a Local Management Session” on page 116.
2	Move to the Privileged Exec mode with the ENABLE command. <code>awplus> enable</code>
3	Move to the Global Configuration mode with the CONFIGURE TERMINAL command. <code>awplus# configure terminal</code> Enter configuration commands, one per line. End with CNTL/Z.
4	Enter the port Interface mode for ports 25 and 26 on all the switches in the stack. This example assumes the stack has four switches: <code>awplus(config)# interface port1.0.25-1.0.26,port2.0.25-2.0.26,port3.0.25-3.0.26,port4.0.25-4.0.26</code>
5	Designate the ports as stacking ports with the STACKPORT command. <code>awplus(config-if)# stackport</code> % Save the config and restart the system for this change to take effect.
6	Return to the Global Configuration mode. <code>awplus(config-if)# exit</code>

Table 18. Adding Ports 25 and 26 to the Stack Trunk (Continued)

Step	Description and Command
7	Return to the Privileged Exec mode. awplus(config)# exit
8	Enter the WRITE command to save your change. If this is the first management session, the switch adds the configuration file DEFAULT.CFG to flash memory, for storing your configuration changes. If you do not save your changes, they will be discarded and you will have to reenter them when you reboot the switch in the next step. awplus# write Building configuration ... [OK]
9	Power off the switches of the stack.
10	Cable ports 25 and 26.
11	Power on the switches.
12	Wait three minutes for the switches to initialize their management software and form the stack.
13	Repeat “Verifying the Stack” on page 118.

AT-x530-52GTxm and AT-x530-52GPxm

The procedure assumes the following:

- ☐ You performed the procedures earlier in this chapter to power on and verify the stack with ports 49 and 50 as the stack trunk.
- ☐ Ports 49 to 50 are not cabled. If there are cables connected to the ports, remove them before performing the procedure.

To add ports 49 and 50 to the stack trunk, perform the following procedure:

Table 19. Adding Ports 49 and 50 to the Stack Trunk

Step	Description and Command
1	Start a local management session on any switch in the stack. Refer to “Starting a Local Management Session” on page 116.
2	Move to the Privileged Exec mode with the ENABLE command. awplus> enable

Table 19. Adding Ports 49 and 50 to the Stack Trunk (Continued)

Step	Description and Command
3	Move to the Global Configuration mode with the CONFIGURE TERMINAL command. <pre>awplus# configure terminal</pre> Enter configuration commands, one per line. End with CNTL/Z.
4	Enter the port Interface mode for ports 25 and 26 on all the switches in the stack. This example assumes the stack has four switches: <pre>awplus(config)# interface port1.0.49-1.0.50,port2.0.49-2.0.50,port3.0.49-3.0.50,port4.0.49-4.0.50</pre>
5	Designate the ports as stacking ports with the STACKPORT command. <pre>awplus(config-if)# stackport</pre> % Save the config and restart the system for this change to take effect.
6	Return to the Global Configuration mode. <pre>awplus(config-if)# exit</pre>
7	Return to the Privileged Exec mode. <pre>awplus(config)# exit</pre>
8	Enter the WRITE command to save your change. If this is the first management session, the switch adds the configuration file DEFAULT.CFG to flash memory, for storing your configuration changes. If you do not save your changes, they will be discarded and you will have to reenter them when you reboot the switch in the next step. <pre>awplus# write Building configuration ... [OK]</pre>
9	Power off the switches of the stack.
10	Cable ports 49 and 50.
11	Power on the switches.
12	Wait three minutes for the switches to initialize their management software and form the stack.
13	Repeat “Verifying the Stack” on page 118.

Powering on a Switch

Before powering on a switch, review the information in “Power Specifications” on page 172 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 a switch, perform the following procedure:

1. Install the power cord retaining clip on the AC power connector on the rear panel of the switch. Refer to Figure 47.

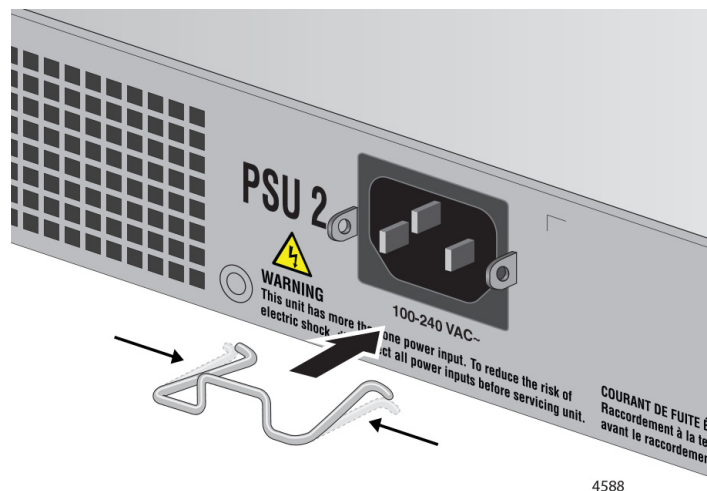


Figure 47. Installing the Power Cord Retaining Clip

2. Connect the AC power cord to the AC power connector on the rear panel of the switch. Refer to Figure 48.

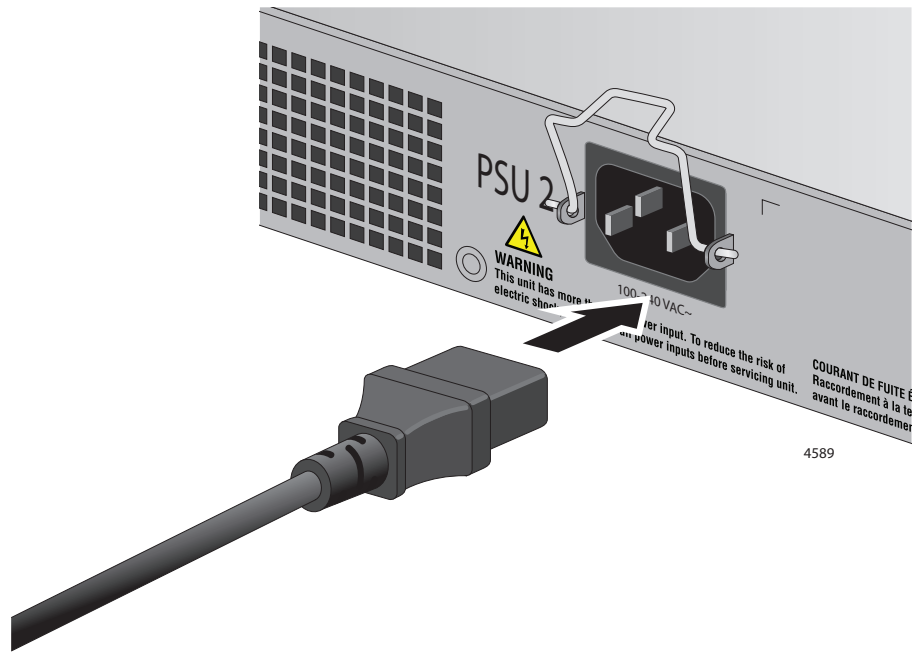


Figure 48. Connecting the AC Power Cord to the Switch

3. Lower the power cord retaining clips to secure the cord to the switch. Refer to Figure 49.

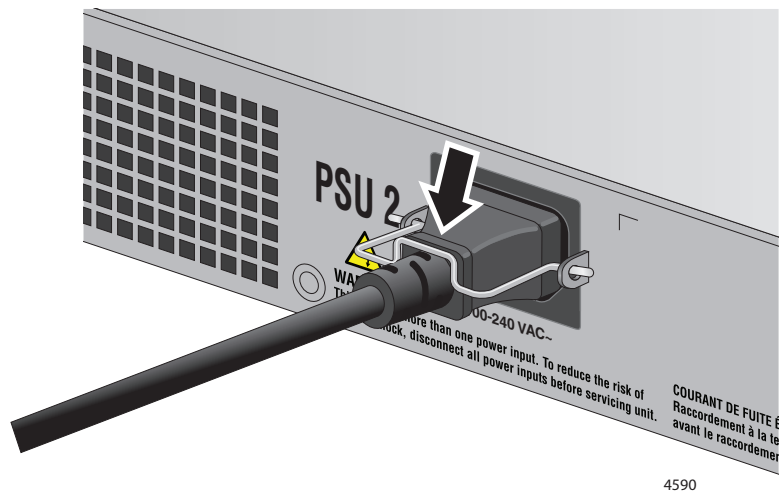


Figure 49. Plugging in the AC Power Cord to the Switch

4. Repeat steps 1 to 3 to connect a power cord to the second power supply.

5. Connect the power cord to an appropriate AC power source. Refer to Figure 50 on page 124.
6. Repeat this procedure to connect the second power cord to the switch.

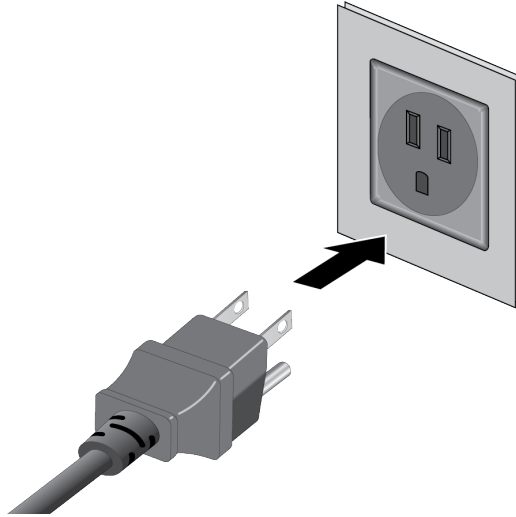


Figure 50. Plugging in the AC Power Cord to an AC Source

7. Wait two minute for the switch to initialize its management software.

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 can monitor the bootup sequence by connecting a terminal or computer with a terminal emulator program to the Console port. (The Console port settings are provided in “Starting a Local Management Session” on page 116.) The switch displays the messages in Figure 51 through Figure 53 on the Console port as it initializes the management software.

```

Bootloader 6.2.12 loaded
Press <Ctrl+B> for the Boot Menu
Reading flash:x530-5.4.9-2.2-rc1.rel...

Verifying release... OK
Booting...
Starting base/first... [ OK ]
Mounting virtual filesystems... [ OK ]

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

Allied Telesis Inc.
AlliedWare Plus (TM) v5.4.9
Current release filename: x530-5.4.9-2.2-rc1.rel...
Built: Mon Sep 23 01:57:50 UTC 2019
Mounting static filesystems... [ OK ]
Attaching to /dev/mtd0... [ OK ]
Mounting file system... [ OK ]
Checking for last gasp debug output... [ OK ]
Checking NVS filesystem... [ OK ]
Mounting NVS filesystem... [ OK ]
Initializing random number generator... [ OK ]
Starting base/hwrandom... [ OK ]
Starting base/jitterentropy-rngd... [ OK ]
Starting base/dbus... [ OK ]
Starting base/linux... [ OK ]

```

Figure 51. Switch Initialization Messages

```

Starting base/loopback... [ OK ]
Starting base/poe_done... [ OK ]
Starting base/portmapper... [ OK ]
Received event syslog.done
Starting base/modules... [ OK ]
Received event modules.done
Starting base/reboot-stability... [ OK ]
Checking system reboot stability... [ OK ]
Starting base/apteryx... [ OK ]
Starting base/crond... [ OK ]
Starting base/appmond... [ OK ]
Starting base/clockcheck... [ OK ]
Starting network/execd... [ OK ]
Starting base/inet... [ OK ]
Received event apteryx.done
Starting hardware/early_host_info... [ OK ]
Starting base/alfred... [ OK ]
Starting base/kernond... [ OK ]
Starting base/apteryx-sync... [ OK ]
Starting base/logconf... [ OK ]
Received event apteryx-sync.done
Starting hardware/platformd... [ OK ]
Starting hardware/plugman... [ OK ]
Starting hardware/timeout... [ OK ]
Starting hardware/hardware-done... [ OK ]
Received event board.inserted
Received event hardware.done
Starting base/external-media... [ OK ]
Starting network/startup... [ OK ]
Starting network/hostcfg... [ OK ]
Received event hostcfg.done
Starting network/cmplplatformd... [ OK ]
Starting base/eventwatch... [ OK ]
Starting network/startup... [ OK ]
Starting hardware platform_eventd... [ OK ]
Starting network/licd... [ OK ]
Starting network/stackd... [ OK ]
Starting network/election.timeout... [ OK ]
Starting network/corosync... [ OK ]
Received event network.enabled

```

Figure 52. Switch Initialization Messages (Continued)

```
Initializing HA processes:
atmf_agentd, execd, exfx, hostd, atmfd, auth, epsr
hsl, imi, imiproxyd, lldpd, loopprot, mstp, nsm
pim6d, ripngd, rmon, sflowd, vrrpd, bgpd, irdpd
lacp, ospf6d, ospfd, pdmd, pimd, ripd, udlld

Received event network.initialized

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

Received event network.activated

Loading default configuration
..

done!
Received event network.configured
```

Figure 53. Switch Initialization Messages (Continued)

Chapter 8

Building the Stack Trunk with 5 Gbps Multi-Speed Ports

This chapter contains the following sections:

- ❑ “Introduction” on page 130
- ❑ “Command Summary” on page 132
- ❑ “Configuring the Master Switch” on page 135
- ❑ “Configuring Member Switches” on page 144
- ❑ “Powering on the Stack” on page 152
- ❑ “Verifying the Stack” on page 153

Introduction

As explained in “Stack Trunks of 5 Gbps” on page 60, you can choose the ports of the stack trunk. The default trunk ports are 10 Gbps ports:

- ❑ Ports 27 and 28 on the AT-x530-28GTXm and AT-x530-28GPXm
- ❑ Ports 51 and 52 on the AT-x530-52GTXm and AT-x530-52GPXm

Directions on how to use those ports as the stack trunk are provided in Chapter 7, “Building the Trunk with Default 10 Gbps Stacking Ports” on page 109.

This chapter contains the procedures for configuring switches to use 5 Gbps ports for the stack trunk. Refer to “Stack Trunks of 5 Gbps” on page 53.

- ❑ Ports 21 to 24 on the AT-x530-28GTXm and AT-x530-28GPXm

Here are the general steps:

1. Fill in “Stacking Worksheet” on page 74.
2. Review the configuration commands in “Command Summary” on page 132.
3. Perform “Configuring the Master Switch” on page 135.
4. Perform “Configuring Member Switches” on page 144.
5. Perform “Powering on the Stack” on page 152
6. Perform “Verifying the Stack” on page 153

Review the following information before performing the instructions:

- ❑ Perform the procedures in the order presented here.
- ❑ Choose the master switch before beginning the procedure. It can be any of the switches. Refer to “Master and Member Switches” on page 66.
- ❑ If you have not selected the trunk ports yet, you should do so before continuing. Refer to “Stack Trunks” on page 55.
- ❑ If you have already connected network cables to the ports of the stack trunk, disconnect them before continuing. You should cable the ports after configuring the switches for stacking.

Note

Cabling the ports of the stack trunk before configuring the switches can result in loops in your network topology, which can cause poor network performance.

Command Summary

The following sections briefly describe the commands for configuring the master and member switches for stacking with the 5 Gbps ports. For further instructions, refer to the *Software Reference for x530 Switch, AlliedWare Plus Operating System*. After reviewing the commands, go to “Configuring the Master Switch” on page 135 to start the configuration procedures.

Note

The following instructions in this chapter are for the AT-x530-28GTXm or AT-x530-28GPXm. If you are using the AT-x530-52GTXm or AT-x530-52GPXm, refer to XXXX.

STACKPORT

This command designates the ports of the stack trunk. After you enter the command, the designated ports stop functioning as regular Ethernet ports and function instead as the stack trunk. If you are using the SFP+ ports 27 and 28 of AT-x530-28GTXm and AT-x530-28GPXm as the stack trunk, you do not have to perform this command because those ports are the default trunk ports. However, if you want to use the optional 5 Gbps ports as trunk ports, you have to designate them with this command. Refer to Table 15 on page 55 for a list of the default and optional trunk ports.

The command is performed in the Interface mode of the selected ports. In this example, the optional stacking ports 23 to 24 on the AT-x530-28GTXm or AT-x530-28GPXm switches are designated as the stack trunk:

```
awplus(config)# interface port1.0.23-1.0.24
awplus(config-if)# stackport
```

To remove the stacking function from ports and return them to regular Ethernet networking ports, use the NO STACKPORT command. You might perform this command if you are not using SFP+ ports 27 and 28 as the stack trunk and want to use them instead as regular Ethernet ports, or if you inadvertently assign the stacking function to the wrong ports. This example removes the stacking function from the default stacking ports 27 and 28:

```
awplus(config)# interface port1.0.27-1.0.28
awplus(config-if)# no stackport
```

STACK ENABLE

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

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

If you ever want to disable stacking, such as to use the switch as a stand-alone unit, enter the NO STACK ENABLE command, shown here:

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

STACK PRIORITY

This command assigns priority numbers to the switches of the stack. The switches use the numbers to select the master switch. The lower the number the higher the priority. The unit with the lowest number becomes the master. If both have the same priority value, the MAC addresses determines the master. As with priority numbers, the lower the MAC address, the higher the priority. A switch can have only one priority number.

Allied Telesis recommends changing a switch's priority number to match its ID number. For example, the switch with ID 1 should be assigned priority 1, switch with ID 2 should be assigned priority 2, and so on. This is not required, but it can make managing and troubleshooting the stack easier.

The STACK PRIORITY command is found in the Global Configuration mode and has the following format:

```
stack <switch_ID> priority <priority_number>
```

The variables are defined here:

- ❑ switch_ID – This is the ID number of the switch. The range is 1 to 4. You can specify only one ID number.
- ❑ priority_number – This is the new priority number for the switch. You can specify only one number. The range is 0 to 255. The default is 128.

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

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

STACK RENUMBER

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

```
stack <current_switch_ID> renumber <new_switch_ID>
```

The variables are defined here:

- ❑ `current_switch_ID` - This is the current ID number of the switch. You can specify only one ID number.
- ❑ `new_switch_ID` - This is the new ID number for the switch. You can specify only one number. The range is 1 to 4. The default is 1.

Changing the ID number requires resetting the switch.

This example changes a switch ID from 1, the default, to 2:

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

SWITCH PROVISION

To ensure that the first power-on of the stack is successful, configure the master switch such that it is aware of the member switches, prior to forming the stack. This involves using the SWITCH PROVISION command to add the member switches as provisioned units on the master switch. Here is the format of the command:

```
switch <switch_ID> provision x530-28
```

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

```
awplus(config)# switch 2 provision x530-28
```

Configuring the Master Switch

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

- ❑ “General Steps for the Master Switch,” next
- ❑ “Configuring the Master Switch - Part I” on page 136
- ❑ “Configuring the Master Switch - Part II” on page 139
- ❑ “Verifying the Master Switch” on page 141
- ❑ “What to Do Next” on page 142

Note

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

You need to know the following to perform these procedures:

- ❑ How many member switches will be in the stack?
- ❑ Which 5 Gbps ports will be used as the stack trunk on the master and member switches? Refer to “Stack Trunks” on page 55.

The procedures should be performed in the order presented here.

General Steps for the Master Switch

The procedure for configuring the master switch to use the 5 Gbps ports as the stacking ports is divided into two parts. Here are the general steps to Part I:

1. Start a local management session on the switch.
2. Display the hardware status and management software version number with the `SHOW SYSTEM ENVIRONMENT` and `SHOW VERSION INSTALLED` commands, respectively, in the Privilege Exec mode.
3. Enable the VCStack feature with the `STACK ENABLE` command in the Global Configuration mode. You will probably not have to perform this step because the default setting for the feature is enabled.
4. Assign the master switch the priority 1 with the `STACK PRIORITY` command in the Global Configuration mode. This is to ensure that it is selected as the master switch during the first power-on of the stack.
5. Remove the stacking function from the default stacking ports 27 and 28 on the master switch with the `NO STACKPORT` command.

6. Designate the 5 Gbps ports as the stack trunk on the master switch, with the STACKPORT command.
7. Save the changes with the WRITE command in the Privileged Exec mode.

Here are the general steps to Part II:

1. Add the member switches as provisioned units to the master switch, with the SWITCH PROVISION command. This step is to ensure that the master switch knows about the member switch during the first power-on of the stack.
2. Remove the stacking function from the default stacking ports 27 and 28 on the provisioned member switches with the NO STACKPORT command.
3. Designate the 5 Gbps ports as the stack trunk on the provisioned member switches, with the STACKPORT command.
4. Save your changes with the WRITE command in the Privilege Exec mode.
5. Reboot the switch with the REBOOT command.
6. Start a new local management session.
7. Verify the changes with the SHOW STACK and SHOW RUNNING-CONFIG command.

Configuring the Master Switch - Part I

To configure the master switch to use 5 Gbps ports for the stack trunk, perform the procedure in Table 20.

Table 20. Configuring the Master Switch for 5 Gbps Stacking Ports - Part I

Step	Description and Command
1	Power on the master switch and wait two minutes for it to initialize the management software. Refer to “Powering On a Switch” on page 135.
2	Start a local management session. Refer to “Starting a Local Management Session” on page 130.
3	Move to the Privileged Exec mode with the ENABLE command. awplus> enable
Steps 4 to 6 display the status of the switch hardware and the version number of the AlliedWare Plus management software.	

Table 20. Configuring the Master Switch for 5 Gbps Stacking Ports - Part I (Continued)

Step	Description and Command
4	Verify that the switch hardware is operating correctly by entering the SHOW SYSTEM ENVIRONMENT command. All components should have the status Ok. <pre>awplus# show system environment Environment Monitoring Status Overall Status: Normal Resource ID: 1 Name: AT-x530-28GPXm ID Sensor (Units) Reading Low Limit High Limit Status 1 Fan: Fan 1 (RPM) 5980 4800 - ok 2 voltage: 1.0V (Volts) 1.040 0.891 1.090 ok .</pre>
5	Display the version number of the AlliedWare Plus operating software on the switch by entering the SHOW VERSION INSTALLED command. Write down the version number in the worksheet in Table 16 on page 71. After viewing the version numbers on all the switches, you will compare them to confirm they all have the same version. Switches with different versions will have to be updated. <pre>awplus# show version installed Current software ----- Software version : value Build date : value Installed software ----- Build name : value Build version : value Build date : value</pre>
6	Move to the Global Configuration mode with the CONFIGURE TERMINAL command. <pre>awplus# configure terminal Enter configuration commands, one per line. End with CNTL/Z.</pre>
Step 7 enables the VCStack feature on the switch. You probably do not need to perform this step because the feature is enabled by default. If the Switch ID LED is displaying "0", perform the step. Otherwise, go to step 8.	
7	Activate VCStack on the switch with the STACK ENABLE command. <pre>awplus(config)# stack enable % Automatically enabling 'stack virtual-mac' to minimize disruption form failovers. % Please check that the new MAC 0000.cd37.0431 is unique within the network. % Save the config and restart the system for this change to take effect.</pre>

Table 20. Configuring the Master Switch for 5 Gbps Stacking Ports - Part I (Continued)

Step	Description and Command
Step 8 assigns priority 1 to the switch with the STACK PRIORITY command, so that it functions as the master unit of the stack.	
8	Assign priority 1 to the switch with the STACK PRIORITY. awplus(config)# stack 1 priority 1
Steps 9 to 10 remove stacking from the default stacking ports 27 and 28 so that they function as regular networking ports.	
9	Enter the Interface modes for the default stacking ports 27 and 28 on the master switch: awplus(config)# interface port1.0.27-1.0.28 % port1.0.27 is currently configured as a stack-port. Use caution when altering its config. % port1.0.28 is currently configured as a stack-port. Use caution when altering its config.
10	Remove the stacking function from the ports with the NO STACKPORT command, so that they function as regular networking ports: awplus(config-if)# no stackport % Save the config and restart the system for this change to take effect.
Steps 11 and 12 designate 5 Gbps ports as the active stacking ports.	
11	Enter the Interface mode of the 5 Gbps g ports to be used as the stack trunk. Refer to Table 17 on page 52. If you filled out the worksheet in Table 19 on page 74, refer there for the ports. This example assumes you want to use 5 Gbps ports 23 and 24 as the stack trunk. awplus(config-if)# interface port1.0.23-1.0.24
12	Designate the ports as the stack trunk with the STACKPORT command: awplus(config-if)# stackport % Save the config and restart the system for this change to take effect.
The remaining steps save your changes.	
13	Return to the Global Configuration mode with the EXIT command: awplus(config-if)# exit
14	Return to the Privileged Exec mode. awplus(config)# exit

Table 20. Configuring the Master Switch for 5 Gbps Stacking Ports - Part I (Continued)

Step	Description and Command
15	Enter the WRITE command to save your change. If this is the first management session, the switch adds the configuration file DEFAULT.CFG to flash memory, for storing your configuration changes. If you do not save your changes, they will be discarded and you will have to reenter them when you reboot the switch later in these procedures. <pre>awplus# write Building configuration ... [OK]</pre>
16	Go to “Configuring the Master Switch - Part II,” next.

Configuring the Master Switch - Part II

In Part II, you add the member switches as provisioned units to the master switch and designate their 5 Gbps stacking ports. Adding member switches as provisioned devices ensures that the master switch is aware of them during the first stack power-on. The procedure assumes you are continuing directly from the previous procedure.

Table 21. Configuring the Master Switch for 5 Gbps Stacking Ports - Part II

Step	Description and Command
Steps 1 to 2 add the member switches as provisioned switches on the master switch. This is so the master switch is aware of the switches when the stack is powered on for the first time.	
1	Move to the Global Configuration mode with the CONFIGURE TERMINAL command. <pre>awplus# configure terminal Enter configuration commands, one per line. End with CNTL/Z.</pre>
2	Add the member switches to the master switch as provisioned switches with the SWITCH PROVISION command. Assign a unique ID number, in the range of 2 to 4, to each unit. The following examples add three provisioned member switches to the master switch, with the IDs 2 to 4: <pre>awplus(config)# switch 2 provision x530-28 awplus(config)# switch 3 provision x530-28 awplus(config)# switch 4 provision x530-28</pre>
Steps 3 and 4 remove the stacking function from the default stacking ports 27 and 28 on the provisioned member switches.	
3	Enter the port Interface modes of the default stacking ports 27 and 28 on the provisioned member switches. The example here assumes there are three provisioned member switches, with the IDs 2 to 4: <pre>awplus(config)# interface port2.0.27-2.0.28,port3.0.27-3.0.28,port4.0.27-4.0.28</pre>

Table 21. Configuring the Master Switch for 5 Gbps Stacking Ports - Part II (Continued)

Step	Description and Command
4	Remove the stacking function from the ports to convert them into regular Ethernet ports, with the NO STACKPORT command: <pre>awplus(config-if)# no stackport</pre> % Save the config and restart the system for this change to take effect.
Steps 5 and 6 add the stacking function to the selected 5 Gbps stacking ports on the provisioned member switches.	
5	Enter the Interface modes of the 5 Gbps ports to be used as the stack trunk on the provisioned member switches. If you filled out the worksheet on Table 16 on page 71, refer there for the stacking ports. This example assumes that there are three member switches that are to use ports 23 and 24 as the stack trunk. <pre>awplus(config)# interface port2.0.23-2.0.24,port3.0.23-3.0.24,port4.0.23-4.0.24</pre>
6	Designate the ports as stacking ports with the STACKPORT command. <pre>awplus(config-if)# stackport</pre> % Save the config and restart the system for this change to take effect.
Steps 7 to 13 save your changes on the master switch and reboot it.	
7	Return to the Global Configuration mode. <pre>awplus(config-if)# exit</pre>
8	Return to the Privileged Exec mode. <pre>awplus(config)# exit</pre>
9	Enter the WRITE command to save your changes. <pre>awplus# write Building configuration ... [OK]</pre>
10	Restart the switch with the REBOOT command. <pre>awplus# reboot reboot system? (y/n): awplus#</pre>
11	Type "Y" for yes.
12	Wait two minutes for the switch to initialize the management software.

Table 21. Configuring the Master Switch for 5 Gbps Stacking Ports - Part II (Continued)

Step	Description and Command
13	Go to “Verifying the Master Switch” on page 141.

Verifying the Master Switch

Perform the steps in Table 22 to confirm the configuration of the master switch.

Table 22. Verifying the Master Switch

Step	Description and Command																														
1	Start a new local management session on the master switch.																														
2	Move to the Privileged Exec mode with the ENABLE command. awplus> enable																														
3	Enter the SHOW STACK command. Here is an example of the display: awplus# show stack Virtual Chassis Stacking summary information <table><tr><th>ID</th><th>Pending ID</th><th>MAC address</th><th>Priority</th><th>Status</th><th>Role</th></tr><tr><td>1</td><td>-</td><td>e01a.ba56.c208</td><td>1</td><td>Ready</td><td>Active Master</td></tr><tr><td>2</td><td>-</td><td>-</td><td>-</td><td>-</td><td>Provisioned</td></tr><tr><td>3</td><td>-</td><td>-</td><td>-</td><td>-</td><td>Provisioned</td></tr><tr><td>4</td><td>-</td><td>-</td><td>-</td><td>-</td><td>Provisioned</td></tr></table> Operational Status	ID	Pending ID	MAC address	Priority	Status	Role	1	-	e01a.ba56.c208	1	Ready	Active Master	2	-	-	-	-	Provisioned	3	-	-	-	-	Provisioned	4	-	-	-	-	Provisioned
ID	Pending ID	MAC address	Priority	Status	Role																										
1	-	e01a.ba56.c208	1	Ready	Active Master																										
2	-	-	-	-	Provisioned																										
3	-	-	-	-	Provisioned																										
4	-	-	-	-	Provisioned																										

Table 22. Verifying the Master Switch (Continued)

Step	Description and Command
4	Enter the SHOW RUNNING-CONFIG command to display the running configuration of the master switch. You should use the display to confirm that you designated the correct 5 Gbps trunk ports for the master and member switches. The display should contain INTERFACE PORT commands that identify the ports and are followed by STACKPORT commands. In the following example, ports 23 and 24 on the master and member switches are to be the stack trunk: <pre> interface port1.0.23-1.0.24 stackport . interface port2.0.24-2.0.24 stackport . interface port3.0.23-3.0.24 stackport . interface port4.0.23-4.0.24 stackport </pre>
5	Go to “What to Do Next” on page 142.

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

1. Power off the switch by disconnecting its AC power cords from the AC power sources. Refer to Figure 54.

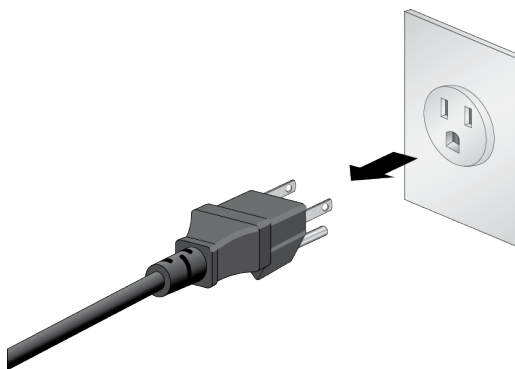


Figure 54. Powering Off the Switch

2. Configure the member switches. Refer to “Configuring Member Switches” on page 144.
3. After configuring the master and member switches, cable the ports of the stack trunk on all the switches. Refer to “Cabling Twisted Pair Ports” on page 156.

4. Power on the master and member switches of the stack. Refer to “Powering on the Stack” on page 152.
5. Verify that the switches formed the stack by referring to “Verifying the Stack” on page 153.
6. Cable the networking ports. Refer to Chapter 9, “Cabling the Networking Ports” on page 155.

Configuring Member Switches

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

- ❑ “General Steps for the Member Switch” on page 144
- ❑ “Configuring Member Switches - Part I” on page 145
- ❑ “Configuring Member Switches - Part II” on page 147
- ❑ “Verifying Member Switches” on page 149
- ❑ “What to Do Next” on page 150

Note

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

The procedures should be performed in the order presented here.

General Steps for the Member Switch

The procedure for configuring member switches for stacking is divided into two parts. The general steps to Part I are listed here:

1. Start a local management session on the switch.
2. View the hardware status and management software version number with the `SHOW SYSTEM ENVIRONMENT` and `SHOW VERSION INSTALLED` commands in the Privilege Exec mode.
3. Enable the VCSStack feature with the `STACK ENABLE` command in the Global Configuration mode. You will probably not have to perform this step because the default setting for the feature is enabled.
4. Assign an ID number in the range of 2 to 4 to the member switch with the `SWITCH RENUMBER` command in the Global Configuration mode.

Note

Changing a member switch's ID does not delete the default ID 1 from its configuration. Instead, the member switch retains it and uses default ID 1 as the provisioned master switch.

5. Save your changes with the `WRITE` command in the Privilege Exec mode.
6. Restart the switch with the `REBOOT` command.

The general steps in Part II are listed here:

1. Start a new local management session with the switch.
2. Assign the member switch a priority number equal to its ID number, with the STACK PRIORITY command in the Global Configuration mode.
3. Remove the stacking function from the default stacking ports 27 and 28, with the NO STACKPORT command.
4. Designate the ports of the stack trunk on both the provisioned master switch and member switch, with the STACKPORT command in the port Interface mode.
5. Save your changes with the WRITE command in the Privilege Exec mode.
6. Restart the switch with the REBOOT command.
7. Start a new local management session.
8. Verify the changes with the SHOW STACK and SHOW RUNNING-CONFIG command.

Configuring Member Switches - Part I

The instructions for configuring member switches are divided into two parts. You do the following in Part I:

- ☐ Display the hardware status and management software version number.
- ☐ Enable VCStack.
- ☐ Set the switch ID number.

To configure a member switch, perform the procedure in Table 23.

Table 23. Configuring Member Switches - Part I

Step	Description and Command
1	Power on a member switch and wait two minutes as it initializes the management software. Refer to “Powering On a Switch” on page 135.
2	Start a local management session. Refer to “Starting a Local Management Session” on page 130.
3	Enter the ENABLE command to move from the User Exec mode to the Privileged Exec mode. awplus> enable

Table 23. Configuring Member Switches - Part I (Continued)

Step	Description and Command
4	Verify that the switch hardware is operating correctly, with the SHOW SYSTEM ENVIRONMENT command. All components should have the status Ok. <pre>awplus# show system environment Environment Monitoring Status Overall Status: Normal Resource ID: 1 Name: AT-x530-28GPXm ID Sensor (Units) Reading Low Limit High Limit Status 1 Fan: Fan 1 (RPM) 5980 4800 - ok 2 voltage: 1.0V (Volts) 1.040 0.891 1.090 ok .</pre>
5	Display the version number of the AlliedWare Plus operating software on the member switch by entering the SHOW VERSION INSTALLED command. Write down the version number in the worksheet in Table 16 on page 71. After viewing the version numbers on all the switches, you will compare them to confirm they all have the same version. Switches with different versions will have to be updated.
5	Move to the Global Configuration mode with the CONFIGURE TERMINAL command. <pre>awplus# configure terminal Enter configuration commands, one per line. End with CNTL/Z.</pre>
Step 6 enables the VCStack feature on the switch. You will probably not need to perform the step because the feature is enabled by default. If the Switch ID LED is displaying "0", perform the step. Otherwise, go to step 7.	
6	Activate VCStack on the switch with the STACK ENABLE command. <pre>awplus(config)# stack enable % Automatically enabling 'stack virtual-mac' to minimize disruption form failovers. % Please check that the new MAC 0000.cd37.0431 is unique within the network. % Save the config and restart the system for this change to take effect.</pre>
Steps 7 to 13 set the member switch's ID number, save your changes, and reboot the unit.	
7	Set the ID number of the member switch with the STACK RENUMBER command. If you are using the worksheet on Table 19 on page 74, refer there for the ID numbers. This example assigns the ID number 2 to the member switch. <pre>awplus(config)# stack 1 renumber 2 % warning: the new ID will not become effective until the stack- member reboots. % warning: the boot configuration may now be invalid.</pre>

Table 23. Configuring Member Switches - Part I (Continued)

Step	Description and Command
8	Return to the Privileged Exec mode. awplus(config)# exit
9	Enter the WRITE command to save your change. If this is the first management session, the switch adds the configuration file DEFAULT.CFG to flash memory, for storing your configuration changes. awplus# write Building configuration ... [OK]
10	Restart the switch with the REBOOT command. awplus# reboot reboot system? (y/n): awplus#
11	Type "Y" for yes.
12	Wait two minutes for the switch to initialize its management software.
13	Check the ID LED on the front panel and do one of the following: - If the ID LED is displaying the switch's new ID number, go to "Configuring Member Switches - Part II," next. - If the ID LED is displaying a different number, repeat this procedure. Be sure to correctly enter the STACK RENUMBER command and to save your changes with the WRITE command.

Configuring Member Switches - Part II

This section contains instructions to the second part to configuring member switches. The instructions explain how configure the following parameters:

- ☐ Set the priority number. For background information, refer to "Selection of the Master Switch" on page 69.
- ☐ Designate the optional stacking ports for the stack trunk. Refer to "Stack Trunks" on page 52.

To configure a member switch, perform the procedure in Table 24.

Table 24. Configuring Member Switches - Part II

Step	Description and Command
1	Start a new local management session on the member switch. Refer to "Starting a Local Management Session" on page 130.

Table 24. Configuring Member Switches - Part II (Continued)

Step	Description and Command
2	Enter the ENABLE command to move from the User Exec mode to the Privileged Exec mode. awplus> enable
Steps 3 and 4 set the switch's priority value to be the same as its ID number.	
3	Move to the Global Configuration mode with the CONFIGURE TERMINAL command. awplus# configure terminal Enter configuration commands, one per line. End with CNTL/Z.
4	Assign a priority value to the switch equal to its ID number, with the STACK PRIORITY. This example assigns priority 2 to a member switch with the ID 2: awplus(config)# stack 2 priority 2
Steps 5 and 6 remove the stacking function from the default stacking ports 27 and 28 on the member switch.	
5	Enter the port Interface modes of the default stacking ports 27 and 28 on the member switch. The example here assumes the member switch has the ID 2: awplus(config)# interface port2.0.27-2.0.28 % port1.0.27 is currently configured as a stack-port. Use caution when altering its config. % port1.0.28 is currently configured as a stack-port. Use caution when altering its config.
6	Remove the stacking function from the ports to convert them into regular Ethernet ports, with the NO STACKPORT command: awplus(config-if)# no stackport % Save the config and restart the system for this change to take effect.
Steps 7 and 8 add the stacking function to the optional stacking ports on the member switch.	
7	Enter the Interface modes of the optional stack ports on the member switch. If you filled out the worksheet in Table 16 on page 71, refer there for the ports. The example command here assumes the switch has the ID 2 and will be using ports 23 and 24 for the stack trunk. Be sure to modify the command with the ports you selected for the stack trunk. awplus(config-if)# interface port2.0.23-1.0.24

Table 24. Configuring Member Switches - Part II (Continued)

Step	Description and Command
8	Designate the ports as the stack trunk with the STACKPORT command. awplus(config-if)# stackport % Save the config and restart the system for this change to take effect.
The remaining steps save your changes and reboot the switch.	
9	Return to the Global Configuration mode. awplus(config-if)# exit
10	Return to the Privileged Exec mode. awplus(config)# exit
11	Save your changes with the WRITE command. awplus# write Building configuration ... [OK]
12	Restart the switch. awplus# reboot reboot system? (y/n):
13	Type "Y" for yes.
14	Wait two minutes for the switch to initialize its management software.
15	Go to "Verifying Member Switches," next.

Verifying Member Switches Perform the steps in Table 25 to confirm the configuration of a member switch.

Table 25. Verifying Member Switches

Step	Description and Command
1	Start a local management session. Refer to "Starting a Local Management Session" on page 130.
2	Move to the Privileged Exec mode. awplus> enable

Table 25. Verifying Member Switches (Continued)

Step	Description and Command
3	Enter the SHOW STACK DETAIL command and examine the display for the entry that has the same ID number of the member switch. Here is an example for the member switch with the ID 2: <pre>awplus# show stack detail . . Stack member 2: ----- ID 2 MAC address e01a:ea20:8011 Last role change Thur Nov 23 21:15:20 2018 Product type AT-x550-18XSPqm Role Active Master Status Ready Priority 2 Host name awplus S/w version auto synchronization On Resiliency link status Not configured Stack port2.0.15 status Down Stack port2.0.16 status Down . .</pre> Examine the entry for the following: - The “Priority” value should be the same as the switch’s ID number. If they are not the same, repeat “Configuring Member Switches - Part II” on page 147. Be sure to perform the STACK PRIORITY command and save your changes with the write command. - The “Stack port status” fields, the last two lines, should identify the selected optional stack ports. If they identify the wrong ports, such as the default ports 27 and 28, repeat “Configuring Member Switches - Part II” on page 147. (The status of the ports is Down because the stack ports are not cabled yet.)
5	Go to “What to Do Next,” next.

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

1. Power off the switch by disconnecting its AC power cords from the AC power sources. Refer to Figure 54 on page 142.
2. Repeat this procedure to configure any additional member switches.
3. If you have not already configured the master switch, perform “Configuring the Master Switch” on page 135.

4. Cable the 5 Gbps ports of the stack trunk, on the master and member switches. Refer to “Cabling Twisted Pair Ports” on page 156.

Note

When cabling the stack trunk, remember that the cables must crossover to different ports. For example, if you are using ports 15 and 16 for the stack trunk, port 15 on a switch has to connect to port 16 on the next switch.

5. Power on the master and member switches of the stack, as explained in “Powering on the Stack” on page 152.
6. Verify that the switches successfully formed the stack by performing “Verifying the Stack” on page 153.
7. Cable the networking ports, as explained in Chapter 8, “Cabling the Networking Ports” on page 165.

Powering on the Stack

After configuring the master and member switches, you are ready to cable the 5 Gbps ports of the stack trunk and power on the stack for the first time. (If you want to monitor the power-on sequence, connect a terminal or computer with a terminal emulator program to the Console port on either switch).

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

1. Verify that the master and member switches are powered off.
2. Cable the 5 Gbps ports of the stack trunk on the switches. Refer to “Cabling Twisted Pair Ports” on page 156.
3. Power on all the switches at the same time or within thirty seconds of each other. Refer to “Powering On a Switch” on page 135.

Refer to “Power Specifications” on page 184 for the power specifications of the switches.



Warning

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

Note

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

4. Wait two minutes for the switches to form the stack.
5. Go to “Verifying the Stack” on page 153.

Verifying the Stack

To verify the stack, perform the following procedure:

1. Start a local management session on any switch in the stack. Refer to “Starting a Local Management Session” on page 130.
2. From the User Exec mode, enter the SHOW STACK command:

```
awplus> show stack
```

An example of the command for a stack of four switches is shown in Figure 55.

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

ID	Pending ID	MAC address	Priority	Status	Role
1	-	e01a:ea20:8011	1	Ready	Active Master
2	-	e01a:ea20:8023	2	Ready	Backup Member
3	-	e01a:ea20:9a45	3	Ready	Backup Member
4	-	e01a:ea20:1b8a	4	Ready	Backup Member

```
Operational Status          Normal operations
Stack MAC address           e01a:ea20:8011
```

Figure 55. SHOW STACK Command

Review the following items:

- ❑ The command should list all the switches. If the list is incomplete, refer to Chapter 10, “Troubleshooting” on page 163.
 - ❑ The Operational Status field should be “Normal operations” to indicate that all the stacking ports are operating normally.
 - ❑ If the Operational Status field is displaying “Not all stack ports are up,” one or more stacking ports are not being used or cannot establish links with their counterparts. For more information, refer to Chapter 10, “Troubleshooting” on page 163.
3. Go to Chapter 9, “Cabling the Networking Ports” on page 155, to complete the installation.

Chapter 9

Cabling the Networking Ports

This chapter contains the following procedures:

- ❑ “Cabling Twisted Pair Ports” on page 156
- ❑ “Guidelines to Handling SFP and SFP+ Transceivers” on page 157
- ❑ “Installing SFP or SFP+ Transceivers in the Switch” on page 158
- ❑ “Installing AT-SP10TW Direct Connect Twinax Cables” on page 160

Cabling Twisted Pair Ports

Here are the guidelines to cabling the twisted pair ports on the switch:

- ❑ The minimum twisted pair cable requirements are as follows:
 - 10/100 Mbps ports: Standard TIA/EIA 568-B-compliant Category 3 unshielded cabling.
 - 1/2.5/5 Gbps ports: Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) unshielded cabling.
 - 10 Gbps ports: Standard TIA/EIA 568-C-compliant Category 6a unshielded cabling.
- ❑ PoE is enabled by default on the AT-x530-28GPXm and AT-x530-52GPXm switch ports.
- ❑ The connectors on the cables must fit snugly into the ports, and the tabs must lock the connectors into place.
- ❑ The default speed setting for the ports is Auto-Negotiation. This setting is appropriate for ports connected to network devices that also support Auto-Negotiation.
- ❑ The ports must be set to the default setting of Auto-Negotiation to operate at 1000 Mbps.
- ❑ The twisted pair ports can operate in either half- or full-duplex mode when operating at 10/100 Mbps. However, if any of the twisted pair ports operate at 1 Gbps or higher, then the duplex mode is always full-duplex.
- ❑ Do not attach cables to ports of static or Link Aggregation Control Protocol (LACP) port trunks until after you configure the trunks on the switch. Otherwise, the ports will form network loops that can adversely affect network performance.

Guidelines to Handling SFP and SFP+ Transceivers

Review the following guidelines before installing SFP or SFP+ transceivers in the switches:

- ☐ The transceivers are hot-swappable. You can install them while the switch is powered on.
- ☐ For a list of supported transceivers, refer to the product data sheet on the Allied Telesis web site.
- ☐ The operational specifications and fiber optic cable requirements of the transceivers are provided in the documents included with the devices.
- ☐ Install a transceiver before connecting the fiber optic cable.
- ☐ Fiber optic transceivers are dust sensitive. Always keep the plug in the optical bores when a fiber optic cable is not installed, or when you store the transceiver. When you do remove the plug, keep it for future use.
- ☐ Unnecessary removal and insertion of a transceiver can lead to premature failure.



Caution

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. *See* E92

Installing SFP or SFP+ Transceivers in the Switch

This section contains installation instructions for SFP or SFP+ transceivers in the switches:

- ❑ Ports 25 to 28 of the AT-x530-28GTXm and AT-x530-28GPXm
- ❑ Ports 49 to 52 of the AT-x530-52GTXm and AT-x530-52GPXm

The following illustrations show a transceiver with a duplex LC connector. The connectors on your transceivers may be different.

To install transceivers, perform the following procedure:

1. Select a port for the transceiver.
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 port, position the transceiver with the Allied Telesis label facing up. If you are installing the transceiver in a bottom port, position the transceiver with the label facing down. Refer to Figure 56.

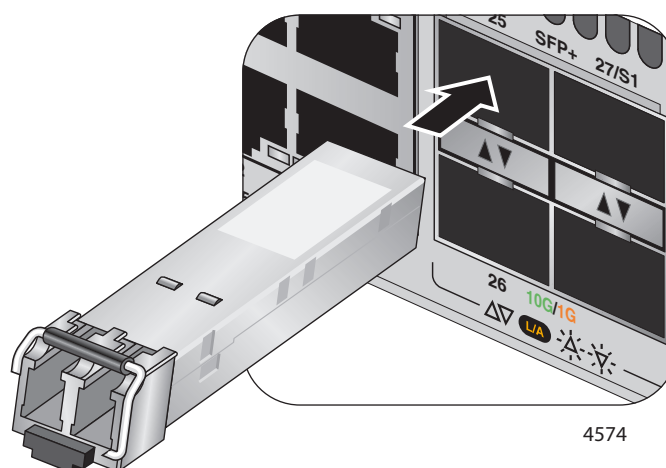


Figure 56. Installing an SFP Transceiver

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

Note

If you are ready to attach the fiber optic cable to the transceiver, continue with the next step. Otherwise, repeat steps 1 through 5 to install the remaining transceivers in the switch.

5. Verify the position of the handle on the transceiver. If the transceiver is in a top port, the handle must be in the upright position, as shown in Figure 57. If the transceiver is in a bottom port, the handle must be in the down position.

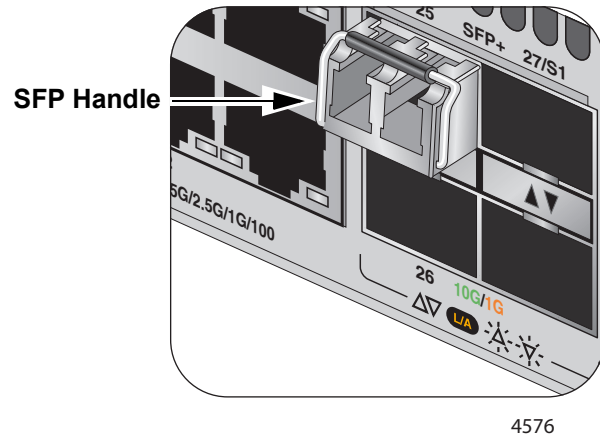


Figure 57. Positioning the SFP or SFP+ Handle in the Upright Position

6. Connect the fiber optic cable to the transceiver, as shown in Figure 58. The connector on the cable must fit snugly into the port, and the tab must lock the connector into place.

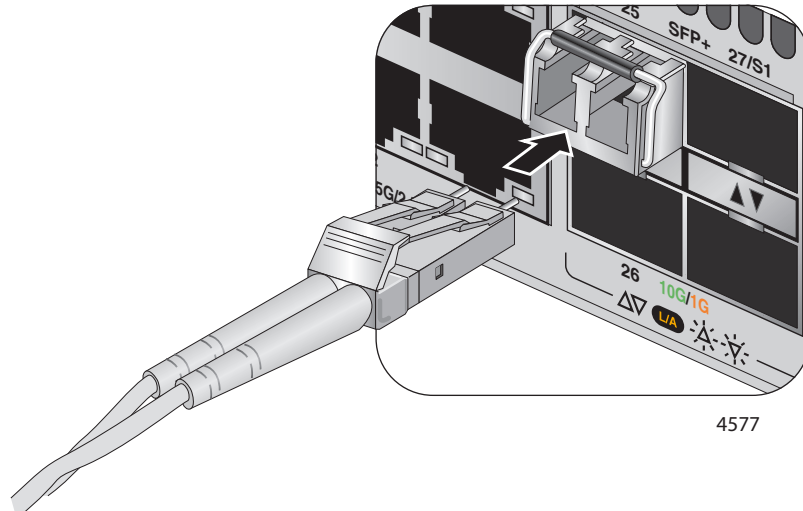


Figure 58. Connecting a Fiber Optic Cable to an SFP or SFP+ Transceiver

7. Repeat this procedure to install additional transceivers.

Installing AT-SP10TW Direct Connect Twinax Cables

The SFP and SFP+ transceiver ports of the switches support AT-SP10TW direct connect twinax cables:

- ❑ Ports 25 to 28 of the AT-x530-28GTXm and AT-x530-28GPXm
- ❑ Ports 49 to 52 of the AT-x530-52GTXm and AT-x530-52GPXm

The cables are an economical way to add 10 Gbps connections over short distances. They have SFP+ transceivers on both ends and come in lengths of 1 and 3 meters.

To install AT-SP10TW cables in the switch, perform the following procedure:

1. Select a port for the transceiver.
2. Remove the transceiver from its shipping container and store the packaging material in a safe location.
3. To install the transceiver in a port in the top row, position the transceiver with the Allied Telesis label facing up. To install the transceiver in a port in the bottom row, position the transceiver with the label facing down. Refer to Figure 59.

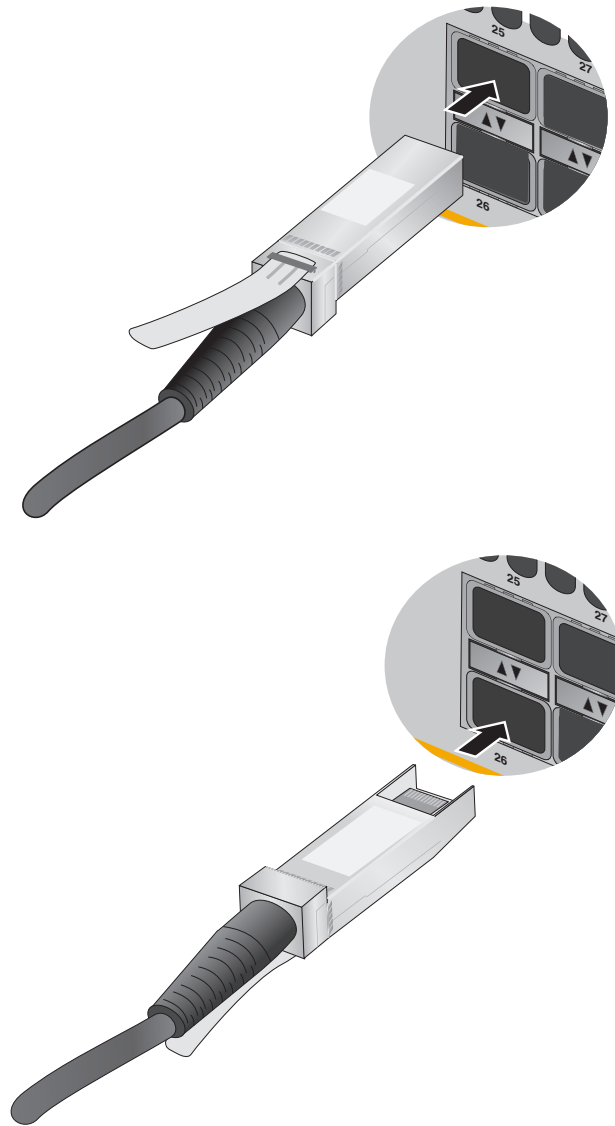


Figure 59. Installing AT-SP10TW Cables

4. Slide the transceiver into the port until it clicks into place.
5. Connect the other end of the cable into an SFP+ port on another network device.
6. Repeat this procedure to install additional transceivers.

Note

To remove the connector and cable from the port, gently push on the connector, pull on the release tab, and slide the connector from the port.

Chapter 10

Troubleshooting

This chapter contains suggestions on how to troubleshoot problems with the switch.

Note

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

Problem 1: All the port LEDs and 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 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. The power requirements for the switch are listed in “Power Specifications” on page 172.

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

Solution: The switch might 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 can also toggle the LEDs off and on with the ECOFRIENDLY LED and NO ECOFRIENDLY LED commands in the command line interface.

Problem 3: A twisted pair port on the switch is connected to an active 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 network device connected to the twisted pair port is powered on and is operating properly.
- ❑ Try connecting another network device to the twisted pair port with a different cable. If the twisted pair port is able to establish a link, then the problem is with the cable or the other network device.
- ❑ Verify that the twisted pair cable does not exceed 100 meters (328 feet).
- ❑ Verify that you are using the appropriate category of twisted pair cable. Refer to "Cable Requirements" on page 30.
- ❑ Verify that the port is connected to the correct twisted pair cable. Allied Telesis recommends Standard TIA/EIA 568-B-compliant Category 6 shielded cabling or Standard TIA/EIA 568-C-compliant Category 6a shielded cabling for the twisted pair ports.

Note

Twisted pair ports may require five to ten seconds to establish a link.

Problem 4: The LINK/ACT LED for an SFP, SFP+ or QSFP+ transceiver is off.

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

- ❑ Verify that the remote network device connected to the fiber optic port is operating properly.
- ❑ Verify that the fiber optic cable is securely connected to the port on the transceiver and to the port on the remote network device.
- ❑ Check that the transceiver is fully inserted in the port.
- ❑ 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.
- ❑ 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 management software to verify that the port is enabled.
- ❑ If the remote network device is a managed device, use the management firmware to determine whether the 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: The SHOW STACK command is not displaying all the switches in the stack.

Solutions: If you are using 10 Gbps ports for the stack trunk, try the following:

- ❑ Verify that the stacking ports are properly cabled. Refer to Chapter 9, “Cabling the Networking Ports” on page 155.
- ❑ If you are using SFP+ transceivers for the stack trunk, verify that they are fully inserted into the transceiver ports.
- ❑ If you are using AT-SP10TW direct connect twinax cables, verify that they are from Allied Telesis. The trunk will not work with cables from other network equipment manufacturers.
- ❑ Verify that the VCStack is activated on the switches. For instructions refer to “Verifying the Stack” on page 153.
- ❑ Verify the switches have the same software version, AlliedWare Plus v5.4.9. This can be checked during initialization, refer to “Monitoring the Initialization Processes” on page 119.

Problem 6: The AT-x530-28GPXm or AT-x530-52GPXm switch is not providing power to a PoE device.

Solutions: Try the following:

- ❑ Check the port’s PoE LED. If the LED is flashing amber, the switch has reached its maximum power budget and cannot support any additional PoE devices.
- ❑ Review the powered device 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-x530-28GPXm switch does 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 switch.

- ❑ Use the `SHOW SYSTEM ENVIRONMENT` command to confirm that both power supplies are operating normally.
- ❑ If the problem is with a powered device connected to the AT-x530-52GPXm switch, use the management software to determine whether the switch has reached its maximum power budget of 370W with one power supply or 740 with two power supplies, and so cannot support any further powered devices.
- ❑ Check that the power device power requirements do not exceed 30 W. This can be verified by reviewing the device documentation or data sheet.
- ❑ Verify that you are using the appropriate category of twisted-pair cable. Refer to “Cable Requirements” on page 30.
- ❑ 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 7: The switch functions intermittently.

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

- ❑ Use the `SHOW SYSTEM ENVIRONMENT` command in the Privileged Exec mode to verify that the input voltage from the power source to the switch is stable and within the approved operating range. The unit will shut down if the input voltage fluctuates above or below the approved operating range.
- ❑ Use the `SHOW SYSTEM ENVIRONMENT` command in the Privileged Exec mode to verify that the fan is operating correctly.
- ❑ Verify that the location of the switch allows for adequate airflow. The unit will shut down if it is overheating.

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

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

- ❑ A cooling fan has failed.
- ❑ The switch might be overheating and may have to shut down.

Contact your Allied Telesis sales representative for assistance.

Appendix A

Technical Specifications

This appendix contains the following sections:

- ❑ "Physical Specifications" on page 168
- ❑ "Environmental Specifications" on page 171
- ❑ "Power Specifications" on page 172
- ❑ "RJ-45 Twisted Pair Port Pinouts" on page 173
- ❑ "RJ-45 Style Serial Console Port Pinouts" on page 174
- ❑ "USB Port" on page 175

Physical Specifications

Dimensions

Table 26 lists the dimensions of the switches. The dimensions are shown in Figure 60 through Figure 63 on page 169.

Table 26. Product Dimensions

Model	Dimension (L x H x D)
AT-x530-28GTXm	44.05 cm x 4.37 cm x 32.26 cm (17.344 in. x 1.72 in. x 12.7 in.)
AT-x530-28GPXm	44.05 cm x 4.37 cm x 42.06cm (17.344 in. x 1.72 in. x 16.56 in.)
AT-x530-52GTXm	44.05 cm x 4.37 cm x 32.26 cm (17.344 in. x 1.72 in. x 12.7 in.)
AT-x530-52GPXm	44.05 cm x 4.37 cm x 42.06cm (17.344 in. x 1.72 in. x 16.56 in.)

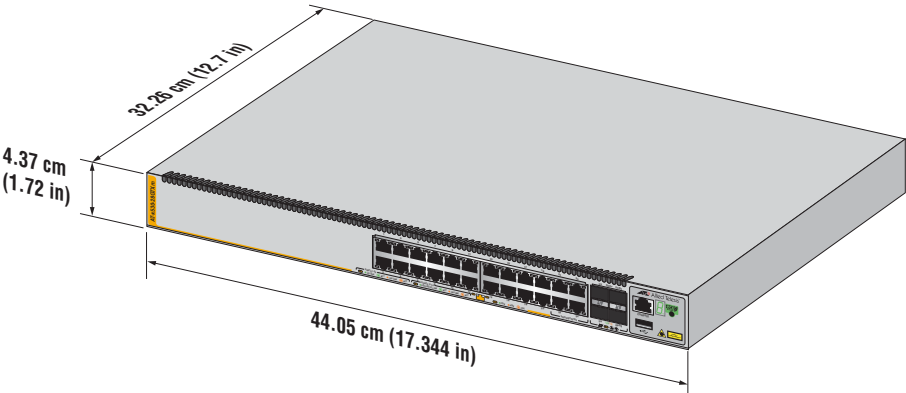


Figure 60. AT-x530-28GTXm Dimensions

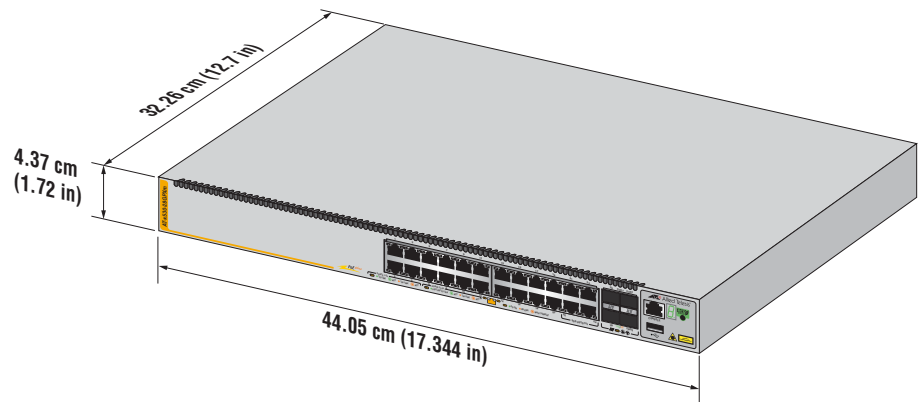


Figure 61. AT-x530-28GPXm Dimensions

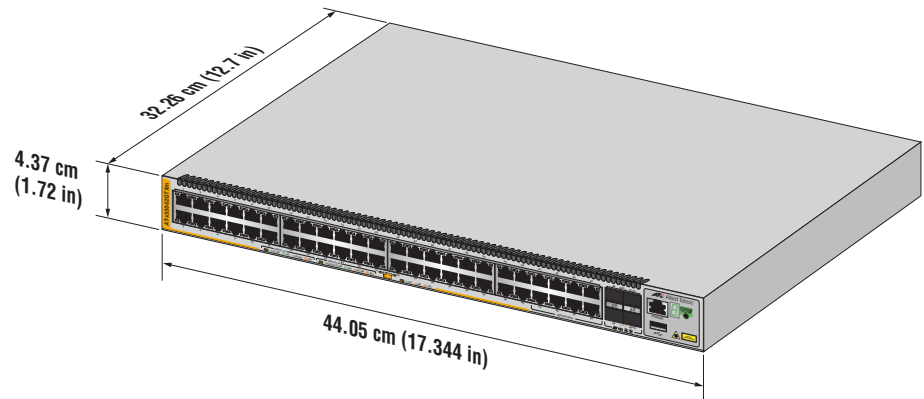


Figure 62. AT-x530-52GTXm Dimensions

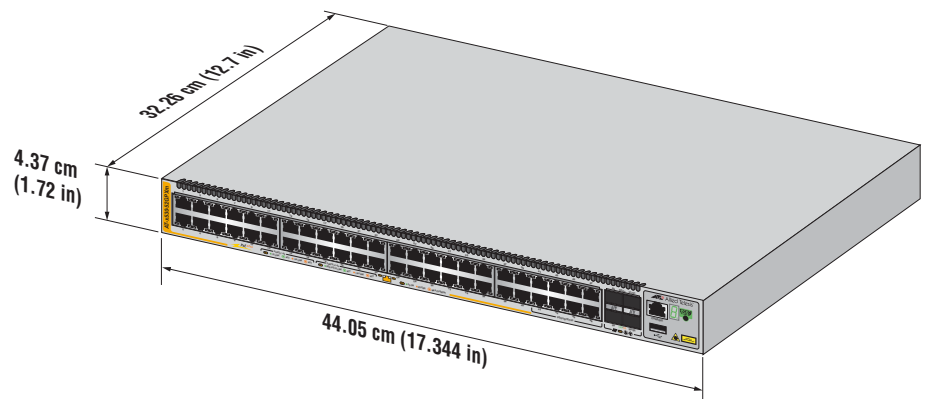


Figure 63. AT-x530-52GPXm Dimensions

Weights

Table 27 lists the weights of the switches.

Table 27. Product Weights

AT-x530-28GTXm	4.42 kg (9.75 lb)
AT-x530-28GPXm	6.31 kg (13.90 lb)
AT-x530-52GTXm	4.67 kg (10.5 lb.)
AT-x530-52GPXm	6.09 kg (13.7 lb)

Ventilation

Table 28 lists the ventilation requirements.

Table 28. Ventilation Requirements

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

Table 29 lists the environmental specifications of the switches.

Table 29. Environmental Specifications

Operating Temperature	0° C to 50° C (32° F to 122° F)
Storage Temperature	-25° C to 70° C (-13° F to 158° F)
Operating Humidity	5% to 90% noncondensing
Storage Humidity	5% to 95% noncondensing
Maximum Operating Altitude	3,000 m (9,842 ft)
Maximum Nonoperating Altitude	4,000 m (13,100 ft)
Product Noise Level	More than 42 dB @ 30C or less
Installation Requirement	Tabletop, wall or rack mount

Power Specifications

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

Maximum Power Consumption

Table 30 lists the maximum power consumptions for the switches.

Table 30. Maximum Power Consumptions

AT-x530-28GTXm	55 watts
AT-x530-28GPXm	900 watts
AT-x530-52GTXm	88 watts
AT-x530-52GPXm	970 watts

Input Voltages

Table 31 lists the input voltages for the switches.

Table 31. Input Voltages

AT-x530-28GTXm	100-240 VAC~, 1.0A per input, 50/60 Hz (x2)
AT-x530-28GPXm	100-240 VAC~, 6.0A per input, 50/60 Hz (x2)
AT-x530-52GTXm	100-240 VAC~, 1.0A per input 50/60 Hz (x2)
AT-x530-52GPXm	100-240 VAC~, 6.0A per input, 50/60 Hz (x2)

Heat Dissipation

Table 32 lists the heat dissipation for the switches.

Table 32. Heat Dissipation

AT-x530-28GTXm	190 BTU/hr
AT-x530-28GPXm	3100 BTU/hr
AT-x530-52GTXm	300 BTU/hr
AT-x530-52GPXm	3310 BTU/hr

RJ-45 Twisted Pair Port Pinouts

Figure 64 illustrates the pin layout of the RJ-45 connectors on the front panel of the switch.

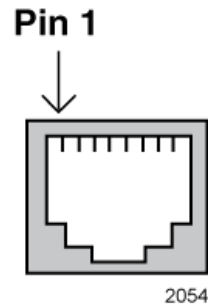


Figure 64. RJ-45 Socket Pin Layout (Front View)

Table 33 lists the pin signals.

Table 33. Pin Signals for 100M/1G/2.5G/5G Base-T Connectors

Pin	100 Mbps MDI Signal	100 Mbps MDI-X Signal	1G/2.5G/5G Signal
1	TX+	RX+	Bi-directional pair A+
2	TX-	RX-	Bi-directional pair A-
3	RX+	TX+	Bi-directional pair B+
4	Not used	Not used	Bi-directional pair C+
5	Not used	Not used	Bi-directional pair C-
6	RX-	TX-	Bi-directional pair B-
7	Not used	Not used	Bi-directional pair D+
8	Not used	Not used	Bi-directional pair D-

RJ-45 Style Serial Console Port Pinouts

Table 34 lists the pin signals of the RJ-45 style serial console port.

Table 34. RJ-45 Style Serial Console Port Pin Signals

Pin	Signal
1	RTS#
2	Not used
3	Transmit Data
4	Ground
5	Ground
6	Receive Data
7	Not used
8	CTS

USB Port

Table 35 lists the pin signals of the USB port.

Table 35. USB Port Pin Signals

Pin	Signal
1	+5V
2	DATA-
3	DATA+
X	NC
4	GND

