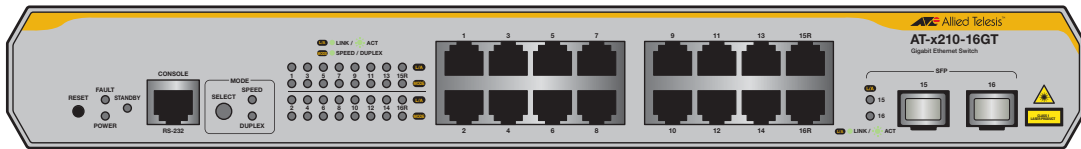
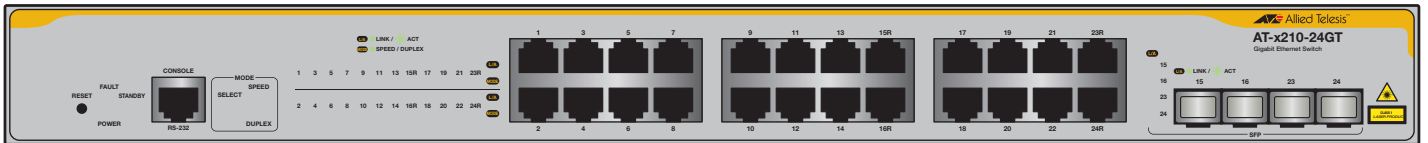


AT-x210-24GT AT-x210-16GT AT-x210-9GT

Gigabit Ethernet Switches



Installation Guide

Copyright © 2013 Allied Telesis, Inc.

All rights reserved. No part of this publication may be reproduced without prior written permission from Allied Telesis, Inc.

Allied Telesis and the Allied Telesis logo are trademarks of Allied Telesis, Incorporated. All other product names, company names, logos or other designations mentioned herein are trademarks or registered trademarks of their respective owners.

Allied Telesis, Inc. reserves the right to make changes in specifications and other information contained in this document without prior written notice. The information provided herein is subject to change without notice. In no event shall Allied Telesis, Inc. be liable for any incidental, special, indirect, or consequential damages whatsoever, including but not limited to lost profits, arising out of or related to this manual or the information contained herein, even if Allied Telesis, Inc. has been advised of, known, or should have known, the possibility of such damages.

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 meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

RFI Emissions	EN 55022:2010 EN 61000-3-2:2006+A1:2009+A2:2009 EN 61000-3-3:2008 EN 62233:2008 EN 62311:2008 FCC Class A FCC Part 15 (47 CFR 15) ICES-003 VCCI-A VCCI-B 2004/108/EC EMC Directive
---------------	--

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


Environmental Compliance	2011/65/EU RoHS Directive
Electrical Safety	C-TICK CE 2006/95/EC Low Voltage Directive EN 60950-1:2006+A11:2009+A1:2010+A12:2011 IEC 60950-1 (ed.2) UL 60950 (cUL _{US})



Laser Safety EN 60825-1:2007

Immunity EN 55024:2010

Translated Safety Statements

Important: The  indicates that a translation of the safety statement is available in a PDF document titled *Translated Safety Statements* posted on the Allied Telesis website at www.alliedtelesis.com.

Contents

Preface	1
Symbol Conventions	2
Contacting Allied Telesis.....	3
Chapter 1: Overview	
Features	6
Twisted Pair Ports	6
SFP Slots.....	6
LEDs.....	7
Installation Options	7
Power Conservation	7
MAC Address Table	7
Package Contents.....	8
Front and Back Panels.....	9
Management Software	11
Twisted Pair Ports	12
LEDs	13
POWER/FAULT/STANDBY LEDs.....	13
10Base-T/100Base-TX/1000 Base-T Link Activity LEDs.....	15
SFP LEDs.....	17
Power Supply	19
Chapter 2: Installation	
Reviewing Safety Precautions.....	22
Selecting a Site for the Switch	24
Cable Specifications.....	25
Unpacking the Switch.....	26
Installing the Switch on a Table or a Desktop.....	27
Installing the Switch in an Equipment Rack	28
Installing Optional SFP Transceivers	35
Cabling the Switch	39
Powering On the Switch.....	41
Monitoring the Initialization Processes.....	43
Chapter 3: Troubleshooting	
Appendix A:	
Physical Specifications	52
Dimensions.....	52
Weight	52
Environmental Specifications	52
Power Specifications.....	53
Electrical Safety and Electromagnetic Emissions Certifications	53
Connectors and Port Pinouts	54

Figures

Figure 1: AT-x210-9GT, AT-x210-16GT, and AT-x210-24GT packaging.....	8
Figure 2: AT-x210-9GT, AT-x210-16GT, and AT-x210-24GT Front Panels.....	9
Figure 3: MODE LED Toggle button.....	10
Figure 4: AT-x210-9GT, AT-x210-16GT, and AT-x210-24GT Back Panels.....	10
Figure 5: POWER LED on AT-x210-9GT.....	13
Figure 6: FAULT LED on AT-x210-9GT.....	14
Figure 7: FAULT LED on AT-x210-16GT.....	14
Figure 8: AT-x210-9GT Link/Activity and Speed LEDs.....	15
Figure 9: AT-x210-16GT Link/Activity/Speed LEDs.....	16
Figure 10: AT-x210-24GT Link/Activity/Speed Port LED.....	16
Figure 11: AT-x210-9GT SFP Speed and Link/Activity LEDs.....	17
Figure 12: AT-x210-16GT SFP Status LEDs.....	18
Figure 13: AT-x210-24GT SFP Status LEDs.....	18
Figure 14: Attaching the Rubber Feet.....	27
Figure 15: Turning the Switch Upside Down.....	28
Figure 16: Attaching brackets to an AT-x210-24GT.....	28
Figure 17: Mounting an AT-x210-24GT Switch in an Equipment Rack.....	29
Figure 18: Attaching the brackets level with the front of an AT-x210-16GT.....	30
Figure 19: Close up showing a bracket positioned for an AT-x210-9GT.....	30
Figure 20: Mounting an AT-x210-16GT Switch in an Equipment Rack.....	31
Figure 21: Fitting rack mount handles to the brackets for an AT-x210-9GT.....	32
Figure 22: Fitting brackets to the mounting for an AT-x210-9GT.....	32
Figure 23: Attaching cable tray brackets for an AT-x210-9GT.....	33
Figure 24: Mounting an AT-x210-9GT Switch in an Equipment Rack.....	33
Figure 25: Mounting an AT-x210-9GT Switch in an Equipment Rack.....	34
Figure 26: Securing cables to the cable tray for an AT-x210-9GT.....	34
Figure 27: Removing the Dust Plug from an SFP Slot.....	35
Figure 28: Inserting the SFP on an AT-x210-24GT.....	36
Figure 29: Inserting the SFP on an AT-x210-16GT.....	36
Figure 30: Positioning the SFP Handle in the Upright Position.....	37
Figure 31: Ejecting an SFP transceiver after lowering the SFP Handle to the Downwards Position.....	37
Figure 32: Lifting the AC Power Cable Hook on an AT-x210-16GT Switch.....	41
Figure 33: Plugging in the AC Power Cord on an AT-x210-16GT Switch.....	41
Figure 34: Switch Initialization Messages.....	43
Figure 35: Switch Initialization Messages (Continued).....	44
Figure 36: Switch Initialization Messages (Continued).....	45
Figure 37: RJ-45 Connector and Port Pin Layout.....	54

Tables

Table 1. AT-x210-9GT POWER LED Functional Descriptions	13
Table 2. AT-x210-16GT and AT-x210-24GT FAULT LED Functional Descriptions	14
Table 3. AT-x210-16GT and AT-x210-24GT STANDBY LED Functional Descriptions	14
Table 4. AT-x210-9GT LINK/ACT and SPEED/DUPLEX LED Descriptions	15
Table 5. AT-x210-16GT and AT-x210-24GT LINK/ACT and SPEED/DUPLEX LED Descriptions	17
Table 6. SFP Link/Activity LED Functional Descriptions	18
Table 7. Twisted Pair Cabling and Distances	25
Table 8. Chassis Dimensions	52
Table 9. Chassis Weight	52
Table 10. Environmental Specifications	52
Table 11. Power Specifications	53
Table 12. Safety and Electromagnetic Emissions Certifications	53
Table 13. MDI Pin Signals (10Base-T or 100Base-TX)	54
Table 14. MDI-X Pin Signals (10Base-T or 100Base-TX)	54
Table 15. RJ-45 1000Base-T Connector Pinouts	55

Preface

This guide contains the installation instructions for the AT-x210-9GT, AT-x210-16GT, and AT-x210-24GT Gigabit Ethernet Switches. This preface contains the following sections:

- “Symbol Conventions” on page 2
- “Contacting Allied Telesis” on page 3

Symbol 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.

**Warning**

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

Contacting Allied Telesis

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

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

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

Chapter 1

Overview

This chapter provides descriptions of the AT-x210-9GT, AT-x210-16GT, and AT-x210-24GT Gigabit Ethernet Switches and contains the following sections:

- “Features” on page 6
- “Package Contents” on page 8
- “Front and Back Panels” on page 9
- “Management Software” on page 11
- “Twisted Pair Ports” on page 12
- “LEDs” on page 13
- “Power Supply” on page 19

Features

Here are the hardware features of the AT-x210-9GT, AT-x210-16GT and AT-x210-24GT Gigabit Ethernet Switches.

Twisted Pair Ports

Here are the basic features of the 10/100/1000 Mbps twisted-pair ports:

- 9, 16, or 24 ports per switch
- 10Base-T (IEEE 802.3i), 100Base-TX (IEEE 802.3u) and 1000Base-T (IEEE 802.3ab) compliant
- IEEE 802.3u Auto-Negotiation compliant
- Auto-MDI/MDIX
- 100 meters (328 feet) maximum operating distance
- IEEE 802.3x Flow Control in 10Base-T/100Base-TX full-duplex operation
- IEEE 802.3x Back Pressure in 10Base-T/100Base-TX half-duplex operation
- IEEE803.3z 1000Base-T Flow Control
- Support for Jumbo frames up to 10KB
- RJ-45 connectors

SFP Slots

All three switches support both 100Base-FX and 1000Base-SX/LX transceivers. The switches support either two or four slots for SFPs:

- One SFP slot on the AT-x210-9GT Switch
- Two SFP slots on the AT-x210-16GT Switch
- Four SFP slots on the AT-x210-24GT Switch

Note

You must purchase SFP transceivers separately. For a list of supported transceivers, contact your Allied Telesis distributor or reseller.

Note

See the product data sheets for the specific ATI SFP modules supported by the AT-x210 series switches.

LEDs Here is a brief description of the port LEDs:

- Power LED/Fault/Standby LEDs; refer to “POWER/FAULT/STANDBY LEDs” on page 13.
- Speed and link/activity LEDs for the twisted pair ports; see “10Base-T/100Base-TX/1000 Base-T Link Activity LEDs” on page 15.
- Link/activity LEDs for the SFP slots; see “SFP LEDs” on page 17.

Installation Options

The AT-x210-9GT switch can be installed in the following way:

- Mounted on a Desk or tabletop

The AT-x210-16GT and AT-x210-24GT switches can be installed in the following ways:

- Rack mounted in a 19-inch equipment rack
- Mounted on a Desk or tabletop
- Wall mounted

Power Conservation

The AT-x210-9GT, AT-x210-16GT, and AT-x210-24GT switches have the following power conservation features:

- High-efficiency power supply
- Power scaling based on traffic loads on ports operating at 1000 Mbps (Port power scaling not available at 10 or 100 Mbps)
- Power shutdown on unused ports

MAC Address Table

Here are the basic features of the MAC address table:

- Storage capacity up to 8KB MAC address entries
- Automatic learning and aging

Package Contents

Figure 1 illustrates the package contents for the AT-x210-9GT, AT-x210-16GT, and AT-x210-24GT Gigabit Ethernet Switches.

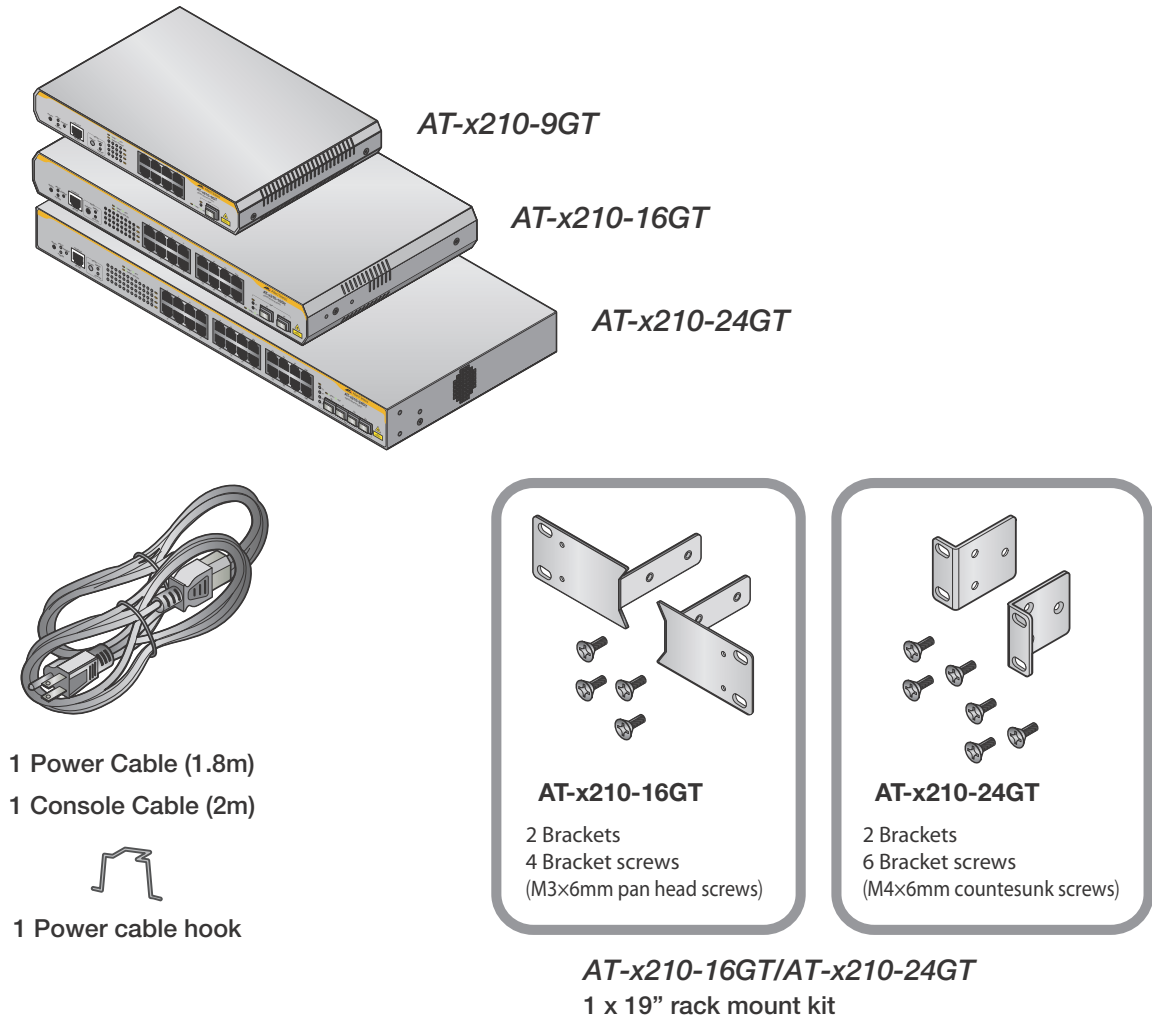
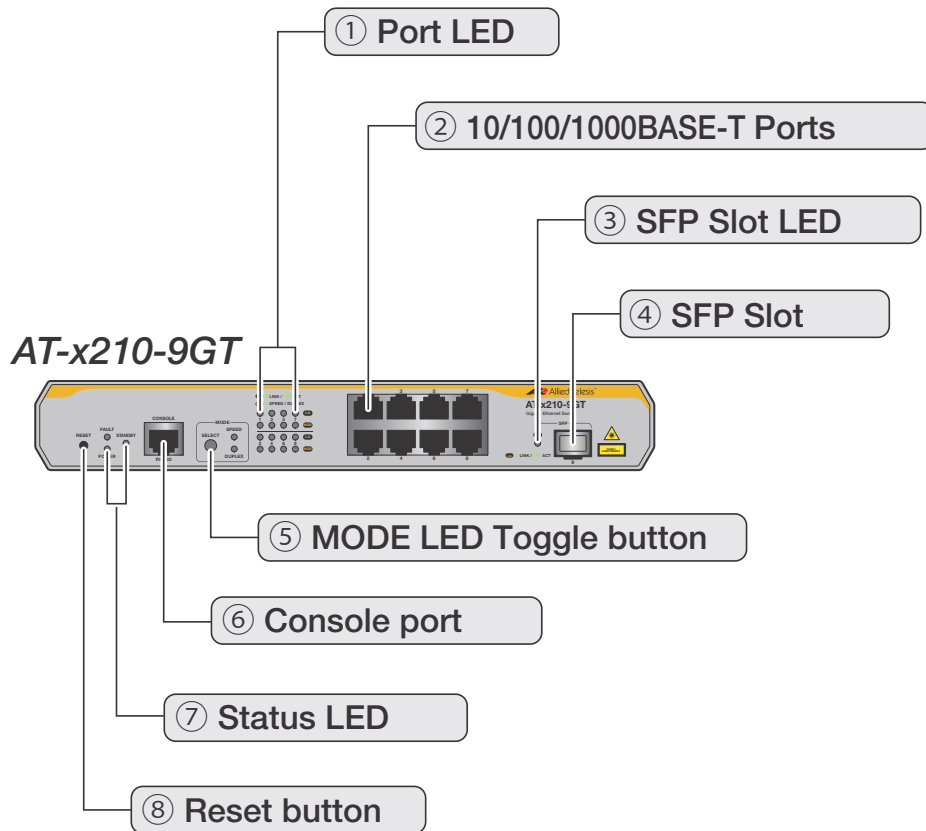


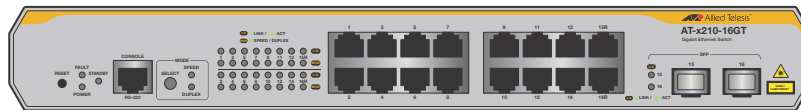
Figure 1. AT-x210-9GT, AT-x210-16GT, and AT-x210-24GT packaging

Front and Back Panels

Figure 2 illustrates the front panels of the AT-x210-9GT, AT-x210-16GT, and AT-x210-24GT Gigabit Ethernet Switches.



AT-x210-16GT



AT-x210-24GT



Figure 2. AT-x210-9GT, AT-x210-16GT, and AT-x210-24GT Front Panels

Figure 3 illustrates the MODE LED toggle button on the front panel of the of the AT-x210-9GT and AT-x210-16GT Gigabit Ethernet Switches. This button changes front panel LEDs for SPEED, DUPLEX, or turns off LEDs.

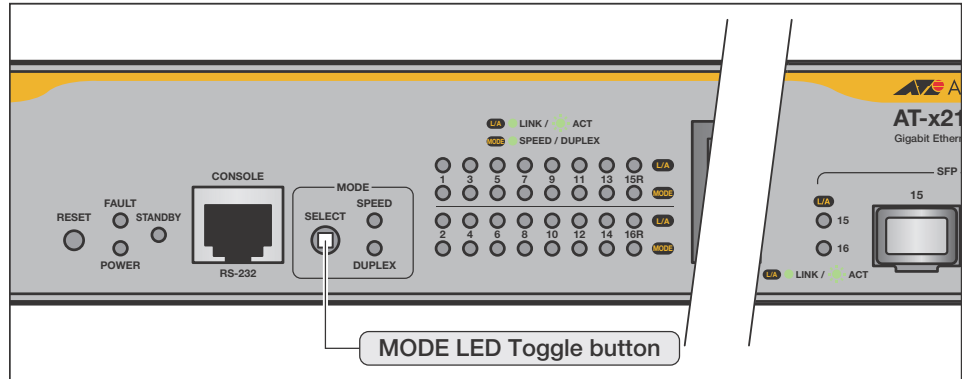


Figure 3. MODE LED Toggle button

Figure 4 illustrates the front panels of the AT-x210-9GT, AT-x210-16GT, and AT-x210-24GT Gigabit Ethernet Switches.

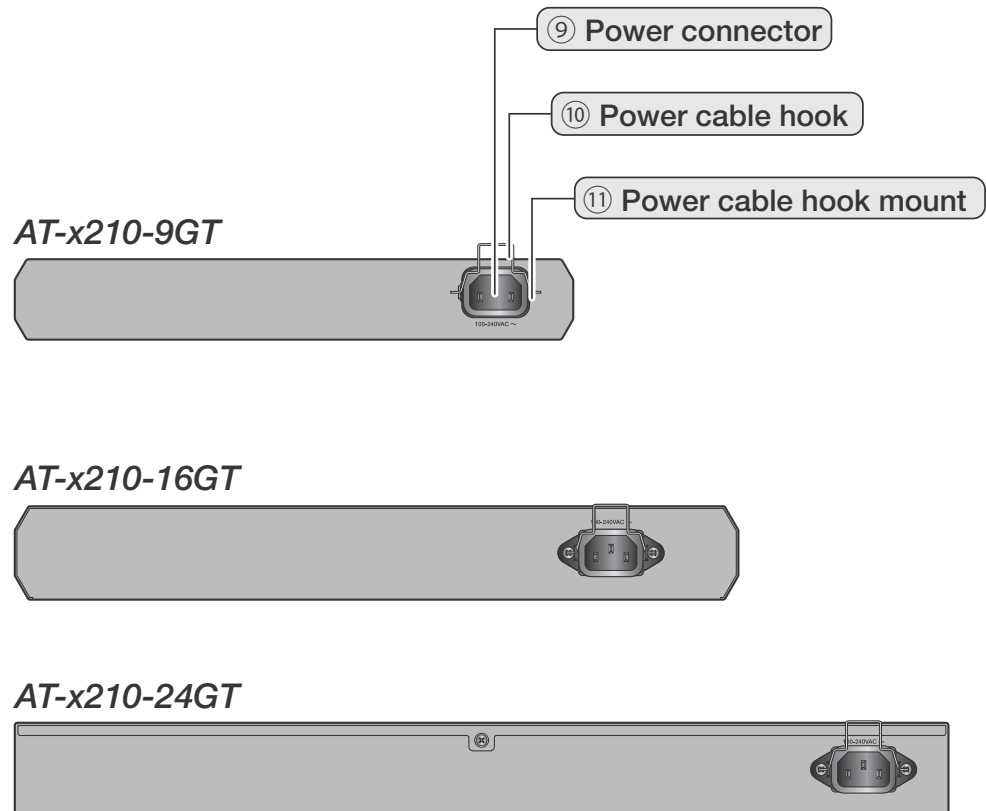


Figure 4. AT-x210-9GT, AT-x210-16GT, and AT-x210-24GT Back Panels

Management Software

The switches are shipped with the management software pre-installed. The software provides a command line interface and a GUI (Graphical User Interface) for in-band, over-the-network management. Refer to the:

- AlliedWare Plus Software Reference for x210 Series Switches

In the unlikely event that the management software becomes corrupted or damaged on the switch, you can download the software from the Allied Telesis corporate web site and reinstall it on the switch. For instructions on how to install new management software, see the product documentation.

Twisted Pair Ports

The AT-x210-9GT, AT-x210-16GT, and AT-x210-24GT Layer 2 Gigabit Ethernet Switches feature 9, 16, and 24 twisted pair ports, respectively. All ports are 10Base-T, 100Base-TX, and 1000Base-T compliant. You can set the port speeds and duplex modes either automatically with IEEE 802.3u Auto-Negotiation or manually with the management software.

The twisted pair ports feature 8-pin RJ-45 connectors. For the port pinouts, see “Connectors and Port Pinouts” on page 54.

The ports have a maximum operating distance of 100 m (328 feet). For 10 Mbps operation, the ports require Category 3 or better 100 ohm shielded or unshielded twisted pair cabling. For 100 or 1000 Mbps operation, the ports require Category 5 or Enhanced Category 5 (5E) 100 ohm shielded or unshielded twisted pair cabling.

The ports feature auto-MDI, which automatically configures the ports as MDI or MDI-X. This feature allows you to use straight-through twisted pair cables regardless of the wiring configurations of the ports on the end nodes.

Note

A switch port connected to an end node that is not using Auto-Negotiation should not use Auto-Negotiation to set the speed and duplex mode, because a duplex mode mismatch may occur. In this case, disable Auto-Negotiation and set the port's speed and duplex mode manually.

LEDs

There are four types of LEDs on the AT-x210 switches:

- “POWER/FAULT/STANDBY LEDs” on page 13
- “10Base-T/100Base-TX/1000 Base-T Link Activity LEDs” on page 15
- “SFP LEDs” on page 17

POWER/ FAULT/ STANDBY LEDs

The POWER LED reports the status of AC power and is located on the left side of the front panel of the AT-x210-9GT switch. See Figure 5.

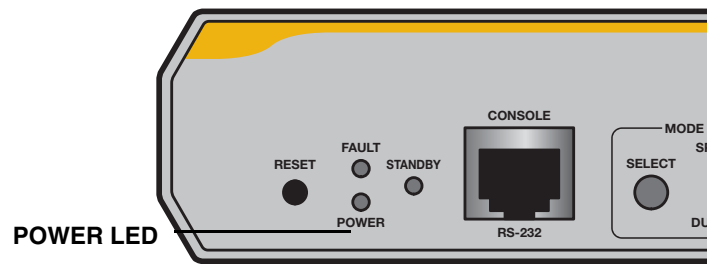


Figure 5. POWER LED on AT-x210-9GT

Table 1 describes the POWER LED for the AT-x210-9GT switch.

Table 1. AT-x210-9GT POWER LED Functional Descriptions

LED	State	Description
POWER	Off	Indicates either the switch is not receiving AC power or the AC input power is operating outside the normal range.
	Steady Green	The switch is receiving AC input power and is operating normally.

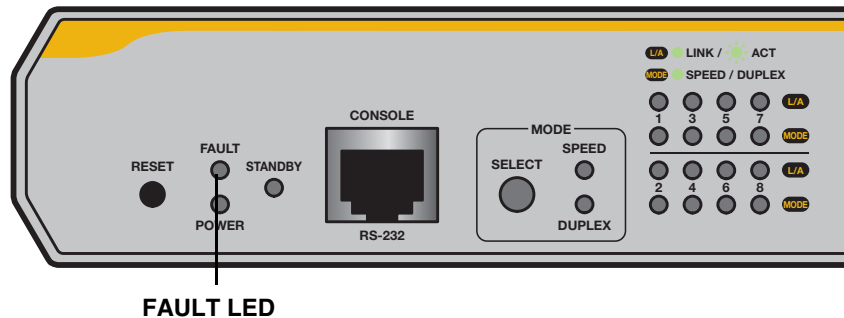


Figure 6. FAULT LED on AT-x210-9GT

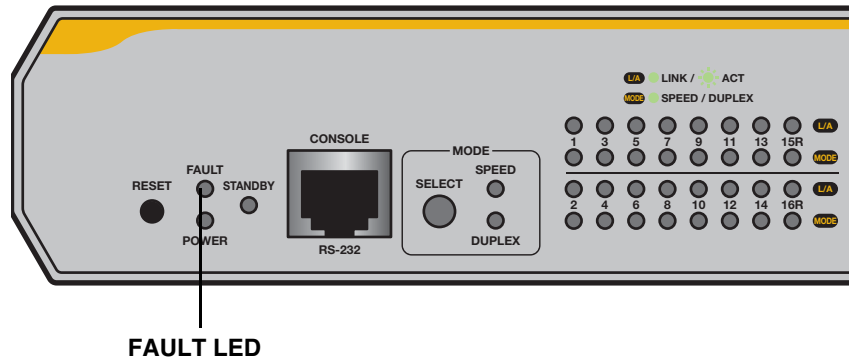


Table 2 describes the functions for the FAULT LED for the AT-x210-9GT and AT-x210-16GT switches.

Table 2. AT-x210-16GT and AT-x210-24GT FAULT LED Functional Descriptions

LED	State	Description
FAULT	Off	The switch is receiving AC input power and is operating normally
	6 flashes in 2 seconds	Flashing indicates the switch is overheating. Contact Allied Telesis for support and advice.
	Steady Green	Indicates the system is experiencing failure.

Figure 7. FAULT LED on AT-x210-16GT

Table 3 describes the functions for the STANDBY LED for the AT-x210-9GT and AT-x210-16GT switches.

Table 3. AT-x210-16GT and AT-x210-24GT STANDBY LED Functional Descriptions

LED	State	Description
STANDBY	Off	STANDBY is not supported. The LED is not lit.

**10Base-T/
100Base-TX/1000
Base-T Link
Activity LEDs**

The Link Activity (L/A) LEDs provide information about the 10Base-T/100Base-TX/1000Base-T ports.

AT-x210-9GT Link/Activity and Speed LEDs

The AT-x210-9GT switch indicates LINK/ACT (link/activity) and SPEED/DUPLEX (speed/duplex) with two LEDs for each port. See Figure 8.

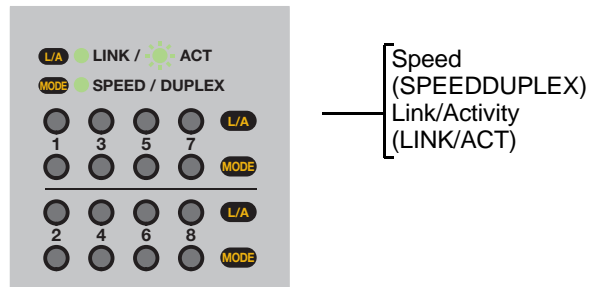


Figure 8. AT-x210-9GT Link/Activity and Speed LEDs

See Table 4 for a description for the AT-x210-9GT Link/Activity and Speed LEDs.

Table 4. AT-x210-9GT LINK/ACT and SPEED/DUPLEX LED Descriptions

LED	State	Description
Link/Activity (LINK/ACT)	Off	The port has not established a link with a network device, or the ecofriendly feature is enabled with the MODE LED button to turn off the front panel LEDs. Use the MODE LED button to turn off the front panel LEDs and conserve electricity when you are not monitoring the switch.
	Blinking Green	The port is transmitting or receiving network packets.
	Steady Green	The port has established a link with a network device and is active.
Speed/Duplex (SPEED/DUPLEX)	Off	The maximum operating speed of the port is 10 or 100 Mbp, or the ecofriendly feature is enabled with the MODE LED button to turn off the front panel LEDs.
	Steady Green	The maximum operating speed of the port is 1000 Mbps.

AT-x210-16GT Link/Activity LEDs

The AT-x210-16GT switch has two LEDs per port on the front panel to indicate link, activity, duplex, and speed status. See Figure 9.

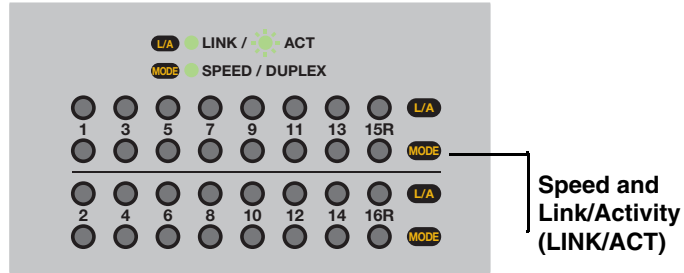


Figure 9. AT-x210-16GT Link/Activity/Speed LEDs

AT-x210-24GT Link/Activity LEDs

The AT-x210-24GT switch has two LEDs per port to indicate port's link, activity, duplex, and speed status. See Figure 10.

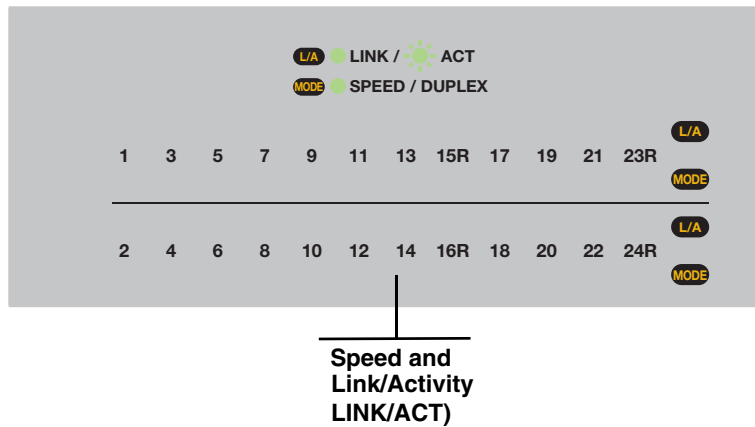


Figure 10. AT-x210-24GT Link/Activity/Speed Port LED

See Table 5 for a description for the AT-x210-16GT and AT-x210-24GT Link/Activity and Speed LEDs.

Table 5. AT-x210-16GT and AT-x210-24GT LINK/ACT and SPEED/ DUPLEX LED Descriptions

LED	State	Description
Link/Activity (LINK/ACT)	Off	The port has not established a link with a network device, or the ecofriendly feature is enabled with the MODE LED button to turn off the front panel LEDs. Use the MODE LED button to turn off the front panel LEDs and conserve electricity when you are not monitoring the switch.
	Blinking Green	The port is transmitting or receiving network packets.
	Steady Green	The port has established a link with a network device and is active.
Speed/Duplex (SPEED/ DUPLEX)	Off	The maximum operating speed of the port is 10 or 100 Mbps, or the ecofriendly feature is enabled with the MODE LED button to turn off the front panel LEDs. Use the MODE LED button to turn off the front panel LEDs and conserve electricity when you are not monitoring the switch.
	Steady Green	The maximum operating speed of the port is 1000 Mbps.

SFP LEDs

The SFP LEDs indicate the Link/Activity and Speed status of each SFP slot.

The AT-x210-9GT and AT-x210-16GT switches have the SFP LEDs on the front panel. See Figure 11 and Figure 12.

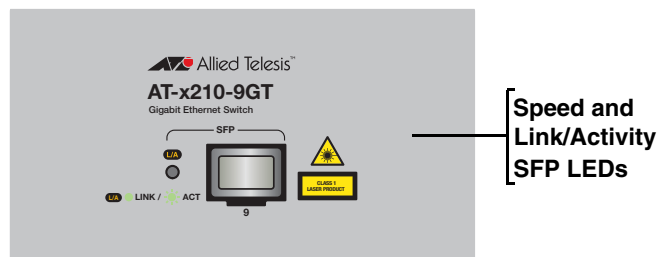


Figure 11. AT-x210-9GT SFP Speed and Link/Activity LEDs

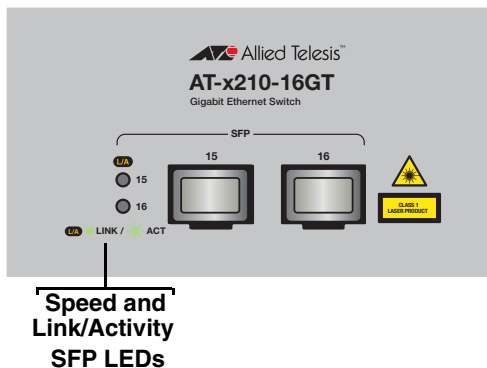


Figure 12. AT-x210-16GT SFP Status LEDs

The AT-x210-24GT SFP LEDs can be found on between the upper and lower SFP slots. See Figure 13.

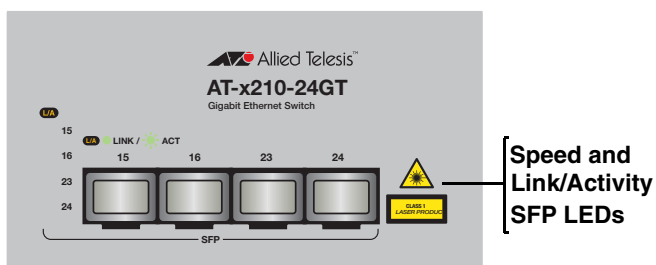


Figure 13. AT-x210-24GT SFP Status LEDs

Table 6 describes the Link/Activity LEDs for the SFP slots.

Table 6. SFP Link/Activity LED Functional Descriptions

LED	State	Description
SFP	Off	The port on the SFP transceiver has not established a link with an end node or the transceiver slot is empty, or the ecofriendly feature is enabled with the MODE LED button to turn off the front panel LEDs. Use the MODE LED button to turn off the front panel LEDs and conserve electricity when you are not monitoring the switch.
	Blinking Green	The SFP transceiver is transmitting or receiving network packets (Activity).
	Steady Green	The SFP transceiver has established a link with a network device, but is not transmitting or receiving network packets (Link).

Power Supply

Each switch has an internal power supply with a single AC power supply socket on the back panel. To power the switch on or off, connect or disconnect the power cord provided with the switch. A power cord is supplied with the switch.

Note

For the power requirements, see the “Power Specifications” on page 53.

Chapter 2

Installation


This chapter contains the following sections:

- “Reviewing Safety Precautions” on page 22
- “Selecting a Site for the Switch” on page 24
- “Cable Specifications” on page 25
- “Unpacking the Switch” on page 26
- “Installing the Switch on a Table or a Desktop” on page 27
- “Installing the Switch in an Equipment Rack” on page 28
- “Installing Optional SFP Transceivers” on page 35
- “Cabling the Switch” on page 39
- “Powering On the Switch” on page 41
- “Monitoring the Initialization Processes” on page 43

Reviewing Safety Precautions


Please review the following safety precautions before you begin to install the chassis or any of its components.

Note

The  indicates that a translation of the safety statement is available in a PDF document titled **Translated Safety Statements**.




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 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

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

Operating Temperature. This product is designed for a maximum ambient temperature of 40° degrees C.  E7

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

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

**Warning**

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

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

**Caution**

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

**Warning**

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

Selecting a Site for the Switch

Observe the following requirements when choosing a site for your switch:

- If you plan to install the switch in an equipment rack, verify that the rack is safely secured and will not tip over. Devices in a rack should be installed starting at the bottom, with the heavier devices near the bottom of the rack.
- If you are installing the switch on a table, verify that the table is level and secure.
- The power outlet for the switch should be located near the unit and should be easily accessible.
- The site should provide for easy access to the ports on the front of the switch. This will make it easier for you to connect and disconnect cables, as well as view the switch's LEDs.
- Air flow around the unit and through its vents on the side and rear should not be restricted so that the switch can maintain adequate cooling.
- Do not place objects on top of the switch.
- Do not expose the switch to moisture or water.
- Ensure that the site is a dust-free environment.
- You should use dedicated power circuits or power conditioners to supply reliable electrical power to the network devices.

Cable Specifications

Table 7 contains the cable specifications for the twisted pair ports.

Table 7. Twisted Pair Cabling and Distances

Speed	Type of Cable	Maximum Operating Distance
10 Mbps	Standard TIA/EIA 568-B-compliant Category 3 or better shielded or unshielded cabling with 100 ohm impedance and a frequency of 16 MHz.	100 m (328 ft)
100 Mbps	Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz.	100 m (328 ft)
1000 Mbps	Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz.	100 m (328 ft)

Note

The twisted pair ports on the switch feature auto-MDI when operating at 10, 100, or 1000 Mbps. A port is configured as MDI or MDI-X when it is connected to an end node. Consequently, you can use a straight-through twisted pair cable when connecting any type of network device to a port on the switch.

Unpacking the Switch

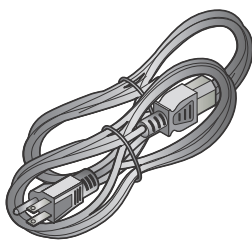
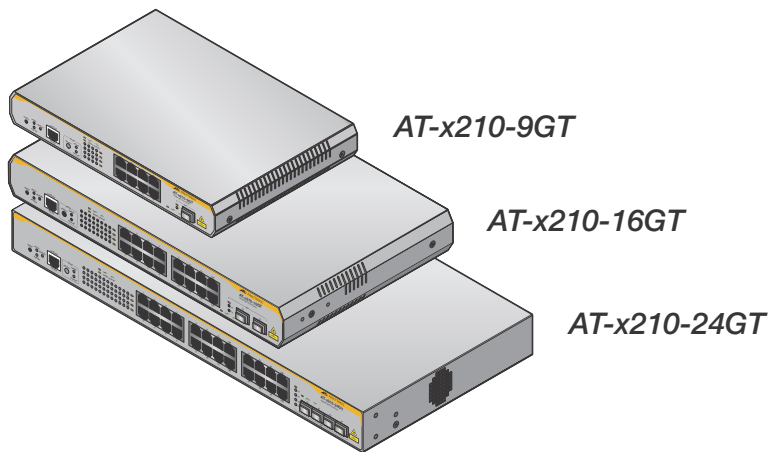
To unpack the switch, perform the following procedure:

1. Remove all of the components from the shipping package.

Note

Store the packaging material in a safe location. You must use the original shipping material if you need to return the unit to Allied Telesis.

2. Place the switch on a level, secure surface.
3. In addition to an AT-x210-9GT, AT-x210-16GT, or AT-x210-24GT switch, verify that the shipping container includes the following items:

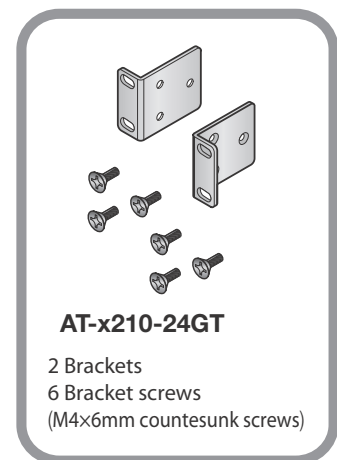
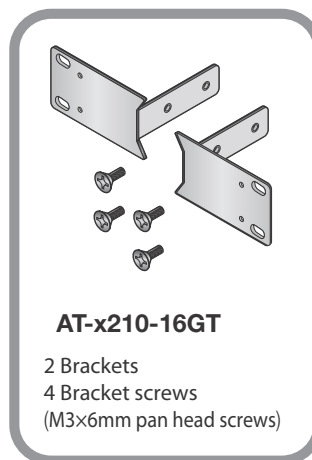


1 Power Cable (1.8m)

1 Console Cable (2m)



1 Power cable hook



AT-x210-16GT/AT-x210-24GT

1 x 19" rack mount kit

Installing the Switch on a Table or a Desktop

You can install AT-x210-16GT and AT-x210-24GT switches on a desktop, or in a standard 19-inch equipment rack. To install AT-x210-16GT and AT-x210-24GT switches in a rack, see “Installing the Switch in an Equipment Rack” on page 28. The AT-x210-9GT is rack mountable using an optional AT-x210-9GT rack mount kit (Part Number: 990-003904-00). Separate installation instructions are included with the AT-x210-9GT rack mount kit.

Here are the guidelines to selecting a suitable site for desktop or table use:

- ❑ The table should be level and stable and the power outlets should be located near the switches and be easily accessible.
- ❑ The site should allow for easy access to the ports on the front of the switches, so that you can easily connect and disconnect cables, and view the port LEDs.
- ❑ The site should not expose the switches to moisture or water and the site should be a dust-free environment.
- ❑ The site should include dedicated power circuits or power conditioners to supply reliable electrical power to the network devices.
- ❑ The rubber feet on the bottom of the switches should be left on for table or desktop installation.

If your switch does not already have rubber feet fitted, fit these as follows:

1. Remove all equipment from the package and store the packaging material in a safe place.
2. Turn the switch over and place it on a table.
3. Screw the four rubber feet to the bottom of the switch as shown below:

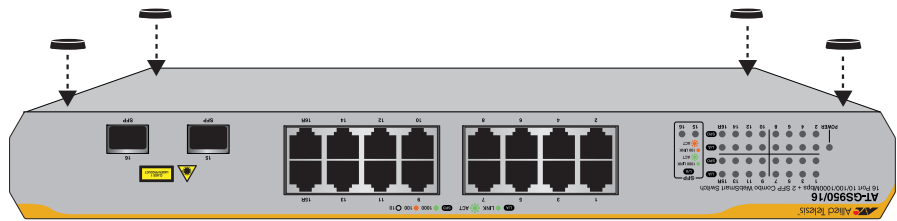


Figure 14. Attaching the Rubber Feet

4. Turn the switch over again and place it on a flat, secure surface (such as a desk or table) leaving ample space around the unit for ventilation.
5. Go to “Installing Optional SFP Transceivers” on page 35 or “Cabling the Switch” on page 39.

Installing the Switch in an Equipment Rack

Note: These instructions show you how to install an AT-x210-9GT, AT-x210-16GT or AT-x210-24GT switch in an equipment rack. Rack mount kit brackets are included with AT-x210-16GT and AT-x210-24GT switches. The AT-x210-9GT switch is installed in a rack with the optional AT-x210-9GT rack mount kit (Part Number 990-003904-00).

To install AT-x210-9GT, AT-x210-16GT or AT-x210-24GT switches in a 19-inch equipment rack, follow these steps:

1. Place the unit upside down on a level, secure surface.

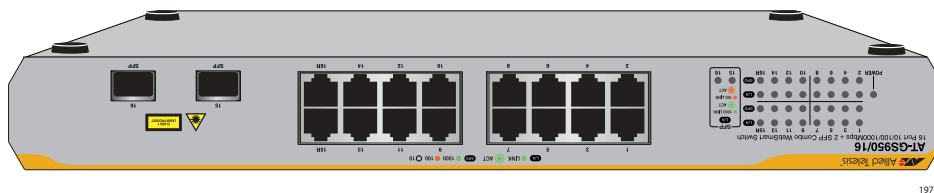


Figure 15. Turning the Switch Upside Down

2. Unscrew the rubber feet from the bottom and turn the switch over.
3. For AT-x210-24GT Switches, attach two rack mount brackets to the sides of the switch using the bracket screws that come with the unit.

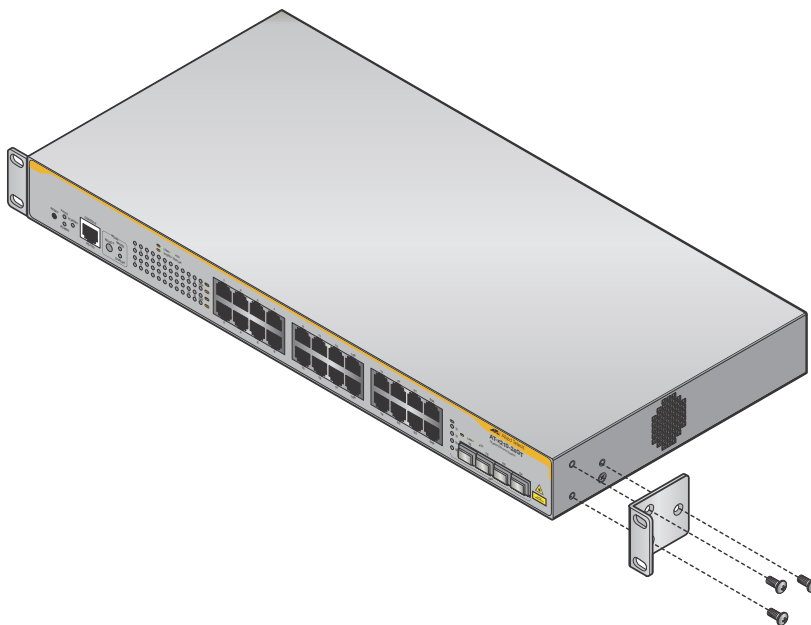


Figure 16. Attaching brackets to an AT-x210-24GT

4. Mount an AT-x210-24GT switch in a 19-inch equipment rack using four equipment rack screws (not provided with the switch).

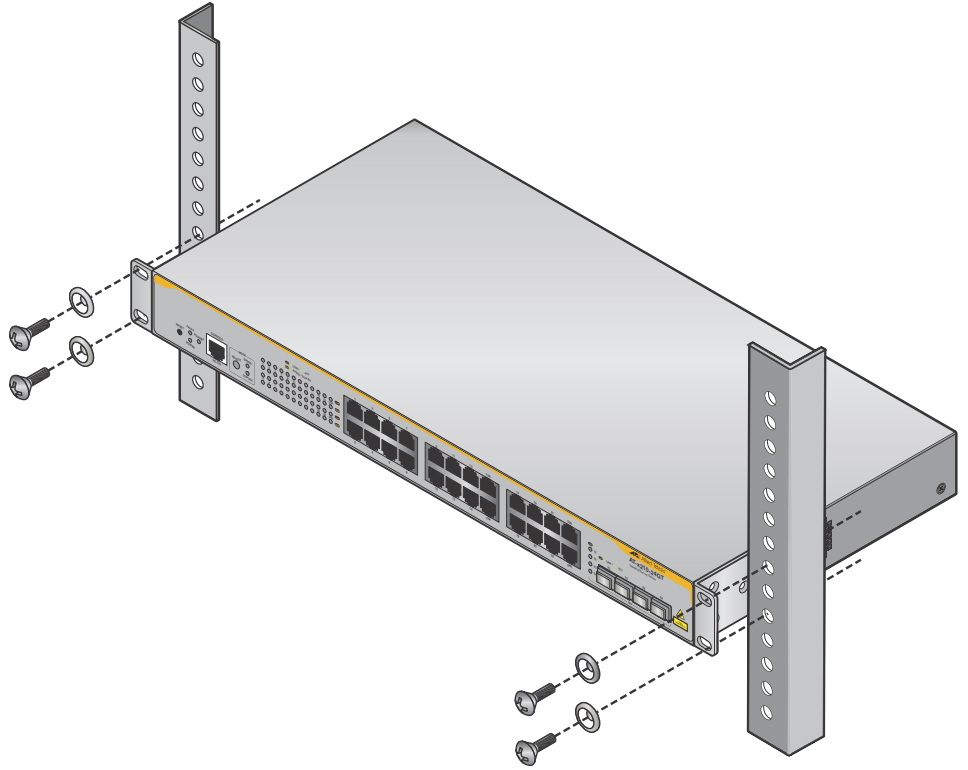


Figure 17. Mounting an AT-x210-24GT Switch in an Equipment Rack

5. For AT-x210-16GT Switches, attach the two rack mount brackets to the sides of the switch using the bracket screws that come with the unit. See the bracket position as shown in Figure 18 and Figure 19.

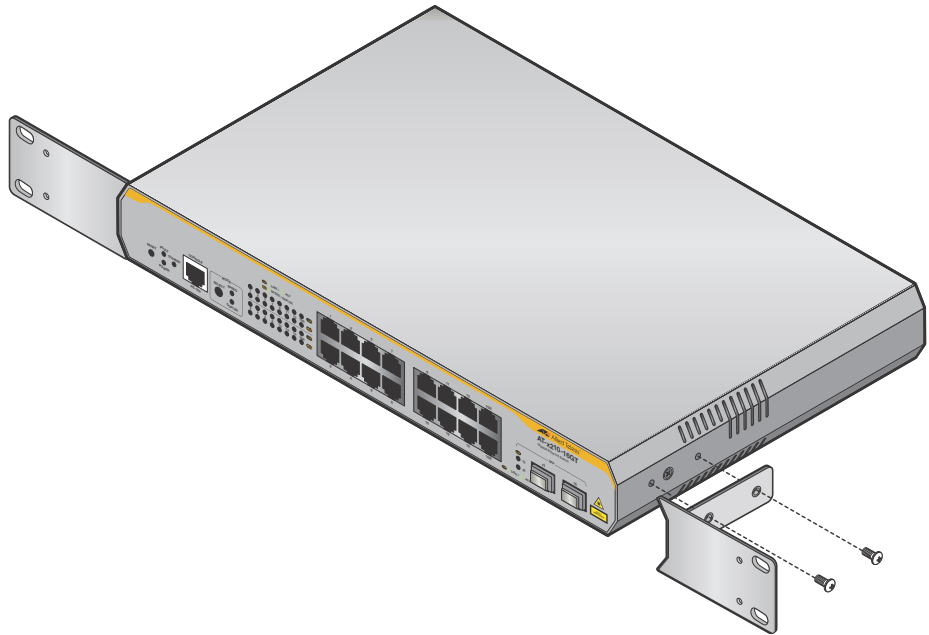


Figure 18. Attaching the brackets level with the front of an AT-x210-16GT

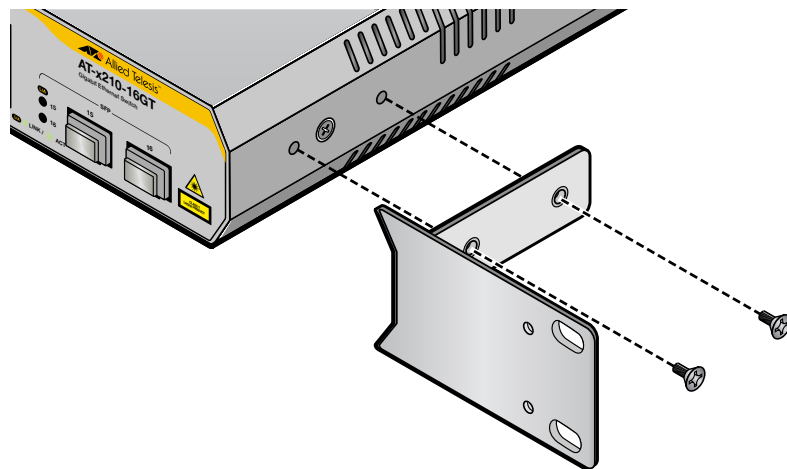


Figure 19. Close up showing a bracket positioned for an AT-x210-9GT

6. Mount an AT-x210-16GT switch in a 19-inch equipment rack using the provided spacer bracket mounts with four equipment rack screws (not provided with the switch), as shown in Figure 20.

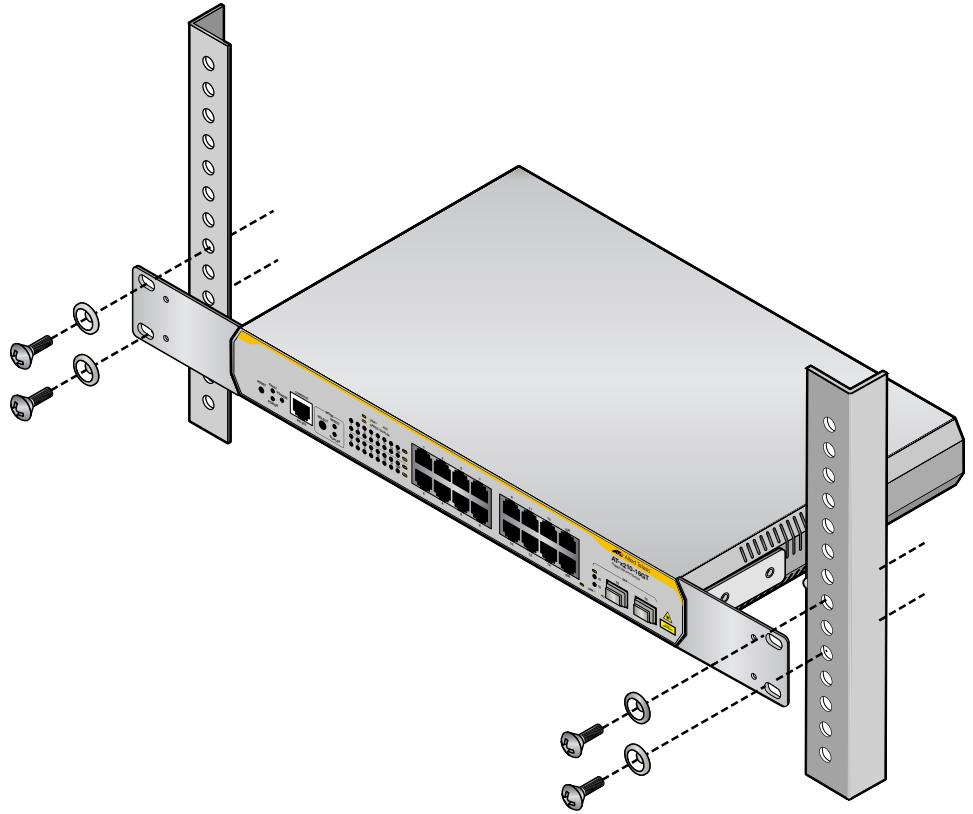


Figure 20. Mounting an AT-x210-16GT Switch in an Equipment Rack

7. For AT-x210-9GT switches, first fit the rack mount handles to the brackets using the supplied M3x6mm pan head screws, as shown below in Figure 21.

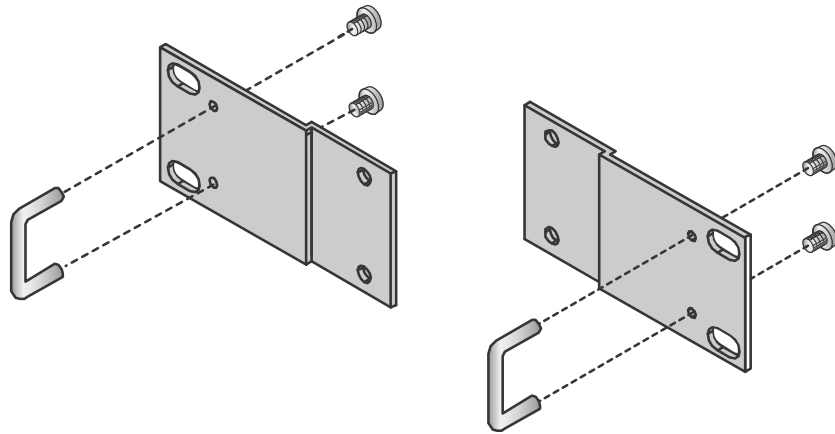


Figure 21. Fitting rack mount handles to the brackets for an AT-x210-9GT

8. After fitting the rack mount handles to the brackets using the supplied M3x6mm pan head screws, as shown about in Figure 21, fit these brackets with handles to the mounting for AT-x210-9GT switches using the supplied M4x6mm countersunk screws, as shown below in Figure 22.

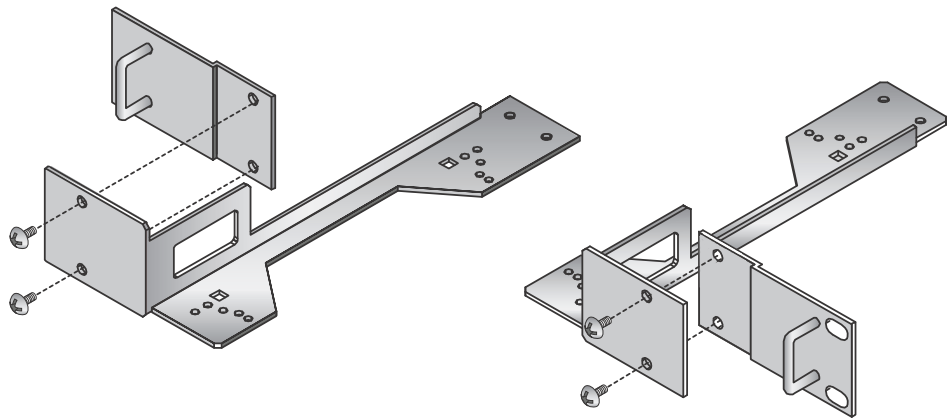


Figure 22. Fitting brackets to the mounting for an AT-x210-9GT

9. Next attach the cable tray brackets for AT-x210-9GT switches, as shown below in Figure 23.

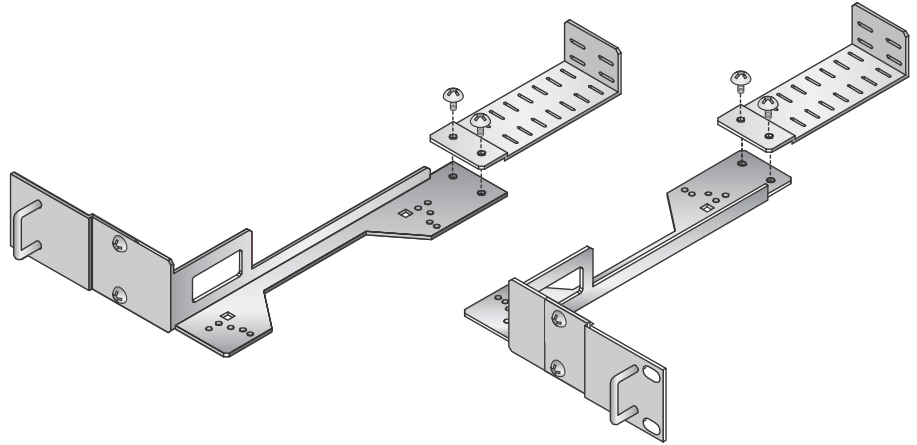


Figure 23. Attaching cable tray brackets for an AT-x210-9GT

10. Mount an AT-x210-9GT switch in a 19-inch equipment rack, as shown below in Figure 24, using the screws from the rubber feet after removing these screws, as shown earlier in Figure 15.

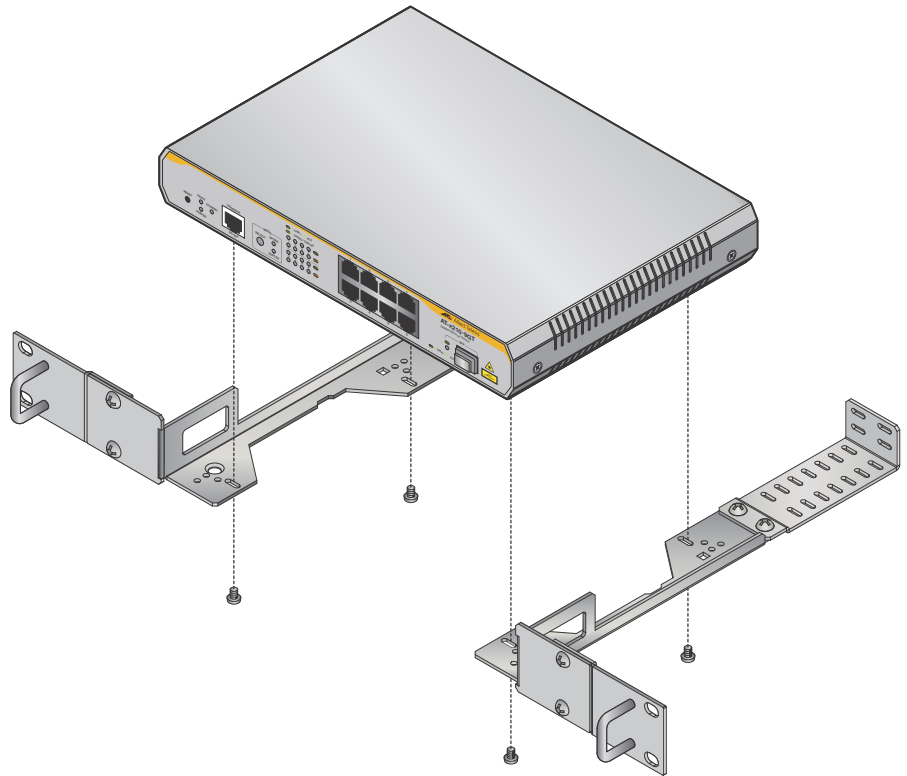


Figure 24. Mounting an AT-x210-9GT Switch in an Equipment Rack

11. Mount an AT-x210-9GT switch in a 19-inch equipment rack using the provided spacer bracket mounts with four equipment rack screws, as shown in Figure 25.

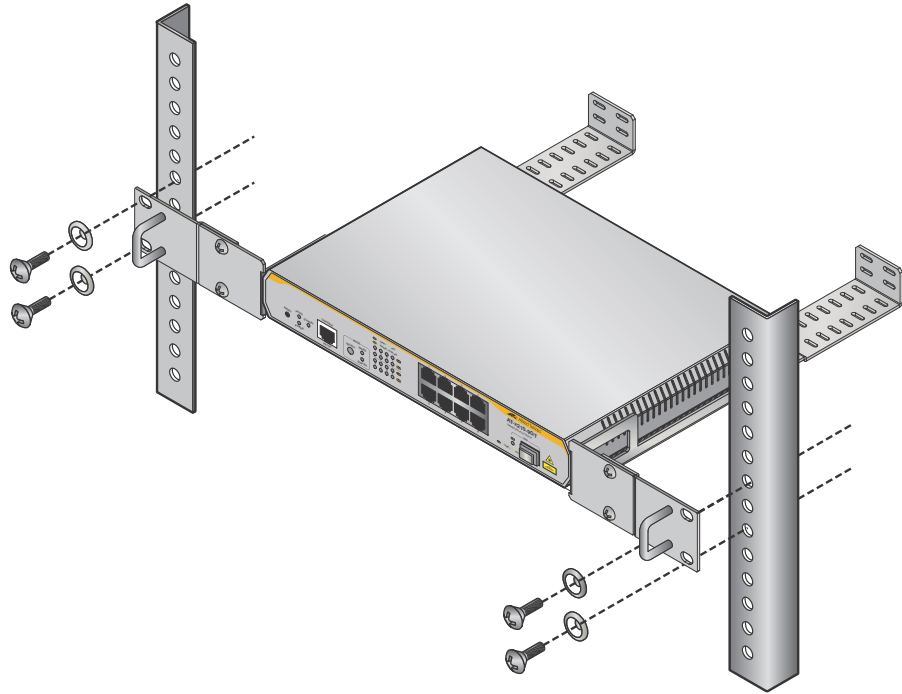


Figure 25. Mounting an AT-x210-9GT Switch in an Equipment Rack

12. Secure cables to the cable tray fitted earlier, as shown in Figure 26.

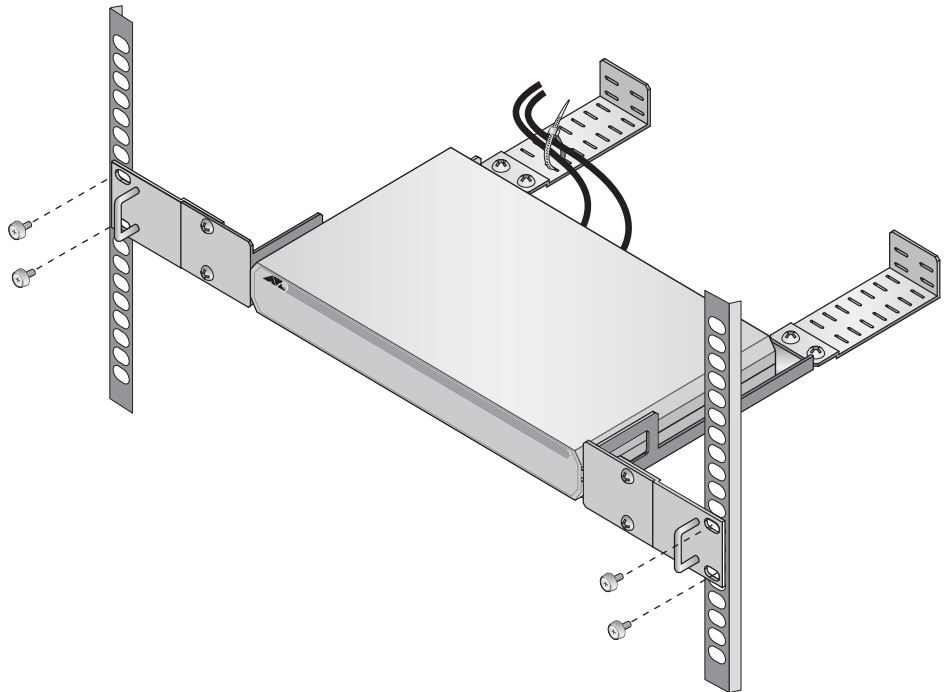


Figure 26. Securing cables to the cable tray for an AT-x210-9GT

Installing Optional SFP Transceivers

To install an SFP transceiver, perform the following procedure:

Note

The transceiver can be hot-swapped; you do not need to power off the switch to install a transceiver. However, always remove the cables before removing the transceiver.

Note

You should always install the transceiver before connecting the fiber optic cables to it.

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

**Warning**

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

2. Remove the dust plug from an SFP slot. See Figure 27.

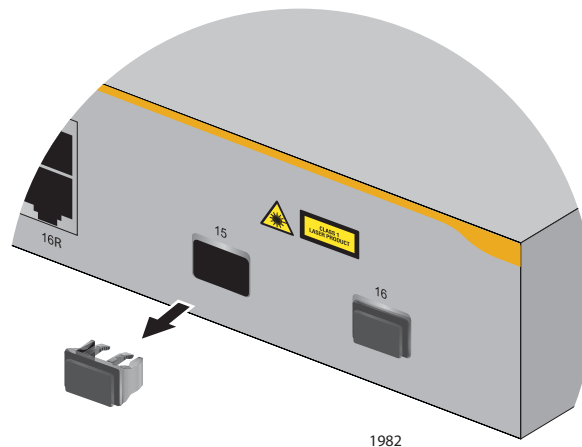


Figure 27. Removing the Dust Plug from an SFP Slot

3. Position the SFP transceiver with the label facing up.

4. For an AT-x210-24GT Switch, gently slide the transceiver into the SFP slot until it clicks into place, as shown in Figure 28.

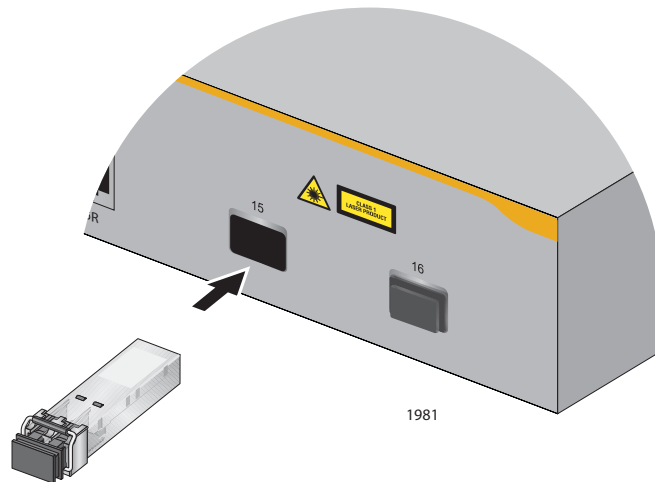


Figure 28. Inserting the SFP on an AT-x210-24GT

5. For an AT-x210-16GT Switch, gently slide the transceiver into the SFP slot until it clicks into place, as shown in Figure 29.

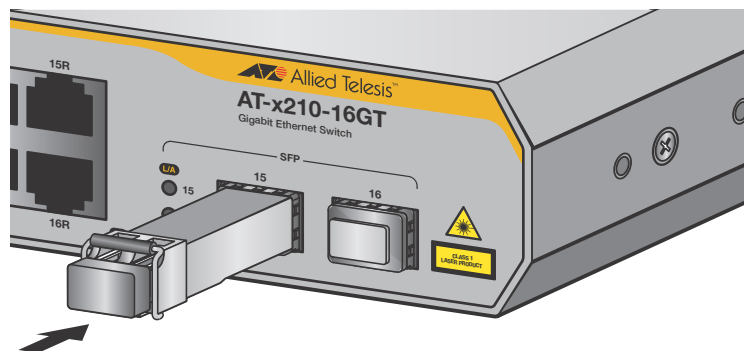


Figure 29. Inserting the SFP on an AT-x210-16GT

6. Verify that the handle on the transceiver is in the upright position, as shown in Figure 30. This secures the transceiver and prevents it from being dislodged from the slot.

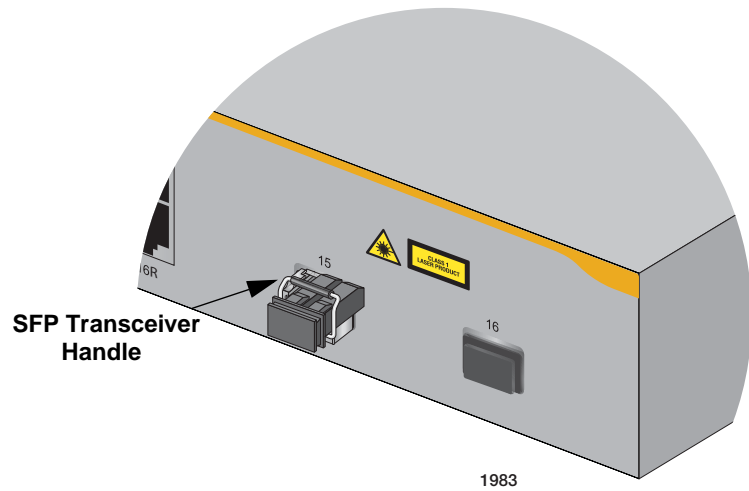


Figure 30. Positioning the SFP Handle in the Upright Position

7. Eject SFP transceivers, as shown in Figure 31. First lower the SFP Transceiver Handle, then gently remove the SFP Transceiver.

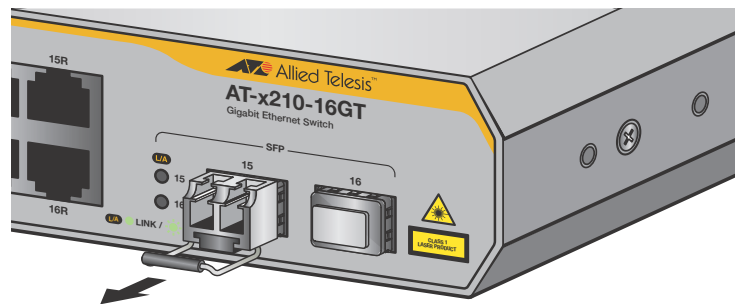


Figure 31. Ejecting an SFP transceiver after lowering the SFP Handle to the Downwards Position

8. Repeat steps 2 through 6 to install additional SFP transceivers.

Note

SFP transceivers are dust sensitive. Always keep the plug in the optical bores when a fiber optic cable is not installed, or when storing the SFP. When you do remove the plug, keep it for future use.

Note

Unnecessary removal and insertion of an SFP can lead to premature failure.

For information on the cable specifications of the SFP, consult the documentation shipped with the SFP.

9. Go to “Cabling the Switch” on page 39.

Cabling the Switch

Observe the following guidelines when connecting twisted pair and fiber optic cables to the ports on the switch:

- The connector on the cable should fit snugly into the port on the switch. The tab on the connector should lock the connector into place.
- Because the twisted pair ports have auto-MDI/MDI-X, you may use straight-through twisted pair cable to connect any type of network device to the switch.
- If your network topology contains a loop where two or more network devices can communicate with each other over more than one network path, do not connect the network cables that form the loop until after you activate a spanning tree protocol on the switch. Data loops can adversely affect network performance.
- If you are creating a port trunk, do not connect the cables of the trunk to the switch until after you have created the trunk in the switch's management software. Otherwise, a network loop will result which can adversely affect network performance.
- The default setting for the wiring configurations of the ports is auto-MDI/MDI-X. The default setting is appropriate for switch ports that are connected to 10/100Base-TX network devices that also support auto-MDI/MDI-X.
- The default auto-MDI/MDI-X setting is not appropriate for switch ports that are connected to 10/100Base-TX network devices that do not support auto-MDI/MDI-X and have a fixed wiring configuration. For switch ports connected to those types of network devices, you should disable auto-MDI/MDI-X and set the wiring configurations manually.
- The appropriate MDI/MDI-X setting for a switch port connected to a 10/100Base-TX network device with a fixed wiring configuration depends on the setting of the network device and whether the switch and network device are connected with straight-through or crossover cable. If you are using straight-through twisted pair cable, the wiring configurations of a port on the switch and a port on a network device must be opposite each other, such that one port uses MDI and the other MDI-X. For example, if a network device has a fixed wiring configuration of MDI, you must disable auto-MDI/MDI-X on the corresponding switch port and manually set it to MDI-X. If you are using crossover twisted pair cable, the wiring configurations of a port on the switch and a port on a network device must be the same.

- The default speed setting for the ports is Auto-Negotiation. This setting is appropriate for ports connected to network devices that also support Auto-Negotiation.
- The default speed setting of Auto-Negotiation is not appropriate for ports connected to 10/100Base-TX network devices that do not support Auto-Negotiation and have fixed speeds. For those switch ports, you should disable Auto-Negotiation and set the port's speed manually to match the speeds of the network devices.
- The 10/100/1000Base-T ports must be set to Auto-Negotiation, the default setting, to operate at 1000Mbps.
- The default duplex mode setting for the ports is Auto-Negotiation. This setting is appropriate for ports connected to network devices that also support Auto-Negotiation for duplex modes.
- The default duplex mode setting for the ports is Auto-Negotiation. This setting is appropriate for ports connected to network devices that also support Auto-Negotiation for duplex modes.
- The default duplex mode setting of Auto-Negotiation is not appropriate for ports connected to network devices that do not support Auto-Negotiation and have a fixed duplex mode. You should disable Auto-Negotiation on those ports and set their duplex modes manually to avoid the possibility of duplex mode mismatches. A switch port using Auto-Negotiation defaults to half-duplex if it detects that the end node is not using Auto-Negotiation, which can result in a mismatch if the end node is operating at a fixed duplex mode of full-duplex.
- Do not attach cables to ports of static or LACP port trunks until after you have configured the trunks on the switch. Otherwise, the ports will form network loops that can adversely affect network performance

Powering On the Switch

To power on the AT-x210-24GT, AT-x210-16GT, or AT-x210-9GT switch, perform the following procedure:

1. Plug the power cord into the AC power connector, as shown in Figure 32 on the back of an AT-x210-16GT Switch.

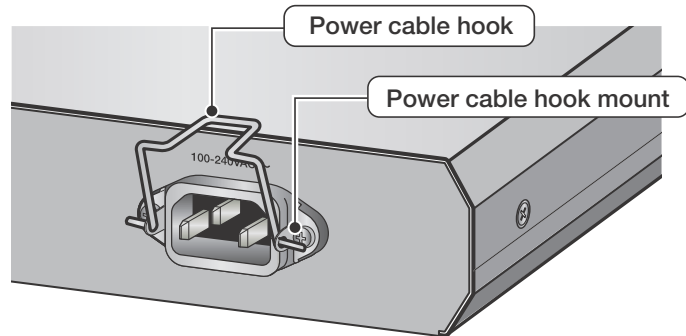


Figure 32. Lifting the AC Power Cable Hook on an AT-x210-16GT Switch

2. Plug the power cord into the AC power connector as shown in Figure 33 on the back of an AT-x210-16GT Switch.

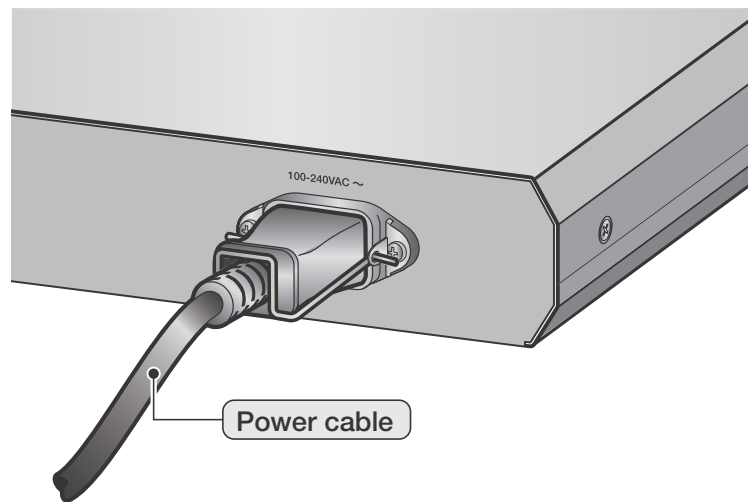


Figure 33. Plugging in the AC Power Cord on an AT-x210-16GT Switch

3. Plug the other end of the power cord into a wall outlet.



Warning

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

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

4. Verify that the POWER LED is green. If the LED is OFF, see Chapter 3, “Troubleshooting” on page 47.

The switch is now powered on and ready for network operations. For information on how to manage the switch, see the following manual:

- AlliedWare Plus Software Reference for x210 Series Switches

Monitoring the Initialization Processes

It takes about thirty seconds for the switch to initialize its management software programs and features, and load the default configuration.

You may also monitor the bootup sequence by connecting a terminal or computer that has a terminal emulator program, to the Console port on the master switch. You will see the messages in Figure 34 here to Figure 36 on page 45.

```

Bootloader 2.0.10 loaded
Press <Ctrl+B> for the Boot Menu

Reading filesystem...
Loading flash: x210-5.4.3.rel
Verifying release... OK
Booting...
Starting base/first...                [ OK ]
Mounting virtual filesystems...       [ OK ]

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

Allied Telesis Inc.
AlliedWare Plus (TM) v5.4.3
Current release filename: x210-5.4.3.rel
Original release filename: x210-5.4.3.rel
Built: Tue Jul 9 18:20:42 NZST 2013 by: maker@maker04-build
Mounting static filesystems...        [ OK ]
Checking flash filesystem...          [ OK ]
Mounting flash filesystem...          [ OK ]
Checking NVS filesystem...           [ OK ]
Mounting NVS filesystem...           [ OK ]
Starting base/dbus...                 [ OK ]
Starting base/syslog...               [ OK ]
  
```

Figure 34. Switch Initialization Messages

```

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

Initializing HA processes:
openhpid, hostd, cntrd, nsm, auth, epsr, hsl
imiproxyd, irdpd, lldpd, loopprot, mstp
rmon, sflowd, imi, lacp

Received event network.initialized

Assigning Active Workload to HA processes:
hsl, nsm, rmond, sflowd, irdpd, lacpd
lldpd, loopprot, mstp, authd, epsrd, imi, imiproxyd

Received event network.activated

Loading default configuration
Warning: flash:/default.cfg does not exist, loading factory defaults.
..

```

Figure 35. Switch Initialization Messages (Continued)

Assigning Active Workload to HA processes:

```
hsl, nsm, rmond, sflowd, vrrpd, irpd, lacpd  
lldpd, looprotd, mstpd, authd, epsrd, imi, imiproxyd
```

Received event network.activated

Loading default configuration

Warning: flash:/default.cfg does not exist, loading factory defaults.

..

done!

Received event network.configured

awplus login:

Figure 36. Switch Initialization Messages (Continued)

Chapter 3

Troubleshooting

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

Note

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

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

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

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

Problem 2: A twisted pair port on the switch is connected to a network device but the port's LINK/ACT LED is off.

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

- Verify that the network device connected to the twisted pair port is powered on and is operating properly.
- Verify that the twisted pair cable is securely connected to the port on the media converter channel and to the port on the remote network device.
- Verify that the port is connected to the correct twisted pair cable. This is to eliminate the possibility that the port is connected to the wrong network device, such as a powered off device.
- 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: Category 3 or better for 10 Mbps operation and Category 5 and Category 5E for 100 and 1000 Mbps operation.

Note

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

Problem 3: The LINK/ACT LED for an SFP transceiver is off.

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

- Verify that the 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 media converter channel and to the port on the remote network device.
- Check that the SFP module is fully inserted in the slot.
- Verify that the operating specifications of the fiber optic ports on the SFP transceiver and the remote network device are compatible.
- Verify that the correct type of fiber optic cabling is being used.
- Verify that the port is connected to the correct fiber optic cable. This is to eliminate the possibility that the port is connected to the wrong remote network device, such as a powered off device.
- Try connecting another network device to the fiber optic port using a different cable. If the port is able to establish a link, then the problem is with the cable or with the other network device.
- Use the switch's management software to verify that the port is enabled.
- If the remote network device is a management device, use its management firmware to determine whether its port is enabled.
- Test the attenuation 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 4: Network performance between a twisted pair port on the switch and a network device is slow.

Solution: There might be a duplex mode mismatch between the port and the network device. This occurs when a twisted pair port using Auto-Negotiation is connected to a device with a fixed duplex mode of full duplex. If this is the cause of the problem, adjust the duplex mode of the port on the network device or on the switch so that both ports are using the same duplex mode.

Problem 5: A port's LINK/ACT LED is blinking.

Solutions: The link between the port and the network device is intermittent. Try the following:

- Connect another network device with a different cable to the port. If the Link LED remains steady on, then the problem is with the original cable or the network device.
- If the problem is with an SFP transceiver, check that the transceiver is fully inserted in the slot.

Appendix A

Technical Specifications

Physical Specifications

Dimensions

Table 8. Chassis Dimensions

Model	W x D x H mm (in)
AT-x210-9GT	263 mm x 179 mm x 38 mm (10.35 in x 7.05 in x 1.50 in)
AT-x210-16GT	341 mm x 210 mm x 44 mm (13.42 in x 8.26 in x 1.73 in)
AT-x210-24GT	440 mm x 210 mm x 44 mm (17.32 in x 8.26 in x 1.73 in)

Weight

Table 9. Chassis Weight

Model	W x D x H mm (in)
AT-x210-9GT	1.4 kg (3.08 lbs)
AT-x210-16GT	2.0 kg (4.41 lbs)
AT-x210-24GT	2.7 kg (5.95 lbs)

Environmental Specifications

Table 10. Environmental Specifications

Operating Temperature	0° C to 40° C (32° F to 104° F)
Storage Temperature	-20° C to 60° C (-4° F to 140° F)
Operating Humidity	5% to 80% non-condensing
Storage Humidity	5% to 95% non-condensing
Operating Altitude Range	Up to 3,000 m (9,843 ft)

Power Specifications

Input Supply Voltage - 100-240 VAC, 50 - 60 Hz

Table 11. Power Specifications

AT-x210-9GT	12 W
AT-x210-16GT	19 W
AT-x210-24GT	28 W

Electrical Safety and Electromagnetic Emissions Certifications

Table 12. Safety and Electromagnetic Emissions Certifications

RFI Emissions	EN 55022:2010 EN 61000-3-2:2006+A1:2009+A2:2009 EN 61000-3-3:2008 EN 62233:2008 EN 62311:2008 FCC Class A FCC Part 15 (47 CFR 15) ICES-003 VCCI-A VCCI-B 2004/108/EC EMC Directive
Electrical Safety	C-TICK CE 2006/95/EC Low Voltage Directive EN 60950-1:2006+A11:2009+A1:2010+A12:2011 IEC 60950-1 (ed.2) UL 60950 (cUL _{US})
Environmental Compliance	2011/65/EU RoHS Directive
Immunity	EN 55024:2010
Laser Safety	EN 60825-1:2007

Connectors and Port Pinouts

This section lists the connectors and connector pinouts.

Figure 37 illustrates the pin layout for an RJ-45 connector and port.

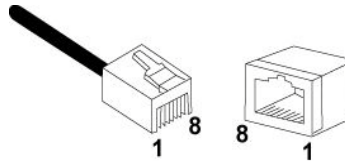


Figure 37. RJ-45 Connector and Port Pin Layout

Table 13 lists the RJ-45 pin signals when a twisted pair port is operating in the MDI configuration.

Table 13. MDI Pin Signals (10Base-T or 100Base-TX)

Pin	Signal
1	TX+
2	TX-
3	RX+
6	RX-

Table 14 lists the RJ-45 port pin signals when a twisted pair port is operating in the MDI-X configuration.

Table 14. MDI-X Pin Signals (10Base-T or 100Base-TX)

Pin	Signal
1	RX+
2	RX-
3	TX+
6	TX-

Table 15 lists the RJ-45 connector pins and their signals when a 1000Base-TX port is operating at 1000 Mbps.

Table 15. RJ-45 1000Base-T Connector Pinouts

Pin	Pair	Signal
1	1	TX and RX+
2	1	TX and RX-
3	2	TX and RX+
4	3	TX and RX+
5	3	TX and RX-
6	2	TX and RX-
7	4	TX and RX+
8	4	TX and RX-

