

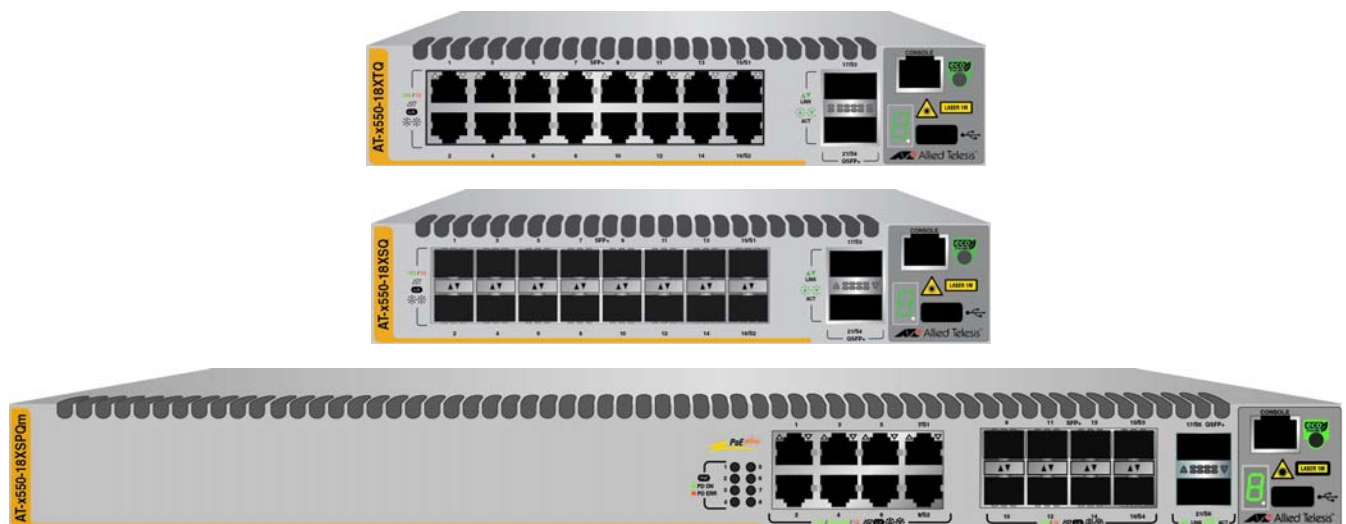
# x550 Series

Stackable 10Gigabit Intelligent Access Ethernet Switches  
AlliedWare Plus™ v5.4.8-0.2

AT-x550-18XTQ

AT-x550-18XSQ

AT-x550-18XSPQm



## Installation Guide for Stand-alone Switches

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# Electrical Safety and Emissions Standards

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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<sub>US</sub>)




Laser Safety

EN60825

## Translated Safety Statements

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

# Contents

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|  |    |
|--|----|
| <b>Preface</b> .....   | 11 |
| Document Conventions .....   | 12 |
| Contacting Allied Telesis .....  | 13 |
| <b>Chapter 1: Overview</b> .....   | 15 |
| Front and Rear Panels .....  | 16 |
| Management Panel .....   | 18 |
| Features .....   | 19 |
| x550 Models .....  | 19 |
| 1Gbps and 10Gbps Twisted Pair Ports .....                                      | 19 |
| 1/2.5/5/10Gbps Twisted Pair Ports .....  | 19 |
| Power Over Ethernet .....  | 20 |
| 1Gbps SFP or 10Gbps SFP+ Transceiver Slots .....                               | 20 |
| 40Gbps QSFP+ Transceiver Slots .....   | 20 |
| LEDs .....   | 21 |
| Installation Options .....   | 21 |
| Management Software and Interfaces .....                                       | 21 |
| Management Methods .....   | 21 |
| 1Gbps/10Gbps Twisted Pair Ports on the AT-x550-18XTQ Switch .....              | 22 |
| Cable Requirements .....   | 22 |
| LEDs .....   | 23 |
| 1/2.5/5/10Gbps Twisted Pair Ports on the AT-x550-18XSPQm Switch .....          | 25 |
| Cable Requirements .....   | 25 |
| LEDs .....   | 27 |
| PoE LEDs .....   | 28 |
| Power Over Ethernet on the AT-x550-18XSPQm Switch .....                        | 30 |
| PoE Standards .....  | 30 |
| Powered Device Classes .....   | 30 |
| Power Budget .....   | 31 |
| Port Prioritization .....  | 31 |
| Wiring Implementation .....  | 32 |
| SFP+ Transceiver Slots on the AT-x550-18XSQ and AT-x550-18XSPQm Switches ..... | 33 |
| SFP and SFP+ Transceivers .....  | 33 |
| LEDs .....   | 33 |
| QSFP+ Transceiver Slots .....  | 35 |
| QSFP+ Transceivers .....   | 35 |
| Breakout Cables .....  | 35 |
| Port Numbering .....   | 36 |
| LEDs .....   | 36 |
| eco-friendly Button .....  | 38 |
| VCStack Feature .....  | 39 |
| Switch ID LED .....  | 40 |
| USB Port .....   | 42 |
| Console Port .....   | 43 |
| Power Supply .....   | 44 |
| Software and Hardware Releases .....   | 45 |
| <b>Chapter 2: Beginning the Installation</b> .....                             | 47 |
| Reviewing Safety Precautions .....   | 48 |
| Choosing a Site for the Switch .....   | 52 |

|  |            |
|--|------------|
| Unpacking the AT-x550-18XTQ or AT-x550-18XSQ Switch.....   | 53         |
| Unpacking the AT-x550-18XSPQm Switch.....  | 56         |
| <b>Chapter 3: Installing the Switch on a Table or in an Equipment Rack .....</b>                             | <b>59</b>  |
| Installing the Switch on a Table or Desktop.....   | 60         |
| Overview of Installing the AT-x550-18XTQ and AT-x550-18XSQ Switches in an Equipment Rack.....                | 61         |
| Installing the AT-x550-18XTQ or AT-x550-18XSQ Switch in an Equipment Rack with the AT-RKMT-J14 Brackets..... | 63         |
| Required Items .....   | 63         |
| Switch Orientations in the Equipment Rack.....   | 63         |
| Installing the Switch .....  | 65         |
| Installing the AT-x550-18XTQ or AT-x550-18XSQ Switch in an Equipment Rack with the AT-RKMT-J15 Bracket.....  | 68         |
| Required Items .....   | 68         |
| Installing the Switch .....  | 68         |
| Installing the AT-x550-18XSPQm Switch in an Equipment Rack .....   | 74         |
| Required Items .....   | 74         |
| Switch Orientations in the Equipment Rack.....   | 74         |
| Installing the Switch .....  | 75         |
| <b>Chapter 4: Installing the Switch on a Wall .....</b>  | <b>77</b>  |
| Switch Orientations on a Wall.....   | 78         |
| Installation Guidelines.....   | 79         |
| Tools and Material .....   | 79         |
| Plywood Base for a Wall with Wooden Studs.....   | 81         |
| Installing a Plywood Base .....  | 83         |
| Installing the Switch on a Plywood Base .....  | 84         |
| Installing the Switch on a Concrete Wall.....  | 87         |
| <b>Chapter 5: Powering On the Switch .....</b>   | <b>91</b>  |
| Powering On the Switch.....  | 92         |
| Monitoring the Initialization Processes.....   | 95         |
| <b>Chapter 6: Configuring the Switch for Stand-alone Operations .....</b>                                    | <b>99</b>  |
| Determining the Stand-alone or Stacking Status of the Switch .....   | 100        |
| Starting a Local Management Session .....  | 101        |
| Disabling the VCStack Feature.....   | 103        |
| Configuring QSFP+ Transceiver Slots 17 and 21 for Breakout Cables .....                                      | 105        |
| Saving Your Changes and Rebooting the Switch .....   | 106        |
| Specifying Ports in the Command Line Interface for Stand-alone Switches.....                                 | 107        |
| <b>Chapter 7: Cabling the Networking Ports .....</b>   | <b>109</b> |
| Cabling Twisted Pair Ports on AT-x550-18XTQ and AT-x550-18XSPQm Switches .....                               | 110        |
| Guidelines to Handling SFP, SFP+, and QSFP+ Transceivers .....   | 111        |
| Installing 1Gbps SFP or 10Gbps SFP+ Transceivers in AT-x550-18XSQ and AT-x550-18XSPQm Switches .....         | 112        |
| Installing AT-SP10TW Direct Connect Twinax Cables in AT-x550-18XSQ and AT-x550-18XSPQm Switches.....         | 116        |
| Installing AT-QSFPSR4 or AT-QSFPLR4 Transceivers in QSFP+ Slots .....  | 118        |
| Installing AT-QSFPCU Cables in QSFP+ Slots .....   | 119        |
| <b>Chapter 8: Troubleshooting .....</b>  | <b>121</b> |
| <b>Appendix A: Technical Specifications .....</b>  | <b>125</b> |
| Physical Specifications .....  | 126        |
| Environmental Specifications.....  | 127        |
| Power Specifications.....  | 128        |
| Certifications .....   | 129        |
| RJ-45 Twisted Pair Port Pinouts .....  | 130        |
| RJ-45 Style Serial Console Port Pinouts .....  | 131        |

# Figures

---

|  |    |
|--|----|
| Figure 1: Front Panels of the x550 Series Switches.....  | 16 |
| Figure 2: Back Panels .....  | 17 |
| Figure 3: Management Panel .....   | 18 |
| Figure 4: Link and Activity LEDs for the 1Gbps/10Gbps Ports on the AT-x550-18XTQ, Switch .....                             | 23 |
| Figure 5: Link and Activity LEDs for the 1/2.5/5/10Gbps Ports on the AT-x550-18XSPQm, Switch .....                         | 27 |
| Figure 6: PoE LEDs for the 1/2.5/5/10Gbps Ports on the AT-x550-18XSPQm, Switch .....                                       | 28 |
| Figure 7: Link and Activity LEDs for the 1Gbps SFP and 10Gbps Slots on the AT-x550-18XSQ and AT-x550-18XSPQm Switches..... | 33 |
| Figure 8: QSFP+ to SFP+ Breakout Cable.....  | 35 |
| Figure 9: LEDs for the 40Gbps QSFP+ Slots .....  | 36 |
| Figure 10: Switch ID LED .....   | 40 |
| Figure 11: Switch ID LED .....   | 40 |
| Figure 12: Switch ID LEDs in Low Power Mode .....  | 41 |
| Figure 13: AT-x550-18XTQ or AT-x550-18XSQ Switch Shipping Box .....  | 53 |
| Figure 14: Accessory Kit.....  | 54 |
| Figure 15: Accessory Kit (Continued).....  | 55 |
| Figure 16: AT-x550-18XSPQm Switch Shipping Box.....  | 56 |
| Figure 17: Accessory Items .....   | 57 |
| Figure 18: AT-RKMT-J14 Brackets and Switch .....   | 61 |
| Figure 19: AT-RKMT-J15 Bracket .....   | 61 |
| Figure 20: AT-RKMT-J15 Bracket with Switches.....  | 62 |
| Figure 21: Bracket Holes .....   | 63 |
| Figure 22: AT-RKMT-J14 Bracket Holes .....   | 64 |
| Figure 23: Switch Orientations with the Front Panel Facing the Front of the Equipment Rack .....                           | 64 |
| Figure 24: Switch Orientations with the Rear Panel Facing the Front of the Equipment Rack.....                             | 65 |
| Figure 25: Attaching the Handles to the AT-RKMT-J14 Brackets .....   | 66 |
| Figure 26: Attaching the AT-RKMT-J14 Brackets to the Switch .....  | 66 |
| Figure 27: Installing the Switch in an Equipment Rack.....   | 67 |
| Figure 28: Installing the AT-RKMT-J15 Bracket in the Equipment Rack.....   | 68 |
| Figure 29: Loosening the Two Thumbscrews on the Front of the AT-RKMT-J15 Bracket .....                                     | 69 |
| Figure 30: Sliding Out the Tray from the AT-RKMT-J15.....  | 69 |
| Figure 31: Removing the Plastic Feet from the Bottom Panel of the Switch .....   | 70 |
| Figure 32: Placing a Switch in the AT-RKMT-J15 Bracket .....   | 71 |
| Figure 33: Securing the Switch to the AT-RKMT-J15 Bracket.....   | 71 |
| Figure 34: Sliding in the Bracket Tray.....  | 72 |
| Figure 35: Tightening the Two Thumbscrews on the AT-RKMT-J15 Bracket .....   | 73 |
| Figure 36: Bracket Holes on the AT-x550-18XSPQm Switch.....  | 74 |
| Figure 37: AT-x550-18XSPQm Switch Orientations in an Equipment Rack.....   | 75 |
| Figure 38: Example of Attaching the Brackets to the AT-x550-18XSPQm Switch .....   | 76 |
| Figure 39: Installing the Switch in an Equipment Rack.....   | 76 |
| Figure 40: Positioning the Switches on the Wall.....   | 78 |
| Figure 41: Switch on the Wall with a Plywood Base.....   | 81 |
| Figure 42: Steps to Installing the Switch with a Plywood Base .....  | 82 |
| Figure 43: Installing the Wall Brackets .....  | 84 |
| Figure 44: Installing the Brackets on the AT-x550-18XSPQm Switch .....   | 85 |
| Figure 45: Securing the Switch to the Plywood Base.....  | 86 |
| Figure 46: Marking the Locations of the Bracket Holes on a Concrete Wall .....   | 88 |
| Figure 47: Installing the Switch on a Concrete Wall .....  | 89 |
| Figure 48: Installing the Power Cord Retaining Clip .....  | 92 |

|   |     |
|---|-----|
| Figure 49: Connecting the AC Power Cord.....                                  | 93  |
| Figure 50: Lowering the Power Cord Retaining Clip.....                        | 93  |
| Figure 51: Connecting the Power Cord to an AC Power Source.....               | 94  |
| Figure 52: Switch Initialization Messages.....                                | 95  |
| Figure 53: Switch Initialization Messages (Continued).....                    | 96  |
| Figure 54: Switch Initialization Messages (Continued).....                    | 97  |
| Figure 55: Connecting the Management Cable to the Console Port .....          | 101 |
| Figure 56: User Exec Mode Prompt.....   | 102 |
| Figure 57: SHOW STACK Command.....  | 103 |
| Figure 58: Moving to the Global Configuration Mode .....                      | 104 |
| Figure 59: Confirmation Prompt for the NO STACK ENABLE Command .....          | 104 |
| Figure 60: Disabling VCStack.....   | 104 |
| Figure 61: Returning to the Privileged Exec Mode .....                        | 106 |
| Figure 62: Saving the Changes with the WRITE Command.....                     | 106 |
| Figure 63: PORT Parameter in the Command Line Interface.....                  | 107 |
| Figure 64: Removing the Dust Plug from an SFP Slot.....                       | 112 |
| Figure 65: Installing an SFP Transceiver.....                                 | 113 |
| Figure 66: Removing the Dust Cover from an SFP or SFP+ Transceiver .....      | 114 |
| Figure 67: Positioning the SFP or SFP+ Handle in the Upright Position .....   | 114 |
| Figure 68: Connecting a Fiber Optic Cable to an SFP or SFP+ Transceiver ..... | 115 |
| Figure 69: Installing AT-SP10TW Cables .....                                  | 116 |
| Figure 70: Removing the Dust Cover from a QSFP+ Transceiver Slot .....        | 119 |
| Figure 71: Sliding the AT-QSFPCU Cable into the Slot.....                     | 119 |
| Figure 72: Pin Layout for the RJ-45 Twisted Pair Ports (Front View) .....     | 130 |



# Tables

---

|  |     |
|--|-----|
| Table 1: Basic Features .....  | 19  |
| Table 2: Twisted Pair Ports on the AT-x550-18XTQ Switch .....  | 22  |
| Table 3: Cable Requirements for the 1Gbps/10Gbps Twisted Pair Ports on the AT-x550-18XTQ Switch .....                          | 22  |
| Table 4: Link and Activity LEDs for the 1Gbps/10Gbps Ports on the AT-x550-18XTQ Switch .....                                   | 23  |
| Table 5: 1/2.5/5/10Gbps Twisted Pair Ports on the AT-x550-18XSPQm Switch .....   | 25  |
| Table 6: Cable Requirements for the PoE+ Ports on the AT-x550-18XSPQm Switch, at 1Gbps or 2.5Gbps .....                        | 26  |
| Table 7: Cable Requirements for the PoE+ Ports on the AT-x550-18XSPQm Switch, at 5Gbps or 10Gbps .....                         | 26  |
| Table 8: Link and Activity LEDs for the 1/2.5/5/10Gbps Ports on the AT-x550-18XSPQm Switch .....                               | 28  |
| Table 9: PoE LEDs for the 1/2.5/5/10Gbps Ports on the AT-x550-18XSPQm Switch .....   | 29  |
| Table 10: IEEE Powered Device Classes .....  | 30  |
| Table 11: Link and Activity Status LEDs for the 1Gbps and 10Gbps Ports on the AT-x550-18XTQ or<br>AT-x550-18XSPQm Switch ..... | 34  |
| Table 12: Link and Activity Status LEDs for the 40Gbps QSFP+ Transceiver Slots with QSFP+ Transceivers .....                   | 36  |
| Table 13: Link and Activity Status LEDs for the 40Gbps QSFP+ Transceiver Slots with Breakout Cables .....                      | 37  |
| Table 14: Software and Hardware Releases .....   | 45  |
| Table 15: PORT Parameter Format .....  | 107 |
| Table 16: Product Dimensions .....   | 126 |
| Table 17: Product Weights .....  | 126 |
| Table 18: Ventilation Requirements .....   | 126 |
| Table 19: Environmental Specifications .....   | 127 |
| Table 20: Maximum Power Consumptions .....   | 128 |
| Table 21: Input Voltages .....   | 128 |
| Table 22: Heat Dissipation .....   | 128 |
| Table 23: Product Certifications .....   | 129 |
| Table 24: Pin Signals for the Twisted Pair Ports .....   | 130 |
| Table 25: RJ-45 Style Serial Console Port Pin Signals .....  | 131 |



# Preface

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This guide contains the installation instructions for the x550 Series of stackable 10 Gigabit, Layer 3 Ethernet switches. This preface contains the following sections:

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

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**Note**

This guide explains how to install the switches as stand-alone units. For instructions on how to build a stack with Virtual Chassis Stacking (VCStack™), refer to the *x550 Series Installation Guide for Virtual Chassis Stacking*.

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## Document Conventions

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This document uses the following conventions:

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**Note**

Notes provide additional information.

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**Caution**

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

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**Warning**

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

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## Contacting Allied Telesis

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

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

For sales or corporate information, go to **[www.alliedtelesis.com/purchase](http://www.alliedtelesis.com/purchase)** and select your region.



# Chapter 1

## Overview

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This chapter contains the following sections:

- ❑ “Front and Rear Panels” on page 16
- ❑ “Management Panel” on page 18
- ❑ “Features” on page 19
- ❑ “1Gbps/10Gbps Twisted Pair Ports on the AT-x550-18XTQ Switch” on page 22
- ❑ “1/2.5/5/10Gbps Twisted Pair Ports on the AT-x550-18XSPQm Switch” on page 25
- ❑ “Power Over Ethernet on the AT-x550-18XSPQm Switch” on page 30
- ❑ “SFP+ Transceiver Slots on the AT-x550-18XSQ and AT-x550-18XSPQm Switches” on page 33
- ❑ “QSFP+ Transceiver Slots” on page 35
- ❑ “eco-friendly Button” on page 38
- ❑ “VCStack Feature” on page 39
- ❑ “Switch ID LED” on page 40
- ❑ “USB Port” on page 42
- ❑ “Console Port” on page 43
- ❑ “Power Supply” on page 44
- ❑ “Software and Hardware Releases” on page 45

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### Note

This guide explains how to install the switches as stand-alone units. For instructions on how to build a stack with Virtual Chassis Stacking (VCStack™), refer to the *x550 Series Installation Guide for Virtual Chassis Stacking*.

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# Front and Rear Panels

The front panels on the x550 Series switches are shown in Figure 1.

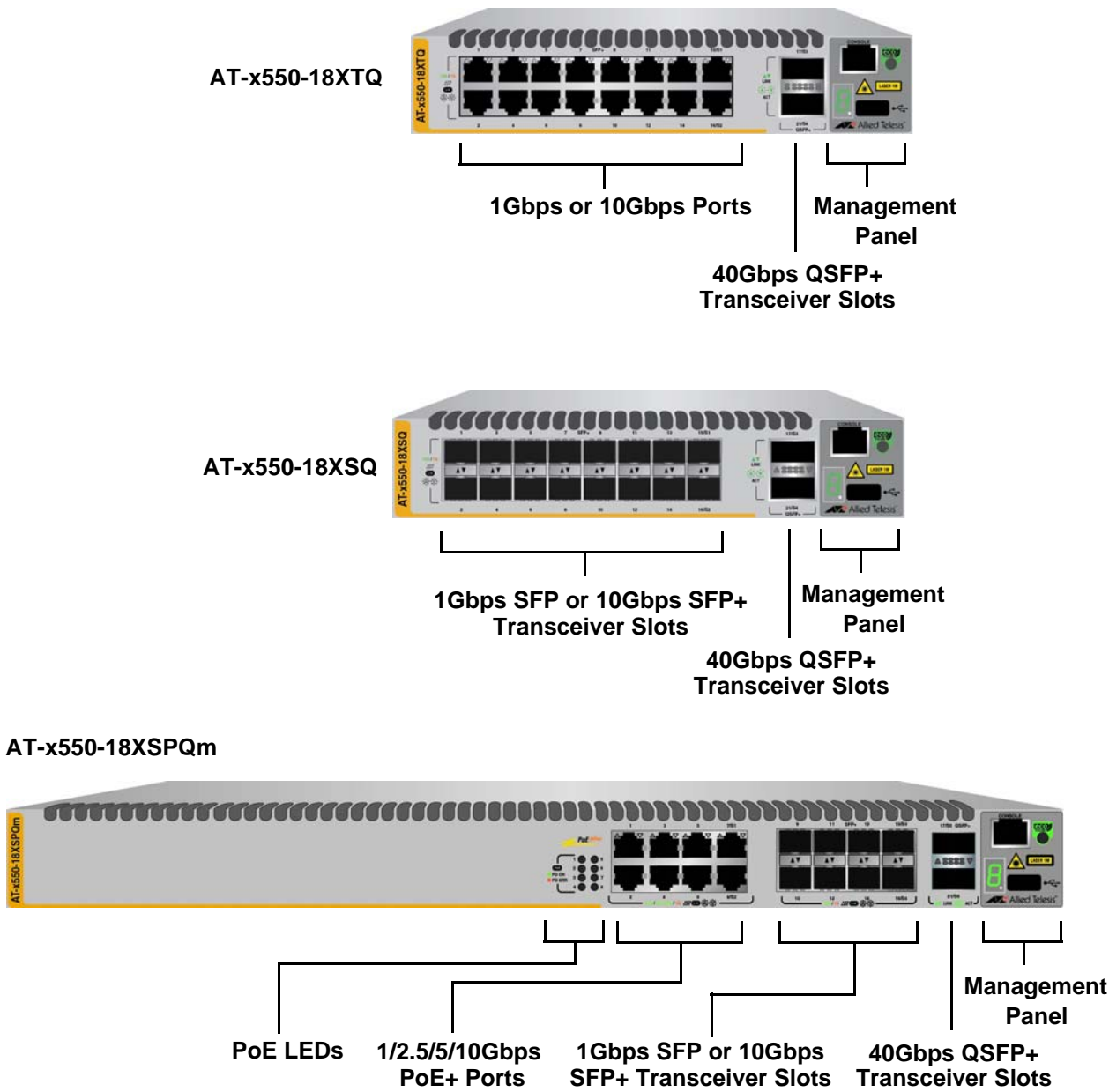


Figure 1. Front Panels of the x550 Series Switches

The rear panels are shown in Figure 2 on page 17.



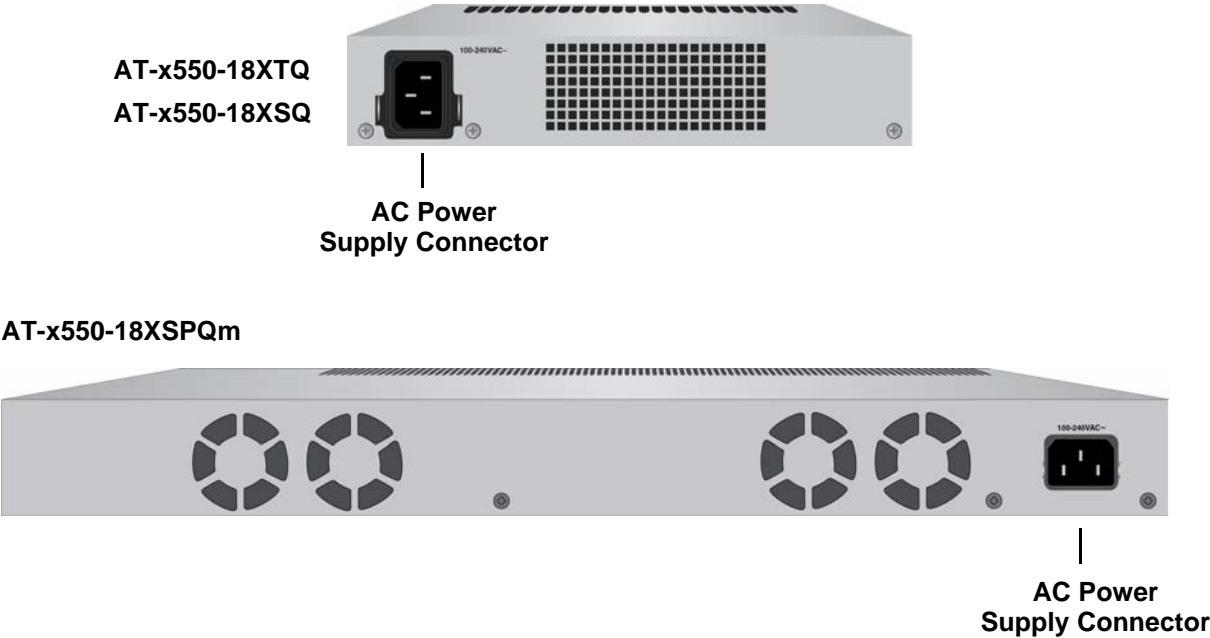


Figure 2. Back Panels

## Management Panel

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Figure 3 identifies the components on the management panel.

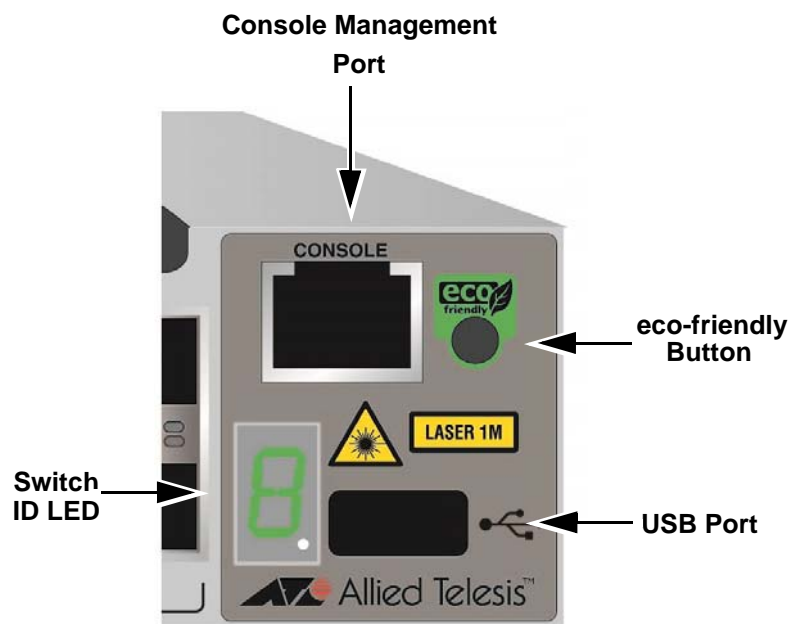


Figure 3. Management Panel

## Features

The Allied Telesis x550 Series switches are stackable 10 Gigabit, Layer 3 Ethernet switches. The following sections list the features:

**x550 Models** Table 1 lists the basic features.

Table 1. Basic Features

| Model           | 1/2.5/5/10 Gbps PoE+ Twisted Pair Ports | 1Gbps and 10Gbps Twisted Pair Ports | 1Gbps SFP and 10Gbps SFP+ Transceiver Slots | 40Gbps QSFP+ Transceiver Slots | VCStack |
|-----------------|---|-------------------------------------|---|--------------------------------|---------|
| AT-x550-18XTQ   | 0                                       | 16                                  | 0   | 2                              | Yes     |
| AT-x550-18XSQ   | 0                                       | 0                                   | 16  | 2                              | Yes     |
| AT-x550-18XSPQm | 8                                       | 0                                   | 8   | 2                              | Yes     |

The following items provide additional information:

- ☐ The 40Gbps QSFP+ slots 17 and 21 can be used as regular Ethernet networking ports or stacking ports with the VCStack feature.
- ☐ When used as regular networking ports the 40Gbps QSFP+ slots 17 and 21 support 40Gbps transceivers or breakout cables, which convert the slots into four 10Gbps ports.
- ☐ The switches come with one pre-installed power supply. It is not field-replaceable.

### 1Gbps and 10Gbps Twisted Pair Ports

The sixteen twisted pair ports on the AT-x550-18XTQ Switch have these features:

- ☐ 1Gbps or 10Gbps operation
- ☐ 100 meters (328 feet) maximum operating distance per port
- ☐ Auto-Negotiation for speed
- ☐ Full-duplex mode only
- ☐ Port Link/Activity (L/A) LEDs

### 1/2.5/5/10Gbps Twisted Pair Ports

The eight twisted pair ports on the AT-x550-18XSPQm Switch have these features:

- ☐ 1Gbps, 2.5Gbps, 5Gbps, or 10Gbps operation
- ☐ 100 meters (328 feet) maximum operating distance per port

- ☐ Auto-Negotiation for speed
- ☐ Full-duplex mode only
- ☐ Port Link/Activity (L/A) LEDs
- ☐ Power over Ethernet (PoE+)

### **Power Over Ethernet**

Here are the basic features of PoE+ on the twisted pair ports on the AT-x550-18XSPQm Switch:

- ☐ Supported on ports 1 to 8.
- ☐ Supports PoE (15.4 watts maximum) and PoE+ (30 watts maximum) powered devices
- ☐ 240W power budget
- ☐ Supports powered device classes 0 to 4
- ☐ Port prioritization
- ☐ Mode A wiring
- ☐ IEEE802.3at compliant

### **1Gbps SFP or 10Gbps SFP+ Transceiver Slots**

The sixteen 1Gbps/10Gbps transceiver slots in the AT-x550-18XSQ Switch support the following types of transceivers:

- ☐ 1Gbps SX/LX SFP transceivers
- ☐ 10Gbps SR/LR SFP+ fiber optic transceivers
- ☐ 10Gbps AT-SP10TW direct connect twinax cables with SFP+ transceiver-style connectors

These items provide additional information:

- ☐ They do not support 100Mbps transceivers.
- ☐ They support full-duplex mode only.

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

### **40Gbps QSFP+ Transceiver Slots**

The two 40Gbps QSFP+ transceiver slots support the following types of transceivers:

- ☐ AT-QSFPSR4 transceiver - 150m using multi-mode fiber optic cable
- ☐ AT-QSFPLR4 transceiver - 10k with single-mode fiber optic cable
- ☐ AT-QSFP1CU and AT-QSFP3CU direct connect cables in lengths of 1 and 3 meters, respectively
- ☐ AT-QSFP-4SFP10G-3CU and AT-QSFP-4SFP10G-5CU breakout cables in lengths of 3 and 5 meters, respectively

**Note**

The QSFP+ slots are initially configured as stacking slots for the VCStack feature. If you will use the switch as a stand-alone unit, you can use the slots with transceivers as regular Ethernet networking ports by disabling the VCStack feature. The instructions are provided in Chapter 6, “Configuring the Switch for Stand-alone Operations” on page 99.

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

For instructions on the VCStack feature, refer to the *x550 Series Installation Guide for Virtual Chassis Stacking*.

**LEDs**

Here are the port LEDs:

- ☐ Link/activity LEDs for the twisted pair ports on AT-x550-18XTQ and AT-x550-18XSPQm Switches
- ☐ Link/activity LEDs for the SFP and SFP+ transceiver slots on the AT-x550-18XSQ Switch
- ☐ Link/activity LEDs for the QSFP+ transceiver slots
- ☐ PoE+ LEDs on the AT-x550-18XSPQm Switch
- ☐ Stack ID number LED
- ☐ eco-friendly button turns off the LEDs to conserve electricity

**Installation Options**

Here are the installation options:

- ☐ Desk or tabletop
- ☐ 19-inch equipment rack
- ☐ Wooden or concrete wall

**Management Software and Interfaces**

Here are the management software and interfaces:

- ☐ AlliedWare Plus Management Software
- ☐ Command line interface
- ☐ Web browser interface

**Management Methods**

Here are the methods for managing the switches:

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

## 1Gbps/10Gbps Twisted Pair Ports on the AT-x550-18XTQ Switch

The specifications of the sixteen twisted pair ports on the AT-x550-18XTQ Switch are listed in Table 2.

Table 2. Twisted Pair Ports on the AT-x550-18XTQ Switch

| Specification    | Description   |
|------------------|---|
| Port Speed       | 1Gbps or 10Gbps<br>You can set port speed with Auto-Negotiation or manually. The default is Auto-Negotiation. |
| Duplex Mode      | Full-duplex only  |
| Maximum Distance | 100 meters (328 feet)   |
| Connector        | 8-pin RJ-45   |

### Note

The ports must be set to Auto-Negotiation to function at 1Gbps. The network devices connected to the ports must be IEEE 802.3u compliant.

## Cable Requirements

The cable requirements for the ports are listed in Table 3.

Table 3. Cable Requirements for the 1Gbps/10Gbps Twisted Pair Ports on the AT-x550-18XTQ Switch

| Cable Type  | 1Gbps | 10Gbps |
|---|-------|--------|
| Standard TIA/EIA 568-B-compliant Category 3 shielded or unshielded cabling with 100 ohm impedance and a frequency of 16 MHz.                    | No    | No     |
| Standard TIA/EIA 568-A-compliant Category 5 shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz.                   | No    | No     |
| Standard TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz. | Yes   | No     |

Table 3. Cable Requirements for the 1Gbps/10Gbps Twisted Pair Ports on the AT-x550-18XTQ Switch (Continued)

| Cable Type   | 1Gbps | 10Gbps |
|--|-------|--------|
| Standard TIA/EIA 568-B-compliant Category 6 shielded cabling.  | Yes   | No     |
| Standard TIA/EIA 568-B-compliant Category 6a shielded cabling. | Yes   | Yes    |

Refer to Table 24 on page 130 for the port pinouts of the twisted pair ports.

**LEDs** Each 1Gbps/10Gbps twisted pair port on the AT-x550-18XTQ Switch, has an LED that displays link and activity information. The LED is shown in Figure 4.

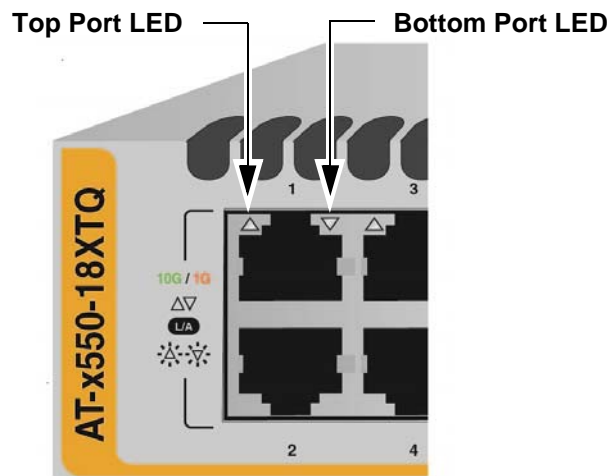


Figure 4. Link and Activity LEDs for the 1Gbps/10Gbps Ports on the AT-x550-18XTQ, Switch

The states of the link and activity LEDs are described in Table 4.

Table 4. Link and Activity LEDs for the 1Gbps/10Gbps Ports on the AT-x550-18XTQ Switch

| State          | Description   |
|----------------|---|
| Solid Green    | The port has established a 10Gbps link to a network device. |
| Flashing Green | The port is transmitting or receiving data at 10Gbps.       |
| Solid Amber    | The port has established a 1Gbps link to a network device.  |

Table 4. Link and Activity LEDs for the 1Gbps/10Gbps Ports on the AT-x550-18XTQ Switch (Continued)

| State          | Description   |
|----------------|---|
| Flashing Amber | The port is transmitting or receiving data at 1Gbps.  |
| Off            | <p>Possible causes of this state are listed here:</p> <ul style="list-style-type: none"><li>- The port has not established a link with another network device.</li><li>- The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.</li></ul> |



## 1/2.5/5/10Gbps Twisted Pair Ports on the AT-x550-18XSPQm Switch

The specifications for twisted pair ports 1 to 8 on the AT-x550-18XSPQm Switch are listed in Table 5.

Table 5. 1/2.5/5/10Gbps Twisted Pair Ports on the AT-x550-18XSPQm Switch

| Specification       | Description  |
|---------------------|--|
| Port Speed          | 1Gbps, 2.5Gbps, 5Gbps, or 10Gbps<br>You can set port speed with Auto-Negotiation or manually. Guidelines are given here:<br>- 1Gbps and 10Gbps can be set either manually or with Auto-Negotiation.<br>- 2.5Gbps and 5Gbps must be set with Auto-Negotiation.<br>The default port setting is Auto-Negotiation. |
| Duplex Mode         | Full-duplex only   |
| Maximum Distance    | 100 meters (328 feet)  |
| Power over Ethernet | PoE (15.4 watts maximum) and PoE+ (30 watts maximum)   |
| Power Budget        | 240W   |
| PoE Mode            | Mode A   |
| Connector           | 8-pin RJ-45  |

### Note

The network devices connected to the ports must be IEEE 802.3u compliant.

## Cable Requirements

The cable requirements for the PoE+ twisted pair ports on the AT-x550-18XSPQm Switch are listed in Table 6 on page 26 and Table 7 on page 26.

Table 6. Cable Requirements for the PoE+ Ports on the AT-x550-18XSPQm Switch, at 1Gbps or 2.5Gbps

| Cable Type  | 1Gbps   |     |      | 2.5Gbps |     |      |
|---|---------|-----|------|---------|-----|------|
|   | Non-PoE | PoE | PoE+ | Non-PoE | PoE | PoE+ |
| Standard TIA/EIA 568-B-compliant Category 3 shielded or unshielded cabling with 100 ohm impedance and a frequency of 16 MHz.                    | No      | No  | No   | No      | No  | No   |
| Standard TIA/EIA 568-A-compliant Category 5 shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz.                   | Yes     | Yes | No   | No      | No  | No   |
| Standard TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz. | Yes     | Yes | Yes  | Yes     | Yes | No   |
| Standard TIA/EIA 568-B-compliant Category 6, 6a, or higher shielded cabling.  | Yes     | Yes | Yes  | Yes     | Yes | Yes  |

Table 7. Cable Requirements for the PoE+ Ports on the AT-x550-18XSPQm Switch, at 5Gbps or 10Gbps

| Cable Type   | 5Gbps   |     |      | 10Gbps  |     |      |
|--|---------|-----|------|---------|-----|------|
|  | Non-PoE | PoE | PoE+ | Non-PoE | PoE | PoE+ |
| Standard TIA/EIA 568-B-compliant Category 3 shielded or unshielded cabling with 100 ohm impedance and a frequency of 16 MHz. | No      | No  | No   | No      | No  | No   |

Table 7. Cable Requirements for the PoE+ Ports on the AT-x550-18XSPQm Switch, at 5Gbps or 10Gbps

| Cable Type  | 5Gbps   |     |      | 10Gbps  |     |      |
|---|---------|-----|------|---------|-----|------|
|   | Non-PoE | PoE | PoE+ | Non-PoE | PoE | PoE+ |
| Standard TIA/EIA 568-A-compliant Category 5 shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz.                   | No      | No  | No   | No      | No  | No   |
| Standard TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz. | No      | No  | No   | No      | No  | No   |
| Standard TIA/EIA 568-B-compliant Category 6, 6a, or higher shielded cabling.  | Yes     | Yes | Yes  | Yes     | Yes | Yes  |

**LEDs** This section explains the LEDs for the 1/2.5/5/10Gbps twisted pair ports on the AT-x550-18XSPQm Switch. Each port has one LED that displays link and activity information. The LEDs are shown in Figure 5.

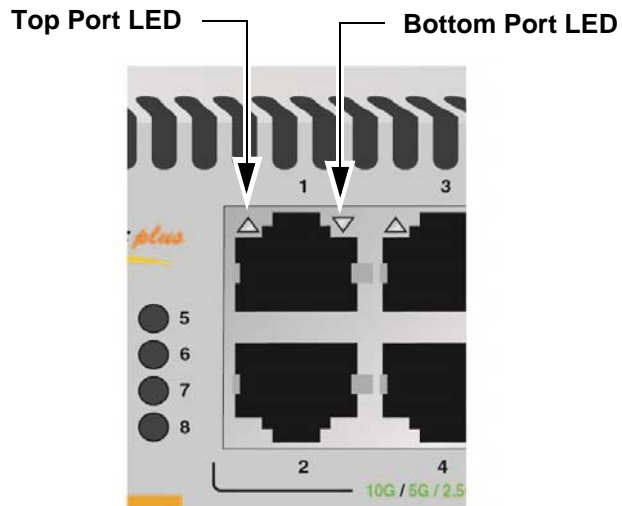


Figure 5. Link and Activity LEDs for the 1/2.5/5/10Gbps Ports on the AT-x550-18XSPQm, Switch

The states of the link and activity LEDs are described in Table 8 on page 28.

Table 8. Link and Activity LEDs for the 1/2.5/5/10Gbps Ports on the AT-x550-18XSPQm Switch

| State          | Description  |
|----------------|--|
| Solid Green    | The port has established a 2.5Gbps, 5Gbps, or 10Gbps link to a network device.   |
| Flashing Green | The port is transmitting or receiving data at 2.5Gbps, 5Gbps or 10Gbps.  |
| Solid Amber    | The port has established a 1Gbps link to a network device.   |
| Flashing Amber | The port is transmitting or receiving data at 1Gbps.   |
| Off            | <p>Possible causes of this state are listed here:</p> <ul style="list-style-type: none"> <li>- The port has not established a link with another network device.</li> <li>- The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.</li> </ul> |

## PoE LEDs

This section explains the PoE LEDs for the 1/2.5/5/10Gbps twisted pair ports on the AT-x550-18XSPQm Switch. Each port has one LED. Refer to Figure 6.

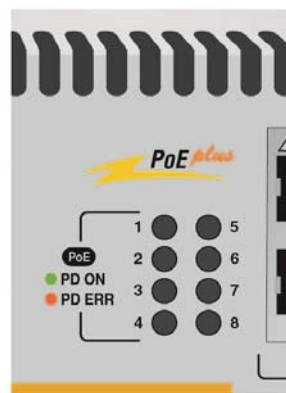


Figure 6. PoE LEDs for the 1/2.5/5/10Gbps Ports on the AT-x550-18XSPQm, Switch

The states of the PoE LEDs are described in Table 9 on page 29.

Table 9. PoE LEDs for the 1/2.5/5/10Gbps Ports on the AT-x550-18XSPQm Switch

| State       | Description  |
|-------------|--|
| Green       | The switch is delivering power to a powered device (PD) on the port.   |
| Solid Amber | The switch has shut down PoE on the port because of a fault condition.   |
| Off         | <p>This LED state can result from the following conditions:</p> <ul style="list-style-type: none"><li>- The port is not connected to a PD.</li><li>- The PD is powered off.</li><li>- The port is disabled in the management software.</li><li>- PoE is disabled on the port.</li><li>- The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.</li></ul> |

## Power Over Ethernet on the AT-x550-18XSPQm Switch

The AT-x550-18XSPQm Switch features PoE on the eight 1/2.5/5/10Gbps twisted pair ports. 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 is often limited by whether there is a power source nearby. This often limits equipment placement or requires the added time and cost of having additional electrical sources installed. But with PoE, you can install PoE-compatible devices wherever they are needed without having to worry about whether there are power sources nearby.

A device that provides PoE to network devices, such as the AT-x550-18XSPQm Switch, 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 switch automatically determines whether or not devices connected to its 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-x550-18XSPQm Switch supports 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 12.95 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 10 on page 30. The classes are based on the amount of power the devices require. The switches support all five classes.

Table 10. IEEE Powered Device Classes

| Class | Maximum Power Output from a Switch Port | PD Power Range  |
|-------|---|-----------------|
| 0     | 15.4W                                   | 0.44W to 12.95W |
| 1     | 4.0W                                    | 0.44W to 3.84W  |

Table 10. IEEE Powered Device Classes (Continued)

| Class | Maximum Power Output from a Switch Port | PD Power Range  |
|-------|---|-----------------|
| 2     | 7.0W                                    | 3.84W to 6.49W  |
| 3     | 15.4W                                   | 6.49W to 12.95W |
| 4     | 30.0W                                   | 12.95W to 25.5W |

**Power Budget**

The AT-x550-18XSPQm Switch has a DC power budget of 240W. This is the total maximum amount of power that the switch can supply to powered devices on the eight PoE+ twisted pair ports. Under normal operating conditions, the power budget enables the switch to support eight Class 4 devices with the maximum 25.5W on all eight PoE+ ports, simultaneously.

**Port Prioritization**

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

There are three priority levels:

- ☐ Critical
- ☐ High
- ☐ Low

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

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

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

provided to the ports based on port number, in ascending order.

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

## **Wiring Implementation**

The IEEE 802.3af standard defines two methods for 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 10Base-T and 100Base-TX devices, the wires connected to pins 1, 2, 3, and 6 on the RJ-45 connectors carry the network traffic while the wires connected to pins 4, 5, 7, and 8 are unused. With 1000Base-T devices, all eight wires are used to carry network data.

It takes four wires to deliver DC power to a 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-x550-18XSPQm Switch 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 Slots on the AT-x550-18XSQ and AT-x550-18XSPQm Switches

The AT-x550-18XSQ and AT-x550-18XSPQm Switches have sixteen and eight slots, respectively, for SFP or SFP+ transceivers.

### SFP and SFP+ Transceivers

The slots support the following types of transceivers:

- ❑ 1Gbps SX/LX SFP transceivers
- ❑ 10Gbps SR/LR SFP+ fiber optic transceivers
- ❑ 10Gbps AT-SP10TW direct connect twinax cables with SFP+ transceiver-style connectors

Guidelines for the SFP+ transceiver slots are listed here:

- ❑ They do not support 100Mbps-FX transceivers.
- ❑ They support full-duplex mode only.
- ❑ You can set the port speeds with Auto-Negotiation or manually. The default is Auto-Negotiation.

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

This section applies to the 1Gbps SFP and 10Gbps SFP+ transceiver slots on the AT-x550-18XSQ and AT-x550-18XSPQm Switches. Each transceiver slot has one LED. The LEDs are located between the slots. Refer to Figure 7.

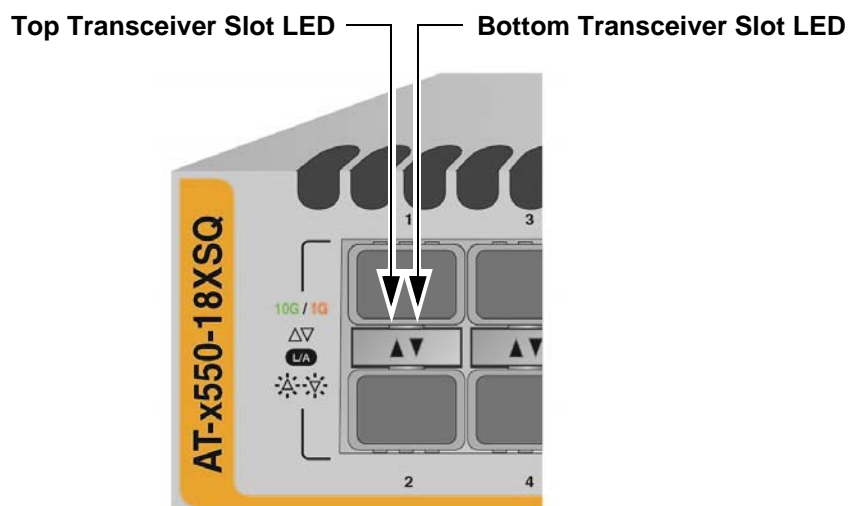


Figure 7. Link and Activity LEDs for the 1Gbps SFP and 10Gbps Slots on the AT-x550-18XSQ and AT-x550-18XSPQm Switches

The LEDs displays link status and activity. The possible LED states are described in Table 11.

Table 11. Link and Activity Status LEDs for the 1Gbps and 10Gbps Ports on the AT-x550-18XTQ or AT-x550-18XSPQm Switch

| State          | Description   |
|----------------|---|
| Solid Green    | The transceiver has established a 10Gbps link to a network device.  |
| Flashing Green | The transceiver is transmitting or receiving data in 10Gbps.  |
| Solid Amber    | The transceiver has established a 1Gbps link to a network device.   |
| Flashing Amber | The transceiver is transmitting or receiving data in 1Gbps.   |
| Off            | <p>Possible causes of this state are listed here:</p> <ul style="list-style-type: none"> <li>- The slot is empty.</li> <li>- The transceiver has not established a link to a network device.</li> <li>- The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.</li> </ul> |

## QSFP+ Transceiver Slots

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All AT-x550 Switch models have two QSFP+ transceiver slots.

### QSFP+ Transceivers

The slots support the following types of 40Gbps transceivers:

- ❑ AT-QSFPSR4 transceiver - requires 12-strand OM4 fiber optic cable and has a maximum operating distance of 150m (492 ft).
- ❑ AT-QSFPLR4 transceiver - requires single-mode fiber optic cable and has an operating range of 2m (6.6 ft) to 10km (6.2 mi).
- ❑ AT-QSFP1CU and AT-QSFP3CU direct connect cables in lengths of 1 and 3 meters, respectively
- ❑ AT-QSFP-4SFP10G-3CU and AT-QSFP-4SFP10G-5CU breakout cables in lengths of 3 and 5 meters, respectively

You can use QSFP+ transceivers as standard networking ports or as stacking ports for the VCStack feature.

---

#### Note

The QSFP+ transceiver slots are initially configured as stacking slots for the VCStack feature. If you will use the switch as a stand-alone unit, you can use the slots with transceivers as regular Ethernet networking ports by disabling the VCStack feature. For instructions, refer to Chapter 6, “Configuring the Switch for Stand-alone Operations” on page 99. For instructions on VCStack, refer to the *x550 Series Installation Guide for Virtual Chassis Stacking*.

---

For a list of supported QSFP+ transceivers, refer to the x550 Series data sheet on the Allied Telesis web site.

### Breakout Cables

When the VCStack feature is disabled and the switch is operating as a stand-alone device, the QSFP+ transceiver slots support the AT-QSFP-4SFP10G-3CU and AT-QSFP-4SFP10G-5CU breakout cables. Refer to Figure 8. A breakout cable converts a QSFP+ transceiver slot from one 40Gbps port to four 10Gbps ports.



Figure 8. QSFP+ to SFP+ Breakout Cable

Port Numbering

The QSFP+ slots are numbered 17 and 21 on the front panel. Here are the guidelines to port numbering:

- ❑ A QSFP+ transceiver in slot 17 has the port number 17.
- ❑ A QSFP+ transceiver in slot 21 has the port number 21.
- ❑ A breakout cable in slot 17 has the port numbers 17, 18, 19, and 20.
- ❑ A breakout cable in slot 21 has the port numbers 21, 22, 23, and 24.

LEDs

Each 40Gbps QSFP+ transceiver slot has one LED. The LEDs are located between the transceiver slots. Refer to Figure 9.

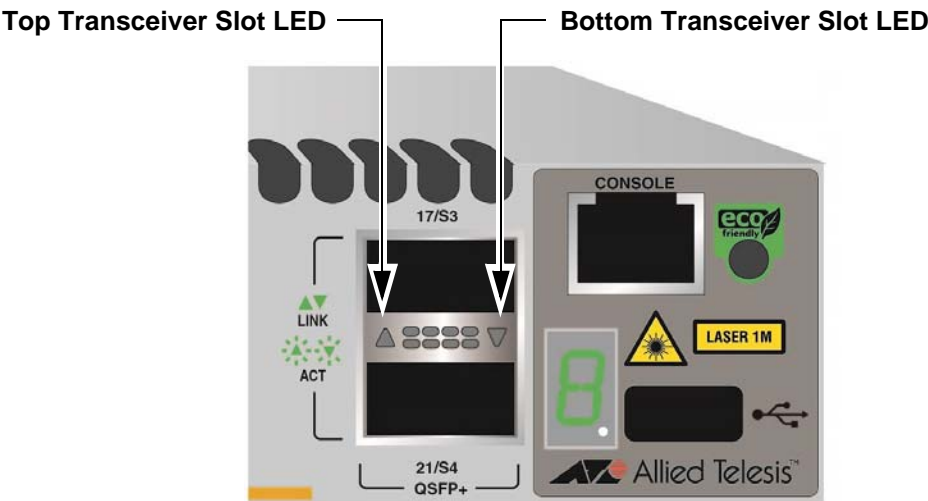


Figure 9. LEDs for the 40Gbps QSFP+ Slots

The LED displays link and activity status. Refer to Table 12.

Table 12. Link and Activity Status LEDs for the 40Gbps QSFP+ Transceiver Slots with QSFP+ Transceivers

| State          | Description  |
|----------------|--|
| Solid Green    | The transceiver has established a 40Gbps link to a network device. |
| Flashing Green | The transceiver is transmitting or receiving data.                 |

Table 12. Link and Activity Status LEDs for the 40Gbps QSFP+ Transceiver Slots with QSFP+ Transceivers (Continued)

| State | Description   |
|-------|---|
| Off   | <p>Possible causes of this state are listed here:</p> <ul style="list-style-type: none"> <li>- The slot is empty.</li> <li>- The transceiver has not established a link to a network device.</li> <li>- The LEDs are turned off. To turn on the LEDs, use the eco-friendly button.</li> </ul> |

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

Table 13. Link and Activity Status LEDs for the 40Gbps QSFP+ Transceiver Slots with Breakout Cables

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

## eco-friendly Button

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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.

The Switch ID LED is always on, but it displays different information depending on whether the LEDs are on or off. When the LEDs are on, the ID LED displays the ID number of the switch. When the switch is operating in the low power mode with the LEDs off, the ID LED indicates whether the switch is a stand-alone unit or the master or member switch of a VCStack, as detailed in Figure 12 on page 41.

---

### **Note**

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

---

## VCStack Feature

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

- ❑ 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 the devices as stand-alone units. For instructions on VCStack, refer to the *x550 Series Installation Guide for Virtual Chassis Stacking*.

---

## 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 4. Chapter 5, “Powering On the Switch” on page 91 has the procedure for verifying and, if necessary, changing the ID number of the switch for stand-alone operation.

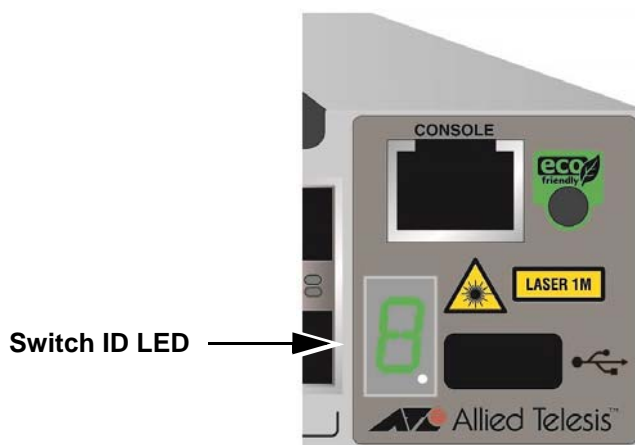
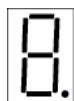


Figure 10. Switch ID LED

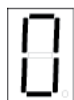
The states of the LED when the switch is not operating in the low power mode are shown in Figure 11.



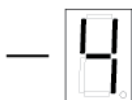
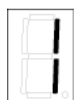
The switch is booting up.



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 4 as part of a VCStack.



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

Figure 11. Switch ID LED

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



the following problems:

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

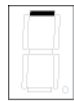
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**Note**

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

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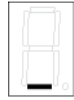
The states of the LED when the switch is operating in the low power mode are shown in Figure 12.



**The switch is the master switch of a VCS stack.**



**The switch is operating as a stand-alone unit.**



**The switch is a member switch of a VCS stack.**

2667

Figure 12. Switch ID LEDs in Low Power Mode

## USB Port

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

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

The port is USB2.0 compatible.

## Console Port

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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, you use the provided management cable to connect a terminal or a personal 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: 9600 bps (Range is 9600 to 115200 bps)
- ☐ Data bits: 8
- ☐ Parity: None
- ☐ Stop bits: 1
- ☐ Flow control: None

---

**Note**

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

---

## Power Supply

---

The switch comes with a pre-installed power supply. Refer to “Technical Specifications” on page 125 for the input voltage ranges.



---

**Warning**

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

---

---

**Note**

The power supply is not field-replaceable.

---

## Software and Hardware Releases

---

Software and hardware releases for the AlliedWare Plus operating software and x550 Switch Series are listed Table 14. Version 5.4.7A-0 of the AlliedWare Plus operating software was the initial release for this product.

Table 14. Software and Hardware Releases

| AlliedWare Plus Version | Hardware / VCStack  |
|-------------------------|---|
| v5.4.7A-0               | AT-x550-18XTQ Switch<br>AT-x550-18XSQ Switch  |
|                         | VCStack feature:<br>Maximum number of switches in a stack: 2<br>Trunk ports: 40Gbps QSFP+ transceiver slots 17 and 21 (S3 and S4).                                      |
| v5.4.7-1                | VCStack feature:<br>Maximum number of switches in a stack: 4<br>Trunk ports: 40Gbps QSFP+ transceiver slots 17 and 21 (S3 and S4) or 10Gbps ports 15 and 16 (S1 and S2) |
| v5.4.8-0.2              | AT-x550-18XSPQm Switch  |



## Chapter 2

# Beginning the Installation

---

The chapter contains the following sections:

- ❑ “Reviewing Safety Precautions” on page 48
- ❑ “Choosing a Site for the Switch” on page 52
- ❑ “Unpacking the AT-x550-18XTQ or AT-x550-18XSQ Switch” on page 53
- ❑ “Unpacking the AT-x550-18XSPQm Switch” on page 56


## Reviewing Safety Precautions

---

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

---

### Note


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

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---

### 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 45° degrees 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


---



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**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 (T<sub>mra</sub>).  E35

---

**Caution**

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

**Warning**

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

**Warning**

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

**Warning**

This product may have multiple AC power cords installed. To 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 slots or plugs. E44

**Warning**

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

**Caution**

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

**Warning**

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

## Choosing a Site for the Switch

---

Observe these requirements when planning the installation of the switch.

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



### 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 AT-x550-18XTQ or AT-x550-18XSQ Switch

---

Figure 13 shows the shipping box for the AT-x550-18XTQ or AT-x550-18XSQ Switch.

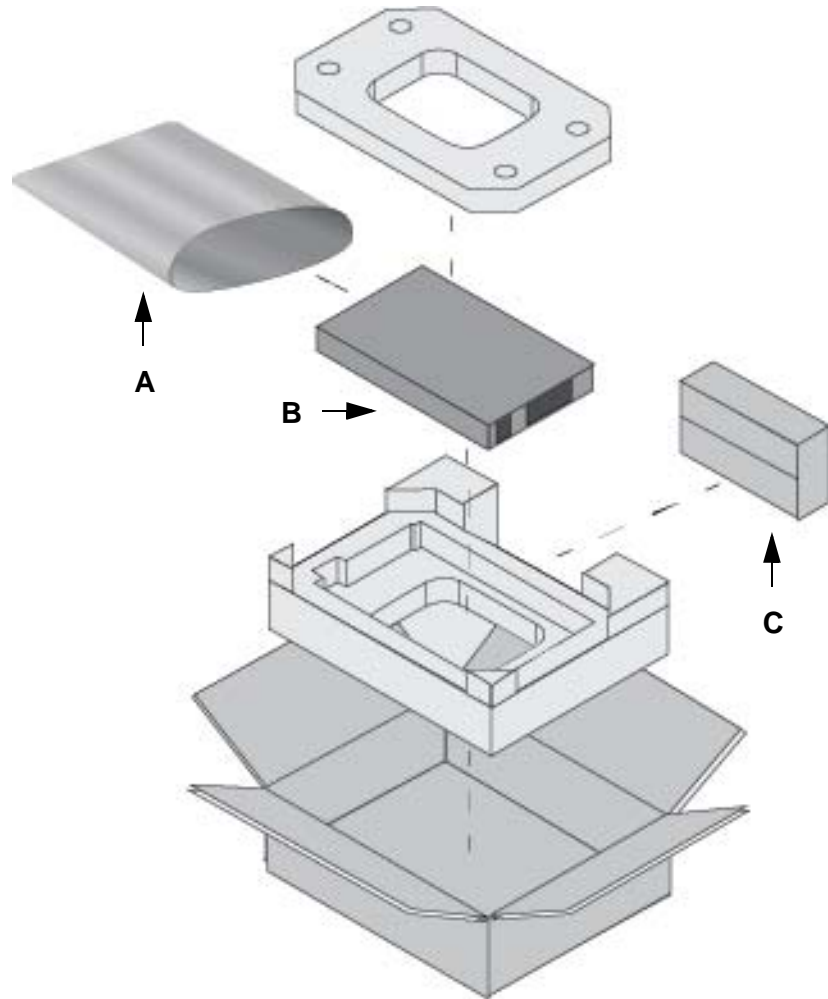


Figure 13. AT-x550-18XTQ or AT-x550-18XSQ Switch Shipping Box

The items in the box are listed here:

- ☐ A - Protective bag
- ☐ B - AT-x550-18XTQ or AT-x550-18XSQ Switch
- ☐ C - Accessory kit

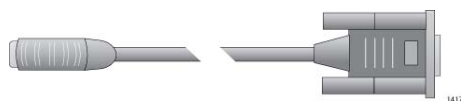
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**Note**

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

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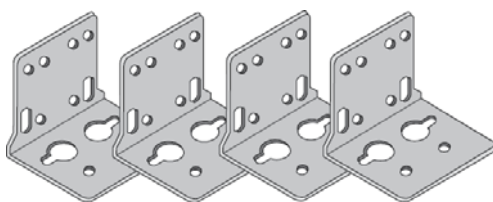
Figure 14 here and Figure 15 on page 55 list the items in the accessory kit. Contact your Allied Telesis sales representative for assistance if any item is missing or damaged.



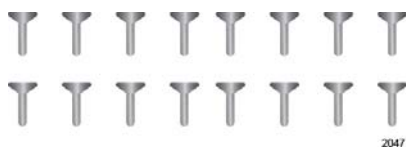
One 2m (6.6 ft) local management cable with RJ-45 (8P8C) and DB-9 (D-sub 9-pin) connectors.



One regional AC power cord



Four AT-RKMT-J24 wall-mounting brackets



Sixteen screws for attaching the AT-RKMT-J24 wall brackets to the switch.

Length: 6.0mm (0.2 in.)  
Diameter: 4.0mm (0.2 in.)



Four anchors for concrete walls:  
Length: 29.6mm (1.2 in.)  
Diameter: 6.0mm (0.2 in.)

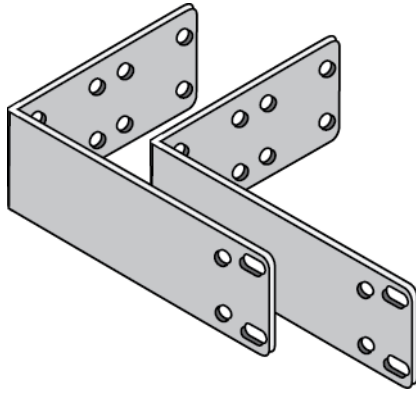


Four screws for wood or concrete walls:  
Length: 32mm (1.3 in.)  
Diameter: 4mm (0.2 in.)

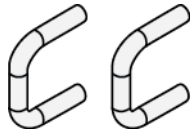


Power cord retaining clip

Figure 14. Accessory Kit



Two AT-RKMT-J14 equipment  
rack brackets



Two handles for the AT-RKMT-  
J14 equipment rack brackets



Four screws for attaching the handles  
to the AT-RKMT-J14 equipment rack  
brackets:  
Length: 6.0mm (0.2 in.)  
Diameter: 3.0mm (0.1 in.)

Figure 15. Accessory Kit (Continued)

## Unpacking the AT-x550-18XSPQm Switch

Figure 16 shows the shipping box for the AT-x550-18XSPQm Switch.

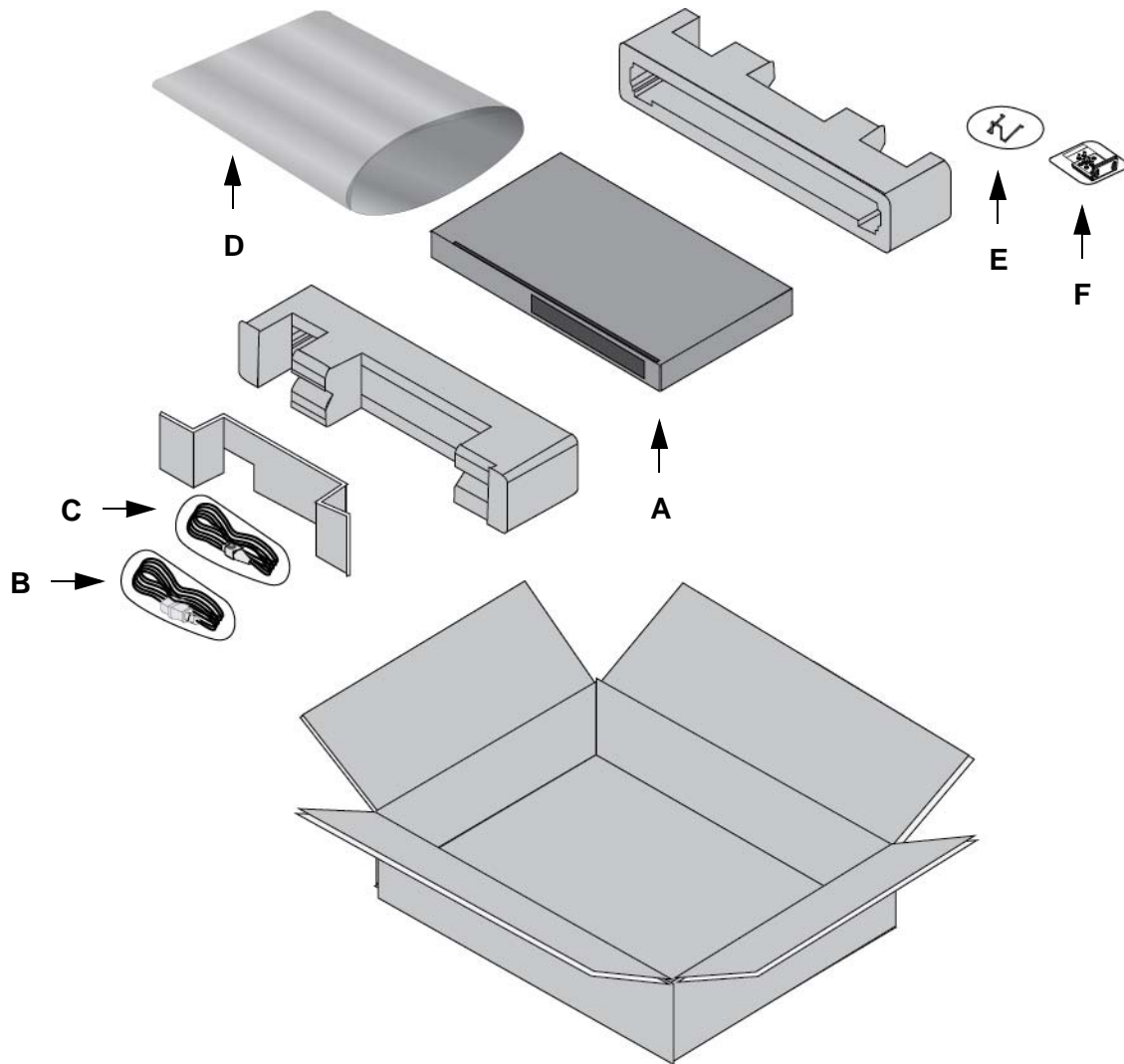


Figure 16. AT-x550-18XSPQm Switch Shipping Box

The items in the box are listed here:

- ☐ A - AT-x550-18XSPQm Switch
- ☐ B - AC power cord
- ☐ C - Management cable
- ☐ D - Protective bag
- ☐ E - Power cord retaining clip
- ☐ F - Brackets and screws



**Note**

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

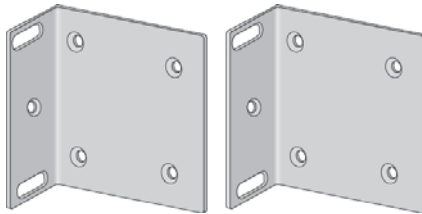
Figure 17 list the accessory items included with the switch. Contact your Allied Telesis sales representative for assistance if any item is missing or damaged.



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



One regional AC power cord



Two wall/equipment rack brackets



Four screws for attaching the wall/equipment rack brackets to the switch.

Length: 6.0mm (0.2 in.)

Diameter: 4.0mm (0.2 in.)



Two anchors for concrete walls:

Length: 29.6mm (1.2 in.)

Diameter: 6.0mm (0.2 in.)



Two screws for wood or concrete walls:

Length: 32mm (1.3 in.)

Diameter: 4mm (0.2 in.)



Power cord retaining clip

Figure 17. Accessory Items



## Chapter 3

# Installing the Switch on a Table or in an Equipment Rack

---

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

- ❑ “Installing the Switch on a Table or Desktop” on page 60
- ❑ “Overview of Installing the AT-x550-18XTQ and AT-x550-18XSQ Switches in an Equipment Rack” on page 61
- ❑ “Installing the AT-x550-18XTQ or AT-x550-18XSQ Switch in an Equipment Rack with the AT-RKMT-J14 Brackets” on page 63
- ❑ “Installing the AT-x550-18XTQ or AT-x550-18XSQ Switch in an Equipment Rack with the AT-RKMT-J15 Bracket” on page 68
- ❑ “Installing the AT-x550-18XSPQm Switch in an Equipment Rack” on page 74

## Installing the Switch on a Table or Desktop

---

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

---

### Note

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

---



---

### 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

---

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

1. Review the procedure in Chapter 2, “Choosing a Site for the Switch” on page 52 to verify that the selected site is suitable for the unit.
2. Check to be sure that the table is strong enough to support the weight of the switch.
3. Lift the chassis onto the table.
4. Check to be sure that all of the appropriate components are included in the shipping container. Refer to “Unpacking the AT-x550-18XTQ or AT-x550-18XSQ Switch” on page 53 or “Unpacking the AT-x550-18XSPQm Switch” on page 56.

After placing the switch on the table or desktop, go to Chapter 5, “Powering On the Switch” on page 91.

## Overview of Installing the AT-x550-18XTQ and AT-x550-18XSQ Switches in an Equipment Rack

---

You can install the AT-x550-18XTQ and AT-x550-18XTQ Switches in a 19-inch equipment rack two ways. One way is with the AT-RKMT-J14 brackets that come with the switch. Refer to Figure 18.



Figure 18. AT-RKMT-J14 Brackets and Switch

For installation instructions, refer to “Installing the AT-x550-18XTQ or AT-x550-18XSQ Switch in an Equipment Rack with the AT-RKMT-J14 Brackets” on page 63.

You can also install the switch in an equipment rack with the optional AT-RKMT-J15 bracket. Refer to Figure 19.

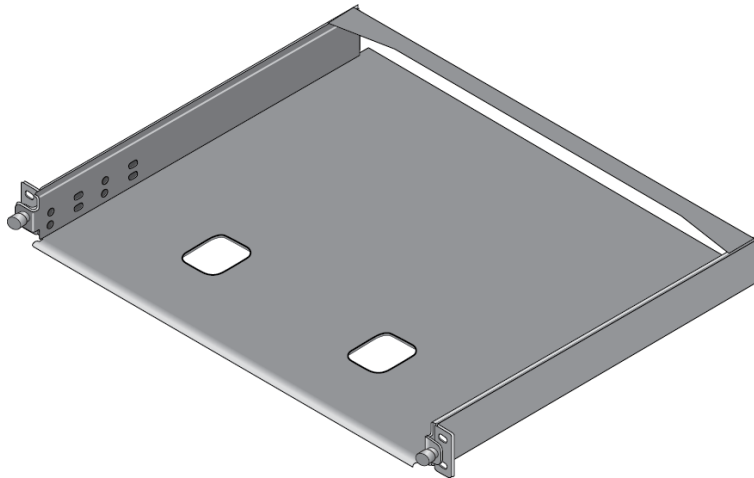


Figure 19. AT-RKMT-J15 Bracket

The bracket lets you install two switches side-by-side. Refer to Figure 20.

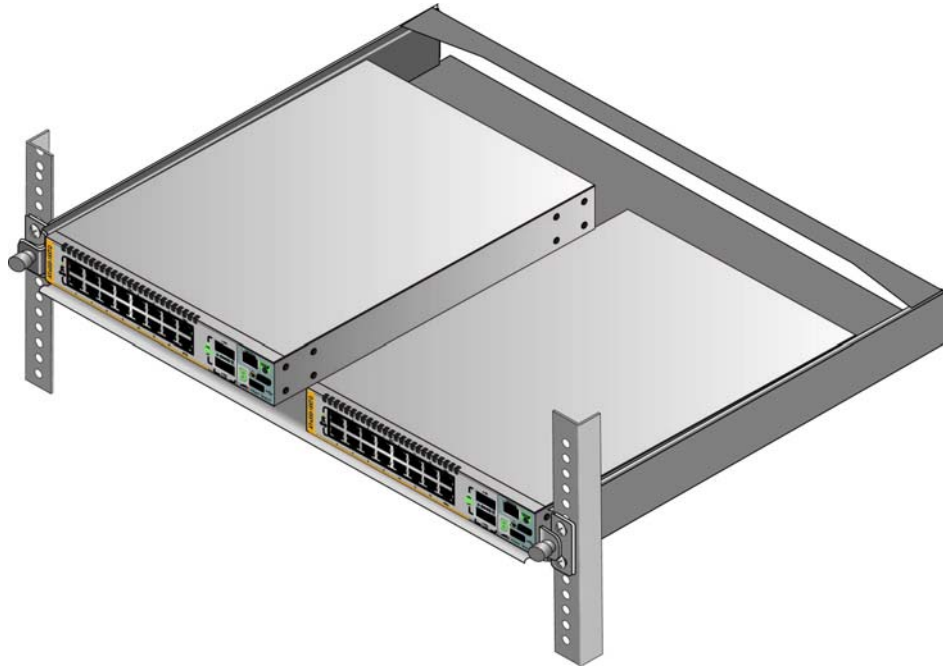


Figure 20. AT-RKMT-J15 Bracket with Switches

---

**Note**

The AT-RKMT-J15 Bracket is purchased separately.

---

For installation instructions refer, to “Installing the AT-x550-18XTQ or AT-x550-18XSQ Switch in an Equipment Rack with the AT-RKMT-J15 Bracket” on page 68.

## Installing the AT-x550-18XTQ or AT-x550-18XSQ Switch in an Equipment Rack with the AT-RKMT-J14 Brackets

---

This section contains the procedure for installing the AT-x550-18XTQ or AT-x550-18XSQ Switch in a standard 19-inch equipment rack, with the AT-RKMT-J14 Brackets included with the switch.

### Required Items

The following items are required to install the switch in an equipment rack with the AT-RKMT-J14 Brackets:

- ☐ Two AT-RKMT-J14 equipment rack brackets (included with the switch)
- ☐ Eight M4x6mm bracket screws (included with the switch)
- ☐ Four M3x6mm screws (included with the switch)
- ☐ Two bracket handles (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 AT-RKMT-J14 Brackets. Refer to Figure 21.

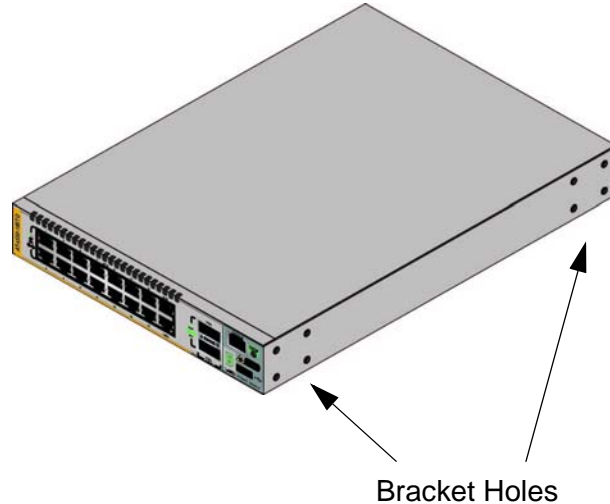


Figure 21. Bracket Holes

The brackets also have two sets of four holes. Refer to Figure 22 on page 64.

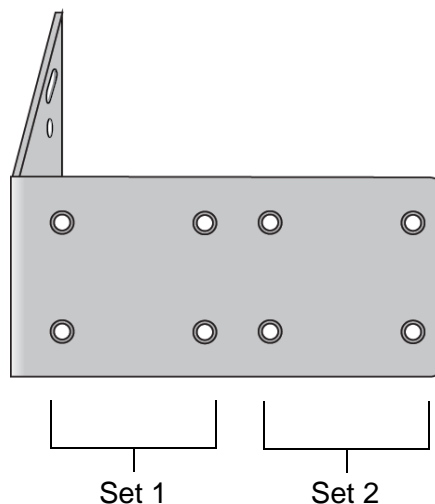


Figure 22. AT-RKMT-J14 Bracket Holes

You can use the different sets of holes on the switch and brackets 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. The illustrations in Figure 23 show the switch orientations with the front panel facing the front of the equipment rack.

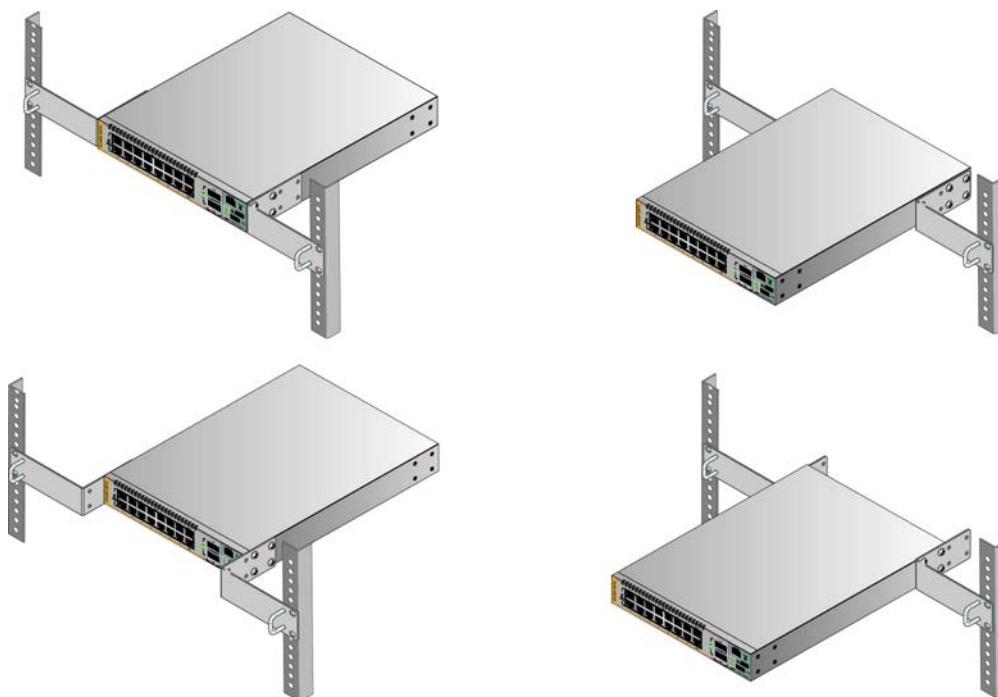


Figure 23. Switch Orientations with the Front Panel Facing the Front of the Equipment Rack



You can also orient the switch with the rear panel facing the front of the equipment rack. Refer to Figure 24.

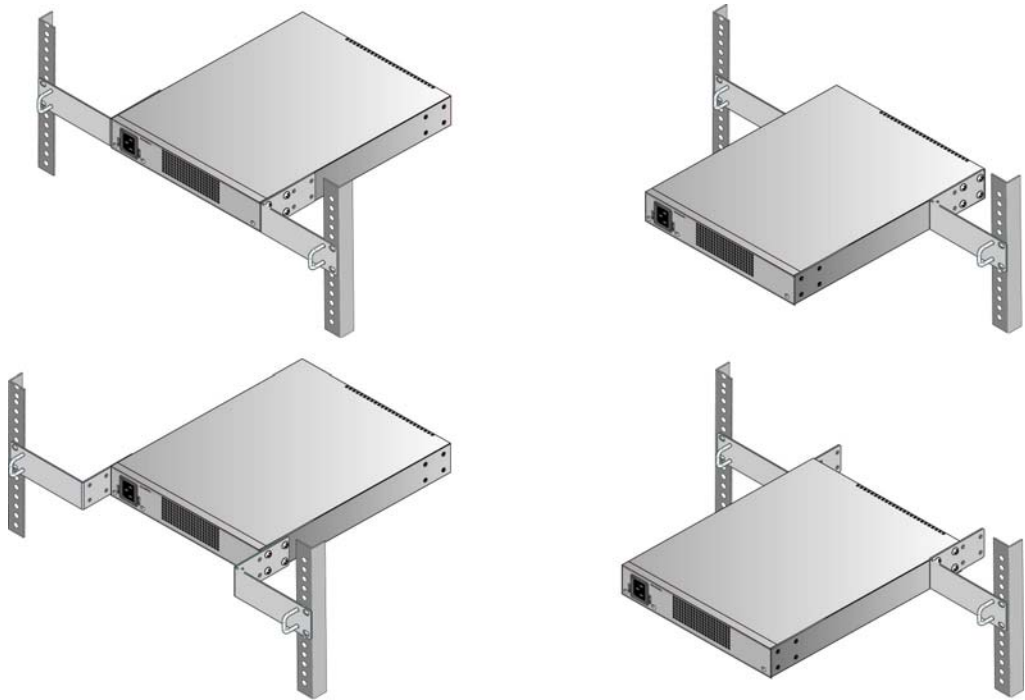


Figure 24. Switch Orientations with the Rear Panel Facing the Front of the Equipment Rack

## 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 63.

Please review the installation guidelines in “Choosing a Site for the Switch” on page 52 before installing the switch in an equipment rack.



### Caution

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

To install the switch in a 19-inch equipment rack with the AT-RKMT-J14 Brackets, perform the following procedure:

1. Attach the two handles to the AT-RKMT-J14 Brackets using the four M3x6mm screws included with the switch. Refer to Figure 25 on page 66.

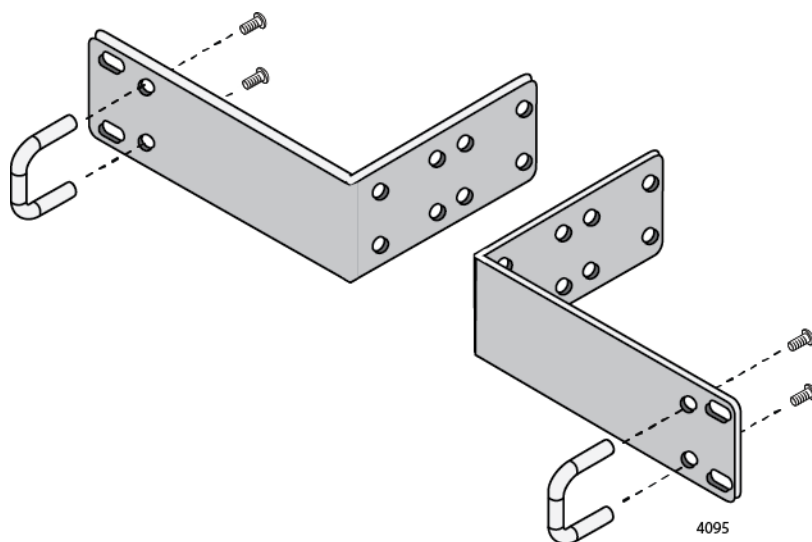


Figure 25. Attaching the Handles to the AT-RKMT-J14 Brackets

2. Place the switch on a level, secure surface.
3. Attach the two brackets to the sides of the switch in the selected position, using the eight M4x6mm screws included with the unit. (Refer to Figure 23 on page 64 and Figure 24 on page 65.) The illustration in Figure 26 shows the installation of the brackets such that the front panel of the switch is even with the front of the equipment rack.

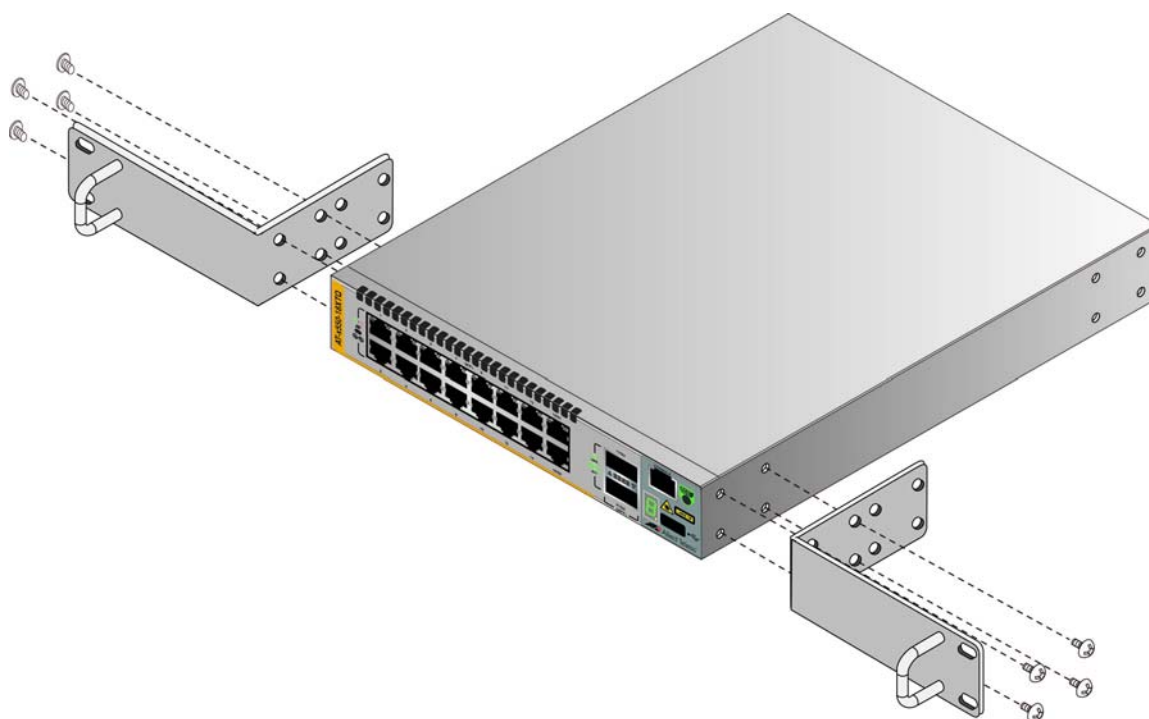


Figure 26. Attaching the AT-RKMT-J14 Brackets to the Switch

4. 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 27.

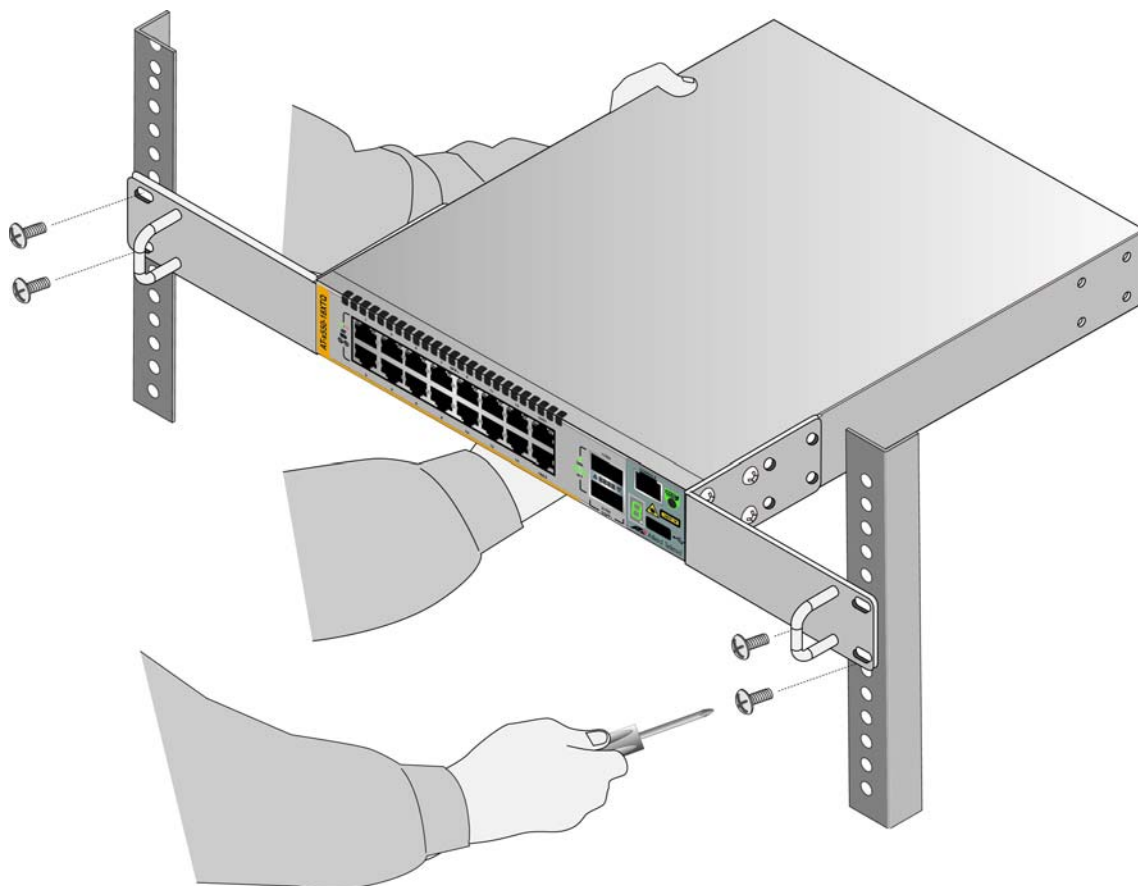


Figure 27. Installing the Switch in an Equipment Rack

5. Go to Chapter 5, “Powering On the Switch” on page 91.

## Installing the AT-x550-18XTQ or AT-x550-18XSQ Switch in an Equipment Rack with the AT-RKMT-J15 Bracket

---

This section contains the procedure for installing the AT-x550-18XTQ or AT-x550-18XSQ Switch in a standard 19-inch equipment rack, with the optional AT-RKMT-J15 Bracket.

### Required Items

The following items are required to install the switch in an equipment rack with the AT-RKMT-J15 Bracket:

- ☐ One AT-RKMT-J15 equipment rack bracket (sold separately)
- ☐ Four M4x6mm bracket screws (included with the switch)
- ☐ Cross-head screwdriver (not provided)
- ☐ Flat-head screwdriver (not provided)
- ☐ Four standard equipment rack screws (not provided)

### Installing the Switch

To install the switch in a 19-inch equipment rack with the AT-RKMT-J15 Bracket, perform the following procedure:

1. Have another person hold the AT-RKMT-J15 Bracket at the desired location in the equipment rack while you secure it using four standard equipment rack screws (not provided). Refer to Figure 28.

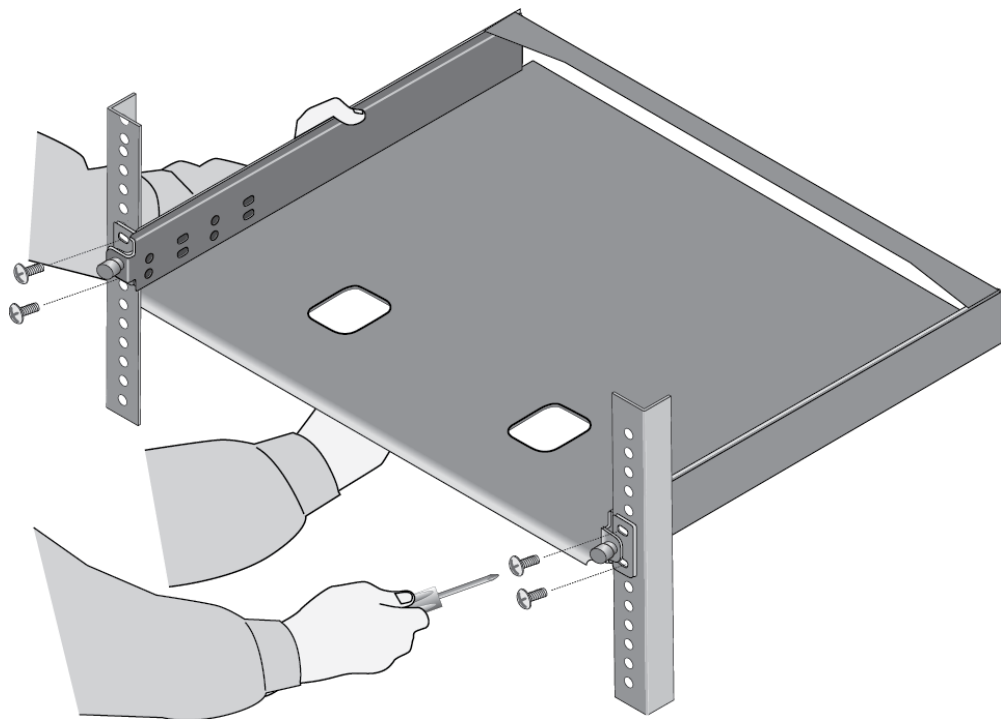


Figure 28. Installing the AT-RKMT-J15 Bracket in the Equipment Rack

2. Loosen the two thumbscrews on the front of the bracket. Refer to Figure 29.

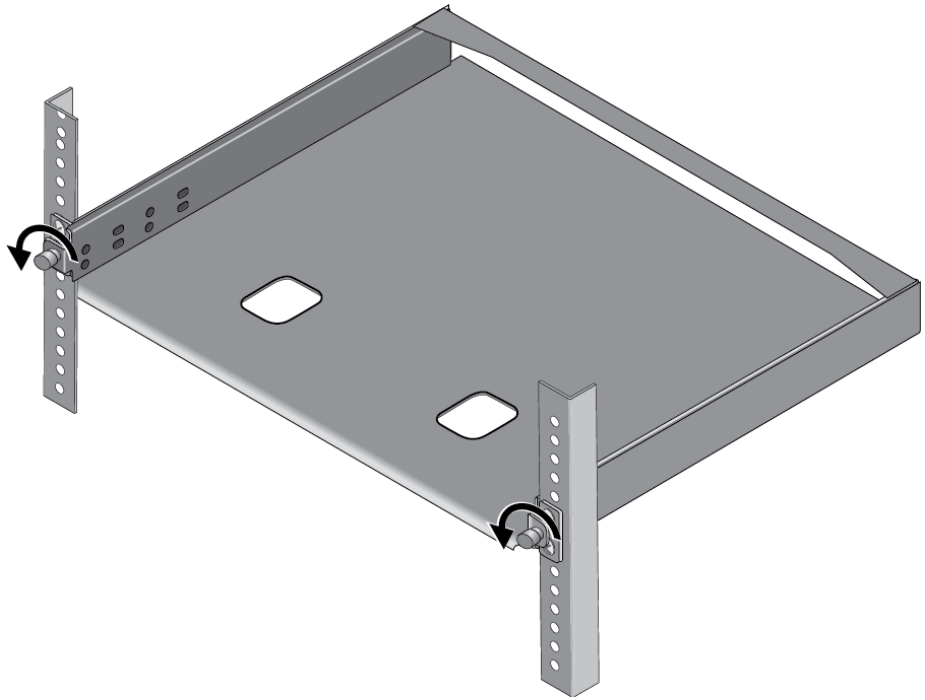


Figure 29. Loosening the Two Thumbscrews on the Front of the AT-RKMT-J15 Bracket

3. Slide out the bracket tray. Refer to Figure 30.

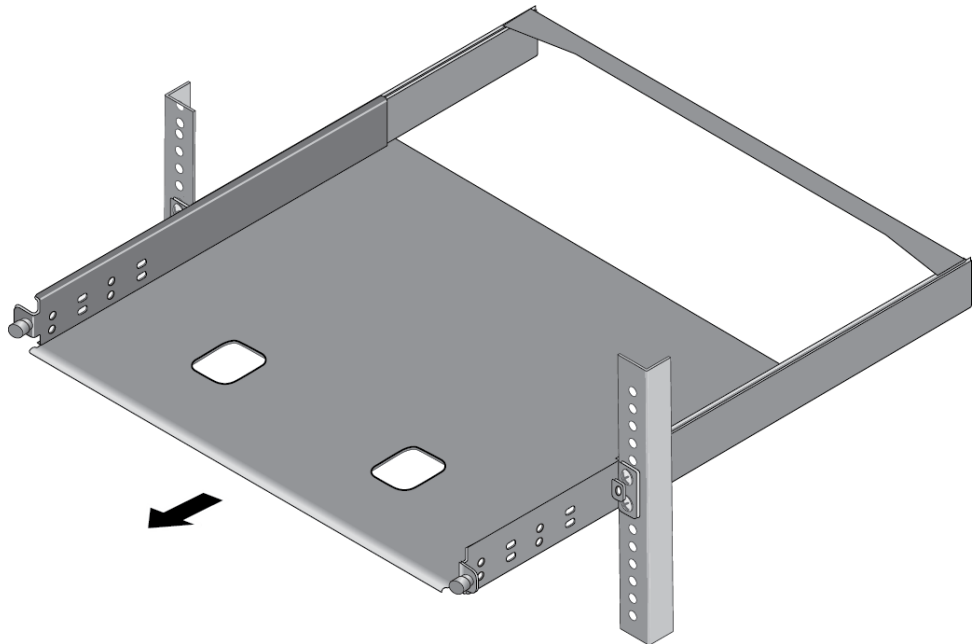


Figure 30. Sliding Out the Tray from the AT-RKMT-J15

---

**Note**

Steps 4 to 6 remove the plastic feet from the bottom of the switch. You must remove the plastic feet to install the switch in the AT-RKMT-J15 Bracket.

---

4. Place the switch upside-down on a table.
5. Use a small flat-head screwdriver to pry the four plastic feet from the bottom of the switch. Refer to Figure 31.

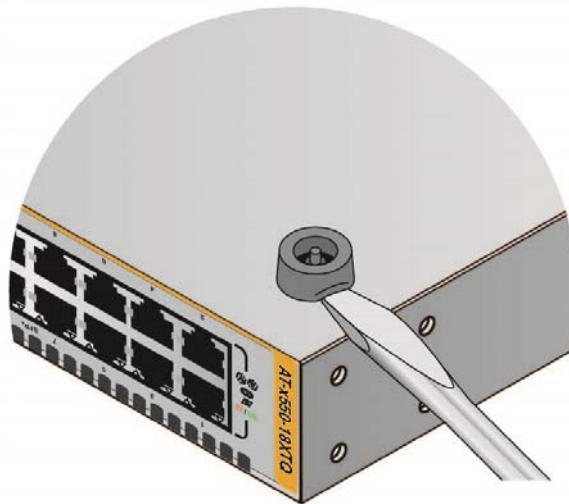


Figure 31. Removing the Plastic Feet from the Bottom Panel of the Switch

6. Turn the switch over so that it is right-side up.
7. Place the switch in the left or right side of the bracket, with its front panel facing the front of the bracket. If you are installing only one switch, you can install it on either the left or right side. Refer to Figure 32 on page 71.

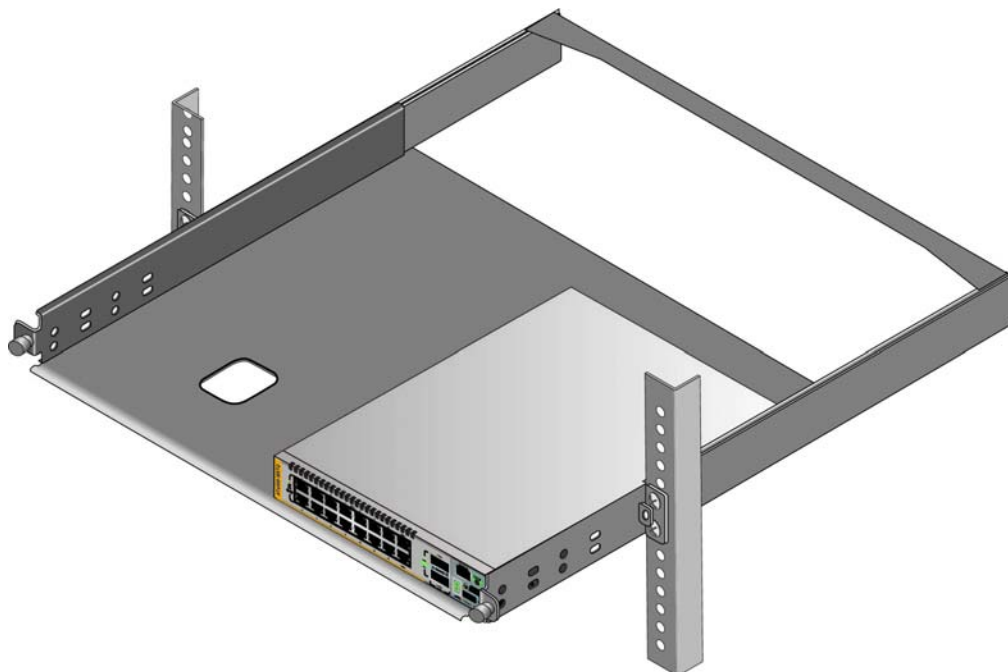


Figure 32. Placing a Switch in the AT-RKMT-J15 Bracket

8. Install two M4x6mm screws included with the switch to secure the switch to the bracket. Refer to Figure 33.

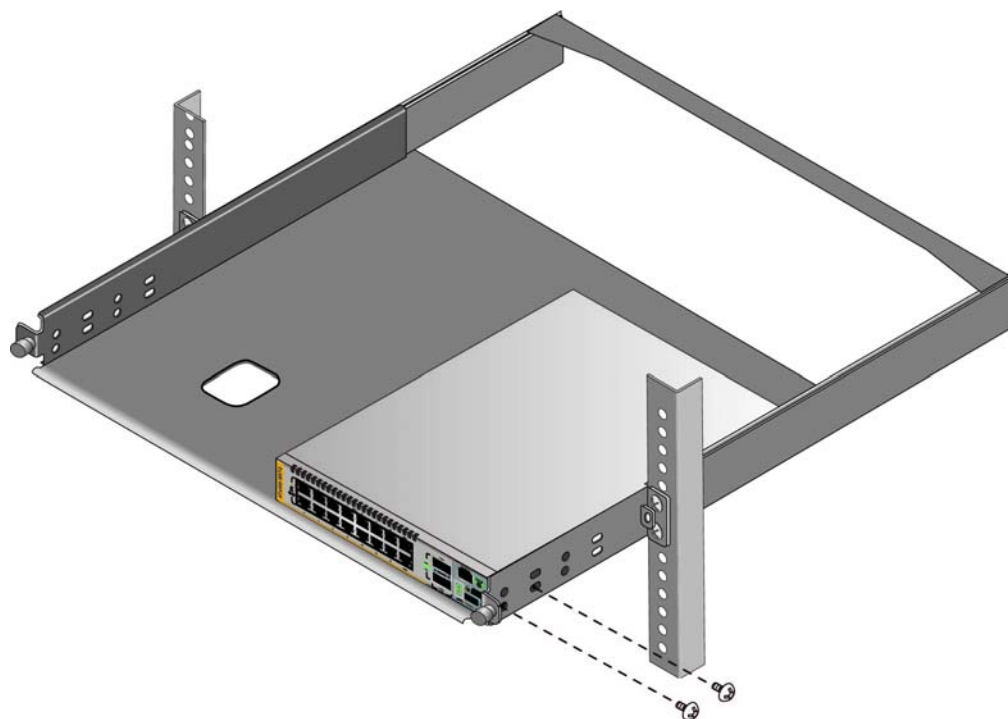


Figure 33. Securing the Switch to the AT-RKMT-J15 Bracket

9. To install a second switch in the bracket, repeat steps 4 to 8.
10. Slide in the bracket tray. Refer to Figure 34.

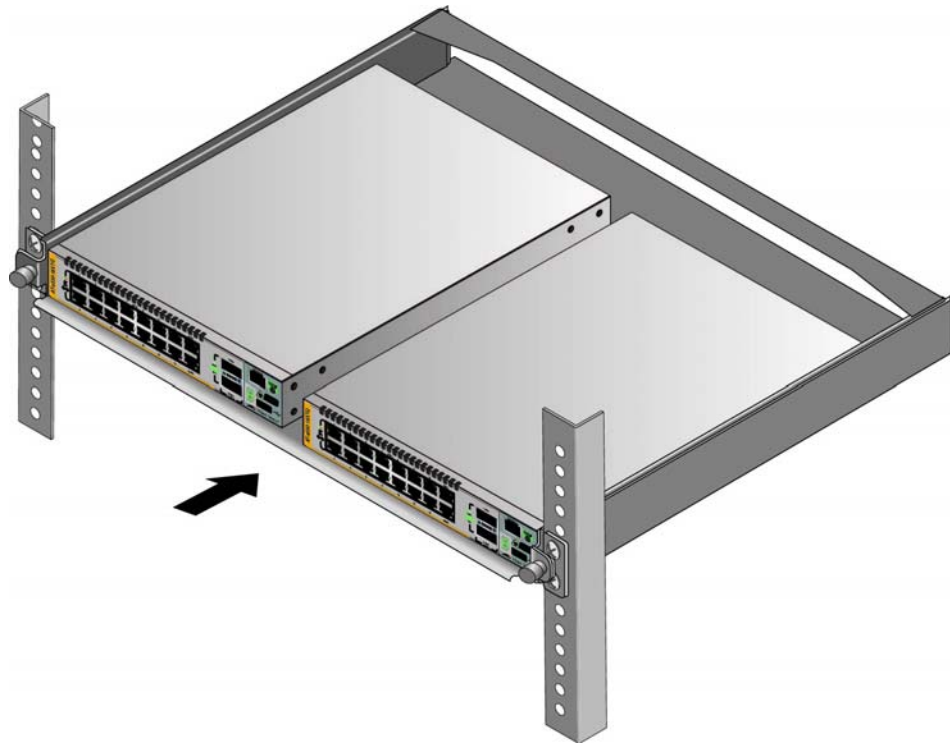


Figure 34. Sliding in the Bracket Tray

11. Tighten the two thumbscrews to secure the tray to the bracket. Refer to Figure 35 on page 73.



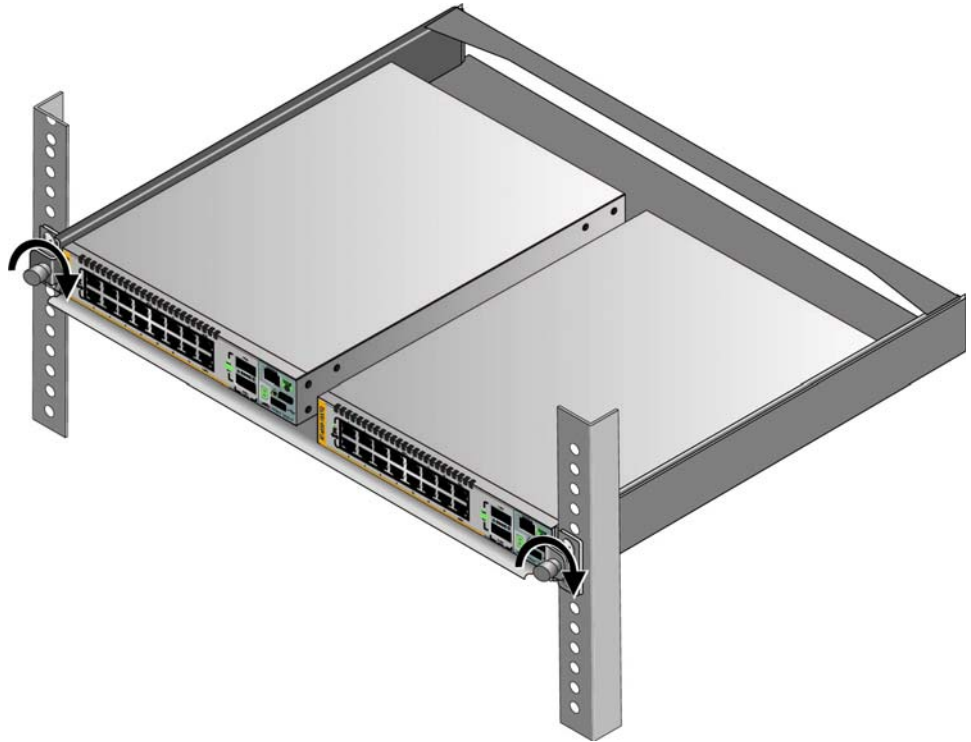


Figure 35. Tightening the Two Thumbscrews on the AT-RKMT-J15 Bracket

12. Go to Chapter 5, “Powering On the Switch” on page 91.

## Installing the AT-x550-18XSPQm Switch in an Equipment Rack

---

This section contains the procedure for installing the AT-x550-18XSPQm Switch in a standard 19-inch equipment rack, with the brackets included with the unit.

### Required Items

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

- ❑ Two 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 36.

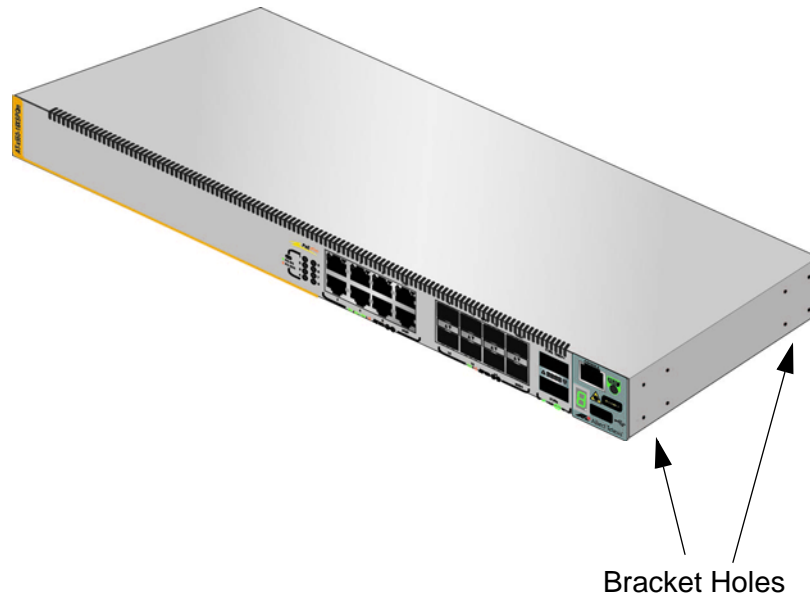


Figure 36. Bracket Holes on the AT-x550-18XSPQm Switch

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. The illustrations in Figure 37 show the switch orientations with the front panel facing the front of the equipment rack.



Figure 37. AT-x550-18XSPQm Switch Orientations in an Equipment Rack

## 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 74.

Please review the installation guidelines in “Choosing a Site for the Switch” on page 52 before installing the switch in an equipment rack.



### Caution

The chassis may be heavy and awkward to lift. Allied Telesis recommends that you get assistance when mounting the chassis in an equipment rack. *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 included with the unit. The illustration in Figure 38 on page 76 shows the installation of the brackets such that the front panel of the switch is even with the front of the equipment rack.



Figure 38. Example of Attaching the Brackets to the AT-x550-18XSPQm 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 39.

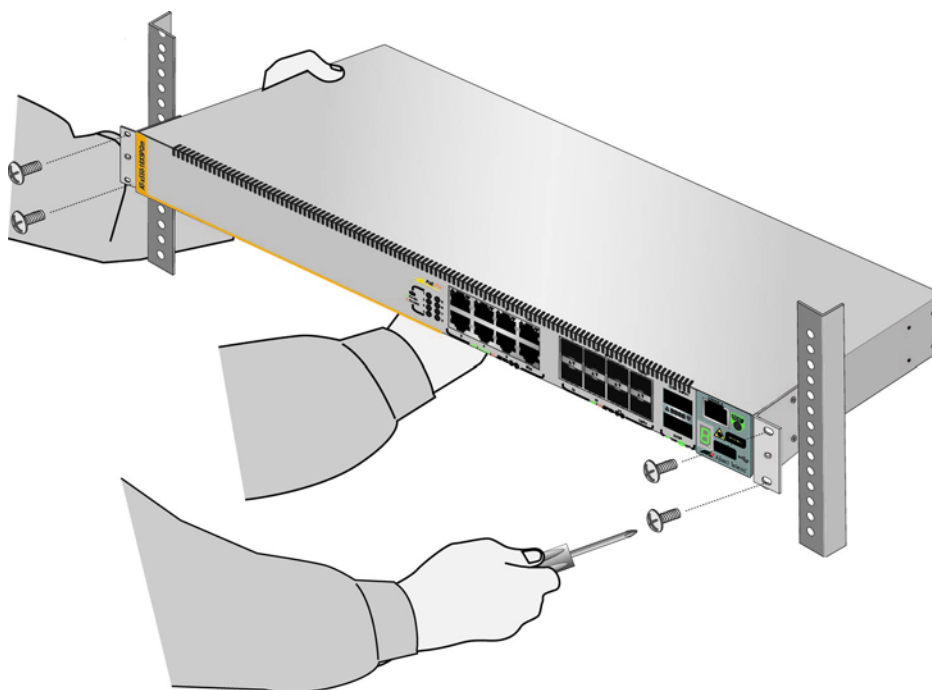


Figure 39. Installing the Switch in an Equipment Rack

4. Go to Chapter 5, “Powering On the Switch” on page 91.

## Chapter 4

# Installing the Switch on a Wall

---

The procedures in this chapter are listed here:

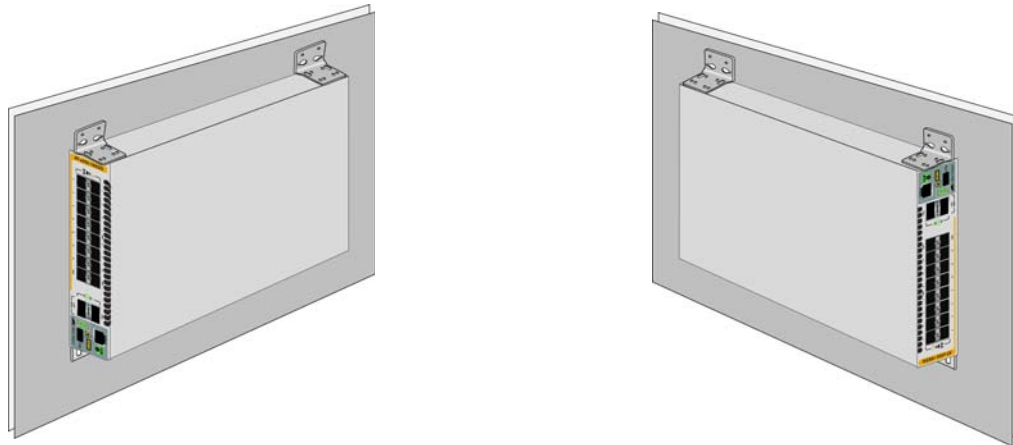
- ❑ “Switch Orientations on a Wall” on page 78
- ❑ “Installation Guidelines” on page 79
- ❑ “Plywood Base for a Wall with Wooden Studs” on page 81
- ❑ “Installing a Plywood Base” on page 83
- ❑ “Installing the Switch on a Plywood Base” on page 84
- ❑ “Installing the Switch on a Concrete Wall” on page 87

## Switch Orientations on a Wall

---

You can install the switch on a wall with the front panel on the left or right, as shown in Figure 40. Do not install it with the front panel on the top or bottom.

AT-x550-18XTQ or AT-x550-18XSQ Switch



AT-x550-18XSPQm Switch

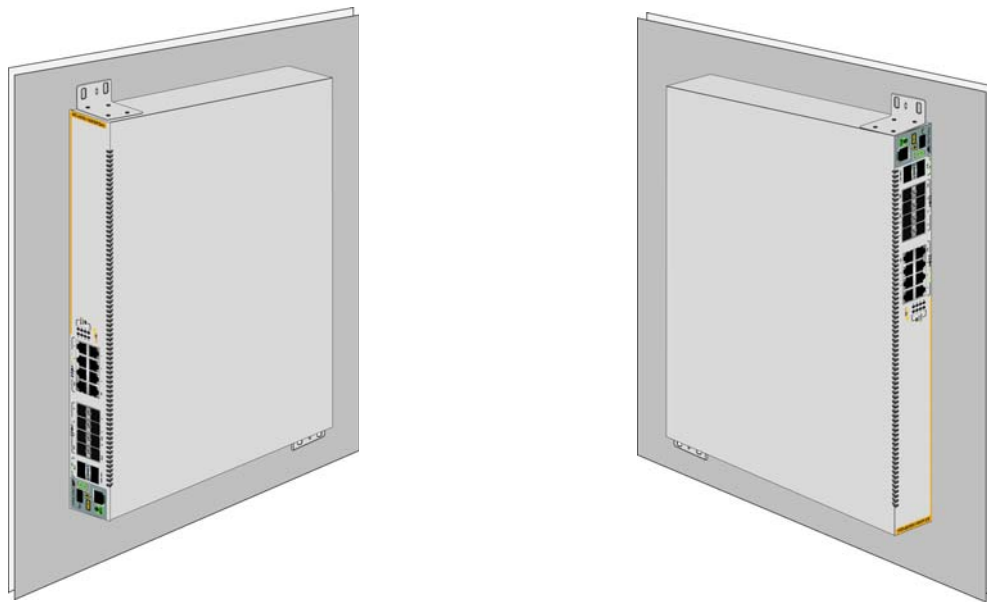


Figure 40. Positioning the Switches on the Wall

## Installation Guidelines

---

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

- ❑ You may install the switch on a wall that has wooden studs or on a concrete wall.
- ❑ If you are installing the switch on a wall with wooden studs, you should use a plywood base to support the switch. For more information, refer to “Plywood Base for a Wall with Wooden Studs” on page 81. A plywood base is not required for a concrete wall.
- ❑ You should not install the switch on a wall that has metal studs. Metal studs may not be strong enough to safely support the device.
- ❑ You should not install the switch 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 may result if it is not properly fastened to the wall. *E105*

---

## Tools and Material

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


- ❑ For the AT-x550-18XTQ or AT-x550-18XSQ Switch, four AT-BRKT-J24 wall brackets and sixteen screws (included with the switch)
- ❑ For the AT-x550-18XSPQm Switch, two wall/equipment rack brackets and eight screws (included with the switch)
- ❑ For the AT-x550-18XTQ or AT-x550-18XSQ Switch, four wall anchors and screws (included with the switch)
- ❑ For the AT-x550-18XSPQm Switch, two wall anchors and screws (included with the switch)
- ❑ Cross-head screwdriver (not provided)
- ❑ Stud finder for a wooden wall, capable of identifying the middle of wall studs and hot electrical wiring (not provided)
- ❑ Drill and 1/4" carbide drill bit for a concrete wall (not provided)
- ❑ Plywood base if you are installing the switch on a wall with wooden

studs (not provided.) Refer to “Plywood Base for a Wall with Wooden Studs” on page 81 for illustrations.

- ❑ Four screws for attaching the plywood base to the wall (not provided)



**Caution**

The supplied screws and anchors might not be appropriate for all walls. A qualified building contractor should 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, Allied Telesis recommends using a plywood base for the device. (A plywood base is not required for a concrete wall.) Refer to Figure 41.

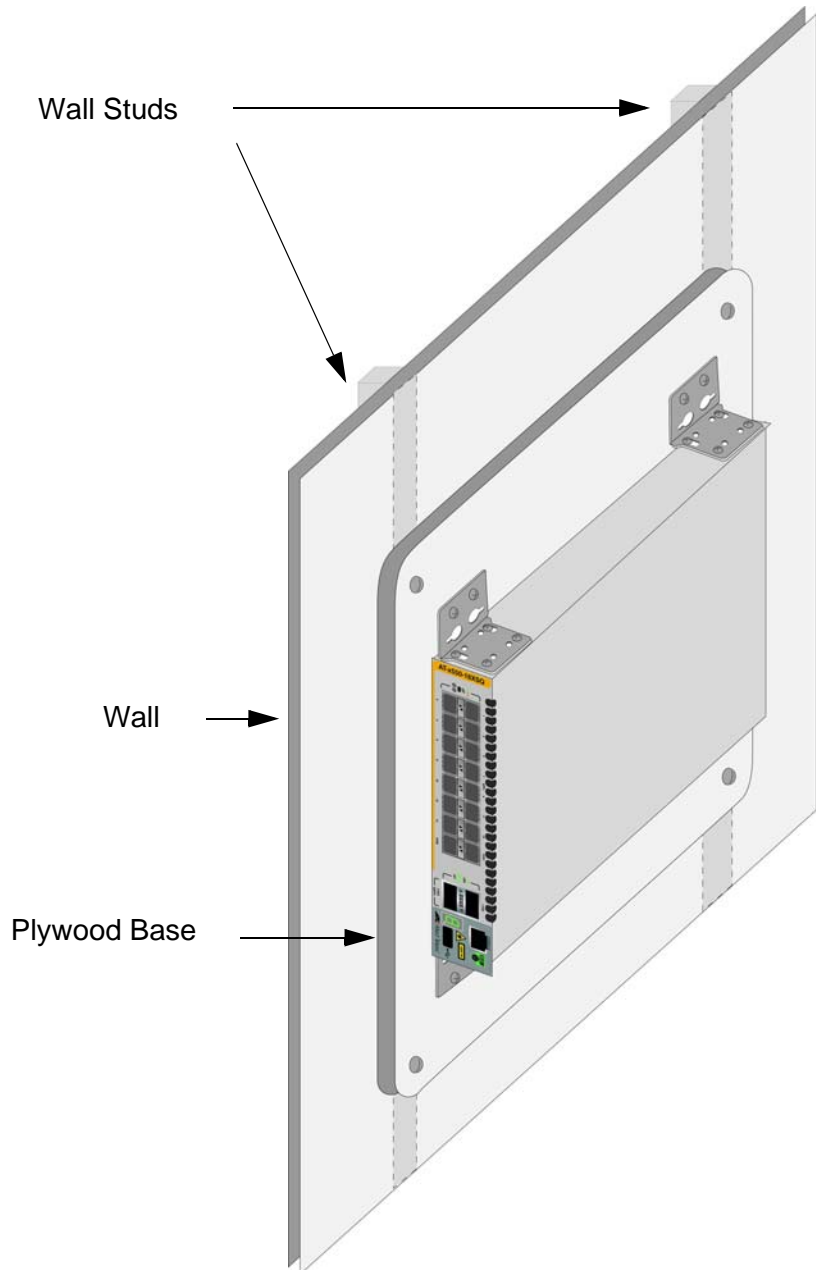


Figure 41. Switch on the Wall with a Plywood Base

The plywood base should be mounted to two studs in the wall. The recommended minimum dimensions of the plywood base for the AT-x550-

18XTQ or AT-x550-18XSQ Switch are listed here:

- ❑ Width: 55.9 centimeters (22 inches)
- ❑ Height: 35.6 centimeters (14 inches)
- ❑ Thickness: 2.5 centimeters (1 inch)

The recommended minimum dimensions of the plywood base for the AT-x550-18XSPQm Switch are listed here:

- ❑ 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.

You should install the plywood base on the wall and then install the switch on the base. Refer to Figure 42.

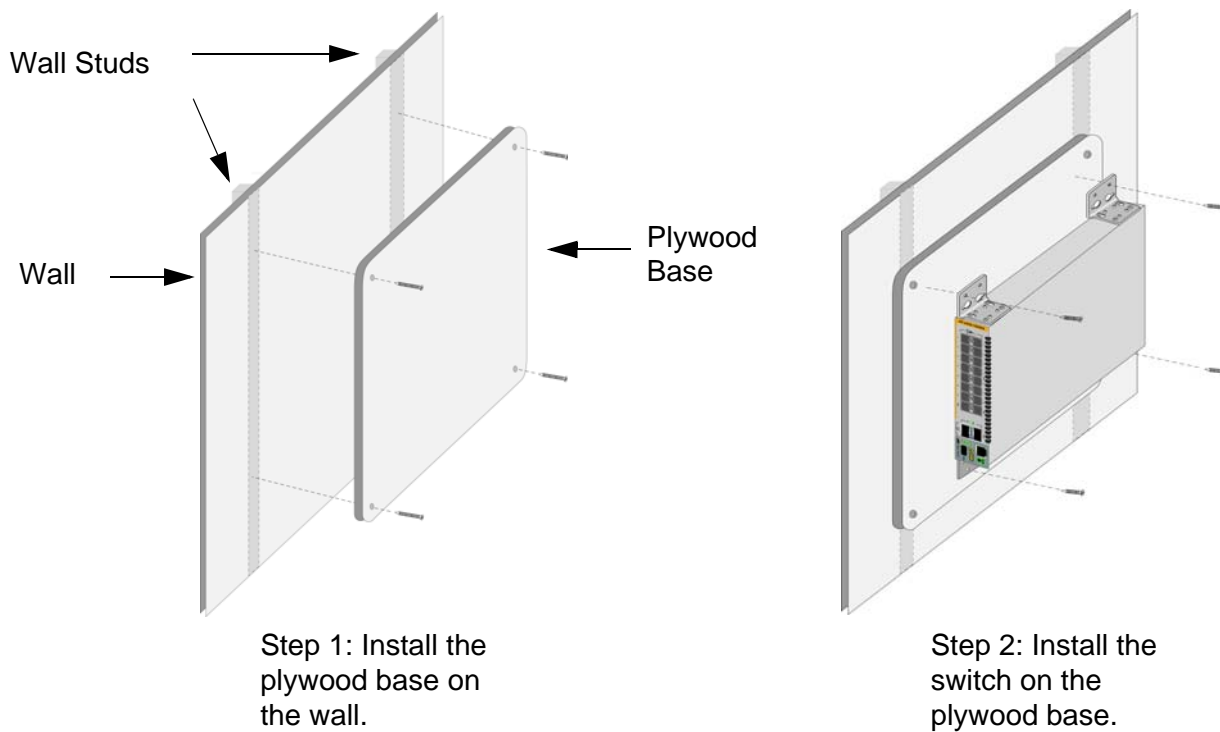


Figure 42. Steps to Installing the Switch with a Plywood Base

## 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 81. Consult a qualified building contractor for installation instructions for the plywood base. The installation guidelines are listed here:

- ☐ You should use a stud finder to identify the middle of studs and hot electrical wiring in the wall.
- ☐ You should attach the base to two wall studs with a minimum of four screws.
- ☐ The selected wall location for the base should 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

---

This procedure assumes that the plywood base for the switch is already installed on the wall. Please review “Reviewing Safety Precautions” on page 48 and “Choosing a Site for the Switch” on page 52 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 may result if it is not properly fastened to the wall. *See E105*

---

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

1. Place the switch in a table.
2. For the AT-x550-18XTQ or AT-x550-18XSQ Switch, install the four AT-BRKT-J24 wall brackets to the sides of the unit, with the sixteen M4x6mm screws included with the switch. Refer to Figure 43.

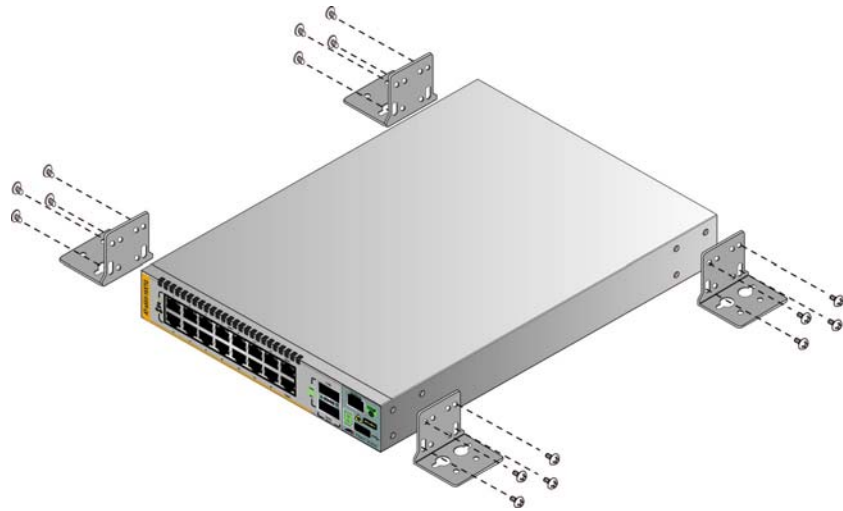


Figure 43. Installing the Wall Brackets

3. For the AT-x550-18XSPQm Switch, install the two wall/equipment rack brackets to the sides of the unit with the eight M4x6mm screws included with the switch. The brackets should be installed diagonally across from each other. Refer to Figure 44.

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.



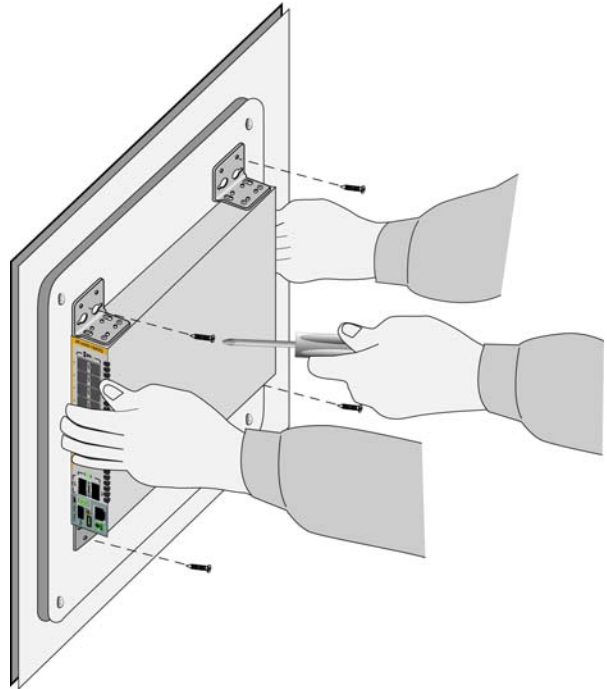
Figure 44. Installing the Brackets on the AT-x550-18XSPQm Switch

4. 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 45 on page 86.

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

- ☐ Position it so that the front panel is either on the left or right. Refer to Figure 43. Do not install it with the front panel facing up or down.
- ☐ Leave sufficient space from other devices or walls so that you can access the front and back panels, and for adequate air ventilation.

AT-x550-18XTQ  
AT-x550-18XSQ



AT-x550-18XSPQm

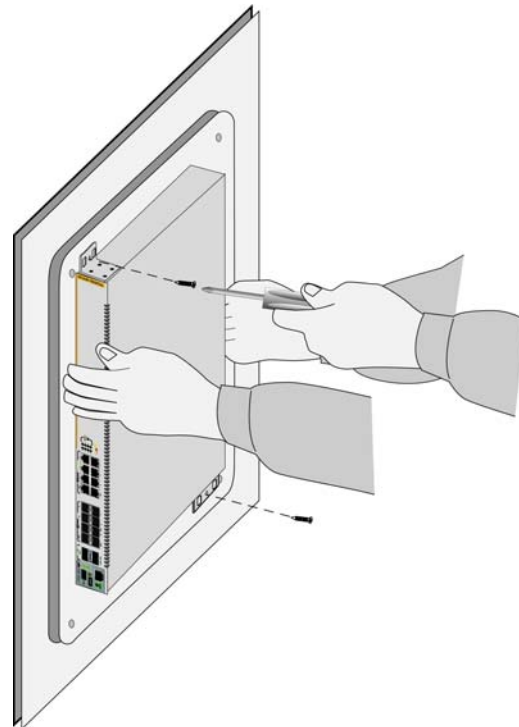


Figure 45. Securing the Switch to the Plywood Base

5. Go to Chapter 5, “Powering On the Switch” on page 91.

## 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 78
- ❑ “Installation Guidelines” on page 79




### Warning

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

---



### Warning

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

---

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

1. Place the switch in a table.
2. For the AT-x550-18XTQ or AT-x550-18XSQ Switch, install the four AT-BRKT-J24 wall brackets to the sides of the unit, with the sixteen M4x6mm screws included with the switch. Refer to Figure 43 on page 84.
3. For the AT-x550-18XSPQm Switch, install the two wall/equipment rack brackets to the sides of the unit with the eight M4x6mm screws included with the switch. The brackets should be installed diagonally across from each other. Refer to Figure 44 on page 85.
4. Have another people hold the switch on the concrete wall at the selected location for the device while you use a pencil or pen to mark the wall with the locations of the four screw holes in the four brackets (one screw per bracket). Refer to Figure 46 on page 88.

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

- ❑ Position the switch so that the front panel is either on the left or the right. Refer to Figure 40 on page 78. You may not install the switch with the front panel facing up or down.
- ❑ Leave sufficient space from other devices or walls so that you can access the front and back panels, and for adequate air ventilation.

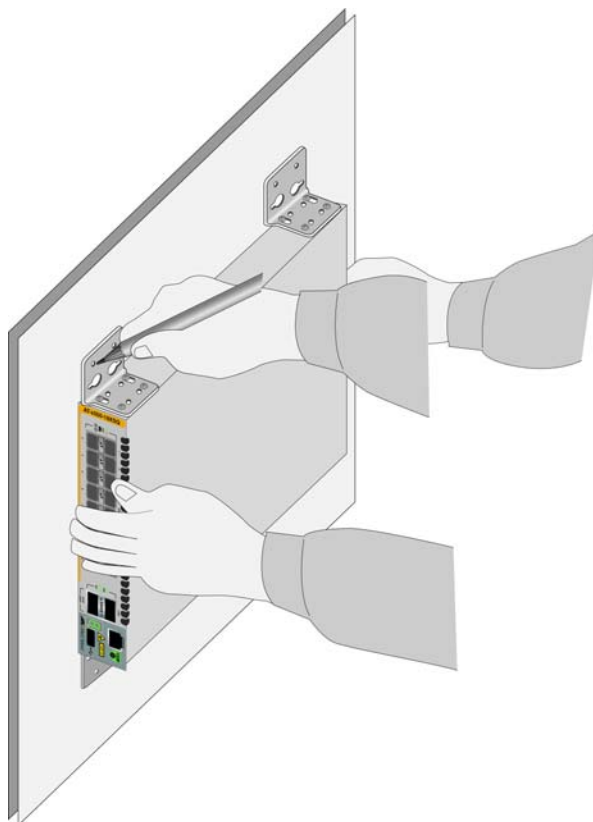


Figure 46. Marking the Locations of the Bracket Holes on a Concrete Wall

5. Place the switch on a table or desk.
6. Use a drill and 1/4" 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.
  - ☐ Allied Telesis recommends cleaning out the holes with a brush or compressed air.
7. Insert the anchors into the holes.
8. Have another person hold the switch at the selected wall location while you secure it to the wall with the M4x32mm provided screws. Refer to Figure 47 on page 89.



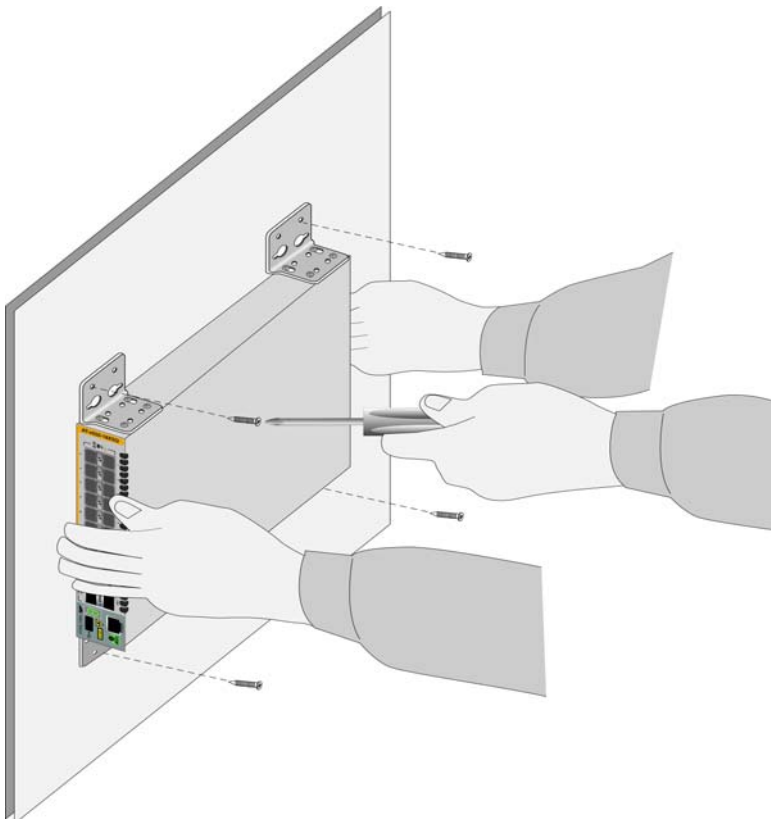


Figure 47. Installing the Switch on a Concrete Wall

9. Go to Chapter 5, “Powering On the Switch” on page 91.



## Chapter 5

# Powering On the Switch

---

This chapter contains the following procedures:

- ❑ “Powering On the Switch” on page 92
- ❑ “Monitoring the Initialization Processes” on page 95

## Powering On the Switch

Before powering on the switch, review the information in “Power Specifications” on page 128 for the power specifications.



### Warning

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

### Note

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

To power on the switch, perform the following procedure:

1. Install the power cord retaining clip on the AC power connector on the rear panel of the switch. Refer to Figure 48.

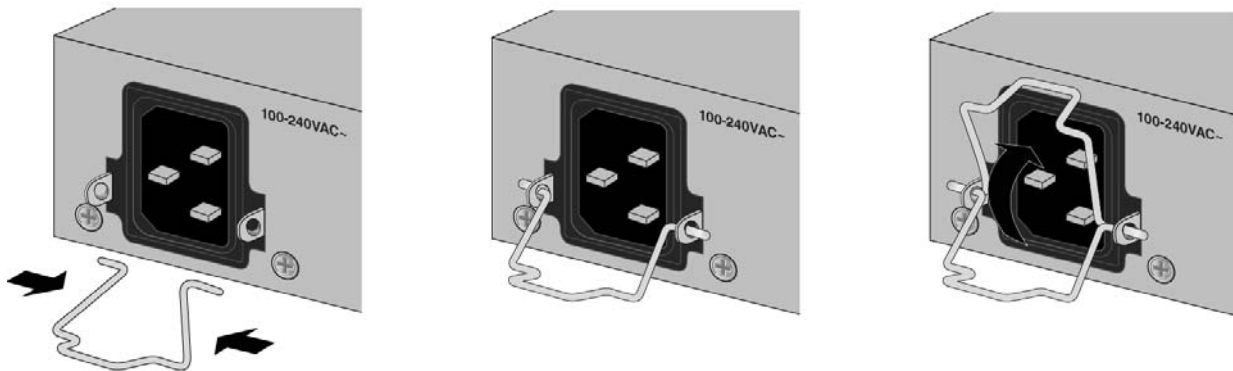


Figure 48. Installing the Power Cord Retaining Clip

2. Connect the AC power cord to the AC power connector on the rear panel. Refer to Figure 49 on page 93.

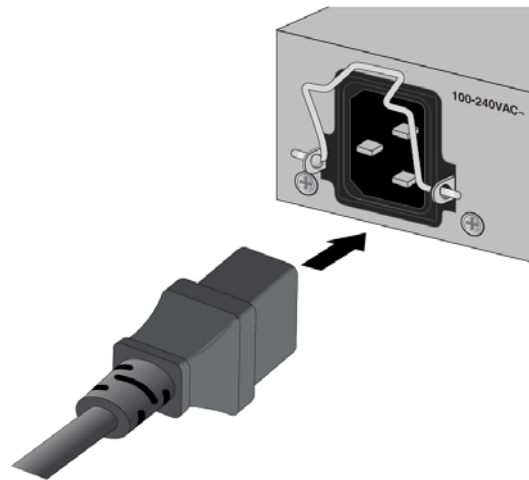


Figure 49. Connecting the AC Power Cord

3. Lower the power cord retaining clip to secure the cord to the switch. Refer to Figure 50.

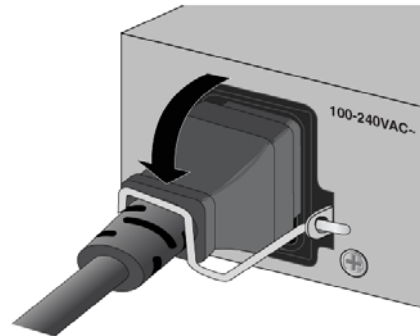


Figure 50. Lowering the Power Cord Retaining Clip

4. Connect the power cord to an appropriate AC power source. Refer to Figure 51 on page 94.

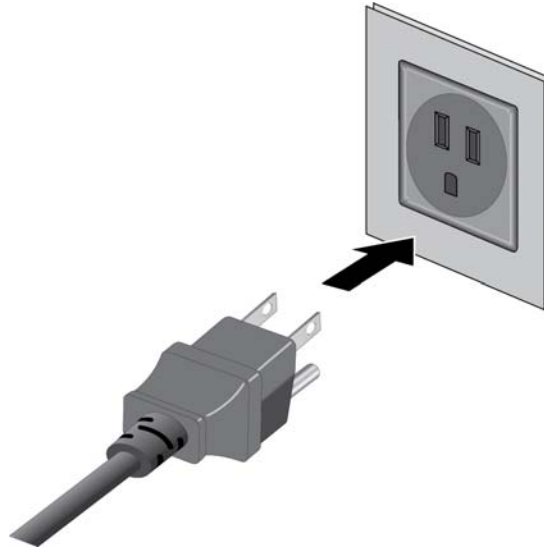


Figure 51. Connecting the Power Cord to an AC Power Source

---

**Note**

The illustration shows a North American power cord. Your power cord may be different.

---

5. Do one of the following:
  - ☐ To monitor the switch as it initializes the management software, go to “Monitoring the Initialization Processes” on page 95.
  - ☐ Wait two minutes for the switch to initialize its management software and then go to Chapter 6, “Configuring the Switch for Stand-alone Operations” on page 99.

## 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 101.) The switch displays the messages in Figure 52 to Figure 54 on page 97 on the Console port as it initializes the management software.

```

Bootloader 6.2.3 loaded
Press <Ctrl+B> for the Boot Menu
Loading flash:x550-cap_x550-5.4.8-0.1.rel...
Verifying release... OK
Booting...
Uncompressing Linux... done, booting the kernel
Starting base/first... [ OK ]
Mounting virtual filesystems... [ OK ]

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

Allied Telesis Inc.
AlliedWare Plus (TM) v5.4.8
Current release filename: x550-5.4.8-0.2.rel
Built: Mon Apr 21 13:30:30 UTC 2018
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/dbus... [ OK ]
Starting base/linux... [ OK ]
Starting base/syslog... [ OK ]

```

Figure 52. 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 base/inet... [ OK ]
Received event apteryx.done
Starting hardware/early_host_info... [ OK ]
Starting base/eventwatch... [ 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/plugman... [ OK ]
Starting base/openhpi... [ OK ]
Starting hardware/timeout... [ OK ]
Received event board.inserted
Starting hardware/hardware-done... [ OK ]
Received event hardware.done
Starting network/startup... [ OK ]
Starting base/external-media... [ OK ]
Received event hostcfg.done
Starting network/lld... [ OK ]
Starting network/stackd... [ OK ]
Starting network/election.timeout... [ OK ]
Received event network.enabled
Initializing HA processes:
hostd, atmfd_agentd, auth, epsr, imiproxyd, lldpd, mstp
ospf6d, atmfd_agentd, rmon, sflowd, atmfd, cntrd, irdpd
l2cp, loopprot, nsm, onm, pdmd, pim6d, ripd
udldd, vrrpd, bgpd, hsl, imi, ospfd, pimd

```

Figure 53. Switch Initialization Messages (Continued)



Received event network.initialized

00:50:36 awplus-1 VCS[688]: No Neighboring members found, unit may be in a standalone configuration

Received event vcs.elected-master

00:50:36 awplus-1 VCS[688]: Startup speed can be improved by adding 'no stack 1 enable' to configuration

00:50:36 awplus-1 VCS[688]: Member 1 has become the Active Master

Assigning Active Workload to HA processes:

hsl, nsm, epsrd, lacpd, lldpd, loopprotd, mstp

onmd, ospf6d, ospfd, pdmd, ripd, ripngd, rmond

vrpd, ayuthd, bgpd, irpd, pim6d, pimd, pimd, sflowd

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 54. Switch Initialization Messages (Continued)

After the switch has initialized its management software, go to Chapter 6, "Configuring the Switch for Stand-alone Operations" on page 99.



## Chapter 6

# Configuring the Switch for Stand-alone Operations

---

This chapter contains the following procedures:

- ❑ “Determining the Stand-alone or Stacking Status of the Switch” on page 100
- ❑ “Starting a Local Management Session” on page 101
- ❑ “Disabling the VCStack Feature” on page 103
- ❑ “Configuring QSFP+ Transceiver Slots 17 and 21 for Breakout Cables” on page 105
- ❑ “Saving Your Changes and Rebooting the Switch” on page 106
- ❑ “Specifying Ports in the Command Line Interface for Stand-alone Switches” on page 107

## Determining the Stand-alone or Stacking Status of the Switch

---

After powering on the switch and waiting two minutes for it to initialize its management software, examine the switch ID LED on the front panel. If the LED is displaying the number “1” or higher, the VSTACK feature is enabled on the unit. You need to disable it to use the switch in stand-alone mode. For instructions, start with “Starting a Local Management Session” on page 101.

If the LED is displaying “0”, the VSTACK feature is already disabled and the switch is operating as a stand-alone unit. Do one of the following:

- ❑ If you plan to use breakout cables in the QSFP+ transceiver slots, perform “Starting a Local Management Session” on page 101 and “Configuring QSFP+ Transceiver Slots 17 and 21 for Breakout Cables” on page 105.
- ❑ Otherwise, go to Chapter 7, “Cabling the Networking Ports” on page 109.



### Caution

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

---

---

### Note

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

---

## Starting a Local Management Session

---

This procedure requires a terminal or a terminal emulator program and the management cable that comes with the switch. To start a local management session on the switch, perform the following procedure:

1. Connect the RJ-45 connector on the management cable to the Console port on the front panel of the switch, as shown in Figure 55.

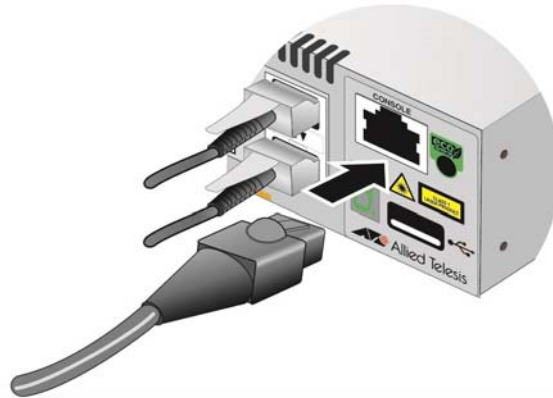


Figure 55. Connecting the Management Cable to the Console Port

2. Connect the other end of the cable to an RS-232 port on a terminal or PC with a terminal emulator program.
3. Configure the terminal or terminal emulator program as follows:
  - ☐ Baud rate: 9600 bps (The baud rate of the Console Port is adjustable from 1200 to 115200 bps. The default is 9600 bps.)
  - ☐ Data bits: 8
  - ☐ Parity: None
  - ☐ Stop bits: 1
  - ☐ Flow control: None

---

**Note**

The port settings are for a DEC VT100 or ANSI terminal, or an equivalent terminal emulator program.


---

4. Press Enter.

You are prompted for a user name and password.

5. When prompted, enter a user name and password to log on 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 prompt, shown in Figure 56. is displayed.



```
awpl us>
```

Figure 56. User Exec Mode Prompt

---

**Note**

The User Exec mode is the first level in the command mode interface. For complete information on the modes and commands, refer to the *Software Reference for x550 Series Switches, AlliedWare Plus Operating System* at [www.alliedtelesis.com](http://www.alliedtelesis.com).

---

6. Do one of the following:
  - ❑ If you need to disable the VCStack feature, perform the procedure in “Disabling the VCStack Feature” on page 103.
  - ❑ If the VCStack feature is already disabled, but you plan to use breakout cables in the QSFP+ slots, go to “Configuring QSFP+ Transceiver Slots 17 and 21 for Breakout Cables” on page 105.

## Disabling the VCSStack Feature

The following procedures explain how to disable the VCSStack feature to use the switch as a stand-alone unit.



### Caution

Disabling the VCSStack feature requires resetting the switch. Some network traffic may be lost if the switch is connected to a live network. *E89*

To disable the VCSStack feature, perform the following procedure:

1. Start a local management session on the switch. For instructions, refer to “Starting a Local Management Session” on page 101.
2. At the User Exec mode prompt, enter the SHOW STACK command to display the status of the VCSStack feature on the switch. Figure 57 is an example of the command.

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

Figure 57. SHOW STACK Command

3. If the Operational Status of the switch is “Stacking Hardware Disabled,” the VCSStack feature is already disabled on the unit. You can use the transceiver slots 17 and 21 with QSFP+ transceivers as regular networking ports. To use the slots with breakout cables, go to “Configuring QSFP+ Transceiver Slots 17 and 21 for Breakout Cables” on page 105. Otherwise, go to Chapter 7, “Cabling the Networking Ports” on page 109.
4. If the Operational Status is “Standalone Unit,” the VCSStack feature is active on the unit. (The “standalone” status means the switch is functioning as a stack of one switch.) You must disable the feature to use the switch as a stand-alone unit. Continue with the next step.
1. Move to the Global Configuration mode by entering the ENABLE and CONFIGURE TERMINAL commands, as shown in Figure 58 on page 104.

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

Figure 58. Moving to the Global Configuration Mode

2. To disable the VCStack feature, enter the NO STACK ENABLE command in this format:

```
no stack id enable
```

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

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

The confirmation prompt in Figure 59 is displayed.

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

Figure 59. Confirmation Prompt for the NO STACK ENABLE Command

3. Type Y to disable VCStack on the switch or N to cancel the procedure.

The switch displays the message in Figure 60.

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

Figure 60. Disabling VCStack

4. Press the Return key to re-display the Global Configuration mode prompt.
5. Do one of the following:
  - ❑ To configure P17 and P21 transceiver slots for breakout cables, go to “Configuring QSFP+ Transceiver Slots 17 and 21 for Breakout Cables” on page 105 and start with step 3.
  - ❑ Otherwise, go to “Saving Your Changes and Rebooting the Switch” on page 106.



## Configuring QSFP+ Transceiver Slots 17 and 21 for Breakout Cables

---

To configure the QSFP+ transceiver slots 17 and 21 for breakout cables, perform the following procedure:

1. Start a local management session on the switch. For instructions, refer to “Starting a Local Management Session” on page 101.
2. Move to the Global Configuration mode by entering the `ENABLE` and `CONFIGURE TERMINAL` commands, as shown in Figure 58 on page 104.
3. Enter the `PLATFORM PORTMODE INTERFACE` command to configure one or both QSFP+ transceiver slots for breakout cables. The format of the command is shown here:

```
pl atform portmode i nterface ports 10gx4 | 40g
```

The `PORTS` variable specifies the QSFP+ transceiver slots for the breakout cables, which are 1.0.17 and 1.0.21 on the x550 Ethernet Switch Series. The 10gx4 parameter configures the slots for breakout cables while the 40g parameter configures the slots for regular QSFP+ transceivers, which is the default.

This example of the command configures QSFP+ transceiver slot 17 for a breakout cable:

```
awpl us(confi g)# pl atform portmode i nterface port1.0.17
10gx4
```

4. After configuring the transceiver slots, go to “Saving Your Changes and Rebooting the Switch” on page 106.

## Saving Your Changes and Rebooting the Switch

---

After disabling the VCStack feature or configuring the 1.0.17 and 1.0.21 transceiver slots for breakout cables, you have to save your configuration changes and reboot the switch. Changes to the status of the VCStack feature and QSFP+ transceiver slots do not take affect until after you reboot the unit.

To save your configuration changes and reboot the switch, perform the following procedure:

1. From the Global Configuration mode, enter the EXIT command to return to the Privileged Exec mode, as shown in Figure 61.

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

Figure 61. Returning to the Privileged Exec Mode

2. Enter the WRITE command to save your change in the configuration file. The switch displays the confirmation prompt in Figure 62.

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

Figure 62. Saving the Changes with the WRITE Command

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

3. Enter the REBOOT command to reboot the switch.
4. At the confirmation prompt, type “Y” for yes.
5. Wait two minutes for the switch to initialize its management software and afterwards examine the Switch ID LED again. The switch is ready for normal network operations as a stand-alone unit if its ID number is “0.” If the number is not “0,” repeat the procedures in this chapter, being sure to save your configuration changes with the WRITE command.
6. Go to Chapter 7, “Cabling the Networking Ports” on page 109.

## Specifying Ports in the Command Line Interface for Stand-alone Switches

The individual ports on the switches are specified in the command line interface with the PORT parameter. The format of the parameter is shown in Figure 63.

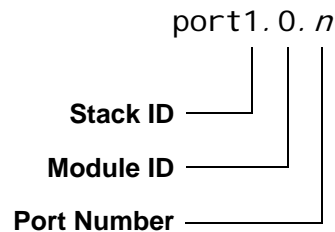


Figure 63. PORT Parameter in the Command Line Interface

The three parts of the PORT parameter are described in Table 15.

Table 15. PORT Parameter Format

| Number      | Description   |
|-------------|---|
| Stack ID    | Designates the switch's ID number. The correct value is "1" for a stand-alone switch. Do not enter 0, the value displayed on the Switch ID LED. |
| Module ID   | Designates the module number of a port. The x550 Series switches do not have modules. Consequently, this value is always 0 (zero).              |
| Port Number | Designates a port number.   |

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

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

For instructions on the command line interface and the PORT parameter, refer to the *Software Reference for x550 Series Switches, AlliedWare Plus Operating System*.



## Chapter 7

# Cabling the Networking Ports

---

This chapter contains the following procedures:

- ❑ “Cabling Twisted Pair Ports on AT-x550-18XTQ and AT-x550-18XSPQm Switches” on page 110
- ❑ “Guidelines to Handling SFP, SFP+, and QSFP+ Transceivers” on page 111
- ❑ “Installing 1Gbps SFP or 10Gbps SFP+ Transceivers in AT-x550-18XSQ and AT-x550-18XSPQm Switches” on page 112
- ❑ “Installing AT-SP10TW Direct Connect Twinax Cables in AT-x550-18XSQ and AT-x550-18XSPQm Switches” on page 116
- ❑ “Installing AT-QSFPSR4 or AT-QSFPLR4 Transceivers in QSFP+ Slots” on page 118
- ❑ “Installing AT-QSFPCU Cables in QSFP+ Slots” on page 119

## **Cabling Twisted Pair Ports on AT-x550-18XTQ and AT-x550-18XSPQm Switches**

---

Here are the guidelines to cabling the twisted pair ports on AT-x550-18XTQ and AT-x550-18XSPQm switches:

- ❑ The cable specifications for the ports on the AT-x550-18XTQ switch are listed in Table 3 on page 22.
- ❑ The cable specifications for the ports on the AT-x550-18XSPQm switch are listed in Table 6 on page 26 and Table 7 on page 26.
- ❑ PoE is enabled by default on the ports on the AT-x550-18XSPQm switch.
- ❑ The connectors on the cables should fit snugly into the ports, and the tabs should 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 Aut-Negotiation.
- ❑ The ports must be set to Auto-Negotiation, the default setting, to operate at 1000Mbps.
- ❑ The ports support full-duplex only.
- ❑ Do not attach cables to ports of static or 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, SFP+, and QSFP+ Transceivers

---

Please review the following guidelines before installing SFP, SFP+, or QSFP+ 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.
- ❑ You should install a transceiver before connecting its 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. ⚡ E92

---

### Note

QSFP+ transceiver slots 17 and 21 are initially configured as stacking slots for the VCStack feature. If you are using the switch as a stand-alone unit, you can use the slots and QSP+ transceivers as regular Ethernet networking ports by disabling the VCStack feature. For instructions, refer to “Disabling the VCStack Feature” on page 103.

---

## Installing 1Gbps SFP or 10Gbps SFP+ Transceivers in AT-x550-18XSQ and AT-x550-18XSPQm Switches

---

This section contains installation instructions for SFP or SFP+ transceivers in slots 1 to 16 in the AT-x550-18XSQ Switch and slots 9 to 16 in the AT-x550-18XSPQm Switch.

The 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 slot for the transceiver.
2. If the slot has a dust cover, remove it. Refer to Figure 64.

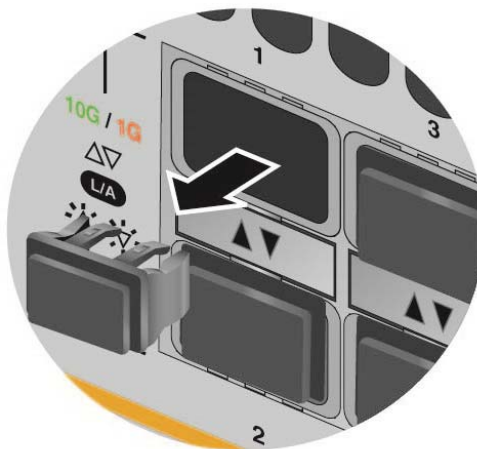


Figure 64. Removing the Dust Plug from an SFP Slot

3. Remove the transceiver from its shipping container and store the packaging material in a safe location.
4. If you are installing the transceiver in a top slot, position the transceiver with the Allied Telesis label facing up. If you are installing the transceiver in a bottom slot, position the transceiver with the label facing down. Refer to Figure 65 on page 113.



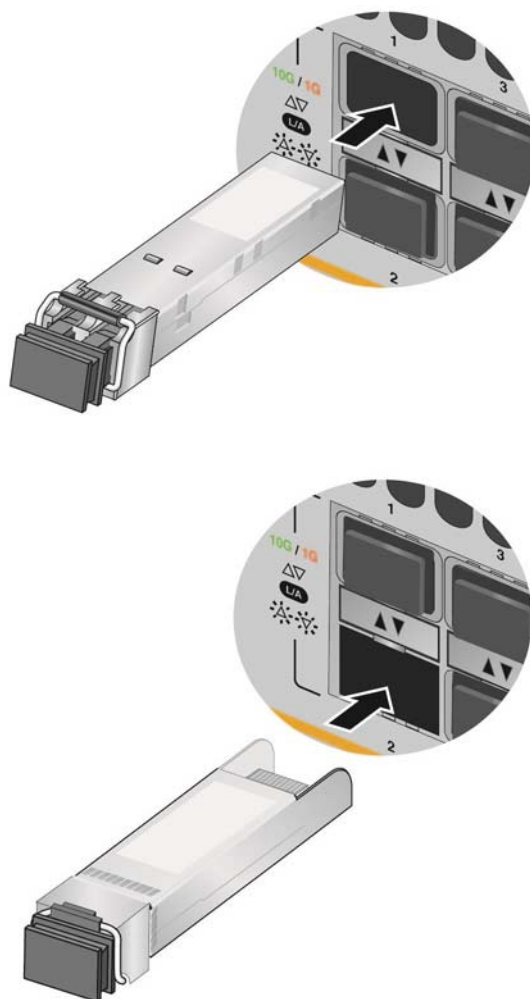


Figure 65. Installing an SFP Transceiver

5. Slide the transceiver into the slot 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 to 4 to install the remaining transceivers in the switch.

---

6. Remove the dust cover from the transceiver, as shown in Figure 66.

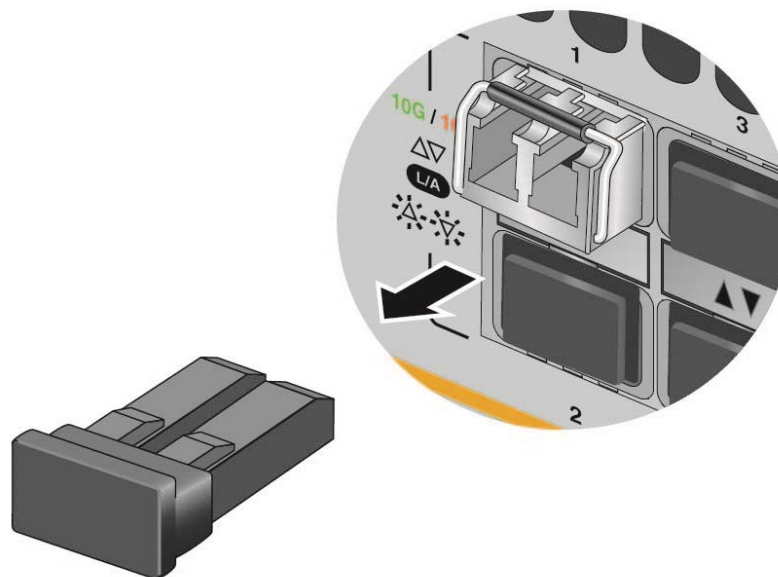


Figure 66. Removing the Dust Cover from an SFP or SFP+ Transceiver

7. Verify the position of the handle on the transceiver. If the transceiver is in a top slot, the handle should be in the upright position, as shown in Figure 67. If the transceiver is in a bottom slot, the handle should be in the down position.

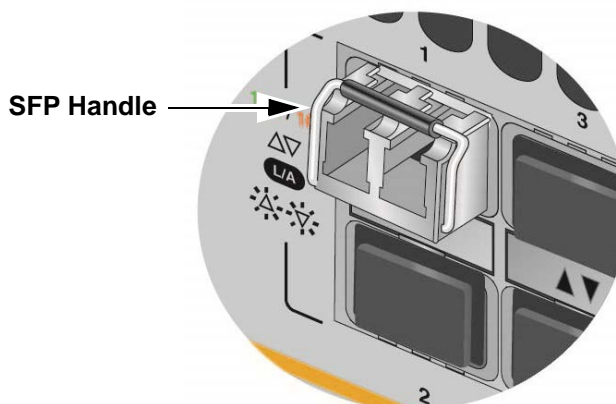


Figure 67. Positioning the SFP or SFP+ Handle in the Upright Position

8. Connect the fiber optic cable to the transceiver, as shown in Figure 68 on page 115. The connector on the cable should fit snugly into the port, and the tab should lock the connector into place.

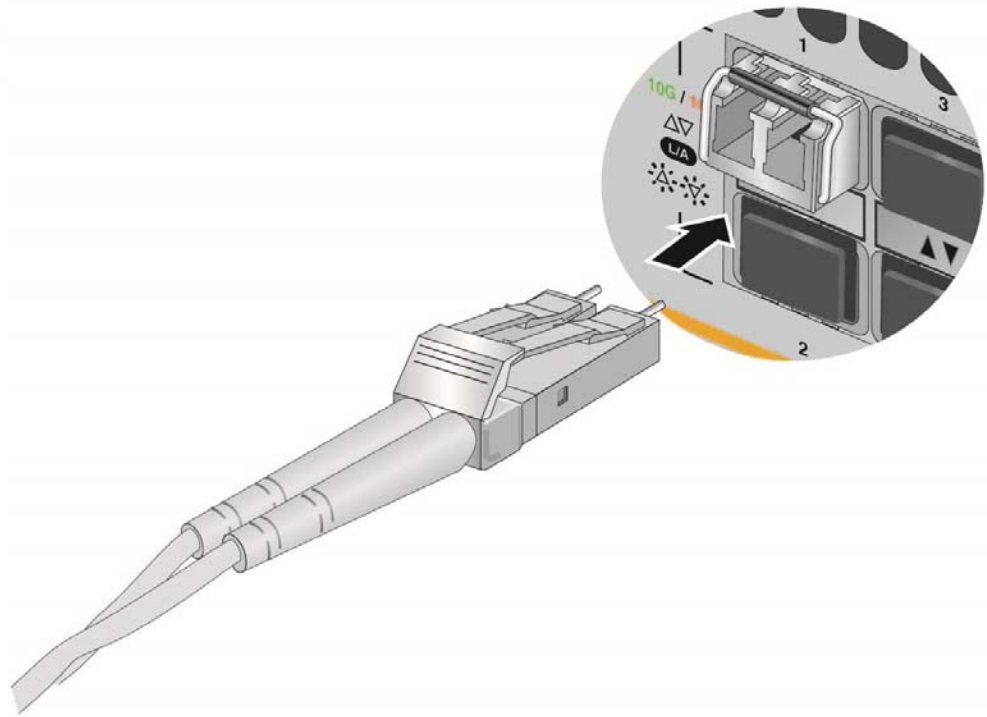


Figure 68. Connecting a Fiber Optic Cable to an SFP or SFP+ Transceiver

9. Repeat this procedure to install additional transceivers.

## Installing AT-SP10TW Direct Connect Twinax Cables in AT-x550-18XSQ and AT-x550-18XSPQm Switches

---

The SFP and SFP+ transceiver slots 1 to 16 on the AT-x550-18XSQ Switch and slots 9 to 16 in the AT-x550-18XSPQm Switch support AT-SP10TW direct connect twinax cables. The cables are an economical way to add 10Gbps connections over short distances. They have SFP+ transceivers on both ends and come in lengths of 1, 3, and 7 meters.

To install AT-SP10TW cables in AT-x550-18XSQ or AT-x550-18XSPQm switches, perform the following procedure:

1. Select a slot for the transceiver.
1. If the slot has a dust cover, remove the cover. Refer to Figure 64 on page 112.
2. Remove the transceiver from its shipping container and store the packaging material in a safe location.
3. To install the transceiver in a slot in the top row, position the transceiver with the Allied Telesis label facing up. To install the transceiver in a slot in the bottom row, position the transceiver with the label facing down. Refer to Figure 69 on page 116.

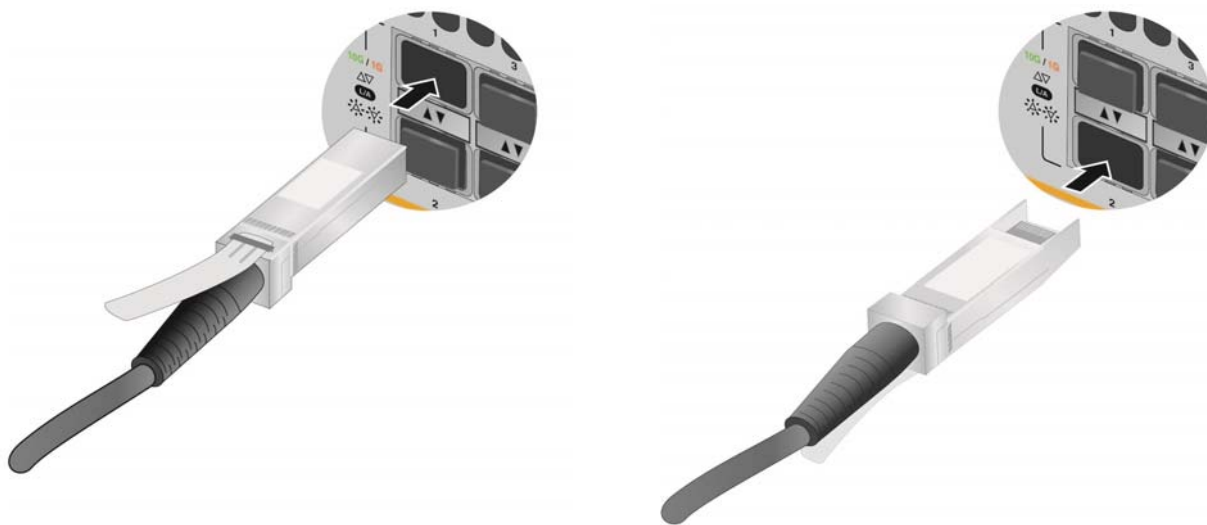


Figure 69. Installing AT-SP10TW Cables

4. Slide the transceiver into the slot until it clicks into place.
5. Connect the other end of the cable into an SFP+ slot on another network device.

6. Repeat this procedure to install additional transceivers.

---

**Note**

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

---

## **Installing AT-QSFPSR4 or AT-QSFPLR4 Transceivers in QSFP+ Slots**

---

This section contains the procedure for installing AT-QSFPSR4 or AT-QSFPLR4 transceivers in the QSFP+ slots 17 and 21.

Please review “Guidelines to Handling SFP, SFP+, and QSFP+ Transceivers” on page 111 before performing this procedure.

To install AT-QSFPSR4 or AT-QSFPLR4 transceivers, perform the following procedure:

1. Remove the dust cover from QSFP+ slot 17 or 21. Refer to Figure 70 on page 119.
2. Slide a QSFP+ transceiver into the slot until it clicks into place.
3. Attach fiber optic cable to the transceiver.
4. Connect the other end of the cable to a compatible QSFP+ port in another network device.
5. Repeat this procedure to install a second QSFP+ transceiver.

---

**Note**

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

---

## Installing AT-QSFPCU Cables in QSFP+ Slots

This section contains instructions on how to install AT-QSFPCU Cables in the QSFP+ slots 17 and 21. You can use the cables in place of fiber optic cables and transceivers for 40GbE links of up to 1 or 3 meters. The model names of the cables are listed here:

- ❑ AT-QSFP1CU - 1 meter
- ❑ AT-QSFP3CU - 3 meters

Please review “Guidelines to Handling SFP, SFP+, and QSFP+ Transceivers” on page 111 before performing this procedure.

To install AT-QSFPCU Cables, perform the following procedure:

1. Remove the dust cover from a QSFP+ slot in the switch. Figure 70 shows the removal of the dust cover from slot 17.

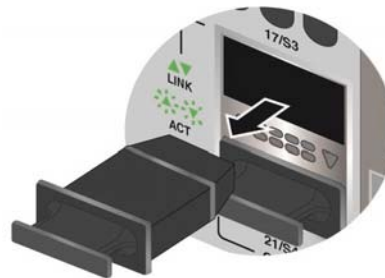


Figure 70. Removing the Dust Cover from a QSFP+ Transceiver Slot

2. Orient the connector on the AT-QSFPCU Cable with the release tab on top and slide it into the slot until it clicks into place. Refer to Figure 71.

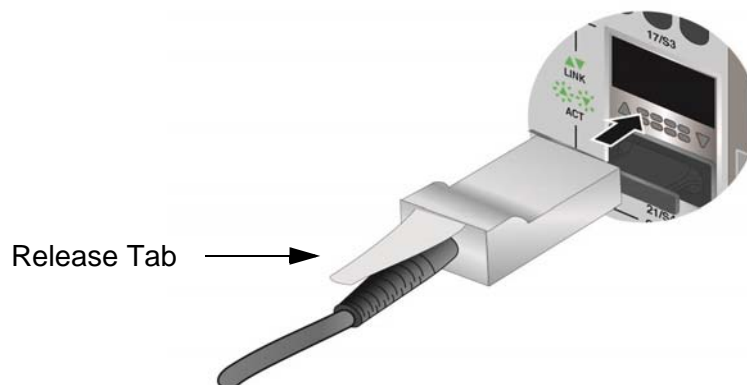


Figure 71. Sliding the AT-QSFPCU Cable into the Slot

3. Install the other end of the cable into a compatible QSFP+ slot on another network device.
4. Repeat this procedure to install additional AT-QSFPCU Cables.

---

**Note**

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

---



## Chapter 8

# 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](http://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 128.

**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 AT-x550-18XTQ or AT-x550-18XSPQm 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. Cable requirements are listed in Table 2 on page 22.
- ❑ Verify that the port is connected to the correct twisted pair cable.

---

**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 slot.
- ❑ 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's management software to verify that the port is enabled.
- ❑ If the remote network device is a managed device, use its management firmware to determine whether its port is enabled.
- ❑ Test the attenuation of both directions on the fiber optic cable with a fiber optic tester to determine whether the optical signal is too weak (sensitivity) or too strong (maximum input power).

**Problem 5:** A port on the AT-x550-18XSPQm Switch is not providing power to a PoE or PoE+ device.

**Solutions:** Try the following:

- ❑ Review the PD's documentation to confirm that the device supports Mode A of the IEEE 802.3at standard. Mode A is one of

two modes that define the connector pins that deliver the power from the port in the switch to the powered device. In Mode A, the power is carried on pins 1, 2, 3, and 6 on the RJ-45 port, the same pins that carry the network traffic. The second mode, Mode B, defines pins 4, 5, 7, and 8 as the power carriers. The AT-x550-18XSPQm 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.

- ❑ Check that the device's power requirements do not exceed 30 W. This can be verified by reviewing the device's documentation or data sheet.
- ❑ Verify that you are using the appropriate category of twisted-pair cable by referring to Table 6 on page 26 and Table 7 on page 26.
- ❑ 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 6:** The switch functions intermittently.

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

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

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

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

- ❑ A cooling fan has failed.
- ❑ The 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 126
- ❑ "Environmental Specifications" on page 127
- ❑ "Power Specifications" on page 128
- ❑ "Certifications" on page 129
- ❑ "RJ-45 Twisted Pair Port Pinouts" on page 130
- ❑ "RJ-45 Style Serial Console Port Pinouts" on page 131

## Physical Specifications

---

### Dimensions (H x W x D)

Table 16 lists the dimensions of the switches.

Table 16. Product Dimensions

|                 |   |
|-----------------|---|
| AT-x550-18XTQ   | 4.4 cm x 21.0 cm x 34.4 cm<br>(1.7 in. x 8.3 in. x 13.6 in.)  |
| AT-x550-18XSQ   | 4.4 cm x 21.0 cm x 34.4 cm<br>(1.7 in. x 8.3 in. x 13.6 in.)  |
| AT-x550-18XSPQm | 4.4 cm x 44.0 cm x 26.0 cm<br>(1.7 in. x 17.3 in. x 10.2 in.) |

### Weights

Table 17 lists the weights of the switches and power supplies.

Table 17. Product Weights

|                 |                    |
|-----------------|--------------------|
| AT-x550-18XTQ   | 3.11 kg (6.85 lb.) |
| AT-x550-18XSQ   | 3.18 kg (7.00 lb.) |
| AT-x550-18XSPQm | 4.15 kg (9.15 lb.) |

### Ventilation

Table 18 lists the ventilation requirements.

Table 18. Ventilation Requirements

|   |                |
|---|----------------|
| Recommended Minimum<br>Ventilation on All Sides | 10 cm (4.0 in) |
|---|----------------|

## Environmental Specifications

---

Table 19 lists the environmental specifications of the switches.

Table 19. Environmental Specifications

|                               |                                    |
|-------------------------------|------------------------------------|
| Operating Temperature         | 0° C to 45° C (32° F to 113° F)    |
| Storage Temperature           | -25° C to 70° C (-13° F to 158° F) |
| Operating Humidity            | 5% to 90% noncondensing            |
| Storage Humidity              | 5% to 95% noncondensing            |
| Maximum Operating Altitude    | 3,000 m (9,842 ft)                 |
| Maximum Nonoperating Altitude | 4,000 m (13,100 ft)                |

## Power Specifications

---

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

### Maximum Power Consumption

Table 20 lists the maximum power consumptions for the switches.

Table 20. Maximum Power Consumptions

|                 |                        |
|-----------------|------------------------|
| AT-x550-18XTQ   | 128.0 watts            |
| AT-x550-18XSQ   | 111.0 watts            |
| AT-x550-18XSPQm | 391.0 watts (with PoE) |

### Input Voltages

Table 21 lists the input voltages for the switches.

Table 21. Input Voltages

|                 |                                      |
|-----------------|--------------------------------------|
| AT-x550-18XTQ   | 100-240 VAC~, 1.5A maximum, 50/60 Hz |
| AT-x550-18XSQ   | 100-240 VAC~, 1.5A maximum, 50/60 Hz |
| AT-x550-18XSPQm | 100-240 VAC~, 4A maximum, 50/60 Hz   |

### Heat Dissipation

Table 22 lists the heat dissipation for the switches.

Table 22. Heat Dissipation

|                 |             |
|-----------------|-------------|
| AT-x550-18XTQ   | 436 BTU/hr  |
| AT-x550-18XSQ   | 378 BTU/hr  |
| AT-x550-18XSPQm | 1334 BTU/hr |



## Certifications

---

Table 23 lists the product certificates.

Table 23. Product Certifications

|                             |   |
|-----------------------------|---|
| EMI (Emissions)             | FCC Class A, EN55032 Class A, EN61000-3-2, EN61000-3-3, VCCI Class A, CISPR Class A, C-TICK, CE |
| EMC (Immunity)              | EN55024   |
| Electrical and Laser Safety | EN60950-1 (TUV), UL 60950-1 (CUL <sub>US</sub> ), EN60825                                       |
| Compliance Marks            | CE, CUL <sub>US</sub> , TUV, C-Tick   |

# RJ-45 Twisted Pair Port Pinouts

Figure 72 illustrates the pin layout of the RJ-45 twisted pair ports on the AT-x550-18XTQ and AT-x550-18XSPQm Switches.

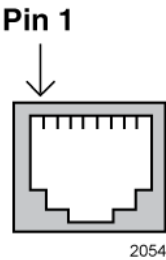


Figure 72. Pin Layout for the RJ-45 Twisted Pair Ports (Front View)

Twisted pair ports 1 to 16 on the AT-x550-18XTQ Switch can operate at 1Gbps or 10Gbps. Twisted pair ports 1 to 8 on the AT-x550-18XSPQm Switch can operate at 1Gbps, 2.5Gbps, 5Gbps, or 10Gbps. The pin signals are the same for all speeds. Refer to Table 24.

Table 24. Pin Signals for the Twisted Pair Ports

| Pinout | Pair     |
|--------|----------|
| 1      | Pair 1 + |
| 2      | Pair 1 - |
| 3      | Pair 2 + |
| 4      | Pair 3 + |
| 5      | Pair 3 - |
| 6      | Pair 2 - |
| 7      | Pair 4 + |
| 8      | Pair 4 - |

## RJ-45 Style Serial Console Port Pinouts

---

Table 25 lists the pin signals of the RJ-45 style serial Console port.

Table 25. RJ-45 Style Serial Console Port Pin Signals

| Pin | Signal           |
|-----|------------------|
| 1   | Looped to pin 8. |
| 2   | Looped to pin 7. |
| 3   | Transmit Data    |
| 4   | Ground           |
| 5   | Ground           |
| 6   | Receive Data     |
| 7   | Looped to pin 2. |
| 8   | Looped to pin 1. |

