Layer 2 Fast Ethernet Switch

AT-8000/8POE

Installation Guide

613-000238 Rev. C

Allied Telesis

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.

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

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

RFI Emissions	FCC Class A, EN55022 Class A, EN61000-3-2, EN61000-3-3, 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.

Immunity	EN55024
Electrical Safety	EN60950 (TUV), UL 60950 ($_{C}UL_{US}$)
Laser Safety	EN60825

Translated Safety Statements

Important: The ☞ indicates that a translation of the safety statement is available in a PDF document titled “Translated Safety Statements” (613-000405) posted on the Allied Telesis website at www.alliedtelesis.com.

Contents

Figures

Tables

Preface

This guide contains instructions on how to install the AT-8000/8POE Fast Ethernet Switch. This preface contains the following sections:

Safety Symbols Used in this Document

This document uses the safety symbols defined in Table 1.

Table 1. Safety Symbols

Symbol	Meaning	Description
	Caution	Performing or omitting a specific action may result in equipment damage or loss of data.
	Warning	Performing or omitting a specific action may result in electrical shock.

Where to Find Web-based Guides

The installation and user guides for all Allied Telesis products are available in portable document format (PDF) on our web site at **www.alliedtelesis.com**. You can view the documents online or download them onto a local workstation or server.

Contacting Allied Telesis

This section provides Allied Telesis contact information for technical support as well as sales or corporate information.

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For Technical Support via email or telephone, refer to the Allied Telesis web site: **www.alliedtelesis.com**. Select your country from the list displayed on the website. Then select the appropriate menu tab.

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To obtain an RMA number, contact the Allied Telesis Technical Support group at our web site: **www.alliedtelesis.com/support/rma**. Select your country from the list displayed on the website. Then select the appropriate menu tab.

For Sales or Corporate Information

You can contact Allied Telesis for sales or corporate information at our web site: **www.alliedtelesis.com**. Select your country from the list displayed on the website. Then select the appropriate menu tab.

Warranty

The AT-8000/8POE has a Lifetime Warranty (two years fan and PSU). Go to **www.alliedtelesis.com/warranty** for the specific terms and conditions of the warranty and for warranty registration.

Management Software Updates

New releases of management software for our managed products are available from either of the following Internet sites:

- Allied Telesis web site: **www.alliedtelesis.com**
- Allied Telesis FTP server: **ftp://ftp.alliedtelesis.com**

If you prefer to download new software from the Allied Telesis FTP server from your workstation's command prompt, you will need FTP client software and you must log in to the server. Enter "anonymous" for the user name and your email address for the password.

Chapter 1
Overview

The AT-8000/8POE Fast Ethernet Switch is designed to simplify the task of creating or expanding an Ethernet, Fast Ethernet, or Gigabit Ethernet network with the power of Power over Ethernet (PoE).

This chapter contains the follows sections:

Features

The features of the AT-8000/8POE Fast Ethernet Switch include:

- Port status LEDs
- Eight Auto-Negotiating 10/100Base-T twisted pair ports with Power over Ethernet (PoE) capability and one 10/100/1000Base-T port with RJ-45 connectors
- One combo small form-factor pluggable (SFP) port
- Auto MDI/MDI-X on the twisted pair ports
- IEEE 802.3 and IEEE 802.3u compliant
- IEEE 802.3x flow control in full-duplex operation; back pressure in half-duplex operation
- Store and forward switching mode
- MAC address table capacity of up to 8K addresses with automatic aging
- Menus-, web-based, and limited CLI configuration using the AT-S81 management software
- Power over Ethernet, IEEE 802.3af

Front and Back Panels

Figure 1 illustrates the front panel of the AT-8000/8POE Fast Ethernet Switch.

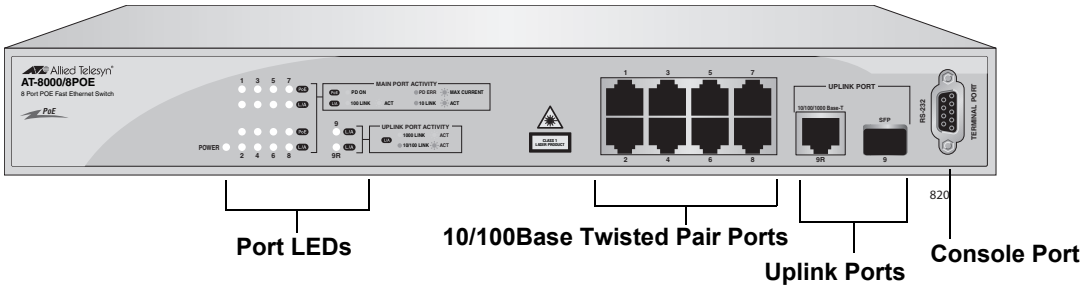

Figure 1. AT-8000/8POE Front Panel

Figure 2 illustrates the back panel of the AT-8000/8POE Fast Ethernet Switch.

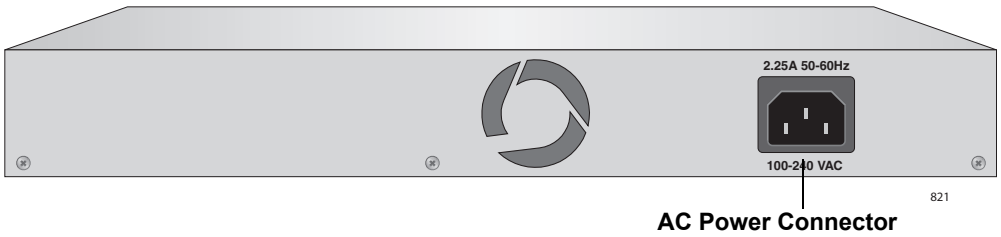

Figure 2. AT-8000/8POE Back Panel

Ports

The AT-8000/8POE Fast Ethernet Switch features eight twisted pair ports, one 10/100/1000Base-T port, and one combo SFP port.

Twisted Pair Ports

The twisted pair ports feature 8-pin RJ-45 connectors. (For the port pinouts, refer to “Connectors and Port Pinouts” on page 55.)

The ports on the AT-8000/8POE Fast Ethernet Switch are 10Base-T and 100Base-TX compliant and are capable of 10 megabits per second (Mbps) and 100 Mbps speeds.

The ports are IEEE 802.3u Auto-Negotiation compliant. With Auto-Negotiation, the switch automatically matches the highest possible common speed between each switch port and each end node. For example, if an end node is capable of only 10 Mbps, the switch sets the port connected to the end node to 10 Mbps.

Each twisted pair port on the switches can operate in either half- or full-duplex mode. The twisted pair ports are IEEE 802.3u-compliant and Auto-Negotiate the duplex mode setting.

> **Note**
> In order for the switch to set the duplex mode for each port correctly, the end nodes that you connect to the switch ports should also use Auto-Negotiation. Otherwise, a duplex mode mismatch can occur, affecting network performance. For further information, refer to “Duplex Mode” on page 27.

Each twisted pair port has a maximum operating distance of 100 m (328 feet).

For 10 Mbps operation, Category 3 or better 100 ohm shielded or unshielded twisted pair cabling is required. For 100 or 1000 Mbps operation, Category 5 and Enhanced Category 5 (5E) 100 ohm shielded or unshielded twisted pair cabling is required.

The twisted pair ports are auto-MDI/MDIX. They automatically configure themselves as either MDI or MDI-X. This feature allows you to use either straight-through or crossover twisted pair cables to connect devices to the ports.

The ports can operate as either standard 10/100Base-T ports or as PoE ports.

10/100/1000 RJ-45 Uplink Port

The 10/100/1000Base-T uplink port is a backup for the SFP uplink port. If the SFP's fiber connection fails, the 10/100/1000Base-T uplink port takes over the connection.

SFP Port

The SFP port, port 9, can operate in place of its twisted pair port equivalent to provide fiber optic uplink connectivity. When an SFP is inserted in the SFP port and a fiber optic cable is connected, the corresponding twisted pair port is disabled.

RS-232 Console Port

The RS-232 console port uses the management cable supplied with the switch. Through the console port you can connect to the switch and use the menus-based AT-S81 management software user interface.

LEDs

The LEDs on the front panel display the system and port status information. Each port has two LEDs as shown in Figure 3.

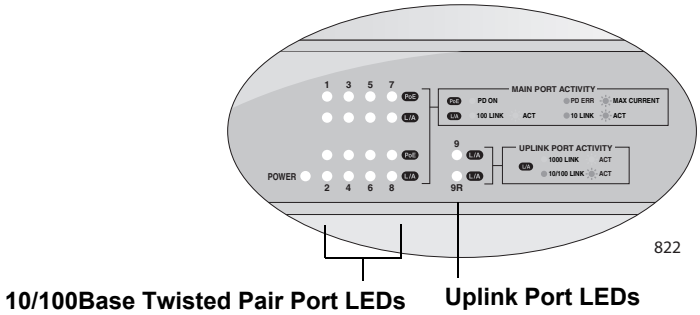

Figure 3. Port LEDs

Table 2 describes the LEDs for the 10/100Base-T ports.

Table 2. 10/100Base-T PoE Port LEDs

LED	State	Description
PoE	Solid green	The port is connected to a valid powered device and power is being supplied to the port.
	Solid amber	The power required by the connected device exceeds the port's power budget.
	Blinking amber	The overall power budget for the switch was exceeded when powered device was connected to this port.
	Off	The port is not connected to a valid powered device and power is not being supplied on the port.
LINK/ACT	Off	The port has not established a link with an end node.
	Solid green	A valid link has been established on the port and the port is operating in 100Base-T mode.
	Blinking green	The port is transmitting or receiving data at 100 Mbps.

Table 2. 10/100Base-T PoE Port LEDs (Continued)

LED	State	Description
	Amber	A valid link has been established on the port and the port is operating in 10Base-T mode.
	Blinking amber	The port is transmitting or receiving data at 10 Mbps.

Table 4 describes the Power LED.

Table 3. Power LED

LED	State	Description
Power	Green	The switch is powered on and is operating normally.

Table 4 describes the LEDs for the uplink ports.

Table 4. Uplink Port LEDs

LED	State	Description
LINK/ACT	Off	The port has not established a link with an end node.
	Green	A valid link has been established on the port at 1000 Mbps.
	Blinking Green	The port is transmitting or receiving data at 1000 Mbps.
	Amber	A valid link has been established on the port at 10 or 100 Mbps.
	Blinking Amber	The port is transmitting or receiving data at 10 or 100 Mbps.

Power Supply

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

Note
For the power requirements, refer to “Power Specifications” on page 53.

Power over Ethernet

The twisted pair ports on the AT-8000/8POE Fast Ethernet Switch feature Power over Ethernet (PoE). PoE is a mechanism for supplying power to network devices over the same twisted pair cables used to carry network traffic. This feature can simplify network installation and maintenance by allowing you to use the switch as a central power source for other network devices.

A device that receives its power over an Ethernet cable is called a *powered device*. Examples of such devices can be wireless access points, IP telephones, web cams, and even other Ethernet switches. A powered device connected to a port on the switch will receive both network traffic and power over the same twisted pair cable.

There are several advantages that the PoE feature of the AT-8000/8POE Fast Ethernet Switch adds to the installation and maintenance of your network. First, because the switch acts as the central power source for your powered devices, adding an uninterruptible power source (UPS) to the switch increases the protection not just to the switch itself from possible power source problems but also to all of the powered devices connected to it. This can increase the reliability of your network by minimizing the impact to network operations from a power failure.

PoE can also simplify the installation of your network. A frequent issue in selecting a location for a network device is whether there is a power source nearby. This often limits equipment placement or requires the added cost and time of having additional electrical sources installed. With PoE, you can install PoE-compatible network equipment wherever they are needed without having to worry about whether they are near a power source.

The switch automatically determines whether or not a device connected to a port is a powered device. A powered device has a signature resistor or signature capacitor that the switch can detect over the Ethernet cabling. If the resistor or capacitor is present, the switch assumes that the device is a powered device.

A port on the switch connected to a powered device can supply up to 15.4 watts of power to the device, while at the same time furnishing standard 10/100 Mbps Ethernet functionality. A port connected to a network node that is not a powered device (that is, a device that receives its power from another power source) functions as a regular Ethernet port, without PoE. The PoE feature remains enabled on the port but no power is delivered to the device.

Power Budgeting

The AT-8000/8POE Fast Ethernet Switch provides a maximum of 15.4 W of power per port on six of the eight ports for a total power consumption of 95 W, while at the same time furnishing standard 10/100 Mbps Ethernet functionality.

The AT-8000/8POE smart power management functionality supports any combination of Ethernet ports (1-8) that supply power for IEEE 802.3af Class 0, 1, 2, or 3 powered devices up to a maximum of 95 watts, as described in Table 5.

Note
Power is supplied to the powered devices in the order that the ports are connected or on a first-come-first-served basis until the 95 watt limit is reached. If the switch is power cycled after the PoE devices are connected to the switch ports, the power is supplied to ports 1 through 8 in that order.

Table 5. IEEE 802.3af Class vs. Power Levels

Class	Usage	Minimum Power Levels Output at the PSE	Maximum Power Levels Output at the PD
0	Default	15.4W	0.44W to 12.95W
1	Optional	4.0W	0.44W to 3.84W
2	Optional	7.0W	3.84W to 6.49W
3	Optional	15.4W	6.49W to 12.95W

A port connected to a network node that is not a powered device (that is, a device that receives its power from another power source) functions as a regular Ethernet port, without PoE. The PoE feature remains enabled on the port but no power is delivered to the device.

Implementation

A standard Ethernet twisted pair cable contains four pairs of strands for a total of eight strands. 10/100 Mbps network traffic requires only four strands (1, 2, 3, and 6), leaving four strands in the cable unused (4, 5, 7, and 8).

The PoE standard, IEEE 802.3af, describes two alternative ways for delivering power to a powered device (PD) over twisted pair cabling. Alternative A uses the same strands that carry the network traffic. Alternative B uses the spare strands. The PoE implementation on the AT-8000/8POE Fast Ethernet Switch is Alternative B, where power is transmitted over strands 4, 5, 7, and 8.

PD’s that comply with the IEEE 802.3af standard typically support both power delivery methods. So long as a PD is compliant with the standard, it

should be able to receive its power from the switch while using either a straight or cross-over cable. The PoE feature on the AT-8000/8POE Fast Ethernet Switch should also work with most legacy PD's as long as the device can be powered on pins 4, 5, 7, and 8.

Ethernet Switching Basics

An Ethernet switch interconnects network devices, such as workstations, printers, routers, and other Ethernet switches, so that they can communicate with each other by sending and receiving Ethernet frames.

MAC Address Table

Every hardware device on your network has a unique MAC address. This address is assigned to the device by the device's manufacturer. For example, when you install a Network Interface Card (NIC) in a computer so that you can connect it to the network, the NIC already has a MAC address assigned to it by its manufacturer.

The MAC address table in the AT-8000/8POE Fast Ethernet Switch can store up to 8K MAC addresses. The switch uses the table to store the MAC addresses of the network end nodes connected to the ports, along with the port number on which each address was learned.

A switch learns the MAC addresses of the end nodes by examining the source address of each packet received on a port. It adds the address and port on which the packet was received to the MAC table if the address had not already been entered in the table. The result is a table that contains all the MAC addresses of the devices that are connected to the switch's ports, and the port number where each address was learned.

When the switch receives a packet, it also examines the destination address and, by referring to its MAC address table, determines the port on which the destination end node is connected. It then forwards the packet to the appropriate port and on to the end node. This increases network bandwidth by limiting each frame to the appropriate port when the intended end node is located, freeing the other switch ports for receiving and transmitting data.

If the switch receives a packet with a destination address that is not in the MAC address table, it floods the packet to all the ports on the switch. If the ports have been grouped into virtual LANs, the switch floods the packet only to those ports which belong to the same VLAN as the port on which the packet was received. This prevents packets from being forwarded into inappropriate LAN segments, decreasing network security. When the destination end node responds, the switch adds its MAC address and port number to the table.

If the switch receives a packet with a destination address that is on the same port on which the packet was received, it discards the packet without forwarding it on to any port. Since both the source end node and the destination end node for the packet are located on the same port on the switch, there is no reason for the switch to forward the packet.

Duplex Mode

Duplex mode refers to how an end node receives and transmits data. If an end node can receive or transmit data, but not both simultaneously, the end node is operating in what is referred to as half-duplex mode. If an end node can both receive and transmit data simultaneously, the end node is said to be operating in full-duplex mode. Naturally, an end node capable of operating in full-duplex can handle data much faster than an end node that can only operate in half-duplex mode.

The twisted pair ports on the AT-8000/8POE Fast Ethernet Switch can operate in either half-or full-duplex mode. They are IEEE 802.3u-compliant and use Auto-Negotiation to set the duplex mode setting for you automatically.

For Auto-Negotiation to operate properly on a switch, the end nodes connected to the switch should also use Auto-Negotiation. If an end node does not have this feature and has a fixed duplex mode of full-duplex, the result will be a duplex mode mismatch between the end node and a switch port. A port on the Gigabit Ethernet switch connected to an end node with a fixed duplex mode of full-duplex will operate at only half-duplex. This results in the end node using full-duplex and the switch port using half-duplex. This can produce network performance problems. If you encounter this situation, you must configure the port on the end node to use Auto-Negotiation or, if it lacks that feature, to half-duplex.

Note

Because the ports on the AT-8000/8POE Fast Ethernet Switch operate in Auto-Negotiate mode only, the end nodes connected to the switch must also be configured to operate in the Auto-Negotiate mode. If an end node is configured to a specific duplex setting in a manual mode, it will not respond to the Auto-Negotiate protocol from the AT-8000/8POE Fast Ethernet Switch. (The speed is determined from the link pulses, however, so the speed is always detected correctly.) As a result, the port setting on the switch will end up at half-duplex. If the end node is manually configured to full-duplex, there will be a duplex mismatch and data will be lost. If the end node is manually configured to half-duplex, both ports will have the speed and duplex match up correctly.

Store and Forward

The AT-8000/8POE Fast Ethernet Switch uses store and forward as the method for receiving and transmitting frames. When a Ethernet frame is received on a switch port, the switch does not retransmit the frame out the destination port until it has received the entire frame and stored the frame in a port buffer. It then examines the frame to determine if it is a valid frame. Invalid frames, such as fragments or runts, are discarded by the switch. This insures that only valid frames are transmitted out the switch ports and that damaged frames are not propagated on your network.

Back Pressure and Flow Control

To maintain the orderly movement of data between the end nodes, an Ethernet switch may periodically need to signal an end node to stop sending data. This can occur under several circumstances. For example, if two end nodes are operating at different speeds, the switch, while transferring data between the end nodes, might need to instruct the faster end node to stop transmitting data to allow the slower end node to catch up. An example of this would be when a server operating at 100 Mbps is sending data to a workstation operating at only 10 Mbps.

How a switch signals an end node to stop transmitting data differs depending on the speed and duplex mode of the end node and switch port. A twisted pair port operating at 100 Mbps and half-duplex mode will stop an end node from transmitting data by forcing a collision. A collision on an Ethernet network occurs when two end nodes attempt to transmit data using the same data link at the same time. A collision causes end nodes to stop sending data. When the switch needs to stop a 100 Mbps, half-duplex end node from transmitting data, it forces a collision on the data link, which stops the end node. When the switch is ready to receive data again, the switch stops forcing collisions. This is referred to as back pressure.

A port operating at 100 Mbps and full-duplex mode uses PAUSE frames, as specified in the IEEE 802.3x standard, to stop the transmission of data from an end node. Whenever the switch wants an end node to stop transmitting data, it issues this frame. The frame instructs the end node to cease transmission. The switch continues to issue PAUSE frames until it is ready again to receive data from the end node. This is referred to as flow control.

The AT-8000/8POE Fast Ethernet Switch supports back pressure flow control in half duplex mode and pause frame flow control in full duplex mode.

Network Topologies

This section illustrates two network topologies that you can create with the AT-8000/8POE Fast Ethernet Switch: a power workgroup and collapsed backbone. Both types of topologies are described below.

Power Workgroup Topology

The topology shown in Figure 4 is commonly referred to as a power workgroup topology. Two AT-8000/8POE Fast Ethernet switches are connected to an AT-9424T Gigabit Ethernet Switch, one via an RJ45 connection and the other using a fiber optic connection. Access points and IP phones are connected to the switches as PoE devices. The access points, in turn, support a wireless Ethernet network of laptop users.

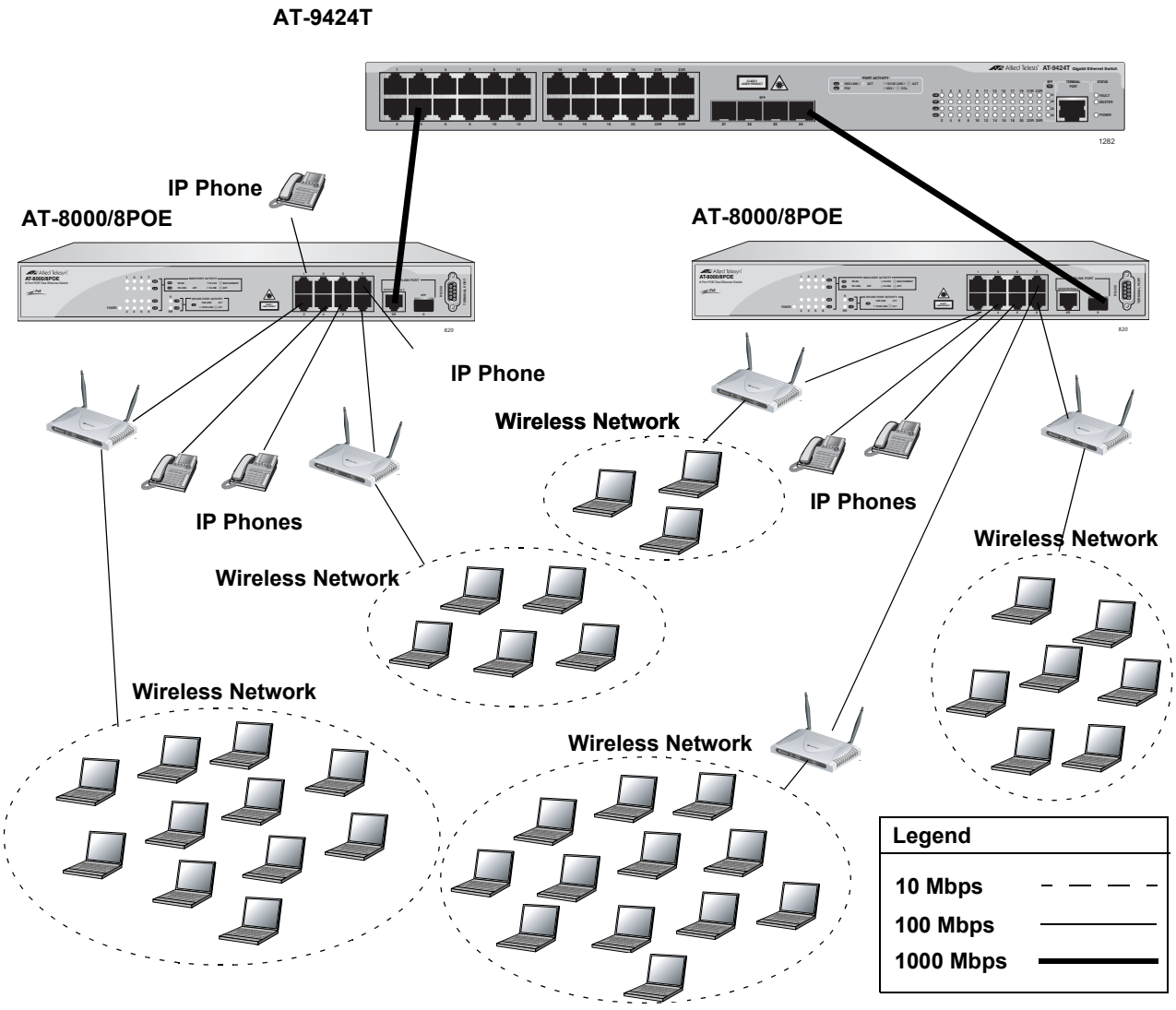

Figure 4. Power Workgroup Topology

Collapsed Backbone

In the topology illustrated in Figure 5, an AT-9424T Gigabit Ethernet Switch forms the backbone that connects to servers and AT-8000/8POE Fast Ethernet switches using Gigabit Ethernet uplinks. This type of topology is often referred to as a collapsed backbone topology. The switch functions as the focal point of the network and transfers an Ethernet frame between the Fast Ethernet switches only when the destination end node for the frame is on a different switch than the end node that originated the frame. This reduces the amount of unnecessary data traffic in each workgroup, freeing up bandwidth and improving network performance.

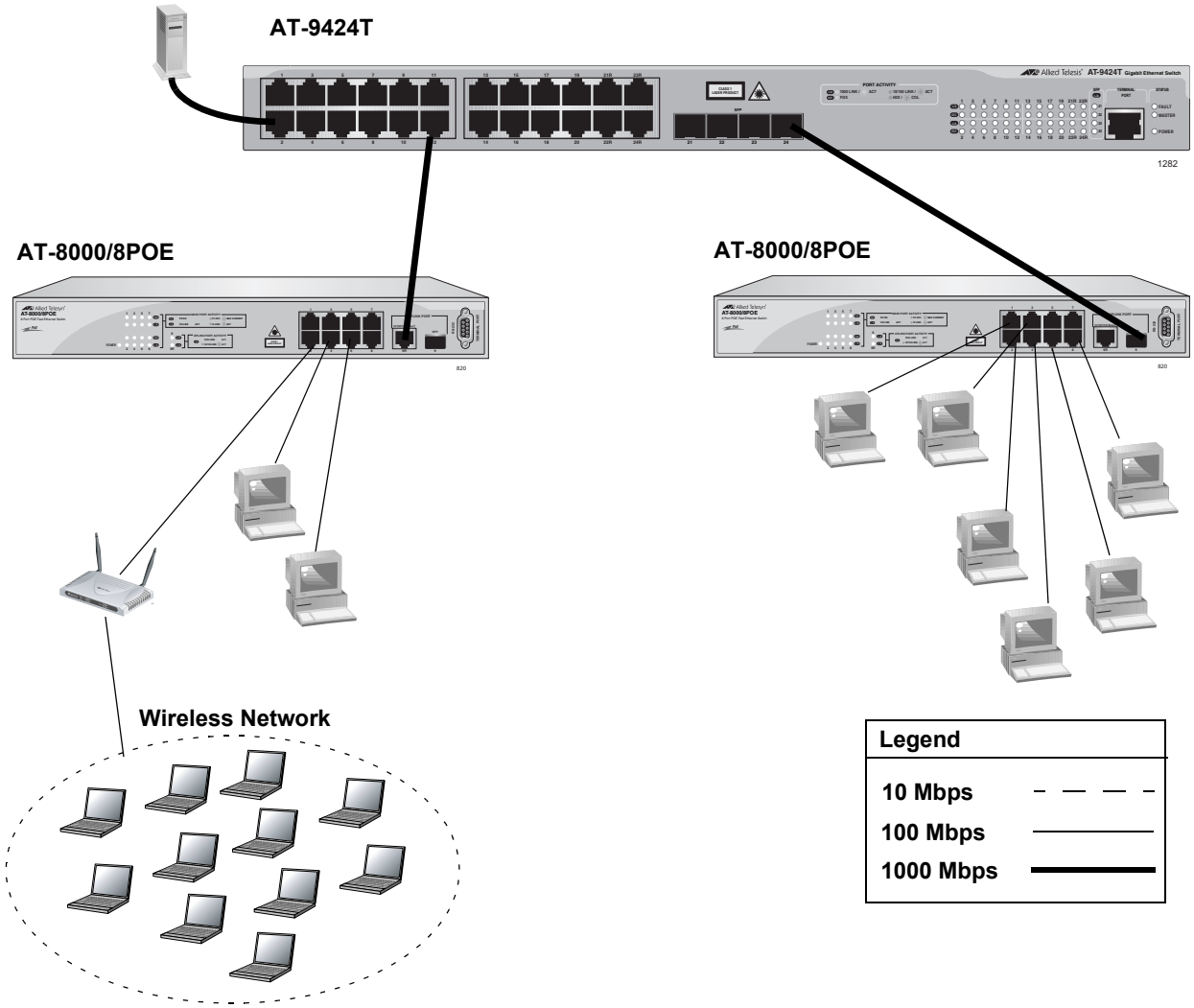

Figure 5. Collapsed Backbone Topology

Chapter 2

Installation

This chapter contains the following sections:

Reviewing Safety Precautions

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

Note
The ✍ indicates that a translation of the safety statement is available in a PDF document titled “Translated Safety Statements” (613-000405) on the Allied Telesis website at www.alliedtelesis.com.

⚠ **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

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

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

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

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

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

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

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

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

Selecting a Site for the Switch

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

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

Cabling

Table 6 contains the cabling specifications for the twisted pair ports.

Table 6. Twisted Pair Cabling and Distances

Speed	Type of Cable	Maximum Operating Distance
10 Mbps	Category 3 or better 100-ohm shielded or unshielded twisted pair cable	100 m (328 ft)
100 Mbps	Category 5 or Category 5E (Enhanced) 100-ohm shielded or unshielded twisted pair cable	100 m (328 ft)
1000 Mbps	Category 5 and Category 5E (Enhanced) 100-ohm shielded or unshielded twisted pair cable	100 m (328 ft)

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

Unpacking the Switch

To unpack the switch, perform the following procedure:

1. Remove all components from the shipping package.

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

2. Place the switch on a level, secure surface.

3. Ensure the following hardware components are included in your switch package. If any item is missing or damaged, contact your Allied Telesyn sales representative for assistance.

   - ❒ Two rack-mount brackets
   - ❒ Eight rack-mount bracket screws (black)
   - ❒ Four rack-mounting screws (stainless steel)
   - ❒ Four rubber feet (for desktop use)
   - ❒ One management cable
   - ❒ One power cord
   - ❒ Documentation CD

Installing the Switch on a Desktop

You can place AT-8000/8POE Fast Ethernet Switch on a desktop or install it in a 19-inch rack. To install the switch in a rack, refer to “Installing the Switch in a Rack” on page 38.

To place the switch on a desktop, perform the following procedure:

1. Remove all equipment from the package and store the packaging material in a safe place.

2. Turn the switch over and attach the four rubber feet to the bottom of the switch as shown in Figure 6.

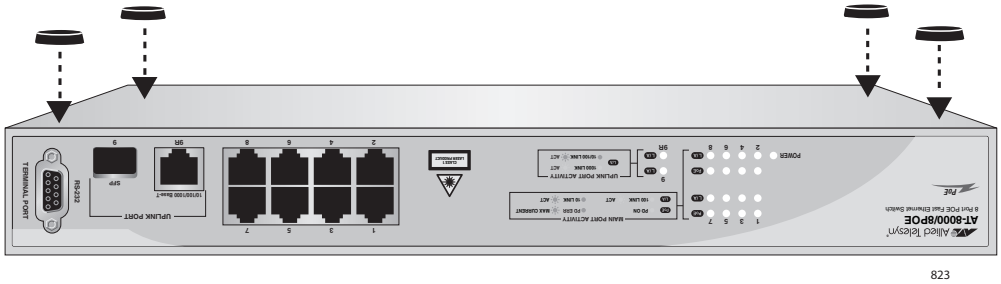

Figure 6. Attaching the Rubber Feet

3. Turn the switch over again and place it on a flat, secure surface (such as a desk or table) leaving ample space around the unit for ventilation.

Installing the Switch in a Rack

To install the AT-8000/8POE Fast Ethernet Switch in a rack, perform the following procedure:

1. If attached, remove the rubber feet using a flat-head screwdriver.

2. Install a bracket on one side of the switch using a Phillips screwdriver and four of the rack-mount screws included with the switch, as shown in Figure 7.

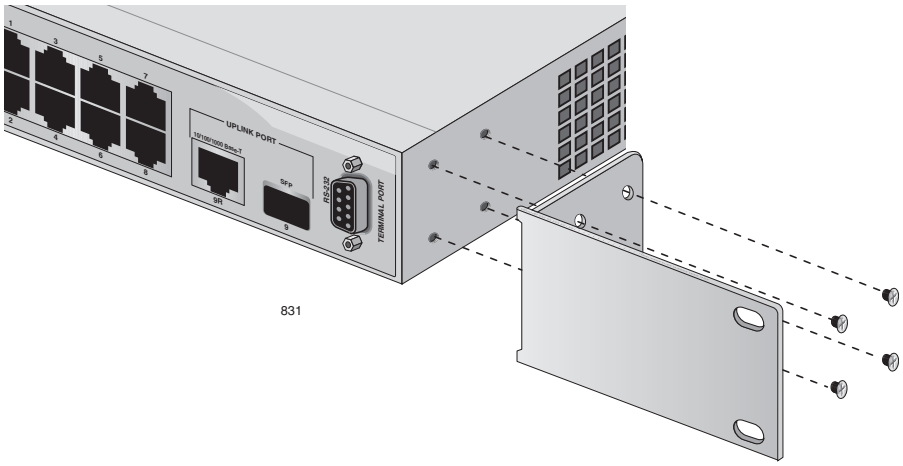

Figure 7. Attaching the Rack-Mount Bracket

3. Repeat step 2 to attach the remaining bracket to the other side of the switch.

4. Mount the switch on a 19-inch rack using the four large screws included, as shown in Figure 8

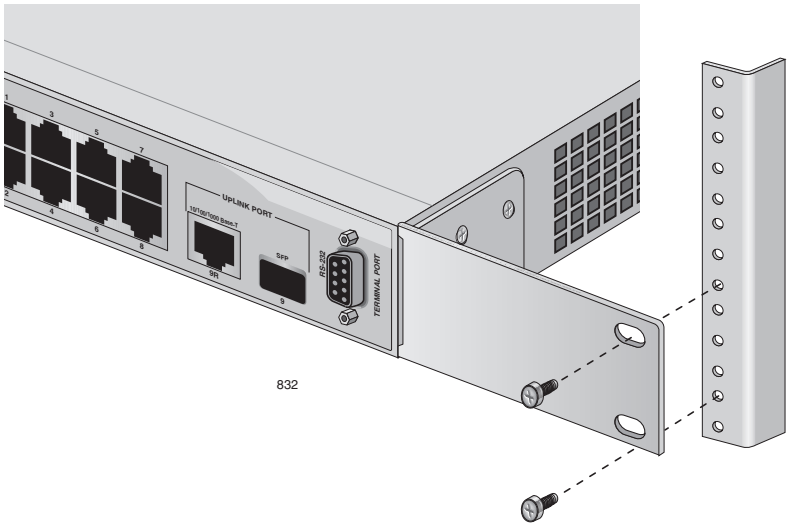

Figure 8. Mounting the Switch on the Rack

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

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

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

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

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

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

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

Installing an Optional SFP Transceiver

The AT-8000/8POE Fast Ethernet Switch has one SFP uplink port.

To install an SFP transceiver, perform the following procedure:

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

Note
You must install the transceiver before you connect cables to it.

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

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

2. Remove the dust plug from the SFP slot, as shown in Figure 9.

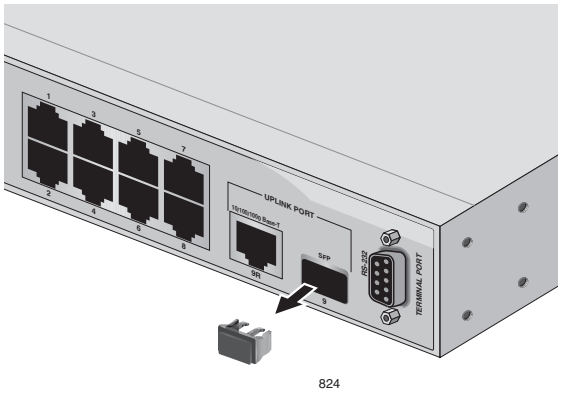

Figure 9. Removing the Dust Plug from the SFP Slot

3. Locate the label on the transceiver and turn it so that the label is on top and the alignment groove is on the bottom.

4. Slide the SFP transceiver into an SFP slot on the switch, as shown in Figure 10.

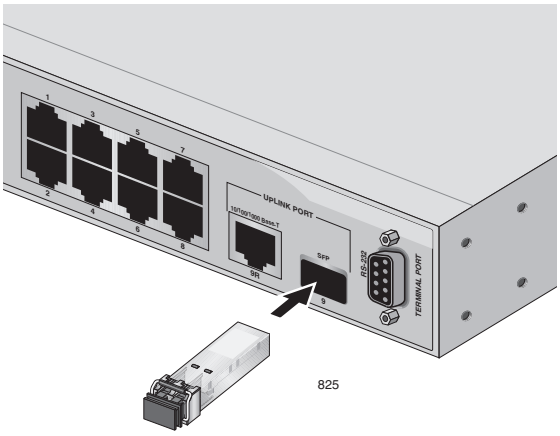

Figure 10. Inserting the SFP

5. Repeat steps 2 through 4 if you are installing another SFP transceiver.

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

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

For information about cabling for the SFP, consult the documentation that was shipped with the SFP.

Cabling and Powering On the Switch

Connecting the Twisted Pair Cables

To connect the twisted cables to the RJ-45 ports on the AT-8000/8POE Fast Ethernet Switch, perform the following procedure:

1. Plug the twisted pair data cables into the RJ-45 ports on the switch, as shown in Figure 11.

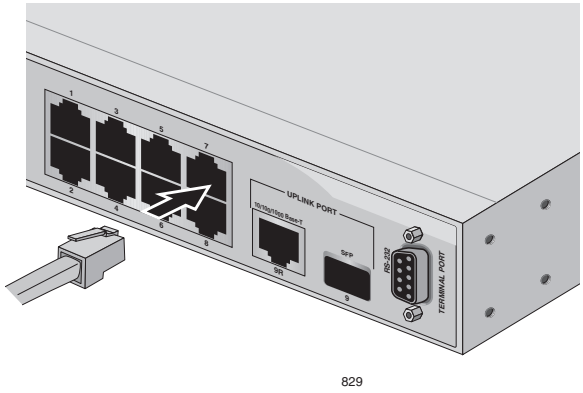

Figure 11. Connecting the Twisted Pair Data Cables

When you connect a twisted pair cable to a port, observe the following guidelines:

- An RJ-45 connector should fit snugly into the port on the switch. The tab on the connector should lock the connector into place.
- The ports on the switch are auto-MDI/MDI-X. You can use either a straight-through or crossover twisted pair cable to connect any type of network device to a port on the switch.
- The network should not contain data loops, which can adversely affect network performance. A data loop exists when two or more network devices can communicate with each other over more than one data path.

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

2. Connect the other end of the twisted pair cable to a port in the end node.

Connecting the Fiber Optic Cables

To connect a fiber optic cable to an SFP installed in the AT-8000/8POE Fast Ethernet Switch, perform the following procedure:

1. Remove the dust plug from the SFP, as shown in Figure 12.

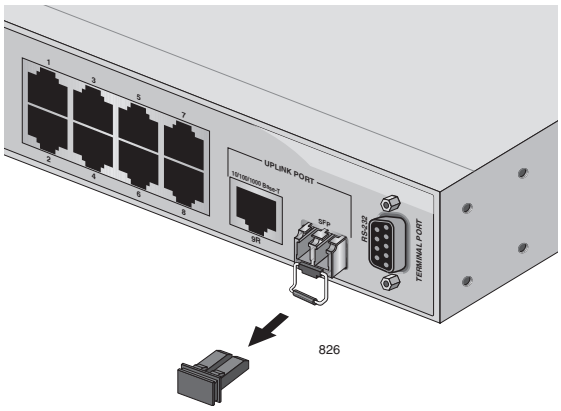

Figure 12. Removing the Dust Cover from the SFP.

Warning: Class 1 laser product. ↷L1

Do not stare into the laser beam. ↷L2

2. Connect the fiber optic cable to the SFP port, as shown in Figure 13.

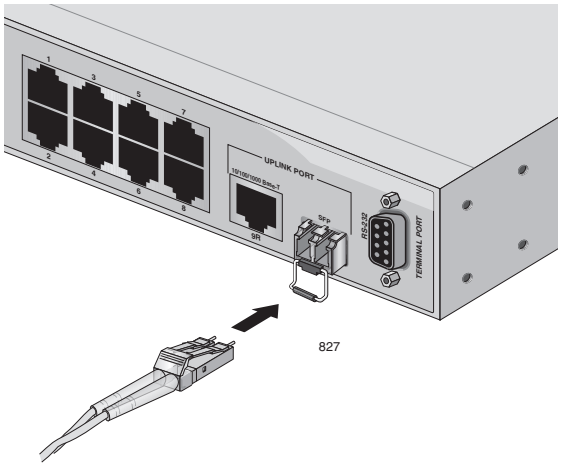

Figure 13. Connecting the Fiber Optic Cable

Powering On the Switch

To power on the switch, perform the following procedure:

1. Plug the power cord into the AC power connector on the back of the switch, as shown in Figure 14.

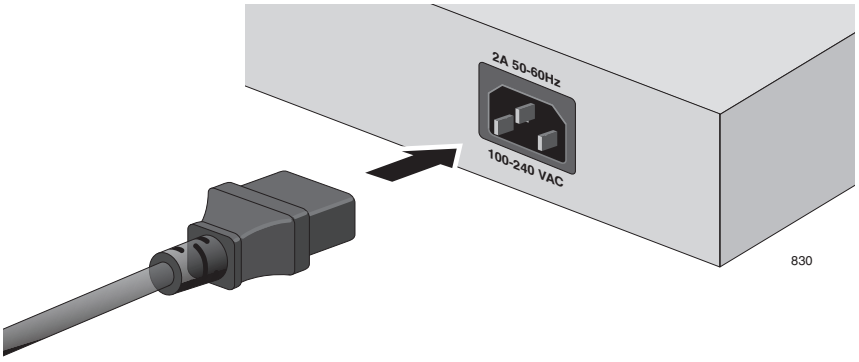

Figure 14. Plugging in the AC Power Cord

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

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

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

3. Verify that the POWER LED is green. If the LED is OFF, refer to Chapter 3, “Troubleshooting” on page 51.

   The switch is now powered on and ready for network operations. To start a local management session on the switch, refer to “Starting a Management Session” on page 46. To start a remote management session, the switch must have an IP address. For information about giving the switch an IP address and starting a remote management session, refer to the *AT-S81 Management Software User’s Guide*.

Starting a Management Session

The AT-8000/8POE Fast Ethernet Switch provides two methods for accessing the switch and performing management functions, as described in the following sections:

- ❒ “Establishing a Local Connection to use the Menus Interface,” next
- ❒ “Establishing a Remote Connection to Use the Web Browser Interface” on page 48

Establishing a Local Connection to use the Menus Interface

To start a local management session on an AT-8000/8POE Fast Ethernet Switch, perform the following procedure:

1. Connect one end of the management cable to the console port on the switch, as shown in Figure 15.

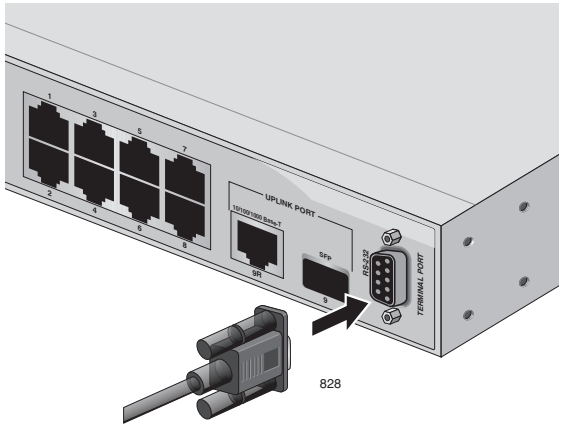

Figure 15. Connecting the Console Cable

2. Connect the other end of the cable to the 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
   - ❒ Data bits: 8
   - ❒ Stop bits: 1
   - ❒ Flow control: None

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

The Login Menu is shown in Figure 16.

```
============================================================
AT-8000/8POE Management System Version
Local - Console
Allied Telesyn International Corp.
Copyright 2007
============================================================

Login Menu

Login:
```

Figure 16. Login Menu

4. Enter “manager” for the login name and press Return.

   You are prompted for a password.

5. Enter “friend” as the password.

   The Main Menu is shown in Figure 17.

```
AT-8000/8POE Local Management System
Enter the character in square brackets to select option

Main Menu

[G]eneral Information
[B]asic Switch Configuration...
[A]dvanced Switch Configuration...
Switch [T]ools...
[S]tatistics
[C]ommand Line Interface
[Q]uit




Command>
```

Figure 17. Main Menu

For detailed information about configuring the AT-8000/8POE Fast Ethernet Switch, refer to the *AT-S81 Management Software User’s Guide*.

Establishing a Remote Connection to Use the Web Browser Interface

In order for you to manage a switch using the web browser interface, the switch must have an IP address and subnet mask. You must use the menus interface to assign an IP address.

Note
The remote management station must be a member of the switch's Default VLAN. The switch responds and processes management packets only if they are received on an untagged port of the Default VLAN.

To start a web browser management session, perform the following procedure:

1. Start your web browser.

   Note
   If your PC with the web browser is connected directly to the switch to be managed or is on the same side of a firewall as the switch, you must configure your browser's network options not to use proxies. Consult your web browser's documentation on how to configure the switch's web browser to not use proxies.

2. In the URL field of the browser, enter the IP address of the switch to be managed, as shown in Figure 18.

Figure 18. Entering a Switch's IP Address in the URL Field

The AT-S81 management software displays the login dialog box, as shown in Figure 19.

Figure 19. AT-S81 Login Dialog Box

3. Enter the AT-S81 management login user name and password. The default user name is “manager” and the default password is “friend.” The login name and password are case-sensitive.

   The AT-S81 management software displays the home page. The window contains an image of the front of the switch. Ports that have a link to an end node are green. Ports without a link are grey. An example of a home page is shown in Figure 20.

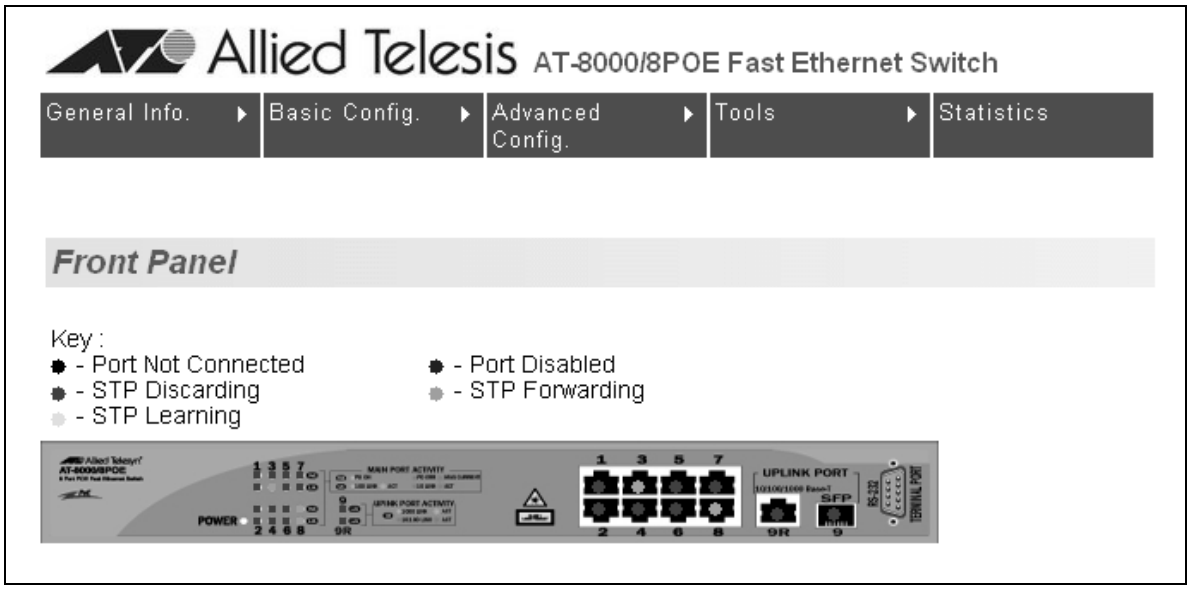

Figure 20. Home Page for the AT-8000/8POE Fast Ethernet Switch

The main menu is on the top of the home page. It consists of the following selections:

- General Info.
- Basic Config.
- Advanced Config.
- Tools
- Statistics

A web browser management session remains active even if you link to other sites. You can return to the management web pages anytime as long as you do not quit the browser.

For more information about the web browser interface, refer to the *AT-S81 Management Software User’s Guide.*

Warranty Registration

Allied Telesis hardware products are covered under limited warranties. Some products have a longer or more appropriate coverage the others.

The AT-8000/8POE Fast Ethernet switch has a limited warranty of Lifetime (24 months Fan & PSU).

All Allied Telesis warranties are subject to and provided only on the terms and conditions set out in the Allied Telesis Limited Warranties listed on the Allied Telesis website at **http://alliedtelesis.com/support/warranty**.

Chapter 3
Troubleshooting

This chapter contains information on how to troubleshoot the switch in the event that a problem occurs.

> **Note**
> If you need further assistance, please contact Allied Telesyn Technical Support. Refer to “Contacting Allied Telesis” on page 14.

Check the Power LED on the front of the switch. If the LED is OFF, indicating that the unit is not receiving power, do the following:

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

Verify that the LINK/ACT LED for each port is ON. If a LINK/ACT LED is OFF, do the following:

- Verify that the end node connected to the port is powered on and is operating properly.
- Verify that the twisted pair cable is securely connected to the port on the switch and to the port on the end node.
- Ensure that the twisted pair cable does not exceed 100 meters (328 feet).
- Verify that you are using the appropriate category of twisted pair cable: Category 3 or better for 10 Mbps operation and Category 5 and Category 5E for 100 and 1000 Mbps operation.

On those ports that are supplying PoE power to another device, verify that the port PoE LED is solid green. If the LED is not solid green, do the following:

- Verify that the connected device is no more than 100 feet from the switch.

- If the port PoE LED is solid amber, then the power required by the connected device is more than the maximum power budget for the port. If this is the case, the connected device may not qualify for connection to the switch.
- If the port PoE LED is blinking amber, then the overall power budget of the switch was exceeded when the powered device was connected. Re-evaluate the overall power requirements of all the powered devices connected to the switch to assure that the overall power budge is not exceeded. This may mean that more than one switch is required to supply the PoE power required by the PoE powered devices on the network.
- If the PoE LED is off, then do the following:
  - Verify that the twisted pair cable is securely connected to the port on the switch and to the port on the connected device; and
  - Verify that the connected device conforms to IEEE 802.1af

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

Appendix A

Technical Specifications

Physical Specifications

Dimensions:	330 mm x 204 mm x 43.6 mm 12.99 in x 8.03 in x 1.72 in)
Weight:	3.25 kg (7.16 lbs)

Environmental Specifications

Operating Temperature:	0° C to 45° C (32° F to 113° F)
Storage Temperature:	-20° C to 70° C (-4° F to 158° F)
Operating Humidity:	10% to 90% non-condensing
Storage Humidity:	5% to 95% non-condensing
Operating Altitude Range:	Up to 3,000 m (9,843 ft)

Power Specifications

AC Voltage/Frequency Requirements:	100 - 240 VAC, 50/60 Hz
AC Input Power Consumption:	135 W maximum
Available Power over Ethernet:	95 W @ 48 VDC
IEEE 802.3af Class 3 (15.4 W):	Max 6 ports
IEEE 802.3af Class 2 (7.3 W):	Max 8 ports
IEEE 802.3af Mode:	Alternative B

Safety and Electromagnetic Emissions Certifications

EMI/RFI:	FCC Class A, EN55022 Class A, CISPR Class A
Immunity:	EN55024
Electrical Safety:	EN60950 (TUV), UL60950 ($_{c}$UL$_{us)}$, C-TICK, CE

Connectors and Port Pinouts

This section lists the connectors and connector pinouts for the AT-8000/8POE Fast Ethernet Switch and their components.

Figure 21 illustrates the pin layout for an RJ-45 connector and port.

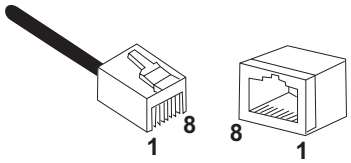

Figure 21. RJ-45 Connector and Port Pin Layout

Table 7 lists the RJ-45 pin signals when a twisted pair port is operating in the MDI configuration.

Table 7. MDI Pin Signals (10Base-T or 100Base-TX)

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

Table 8 lists the RJ-45 port pin signals when a twisted pair port is operating in the MDI-X configuration.

Table 8. MDI-X Pin Signals (10Base-T or 100Base-TX)

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

Table 9 lists the RJ-45 connector pins and their signals when a

1000Base-T port is operating at 1000 Mbps.

Table 9. RJ-45 1000Base-T Connector Pinouts

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