AT-8400 Series Switch

AT-8400

Reference Guide

Allied Telesyn
Simply connecting the IP world

PN 613-50399-00 Rev C

Electrical Safety and Emission Compliance Statement

Standards: This product meets the following standards:

U.S. Federal Communications Commission
Radiated Energy Note: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the 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 by the manufacturer or the FCC can void your right to operate this equipment.

Industry Canada
This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

RFI Emission	FCC Class A, EN55022 Class A, EN61000-3-2, EN61000-3-3, VCCI Class A, C-TICK 1

Warning: In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures. 2

Immunity	EN55024 3
Electrical Safety	EN60950 (TUV), UL60950 (UL/cUL) 4
Laser	EN60825 5

Important: Appendix A contains translated safety statements for installing this equipment. When you see the , go to Appendix A for the translated safety statement in your language.

Wichtig: Anhang A enthält übersetzte Sicherheitshinweise für die Installation dieses Geräts. Wenn Sie sehen, schlagen Sie in Anhang A den übersetzten Sicherheitshinweis in Ihrer Sprache nach.

Vigtigt: Tillæg A indeholder oversatte sikkerhedsadvarsler, der vedrører installation af dette udstyr. Når De ser symbolet , skal De slå op i tillæg A og finde de oversatte sikkerhedsadvarsler i Deres eget sprog.

Belangrijk: Appendix A bevat vertaalde veiligheidsopmerkingen voor het installeren van deze apparatuur. Wanneer u de ziet, raadpleeg Appendix A voor vertaalde veiligheidsinstructies in uw taal.

Important: L'annexe A contient les instructions de sécurité relatives à l'installation de cet équipement. Lorsque vous voyez le symbole , reportez-vous à l'annexe A pour consulter la traduction de ces instructions dans votre langue.

Tärkeää: Liite A sisältää tämän laitteen asentamiseen liittyvät käännetyt turvaohjeet. Kun näet -symbolin, katso käännettyä turvaohjetta liitteestä A.

Importante: l'Appendice A contiene avvisi di sicurezza tradotti per l'installazione di questa apparecchiatura. Il simbolo , indica di consultare l'Appendice A per l'avviso di sicurezza nella propria lingua.

Viktig: Tillegg A inneholder oversatt sikkerhetsinformasjon for installering av dette utstyret. Når du ser , åpner du til Tillegg A for å finne den oversatte sikkerhetsinformasjonen på ønsket språk.

Importante: O Anexo A contém advertências de segurança traduzidas para instalar este equipamento. Quando vir o símbolo , leia a advertência de segurança traduzida no seu idioma no Anexo A.

Importante: El Apéndice A contiene mensajes de seguridad traducidos para la instalación de este equipo. Cuando vea el símbolo , vaya al Apéndice A para ver el mensaje de seguridad traducido a su idioma.

Obs! Bilaga A innehåller översatta säkerhetsmeddelanden avseende installationen av denna utrustning. När du ser , skall du gå till Bilaga A för att läsa det översatta säkerhetsmeddelandet på ditt språk.

Table of Contents

Preface

This reference guide provides a description of the AT-8400 Series switch and its hardware and software features. In addition, it provides instructions on how to install the chassis, the AT-8401 management fabric card, the AT-8400 line cards, and power supplies. Troubleshooting information is also provided.

How This Guide is Organized

This guide contains the following chapters and appendices:

Chapter 1, AT-8400 Series Switch Overview, describes the features and functions of the AT-8400 chassis and its associated software.

Chapter 2, Fast Ethernet and Gigabit Ethernet Line Cards, describes the AT-8400 line cards.

Chapter 3, Installing the AT-8400 Chassis, explains how to install the chassis on a desktop or in a rack.

Chapter 4, Installing and Replacing the AT-8401 Management Card, explains how to replace the AT-8401 management card.

Chapter 5, Installing and Removing Line Cards, provides generic procedures for installing and removing line cards.

Chapter 6, Installing or Replacing a Power Supply, provides instructions on how to install and remove power supplies.

Chapter 7, Cabling and Powering on the Chassis, provides instructions on how to cable and power on the chassis.

Chapter 8, Troubleshooting, provides troubleshooting information about the AT-8401 management card, the AT-8400 line cards, and the power supplies.

Appendix A, Technical Specifications, provides technical specifications for the chassis.

Appendix B, Translated Safety Information, contains multi-language translations of the safety and emission statements in this guide.

Where to Find Related Guides

The Allied Telesyn web site at www.alliedtelesyn.com offers you an easy way to access the most recent documentation, software, and technical information for all of our products.

For instructions on how to manage the chassis and line cards, refer to the following software guides, which are also available on our web site:

- **AT-S60 Management Software User's Guide**
  PN 613-50400-00
- **AT-S60 Management Software Command Line User's Guide**
  PN 613-50401-00

Document Conventions

This guide uses the following conventions:

Note
Notes provide additional information.

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

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

Contacting Allied Telesyn

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

Online Support

You can request technical support online by accessing the Allied Telesyn Knowledge Base from the following web site: **http://kb.alliedtelesyn.com**. You can use the Knowledge Base to submit questions to our technical support staff and review answers to previously asked questions.

Email and Telephone Support

For Technical Support via email or telephone, refer to the Support & Services section of the Allied Telesyn web site: **http://www.alliedtelesyn.com**.

Returning Products

Products for return or repair must first be assigned a Return Materials Authorization (RMA) number. A product sent to Allied Telesyn without a RMA number will be returned to the sender at the sender's expense.

To obtain a RMA number, contact Allied Telesyn's Technical Support at our web site: **http://www.alliedtelesyn.com**

For Sales or Corporate Information

You can contact Allied Telesyn for sales or corporate information at our web site: http://www.alliedtelesyn.com. To find the contact information for your country, select Contact Us then Worldwide Contacts.

Obtaining Management Software Updates

New releases of management software for our managed products can be downloaded from the Allied Telesyn web site: **http://www.alliedtelesyn.com**.

Chapter 1
AT-8400 Series Switch Overview

This chapter contains the following sections:

Overview

The AT-8400 Series switch is a modular unit that simplifies the task of building and maintaining a Fast Ethernet or Gigabit Ethernet network. See Figure 1. With the AT-8400 Series switch, you can build an Ethernet network customized to the unique needs of your network environment.

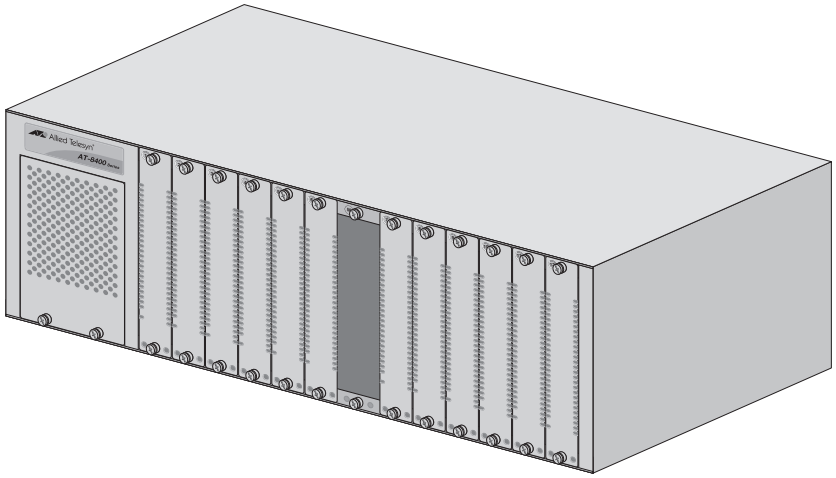


Figure 1 AT-8400 Series Switch

You can connect your workgroup hubs and other switches to the chassis so that the AT-8400 Series switch functions as the focal point of your network. You can also connect workstations, servers, printers, and routers directly to the chassis so that each device has sole use of a dedicated link to the network.

Below are the cards that are available for the AT-8400 Series switch.

- ❑ AT-8411 TX line card — _Fast Ethernet with eight 10/100Base-TX twisted-pair ports
- ❑ AT-8412/SC line card — Fast Ethernet with four fiber optic ports
- ❑ AT-8412/MT line card — Fast Ethernet with four fiber optic ports
- ❑ AT-8413 GB/T line card — Gigabit Ethernet with one twisted-pair port and one expansion slot for an optional GBIC module
- ❑ AT-8414/ST line card — Fast Ethernet with four fiber optic ports
- ❑ AT-8414/SC line card — Fast Ethernet with four fiber optic ports

Note
For a current list of line cards for the AT-8400 Series switch, refer to the Allied Telesyn web site or contact your ATI sales representative.

The chassis can contain any combination of line cards, and in any order.

Hardware Features

Hardware features of the AT-8400 Series switch include:

- ❑ 13 slots — 12 slots for line cards, such as Fast Ethernet and Gigabit Ethernet cards, and one slot for the AT-8401 management card
- ❑ One pre-installed AC or DC power supply (depending on the chassis model)
- ❑ One expansion slot for a redundant power supply
- ❑ Two pre-installed fans at the rear of the chassis
- ❑ One AT-8401 management card (sold separately) that supports the following management access methods:
  - — Local (out-of-band) management using the RS-232 port on the card
  - — Remote (in-band) management using Telnet, a web browser, or an SNMP application program

Software Features

For a complete list and description of the software features, refer to the **AT-S60 Management Software User's Guide** and the **AT-S60 Command Line User's Guide**.

Front and Back Panel Components

Figure 2 illustrates the front panel of the chassis.

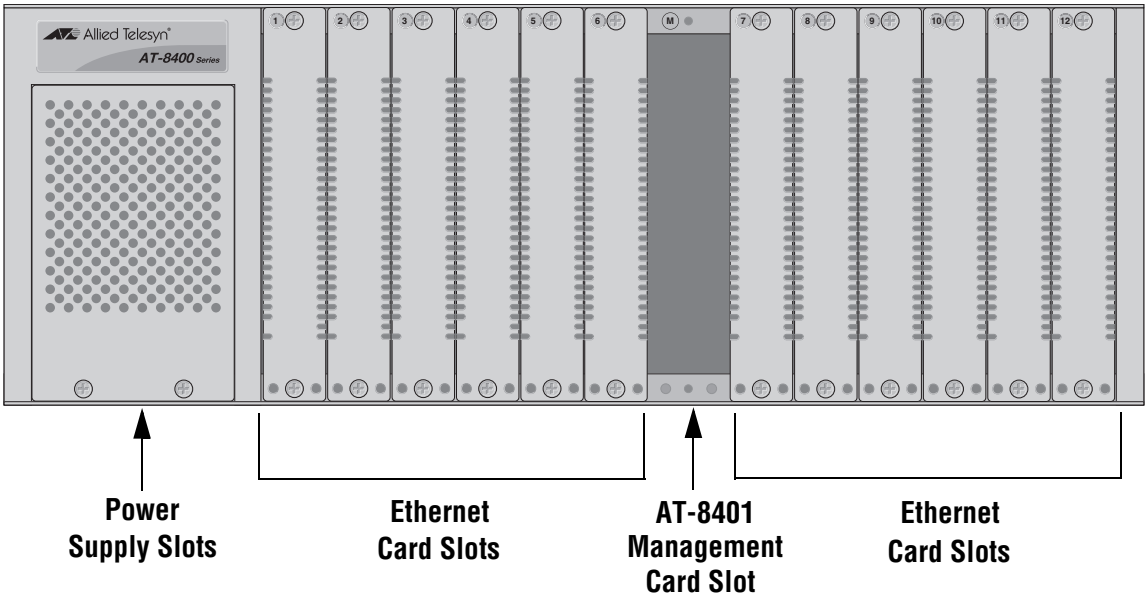


Figure 2 Front Panel of the AT-8400 Series Switch

Figure 3 illustrates the rear panel of the AC model of the AT-8400 Series switch.

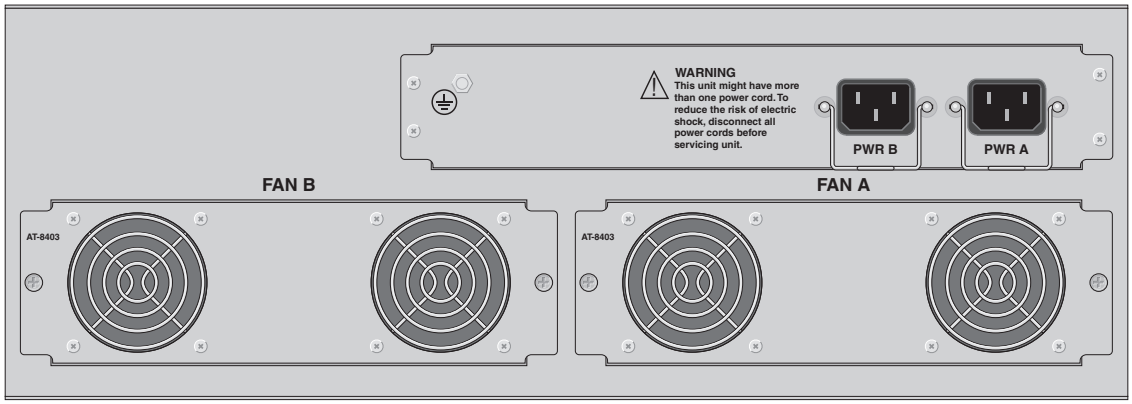


Figure 3 Rear Panel of the AT-8400 Series Switch (AC Model)

Figure 4 illustrates the back panel of the DC model of the AT-8400 Series switch.

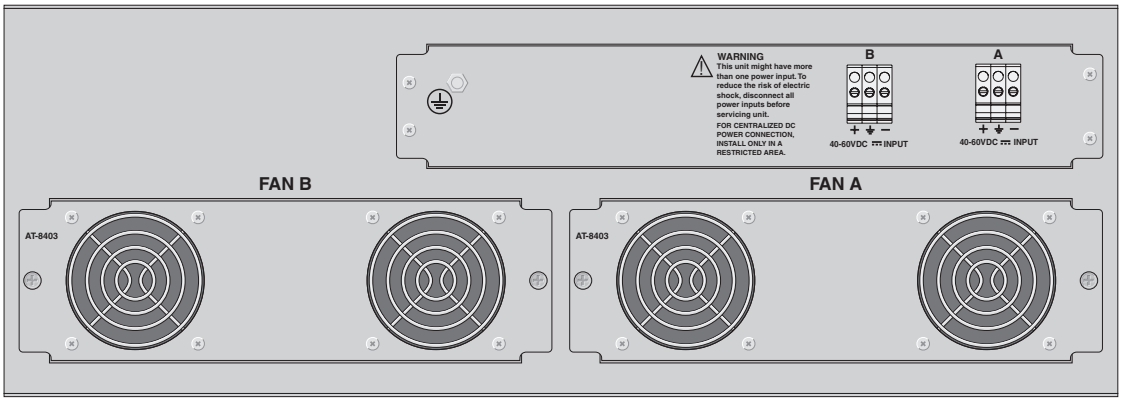


Figure 4 Rear Panel of the AT-8400 Series Switch (DC Model)

Chassis Slots 1 through 12

Slots 1 through 12 accommodate the Fast Ethernet and Gigabit Ethernet line cards. When installed, the cards are interconnected via the chassis backplane and function as one logical Ethernet switch. Ethernet line cards can be installed in any of the slots and in any order.

The chassis can accommodate a variety of Fast Ethernet and Gigabit Ethernet line cards. Chapter 2 contains descriptions of the line cards that were available when this manual was released.

Note
Contact your Allied Telesyn sales representative for a complete list of available line cards for the AT-8400 Series switch.

Chassis Slot M and the AT-8401 Management Card

Slot M on the front panel of the chassis is intended for the AT-8401 management card, illustrated in Figure 5. The card contains the AT-S60 management software.

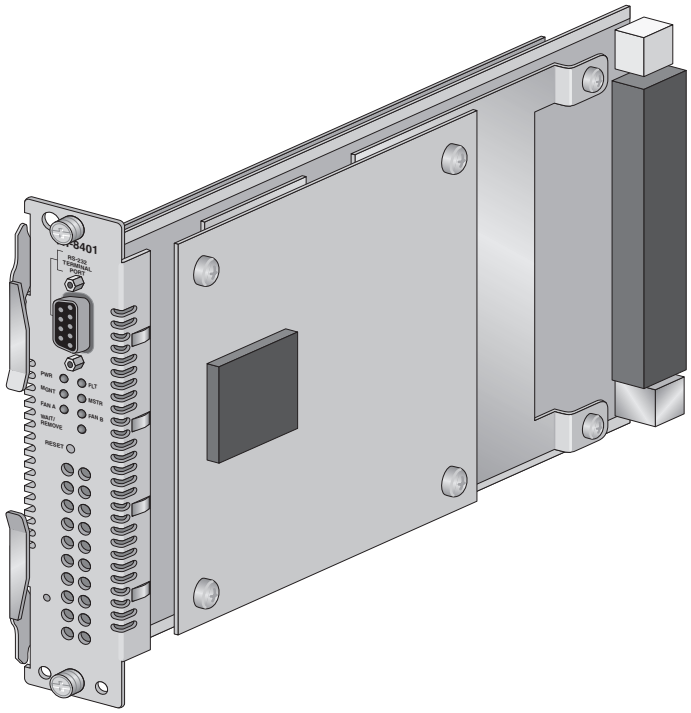


Figure 5 AT-8401 Management Card

You can use the management card and software to configure and monitor the ports on the Ethernet line cards. For instance, you can use the software to set port speeds, enable and disable ports, create virtual LANs, configure port security, and so forth.

There are several different ways that you can manage an AT-8400 Series switch. You can manage the unit locally through the RS-232 Terminal Port on the management card. The RS-232 Terminal Port has a DB-9 female connector and uses a straight-through RS-232 cable (not provided). You need to set the baud rate to 115,200. The default settings for the RS-232 Terminal Port are:

- ❑ Baud Rate: 115,200 bps
- ❑ Data bits: 8
- ❑ Parity: None
- ❑ Stop bits: 1
- ❑ Flow control: None

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

You can also manage the chassis remotely from any management workstation on your network using the Telnet application protocol, a web browser, or an SNMP application program.

The management software features a series of menus that make it very easy to configure port and card settings. You can also manage the unit using a series of command line commands.

The AT-8401 management card is responsible for maintaining the configurations of the various line cards in the chassis. The management card downloads the configurations to the line cards whenever the chassis is power cycled or reset.

There are several rules to keep in mind when it comes to the management card:

- The AT-8400 Series switch must have an AT-8401 management card installed, even if you do not intend to manage the Ethernet line cards. The Ethernet line cards will not forward Ethernet traffic if a management card is not installed in the chassis.
- The chassis can contain only one AT-8401 management card and it must be installed in Slot M. You cannot install the card in any other slot in the chassis.
- The management card retains the configuration information of the line cards indefinitely, even when the chassis is powered off or the management card is removed.
- A management card cannot be hot swapped. You must power off the chassis to replace it.

Note
For instructions on how to manage the switch, refer to the **AT-S60 Management Software User's Guide** and the **AT-S60 Command Line User's Guide**.

MAC Address Table

The AT-8401 management card features a MAC address table with a storage capacity up to 8K.

Reset Button

On the management card is a reset button. Pressing the button resets the management card and all line cards in the chassis. The chassis performs a series of diagnostics test that take only a few moments to complete. Once the diagnostic tests are finished, the management card reloads the AT-S60 management software and restores the configuration information to each line card. The entire reset process takes approximately 30 seconds to complete.

LEDs

The LEDs on the management card display status information about the chassis. You can use the LEDs to troubleshoot the chassis should a problem occur. The LEDS are defined in Table 1.

Table 1 AT-8401 Management Card LEDs

LED	State	Description
PWR[1]	Steady Green	The management card is receiving power.
FLT	Steady Red	There is a system fault. This is an unrecoverable error. See Troubleshooting on page -89.
MGMT	Steady Green	Indicates Power on Self Test (POST) has been completed successfully.
	Steady Yellow	Indicates POST is occurring. If this LED remains in this state for more than one minute, POST has failed.
MSTR	Steady Green	Switch is the master of an enhanced stack.
	OFF	Indicates the switch is a slave switch of an enhanced stack. Or, indicates the switch is not a member of an enhanced stack.
FAN A	Steady Green	Fan A is operating correctly.
	Steady Amber	Fan A is experiencing alarm conditions.
	OFF	FAN A is not installed.

Table 1 AT-8401 Management Card LEDs

LED	State	Description
FAN B	Steady Green	Fan B is operating correctly.
	Steady Yellow	Fan B is experiencing alarm conditions.
	OFF	FAN B is not installed.
WAIT/ REMOVE	Steady Green	Indicates you can add or remove a line card from the AT-8400 Series switch safely.
	Steady Amber	Indicates a disconnect request is being processed. You **cannot** add or remove a line card from the AT-8400 Series switch safely while the LED is in this state.

RS-232 Port Pinouts

Table 2 lists the pin signals on the RS-232 Port on the management card.

Table 2 RS-232 Port Pin Signals

Pin	Signal
1	Data Carrier Detect
2	Transmit Data
3	Receive Data
4	Data Set Ready
5	Ground
6	Data Terminal Ready
7	Clear to Send
8	Request to Send
9	Ring Indicator

Power Supplies

On the front panel of the chassis beneath the power supply cover are two power supply slots labelled PWR A and PWR B. See Figure 6. One AC or DC power supply comes pre-installed in the PWR A slot. The power supply can power a fully loaded chassis with twelve line cards and the management card.

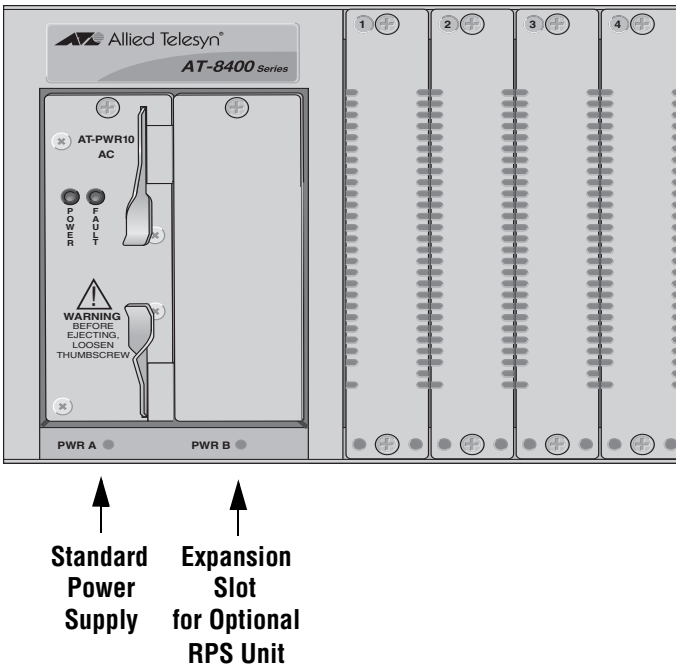


Figure 6 Power Supply Slots

You can install an optional redundant power supply in the PWR B slot. The extra power supply can prevent an interruption to your Ethernet network should the standard power supply fail. An optional redundant power supply operates in a standby mode. It provides power to the chassis only if the main power supply fails or loses power.

When ordering a redundant power supply, please note the following:

- ❑ An AT-8400 Series switch has either AC power sockets or DC terminal blocks on the back panel. When purchasing a new power supply, be sure that the new power supply you order is appropriate for your system. You cannot install an AC power supply in a DC chassis or a DC power unit in an AC chassis.
- ❑ There may be several different models of AC and DC power supplies. Each model is rated for a different power load. Both power supplies in a chassis must be of the same model type. Do not mix power supplies with different power ratings in the same chassis.

Power Supply LEDs

A power supply has two LEDs. The LEDs are defined in Table 3.

Table 3 Power Supply LEDs

LED	State	Description
POWER	OFF	The power supply is not receiving power.
	Solid Green	The power supply is receiving power.
FAULT	OFF	The power supply is operating normally.
	Solid Red	The power supply is failing or has failed.

Power Supply Connectors

The chassis of an AT-8400 Series Switch is either AC powered or DC powered. An AC powered chassis has two AC power sockets on the back panel (see Figure 3 on page 4). A DC powered chassis has two DC terminal blocks on the back panel (see Figure 4 on page 5). One power connector is used for the pre-installed power supply. The other is for the optional redundant power supply. For instructions on how to connect power to an AC powered chassis, refer to Powering on an AC Chassis on page 85. For instructions on how to connect power to a DC powered chassis, refer to Powering on a DC Chassis on page 86.

Chapter 2

Fast Ethernet and Gigabit Ethernet Line Cards

This chapter contains the following sections:

Ethernet Line Card Overview

The following Ethernet line cards are available for the AT-8400 Series switch:

- ❑ AT-8411 TX Line Card
- ❑ AT-8412/SC FX Line Card
- ❑ AT-8412/MT FX Line Card
- ❑ AT-8413 GB/T Line Card
- ❑ AT-8414/ST Line Card
- ❑ AT-8414/SC Line Card

Table 4 lists the line card configurations.

Table 4 Basic Line Card Configurations

Line Card	Number of Ports	Speed	Cable	Connector	Maximum Distance
AT-8411 TX	8	10 or 100 Mbps	Twisted-pair	RJ-45	100 meters (328 feet)
AT-8412/SC FX	4	100 Mbps	Fiber Optic[1]	Dual SC	2 kilometers (1.25 miles)[2]
AT-8412/MT FX	4	100 Mbps	Fiber Optic[1]	MT-RJ	2 kilometers (1.25 miles)[2]
AT-8413 GB/T	1	10/100/ 1000 Mbps	Twisted-pair	RJ-45	100 meters (328 feet)
	1 GBIC slot[3]	1000 Mbps	Fiber Optic	Varies by GBIC module	Varies by GBIC module
AT-8414/ST	4	10 Mbps	Fiber Optic[1]	ST	2 kilometers (1.25 miles)[2]
AT-8414/SC	4	10 Mbps	Fiber Optic[1]	SC	2 kilometers (1.25 miles)[2]

1. Do not use single mode fiber optic cable with these ports.
2. Assumes full-duplex operation.
3. GBIC module sold separately.

AT-8411 TX Line Card

The AT-8411 TX line card, illustrated in Figure 7, features eight 10/100Base-TX ports.

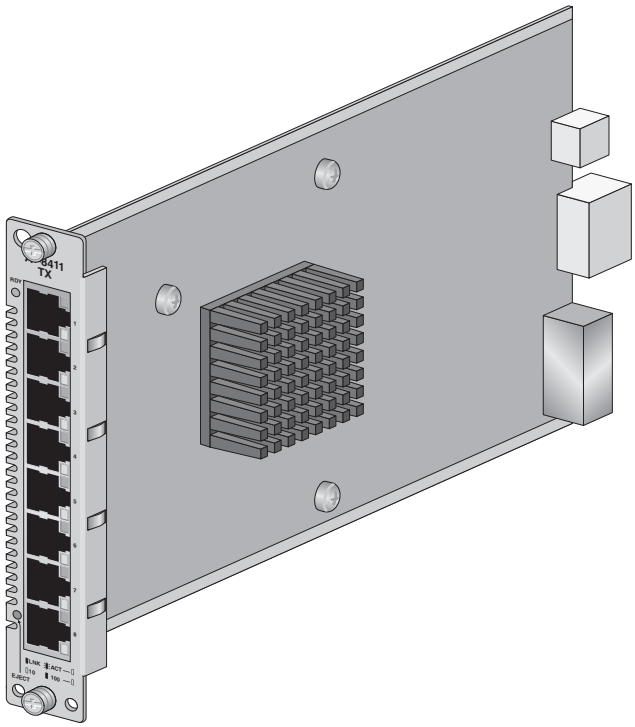


Figure 7 AT-8411 TX Line Card

Type of Connector

The twisted-pair ports on the line card feature 8-pin RJ-45 connectors.

Maximum Distance

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

Speed

The ports are 10Base-T and 100Base-TX compliant and are capable of both 10 megabits per second (Mbps) and 100 Mbps speeds. You can set the port speed manually or, since the ports are IEEE 802.3u Auto-Negotiation compliant, you can let the switch set each port's speed automatically. 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.

Note
Auto-Negotiation is activated as the default on all twisted-pair ports on the switch. To deactivate Auto-Negotiation and set the speeds manually, refer to the **AT-S60 Management Software User's Guide** or the **AT-S60 Command Line User's Guide**.

Duplex Mode

Each twisted-pair port on the line card can operate in either half- or full-duplex mode. The twisted-pair ports are IEEE 802.3u-compliant and will Auto-Negotiate the duplex mode setting. If the end node connected to a twisted-pair port on the switch is capable of full-duplex operation, the switch sets the twisted-pair port to full-duplex. If the end node is capable of only half-duplex, the port is set to half-duplex.

If desired, Auto-Negotiation on one or all of the ports can be disabled to let you set the duplex mode manually with the management software.

Type of Cabling

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

Auto-MDI

The ports are auto-MDI when the port is set to Auto-Negotiation. They automatically configure themselves as either MDI or MDI-X when connected to an end node. This feature allows you to use either straight-through or crossover twisted-pair cables to connect devices to the ports.

Note
Auto-MDI is activated as the default on all twisted-pair 10/100 ports on the switch. To activate Auto-MDI, and set the port manually, refer to the **AT-S60 Management Software User's Guide** or the **AT-S60 Command Line User's Guide**.

LEDs

Table 5 describes the port LEDs.

Table 5 AT-8411 TX Line Card LEDs

LED	State	Description
RDY	Steady Green	The line card is receiving power and is ready to pass traffic.
LINK/ACT	OFF	The port has not established a valid link with the end node.
	Steady Green	The port has established a valid link with the end node.
	Flashing Green	The port is transmitting and/or receiving data.
LINK 10/ 100	OFF	The port has established a valid 10 Mbps link with the end node.
	Steady Green	The port has established a valid 100 Mbps link with the end node.

RJ-45 Twisted-pair Port Pinouts

Figure 8 illustrates the pin layout to an RJ-45 connector and port.

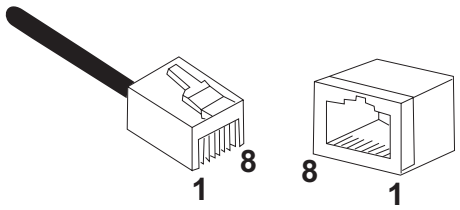


Figure 8 RJ-45 Connector and Port Pin Layout

Table 6 lists the RJ-45 pin signals when a twisted-pair port is operating in the MDI configuration.

Table 6 MDI Pin Signals (10 or 100 Mbps)

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

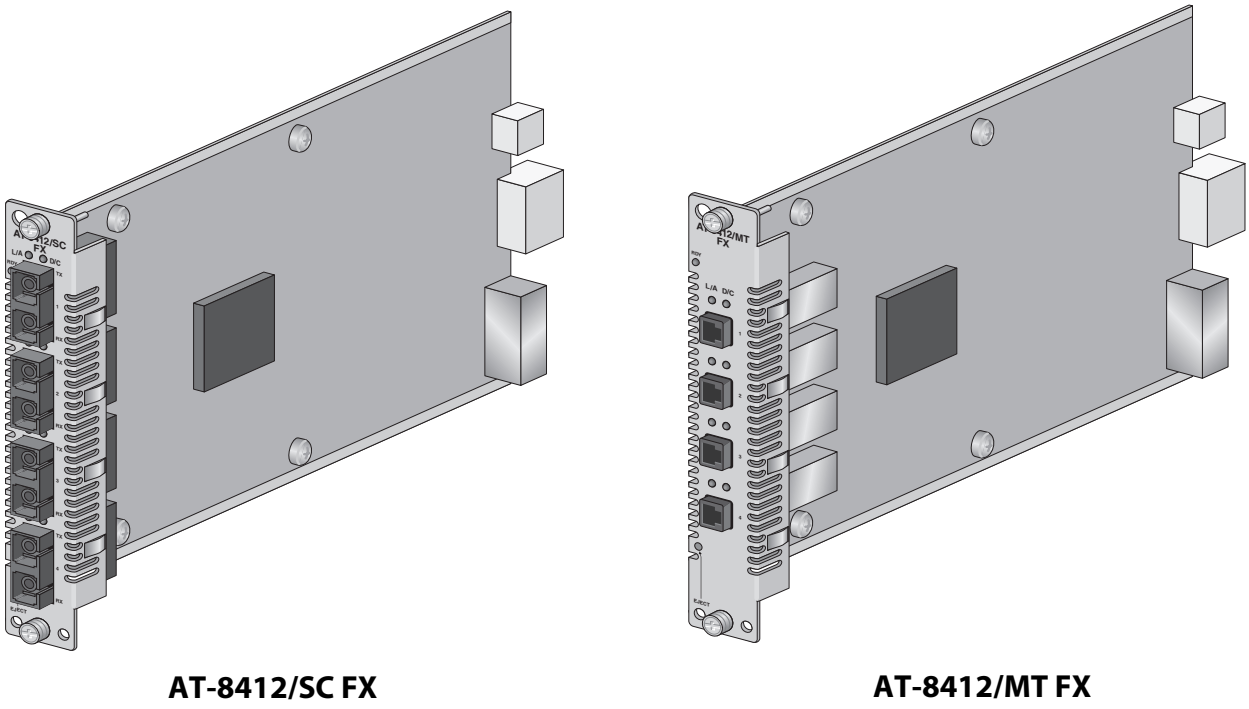
Table 7 lists the RJ-45 port pin signals when a twisted-pair port is operating in the MDI-X configuration.

Table 7 MDI-X Pin Signals (10 or 100 Mbps)

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

AT-8412/SC FX and AT-8412/MT FX Line Cards

The AT-8412/SC FX and AT-8412/MT FX line cards, illustrated in Figure 9, feature four fiber optic 100Base-FX ports. The two line cards are operationally identical; the only difference is the type of fiber optic connector.



AT-8412/SC FX **AT-8412/MT FX**

Figure 9 AT-8412/SC FX and AT-8412/MT FX Line Cards

Type of Connector The four fiber optic ports have either dual SC connectors or MT-RJ connectors, depending on the model.

Speed The ports have a fixed operating speed of 100 megabits per second (Mbps). The speed cannot be changed.

Duplex Mode The fiber optic ports can operate in either half- or full-duplex mode. You can set the duplex mode manually. The default setting is full-duplex.

Maximum Distance Each fiber optic port has a maximum operating distance of 2 kilometers (1.25 miles) when operating in full-duplex mode and 412 meters (1,360 feet) when operating in half-duplex mode.

Type of Cabling The ports can use either 50/125 or 62.5/125 micron multimode fiber optic cable.

Note
Do not use single-mode fiber optic cable with these line cards.

LEDs

Table 8 describes the port LEDs.

Table 8 AT-8412/SC FX and AT-8412/MT FX Line Card LEDs

LED	State	Description
RDY	Steady Green	The line card is receiving power and is ready to forward traffic.
L/A	Steady Green	The port has established a valid link with its end node.
	Flashing Green	The port is transmitting and/or receiving data packets.
	OFF	The port has not established a valid link with its end node.
D/C	Steady Green	The port is operating at 100 Mbps in full duplex.
	Flashing Green	The port is experiencing data collisions.
	OFF	The port is operating in half-duplex mode without collisions.

Fiber Optic Port Specifications

Table 9 lists the fiber optic port specifications.

Table 9 AT-8412/SC FX and AT-8412/MT FX Fiber Optic Port Specifications

Pin	**Signal**
Standard	100Base-FX
Speed	100 Mbps
Maximum Operating Distance	Full duplex: 2 kilometers (1.25 miles) Half duplex: 412 meters (1,370 feet)
Operating Wavelength	1310 nm
Transmitter Output Power	50/125 µm cabling Min: -22.5 dBm avg. Max: -14 dBm avg. 62.5/125 µm cabling Min: -19 dBm avg. Max: -14 dBm avg.
Receiver Sensitivity	Min: -31 dBm avg. Max: -14 dBm avg.

AT-8413 GB/T Line Card

The AT-8413 GB/T Gigabit Ethernet line card, illustrated in Figure 10, features one 10/100/1000 Mbps twisted-pair Ethernet port and one expansion slot for an optional GBIC module.

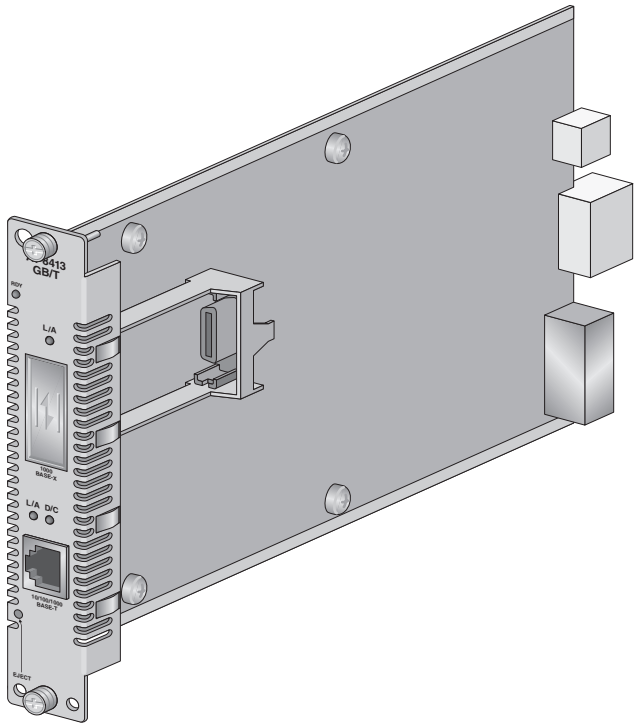


Figure 10 AT-8413 GB/T Gigabit Ethernet Line Card

You can use the line card two different ways. One way is to use just one port on the card at a time. This means that you can use the twisted-pair port or install a GBIC module and use the port on the GBIC.

Another way that you can use this line card is for port backup. This involves using both the twisted-pair port and a port on a GBIC module simultaneously to provide a redundant path in the event an active path should fail or be disconnected. This feature is explained in Port Backup on page 28.

Note
The AT-8413 line card can forward traffic through the twisted-pair port or a GBIC port, but it cannot forward traffic through both ports simultaneously.

Twisted-pair Port

Type of Connector

The twisted-pair port features an 8-pin RJ-45 connector. (The port uses four pins when operating at 10 or 100 Mbps and all eight pins when operating at 1000 Mbps.)

Speed

The twisted-pair port can operate at 10, 100, or 1000 Mbps. You can set the port speed manually or, since the ports are IEEE 802.3u Auto-Negotiation compliant, you can let the switch set each port's speed automatically. 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.

Note
Auto-Negotiation is activated as the default on all twisted-pair ports on the switch. To deactivate Auto-Negotiation and set the speeds manually, refer to the **AT-S60 Management Software User's Guide** or the **AT-S60 Command Line User's Guide**.

Duplex Mode

The twisted-pair port can operate in either half- or full-duplex mode. The port is IEEE 802.3u-compliant and will Auto-Negotiate the duplex mode setting. If desired, Auto-Negotiation on the port can be disabled so that you can set the duplex mode manually through the management software.

Maximum Distance

The twisted-pair port has a maximum operating distance of 100 meters (328 feet).

Type of Cabling

For 10 Mbps, the port requires Category 3 or better 100 ohm shielded or unshielded twisted-pair cabling. For 100 or 1000 Mbps operation, the port requires Category 5 or Enhanced Category 5 (5E) 100 ohm shielded or unshielded twisted-pair cabling.

Auto-MDI

For speeds of 10 Mbps and 100 Mbps, the twisted-pair port is auto-MDI when the port is set to Auto-Negotiation. It automatically configures itself as either MDI or MDI-X when connected to an end node. This feature allows you to use either a straight-through or crossover twisted-pair cable when connecting any network device to the port.

Note
Auto-MDI is activated as the default on all twisted-pair 10/100 ports on the switch. To activate Auto-MDI, and set the port manually, refer to the **AT-S60 Management Software User's Guide** or the **AT-S60 Command Line User's Guide**.

Port Pinouts

For the pinouts of the twisted-pair port when operating at 10 or 100 Mbps in the MDI configuration, refer to Table 6 on page 19. For the pinouts of the twisted-pair port when operating at 10 or 100 Mbps in the MDI-X configuration, refer to Table 7 on page 19.

When the port is operating at 1,000 Mbps, all four pairs are used. The table below lists the port pinouts.

Table 10 Pin Configurations (1,000 Mbps)

MDI Configuration	
Pin	**Pair**
1	TP0+
2	TP0-
3	TP1+
4	TP2+
5	TP2-
6	TP1-
7	TP3+
8	TP3-

Twisted-pair Port LEDs

The twisted-pair port LEDs are defined in Table 11.

Table 11 AT-8413 GB/T Twisted-pair Port LEDs

LED	State	Description
RDY	Steady Green	Indicates the line card is receiving power and is ready to pass traffic.
L/A	Off	Indicates the port has not established a valid link with its end node.
	Steady Amber	Indicates the port has established a 10 or 100 Mbps link with the end node.
	Flashing Amber	Indicates data activity on the port,
	Steady Green	Indicates the port has established a 1,000 Mbps link with the end node.
	Flashing Green	Indicates data activity on the port.
D/C	Steady Green	Indicates the port is operating in full-duplex.
	Steady Amber	Indicates the port is operating in half-duplex.
	Flashing Amber	Indicates collisions are occurring on the port.

Gigabit Interface Converter (GBIC) Slot

The AT-8413 line card has one expansion slot that can accommodate one optional fiber optic Gigabit Interface Converter (GBIC) Ethernet module.

A GBIC module is a fast and easy way for you to add an 1000 Mbps fiber optic port to your switch. You can use a GBIC module to extend the distance of your network, build a high-speed backbone network between switches, or connect additional nodes to the network, such as high-speed servers.

The speed on a GBIC module is fixed at 1,000 Mbps. It cannot be changed.

Figure 11 shows an example of a fiber optic GBIC module.

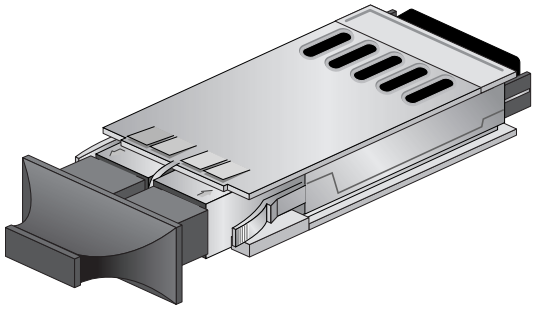


Figure 11 GBIC Module

Note
For a list of the Allied Telesyn GBIC modules supported by the AT-8413 line card, contact your Allied Telesyn sales representative.

GBIC Slot LEDs

The GBIC slot LEDs are defined in Table 12.

Table 12 AT-8413 GB/T GBIC LED

LED	State	Description
L/A	OFF	The GBIC port has not established a valid link with its end node.
	Steady Green	The GBIC port has established a valid link with its end node.
	Flashing Green	The GBIC port is transmitting and/or receiving data packets.

Port Backup

The AT-8413 line card features port backup. This feature can prevent a loss of connectivity between critical network devices should a link between switches be disconnected or fail.

Port backup involves using both the twisted pair port on the line card and installing a fiber optic or twisted pair GBIC module in the GBIC expansion slot. You connect the two ports to another AT-8413 line card in another AT-8400 Series switch, or to ports on another Ethernet switch.

The line card designates one port to provide the active link and disables the other port. If the active link is lost, for instance, if the data cable is disconnected, the backup port is activated.

Note
This feature is independent of Spanning Tree Protocol and Rapid Spanning Tree Protocol. You do not need to activate spanning tree to use this feature.

Here are a few examples to illustrate the feature. In Figure 12, the twisted pair and GBIC port on two AT-8413 link cards in two different AT-8400 chassis are connected together. If the GBIC ports are providing the active link, a loss of the link, such as from a defective fiber optic cable, would cause the line cards to automatically reestablish the link to the two chassis using the twisted pair ports.

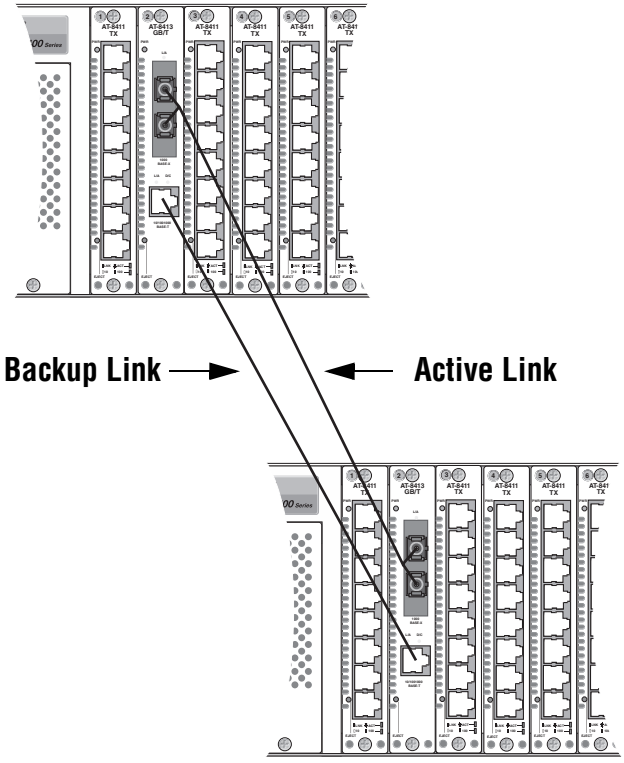


Figure 12 AT-8413 Line Card Port Backup - Example 1

You can have the connections go to different AT-8413 line cards. This increases protection to network connectivity against the failure of an AT-8413 card. This is illustrated in Figure 13 where the ports on the AT-8413 line card in the top AT-8400 Series switch are connected to two different AT-8413 line cards in the bottom AT-8400 Series switch
.

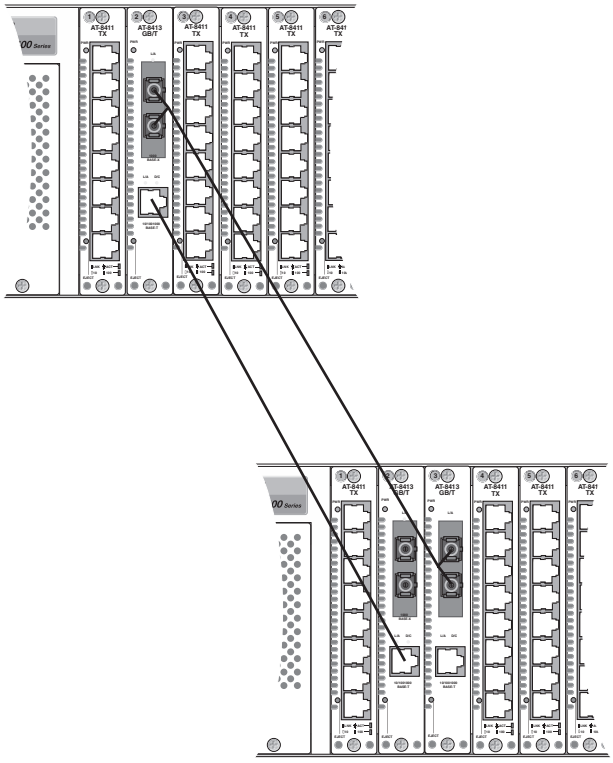


Figure 13 AT-8413 Line Card Port Backup - Example 2

You can also have link redundancy from an AT-8413 line card to another type of Ethernet switch. The example in Figure 14 shows link backup to an AT-8000 Series switch that has two Gigabit Ethernet expansion modules, one with a twisted pair port and one with a fiber optic port.

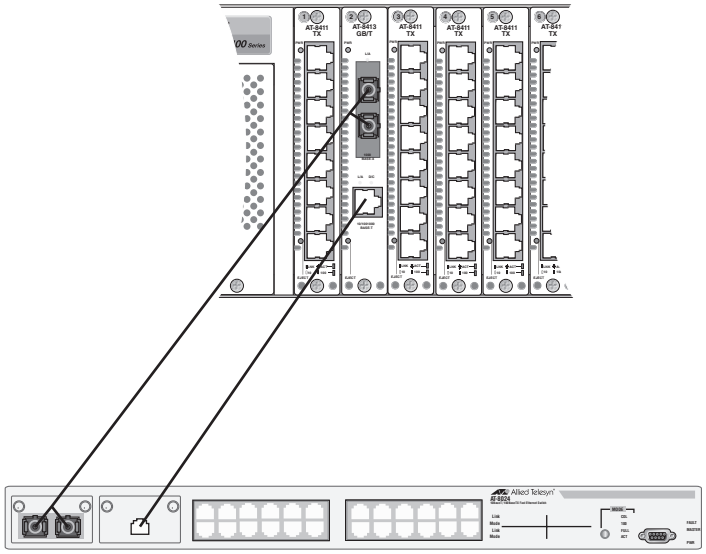


Figure 14 AT-8413 Line Card Port Redundancy - Example 3

How the AT-8413 line card selects the active link is straightforward. It assigns the active status to whichever port is first to establish a link with its opposite port. That link remains as the active link until the link is lost. At that point, the backup link becomes the active link, and remains so until there is a change to its link status.

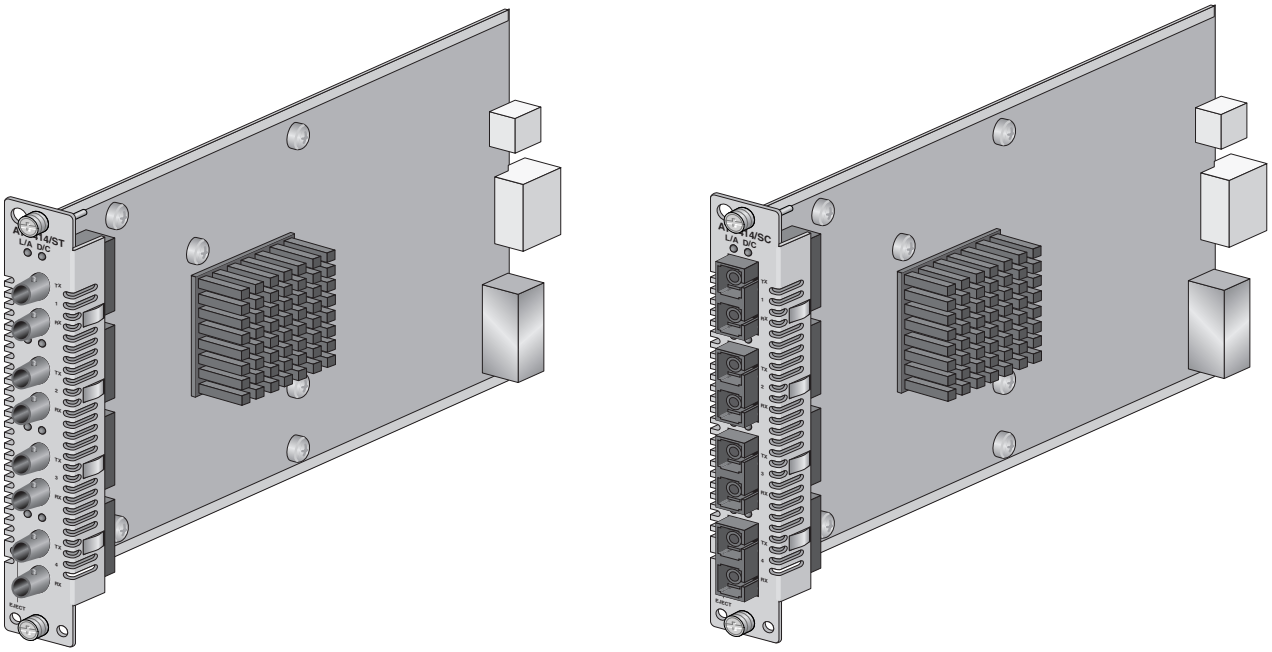
The actual process of activating a disabled port and establishing a link can take the line card several seconds to complete. This may result in some data loss during the few seconds required by the line card to establish the new link.

If you have links to both the twisted pair and the fiber ports and you reset or power cycle an AT-8400 Series switch, the switch defaults to the fiber optic port first. In general, a fiber optic port is quicker at establishing a link than a twisted pair port.

There is no software management required to use this feature. Connecting the data cables and allowing the line card to establish an active link is all that is necessary. It should be noted that you cannot designate the active link through the AT-S60 management software. As explained, the line card determines that automatically.

AT-8414/ST and AT-8414/SC Line Cards

The AT-8414/ST and AT-8414/SC line cards, illustrated in Figure 15, feature four fiber optic 10Base-FX ports. The two line cards are operationally identical; the only difference is the type of fiber optic connector.



AT-8414/ST **AT-8414/SC**

Figure 15 AT-8414/ST and AT-8414/SC Line Cards

Type of Connector The four fiber optic ports have either ST connectors or SC connectors, depending on the model.

Speed The ports have a fixed operating speed of 10 megabits per second (Mbps). The speed cannot be changed.

Duplex Mode The fiber optic ports can operate in either half- or full-duplex mode. You can set the duplex mode manually. The default setting is full-duplex.

Maximum Distance Each fiber optic port has a maximum operating distance of 2 kilometers (1.25 miles) when operating in full-duplex mode and 412 meters (1,360 feet) when operating in half-duplex mode.

Type of Cabling The ports can use either 50/125 or 62.5/125 micron multimode fiber optic cable.

LEDs Table 13 describes the port LEDs.

Table 13 AT-8414/ST and AT-8414/SC Line Card LEDs

LED	State	Description
RDY	Steady Green	The line card is receiving power and is ready to forward traffic.
L/A	Steady Green	The port has established a valid link with its end node.
	Flashing Green	The port is transmitting and/or receiving data packets.
	OFF	The port has not established a valid link with its end node.
D/C	Steady Green	The port is operating in full duplex.
	Flashing Green	The port is operating in half-duplex and is experiencing data collisions.
	OFF	The port is operating in half-duplex mode without data collisions.

Fiber Optic Port Specifications

Table 14 lists the fiber optic port specifications.

Table 14 AT-8414/ST and AT-8414/SC Fiber Optic Port Specifications

Pin	**Signal**
Standard	10Base-FX
Speed	10 Mbps
Maximum Operating Distance	Full duplex: 2 kilometers (1.25 miles) Half duplex: 412 meters (1370 feet)
Operating Wavelength	850 nm
Transmitter Output Power	50/125 µm cabling Min: -22.5 dBm avg. Max: -14 dBm avg. 62.5/125 µm cabling Min: -19 dBm avg. Max: -14 dBm avg.
Receiver Sensitivity	Min: -31 dBm avg. Max: -14 dBm avg.

Chapter 3

Installing the AT-8400 Chassis

This chapter contains the following sections:

Overview

This chapter discusses how to install the AT-8400 chassis on a desktop or in a rack and the necessary preparations you need to make before installing the chassis. A rackmounting kit, that includes the brackets that are needed to mount the chassis in a 19-inch rack, is shipped with the chassis.

Before you install the chassis, you need to make the following preparations:

- Verifying Package Contents on page 37
- Preparing the Site on page 38
- Reviewing Safety Precautions on page 38

Verifying Package Contents

Make sure the following items are included in your package. If items are missing or damaged, contact your Allied Telesyn sales representative for assistance.

- ❑ One AT-8400 chassis
- ❑ One rackmounting kit
- ❑ AT-8400 Chassis Installation Guide
- ❑ Warranty card

Preparing the Site

Be sure to observe the following guidelines when planning the installation of your chassis.

- ❑ Make sure power for the chassis is accessible and cables can be easily connected.
- ❑ Cables must be away from sources of electrical noise such as radios, transmitters, broadband amplifiers, power lines, fluorescent or halogen light fixtures.
- ❑ Air flow around the chassis and through its vents on the rear panel should not be restricted.
- ❑ If you are using the chassis on a desktop, make sure it is placed on a level, secure surface.
- ❑ Do not place objects on top of the chassis.
- ❑ Do not expose the chassis to moisture or water.
- ❑ Make sure the chassis is in a dust-free environment.
- ❑ Use dedicated power circuits or power conditioners to supply reliable electrical power to the network devices.

Reviewing Safety Precautions

Please review the following safety precautions before you install the AT-8400 chassis, the AT-8401management card, and AT-8400 line cards. (The first two warnings apply only if you purchased a line card with a fiber optic port.)

Laser
Class 1 laser product. 6

Laser
Do not stare into the laser beam. 7

Warning
Electric Shock Hazard: To prevent electric shock, do not remove the cover. There are no user-serviceable parts inside. The unit contains hazardous voltages and should only be opened by a trained and qualified technician. 8

Warning
Lightning Danger: Do not work on this equipment or cables during periods of lightning activity. 9

Caution
Power cord is used as a disconnection device: To de-energize equipment, disconnect the power cord. 10

Warning
Electrical-Type Class 1 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. 11

Caution
Pluggable Equipment: The socket outlet should be installed near the equipment and should be easily accessible. 12

Caution
Air vents: The air vents must not be blocked on the unit and must have free access to the room ambient air for cooling. 13

Caution
Operating Temperature: This product is designed for a maximum ambient temperature of 40°C. 14

Caution
All Countries: Install this product in accordance with local and National Electric Codes. 15

Warning
Remove all metal jewelry, such as rings and watches, before installing or removing a line card from a powered on chassis.

Installing the Chassis on a Desktop

This section explains how to install the chassis on a desktop. To install the chassis in a rack, refer to Installing the Chassis in a Rack on page 41.

For desktop installation, perform the following procedure:

1. Unpack all the items from the shipping container and store the packaging material in a safe location.

   Note
   Keep the shipping material. You must use the original shipping material if you need to return the chassis to Allied Telesyn.

2. Place the chassis down on a level, secure surface.

   The chassis is equipped with four protective rubber feet. This allows the chassis to be placed on many types of surfaces.

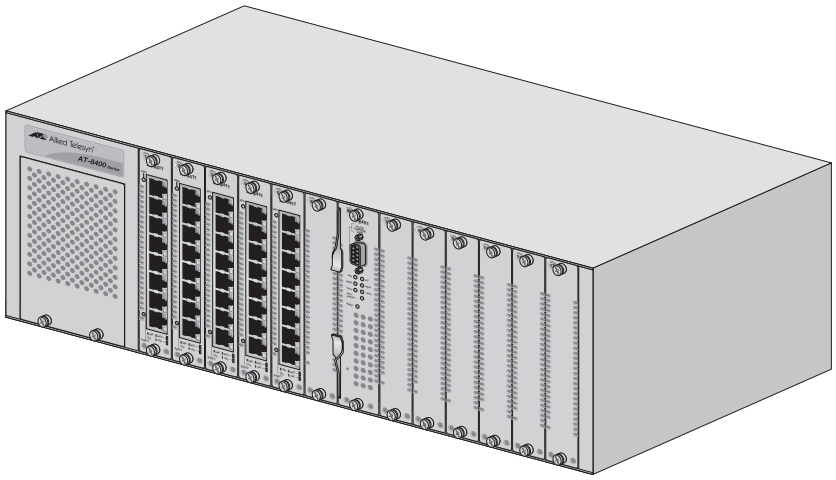


Figure 16 Desktop Installation

3. Do not apply power at this time. Go to Connecting the Frame Ground on page 84.

Installing the Chassis in a Rack

The chassis can be installed in a 3.5 RU opening in a standard 19-inch rack. It is recommended that you install the chassis in the rack after installing the following into the chassis:

- ❑ AT-8401 management card
- ❑ AT-8400 line cards
- ❑ Power supply

Since a fully assembled chassis is heavy, Allied Telesyn recommends two people lift it into a rack. See the Warning below.

Warning
Safety Hazard: A chassis with one AT-8401management line card, five AT-8411 line cards, and one power supply weighs 12.98 kg (28.85 lbs). Be sure to take the weight into consideration when selecting a shelf on a rack and lifting the chassis.

For rackmount installation, perform the following procedure:

1. If desired, remove the protective rubber feet from the bottom of the chassis.

   Removing the feet allows you to have more space to install the chassis into the rack. This is an optional step.

   Before removing the feet, carefully place the chassis upside down.

2. Remove the feet with a standard flat-head screw driver, as shown in Figure 17.

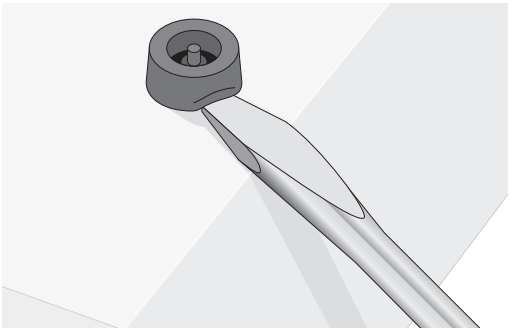


Figure 17 Removing the Protective Rubber Feet

3. Attach the brackets to the sides of the chassis with four screws (provided) on each side.

There are two ways to attach the brackets. You can flip the ears of the brackets to the front, as shown in Figure 18. Or, you can flip the ears of the brackets to the rear, as shown in Figure 19. When the ears of the brackets are flipped to the rear, the chassis sticks out from the rack 4.31 inches (10.95 cm).

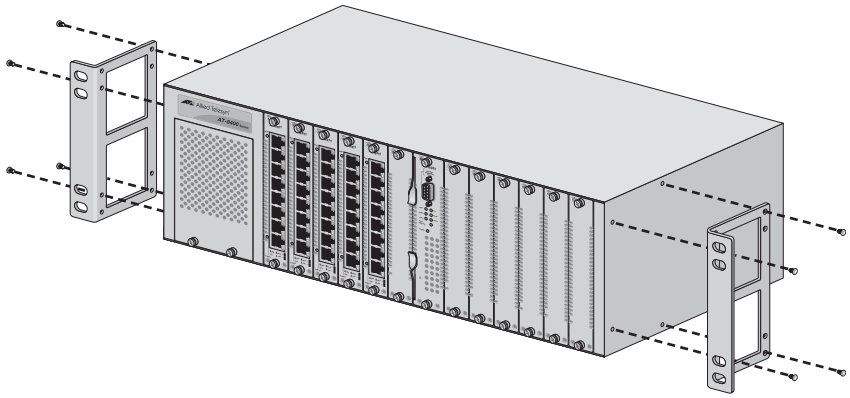


Figure 18 Attaching the brackets, with the ears flipped to the front

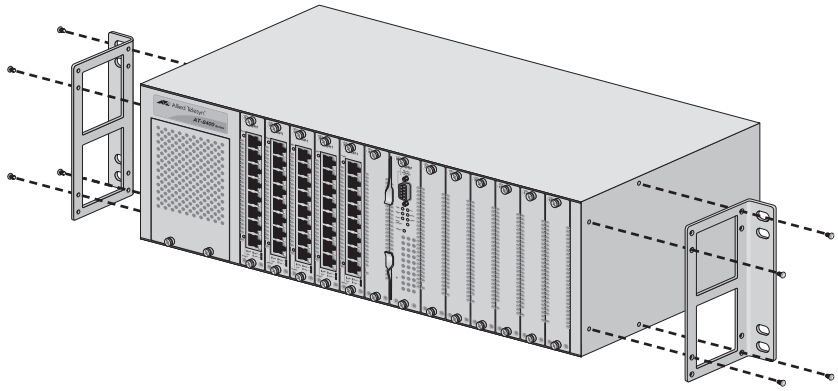


Figure 19 Attaching the brackets, with the ears flipped to the rear

Note
The chassis may be heavy and awkward to lift. It is recommended that you get assistance with the next step.

4. Attach the chassis to the rack with two screws (not provided) on each side. Refer to Figure 20.

Note
The brackets are designed to be installed in a 3.5RU opening on a standard rack.

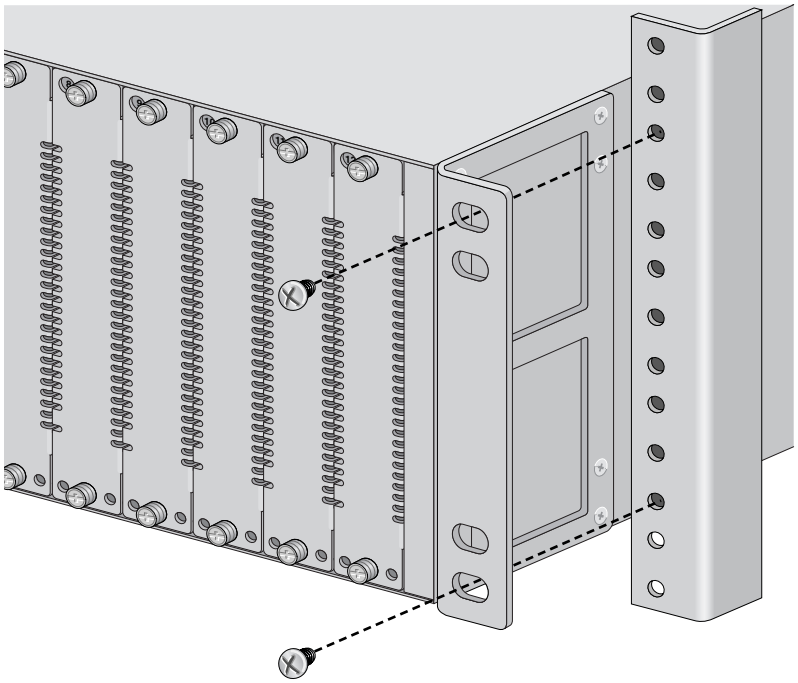


Figure 20 Installing the Chassis in a Rack

5. Do not apply power at this time. Connect the frame ground to the chassis. Refer to Connecting the Frame Ground on page 84.

Warranty Registration

When you have finished installing the product, you should register your product by completing the enclosed warranty card and sending it in.

Chapter 4

Installing and Replacing the AT-8401 Management Card

This chapter contains the following sections:

Overview

This chapter describes how to install and replace an AT-8401 management card into an AT-8400 chassis. For background information about the management card, see Chassis Slot M and the AT-8401 Management Card on page 7.

Verifying Package Contents

Make sure the following items are included in your AT-8401 management card package. If items are missing or damaged, contact your Allied Telesyn sales representative for assistance.

- ❑ One AT-8401 management card
- ❑ AT-8401 Management Fabric Card Installation Guide
- ❑ Warranty card
- ❑ MAC address stickers

Installing an AT-8401 Management Card

This section describes how to install an AT-8401 management card in the AT-8400 chassis. Use this procedure when the chassis is powered down. You can install a maximum of one management card in an AT-8400 chassis.

For information about replacing a management card, see Replacing an AT-8401 Management Card on page 52.

Procedure for Installing a Management Card

To install an AT-8401 management card, perform the following procedure:

Caution
Before installing a management card, refer to Appendix A, Technical Specifications on page 97 for safety and emissions information.

1. Unpack the new management card from its shipping container and store the packaging material in a safe location.

   Be sure to observe all standard electrostatic discharge (ESD) precautions, such as wearing an antistatic wrist strap, to avoid damaging the device.

2. Check that the card package includes all the items listed in the Verifying Package Contents section in this chapter. If any item is missing or damaged, contact your Allied Telesyn sales representative for assistance.

   Keep the shipping material. You must use the original shipping material if you need to return the card to Allied Telesyn.

3. Align the edge of the card with the top and bottom guide rails as you carefully slide the management card into slot M, keeping the locking levers in the released position as shown in the following diagram. Avoid touching the management card components. See Figure 21.

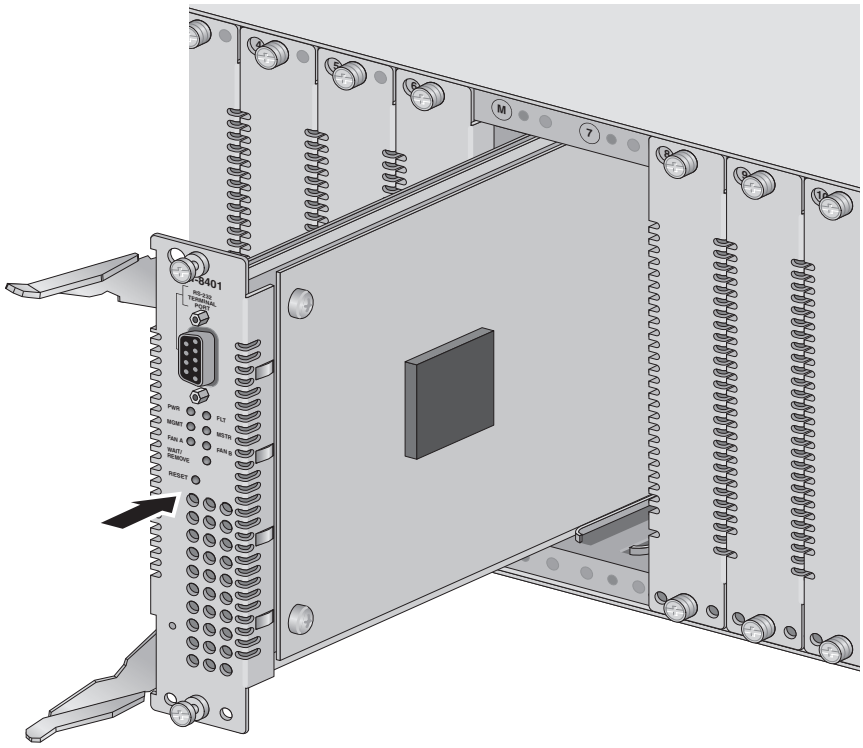


Figure 21 Sliding the Management Card into Slot M

4. Push the card until it is within a quarter inch of the front of the chassis.

   As the card approaches the front of the chassis, the top and bottom locking levers lean toward the front of the card.

5. Simultaneously push the locking levers on the management card into the locked position as shown in the diagram. When the levers are engaged, they are parallel to the front of the card which is flush with the front of the chassis. See Figure 22.

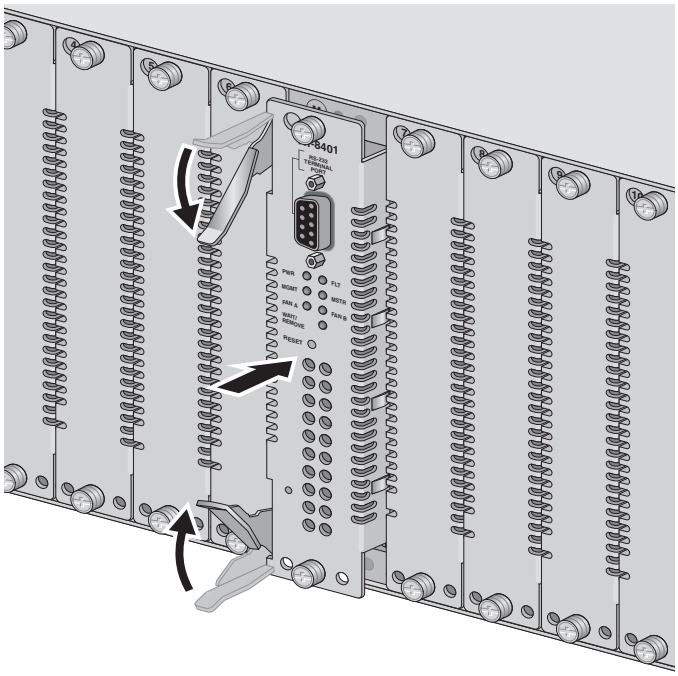


Figure 22 Moving the Locking Levers Toward the Chassis

6. Secure the management card to the chassis by using a Phillips screwdriver to tighten the two installation screws found on the faceplate.

7. For local management of the chassis, attach one end of a RS-232 cable with a DB9 connector to the RS-232 port on the management card and the other end of the cable to a terminal or PC with a terminal emulator program. See Figure 23.

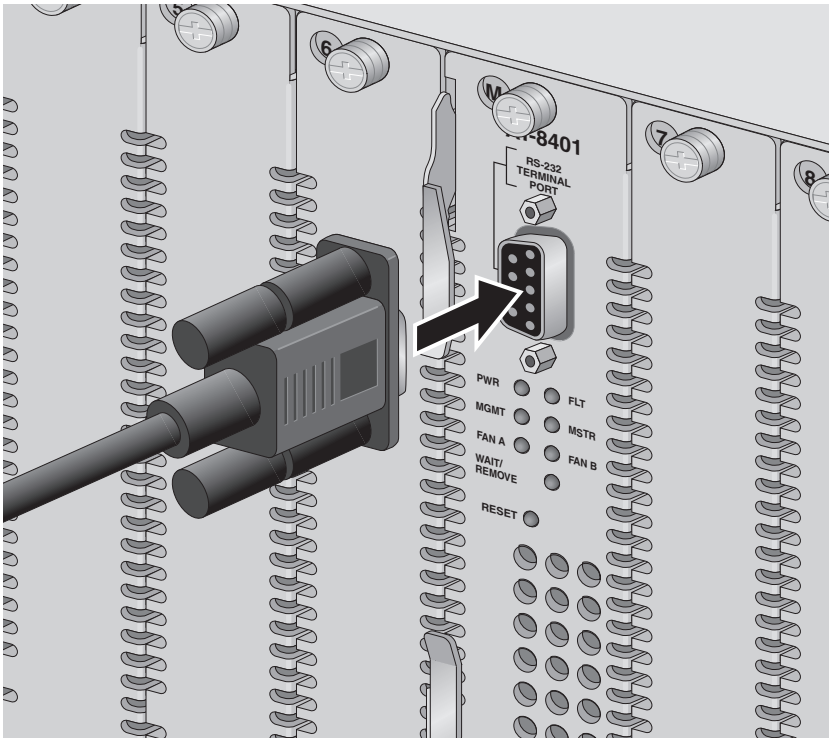


Figure 23 Connecting the RS-232 Cable

8. Make sure the PWR, FAN A, and FAN B LEDS on the front of the management card are steady green. See Figure 24.

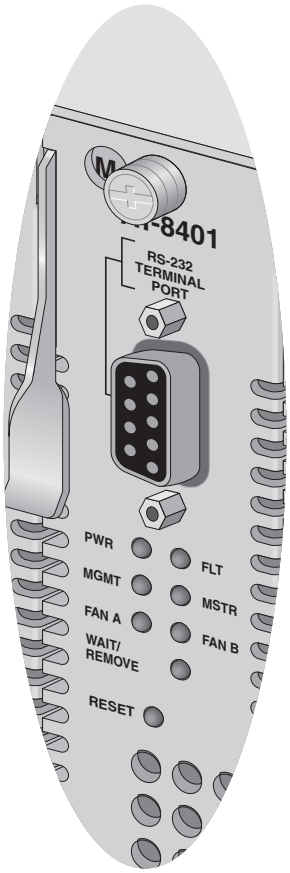


Figure 24 AT-8401 Management Card LEDs

9. Attach a MAC address sticker to the front of the chassis.

   This sticker contains the MAC address of the AT-8401 management card. Allied Telesyn recommends attaching the sticker to the power supply cover on the front of the chassis.

Replacing an AT-8401 Management Card

This section describes how to replace an AT-8401 management card from the AT-8400 chassis. You must power down the chassis before you can replace a management card. For information about installing a management card, see Installing an AT-8401 Management Card on page 47.

This procedure discusses how to remove an installed AT-8401 management card and replace it with a new one while the chassis is powered down. You can install a maximum of one AT-8401 management card in an AT-8400 chassis.

The AT-S60 software resides on the management card and directs the activity of the AT-8400 line cards. Consequently, when you remove the AT-8401 from the chassis, the AT-8400 line cards will not forward packets. However, the configuration information that pertains to the AT-8400 line cards is retained.

For detailed information about the AT-8401 management card, see Chassis Slot M and the AT-8401 Management Card on page 7.

Procedure or Replacing a Management Card

To replace an AT-8401 management card in a powered down AT-8400 Chassis, perform the following procedure:

⚠ Caution
Before installing a line card, refer to Appendix A, Technical Specifications, for safety and emissions information.

1. Using a Phillips screwdriver, loosen the two installation screws found on the card faceplate of the installed AT-8401 management card located in slot M.

⚠ Caution
Be sure to observe all standard electrostatic discharge (ESD) precautions, such as wearing an antistatic wrist strap, to avoid damaging the device.

2. Pull the top and bottom locking levers out and away from the card as you slide the card out of the chassis. See Figure 25.

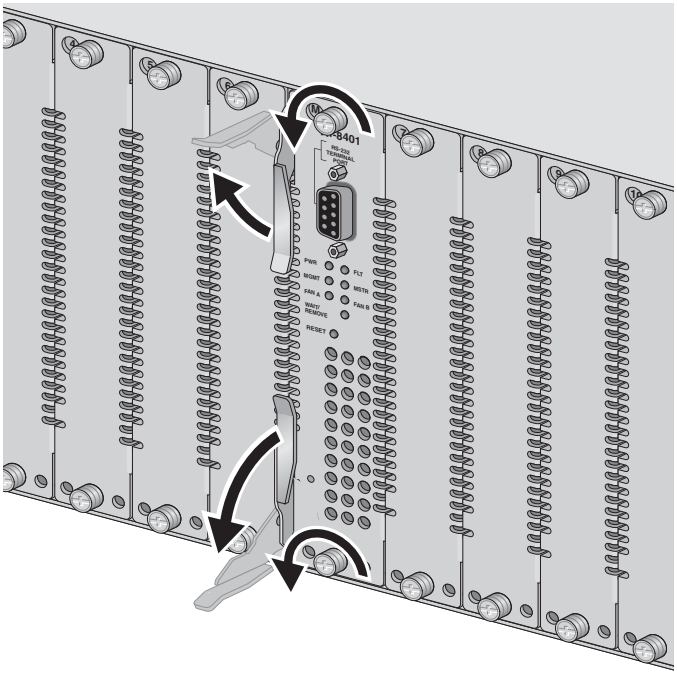


Figure 25 Removing the AT-8401 Management Card

3. Unpack the new management card from its shipping container and store the packing material in a safe location.

Caution
Be sure to observe all standard electrostatic discharge (ESD) precautions, such as wearing an antistatic wrist strap, to avoid damaging the device. If you are removing a card, store it in an antistatic bag or immediately install it in another slot. A card can be damaged by static electricity.

4. Check that the card package includes all the items listed in the section titled Verifying Package Contents. If any item is missing or damaged, contact your Allied Telesyn sales representative for assistance.

Note
Keep the shipping material. You must use the original shipping material if you need to return the chassis to Allied Telesyn.

5. Carefully slide the management card into slot M, keeping the locking levers in the released position as shown in Figure 26.

   Avoid touching the management card components.

Note
If the management card doesn't slide in easily, check that you are sliding it into slot M.

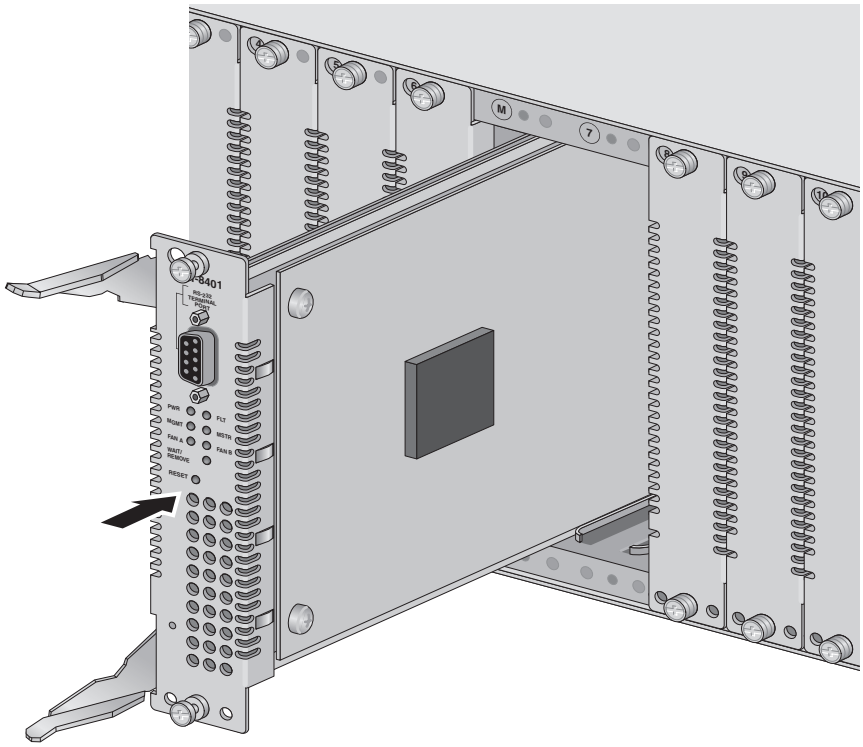


Figure 26 Installing the AT-8401 Management Card into slot M

6. Push the card until it is within a quarter inch of the front of the chassis.

   As you slide the management card into the chassis, the top and bottom locking levers on the AT-8401 management card lean in toward the front of the chassis. See Figure 27.

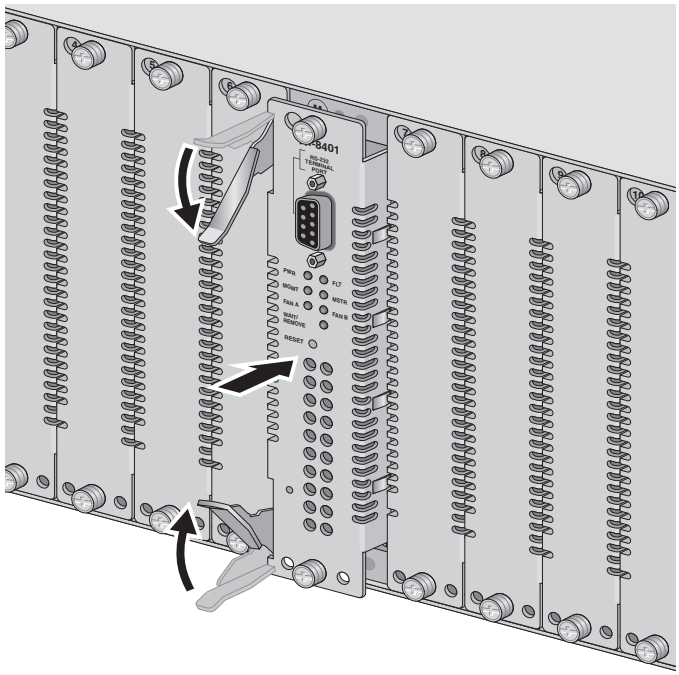


Figure 27 Locking levers angle toward the chassis

7. Simultaneously push the locking levers on the management card into the locked position.

   When the levers are engaged, they are parallel to the front of the card which is flush with the chassis. See Figure 28

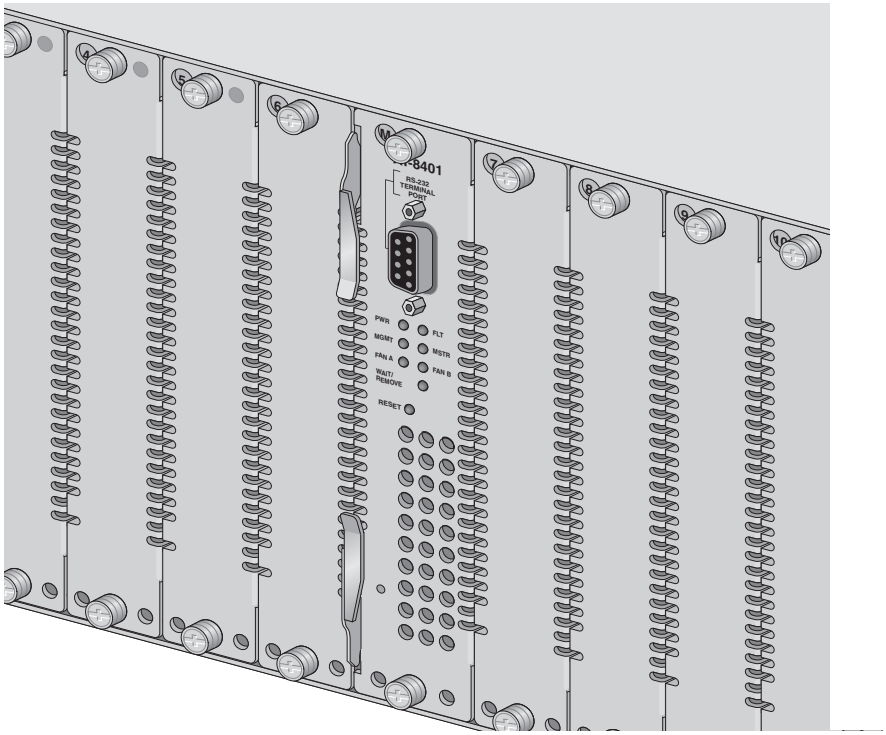


Figure 28 AT-8401 Management Card Installed

8. Secure the card to the chassis by using a Phillips screwdriver to tighten the two installation screws on the card faceplate.

Note
Always use installation screws to secure the card to the chassis. Leaving a card partially seated may cause the system to halt and subsequently crash.

9. For local management of the chassis, attach one end of a RS-232 cable with a DB9 connector to the RS-232 port on the management card and the other end of the cable to a terminal or PC with a terminal emulator program. See Figure 29.

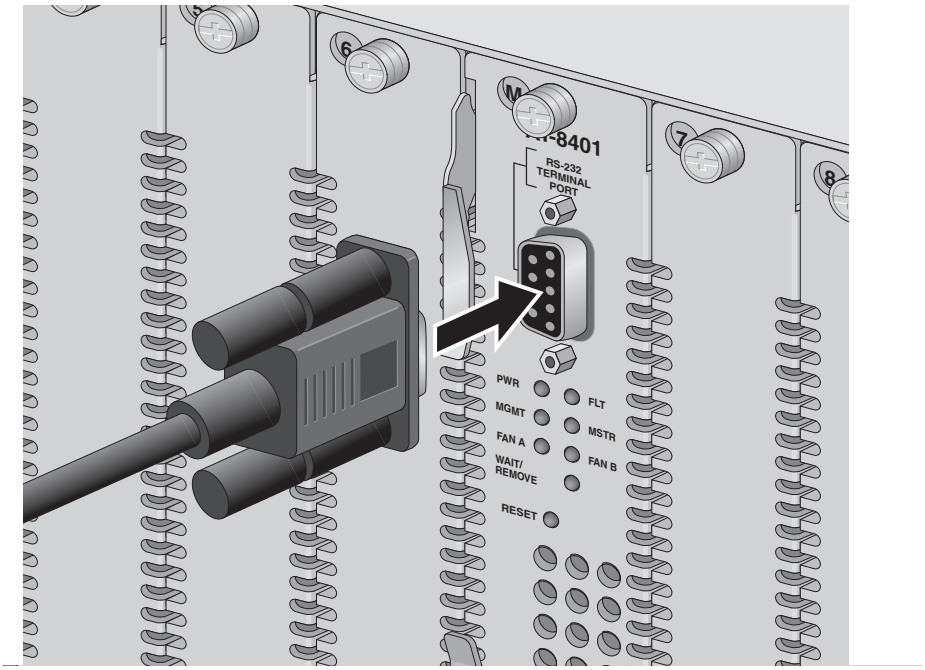


Figure 29 Installing a RS-232 cable

10. Attach a MAC address sticker to the front of the chassis.

    This sticker contains the MAC address of the AT-8401 management card. Allied Telesyn recommends attaching the sticker to the power supply cover on the front of the chassis.

11. Power on the end nodes.

12. Make sure the POWER, FAN A, and FAN B LEDs are a steady green. See Figure 30.

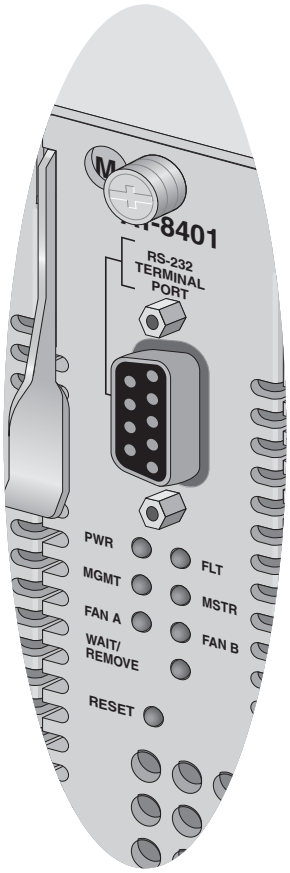


Figure 30 AT-8401 Management Card LEDs

Chapter 5

Installing and Removing Line Cards

This chapter contains the following sections:

Overview

This chapter contains general instructions for installing and removing line cards from the AT-8400 chassis as well as an explanation of what happens to your software configuration when you replace a line card. For information about a particular line card, refer to Chapter 2, Ethernet Line Card Overview on page 16.

Verifying Package Contents

Make sure the following items are included in your package. If items are missing or damaged, contact your Allied Telesyn sales representative for assistance.

- ❑ One AT-8400 line card
- ❑ Line Card Installation Guide
- ❑ Line Card Warranty card

Installing a Line Card

You can install a line card when the AT-8400 chassis is powered on. This section explains how to install a line card into the AT-8400 chassis. It is a generic procedure that you can use to install any of the AT-8400 line cards, with the exception of the AT-8401 Management Card. For more information, refer to Chapter 4: Installing and Replacing the AT-8401 Management Card on page 45 for instructions.

To illustrate the procedure, diagrams of the AT-8411 line card are shown.

1. Select a slot in the AT-8400 chassis where you will install the line card.

   You can install the line card in slots 1 through 12.

   Note
   Do not use this procedure to install the AT-8401 management line card in Slot M. When installing the management line card, refer to the Installing and Replacing the AT-8401 Management Card on page 45.

2. Using a Phillips screwdriver, loosen the two installation screws on the faceplate. See Figure 31.

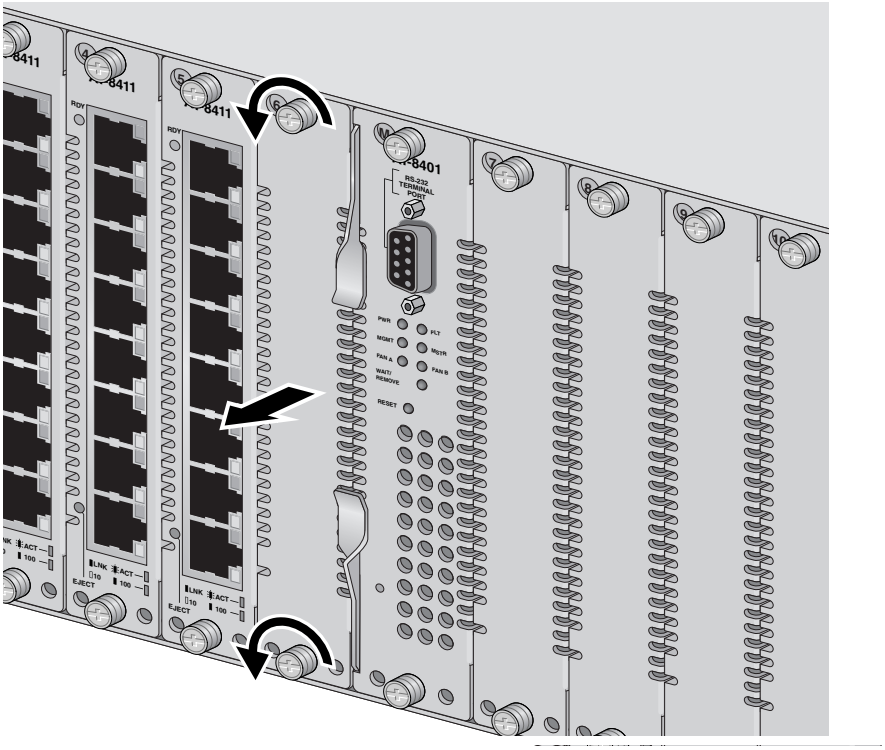


Figure 31 Removing a Blank Faceplate from the AT-8400 Chassis

3. Remove the faceplate from the slot.

   Keep the faceplate in a safe area. The faceplate is required on unused slots to maintain proper airflow and to keep dust from getting into the chassis.

4. Check the WAIT/REMOVE LED on the AT-8401 management card. See Figure 32 below.

   After you remove the faceplate, the WAIT/REMOVE LED on the AT-8401 management card turns a steady amber. After approximately 20 seconds, the WAIT/REMOVE LED turns a steady green.

Caution
When the WAIT/REMOVE LED is steady amber, it is not safe to install a line card. In this case, wait approximately twenty seconds until the WAIT/REMOVE LED turns steady green before proceeding with the installation procedure.

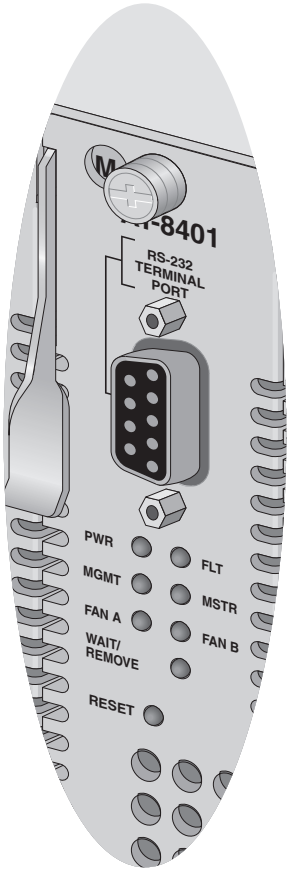


Figure 32 AT-8401 Management Card LEDs

5. Unpack the line card from its shipping container and store the packaging material in a safe location.

Caution
Be sure to observe all standard electrostatic discharge (ESD) precautions, such as wearing an antistatic wrist strap, to avoid damaging the device. If you are removing a line card, store it in an antistatic bag or immediately install it in another slot. A line card can be damaged by static electricity.

6. Check that the line card package includes all the items listed in the section titled Package Contents. If any item is missing or damaged, contact your Allied Telesyn sales representative for assistance.

Note
Keep the shipping material. You must use the original shipping material if you need to return the chassis to Allied Telesyn.

7. Align the edge of the line card with the top and bottom guide rails as you carefully slide the line card into a slot. See Figure 33 below.

   Avoid touching the components on the line card.

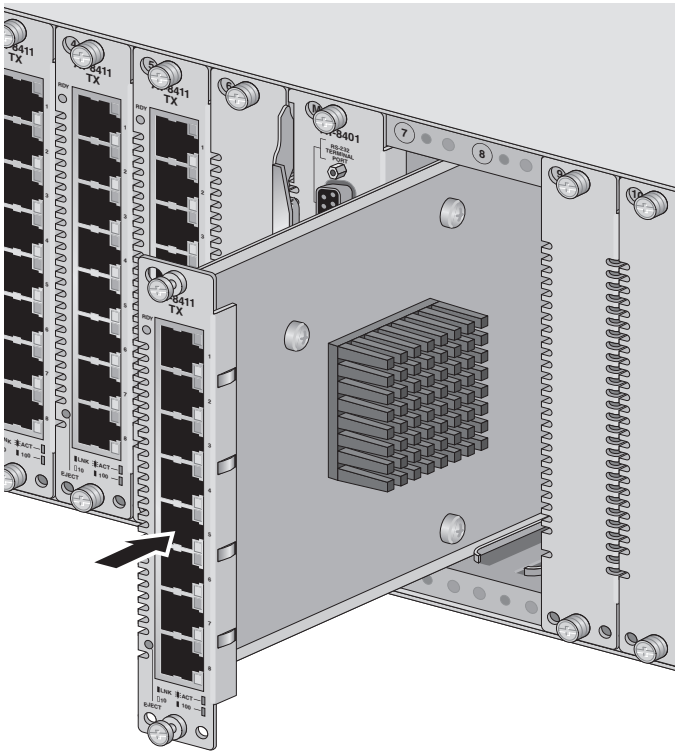


Figure 33 Installing the AT-8411 Line Card into slot 7

8. Slide the line card into the chassis until the faceplate is flush with the front of the chassis.

9. Secure the line card to the chassis by using a Phillips screwdriver to tighten the two installation screws on the line card faceplate.

> **Note**
> Always tighten the installation screws to secure the line card to the chassis. Leaving a line card partially seated may cause the system to halt and subsequently crash.

10. If you are installing a line card with a dust cover over a fiber optic port, remove the dust cover and store it for future use.

11. Connect the appropriate cables to the line card. Refer to Table 4, Basic Line Card Configurations on page 16 for cabling details about a particular line card.

    Figure 34 shows a twisted pair cable being inserted into an RJ-45 connector on an AT-8411 Line Card.

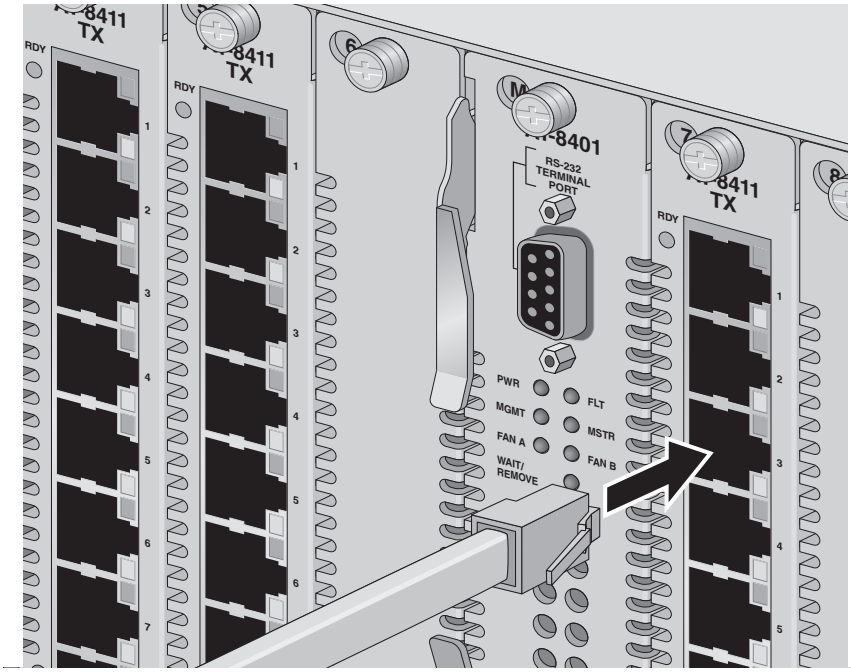


Figure 34 Installing a Twisted Pair Cable into an RJ-45 connector

12. Power on the end nodes.

13. Make sure the appropriate LEDs are lit. See Chapter 2, Fast Ethernet and Gigabit Ethernet Line Cards on page 15 for LED and cabling details about a particular line card.

Removing a Line Card

You can remove a line card when the AT-8400 Chassis is powered on. This section explains how to remove a line card from the AT-8400 chassis. It is a generic procedure that you can use to remove any of the line cards, with the exception of the AT-8401 management card. To illustrate the procedure, diagrams of the AT-8411 line card are used.

Before you use this procedure, see Software Implications of Replacing Line Cards on page 69 for information about preserving your software configuration when you remove and replace a line card.

Caution
Replace line cards one at a time to avoid system malfunction.

Note
Allied Telesyn recommends that you cover all fiber optic ports *immediately* after you remove fiber optic cables. Make sure to collect the port dust caps before you start the removal procedure and have them available nearby.

For line card removal, perform the following procedure:

1. Select a line card to remove.

   Use this procedure to remove a line card from slots 1 through 12.

   Note
   Do not use this procedure to remove the AT-8401 management line card in Slot M. When removing the management line card, refer to the Installing and Replacing the AT-8401 Management Card on page 45

2. Remove all cables (twisted pair or fiber optic) from the ports on the line card.

3. Cover the open fiber optic ports with an appropriate dust cap for each connector type.

4. Examine the LEDs on the AT-8401 management line card. See Figure 35.

   If the WAIT/REMOVE LED is steady green, you safely can remove a line card from the chassis.

Caution

If the WAIT/REMOVE LED is steady amber, it is not safe to remove a line card. In this case, you must wait approximately 20 seconds until the WAIT/REMOVE LED turns steady green before you can safely remove a line card from the chassis.

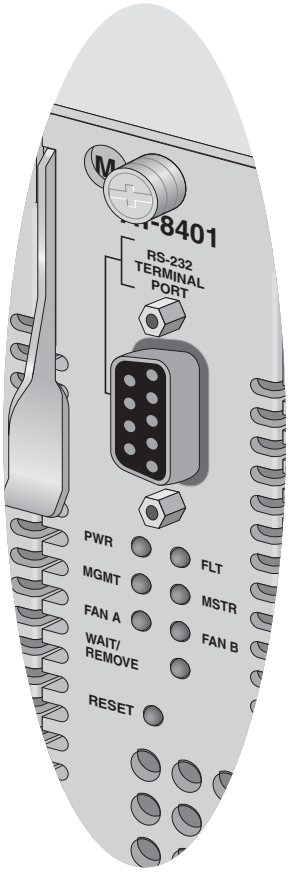


Figure 35 AT-8401Management Card LEDs

5. Using a Phillips screwdriver, loosen the two installation screws on the faceplate of the line card. See Figure 36.

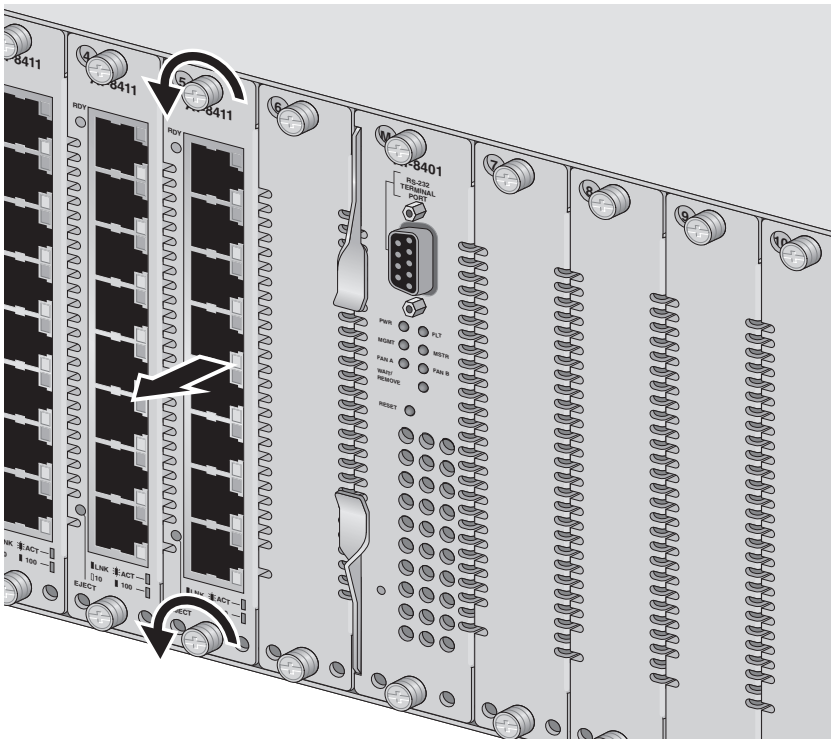


Figure 36 Removing an AT-8411 Line Card

6. Pull the line card forward and remove it from the chassis.

   Once you have removed the line card from the chassis, the WAIT/REMOVE LED on the AT-8401 management card turns steady amber. Approximately twenty seconds later, the WAIT/REMOVE LED turns steady green.

Caution

Be sure to observe all standard electrostatic discharge (ESD) precautions, such as wearing an antistatic wrist strap, to avoid damaging the device. Store the line card in an antistatic bag or immediately install it in another slot. A line card can be damaged by static electricity.

7. When the WAIT/REMOVE LED is steady green, you must install either a blank faceplate or another line card into the empty slot.

   The faceplate keeps dust from getting into the chassis and maintains proper airflow.

   To install a line card, see Installing a Line Card on page 61.

Software Implications of Replacing Line Cards

The AT-S60 software allows you to remove and replace, or hot swap, line cards in the AT-8400 Series switch while preserving your software configuration. The hot swap procedure is discussed in Removing a Line Card on page 65. You can hot swap line cards and preserve your software configuration while using a local, Telnet, or Web browser management session.

In general, replacing a line card with a line card of the same type allows you to preserve your software configuration. However, if you remove a line card and replace it with a different type of line card, you will lose your configuration.

There are three possible scenarios when removing and replacing a line card:

- Remove a line card and replace it with the same line card or a line card of the same type. For example, you remove an AT-8411 line card and replace it with another AT-8411 line card. In this case, all software configuration changes are preserved.
- Remove a line card and replace it with a line card of a different type. For example, you remove an AT-8411 line card and replace it with an AT-8413 line card. In this case, the software configuration pertaining to the AT-8411 line card is saved in the database. At the same time, the switch recognizes the AT-8413 line card and loads the default configuration into RAM. However, if you select **Save Configuration changes** on the Main Menu, the AT-8411 line card configuration is lost and the default configuration for the AT-8413 line card is saved in the database.
- Remove a line card and do not replace it. In this case, the software configuration changes are retained. However, certain features may not be active.

Software configuration changes are retained on the AT-8401 management card. After you remove a line card from the chassis, the software configuration is preserved. If you replace the line card with a line card of the same type, the software configuration is reactivated with the new line card. However, if you replace the line card with a line card of a different type and then click **Save Configuration changes** on the Main Menu, the software configuration is lost.

When you remove a line card and do not replace it, the information you configured for the line card is saved on the AT-8401 management card. However, removing a line card and not replacing it affects software configuration of the following features:

- ❑ Port trunking
- ❑ VLAN
- ❑ GARP VLAN Registration Protocol (GVRP)
- ❑ Multiple VLANs
- ❑ 802.1x Port-Based Network Access Control
- ❑ STP and RSTP

The changes that result from removing and replacing a line card are discussed in the following sections. For detailed information about port trunking, VLAN, and RSTP features, see the **AT-S60 Management Software User's Guide**.

Hot Swapping and Port Trunking

You can use the AT-S60 software to configure port trunking on individual ports. For the AT-8400 Series Switch, a port trunk consists of a maximum of eight ports that have been grouped together to function as one logical path. The general rule for port trunking is when you replace a line card with the same type of line card, the trunk is retained. When you replace a line card with a different type of line card and select **Save Configuration changes** from the Main Menu, then the trunk is changed permanently. The ports on the line card are removed from the port trunk.

Before you remove or replace line cards that are configured in your port trunk, you need to consider the implications to your software configuration. If you have configured a port trunk on your switch and you remove a line card whose ports are in the trunk, then the ports belonging to the removed line card are also removed from the port trunk. However, the trunk name, trunk ID, and type are retained in the memory located on the AT-8401 management card.

Port trunks that are comprised of AT-8411 line cards are configured differently from port trunks that are comprised of AT-8413 line cards. For an AT-8411 port trunk, all ports included in the trunk must reside on the same line card. Consequently, when you remove the AT-8411 line card **all** the ports included in the port trunk disappear. The port trunk configuration is saved on the AT-8401 management card. If you insert another AT-8411 line card in the same slot, the original port trunk is restored. If you insert a different type of line card and click **Save Configuration changes** at the Main Menu, the port trunk configuration is lost.

For AT-8413 port trunk, all ports that are included in the trunk must belong to different line cards. As a result, when you remove an AT-8413 line card that is included in a port trunk, the port on the AT-8413 line card that you removed is dropped from the port trunk. Although, the software configuration for that port on the original port trunk is preserved.

However, ports that are included in the port trunk on AT-8413 line cards that were not replaced are retained. For example, if you have three AT-8413 ports in a trunk and you remove one, then the port on the AT-8413 that you removed is dropped from the trunk but the other two remain. If you replace the AT-8413 with another AT-8413, the original port trunk is restored.

If you replace the AT-8413 with a line card of a different type, for example, an AT-8411 line card, then the AT-8411 line card does not become a member of the original port trunk. In addition, after you have installed the AT-8411 and click **Save Configuration changes** at the Main Menu, the port trunk configuration information is lost.

Hot Swapping and VLANs

You can use the AT-S60 software to create VLANs on AT-8400 Series switches. Hot-swapping can affect the software configuration of different types of VLANs — VLANs, GARP VLANs and Multiple VLANs. If you have configured ports on a line card to be included in a VLAN, when you remove the line card the ports included in the VLAN become inactive. However, the VLAN configuration is saved on the AT-8401 management card. If you replace a line card with a line card of the same type, the ports on the new line card are assigned to the same VLAN as the ports on the card it replaced.

If you replace a line card with a line card of a different type and then select **Save Configuration changes** from the Main Menu, the ports on the new line card are automatically assigned to the Default_VLAN.

The GARP VLAN Registration Protocol and Multiple VLANs features are managed on a per switch basis instead of a per port basis. The management software will re-initialize and reconfigure the ports for these features when you replace a line card of the same or a different type. In these cases, you do not need to reconfigure the ports of the new line card.

For example with GVRP, when the same or a different line card is installed where a previous line card existed and when a new link status on any port becomes active, new PDUs (protocol data units) are initiated from that device port connected to that port. As a result, the switch relearns the dynamic VLAN assignments as it receives PDUs from the other switches.

In the case of Multiple VLANs, the number of VLANS is equal to the (Number of Available Ports) — 1. So, if the same or a different line card is installed where a previous line card existed and the total number of ports changed, then the number of VLANs are automatically adjusted by the management software.

Hot Swapping with STP, RSTP, and MSTP

You can use the STP, RSTP, and MSTP features to assign port priority to individual ports on a line card. When you remove a line card, the port priority that you assigned to each port on the line card is dropped. However, the software configuration for port priority is preserved. When you install a line card of the same type, the configuration of port priority is restored.

If you replace a line card with a line card of a different type and then select **Save Configuration changes** from the Main Menu, the port priority configuration changes are lost.

Hot Swapping and 802.1x Port-Based Network Access Control

You can use the AT-S60 software to enable 802.1x Port-Based Access Control on AT-8400 Series switch. If you have configured specific ports on a line card for Port-Based Access Control, when you remove the line card the ports include in the Port-Based Access Control become inactive. However, the Port-Based Access Control configuration is saved on the AT-8401 management card. If you replace a line card with a line card of the same type, the same ports remain configured on the new line card are as the ports on the card it replaced. If you replace a line card with a line card of a different type and then select **Save Configuration changes** from the Main Menu, you need to reconfigure the ports on the new line card for Port-Based Access Control.

Chapter 6

Installing or Replacing a Power Supply

The chassis comes with one AC or DC power supply pre-installed. You can install an additional power supply to add redundant power to your system. Sections in the chapter include:

Package Contents

Make sure the following items are included in the shipping package with the power supply. If any item is missing or damaged, contact your Allied Telesyn sales representative for assistance.

- ❑ One AT-PWR10 (AC) or AT-PWR11 (DC) Redundant Power Supply
- ❑ Power Cord (AT-PWR10 only)
- ❑ Installation Guide
- ❑ Warranty Card

Removing a Power Supply

You can remove or replace a power supply from an AT-8400 chassis without having to power off the switch. To remove a power supply, perform the following procedure:

1. Using a Phillips screwdriver, loosen the two captive screws that secure the power supply cover to the chassis and remove the cover. You remove the cover by angling it from the bottom as you slide it down and out of the chassis.

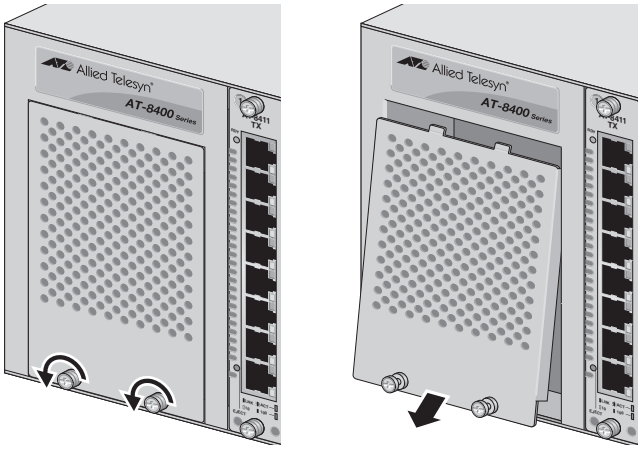


Figure 37 Removing the Cover Plate

2. Using a Phillips screwdriver, loosen the captive screw that secures the power supply to be removed.

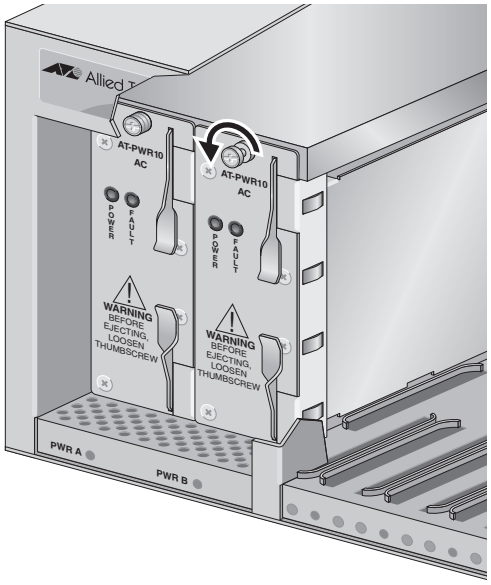


Figure 38 Loosening the Captive Screw that Secures the Power Supply

3. Simultaneously push the locking levers on the power supply to the released position.

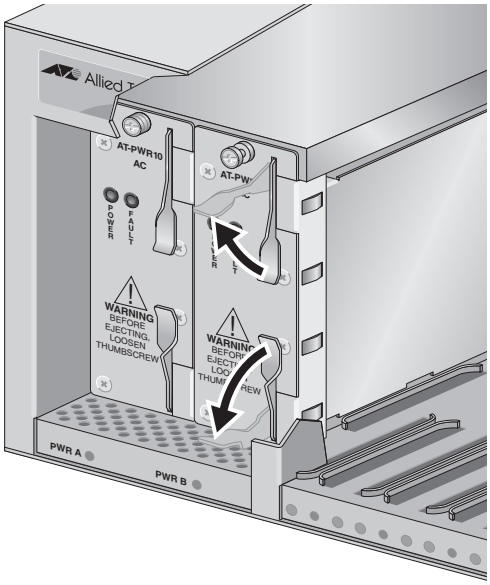


Figure 39 Moving the Locking Levers into the Released Position

4. Slide the power supply out of the chassis.

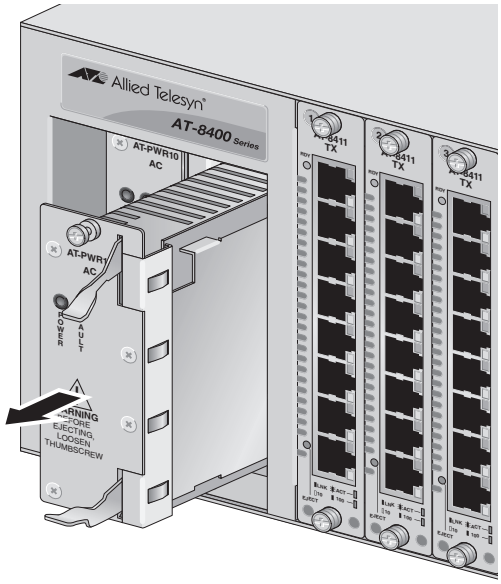


Figure 40 Removing the Power Supply

Warning
The power supply may be hot. Handle it carefully to avoid physical injury.

Note

To install a new power supply, go to the next procedure, Installing a Power Supply on page 79, and start with Step 3. If you are not installing a new power supply, complete the rest of this procedure to install the blank faceplate over the empty power supply slot. The faceplate ensures proper cooling and ventilation of the AT-8400 Series switch.

5. Slide in the blank faceplate into the empty power supply slot.

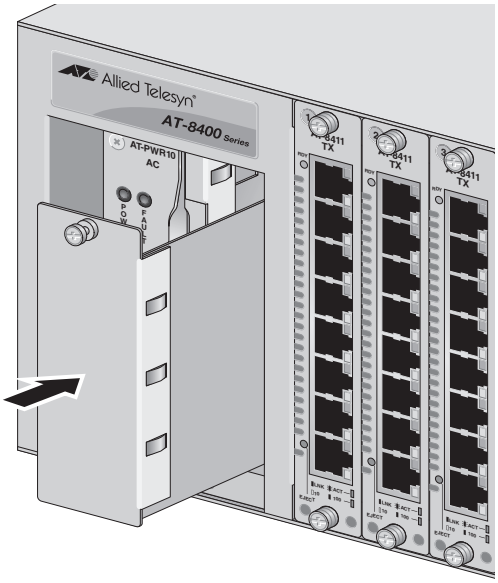


Figure 41 Sliding in the Blank Faceplate

6. Secure the blank faceplate to the chassis by tightening the captive screw on the faceplate

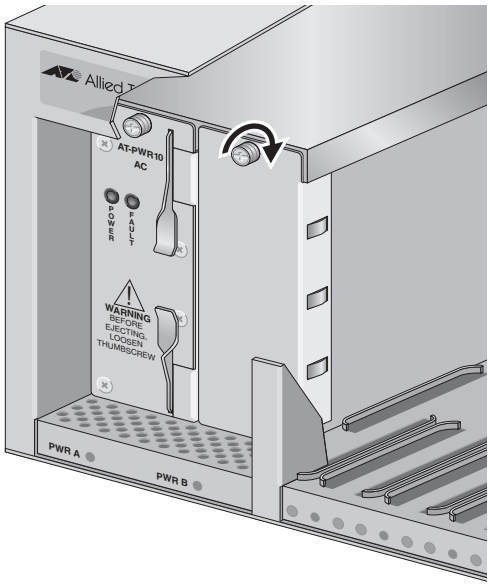


Figure 42 Securing the Blank Faceplate

7. Slide the power supply cover back into the chassis and secure the cover by tightening the two captive screws.

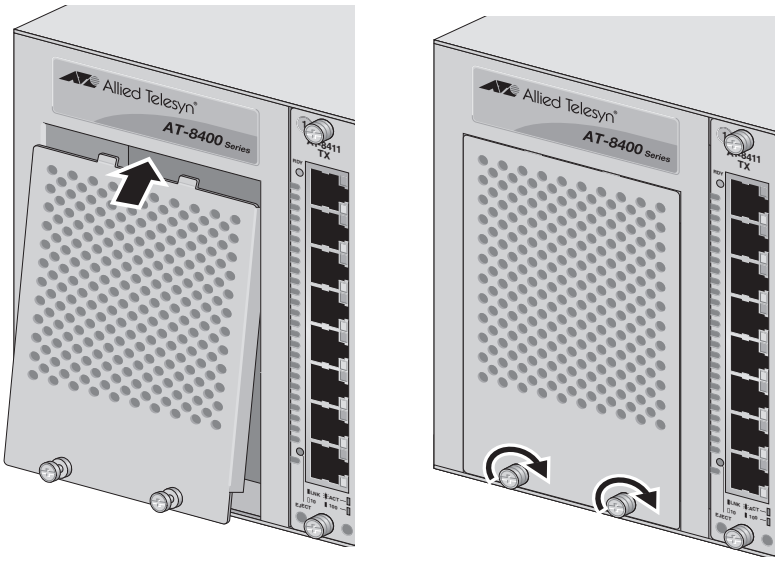


Figure 43 Installing the Power Supply Cover

Installing a Power Supply

This section contains the procedure for installing an AC or DC power supply in an AT-8400 Series switch. You can install a power supply without powering off the chassis.

Before installing a power supply, please note the following:

- ❑ An AT-8400 Series switch will have either AC power sockets or DC terminal blocks on the back panel. You should check that the new power supply is appropriate for your system. For example, you cannot install an AT-PWR10 (AC) power supply in a DC chassis or an AT-PWR11 (DC) power unit in an AC chassis.
- ❑ There are several different models of AC and DC power supplies. Each model is rated for a different power load. Both power supplies in a chassis must be of the same model type. Do not mix power supplies with different power ratings in the same chassis.

Note
If you are replacing a power supply and are continuing on from the procedure Removing a Power Supply on page 75, start with Step 3.

To install a power supply, follow these steps:

1. Using a Phillips screwdriver, loosen the two captive screws that secure the power supply cover to the chassis and remove the cover. You remove the cover by angling it from the bottom as you slide it down and out of the chassis.

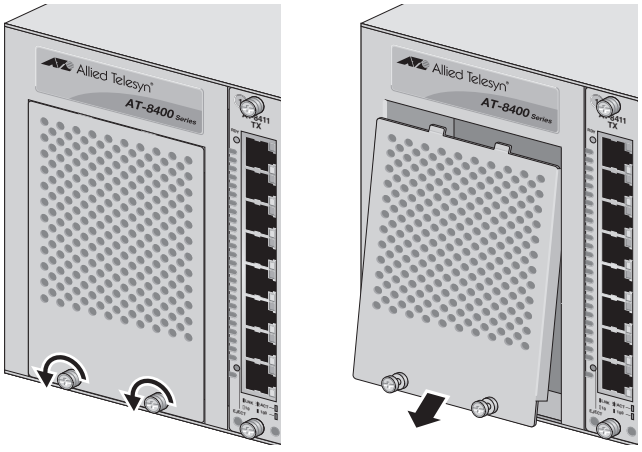


Figure 44 Removing the Cover Plate

2. Using a Phillips screwdriver, loosen the captive screw that secures the cover over the power supply PWR B slot and slide the cover from the chassis.

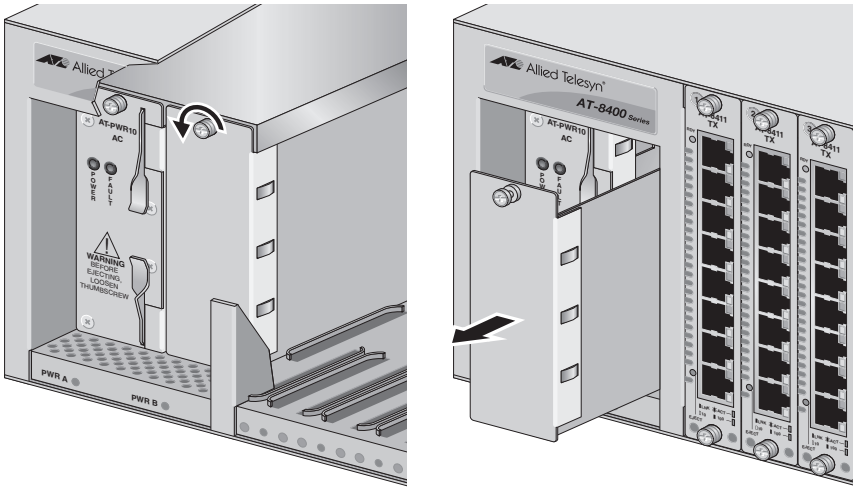


Figure 45 Removing the Blank Faceplate

Note
Store the faceplate in a safe location. If you remove a power supply, you should reinstall the faceplate because it helps to ensure proper airflow and cooling in the chassis.

3. Place the locking levers on the new AT-PWR10 power supply into the released position.

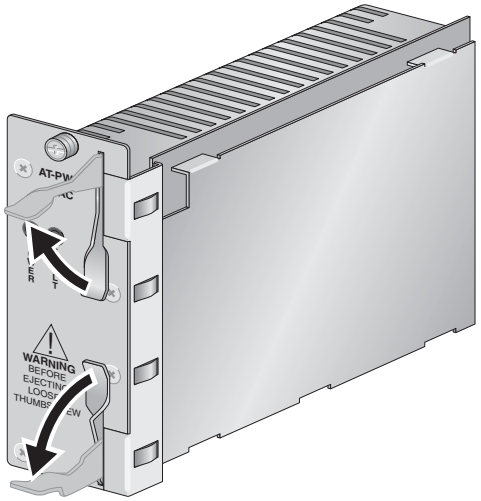


Figure 46 Moving the Locking Levers into the Released Position

4. Slide the new power supply into the power supply slot until it makes contact with the backplane of the chassis. Be sure that the labeling on the power supply is right-side up. Also be sure to align the green board on the power supply with the slots in the chassis. Once the power supply makes contact with its connector on the backplane, press firmly to fully seat the power supply on the power connector on the backplane.

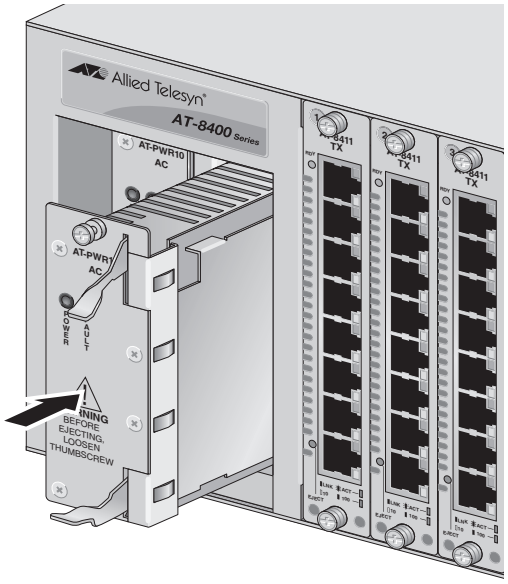


Figure 47 Sliding in the Power Supply

5. Simultaneously push the locking levers on the power supply into the locked position and tighten the captive screw to secure the power supply in the chassis.

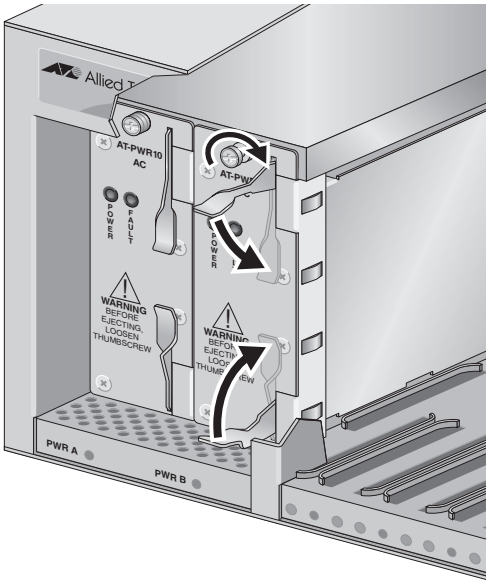


Figure 48 Securing the Power Supply

Note
Always use the locking levers and the installation screw to secure the power supply to the switch. Leaving the power supply partially seated may cause the system to halt and subsequently crash.

6. Slide the power supply cover back into the chassis and secure the cover by tightening the two captive screws.

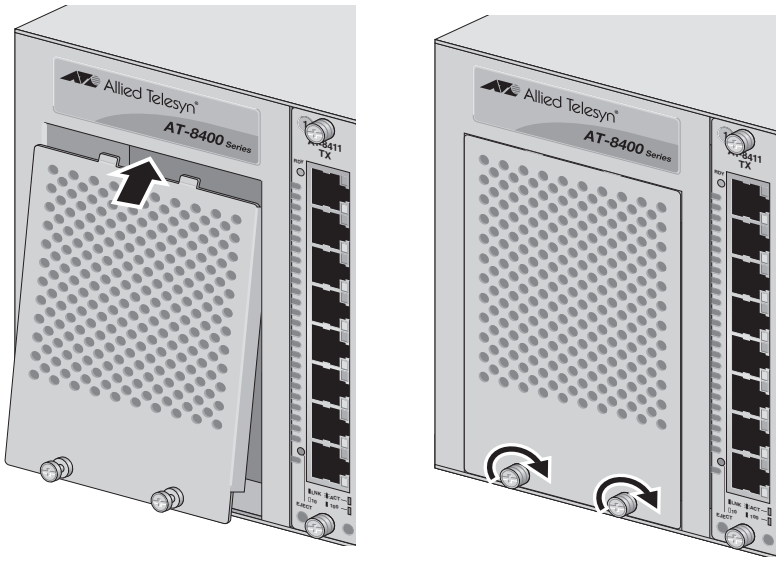


Figure 49 Installing the Power Supply Cover

This completes the installation procedure for a power supply. For directions on how to power on the unit, go to **Chapter 6,** Cabling and Powering on the Chassis on page 83.

Chapter 7

Cabling and Powering on the Chassis

This chapter contains the following sections:

Overview

This **chapter** describes how to cable and power on the AT-8400 Series switch. First, you need to ground the chassis. Then you can add power. Procedures for both the AC and DC chassis are provided.

Connecting the Frame Ground

To ensure the safe and proper operation of your AT-8400 Series switch, you must ground the unit to a ground point using the frame ground connector on the back panel.

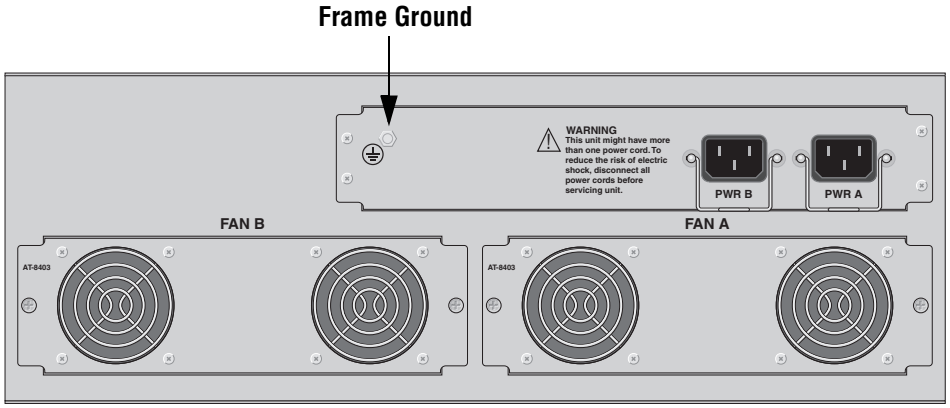


Figure 50 Frame Ground Connector

The location of the frame ground is the same on both AC and DC powered chassis.

Grounding the chassis requires the following items:

- ❑ One cable lug for connecting the grounding wire to the connector on the chassis
- ❑ One 12 AWG bundled wire or 14 AWG solid wire

These items are not supplied with the AT-8400 Series switch.

Warning
You should attach the frame ground **before** you power on the chassis.

Warning
The DC terminal blocks on a DC powered AT-8400 chassis have ground connectors. The ground connectors on the DC terminal blocks should never be connected to the frame ground.

To attach the frame ground, perform the following procedure:

1. Use a crimping tool to affix the cable lug to one end of the 14 AWG ground wire.
2. Remove the 4M nut from the frame ground connector on the back panel of the AT-8400 chassis.
3. Attach the ground wire to the frame ground connector on the AT-8400 chassis and secure with the 4M nut removed in Step 2.
4. Attach the other end of the ground wire to an appropriate earth ground.

Powering on an AC Chassis

This procedure describes how to power on an AC powered AT-8400 Series switch with an AT-PWR10 power supply installed. If you have an AT-PWR11 power supply installed in your chassis, see Powering on a DC Chassis on page 86.

1. Connect the AC power cord to the PWR A power connector on the back panel of the chassis. See Figure 51.

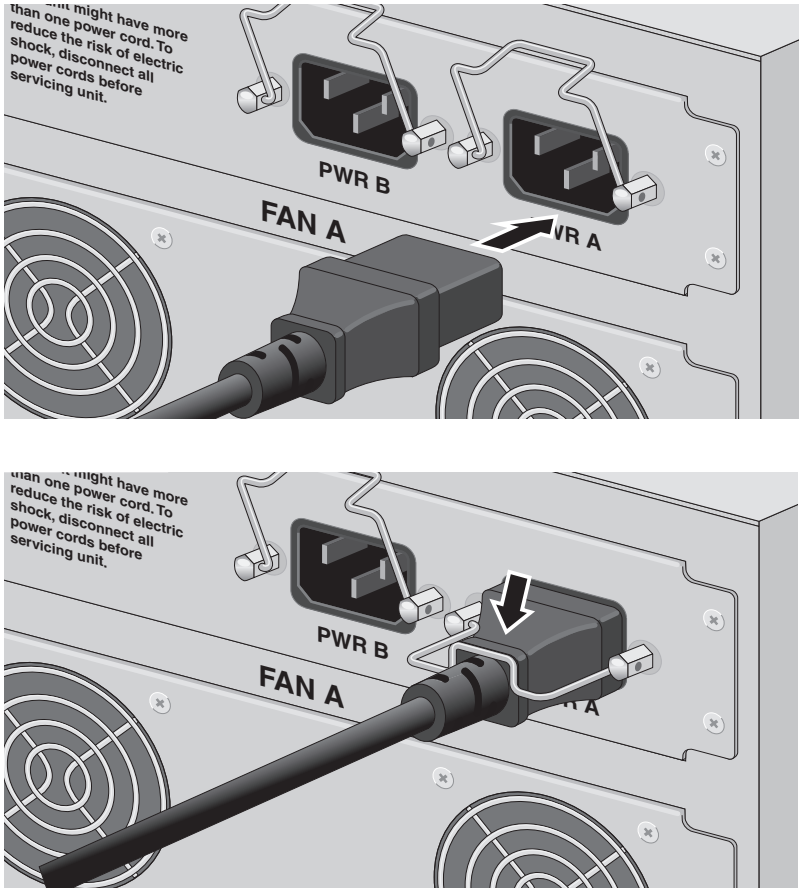


Figure 51 Securing an AC power cord

2. Secure the cord by lowering the securing bracket.
3. Connect the power cord to an AC power source.
4. If you purchased an optional redundant power supply, repeat this procedure to connect a power cord to the PWR B connector.

Powering on a DC Chassis

This procedure describes how to power on a DC powered AT-8400 Series switch. If your chassis is AC powered, see Powering on an AC Chassis on page 85.

Warning
ALWAYS connect the wiring to the LAN equipment before connecting the wiring to the breaker. To avoid the danger of physical injury from electrical shock, do not work with HOT feeds. Always be sure that the breaker is in the OFF position before connecting the wiring to the breaker. 16

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

1. Locate the two DC terminal blocks, labeled PWR A and PWR B, on the rear panel of the chassis.

Note
If the chassis contains only one power supply, you can connect the DC power wires to either terminal block.

2. Starting from the left side of a terminal block, identify the **positive**, **power supply ground** and **negative** terminals using the symbols below the terminal block, as shown in Figure 52.

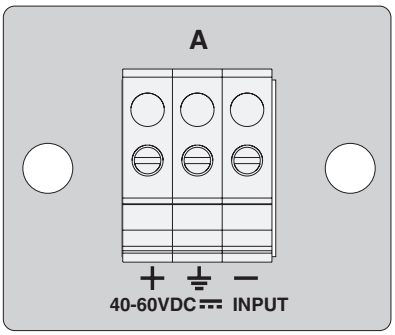


Figure 52 DC Terminal Block

3. With a 14-gauge wire-stripping tool, strip the three wires in the tray cable coming from the DC input power source to 8mm ± 1mm (0.31 in., ± 0.039 in.). See Figure 53.

Warning
Do not strip more than the recommended amount of wire. Stripping more than the recommended amount can create a safety hazard by leaving exposed wire on the terminal block after installation. 17

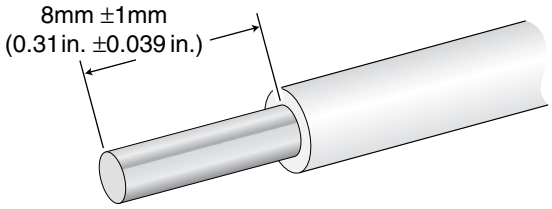


Figure 53 Stripping the Wires

4. Connect the power supply ground wire to the terminal marked with the ground symbol. Inserting the wire into the terminal and tightening the connection with a flathead screwdriver. See Figure 54.

Warning
When installing this equipment, always ensure that the power supply ground connection is installed first and disconnected last. 18

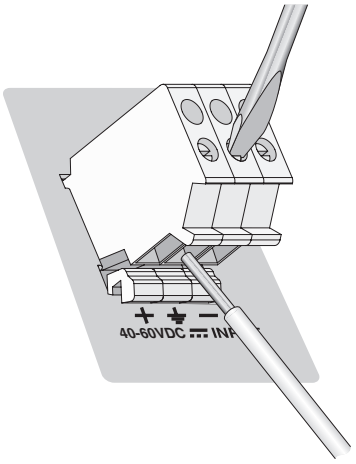


Figure 54 Inserting Wires into DC Terminal Block

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

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

Warning
Safety Hazard - Check to see if there are any exposed copper strands coming from the installed wires. When this installation is done correctly there should be no exposed copper wire strands extending from the terminal block. Any exposed wiring can conduct harmful levels of electricity to persons touching the wires. 19

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

Note
This system will work with a positive grounded or negative grounded DC system. 20

8. Ensure that the circuit breaker is in the OFF position.
9. Connect the supply-cable wires to the circuit breaker.
10. If you installed an optional redundant power supply, repeat this procedure to attach DC wires to the second terminal block.
11. Energize the circuit breaker.

Chapter 8
Troubleshooting

This chapter contains the following sections:

Overview

This chapter discusses what actions to take if you encounter errors when establishing a management session and how to correct problems with the AT-8401 management card, AT-8400 line cards, and power supplies.

Management Session Errors

This section describes what actions to take if you cannot establish a management session. Both local and remote management sessions are discussed.

If a local management session cannot be established, do the following:

- ❑ Check that the management card is securely seated in the chassis.
- ❑ Verify that a straight-through RS-232 cable is connected to the management card.
- ❑ Check that the RS-232 cable is securely connected to the RS-232 port on the management card and the other end is connected to a terminal or PC.
- ❑ Verify the RS-232 cable is a straight-through cable and not a crossover cable.
- ❑ Verify that the operating parameters for the terminal or the terminal emulator program are configured correctly. The default values for the RS-232 port can be found in the **AT-S60 Management Software User's Guide**. This guide is available online at www.alliedtelesyn.com.

If a remote management session cannot be established:

- ❑ Check that the AT-8401 management card is securely seated in the chassis.
- ❑ Verify that an IP address has been assigned to the management card and you are using the same IP address at the start of the remote session. Refer to the **AT-S60 User's Guide** for instructions on assigning an IP address.
- ❑ Ping the chassis from a workstation using a PING utility. If a ping fails, either the chassis is not operating, the physical data path to the chassis has experienced a failure, or an incorrect IP address has been entered.
- ❑ Reset the AT-8401 management card by pressing the Reset button on the front of the management card.

Using the Reset button will briefly interrupt network operations on the AT-8400 line cards.

Troubleshooting the AT-8401 Management Card

This section describes what to do if you encounter problems with the AT-8401 management card. Consult the POWER and MGMT LEDs for troubleshooting information.

After examining the AT-8401 LEDS, verify that the PWR LED on the management card is steady green. If it is OFF for more than 10 seconds, do the following:

- ❑ Check that the power cord is securely connected to the power outlet.
- ❑ Check that the management card is seated properly.
- ❑ Check that the power supply is securely seated in the chassis.
- ❑ Check that Fans A and B, located on the rear of the chassis, are operating. If either fan is not operating, it is likely that a power supply has failed.
- ❑ For an AC chassis, check the power cord is securely seated in the chassis.
- ❑ For a DC chassis, check that the wires are connected to the correct terminals.

If the MGMT LED stays steady amber for more than one minute, you need to reset the switch. Press the Reset button on the management card. If the MGMT LED continues to stay steady amber:

- ❑ For an AC chassis, turn off the power by unplugging the power cord. Then turn on the power by plugging in the power cord to a power source.
- ❑ For a DC chassis or AC chassis, turn off the power by removing a power supply. Then, reinstall the power supply.

After trying the above methods, if the MGMT LED continues to be steady amber, call Technical Support.

Troubleshooting the AT-8400 Line Cards

This section describes what to do if you encounter problems with the AT-8411, AT-8412, AT-8413, and AT-8414 line cards. Check the LEDs on the AT-8400 line cards and then use the following guidelines.

If the LNK/ACT or L/A LED is OFF on the AT-8411, AT-8412, AT-8413, or AT-8414 line cards, do the following:

- ❑ Check that the line card is securely seated in the chassis.
- ❑ Check that the chassis is receiving power.
- ❑ Try installing the line card in another slot. You can install AT-8400 line cards in slots one through twelve.
- ❑ Make sure there is power to the end node.
- ❑ Check the twisted-pair cable is secure.
- ❑ Replace the twisted-pair cable with new twisted-pair cable.
- ❑ Check that the cable is securely connected to the ports on the line card and on the end node.
- ❑ Check that the appropriate type of cable for the port is being used. Consult the installation guide for your AT-8400 line card for cabling information.
- ❑ For a fiber optic port, check that the maximum allowable loss budget has not been exceeded.

AT-8411 Line Cards

Here is information specific to troubleshooting the AT-8411 line card:

- ❑ If all the LEDs on the line card light up in a random pattern and the card does not operate properly, check that the line card is properly seated in the chassis.
- ❑ If the LEDS on the line card light up in a random pattern, but some remain unlit and the card is operating properly, then the LEDs that are off may be burned out. Call Technical Support.
- ❑ If the LNK/ACT and LNK 10/100 LEDs are steady green, but the RDY LED is off the card did not boot properly. Check the console
- ❑ If the AT-8411 line card operates properly, but the RDY LED is off call Technical Support.
- ❑ If the card is seated properly, but all the LEDs are off, the card is not properly initialized. Check the console for initialization information.

AT-8412 and AT-8414 Line Cards

The AT-8412 and AT-8414 line cards contain a D/C LED. Under normal operating conditions, the D/C LED is off when the port is operating in half-duplex mode. If this LED is off and there is a communication problem between the end nodes, it may be that the two sides are working in half-duplex mode and data collisions are not occurring. Check that the end nodes are operating in the same duplex mode.

Troubleshooting the Power Supplies

This section covers troubleshooting information for both the AT-PWR10 and AT-PWR11 Power Supplies.

If you have lost power to the AT-PWR10 or AT-PWR11 Power Supplies, check the LEDs on the power supplies and then use the following guidelines for both AC or DC chassis.

If both the POWER and FAULT LEDs are off, do the following:

- ❑ Check that the power supply is firmly seated in its slot in the chassis.
- ❑ Check that the two screws on the power supply are securely fastened. If they are loose, use a Phillips screwdriver to tighten them.
- ❑ If you cannot insert a power supply completely into the chassis, check that you are inserting the appropriate power supply for your type of chassis. The AC chassis are keyed to only accept the AT-PWR10 power supply while the DC chassis are keyed to only accept the AT-PWR11 power supply. Only the power supply that matches the power requirements of the chassis will seat fully into the power supply slot.
- ❑ Check that the management card is fully seated in the chassis. The management card affects the LEDs on the power supplies. The management card needs to be fully seated before the POWER LED on the power supply can turn steady green.

AT-PWR10 AC Power Supply

Use the following guidelines to troubleshoot the AT-PWR10 AC Power Supply:

- ❑ Check that the power cord is securely connected to the power connector (at rear of the chassis) and to an appropriate power source.
- ❑ Verify that the power outlet has power by connecting another device to it.
- ❑ Try connecting the power supply to another power source. Or, use a new power cord. Refer to Powering on an AC Chassis on page 85.
- ❑ Check that the power cord is inserted into the IEC connector that corresponds to the slot of the installed power supply. For example, if the power supply is installed in slot Power A, then plug the power cord into PWR A at the rear of the chassis.
- ❑ Remove all the line cards from the chassis, except the management card. It may be that one of the line cards needs repair and it is preventing the power supplies from coming up. If the power supplies continue to have OFF POWER and FAULT LEDs, then you may need to replace either the power supplies or the management card.

AT-PWR11 DC Power Supply

Use the following guidelines to troubleshoot an AT-PWR11 DC Power Supply:

- ❑ Make sure the wires are connected to the correct terminals. Refer to Powering on a DC Chassis on page 86.
- ❑ Remove all the line card from the chassis, except the management card. It may be that one of the line cards needs repair and it is preventing the power supplies from coming up. If the power supplies continue to have OFF POWER and FAULT LEDs, then you may need to replace either the power supplies or the management card.
- ❑ Use the unused DC terminal block as the power input. If the other DC Terminal block is being used and it is working, then the Power Entry Module for the chassis may have failed or blown a production fuse. In this case, call Technical Support.

If the POWER LED is OFF and the FAULT LED is ON, do the following:

- ❑ Check that the power supply is firmly seated in its slot.
- ❑ Check that there is enough room around the chassis for ventilation.

- This could be one of three issues: the fans for the power supplies may have failed, the management card may be experiencing a fault, or the power supply may have failed. If one of the power supplies has failed, you can confirm this by loading three or more line cards into the chassis. If the fault LED on the power supply turns OFF and the POWER LED turns steady green in response to loading the line cards into the chassis, then the power supply fans may have failed. You can confirm this by looking at the FAN A and FAN B LEDs on the management card. If the FAN A or FAN B LEDs turn steady amber, then the fans have failed. For troubleshooting information about the management card, see Troubleshooting the AT-8401 Management Card on page 91. For troubleshooting information about power supplies, see Troubleshooting the Power Supplies on page 93.

Support Information

If you are still experiencing problems after using the troubleshooting information in this chapter, contact Allied Telesyn Technical Support for assistance. Refer to Contacting Allied Telesyn on page xiii.

Appendix A
Technical Specifications

Overview

This section lists the technical specifications of an AT-8400 chassis that contains the following installed components:

- ❑ Six AT-8400 line cards
- ❑ One AT-PWR10 Redundant Power Supply (AC) or one AT-PWR11 Redundant Power Supply (DC)

Technical specifications of the AT-8400 lie cards are also included.

Physical Characteristics

Dimensions:	W x D x H 30.48 cm x 43.82 cm x 15.56 cm (12 in x 17.25 in x 6.125 in)
Weight: Chassis with one power supply:	11.0 kg (24.5 lbs)
Weight: Chassis with one power supply, six AT-8400 line cards:	12.98 kg (28.85 lbs)
Maximum Operating Temperature:	0° C to 40° C (32° F to 104° F)
Maximum Storage Temperature:	-25° C to 70° C (-13° F to 158° F)
Humidity:	5% to 90% maximum (non-condensing)

Power Requirements

Input Supply Voltages:

AT-PWR10 (AC) Power Supply: 100 - 240V AC, 3A maximum, 50/60 Hz

AT-PWR11 (DC) Power Supply: 40 - 60V DC, 7.2A maximum

Agency Certifications

RFI Emission	
AT-8400 Series Chassis:	FCC Class A, EN55022 Class A, EN61000-3-2, EN61000-3-3, VCCI Class A, C-TICK
AT-8400 Line Cards:	FCC Class A, EN55022 Class A,VCCI Class A, C-TICK
Immunity:	EN55024
Electrical Safety:	EN60950 (TUV), UL60950 (UL/cUL)
Laser:	EN60825

Line Card Environmental Specifications

The following specifications apply to all AT-8400 line cards -- the AT-8411, AT-8412, AT-8413, and AT-8414 -- unless specifically noted:

Maximum Operating Temperature:	0° C to 40° C (32° F to 104° F)
Maximum Storage Temperature	
AT-8411, AT-8412, AT-8413:	-20° C to 80° C (-4° F to 176° F)
AT-8414:	-25° C to 75° C (-13° F to 167° F)
Operating and Storage Altitude:	Up to 3,048 meters (10,000 feet)
Relative Humidity	
AT-8411, AT-8412, AT-8413:	5% to 80% maximum (non-condensing)
AT-8414:	5% to 95% maximum (non-condensing)

Appendix B
Translated Safety Information

Important: This appendix contains multiple-language translations for the safety statements in this guide.

Wichtig: Dieser Anhang enthält Übersetzungen der in diesem Handbuch enthaltenen Sicherheitshinweise in mehreren Sprachen.

Vigtigt: Dette tillæg indeholder oversættelser i flere sprog af sikkerhedsadvarslerne i denne håndbog.

Belangrijk: Deze appendix bevat vertalingen in meerdere talen van de veiligheidsopmerkingen in deze gids.

Important: Cette annexe contient la traduction en plusieurs langues des instructions de sécurité figurant dans ce guide.

Tärkeää: Tämä liite sisältää tässä oppaassa esiintyvät turvaohjeet usealla kielellä.

Importante: questa appendice contiene traduzioni in più lingue degli avvisi di sicurezza di questa guida.

Viktig: Dette tillegget inneholder oversettelser til flere språk av sikkerhetsinformasjonen i denne veiledningen.

Importante: Este anexo contém traduções em vários idiomas das advertências de segurança neste guia.

Importante: Este apéndice contiene traducciones en múltiples idiomas de los mensajes de seguridad incluidos en esta guía.

Obs! Denna bilaga innehåller flerspråkiga översättningar av säkerhetsmeddelandena i denna handledning.

Standards: This product meets the following standards.

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

Industry Canada
This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

1 RFI Emission — FCC Class A, EN55022 Class A, EN61000-3-2, EN61000-3-3, VCCI Class A, C-TICK

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

3 Immunity — EN55024

4 Electrical Safety — EN60950 (TUV), UL60950 (UL/cUL)

5 Laser — EN60825

Safety

6 **Warning:** Class 1 Laser product.

7 **Warning:** Do not stare into the laser beam.

8 **Electrical Notices**
Warning: Electric Shock Hazard
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.

9 **Lightning Danger**
Danger: Do not work on equipment or cables during periods of lightning activity.

10 **Caution:** Power cord is used as a disconnection device. To de-energize equipment, disconnect the power cord.

11 Electrical - Type Class 1 Equipment
This equipment must be earthed. 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.

12 Pluggable Equipment, the socket outlet shall be installed near the equipment and shall be easily accessible.

13 **Caution:** Air vents must not be blocked and must have free access to the room ambient air for cooling.

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

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

16 As a safety precaution, a 10 Amp circuit breaker should be installed at the supply end of the cable to be used with this LAN equipment.

Always connect the wiring to the LAN equipment first before connecting the wiring to the breaker. To avoid the danger of physical injury from electrical shock, do not work with HOT feeds. Always be sure that the breaker is in the OFF position before connecting the wiring to the breaker.

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

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

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

20 This system will work with Positive grounded or Negative Grounded dc systems.

Normen: Dieses Produkt erfüllt die Anforderungen der nachfolgenden Normen.

1	Hochfrequenzstörung	FCC Klasse A, EN55022 Klasse A, EN61000-3-2, EN61000-3-3, VCCI Klasse A, C-TICK

2 **Warnung**: Bei Verwendung zu Hause kann dieses Produkt Funkstörungen hervorrufen. In diesem Fall müßte der Anwender angemessene Gegenmaßnahmen ergreifen.

3	Störsicherheit	EN55024
4	Elektrische Sicherheit	EN60950 (TUV), UL60950 (UL/cUL)
5	Laser	EN60825

Sicherheit

6 **Warnung:** Laserprodukt der Klasse 1.

7 **Warnung:** Nicht direkt in den Strahl blicken.

8 **Achtung:** GEFÄHRLICHE SPANNUNG
Das Gehäuse nicht öffnen. Das Gerät enthält keine vom Benutzer wartbaren Teile. Das Gerät steht unter Hochspannung und darf nur von qualifiziertem technischem Personal geöffnet werden. Vor Anschluß der LAN-Kabel, Gerät vom Netz trennen.

9 **Gefahr Durch Blitzschlag**
Gefahr: Keine Arbeiten am Gerät oder an den Kabeln während eines Gewitters ausführen.

10 **Vorsicht:** DAS NETZKABEL DIENT ZUM TRENNEN DER STROMVERSORGUNG. ZUR TRENNUNG VOM NETZ, KABEL AUS DER STECKDOSE ZIEHEN.

11 GERÄTE DER KLASSE 1
DIESE GERÄTE MÜSSEN GEERDET SEIN. Der Netzstecker darf nur mit einer vorschriftsmäßig geerdeten Steckdose verbunden werden. Ein unvorschriftsmäßiger Anschluß kann die Metallteile des Gehauses unter gefährliche elektrische Spannungen setzen.

12 Steckbares Gerät: Die Anschlußbuchse sollte in der Nähe der Einrichtung angebracht werden und leicht zugänglich sein."

13 **Vorsicht**
Die Entlüftungsöffnungen dürfen nicht versperrt sein und müssen zum Kühlen freien Zugang zur Raumluft haben.

14 **Betriebstemperatur:** Dieses Produkt wurde für den Betrieb in einer Umgebungstemperatur von nicht mehr als 40° C entworfen.

15 **Alle Länder:** Installation muß örtlichen und nationalen elektrischen Vorschriften entsprechen.

16 **Warnung**: Aus Sicherheitsgründen sollte am Netzteilende des mit dieser LAN-Einrichtung verwendeten Kabels ein 10-Ampere-Leistungsschalter installiert werden.

Nehmen Sie STETS zuerst die Verkabelung der LAN-Einrichtung vor, bevor Sie die Kabel an den Leistungsschalter anschließen. Arbeiten Sie nie mit SPANNUNGSFÜHRENDEN Kabeln, um Körperverletzungen durch Stromschlag zu vermeiden. Achten Sie stets darauf, daß sich der Leistungsschalter in der Position OFF (Aus) befindet, bevor Sie Kabel an den Leistungsschalter anschließen.

17 **Warnung**: Ziehen Sie nicht mehr als die empfohlene Drahtlänge ab. Wird mehr als die empfohlene Länge abisoliert, stellt dies ein Sicherheitsrisiko dar, da auf dem Anschlußklemmblock nach der Installation möglicherweise freiliegende Drähte verbleiben.

18 **Warnung**: Bei der Installation dieser Einrichtung ist stets sicherzustellen, daß der Masseanschluß jeweils zuerst installiert und zuletzt getrennt wird.

19 **Vorsicht**: "Sicherheitsrisiko" Prüfen Sie, daß aus dem installierten Draht keine freiliegenden Kupferlitzen herausragen. Bei korrekter Installation sollten aus dem Anschlußklemmblock keine freiliegenden Kupferlitzen vorstehen. Freiliegende Kabel führen genug Spannung, um Personen zu gefährden, die diese Drähte berühren.

20 **Hinweis**: Dieses System kann mit positiv geerdeten oder negativ geerdeten Gleichstromsystemen betrieben werden.

Standarder: Dette produkt tilfredsstiller de følgende standarder.

1 Radiofrekvens forstyrrelsesemission FCC Klasse A, EN55022 Klasse A, EN61000-3-2, EN61000-3-3, VCCI Klasse A, C-TICK

2 **Advarsel**: Iet hjemligt miljø kunne dette produkt forårsage radio forstyrrelse. Bliver det tilfældet, påkræves brugeren muligvis at tage tilstrækkelige foranstaltninger.

3	Immunitet	EN55024
4	Elektrisk sikkerhed	EN60950 (TUV), UL60950 (UL/cUL)
5	Laser	EN60825

Sikkerhed

6  **Advarsel:** Laserprodukt av klasse 1.

7  **Advarsel**: Stirr ikke på strålen.

8 

Elektriske Forholdsregler
Advarsel: RISIKO FOR ELEKTRISK STØD
For at forebygge ELEKTRISK stød, undlad at åbne apparatet. Der er ingen indre dele, der kan repareres af brugeren. Denne enhed indeholder LIVSFARLIGE STRØMSPÆNDINGER og bør kun åbnes af en uddannet og kvalificeret tekniker. For at undgå risiko for ELEKTRISK STØD, afbrydes den elektriske strøm til produktet, før LAN-kablerne monteres eller afmonteres.

9 

Fare Under Uvejr
Fare: UNDLAD at arbejde på udstyr eller KABLER i perioder med LYNAKTIVITET.

10  **Advarsel:** Den strømførende ledning bruges til at afbryde strømmen. Skal strømmen til apparatet afbrydes, tages ledningen ud af stikket.

11 ELEKTRISK - KLASSE 1-UDSTYR
DETTE UDSTYR KRÆVER JORDFORBINDELSE. Stikket skal være forbundet med en korrekt installeret jordforbunden stikkontakt. En ukorrekt installeret stikkontakt kan sætte livsfarlig spænding til tilgængelige metaldele.

12  Udstyr Til Stikkontakt, stikkontakten bør installeres nær ved udstyret og skal være lettilgængelig.

13  **Advarsel:** Ventilationsåbninger må ikke blokeres og skal have fri adgang til den omgivende luft i rummet for afkøling.

14  **Betjeningstemperatur:** Dette apparat er konstrueret til en omgivende temperatur på maksimum 40 grader C.

15  **Alle Lande:** Installation af produktet skal ske i overensstemmelse med lokal og national lovgivning for elektriske installationer.

16 **Advarsel**: Der bør indskydes en 10 A automatsikring på forsyningsenden af kablet til dette LAN-udstyr.

Man skal ALTID først forbinde ledningerne med LAN-udstyret inden de forbindes med automatsikringen. Ved ledningsarbejde skal strømmen altid være AFBRUDT til forebyggelse af fare for elektrisk stød. Man skal altid SLUKKE automatsikringen inden man forbinder ledninger med den.

17 **Advarsel**: Man bør ikke afisolere mere af ledningerne end anvist, for så kan sådanne blanke ledninger udgøre et faremoment efter montering på klemmerækken.

18 **Advarsel**: Ved installering af dette udstyr skal steljord altid forbindes først og aftages sidst.

19 **Forsigtig**: "Fare" Se omhyggeligt efter om der stikker blanke kobbertråde ud fra klemmeforbindelserne. Ved korrekt montering er det ikke tilfældet. Enhver afisoleret leder kan lede farlig strømstyrke til personer, som kommer til at røre ved dem.

20 **Bemærk**: Dette udstyr kan køre både på jævnstrøm med positiv og med negativ jord.

Eisen: Dit product voldoet aan de volgende eisen.

1	RFI Emissie	FCC Klasse A, EN55022 Klasse A, EN61000-3-2, EN61000-3-3, VCCI Klasse A, C-TICK

2 **Waarschuwing**: Binnenshuis kan dit product radiostoring veroorzaken, in welk geval de gebruiker verplicht kan worden om gepaste maatregelen te nemen.

3	Immuniteit	EN55024
4	Electrische Veiligheid	EN60950 (TUV), UL60950 (UL/cUL)
5	Laser	EN60825

Veiligheid

6 **Waarshuwing:** Klasse-1 laser produkt.

7 **Waarchuwing:** Neit in de straal staren.

8 **Waarschuwingen Met Betrekking Tot Elektriciteit**
Waarschuwing: GEVAAR VOOR ELEKTRISCHE SCHOKKEN
Verwijder het deksel niet, teneinde ELEKTRISCHE schokken te voorkomen. Binnenin bevinden zich geen onderdelen die door de gebruiker onderhouden kunnen worden. Dit toestel staat onder GEVAARLIJKE SPANNING en mag alleen worden geopend door een daartoe opgeleide en bevoegde technicus. Om het gevaar op ELEKTRISCHE SCHOKKEN te vermijden, moet u het toestel van de stroombron ontkoppelen alvorens de LAN-kabels te koppelen of ontkoppelen.

9 **Gevaar Voor Blikseminslag**
Gevaar: NIET aan toestellen of KABELS WERKEN bij BLIKSEM.

10 **Waarschuwing:** Het toestel wordt uitgeschakeld door de stroomkabel te ontkoppelen. Om het toestel stroomloos te maken: De stroomkabel ontkoppelen.

11 ELEKTRISCHE TOESTELLEN VAN KLASSE 1
DIT TOESTEL MOET GEAARD WORDEN. De stekker moet aangesloten zijn op een juist geaarde contactdoos. Een onjuist geaarde contactdoos kan de metalen onderdelen waarmee de gebruiker eventueel in aanraking komt onder gevaarlijke spanning stellen.

12 Aan Te Sluiten Apparatuur, de contactdoos wordt in de nabijheid van de apparatuur geïnstalleerd en is gemakkelijk te bereiken."

13 **Opgelet:** De ventilatiegaten mogen niet worden gesperd en moeten de omgevingslucht ongehinderd toelaten voor afkoeling.

14 **Bedrijfstemperatuur:** De omgevingstemperatuur voor dit produkt mag niet meer bedragen dan 40 graden Celsius.

15 **Alle Landen:** het toestel installeren overeenkomstig de lokale en nationale elektrische voorschriften.

16 Waarschuwing: Op de kabel die op de LAN-apparatuur wordt aangesloten dient een zekering van 10 amp te worden gemonteerd aan de zijde van de aansluiting op de voeding.

Sluit bedrading ALTIJD eerst op de LAN-apparatuur aan en pas daarna op de zekering. Voorkom het risico op een elektrische schok en schakel eerst de voeding uit. Controleer voordat u de bedrading op de zekering aansluit altijd of de zekering zich in de stand UIT bevindt.

17 **Waarschuwing**: Verwijder niet meer dan de aanbevolen hoeveelheid isolatiemateriaal. Als u meer dan de aanbevolen hoeveelheid verwijdert, kan dit een veiligheidsrisico veroorzaken doordat draden bloot blijven liggen na aansluiting op het blok.

18 **Waarschuwing**: Zorg er tijdens installatie van de apparatuur altijd voor dat de aardeaansluiting van het frame als eerste wordt geplaatst en als laatste wordt losgemaakt.

19 Let op: "Veiligheidsrisico" Controleer of er bij de aangesloten bedrading geen koper blootligt. Als de installatie juist is uitgevoerd, is er bij het aansluitblok geen koperdraad zichtbaar. Blootliggende bedrading kan schadelijke elektriciteitsniveaus geleiden naar personen die met de draden in aanraking komen.

20 **Opmerking**: Dit systeem werkt met positief geaarde of negatief geaarde dc-systemen.

Normes: ce produit est conforme aux normes de suivantes:

1 Emission d'interférences radioélectriques — FCC Classe A, EN55022 Classe A, EN61000-3-2, EN61000-3-3, VCCI Classe A, C-TICK

2 **Mise En Garde**: dans un environnement domestique, ce produit peut provoquer des interférences radioélectriques. Auquel cas, l'utilisateur devra prendre les mesures adéquates.

3 Immunité — EN55024

4 Sécurité électrique — EN60950 (TUV), UL60950 (UL/cUL)

5 Laser — EN60825

Sécurité

6 **Attention**: Producit laser di classe 1.

7 **Attention**: Ne pas fixer le faisceau des yeux.

8 **Information Sur Les Risques Électriques**
Avertissement: DANGER D'ÉLECTROCUTION
Pour éviter toute ÉLECTROCUTION, ne pas ôter le revêtement protecteur du matériel. Ce matériel ne contient aucun élément réparable par l'utilisateur. Il comprend des TENSIONS DANGEREUSES et ne doit être ouvert que par un technicien dûment qualifié. Pour éviter tout risque d'ÉLECTROCUTION, débrancher le matériel avant de connecter ou de déconnecter les câbles LAN.

9 **Danger De Foudre**
Danger: NE PAS MANIER le matériel ou les CÂBLES lors d'activité orageuse.

10 **Attention:** Le cordon d'alimentation sert de mise hors circuit. Pour couper l'alimentation du matériel, débrancher le cordon.

11 ÉQUIPEMENT DE CLASSE 1 ÉLECTRIQUE
CE MATÉRIEL DOIT ÊTRE MIS A LA TERRE. La prise de courant doit être branchée dans une prise femelle correctement mise à la terre car des tensions dangereuses risqueraient d'atteindre les pièces métalliques accessibles à l'utilisateur.

12 Equipement Pour Branchement Electrique, la prise de sortie doit être placée près de l'équipement et facilement accessible".

13 **Attention:** Ne pas bloquer les fentes d'aération, ceci empêcherait l'air ambiant de circuler librement pour le refroidissement.

14 **Température De Fonctionnement:** Ce matériel est capable de tolérer une température ambiante maximum de ou 40 degrés Celsius.

15 **Pour Tous Pays:** Installer le matériel conformément aux normes électriques nationales et locales.

16 **Avertissement**: Par mesure de sécurité, un disjoncteur de 10 A doit être installé au point d'alimentation électrique du câble devant être utilisé avec cet équipement de réseau local (LAN).

Connectez TOUJOURS le câblage à l'équipement LAN avant de le connecter au disjoncteur. Pour éviter tout risque de blessure corporelle par électrocution, ne travaillez pas lorsque le matériel est sous tension. Assurez-vous toujours que le disjoncteur est bien en position d'ARRET avant de le connecter au câblage.

17 **Avertissement**: Ne coupez pas une quantité de câble supérieure à celle qui est recommandée. Cela pourrait constituer un risque de sécurité en laissant du câblage à nu sur le bornier après l'installation.

18 **Avertissement**: Lors de l'installation de cet équipement, vérifiez toujours que la connexion de terre du châssis est installée en premier et débranchée en dernier.

19 **Attention**: "Risque de sécurité" Vérifiez qu'aucun fil de cuivre dénudé ne sort du câble installé. Lorsque cette installation est effectuée correctement, aucun fil de cuivre ne devrait dépasser du bornier. Tout câblage dénudé peut être conducteur de tensions dangereuses pour les personnes touchant les câbles.

20 **Remarque**: Ce système peut fonctionner avec des systèmes C.C. dotés d'une mise à la terre positive ou négative.

Standardit: Tämä tuote on seuraavien standardien mukainen.

1	Radioaaltojen häirintä	FCC Luokka A, EN55022 Luokka A, EN61000-3-2, EN61000-3-3, VCCI Luokka A, C-TICK

2 Varoitus: Kotiolosuhteissa tämä laite voi aiheuttaa radioaaltojen häiröitä, missä tapauksessa laitteen käyttäjän on mahdollisesti ryhdyttävä tarpeellisiin toimenpiteisiin.

3	Kestävyys	EN55024
4	Sähköturvallisuus	EN60950 (TUV), UL60950 (UL/cUL)
5	Laser	EN60825

Turvallisuus

6 **Varoitus:** Luokan 1 Lasertuote.

7 **Variotus:** Älä katso säteeseen.

8 **Sähköön Liittyviä Huomautuksia**
Varoitus: SÄHKÖISKUVAARA
Estääksesi SÄHKÖISKUN älä poista kantta. Sisällä ei ole käyttäjän huollettavissa olevia osia. Tämä laite sisältää VAARALLISIA JÄNNITTEITÄ ja sen voi avata vain koulutettu ja pätevä teknikko. Välttääksesi SÄHKÖISKUN mahdollisuuden katkaise sähkövirta tuotteeseen ennen kuin liität tai irrotat paikallisverkon (LAN) kaapelit.

9 **Salamaniskuvaara**
Hengenvaara: ÄLÄ TYÖSKENTELE laitteiden tai KAAPELEIDEN KANSSA SALAMOINNIN AIKANA.

10 **Huomautus:** Virtajohtoa käytetään virrankatkaisulaitteena. Virta katkaistaan irrottamalla virtajohto.

11 SÄHKÖ - TYYPPILUOKAN 1 LAITTEET
TÄMÄ LAITE TÄYTYY MAADOITTAA. Pistoke täytyy liittää kunnollisesti maadoitettuun pistorasiaan. Virheellisesti johdotettu pistorasia voi altistaa metalliosat vaarallisille jännitteille.

12 **Pistorasiaan Kytkettävä Laite:** pistorasia on asennettava laitteen lähelle ja siihen on oltava esteetön pääsy."

13 **Huomautus:** Ilmavaihtoreikiä ei pidä tukkia ja niillä täytyy olla vapaa yhteys ympäröivään huoneilmaan, jotta ilmanvaihto tapahtuisi.

14 **Käyttölämpötila:** Tämä tuote on suunniteltu ympäröivän ilman maksimilämpötilalle 40°C.

15 **Kaikki Maat:** Asenna tuote paikallisten ja kansallisten sähköturvallisuusmääräysten mukaisesti.

16 Varoitus: Tämän LAN-laitteen kanssa käytettävän kaapelin syöttöpäähän tulee turvallisuussyistä asentaa 10 A virrankatkaisin.

Yhdistä johdot AINA ensin LAN-laitteeseen ennen virrankatkaisimeen kytkemistä. Sähköiskusta johtuvien vammojen välttämiseksi älä käsittele JÄNNITTEELLISIÄ johtoja. Varmista aina, että virrankatkaisin on pois päältä (OFF) ennen kuin yhdistät johdot katkaisimeen.

17 **Varoitus**: Älä poista johtimesta päällystettä enempää kuin on suositeltu. Päällysteen poistaminen suositusta pidemmältä matkalta voi aiheuttaa turvallisuusriskin, sillä riviliittimeen jää asennuksen jälkeen paljaita johtimia.

18 **Varoitus**: Kun asennat tätä laitetta, varmista aina, että runkomaadoitettu liitin kytketään ensin ja irrotetaan viimeiseksi.

19 **Huomio**: Turvallisuusriski Tarkista, ettei asennetusta johtimesta näy paljaita kuparisäikeitä. Kun asennus suoritetaan oikein, riviliittimestä ei pitäisi näkyä paljaita kuparijohdinsäikeitä. Paljaat johtimet voivat aiheuttaa sähköiskuvaaran, jos niihin kosketaan.

20 **Huomaa**: Tämä järjestelmä toimii positiivisesti tai negatiivisesti maadoitettujen tasavirtajärjestelmien kanssa.

Standard: Questo prodotto è conforme ai seguenti standard.

1 Emissione RFI (interferenza di radiofrequenza) — FCC Classe A, EN55022 Classe A, EN61000-3-2, EN61000-3-3, VCCI Classe A, C-TICK

2 **Avvertenza:** in ambiente domestico questo prodotto potrebbe causare radio interferenza. In questo caso potrebbe richiedersi all'utente di prendere gli adeguati provvedimenti.

3 Immunità — EN55024

4 Sicurezza elettrica — EN60950 (TUV), UL60950 (UL/cUL)

5 Laser — EN60825

Norme Di Sicurezza

6 **Avvertenza**: Prodotto laser di Classe 1.

7 **Avertenza:** Non fissare il raggio con gli occhi.

8 **Avvertenze Elettriche**
Attenzione: PERICOLO DI SCOSSE ELETTRICHE
Per evitare SCOSSE ELETTRICHE non asportare il coperchio. Le componenti interne non sono riparabili dall'utente. Questa unità ha TENSIONI PERICOLOSE e va aperta solamente da un tecnico specializzato e qualificato. Per evitare ogni possibilità di SCOSSE ELETTRICHE, interrompere l'alimentazione del dispositivo prima di collegare o staccare i cavi LAN.

9 **Pericolo Di Fulmini**
Pericolo: NON LAVORARE sul dispositivo o sui CAVI durante PRECIPITAZIONI TEMPORALESCHE.

10 **Attenzione:** Il cavo di alimentazione è usato come dispositivodi disattivazione. Per togliere la corrente al dispositivo staccare il cavo di alimentazione.

11 ELETTRICITÀ - DISPOSITIVI DI CLASSE 1
QUESTO DISPOSITIVO DEVE AVERE LA MESSA A TERRA. La spina deve essere inserita in una presa di corrente specificamente dotata di messa a terra. Una presa non cablata in maniera corretta rischia di scaricare una tensione pericolosa su parti metalliche accessibili.

12 Apparecchiatura Collegabile, la presa va installata vicino all'apparecchio per risultare facilmente accessibile".

13 **Attenzione:** le prese d'aria non vanno ostruite e devono consentire il libero ricircolo dell'aria ambiente per il raffreddamento.

14 **Temperatura Di Funzionamento:** Questo prodotto è concepito per una temperatura ambientale massima di 40 gradi centigradi.

15 **Tutti I Paesi:** installare il prodotto in conformità delle vigenti normative elettriche nazionali.

16 **Avvertenza**: A titolo di cautelativo, installare un interruttore di sicurezza da 10 ampere sull'estremità in entrata del cavo di alimentazione di questa apparecchiatura LAN.

Collegare SEMPRE il cablaggio prima all'apparecchiatura LAN e poi all'interruttore. Per evitare i infortuni causati da folgorazione, non lavorare su cavi SOTTO TENSIONE. Prima di collegare il cavo all'interruttore di sicurezza, accertarsi sempre che quest'ultimo sia disinserito.

17 **Avvertenza**: Per evitare i possibili pericoli associati all'esposizione dei fili sulla morsettiera dopo l'installazione, non rimuovere l'isolamento oltre le misure specificate.

18 **Avvertenza**: Quando si installa questo apparecchio, accertarsi sempre che il collegamento a massa del telaio sia sempre il primo ad essere effettuato e l'ultimo ad essere scollegato.

19 **Attenzione**: "Pericolo!" Controllare che il filo installato non abbia trefoli in rame esposti. Se l'installazione è stata effettuata in modo corretto, non vi deve protrudere dalla morsettiere alcun trefolo in rame esposto. In caso di contatto, un filo esposto può condurre livelli di elettricità pericolosi a quanti lo tocchino.

20 **Nota**: Questo sistema funziona con sistemi a CC con massa positiva o negativa.

Sikkerhetsnormer: Dette produktet tilfredsstiller følgende sikkerhetsnormer.

1	RFI stråling	FCC Klasse A, EN55022 Klasse A, EN61000-3-2, EN61000-3-3, VCCI Klasse A, C-TICK

2 **Advarsel**: Hvis dette produktet benyttes til privat bruk, kan produktet forårsake radioforstyrrelse. Hvis dette skjer, må brukeren ta de nødvendige forholdsregler.

3	Immunitet	EN55024
4	Elektrisk sikkerhet	EN60950 (TUV), UL60950 (UL/cUL)
5	Laser	EN60825

Sikkerhet

6 **Advarsel:** Laserprodukt av klasse 1.

7 **Advarsal:** Stirr ikke på strålen.

8 **Elektrisitet**
Advarsel: FARE FOR ELEKTRISK SJOKK
For å unngå ELEKTRISK sjokk, må dekslet ikke tas av. Det finnes ingen deler som brukeren kan reparere på innsiden. Denne enheten inneholder FARLIGE SPENNINGER, og må kun åpnes av en faglig kvalifisert tekniker. For å unngå ELEKTRISK SJOKK må den elektriske strømmen til produktet være avslått før LAN-kablene til- eller frakobles.

9 **Fare For Lynnedslag**
Fare: ARBEID IKKE på utstyr eller KABLER i TORDENVÆR.

10 **Forsiktig:** STRØMLEDNINGEN BRUKES TIL Å FRAKOBLE UTSTYRET. FOR Å DEAKTIVISERE UTSTYRET, må strømforsyningen kobles fra.

11 ELEKTRISK - TYPE 1- KLASSE UTSTYR
DETTE UTSTYRET MÅ JORDES. Strømkontakten må være tilkoplet en korrekt jordet kontakt. En kontakt som ikke er korrekt jordet kan føre til farlig spenninger i lett t ilgjengelige metalldeler.

12 Utstyr For Stikkontakt. Stikkontakten skal monteres i nærheten av utstyret og skal være lett tilgjengelig."

13 **Forsiktig:** Lufteventilene må ikke blokkeres, og må ha fri tilgang til luft med romtemperatur for avkjøling.

14 **Driftstemperatur:** Dette produktet er konstruert for bruk i maksimum romtemperatur på 40 grader celsius.

15 **Alle Land:** Produktet må installeres i samsvar med de lokale og nasjonale elektriske koder.

16 **Advarsel**: Av sikkerhetshensyn bør en automatsikring på 10 A monteres i forsyningsenden av kabelen som skal brukes sammen med dette LAN-utstyret.

Du skal ALLTID først kople ledningene til LAN-utstyret før du kopler ledningene til automatsikringen. Arbeid aldri med ledninger uten at strømmen er slått av, ettersom det ellers kan være fare for personskader som følge av elektrisk støt. Pass alltid på at automatsikringer er slått AV før du kopler ledningene til automatsikringen.

17 **Advarsel**: Du skal ikke avisolere mer av ledningen enn det som er anbefalt. Dersom du avisolerer mer enn det som er anbefalt, kan dette forårsake en sikkerhetsfare, ettersom det vil finnes uisolert ledning på rekkeklemmen etter montering.

18 **Advarsel**: Når du monterer dette utstyret, skal du alltid passe på at forbindelsen til rammejordingen monteres først og koples fra sist.

19 **Forsiktig**: "Sikkerhetsfare" Kontroller om uisolerte koppertråder stikker ut av den monterte ledningen. Hvis monteringen er riktig utført, skal det ikke finnes uisolerte kobbertråder som stikker ut fra rekkeklemmen. Uisolerte ledninger kan lede skadelige mengder strøm til personer som berører ledningene.

20 **Merknad**: Systemet fungerer med positivt og negativt jordede likestrømssystemer.

Padrões: Este produto atende aos seguintes padrões.

1 Emissão de interferência de radiofrequência — FCC Classe A, EN55022 Classe A, EN61000-3-2, EN61000-3-3, VCCI Classe A, C-TICK

2 **Aviso**: Num ambiente doméstico este produto pode causar interferência na radiorrecepção e, neste caso, pode ser necessário que o utente tome as medidas adequadas.

3 Imunidade — EN55024

4 Segurança Eléctrica — EN60950 (TUV), UL60950 (UL/cUL)

5 Laser — EN60825

Segurança

6 Aviso: Produto laser de classe 1

7 **Aviso:** Não olhe fixamente para o raio.

8 **Avisos Sobre Características Elétricas**
Atenção: PERIGO DE CHOQUE ELÉTRICO
Para evitar CHOQUE ELÉTRICO, não retire a tampa. Não contém peças que possam ser consertadas pelo usuário. Este aparelho contém VOLTAGENS PERIGOSAS e só deve ser aberto por um técnico qualificado e treinado. Para evitar a possibilidade de CHOQUE ELÉTRICO, desconecte o aparelho da fonte de energia elétrica antes de conectar e desconectar os cabos da LAN.

9 **Perigo De Choque Causado Por Raio**
Perigo: NÃO TRABALHE no equipamento ou nos CABOS durante períodos suscetíveis a QUEDAS DE RAIO.

10 **Cuidado:** O CABO DE ALIMENTAÇÃO É UTILIZADO COMO UM DISPOSITIVO DE DESCONEXÃO. PARA DESELETRIFICAR O EQUIPAMENTO, desconecte o cabo de ALIMENTAÇÃO.

11 ELÉTRICO - EQUIPAMENTOS DO TIPO CLASSE 1
DEVE SER FEITA LIGAÇÃO DE FIO TERRA PARA ESTE EQUIPAMENTO. O plugue de alimentação deve ser conectado a uma tomada com adequada ligação de fio terra. Tomadas sem adequada ligação de fio terra podem transmitir voltagens perigosas a peças metálicas expostas.

12 Equipamento De Ligação, a tomada eléctrica deve estar instalada perto do equipamento e ser de fácil acesso."

13 **Cuidado:** As aberturas de ventilação não devem ser bloqueadas e devem ter acesso livre ao ar ambiente para arrefecimento adequado do aparelho.

14 **Temperatura De Funcionamento:** Este produto foi projetado para uma temperatura ambiente máxima de 40 graus centígrados.

15 **Todos Os Países:** Instale o produto de acordo com as normas nacionais e locais para instalações elétricas.

16 **Aviso**: Como medida de precaução, deve instalar-se um disjuntor de 10 Amp na extremidade de alimentação do cabo a ser usado com este equipamento LAN.

Ligue SEMPRE os cabos ao equipamento LAN primeiro antes de os ligar ao disjuntor. Para evitar o perigo de ferimentos por choque eléctrico, não trabalhe com alimentadores LIGADOS. Verifique sempre se o disjuntor está na posição OFF (desligado) antes de ligar os cabos ao mesmo.

17 **Aviso**: Não corte mais fio do que recomendado. Cortar mais do que o recomendado pode ser perigoso, por deixar fio exposto no terminal depois da instalação.

18 **Aviso**: Ao ligar este equipamento, instale sempre primeiro a ligação à terra e desligue-a sempre em último.

19 **Atenção**: "Perigo" Verifique se há algum fio de cobre exposto a sair do fio instalado. Quando esta instalação é feita correctamente não deve haver qualquer fio de cobre exposto a sair do terminal. Qualquer fio exposto pode conduzir níveis perigosos de electricidade para a pessoa que toque nos fios.

20 **Nota**: Este sistema funciona com sistemas CC com ligações à terra Positivas ou Negativas.

Estándares: Este producto cumple con los siguientes estándares.

1 Emisión RFI — FCC Clase A, EN55022 Clase A, EN61000-3-2, EN61000-3-3, VCCI Clase A, C-TICK

2 **Advertencia**: en un entorno doméstico, este producto puede causar radiointerferencias, en cuyo caso, puede requerirse del usuario que tome las medidas que sean convenientes al respecto.

3 Inmunidad — EN55024

4 Seguridad eléctrica — EN60950 (TUV), UL60950 (UL/cUL)

5 Laser — EN60825

SEGURIDAD

6 ¡**Advertencia**! Producto láser Clase 1.

7 **¡Advertencia!** No mirat fijamente el haz.

8 **AVISOS ELECTRICOS**
Advertencia: PELIGRO DE ELECTROCHOQUE
Para evitar un ELECTROCHOQUE, no quite la tapa. No hay ningún componente en el interior al cual puede prestar servicio el usuario. Esta unidad contiene VOLTAJES PELIGROSOS y sólo deberá abrirla un técnico entrenado y calificado. Para evitar la posibilidad de ELECTROCHOQUE desconecte la corriente eléctrica que llega al producto antes de conectar o desconectar los cables LAN.

9 **PELIGRO DE RAYOS**
Peligro: NO REALICE NINGUN TIPO DE TRABAJO O CONEXION en los equipos o en LOS CABLES durante TORMENTAS ELECTRICAS.

10 **Atencion:** EL CABLE DE ALIMENTACION SE USA COMO UN DISPOSITIVO DE DESCONEXION. PARA DESACTIVAR EL EQUIPO, desconecte el cable de alimentación.

11 ELECTRICO - EQUIPO DEL TIPO CLASE 1
ESTE EQUIPO TIENE QUE TENER CONEXION A TIERRA. El cable tiene que conectarse a un enchufe a tierra debidamente instalado. Un enchufe que no está correctamente instalado podría ocasionar tensiones peligrosas en las partes metálicas que están expuestas.

12 EQUIPO CONECTABLE, el tomacorriente se debe instalar cerca del equipo, en un lugar con acceso fácil".

13 **ATENCION:** Las aberturas para ventilación no deberán bloquearse y deberán tener acceso libre al aire ambiental de la sala para su enfriamiento.

14 **TEMPERATURA REQUERIDA PARA LA OPERACIÓN:** Este producto está diseñado para una temperatura ambiental máxima de 40 grados C.

15 **PARA TODOS LOS PAÍSES:** Monte el producto de acuerdo con los Códigos Eléctricos locales y nacionales.

16 **Advertencia**: Por razones de precaución, se debe instalar un cortacircuitos de 10 amperios en el extremo de alimentación del cable que se utilizará con este equipo LAN.

SIEMPRE conecte los cables al equipo LAN primero, antes de conectarlos al cortacircuitos. Para evitar el peligro de sufrir daños corporales a causa de sacudidas eléctricas, no trabaje con conductores CON CORRIENTE. Asegúrese siempre de que el cortacircuitos esté en la posición de APAGADO (OFF) antes de conectar los cables al cortacircuitos.

17 **Advertencia**: No pele el cable más de la cantidad recomendada, ya que si después de instalar el bloque terminal quedan cables pelados, habrá riesgos de seguridad.

18 **Advertencia**: Cuando instale dicho equipo, asegúrese siempre de que el bastidor se conecte a tierra primero y se desconecte por último.

19 **Cuidado**: "Riesgo de seguridad" Cerciórese de que no haya hilos de cobre pelados que salgan del alambre instalado. Cuando dicha instalación se realiza correctamente, los hilos de cobre pelados no deben salir del bloque terminal. Todo alambre pelado puede conducir niveles de electricidad nocivos a la persona que lo toca.

20 **Nota**: Este sistema funcionará con sistemas de CC con conexión positiva o negativa a tierra.

Standarder: Denna produkt uppfyller följande standarder.

1	Radiostörning	FCCI Klass A, EN55022 Klass A, EN61000-3-2, EN61000-3-3, VCCI Klass A, C-TICK

2 **Varning**: Denna produkt kan ge upphov till radiostörningar i hemmet, vilket kan tvinga användaren till att vidtaga erforderliga åtgärder.

3	Immunitet	EN55024
4	Elsäkerhet	EN60950 (TUV), UL60950 (UL/cUL)
5	Laser	EN60825

Säkerhet

6 **Varning!** Laserprodukt av klass 1.

7 **Varning!** Laserstrålning när enheten är öppen.

8 **Tillkännagivanden Beträffande Elektricitetsrisk:**
RISK FÖR ELEKTRISK STÖTFör att undvika ELEKTRISK stöt, ta ej av locket. Det finns inga delar inuti som behöver underhållas. Denna apparat är under HÖGSPÄNNING och får endast öppnas av en utbildad kvalificerad tekniker. För att undvika ELEKTRISK STÖT, koppla ifrån produktens strömanslutning innan LAN-kablarna ansluts eller kopplas ur.

9  **Fara För Blixtnedslag**
Fara: ARBETA EJ på utrustningen eller kablarna vid ÅSKVÄDER.

10  **Varning:** NÄTKABELN ANVÄNDS SOM STRÖMBRYTARE FÖR ATT KOPPLA FRÅN STRÖMMEN, dra ur nätkabeln.

11 ELEKTRISKT - TYP KLASS 1 UTRUSTNING
DENNA UTRUSTNING MÅSTE VARA JORDAD. Nätkabeln måste vara ansluten till ett ordentligt jordat uttag. Ett felaktigt uttag kan göra att närliggande metalldelar utsätts för högspänning. Apparaten skall anslutas till jordat uttag, när den ansluts till ett nätverk.

12  Utrustning Med Plugg. Uttaget skall installeras i utrustningens närhet och vara lättåtkomligt".

13  **Varning:** Luftventilerna får ej blockeras och måste ha fri tillgång till omgivande rumsluft för avsvalning.

14  **Driftstemperatur:** Denna produkt är konstruerad för rumstemperatur ej överstigande 40 grader Celsius.

15  **Alla Länder:** Installera produkten i enlighet med lokala och statliga bestämmelser för elektrisk utrustning.

16 **Varning**: Av säkerhetsskäl skall en 10 A automatsäkring anslutas till försörjningsänden på kabeln som används till denna LAN-utrustning.

Ledningar skall ALLTID anslutas till LAN-utrustningen innan ledningarna ansluts till automatsäkringen. För att förebygga uppkomsten av personskador orsakade av elektrisk stöt skall man inte vidröra strömförande uttag. Kontrollera alltid att automatsäkringen är i läget OFF (AV) innan anslutning av ledningar till automatsäkringen sker.

17 **Varning**: Skala inte av mer isolering än vad som anges ovan. Skalas för mycket isolering av kan fara uppstå om oskyddad tråd vidröras på anslutningsplinten efter anslutningen.

18 **Varning**: Vid anslutning av denna utrustning skall man alltid se till att jordtråden ansluts först och lossas sist.

19 **Obs! Fara**! Kontrollera om små koppartrådar sticker ut ifrån den anslutna tråden. Om anslutningen utförts riktigt sticker inga trådar ut från anslutningsplinten. Oisolerade trådar kan överföra skadlig elektricitet till person som vidrör trådarna.

20 **Anmärkning**: Detta system fungerar både med positivt och negativt jordade likströmskällor.