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Simply connecting the (IP) world

*AT-8411 TX*

*Line Card*

*Installation Guide*

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# ***Electrical Safety and Emission Compliance Statement***

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**Standards:** This product meets the following standards when installed in compliant host equipment.

## **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 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  
VCCI Class A  
C-TICK 2 1



**Warning:** In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.  
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**Immunity**      EN55024 3

**Electrical Safety**      EN60825  
EN60950 (TUV)  
UL60950 (cUL<sub>us</sub>)

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### **Note**

For language translations of this safety information, see the Electrical Safety and Emission Compliance Statement in the **AT-8400 Series Switch Reference Guide**.

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# ***Welcome to Allied Telesyn***

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This guide provides a comprehensive description of the AT-8411 TX line card. The following topics are covered:

- ❑ “Overview” on page 1
- ❑ “Installation and Removal” on page 5
- ❑ “Troubleshooting” on page 19
- ❑ “Technical Specifications” on page 21
- ❑ “Port Specifications and Cabling” on page 23

## Related Documents

The Allied Telesyn web site at [www.alliedtelesyn.com](http://www.alliedtelesyn.com) offers you an easy way to access the most recent documentation, software, and technical information for all of our products. For details on the features and functions of your Allied Telesyn AT-8400 chassis and for instructions on how to manage the chassis and line cards, refer to the following manuals from our web site:

- ❑ **AT-8400 Series Switch Reference Guide**  
PN 613-50399-00
- ❑ **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:

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### Note

A note provides additional information.

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### **Caution**

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

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### **Warning**

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

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## **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.

Welcome to Allied Telesyn

## **E-mail and Telephone Support**

For Technical Support via e-mail 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**.

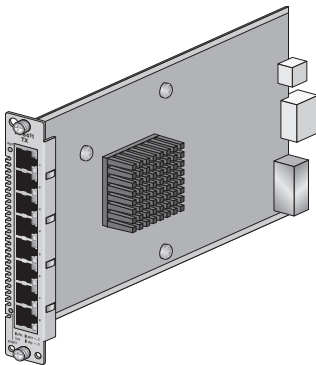
# Chapter 1

## Overview

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The AT-8411 TX line card is an Ethernet line card designed for the AT-8400 chassis. See Figure 1 below. The AT-8411 line card has eight 10/100 Mbps ports with RJ-45 connectors. The line cards can be installed in slots 1 through 12 on the front of the chassis.

AT-8411 line cards can be installed without powering off the AT-8400 chassis. You can install a maximum of 12 AT-8411 line cards in an AT-8400 chassis.



**Figure 1.** AT-8411 TX Line Card

## Port Speed

You can choose between a 10 Mbps and a 100 Mbps port speed for the AT-8411 TX line card. Port speed is configured in the software. See the **AT-S60 Management Software User's Guide** for port speed configuration information.

## Status LEDs

The AT-8411 line cards have port LEDs which display link and activity status about each fiber port. See Table 1 for LED information.

**Table 1: AT-8411 TX LEDs**

LED	State	Description
RDY	Steady Green	Indicates line card is receiving power and is ready to forward packets.
LNK ACT	Steady Green	The port has established a valid link with the end node.
	Flashing Green	The port is transmitting and/or receiving data.
LNK 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.



## ***Chapter 2***

# ***Installation and Removal***

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This chapter contains the procedures for installing and removing an AT-8411 TX line cards.

### **Verifying the Package Contents**

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

- One AT-8411 TX Line Card
- Installation Guide
- Warranty Card

### **Installing an AT-8411 Line Card**

This section describes how to install an AT-8411 TX line card into an AT-8400 chassis. If you are replacing a line card, refer to the “Removing an AT-8411 Line Card” on page 13 for instructions on how to remove the line card.

You can install an AT-8411 line card whether the chassis is powered on or powered off. The following procedure assumes that the chassis is powered on and that you are removing an attached faceplate.



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**Caution**

Before installing an AT-8411 line card, refer to the *AT-8400 Series Switch Reference Guide* for electrical safety information.

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To install an AT-8411 line card, perform the following procedure:

1. Select a slot in the AT-8400 chassis where you will install the AT-8411 line card. You can install the line card in any slot marked 1 through 12.



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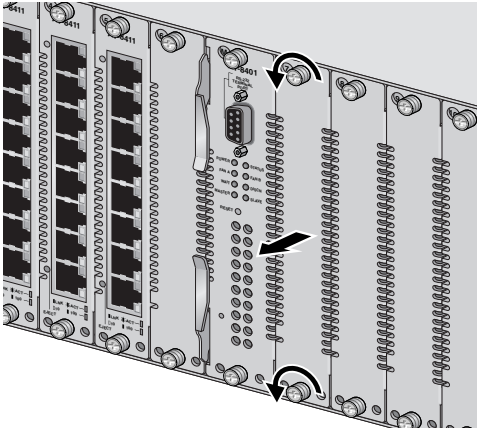
**Caution**

Do not install a line card in Slot M. Slot M is reserved for the AT-8401 Management Fabric Card.

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2. Use a Phillips screwdriver to loosen the two installation screws on the faceplate that is occupying the slot you have chosen for your AT-8411 line card. See Figure 2 below.



**Figure 2.** Removing a Blank Faceplate

3. Remove the faceplate from the slot.

Keep the faceplate in a safe area in case you need to cover the slot. The faceplate keeps dust from getting into the switch and maintains proper airflow.

4. Examine the WAIT/REMOVE LED on the AT-8401 management card. See Figure 3 below. If the LED is a steady amber, you cannot safely install a line card. Wait approximately 20 seconds and the WAIT/REMOVE LED will turn a steady green. When the WAIT/REMOVE LED is a steady green, it is safe to install a line card.

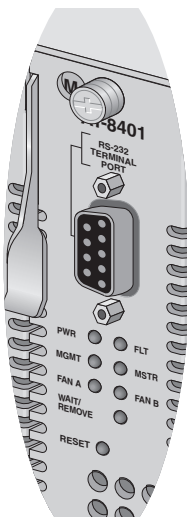


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### Caution

If the WAIT/REMOVE LED is a steady amber, it is not safe to install a line card.

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**Figure 3.** AT-8401 Management Card LEDs

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

**Caution**

Observe all standard electrostatic discharge (ESD) precautions, such as wearing an antistatic wrist strap, to avoid damaging the chassis device. Line cards can be damaged by static electricity.

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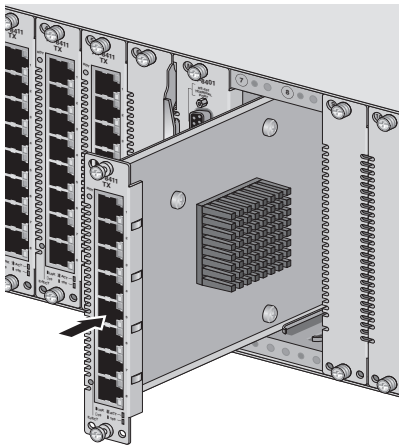
**Note**

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

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6. Verify that the line card package includes all the items previously listed in “Verifying the Package Contents” on page 5. If any item is missing or damaged, contact your Allied Telesyn sales representative for assistance.

7. Align the edge of the line card with the top and bottom guide rails before carefully sliding the line card into the slot. See Figure 4 below. Keep sliding the line card forward into the slot until the faceplate is flush with the front of the chassis. Avoid touching the line card components.



**Figure 4.** Installing an AT-8411/ST Line Card

8. Secure the AT-8411 line card to the chassis by using a Phillips screwdriver to tighten the two installation screws on the line card faceplate.

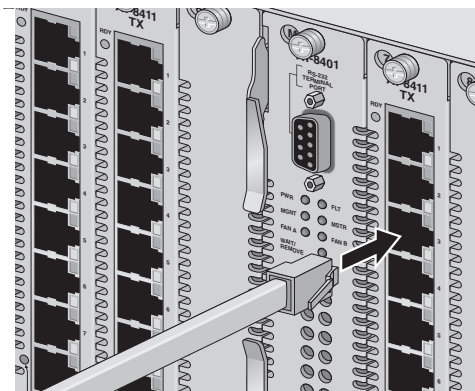
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**Note**

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

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9. Connect the twisted-pair cables to any of the eight RJ-ports on the AT-8411 line card. See Figure 5 below. For guidelines regarding connecting a twisted-pair cable to a port, see the **AT-8400 Series Switch Reference Guide**.



**Figure 5.** Connecting a Twisted-pair Cable to an AT-8411 TX Line Card

10. Power on the end node.

## Installation and Removal

11. Make sure the line card's RDY LED and the LNK (Link) LED for the connected ports are lit a steady green.

See "Status LEDs" on page 3 for complete LED information.

## Removing an AT-8411 Line Card

This section explains how to remove an AT-8411 line card from the AT-8400 chassis. You can remove an AT-8411 line card when the AT-8400 is powered on.

An AT-8411 line card can be removed and replaced, or hotswapped, with another AT-8411 line card while the AT-8400 chassis is powered on. When you replace an AT-8411 line card, the software configuration for the line card is retained on the AT-8401 management card. For further information on the effects of hot swapping AT-8411 line cards, see the **AT-8400 Series Switch Reference Guide**.

Allied Telesyn recommends you cover the optic ports after you remove the fiber optic cables. As a result, you need the appropriate ST or SC dust caps to perform this procedure.



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### Caution

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

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To remove an AT-8411 line card, perform the following procedure:

1. Select a line card to remove.

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

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**Note**

Do not use this procedure to remove the AT-8401 management card from Slot M.

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2. Remove the twisted-pair cables from the ports on the line card.
3. Examine the LEDs on the AT-8401 management card. See Figure 6 on page 15.

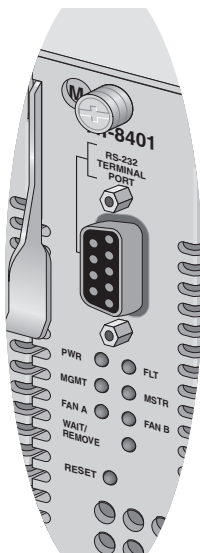
If the WAIT/REMOVE LED is a steady green, you can safely remove a line card from the chassis.

**Caution**

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

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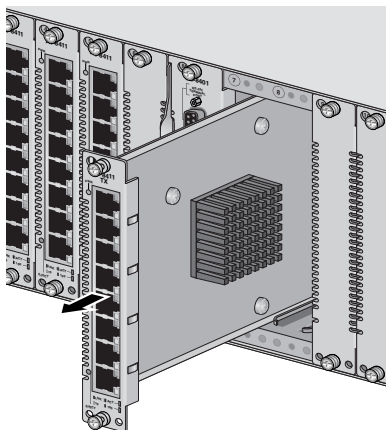




**Figure 6.** AT-8401 Management Card LEDs



5. Pull the line card forward and remove it from the chassis. See Figure 8 below.



**Figure 8.** Removing an AT-8411 TX Line Card

Once you have removed the line card from the chassis, the WAIT/REMOVE LED on the AT-8401 management card turns a steady amber. Approximately 20 seconds later, the WAIT/REMOVE LED turns a steady green.



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### **Caution**

Observe all standard electrostatic discharge (ESD) precautions, such as wearing an antistatic wrist strap, to avoid damaging the chassis device. Store the removed line card in an antistatic bag, or immediately install the card in another slot. Line cards can be damaged by static electricity.

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6. When the WAIT/REMOVE LED is a 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 an AT-8411 Line Card” on page 5.

## **Warranty Registration**

When you have finished installing the product, register your product by completing the enclosed warranty card and sending it in. You can also fill out the registration online by selecting “Warranties” under “Support & Services” from **[www.alliedtelesyn.com](http://www.alliedtelesyn.com)**.

## ***Chapter 3***

# ***Troubleshooting***

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Follow the guidelines below to test and troubleshoot your AT-8411 line card in the event a problem occurs.

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, and some remain off and the card is operating properly, then the LEDs that are off may be burned out. Call Technical Support.

If the LINK/ACT and LINK 10/100 LEDs are a steady green, but the RDY LED is off and the card did not boot properly, check the console.

If the 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.

If the LINK/ACT (L/A) LED is off, 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 an AT-8411 line card in slots 1 through 12.
- ❑ Check that there is power to the end node.
- ❑ Check that the twisted-pair cable is securely connected to the ports on the line card and on the end node.
- ❑ Replace the current twisted-pair cable with a new twisted-pair cable.
- ❑ Check that the appropriate type of cable for the port is connected to the port. See “Installing an AT-8411 Line Card” on page 5.

If you are still experiencing problems after using the troubleshooting information in this chapter, refer to “Contacting Allied Telesyn” on page ix.

# ***Appendix A***

## ***Technical Specifications***

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### **Maximum Operating Temperature:**

0° C to 40° C (32° F to 104° F)

### **Maximum Storage Temperature:**

-20° C to 80° C (-4° F to 176° F)

### **Operating and Storage Altitude:**

Up to 3,048 meters (10,000 feet)

### **Relative Humidity Operating and Storage:**

5% to 80% (non-condensing)

## **Agency Certifications**

### **RFI Emission**

FCC Class A,  
EN55022 Class A,  
VCCI Class A,  
C-TICK

### **Immunity**

EN55024

### **Electrical Safety**

UL60950 (UL/cUL),  
EN60950 (TUV)  
EN60825





## ***Appendix B***

# ***Port Specifications and Cabling***

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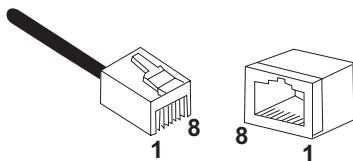
This appendix provides port specifications and cabling information for the AT-8411 TX line card.

### **Pinouts and Cabling**

This appendix provides pin layout and cabling information for the AT-8411 TX line card.

### **Pinout Assignments**

Figure 9 shows the pin layout to an RJ-45 connector and port.



**Figure 9.** RJ-45 Connector and Port Pin Layout

Table 1 lists the MDI and MDI-X RJ-45 twisted-pair port pinouts for 10Base-T or 100Base-TX ports.

**Table 2:** MDI and MDI-X Pin Signals

<b>Pin Number</b>	<b>MDI</b>	<b>MDI-X</b>
1	TX+	RX+
2	TX-	RX-
3	RX+	TX+
4	-	
5	-	
6	RX-	TX-
7	-	
8	-	

## Cable Specifications

The following table contains the cabling specifications for the AT-8411 twisted-pair ports. The operating wavelength is 1310 nm.

**Table 3:** Cable Specifications

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

The twisted-pair ports on the AT-8411 TX line card feature auto-MDI. They are configured automatically by the AT-8400 switch as MDI or MDI-X when connected to an end node. Use either a straight-through or a crossover twisted-pair cable when connecting any network device to a port on the line card.

