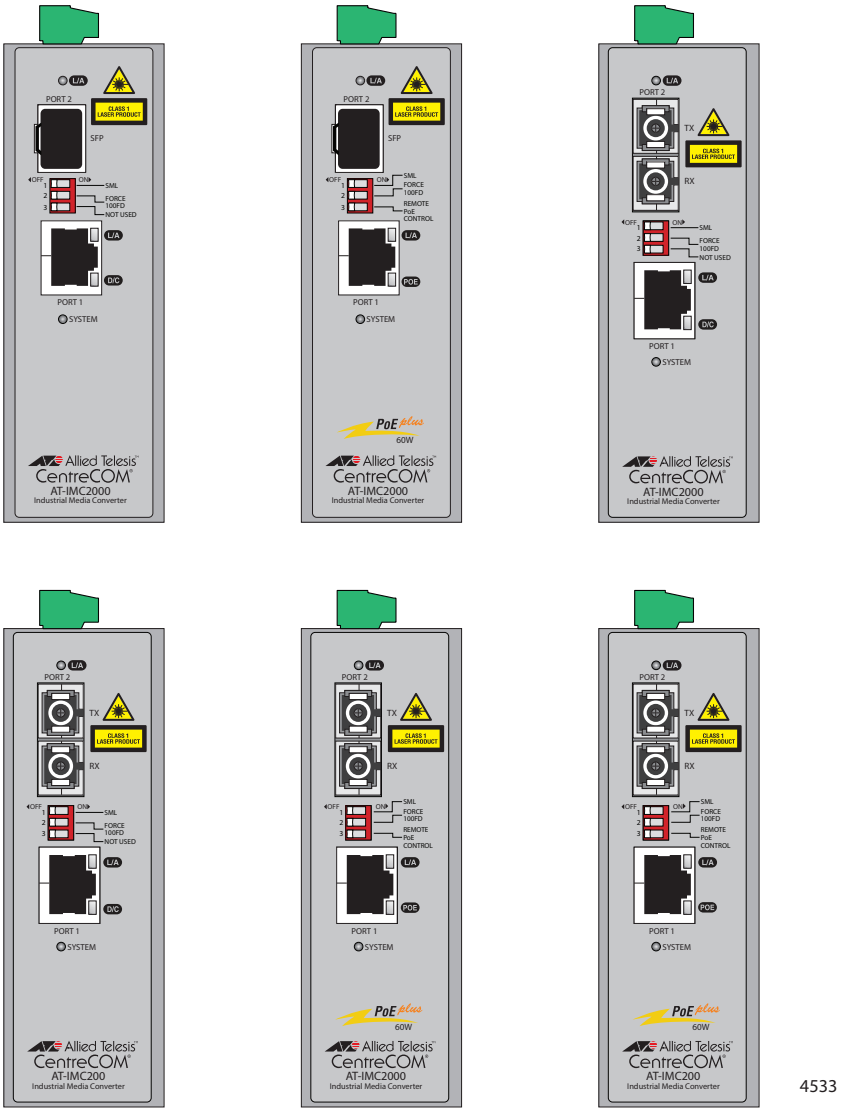
IMC2000/200 Series

Industrial Switching Media Converters

- AT-IMC2000TP/SP
- AT-IMC2000TP/SC
- AT-IMC2000T/SP
- AT-IMC2000T/SC
- AT-IMC200TP/SC
- AT-IMC200T/SC



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Installation Guide

the solution : the network

613-002626 Rev A

Electrical Safety and Emissions Standards

This section contains the following:

US 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

Radiated Energy

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Emissions, Immunity and Electrical Safety Standards

RFI Emissions	FCC Class A, EN55032 Class A, CISPR 32 Class A, RCM, VCCI, FCC Part 15, ICES

Warning
In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures. E84

EMC (Immunity)	EN55024, EN55035, EN61000-3-2, EN61000-3-3
Electrical Safety	EN60950-1 (TUV), UL 60950-1 ($_{C}UL_{US}$)

Warning
Laser Safety: EN60825 L7

Translated Safety Statements

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

Contents

Preface

This guide contains the installation instructions for the following Industrial Switching Media Converters.

- AT-IMC2000TP/SP
- AT-IMC2000TP/SC
- AT-IMC2000T/SP
- AT-IMC2000T/SC
- AT-IMC200TP/SC
- AT-IMC200T/SC

This preface contains the following sections:

Symbol Conventions

This document uses the following conventions:

Note
Notes provide additional information.

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

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

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

Contacting Allied Telesis

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

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

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

Chapter 1

Overview

This chapter contains the following sections:

Description

The IMC2000/200 series media converter extends the distance of your network by interconnecting LAN devices that are physically separated by large distances. In addition, this series models are industrial media converters, which can be deployed outdoors and in hash environments.

Figure 1 shows the AT-IMC2000TP/SP model.

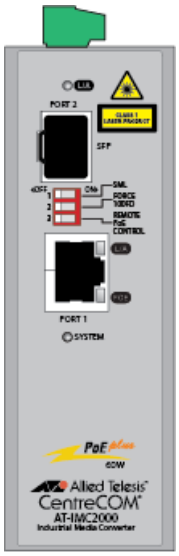


Figure 1. AT-IMC2000T/SP Media Converter

Key Features

The IMC2000/200 series media converter has the following key features:

- Tolerance to harsh industrial environments (See “Environmental Specifications” on page 49)
- DIN rail mountable
- Wall mountable

Note

To install the media converter on the wall, you must obtain the optional wall mounting kit separately.

- DC power connector
- IEEE 802.3u Auto-Negotiation compliant on the copper port
- Auto-Negotiation or 100 Mbps full-duplex mode on the copper port
- Auto MDI/MDI-X on the copper port (See “Auto MDI/MDI-X” on page 13)
- One SC or SFP fiber optics connector

- One twisted-pair port (See “Twisted-Pair Port” on page 14)
- Far end fault on 100Mb fiber port
- Power over Ethernet (PoE) (IEEE 802.3at 30watt)
- Pre-standard 60watt PoE (LTPoE++)
- 10Kbyte Jumbo packets
- Smart Missing Link™(SML) (See “Smart MissingLink™ (SML)” on page 18)

Table 1 shows the specifications of the ports and PoE for each model.

Table 1. Connecting Networks

Model	PoE	Fiber-optic Port		Copper Port
		Connector	L1 Standard	
AT-IMC2000TP/SP	60W	SFP	100/1000Base-X	10/100/1000Base-T
AT-IMC2000TP/SC		SC	1000Base-SX	
AT-IMC2000T/SP	n/a	SFP	100/1000Base-X	
AT-IMC2000T/SC		SC	1000Base-SX	
AT-IMC200TP/SC	60W	SC	100Base-FX	10/100/1000Base-T
AT-IMC200T/SC	n/a	SC		

Auto MDI/ MDI-X

An RJ45 twisted-pair port on a 100 Mbps Ethernet network device can have one of two possible wiring configurations: MDI or MDI-X. The RJ45 port on a PC, router, or bridge is typically wired as MDI, while the twisted-pair port on a switch or hub is usually MDI-X.

The media converter features Auto MDI/MDI-X. The twisted-pair port automatically determines the configuration of the port on the device to which it is connected and then configures itself appropriately.

For example, if a port on a media converter is connected to a port on a bridge, which is typically wired as MDI, the port on the media converter automatically configures itself as MDI-X.

This feature allows you to use a straight-through cable when connecting any type of device to the media converter, regardless of the wiring configuration of the port on the device.

DIP Switches

The media converter is equipped with the DIP switches. Figure 2 shows the DIP switches on the media converter.

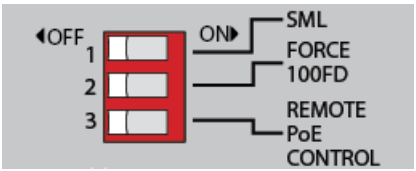


Figure 2. DIP Switches

To configure the media converter, use the following DIP switches:

- SML - Turn on or off the SML feature.
- FORCE 100FD - Select Auto Negotiation or set the port speed for 100Mbps in full-duplex mode.
- REMOTE PoE CONTROL - Activate or deactivate remote PoE which allows you to remotely power cycle your PoE device.

Note

The only AT-IMC2000TP/SP, AT-IMC2000TP/SC, and AT-IMC200TP/SC models are equipped with the Remote PoE Control DIP switch. DIP switch 3 is not used for the other models.

DC Power

The IMC2000/200 series media converter is equipped with the DC power connector.

Twisted-Pair Port

The twisted-pair port features an eight-pin RJ45 connector that uses four pins at 10 or 100 Mbps and all eight pins at 1000 Mbps. For the port pinouts, see “RJ45 Connector and Port Pinouts” on page 50.

The port has a maximum operating distance of 100 m (328 feet). For twisted-pair port cabling specifications, refer to Table 3 on page 27.

Auto-Negotiation or 100 Mbps Setting

You can set the twisted-pair port to 100 Mbps full-duplex mode or Auto-Negotiation mode using the DIP switch See Figure 2 on page 14.

- When this DIP switch is in the FORCE 100 F/D (up) position, the twisted-pair port is forced to 100 Mbps full-duplex mode, and Auto Negotiation is disabled
- When in the AUTO NEG (down) position, the twisted-pair port operates in Auto-Negotiation mode.

Caution

100 Mbps full-duplex mode should not be used unless absolutely necessary because forcing 100 Mbps full-duplex in most applications is likely to cause a duplex mismatch, in turn, causing poor network performance. 100 Mbps full-duplex mode should only be used when the link partner is already forced to 100 Mbps full-duplex operation, and Auto-Negotiation is disabled on the link partner. In this specific case, using Auto Negotiation on the media converter would result in a duplex mismatch.

LEDs

Figure 3 shows the LEDs on the AT-IMC2000TP/SP media converter.

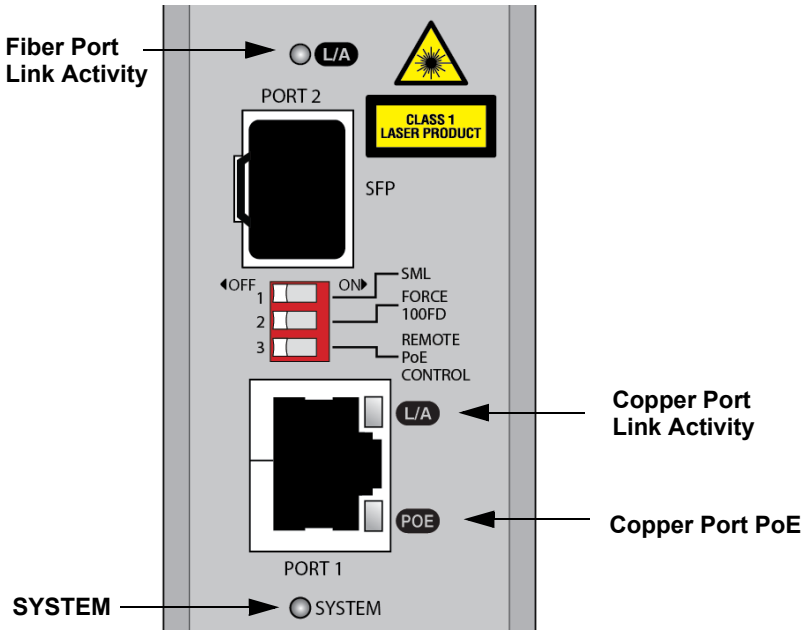


Figure 3. LEDs on the AT-IMC2000TP/SP Media Converter

Figure 4 shows the LEDs on the AT-IMC2000T/SC media converter.

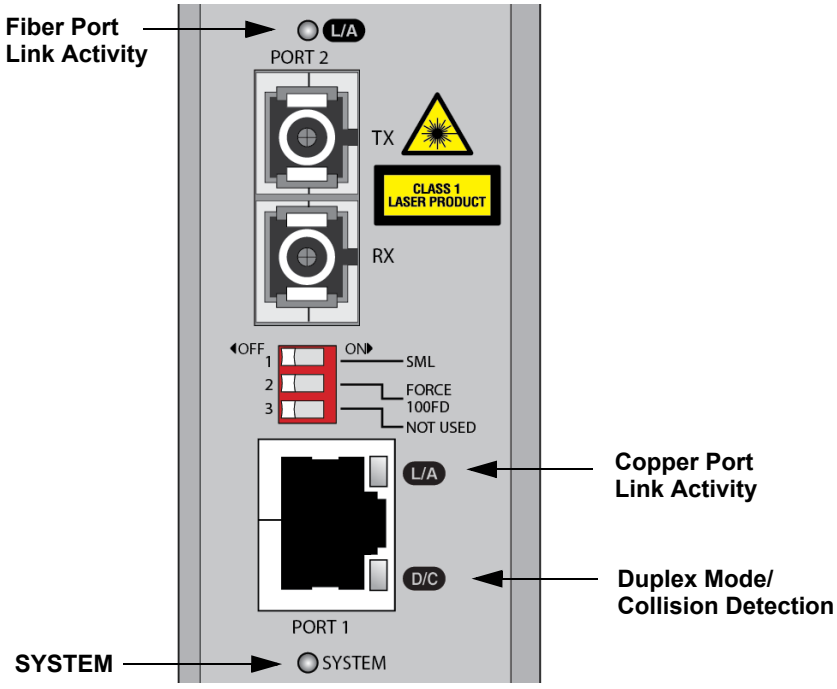


Figure 4. LEDs on the AT-IMC2000T/SC Media Converter

Table 2 describes the media converter's LEDs.

Table 2. Media Converter LED Functional Descriptions

LED		State	Description
SYSTEM		Off	The media converter is not operational.
		Solid Green	The media converter is operational.
		Slow Blinking Green	An error is present on the media converter.
Fiber Port L/A (Link/Activity)		Off	The port has not established a link.
		Solid Green	The port has an established link to a network device, but it is not transmitting or receiving network packets.
		Rapid Blinking Green	The port is transmitting or receiving network packets.
		Slow Blinking Green	SML is on and detects a failure on the copper port or the remote fiber port when operating in a back-to-back configuration with another IMC2000/200 Series media converter.
Copper Port	L/A (Link/Activity)	Off	The port has not established a link.
		Solid Green	The port has an established link to a network device, but it is not transmitting or receiving network packets.
		Rapid Blinking Green	The port is transmitting or receiving network packets.
		Slow Blinking Green	SML is on and detects a failure on the link on the fiber port.
	D/C (Duplex Mode and Collisions)	Off	The port is not operating or operating in half-duplex mode.
		Solid Green	The port is operating in full-duplex mode.
		Blinking Green	Collisions are occurring on the port.
	POE	Off	There is no powered device detected.
		Solid Green	The end-node is a powered device and the port is providing power to it.

Smart MissingLink™ (SML)

If one of the Ethernet connections to the media converter loses link, the Smart MissingLink™ (SML) feature allows you to determine which port still has a valid connection and which port requires troubleshooting. The value to this type of network monitoring and fault notification is that you can quickly determine which media converter port has failed and troubleshoot the specific area where the problem is occurring.

When the media converter detects a loss of connection on one of the ports, the port's L/A LED is turned off. At the same time, the media converter causes the opposite port's L/A LED to blink while simultaneously turning OFF that port's Ethernet connection to its end node. This occurs even though the properly operating port had a valid connection before the failure occurred: The reason for this is so that its end node is notified that the data path has been compromised, and immediate action is required.

For example, if the network connection to the media converter's twisted-pair port fails, the FIBER P2 L/A LED blinks slowly while its link is turned OFF. The COPPER P2 L/A LED is turned OFF, indicating a failed connection on the twisted-pair port. If the failure had started with the fiber-optic cabling, then the COPPER P2 L/A LED would blink slowly, and the FIBER P2 L/A LED would turn OFF.

SML Example Scenarios

Following are example scenarios with one SML enabled media converter connected between two end nodes.

Figure 5 shows media converter and end node L/A LED behavior with SML enabled under normal conditions.

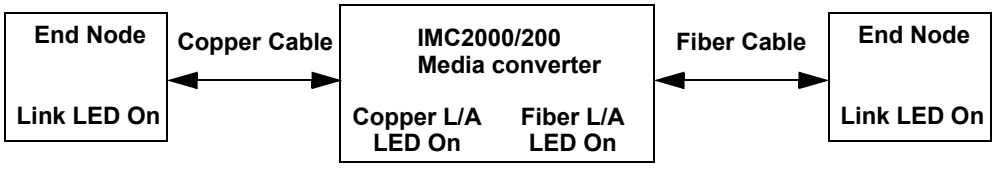


Figure 5. SML in Normal Condition

Figure 6 shows media converter and end node L/A LED behavior with SML enabled with a fiber connection down.

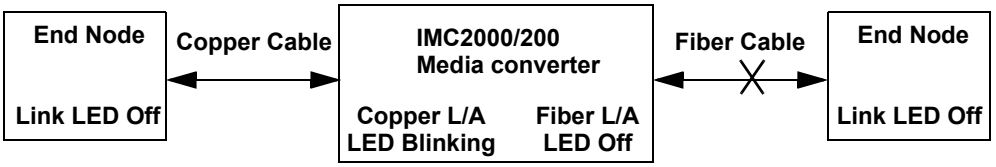


Figure 6. SML with Fiber Connection Down

Figure 7 shows media converter and end node L/A LED behavior with SML enabled with a copper connection down.

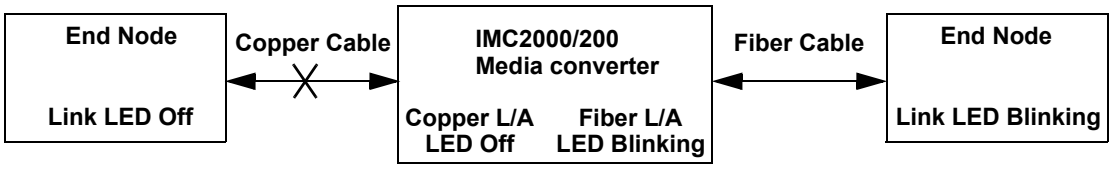


Figure 7. SML with Copper Connection Down

SML Example Scenarios with Two Connected Media Converters

Following are example scenarios with two SML enabled media converters connected back-to-back (bookend mode).

Figure 8 shows media converter and end node L/A LED behavior with SML enabled under normal conditions.

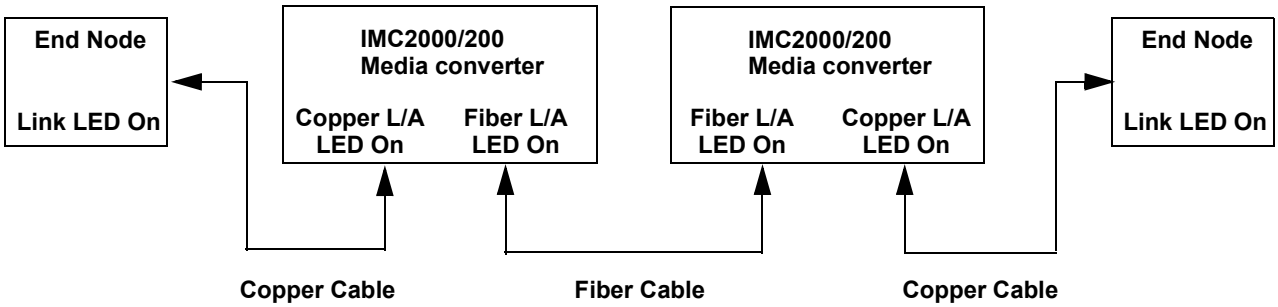


Figure 8. SML in Normal Condition with Two Media Converters

Figure 9 shows media converter and end node L/A LED behavior with SML enabled with a copper connection down between a media converter and an end node.

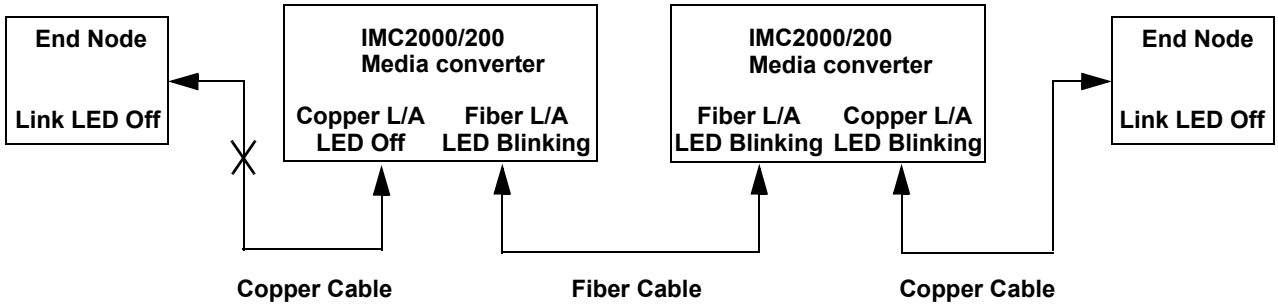


Figure 9. SML with Copper Connection to End Node Down

Figure 10 shows media converter and end node L/A LED behavior with SML enabled with a fiber connection down between two media converters.

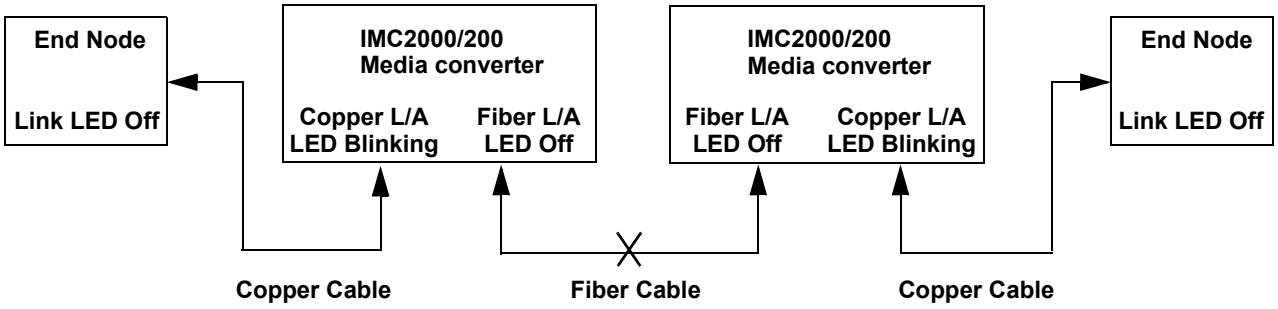


Figure 10. SML with Fiber Connection Between Media Converters Down

Enabling SML

To enable SML on the unit, set the SML ON/OFF DIP switch 1 to the ON position. See Figure 2 on page 14.

Power over Ethernet (PoE)

Power over Ethernet (PoE) technology permits both power and data to be transmitted over an Ethernet cable. Both PoE (EEE802.3af) and PoE+ (IEEE802.3at) are supported on the twisted-pair port of the media converter. Powered device classes 0, 1, 2, 3, and 4 are supported.

Warning

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

Enabling Remote PoE Control

PoE is enabled on the media converter by default: the Remote PoE Control DIP switch in the OFF position. See Figure 2 on page 14.

To enable PoE only when the fiber link is up, which allows you to remotely power cycle your PoE device, set the REMOTE PoE CONTROL switch to the ON position.

Chapter 2

Installation

This chapter contains the following sections:

Reviewing Safety Precautions

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

Note

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

Caution

Air vents must not be blocked and must have free access to the room ambient air for cooling. ✍ E6

Note

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

Note

The power input must be provided from SELV source only, per IEC60950. Do not connect to a centralized DC battery bank. ✍ E31

Warning

Operating Temperature. This product is designed for a maximum ambient temperature of 75° degrees C. ✍ E57

Caution

Failing to pick up the ferrule tip when you reach the bottom of the cleaning surface can result in static electricity that can damage the fiber-optic cable. ✍ E82

Warning

In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures. E84

Warning

An SFP transceiver can be damaged by static electricity. Be sure to observe all standard electrostatic discharge (ESD) precautions, such as wearing an antistatic wrist strap, to avoid damaging the transceiver. E86

Warning

Do not stare into the laser beam. L2

Warning

Do not look directly at the fiber-optic cable ends or inspect the cable ends with an optical lens. L6

Warning

Laser Safety: EN60825-1. L7

Selecting a Site for the Media Converter

Observe the following requirements when choosing a site for your media converter:

- If you are installing the media converter on a table, verify that the table is level and secure.
- The site should provide for easy access to the ports on the front of the media converter. This will make it easier for you to connect and disconnect cables, as well as view the media converter's LEDs.
- Air flow around the unit and through its vents on the side should not be restricted so that the media converter can maintain adequate cooling.
- Do not place objects on top of the media converter.
- Do not expose the media converter to moisture or water.
- You should use dedicated power circuits or power conditioners to supply reliable electrical power to the network devices.

Planning the Installation

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

- On the AT-IMC2000 media converter, the end node connected to the fiber connector on the media converter must operate at 1000 Mbps, except for the AT-IMC2000/SP when using a 100 Mbps SFP module.
- On the AT-IMC200 media converters, the end node connected to the fiber connector on the media converter must operate at 100 Mbps.
- The two end-nodes connected to the ports of the media converter must operate with the same duplex mode, either half- or full-duplex. The twisted-pair port on the media converter can operate in either mode with Auto Negotiation enabled.
- The media converter connects a copper unshielded twisted pair (UTP) network cabling to a fiber optic cabling, which allows two network devices, such as a network adapter card, repeater, switch, media converter, router, camera, or access point, across long distances.
- The twisted-pair port has a maximum operating distance of 100 meters (328 feet).

Cable Specifications for Copper Port

Table 3 contains the cable specifications for the twisted-pair port.

Table 3. Twisted-Pair Port Cabling Specifications

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

Speed/Duplex Combinations for AT-IMC2000

For speed/duplex interactions between the copper port on the AT-IMC2000 and the copper link partner, see Table 4 for allowable speed/duplex combinations.

Table 4. Copper Connection Speed/Duplex and Resulting Speed - AT-IMC2000

AT-IMC2000 Copper Port Speed/Duplex Setting	**Copper Link Partner Port Setting**			
	Auto Negotiation	100Mbps Force Full Duplex	100Mbps Force Half Duplex	1000Mbps Force Full Duplex*
Auto Negotiation	1000Mbps full duplex connection for Gigabit Link Partners 100Mbps full duplex connection for 100Mbps Link Partners	Duplex mismatch – not supported	100Mbps half duplex connection	1000Mbps full duplex connection
100Mbps Full Duplex	Duplex mismatch – not supported	100Mbps full duplex connection	Duplex mismatch – not supported	No connection
*Although 1000Mbps connections require Auto Negotiation, some switches allow the option of only advertising 1000Mbps speed. Note: The fiber port always runs at 1000Mbps full duplex.				

Speed/Duplex Combinations for AT-IMC200

For speed/duplex interactions between the copper port on the AT-IMC200 and the copper link partner, see Table 5 on page 29 for allowable speed/duplex combinations.

Table 5. Copper Connection Speed/Duplex and Resulting Speed - AT-IMC200

AT-IMC200 Copper Port Speed/Duplex Setting	Copper Link Partner Port Setting			
	Auto Negotiation	100Mbps Force Full Duplex	100Mbps Force Half Duplex	1000Mbps Force Full Duplex*
Auto Negotiation	100Mbps full duplex connection	Duplex mismatch – not supported	100Mbps half duplex connection	No connection
100Mbps Full Duplex	Duplex mismatch – not supported	100Mbps full duplex connection	Duplex mismatch – not supported	No connection
*Although 1000Mbps connections require Auto Negotiation, some switches allow the option of only advertising 1000Mbps speed. Note: The fiber port always runs at 100Mbps full duplex.				

Note

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

For the fiber-optic port specifications, refer to “Fiber-Optic Port Specifications” on page 52.

Unpacking the Media Converter

To unpack the media converter, perform the following procedure:

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

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

2. Place the media converter on a level, secure surface.

3. Verify that the hardware components are included in your switch package.Table 7 shows a list of the hardware components.

Table 6. Components in the Shipping Box

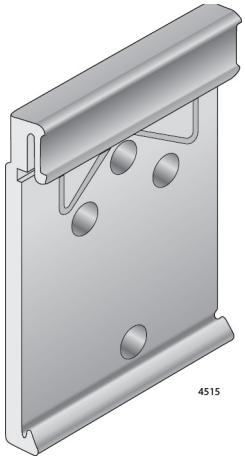
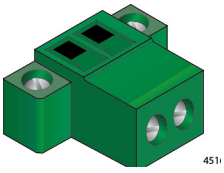
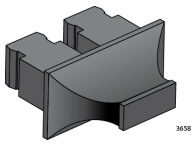
Component	Illustration
One bracket for DIN rail (Pre-installed)	
Two screws for the bracket (Pre-installed)	
One 2-pin terminal block for DC power	

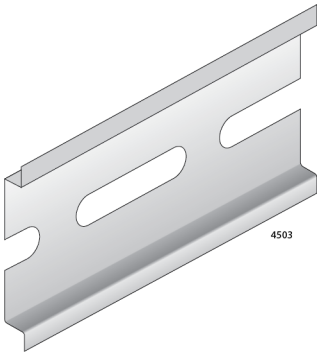
Table 6. Components in the Shipping Box

Component	Illustration
One fiber port dust cover (pre-installed) For AT-IMC200xTP/SC and AT-IMC200xT/SC models only	
One SFP slot dust cover (pre-installed) For AT-IMC2000TP/SP and AT-IMC2000T/SP models only	

4. Verify that the hardware components in the wall-mount kit. Table 7 shows a list of the hardware components.

Note
To install the media converter on the wall, you must purchase this wall-mount kit separately.

Table 7. Components in the Wall Mount Kit

Component	Illustration
One piece of DIN rail for wall-mount	
Two sets of metal anchor and screw for wall-mount	

Installing the Media Converter

You may install the media converter on a desktop, on a DIN rail, or on a wall. Perform one of the following procedures:

- To install the media converter on a DIN rail, see “Installing the Media Converter on a DIN Rail” on page 33.
- To install the media converter on a wall, see “Installing the Media Converter on a Wall” on page 35.

Installing the Media Converter on a DIN Rail

To install the media converter on a DIN rail, perform the following procedure:

1. Take the media converter. See Figure 11.

Figure 11. The Media Converter with the Bracket Attached

2. Hook the top of the bracket on the upper side of the DIN rail and snap down the media converter unit, as shown in Figure 12.

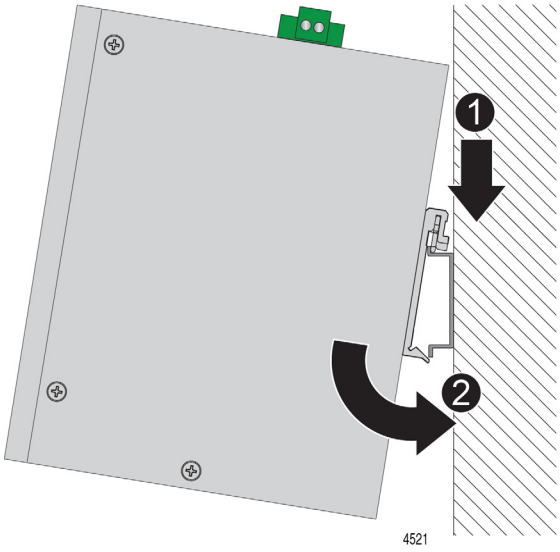


Figure 12. Hook the Bracket on the DIN Rail

3. Ensure that the media converter unit is attached securely to the DIN rail. See Figure 13.

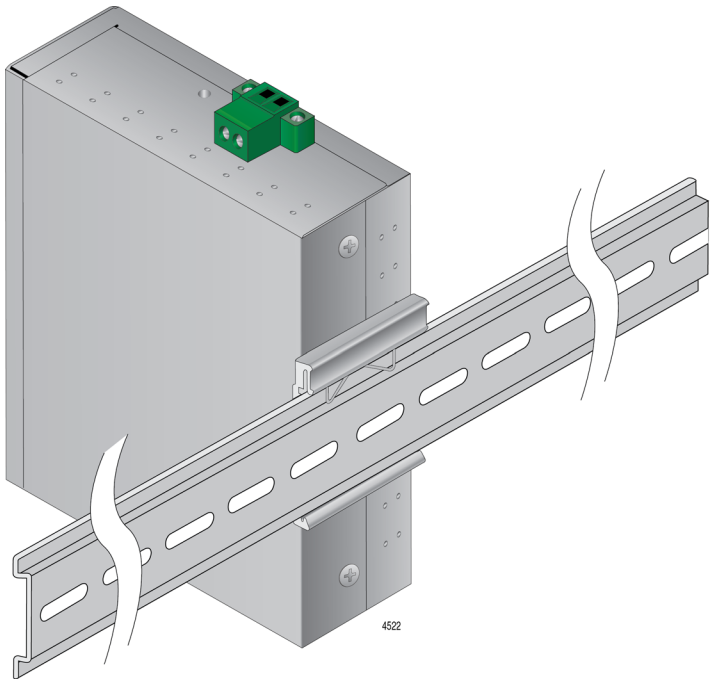


Figure 13. Securing the Media Converter to a DIN Rail

Installing the Media Converter on a Wall

To install the media converter on a wail, perform the following procedure:

1. Use a pencil or pen to mark the wall with two screw locations in the openings of your DIN rail. See Figure 14.

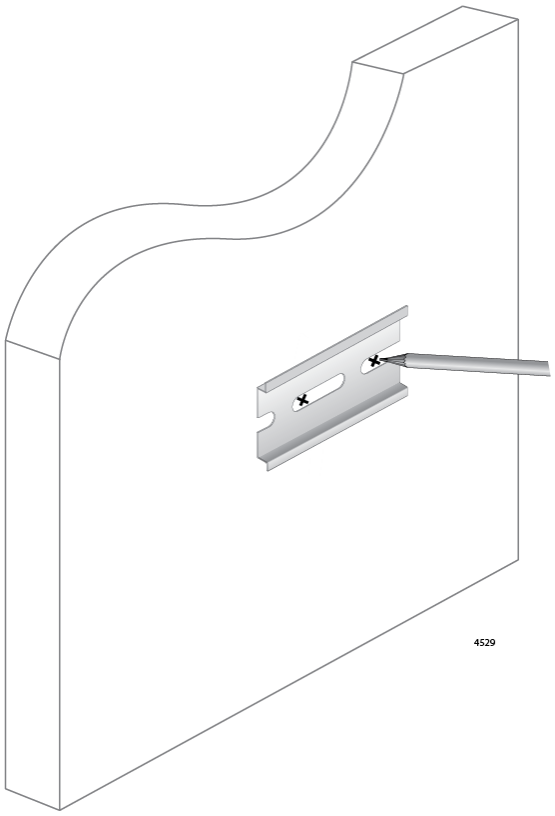


Figure 14. Marking the Wall for Screw Locations

2. Pre-drill two 3/16-inch holes where you just marked. See Figure 15 on page 36.

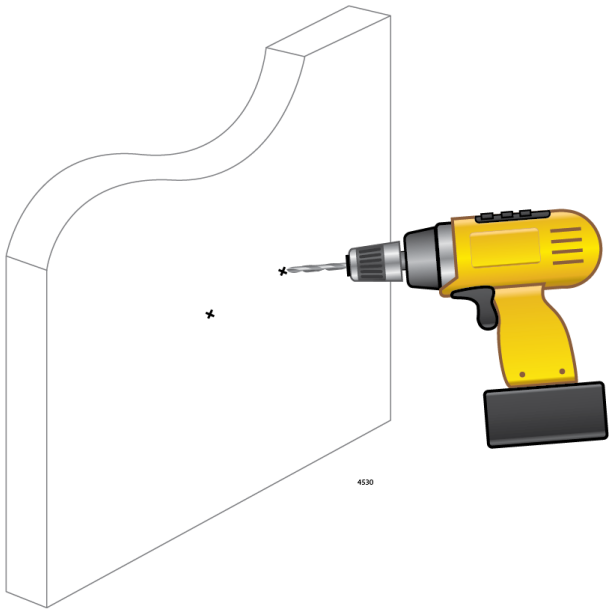


Figure 15. Pre-drilling the Holes on the Wall

3. Insert two metal anchors into the holes you drilled in Step 2.

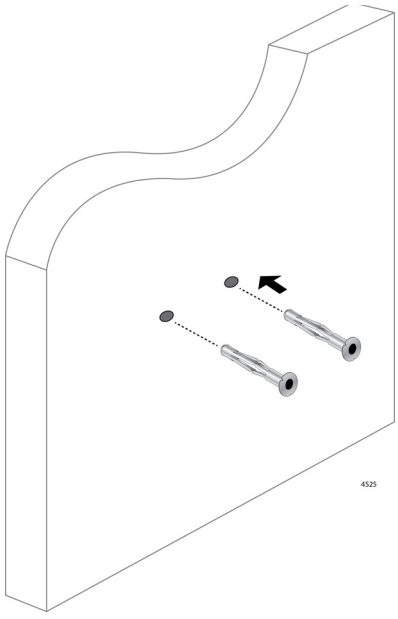


Figure 16. Pre-drilling Holes

4. Align the openings in the piece of the DIN rail to the metal anchors on the wall and insert the screws into the metal anchors. See Figure 17 on page 37.

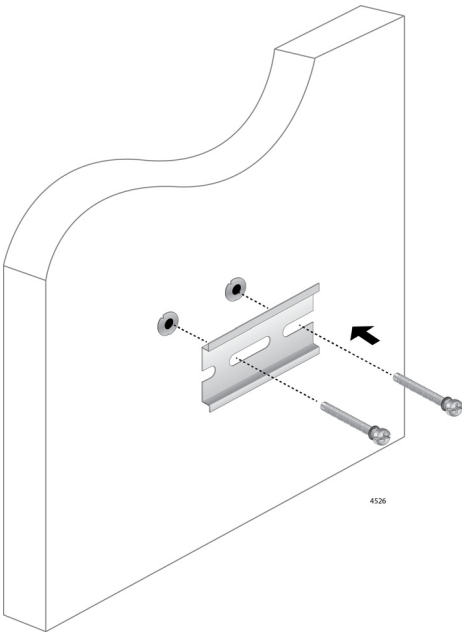


Figure 17. Installing the Piece of DIN Rail on the Wall

5. Tighten the screws to attach the piece of the DIN rail to the wall.
6. Hook the top of the bracket on the upper side of the piece of the DIN rail and snap down the media converter unit, as shown in Figure 12 on page 33.
7. Ensure that the media converter is installed securely to the wall. See Figure 18.

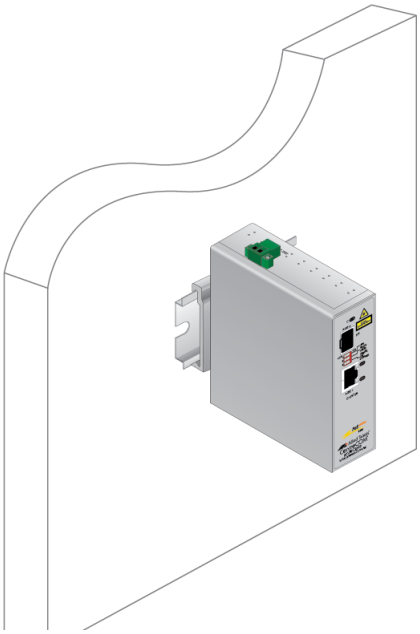


Figure 18. Media Converter on the Wall

Installing the SFP Transceiver

To install an SFP transceiver, perform the following procedure:

Note

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

Note

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

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

Warning

An SFP transceiver can be damaged by static electricity. Be sure to observe all standard electrostatic discharge (ESD) precautions, such as wearing an antistatic wrist strap, to avoid damaging the transceiver. E86

2. Remove the dust plug from the SFP slot. See Figure 19.

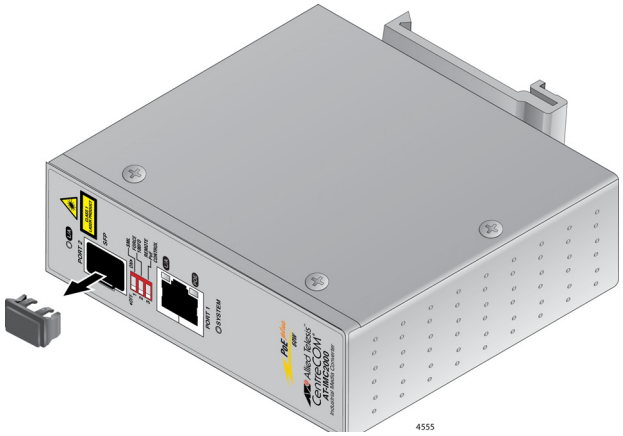


Figure 19. Removing the Dust Plug from an SFP Slot

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

4. Slide the transceiver into the SFP slot until it clicks into place. See Figure 20.

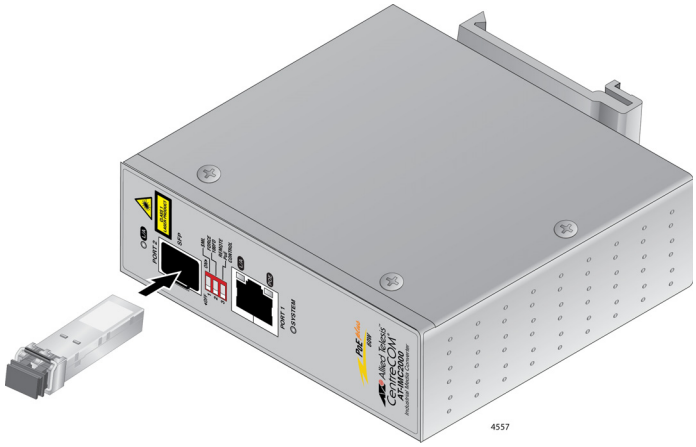


Figure 20. Inserting the SFP

5. Verify that the handle on the transceiver is in the upright position, as shown in Figure 21. This secures the transceiver and prevents it from being dislodged from the slot.

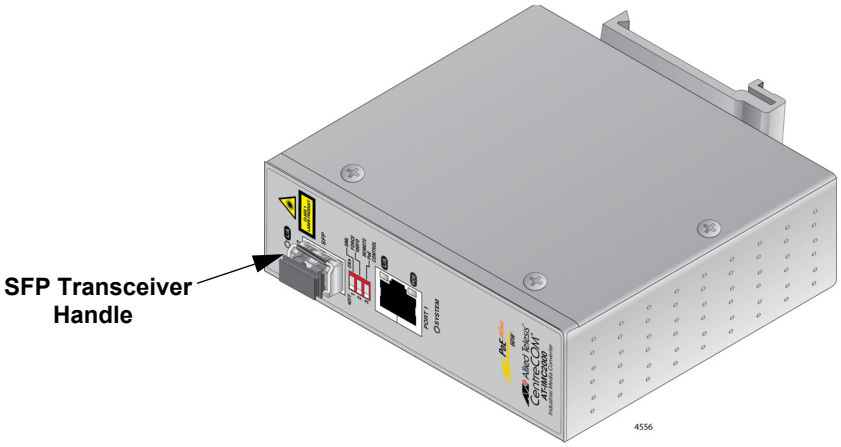


Figure 21. Positioning the SFP Handle in the Upright Position

Note

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

Note

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

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

Chapter 3

Powering On the Media Converter

This chapter contains the following procedures:

Wiring and Powering on the Media Converter

To wire and power on the IMC2000/200 series media converter, perform the following procedure:

Warning
Only trained and qualified personnel are allowed to install or to replace this equipment. **E14**

1. Identify the **positive** and **negative** terminals on the DC power supply terminal block, as shown in Figure 22.

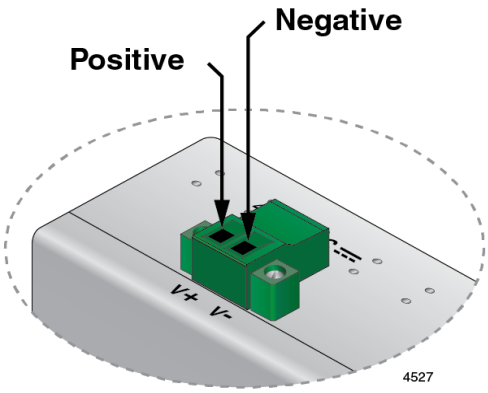


Figure 22. Locating the Terminals on the DC Terminal Block

2. Before you strip and attach the wires, review the following safety precautions:

Warning
For centralized DC power connection, install only in a restricted access area. **E23**

Note
A tray cable is required to connect the power source if the unit is powered by centralized DC power. The tray cable must be a UL listed Type TC tray cable and rated at 600 V and 90 degrees C, with three conductors, minimum 14 AWG. **E24**

Warning
The source of the DC input shall be isolated from the AC power source by reinforced insulation. **E117**

3. With a 14-gauge wire-stripping tool, strip the two wires in the tray cable coming from the DC input power source to 8 millimeters ± 1 millimeters (0.31 inches ± 0.039 inches), as shown in Figure 23.

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. **E10**

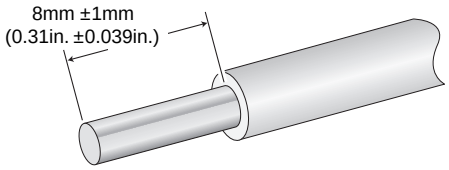


Figure 23. Stripped Wire

4. Connect the negative feed wire to the terminal marked **V-** (**negative**) by inserting the wire into the terminal block and tightening the connection with a flathead screwdriver. SeeFigure 24.

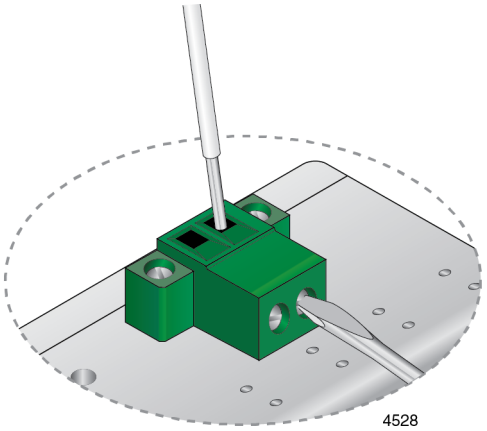


Figure 24. Connecting the Feed Wire

5. Connect the positive feed wire to the terminal block marked **V+** (**positive**).

Warning
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. **E12**

6. Secure the cables using multiple cable ties (not provided) to minimize the chance of the connections being disturbed by casual contact with the wiring.

   Allied Telesis recommends that you use at least four cable ties 10 centimeters (4 inches) apart with the first one located within 15 centimeters (6 inches) of the terminal block.

7. Verify that the SYSTEM LED is green.

   If it is not, refer to Chapter 4, “Troubleshooting” on page 45.

Chapter 4
Troubleshooting

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

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

Problem 1: The SYSTEM LED on the media converter is off.

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

- Verify that the power cord is securely connected to the power source and to the DC connector of the media converter.
- Verify that the power outlet has power by connecting another device to it.
- Try using another power source.
- Verify that the DC voltage from the power source is within the required levels for the AT-IMC2000/200 series media converter.

Solution: An internal component on the unit is damaged or not working properly. Try the following:

- Power cycling the unit.
- If power cycling does not clear the fault, return the unit to Allied Telesis.

Problem 2: The SYSTEM LED on the media converter is blinking slowly.

Solution: An error is present on the unit. Try the following:

- Power cycling the unit.

If it is an AT-IMC2000TP/SP or AT-IMC2000T/SP unit, a transmit fault may be occurring on the SFP module, or the SFP module itself may be causing some other errors. The media converter will try to clear this error, but if the error persists, try the following:

- Remove and re-seat the SFP module.
- Try a different SFP module.
- Verify the SFP module is the correct type for your application.

Problem 3: The twisted-pair port on the media converter is connected to an end node, but the copper port's L/A LED is off.

Solutions: The port is unable to establish a link to an end node. Try the following:

- Verify that the end node connected to the twisted-pair port is powered on and is operating properly.
- Verify that the twisted-pair cable is securely connected to the port on the media converter channel and to the port on the remote end-node.
- Verify that the port is connected to the correct twisted-pair cable. This is to eliminate the possibility that the port is connected to the wrong end-node, such as a powered-off device.
- Try connecting another end node to the twisted-pair port with a different cable. If the twisted-pair port is able to establish a link, then the problem is with the cable or the other end-node.
- Verify that the twisted-pair cable does not exceed 100 meters (328 feet).
- Verify that the end node connected to the media converter is operating at the same speed.
- Verify that you are using the appropriate category of twisted-pair cable: Category 3 or better for 10 Mbps operation and Category 5 and Category 5E for 100 and 1000 Mbps operation.

Note
A 1000Base connection may require 5 to 10 seconds to establish a link.

Problem 4: The FIBER port's L/A LED for the fiber-optic port is off.

Solutions: The fiber-optic port on the transceiver is unable to establish a link to an end node. Try the following:

- Verify that the end node connected to the fiber-optic port is operating properly.
- Verify that the fiber-optic cable is securely connected to the port on the media converter channel and to the port on the remote end-node.
- Verify that the end node connected to the media converter is operating at the same speed.
- Verify that the media converter's transmitter port (TX) is connected to the end node's receiver port (RX) and that the media converter's receiver port (RX) is connected to the end node's transmitter port (TX).

- On the AT-IMC2000TP/SP or AT-IMC2000T/SP unit, check that the SFP module is fully inserted in the slot.
- On the AT-IMC2000TP/SP or AT-IMC2000T/SP unit, verify that the operating specifications and wave lengths of the fiber-optic port on the SFP transceiver and the remote end-node are compatible.
- Verify that the correct type of fiber-optic cabling is being used.
- Verify that the port is connected to the correct fiber-optic cable. This is to eliminate the possibility that the port is connected to the wrong remote end-node, such as a powered-off device.
- Try connecting another end node to the fiber-optic port using a different cable. If the port is able to establish a link, then the problem is with the cable or with the other end node.
- If the remote end-node is a management device, use its management firmware to determine whether its port is enabled.
- Test the attenuation on the fiber-optic cable with a fiber-optic tester to determine whether the optical signal is too weak (sensitivity) or too strong (maximum input power).

Problem 5: Network performance between the twisted-pair port on the media converter and an end node is slow.

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

Appendix A

Technical Specifications

Below are the technical specifications for the media converters. The specification categories are as follows:

Physical Specifications

Table 8. Physical Specifications

Dimensions W x D x H	50.8 mm x 99.1 mm x 20.3 mm (2.0 in x 3.9 in x 0.8 in)
Weight	0.2 kg (0.4 lb)

Environmental Specifications

Table 9. Environmental Specifications

Operating Temperature	-40°C to 75°C (-40°F to 167°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Operating Humidity	5% to 95% non-condensing
Storage Humidity	5% to 95% non-condensing
Operating Altitude Range	Up to 2,000 m (6,561.7 ft)

Power Specifications

The following specifications apply to the DC power connector on the media converter.

Table 10 shows power specifications for the AT-IMC2000TP/SP,AT-IMC2000TP/SC, and AT-IMC200TP/SC models.

Table 10. Power Specifications for the AT-IMC2000/200TP Models

Input supply voltage	48-60VDC
Input current	1.5A max

Table 11 shows power specifications for the AT-IMC2000T/SP, AT-IMC2000T/SC, and AT-IMC200T/SC models.

Table 11. Power Specifications for the AT-IMC2000/200T Models

Input supply voltage	12-60 VDC
Input current	200mA max

RJ45 Connector and Port Pinouts

Figure 25 illustrates the pin layout for the RJ45 connector and port.

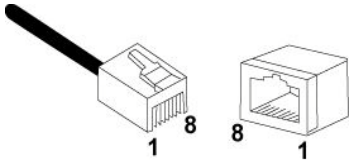


Figure 25. RJ45 Connector and Port Pin Layout

Table 12 lists the pin signals when a port is operating in the MDI configuration at 10 or 100 Mbps.

Table 12. MDI Pin Signals (10 or 100 Mbps)

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

Table 13 lists the pin signals when a port is operating in the MDI-X configuration at 10 or 100 Mbps.

Table 13. MDI-X Pin Signals (10 or 100 Mbps)

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

Table 14 lists the pin signals when a port is operating at 1000 Mbps.

Table 14. Pin Signals (1000 Mbps)

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

Fiber-Optic Port Specifications

The fiber type for the media converter is multimode.

Table 15 lists fiber-optic port specifications for the AT-IMC2000 media converters.

Table 15. AT-IMC2000 Fiber-Optic Port Specifications

Fiber Optic Cable	Cable Diameter (Core/Cladding)	Max Distance[1]	Optical Parameters				
			Launch Power		Receive Power		Optical Power Budget
			Min.	Max.	Min (Sensitivity)	Max (Overload)	
FDDI	62.5/125 um	220 m	-9.5 dBm	-4.0 dBm	-20 dBm	-3 dBm	10.5 dBm
OM1	62.5/125 um	275 m					
OM2	50/125 um	550 m					

1. For reference only, actual distance is dependent on the specific attenuation of the cabling environment.

Table 16 lists fiber-optic port specifications for the AT-IMC200 media converters.

Table 16. AT-IMC200 Fiber-Optic Port Specifications

Fiber Optic Cable	Cable Diameter (Core/Cladding)	Max Distance[1]	Optical Parameters				
			Launch Power		Receive Power		Optical Power Budget
			Min.	Max.	Min (Sensitivity)	Max (Overload)	
FDDI	62.5/125 um	2 km	-20 dBm	-14 dBm	-32 dBm	-3 dBm	12 dBm
OM1	62.5/125 um	2 km					
OM2	50/125 um	2 km					

1. For reference only, actual distance is dependent on the specific attenuation of the cabling environment.

Appendix B

Cleaning Fiber-Optic Connectors

This appendix contains the following sections:

This appendix describes how to clean fiber-optic connectors.

Introduction

The fiber-optic connector consists of a fiber-optic plug and its adapter. The end of the fiber-optic cable is held in the core of the ferrule in the plug. Light signals are transmitted through the core of the fiber. Even minor smudges, or dirt, on the end face of the fiber (completely invisible to the naked eye) can disrupt light transmission and lead to failure of the component or of the entire system. Therefore, it is of utmost importance to clean all fiber-optic connectors before use.

Figure 26 shows the ferrule in an SC connector.

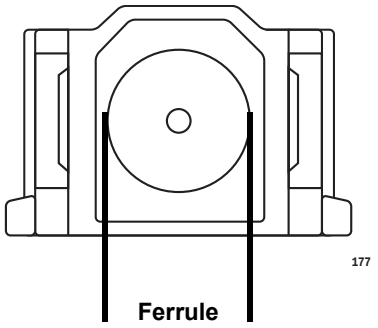


Figure 26. Ferrule in an SC Connector Plug

The end face of an unclean and clean ferrule are shown in Figure 27.

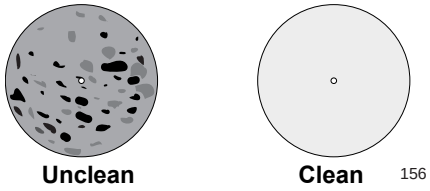


Figure 27. Unclean and Clean Ferrule

Using a Cartridge-Type Cleaner

Fiber-optic cartridge cleaners, shown in Figure 28, are available from many vendors and are typically called “cartridge cleaners”.

Figure 28. Cartridge Cleaner

Note
Do not use compressed air or aerosol air to clean a fiber-optic connector.

To clean a fiber-optic connector using a cartridge cleaner, perform the following procedure.

1. With one hand, hold the cartridge cleaner and push the lever on the cleaning cartridge in the direction of the arrow to expose the cleaning surface, as shown in Figure 29 on page 55.

2. Place the ferrule tip on the exposed cleaning surface and rub the ferrule in a downward direction, as shown in Figure 29 on page 55.

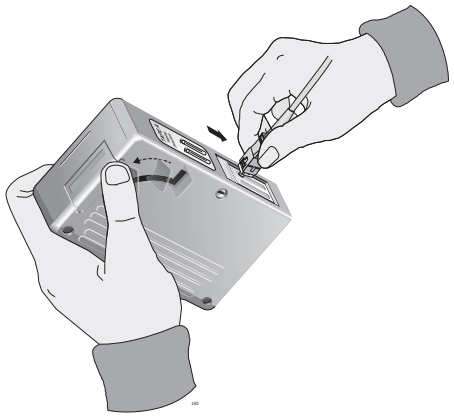


Figure 29. Rubbing the Ferrule Tip on the Cleaning Surface

Note
Rub the ferrule tip on the cleaning surface in one direction only.

3. When you reach the end of the cleaning surface, pick up the ferrule tip, rotate and place it at the top, and rub downwards at least two times.

Caution
Failing to pick up the ferrule tip when you reach the bottom of the cleaning surface can result in static electricity that can damage the fiber-optic cable. E82

4. If desired, repeat Step 2 and Step 3.

5. If a fiber inspection scope is available, use the scope to inspect the ferrule end face to make sure that it is clean.

6. Reconnect the cable to the port or protect the ferrule tip with a dust cap.

Note
Always keep a dust cap on a fiber-optic cable when it is not in use.

Note
Do not touch the end face of the ferrule in the connector.

Warning
Do not stare into the laser beam. L2

Warning
Do not look directly at the fiber-optic cable ends or inspect the cable ends with an optical lens. L6

Using a Swab

Specially treated swabs, or stick cleaners, are available for cleaning inside connector adapters or hard-to-reach ferrule tips. These swabs, often referred to as “lint-free” or “alcohol-free” swabs, shown in Figure 30, are available from many vendors. Stick cleaners are available in both 2.5 mm and 1.25 mm sizes for use on SC and MU connectors respectively.

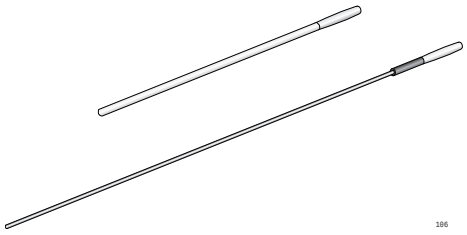


Figure 30. Lint-Free and Alcohol-Free Swabs

Note
Never use a household cotton swab and alcohol to clean a fiber-optic connector. This may leave a residue on the ferrule tip.

Note
Do not used compressed air or aerosol air to clean a fiber-optic connector.

To clean a recessed ferrule using a swab, perform the following procedure.

1. Insert the swab into the adapter as shown in Figure 31. Rub the ferrule tip with the swab.

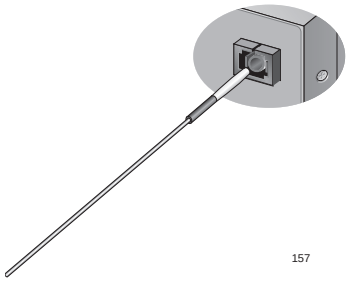


Figure 31. Cleaning a Recessed Ferrule

2. If desired, repeat Step 1.

3. If a fiber inspection scope is available, use the scope to inspect the connector to make sure that it is clean and to check for scratches, pits, or other problems that may affect performance.

Note
Always keep a dust cap on a fiber-optic cable when it is not in use.

Warning
Do not stare into the laser beam. L2

Warning
Do not look directly at the fiber-optic cable ends or inspect the cable ends with an optical lens. L6