



# Allied Telesis

## AT-IMC1000TP/SFP Industrial Gigabit PoE+ Media Converter

### User Manual

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# Preface

## I FCC Warning

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 in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. It may cause harmful interference to radio communications if the equipment is not installed and used in accordance with the instructions. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## II CE Mark Warning

This is a Class-A product. 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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# 1. Overview

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## 1.1 Introduction

The AT-IMC1000TP/SFP Industrial Media Converter is designed to convert Ethernet Gigabit copper networks to Gigabit fiber networks by transparently converting Ethernet signals to optic signals. Furthermore, the AT-IMC1000TP/SFP can work from -40° ~ 75° C. And with IP31 protection, the device can operate in harsh operating environments where condensation may be present. It has one RJ45 port and one SFP slot.

The RJ45 copper port supports 802.3at (PoE+), and it can provide up to 30W on the copper port for a high power PoE application. It also supports MDI/MDIX auto detection, so you don't need to use crossover wires.

The SFP slot provides more flexibility when planning and implementing Ethernet fiber optic networks. The advantages of fiber optics are wide bandwidth, EMI immunity and long-distance transmission capability. Therefore, the AT-IMC1000TP/SFP is an ideal solution for "fiber to building" applications at central offices or local sites. The SFP slot accepts one of a range of SFP fiber modules which allows you to customize the speed (100M/1000M) and distance capability of the fiber optic port for your installation. That means you can easily change the transmission mode and distance of the media converter by simply interchanging one SFP module for another. The SFP module is hot-swappable, and there is a dip switch for adjust the Ethernet speed of the SFP port depending on which SFP module that is installed.

### 1.1.1 Power Input

The device supports 48V DC for the AT-IMC1000TP/SFP itself and the PoE+ power.

### 1.1.2 Flexible Mounting

The AT-IMC1000TP/SFP is extremely compact and supports both DIN-Rail and wall-mount installations. It is suitable for space-constrained environment and flexible for user installation.

### 1.1.3 Wide Operating Temperature

The operating temperature of the AT-IMC1000TP/SFP is between -40° to 75°C. With such a wide temperature range, you can use this media converter in harsh industrial environments.

### 1.1.4 Easy Troubleshooting

LED indicators make troubleshooting quick and easy. The 10/100/1000 Base-TX port has 2 LEDs that display the link and speed status. The SFP port LED displays Link/ACT. There are also LED indicators for PoE activity and Power which can help you in diagnosing issues as they arise.

## 1.2 Features

Standard	IEEE802.3 10BASE-T IEEE 802.3ab 1000BASE-T IEEE802.3u 100BASE-TX/100BASE-FX IEEE802.3x Flow Control and Back pressure IEEE 802.3z 1000BASE-X IEEE 802.3at PoE Plus
LED Indicators	Power, PoE Power, Fault FDX/COL for Fiber, LNK/ACT for Fiber 100M for RJ45, LNK/ACT for RJ45
Connectors	1 x SFP slot 1 x RJ45 2-pin removable terminal blocks
PoE Ports	1
Max PoE Output Power	30W
Max Available Power	33.525W
Alternative Mode	A
PoE Polarity	MDI
Switch Architecture	Store and Forward
Power Input	48VDC power input
Power Consumption	32.725W
Operating Temperature	-40°C to 75°C
Operating Humidity	5% to 95% (non-condensing)
Storage Environment	-40°C to 85°C
Dimensions	Metal case, IP-31 36.7mm (W) x 108.4mm (H) x 94.5mm (D)
Installation	DIN-Rail, Wall-mount (optional)

EMC	<ul style="list-style-type: none"> <li>• FCC Class A</li> <li>• EN61000-6-4</li> <li>• EN61000-6-2</li> <li>• EN61000-4-2 (ESD)</li> <li>• EN61000-4-3 (RS)</li> <li>• EN61000-4-4 (EFT)</li> <li>• EN61000-4-5 (Surge)</li> <li>• EN61000-4-6 (CS)</li> <li>• EN61000-4-8 (Magnetic Field)</li> <li>• EN55022</li> <li>• EN55024</li> </ul>
Safety	<ul style="list-style-type: none"> <li>• UL-508/CSA C22.2</li> <li>• ICE-61850-3</li> </ul>
Stability Testing	<p>IEC60068-2-32 (Free fall)  IEC60068-2-27 (Shock)  IEC60068-2-6 (Vibration)</p>

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## 1.3 Packing List

- 1 x AT-IMC1000TP/SFP Industrial Gigabit Media Converter
- 1 set of Wall Mount kit (2 brackets and 4 screws)
- 1 x ATI Product Insert and China-RoHS HS/TS Substances Concentration Chart

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## 1.4 Supported SFP

For a list of supported transceivers, refer to the AT-IMC1000TP/SFP Data Sheet which can be found on the AT-IMC1000TP/SFP 2-Port Gigabit Ethernet PoE+ Industrial Media Converter product page at [alliedtelesis.com](http://alliedtelesis.com).

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## 1.5 Safety Precaution

**Warning:** Please use a protection devices on the inputs of the power supplies that supply DC voltage to the AT-IMC1000TP/SFP Gigabit PoE+ Industrial Media Converter.

## 2. Hardware Description

In this section, we will introduce the Industrial Gigabit Media Converter's hardware spec, port, cabling information, and wiring installation.

### 2.1 Front Panel

The Front Panel of the AT-IMC1000TP/SFP Industrial Gigabit Media Converter is shown as below.



FIGURE 2-1 Front Panel of the Industrial Gigabit Media Converter

### 2.2 Top View

For IP31 rating, the top panel of the device is without terminal block. The terminal block connector of DC power input is located in the bottom of device.



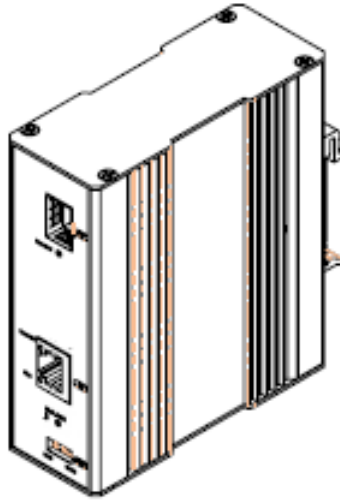


FIGURE 2-2 Top Panel of the Industrial Gigabit Media Converter

## 2.3 Wiring the Power Inputs

Please follow the steps below to insert the power wire.



FIGURE 2-3 Location of V+ and V- Contacts

1. There is a silk print for user to recognize the location of V+ and V- contacts on the device.
2. Insert the positive and negative wires into the V+ and V- contacts on the terminal block connector.

**Note:** The wire gauge for the terminal block should be in the range between 12~ 24 AWG

3. To tighten the wire-clamp screws located at the bottom of the unit (see above picture) highlighted in red for preventing DC wires loosing



FIGURE 2-4 Securing Connector with Two Outside Screws

4. Tighten the two screws on each end of the connector to secure it to the chassis.

## 2.4 LED Indicators

The LEDs located on the front panel of the AT-IMC1000TP/SFP display power status and network status. Each of them has its own specific meaning as below table.

Table 2-1: Industrial Media Converter LED Definition

LED Indicator	Label	Color	Description	
System Power	PWR	Green	On	Power on
			Off	Power off
PoE Power	PoE	Green	On	PoE power input OK
			Off	No PoE power input
RJ-45 (P1)	SPD	Amber	On	Link to 1000 Mbps network
			Off	Not connected to network or not working at speed of 1000M
	L/A	Green	On	Connected to network
			Blink	Networking is active
		Off	Not connected to network	
SFP (P2)	L/A	Green	On	When there is a secure SFP connection
			Blink	When there is transmission or reception of data occurring at speed of 100/1000Mbps
			Off	No SFP connection detected

## 2.5 SFP Speed DIP-Switch

The DIP-Switch is used to configure the speed of SFP Port (P2). The default value of DIP-switch is 100M.

Table 2-2: SFP Speed DIP-Switch Definition

Status	Description
100	SFP Port (P2) Speed - 100M
1000	SFP Port (P2) Speed - 1000M

## 2.6 Ports

**RJ-45 ports (Auto MDI/MDIX):** The RJ-45 ports are auto-sensing for 10Base-T, 100Base-TX or 1000Base-T devices connections. Auto MDI/MDIX means that you can connect to another switch or workstation without changing straight through or crossover cabling. See figures as below for straight through and crossover cable schematic.

### 2.6.1 RJ-45 Pin Assignments

Table 2-3: MDI Pin Assignments

Pin Number	Assignment
1	Tx+
2	Tx-
3	Rx+
6	Rx-

**Note:** “+” and “-” signs represent the polarity of the wires that make up each wire pair.

All ports on this industrial media converter support automatic MDI/MDI-X operation, you can use straight-through cables (See Figure below) for all network connections to PCs or servers, or to other switches or hubs. In straight-through cable, pins 1, 2, 3, and 6, at one end of the cable, are connected straight through to pins 1, 2, 3 and 6 at the other end of the cable. The table below shows the 10BASE-T/ 100BASE-TX /1000Base-T MDI and MDI-X port pin outs.

Table 2-4: MDI/MDI-X Pin Assignments

Pin MDI-X	Signal Name	MDI Signal Name
1	Receive Data plus (RD+)	Transmit Data plus (TD+)
2	Receive Data minus (RD-)	Transmit Data minus (TD-)



### 2.6.3 Fiber Port

The small form-factor pluggable (SFP) is a compact optical transceiver used in optical communications for both telecommunication and data communication applications.

Fiber segment using single-mode connector type must use 9/125 $\mu\text{m}$  single-mode fiber cable. You can connect two devices in the distance supported by SFP modules. Fiber segment using multi-mode connector type must use 50/125 or 62.5/125 $\mu\text{m}$  multi-mode fiber cable. You can connect two devices up to 550m distances.

## 3. Mounting Installation

### 3.1 DIN-Rail Mounting

The DIN-Rail is screwed on the industrial switch when out of factory. If the DIN-Rail is not screwed on the industrial switch, please see the following figure to screw the DIN-Rail on the switch. Follow the below steps to hang the industrial switch.

1. Use the screws to screw on the DIN-Rail clip on the industrial switch.
2. To remove the DIN-Rail clip, reverse step 1.



FIGURE 3-1 DIN-Rail Bracket Mounting Screw Location

3. First, insert the top of DIN-Rail bracket onto the top of the DIN-Rail track.

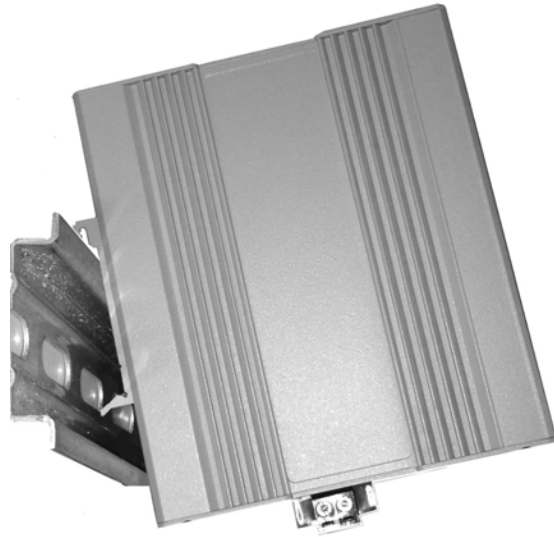


FIGURE 3-2 Align top of DIN-Rail Bracket on Top of DIN-Rail

4. Then, lightly push the button of DIN-Rail into the track.



FIGURE 3-3 Bottom of DIN-Rail Bracket Attached to Bottom of DIN-Rail

5. Check the DIN-Rail clip is tightly fixed on the track.
6. To remove the industrial switch from the track, reverse the steps above.

## 3.2 Wall-Mount Plate Fixing

Follow the steps below to mount the industrial switch with the wall mount plates included.

**Note:** Use # 1 Phillips screwdriver head.

1. Remove the DIN-Rail clip from the industrial switch by unscrewing the three DIN-Rail clip mounting screws.
2. Remove the four end plate chassis screws next to the rear panel of the chassis.
3. Position the wall-mount plates on the rear panel of the industrial switch.
4. Use the screws provided to secure the wall-mount plates on the industrial switch.
5. Use the hook holes at the corners of the wall-mount plates to hang the industrial switch on the wall.
6. To remove the wall-mount plates, reverse the steps above.

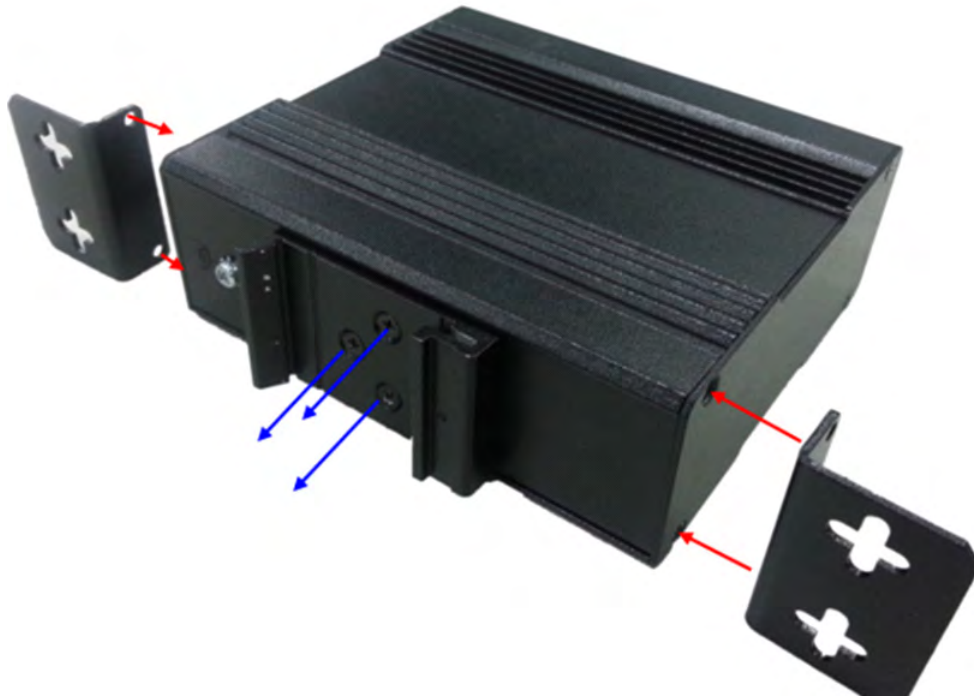


FIGURE 3-4 Attaching Wall Mount Plates



## 4. Cabling Installation

This section describes the cable installation for the AT-IMC1000TP/SFP.

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### 4.1 Installing Copper Ethernet Cable

Insert a Category 5e cable into copper RJ-45 port (P1) and the other end of the cable into the network link-partner's copper RJ-45 port, ex: switch, PC, or Server. The cable between the link partner (switch, hub, workstation, etc.) and the converter must be less than 100 meters (328 ft.) long and comply with the IEEE 802.3ab 1000Base-T standard for Category 5e or above.

When the AT-IMC1000TP/SFP is powered on and the link partner network device is active, the copper RJ-45 port (P1) LED will light up indicating a link or link activity. Please refer to the [LED Indicators](#) section for LED light meaning.

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### 4.2 Installing SFP Module and Fiber Cable

Insert the proper SFP module and connect fiber cabling as explained in steps 7 and 8 of paragraph [5.2.1](#). The SFP port (P2) LED on the unit will light up when the AT-IMC1000TP/SFP is powered on and the link partner network device is active,. Please refer to the [LED Indicators](#) section for LED light meaning.

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# 5. Hardware Installation

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## 5.1 Selecting a Location

Here are the guidelines for choosing a location for the media converter:

- The AT-IMC1000TP/SFP media converter may be installed on a wall or on a DIN-Rail.
- The power outlet should be located near the unit and be easily accessible.

**Caution:** The AT-IMC1000TP/SFP industrial media converter must be powered only by a UL Listed power supply marked either “LPS” (or Class 2) rated 48Vdc, Max. 1.5A.

**Caution:** The AT-IMC1000TP/SFP industrial media converter must NOT be operated from Centralized battery.

- The site should provide easy access to the ports on the front of the chassis so that you can easily connect and disconnect the network cables, as well as view the unit’s LEDs.
- Air flow around the unit and through the side and rear vents should be unrestricted.
- Do not place objects on top of the chassis.
- Do not expose the device to moisture or water.
- Make sure that the site is in a dust-free environment.
- Use dedicated power circuits or power conditioners to supply reliable electrical power to the network devices.
- Keep the media converter chassis and the twisted pair cable away from sources of electrical noise, such as radios, electric motors, transmitters, broadband amplifiers, power lines, and fluorescent fixtures.

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## 5.2 Installation Steps

### 5.2.1 Physical Installation

1. Unpack the unit packing.
2. Check that the DIN-Rail clip is attached to the unit. If the DIN-Rail clip is not attached to the unit, please refer to the [DIN-Rail Mounting](#) section for DIN-Rail installation. If you want to wall-mount the unit, then please refer to the [Wall-Mount Plate Fixing](#) section.
3. Connect Ground Wire to the Ground screw located on the rear of the chassis to the DIN-Rail bracket.
4. To hang the unit on the DIN-Rail track or wall, please refer to the [Mounting Installation](#) section.
5. Power on the AT-IMC1000TP/SFP and the power LED indicator on the unit will light up. Please refer to the [Wiring the Power Inputs](#) section on how to wire the power. Please refer to the [LED Indicators](#) section for meaning of LED lights.
6. Prepare the twisted-pair, straight through Category 5 cable for Ethernet connection.

7. Insert the transceiver into the SFP module. Notice that the triangle mark is the bottom of the module.

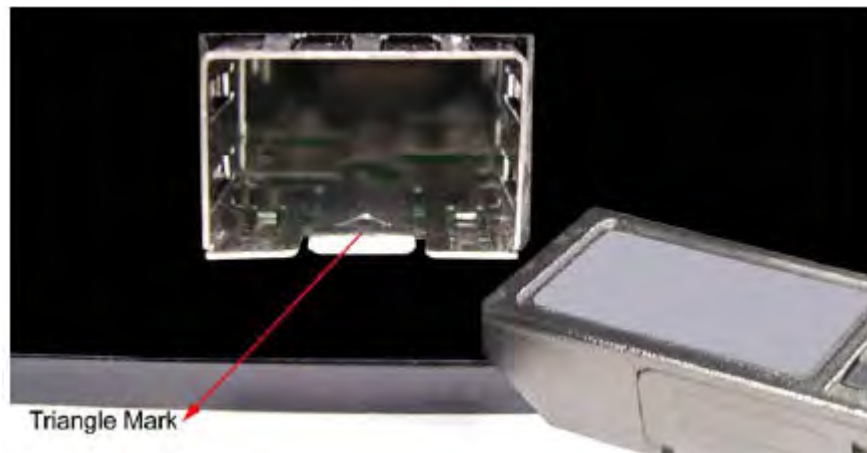


FIGURE 5-1 Insertion of a transceiver into the SFP module

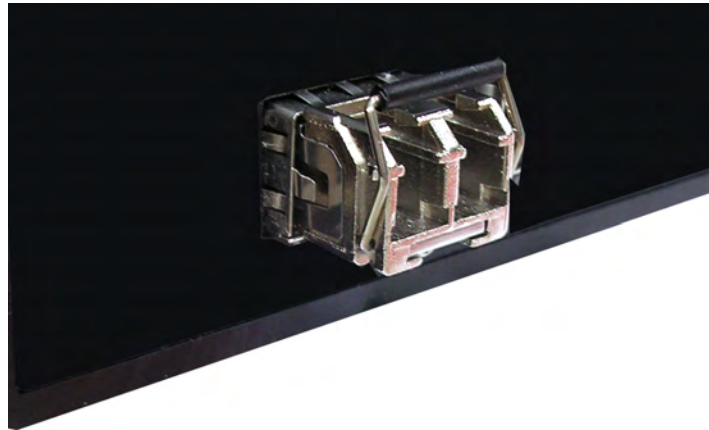


FIGURE 5-2 Transceiver inserted

8. Insert the fiber cable of LC connector into the transceiver.

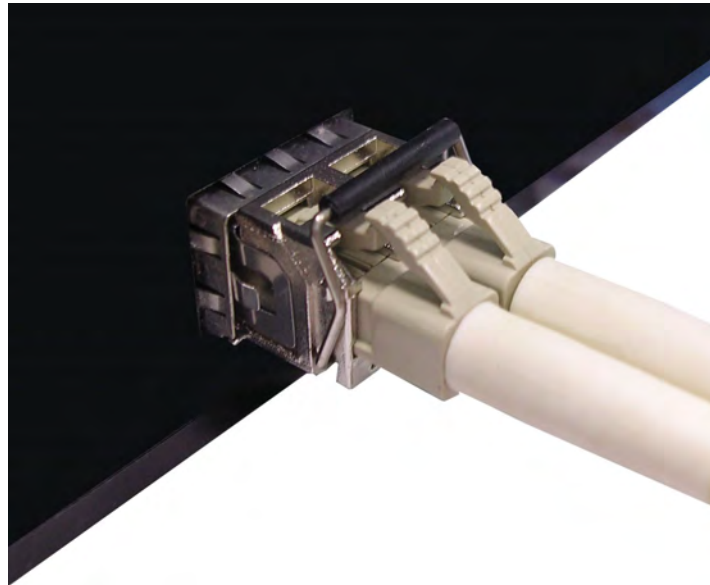


FIGURE 5-3 LC connector to the transceiver

### 5.2.2 Removing the LC connector from the transceiver

1. Press the upper side of the LC connector from the transceiver and pull it out to release

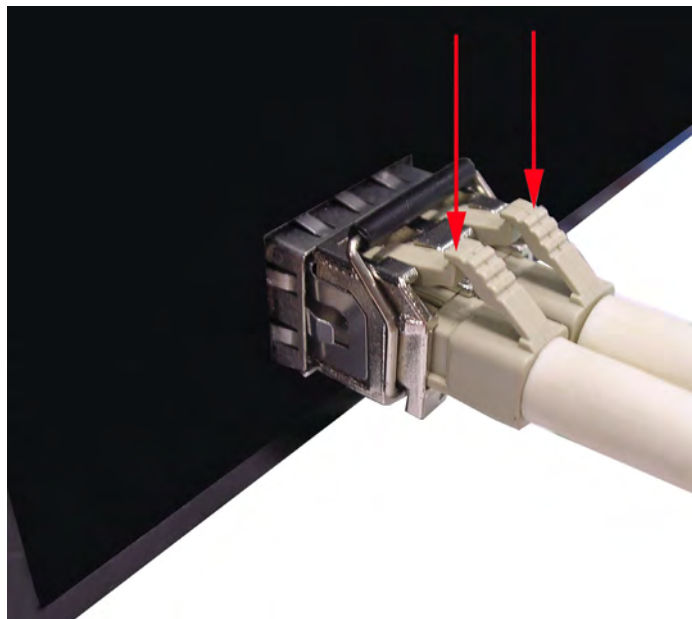


FIGURE 5-4 Remove the LC connector

2. Push down the metal loop and pull the transceiver out by the plastic part.

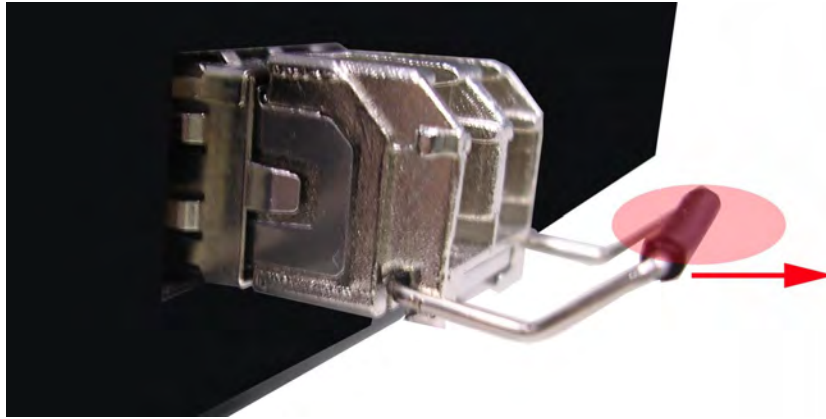

















FIGURE 5-5 Pull out from the SFP module

## 6. Troubleshooting

- Verify that you are using the right power cord/adaptor (DC 48V), please don't use the power adapter with DC output higher than 48V, or it will burn this converter down.
- Select the proper UTP/STP cable to construct your network. Please check that you are using the right cable. Use unshielded twisted-pair (UTP) or shield twisted-pair (STP) cable for RJ-45 connections: 100 $\Omega$  Category 3, 4 or 5 cables for 10Mbps connections, 100 $\Omega$  Category 5 cable for 100Mbps connections or 100 $\Omega$  Category 5e/above cable for 1000Mbps connections. Also be sure that the length of any twisted-pair connection does not exceed 100 meters (328 feet).
- Diagnosing LED Indicators: the unit can be easily monitored through panel indicators to assist in identifying problems, which describes common problems you may encounter and where you can find possible solutions.
- If the power indicator does not light up when the power cord is plugged in, you may have a problem with power cord. Then check for loose power connections, power losses or surges at power outlet. IF you still cannot resolve the problem, contact your local dealer for assistance.
- If the LED indicators are normal and the connected cables are correct and the packets still cannot transmit, please check your system's Ethernet devices' configuration or status.

## 7. Reviewing the Safety Guidelines

Please review the following safety guidelines before you begin to install the AT-IMC1000TP/SFP Industrial Media Converter.

- Note:** The  indicates that a translation of the safety statement is available in a PDF document titled “Translated Safety Statements” posted on the Allied Telesis website at [www.alliedtelesis.com/support](http://www.alliedtelesis.com/support).
- Note:** Refer to the documentation that comes with the SFP module to determine whether the module is a Class 1 LED product or a Class 1 Laser product.
- Warning:** Class 1 Laser product.  L1
- Warning:** Do not stare into the laser beam.  L2
- Warning:** Class 1 LED product.  L3
- Warning:** The fiber optic ports contain a Class 1 laser device. When the ports are disconnected, always cover them with the provided plug. Exposed ports may cause skin or eye damage L4
- Caution:** Using controls, making adjustments to performance, or performing procedures other than those specified herein may result in hazardous radiation exposure. The protection provided by the equipment may be impaired if the equipment is used in a manner not specified by Allied Telesis, Inc.
- Do not remove the cover from the unit or change any of the internal cables or wiring. Only an authorized Allied Telesis service technician should make repairs to this device. The TX and RX multiplexing ports contain embedded Class 3B lasers operating in Class 1 compliance. Do not make any modifications to the unit that would override the safeguards that maintain the Class 1 compliance.
- The laser light used by the multiplexing ports and SFP modules is invisible. Standard safety precautions (e.g. avoid looking directly into a fiber optic port) should always be observed when installing or maintaining this product.  L5
- Warning:** Do not look directly at the fiber optic cable ends or inspect the cable ends with an optical lens.  L6
- Warning:** To prevent electric shock, do not remove the cover. No user-serviceable parts inside. This unit contains hazardous voltages and should only be opened by a trained and qualified technician. To avoid the possibility of electric shock, disconnect electric power to the product before connecting or disconnecting the LAN cables.  E1
- Warning:** Do not work on equipment or cables during periods of lightning activity.  E2
- Caution:** Air vents must not be blocked and must have free access to the room ambient air for cooling.  E6
- Warning:** Operating Temperature. This product is designed for a maximum ambient temperature of 75° degrees C.  E53
- All Countries: Install product in accordance with local and National Electrical Codes.  E8
- 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
- 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
- Warning:** Only trained and qualified personnel are allowed to install or to replace this equipment.  E14
- Caution:** Do not install in direct sunlight, or a damp or dusty place.  E16

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

**Warning:** Circuit breaker is used as a disconnection service. To de-energize equipment, shut down the circuit breaker and then disconnect the input wire. ⚡ E38

**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

**Caution:** The unit does not contain serviceable components. Please return damaged units for servicing. ⚡ E42

**Caution:** During normal operations, the SFP module may have a case temperature that exceeds 70° C (158° F). If you remove the module, exercise caution when handling with unprotected hands. ⚡ E43