



# Allied Telesis

AT-IMC1000T/SFP

Industrial Gigabit 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.

## 1. Overview

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### 1.1 Introduction

The AT-IMC1000T/SFP Gigabit Ethernet Industrial Media Converter is designed to convert Gigabit copper Ethernet networks to Gigabit fiber networks by transparently converting Ethernet signals to optic signals. The advantages of fiber optics are wide bandwidth, EMI immunity and long-distance transmission capability. The AT-IMC1000T/SFP is an ideal solution for “fiber to building” applications at central offices or local sites. On the copper port, it supports MDI/MDIX auto detection, so you don’t need to use crossover wires. Furthermore, the AT-IMC1000T/SFP can work normally in an extended temperature range from -40°C to 75°C and accepts a wide voltage range from +12 ~ 48 VDC. It also provides 3,000 VDC surge (EFT) protection against over-voltage, so it is suitable for harsh operating environments.

#### 1.1.1 Gigabit Fiber Converter

This switch converter has one SFP slot which provides the flexibility when planning and implementing a network. The slot can accept most 1000M SFP-type fiber modules that are designed for transmitting over many Kilometers. This means you can easily change the transmission mode and distance of the switch by simply pulling out the SFP module and plugging in a different module. The SFP module is hot-swappable and plug-and-play.

#### 1.1.2 Dual Power Input

To reduce the risk of power failure, the Industrial Media Converter provides +12 ~ 48 VDC dual power inputs. If there is power failure, the unit will switch automatically to the secondary power input.

#### 1.1.3 Flexible Mounting

The Industrial Media Converter is compact and can be mounted on a DIN-Rail or a wall, so it is suitable for any space-constrained environment.

#### 1.1.4 Advanced Protection

The power line of the switch converter supports up to 3,000 VDC EFT protection, which secure equipment against unregulated voltage and makes the unit safer and more reliable. Meanwhile, 6,000 VDC ESD protections for Ethernet ports make the Industrial Media Converter more suitable for harsh environments.

#### 1.1.5 Wide Operating Temperature

The operating temperature of the the switch converter is between -40°C to 75°C. With such a wide range, you can use the Industrial Media Converter in some of the harshest industrial environments that exist.

#### 1.1.6 Environments

This equipment is for use in pollution degree 2 environments.

### 1.1.7 Easy Troubleshooting

LED indicators make troubleshooting quick and easy. The 10/100/1000 Base-TX port (P1) has 2 LEDs that display the link status, network activity and the port speed. Also the three power indicators P1, P2 and Fault can help you diagnose power issues immediately.

## 1.2 Features

Table 1-1: Unit Features

Standard	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX IEEE 802.3ab 1000Base-T IEEE 802.3x Flow Control and Back pressure IEEE 802.3z 1000BaseSX/LX standards
LED Indicators	Per unit: Power1 (Green), Power2 (Green), Fault (Red) Fiber: Link/Active (Green) TX: Link/Active (Green), 1000M (Amber)
Connector	Fiber: 1 G Duplex LC SFP bay slot x 1 RJ-45 (10/100/1000Mbps) Socket x 1
Fiber Parameters	Fiber parameters and distances will depend upon the used SFP module. Please refer to SFP module documentation
Link Lose Forward	TX -> SFP: If TX port link down, the media converter will force SFP port to link down SFP -> TX: If SFP port link down, the media converter will force TX port to link down
Switch Architecture	Store and Forward
Power Input	12~48VDC, redundant power with polarity reverse protect function and removable terminal block
Power Consumption	5.28 Watts (max.)
Operating Temperature	Wide Operating Temperature: -40°C to 75°C
Operating Humidity	5% to 95%
Storage Environment	-40°C to 85°C
Dimensions	Metal case. IP-30, 30mm (W) x 140mm (H) x 95mm (D)
Installation	DIN-Rail and Wall-mount design

EMC	<ul style="list-style-type: none"> <li>• FCC Class A</li> <li>• CE EN61000-4-2 (ESD)</li> <li>• CE EN61000-4-3 (RS)</li> <li>• CE EN-61000-4-4 (EFT),</li> <li>• CE EN61000-4-5 (Surge)</li> <li>• CE EN61000-4-6 (CS)</li> <li>• CE EN61000-4-8</li> <li>• CE EN61000-4-11</li> <li>• CE EN61000-4-12</li> <li>• CE EN61000-6-2</li> <li>• CE EN61000-6-4</li> </ul>
Safety	<ul style="list-style-type: none"> <li>• UL, cUL, CE/EN60950-1</li> <li>• Class 1 Division 2</li> </ul>
Stability Testing	IEC60068-2-32 (Free fall), IEC60068-2-27 (Shock), IEC60068-2-6 (Vibration)

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## 1.3 Packing List

- 1 x AT-IMC1000T/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-IMC1000T/SFP 2-Port Gigabit Ethernet 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-IMC1000T/SFP Gigabit Ethernet Industrial Media Converter.

## 2. Hardware Description

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

### 2.1 Front Panel

The Front Panel of the AT-IMC1000T/SFP Industrial Media Converter is shown as below.



FIGURE 2-1 Front Panel of the Industrial Media Converter

### 2.2 Top View

The top panel of the Industrial Media Converter is equipped one terminal block connector of two DC power inputs.

**Warning:** Please connect Ground Wire to Ground Screw located near to the power socket.



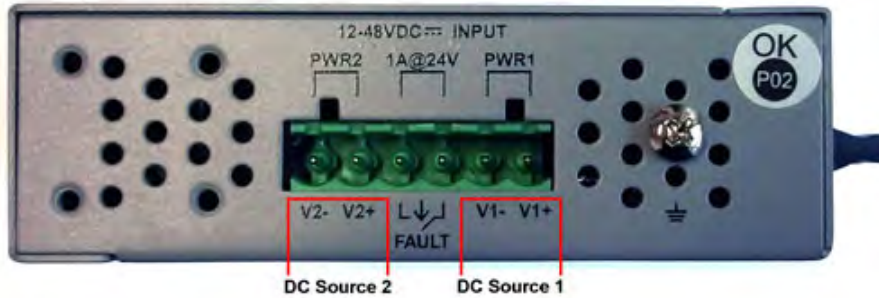


FIGURE 2-2 Top Panel of the Industrial Media Converter

## 2.3 Wiring the Power Inputs

Please follow the steps to connect the power wires.

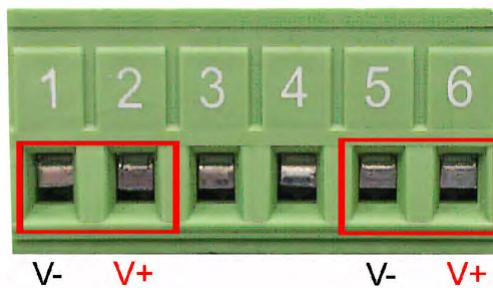


FIGURE 2-3 V+ and V- Contacts

1. Insert the positive and negative wires into the V+ and V- contacts on the terminal block connector.

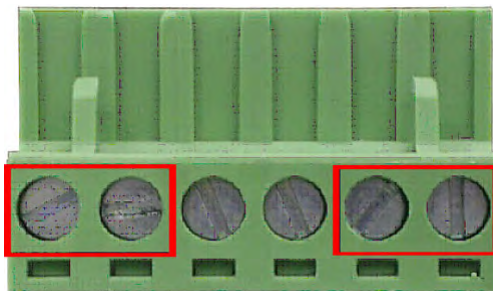


FIGURE 2-4 Wire-clamp Screws

2. Tighten the wire-clamp screws to prevent the wires from loosening.

## 2.4 Wiring the Fault Alarm Contact

The fault alarm contacts are in the middle of the terminal block connector as the picture shows below. Inserting the wires, it will detect the fault status which the power is failure or port link failure (for managed model) and form an open circuit.



FIGURE 2-5 Fault Alarm Contacts

1. Insert the wires into the fault alarm contacts (N. 3 and 4)

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

## 2.5 LED Indicators

The LEDs located on the front panel display the power status and network status of the Industrial Media Converter. Each of them has its own specific meaning as defined in Table 2-1.

Table 2-1: Industrial Media Converter LED Definition

LED	Color	Description	
PWR1	Green	On	Power input 1 is active
		Off	Power input 1 is inactive
PWR2	Green	On	Power input 2 is active
		Off	Power input 2 is inactive
Fault	Red	On	Power input 1 or 2 has failed
		Off	Power input 1 or 2 are both functional or no power inputs
L/A	Green	On	Fiber connected to network
		Blink	Networking is active
		Off	Fiber not connected to network
SPD	Amber	On	Link to 1000 Mbps network
		Off	Not connected to network or not working at speed of 1000M

Table 2-1: Industrial Media Converter LED Definition

LED	Color	Description	
L/A	Green	On	RJ-45 connected to network
		Blink	Networking is active
		Off	RJ-45 not connected to network

## 2.6 DIP-Switch

Table 2-2: Industrial Media Converter DIP-Switch Status Definition

S/W No	Status	Description
1	On	Enables Port/Power Alarm
	Off	Disables Port/Power Alarm
2	On	Enables LLF
	Off	Disables LLF

**Link Loss Forwarding (DIP-Switch 2):** When LLF enabled, it allows UTP link failures to be reported to the fiber side and also allows Fiber link failures to be reported to the UTP side. Therefore, a link fault pass-through feature is provided in both UTP and Fiber side.

**Note:** When SW 2 is on, once the fiber or UTP/STP cable is disconnected, the LNK/ACT LED off. When the cable is reconnected, the LNK/ACT LED blinks for 2 ~ 6 seconds which means the connection is recovering from failure.

**Note:** Please don't change the DIP-switch setting when UTP or fiber port is transmitting or receiving data. It may cause some data error.

**Note:** Besides, if you change the DIP-switch setting, please power off the converter and power on again to make the setting effective.

## 2.7 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.



## 3. Mounting Installation

### 3.1 DIN-Rail Mounting

The DIN-Rail clip is screwed on the AT-IMC1000T/SFP Industrial Media Converter when out of factory. If the DIN-Rail clip is not installed on the back of the media converter, 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 3.1.1.

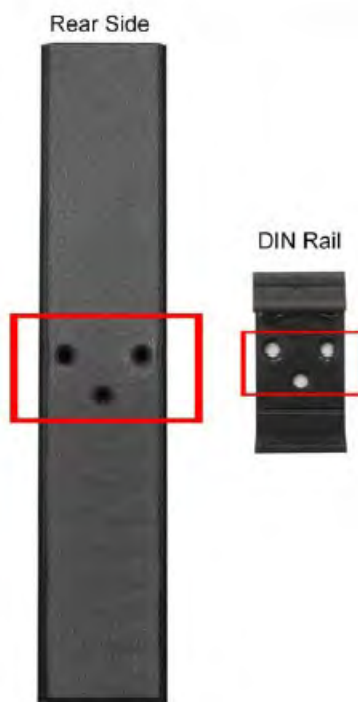


FIGURE 3-1 DIN-Rail Mounting

3. Align the top of the chassis DIN-Rail clip on the rear of the chassis with the top track of the DIN-Rail. See [Figure 3-1](#)

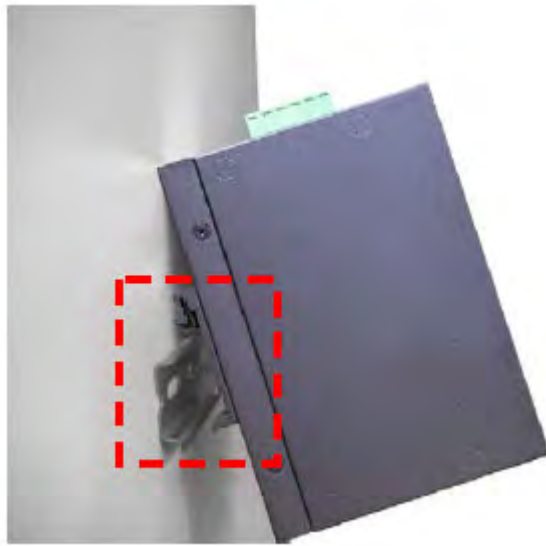


FIGURE 3-2 Push the chassis down onto the upper DIN-Rail track

4. Lightly push the chassis down onto the upper DIN-Rail track until the bottom of the chassis can swing back toward the wall and under the bottom DIN-Rail track. See [Figure 3-2](#).

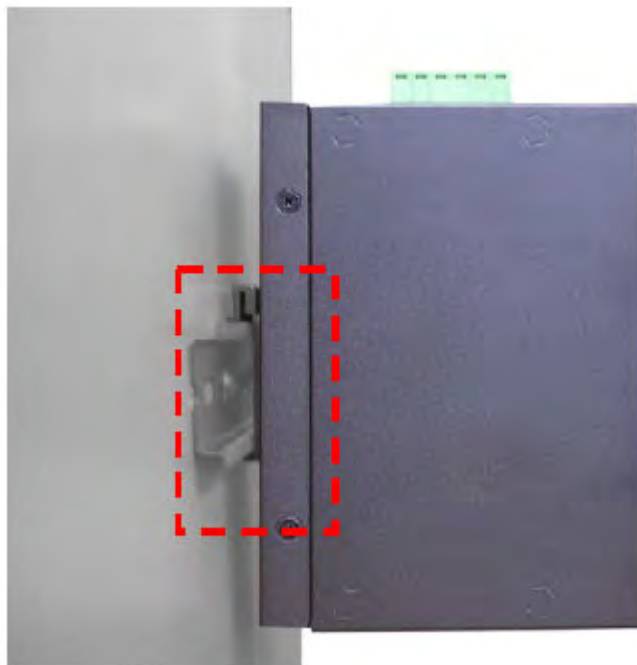


FIGURE 3-3 Push the chassis down

5. Release the downward pressure on the chassis and allow the bottom slot of the chassis DIN-Rail clip to tightly fix itself to the DIN-Rail.
6. To remove the AT-IMC1000T/SFP Industrial Media Converter, lightly press down on the chassis and pull the bottom of the chassis away from the bottom DIN-Rail track. Then lift the chassis up off the upper DIN-Rail track.

## 3.2 Wall-Mount Plate Fixing

Follow the steps below to mount the AT-IMC1000T/SFP Industrial Media Converter with the wall mount plates included.

**Note:** It isn't necessary to remove the DIN-Rail clip with the wall mount brackets installed 90 degrees from what is shown.

1. Place the wall-mount plates on the rear panel of the media converter. See [Figure 3-4](#).
2. Use the screws to secure the wall-mount plates on the media converter.
3. Use the hook holes at the corners of the wall-mount plates to hang the industrial switch on the wall.
4. To remove the wall-mount plates, reverse the steps above.



FIGURE 3-4 Wall-Mount Plate Fixing

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## 4. Cabling Installation

This section describes the cable installation for the AT-IMC1000T/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-IMC1000T/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](#). The SFP port (P2) LED on the unit will light up when the AT-IMC1000T/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-IMC1000T/SFP Industrial Media Converter may be installed on a desktop, on a wall or on DINRAIL.

**Note:** The DINRAIL bracket must be ordered separately from the AT-PC2002/POE+ media converter

- The power outlet should be located near the unit and be easily accessible.

**Caution:** The AT-IMC1000T/SFP Industrial Media Converter must be powered only by a UL Listed power supply marked either "LPS" (or Class 2) rated 56Vdc, 1A.

**Caution:** The AT-IMC1000T/SFP Industrial Media Converter must NOT be operated from Centralized DC 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
- If you are installing the chassis on a table, be sure the table is level and secure.
- 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

1. Unpack the unit packing.
2. Check the DIN-rail clip is screwed on the unit. If the DIN-rail clip is not screwed on 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. To hang the unit on the DIN-rail track or wall, please refer to the [Mounting Installation](#) section.
4. Connect Ground Wire to the Ground screw located near the Power Socket
5. Power on the Unit 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.

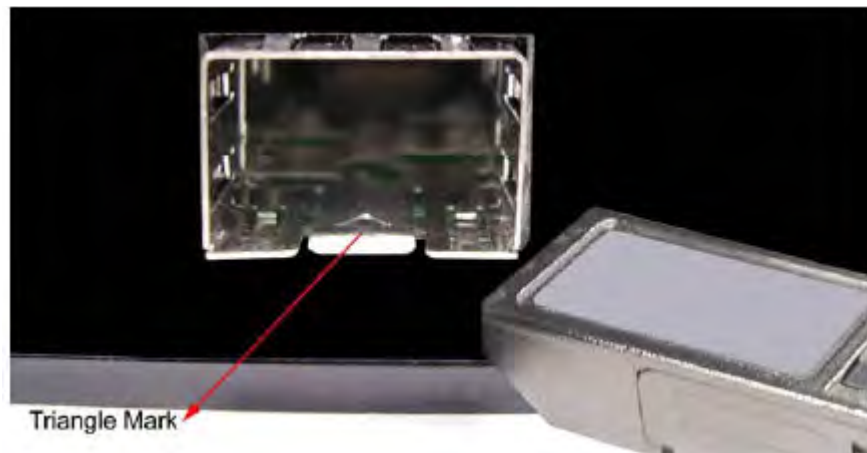


FIGURE 5-1 SFP module to bay



FIGURE 5-2 SFP module inserted into its bay

8. Insert the fiber cable LC connector into SFP module as shown in [Figure 5-3](#).

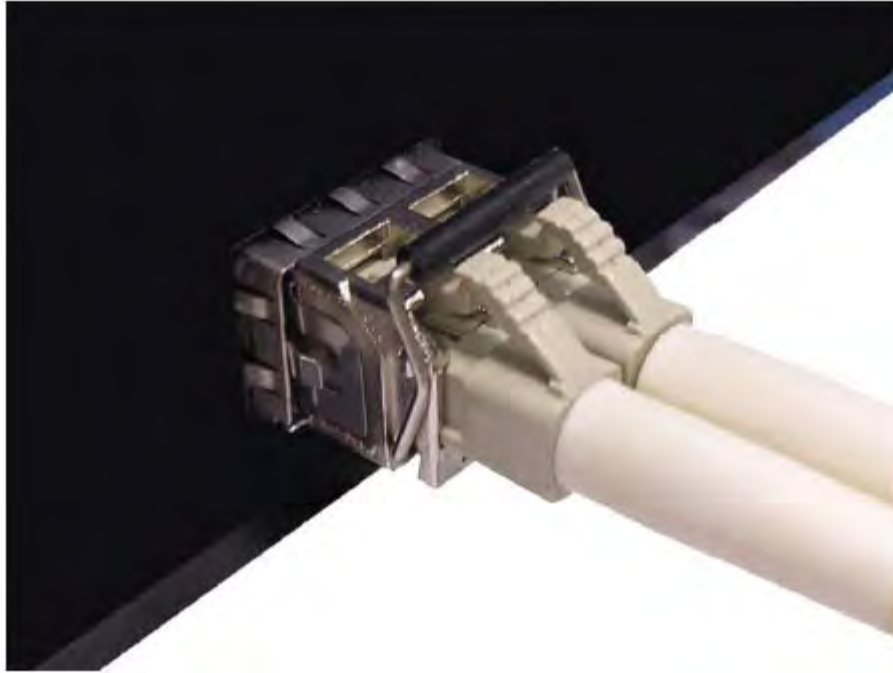


FIGURE 5-3 LC connector to SFP module

### 5.2.1 Removing the LC connector from the transceiver

1. Press the release tabs on the upper side of the LC connector and pull the fiber cable out of the SFP module. See [Figure 2-6](#) for the location of the fiber cable release tabs.

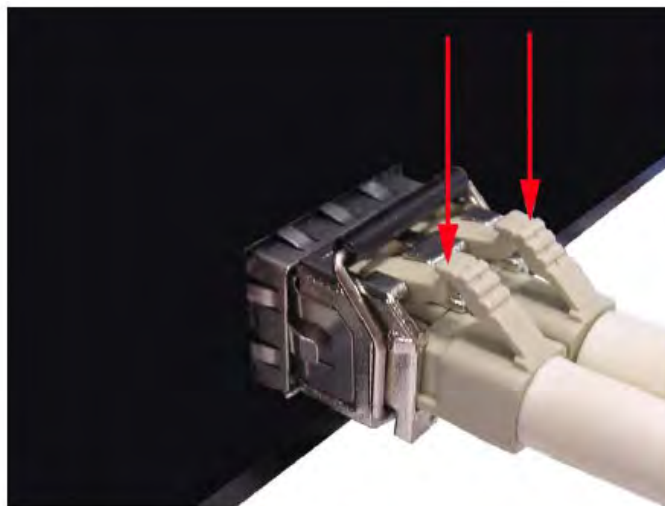


FIGURE 5-4 Remove LC connector

2. Second, push down the metal loop and pull the SFP module out by the plastic part.




FIGURE 5-5 Pull out the SFP module

## 6. Troubleshooting

- Verify that you are using the right power cord/adapter (DC 12-48V), 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: 100Mbps Category 3, 4 or 5 cables for 10Mbps connections or 100Mbps Category 5 cable for 100Mbps 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-IMC1000T/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](http://www.alliedtelesis.com).

**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 40° degrees C.  E7

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

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

**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