Allied Telesyn

AT-MC101XL
AT-MC102XL
AT-MC103XL
AT-MC103LH
AT-MC104XL
AT-MC104LH

Fast Ethernet Media Converters

Version 4

Installation Guide

Electrical Safety and Emission Compliance Statement

Standards: This product meets the following standards.

U.S. Federal Communications Commission

Declaration of Conformity

Manufacturer Name:	**Allied Telesyn, Inc.**
Declares that the product:	**Fast Ethernet Media Converters**
Model Numbers:	**AT-MC101XL, AT-MC102XL,**
	AT-MC103XL, AT-MC103LH,
	AT-MC104XL, AT-MC104LH

This product complies with FCC Part 15B, Class B Limits:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device must not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Radiated Energy

Note: This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of 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 and, if not installed and used in accordance with instructions, may 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 the 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.

Changes and modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission rules.

Industry Canada

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Electrical Safety and Emission Compliance Statement

	RFI Emissions	FCC Part 15 Class B, EN55022 Class B, CISPR 22 Class B, C-TICK
	Immunity	EN55024
	Electrical Safety	UL 60950-1 ($_c$UL$_{US}$), EN60950 (TUV), CE
⚠	Laser Safety	EN60825

⚠ **Warning:** Class 1 Laser product. ∾ **1**

⚠ **Warning**: Do not stare into the Laser beam. ∾ **2**

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

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

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

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

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

Важно: Приложение С содержит переведенную инструкцию по безопасности при установке данного устройства. Если Вы встретите ∾, перейдите к Приложению С для получения переведенной инструкции по безопасности.

Contents

Preface

This guide contains instructions on how to install an AT-MC10x Media Converter.

How This Guide is Organized

This guide contains the following chapters and appendices:

❒ Chapter 1, "Overview" on page 1

❒ Chapter 2, "Installation" on page 13

❒ Chapter 3, "Troubleshooting" on page 27

❒ Appendix A, "Technical Specifications" on page 31

❒ Appendix B, "Cleaning Fiber Optic Connectors" on page 37

❒ Appendix C, "Translated Electrical, Safety, and Emission Information" on page 43

This preface contains the following sections:

❒ "Document Conventions" on page viii

❒ "Where to Find Web-based Guides" on page ix

❒ "Contacting Allied Telesyn" on page x

Document 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.

Where to Find Web-based Guides

The installation and user guides for all Allied Telesyn products are available in portable document format (PDF) on our web site at **www.alliedtelesyn.com**. You can view the documents online or download them onto a local workstation or server.

Contacting Allied Telesyn

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

Online Support

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

Email and Telephone Support

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

Returning Products

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

To obtain an RMA number, contact Allied Telesyn's Technical Support group through the Allied Telesyn web site: **www.alliedtelesyn.com**.

Sales or Corporate Information

You can contact Allied Telesyn for sales or corporate information on our web site: **www.alliedtelesyn.com**. To find the contact information for your country, select Contact Us -> Worldwide Contacts.

Chapter 1
Overview

The AT-MC10x Series Fast Ethernet Media Converters include the following models:

- ❐ AT-MC101XL
- ❐ AT-MC102XL
- ❐ AT-MC103XL
- ❐ AT-MC103LH
- ❐ AT-MC104XL
- ❐ AT-MC104LH

The AT-MC10x Series Fast Ethernet Media Converters are designed to extend the distance of your network by interconnecting LAN devices that are physically separated by large distances.

The AT-MC101XL, AT-MC102XL, AT-MC103XL, and AT-MC103LH media converters feature a 100Base-TX twisted pair port and an 100Base-FX fiber optic port. The twisted pair port has an RJ-45 connector and a maximum operating distance of 100 meters (328 feet). The fiber optic port has a dual ST or dual SC connector and a maximum operating distance of 2 kilometers (1.2 miles) to 40 kilometers (24.8 miles), depending on the model.

The AT-MC104XL and AT-MC104LH media converters feature two 100Base-FX fiber optic ports with either dual SC or dual ST connectors. One port uses multi-mode fiber optic cabling and has a maximum distance of 2 kilometers (1.2 miles). The second port uses single-mode fiber optic cabling and has a maximum distance of 15 kilometers (9.3 miles) to 40 kilometers (24.8 miles), depending on the model.

These media converters operate at 100 Mbps and feature half- and full-duplex operation.

The AT-MC10x Series media converters can be installed on a desktop or in an AT-MCR12 chassis, AT-WLMT-10 Wallmounting Bracket, or AT-TRAY4 Rackmount Tray. The AT-MC10x Series media converters are easy to install and do not require any software configuration or management.

Figure 1 displays an AT-MC101XL Media Converter.
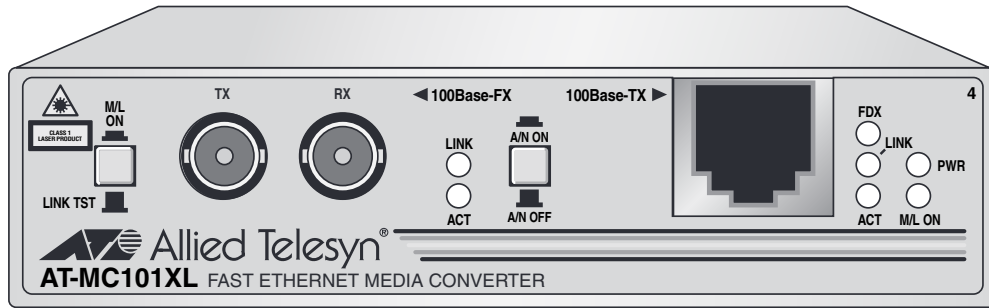
Figure 1. AT-MC101XL Model

Figure 2 displays an AT-MC102XL Media Converter.

Figure 2. AT-MC102XL Model
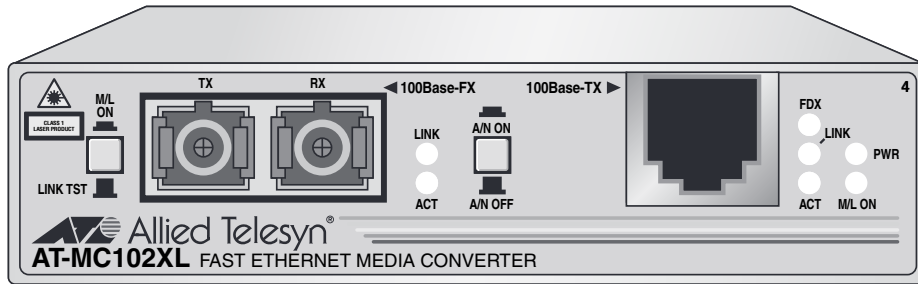
Figure 3 displays an AT-MC103XL Media Converter.
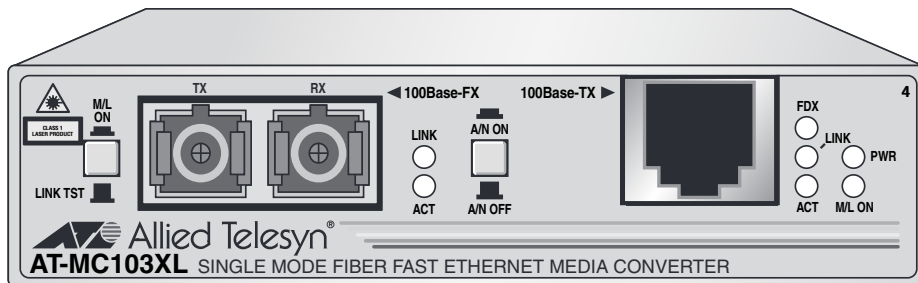
Figure 3. AT-MC103XL Model

Figure 4 displays an AT-MC103LH Media Converter.
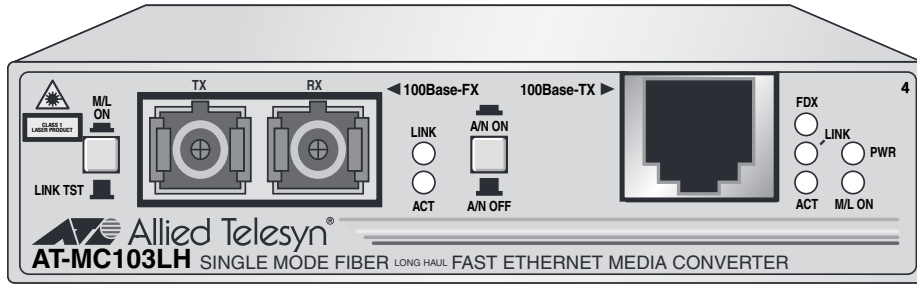
Figure 4. AT-MC103LH Model - Front Panel

Figure 5 displays an AT-MC104XL Media Converter.
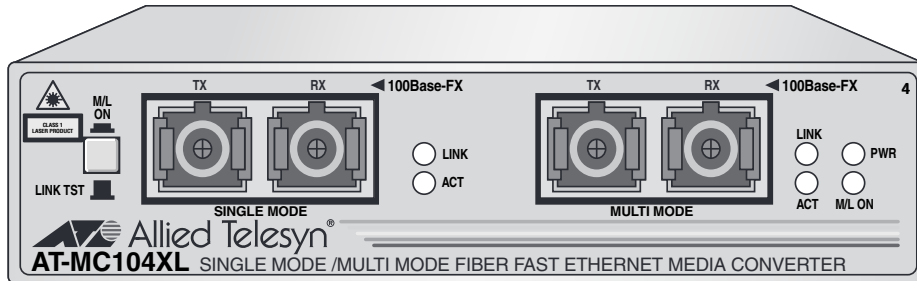
Figure 5. AT-MC104XL Model - Front Panel

Figure 6 displays an AT-MC104LH Media Converter.
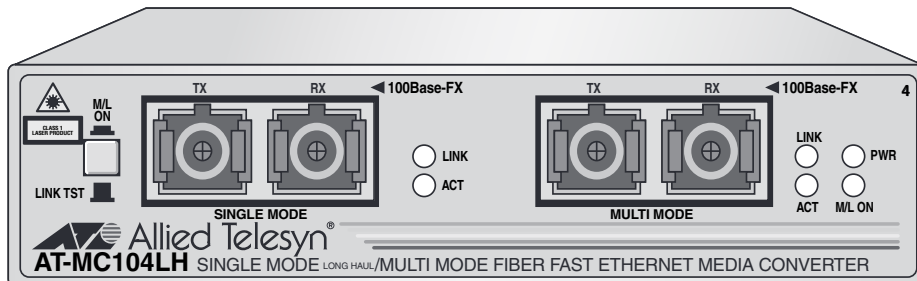
Figure 6. AT-MC104LH Model - Front Panel

Figure 7 displays an AT-MC103LH Media Converter.
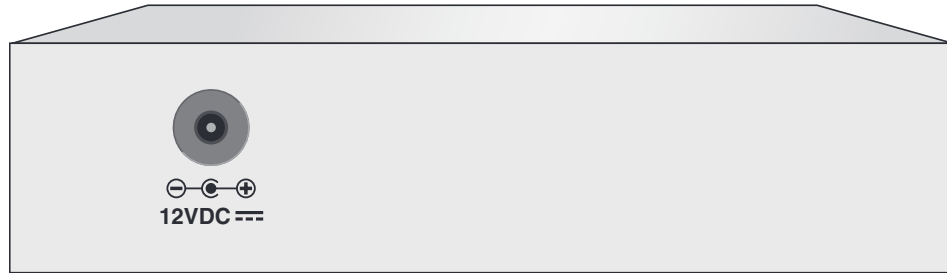
Figure 7. AT-MC10x Series - Rear Panel

Table 1 lists the maximum operating distances for the AT-MC101XL, AT-MC102XL, AT-MC103XL, and AT-MC103LH media converters.

Table 1. Maximum Operating Distances
(AT-MC101XL, AT-MC102XL, AT-MC103XL, and AT-MC103LH)

Model	Type of Connector		Maximum Operating Distance [1]	
	100Base-FX	100Base-TX	100Base-FX	100Base-TX
AT-MC101XL	Dual ST	RJ-45	2 km (1.2 mi)	100 m (328 ft)
AT-MC102XL	Dual SC	RJ-45	2 km (1.2 mi)	100 m (328 ft)
AT-MC103XL	Dual SC	RJ-45	15 km (9.3 mi)	100 m (328 ft)
AT-MC103LH	Dual SC	RJ-45	40 km (24.8 mi)	100 m (328 ft)

1. Maximum distance may be less depending on the duplex mode of the end stations and the type of fiber optic cabling used with the port.

Table 2 lists the maximum operating distances for the AT-MC104XL and AT-MC104LH media converters.

Table 2. Maximum Operating Distances
(AT-MC104XL and AT-MC104LH)

Model	Type of Connector		Maximum Operating Distance [1]	
	Port 1 (Single-mode)	Port 2 (Multi-mode)	Port 1 (Single-mode)	Port 2 (Multi-mode)
AT-MC104XL	Dual SC	Dual SC	15 km (9.3 mi)	2 km (1.2 mi)
AT-MC104LH	Dual SC	Dual SC	40 km (24.8 mi)	2 km (1.2 mi)

Key Features

The media converters have the following key features:

❒ LEDs for unit and port status

❒ 100Base-TX twisted pair port (all models except AT-MC104xx Series)

❒ 100Base-FX fiber optic port(s)

❒ Auto MDI-MDI/X

❒ Half- or full-duplex operation with Auto-Negotiation function

❒ Link Test/MissingLink[TM] button for performing a link test or activating the MissingLink feature which notifies end-nodes of connection failures

❒ External AC/DC power adapter

❒ Standard size for use in an AT-MCR12 chassis, AT-WLMT-10 bracket, or AT-TRAY4 tray

Status LEDs

Figure 3 defines the media converter's LEDs.

Table 3. Status LEDs

LED	State	Color	Description
PWR	ON	Green	Power is applied to the media converter.
FDX [1]	ON	Green	The port is operating in full-duplex mode.
	OFF		The port is operating in half-duplex mode.
LINK	ON	Green	A link has been established on the port.
ACT	ON	Green	Network traffic is being received on the port.
M/L ON	ON	Green	The MissingLink feature is activated on the media converter.
	OFF		The MissingLink feature is disabled and the media converter is operating in the link test mode.

1 This LED does not apply to the AT-MC104xx models.

Auto MDI/MDI-X

An RJ-45 twisted pair port on an 100 Mbps Ethernet network device can have one of two possible wiring configurations: MDI or MDI-X. The RJ-45 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 AT-MC10x Series media converters feature automatic MDI/MDI-X. The 100Base-TX 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.

Link Test (LINK TST)/MissingLink^{TM} (M/L) Button

The LINK TST/M/L button allows you to perform a link test on the ports on the media converter. This button also allows you to activate the MissingLink feature on the unit. Both features are describe in the following section.

Link Test

The link test is a fast and easy way for you to test the connections between the ports on the media converter and the nodes that are connected to the ports. If a network problem occurs, you can perform a link test to determine which port is experiencing a problem, and be able to focus on the port and end-node where the problem resides.

A link test is performed when the button is in the LINK TST (OUT) position. For instructions on performing a link test, refer to "Troubleshooting" on page 33.

> **Note**
> Leaving the media converter in the LINK TST (OUT) position will not interfere with the units ability to pass network traffic.

MissingLink

The MissingLink feature enables the fiber optic ports on the media converter to pass the "Link" status of their connections to each other. When the media converter detects a problem with one of the ports, such as the loss of connection to an end-node, the media converter shuts down the connection to the other port, thus notifying the node that the connection has been lost.

For example, if the twisted pair cable to the 100Base-TX port on the media converter were to fail, the media converter would respond by dropping the link on the 100Base-FX fiber optic port. In this way, the media converter notifies the end-node connected to the fiber optic port that the connection on the twisted pair port has been lost. If the failure had started with the fiber optic cabling, the unit would drop the link to the twisted pair port.

The value to this type of network monitoring and fault notification is that some hubs and switches can be configured to take a specific action in the event of the loss of connection on a port. In some cases, the unit can be configured to seek a redundant path to a disconnected node or send out a trap to a network management station, and so alert the network administrator of the problem.

Note
The MissingLink feature is disabled when you perform a link test with the Link Test/MissingLink button. Consequently, to ensure that the MissingLink feature is activated on the media converter, always set the button to the M/L ON (IN) position during normal network operations.

Auto-Negotiation Button

The Auto-Negotiation (A/N) button, located on the front panel of the AT-MC101XL, AT-MC102XL, and AT-MC103XL/LH, enables and disables the Auto-Negotiation feature (IEEE 802.3u) of the media converter. The media converter uses Auto-Negotiation to determine the duplex mode of the ports. The duplex mode refers to the manner in which an end-node sends and receives data on the network. An end-node can operate in either half- or full-duplex mode. A node operating in half-duplex can either send or receive data, but not both at the same time. An end-node operating in full-duplex can send and receive data simultaneously. The best network performance is achieved when an end-node can operate in full-duplex mode.

In most configurations, you will want to leave the Auto-Negotiation button activated so the unit can determine the appropriate duplex mode, based on the capabilities of the end-nodes. For example, the Auto-Negotiation feature on the media converter should be left activated in situations where both end-nodes are also capable of Auto-Negotiation, or where both end-nodes have been pre-set to the same mode or are capable of operating in only one duplex mode, such as half-duplex.

There is one situation where it may be necessary to disable the Auto-Negotiation feature, and that is to prevent a mismatch from occurring between the duplex modes of the end-nodes. For example, Figure 8 shows two units that have been connected with a media converter. Unit 1 is a repeater that is capable of operating in half-duplex mode only. Unit 2 is a switch that can operate in either half- or full-duplex mode, and will Auto-Negotiation the duplex mode.

In attempting to Auto-Negotiate with Unit 1, the media converter will determine that the unit is capable of half-duplex only and will set the port connected to the unit appropriately. In Auto-Negotiating with Unit 2, the media converter will determine that the unit can manage full-duplex and will set the port connected to the unit to full-duplex. The result is a mismatch, with one unit operating in half-duplex and the other unit operating in full-duplex. This is referred to as a classic duplex mode mismatch and will result in poor network performance between the end-nodes.

Figure 8. Example of a Duplex Mode Mismatch

You can resolve the mismatch in one of two ways:

❒ Manually configure Unit 2, if possible, so that the port connected to the media converter is set to half-duplex.

❒ Disable Auto-Negotiation on the media converter using the Auto-Negotiation button. With Auto-Negotiation on the media converter disabled, Unit 2 will assume that the converter is capable of only half-duplex operation, thus eliminating the mismatch in duplex modes between the end-nodes.

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Note

After a configuration change, you must reset the media converter by powering OFF then powering ON the unit

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On the AT-MC101XL, AT-MC102XL, AT-MC103XL, and AT-MC103LH models, set the Auto-Negotiation feature as follows:

❒ If both end-nodes will use Auto-Negotiation to determine the duplex mode, or if both are pre-set to operate with the same duplex mode, such as half-duplex, set the switch to the A/N ON (IN) position. This is the default setting.

❒ If one end-node is capable of operating at only half-duplex mode while the other node will determine its duplex mode through Auto-Negotiation, set the switch to the A/N OFF (OUT) position.

External AC/DC Power Adapter

An external AC/DC power adapter is included with the media converter for standalone operation. The power adapter supplies 12V DC to the media converter. Allied Telesyn supplies an approved safety compliant AC power adapter for the 120 and 240V AC versions with an unregulated output of 12V DC at 1 A. The power required for the media converter is 12V DC, 500 mA.