

# **TP-LINK®**

## **User Guide**

**MC100CM**

**MC110CS**

**Fast Ethernet Media Converter**

**MC111CS**

**MC112CS**

**WDM Fast Ethernet Media Converter**



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## **FCC STATEMENT**



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 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 the 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.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1) This device may not cause harmful interference.
- 2) This device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## **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.

## **IC STATEMENT**

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.

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## Package contents

The following items should be found in your package:

- One Converter
- One AC-DC Power Adapter (DC9V/600mA)
- One User Guide
- One Purchasing Guide



**Note:**

Make sure that the package contains the above items. If any of the listed items are damaged or missing, please contact your distributor.

# Chapter 1 Introduction

Thank you for choosing the **MC100CM/MC110CS Fast Ethernet Media Converters** or the **MC111CS/MC112CS WDM Fast Ethernet Media Converters**!

## 1.1 Overview of the Converter

MC100CM and MC110CS are Fast Ethernet Media Converters. MC111CS and MC112CS are WDM Fast Ethernet Media Converters, which adopt WDM (Wavelength Division Multiplexing) technology that increases the information carrying capacity of fiber via multiplex and receive signals at different wavelengths on single strand cable. You can save half cabling cost when you use MC111CS and MC112CS instead of your original dual fiber converter.

The converter mediates between a 10/100Base-TX segment and a 100Base-FX segment. It is primarily designed for large, higher speed/bandwidth demanding workgroups that require expansion of the Fast Ethernet network.

The converter also features the LFP (Link Fault Pass through) function, and for its procedure illustrates, please refer to the section 1.5.3.



### Note:

MC100CM(UN)REV3.0 and MC110CS(UN)REV3.0 can also be powered by 5VDC adapter.



## 1.2 Conventions

The Converter mentioned in this guide stands for Fast Ethernet Media Converters or the WDM Fast Ethernet Media Converters without any explanation.

The TP port mentioned in this User Manual stands for the TX port without any explanations.



### Note:

The four converters are sharing this User Guide. The differences between them please refer to the table of the section 1.4.

## 1.3 Features

- Complies with 802.3u 10/100Base-TX, 100Base-FX standards.
- Provides one SC fiber connector and one RJ-45 connector.
- Supports auto negotiation of duplex mode on TP port.
- Supports auto negotiation of 10/100Mbps and auto MDI/MDI-X for TP port.
- Supports Link Fault Pass Through function and Far End Fault function.
- Extends fiber distance up to 2km for multi-mode fiber and 20km for single-mode fiber.
- Easy-to-view LED indicators provide status to monitor network activity easily.
- External power supply.

## 1.4 Connectors and Network Cables Supported

The connectors and network cables supported by the converter are listed as follows.

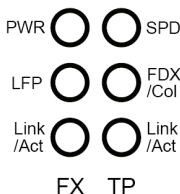
- **Connectors:** RJ-45, SC.
- **Network Cables:** Cat.5 Twisted-Pair (below abbreviated as TP), 9/125um Single-mode fiber and 50/125, 62.5/125um Multi-mode fiber.

| Model NO. | Interface | Transmission Distance | Transmission Media    | Output Center Wavelength |
|-----------|-----------|-----------------------|-----------------------|--------------------------|
| MC100CM   | RJ45--SC  | 2km                   | Multi-mode Fiber, TP  | 850nm                    |
| MC110CS   | RJ45--SC  | 20km                  | Single-mode Fiber, TP | 1310nm                   |
| MC111CS   | RJ45--SC  | 20km                  | Single-mode Fiber, TP | 1550nmTX<br>1310nmRX     |
| MC112CS   | RJ45--SC  | 20km                  | Single-mode Fiber, TP | 1310nmTX<br>1550nmRX     |

## 1.5 Appearance Indication

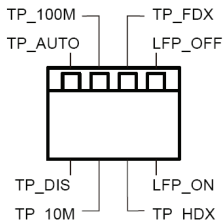
### 1.5.1 LED Indicators

The converter has LED indicators which can provide a real-time report. When you take a look at these indicators, you will know what's happening on your network. For details, please refer to the table as shown below.



| Name |          | Status   | Indication  |
|------|----------|----------|---|
| PWR  |          | On       | Power on  |
|      |          | Off      | Power off   |
| LFP  |          | On       | The Link Fault Pass Through function enable.                                    |
|      |          | Off      | The Link Fault Pass Through function disable.                                   |
| FX   | Link/Act | On       | There's a valid link.   |
|      |          | Flashing | The converter is receiving or transmitting data from the fiber optic connector. |
|      |          | Off      | There's no valid link.  |
| TP   | SPD      | On       | The TP port is connected to 100Base-Tx  |
|      |          | Off      | The TP port is connected to 10Base-Tx device or no connection.                  |
|      | FDX/Col  | On       | The TP port is operating in Full-Duplex   |
|      |          | Flashing | There's a collision.  |
|      |          | Off      | The TP port is operating in Half-Duplex mode.                                   |
|      | Link/Act | On       | There's a valid link.   |
|      |          | Flashing | The converter is receiving or transmitting data from the TP port.               |
|      |          | Off      | There's no connection on the TP port.   |

## 1.5.2 Switch



- **TP\_AUTO:** The TP port operates in Auto-Negotiation mode;
- **TP\_DIS:** The TP port operates in FORCE mode;
- **TP\_100M:** The TP port operates in 100Base-Tx;
- **TP\_10M:** The TP port operates in 10Base-T mode;
- **TP\_FDX:** The TP port operates in Full-Duplex mode;
- **TP\_HDX:** The TP port operates in Half-Duplex mode;
- **LFP\_OFF:** The Link Fault Pass Through function disable;
- **LFP\_ON:** The Link Fault Pass Through function enable.

Connect different devices, we suggest leaving the switches like these as shown below, otherwise the Media Converter may not work normally.

| The Mode Of The Device       | Switch  |
|------------------------------|---|
| TP:AUTO; LFP ON              | TP_AUTO, TP_100M, TP_FDX, LFP_ON              |
| TP:AUTO; LFP OFF             | TP_AUTO, TP_100M, TP_FDX, LFP_OFF             |
| TP:FORCE,100M,FULL; LFP ON   | TP_DIS, TP_100M, TP_FDX, LFP_ON               |
| TP:FORCE,100M,FULL; LFP OFF  | TP_DIS, TP_100M, TP_FDX, LFP_OFF              |
| TP:FORCE,100M, HALF; LFP ON  | (TP_DIS or TP_AUTO), TP_100M, TP_HDX, LFP_ON  |
| TP:FORCE,100M, HALF; LFP OFF | (TP_DIS or TP_AUTO), TP_100M, TP_HDX, LFP_OFF |
| TP:FORCE,10M,FULL; LFP ON    | TP_DIS, TP_10M, TP_FDX, LFP_ON                |
| TP:FORCE,10M,FULL; LFP OFF   | TP_DIS, TP_10M, TP_FDX, LFP_OFF               |
| TP:FORCE,10M, HALF; LFP ON   | (TP_DIS or TP_AUTO), TP_10M, TP_HDX, LFP_ON   |
| TP:FORCE,10M, HALF; LFP OFF  | (TP_DIS or TP_AUTO), TP_10M, TP_HDX, LFP_OFF  |



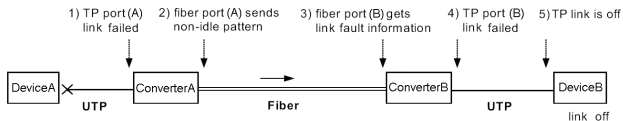
**Note:**

- 1) We suggest leaving the switches on TP\_AUTO, TP\_100M, TP\_FDX, and LFP\_ON, because this configuration is suitable for lots of situations.
- 2) You have to reset the converter after configuring the switches.

### 1.5.3 Link Fault Pass Through Function

In common situations, when one side of the link fails, the other side continues transmitting packets, and waiting for a response that never arrives from the disconnected side.

With the Link Fault Pass Through function enabled (optional with switch LFP), TP port and FX port of the same converter will inform each other the fault link status so that when one side of the link fails, the other side will force the link to shut down as soon as noticed. The procedure will be illustrated as shown below.



The procedure of link fault pass through

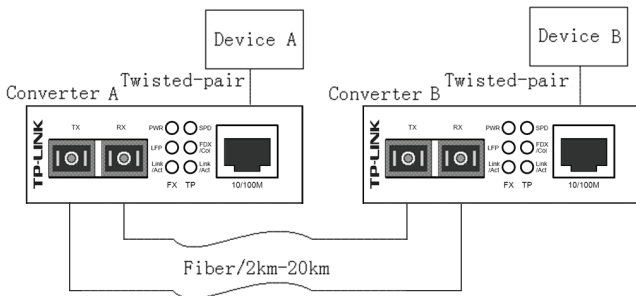
If link fail happens on TP port (A), the FX port (A) sends non-idle pattern to notice the FX port (B). The FX port (B) then forces its TP port (B) to link failed after receiving the non-idle pattern. Link status LED will also be off for both Converters and Devices as shown below.

|                    | Link LED |             |             |
|--------------------|----------|-------------|-------------|
| <b>Device A</b>    | Off      |             |             |
| <b>Device B</b>    | Off      |             |             |
|                    | FX_LFP   | FX_Link/Act | TP_Link/Act |
| <b>Converter A</b> | On       | Off         | Off         |
| <b>Converter B</b> | On       | Off         | Off         |

## Chapter 2 Installation Guide

### 2.1 Fast Ethernet Media Converter

1. The SC fiber connector of MC100CM transmits/receives data by 850nm short wave laser on multi-mode fiber.
2. The SC fiber connector of MC110CS transmits/receives data by 1310nm short wave laser on single-mode fiber.



Transmits and receives data on different fibers



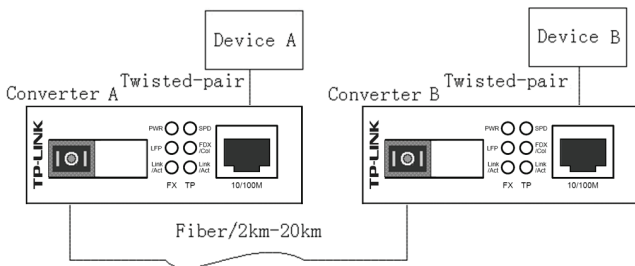
#### Note:

You have to use either two MC100CM connectors or two MC110CS connectors to cooperate.

### 2.2 WDM Fast Ethernet Media Converter

1. The SC fiber connector of MC111CS transmits data by 1550nm short wave laser while receives data by 1310nm short wave laser on one single-mode fiber.

2. The SC fiber connector of MC112CS transmits data by 1310nm short wave laser while receives data by 1550nm short wave laser on one single-mode fiber.



Transmits and receives data on the same fiber



**Note:**

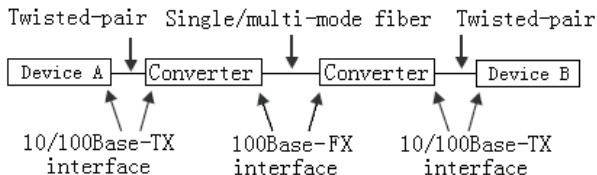
You have to use MC111CS and MC112CS at the same time to cooperate.



## Chapter 3 Configuration

In order to achieve the aim of effectively expanding a Fast Ethernet network, you can use the converter like the following examples:

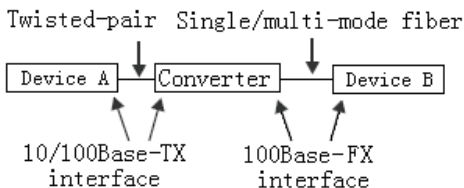
1. Place two converters back to back between the following end devices.



### Note:

You should use two MC100CM Media Converters or two MC110CS Media Converters, or one MC111CS and one MC112CS to expand your network. Error will occur when you use other ways.

2. Another effective application is to place one converter directly between a 10/100Base-TX network and a 100Base-FX device.



### **3.1 Installation Procedure**

Use a fiber cable to connect two converters, or connect a converter with a 100Base-FX Device.

1. Connection of a Converter and a 10/100Base-TX Device (HUB or Switch).
  - Make sure that the length of the Cat.5 twisted pair cable between the 10/100Base-TX device and the converter is less than 100 meters.
  - Connect one end of the Cat.5 twisted pair cable to the RJ45 jack on the converter and the other end of the cable to the RJ45 jack on the 10/100Base-TX device.
2. Connection of two Converters or a Converter and a 100Base-FX Device.
  - Use a SC fiber cable to connect the two Converters' SC connector or the SC connector of a Converter and a 100Base-FX Device.
3. Turn on the power.

## Appendix: Specifications

|                  |   |
|------------------|---|
| Standard         | IEEE 802.3 / IEEE 802.3u                |
| Connector        | 1 SC fiber optic; 1 RJ45 jack           |
| Max.<br>Distance | Cat.5 Twisted Pair:100m                 |
|                  | Multi-mode Fiber Optic: 2km             |
|                  | Single-mode Fiber Optic: 20km           |
| Temperature      | Operation: 0°C ~ 40°C                   |
|                  | Storage: -40°C ~ 70°C                   |
| Humidity         | Storage: 5% ~ 90% RH<br>Non-condensing  |
|                  | Working: 10% ~ 90% RH<br>Non-condensing |

