

MC1000-SFP-FP

Ethernet-to-Fiber Media Converter

User's Guide

Version 1.00

4/2007

Edition 1



About This User's Guide

Intended Audience

This manual is intended for people who want to configure the MC1000-SFP-FP using the web configurator. A basic knowledge of computer networking and IP addresses will be helpful.

Related Documentation

ZyXEL Web Site

Please refer to www.zyxel.com for product certifications.

User Guide Feedback

Help us help you. Send all User Guide-related comments, questions or suggestions for improvement to the following address, or use e-mail instead. Thank you!

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Safety Warnings



For your safety, be sure to read and follow all warning notices and instructions.

- Do NOT use this product near water, for example, in a wet basement or near a swimming pool.
- Do NOT expose your device to dampness, dust or corrosive liquids.
- Do NOT store things on the device.
- Do NOT install, use, or service this device during a thunderstorm. There is a remote risk of electric shock from lightning.
- Connect ONLY suitable accessories to the device.
- Do NOT open the device or unit. Opening or removing covers can expose you to dangerous high voltage points or other risks. ONLY qualified service personnel should service or disassemble this device. Please contact your vendor for further information.
- ONLY qualified service personnel should service or disassemble this device.
- Make sure to connect the cables to the correct ports.
- Place connecting cables carefully so that no one will step on them or stumble over them.
- Always disconnect all cables from this device before servicing or disassembling.
- Use ONLY an appropriate power adaptor or cord for your device.
- Connect the power adaptor or cord to the right supply voltage (for example, 110V AC in North America or 230V AC in Europe).
- Do NOT allow anything to rest on the power adaptor or cord and do NOT place the product where anyone can walk on the power adaptor or cord.
- Do NOT use the device if the power adaptor or cord is damaged as it might cause electrocution.
- If the power adaptor or cord is damaged, remove it from the power outlet.
- Do NOT attempt to repair the power adaptor or cord. Contact your local vendor to order a new one.
- Do not use the device outside, and make sure all the connections are indoors. There is a remote risk of electric shock from lightning.
- **CAUTION: RISK OF EXPLOSION IF BATTERY (on the motherboard) IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.** Dispose them at the applicable collection point for the recycling of electrical and electronic equipment. For detailed information about recycling of this product, please contact your local city office, your household waste disposal service or the store where you purchased the product.
- Do NOT obstruct the device ventilation slots, as insufficient airflow may harm your device.

This product is recyclable. Dispose of it properly.



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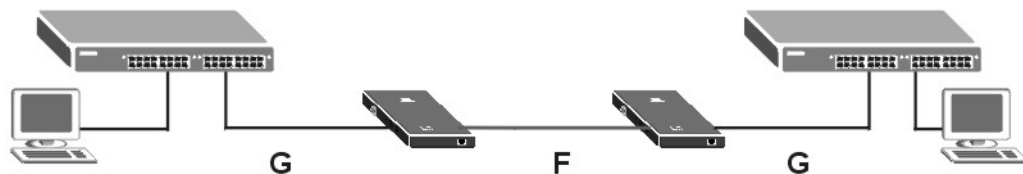
Introduction

1.1 Overview

The MC1000-SFP-FP is a Gigabit Ethernet-to-Fiber media converter. It can convert transmissions between 10/100/1000 Base-X UTP (Unshielded Twisted Pair) copper media and 1000 Base-X SFP (Small Form-factor Pluggable, also known as mini-GBIC) fiber media.

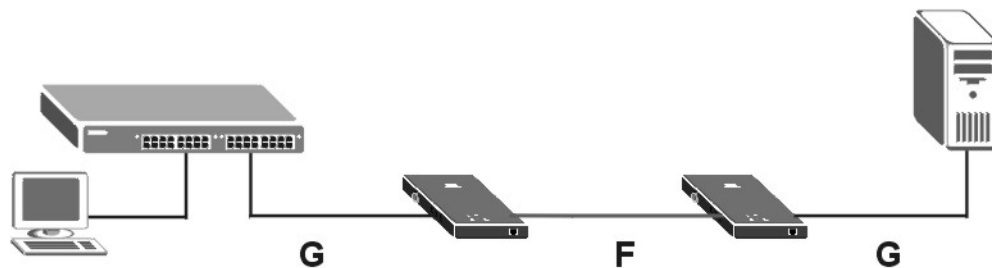
In the next example (G is the Gigabit Ethernet link and F is the fiber link), the MC1000-SFP-FP functions as a high-speed bridge between switches connecting workgroups in branch offices for instance.

Figure 1 MC1000-SFP-FP Example Application 1



In the next example (G is the Gigabit Ethernet link and F is the fiber link), the MC1000-SFP-FP allows high-speed access to servers for various workgroups within an enterprise.

Figure 2 MC1000-SFP-FP Example Application 2

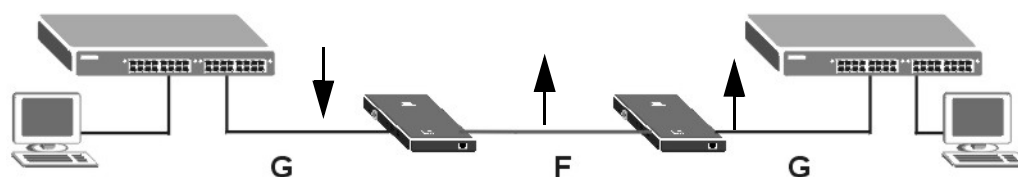


1.1.1 Link-Fault Signaling (LFS)

The MC1000-SFP-FP supports Link-Fault Signaling (LFS). LFS monitors both copper and fiber segments and informs other segments if one segment goes down (the LFS LED also lights).

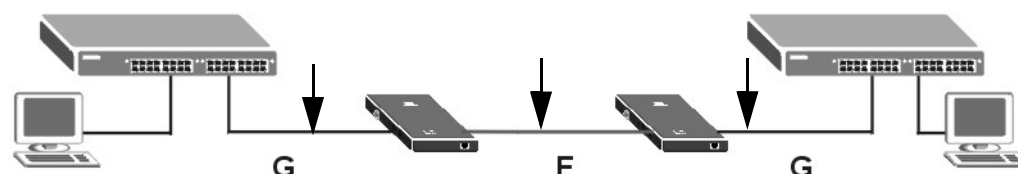
For example, if LFS is disabled and one side of a link fails (down arrow), the other segments will keep on transmitting packets (up arrows) and wait for responses that will never arrive.

Figure 3 No Link-Fault Signaling



With LFS enabled, a link down detected on the Ethernet port will force a link down on the fiber port and vice-versa. The up link will stop transmitting and turn off as soon as the remote link is down.

Figure 4 With Link-Fault Signaling



1.1.2 Fiber Cable Protection

The MC1000-SFP-FP comes with wire mounts that keep fiber-optic cable from easily breaking by allowing you to wrap it within the MC1000-SFP-FP.

Fiber-optic Connection

2.1 Overview

To make the MC1000-SFP-FP fiber-optic connection you need to:

- 1 Open the MC1000-SFP-FP
- 2 Disable DIP switch 1 (LFS)
- 3 Install an SFP transceiver
- 4 Attach the wire mounts
- 5 Insert a fiber-optic cable through a bushing and wrap it around the wire mounts
- 6 Connect the fiber-optic cable to the SFP transceiver
- 7 Enable DIP switch 1 (LFS)

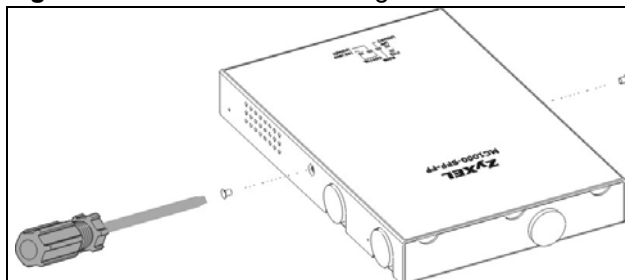


Only qualified technicians should perform these actions! Please skip this chapter if you are not a qualified technician.

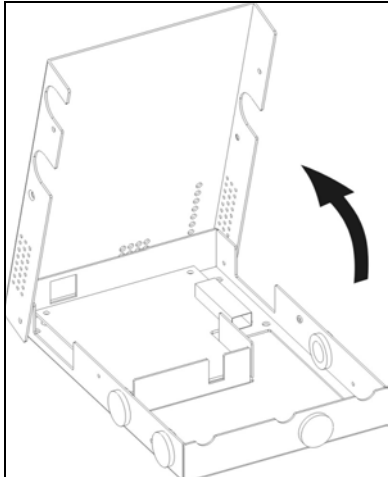
2.2 Open the MC1000-SFP-FP

- 1 First remove both screws from the housing.

Figure 5 Remove The Housing Screws



- 2 Then lift open the cover as shown.

Figure 6 Open The Cover

2.3 DIP Switch 1

The MC1000-SFP-FP supports Link-Fault Signaling (LFS). LFS monitors both copper and fiber segments and informs other segments if one segment goes down (the LFS LED also lights). See [Section 1.1.1 on page 13](#) for more information on LFS.

Use DIP switch 1 to enable or disable Link-Fault Signaling (LFS). The DIP switches are located on the printed circuit board inside the MC1000-SFP-FP.



Only DIP switch 1 has functionality. Ignore the other DIP switches.

- Set DIP switch 1 to the **OFF** position when installing cables or when testing the network connection.
- Set DIP switch 1 to the **ON** position after you've installed cables and tested that the connection is working correctly.

2.4 Install A Transceiver

The MC1000-SFP-FP supports MSA (Multi-Source Agreement) compliant SFP transceivers. Inside the MC1000-SFP-FP, there is a slot for an SFP transceiver with an LC-type connector. SFP transceivers provide duplex single-mode or multi-mode connections. See the product specifications appendix for a list of transceivers supported at the time of writing.



Please observe the following warnings when working with transceivers!

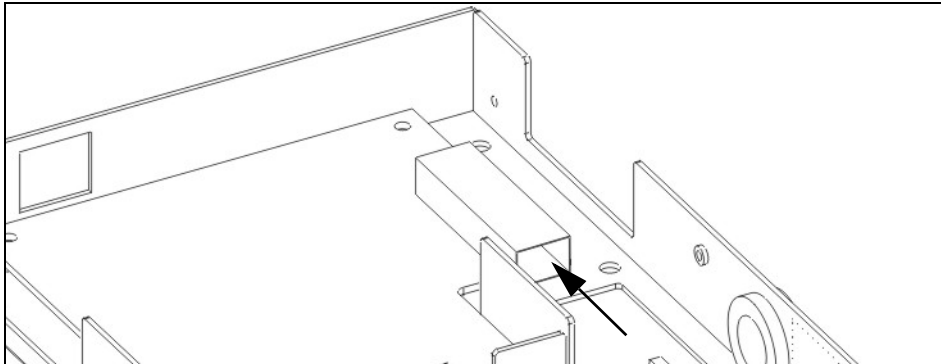
- Only trained and qualified personnel should install or replace transceivers.
- SFP transceivers are static sensitive. To prevent damage from electrostatic discharge (ESD), it is recommended you attach an ESD preventive wrist strap to your wrist and to a bare metal surface when you install or remove a SFP transceiver.
- SFP transceivers are dust sensitive. Avoid getting dust and other contaminants into the optical bores, as the optics do not work correctly when obstructed with dust.
- SFP transceivers are equipped with a Class 1 laser, which emits invisible radiation. Laser radiation is present when the device or system is powered up. To avoid possible eye injury, do not look into an operating fiber-optic transceiver's connectors.
- Dispose of your fiber-optic transceivers according to all national laws and regulations.

2.4.1 Procedure To Install An SFP Transceiver

Do NOT remove and install an SFP transceiver more often than is absolutely necessary. Doing so may shorten the useful life of the SFP transceiver.

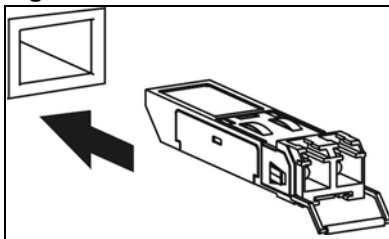
- 1 Disconnect all fiber-optic cables from an SFP transceiver before installing or removing it.
- 2 Attach an ESD preventive wrist strap to your wrist and to a bare metal surface.
- 3 Remove the SFP transceiver from its protective packaging.
- 4 Align the SFP transceiver in front of the slot opening on a device.

Figure 7 Transceiver Slot



- 5 Insert the SFP transceiver into the slot until the SFP transceiver snaps into place.

Figure 8 Install An SFP Transceiver

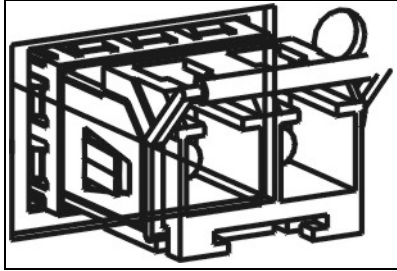




SFP transceiver installation orientation varies depending on your device. Your SFP transceiver comes with a mechanism that prevents incorrect insertion. Do NOT force or twist the SFP transceiver into a slot.

- 6 Lock the transceiver into place (if your transceiver has a locking mechanism).

Figure 9 Lock Transceiver



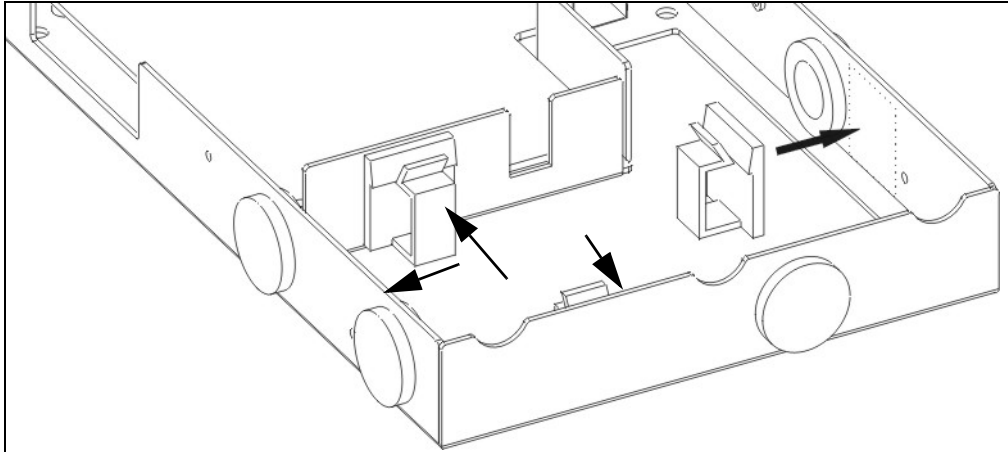
See the transceiver User's Guide for more information.

2.5 Install Fiber-optic Cable

Follow these procedures to install the fiber-optic cable.

2.5.1 Attach Wire Mounts

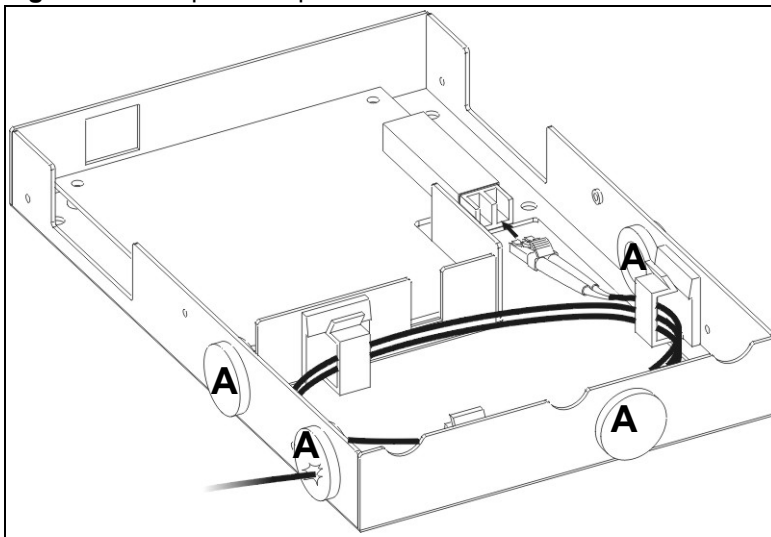
The purpose of the wire mounts is to securely wrap extra length of fiber optic cable you may have within the MC1000-SFP-FP in order to prevent it from being damaged. Remove the adhesive cover from the wire mounts and attach them to the sides of the MC1000-SFP-FP as shown.

Figure 10 Attach Wire Mounts.

2.5.2 Insert Fiber-optic Cable

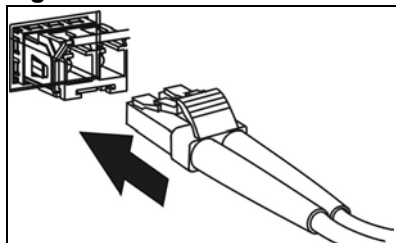
The MC1000-SFP-FP has holes (labelled **A** in the following figure) through which you may insert fiber-optic cable.

- 1 Insert a bushing into a hole through which you will insert the fiber-optic cable. The bushing sheathes the cable, holds it in place and covers the hole.
- 2 Create a hole in the bushing and thread the fiber-optic cable through it.
- 3 Insert bushings into the remaining vacant holes to cover them.
- 4 Wrap excessive fiber-optic cable around the inside of the MC1000-SFP-FP using the wire mounts as shown in the following figure.

Figure 11 Wrap Fiber-optic Cable

2.5.3 Connect The Fiber-optic Cable To The Transceiver

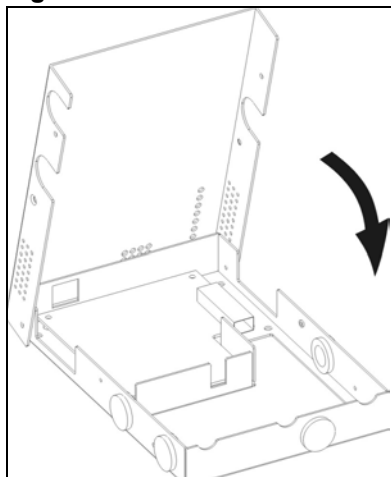
- 1 Remove the dust plugs from the SFP transceiver and the cables.
- 2 Insert the end of the fiber-optic cable into the SFP transceiver.

Figure 12 Insert Cable

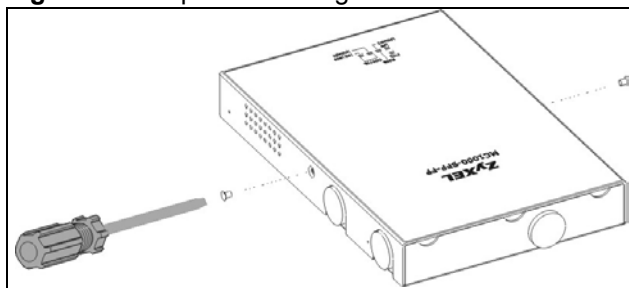
2.6 Close the MC1000-SFP-FP

After you have disabled DIP switch 1 (LFS), installed the SFP transceiver, attached the wire mounts, threaded fiber-optic cable through a bushing, wrapped excessive fiber-optic cable around the wire mounts, inserted the fiber-optic cable into the SFP transceiver and enabled DIP switch 1 (LFS) again, you should close the housing cover and secure it with the same screws you removed as shown in [Section 2.2 on page 15](#).

- 1 Close the cover as shown.

Figure 13 Close The Cover

- 2 Screw the cover back on the housing as shown.

Figure 14 Replace Housing Cover Screws

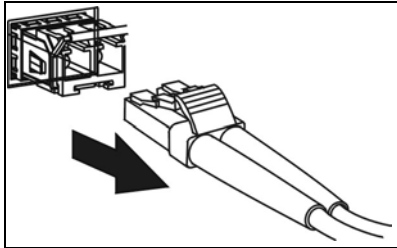
2.7 Replacing An SFP Transceiver

To replace an SFP transceiver, first remove the original one and then insert a new one as documented previously.

2.7.1 Procedure To Remove An SFP Transceiver

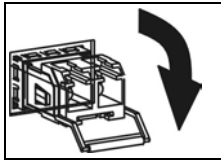
- 1 Attach an ESD preventive wrist strap to your wrist and to a bare metal surface on the chassis.
- 2 Disconnect the fiber-optic cable from the SFP transceiver.

Figure 15 Remove Fiber-optic Cable



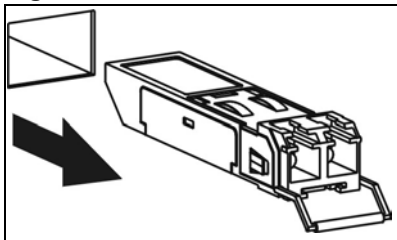
- 3 Insert the dust plug into the port on the SFP transceiver.
- 4 Pull the latch out and down to unlock the SFP transceiver.

Figure 16 Unlock The Transceiver



- 5 Using your thumb and index finger, grasp both sides of the transceiver and carefully slide it out of the slot.

Figure 17 Remove Transceiver



Do NOT force or twist the transceiver out of a slot.

Deploying the MC1000-SFP-FP

3.1 Overview

In this chapter we show you how to:

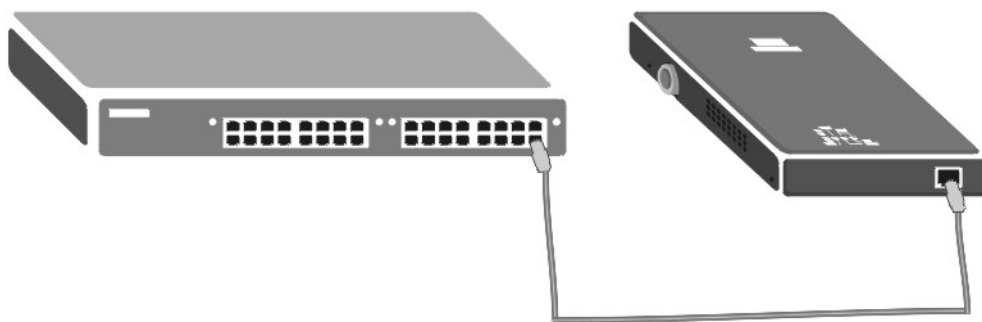
- Make the LAN connection
- Make the power connection and turn the MC1000-SFP-FP on
- Use the LEDs to check correct operation of the MC1000-SFP-FP
- Mount the MC1000-SFP-FP on a wall.

The MC1000-SFP-FP can also be placed on a desktop. Make sure that there is proper MC1000-SFP-FP dissipation from and adequate ventilation around the device. Do not place heavy objects on the MC1000-SFP-FP.

3.2 LAN Connection

Connect the Ethernet port on the rear of the MC1000-SFP-FP to a computer, switch or router on your network using an Ethernet cable. The port is Auto MDI/MDI-X meaning you can use either a straight-through or crossover Ethernet cable. Use an 8-wire Ethernet Cat 5e cable for Gigabit connections.

Figure 18 LAN Connection



3.3 Power Connection

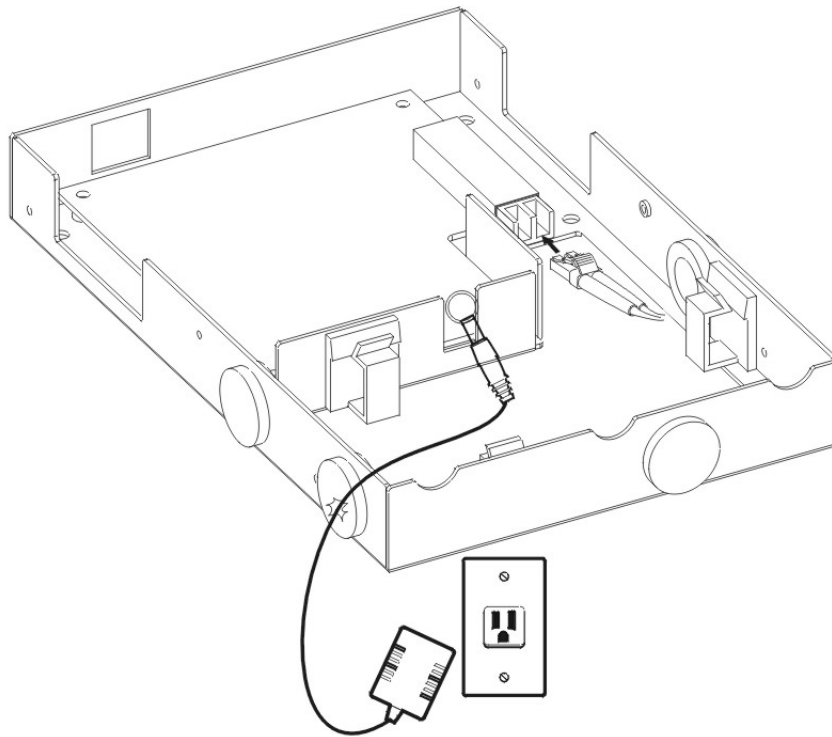
Connect one end of the power cord to the power socket in the MC1000-SFP-FP and the other end to a power source.



Be careful not to damage the fiber optic cables if you have already connected them to the SFP transceiver.

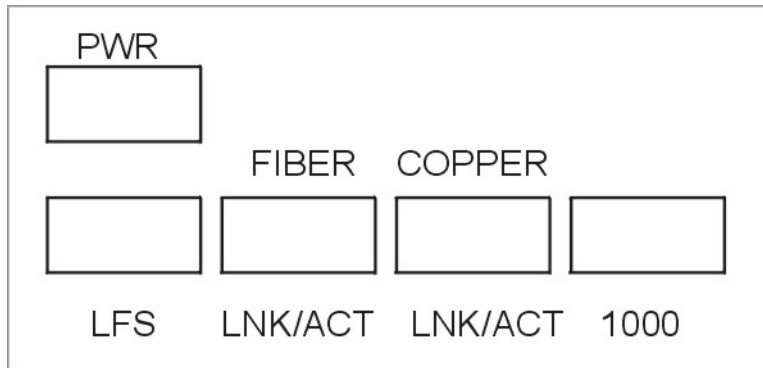
To turn the MC1000-SFP-FP on, connect the external power supply to a power outlet.

Figure 19 Power Connection



3.4 Front Panel LEDs

The MC1000-SFP-FP LEDs are on the top. Look at them to quickly check the status of the MC1000-SFP-FP.

Figure 20 MC1000-SFP-FP LEDs**Table 1** Front Panel LEDs

LED	COLOR	STATUS	DESCRIPTION
PWR	Green	Off	The MC1000-SFP-FP is turned off.
		On	The MC1000-SFP-FP is turned on.
LFS	Red	Off	Fiber-optic and Ethernet links to the MC1000-SFP-FP are operating normally.
		On	There is a disruption or break in the fiber-optic or Ethernet link to the MC1000-SFP-FP.
FIBER LNK/ ACT	Green	Off	The SFP transceiver is not connected to a fiber-optic link or the link is down.
		On	The SFP transceiver is connected to a fiber-optic link.
		Flashing	The MC1000-SFP-FP is sending or receiving packets on this port.
COPPER LNK/ ACT	Green	Off	The Ethernet port is not connected to an Ethernet device or the link is down.
		On	The Ethernet port is connected to an Ethernet device.
		Flashing	The MC1000-SFP-FP is sending or receiving packets on this port.
1000	Green	Off	There is no traffic on this port.
		On	The MC1000-SFP-FP is sending or receiving packets at 1000 Mbps.

3.5 Wall-mounting Instructions

Complete the following steps to hang your MC1000-SFP-FP on a wall.

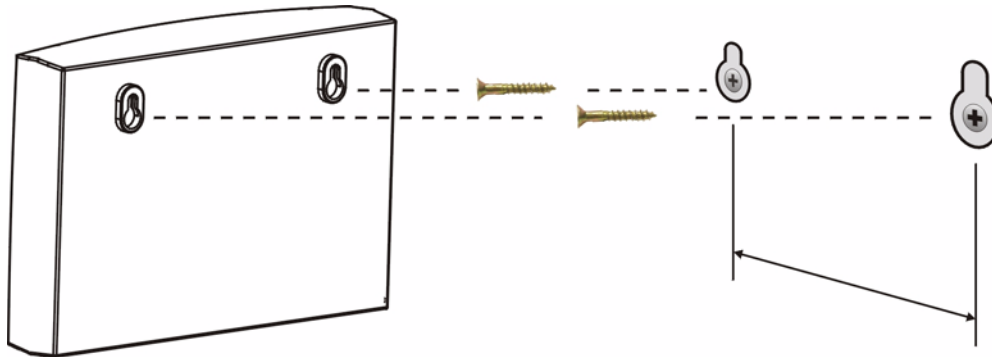
- 1 Select a position free of obstructions on a sturdy wall.
- 2 Drill two holes just big enough for M3 size screws.



Be careful to avoid damaging pipes or cables located inside the wall when drilling holes for the screws.

- 3** Do not insert the screws all the way into the wall. Leave a small gap of about 0.5 cm between the heads of the screws and the wall.
- 4** Make sure the screws are snugly fastened to the wall. They need to hold the weight of the MC1000-SFP-FP with the connection cables.
- 5** Align the holes on the back of the MC1000-SFP-FP with the screws on the wall. Hang the MC1000-SFP-FP on the screws.

Figure 21 Wall-mounting Example



Product Specifications

Table 2 Product Specifications

SPECIFICATION	DESCRIPTION
Standards Supported	IEEE 802.3 (10BASE-T Ethernet) IEEE 802.3u (100BASE-TX/ Fast Ethernet) IEEE 802.3ab (1000Base-T) IEEE 802.3z (1000Base-SX/LX)
Interfaces	One 10/100/1000 Mbps Ethernet port
	Auto MDI/MDI-X support on RJ-45 port
	One SFP slot for Gigabit Ethernet link
	Extends distances up to 500m (1,650ft) for multi-mode fiber module 80km (317,625ft) for single-mode fiber module (depends on the SFP transceiver you install)
Management	Alarm LED illuminates to indicate link failure
	Status LEDs for easy monitoring of device's status
Connectors	One RJ-45
	One Fiber SFP
Maximum Distances allowed	UTP: 100m (Cat 5/5e/6)
	Fiber: SFP; up to 500m (multi-mode), 80km (single-mode; depends on the SFP transceiver you install)
Cables	Single-mode fiber: 9/125um
	Multi-mode fiber: 50/125 or 62.5/125um
	Copper: Cat 5/5E/6. Use 8-wire Ethernet cable for Gigabit Ethernet
Data Rates	Fiber: 1000 Mbps
	Copper: 10/100/1000Mbps
DIP Switches	DIP 1 – LFS: Enable/disable Link Fault Signaling (LFS)
Power	12V DC, 0.8A, external power supply adapter
	Frequency: 50 Hz to 60 Hz
Operating Environment	Temperature: 0°C to 45°C
	Humidity: 10% to 90%, non-condensing
Storage Environment	Temperature: -20°C to 70°C
	Humidity: 5% to 90%, non-condensing
Emissions	FCC Part 15 of Class B & CE approved
Dimensions	194 x 130 x 26 mm (L x W x H)

Table 2 Product Specifications

SPECIFICATION	DESCRIPTION
Weight	292g
SFP Transceivers	Use 3.3V power input and LC-type connectors.
Supported transceivers ^A	• SFP-SX • SFP-LX-10 • SFP-LHX-40 • SFP-ZX-80 • SFP-BX1310-10 • SFP-BX1490-10

A. Supported at the time of writing.

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Certifications

Federal Communications Commission (FCC) Interference Statement

The device complies with Part 15 of FCC rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operations.

This device has been tested and found to comply with the limits for a Class B 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 device generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

Notices

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

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

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

Viewing Certifications

- 1 Go to <http://www.zyxel.com>.
- 2 Select your product on the ZyXEL home page to go to that product's page.
- 3 Select the certification you wish to view from this page.

ZyXEL warrants to the original end user (purchaser) that this product is free from any defects in materials or workmanship for a period of up to two years from the date of purchase. During the warranty period, and upon proof of purchase, should the product have indications of failure due to faulty workmanship and/or materials, ZyXEL will, at its discretion, repair or replace the defective products or components without charge for either parts or labor, and to whatever extent it shall deem necessary to restore the product or components to proper operating condition. Any replacement will consist of a new or re-manufactured functionally equivalent product of equal or higher value, and will be solely at the discretion of ZyXEL. This warranty shall not apply if the product has been modified, misused, tampered with, damaged by an act of God, or subjected to abnormal working conditions.

Note

Repair or replacement, as provided under this warranty, is the exclusive remedy of the purchaser. This warranty is in lieu of all other warranties, express or implied, including any implied warranty of merchantability or fitness for a particular use or purpose. ZyXEL shall in no event be held liable for indirect or consequential damages of any kind to the purchaser.

To obtain the services of this warranty, contact ZyXEL's Service Center for your Return Material Authorization number (RMA). Products must be returned Postage Prepaid. It is recommended that the unit be insured when shipped. Any returned products without proof of purchase or those with an out-dated warranty will be repaired or replaced (at the discretion of ZyXEL) and the customer will be billed for parts and labor. All repaired or replaced products will be shipped by ZyXEL to the corresponding return address, Postage Paid. This warranty gives you specific legal rights, and you may also have other rights that vary from country to country.

Registration

Register your product online to receive e-mail notices of firmware upgrades and information at www.zyxel.com for global products, or at www.us.zyxel.com for North American products.

Customer Support

Please have the following information ready when you contact customer support.

Required Information

- Product model and serial number.
- Warranty Information.
- Date that you received your device.
- Brief description of the problem and the steps you took to solve it.

Corporate Headquarters (Worldwide)

- Support E-mail: support@zyxel.com.tw
- Sales E-mail: sales@zyxel.com.tw
- Telephone: +886-3-578-3942
- Fax: +886-3-578-2439
- Web Site: www.zyxel.com, www.europe.zyxel.com
- FTP Site: [ftp.zyxel.com](ftp://ftp.zyxel.com), [ftp.europe.zyxel.com](ftp://ftp.europe.zyxel.com)
- Regular Mail: ZyXEL Communications Corp., 6 Innovation Road II, Science Park, Hsinchu 300, Taiwan

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- Sales E-mail: sales@zyxel.co.cr
- Telephone: +506-2017878
- Fax: +506-2015098
- Web Site: www.zyxel.co.cr
- FTP Site: [ftp.zyxel.co.cr](ftp://ftp.zyxel.co.cr)
- Regular Mail: ZyXEL Costa Rica, Plaza Roble Escazú, Etapa El Patio, Tercer Piso, San José, Costa Rica

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“+” is the (prefix) number you dial to make an international telephone call.