

PLANET Fiber Transceiver

MFB-Series/MGB-Series/MTB-Series

User's Manual

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Revision

User's Manual of PLANET SFP/SFP+ Mini-GBIC Transceiver

For Models: MFB-SERIES/MGB-SERIES/MTB-SERIES

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1. Overview

Thank you for purchasing PLANET SFP/SFP+ Mini-GBIC Transceiver which includes the Ethernet module of the MFB/MGB and MTB families.

The MFB family's Fast Ethernet SFP module can be installed into PLANET Switch products with 100BASE-FX SFP interface. The distance can be extended from 2km (multi-mode, LC) to up to 120km (single-mode, LC).

The MGB family's Gigabit Ethernet SFP module can be installed into PLANET Switch products with 1000BASE-SX/LX SFP interface. The distance can be extended from 30m (TP) and 300m (multi-mode, LC) to up to 60km (single-mode, LC).

The MTB family's 10G Ethernet SFP+ module can be installed into PLANET products with 10G SFP+ interface.

2. Checklist

Your SFP/SFP+ Package should contain the following items:

- The SFP/SFP+ Transceiver Module x 1
- The User's Manual x 1

If any item is missing or damaged, please consult the dealer from whom you purchased your SFP/SFP+ Mini-GBIC Ethernet transceiver module.

3. Introduction and Model List

3-1 The MFB-Series Mini-GBIC Transceiver Module List

Fast Ethernet Transceiver (100BASE-X SFP)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (nm)	Operating Temp.
MFB-FX	100	LC	Multi-Mode	2km	1310nm	0 ~ 60°C
MFB-F20	100	LC	Single Mode	20km	1310nm	0 ~ 60°C
MFB-F40	100	LC	Single Mode	40km	1310nm	0 ~ 60°C
MFB-F60	100	LC	Single Mode	60km	1310nm	0 ~ 60°C
MFB-F120	100	LC	Single Mode	120km	1550nm	0 ~ 60°C
MFB-TFX	100	LC	Multi-Mode	2km	1310nm	-40 ~ 75°C
MFB-TF20	100	LC	Single Mode	20km	1550nm	-40 ~ 75°C

Fast Ethernet Transceiver (100BASE-BX, Single Fiber Bi-directional SFP)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (TX)	Wavelength (RX)	Operating Temp.
MFB-FA20	100	WDM (LC)	Single Mode	20km	1310nm	1550nm	0 ~ 60°C
MFB-FB20	100	WDM (LC)	Single Mode	20km	1550nm	1310nm	0 ~ 60°C
MFB-TFA20	100	WDM (LC)	Single Mode	20km	1310nm	1550nm	-40~75°C
MFB-TFB20	100	WDM (LC)	Single Mode	20km	1550nm	1310nm	-40~75°C
MFB-TFA40	100	WDM (LC)	Single Mode	40km	1310nm	1550nm	-40~75°C
MFB-TFB40	100	WDM (LC)	Single Mode	40km	1550nm	1310nm	-40~75°C
MFB-TSA	100	WDM (LC)	Multi-Mode	2km	1310nm	1550nm	-40~75°C
MFB-TSB	100	WDM (LC)	Multi-Mode	2km	1550nm	1310nm	-40~75°C



1. When shorter distance single mode fiber cables are used, you might need to insert an in-line optical attenuator in the link to avoid overloading the receiver. Follow the I-TUT G652 document for the same fiber cable length.
2. The attenuation coefficient mentioned in the following chapters is for reference only.

Attenuation coefficient	Wavelength region	Typical link value
	1260nm-1360nm	0.5 dB/km
	1530nm-1565nm	0.4 dB/km

Physical Fiber Cable Length "n" km \ SFP Model	MFB-F20 MFB-TF20	MFB-F40	MFB-F60	MFB-F120
10 < n < 20	2 dB	4-6 dB	8-10 dB	25-27 dB
20 < n < 40	--	2-4 dB	6-8 dB	23-25 dB
40 < n < 60	--	--	2-4 dB	18-20 dB

Physical Fiber Cable Length "n" km \ SFP Model	MFB-TSA MFB-TSB	MFB-TFA10 MFB-TFB10	MFB-FA20 / MFB-FB20 MFB-TFA20 / MFB-TFB20	MFB-TFA40 MFB-TFB40
0.22 < n < 2	1 dB	--	--	--
10 < n < 20	--	--	2 dB	4-6 dB
20 < n < 40	--	--	--	2-4 dB
40 < n < 60	--	--	--	--

3-2 The MGB-Series Mini-GBIC Transceiver Module List

Gigabit Ethernet Transceiver (1000BASE-X SFP)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (nm)	Operating Temp.
MGB-GT	1000	Copper	--	100m	--	0 ~ 60°C
MGB-SX	1000	LC	Multi-Mode	550m	850nm	0 ~ 60°C
MGB-SX2	1000	LC	Multi-Mode	2km	1310nm	0 ~ 60°C
MGB-LX	1000	LC	Single Mode	10km	1310nm	0 ~ 60°C
MGB-L30	1000	LC	Single Mode	30km	1310nm	0 ~ 60°C
MGB-L40	1000	LC	Single Mode	40km	1550nm	0 ~ 60°C
MGB-L50	1000	LC	Single Mode	50km	1550nm	0 ~ 60°C

MGB-L70	1000	LC	Single Mode	70km	1550nm	0 ~ 60°C
MGB-L120	1000	LC	Single Mode	120km	1550nm	0 ~ 60°C
MGB-TSX	1000	LC	Multi-Mode	550m	850nm	-40 ~ 75°C
MGB-TLX	1000	LC	Single Mode	10km	1310nm	-40 ~ 75°C
MGB-TL30	1000	LC	Single Mode	30km	1310nm	-40 ~ 75°C
MGB-TL70	1000	LC	Single Mode	70km	1550nm	-40 ~ 75°C

Gigabit Ethernet Transceiver (1000BASE-BX, Single Fiber Bi-directional SFP)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (TX)	Wavelength (RX)	Operating Temp.
MGB-LA10	1000	WDM (LC)	Single Mode	10km	1310nm	1550nm	0 ~ 60°C

MGB-LB10	1000	WDM (LC)	Single Mode	10km	1550nm	1310nm	0 ~ 60°C
MGB-LA20	1000	WDM (LC)	Single Mode	20km	1310nm	1550nm	0 ~ 60°C
MGB-LB20	1000	WDM (LC)	Single Mode	20km	1550nm	1310nm	0 ~ 60°C
MGB-LA40	1000	WDM (LC)	Single Mode	40km	1310nm	1550nm	0 ~ 60°C
MGB-LB40	1000	WDM (LC)	Single Mode	40km	1550nm	1310nm	0 ~ 60°C
MGB-LA60	1000	WDM (LC)	Single Mode	60km	1310nm	1550nm	0 ~ 60°C
MGB-LB60	1000	WDM (LC)	Single Mode	60km	1550nm	1310nm	0 ~ 60°C
MGB-TLA10	1000	WDM (LC)	Single Mode	10km	1310nm	1550nm	-40 ~ 75°C
MGB-TLB10	1000	WDM (LC)	Single Mode	10km	1550nm	1310nm	-40 ~ 75°C
MGB-TLA20	1000	WDM (LC)	Single Mode	20km	1310nm	1550nm	-40 ~ 75°C
MGB-TLB20	1000	WDM (LC)	Single Mode	20km	1550nm	1310nm	-40 ~ 75°C

MGB-TLA40	1000	WDM (LC)	Single Mode	40km	1310nm	1550nm	-40 ~ 75°C
MGB-TLB40	1000	WDM (LC)	Single Mode	40km	1550nm	1310nm	-40 ~ 75°C
MGB-TLA60	1000	WDM (LC)	Single Mode	60km	1310nm	1550nm	-40 ~ 75°C
MGB-TLB60	1000	WDM (LC)	Single Mode	60km	1550nm	1310nm	-40 ~ 75°C

Physical Fiber Cable Length "n" km	SFP Model				
	MGB-LX	MGB-L30	MGB-L40	MGB-L70	MGB-L120
10 < n < 20	--	2-4 dB	5-7 dB	13-15 dB	25-27 dB
20 < n < 40	--	2 dB	3-5 dB	10-12 dB	23-25 dB
40 < n < 60	--	--	--	5-7 dB	18-20 dB

Physical Fiber Cable Length "n" km \ SFP Model	MGB-TLX	MGB-TL30	MGB-TL70
10 < n < 20	--	2-4 dB	13-15 dB
20 < n < 40	--	2 dB	10-12 dB
40 < n < 60	--	--	5-7 dB

Physical Fiber Cable Length "n" km \ SFP Model	MGB-LA10 MGB-LB10 MGB-TLA10 MGB-TLB10	MGB-LA20 MGB-LB20 MGB-TLA20 MGB-TLB20	MGB-LA40 MGB-LB40 MGB-TLA40 MGB-TLB40	MGB-LA60 MGB-LB60 MGB-TLA60 MGB-TLB60
10 < n < 20	--	2 dB	4-6 dB	8-10 dB
20 < n < 40	--	--	2-4 dB	6-8 dB
40 < n < 60	--	--	--	2-4 dB

3-3 The MTB-Series Mini-GBIC Transceiver Module List

10Gbps SFP+ (10G Ethernet/10GBASE)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (nm)	Operating Temp.
MTB-RJ	10G	Copper	--	30m	--	0 ~ 70°C
MTB-SR	10G	LC	Multi-Mode	Up to 300m	850nm	0 ~ 60°C
MTB-LR	10G	LC	Single Mode	10km	1310nm	0 ~ 60°C
MTB-TSR	10G	LC	Multi-Mode	Up to 300m	850nm	-40 ~ 75°C
MTB-TLR	10G	LC	Single Mode	10km	1310nm	-40 ~ 75°C

10Gigabit Ethernet Transceiver (10GBASE-BX, Single Fiber Bi-directional SFP)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (TX)	Wavelength (RX)	Operating Temp.
MTB-LA20	10G	WDM (LC)	Single Mode	20km	1270nm	1330nm	0 ~ 60°C
MTB-LB20	10G	WDM (LC)	Single Mode	20km	1330nm	1270nm	0 ~ 60°C
MTB-LA40	10G	WDM (LC)	Single Mode	40km	1270nm	1330nm	0 ~ 60°C
MTB-LB40	10G	WDM (LC)	Single Mode	40km	1330nm	1270nm	0 ~ 60°C
MTB-LA60	10G	WDM (LC)	Single Mode	60km	1270nm	1330nm	0 ~ 60°C
MTB-LB60	10G	WDM (LC)	Single Mode	60km	1330nm	1270nm	0 ~ 60°C

Physical Fiber Cable Length "n" km	SFP Model	MTB-LA20 MTB-LB20	MTB-LA40 MTB-LB40	MTB-LA60 MTB-LB60
10 < n < 20		2 dB	4-6 dB	8-10 dB
20 < n < 40		--	2-4 dB	6-8 dB
40 < n < 60		--	--	2-4 dB

4. Installing SFP/SFP+ Transceiver Module

4-1 Install the SFP/SFP+ Mini-GBIC Transceiver Module

Please follow these steps to install the SFP/SFP+ Mini-GBIC module:

1. Power on the Switch and place the Switch on a flat surface. Install the new SFP/SFP+ Mini-GBIC module by inserting it into the slot and sliding it in until it stops (See **Figure 1**). Press it firmly until you hear the module snap into place. Never force, twist or bend the SFP/SFP+ Mini-GBIC module. The SFP/SFP+ Mini-GBIC module slides in smoothly and the Switch will automatically detect the new module.

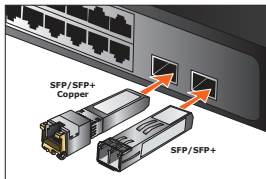


Figure 1: Insert the SFP/SFP+ Mini-GBIC Module

2. After the TP/Fiber connection is made successfully, check the LEDs to verify that if there is a link and a proper connection at the port.

Please refer to the user's manual for more about the Switch or module's management.

4-2 Remove the SFP/SFP+ Transceiver Module

1. Make sure there is no network activity by consulting or checking with the network administrator.
2. Remove the Fiber Optic Cable gently (See Figure 2).
3. Turn the handle of the SFP/SFP+ Transceiver module to the horizontal level.
4. Pull out the SFP/SFP+ Transceiver module gently through the handle.

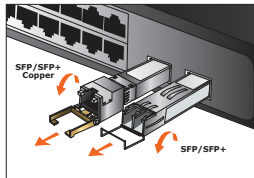


Figure 2

4-3 Connecting the UTP Cable

The 1/2.5/5/10GBASE-T port uses RJ45 socket -- similar to phone jack -- for connection of unshielded twisted-pair cable (UTP). The 802.3ab/802.3bz/802.3ae Ethernet standard requires Category 5 UTP for 100Mbps 100BASE-TX. 1/2.5/5/10GBASE-T uses Cat5e/6/7 UTP (see table below). Maximum distance is 100 meters (328 feet).

Standard	Transfer Speed	Cable Requirement 100M
100BASE-FX	Multi-mode	50/125 μ m or 62.5/125 μ m
100BASE-FX	Single mode	9/125 μ m
100BASE-BX	Multi-mode	50/125 μ m
1000BASE-SX	Multi-mode	50/125 μ m or 62.5/125 μ m



Note

Be sure the connected network devices support MDI/MDI-X. If it does not support, then use the crossover Category 5e cable.



Warning

Never pull out the SFP/SFP+ Transceiver module without pulling the handle or the push bolts on the module. Directly pulling out the SFP/SFP+ Transceiver module would damage the SFP/SFP+ Transceiver module of the device.

Appendix A

A.1 Fiber Optic Cable Connection Parameters

The wiring details are shown below:

■ Fiber Optic Patch Cables:

Standard	Fiber Type	Cable Specifications
100BASE-FX	Multi-mode	50/125 μ m or 62.5/125 μ m
100BASE-FX	Single mode	9/125 μ m
100BASE-BX	Multi-mode	50/125 μ m
1000BASE-SX	Multi-mode	50/125 μ m or 62.5/125 μ m
1000BASE-LX	Single mode	9/125 μ m
1000BASE-BX	Single mode	9/125 μ m
10GBASE-SR	Multi-mode	50/125 μ m or 62.5/125 μ m
10GBASE-LR	Single mode	9/125 μ m
10GBASE-BX	Single mode	9/125 μ m

Safety Notice

Fiber-optic SFP modules are equipped with a Class 1 laser, which emits invisible radiation. Read the following safety warning carefully.



Note

Class 1 Laser Product
Complies with FDA Regulation 21 CFR 1040.10 and 1040.11



Warning

Class 1 radiation is present when the device or system is powered up.



Warning

Only trained and qualified personnel should be allowed to install or replace these modules.