PLANET Fiber Transceiver

MFB-Series/MGB-Series/MTB-Series

User's Manual

Trademarks

Contents are subject to revision without prior notice.

PLANET is a registered trademark of PLANET Technology Corp. All other trademarks belong to their respective owners.

Disclaimer

PLANET Technology does not warrant that the hardware will work properly in all environments and applications, and makes no warranty and representation, either implied or expressed, with respect to the quality, performance, merchantability, or fitness for a particular purpose.

PLANET has made every effort to ensure that this User's Manual is accurate; PLANET disclaims liability for any inaccuracies or omissions that may have occurred.

Information in this User's Manual is subject to change without notice and does not represent a commitment on the part of PLANET. PLANET assumes no responsibility for any inaccu-racies that may be contained in this User's Manual. PLANET makes no commitment to update or keep current the information in this User's Manual, and reserves the right to make improvements to this User's Manual

and/or to the products de-scribed in this User's Manual, at any time without notice.

If you find information in this manual that is incorrect, misleading, or incomplete, we would appreciate your comments and sugges-tions.

FCC NOTICE (Class B)

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, and (2) this device must accept any interference received, including interference that may cause un-desired operation.

CE Mark Warning

Operation of this equipment in a residential environment could cause radio interference.

WEEE Warning

To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, end users of electrical and electronic equipment should understand the meaning of the crossed-out wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately.

Revision

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

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

Rev: 2.0 (April, 2023)

Part No: 2010-AG0220-0A5

Table of Contents

1. Overview 6
2. Checklist 7
3. Introduction and Model List 8
   3-1 The MFB-Series Mini-GBIC Transceiver Module List 8
   3-2 The MGB-Series Mini-GBIC Transceiver Module List 12
   3-3 The MTB-Series Mini-GBIC Transceiver Module List 19
4. Installation and Removal of Transceiver Module 24
   4-1 Installing the SFP/SFP+ Mini-GBIC Transceiver Module 24
   4-2 Removing the SFP/SFP+ Transceiver Module 25
   4-3 Connecting the UTP Cable 26

Appendix A 27
   A.1 Fiber Optic Cable Connection Parameters 27

Safety Notice 29

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 and 2500BASE-X SFP interface. The distance can be extended from 100m (TP) and 2km (multi-mode/single-mode, LC) to up to 120km (single-mode, LC).

The MTB family's 10G Ethernet SFP+ module can be installed into PLANET products with 10G SFP+ interface. The SFP+ transceivers can be extended from a distance of 300m (multi-mode, LC) to up to 80km (single-mode, LC). The deployment distance of 10G can be extended to 30 meters

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 ~ 60ºC
MFB-F20	100	LC	Single Mode	20km	1310nm	0 ~ 60ºC
MFB-F40	100	LC	Single Mode	40km	1310nm	0 ~ 60ºC
MFB-F60	100	LC	Single Mode	60km	1310nm	0 ~ 60ºC
MFB-F120	100	LC	Single Mode	120km	1550nm	0 ~ 60ºC
MFB-TFX	100	LC	Multi-Mode	2km	1310nm	-40 ~ 85ºC
MFB-TF20	100	LC	Single Mode	20km	1310nm	-40 ~ 85ºC

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

Model	DDM	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (TX)	Wavelength (RX)	Operating Temp.
MFB-FA20	--	100	WDM (LC)	Single Mode	20km	1310nm	1550nm	0 ~ 60ºC
MFB-FB20	--	100	WDM (LC)	Single Mode	20km	1550nm	1310nm	0 ~ 60ºC
MFB-TFA20	--	100	WDM (LC)	Single Mode	20km	1310nm	1550nm	-40~85ºC
MFB-TFB20	--	100	WDM (LC)	Single Mode	20km	1550nm	1310nm	-40~85ºC
MFB-TFA40	--	100	WDM (LC)	Single Mode	40km	1310nm	1550nm	-40~85ºC
MFB-TFB40	--	100	WDM (LC)	Single Mode	40km	1550nm	1310nm	-40~85ºC
MFB-TSA	YES	100	WDM (LC)	Multi-Mode	2km	1310nm	1550nm	-40~85ºC
MFB-TSB	YES	100	WDM (LC)	Multi-Mode	2km	1550nm	1310nm	-40~85ºC

1. When shorter 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.

	Wavelength region	Typical link value
Attenuation coefficient	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	DDM	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (nm)	Operating Temp.
MGB-GT	--	1000	Copper	--	100m	--	0 ~ 60ºC
MGB-SX(V2)	YES	1000	LC	Multi Mode	550m	850nm	0 ~ 60ºC
MGB-SX2(V2)	YES	1000	LC	Multi Mode	2km	1310nm	0 ~ 60ºC
MGB-LX(V2)	YES	1000	LC	Single Mode	20km	1310nm	0 ~ 60ºC
MGB-L40	YES	1000	LC	Single Mode	40km	1310nm	0 ~ 60ºC
MGB-L80	YES	1000	LC	Single Mode	80km	1550nm	0 ~ 60ºC
MGB-L120(V2)	YES	1000	LC	Single Mode	120km	1550nm	0 ~ 60ºC

MGB-TGT	--	1000	Copper	--	100m	--	-40 ~ 85ºC
MGB-TSX	YES	1000	LC	Multi Mode	550m	850nm	-40 ~ 85ºC
MGB-TSX2	YES	1000	LC	Multi Mode	2km	1310nm	-40 ~ 85ºC
MGB-TLX(V2)	YES	1000	LC	Single Mode	20km	1310nm	-40 ~ 85ºC
MGB-TL30	YES	1000	LC	Single Mode	30km	1310nm	-40 ~ 85ºC
MGB-TL40	YES	1000	LC	Single Mode	40km	1310nm	-40 ~ 85ºC
MGB-TL70	YES	1000	LC	Single Mode	70km	1550nm	-40 ~ 85ºC
MGB-TL80	YES	1000	LC	Single Mode	80km	1550nm	-40 ~ 85ºC

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

Model	DDM	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (TX)	Wavelength (RX)	Operating Temp.
MGB-LA10(V2) MGB-LB10(V2)	YES	1000	WDM (LC)	Single Mode	10km	1310nm	1550nm	0 ~ 60ºC
		1000	WDM (LC)	Single Mode	10km	1550nm	1310nm	0 ~ 60ºC
MGB-LA20(V2) MGB-LB20(V2)	YES	1000	WDM (LC)	Single Mode	20km	1310nm	1550nm	0 ~ 60ºC
		1000	WDM (LC)	Single Mode	20km	1550nm	1310nm	0 ~ 60ºC
MGB-LA40(V2) MGB-LB40(V2)	YES	1000	WDM (LC)	Single Mode	40km	1310nm	1550nm	0 ~ 60ºC
		1000	WDM (LC)	Single Mode	40km	1550nm	1310nm	0 ~ 60ºC
MGB-LA80 MGB-LB80	YES	1000	WDM (LC)	Single Mode	80km	1490nm	1550nm	0 ~ 60ºC
		1000	WDM (LC)	Single Mode	80km	1550nm	1490nm	0 ~ 60ºC

MGB-TSA MGB-TSB	YES	1000	WDM (LC)	Multi Mode	2km	1310nm	1550nm	-40 ~ 85ºC
		1000	WDM (LC)	Multi Mode	2km	1550nm	1310nm	-40 ~ 85ºC
MGB-TLA10(V2) MGB-TLB10(V2)	YES	1000	WDM (LC)	Single Mode	10km	1310nm	1550nm	-40 ~ 85ºC
		1000	WDM (LC)	Single Mode	10km	1550nm	1310nm	-40 ~ 85ºC
MGB-TLA20 MGB-TLB20	YES	1000	WDM (LC)	Single Mode	20km	1310nm	1550nm	-40 ~ 85ºC
		1000	WDM (LC)	Single Mode	20km	1550nm	1310nm	-40 ~ 85ºC
MGB-TLA40 MGB-TLB40	YES	1000	WDM (LC)	Single Mode	40km	1310nm	1550nm	-40 ~ 85ºC
		1000	WDM (LC)	Single Mode	40km	1550nm	1310nm	-40 ~ 85ºC
MGB-TLA60 MGB-TLB60	YES	1000	WDM(LC)	Single Mode	60km	1310nm	1550nm	-40 ~ 85ºC
		1000	WDM(LC)	Single Mode	60km	1550nm	1310nm	-40 ~ 85ºC

MGB-TLA80 MGB-TLB80	YES	1000	WDM (LC)	Single Mode	80km	1490nm	1550nm	-40 ~ 85ºC
		1000	WDM (LC)	Single Mode	80km	1550nm	1490nm	-40 ~ 85ºC
MGB-TLA120 MGB-TLB120	YES	1000	WDM(LC)	Single Mode	120km	1490nm	1550nm	-40 ~ 85ºC
		1000	WDM(LC)	Single Mode	120km	1550nm	1490nm	-40 ~ 85ºC

Gigabit Ethernet Transceiver (2500BASE-X SFP)

Model	DDM	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (nm)	Operating Temp.
MGB-2GTSR	YES	2500	LC	Multi Mode	300m	850nm	-40 ~ 85ºC
MGB-2GTLR2	YES	2500	LC	Single Mode	2km	1310nm	-40 ~ 85ºC
MGB-2GTLR20	YES	2500	LC	Single Mode	20km	1310nm	-40 ~ 85ºC

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

Model	DDM	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (TX)	Wavelength (RX)	Operating Temp.
MGB-2GTLA20	YES	2500	WDM(LC)	Single Mode	20km	1310nm	1550nm	-40 ~ 85ºC
MGB-2GTLB20		2500	WDM(LC)	Single Mode	20km	1550nm	1310nm	-40 ~ 85ºC

SFP Model / Physical Fiber Cable Length "n" km	MGB-LX	MGB-L40	MGB-L80	MGB-L120
10 < n < 20	--	5-7 dB	13-15 dB	25-27 dB
20 < n < 40	--	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-TL40	MGB-TL80
10 < n < 20	--	5-7 dB	13-15 dB
20 < n < 40	--	3-5 dB	10-12 dB
60 < n < 80	--	--	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	MGB-LA80 MGB-LB80 MGB-TLA80 MGB-TLB80
10 < n < 20	--	2 dB	4-6 dB	8-10 dB	13-15 dB
20 < n < 40	--	--	2-4 dB	6-8 dB	10-12 dB
40 < n < 60	--	--	--	2-4 dB	5-7 dB
60 < n < 80		--	--	--	2-4 dB

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

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

Model	DDM	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (nm)	Operating Temp.
MTB-RJ	--	10G	Copper	--	30m	--	0 ~ 70ºC
MTB-SR	YES	10G	LC	Multi-Mode	Up to 300m	850nm	0 ~ 60ºC
MTB-SR2	YES	10G	LC	Multi-Mode	2km	850nm	0 ~ 60ºC
MTB-LR	YES	10G	LC	Single Mode	10km	1310nm	0 ~ 60ºC
MTB-LR20	YES	10G	LC	Single Mode	20km	1310nm	0 ~ 60ºC
MTB-LR40	YES	10G	LC	Single Mode	40km	1310nm	0 ~ 60ºC
MTB-LR60	YES	10G	LC	Single Mode	60km	1550nm	0 ~ 60ºC

MTB-LR80	YES	10G	LC	Single Mode	80km	1550nm	0 ~ 60ºC
MTB-TSR	YES	10G	LC	Multi-Mode	Up to 300m	850nm	-40 ~ 85ºC
MTB-TSR2	YES	10G	LC	Multi-Mode	2km	1310nm	-40 ~ 85ºC
MTB-TLR	YES	10G	LC	Single Mode	10km	1310nm	-40 ~ 85ºC
MTB-TLR20	YES	10G	LC	Single Mode	20km	1310nm	-40 ~ 85ºC
MTB-TLR40	YES	10G	LC	Single Mode	40km	1310nm	-40 ~ 85ºC
MTB-TLR60	YES	10G	LC	Single Mode	60km	1550nm	-40 ~ 85ºC
MTB-TLR80	YES	10G	LC	Single Mode	80km	1550nm	-40 ~ 85ºC

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

Model	DDM	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (TX)	Wavelength (RX)	Operating Temp.
MTB-LA10 MTB-LB10	YES	10G	WDM(LC)	Single Mode	10km	1270nm	1330nm	0 ~ 60ºC
		10G	WDM(LC)	Single Mode	10km	1330nm	1270nm	0 ~ 60ºC
MTB-LA20 MTB-LB20	YES	10G	WDM (LC)	Single Mode	20km	1270nm	1330nm	0 ~ 60ºC
		10G	WDM (LC)	Single Mode	20km	1330nm	1270nm	0 ~ 60ºC
MTB-LA40 MTB-LB40	YES	10G	WDM (LC)	Single Mode	40km	1270nm	1330nm	0 ~ 60ºC
		10G	WDM (LC)	Single Mode	40km	1330nm	1270nm	0 ~ 60ºC
MTB-LA60 MTB-LB60	YES	10G	WDM (LC)	Single Mode	60km	1270nm	1330nm	0 ~ 60ºC
		10G	WDM (LC)	Single Mode	60km	1330nm	1270nm	0 ~ 60ºC

MTB-LA70 MTB-LB70	YES	10G	WDM(LC)	Single Mode	70km	1270nm	1330nm	0 ~ 60ºC
		10G	WDM(LC)	Single Mode	70km	1330nm	1270nm	0 ~ 60ºC
MTB-TLA20 MTB-TLB20	YES	10G	WDM(LC)	Single Mode	20km	1270nm	1330nm	-40 ~ 85ºC
		10G	WDM(LC)	Single Mode	20km	1330nm	1270nm	-40 ~ 85ºC
MTB-TLA40 MTB-TLB40	YES	10G	WDM(LC)	Single Mode	40km	1270nm	1330nm	-40 ~ 85ºC
		10G	WDM(LC)	Single Mode	40km	1330nm	1270nm	-40 ~ 85ºC
MTB-TLA60 MTB-TLB60	YES	10G	WDM(LC)	Single Mode	60km	1270nm	1330nm	-40 ~ 85ºC
		10G	WDM(LC)	Single Mode	60km	1330nm	1270nm	-40 ~ 85ºC

SFP Model / Physical Fiber Cable Length "n" km	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. Installation and Removal of Transceiver Module

4-1 Installing 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.

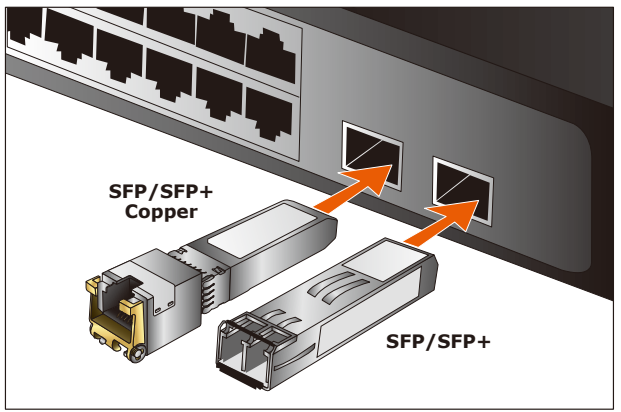

Figure 1: Inserting the SFP/SFP+ Mini-GBIC Module

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 Removing 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.

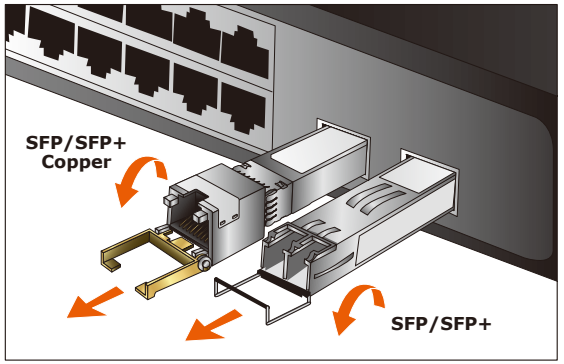

Figure 2: Removing the SFP/SFP+ Mini-GBIC Module

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.

4-3 Connecting the UTP Cable

The 1G/2.5G/5G/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. 1G/2.5G/5G/10GBASE-T uses Cat5e/6/7 UTP (see table below). Maximum distance is 100 meters (328 feet).

Standard	Transfer Speed	Cable Requirement 100M
10GBASE-T	10000Mbit/s	Cat 6A/7
5GBASE-T	5000Mbit/s	Cat 6/6A/7
2.5GBASE-T	2500Mbit/s	Cat 5e/6/6A/7
1000BASE-T	1000Mbit/s	Cat 5e/6/6A/7


Note

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

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	50/125μm or 62.5/125μm
100BASE-FX	Single mode	9/125μm
100BASE-BX	Multi-mode	50/125μm
1000BASE-SX	Multi-mode	50/125μm or 62.5/125μm
1000BASE-LX	Single mode	9/125μm
1000BASE-BX	Single mode	9/125μm

10GBASE-SR	Multi-mode	50/125μm or 62.5/125μm
10GBASE-LR	Single mode	9/125μm
10GBASE-BX	Single mode	9/125μm

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.