

**Industrial 8-Port 10/100/1000BASE-T  
+ 2-Port 100/1000BASE-X SFP Ethernet Switch**

**IGS-1020TF**

User's Manual

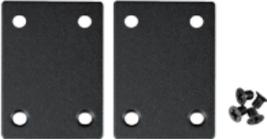
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## 1. Package Contents

Thank you for purchasing PLANET industrial 10-port Gigabit Ethernet Switch, IGS-1020TF. In the following section, the term **“Industrial Gigabit Ethernet Switch”** means the IGS-1020TF.

Open the box of the Industrial Gigabit Ethernet Switch and carefully unpack it. The box should contain the following items:

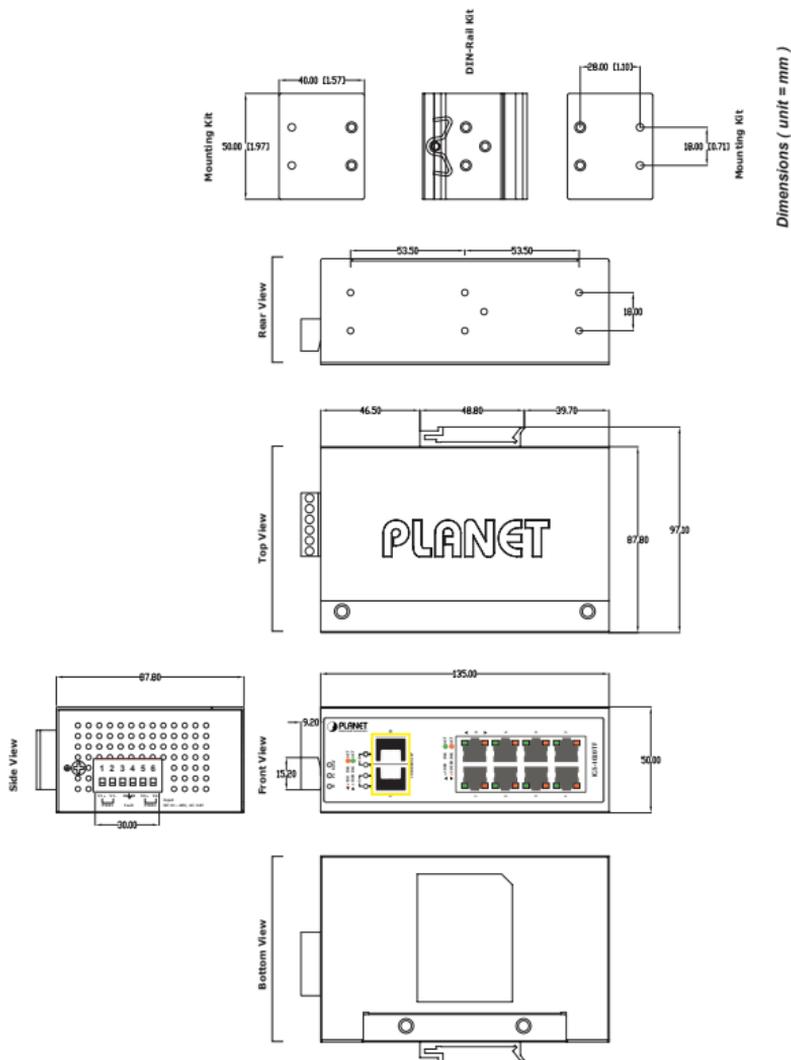
<p>Industrial Gigabit Ethernet Switch x 1</p>  A black industrial Gigabit Ethernet switch with a green terminal block on top, a yellow SFP port, and ten RJ45 ports on the front panel.	<p>User's Manual x 1</p>  The cover of the user's manual, featuring the PLANET logo and the product name "Industrial Ethernet Switch".
<p>Wall-mount Kit x</p>  Two black metal wall-mount brackets, each with four circular holes, and three screws.	<p>DIN Rail Kit x 1</p>  A black metal DIN rail mount with two circular holes and three screws.

If any of these are missing or damaged, please contact your dealer immediately; if possible, retain the carton including the original packing material, and use them again to repack the product in case there is a need to return it to us for repair.

## 2. Hardware Introduction

### 2.1 Physical Dimensions

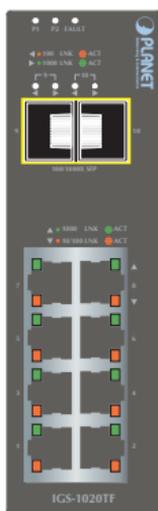
- IGS-1020TF Industrial Gigabit Ethernet Switch dimensions (W x D x H): 135 x 87.8 x 50mm



## 2.2 Switch Front Panel

The front panel of the Industrial Gigabit Ethernet Switch consists of 8 auto-sensing 10/100/1000Mbps Ethernet RJ45 ports and 2 dual speed 100/1000BASE-X SFP slots. The LED Indicators are also located on the RJ45 ports and SFP slots of the Gigabit Ethernet Switch.

Figure 2-1 shows the front panel of Industrial Gigabit Ethernet Switch.



**Figure 2-1:** IGS-1020TF Front Panel

### ■ Gigabit TP Interface

10/100/1000BASE-T Copper, RJ45 Twisted-pair: Up to 100 meters.

### ■ SFP Slot

100/1000BASE-X mini-GBIC slot, SFP (Small-form Factor Pluggable) transceiver module: From 550 meters to 2km (multi-mode fiber) and 10/20/30/40/50/70/120 kilometers (single-mode fiber).

## 2.3 LED Indicators

### System

LED	Color	Function
P1	Green	<b>Lit:</b> indicates power 1 has power.
P2	Green	<b>Lit:</b> indicates power 2 has power.
FAULT	Red	<b>Lit:</b> indicates either power 1 or power 2 has no power.

### Per 10/100/1000T Port

LED	Color	Function
100 LNK/ACT	Orange	<b>Lit:</b> indicates the link through that port is successfully established at 100Mbps or 10Mbps. <b>Blinking:</b> indicates that the Switch is actively sending or receiving data over that port. <b>Off:</b> indicates the link through that port is successfully established at 1000Mbps.
1000 LNK/ACT	Green	<b>Lit:</b> indicates the link through that port is successfully established at 1000Mbps or 10Mbps. <b>Blinking:</b> indicates that the Switch is actively sending or receiving data over that port. <b>Off:</b> indicates the link through that port is successfully established at 100Mbps.

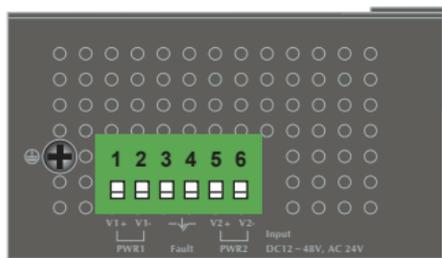
## Per 100 / 1000X SFP Slot

LED	Color	Function
100 LNK/ACT	Orange	<b>Lit:</b> indicates the link through that port is successfully established at 100Mbps. <b>Blinking:</b> indicates that the Switch is actively sending or receiving data over that port. <b>Off:</b> indicates the link through that port is successfully established at 1000Mbps.
1000 LNK/ACT	Green	<b>Lit:</b> indicates the link through that port is successfully established at 1000Mbps or 10Mbps. <b>Blinking:</b> indicates that the Switch is actively sending or receiving data over that port. <b>Off:</b> indicates the link through that port is successfully established at 100Mbps.

## 2.4 Switch Upper Panel

The upper panel of the Industrial Gigabit Ethernet Switch consists of one terminal block connector within two DC power inputs,

Figure 2-2 shows the upper panel of the Industrial Gigabit Ethernet Switch.



**Figure 2-2:** Industrial Gigabit Ethernet Switch Upper Panel

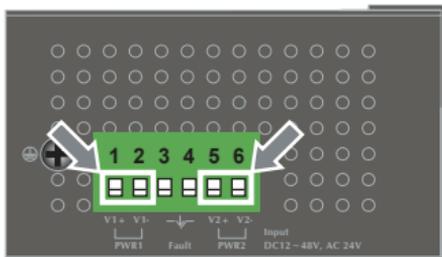
## 2.5 Wiring the Power Inputs

The 6-contact terminal block connector on the top panel of Industrial Gigabit Ethernet Switch is used for two DC redundant power inputs. Please follow the steps below to insert the power wire.

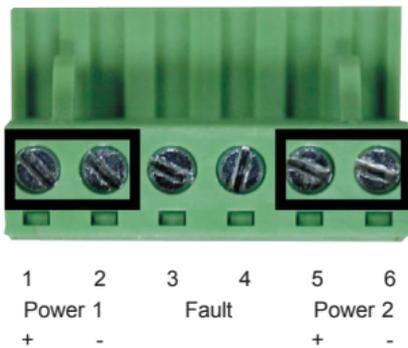


When performing any of the procedures like inserting the wires or tightening the wire-clamp screws, make sure the power is OFF to prevent from getting an electric shock.

1. Insert positive and negative DC power wires into contacts 1 and 2 for POWER 1, or 5 and 6 for POWER 2.



2. Tighten the wire-clamp screws for preventing the wires from loosening.

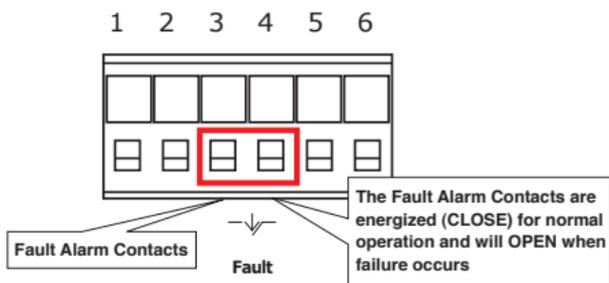


Note

1. The wire gauge for the terminal block should be in the range between 12 and 24 AWG.
2. The DC power input range is 12V ~ 48V DC.

## 2.6 Wiring the Fault Alarm Contact

The fault alarm contacts are in the middle of the terminal block connector as the picture shows below. Inserting the wires, the Industrial Gigabit Ethernet Switch will detect the fault status of the power failure and then forms an open circuit. The following illustration shows an application example for wiring the fault alarm contacts.



Insert the wires into the fault alarm contacts



Note

1. The wire gauge for the terminal block should be in the range between 12 and 24 AWG.
2. Alarm relay circuit accepts up to 30V, max. 3A currents.

## 2.7 Product Specifications

Model	IGS-1020TF
Hardware Specifications	
Copper Ports	8 x 10/100/1000BASE-T RJ45 TP Auto-MDI/MDI-X, auto-negotiation

SFP/mini-GBIC Slots	2 1000BASE-SX/LX/BX SFP interfaces (Port-9 and Port-10) Compatible with 100BASE-FX SFP
Switch Processing Scheme	Store-and-Forward
Switch Fabric	20Gbps (non-blocking)
Switch Throughput (packet per second)	14.88Mpps@64bytes
MAC Address Table	4K entries
Flow Control	Back pressure for half duplex IEEE 802.3x pause frame for full duplex
Jumbo Frame	9216 bytes
Connector	Removable 6-pin terminal block Pin 1/2 for Power 1; Pin 3/4 for fault alarm; Pin 5/6 for Power 2
Alarm	Provides one relay output for power failure Alarm Relay current carry ability: 1A @ DC 24V
LED Indicator	3 x LED for System and Power: Green: DC Power 1 Green: DC Power 2 Red: Power Fault 2 x LED for Per Copper Port (Port-1~Port-8): Green: 1000 LNK/ACT Orange:100 LNK/ACT 2 x LED for Per mini-GBIC interface (Port-9 and Port-10) Green: 1000 LNK/ACT Orange: 100 LNK/ACT

ESD Protection	6KV DC	
Enclosure	IP30 type metal case	
Installation	DIN rail kit and wall mount ear	
Dimensions (W x D x H)	56 x 87 x 135 mm	
Weight	540g	
Power Requirements	DC 12~48V or AC 24V Redundant power with polarity reverses protection function	
Power Consumption/ Dissipation	8.7watts/29.69BTU	
Cable	Twisted-pair	10BASE-T: 2-pair UTP Cat. 3, 4, 5, up to 100 meters 100BASE-TX: 2-pair UTP Cat. 5, 5e up to 100 meters 1000BASE-T: 4-pair UTP Cat. 5e, 6 up to 100 meters
	Fiber-Optic Cable	1000BASE-SX : 50/125μm or 62.5/125μm multi-mode fiber optic cable, up to 550m 1000BASE-LX : 9/125μm single-mode fiber optic cable, up to 10/20/30/40/50/70/120 kilometers (vary on SFP module) 100BASE-FX : 50/125μm or 62.5/125μm multi-mode fiber optic cable, up to 2 kilometers 9/125μm single-mode fiber optic cable, up to 20/40/60 kilometers (vary on SFP module)

Standards Conformance	
Standards Compliance	IEEE 802.3 Ethernet/10BASE-T IEEE 802.3u Fast Ethernet/100BASE-TX IEEE 802.3ab Gigabit Ethernet/1000BASE-T IEEE 802.3z Gigabit Ethernet/1000BASE-SX/LX IEEE 802.3x Full-Duplex Flow Control IEEE 802.3az Energy Efficient Ethernet (EEE) IEEE 802.1p Cos
Regulatory Compliance	FCC Part 15 Class A, CE
Stability Testing	IEC60068-2-32 (free fall) IEC60068-2-27 (anti-shock) IEC60068-2-6 (anti-vibration)
Environment	
Temperature	Operating: -40~75 degrees C Storage: -40~75 degrees C
Humidity	Operating: 5~95% (non-condensing) Storage: 5~95% (non-condensing)

### 3. Installation

This section describes the functionalities of the Industrial Gigabit Ethernet Switch's components and guides how to install it on the DIN-rail and wall. Basic knowledge of networking is assumed. Please read this chapter completely before continuing.



This following picture is telling the user how to install the device, and the device is not IGS-1020TF.

#### 3.1 DIN-rail Mounting Installation

The DIN-rail is screwed on the Industrial Gigabit Ethernet Switch when out of factory. When replacing the wall-mount application with DIN-rail application, Industrial Gigabit Ethernet Switch is needed. Please refer to the following figures to screw the DIN-rail on the Industrial Gigabit Ethernet Switch. To hang the Industrial Gigabit Ethernet Switch, follow the following steps:

**Step 1:** Screw the DIN-rail on the Industrial Gigabit Ethernet Switch.



**Step 2:** Lightly insert the bottom of the switch into the track



**Step 3:** Make sure if the DIN-Rail is tightly secured on the track.



**Step 4:** Please refer to the following procedures to remove the Industrial Gigabit Ethernet Switch from the track.



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**Step 5:** Lightly pull out the bottom of the switch for removing it from the track.

## 3.2 Wall-mount Plate Mounting

To install the Industrial Gigabit Ethernet Switch on the wall, please follow the instructions described below.

**Step 1:** To remove the DIN-Rail from the Industrial Gigabit Ethernet Switch, loosen the screws to remove the DIN-rail.

**Step 2:** Place the wallmount plate on the rear panel of the Industrial Gigabit Ethernet Switch.



**Step 3:** Use the screws to screw the wallmount plate on the Industrial Gigabit Ethernet Switch.

**Step 4:** Use the hook holes at the corners of the wallmount plate to hang the Industrial Gigabit Ethernet Switch on the wall.

**Step 5:** To remove the wallmount plate, reverse the steps above.

### 3.3 Installing the SFP Transceiver

The sections describe how to insert an SFP transceiver into an SFP slot.

The SFP transceivers are hot-pluggable and hot-swappable. You can plug in and out the transceiver to/from any SFP port without having to power down the Industrial Gigabit Ethernet Switch as Figure 2-3 shows.



**Figure 3-1:** Plug-in the SFP Transceiver

PLANET Industrial Gigabit Ethernet Switch supports 100/1000 dual mode with both single mode and multi-mode SFP transceivers.

1. Before we connect Industrial Gigabit Ethernet Switch to the other network device, we have to make sure both sides of the SFP transceivers are with the same media type, for example, 1000BASE-SX to 1000BASE-SX, 1000BASE-LX to 1000BASE-LX.

2. Check whether the fiber-optic cable type matches with the SFP transceiver requirement.

- To connect to **1000BASE-SX** SFP transceiver, please use the multi-mode fiber cable with one side being the male duplex LC connector type.
- To connect to **1000BASE-LX** or **1000BASE-BX** SFP transceiver, please use the **single-mode** fiber cable with one side being the male duplex LC connector type.

■ Connect the Fiber Cable

1. Insert the duplex LC connector into the SFP transceiver.
2. Connect the other end of the cable to a device with SFP transceiver installed.
3. Check the LNK/ACT LED of the SFP slot on the front of the Industrial Gigabit Ethernet Switch. Ensure that the SFP transceiver is operating correctly.
4. Check the Link mode of the SFP port if the link fails.

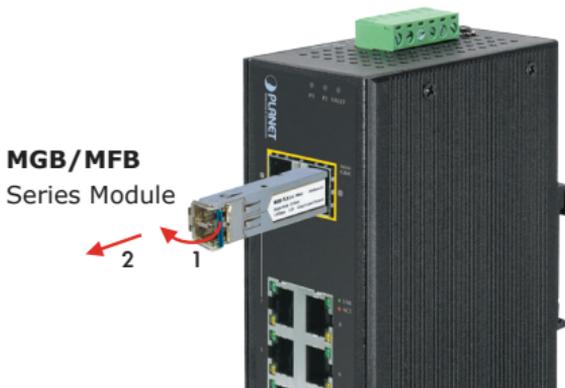


Note

It is recommended to use PLANET SFPs on the Industrial Gigabit Ethernet Switch. If you insert an SFP transceiver that is not supported, the Industrial Gigabit Ethernet Switch will not recognize it.

### 3.4 Removing the Transceiver Module

1. Make sure there is no network activity by consulting or checking with the network administrator. Or through the management interface of the switch/converter (if available) to disable the port in advance.
2. Remove the Fiber Optic Cable gently.
3. Turn the lever of the MGB/MFB module to a horizontal position.
4. Pull out the module gently through the lever.



**Figure 3-2:** Pull Out from the Transceiver



Note

Never pull out the module without pulling the lever or the push bolts on the module. Directly pulling out the module with force could damage the module and the SFP module slot of the Industrial Gigabit Ethernet Switch.

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## **4. Troubleshooting**

This chapter contains information to help you solve issues. If the Industrial Gigabit Ethernet Switch is not functioning properly, make sure the Industrial Gigabit Ethernet Switch was set up according to instructions in this manual.

### **The per port LED is not lit**

Solution:

Check the cable connection of the Industrial Gigabit Ethernet Switch.

### **Per port LED is lit, but the traffic is irregular**

Solution:

Check whether the attached device is not set to dedicated full duplex. Some devices use a physical or software switch to change duplex modes. Auto-negotiation may not recognize this type of full-duplex setting.

### **Why the Industrial Gigabit Ethernet Switch doesn't connect to the network**

Solution:

Check each port LED on the Industrial Gigabit Ethernet Switch. Try another port on the Industrial Gigabit Ethernet Switch. Make sure the cable is installed properly and the right type. Turn off the power. After a while, turn on the power again.

### **Can I install MGB-SX or other non wide temperature SFP module into SFP slot of Industrial Gigabit Ethernet Switch?**

Solution:

Yes, you can. However, the MGB-SX and the other non wide temperature SFP module cannot operate under -40 to 75 degrees C.

## **APPENDIX A: Networking Connection**

### **A.1 Switch's RJ45 Pin Assignments**

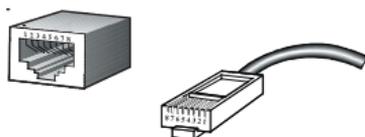
#### **1000Mbps, 1000BASE-T**

<b>Contact</b>	<b>MDI</b>	<b>MDI-X</b>
1	BI_DA+	BI_DB+
2	BI_DA-	BI_DB-
3	BI_DB+	BI_DA+
4	BI_DC+	BI_DD+
5	BI_DC-	BI_DD-
6	BI_DB-	BI_DA-
7	BI_DD+	BI_DC+
8	BI_DD-	BI_DC-

#### **10/100Mbps, 10/100BASE-TX**

<b>RJ45 Connector pin assignment</b>		
<b>Contact</b>	<b>MDI Media Dependent Interface</b>	<b>MDI-X Media Dependent Interface -Cross</b>
1	Tx + (transmit)	Rx + (receive)
2	Tx - (transmit)	Rx - (receive)
3	Rx + (receive)	Tx + (transmit)
4, 5	Not used	
6	Rx - (receive)	Tx - (transmit)
7, 8	Not used	

## A.2 RJ45 Cable Pin Assignments



The standard RJ45 receptacle/connector

There are 8 wires on a standard UTP/STP cable and each wire is color-coded. The following shows the pin allocation and color of straight-through cable and crossover cable connection:

### Straight Cable



SIDE 1

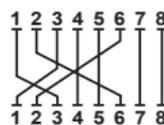
SIDE 1

- 1 = White/Orange
- 2 = Orange
- 3 = White/Green
- 4 = Blue
- 5 = White/Blue
- 6 = Green
- 7 = White/Brown
- 8 = Brown

SIDE 2

- 1 = White/Orange
- 2 = Orange
- 3 = White/Green
- 4 = Blue
- 5 = White/Blue
- 6 = Green
- 7 = White/Brown
- 8 = Brown

### Cross Over Cable



SIDE 1

SIDE 1

- 1 = White/Orange
- 2 = Orange
- 3 = White/Green
- 4 = Blue
- 5 = White/Blue
- 6 = Green
- 7 = White/Brown
- 8 = Brown

SIDE 2

- 1 = White/Green
- 2 = Green
- 3 = White/Orange
- 4 = Blue
- 5 = White/Blue
- 6 = Orange
- 7 = White/Brown
- 8 = Brown

**Figure A-1:** Straight-through and Crossover Cable

Please make sure your connected cables are with the same pin assignment and color as the above picture before deploying the cables into your network.

## A.3 Fiber Optic Cable Connection Parameter

The wiring details are shown below:

### 100FX Fiber Optic Cables:

Standard	Fiber Type	Cable Specifications
100BASE-FX (1300nm)	Multi-mode	50/125 $\mu$ m or 62.5/125 $\mu$ m
100BASE-FX (1310nm)	Multi-mode	50/125 $\mu$ m or 62.5/125 $\mu$ m
	Single-mode	9/125 $\mu$ m
100BASE-BX-U (TX:1310/RX:1550) 100BASE-BX-D (TX:1550/RX:1310)	Single-mode	9/125 $\mu$ m

### 1000X Fiber Optic Cables:

Standard	Fiber Type	Cable Specifications
1000BASE-SX (850nm)	Multi-mode	50/125 $\mu$ m or 62.5/125 $\mu$ m
1000BASE-LX (1300nm)	Multi-mode	50/125 $\mu$ m or 62.5/125 $\mu$ m
	Single-mode	9/125 $\mu$ m

## Wiring Distances:

Standard	Fiber	Diameter (micron)	Modal Bandwidth (MHz * km)	Max. Distance (meters)
1000BASE-SX	MM	62.5	100	220
		62.5	200	275
		50	400	500
		50	500	550
1000BASE-LX	MM	62.5	5	550
		50	4	
		50	5	
	SM	9	N/A	5000*

## ***APPENDIX B: Approved PLANET SFP Transceivers***

The following list of approved PLANET SFP transceivers is correct at the time of publication:

### **Gigabit SFP Transceiver Modules**

MGB-GT	SFP-Port 1000BASE-T Module - 100m
MGB-SX	SFP-Port 1000BASE-SX mini-GBIC module - 550m
MGB-SX2	SFP-Port 1000BASE-SX mini-GBIC module - 2km
MGB-LX	SFP-Port 1000BASE-LX mini-GBIC module - 10km
MGB-L30	SFP-Port 1000BASE-LX mini-GBIC module - 30km
MGB-L50	SFP-Port 1000BASE-LX mini-GBIC module - 50km
MGB-L70	SFP-Port 1000BASE-LX mini-GBIC module - 70km
MGB-L120	SFP-Port 1000BASE-LX mini-GBIC module - 120km
MGB-LA10	SFP-Port 1000BASE-LX (WDM, TX:1310nm) mini-GBIC module - 10km
MGB-LB10	SFP-Port 1000BASE-LX (WDM, TX:1550nm) mini-GBIC module - 10km
MGB-LA20	SFP-Port 1000BASE-LX (WDM, TX:1310nm) mini-GBIC module - 20km
MGB-LB20	SFP-Port 1000BASE-LX (WDM, TX:1550nm) mini-GBIC module - 20km
MGB-LA40	SFP-Port 1000BASE-LX (WDM, TX:1310nm) mini-GBIC module - 40km
MGB-LB40	SFP-Port 1000BASE-LX (WDM, TX:1550nm) mini-GBIC module - 40km

MGB-LA60	SFP-Port 1000BASE-LX (WDM, TX:1310nm) mini-GBIC module - 60km
MGB-LB60	SFP-Port 1000BASE-LX (WDM, TX:1550nm) mini-GBIC module - 60km
MGB-TSX	SFP-Port 1000BASE-SX mini-GBIC module - 550m (-40~75°C)
MGB-TLX	SFP-Port 1000BASE-LX mini-GBIC module - 10km (-40~75°C)
MGB-TL30	SFP-Port 1000BASE-LX mini-GBIC module - 30km (-40~75°C)
MGB-TL70	SFP-Port 1000BASE-LX mini-GBIC module - 70km (-40~75°C)
MGB-TLA10	SFP-Port 1000BASE-LX (WDM, TX:1310nm) mini-GBIC module - 10km (-40~75°C)
MGB-TLB10	SFP-Port 1000BASE-LX (WDM, TX:1550nm) mini-GBIC module - 10km (-40~75°C)
MGB-TLA20	SFP-Port 1000BASE-LX (WDM, TX:1310nm) mini-GBIC module - 20km (-40~75°C)
MGB-TLB20	SFP-Port 1000BASE-LX (WDM, TX:1550nm) mini-GBIC module - 20km (-40~75°C)
MGB-TLA40	SFP-Port 1000BASE-LX (WDM, TX:1310nm) mini-GBIC module - 40km (-40~75°C)
MGB-TLB40	SFP-Port 1000BASE-LX (WDM, TX:1550nm) mini-GBIC module - 40km (-40~75°C)
MGB-TLA60	SFP-Port 1000BASE-LX (WDM, TX:1310nm) mini-GBIC module - 60km (-40~75°C)
MGB-TLB60	SFP-Port 1000BASE-LX (WDM, TX:1550nm) mini-GBIC module - 60km (-40~75°C)

## Fast Ethernet SFP Transceiver Modules

MFB-FX	SFP-Port 100BASE-FX Transceiver (1310nm) - 2km
MFB-F20	SFP-Port 100BASE-FX Transceiver (1310nm) - 20km
MFB-F40	SFP-Port 100BASE-FX Transceiver (1310nm) - 40km
MFB-F60	SFP-Port 100BASE-FX Transceiver (1310nm) - 60km
MFB-F120	SFP-Port 100BASE-FX Transceiver (1550nm) - 120km
MFB-FA20	SFP-Port 100BASE-BX Transceiver (WDM, TX:1310nm) - 20km
MFB-FB20	SFP-Port 100BASE-BX Transceiver (WDM, TX:1550nm) - 20km
MFB-TFX	SFP-Port 100BASE-FX Transceiver (1310nm) - 2km (-40~75°C)
MFB-TF20	SFP-Port 100BASE-FX Transceiver (1310nm) - 20km (-40~75°C)
MFB-TFA20	SFP-Port 100BASE-BX Transceiver (WDM, TX:1310nm) - 20km (-40~75°C)
MFB-TFB20	SFP-Port 100BASE-BX Transceiver (WDM, TX:1550nm) - 20km (-40~75°C)
MFB-TFA40	SFP-Port 100BASE-BX Transceiver (WDM, TX:1310nm) - 40km (-40~75°C)
MFB-TFB40	SFP-Port 100BASE-BX Transceiver (WDM, TX:1550nm) - 40km (-40~75°C)

