Industrial 8-Port 10/100TX 802.3at PoE+

+ 2-Port Gigabit TP/SFP Combo Ethernet Switch

IFGS-1022HPT

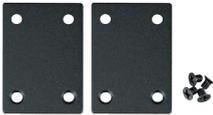User's Manual

Table of Contents

1. Package Contents

Thank you for purchasing PLANET industrial 8-Port 10/100TX 802.3at PoE+ + 2-Port Gigabit TP/SFP combo Ethernet Switch, IFGS-1022HPT. In the following section, the term **"Industrial PoE+ Switch"** means the IFGS-1022HPT.

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

Industrial PoE+ Switch x 1	User's Manual x 1
DIN Rail Kit x 1	Wall-mount Kit x 1

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

■ Dimensions (W x D x H): 161 x 107 x 72mm

Front View

Top View

36.55   29.98

46.38

1Ag/24V

DC1   Fault   DC2   Input DC 48V ~ 56V

IFGS-1022HPT

72

Side View

9.2

152

Ø3.5

107

Side View

Bottom View

Dimensions (unit = mm)
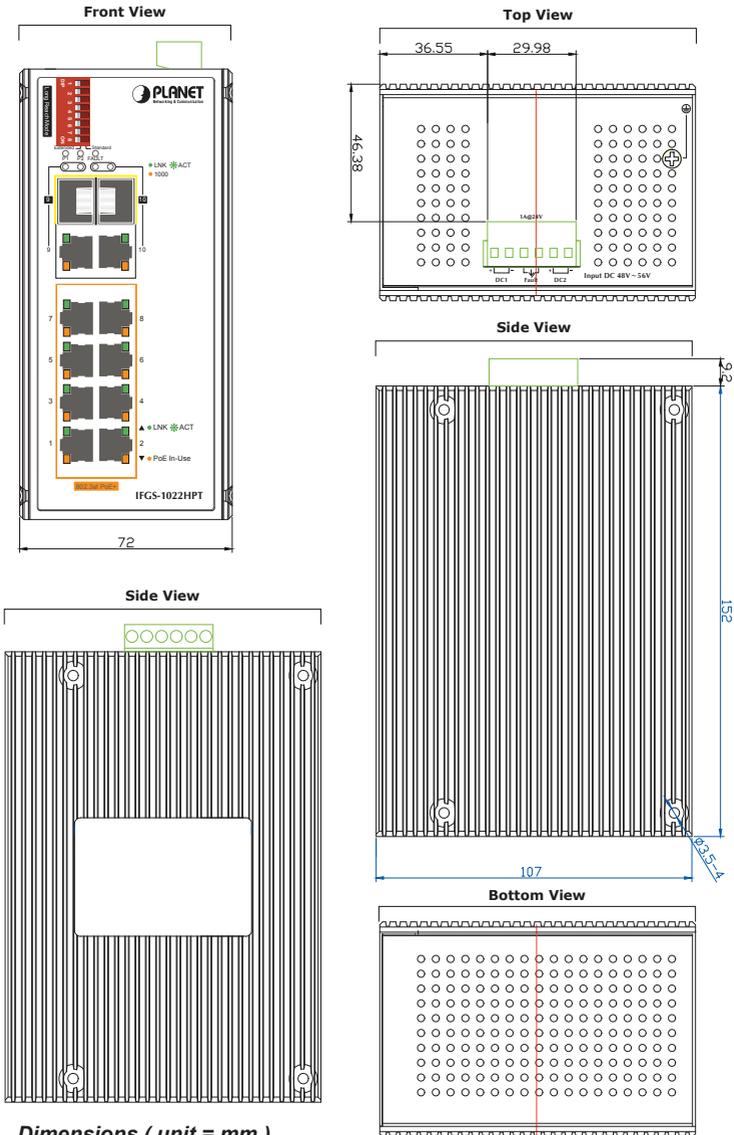
2.2 Switch Front Panel

The front panel of the Industrial PoE+ Switch consists of 8 10/100/BASE-TX ports featuring 30-watt 802.3at PoE+, and 2 additional Gigabit copper/SFP combo interfaces for Gigabit Ethernet extension and video uplink. The LED indicators are also located on the front panel of the Industrial PoE+ Switch.

Figure 2-1 shows the front panel of Industrial PoE+ Switch.
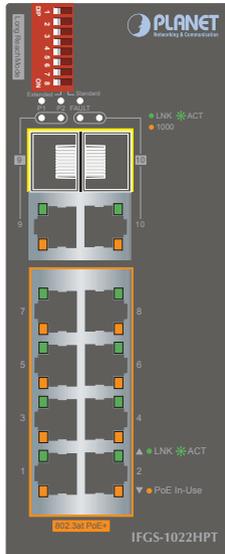
Figure 2-1: IFGS-1022HPT Front Panel

■ **Fast Ethernet TP interfaces (Port 1 to port 8)**

10/100BASE-TX copper, RJ45 twisted-pair: Up to 100 meters.

■ **Gigabit TP Interfaces (Port 9 to port 10 TP/SFP Combo Interfaces)**

10/100/1000BASE-T copper, RJ45 twisted-pair: Up to 100 meters.

■ **Gigabit SFP Slots (Port 9 to port 10 TP/SFP Combo Interfaces)**

1000BASE-SX/LX mini-GBIC slot, SFP (Small Factor Pluggable) transceiver module: From 550 meters (multi-mode fiber) to 10/20/30/40/50/60/70/120 kilo-meters (single-mode fiber).

■ DIP Switch

The Industrial PoE+ Switch has a built-in solid DIP switch that provides **"Standard"** and **"Extend"** operation modes. The Industrial PoE+ Switch operates as a normal IEEE 802.af/at PoE+ Switch in the **"Standard"** operation mode.

In the **"Extend"** operation mode, the Industrial PoE+ Switch operates on a per-port basis at 10Mbps full duplex operation but can support 30-watt PoE power output over a distance of up to 250 meters overcoming the 100m limit on Ethernet UTP cable. With this brand-new feature, the Industrial PoE+ Switch provides an additional solution for 802.3af/at PoE+ distance extension.

Default PoE Mode

PoE IP Camera

100 meters (328 feet)

Extended PoE Mode

PoE IP Camera

250 meters (820 feet)

100BASE-TX UTP with PoE
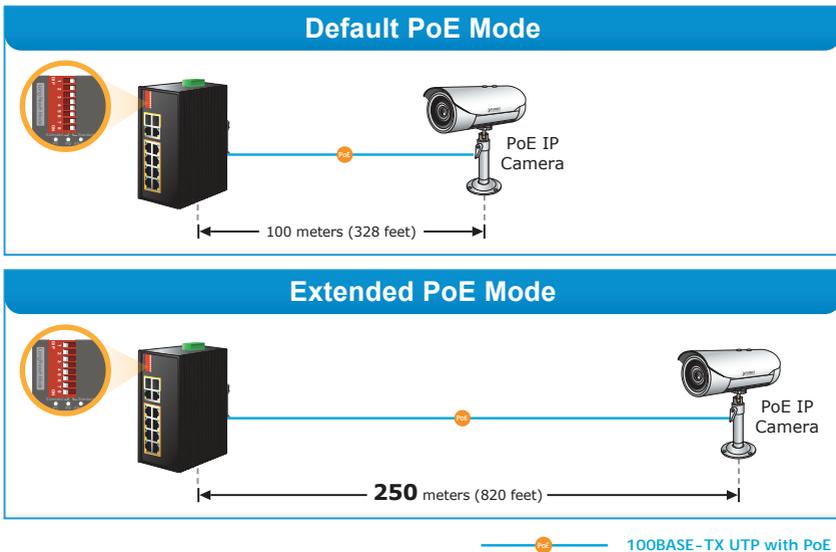
2.3 LED Indicators

System

LED	Color	Function
P1	Green	**Lit:** indicates power 1 has power.
P2	Green	**Lit:** indicates power 2 has power.
FAULT	Red	**Lit:** indicates neither power 1 or power 2 has no power.

Per 802.3at PoE+ 10/100BASE-TX Interface (Port 1 to Port 8)

LED	Color	Function
LNK/ ACT	Green	**Lit:** indicates the link through that port is successfully established at 10Mbps or 100Mbps. **Blinking:** indicates that the switch is actively sending or receiving data over that port.
PoE In-Use	Orange	**Lit:** indicates the port is providing DC in-line power. **Off:** indicates the connected device is not a PoE powered device (PD).

Per 10/100/1000BASE-T Interface (Shared with Port 9 to Port 10)

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

Per 1000X SFP Slot (Shared with Port 9 to Port 10)

LED	Color	Function
LNK/ ACT	Green	**Lit:** indicates the link through that port is successfully established at 1000Mbps. **Blinking:** indicates that the switch is actively sending or receiving data over that port.
1000	Orange	**Lit:** indicates the link through that port is successfully established at 1000Mbps. **Off:** indicates the link through that port is not established.

2.4 Switch Upper Panel

The upper panel of the Industrial PoE+ Switch consists of one terminal block connector within two DC power inputs.

Figure 2-2 shows the upper panel of the Industrial PoE+ Switch.
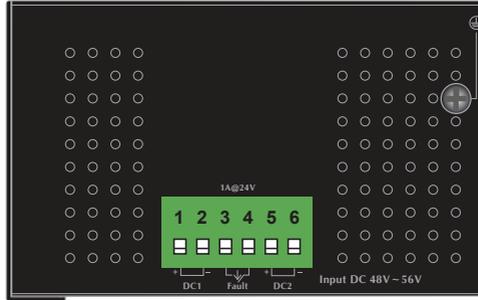
Figure 2-2: Industrial PoE+ Switch Upper Panel

2.5 Wiring the Power Inputs

The 6-contact terminal block connector on the top panel of Industrial PoE+ 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.
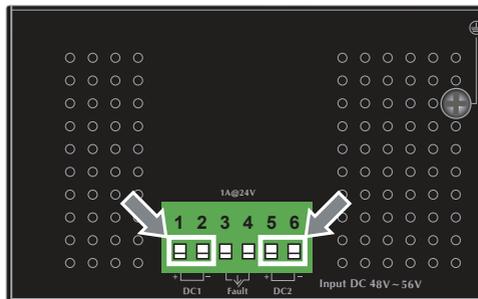
2. Tighten the wire-clamp screws for preventing the wires from loosening.


```
 1     2     3     4     5     6
Power 1     Fault     Power 2
 +     -                +     -
```

	1. The wire gauge for the terminal block should be in the range between 12 and 24 AWG.
Note	2. The DC power input range is 48V ~ 56V 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 PoE+ 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.
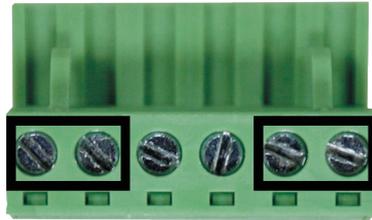

Fault Alarm Contacts

The Fault Alarm Contacts are energized (CLOSE) for normal operation and will OPEN when failure occurs
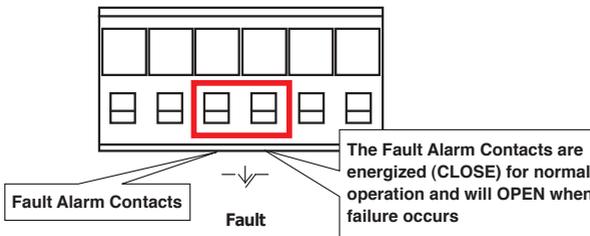
Fault

Insert the wires into the fault alarm contacts

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

2.7 Product Features

➢ **Physical Port**

- **Eight 10/100BASE-TX** Fast Ethernet RJ45 ports with **IEEE 802.3at/af PoE+** Injector (Port-1 to Port-8)
- **Two 10/100/1000BASE-T** Gigabit Ethernet RJ45 ports (Port-9 and Port-10)
- **Two 1000BASE-X** mini-GBIC/SFP slots for SFP type auto detection (Port-9 and Port-10)

➢ **Power over Ethernet**

- Complies with IEEE 802.3at Power over Ethernet Plus, end-span PSE
- Backward compatible with IEEE 802.3af Power over Ethernet
- Up to 8 ports of IEEE 802.3af/802.3at devices powered
- 240-watt PoE budget
- Supports PoE power up to 30 watts for each PoE port
- Auto detects powered device (PD)
- Circuit protection prevents power interference between ports
- Remote power feeding up to 100 meters

➢ **Industrial Case and Installation**

- IP30 metal case
- DIN rail and wall-mount design
- 48~56V DC, redundant power with polarity reverse protect function
- Supports 6000V DC Ethernet ESD protection
- -40 to 75 degrees C operating temperature

➢ **Switching**

- Hardware-based 10/100Mbps (half/full duplex), 1000Mbps (full duplex), auto-negotiation and auto MDI/MDI-X
- Features Store-and-Forward mode with wire-speed filtering and forwarding rates
- IEEE 802.3x flow control for full duplex operation and back pressure for half duplex operation
- 16K MAC address table size
- 10K jumbo frame
- IEEE 802.1Q VLAN transparency
- Hardware DIP switch for **"Standard"** and **"Extend"** mode selection; the **"Extend"** mode features 30-watt PoE transmit distance of 250m at speed of 10Mbps
- Automatic address learning and address aging
- Supports CSMA/CD protocol

2.8 Product Specifications

Product	IFGS-1022HPT
Hardware Specifications	
Fast Ethernet Copper Ports	Eight 10/100BASE-TX RJ45 auto-MDI/MDI-X ports (Port-1 to Port-8)
Gigabit Ethernet Copper Ports	Two 10/100/1000BASE-T RJ45 auto-MDI/MDI-X ports (shared with Port-9 and Port-10)
SFP/mini-GBIC Slots	Two 1000BASE-SX/LX/BX SFP interfaces (shared with Port-9 and Port-10)
PoE Injector Port	Eight ports with 802.3af/802.3at PoE+ injector function (Port-1 to Port-8)
Switch Architecture	Store-and-Forward
Switch Fabric	5.6Gbps/non-blocking
Switch Throughput@64 bytes	4.1Mpps @64 bytes
MAC Address Table	16K entries
Shared Data Buffer	4Mb SRAM
Flow Control	IEEE 802.3x pause frame for full-duplex. Back pressure for half-duplex
Jumbo Frame	10 Kbytes
DIP Switch (Port 1 to port 8)	Standard mode: 30-watt PoE transmit distance of 100m at speed of 10/100Mbps Extend mode: 30-watt PoE transmit distance of 250m at speed of 10Mbps
LED	3 x LED for System and Power: ■ Green: DC Power 1 ■ Green: DC Power 2 ■ Red: Power Fault Alarm 2 x LED for PoE Copper Port (Port-1~Port-8): ■ Green: LNK/ACT (10/100Mbps) ■ Orange: PoE-In-Use 2 x LED for 10/100/1000T Copper Port (Port-9~Port-10): ■ Green: LNK/ACT ■ Orange: 1000 2 x LED for per mini-GBIC interface (Port-9~Port-10) ■ Green: LNK/ACT ■ Orange: 1000

Connector	Removable 6-pin terminal block ■ Pin 1/2 for Power 1 ■ Pin 3/4 for power fault alarm ■ Pin 5/6 for Power 2
Alarm	One relay output for power failure. Alarm relay current carry ability: 1A @ 24V AC
Power Requirements	48~56V DC, 5.5A (max.) (>51V DC for PoE+ output recommended)
Power Consumption/ Dissipation	19 watts, 64BTU (Standby without PoE function) at DC 56V power input 23 watts, 78BTU (Full loading without PoE function) at DC 56V power input 244 watts, 832BTU (Full loading with PoE function) at DC 56V power input
Dimensions (W x D x H)	72 x 107 x 161 mm
Weight	1034g
ESD Protection	6KV DC
Enclosure	IP30 aluminum case
Installation	DIN-rail kit and wall-mount kit
Power over Ethernet	
PoE Standard	IEEE 802.3at Power over Ethernet Plus/PSE
PoE Power Supply Type	End-span
Power Pin Assignment	1/2(+), 3/6(-)
PoE Power Output	IEEE 802.3af Standard - Per port 48V~51V DC (depending on the power supply), max. 15.4 watts IEEE 802.3at Standard - Per port 51V~56V DC (depending on the power supply), max. 30 watts
PoE Power Budget	Dual power input: maximum 240W (depending on power input)
Max. Number of Class 2 PDs	8
Max. Number of Class 3 PDs	8
Max. Number of Class 4 PDs	8
Standards Conformance	
Regulatory Compliance	FCC Part 15 Class A, CE

Stability Testing	IEC 60068-2-32 (free fall)
	IEC 60068-2-27 (shock)
	IEC 60068-2-6 (vibration)
Standards Compliance	IEEE 802.3 10BASE-T
	IEEE 802.3u 100BASE-TX
	IEEE 802.3ab Gigabit 1000BASE-T
	IEEE 802.3z Gigabit SX/LX
	IEEE 802.3x Flow Control and Back Pressure
	IEEE 802.3af Power over Ethernet
	IEEE 802.3at Power over Ethernet Plus
Environment	
Operating Temperature	-40 ~ 75 degrees C
Storage Temperature	-40 ~ 85 degrees C
Humidity	5 ~ 95% (non-condensing)

3. Installation

This section describes the functionalities of the Industrial PoE+ 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.

Note This following picture is telling the user how to install the device, and the device is not IFGS-1022HPT.

3.1 DIN-rail Mounting Installation

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

Step 1: Screw the DIN-rail on the Industrial PoE+ 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 PoE+ Switch from the track.

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 PoE+ Switch on the wall, please follow the instructions described below.

Step 1: To remove the DIN-Rail from the Industrial PoE+ Switch, loosen the screws to remove the DIN-rail.

Step 2: Place the wall mount plate on the rear panel of the Industrial PoE+ Switch.

Step 3: Use the screws to screw the wall mount plate on the Industrial PoE+ Switch.

Step 4: Use the hook holes at the corners of the wall mount plate to hang the Industrial PoE+ Switch on the wall.

Step 5: To remove the wall mount 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 PoE+ Switch as Figure 2-3 shows.

MGB Series Transceiver

Figure 2-3: Plug-in the SFP Transceiver

PLANET Industrial PoE+ Switch supports 1000Mbps mode with both single mode and multi-mode SFP transceivers.

1. Before we connect Industrial PoE+ 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 PoE+ Switch. Ensure that the SFP transceiver is operating correctly.

4. Check the Link mode of the SFP port if the link fails.

<table>
<tr><td>Note</td><td>It is recommended to use PLANET SFPs on the Industrial PoE+ Switch. If you insert an SFP transceiver that is not supported, the Industrial PoE+ Switch will not recognize it.</td></tr>
</table>

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 series module to a horizontal position.

4. Pull out the module gently through the lever.

MGB Series Transceiver

Figure 2-4: Pull Out from the Transceiver

<table>
<tr><td>Note</td><td>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 PoE+ Switch.</td></tr>
</table>

4. Troubleshooting

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

Q1: The per port LED is not lit

Solution:

Check the cable connection of the Industrial PoE+ Switch.

Q2 :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.

Q3: Why the Industrial POE+ Switch doesn't connect to the network

Solution:

Check each port LED on the Industrial PoE+ Switch. Try another port on the Industrial PoE+ Switch. Make sure the cable is installed properly and the right type. Turn off the power. After a while, turn on the power again.
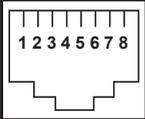
Q4: Can I install MGB-SX or other non wide temperature SFP module into SFP slot of Industrial PoE+ Switch?

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 PoE RJ45 Port Pin Assignments (End-span)

	PIN NO	RJ45 POWER ASSIGNMENT
1 2 3 4 5 6 7 8	1	Power +
	2	Power +
	3	Power -
	6	Power -

A.2 Switch's RJ45 Pin Assignments

1000Mbps, 1000BASE-T

Contact	MDI	MDI-X
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

RJ45 Connector Pin Assignment		
Contact	MDI Media Dependent Interface	MDI-X Media Dependent Interface - Cross
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.3 RJ45 Cable Pin Assignments
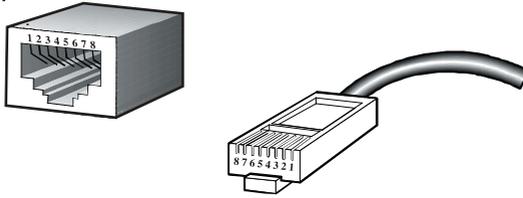
The standard RJ45 receptacle/connector

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 2
1 2 3 4 5 6 7 8	SIDE 1	1 = White/Orange	1 = White/Orange
		2 = Orange	2 = Orange
		3 = White/Green	3 = White/Green
		4 = Blue	4 = Blue
		5 = White/Blue	5 = White/Blue
1 2 3 4 5 6 7 8	SIDE 2	6 = Green	6 = Green
		7 = White/Brown	7 = White/Brown
		8 = Brown	8 = Brown
Crossover Cable		SIDE 1	SIDE 2
1 2 3 4 5 6 7 8	SIDE 1	1 = White/Orange	1 = White/Green
		2 = Orange	2 = Green
		3 = White/Green	3 = White/Orange
		4 = Blue	4 = Blue
1 2 3 4 5 6 7 8	SIDE 2	5 = White/Blue	5 = White/Blue
		6 = Green	6 = Orange
		7 = White/Brown	7 = White/Brown
		8 = 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.4 Fiber Optic Cable Connection Parameter

The wiring details are shown below:

1000X Fiber Optic Cables:

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

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	
		50	4	550
		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)