

**10/100BASE-TX to 100BASE-FX**

**Industrial Media Converter**

**IFT-802T / IFT-802TS15 / IFT-805AT**

**User's Manual**

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## **Revision**

PLANET 10/100BASE-TX to 100BASE-FX Industrial Media Converter User's Manual

For Models: IFT-802T, IFT-802TS15, IFT-805AT

Revision: 1.1 (June, 2015)

Part No: EM-IFT-80xT\_v1.1 (2350-AH1140-001)

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# **1. Introduction**

## **1.1 Package Contents**

Check your package for the following parts:

- 10/100BASE-TX to 100BASE-FX Industrial Media Converter x 1
- User's Manual x 1
- DIN Rail Kit x 1
- Wall Mount Kit x 1
- Screws x 1 (set)

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.

## **1.2 How to Use This Manual**

**This Industrial Media Converter User Manual is structured as follows:**

### **Chapter 2 Installation**

The chapter explains the feature, functionality and the physical installation of the Industrial Media Converter.

### **Chapter 3 Application**

The chapter explains the Industrial Media Converter application.

### **Chapter 4 Media Converter operation**

The chapter explains the Industrial Media Converter transmit operation.

### **Chapter 5 Troubleshooting**

The chapter explains the troubleshooting of the Industrial Media Converter.

### **Appendix A**

This chapter contains cable information of the Industrial Media Converter.

## 1.3 Product Features

### ➤ Physical Port

#### **IFT-802T**

- 1-Port 10/100BASE-TX RJ45
- 1-Port 100BASE-FX interface for up to 2km (Multi-mode fiber 62.5/125µm / 50/125µm)

#### **IFT-802TS15**

- 1-Port 10/100BASE-TX RJ45
- 1-Port 100BASE-FX interface for up to 15km (Single mode fiber 9/125µm)

#### **IFT-805AT**

- 1-Port 10/100BASE-TX RJ45
- 1-Port 100BASE-FX SFP slot (Distance depends on SFP module)

### ➤ Industrial Design

- Slim type IP30 metal case
- -40°C~75°C operating temperature
- DIN rail and wall-mount design
- 12 to 48V DC, redundant power with polarity reverse protect function and connective removable terminal block for master and slave power
- Supports EFT 6KV DC protection for power line
- Supports 6KV DC Ethernet ESD protection

### ➤ Data Communication

- Complies with the IEEE 802.3, IEEE 802.3u Fast Ethernet standard
- Auto-MDI/MDI-X detection and auto-negotiation with half-duplex / full-duplex modes for 10 /100BASE-TX RJ45 port

- Store-and-Forward switching architecture
- Features Store-and-Forward mode with wire-speed filtering and forwarding rates
- Prevents packet loss with back pressure (half-duplex) and IEEE 802.3x pause frame flow control (full-duplex)
- Supports packet size of up to 1522bytes
- CSMA/CD protocol
- Automatic source address learning and aging

## 1.4 Product Specifications

Product	IFT-802T	IFT-802TS15	IFT-805AT
Hardware Specifications			
10/100BASE-TX Port	1 RJ45 Auto-MDI/MDI-X port		
100BASE-FX Port	1 SC Interface		1 SFP Slot
Fiber Port Type	SC / Multi-mode	SC / Single mode	Vary on module
Cable Distance	2km	15km	
Optical Frequency	1310nm	1310nm	
Launch Power (dBm)	Max: -14 Min: -20	Max: 0 Min: -20	
Receive Sensitivity (dBm)	-32	-32	
Maximum Input Power (dBm)	-14	0	
Dimensions (W x D x H)	135mm x 85mm x 32mm		

Weight	430g
Installation	DIN rail kit and wall-mount ear
Maximum Frame Size	Packet size of 1522bytes
Flow Control	Back pressure for half duplex, IEEE 802.3x pause frame for full duplex
Enclosure	IP-30 slim-type metal case
LED Indicator	<p><b>System:</b></p> <ul style="list-style-type: none"> <li>• Power 1 (green)</li> <li>• Power 2 (green)</li> <li>• Fault (green)</li> </ul> <p><b>1 x copper port:</b></p> <ul style="list-style-type: none"> <li>• 10/100 (green)</li> <li>• LNK/ACT(green)</li> </ul> <p><b>1 x 100FX port:</b></p> <ul style="list-style-type: none"> <li>• 100 (green)</li> <li>• LNK/ACT (green)</li> </ul>
Power Input	12 to 48V DC redundant power with polarity reverse protection function
Power Consumption	3 watts / 10BTU (maximum)
Protection	ESD (Ethernet): 6KV DC Surge (Power): 6KV DC
Operating Temperature	-40~75 degrees C
Operating Humidity	5~90% non-condensing
Storage Temperature	-40~85 degrees C
Storage Humidity	5~90% non-condensing

Speed	<p><b>Twisted-pair:</b></p> <ul style="list-style-type: none"> <li>• 10/20Mbps for half / full-duplex</li> <li>• 100/200Mbps for half / full duplex</li> </ul> <p><b>Fiber-optic:</b></p> <ul style="list-style-type: none"> <li>• 200Mbps for full-duplex</li> </ul>
Network Cables	<p><b>10/100BASE-TX:</b></p> <ul style="list-style-type: none"> <li>• 2-pair UTP Cat. 3, 4, 5 (100 meters, max.)</li> <li>• EIA/TIA-568 100-ohm STP (100 meters, max.)</li> </ul> <p><b>100BASE-FX:</b></p> <ul style="list-style-type: none"> <li>• IFT-802T: Multi-mode optic fiber 62.5/125<math>\mu</math>m / 50/125<math>\mu</math>m (2km)</li> <li>• IFT-802TS15: Single mode optic fiber 9/125<math>\mu</math>m (15km)</li> <li>• IFT-805AT: SFP Slot (depending on SFP module)</li> </ul>
Standards Conformance	
Emissions	FCC Class A, CE Class A
Standards Compliance	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX / 100BASE-FX IEEE 802.3x flow control and back pressure
Stability Testing	IEC60068-2-32 (free fall) IEC60068-2-27 (shock) IEC60068-2-6 (vibration)

## 2. Installation

This section describes the functionalities of the Industrial Media Converter's components and guides you how to install it on the desktop. Basic knowledge of networking is assumed. Please read this chapter completely before continuing.

In the following section, the term **"Industrial Media Converter"** means the IFT-802T / 802TS15 / 805AT.

### 2.1 Product Description

The IFT-80xT is an industrially-hardened media converter specially designed to operate under the environment temperature range of -40 to 75°C. The IFT-80xT is highly reliable and stable when operating in the harsh environment. The IFT-80xT provides high level of immunity to electromagnetic interference and heavy electrical surges typical of environments found on plant floors or in curb side traffic control cabinets.

The IFT-80xT is packaged in a compact, IP30 standard metal that allows either DIN or panel mounting for efficient use of cabinet space. The media converter provides an integrated power supply with a wide range of voltages (12 to 48V DC) for worldwide operability or dual-redundancy, reversible polarity, and 24V DC and 48V DC power supply inputs for high availability applications requiring dual or backup power inputs.

The IFT-80xT provides one 10/100BASE-TX optic-fiber SC/SFP interface and one 100BASE-FX optic-fiber SC/SFP interface. It provides multi-mode or single-mode 100BASE-FX SC interface and 100BASE-FX SFP slot. The fiber transmit distance of the IFT-802T can be 2km while that of the IFT-802TS15 is 15km and that of the IFT-805AT varies depending on SFP module.

With Fast Ethernet SFP interface, the IFT-805AT is highly

reliable and flexible to extend the distance from 2km to 60km, depending on the MFB family Fast Ethernet SFP modules.

MFB family Fast Ethernet SFP module comes with one of the following models. The following list the available modules for the IFT-805AT

<b>Fast Ethernet SFP Module List</b>		
Model	Interface	Fiber Connector and Distance
MFB-FX	SFP-Port 100BASE-FX Module	LC, Multi-Mode (1310nm) -2km (-0~50°C)
MFB-F20	SFP-Port 100BASE-FX Module	LC, Single Mode (1310nm) - 20km (-0~50°C)
MFB-F40	SFP-Port 100BASE-FX Module	LC, Single Mode (1310nm) - 40km (-0~50°C)
MFB-F60	SFP-Port 100BASE-FX Module	LC, Single Mode (1310nm) - 60km (-0~50°C)
MFB-FA20	SFP-Port 100BASE-BX Module	LC WDM, Single Mode (TX:1310nm, RX:1550nm) - 20km (-0~50°C)
MFB-FB20	SFP-Port 100BASE-BX Module	LC WDM, Single Mode (TX:1550nm, RX:1310nm) - 20km (-0~50°C)
MFB-TFX	SFP-Port 100BASE-FX Module	LC, Multi-Mode (1310nm) -2km (-40~75°C)
MFB-TF20	SFP-Port 100BASE-FX Module	LC, Single Mode (1310nm) - 20km (-40~75°C)

\* Models with the last two numbers indicate the maximum distance in km.

## 2.1.1 Media Converter Front Panel

Figure 2-1 & 2-2 & 2-3 show a front panel of Industrial Media Converter.



Figure 2-1 IFT-802T Front Panel



Figure 2-2 IFT-802TS15 Front Panel



Figure 2-3 IFT-805AT Front Panel

## 2.1.2 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	Green	<b>Lit:</b> Indicates either power 1 or power 2 has no power.

➤ 10/100BASE-TX RJ45 Port

LED	Color	Function
10/100	Green	<b>Lit:</b> Indicates TP port is successfully connecting to the network at 100Mbps.
		<b>Off:</b> Indicates TP port is successfully connecting to the network at 10Mbps.
LNK/ACT	Green	<b>Lit:</b> Indicates the link through that port is successfully established.
		<b>Blinking:</b> Indicates TP port is actively sending or receiving data over that port.

➤ 100BASE-FX SC / SFP Fiber Interface

LED	Color	Function
100	Green	<b>Lit:</b> Indicates fiber port is successfully connecting to the network at 100Mbps.
LNK/ACT	Green	<b>Lit:</b> Indicates the link through that port is successfully established.
		<b>Blinking:</b> Indicates fiber port is actively sending or receiving data over that port.

### 2.1.3 Media Converter Upper Panel

The upper panel of the Industrial Media Converter consists one terminal block connector within two DC power inputs. Figure 2-4 shows the upper panel of the Industrial Media Converter.

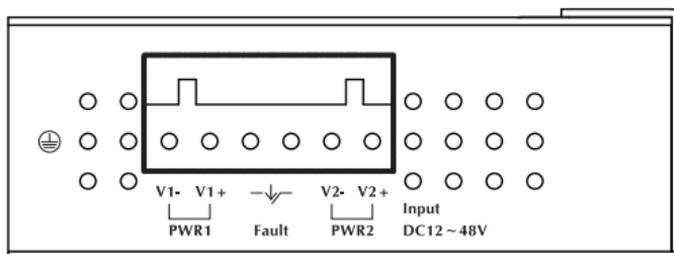
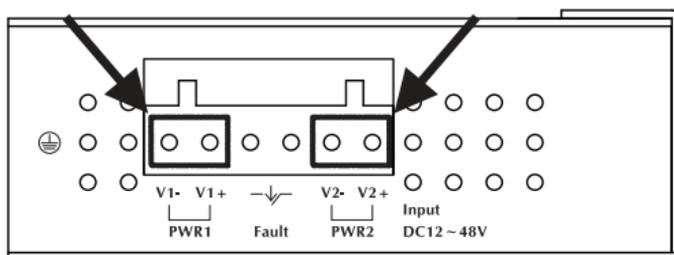


Figure 2-4 Industrial Media Converter Upper Panel.

### 2.1.4 Wiring the Power Inputs

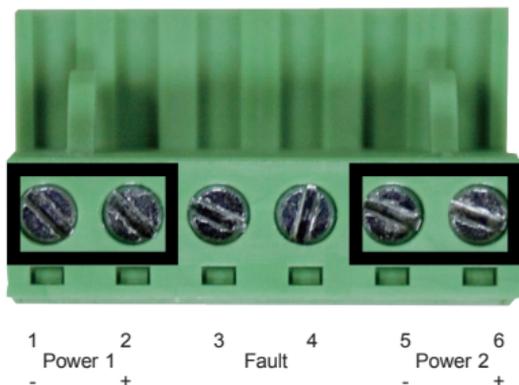
The 6-contact terminal block connector on the top panel of Industrial Media Converter is used for two DC redundant inputs. Please follow the steps below to insert the power wire.

1. Insert positive / negative DC power wires into Contacts 1 and 2 for Power 1 or 5 and 6 for Power 2.



V1- V1 +      V2 - V2 +

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

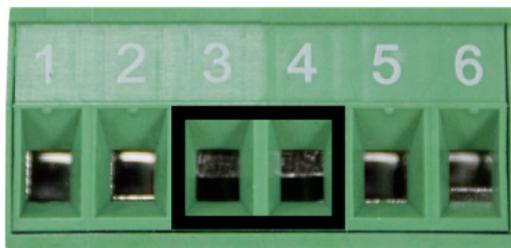


Note

The wire gauge for the terminal block should be in the range of 12 to 24 AWG.

### 2.1.5 Wiring the Fault Alarm Contact

The fault alarm contacts are in the middle of the terminal block connector as the picture shows below. After inserting the wires, the Industrial Media Converter will detect the fault status of the power failure, or port link failure (available for managed model) and then form an open circuit. The following illustration shows an application example for wiring the fault alarm contacts.

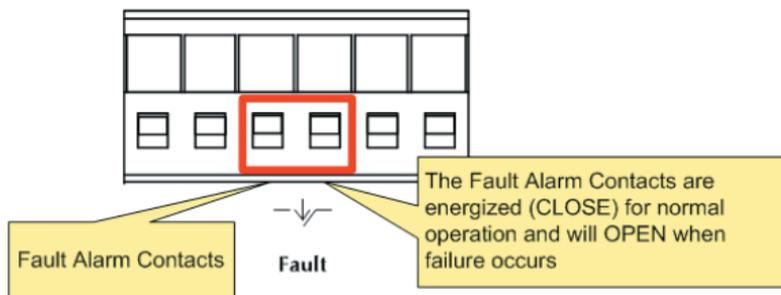


Insert the wires into the fault alarm contacts.



#### Note

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



## 2.2 Mounting Installation

This section describes how to install the Industrial Media Converter and make connections to it. Please read the following steps to perform the procedures in the order being presented.



#### Note

In the installation steps below, this Manual uses the IGS-801 (PLANET 8-port Industrial Gigabit Switch) as an example. However, the steps for PLANET Industrial Media Converter are similar.

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## 2.2.1 Installing DIN-Rail Mounting

Follow the steps below for the DIN-rail mounting of the Industrial Media Converter:



**Step 1:** Screw the DIN-rail on the Industrial Media Converter.



**Step 2:** Lightly slide the DIN-rail into the track.



**Step 3:** Make sure the DIN-rail is tightly on the track.



**Step 4:** To remove Industrial Media Converter from the track, lightly lift it up.

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## 2.2.2 Wall-mount Plate Mounting

To install the Industrial Media Converter on the wall, please follow the instructions described below:

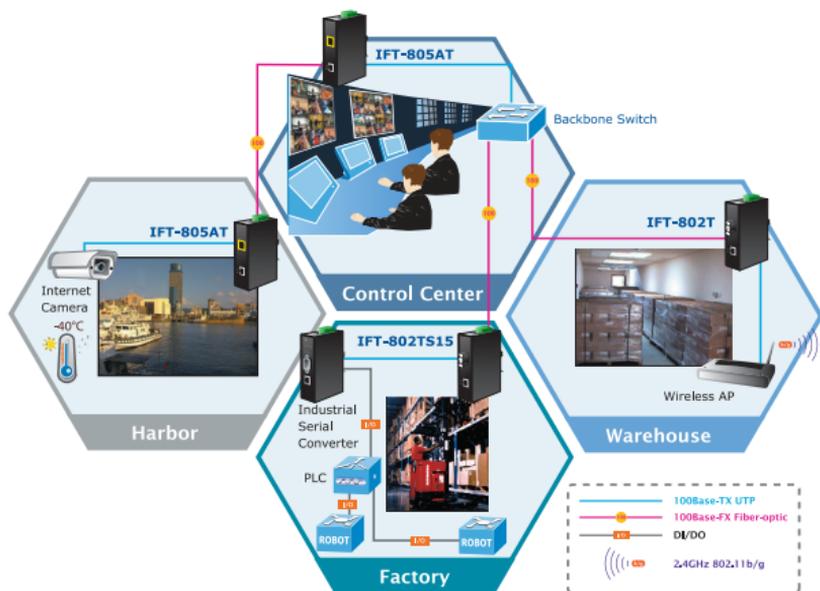
- Step 1:** Remove the DIN-rail from the Industrial Media Converter; loosen the screws to remove the DIN-rail.
- Step 2:** Place the wall-mount plate on the rear panel of the Industrial Media Converter.



- Step 3:** Use the screws to screw the wall-mount plate on the Industrial Media Converter.
- Step 4:** Use the hook holes at the corners of the wall-mount plate to hang the Industrial Media Converter on the wall.
- Step 5:** To remove the wall-mount plate, reverse the steps above.

### 3. Applications

In this section, how to install Industrial Media Converter and its installation points are described below:



#### 3.1 Installation Steps

**Step 1:** Unpack the Industrial Media Converter.

**Step 2:** Screw DIN-rail on the Industrial Media Converter. Please refer to the DIN-rail Mounting section for DIN-rail installation if the DIN-rail is not screwed on the Industrial Media Converter. If you want to wall-mount the Industrial Media Converter, please refer to the Wall-mount Plate Mounting section for wall-mount plate installation.

- 
- Step 3:** To hang the Industrial Media Converter on the DIN-rail track or wall, please refer to the Mounting Installation section.
- Step 4:** Power on the Industrial Media Converter. Please refer to the Wiring the Power Inputs section for power input. The power LED on the Industrial Media Converter will light up. Please refer to the LED Indicators section for the meaning of LED lights.
- Step 5:** Prepare the twisted-pair, straight-through Category 5 cable for Ethernet connection.
- Step 6:** Insert one side of Cat.5 cables into the Industrial Media Converter Ethernet port (RJ45 port) and the other side into the Ethernet port (RJ45 port) of a network devices, for example, switch, PC or server. The UTP port (RJ45) LED on the Industrial Media Converter will light up when the cable is connected with the network device. Please refer to the LED Indicators section for the definitions of LEDs.



Note

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

- Step 7:** Insert the fiber cable from the IFT-802T / 802TS15 / 805AT to the fiber network. TX and RX must be paired at both ends. The optical port LED on the Industrial Media Converter will light up when the cable is connected with the network device. Please refer to the LED Indicators section for the definitions of LEDs
- Step 8:** When all the connections are all set and LED lights all show normal, the installation is completed.

---

## **4. Media Converter Operation**

### **4.1 Learning**

When one packet comes in from any port, the Industrial Media Converter will record the source address, port number and the other related information in the address table. This information will be used to decide whether forwarding or filtering is for future packets.

### **4.2 Forwarding & Filtering**

When one packet comes from a port of the Industrial Media Converter, it will also check the destination address besides the source address learning. The Industrial Media Converter will look up the address table for the destination address. If not found, this packet will be forwarded to all the other ports except the port which this packet comes in. And these ports will transmit this packet to the network it connected. If found, and the destination address is located at a different port from this packet comes in, the Industrial Media Converter will forward this packet to the port where this destination address is located according to the information from address table. But, if the destination address is located at the same port with this packet comes in, then this packet will be filtered, thereby increasing the network throughput and availability

### **4.3 Store-and-Forward**

Store-and-Forward is one type of packet-forwarding techniques. A Store-and-Forward Industrial Media Converter stores the incoming frame in an internal buffer and does the complete error checking before transmission. Therefore, no error packets occur. it is the best choice when a network needs efficiency and stability.

---

The Industrial Media Converter scans the destination address from the packet-header, searches the routing table provided for the incoming port and forwards the packet, only if required. The fast forwarding makes the media converter attractive for connecting servers directly to the network, thereby increasing throughput and availability. However, the media converter is the most commonly used to segment the existing hubs, which nearly always improve the overall performance.

Owing to the learning function of the Industrial Media Converter, the source address and corresponding port number of each incoming and outgoing packet are stored in a routing table. This information is subsequently used to filter packets whose destination address is on the same segment as the source address. It confines network traffic to its respective domain, reducing the overall load on the network.

The Industrial Media Converter performs "Store-and-Forward"; therefore, no error packets occur. More reliably, it reduces the re-transmission rate. No packet loss will occur

## **4.4 Auto-negotiation**

The STP ports on the Industrial Media Converter have a built-in "auto-negotiation". This technology automatically sets the best possible bandwidth when a connection is established with another network device (usually at Power On or Reset). This is done by detecting the modes and speeds within seconds right after both devices are connected. Both 10BASE-T and 100BASE-TX devices can connect with the port in either half- or full-duplex mode.

---

## **5. Troubleshooting**

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

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

#### **Solution:**

Check the cable connection of the Industrial Media Converter.

### **Performance is bad**

#### **Solution:**

Check the speed duplex mode of the partner device. The Industrial Media Converter runs in the auto-negotiation mode and if the partner is set to half duplex, then the performance will be poor.

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

#### **Solution:**

Check that the attached device is not set to dedicate 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 Media Converter doesn't connect to the network**

#### **Solution:**

Check per port LED on the Industrial Media Converter. Try another port on the Industrial Media Converter. Make sure the cable is installed properly. And make sure the cable is the right type to turn off the power. After a while, turn on the power again.

---

## **Why the Industrial Media Converter doesn't connect to the network**

### **Solution:**

Check per port LED on the Industrial Media Converter. Try another port on the Industrial Media Converter. Make sure the cable is installed properly. And make sure the cable is the right type to turn off the power. After a while, turn on the power again.

## **When I connect IFT-80xT to device with 100BASE-FX interface, the 100BASE-FX fiber connection fails**

### **Solution:**

1. Please check the fiber connection between the two devices is correct.
2. Please check the 100BASE-FX interface from other devices run in the same full duplex mode

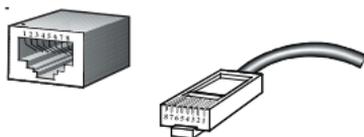
## Appendix A: Networking Connection

### A.1 Media Converter's RJ45 Pin Assignments

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	

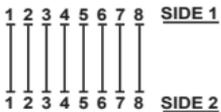
### A.2 RJ45 Cable Pin Assignments



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



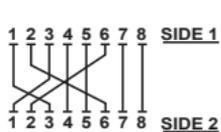
#### SIDE 1

- 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

- 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 Cables

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

## A.3 Fiber Optical Cable Connection Parameter

The wiring details are as shown below:

### ■ Fiber Optical Patch Cables:

Standard	Fiber Type	Cable Specification
100BASE-FX (1300nm)	Multi-mode	50/125µm or 62.5/125µm
100BASE-FX (1310nm)	Multi-mode	50/125µm or 62.5/125µm
	Single mode	9/125µm



## EC Declaration of Conformity

For the following equipment:

\*Type of Product: 10/100BASE-TX to 100BASE-FX Industrial Media Converter with Wide Operating Temperature

\*Model Number: IFT-802T / IFT-802TS15 / IFT-805AT

\* Produced by:

Manufacturer's Name : **Planet Technology Corp.**

Manufacturer's Address: 11F, No 96, Min Chuan Road,  
Hsin Tien, Taipei, Taiwan, R.O.C.

is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility Directive on (2004/108/EC).

For the evaluation regarding the EMC, the following standards were applied:

EN55022	(CLASS A: 2006)
EN 61000-3-2	(2006)
EN 61000-3-3	(1995 / A1: 2001 / A2: 2005)
EN55024	(1998 / A1: 2001 / A2: 2003)
IEC 61000-4-2	(2001)
IEC 61000-4-3	(2008)
IEC 61000-4-4	(2004)
IEC 61000-4-5	(2005)
IEC 61000-4-6	(2008)
IEC 61000-4-8	(2001)
IEC 61000-4-11	(2004)

Responsible for marking this declaration if the:

Manufacturer     Authorized representative established within the EU

Authorized representative established within the EU (if applicable):

Company Name: Planet Technology Corp.

Company Address: 11F, No.96, Min Chuan Road, Hsin Tien, Taipei, Taiwan, R.O.C

Person responsible for making this declaration

Name, Surname Kent Kang

Position / Title : Product Manager

Taiwan  
Place

26<sup>th</sup> July, 2010  
Date

  
Legal Signature

### **PLANET TECHNOLOGY CORPORATION**