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: 1.2 (January, 2020) Part No: EM-IFT-80xT_v1.2 (2350-AH1140-002)

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1. Introduction

1.1 Package Contents

Check your package for the following parts:

Industrial Media Converter x 1	User's Manual x 1	SFP Dust Cap x 1 (IFT-805AT only)
DIN-rail Kit x 1	RJ45 Dust Caps x 1	Wall-mount Kit
د در م	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.

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 Applications

The chapter explains the Industrial Media Converter applications.

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

- One 10/100BASE-TX RJ45 port
- One 100BASE-FX port for up to 2km (Multi-mode fiber 62.5/125μm, 50/125μm)

IFT-802TS15

- One 10/100BASE-TX RJ45 port
- One 100BASE-FX port for up to 15km (Single mode fiber $9/125\mu m)$

IFT-805AT

- One 10/100BASE-TX RJ45 port
- One 100BASE-FX SFP port (Distance depends on SFP module)
- > Industrial Design
 - Slim type IP30 metal case
 - -40°C~75°C operating temperature

- DIN-rail and wall-mount designs
- 12 to 48V DC, redundant power with reverse polarity protection 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 in half-duplex/ full-duplex mode 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	
Cable Distance	2km	15km	module	

Optical Frequency	1310nm	1310nm		
Launch Power (dBm)	Max: -14 Min: -20	Max: 0 Min: -20		
Receive Sensitivity (dBm)	-32	-32	module	
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	System: • Power 1 (green) • Power 2 (green) • Fault (green) 2 x copper port: • 10/100 (green) • LNK/ACT (green) 2 x 100FX port:			
	• 100 (green) • LNK/ACT (green)			
Power Input	12 to 48V DC redundant power with reverse polarity protection			
Power Consumption	3 watts/10BTU (maximum)			

ESD (Ethernet): 6KV DC Surge (Power): 6KV DC	
-40~75 degrees C	
5~90% non-condensing	
-40~85 degrees C	
5~90% non-condensing	
Twisted-pair: • 10/20Mbps for half/full-duplex • 100/200Mbps for half/full duplex Fiber-optic: • 200Mbps for full-duplex	
 10/100BASE-TX: 2-pair UTP Cat. 3, 4, 5 (100 meters, max.) EIA/TIA-568 100-ohm STP (100 meters, max.) 100BASE-FX: IFT-802T: Multi-mode optic fiber 62.5/125μm & 50/125μm (2km) IFT-802TS15: Single mode optic fiber 9/125μm (15km) IFT-805AT: SFP Slot (depending on SFP module) 	
nance	
FCC Class A, CE Class A	
IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX/100BASE-FX IEEE 802.3x flow control and back pressure	
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 to installing it on the desktop. Basic knowledge of networking is assumed. Please read this chapter completely before continuing.

In the following sections, 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 optical fiber SC/SFP interface and one 100BASE-FX optical fiber SC/SFP interface. It provides multi-mode or single-mode 100BASE-FX SC interface and 100BASE-FX SFP slot. The fiber transmission distance of the IFT-802T is 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:

	Fast Ethernet SFP Module List				
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)			
MFB-TFA20	SFP-Port 100BASE -BX Module	LC WDM, Single Mode (TX: 1310nm, RX: 1550nm) – 20km (-40~75°C)			
MFB-TFB20	SFP-Port 100BASE -BX Module	LC WDM, Single Mode (TX: 1550nm, RX: 1310nm) – 20km (-40~75°C)			
MFB-TFA40	SFP-Port 100BASE -BX Module	LC WDM, Single Mode (TX: 1310nm, RX: 1550nm) - 40km (-40~75°C)			

MFB-TFB40	SFP-Port 100BASE -BX Module	LC WDM, Single Mode (TX: 1550nm, RX: 1310nm) - 40km (-40~75°C)
MFB-TSA	SFP-Port 100BASE -BX Module	LC WDM, Multi-mode (TX: 1310nm, RX: 1550nm/DDM) – 2km (-40~75°C)
MFB-TSB	SFP-Port 100BASE -BX Module	LC WDM, Multi-mode (TX: 1550nm, RX: 1310nm/DDM) – 2km (-40~75°C)

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

2.1.1 Media Converter Front Panel

Figures 2-1, 2-2 and 2-3 show the front panels of the Industrial Media Converters.



 Figure 2-1
 IFT-802T
 Figure 2-2
 IFT-802TS15
 Figure 2-3
 IFT-805AT

 Front Panel
 Front Panel
 Front Panel
 Front Panel

2.1.2 LED Indicators

> System

LED	Color	Function
P1	Green	Lit: Indicates power 1 has power.
P2	Green	Lit: Indicates power 2 has power.
FAULT	Green	Lit: Indicates either power 1 or power 2 has no power.

> 10/100BASE-TX RJ45 Port

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

> 100BASE-FX SC/SFP Fiber Interface

LED	Color	Function		
100	Green	n Lit: Indicates fiber port is successfully connecting to the network at 100Mbps.		
	Croon	Lit: Indicates the link through that port is successfully established.		
LINK/ACT	Green	Blinking: 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 of 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 the 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 -

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



The wire gauge for the terminal block should be in the range between 12 and 24 AWG.
 The DC power input range is 12V ~ 48V DC and supports 24V AC.
 Use one power input when using 24V AC.

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.







2.1.6 Grounding the Device



≟ Earth Ground

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.



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.

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 bracket on the Industrial Media Converter.



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



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



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

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 bracket from the Industrial Media Converter; loosen the screws to remove the DIN-rail bracket.
- **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 wallmount 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, it shows you 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 bracket on the Industrial Media Converter. Please refer to the DIN-rail Mounting section for DIN-rail installation if the DIN-rail bracket 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 definitions 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.



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. 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 whether the fiber connection between the two devices is correct.
- 2. Please check the 100BASE-FX interface from other devices that 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:



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 Optic Cable Connection Parameter

The wiring details are as shown below:

Fiber Optic Patch Cables:

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



EC Declaration of Conformity

I hereby confirm that the following equipment complies 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 (2014/30/EU).

Type of Product: 10/100BASE-TX to 100BASE-FX Industrial Media Converter

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

Produced by:

Manufacturer's Name: Planet Technology Corporation

Manufacturer's Address: 10F., No.96, Minquan Rd., Xindian Dist.,

New Taipei City 231, Taiwan, R.O.C.

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

EN 55032	(2012/AC:2013)
EN61000-3-2	(2014)
EN61000-3-3	(2013)
EN 55024	(2010)

Person responsible for making this declaration Name: Kent Kang Title: Director

> Taiwan Country

March 23, 2017 Date

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