

**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

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1. Introduction

1.1 Package Contents

Check the contents of your package for 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 against 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 RJ-45
- 1-Port 100Base-FX interface for up to 2km (Multi-mode fiber 62.5/125 μ m / 50/125 μ m)

IFT-802TS15

- 1-Port 10/100Base-TX RJ-45
- 1-Port 100Base-FX interface for up to 15km (Single mode fiber 9/125 μ m)

IFT-805AT

- 1-Port 10/100Base-TX RJ-45
- 1-Port 100Base-FX SFP slot (Distance depend on SFP module)

■ Industrial Design

- Slim type IP-30 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 protection 6000V DC for power line
- Supports 6000V 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 RJ-45 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)
- Support to handle up to 1522bytes packet size
- CSMA/CD protocol
- Automatic source address learning and aging

1.4 Product Specifications

Product	IFT-802T	IFT-802TS15	IFT-805AT
Hardware Specification			
10/100Base-TX Port	1 RJ-45 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	
Dimension (W x D x H)	135mm x 85mm x 32mm		

Weight	430g
Installation	DIN rail kit and wall mount ear
Maximum Frame Size	1522bytes packet size
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>System:</p> <ul style="list-style-type: none"> • Power 1 (Green), • Power 2 (Green), • Fault (Green) <p>1 x copper port:</p> <ul style="list-style-type: none"> • 10/100 (Green) • LNK/ACT (Green) <p>1 x 100FX port:</p> <ul style="list-style-type: none"> • 100 (Green) • LNK/ACT (Green)
Power Input	12 to 48V DC Redundant power with polarity reverse protection function
Power Consumption	3 Watts / 10BTU (maximum)
Protection	ESD (Ethernet): 6KVDC Surge (Power): 6KVDC
Operating Temperature	-40~75 Degree C
Operating Humidity	5~90% non-condensing
Storage Temperature	-40~85 Degree C
Storage Humidity	5~90% non-condensing

Speed	<p>Twisted-pair:</p> <ul style="list-style-type: none"> • 10/20Mbps for Half / Full-Duplex • 100/200Mbps for Half / Full-Duplex <p>Fiber-optic:</p> <ul style="list-style-type: none"> • 200Mbps for Full-Duplex
Network Cables	<p>10/100Base-TX:</p> <ul style="list-style-type: none"> • 2-Pair UTP Cat. 3, 4, 5 (100meters, max.) • EIA/TIA-568 100-ohm STP (100meters, max.) <p>100Base-FX:</p> <ul style="list-style-type: none"> • 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 (Depend on SFP module)
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 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 are industrially hardened media converters which specially designed to operate under -40 to 75°C environment temperature. The IFT-80xT provides highly reliable and stable working for demand of harsh environment.

The IFT-80xT provide 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 feature of operating temperature range of -40 to 75 Degrees C coupled with hazardous location certification allows the media converter to be placed in almost any location.

The IFT-80xT is packaged in a compact, IP-30 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-redundant, reversible polarity, 24V DC and 48V DC power supply inputs for high availability applications requiring dual or backup power inputs.

The IFT-80xT provides 1 x 10/100Base-TX and 1 x 100Base-FX optic-fiber SC/SFP interface. It provides Multi-mode, Single-mode 100Base-FX SC interface and 100Base-FX SFP slot. The IFT-802T fiber transmit distance can be 2km, IFT-802TS15 fiber transmit distance can be 15km and IFT-805AT is vary on SFP module.

With Fast Ethernet SFP interface, the IFT-805AT is with high reliability and flexibility to extend the distance from 2km to 60Km. It depends 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 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)

* Models with last two numbered characters indicate the maximum distance in km.

2.1.1 Media Converter Front Panel

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



Figure 2-1 IFT-802T / IFT-802TS15 front panel



Figure 2-2 IFT-805AT front panel

2.1.2 LED Indicators

● System

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

- 10/100Base-TX RJ-45 Port

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

- 100Base-FX SC / SFP Fiber Interface

LED	Color	Function
100	Green	Lit: To indicate Fiber port is successfully connecting to the network at 100Mbps.
LNK/ACT	Green	Lit: To indicate the link through that port is successfully established.
		Blink: To indicate 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 consist one terminal block connector within two DC power inputs. Figure 2-3 shows the upper panel of the Industrial Media Converter.

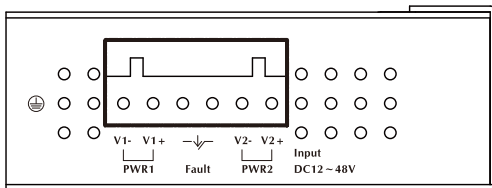
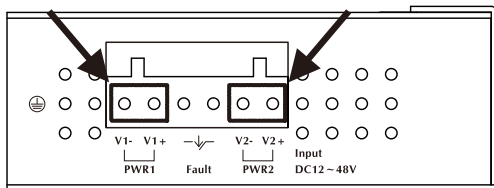


Figure 2-3 Industrial Media Converter Upper Panel.

2.1.4 Wiring the Power Inputs

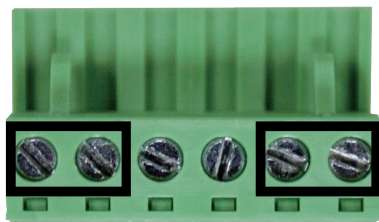
The 6-contact terminal block connector on the top panel of Industrial Media Converter is used for two DC redundant powers input. Please follow the steps below to insert the power wire.

1. Insert positive / negative DC power wires into the 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 losing.



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

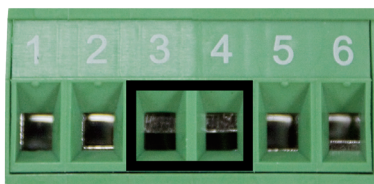


Note

The wire gauge for the terminal block should be in the range between 12 ~ 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. 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 forms an open circuit. The following illustration shows an application example for wiring the fault alarm contacts.

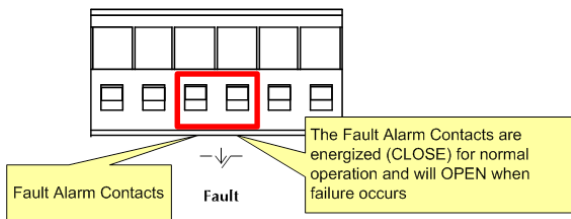


Insert the wires into the fault alarm contacts



Note

1. The wire gauge for the terminal block should be in the range between 12 ~ 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 topics and perform the procedures in the order being presented.

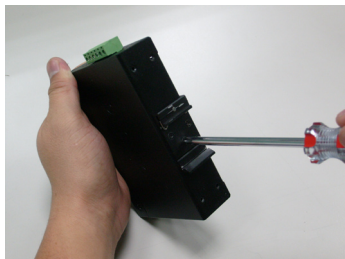


Note

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

2.2.1 Install DIN-Rail Mounting

The DIN-Rail is screwed on the Industrial Media Converter when out of factory. When need to replace the wall mount application with DIN-Rail application on Industrial Media Converter , please refer to following figures to screw the DIN-Rail on the Industrial Media Converter. To hang the Industrial Media Converter, follow the below steps:



Step 1: Screws the DIN-Rail on the Industrial Media Converter.



Step 2: Lightly press the button of DIN-Rail into the track.



Step 3: Check the DIN-Rail is tightly on the track.

Step 4: Please refer to following procedures to remove the Industrial Media Converter from the track.



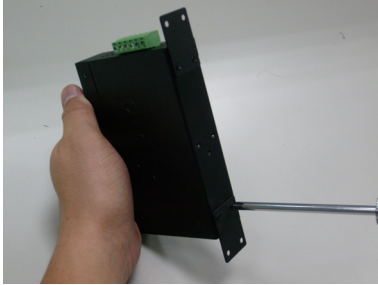
Step 5: Lightly press the button of DIN-Rail for remove it from the track.

2.2.2 Wall Mount Plate Mounting

To install the Industrial Media Converter on the wall, please follows the instructions described below.

Step 1: Remove the DIN-Rail from the Industrial Media Converter; loose the screws to remove the DIN-Rail.

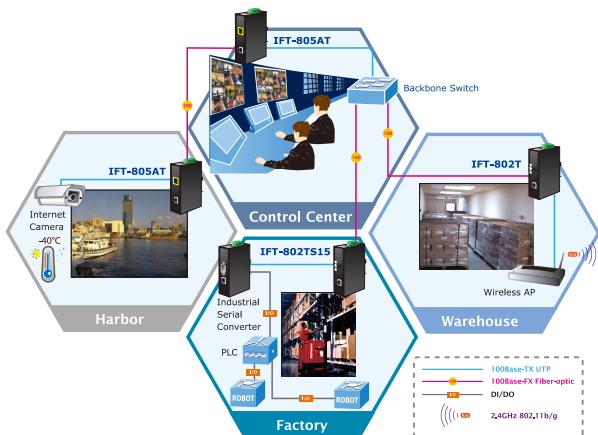
Step 2: Place the wall mount plate on the rear panel of the Industrial Media Converter.



- 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 steps above.

3. Application

In this paragraph, we will describe how to install Industrial Media Converter and the installation points for the attention.



3.1 Installation Steps

Step 1: Unpack the Industrial Media Converter.

Step 2: Check the DIN-Rail is screwed on the Industrial Media Converter. (Please refer to 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, then please refer to 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 meaning of LED lights.
- Step 5:** Prepare the twisted-pair, straight through Category 5 cable for Ethernet connection.
- Step 6:** Insert one side of Category 5 cables into the Industrial Media Converter Ethernet port (RJ-45 port) and another side of category 5 cables to the network devices' Ethernet port (RJ-45 port), ex: Switch, PC or Server. The UTP port (RJ-45) LED on the Industrial Media Converter will light up when the cable connected with the network device. Please refer to the LED Indicators section for LED light meaning.



Note

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

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

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 no. And the other related information in address table. This information will be used to decide either forwarding or filtering for future packets.

4.2 Forwarding & Filtering

When one packet comes from some port of the Industrial Media Converter, it will also check the destination address besides the source address learning. The Industrial Media Converter will lookup 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 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, do the complete error checking before transmission. Therefore, no error packets occurrence, 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 most commonly used to segment existing hubs, which nearly always improves overall performance.

Due 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 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 at the second of both devices is connected and capable of, 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 is run at 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. Make sure the cable is the right type. Turn off the power. After a while, turn on 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 Make sure the cable is the right type Turn off the power. After a while, turn on power again.

Why I connect IFT-80xT to device with 100Base-FX interface and the 100Base-FX fiber connection fail?

Solution:

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

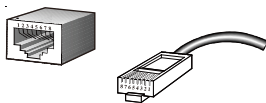
Appendix A: Networking Connection

A.1 Media Converter's RJ-45 Pin Assignments

10/100Mbps, 10/100Base-TX

RJ-45 Connector pin assignment		
Contact	MDI Media Dependant Interface	MDI-X Media Dependant 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 RJ-45 cable Pin Assignments



The standard RJ-45 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 cable and crossover cable connection:

Straight Cable



SIDE 1

SIDE 1

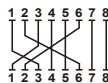
- 1 = White/Orange
- 2 = Orange
- 3 = White/Green
- 4 = Blue
- 5 = White/Blue
- 6 = Green
- 7 = White/Brown
- 8 = Brown

SIDE 2

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

SIDE 2

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

SIDE 2

Figure A-1: Straight-Through and Crossover Cable

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

A.3 Fiber Optical Cable Connection Parameter

The wiring details are as below:

■ Fiber Optical patch Cables:

Standard	Fiber Type	Cable Specification
100Base-FXm (1300nm)	Multi-mode	50/125 μ m or 62.5/125 μ m
100Base-FX (1310nm)	Multi-mode	50/125 μ m or 62.5/125 μ m
	Single mode	9/125 μ m

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

26th July, 2010
Date



Legal Signature

PLANET TECHNOLOGY CORPORATION