

**Industrial 1-Port BNC/RJ11 to 4-Port Gigabit
Ethernet Extender**

IVC-234GT

User's Manual

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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the Instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area

is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CE Mark Warning

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

Energy Saving Note of the Device

This power required device does not support Standby mode operation. For energy saving, please remove the power cable to disconnect the device from the power circuit. Without removing power cable, the device will still consume power from the power source. In view of Saving the Energy and reducing the unnecessary power consumption, it is strongly suggested to remove the power connection for the device if this device is not intended to be active.

WEEE Warning



To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, end users of electrical and electronic equipment should understand the meaning of the crossed-out wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately.

Revision

PLANET Industrial 1-Port BNC/RJ11 to 4-Port Gigabit Ethernet Extender User's Manual

For Models: IVC-234GT

Revision: 1.0 (May 2018)

Part No.: 2350-AC0530-000

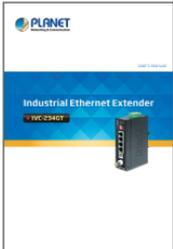
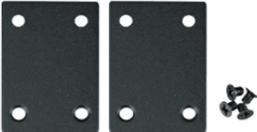
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1. Package Contents

Thank you for purchasing PLANET Industrial 1-Port BNC/RJ11 to 4-Port Gigabit Ethernet Extender, IVC-234GT. In the following sections, the term “Industrial Ethernet Extender” means the IVC-234GT.

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

Industrial Ethernet Extender x 1	User's Manual x 1
	
RJ11/RJ45 Dust Caps	Wall-mount Kit
	

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): 32 x 135 x 87.8mm

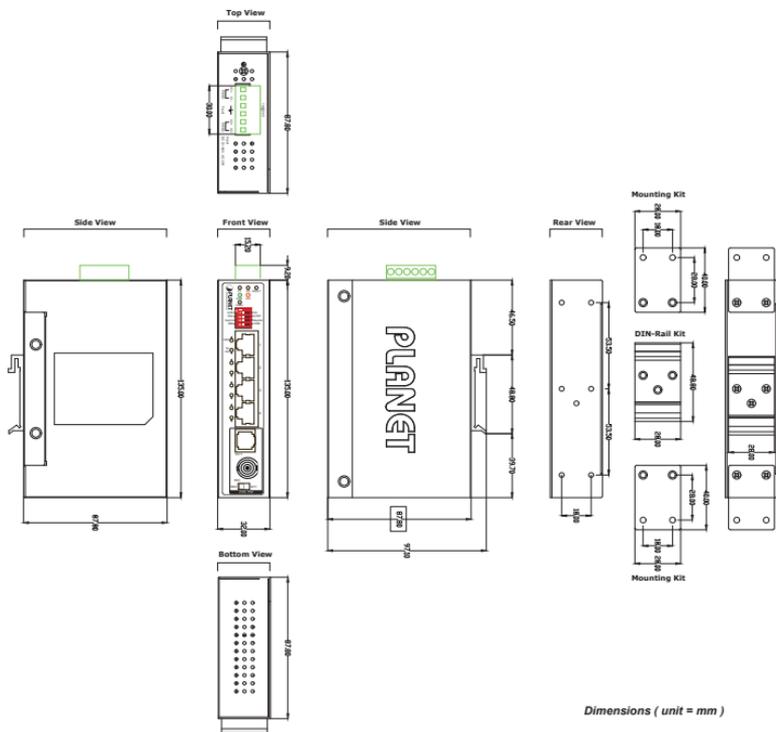


Figure 2-1: IVC-234GT Three-View Diagram

2.2 Front View

■ Front Panel

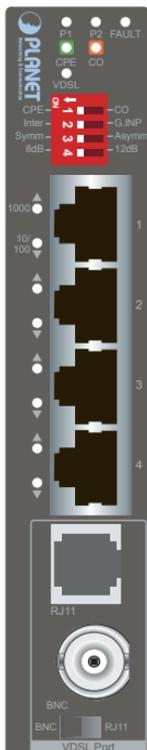


Figure 2-2: IVC-234GT Front Panel

The unit's front panel provides the following simple interfaces:

- LEDs for Power 1, Power 2 and VDSL2
- 4 10/100/1000BASE-T RJ45 ports
- BNC female/ RJ11 connector via DIP switch
- Selectable CO/CPE mode, Target Band Plan and Target SNR Margin via DIP switch

2.3 Top View

The upper panel of the Industrial Ethernet Extender consists of one terminal block connector within two DC power inputs.



Figure 2-3: IVC-234GT Top View

2.4 IVC-234GT LED Indicators

The rich diagnostic LEDs on the front panel can provide the operating status of individual port and whole system.

■ System

LED	Color	Function
P1	Green	Lights to indicate DC power input 1 has power.
P2	Green	Lights to indicate DC power input 2 has power.
Fault	Red	Lights to indicate that DC power has failed.

■ VDSL

LED	Color	Function	
VDSL	Green	Lit	Indicates that the VDSL connection is established.
		Fast Blink	Indicates that the VDSL connection is in training status (about 15 seconds).
		Slow Blink	Indicates that the VDSL connection is in idle status.
CO	Green	Lit	Indicates the Industrial Ethernet Extender is running in CO mode.
CPE	Green	Lit	Indicates the Industrial Ethernet Extender is running in CPE mode.

■ 100/1000BASE-T Port

LED	Color	Function	
1000	Green	Lit	Indicates that the port is operating at 1000Mbps .
		Blink	Indicates that the Industrial Ethernet Extender is actively sending or receiving data over that port at 1000Mbps .
		Off	Indicates that the port is link down or 10/100Mbps .
10/100	Green	Lit	Indicates that the port is operating at 100Mbps or 10Mbps .
		Blink	Indicates that the Industrial Ethernet Extender is actively sending or receiving data over that port at 100Mbps or 10Mbps .
		Off	Indicates that the port is link down or 1000Mbps .

2.5 DIP Switch and Link Type

■ Link Type

The BNC mode allows Industrial Ethernet Extender to connect and transfer data by using BNC cable.

The RJ11 mode allows Industrial Ethernet Extender to connect and transfer data by using telephone wire

■ DIP Switch

The Industrial Ethernet Extender provides a selectable 4-position DIP switch. Switch them on or off to obtain the best coaxial/RJ11 cable connection over a distance.

DIP	DIP-1	DIP-2	DIP-3	DIP-4
	Mode	Transmission	Band Profile	SNR Margin
OFF	CO	G.INP	Asymmetric	12dB
ON (default)	CPE	Interleave	Symmetric	8dB



Note

By default, the 4-position switches of the DIP switch, set at the "ON" position, are operated as "CPE". For operating as "CO", please turn DIP 1 switch to the "OFF" position. Then adjust other DIP switches accordingly to fulfill different network application demands.

■ DIP-1: Mode (CO / CPE)

CO (Central Office)	The Master device mode, usually the CO device, is located at the data center of ISP or enterprise to link to the backbone.
CPE (Customer Premises Equipment)	The Slave device mode, usually the CPE device, is located at branch office, home or remote side as the long reach data receiver. The CPE can be connected to the PC, IP camera or wireless access point, or other network devices.



Note

When the Industrial Ethernet Extender operates in **CPE mode**, DIP switches 2, 3, and 4 are **without function**.

■ DIP-2: Transmission (G. INP and Interleave mode)

G. INP	Method of protection against bursts from other devices or lines to impact your xDSL connection.
Interleave	Method of error correction used on xDSL connection. Interleave requires additional latency to improve resilience to burst of error.

■ DIP-3: Band Profile (Asymmetric/Symmetric)

Asymmetric	The asymmetric mode provides more bandwidth than the other side. This mode provides the highest bandwidth in short range.
Symmetric	With the G.997 band plan supported, the symmetric mode can provide almost the same rate of downstream and upstream.

■ DIP-4: SNR (Signal Noise Ratio) Margin

When the SNR margin is selected, the system provides 12dB/8dB SNR margin for all usable loop lengths. Better channel noise protection is made with the higher SNR margin.



Note

Please **power off** the Industrial Ethernet Extender before making any transmission mode adjustment.

3. Product Specifications

Product		IVC-234GT	
Hardware Specifications			
TP interface		4 10/100/1000BASE-T RJ45 auto-MDI/MDI-X ports	
VDSL	BNC	1 BNC female Ethernet over Coaxial	
		Cabling	Coaxial cable: 75 ohm RG-6/U cable, less than 12Ω/1000 ft RG-59/U cable, less than 30Ω/1000 ft.
		Maximum Distance	Max. 1200m with data transmission (3,937ft.)
	RJ11	1 VDSL2 RJ11 female phone jack Twisted-pair telephone wires (AWG-24 or better) up to 1.2km (3,937ft.)	
Functionality		DIP-1	Select CO or CPE mode
		DIP-2	Select G.INP or Interleaved mode
		DIP-3	Select Band Profile (Asymmetric or Symmetric)
		DIP-4	Select SNR of 12dB or 8dB
Dimensions (W x D x H)		32 x 135 x 87.8mm	
Weight		185g	
Power Requirement		Dual 12~48V DC	
LED Indicators		Power 1/Power 2: Green FAULT: Red 1000BASE-T LNK/ACT: Green 10/100BASE-TX LNK/ACK: Green VDSL: Green CO: Green CPE: Green	
Housing		Metal	

System Specifications	
VDSL Compliance	<ul style="list-style-type: none"> ■ VDSL-DMT ■ ITU-T G.993.1 VDSL ■ ITU-T G.997.1 ■ ITU-T G.993.2 VDSL2 (Profile 17a/30a Support) ■ ITU-T G.993.5 G. Vectoring ■ ITU-T G.998 ■ G.INP
Standards Conformance	
Standards Compliance	IEEE 802.3 Ethernet IEEE 802.3u Fast Ethernet IEEE 802.3ab Gigabit Ethernet ITU-T G.993.1 VDSL ITU-T G.997.1 ITU-T G.993.2 VDSL2 (Profile 17a/30a Support) ITU-T G.993.5 G.Vectoring and G.INP ITU-T G.998
Regulatory Compliance	FCC Part 15 Class A, CE
Environment	
Temperature	Operating: -40~75 degrees C Storage: -40~75 degrees C
Humidity	Operating: 5~95% (non-condensing) Storage: 5~95% (non-condensing)

4. Applications

The Industrial Ethernet Extender does not require any software configuration. Users can immediately use any feature of this product simply by attaching the cables and turning the power on. There are some key limitations on the Industrial Ethernet Extender. Please check the following items.

4.1 Point-to-Point Application -- LAN to LAN Connection

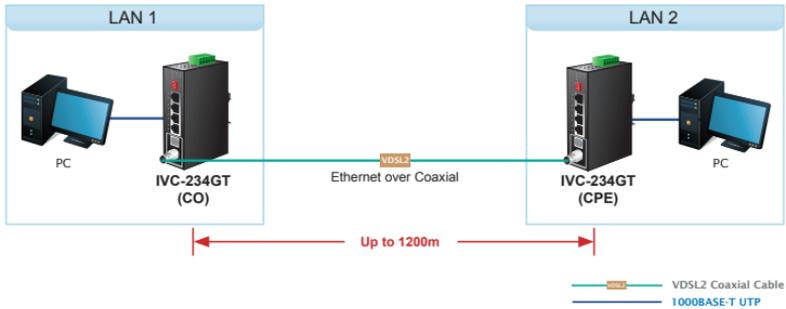
One set of the Industrial Ethernet Extender could be used to link two local area networks that are located in different places. Through the coaxial cable, it could set up a 200/100Mbps asymmetric backbone, but one Industrial Ethernet Extender must be Master (CO mode) and the other one is Slave (CPE mode).



Note

1. The following application is connected by Coaxial cable, you have to transfer the 2-Position DIP switch to the BNC mode. The other connection type must be transferred to RJ11 and connect by RJ11/telephone wire.
2. Only one wire can be connected at a time, coaxial or RJ11.

LAN to LAN Connection



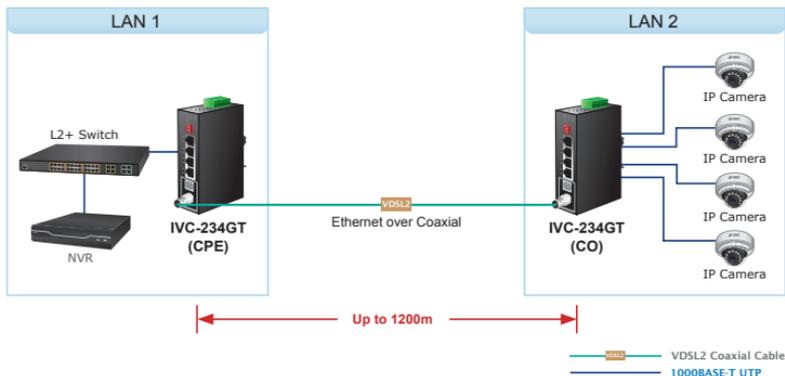
Connecting Standalone PC

Refer to the following procedures to set up the Industrial Ethernet Extender LAN to LAN connection.

1. **[LAN1]** Set the Industrial Ethernet Extender at LAN 1 in the **CO** mode from the DIP switch.
2. **[LAN2]** Set the Industrial Ethernet Extender at LAN 2 in the **CPE** mode from the DIP switch.
3. Power on the Industrial Ethernet Extender CO and CPE at both sides by connecting its power source.
4. Power, CO and CPE LEDs will illuminate correspondingly.
5. Connect coaxial cable from LAN1 IVC-234GT to **VDSL BNC port** of the LAN2 IVC-234GT.
6. **VDSL LNK LED** will blink to illuminate at both Industrial Ethernet Extenders.
7. Connect the IVC-234GT Ethernet **LAN port** to the other network device via regular Cat.5 UTP cable.

4.2 Point to Multi-point Application (IP surveillance)

Applications of IP Surveillance



Building a IP surveillance system

Refer to the following procedure to set up many pairs of IVC-234GT to IP surveillance system.

1. Set the IVC-234GT to be the CO and CPE mode from the DIP switch on the front panel.
2. Power on the IVC-234GT by connecting its power source.
3. Power LED will illuminate.
4. Connect coaxial cable from VDSL port of two IVC-234GT units.
5. VDSL LED will blink to illuminate.
6. Connect Ethernet ports to IP cameras via regular Cat. 5, 5e or 6 cable.
7. Install the NVR and monitor and connect to one Ethernet switch.
8. You can get data transmissions from all IP cameras.

5. Installations

5.1 Wiring the Power Inputs

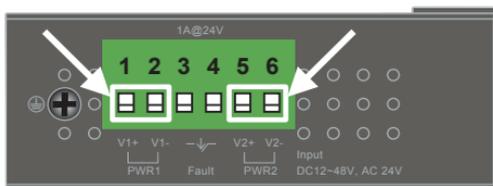
The 6-contact terminal block connector on the top panel of Industrial Ethernet Extender is used for two DC redundant power inputs. Please follow the steps below to insert the power wire.



Caution

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	
+	-			+	-

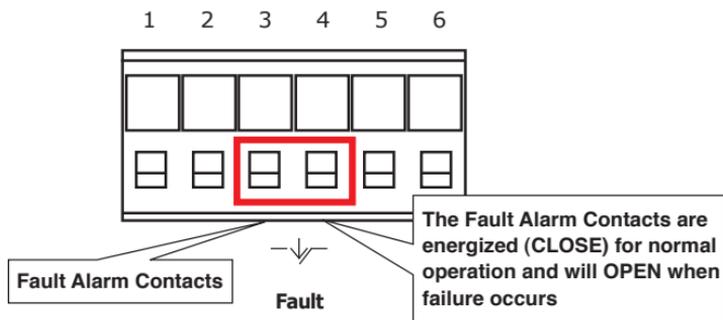


Note

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

5.2 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 Ethernet Extender will detect the fault status of the power failure and then forms an open circuit. The following illustration shows an application example for wiring the fault alarm contacts.



Insert the wires into the fault alarm contacts



Note

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

5.3 DIN-rail Mounting Installation

The DIN-rail bracket is screwed on the Industrial Ethernet Extender when out of factory. Please refer to the following steps for DIN-rail mounting:

Step 1: Screw the DIN-rail bracket on the Industrial Ethernet Extender.



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



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



Step 4: Please refer to the following procedure to remove the Industrial Ethernet Extender from the track.



Step 5: Lightly pull out the bottom of DIN rail for removing it from the track.

5.4 Wall-mount Plate Mounting

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

Step 1: Remove the DIN-rail bracket from the Industrial Ethernet Extender with a screwdriver.

Step 2: Place the wall-mount plate on the rear panel of the Industrial Ethernet Extender.



Step 3: Use the screws to screw the wall-mount plate on the Industrial Ethernet Extender.

Step 4: Use the hook holes at the corners of the wall-mount plate to hang the Industrial Ethernet Extender on the wall.

Step 5: To remove the wall-mount plate, reverse the steps above.

6. Performance Table

- Industrial Ethernet Extender Upstream/Downstream Performance with RJ11 connection

CO DIP Switch Distance (meter)	Interleave (Upstream/Downstream)			
	Asymmetric		Symmetric	
	8dB	12dB	8dB	12dB
200	93/190	85/174	143/148	132/136
400	67/164	59/146	118/119	103/104
600	38/116	28/94	71/75	59/60
800	24/59	22/49	49/36	38/27
1000	9/45	7/40	21/25	15/24
1200	6/30	3/28	16/24	6/20
CO DIP Switch Distance (meter)	G.INP Upstream /Downstream)			
	Asymmetric		Symmetric	
	8dB	12dB	8dB	12dB
200	92/190	85/174	143/148	129/136
400	68/165	57/144	116/115	99/96
600	37/112	28/94	71/69	61/55
800	27/56	22/49	49/32	39/24
1000	9/46	7/40	19/27	15/26
1200	5/31	3/28	16/23	12/20

■ Industrial Ethernet Extender Upstream /Downstream Performance with BNC connection

CO DIP Switch Distance (meter)	Interleave (Upstream/Downstream)			
	Asymmetric		Symmetric	
	8dB	12dB	8dB	12dB
200	84/184	75/169	131/144	125/128
400	49/148	54/128	93/118	89/99
600	36/100	26/80	77/66	64/53
800	21/50	17/39	44/30	37/26
1000	7/42	5/29	20/25	19/28
1200	5/27	3/28	13/27	15/20
CO DIP Switch Distance (meter)	G.INP (Upstream /Downstream)			
	Asymmetric		Symmetric	
	8dB	12dB	8dB	12dB
200	89/185	79/166	140/144	117/123
400	57/155	47/137	104/113	89/96
600	33/75	31/73	62/73	52/43
800	17/66	13/45	40/29	39/24
1000	13/59	6/38	20/27	15/26
1200	4/32	3/22	14/20	12/20

*1 BNC and RJ11 mode must switch to the same position for CO and CPE. Otherwise, it may cause instability.

*2 The actual data rate will vary on the quality of the copper wire and environmental factors.

7. Troubleshooting

SYMPTOM:

VDSL LNK LED does not light up after wire is connected to the VDSL port.

CHECKPOINT:

1. Verify the length of the coaxial cable (not more than 1.2km) connected between the two IVC-234GT units. Please also try to adjust the DIP switch of the IVC-234GT to the other SNR mode.
2. Please note you must use one IVC-234GT in CO mode and the other IVC-234GT in CPE mode to make connection to each other work.

SYMPTOM:

TP LED does not light up after cable is connected to the port.

CHECKPOINT:

1. Verify you are using the Cat.5e or better cable with RJ45 connector to connect to the port.
2. If your device (like LAN card) supports auto-negotiation, please try to manually set at a fixed speed of your device to solve this issue.
3. The IVC-234GT and the connected device's power are on or not.
4. The port's cable is firmly seated in its connectors in the switch and in the associated device.
5. The connecting cable is good and with the correct type.
6. The connecting device, including any network adapter, is functional.

8. FAQs

Q1: What is VDSL2?

A1: VDSL2 (Very High-Bit-Rate Digital Subscriber Line 2), G.993.2 is the newest and most advanced standard of xDSL broadband wire line communications.

Designed to support the wide deployment of Triple Play services such as voice, data, high definition television (HDTV) and interactive gaming, VDSL2 enables operators and carrier to gradually, flexibly, and cost efficiently upgrade the existing xDSL-infrastructure.

Q2: What is SNR and what's the effect?

A2: In analog and digital communications, Signal-to-Noise Ratio, often written as SNR, is a measure of signal strength relative to background noise. The ratio is usually measured in decibels (dB).

In digital communications, the SNR will probably cause a reduction in data speed because of frequent errors that require the source (transmitting) computer or terminal to resend some packets of data. SNR measures the quality of a transmission channel over a network channel. The greater the ratio, the easier it is to identify and subsequently isolate and eliminate the source of noise.

Generally speaking, the higher SNR value gets, the better the line quality gets, but performance is lower.

Q3: What is the best distance for IVC-234GT?

A3: In order to guarantee the stability and better quality of network, we suggest the distance should not exceed 1.2 kilometers.

9. Customer Support

Thank you for purchasing PLANET products. You can browse our online FAQ resource and User's Manual on PLANET Web site first to check if it could solve your issue. If you need more support information, please contact PLANET switch support team.

PLANET online FAQs:

<http://www.planet.com.tw/en/support/faq>

Switch support team mail address:

support@planet.com.tw

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EC Declaration of Conformity

For the following equipment:

*Type of Product : IP30 Industrial Ethernet Extender, 4-Port 10/100/1000T RJ45,
1-Port BNC, 1-Port RJ11

*Model Number : IVC-234GT

* Produced by:

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

Manufacturer's Address : 10F., No.96, Minquan Rd., Xindian Dist.,
New Taipei City 231, 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 (2014/30/EU).

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

EN 55032	(2015 + AC:2016)
EN 55024	(2010 + A1:2015)
EN 55035	(2017)

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: **10F., No.96, Minquan Rd., Xindian Dist., New Taipei City 231, Taiwan, R.O.C.**

Person responsible for making this declaration

Name, Surname **Kent Kang**

Position / Title : **Director**

Taiwan
Place

June 12, 2018
Date


Legal Signature

PLANET TECHNOLOGY CORPORATION

