Gigabit Ethernet over Coaxial Converter

VC-232G

User's Manual

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

Table of Contents

1. Package Contents

Thank you for purchasing PLANET VC-232G **1-Port Gigabit Ethernet over Coaxial Converter**. In the following sections, the term **"EoC Converter"** means the VC-232G.

Open the box of the EoC Converter and carefully unpack it. The box should contain the following items:

VC-232G	User's Manual	DC 5V/2A Power Adapter
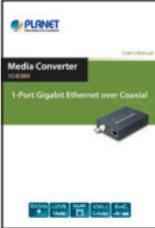
If any of these are missing or damaged, please contact your dealer immediately; if possible, retain the carton including the original packing material, and use them again to repack the product in case there is a need to return it to us for repair.

2.Hardware Introduction

2.1 Physical Dimensions

■ **Dimensions (W x D x H):** 94 x 70.3 x 26mm
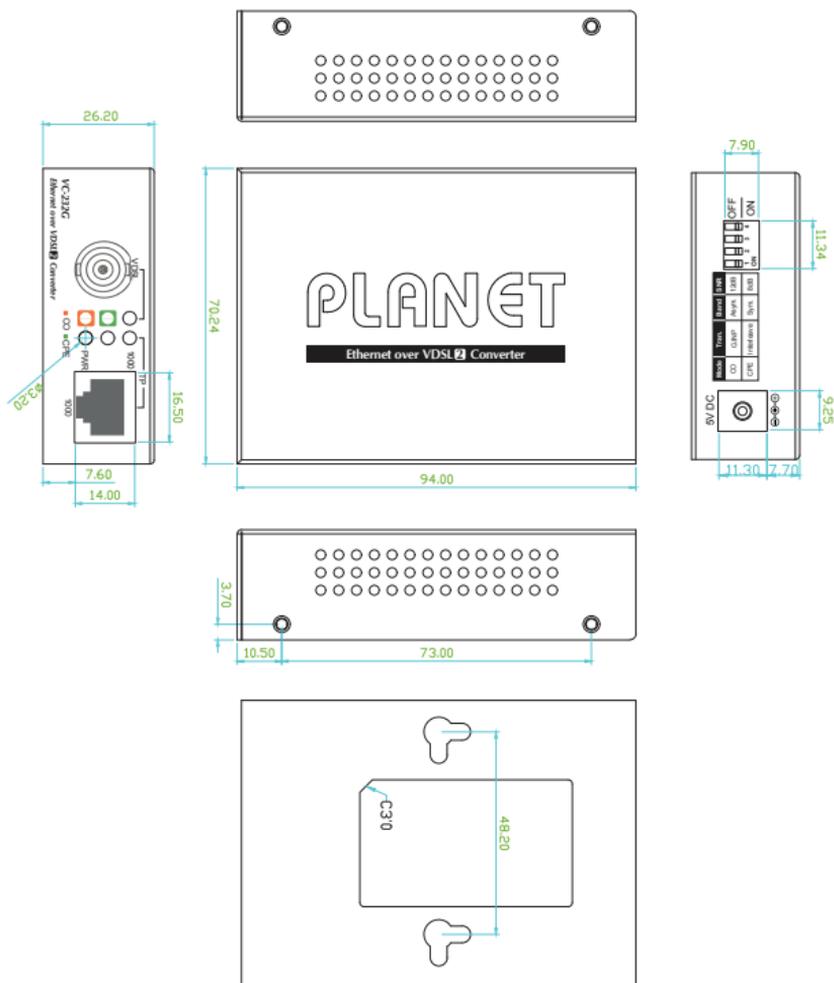
Dimensions (unit = mm)

2.2 Front View

■ VC-232G Front Panel
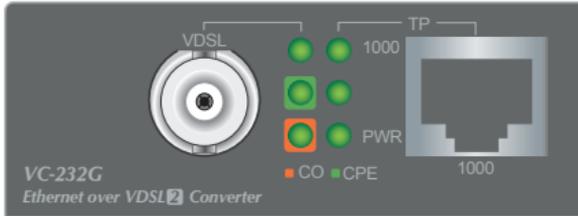
> 1000BASE-T RJ45 connector
> BNC female connector for VDSL2
> LEDs for power, Ethernet and VDSL
> CO/CPE mode selectable via DIP switch

■ VC-232G 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	
PWR	Green	Lit	Indicates that the EoC Converter has power.
		Off	Indicates that the EoC Converter has no power.

◆ VDSL

LED	Color		Function
VDSL	Green	Lit	Indicates that the VDSL connection is established.
		Fast Blink	Indicates that the VDSL connection is at training status (about 10 seconds).
		Slow Blink	Indicates that the VDSL connection is at idle status.
CO	Green	Lit	Indicates the EoC Converter is running in **CO** mode.
CPE	Green	Lit	Indicates the EoC Converter is running in **CPE** mode.

◆ 1000BASE-T Port

LED	Color		Function
1000	Green	Lit	Indicates that the port is operating at **1000Mbps**.
		Blink	Indicates that the EoC Converter is actively sending or receiving data over that port at 1000Mbps.
		Off	Indicates that the port is **linkdown**.

2.3 Rear View

■ VC-232G Front Panel
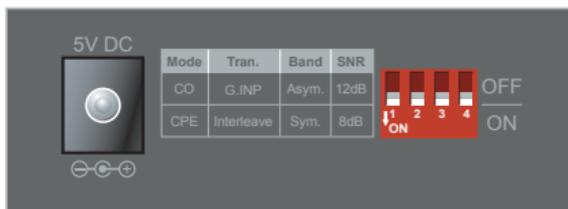
- ➢ DIP switch
- ➢ DC jack (DC input) for power adapter

■ DIP Switch

The EoC Converter provides a selectable 4-position DIP switch. Switch them on or off to obtain the best coaxial 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 site 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 EoC Converter 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 | Asymmetric mode provides more bandwidth than the other side. This mode provides the highest bandwidth in short range. |
| Symmetric | With G.997 band plan supported, 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 VDSL2 Bridge before making any transmission mode adjustment.

◆ DC Power Jack

The VC-232G requires 5V DC, 2A power input, which conforms to the bundled AC adapter. Should you have the issue of power connection, please contact your local sales representative.

> 2.5mm
>
> DC Receptacle 2.5mm
> +5V for each slot
> ⊖⊙⊕
>
> DC receptacle is 2.5mm wide that conforms to the EoC Converter 2.5mm DC jack's central post. Do not install any improper unit.

> Note
>
> In some areas, installing a surge suppression device may also help to protect your EoC Converter from being damaged by unregulated surge or current to the EoC Converter or the power adapter.

3. Product Specifications

Product	VC-232G		
Hardware Specifications			
TP interface	1 Gigabit RJ45 port**		
VDSL Interface	1 BNC female Ethernet over Coaxial		
	Cabling	Coaxial cable: 75 ohm RG-6/U cable, less than12Ω/1000 ft RG-59/U cable, less than 30Ω/1000 ft.	
	Maximum Distance	Max. 1400m with data transmission (4,593ft.)	
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)	97 x 70 x 26 mm		
Weight	185g		
Power Requirement	5V DC, 2A external power		
LED Indicators	Power: Green 1000BASE-T LNK/ACT: Green VDSL: Green CO: Green CPE: Green		
Housing	Metal		

System Specifications	
VDSL Compliance	■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 802.3ab Gigabit Ethernet IEEE 802.3x Full-duplex flow control IEEE 802.1p Class of Service 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: 0~50 degrees C Storage: -10~70 degrees C
Humidity	Operating: 5~95% (non-condensing) Storage: 5~95% (non-condensing)

**The RJ45 port only supports 1000BASE-T Ethernet.

4. Applications

The EoC Converter 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 EoC Converter. Please check the following items

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

One set of the EoC Converter 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 EoC Converter must be **Master** (**CO** mode) and the other one is **Slave** (**CPE** mode).

Point to Point Application
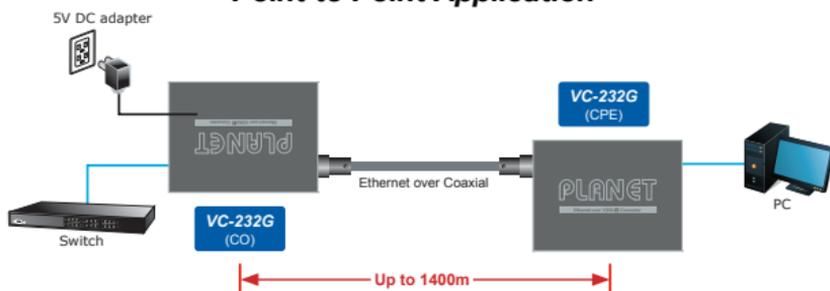
Connecting Standalone PC

Refer to the following procedures to set up the VC-232G LAN to LAN connection.

1. **[LAN1]** Set the VC-232G at LAN 1 to be **CO** mode from the DIP switch

2. **[LAN2]** Set the VC-232G at LAN 2 to be **CPE** mode from the DIP switch

3. Power on the VC-232G CO and CPE at both sides by connecting its power source.

4. Power, CO and CPE LED will illuminate correspondingly.

5. Connect coaxial cable from LAN1 VC-232G to **VDSL BNC port** of the LAN2 VC-232G.

6. **VDSL LNK LED** will blink to illuminate at both VDSL2 bridges.

7. Connect the VC-232G Ethernet **LAN port to** other network device via regular Cat.5 UTP cable.

4.2 VC-232G Point-to-Multi-point Application (IP surveillance)
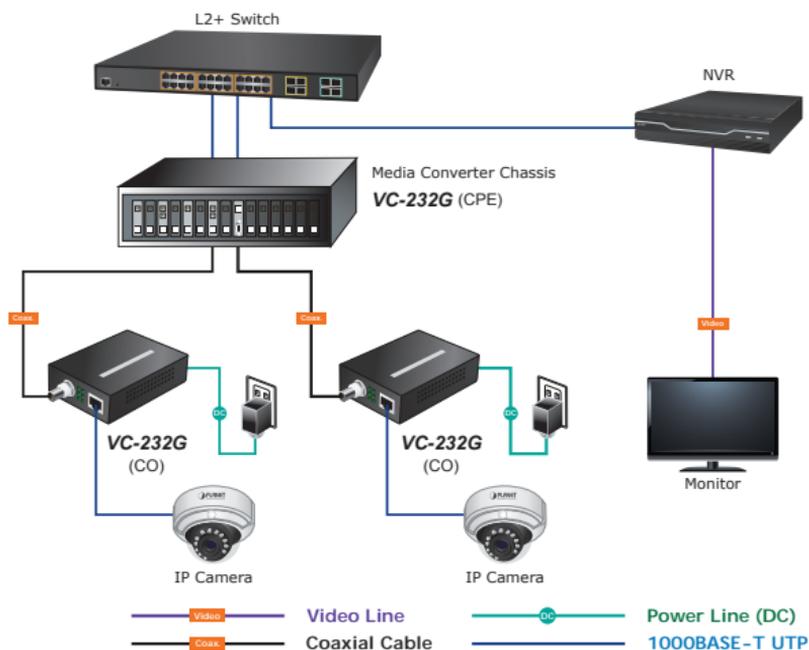
Building an IP surveillance system

Refer to the following procedure to set up an IP surveillance system with many pairs of the VC-232G:

1. Set the VC-232G to be CO and CPE mode from the DIP switch on the rear panel.
2. Power on the VC-232G by connecting its power source.
3. Power LED will illuminate.
4. Connect coaxial cable to the VDSL ports of two VC-232G units.
5. VDSL LED will blink to illuminate.
6. Connect Ethernet port 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.

Installing Ethernet over Coaxial Converter

5. Installations

5.1 Wall-mount Installation

Step 1: Please find the wall that can mount the VC-232G
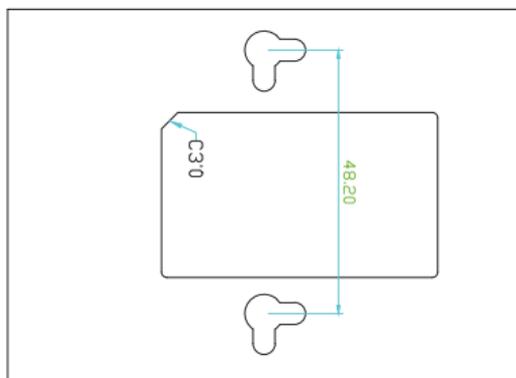
Step 2: Screw two screws on the wall.

Step 3: Hang the VC-232G on the screws from the wall.

Step 4: Repeat Step 5 of Desktop Installation for power supply to the VC-232G

|	
Note	Before mounting the device to the wall, please check the location of the electrical outlet and the length of the Ethernet cable.

5.2 Chassis Installation and Rack Mounting

To install the EoC Converter in a **10-inch** or **19-inch** Converter Chassis with standard rack, follow the instructions described below.

Step 1: Place your VC-232G on a hard flat surface, with the front panel positioned towards your front side.

Step 2: Carefully slide in the module until it is fully and firmly fitted into the slot of the converter chassis.
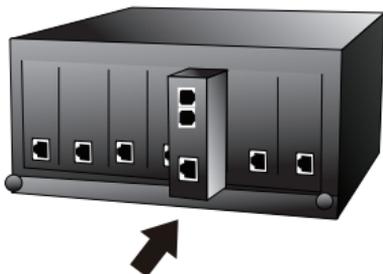
Step 3: Attach a rack-mount bracket to each side of the Converter Chassis with supplied screws attached to the package.

Step 4: After the brackets are attached to the Converter Chassis, use suitable screws to securely attach the brackets to the rack.

Step 5: Proceed with Step 4 and Step 5 of the **2.1 Installation** section to connect the network cabling and supply power to your Converter Chassis.

> ⚠ You must use the screws supplied with the mounting brackets. Damage caused to the parts by using incorrect screws would invalidate your warranty.

6. Performance Table

■ VC-232G Upstream /Downstream Performance

CO DIP Switch / Distance (meter)	Interleave (Upstream/Downstream)			
	Asymmetric		Symmetric	
	8dB	12dB	8dB	12dB
200	88/168	78/145	129/131	117/123
400	75/160	69/137	117/122	102/102
600	59/129	48/118	101/92	88/82
800	32/110	26/94	62/73	47/56
1000	13/82	12/67	20/52	11/44

CO DIP Switch / Distance (meter)	G.INP (Upstream/Downstream)			
	Asymmetric		Symmetric	
	8dB	12dB	8dB	12dB
200	95/200	89/181	147/147	138/143
400	82/175	71/156	132/135	116/120
600	59/151	46/136	108/104	91/89
800	37/122	30/102	76/78	58/60
1000	13/91	8/76	19/55	11/43

**The above table is for your prior reference.

*** The actual data rate will vary on the quality of the coaxial cables 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 1.4km) connected between the two VC-232G units. Please also try to adjust the DIP switch of the VC-232G to the other SNR mode.

2. Please note you must use one VC-232G in CO mode and the other VC-232G in CPE mode to make connection to each other work.

■ **SYMPTOM:**

TP LED does not light 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 Gigabit auto-negotiation, please try to manually set at a fixed speed of your device to solve this issue.

3. The VC-232G 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-effectively 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 VC-232G?

A3: In order to guarantee the stability and better quality of network, we suggest the distance should not exceed 1.4 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 FAQ:
http://www.planet.com.tw/en/support/faq.php?type=1

Switch support team mail address:
support@planet.com.tw

PLANET
Networking & Communication

EC Declaration of Conformity

For the following equipment:

*Type of Product: 1-Port Gigabit Ethernet to VDSL2 Converter

*Model Number: VC-232G

* 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	(2012/AC:2013)
EN 61000-3-2	(2014)
EN 61000-3-3	(2013)
EN 55024	(2010+A1:2015)

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   <u>**Kent Kang**</u>

Position / Title :   <u>**Director**</u>

<u>**Taiwan**</u>   <u>**Oct. 27 , 2017**</u>
Place   *Date*   *Legal Signature*

PLANET TECHNOLOGY CORPORATION