

1. Package Contents

Thank you for purchasing PLANET 1-Port 10/100/1000T 802.3at PoE + Ethernet to VDSL2 Converter, VC-231GP. Open the box of the VC-231GP and carefully unpack it. The box should contain the following items:

VC-231GP x 1		User's Manual x 1	
			
AC-DC Power Adapter x 1	Splitter x 1	RJ11 Telephone Wire x 1	
			
(Input: 54V DC, 0.74A max)			

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. Product Features

> Physical

- 1-port 10/100/1000BASE-T RJ45 with **IEEE 802.3af/802.3at PoE** Injector
- 1 RJ11, connector for VDSL port with VDSL connection
- Additional splitter for POTS connection

> Power over Ethernet

- Complies with IEEE 802.3af/at PoE Plus end-span PSE
- 1 IEEE 802.3af/at device powered
- Supports PoE Power up to 30.8 watts for PoE port
- Provides DC 52V power over RJ45 Ethernet cable to PD with Ethernet port
- Auto-detects IEEE 802.3af/at equipment and protects devices from being damaged by incorrect installation
- Remote power feeding up to 100m
- IEEE 802.3af/at splitter devices compatible

> VDSL2 Features

- Cost-effective bridge function to connect two Ethernet LANs
 - Point-to-multipoint application: Compatible with PLANET and third-party VDSL2 IP DSLAM for last-mile solution
 - Point-to-point application: LAN to LAN extension over phone wire
- Up to 150/150Mbps bandwidth (in **G.INP, Sym, 8dB** mode)
- ITU-T G.993.2 VDSL2 standard
- ITU-T G.993.5 G.Vectoring and G.INP
- DMT-based coding technology
- Additional POST splitter to share voice and data
- CO/CPE mode selectable via DIP switch
- Selectable target band plan (symmetric and asymmetric) and SNR margin
- Half duplex back pressure and IEEE 802.3x full duplex pause frame flow control
- Voice and data communication can be shared simultaneously based on the existing telephone wire with distance up to 1.4km
- Supports IEEE 802.1Q VLAN tag transparency

- VDSL2 stand-alone transceiver for simple bridge modem application

- Advantage of minimum installation time (Simply by Plug and Play)
- Supports extensive LED indicators for network diagnosis

> Layer 2 Features

- Supports auto-negotiation and 10/100Mbps half/full duplex and 1000Mbps full duplex mode on RJ45 port
- Prevents packet loss with back pressure (half-duplex) and IEEE 802.3x pause frame flow control (full-duplex)

> Hardware Features

- Compact size, wall-mountable design
- Metal case, good for heat sinking
- Easy installation; ideal solution for space-limited locations
- Power Input: DC 54V, 0.74A power adapter
- LED Indicators
 - **System:** Power (Green)
 - **TP port:** 100BASE-TX LNK/ACT (Green), 1000BASE-T LNK/ACT (Green), PoE-in-Use (Amber)
 - **VDSL port:** CO (Green), CPE (Green), VDSL (Green)

3. Hardware Introduction

3.1 Front Panel and LED Indicators

■ VC-231GP Front Panel

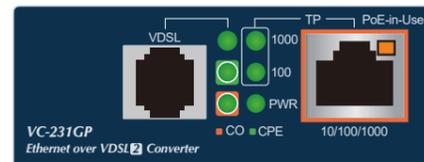


Figure 3-1-1: VC-231GP Front Panel

- > 10/100/1000BASE-T RJ45 connector for Ethernet and 802.3at/af PoE injector
- > RJ11 connector for VDSL2; connect to IP DSLAM or another VDSL2 equipment
- > LEDs for power, Ethernet, PoE and VDSL

■ VC-231GP LED Indication

> System

LED	Color	Function	
PWR	Green	Lit	Indicates that the VC-231GP has power.
		Off	Indicates that the VC-231GP has no power.

> VDSL

LED	Color	Function	
VDSL	Green	Lit	Indicates that the VDSL link is established.
		Fast Blink	Indicates that the VDSL link is at training status (about 10 seconds).
		Slow Blink	Indicates that the VDSL link is at idle status.
CO	Green	Lit	Indicates the VC-231GP is running in CO mode.
CPE	Green	Lit	Indicates the VC-231GP is running in CPE mode.

> 10/100/1000BASE-T 802.3at PoE Port

LED	Color	Function	
1000	Green	Lit	Indicates that the port is operating at 1000Mbps .
		Blink	Indicates that the VC-231GP actively sending or receiving data over that port at 1000Mbps .
		Off	Indicates that the port is link down or operating at 10/100Mbps .

100	Green	Lit	Indicates that the port is operating at 100Mbps or 10Mbps .
		Blink	Indicates that the VC-231GP is actively sending or receiving data over that port at 100Mbps or 10Mbps .
		Off	Indicates that the port is link down or operating at 1000Mbps .
PoE in-Use	Amber	Lit	Indicates that the port is providing DC in-line power to remote powered device.

3.2 Rear Panel and Mode DIP Switch

■ VC-231GP Rear Panel

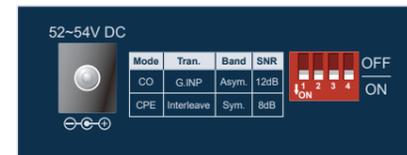


Figure 3-2-1: VC-231GP Rear Panel

- > DIP switch
- > DC jack (DC input) for power adapter

■ DC Power Jack

The VC-231GP requires 54V DC, 0.74A power input, which conforms to the bundled AC-DC adapter. Should you have the issue of power connection, please contact your local sales representative.

Note The device is a power-required device, meaning it will not work till it is powered. If your networks should be active all the time, please consider using UPS (uninterrupted power supply) for your device. It will prevent you from network data loss or network downtime.

Note In some areas, installing a surge suppression device may also help to protect your VC-231GP from being damaged by unregulated surge or current to the VC-231GP or the power adapter.

■ DIP Switch

The VC-231GP provides 4 selective transmission modes. By switching the transmission modes, you can obtain a best transmission mode to suit your phone line quality or distance of connectivity. The following is the summary table of transmission setting, bandwidth and distance extensibility tested for AWG 24 (0.5mm) twisted-pair without noise and cross talk.

	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

> 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 VC-231GP 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 line.
Interleave	Method of error correction used on xDSL line. 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

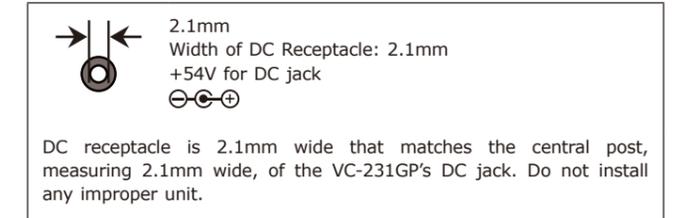
When the SNR margin is selected, the system provides 12dB/8dB SNR margin for all usable loop lengths. Better channel noise protection is made with the higher SNR margin.

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

Note Please **power off** the VC-231GP before making any transmission mode adjustment.

3.3 Power Information

The central posts of the VC-231GP's power jacks measure 2.5mm wide that require +54V DC power input. They conform to the bundled AC-DC adapter. Should you have the issue of power connection, please contact your local sales representative.

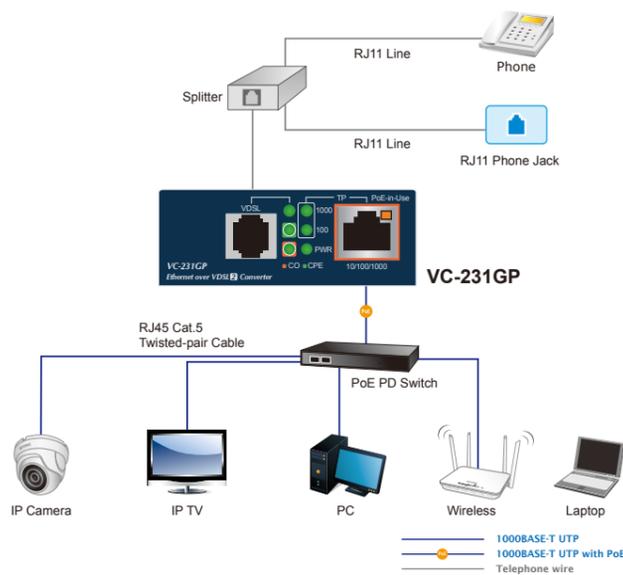


DC receptacle is 2.1mm wide that matches the central post, measuring 2.1mm wide, of the VC-231GP's DC jack. Do not install any improper unit.

4. Connecting And Using The VDSL2 Bridge

The VC-231GP does not require any software configuration. Users can immediately use any feature of this product simply by putting the plug in the receptacle and turning it on. There is some key limitation on the VC-231GP. Please check the following items:

- The device can be used for Point-to-Point (one CO device to one CPE device) connection or Point-to-Multipoint (one multi-port CO device to multi CPE devices) and allows data and voice to work on the same telephone lines.
- The VC-231GP provides only one RJ11 connector for VDSL2 port to build VDSL2 connection. For voice device connection, there is an additional splitter from the package of the VC-231GP, which is an ideal choice.
- Depending on the quality of telephone line, the maximum distance of one VDSL2 segment is 1.4km (4593ft) with AWG 24 telephone wires. The distance could vary on the quality of telephone wires.



5. Product Specifications

Product	VC-231GP
Hardware Specifications	
LAN Port	1 10/100/1000BASE-T RJ45 auto-MDI/MDI-X port
VDSL Port	1 VDSL2 RJ11 female phone jack Twisted-pair telephone wires (AWG24 or better) up to 1.4km
Phone Port	Additional splitter for POTS connection
Dimensions (W x D x H)	97 x 70 x 26 mm
Weight	206g
Power Requirement	DC 54V, 0.74A external power
LED Indicators	System: Power (Green) TP port: 1000BASE-TX LNK/ACT (Green), 1000BASE-T LNK/ACT (Green), PoE-in-Use (Amber) VDSL port: CO (Green), CPE (Green), VDSL (Green)
Housing	Metal
DIP Switch & Functionality	4-position DIP switch <ul style="list-style-type: none"> ● CO/CPE mode select ● Selectable G.INP and interleaved mode ● Selectable target Band Profile ● Selectable target SNR mode
Power Over Ethernet	
PoE Standard	IEEE 802.3af Power over Ethernet IEEE 802.3at Power over Ethernet Plus
PoE Power Output	52V DC: 15.4 watts 52V DC: 30 watts
PoE Power Supply Type	End-span
Power Pin Assignment	1/2(+), 3/6(-)
PoE Power Budget	30 watts
Switch Specifications	
Switch Processing Scheme	Store-and-Forward
Address Table	2K entries
Flow Control	Back pressure for half duplex IEEE 802.3x pause frame for full duplex
Maximum Packet Size	1522bytes

System Specifications	
VDSL Compliance	<ul style="list-style-type: none"> ● VDSL-DMT <ul style="list-style-type: none"> ■ 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
ADSL Compliance	<ul style="list-style-type: none"> ● Capable of ADSL2+/2+ standard <ul style="list-style-type: none"> ■ ITU G.992.3 G.dmt.bis ■ ITU G.992.5 G.dmt.bisplus ● Data Rate: Up to 24Mbps
Standards Conformance	
Standards Compliance	IEEE 802.3 Ethernet IEEE 802.3u Fast Ethernet IEEE 802.3ab Gigabit Ethernet IEEE 802.3x Full-duplex Flow Control IEEE 802.1p Class Of Service IEEE 802.3af Power over Ethernet IEEE 802.3at Power over Ethernet Plus 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 & G.INP ITU-T G.998
Compatible Products	
VDSL2 CO Switch	VC-820M
VDSL2 CO/CPE Bridge	VC-231G VC-234G IVC-234GT VC-231

6. Performance Table

■ VC-231G (CO) / VC-231GP (CPE) Performance, unit: Mbps

Distance (meter)	Interleave (Downstream/Upstream)			
	Asymmetric		Symmetric	
	8dB	12dB	8dB	12dB
200m	190/90	177/83	149/141	136/129
400m	163/64	145/57	116/115	100/101
600m	110/34	92/31	72/70	58/57
800m	73/18	59/15	45/44	42/36
1000m	49/10	44/10	26/16	23/12
1200m	39/8	32/6	26/12	23/10
1400m	25/6	22/3	29/12	17/11

Distance (meter)	G.INP (Downstream/Upstream)			
	Asymmetric		Symmetric	
	8dB	12dB	8dB	12dB
200m	192/93	177/85	150/150	136/133
400m	159/64	144/51	114/113	97/102
600m	106/37	87/29	69/69	54/56
800m	68/19	55/15	49/39	40/35
1000m	49/8	40/8	27/24	24/22
1200m	29/8	38/8	26/12	24/9
1400m	26/6	26/4	21/11	18/12

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

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1-Port 10/100/1000T 802.3at PoE+ Ethernet to VDSL2 Converter

▶ VC-231GP

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2350-AC0540-001

Warning:
This device is compliant with Class A of CISPR 32. In a residential environment this device may cause radio interference.



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.

7. Customer Support

Thank you for purchasing PLANET products. You can browse our online FAQ resource on PLANET Website first to check if it could solve your issue. If you need more support information, please contact PLANET converter support team.

PLANET online FAQs:
<http://www.planet.com.tw/en/support/faq.php?type=1>

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

APPENDIX: Wall-mount Installation

This part describes how to install your VC-231GP and make connections to it.

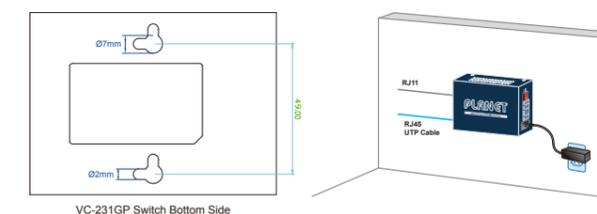
Please read the following topics and perform the procedures in the order being presented.

■ Wall-mount Installation

- Step 1:** Please find the wall that can mount the VC-231GP.
- Step 2:** Screw two screws on the wall.
- Step 3:** Hang the VC-231GP on the screws from the wall.
- Step 4:** Refer to chapter 3.3 Power Information for power supply to the VC-231GP.



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



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