

# 4-Port 10/100/1000T Ethernet to VDSL2 Bridge (35b profile w/ G.vector)



## 200/200Mbps Downstream/Upstream, High-performance Gigabit Ethernet over Phone Wire Solution

PLANET VC-234G, a new-generation and high-performance Gigabit Ethernet-over-VDSL2 Bridge with the brand-new VDSL2 Super Vector 35b profile, works well with a pervasive telephone line network with a symmetric data rate of up to **200/200Mbps (G.INP, Sym, 8dB)** over a distance of **200m and 25/16Mbps** over a long distance of **1.4km**. It is based on the two-core networking technology, **Gigabit Ethernet** and **VDSL2** (Very-high-data-rate Digital Subscriber Line 2). The VDSL2 technology offers absolutely the fastest data transmission speed over the existing copper telephone lines without the need of rewiring.

## High-performance Ethernet over VDSL2 Transmission

Via the latest VDSL2 technology, PLANET VC-234G offers high-speed access to Internet, up to 200Mbps for both upstream and downstream data transmissions. With integrated support for the ITU-T's new **G.993.5 vectoring technology**, the VC-234G offers a stable yet high-speed point-to-point network access up to a duplex data transmission rate of 300Mbps. It provides 2 selective transmission modes -- **asymmetric** mode or **symmetric** mode -- for the transmission of upstream and downstream signals.

- Asymmetric mode – downstream up to **300Mbps** and upstream up to **100Mbps**
- Symmetric mode – downstream up to **200Mbps** and upstream up to **200Mbps**

The symmetric mode provides similar transmission rate on both downstream and upstream while the asymmetric mode performs higher transmission quality in short range. In all, when the VC-234G is in the symmetric mode, it provides a better upstream performance, and when it is in the asymmetric mode, it gives a better downstream performance. It also works in conjunction with vectoring-enabled DSLAMs to remove crosstalk interference and improve maximum line bandwidth across the existing copper infrastructure.

## Physical Port

- Four 10/100/1000BASE-T RJ45 ports with auto MDI/MDI-X function
- One RJ11 connector for VDSL port with VDSL connection
- One RJ11 phone connector for telephone connection

## VDSL2 Features

- ITU-T G.993.2 **VDSL2 Profile 17a/30a/35b**
- ITU-T G.993.5 G.vectoring and G.INP
- DMT-based coding technology
- Built-in POTS splitter to share voice and data
- CO/CPE mode selectable via DIP switch
- Selectable target band plan and SNR margin
- Up to 200/200Mbps bandwidth (in **G.INP, Sym, 8dB** modes)
- Voice and data communication can be shared simultaneously based on the existing telephone wire
- Used in pairs to extend Point-to-Point connection up to 1.4km

## Layer 2 Features

- Complies with IEEE 802.3, 10BASE-T, IEEE 802.3u, 100BASE-TX, IEEE 802.3ab and 1000BASE-T Ethernet standards
- High-performance Store and Forward architecture, broadcast storm control and runt/CRC filtering eliminate erroneous packets to optimize the network bandwidth
- Integrated address look-up engine, supporting 1K absolute MAC addresses
- 1522bytes packet size
- Automatic address learning and address aging
- IEEE 802.1Q VLAN transparency

## Industrial Case and Installation

- Metal case
- Supports extensive LED indicators for network diagnosis
- External 5V DC, 2A power input socket
- Wall mounting or desktop installation
- 0 to 50 degrees C operating temperature
- Advantage of minimum installation time (Simply by Plug-and-Play)

### Implementing with Existing Telephone Copper Wires

The VC-234G is also a **Long Reach Ethernet (LRE)** Bridge providing four RJ45 Ethernet ports and two RJ11 phone jacks, in which one is for VDSL connection and the other one is for POTS (Plain Old Telephone Service) connection. The VC-234G has a built-in POTS splitter to share the existing phone line with POTS; therefore, there is no need to replace the existing copper wiring. Just plug the VC-234G into the existing RJ11 telephone jack and a high-performance VDSL2 network can be connected. The VC-234G is ideal to be used as an Ethernet extender to an existing Ethernet network.

### Delivering High-demanding Service Connectivity for ISP/Triple Play Devices

The VC-234G provides an excellent bandwidth demand for the triple play devices for home entertainment and communication. With the asymmetric data transmission of **324/60Mbps (G.INP, Asym, 8dB)**, the VC-234G enables many multi-media services to work on the local Internet, such as VoD (video on demand), voice over IP, video phone, IPTV, Internet caching server, distance education, and so on, which is ideal for the following network applications:

- Long-distance IP network devices
- IP digital signage
- Cable TV to IPTV
- Distance video education
- Electronic billboards
- Other applications

### Easy and Flexible Installation

The Ethernet-over-VDSL2 Bridge comes with a plug-and-play design and is fully compatible with all kinds of network protocols. Moreover, the operating status of each individual port and the whole system can be watched via the rich diagnostic LEDs on the front panel. The VC-234G offers two modes, CPE and CO, for application -- CPE mode is used at client side and CO mode is at central side. The **CPE** or **CO** mode can be adjusted by using a built-in DIP switch. For point-to-point connection, a CPE mode VC-234G and a CO mode VC-234G must be set up as one pair of Bridges to perform the connection.

### ADSL2+ Fallback

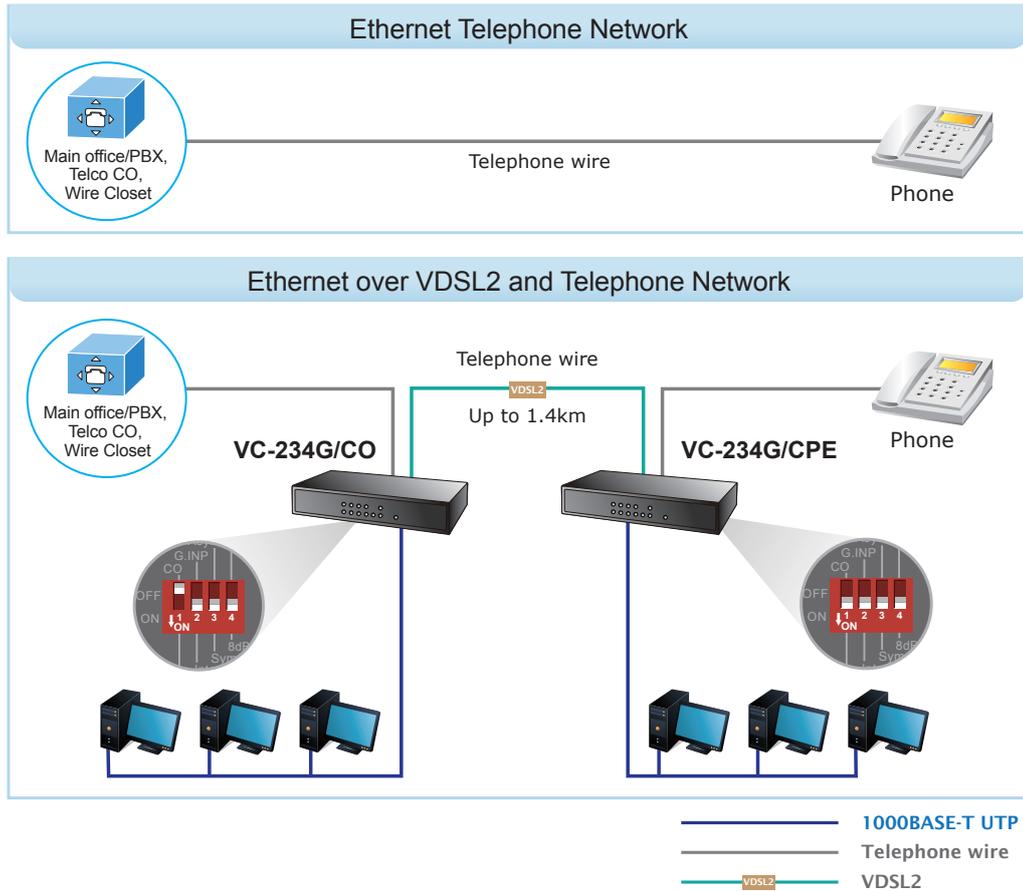
For those ISPs that still provide ADSL broadband service, the VC-234G can support transmission rates up to 24Mbps downstream and 1Mbps upstream with the ADSL2+ technology. The VC-234G establishes a connection with ISP and can be also directly switched over to VDSL2 after the ISP network upgrade.

## Applications

### Ethernet Distance Extension

Two VC-234G Bridge can act as a standalone pair which is good for Ethernet distance extension over the existing telephone wires. With just one pair of AWG-24 copper wires, two Ethernet networks can be easily connected to each other with a maximum data transmission rate of 200Mbps. The telephone service can still be used while the VC-234G CO/CPE is in operation. The two solutions listed below are typical applications for the Ethernet over VDSL2 Bridge.

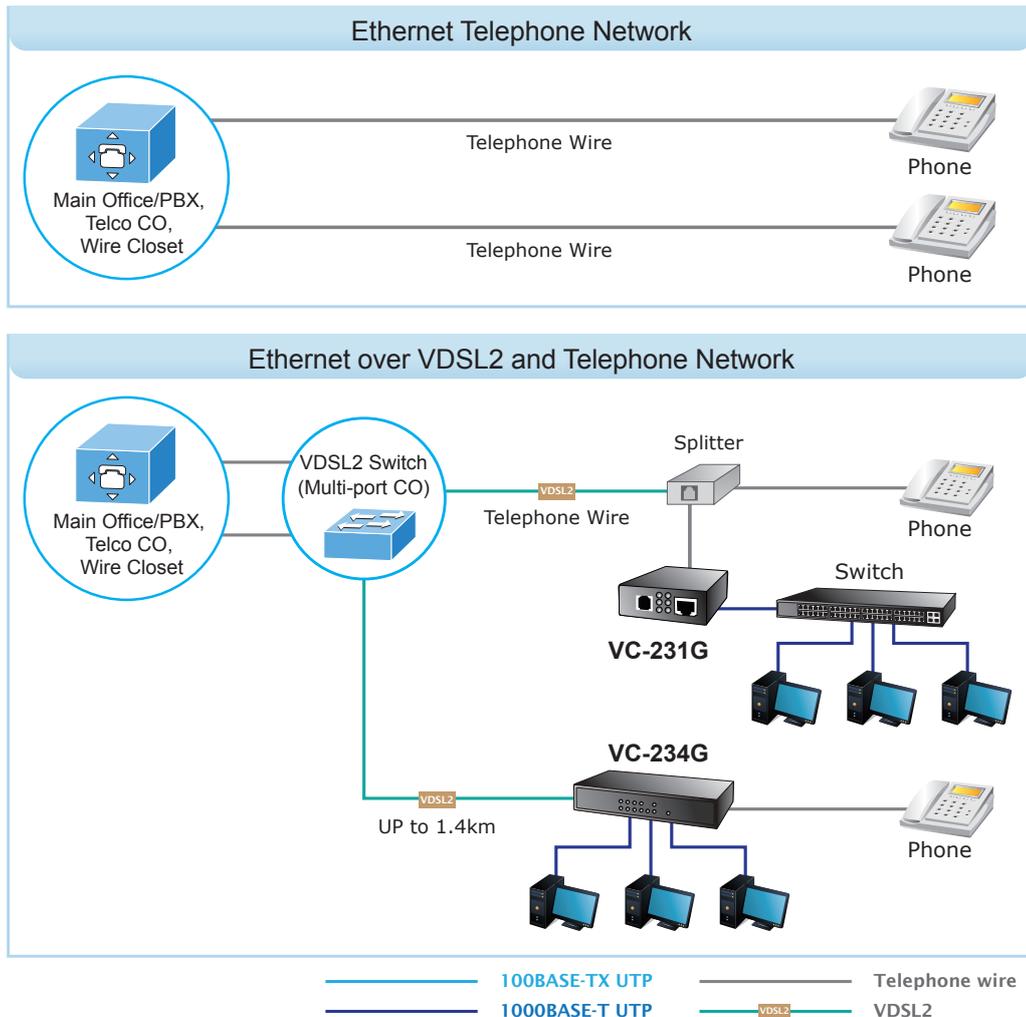
## LAN to LAN Connection



*MTU/MDU/Hospitality Solution*

The VC-234G is a perfect solution to quickly providing cost-effective yet high-speed network services to multi-unit buildings such as residential buildings (multi-dwelling units), commercial (multi-tenant units) buildings, hotels and hospitals. By utilizing the existing telephony infrastructure, a new network installation can be easily built, without requiring new wiring. With a transmission rate of up to **324/60Mbps (G.INP, Asym, 8dB)**, VoD, IP telephony and various broadband services can be easily provided.

## Multi-LAN Connection



## Product Specifications

Product	VC-234G	
<b>Hardware Specifications</b>		
Hardware Version	2	
LAN Ports	4 10/100/1000BASE-T RJ45 auto-MDI/MDI-X ports	
VDSL Port	1 VDSL2 RJ11 female phone jack Twisted-pair telephone wires (AWG-24 or better) up to 1.4km	
Phone Port	1 RJ11 female phone jack, built-in splitter for POTS connection	
DIP Switch & 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)	154.6 x 86 x 26.3 mm	
Weight	366g	
Power Requirements	DC 5V, 2A external power	
Power Consumption/Dissipation	Max. 2.1 watts / 7.1 BTU (Power on without any connection) Max. 3.5 watts / 11.9 BTU (Full Loading)	
LED Indicators	1 x power: Green 4 x 10/100/1000BASE-T LNK/ACT: Green 1 x VDSL: Green 1 x CO: Green 1 x CPE: Green	
Housing	Metal	
<b>Switch Specifications</b>		
Switch Processing Scheme	Store-and-Forward	
Address Table	1K entries	
Maximum Packet Size	1522bytes	
<b>Standards Conformance</b>		
VDSL Compliance	<b>VDSL-DMT</b> <ul style="list-style-type: none"> <li>● ITU-T G.993.1 VDSL</li> <li>● ITU-T G.997.1</li> <li>● ITU-T G.993.2 VDSL2 (Profile 17a/30a/35b support)</li> <li>● ITU-T G.993.5 <b>G.vectoring</b></li> <li>● ITU-T G.998</li> <li>● G.INP</li> </ul>	
ADSL Compliance	Capable of <b>ADSL2/2+</b> standard <ul style="list-style-type: none"> <li>● ITU G.992.3 G.dmt.bis</li> <li>● ITU G.992.5 G.dmt.bisplus</li> </ul> Data Rate: Up to 24Mbps	
Standards Compliance	IEEE 802.3 Ethernet IEEE 802.3u Fast Ethernet IEEE 802.3ab Gigabit Ethernet 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/35b support) ITU-T G.993.5 G.Vectoring & G.INP ITU-T G.998	
Regulatory Compliance	FCC Part 15 Class A, CE	
<b>Environment</b>		
Temperature	Operating: 0~50 degrees C Storage: -10~70 degrees C	
Humidity	Operating: 5~95% (non-condensing) Storage: 5~95% (non-condensing)	

Performance

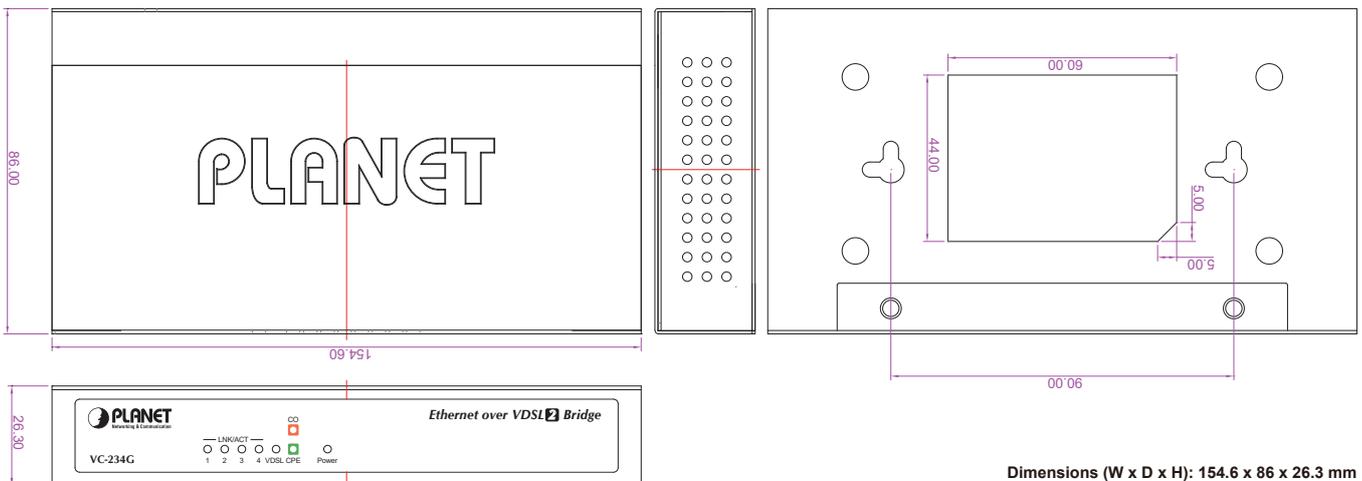
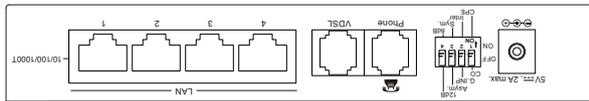
RJ11 Performance* (Downstream/Upstream)	Distance (meter)	Interleave (Downstream/Upstream: Mbps)			
		Asymmetric		Symmetric	
		8dB	12dB	8dB	12dB
	200m	285/58	264/57	182/185	170/173
	400m	187/55	166/52	131/119	116/106
	600m	128/53	108/50	95/89	88/78
	800m	76/42	64/39	71/58	62/48
	1000m	63/24	57/19	53/37	47/31
	1200m	39/11	38/6	34/26	25/20
	1400m	29/11	25/7	29/11	21/12

RJ11 Performance* (Downstream/Upstream)	Distance (meter)	G.INP (Downstream/Upstream: Mbps)			
		Asymmetric		Symmetric	
		8dB	12dB	8dB	12dB
	200m	324/60	303/59	192/193	180/185
	400m	246/55	211/52	135/135	119/106
	600m	131/54	107/49	97/89	90/89
	800m	75/45	63/41	71/56	60/50
	1000m	62/25	57/20	54/40	49/33
	1200m	37/12	38/9	33/25	26/21
	1400m	28/12	24/9	25/16	21/12

\* The performance data above is for reference only. The actual data rate will vary on the quality of the copper wire and environmental factors.

Dimensions



Dimensions (W x D x H): 154.6 x 86 x 26.3 mm

## Ordering Information

VC-234G	4-Port 10/100/1000T Ethernet to VDSL2 Bridge (35b profile w/ G.vector)
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## Related Product

VC-231	Ethernet over VDSL2 Converter (1 x RJ45, 1 x VDSL2/RJ11-30a)
VC-231G	1-Port 10/100/1000T Ethernet to VDSL2 Converter (35b profile w/ G.vector)
VC-231GP	1-Port 10/100/1000T 802.3at PoE+ Ethernet to VDSL2 Converter (35b profile w/ G.vector)
VC-232G	1-Port 10/100/1000T Ethernet over Coaxial Converter (35b profile w/ G.vector)
VC-234	Ethernet over VDSL2 Bridge (4 x RJ45, 1 x VDSL2/RJ11, 1 x Phone-30a)
IVC-234GT	Industrial 1-Port BNC/RJ11 to 4-Port Gigabit Ethernet Extender (35b profile w/ G.vector)