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

PoE Plus High Performance Gigabit Ethernet over Phone Wire Solution
The VC-231GP, a PLANET Long Reach Ethernet (LRE) solution, is a Single-port Gigabit Ethernet-over-VDSL2 Converter with PoE injector function that is installed at a remote location connecting and injecting power to a PoE IP camera, PoE wireless AP, or PoE IP VoIP phone/door phone. It is integrated with three advanced technologies:

■ VDSL2/ADSL2+ Digital Subscriber Line technologies
■ Gigabit Ethernet
■ IEEE 802.3at Power over Ethernet Plus

The VC-231GP works with PLANET VDSL2 converters or multiple-channel VDSL2 switches to be able to simultaneously transmit Ethernet data over a distance of up to 1.4km (4,593ft) over phone wire. The VC-231GP forwards the Ethernet data and provides a maximum of 30-watt power output over an additional 100m UTP cable to a remote IP device complied with 802.3af/at PoE PD (powered device) for network deployment. Users have the ability to grow the structure of the current networks simply with even more flexibility.

Physical Ports
• 1-port 10/100/1000BASE-T RJ45 with IEEE 802.3af/802.3at PoE Injector
• 1 RJ11, connector for xDSL port with VDSL2 or ADSL2+ connection

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

VDSL2 Features
• VDSL2 stand-alone transceiver for simple bridge modem application
• 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)
• Voice and data communication can be shared simultaneously based on the existing telephone wire with distance up to 1.4km
• ITU-T G.993.2 VDSL2 standard
• ITU-T G.993.5 G.Vectoring and G.INP
• DMT-based coding technology
• CO/CPE mode selectable via DIP switch
• Selectable target band plan (symmetric and asymmetric) and SNR margin
• Supports IEEE 802.1Q VLAN tag transparency

Hardware and Installation
• Compact size, wall-mountable design; ideal solution for space-limited locations
• Advantage of minimum installation time (Simply by Plug and Play)
• Metal case, good for heat sinking
• Supports extensive LED indicators for network diagnosis
• Additional POTS splitter to share voice and data
• Supports 6KV DC Ethernet ESD protection
**IEEE 802.3at Power over Ethernet Plus**  
The PoE in-line power following the IEEE 802.3at Power over Ethernet Plus standard makes the VC-231GP able to deliver Gigabit speed Ethernet data and up to 30 watts of power to remote PoE PDs over one Cat.5E/6 Ethernet cable. The VC-231GP provides more flexibility in power requirements for all kinds of PDs at affordable installation costs.

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**150/150Mbps Downstream/Upstream High Performance Gigabit Ethernet over Phone Wire**  
Via the latest VDSL2 technology, the VC-231GP offers selectable asymmetric/symmetric band profile capability. It works well with a pervasive telephone line network with a symmetric data rate of up to 150/150Mbps (G.INP, Sym, 8dB) over a distance of 300m and 21/11Mbps over a long distance of 1.4km. PLANET Gigabit Ethernet over VDSL2 series offers absolutely the fastest data transmission speed over the existing copper telephone lines without the need of rewiring.

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**Versatile, Flexible and Easy Installation**  
PLANET Gigabit Ethernet-over-VDSL2 converters come with a plug-and-play design. The VC-231GP offers two operation 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.

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For point-to-point connection, the VC-231GP in the CPE mode and the VC-231G or VC-234G in the CO mode must be set up as one pair of converters to perform the connection. It gives administrators the ability to reply a fresh local Intranet in various locations by utilizing the original network structure without additional costs.

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**Stable and Reliable DSL Data Connection**  
With the integrated support for the ITU-T’s new G.993.5 Vectoring technology, the VC-231GP works in conjunction with vectoring-enabled DSLAMs to remove crosstalk interference and improve maximum line bandwidth across the existing copper infrastructure.

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**Implementing with Existing Telephone System**  
Use the additional splitter from the package of the VC-231G to share the existing phone line with POTS, thus replacing the existing copper wiring is not necessary. Just plug the VC-231GP with the additional splitter into the existing RJ11 telephone jack and a high-performance VDSL2 network can be connected. It is ideal for use as an Ethernet extender to an existing Ethernet network.
**ADSL2+ Fallback**
For those ISPs that still provide ADSL broadband service, the VC-231GP can support transmission rates up to 24Mbps downstream and 1Mbps upstream with the ADSL2+ technology. The VC-231GP establishes a connection with ISP and can be also directly switched over to VDSL2 after the ISP network upgrade.

**Applications**

**Point-to-Point Application -- LAN to LAN Connection**
Two sets of the VC-231G/VC-231GP could be used to link two local area networks that are located in a different place. Through the normal telephone line, the 150/150Mbps (G.INP, Sym, 8dB) symmetric backbone can be set up, but one VDSL2 Bridge must be Master (CO mode) and the other one is Slave (CPE mode).

**Point-to-Multipoint Application -- Connect to IP DSLAM**
To build a local Internet in apartments, hotels and campuses and hospitality environments, it requires:

- The multi-port VDSL2 IP DSLAM or VDSL2 switch (for example, PLANET VC-820M) operates as a CO Master and needs to be placed in the wiring center (MDF room) and connects to the telephone line system.
- On the other hand, it needs to install one or many CPE Slaves (the VC-231GP) on the individual client side and connect to the multi-port Master through the telephone lines.
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 (AWG-24 or better) up to 1.4km

**Phone Port**
- Additional splitter for POTS connection

**DIP Switch & Functionality**
- 4-position DIP switch
  - CO or CPE mode selectable
  - Selectable G.INP and interleaved mode
  - Selectable target Band plan
  - Selectable target SNR mode

**LED Indicators**
- 1 Power: Green
- 1 1000BASE-T LNK/ACT: Green
- 1 100BASE-TX LNK/ACK: Green
- 1 VDSL: Green
- 1 CO: Green
- 1 CPE: Green
- 1 PoE-in-use: Amber

**ESD Protection**
- 6KV DC

**Enclosure**
- Metal

**Installation**
- Wall mount or DIN rail with optional kit
- Dimensions (W x D x H): 97 x 70 x 26 mm
- Weight: 206g

**Power Requirements**
- DC 54V, 0.74A external power

**Power Consumption**
- CO Mode: 32.4 watts/110BTU
- CPE Mode: 32 watts/109BTU

**Power Over Ethernet**
- PoE Standard: IEEE 802.3at PoE+ PSE
- PoE Power Output Budget: DC 52V, 30 watts
- PoE Power Supply Type: End-span
- Power PIN Assignment: 1/2(+), 3/6(-)

**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: 1522 bytes

**System Specifications**

**VDSSL 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

**ADSL Compliance**
- Capable of ADSL2/2+ standard
  - ITU G.992.3 G.dmt.bis
  - ITU G.992.5 G.dmt.bisplus
- Data Rate: Up to 24Mbp/s

**Performance**

**Interleave, Asym, 8dB**
- 200M ----> 190Mbps/90Mbps
- 400M ----> 163Mbps/64Mbps
- 600M ----> 110Mbps/34Mbps
- 800M ----> 73Mbps/18Mbps
- 1000M ----> 49Mbps/10Mbps
- 1200M ----> 39Mbps/8Mbps
- 1400M ----> 25Mbps/6Mbps

**Interleave, Asym, 12dB**
- 200M ----> 177Mbps/83Mbps
- 400M ----> 145Mbps/57Mbps
- 600M ----> 92Mbps/31Mbps
- 800M ----> 59Mbps/15Mbps
- 1000M ----> 44Mbps/10Mbps
- 1200M ----> 32Mbps/6Mbps
- 1400M ----> 22Mbps/3Mbps

**Interleave, Sym, 8dB**
- 200M ----> 149Mbps/141Mbps
- 400M ----> 116Mbps/115Mbps
- 600M ----> 72Mbps/70Mbps
- 800M ----> 45Mbps/44Mbps
- 1000M ----> 26Mbps/16Mbps
- 1200M ----> 26Mbps/12Mbps
- 1400M ----> 29Mbps/12Mbps

**Interleave, Sym, 12dB**
- 200M ----> 136Mbps/129Mbps
- 400M ----> 100Mbps/101Mbps
- 600M ----> 58Mbps/57Mbps
- 800M ----> 42Mbps/36Mbps
- 1000M ----> 23Mbps/12Mbps
- 1200M ----> 23Mbps/10Mbps
- 1400M ----> 17Mbps/11Mbps
### Performance (Downstream/Upstream)

<table>
<thead>
<tr>
<th>Speed</th>
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<tbody>
<tr>
<td>200M</td>
<td>192Mbps/93Mbps</td>
<td>177Mbps/85Mbps</td>
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<tr>
<td>400M</td>
<td>159Mbps/64Mbps</td>
<td>144Mbps/51Mbps</td>
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<tr>
<td>600M</td>
<td>106Mbps/37Mbps</td>
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<tr>
<td>1400M</td>
<td>26Mbps/6Mbps</td>
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<tr>
<td>1400M</td>
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### Standards Conformance

- 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

### xDSL Compatibility

- VDSL2
  - VC-231G
  - VC-234G
  - VC-234
  - VC-231
  - VC-820M
  - VDR-301N

### Environment

- **Temperature**
  - Operating: 0~50 degrees C
  - Storage: -10~70 degrees C
- **Humidity**
  - Operating: 5~95% (non-condensing)
  - Storage: 5~95% (non-condensing)

## Ordering Information

**VC-231GP**

1-Port 10/100/1000T 802.3at PoE+ Ethernet to VDSL2 Converter (30a profile w/G.Vectoring)

## Related Products

- **VC-231G**
  - 1-Port 10/100/1000T Ethernet to VDSL2 Converter (30a profile w/G.Vectoring)
- **VC-234G**
  - 4-Port 10/100/1000T Ethernet to VDSL2 Bridge (30a profile w/G.Vectoring)
- **VC-234**
  - Ethernet over VDSL2 Converter (1 x RJ45, 1 x VDSL2/RJ11-30a)
- **VC-231**
  - Ethernet over VDSL2 Bridge (4 x RJ45, 1 x VDSL2/RJ11, 1 x Phone-30a)
- **VC-820M**
  - 8-Port VDSL2 + 2G TP/SFP Managed Switch