Industrial 4-Port 10/100/1000T 802.3at PoE+ to VDSL2 Extender

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

To fulfill the needs of long distance and higher speed required Ethernet over Coaxial or phone wire applications, PLANET Technology offers the IVC-234GPT, a new-generation and high-performance Gigabit Ethernet-over-VDSL2 Extender with the brand-new VDSL2 **Super Vector 35b** profile. It features 4 10/100/1000BASE-T RJ45 ports with **802.3at PoE+** injector function, 1 RJ11 female phone jack and 1 BNC female connector. Its IP30 aluminum housing makes the placement of the unit convenient. The IVC-234GPT is based on the coaxial and two-core networking technology, **Gigabit Ethernet** and **VDSL2** (Very-high-data-rate Digital Subscriber Line 2). The VDSL2 technology offers distance extension and signal conversion by transmitting the Ethernet data from the coaxial cable to another 100-meter UTP cable for various IP network devices such as HD IP cameras, wireless access points, NVRs and digital signage. It also offers the fastest data transmission speed over the existing copper telephone lines without the need of rewiring. The IVC-234GPT works well with a pervasive coaxial or telephone line network with **downstream/upstream data rate of up to 200/200Mbps symmetric and 300/100Mbps asymmetric over a distance of 300m**, making a maximum VDSL2 distance reach of up to **1.4km**.

High-performance Ethernet over VDSL2 Transmission

Via the latest VDSL2 technology, PLANET IVC-234GPT 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 IVC-234GPT 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

Physical Port

- Four 10/100/1000BASE-T RJ45 ports with IEEE 802.3af/802.3at PoE Injector function
- One RJ11 female phone jack and one BNC female connector for VDSL2 Transmission

Power over Ethernet

- Complies with IEEE 802.3at/af PoE Plus end-span PSE
- Up to 4 ports of IEEE 802.3af/at devices powered
- Supports PoE power up to 30.8 watts per PoE port
- Provides DC 12-54V power over RJ45 Ethernet cable to PD with Ethernet port
- Up to 120-watt PoE budget
- Auto-detects IEEE 802.3at/af equipment and protects devices from being damaged by incorrect installation
- Remote power feeding up to 100m
- IEEE 802.3at/af splitter devices compatible

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
- 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 RG59/RG6 coaxial cable and 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

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 IVC-234GPT 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.

Delivering High-demanding Service Over Long Distance Connectivity

The IVC-234GPT is also a Long Reach Ethernet (LRE) solution which provides a quick replacement and smooth migration solution from the existing analog system to full digital system. It features two types of VDSL2 transmission, the VDSL2 coaxial cable and VDSL2 RJ11 telephone wire. A normal UTP cable can only be extended up to 100 meters, but with the IVC-234GPT, the distance for Ethernet networking can be extended up to 1,400 meters (4,593ft.).

Industrial Case and Installation

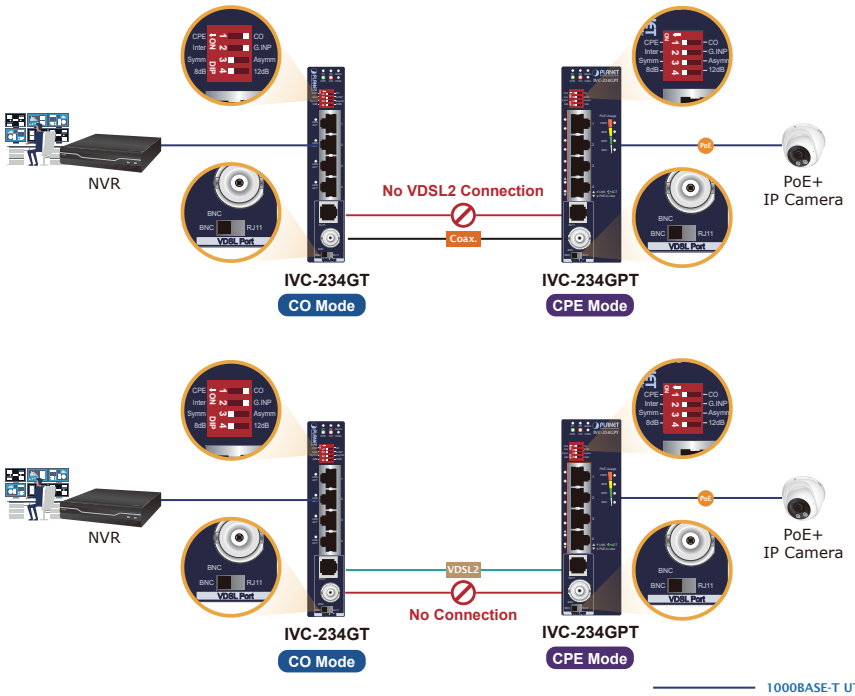
- IP30 aluminum case
- DIN-rail, wall-mount or side wall-mount design for redundant power design
  - 12 to 54V DC, redundant power with reverse polarity protection
- Supports 6000 VDC Ethernet ESD protection
- -40 to 75 degrees C operating temperature
- Advantage of minimum installation time (Simply by Plug-and-Play)
- Supports extensive LED indicators for network diagnosis
- Free fall, shock-proof and vibration-proof for industries

The IVC-234GPT provides an excellent bandwidth demand for the triple play devices for entertainment and communication. With the asymmetric data transmission of 306/60Mbps (G.INP, Asym, 8dB), the IVC-234GPT 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

If you have coaxial cable or RJ11 telephone wire in your existing environment, you can install a pair of the IVC-234GPT very simply without the need to build additional network wires, thus saving costs for network construction.

VDSL2, BNC and RJ11 Connection Diagrams



IEEE 802.3at Power over Ethernet Plus

The IVC-234GPT forwards the Ethernet data and provides a maximum of 30-watt power output over an additional 100m Cat.5E/6 Ethernet cable to a remote IP device complied with 802.3af/at PoE PD (powered device) for network deployment, such as PoE IP camera, PoE wireless AP, or PoE IP VoIP phone/door phone. The IVC-234GPT provides more flexibility in power requirements for all kinds of PDs at affordable installation costs.

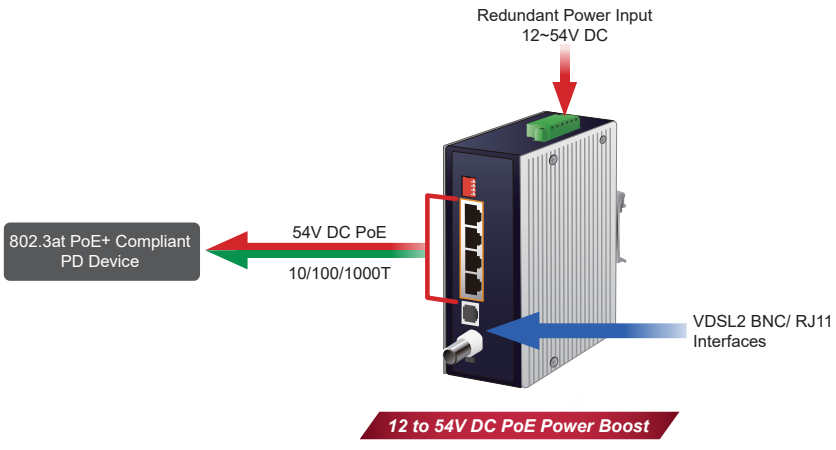
Easy and Flexible Installation

The IVC-234GPT 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 IVC-234GPT 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, one IVC-234GPT in the CPE mode and the other in the CO mode must be set up as one pair of VDSL2 Extenders to perform the connection. This enables the administrator to efficiently manage the network over coaxial cable or RJ11 telephone wire, making long-distance transmission better.

Selectable Target Band Plan via DIP Switch

Convenient and Reliable Power System

To facilitate the 802.3at PoE+ usage with the commonly-used 12~54V DC power input for transportation and industrial-level applications, the IVC-234GPT adopts the **12~54V DC to 54V DC power boost technology** to solve power source issue but does not require special power supplies. Its wide-ranging voltages design is suitable for worldwide operability with high- availability applications requiring dual or backup power inputs.



Stable Operating Performance under Difficult Environments

The IVC-234GPT is the perfect solution for extended data and power transmission for warehouses, parking lots, campuses, casinos, and many more. It can operate stably under temperature range from **-40 to 75 degrees C**, which enables the users to conveniently apply the device in any harsh environment. Without the problem of power source, it makes the installation of remote PoE powered devices easier and more efficient.

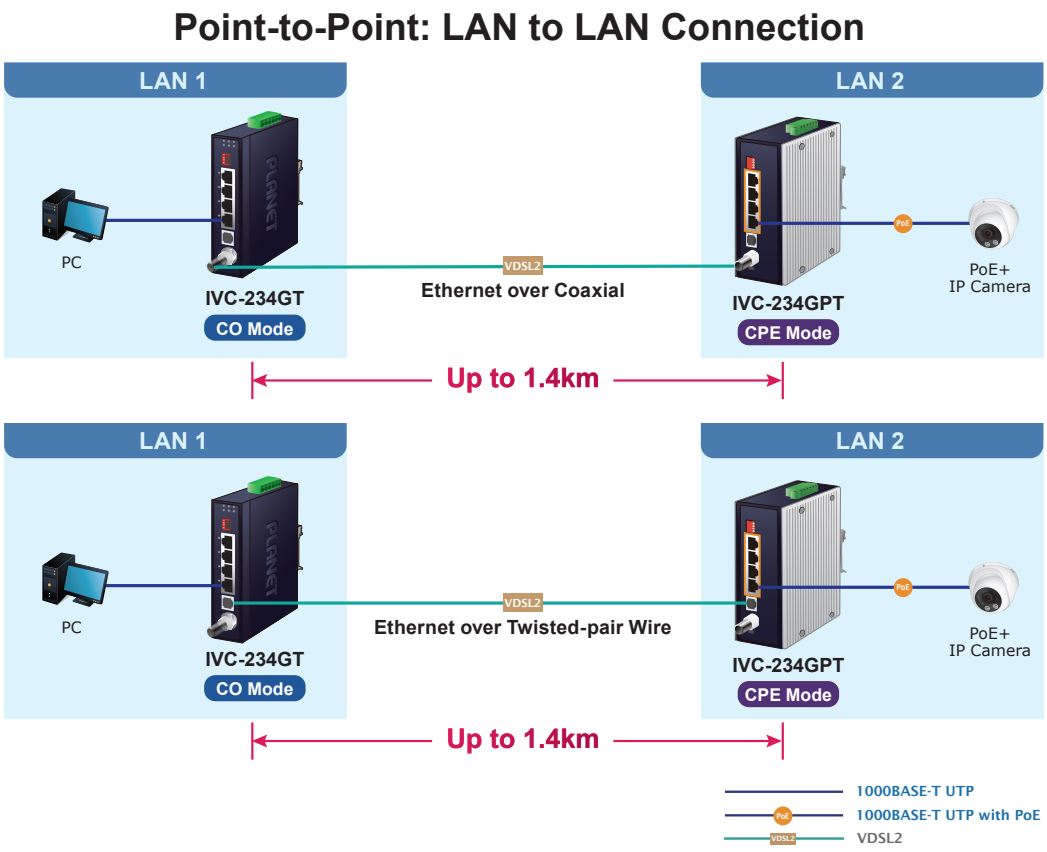
ADSL2+ Fallback

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

Applications

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

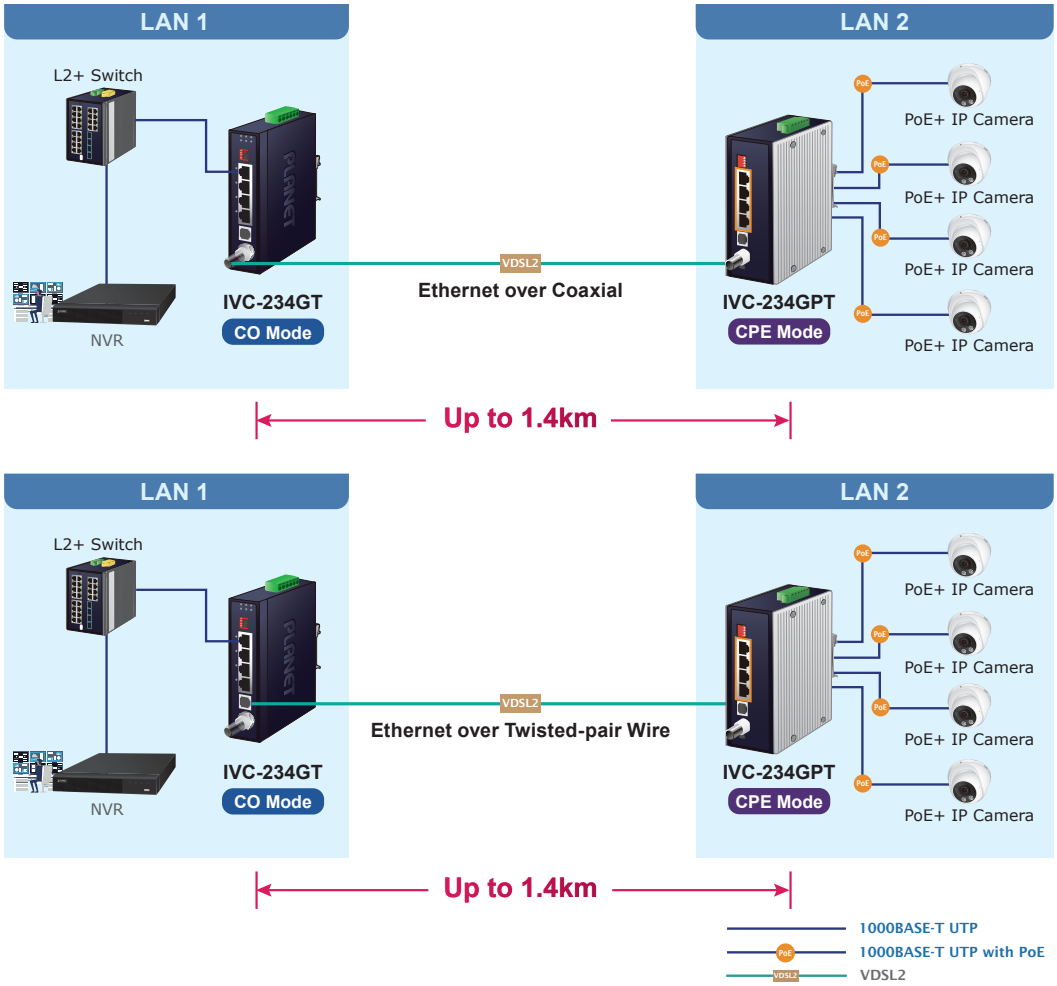
One set of the Industrial Ethernet Extender could be used to link two local Area networks that are located in different places. Through the VDSL2 coaxial cable and VDSL2 RJ11 telephone wire, it could set up a 300/100Mbps asymmetric backbone, but one Industrial Ethernet Extender must be **Master** (**CO** mode) and the other one is **Slave** (**CPE** mode).



Community/Campus Surveillance and Security over IP

To take advantage of digital surveillance system and keep the benefits of VDSL2 coaxial cable/RJ11 telephone wire of the IVC-234GPT, communities, campuses and enterprises can upgrade analog camera system to 802.3t PoE+ IP camera surveillance system without deploying additional new wires. As the IVC-234GPT comes with one RJ11 and one BNC Ethernet over RJ11 and Coaxial port, just plug in the UTP cables of IP camera to the 802.3at PoE+ injector Ethernet ports, use the existing RJ11 or coaxial cable to the RJ11 or BNC connector to easily deploy and extend the distance with signal conversion by transmitting the Ethernet data.

VDSL2 Cabling for IP Surveillance



Specifications

Product		IVC-234GPT
Hardware Specifications		
LAN Ports		4 10/100/1000BASE-T RJ45 auto-MDI/MDI-X ports with 802.3at PoE+ injector function
VDSL Port	BNC	1 BNC female Ethernet over Coaxial port
		Coaxial cable: 75 ohm RG-6/U cable, less than12Ω/1000 ft. RG-59/U cable, less than 30Ω/1000 ft.
		Max. 1400m with data transmission (4,593ft.)
	RJ11	1 VDSL2 RJ11 female phone jack
		Twisted-pair telephone wires (AWG-24 or better)
		Max. 1400m with data transmission (4,593ft.)
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.
ESD Protection		6KV DC
Dimensions (W x D x H)		56 x 86.1 x 135mm
Weight		736g
Power Requirements		DC 12~54V Redundant power with reverse polarity protection
Power Consumption		DC 12V: 60 watts/204BTU DC 24V: 100 watts/341BTU DC 54V: 122 watts/416BTU
LED Indicators		3 x LED for System and Power: ■ **Green**: DC Power 1 ■ **Green**: DC Power 2 ■ **Red**: Alarm 3 x LED for VDSL2 interface: ■ **Green**: VDSL ■ **Green**: CO ■ **Green**: CPE 2 x LED for Per Copper Port (Port-1~Port-4): ■ **Green**: 10/100/1000 LNK/ACT ■ **Amber** PoE-in-Use 4 x LED for PoE Usage: ■ **Amber** 30W ■ **Amber** 60W ■ **Amber** 90W ■ **Amber** 120W
Housing		IP30 Aluminum Case
Power over Ethernet Specifications		
PoE Standard		IEEE 802.3at PoE+ PSE
PoE Power Supply Type		End-span
Power PIN Assignment		1/2(+), 3/6(-)
PoE Power Output		Per port 54V DC, Max. 30.8 watts
PoE Power Output Budget		DC 12V, 60 watts maximum DC 24V, 100 watts maximum DC 48-54V, 120 watts maximum
Switch Specifications		
Switch Processing Scheme		Store-and-Forward
Address Table		1K entries
Maximum Packet Size		1522bytes
Switch 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/35b 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 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
Environment	
Temperature	Operating: -40~75 degrees C Storage: -40~75 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	264/57	255/56	174/171	165/159
400m	212/53	182/49	140/131	125/114
600m	117/44	95/39	80/78	66/66
800m	92/32	76/25	66/52	55/40
1000m	40/29	33/19	42/29	33/25
1200m	30/19	33/19	28/27	26/18
1400m	29/11	25/7	29/11	21/12

Distance (meter)	G.INP (Downstream/Upstream: Mbps)			
	Asymmetric		Symmetric	
	8dB	12dB	8dB	12dB
200m	306/60	279/58	186/186	174/171
400m	221/57	192/52	146/134	129/116
600m	118/45	95/40	81/80	62/54
800m	92/33	77/28	65/51	54/42
1000m	39/22	32/17	42/42	35/25
1200m	30/21	25/16	32/22	26/19
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.

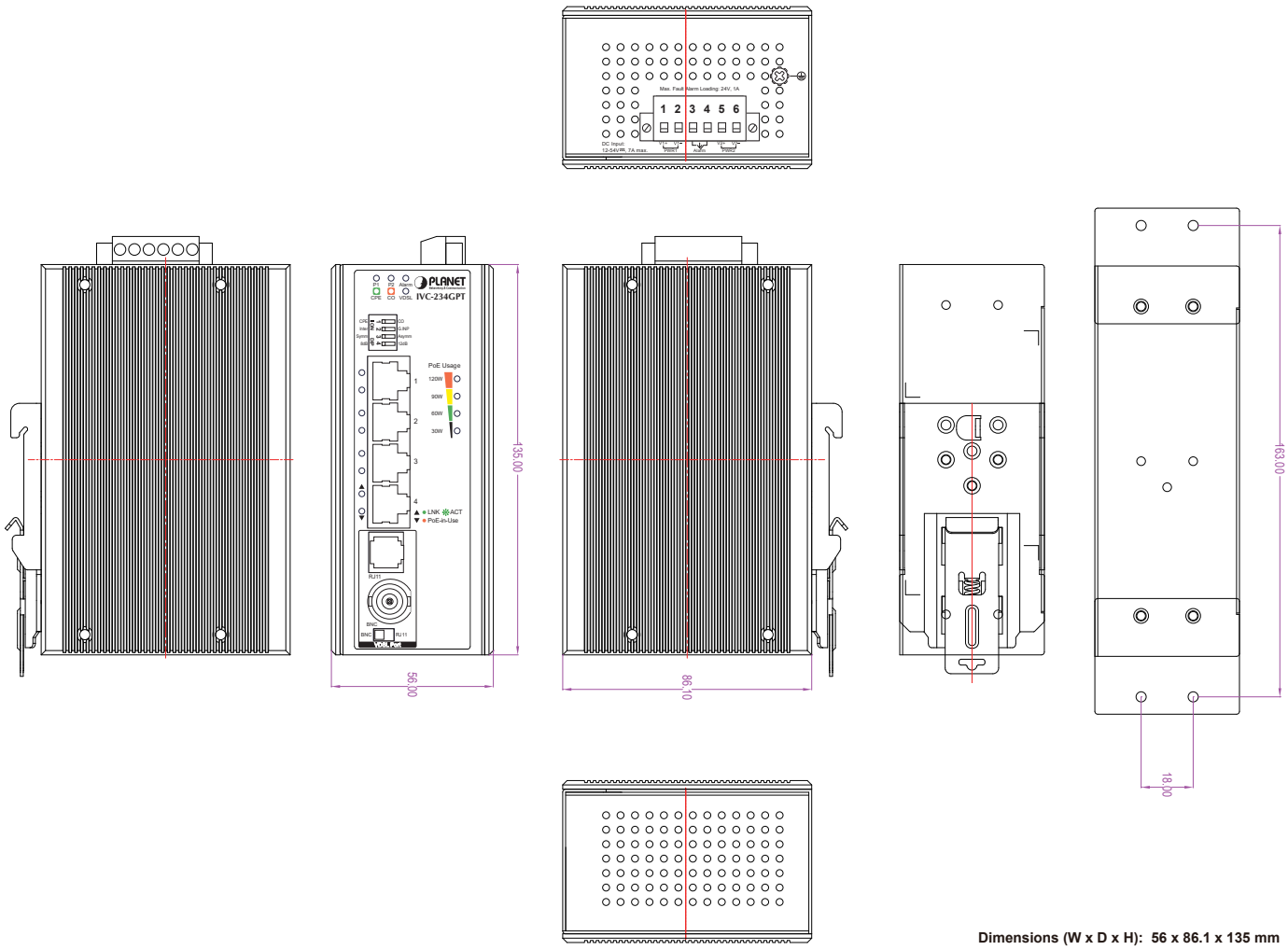
Performance

Coaxial Performance* (Downstream/Upstream)

Distance (meter)	Interleave (Downstream/Upstream: Mbps)			
	Asymmetric		Symmetric	
	8dB	12dB	8dB	12dB
200m	264/57	255/56	177/172	168/164
400m	256/56	213/55	153/150	143/141
600m	184/56	159/51	129/117	111/105
800m	144/52	121/47	101/96	87/86
1000m	94/44	84/39	79/75	68/63
1200m	77/37	63/32	60/60	50/49
1400m	32/21	30/19	28/25	18/15

	Distance (meter)	G.INP (Downstream/Upstream: Mbps)			
		Asymmetric		Symmetric	
		8dB	12dB	8dB	12dB
Coaxial Performance* (Downstream/Upstream)	200m	302/60	277/59	187/182	176/171
	400m	249/58	252/59	163/156	149/142
	600m	191/58	167/56	133/121	118/107
	800m	191/58	121/50	103/97	92/88
	1000m	97/49	83/40	82/70	71/60
	1200m	77/37	63/32	63/56	50/49
	1400m	46/26	37/21	39/31	31/23
	*As there are various resistance values in the category of RG-59/U or RG-6/U cable, the actual data rate will vary on the quality of the copper wire and environmental factors.				

Dimensions



Dimensions (W x D x H): 56 x 86.1 x 135 mm

Ordering Information

IVC-234GPT	Industrial 4-Port 10/100/1000T 802.3at PoE+ to VDSL2 Extender (35b profile w/G.vectoring)

Related Products

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

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