Power over Coaxial Extender

VC-203PT and VC-203PR

User's Manual

Trademarks

Disclaimer

FCC Warning

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.

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

PLANET Industrial Power over Coaxial Extender User's Manual

For Model: VC-203PT / VC-203PR

Revision: 1.0 (May, 2013)

Part No: EM-VC-203PT_203PR_v1.0 (2350-AC0300-000)

Table of Contents

1. INTRODUCTION

Thank you for purchasing PLANET Industrial Power over Coaxial Extender, VC-203PT and VC-203PR. The descriptions of the two models are as follows:

VC-203PT	PoE over Coaxial Extender - Transmitter (1-Port 10/100TX 802.3at PoE PD + 1-Port BNC PoE)
VC-203PR	PoE over Coaxial Extender - Receiver (1-Port 10/100TX 802.3at PoE PSE + 12/24V DC Splitter)

"Industrial Power over Coaxial Extender" mentioned in this Manual represents the above two models.

1.1 Package Contents

Open the box of the Industrial Power over Coaxial Extender and carefully unpack it. The box should contain the following items:

For VC-203PT	For VC-203PR
● Industrial Power over Coaxial Extender – Transmitter x 1 ● User's Manual x 1 ● Power Adapter and Power Cord	● Industrial Power over Coaxial Extender –Receiver x 1 ● User's Manual x 1

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.

1.2 Product Features

Physical Port

Model Name	Ports	
	Copper	**BNC**
VC-203PT	1 x 10/100Base-TX (PoE IN)	Power/Data Transmitter
VC-203PR	1 x 10/100Base-TX (PoE OUT)	Power/Data Receiver

Power over Ethernet

- Eliminates Power cabling with PoE over Coaxial
- Ethernet over coaxial up to 1km with 5C2V/RG6 75Ω cable
- Complies with IEEE 802.3af / IEEE 802.3at Power over Ethernet on RJ-45 ports
- Supports PoE Power up to 30.8 watts (Vary on Power Source and Coaxial Distance)
- Auto detect powered device (PD) (VC-203PR)

Layer 2 Features

- Supports Auto-negotiation and 10/100Mbps half / full duplex mode
- Prevents packet loss with back pressure (Half-Duplex) and IEEE 802.3x PAUSE frame flow control (Full-Duplex)

VDSL2 Features

- One box design, Master / Slave selectable via DIP Switch
- Defines Asymmetric (Band Plan 998) and Symmetric band plans for the transmission of Upstream and Downstream signals

Industrial Case / Installation

- Supports extensive LED indicators for network diagnostics
- IP30 metal case protection
- Compact size, DIN Rail and Wall Mount Design
- Power Input: External DC or PoE power input
- Supports EFT protection 2000 VDC for power line
- Supports 2000 VDC Ethernet ESD protection
- -40 to 75 degrees C operating temperature

1.3 Product Specifications

Model		VC-203PT	VC-203PR
Hardware Specifications			
Interface	Copper	10/100Base-TX RJ-45 Auto-negotiation/ Auto-MDI/MDI-X 802.3at/af PoE Input	10/100Base-TX RJ-45 Auto-negotiation/ Auto-MDI/MDI-X 802.3at/af PoE Output
	Coaxial	BNC, female Power over Coaxial Output	BNC, female Power over Coaxial Input
	DC Socket (Optional)	52~56V DC Input	
	DIP-Switch	2-Position DIP Switch ■ Selectable **CO** or **CPE** mode (Default: **CPE**) ■ Selectable Band plan: **Asymmetric** or **Symmetric** (Default: Asymmetric)	2-Position DIP Switch (Front) ■ Selectable **CO** or **CPE** mode (Default: **CO**) ■ Selectable Band plan: **Asymmetric** or **Symmetric** (Default: Asymmetric)
		---	2-Position DIP Switch (Rear) ■ PoE out or DC out (Default: PoE out) ■ 12V DC / 24V DC output voltage (Default: 12V DC)
LED Indicators		LED is Green Color ■ PWR ■ PoE IN ■ LNK ■ CO ■ CPE ■ LNK/ACT ■ 100	LED is Green Color ■ PWR ■ PoE IN ■ PoE Out ■ LNK ■ CO ■ CPE ■ LNK/ACT ■ 100
ESD Protection		2KV DC	
EFT Protection		2KV DC	
Enclosure		IP30 metal case	

Installation	Wall mount or DIN rail with optional kit	
Dimensions (W x D x H)	94 x 70.3x 39.2 mm	
Weight	288g	302g
Power Requirements	■ RJ-45 PoE Input: 802.3at/af 44~57V DC ■ DC Input: 52~56V DC	■ BNC Power over Coaxial Input: 44~57V DC ■ DC Input: 52~56V DC
Performance* (Down / Up Stream)	Asymmetric Mode (Data Only)	
	200m -> 100/65Mbps 800m -> 100/53Mbps 400m -> 100/64Mbps 1000m -> 94/44Mbps 600m -> 100/59Mbps 1200m -> 84/36Mbps	
	Symmetric Mode (Data Only)	
	200m -> 100/100Mbps 800m -> 79/80Mbps 400m -> 97/100Mbps 1000m -> 69/66Mbps 600m -> 86/91Mbps 1200m -> 60/52Mbps	

Power over Ethernet/Coaxial		
PoE Standard	IEEE 802.3at Type 2 IEEE 802.3af	
PSE Interface	BNC 44~57V DC (Depend on what is the DC/PoE Power Input)	RJ-45 48~56V DC, 600mA max. End-Span, Pin 1/2(+), 3/6(-)
PD Interface	RJ-45, both Mid-Span and End-Span Input Range: 44~57V DC	BNC Input Range: 44~57V DC
DC Power Output	-	12V DC, 2A max. 24V DC, 1A max.
Max. PoE Budget	Power Input by PoE	BNC : 25 watts	RJ-45 : 20 watts
	Power Input by DC	BNC : 30 watts	RJ-45 : 30 watts

Standards Conformance		
Standards Compliance	IEEE 802.3 10Base-T Ethernet IEEE 802.3u 100Base-TX Fast Ethernet IEEE 802.3af Power over Ethernet (802.3at Type 1) IEEE 802.3at Power over Ethernet Plus (802.3at Type 2)	

Regulation 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)
Cable	
Coaxial	RG-6/U cable (Recommended) max. 500 m with PoE+ (1,640 ft.) max. 700 m with PoE (2,297 ft.) max. 1200 m without PoE (3,937 ft.)

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

⚠ Caution

As the VC-203PT is power over coaxial, it only can work with PLANET VC-203PR or VC-205PR. If connects with Non-PoE coax-LAN equipments, it might cause the equipment to damage.

⚠ Do Not Touch the Center Pin

Please take care of the conditions of the resistance value of cables as follows.

Coaxial Cable Type	
RG-59/U	Less than 30Ω/1000 ft.
RG-6/U	Less than 12Ω/1000 ft

Because there are various resistance values in the category of RG-59/U or RG-6/U cable.

1.4 Physical Dimensions

■ VC-203PT dimensions (W x D x H): 94 x 70.3 x 39.2 mm

94.00

70.30

39.20

PLANET

PoE over Coaxial Extender | Transmitter

VC-203PT
PoE over Coaxial Extender

Coaxial

LNK
CO PWR
CPE
LNK/ACT PoE IN
10/100
LAN

Transmitter

PoE IN

10/100Base-TX

52~56V DC IN

■ VC-203PR dimensions (W x D x H): 94 x 70.3 x 39.2 mm

94.00

70.30

39.20

VC-203PR
PoE over Coaxial Extender

Coaxial

PoE IN
PoE Out

LNK
PWR
LNK/ACT
CPE
CO
100
LAN

MODE: DIP-12
CO   Sync.
CPE   Async.
ON 1 2 OFF
ON 1 2

PLANET

PoE over Coaxial Extender   Receiver

PoE Out

10/100Base-TX

DC Out   V+   V−

DC   PoE
Out 24V Out 12V

52~56V DC IN
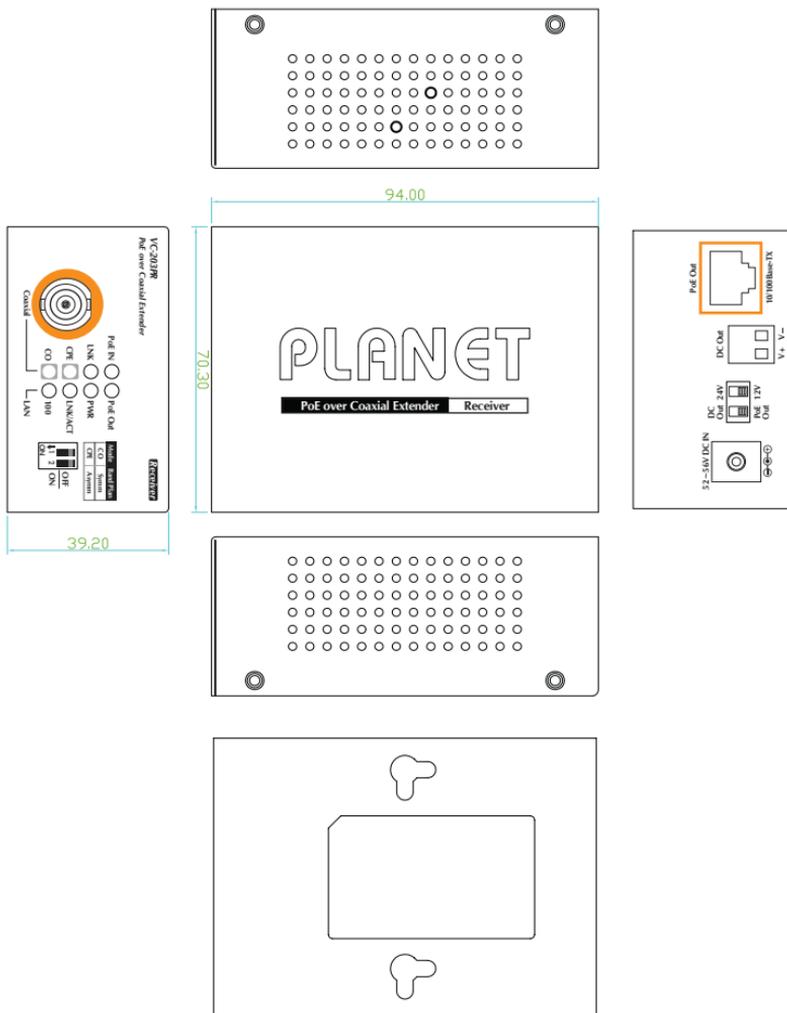
2. INSTALLATION

This section describes the functionalities of the Industrial Power over Coaxial Extender's components and guides you to how to install it on the desktop. Basic knowledge of networking is expected. Please read this chapter completely before continuing.

2.1 Product Description

Power over Coaxial

Based on IEEE 802.3at high power over Ethernet and up to 25 watts of power output, PLANET PoE over coaxial extender solution eliminates the need for additional remote site power while allowing a single PoE source, such as a PoE network switch, to provide power to both transceivers and the camera at long range. This feature eliminates the need for local and remote site power supplies.

IEEE 802.3at/af PoE Injector and Splitter in one box design

The VC-203PR is a Single-Port, 802.3at High Power over Ethernet Injector providing maximum up to 30 watts of power output over Ethernet cable which allows data and power to transmit simultaneously through the cable to PoE PD (Powered Device). In addition, the VC-203PR also features PoE splitter function with selectable 12V/24V DC power output which makes non-PoE equipment power up as well.

Stable Operating Performance under Difficult Environments

The VC-203PT and VC-203PR extender is the perfect solution for extended distance data and power transmission for warehouses, parking lots, campuses, casinos, and many more. They can operate stably under temperature range from -40 to 75 degrees C which enables the users to conveniently apply the device in almost any location of the network.

2.1.1 Power over Coaxial Extender Front Panel

Figure 2-1 and Figure 2-2 show the front panels of the VC-203PT and VC-203PR Industrial Power over Coaxial Extenders.
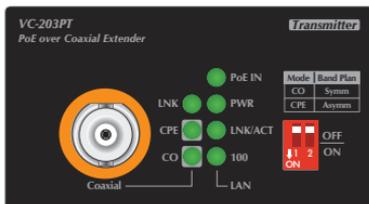
Figure 2-1: VC-203PT front panel   **Figure 2-2:** VC-203PR front panel

■ Front Panel DIP Switch Setting

The front panels of the VC-203PT and VC-203PR provide one 2-DIP switch which is for configuring coaxial link CO/CPE mode and Band plan function.

Refer to the table below to know about the 2-DIP switch settings and descriptions:

	DIP-1	DIP-2
	Mode	Band Plan
OFF	CO	Symmetric
ON	CPE	Asymmetric

2.1.2 LED Indicators

■ System

LED	Color	Function
PWR	Green	**Light:** indicates the power is on.

■ Coaxial / VDSL2 Interfaces

LED	Color	Function
LNK	Green	**Light:** indicates that the coaxial link is established.
		Fast Blink: indicates that the coaxial link is at training status (about 10 seconds).
		Slow Blink: indicates that the coaxial link is at idle status.
CO	Green	**Light:** indicates the coaxial Bridge is running at CO mode.
CPE	Green	**Light:** indicates the coaxial Bridge is running at CPE mode.

■ RJ-45 10/100Base-TX Interfaces

LED	Color	Function
100	Green	**Light:** indicates the extender is successfully connecting to the network at 100Mbps.
		OFF: indicates the extender is successfully connecting to the network at 10Mbps.
LNK/ACT	Green	**Blink:** indicates the extender is actively sending or receiving data over that port.

■ RJ-45 PoE Indicators

LED	Color	Model	Function
PoE IN	Green	VC-203PT	**Light:** indicates the RJ-45 port is receiving the PoE Power.
		VC-203PR	**Light:** indicates the BNC connector is receiving the PoE Power.
PoE Out	Green	VC-203PR	**Light:** indicates the RJ-45 Port is providing PoE power

2.1.3 Power over Coaxial Extender Rear Panel

Figure 2-3 and Figure 2-4 show the rear panels of the VC-203PT and VC-203PR Industrial Power over Coaxial Extenders.
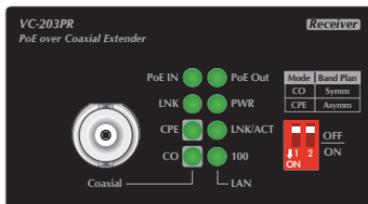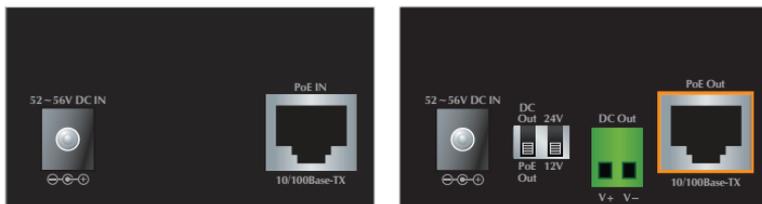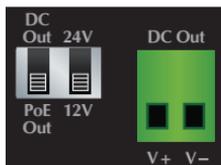

Figure 2-3: VC-203PT rear panel **Figure 2-3:** VC-203PR rear panel

■ **VC-203PR Rear Panel: DIP Switch Setting**

DIP-1	DIP-2
Power Output	Voltage
DC Out	24V
PoE Out (default)	12V (default)

■ **VC-203PR Rear Panel: 2-Pin Terminal Block**

If there is no power socket in the network environment for Non-PoE networked device, the VC-203PR can be of great help by conveniently and easily providing this Ethernet device with DC power. Via the DIP switch configuration, the VC-203PR separates the power out and provides two kinds of DC power output and its voltage and current are shown below:

> 12V DC, 2A max.
> 24V DC, 1A max.

⚠ Caution	• VC-203PR has two power output options; only one mode is available at one time. It cannot use DC power output if power output of DIP switch is in PoE output position. • Disconnect "PoE IN" coaxial cable before changing 12/24V DIP Switch. • Incorrect voltage from "DC Out" might cause damage to connected device.

2.2 Applications of VC-203PT and VC-203PR

Type 1 – VC-203PT with 52~56V power adapter and VC-203PR with PoE power output
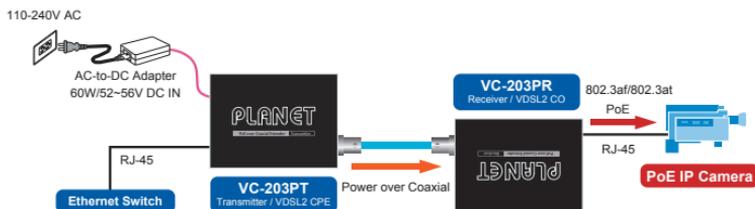
	CPE	CO
	VC-203PT	**VC-203PR**
Power Input	Power adapter with 52~56V DC in	BNC with DC power over coaxial input
Power Output	BNC with DC power over coaxial output	RJ-45 with 802.3at/af PoE output

⚠ Caution	1. PoE Output Capacity is based on different DC Power Input / PoE Input.
	2. VC-203PT has two power input options; only one mode is available at one time. It cannot use PoE power input if power input of DC 52V or 56V is selected.

Type 2 – VC-203PT with 52~56V power adapter and VC-203PR with DC power output

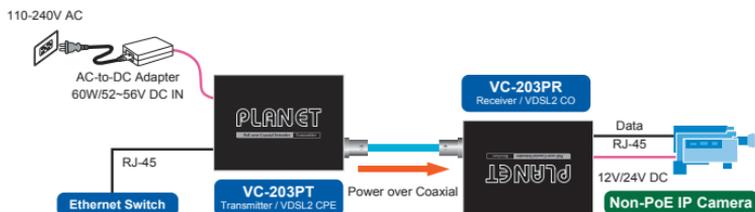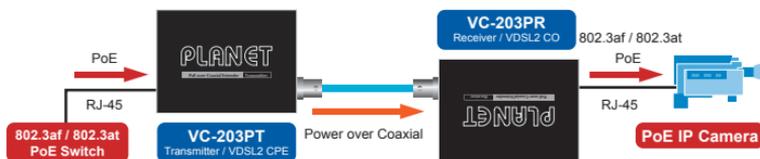|	CPE	CO
	VC-203PT	**VC-203PR**
Power Input	Power adapter with 52~56V DC in	BNC with DC power over coaxial input
Power Output	BNC with DC power over coaxial output	DC Terminal block with 12V or 24V DC output

⚠ Caution	1. Please ensure the VC-203PR output voltage is correct for remote device. 2. Please plug off the PoE Coaxial cable from VC-203PR before switching off the Power Voltage DIP during operation. Wait for 3 seconds until the "PoE IN" LED is completely OFF. Otherwise, it might damage your devices.

Type 3 – VC-203PT with PoE power input and VC-203PR with PoE power output

	CPE	CO
	VC-203PT	**VC-203PR**
Power Input	RJ-45 with 802.3at/af PoE input	BNC with DC power over coaxial input
Power Output	BNC with DC power over coaxial output	RJ-45 with 802.3at/af PoE output

Warning	The VC-203PT accepts IEEE 802.3at equipment for optimal power injection. Any other Non-standard PoE Power devices may cause the VC-203PT to malfunction.

Type 4 – VC-203PT with PoE power input and VC-203PR with DC power output

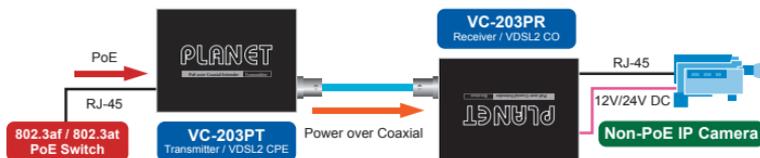|	CPE	CO
	VC-203PT	**VC-203PR**
Power Input	RJ-45 with 802.3at/af PoE input	BNC with DC power over coaxial input
Power Output	BNC with DC power over coaxial output	DC Terminal block with 12V or 24V DC output

Type 5 – PLANET VC-202A (does not support Power over coaxial) with coaxial link to VC-203PR and VC-203PR get external DC power input directly and RJ-45 with PoE output
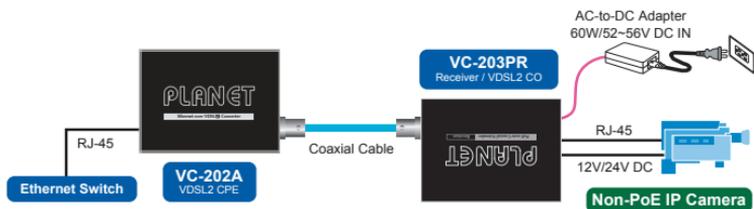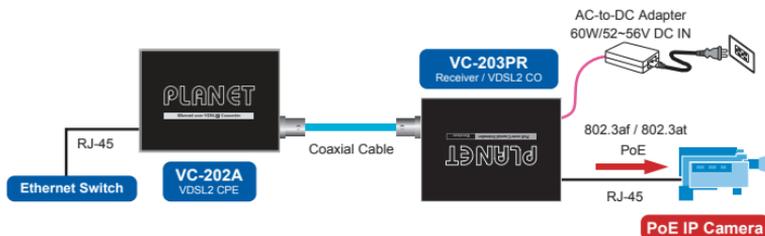
	CPE	CO
	VC-202A / IVC-2002	**VC-203PR**
Power Input	Power adapter with 5V DC in	Power adapter with 52~56V DC in
Power Output	does not support power output	• RJ-45 with 802.3at/af PoE output • DC Terminal block with 12V or 24V DC output

 Caution	As the VC-203PT is power over coaxial, please confirm that other Non-PoE equipment is not connected with the coaxial cable. When you connect the coaxial cable with coax-LAN converter, CCTV camera, etc, it might cause other equipment to damage.

3. TROUBLESHOOTING

This chapter contains information to help you solve issues. If the Industrial Power over Coaxial Extender is not functioning properly, make sure the Industrial Power over Coaxial Extender was set up according to instructions in this manual.

VDSL LNK LED does not light after wire is connected to the VDSL port.

CHECKPOINT:

1. Verify the length of the wire connected between VC-203PT and VC-203PR. It should not be more than 2.4km.

2. Please note you must use one for CO mode and the other with CPE mode, and connect to each other to make it work.

TP LED does not light after cable is connected to the port.

CHECKPOINT:

1. Verify you are using the Cat.5, 5e or 6 cables with RJ-45 connector to connect to the port.

2. If your device (like LAN card) supports Auto-Negotiation, please try to manually modify at a fixed speed of your device.

3. Check whether the power of the converter and the connected device is ON or OFF.

4 Check the port's cable is firmly seated in its connectors in the switch and in the associated device.

5. Check the connecting cable is good.

6. Check the power adapters are functional, including the connecting device.

Performance is bad

CHECKPOINT:

The actual data rate will vary on the quality of the coaxial cable and environment factors.

Why can't power be on when my PoE PD device is connected to VC-203PR ?

CHECKPOINT:

1. Please check the cable type of the connection from VC-203PR to the other end. The cable should be an 8-wire UTP, Category 5 or above, and EIA568 cable within 100 meters. A cable with only 4-wire, short loop or over 100 meters will affect the power supply.

2. Please check and assure the device is fully complied with IEEE 802.3af / IEEE 802.3at standard.

APPENDIX A: NETWORKING CONNECTION

A.1 Switch's RJ-45 Pin Assignments

10/100Mbps, 10/100Base-TX

RJ-45 Connector pin assignment		
Contact	MDI Media Dependant Interface	MDI-X Media Dependant Interface -Cross
1	Tx + (transmit)	Rx + (receive)
2	Tx - (transmit)	Rx - (receive)
3	Rx + (receive)	Tx + (transmit)
4, 5	Not used	
6	Rx - (receive)	Tx - (transmit)
7, 8	Not used	

A.2 RJ-45 Cable Pin Assignments
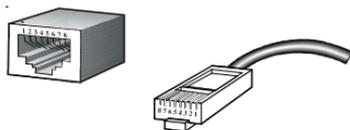
The standard RJ-45 receptacle/connector

There are 8 wires on a standard UTP/STP cable and each wire is color-coded. The following shows the pin allocation and color of straight cable and crossover cable connection:

		SIDE 1	SIDE 2
Straight Cable	**SIDE 1**	1 = White/Orange	1 = White/Orange
1 2 3 4 5 6 7 8		2 = Orange	2 = Orange
		3 = White/Green	3 = White/Green
		4 = Blue	4 = Blue
		5 = White/Blue	5 = White/Blue
1 2 3 4 5 6 7 8	**SIDE 2**	6 = Green	6 = Green
		7 = White/Brown	7 = White/Brown
		8 = Brown	8 = Brown

		SIDE 1	SIDE 2
Crossover Cable	**SIDE 1**	1 = White/Orange	1 = White/Green
1 2 3 4 5 6 7 8		2 = Orange	2 = Green
		3 = White/Green	3 = White/Orange
		4 = Blue	4 = Blue
		5 = White/Blue	5 = White/Blue
1 2 3 4 5 6 7 8	**SIDE 2**	6 = Green	6 = Orange
		7 = White/Brown	7 = White/Brown
		8 = Brown	8 = Brown

Figure A-1: Straight-Through and Crossover Cable

Please make sure your connected cables are with the same pin assignment and color as the above picture before deploying the cables into your network.

EC Declaration of Conformity

For the following equipment:

*Type of Product: PoE over Coaxial Extender - Transmitter
PoE over Coaxial Extender - Receiver with 12/24V DC Splitter

*Model Number: VC-203PT & VC-203PR

* 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.).

When hereby confirmed that the products mentioned comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility (2004/108/EC).
For the evaluation regarding the EMC, the following standards were applied:

EN55022	(2006 + A1 :2007)
EN 61000-3-2	(2006 + A1:2009 + A2:2009)
EN 61000-3-3	(2008)
EN55024	(2010)

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>**Product Manager**</u>

<u>**Taiwan**</u>
Place

<u>**1ˢᵗ July, 2013**</u>
Date

Legal Signature

PLANET TECHNOLOGY CORPORATION