COMTREND CORPORATION

PowerGrid 9142s
Powerline Ethernet Adapter with WiFi
User Manual

Version A1.0, December 23, 2014

261072-025

Preface

This manual provides information related to the installation and operation of this device. The individual reading this manual is presumed to have a basic understanding of telecommunications terminology and concepts.

If you find the product to be inoperable or malfunctioning, please contact technical support for immediate service by email at INT-support@comtrend.com

For product update, new product release, manual revision, or software upgrades, please visit our website at http://www.comtrend.com

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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NOTE:	This document is subject to change without notice.

Protect Our Environment

This symbol indicates that when the equipment has reached the end of its useful life, it must be taken to a recycling centre and processed separate from domestic waste.

The cardboard box, the plastic contained in the packaging, and the parts that make up this router can be recycled in accordance with regionally established regulations. Never dispose of this electronic equipment along with your household waste; you may be subject to penalties or sanctions under the law. Instead, please be responsible and ask for disposal instructions from your local government.

Chapter 1: Product Information

1.1 WiFi Features

- Compatible with IEEE 802.11b/g/n wireless network standard
- Supports 64/128-bit WEP, WPA, and WPA2 wireless data encryption
- Supports MAC address filtering
- Supports WPS (Wi-Fi Protected Setup)
- Easy to use web-based GUI (Graphical User Interface) for network configuration and management purposes

1.2 Powerline Features

- High speed PHY rate - Up to 200Mbps
- Supports 128-bit AES link encryption with key management
- Supports Quality of Service (QoS)
- Support for IPv4/IPv6, IGMP and MLD snooping
- Easy installation - just plug and play
- Wall-mount design

1.3 Safety Information

1. This Wireless-N Powerline Adapter is designed for indoor use only; DO NOT place this Wireless-N Powerline Adapter outdoors.

2. DO NOT put this Wireless-N Powerline Adapter at or near hot or humid places, like kitchens or bathrooms.

3. DO NOT pull any connected cable with force; disconnect it from the Wireless-N Powerline Adapter first.

4. There's no user-serviceable part inside the Wireless-N Powerline Adapter. If you found that the product is not working properly, please contact your dealer of purchase and ask for help. DO NOT disassemble the product; this will void your warranty.

1.4 System Requirements

- Computer or network devices with wired or wireless network interface card.
- Any connected devices must feature a network port.
- Web browser (Microsoft Internet Explorer 4.0 or above, Opera web browser, or Safari web browser).
- An available AC power socket (100 – 240 V, 50/60Hz).

1.5 Package contents

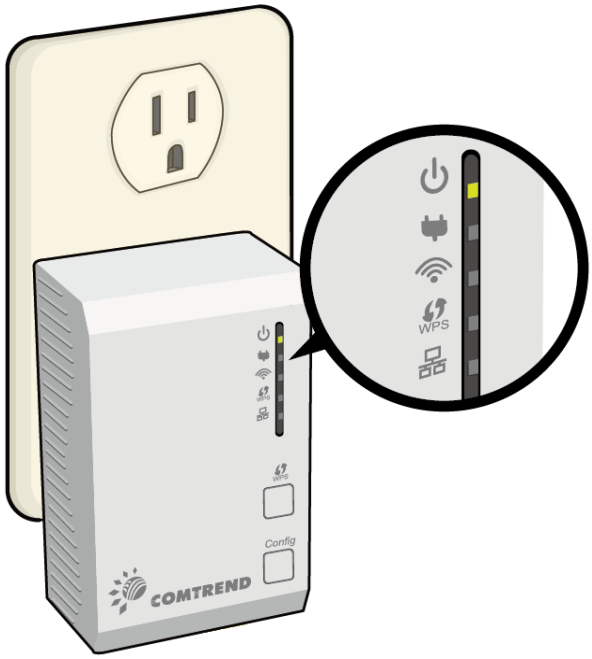
The following items are included in your PG-9142s package:

- A single PG-9142s Wireless-N Powerline Adapter
- One Ethernet cable
- Quick Installation Guide

Chapter 2: Network Setup

2.1 Hardware Setup

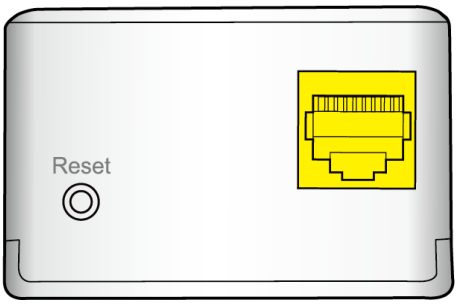
Front Panel and LED indicators



LED	Color
Power	OFF: No power (perhaps the socket to which the Wireless-N Powerline Adapter is connected does not work or is disabled)
	Green: Wireless-N Powerline Adapter is plugged in with voltage present
	Blink: Establishing connection
Status	Green: Excellent network traffic (i.e. the connection speed is more than 90 Megabits per second)
	Orange: Good network traffic (i.e. the connection speed is between 40 and 90 Megabits per second)
	Red: Normal network traffic (i.e. the connection speed is between 1 and 40 Megabits per second)
	Blink: Wireless-N Powerline Adapter in power saving mode (blinks twice every 5 seconds)

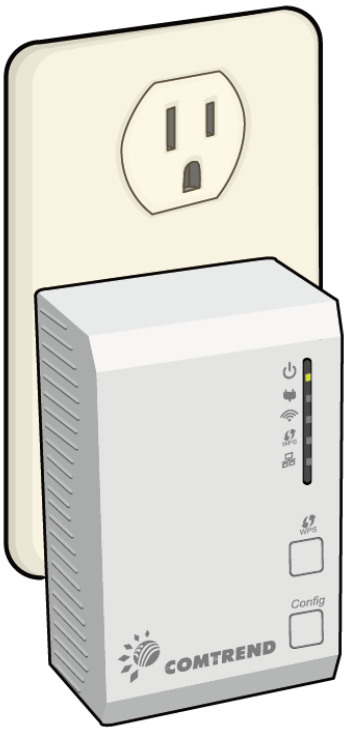
WLAN	Green: WiFi connection established
	Blink: Data transmitting or receiving over WLAN (secured network)
	OFF: WiFi disabled
WPS	Blink: WPS mode is on for 120 seconds
	OFF: WPS mode is off
ETHERNET	Green: LAN connection established
	OFF: LAN connection is not established
	Blink: Data transmitting/receiving

Bottom Panel



Item Name	Description
LAN	Local Area Network (LAN) port
Reset	Press 11 seconds to reset the system with factory defaults

Front Panel Buttons



Item Name	Description
WPS	Press more than 2 seconds to start WPS connection
Config	Press for between 2 – 11 seconds to join/establish a powerline network Press for over 11 seconds to leave a powerline network

2.2 Powerline Logical Network

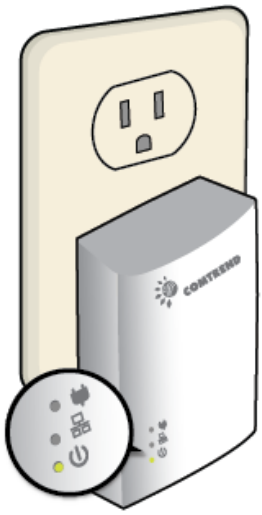
In the following example we are going to show how our PG-9142s works in conjunction with the PG-9141s. See the following illustration for reference.

These steps show how to connect a PowerGrid 9141s unit to a modem or router. This guide assumes that a PowerGrid 9141s will be the primary connection to the modem / router and the PowerGrid 9142s will be used within the network to connect to WiFi capable devices (E.g. Tablet, IP Phone, Access Point).

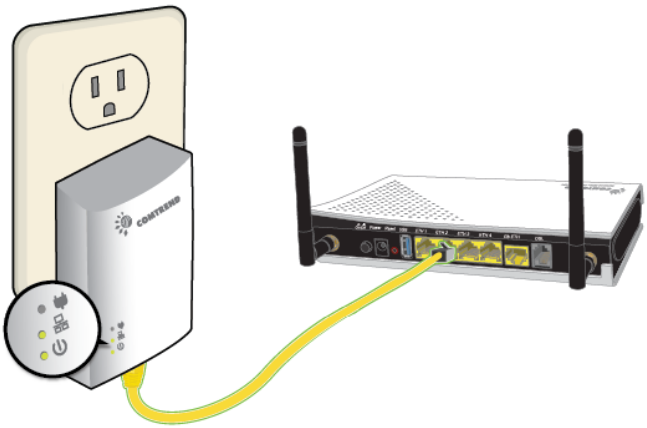
2.2.1 Initial Setup

1. Ensure that your modem or router is powered on.

2. Plug a PowerGrid 9141s unit into the power socket closest to the modem/ router. The **Power LED** will blink **GREEN.**



3. Connect the PowerGrid 9141s unit to the LAN port of the modem/router with an Ethernet (RJ-45) cable. Wait 10 seconds for the PowerGrid's **Ethernet LED** and **Power LED** to light up **GREEN** indicating a stable connection.

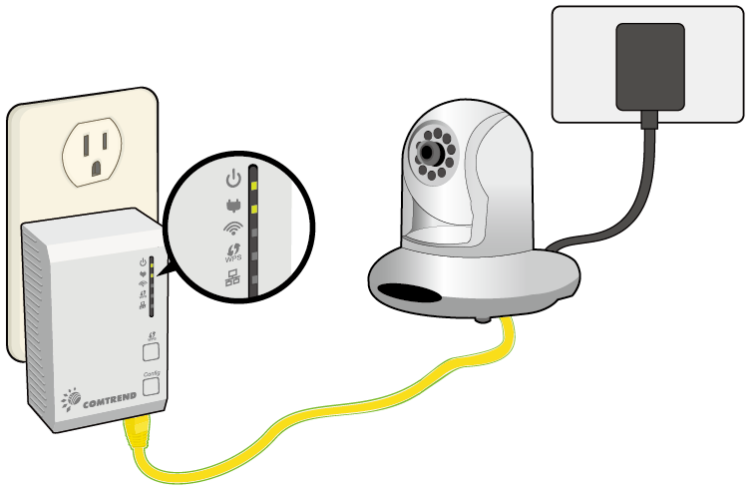


2.2.2 Device Connection

These steps show how to connect a PowerGrid 9142s to a network device. Below we use an Ethernet camera as a network device.

1. Plug a PowerGrid 9142s unit into the power socket closest to the camera or other device. The **Power LED** on the PowerGrid 9142s should light up **GREEN**.

2. Power on your camera (or Ethernet device). Connect the PowerGrid 9142s to the camera with an Ethernet cable. The **Ethernet LED** on the PowerGrid 9142s should light up **GREEN**.



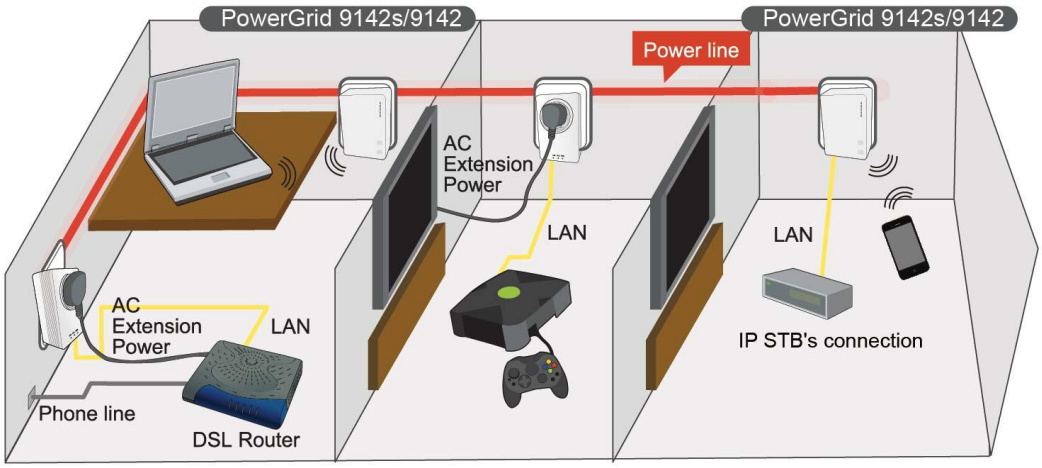
3. The **Status** LED on the PowerGrid 9142s (s) should now be **RED**, **GREEN** or **ORANGE**.

4. If the **Status** LED is off , Press the "**Config**" button on each of the two PowerGrid 9142s and 9141s devices for 2-11 seconds. Upon successful connection of the PowerGrid 9141s, the **Status LED** will light up.

5. If the connection process is not successful, please refer to the trouble shooting steps in 2.2.8

2.2.3 Adding a New Device

Follow steps 1-4 in section 2.2.2 to add additional PowerGrid 9142s devices to the network. Press the "**Config**" button on the new device and one other PowerGrid device in the network so they can pair and transmit data successfully.



2.2.4 PowerGrid 9142s WiFi setup

1. To connect your WiFi device (e.g. computer, tablet, smartphone) to the PowerGrid 9142s Wireless-N Powerline Adapter, go to your device's WiFi settings to search for - and select - the SSID that is located on your PowerGrid 9142s device label.

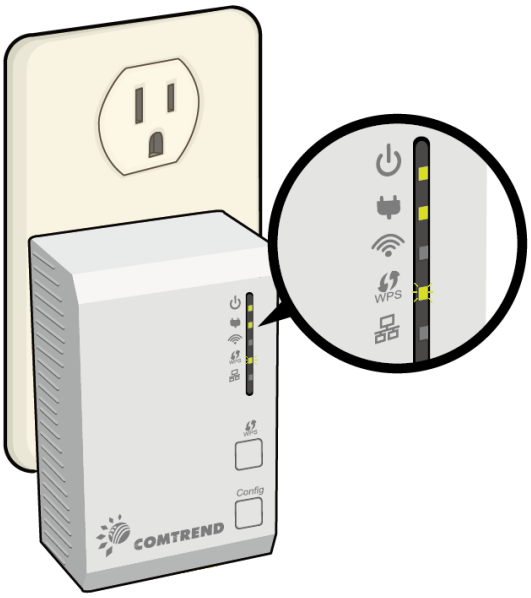
2. When prompted, input the WiFi key located on the PowerGrid 9142s device label to connect.
3. You should now be successfully connected to the PowerGrid 9142s WiFi network.

Note: To configure the WiFi settings of your PowerGrid 9142s using a desktop computer/notebook via an Ethernet cable, please refer to section 2.3 & 2.4

2.2.5 WPS Setup

If your client (e.g. smartphone, notebook, tablet) supports WPS (Wi-Fi Protected Setup) then you can use this method to set up your PowerGrid 9142s' Wi-Fi network.

1. Press and hold the WPS button for more than 2 seconds on the PowerGrid 9142s to activate its WPS. The PowerGrid 9142s' WPS LED should flash to indicate a WPS connection is in progress.



2. Within two minutes, press the WPS button (often the WPS/Reset button) on your client to activate WPS.

Note: Please check the instructions for your wireless client for how long you need to hold down its WPS button to activate WPS.

3. The devices will establish a connection. You can now connect to the PowerGrid 9142s' wireless network with a Wi-Fi device, as described in section 2.2.2 To confirm a successful connection you can see if your client device (e.g. smartphone, notebook, tablet) displays the WiFi connected icon 

2.2.6 How to use a power strip with the PowerGrid 9142s

If you must plug your Wireless-N Powerline Adapter into a power strip, we suggest you use a basic power strip as the more advanced ones have a filter that can interfere with the Powerline signal.

SURGE PROTECTED POWER STRIPS: Avoid plugging PowerGrid units into power strips with surge protection as this will reduce network speed and may even prevent their use.

2.2.7 How to understand the STATUS LED colors

The STATUS LED displays quality of the network and provides important information that will provide solutions to common questions, such as why a High Definition (HD) movie is not showing or shows with pixels. The STATUS LED indicator will vary its color depending on the estimated speed of the Powerline connection. The speed is measured in Megabits Per Second (Mbps).

Color	Information
RED	Normal network traffic (ex. the connection speed is between 1 and 40 Megabits per second).
ORANGE	Good network traffic (ex. the connection speed is between 40 and 90 Megabits per second).
GREEN	Excellent network traffic (ex. the connection speed is more than 90 Megabits per second).

2.2.8 Troubleshooting

The following information should help you diagnose basic setup or installation problems.

	POWER
	STATUS
	WLAN
WPS	WPS
	ETHERNET

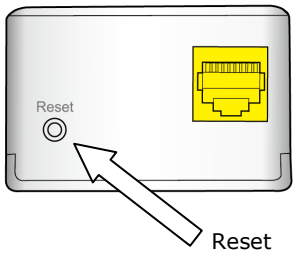
1) POWER LED is OFF: If the **POWER LED** goes off, please make sure that your power socket is working properly (perhaps by testing with another device).Then plug in your PowerGrid 9142s again. If the **POWER LED** does not light up, please contact your equipment supplier for further information.

2) ETHERNET LED is OFF: If the **ETHERNET LED** fails to light up, check that the LAN port of the PowerGrid unit is connected firmly to the LAN port of the other device. To check the condition of the Ethernet cable, use another cable to test the same connection.

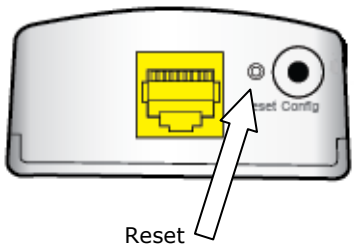
3) STATUS LED is OFF: Plug both PowerGrid units that you're attempting to pair into power sockets that are within the same room; both PowerGrid devices should have an Ethernet cable connected to their respective devices e.g. PC, Router, Set Top Box, camera, etc…). After 10 seconds (approx, until all the LEDs of the device blink), the **STATUS LED** should light up **GREEN**. If not, press the **Config** button on each for 2-5 seconds and let go.

* If you have tried all of the above and are still experiencing problems, you can reset both devices to factory default by using a pin to push the **Reset** button of each device for 11 seconds. The WPS LED will flash every second. After the Reset button is released, the WPS LED will be steady ON for around 5 seconds, then the system will reboot to factory defaults.

PowerGrid 9142s



PowerGrid 9141s



2.2.9 Frequently Asked Questions

This PG-9142s Wireless-N Powerline Adapter has been designed to be reliable and easy to use in creating or extending your existing home network. However, should you experience any problems, please refer to the list below to aid in troubleshooting.

1. What to do if the LEDs do not display as expected?

- Power indictor is flashing, the other indicators are off: The PG-9142s Wireless-N Powerline Adapter went into power saving mode. It occurs 60 seconds after the Ethernet signal connection stops.
- Ethernet LED is off: If the Ethernet LED does not light up, check or connect your devices (PC, STB…etc.) to the port Ethernet PowerGrid to check whether your Ethernet cable works. Alternatively, you can use another similar cable.
- Status LED is off: After performing step 2. (for 2 single units to pair up), if still not working, please do the following 2 steps:
  - Simple Connect: Press the CONFIG push button for more than 11 seconds on each of PG-9142s Wireless-N Powerline Adapters, then press the CONFIG push button for 2-5 seconds on one adapter (the Power LED should blink). Within 2 minutes, press the CONFIG push button for 2-5 seconds on the second adapter. After 10 seconds the two adapters should communicate and the Status LED should be solid on both adapters at the end of the pairing process.
  - Simple Pairing: Plug 2 PG-9142s Wireless-N Powerline Adapters in to power outlets, then connect these 2 devices directly to one another using an Ethernet cable. Wait for the Ethernet LED to turn ON, and then disconnect the Ethernet cable. The Status LED should be solid ON both PG-9142s Wireless-N Powerline Adapters at the end of the pairing process.

2. How do I RESET to factory default settings?

If you have tried the FAQ above action 1., and you are still experiencing problems, you can return both PG-9142s Wireless-N Powerline Adapters to factory settings using the pin by pressing (RESET) for 11 seconds (until the WPS LED flashes every second).

If the power LED on any of the PG-9142s units (in the network) does not light up Green, press the Config button on the problem PG-9142s unit for more than 10 seconds to disconnect it from the network. Then, see section 2.2.1 & 2.2.2 for Network Setup. If the problem persists, please contact your local agent for further assistance.

3. Why is SDTV video not streaming?

- Check the STATUS indicator LED in the adapter connected to the STB.
- If the indicator is RED this means that the PLC link is not able to play an SDTV streaming.
- Try to reposition the adapter into another outlet in order to obtain an ORANGE or GREEN indication.
- If the indicator is ORANGE or GREEN, it should now be able to play SDTV video.
- If the SDTV video still does not play, check the Ethernet cables and the settings of devices connected to the PLC adapters (STB, router, PC, video server, etc.).

4. How many PG-9142s Wireless-N Powerline Adapters could be installed in the home?

For each additional device (computer, modem, router…and so on) that you want to connect to your home network, you will need add additional PG-9142s Wireless-N Powerline Adapters and Ethernet cables, one for each device.

The maximum number of installed devices, is up to 10 in the same home network.

Maximum data transfer between devices, 95 MB /sec.
Poor quality of the wiring and the presence of interference will significantly reduce the possible number of installed devices and data transfer rate.

5. Why is HDTV video not streaming?

- Check the status indicator LED in the adapter connected to the set top box (STB).
- If the indicator is RED or ORANGE this means that the Powerline link is not able to stream HDTV.
- Try to reposition the adapter in another outlet in order to obtain a GREEN indication.
- If the indicator is GREEN, it should now be able to play a HDTV video.
- If the LED is not GREEN check the Ethernet cables and the settings of devices connected to Powerline adapters (STB, DSL router, PC, video server, etc.).

NOTE: If the HDTV video bandwidth is lower than 10Mbps, it may be possible to stream the video with an ORANGE STATUS LED in some cases.

6. What if my Powerline Adapters don't fit into the plug socket?

- Your Wireless-N Powerline Adapter might not fit because the sockets are too close to the floor or are in the skirting board.
- The easiest way around this is to use a trailing power strip, and plug the Adapter into the strip. Please make sure that the strip is not an anti-surge adapter strip.

7. What if the house next door has Powerline Adapters as well?

- Each pair of Wireless-N Powerline Adapters has its own unique security key. This means that your connection is secure and cannot be confused with anyone else's.

8. Is it safe to leave the Powerline Adapters on all the time - is there any danger of overheating?

- Wireless-N Powerline Adapters are CE and FCC certified and completely safe to leave plugged in all the time. They may become slightly warm in use - this is perfectly normal. However, you may wish to put them into standby when not in use.

9. How much power do Wireless-N Powerline Adapters use and how much do they cost each month in electricity?

- The adapters use 5 Watts when in use. Prices vary between electricity suppliers.

10. How can I check that my Wireless-N Powerline Adapters are working properly?

- Your Wireless-N Powerline Adapters are set to work together as a pair, and should work perfectly out of the box. The best way to test them is to find a double plug socket, and plug them in next to each other. Often the best place to find a double plug socket is in your kitchen. Alternatively plug them into a trailing extension strip (but not an anti-surge strip).
- When plugged in, after 10 seconds, the Wireless-N Powerline Adapters will configure themselves so that each has a green status light.
- If the Wireless-N Powerline Adapters don't configure themselves as above, you need to follow the reset procedure (described above).
- When your Wireless-N Powerline Adapters are connected to a device the Ethernet light should light up. When you're using the service the Ethernet light will flash. You may notice that the Status Light on one or both Powerline Adapters changes to red or orange. This isn't something to worry about if you are not having any problems with your connection.

2.3 Connecting to PG-9142s Wireless-N Powerline Adapter by web browser

After the network connection is complete, the next step you should do is setup the Wireless-N Powerline Adapter with proper network parameters, so it can work properly in your network environment.

Before you can connect to the Wireless-N Powerline Adapter and start configuration procedures, your computer must be able to get an IP address automatically (use dynamic IP address). If it's set to use static IP address, or you're unsure, please follow the instructions below to configure your computer to use dynamic IP address. Windows 7 is used for reference; other operating systems might have slightly different configuration options or interfaces.

2.3.1 Windows 7 IP address setup

1. Click the Start button and select Control Panel. Double click Network and Internet and click Network and Sharing Center, the Network and Sharing Center window will appear.

2. Click Change adapter settings and right click on the Local Area Connection icon and select Properties. The Local Area Connection window will appear.

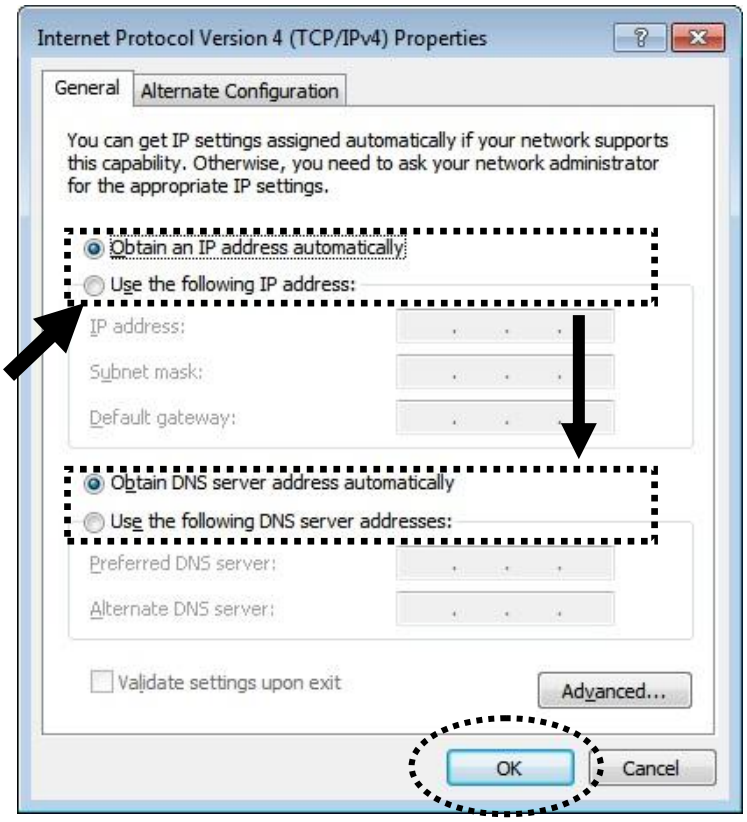
3. Check your list of Network Components. You should see Internet Protocol Version 4 (TCP/IPv4) on your list. Select it and click the Properties button.

4. In the Internet Protocol Version 4 (TCP/IPv4) Properties window, select 'Use the following IP address', then input the following settings in their respective field:

   IP address: 192.168.0.2

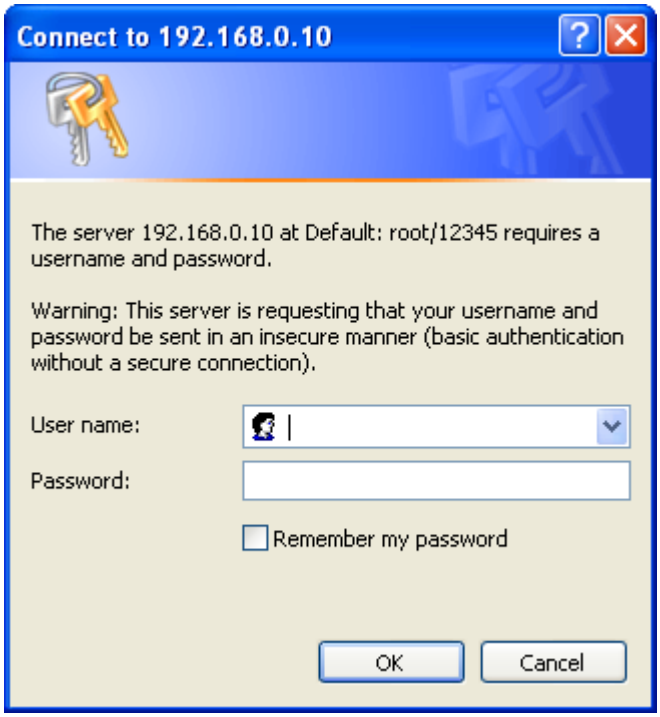
   Subnet Mask: 255.255.255.0

5. Click OK to confirm the setting.



2.3.2 Connecting to Web Management Interface

All functions and settings of this Wireless-N Powerline Adapter must be configured via web management interface. Please start your web browser, and input '**192.168.0.10'** in address bar, then press 'Enter' key. The following message should be shown:



Please input user name and password in the field respectively, default user name is '**root**', and default password is '**12345**', then press 'OK' button, and you can see the Quick Setup interface of this Wireless-N Powerline Adapter.

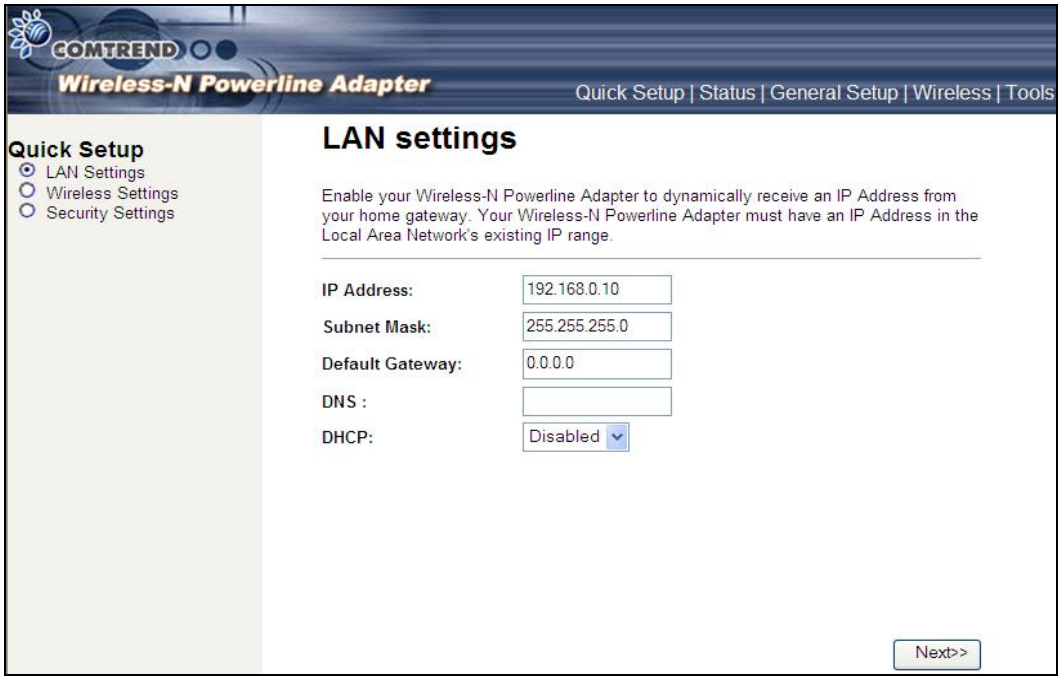
2.4 Quick Setup

After login, the **Quick Setup** screen will appear. It is the default screen when no connections exist. This screen allows for the configuration of DSL settings and the IP configuration. It includes LAN, Wireless and Security setup screens.

NOTE: If you can't see the web management interface, and you're being prompted to input user name and password again, it means you didn't input username and password correctly. Please retype user name and password again. If you're certain about the user name and password you type are correct, please see section 2.1 to perform a factory reset, to set the password back to default value.

2.4.1 LAN Settings

Enable your Wireless-N Powerline Adapter to dynamically receive an IP Address from your home gateway. Your Wireless-N Powerline Adapter must have an IP Address in the Local Area Network's existing IP range.



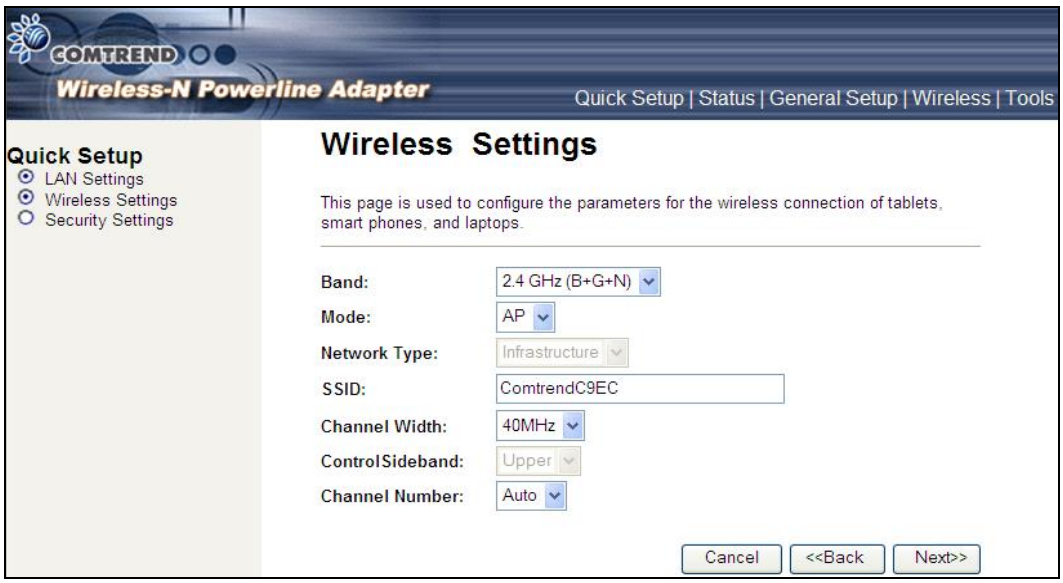
IP Address	The IP address for the Wireless-N Powerline Adapter.
Subnet Mask	The Subnet Mask for the Wireless-N Powerline Adapter.
Default Gateway	Specify the IP address of the default gateway of your network here.

DNS	Input the IP address of the domain name server.
DHCP	Disable or Enable DHCP client. If Enabled, IP Address, Subnet Mask, Default Gateway and DNS will be got by DHCP client automatically.

Click the **Next** button to continue.

2.4.2 Wireless Settings

This page is used to configure the parameters for the wireless connection of tablets, smart phones, and laptops.



Band	Select the wireless band you wish to use. By selecting different band setting, you'll be able to allow or deny the wireless client of a certain band. If you select 2.4GHz (B), 2.4GHz (N), or 2.4GHz (G), only wireless clients using the wireless band you select (802.11b, 802.11 n, or 802.11g) will be able to connect to this Wireless-N Powerline Adapter. If you select 2.4GHz (B+G), then only wireless clients using 802.11b and 802.11g band will be able to connect to this Wireless-N Powerline Adapter. If you want to allow 802.11b, 802.11g, and 802.11 Draft-N clients to connect to this Wireless-N Powerline Adapter, select 2.4GHz (B+G+N).

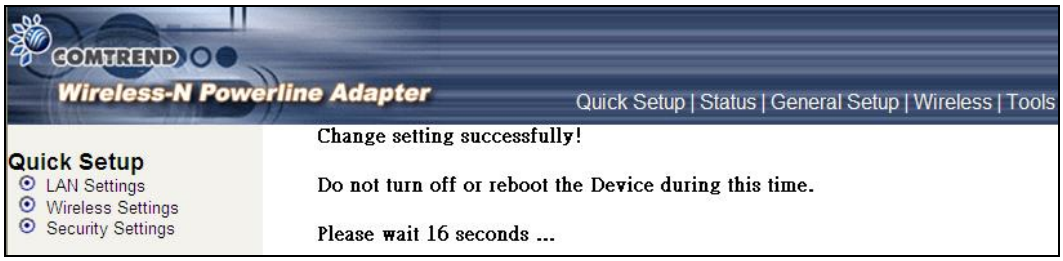
Mode	PG-9142s only supports AP mode.
Network Type	In Infrastructure Mode, wireless clients can access the other networks (perhaps Internet) via this AP. For AP. Only Infrastructure Mode is allowed here.
SSID	Input the ESSID (the name used to identify this Wireless-N Powerline Adapter) here. You can input up to 32 alphanumerical characters. PLEASE NOTE THAT THE ESSID IS CASE SENSITIVE.
Channel Width	Select wireless channel width (bandwidth taken by wireless signals of this Wireless-N Powerline Adapter). It's suggested to select 'Auto 20/40MHz'. Do not change to '20 MHz' unless you know what it is.
Control Sideband	Specify if the extension channel should be in the Upper or Lower sideband.
Channel Number	Select a channel number ("Auto" is recommended). Please select a channel number you wish to use. If you know a certain channel number is being used by other wireless access points nearby, please refrain from using the same channel number.

2.4.3 Security Settings

Turn on WEP or WPA encryption to prevent unauthorized access to your wireless network.

Select the **Encryption** method from the drop down menu. Then select and fill in the required parameters.

Click the **Apply** button to display the following.



Do not turn off or reboot the device during this time.

2.5 Status

2.5.1 Device Status

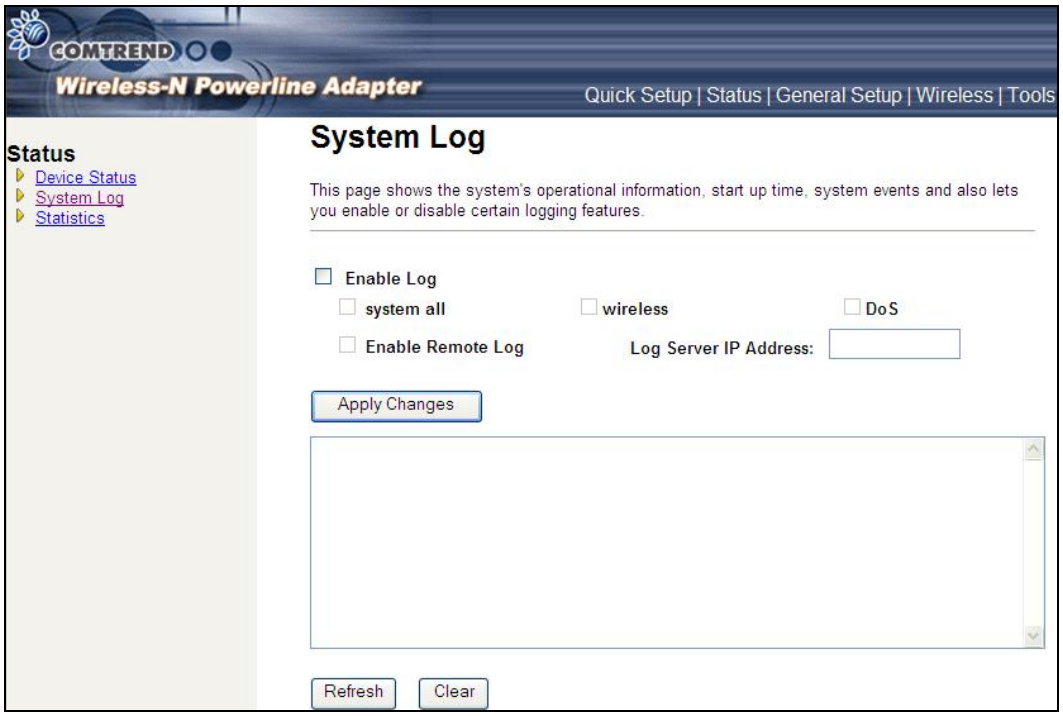
This page shows the current status and some basic settings of the device.

Up time	Displays the total time passed since the Wireless-N Powerline Adapter was powered on.
Firmware Version	Displays Firmware version of wireless Wireless-N Powerline Adapter.
Mode	Displays current wireless operating mode.
Band	Displays the transmission mode (802.11b, 802.11n or 802.11g).
SSID	Displays current SSID (the name used to identify this Wireless-N Powerline Adapter)
Channel Number	Displays current wireless channel number.
Encryption	Displays current wireless security setting.
BSSID	Displays current BSSID (a set of unique identification name of this Wireless-N Powerline Adapter, it cannot be modified by user)

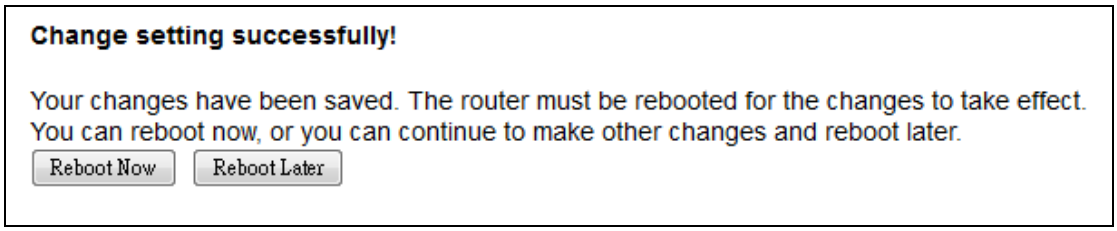
Associated Clients	Displays the number of connected wireless clients.
Attain IP Protocol	Displays the method of obtaining the IP address.
IP Address	Displays the IP address of this Wireless-N Powerline Adapter.
Subnet Mask	Displays the net mask of IP address.
Default Gateway	Displays the IP address of default gateway.
DNS	Displays the IP address of the DNS server.
MAC address	Displays the MAC address of WLAN interface

2.5.2 System Log

This page shows the system's operational information; start up time, system events, and also lets you enable or disable certain logging features.



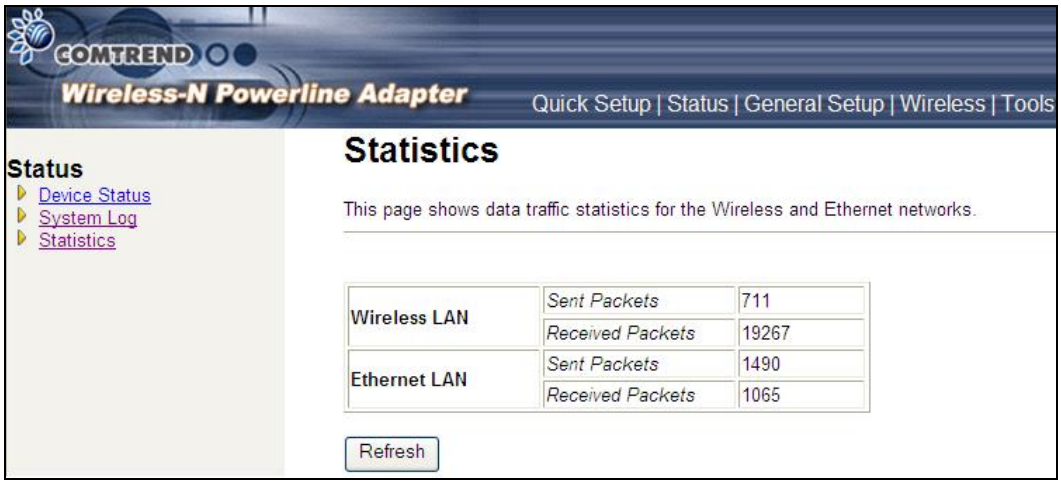
To enable the System Log tick the check box and make your selections.
Click the **Apply Changes** button to display the following.



Click the **Reboot Now** button for the changes to take effect. Click the **Reboot Later** button to continue to make changes and reboot the device at a different time.

2.5.3 Statistics

This page shows the packet count for the Wireless and Ethernet LAN.



Wireless LAN Sent Packets	It shows the statistic count of sent packets on the wireless LAN interface
Wireless LAN Received Packets	It shows the statistic count of received packets on the wireless LAN interface
Ethernet LAN Sent Packets	It shows the statistic count of sent packets on the Ethernet LAN interface
Ethernet LAN Received Packets	It shows the statistic count of received packets on the Ethernet LAN interface

Click the **Refresh** button to update the Wireless/Ethernet LAN statistics.

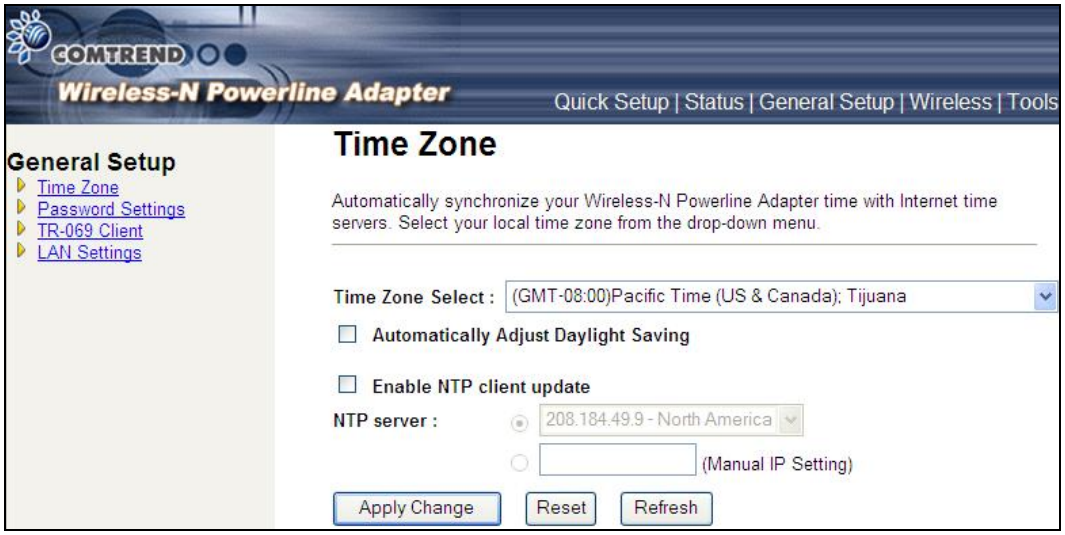
2.6 General Setup

2.6.1 Time Zone Setting

Automatically synchronize your Wireless-N Powerline Adapter time with Internet time servers. Select your local time zone from the drop-down menu.

This page is used to configure NTP client to get current time.

After click 'Time Zone' on the left of web management interface and the following messages will be displayed:



Time Zone Select	Click the time zone in your country
Automatically Adjust Daylight Saving	Click this box to enable or disable Automatically Adjust Daylight Saving function
Enable NTP client update	Click the checkbox to enable NTP client update
NTP server	Click select default or input NTP server IP address

2.6.2 Password

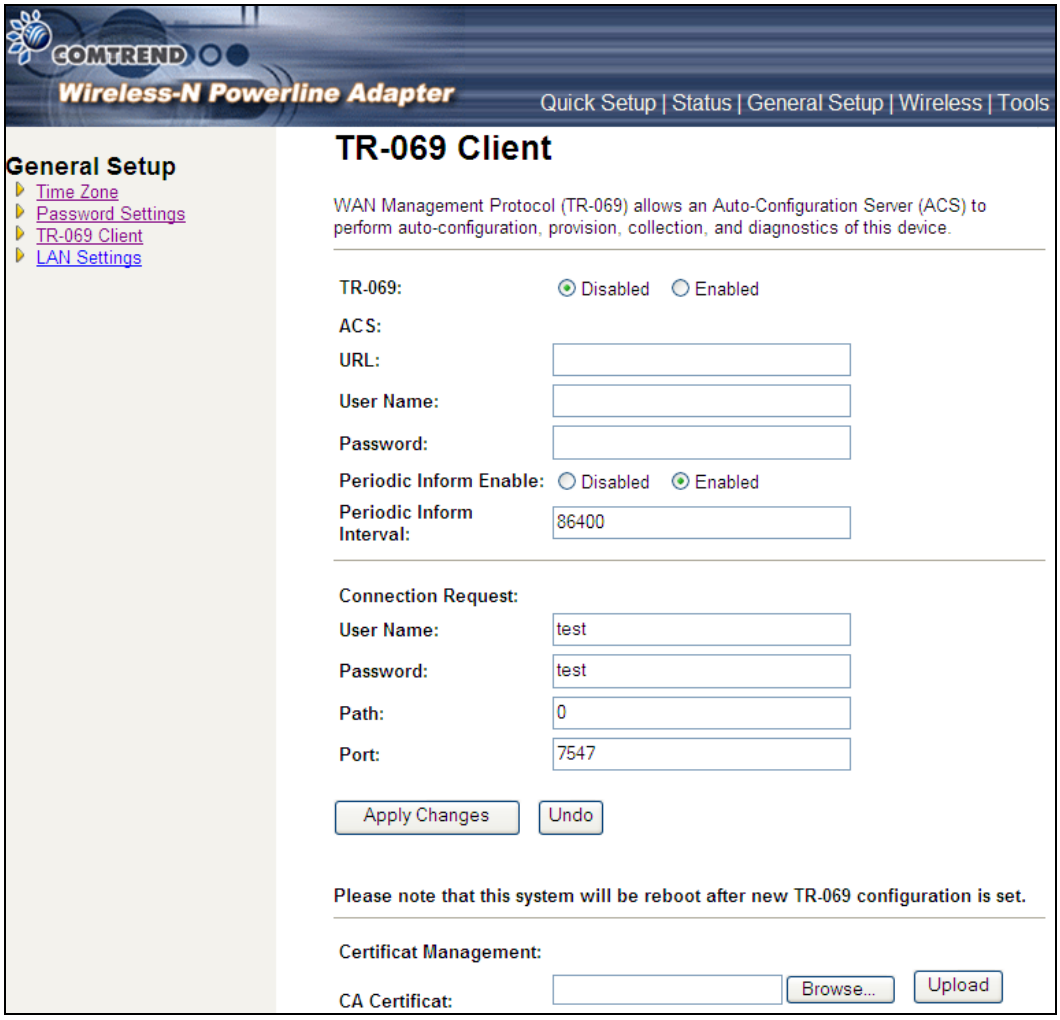
This page is used to set the account to access the web server of your Wireless-N Powerline Adapter. Emptying the user name and password fields will disable the protection.

Click the **Apply Changes** button to create the new password setting.

Click the **Reset** button to reset/clear the data just input on screen.

2.6.3 TR-069 Client

WAN Management Protocol (TR-069) allows an Auto-Configuration Server (ACS) to perform auto-configuration, provision, collection, and diagnostics of this device.



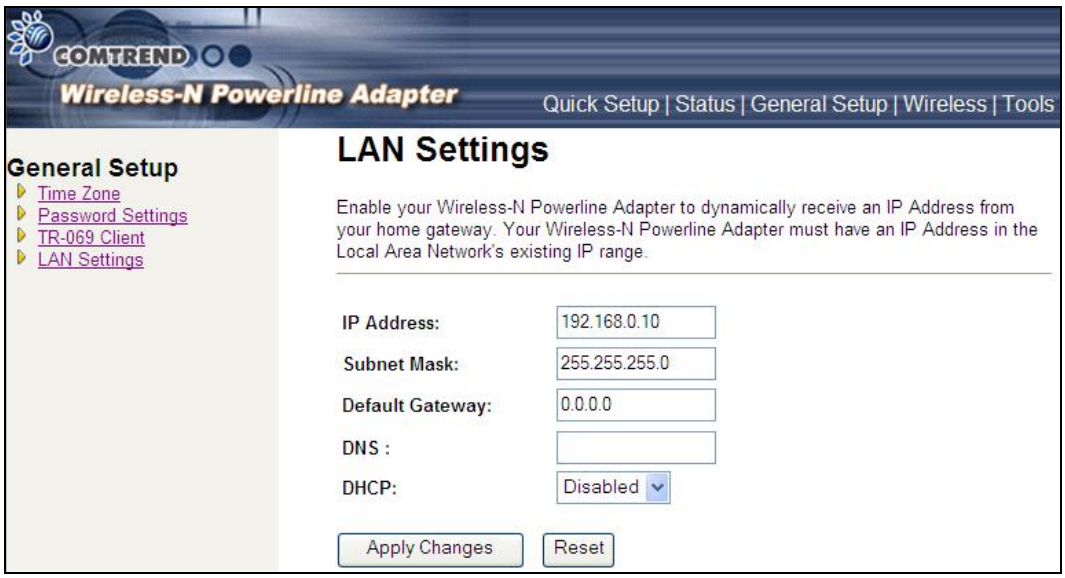
Select desired values and click **Apply Changes** to configure TR-069 client options.

ACS URL	URL for the CPE to connect to the ACS using the CPE WAN Management Protocol. This parameter MUST be in the form of a valid HTTP or HTTPS URL. An HTTPS URL indicates that the ACS supports SSL. The "host" portion of this URL is used by the CPE for validating the certificate from the ACS when using certificate-based authentication.

ACS User Name	Username used to authenticate the CPE when making a connection to the ACS using the CPE WAN Management Protocol. This username is used only for HTTP-based authentication of the CPE.
ACS Password	Password used to authenticate the CPE when making a connection to the ACS using the CPE WAN Management Protocol. This password is used only for HTTP-based authentication of the CPE.
Periodic Inform Enable	Whether or not the CPE periodically sends CPE information to the ACS.
Periodic Inform Interval	The duration in seconds of the interval for which the CPE attempts to connect with the ACE if periodic inform is enabled.
Connection Request	
User Name	Username used to authenticate an ACS making a Connection Request to the CPE.
Password	Password used to authenticate an ACS making a Connection Request to the CPE.
Path	This is an element in the makeup of the Connection Request URL.
Port	This is an element in the makeup of the Connection Request URL.

2.6.4 LAN Settings

Enable your Wireless-N Powerline Adapter to dynamically receive an IP Address from your home gateway. Your Wireless-N Powerline Adapter must have an IP Address in the Local Area Network's existing IP range.



IP Address	The IP address for the Wireless-N Powerline Adapter
Subnet Mask	The Subnet Mask for the Wireless-N Powerline Adapter
Default Gateway	The LAN default gateway
DNS	Specify the IP address of the default gateway of your network here.
DHCP	Disable or Enable DHCP client. If Enabled, IP Address, Subnet Mask, Default Gateway and DNS will be obtained by DHCP client automatically.

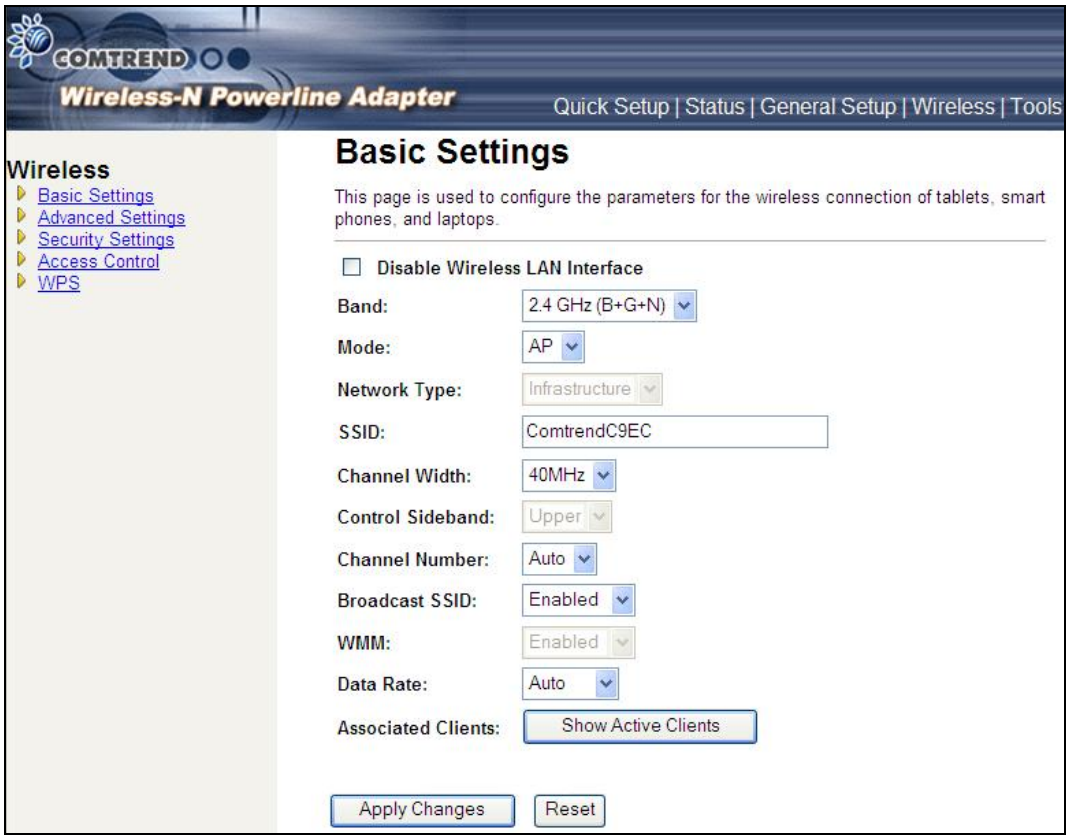
Click the **Apply Changes** button to apply the amendments you made.

Click the **Reset** button to clear the data just inputted on the screen.

2.7 Wireless

2.7.1 Basic settings

This page is used to configure the parameters for the wireless connection of tablets, smart phones, and laptops.

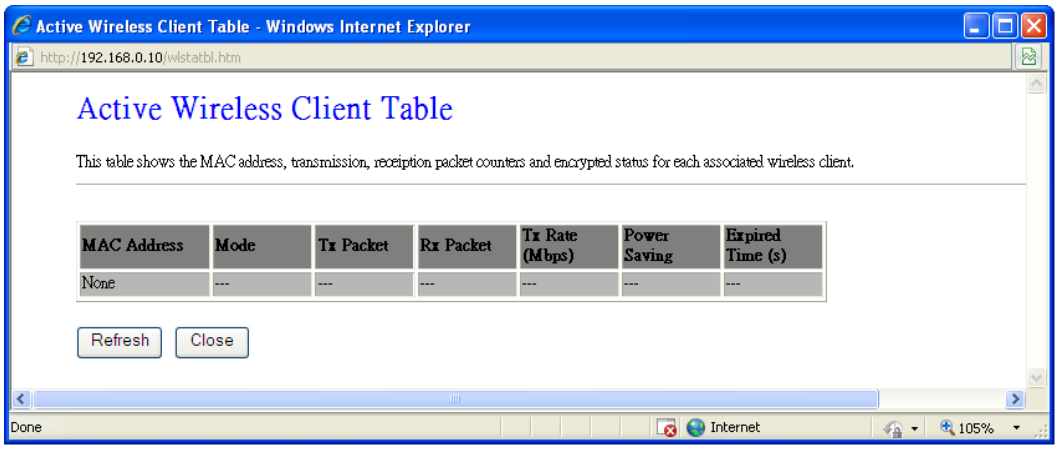


Disable Wireless LAN interface	Click it will disable your Wireless LAN Interface. The Wireless Interface default is Enable.
Band	Please select the wireless band you wish to use. By selecting different band setting, you'll be able to allow or deny the wireless client of a certain band. If you select 2.4GHz (B), 2.4GHz (N), or 2.4GHz (G), only wireless clients using the wireless band you select (802.11b, 802.11 n, or 802.11g) will be able to connect to this Wireless-N Powerline Adapter.

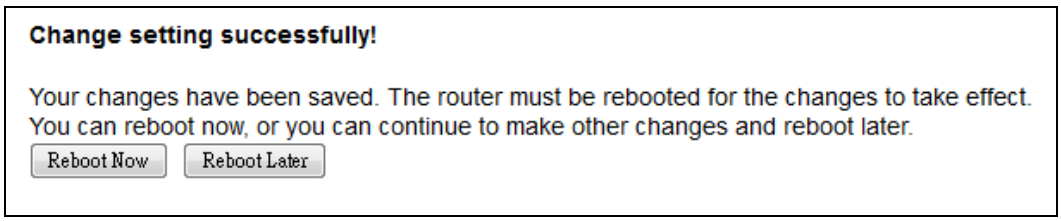
	If you select 2.4GHz (B+G), then only wireless clients using 802.11b and 802.11g band will be able to connect to this Wireless-N Powerline Adapter. If you want to allow 802.11b, 802.11g, and 802.11 Draft-N clients to connect to this Wireless-N Powerline Adapter, select 2.4GHz (B+G+N).
Mode	PG-9142s supports not only AP mode, but also provides WDS, AP+WDS. Please refer to below for detailed wireless Basic Settings. In Default, PG-9142s will work with AP mode.
SSID	Please input the ESSID (the name used to identify this Wireless-N Powerline Adapter) here. You can input up to 32 alphanumerical characters. **PLEASE NOTE THAT THE ESSID IS CASE SENSITIVE.**
Network Type	In Infrastructure Mode, wireless clients can access the other networks (perhaps Internet) via this AP. For AP. Only Infrastructure Mode is allowed here.
Channel Width	Select wireless channel width (bandwidth taken by wireless signals of this Wireless-N Powerline Adapter). It's suggested to select 'Auto 20/40MHz'. Do not change to '20 MHz' unless you know what it is.
Control Sideband	Specify if the extension channel should be in the Upper or Lower sideband.
Channel Number	Please select a channel number you wish to use. If you know a certain channel number is being used by other wireless access points nearby, please refrain from using the same channel number
Broadcast SSID	Decide if the Wireless-N Powerline Adapter will broadcast its own SSID or not. You can hide the SSID of your Wireless-N Powerline Adapter (set the option to 'Disable'), so only people those who know the SSID of your Wireless-N Powerline Adapter can get connected.
WMM	WMM (Wi-Fi Multimedia) technology, which can improve the performance of certain network applications, like audio/video streaming, network telephony (VoIP), and others.

	When you enable WMM function, the Wireless-N Powerline Adapter will define the priority of different kinds of data, to give higher priority to applications which require instant responding. Therefore you can improve the performance of such network applications.
Data rate	Set the wireless data transfer rate to a certain value. Since most of wireless devices will negotiate with each other and pick a proper data transfer rate automatically, **it's not necessary to change this value unless you know what will happen after modification.**
Associated Clients	Click 'Show Active Clients' button and a new popup window will appear which contains the information about all wireless clients connected to this Wireless-N Powerline Adapter. You can click 'Refresh' button in popup window to keep information up-to-date.

Click the **Show Active Clients** button to display the following.



After you finish with setting, please click 'Apply Change', and the following message will be displayed:

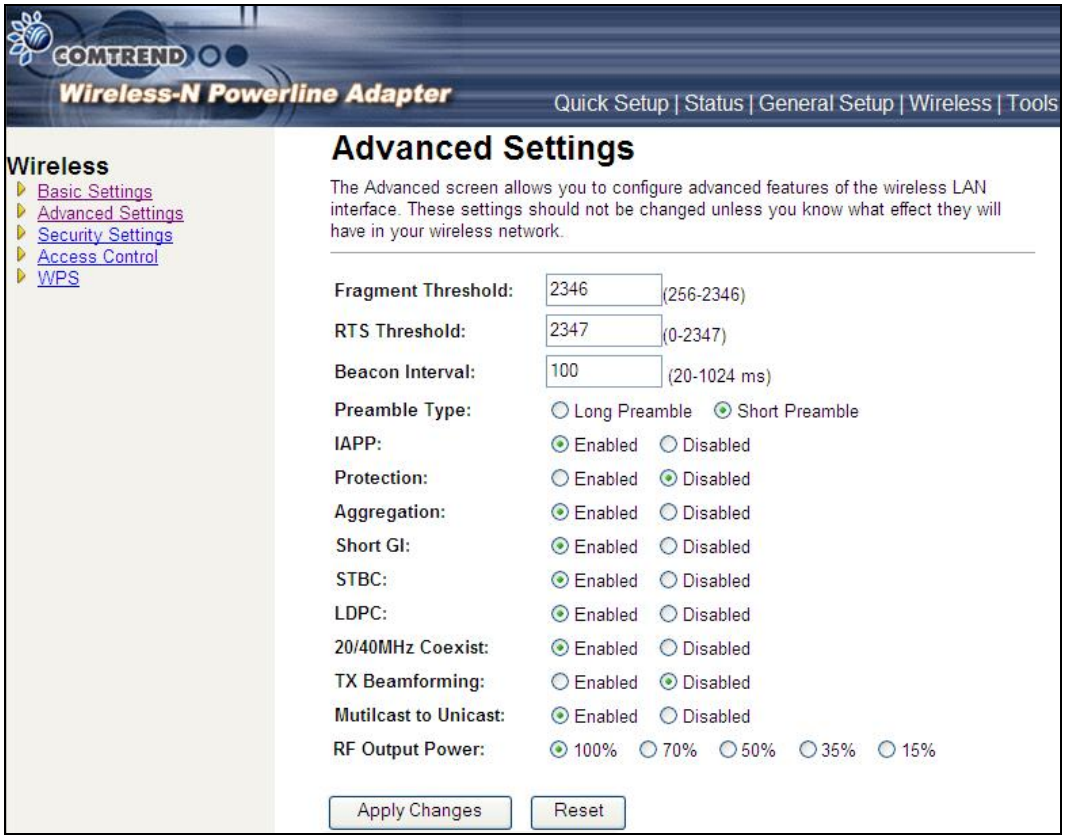


When you see this message, the settings you made is successfully save. You can click 'Reboot Later' button to back to previous page and continue on other setting items, or click 'Reboot Now' button to restart the Wireless-N Powerline Adapter and the changes will take effect after about 30 seconds.

2.7.2 Advanced settings

This Wireless-N Powerline Adapter has many advanced wireless features. Please note that all settings listed here are for experienced users only, if you're not sure about the meaning and function of these settings, please don't modify them, or the wireless performance will be reduced.

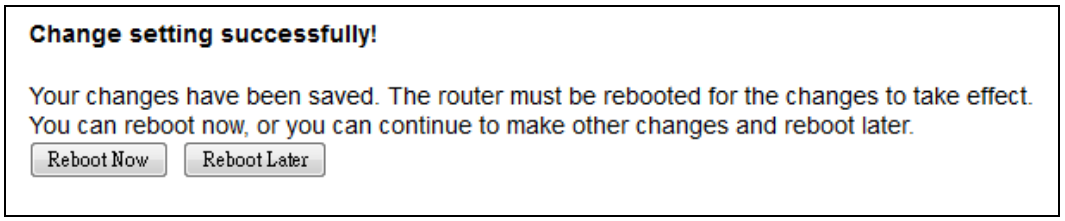
You can click 'Advanced Setting' on the left to enter advanced settings menu, and the following message will be displayed:



Fragment Threshold	Set the Fragment threshold of wireless radio. **Do not modify default value if you don't know what it is, default value is 2346**
RTS Threshold	Set the RTS threshold of wireless radio. **Do not modify default value if you don't know what it is, default value is 2347**
Beacon Interval	Set the beacon interval of wireless radio. **Do not modify default value if you don't know what it is, default value is 100**

Preamble Type	Set the type of preamble of wireless radio, **Do not modify default value if you don't know what it is, default setting is 'Short Preamble'**
IAPP	Click to enable or disable the IAPP function.
Protection	Click to enable or disable the Protection function.
Aggregation	Click to enable or disable the Aggregation function.
Short GI	Click to enable or disable the Short GI function.
STBC	Click to enable or disable the STBC function.
LDPC	Click to enable or disable the LDPC function.
20/40MHz Coexist	Click to enable or disable the 20/40MHz Coexist function.
TX Beamforming	Click to enable or disable the TX Beamforming function.
Multicast to Unicast	Click to enable or disable the multicast to unicast conversion function.
RF Output Power	You can set the output power of wireless radio. Unless you're using this Wireless-N Powerline Adapter in a really big space, you may not have to set output power to 100%. **This will enhance security (malicious / unknown users in distance will not be able to reach your Wireless-N Powerline Adapter).**

After you finish with setting, please click 'Apply Changes', and the following message will be displayed:



When you see this message, the settings you made is successfully save. You can click 'Reboot Later' button to back to previous page and continue on other setting items, or click 'Reboot Now' button to restart the Wireless-N Powerline Adapter and the changes will take effect after about 30 seconds.

2.7.3 Security settings

This Wireless-N Powerline Adapter provides many types of wireless security (wireless data encryption). When you use data encryption, data transferred by radio signals in the air will become unreadable for those people who don't know correct encryption key (encryption password).

You can click 'Security' on the left to enter Security settings menu, and the following message will be displayed:

Encryption	Select the encryption supported over wireless access. The encryption method can be None, WEP, WPA(TKIP), WPA2 or WPA2 Mixed.

Different selections will produce different parameters.

2.7.3.1 Disable Security

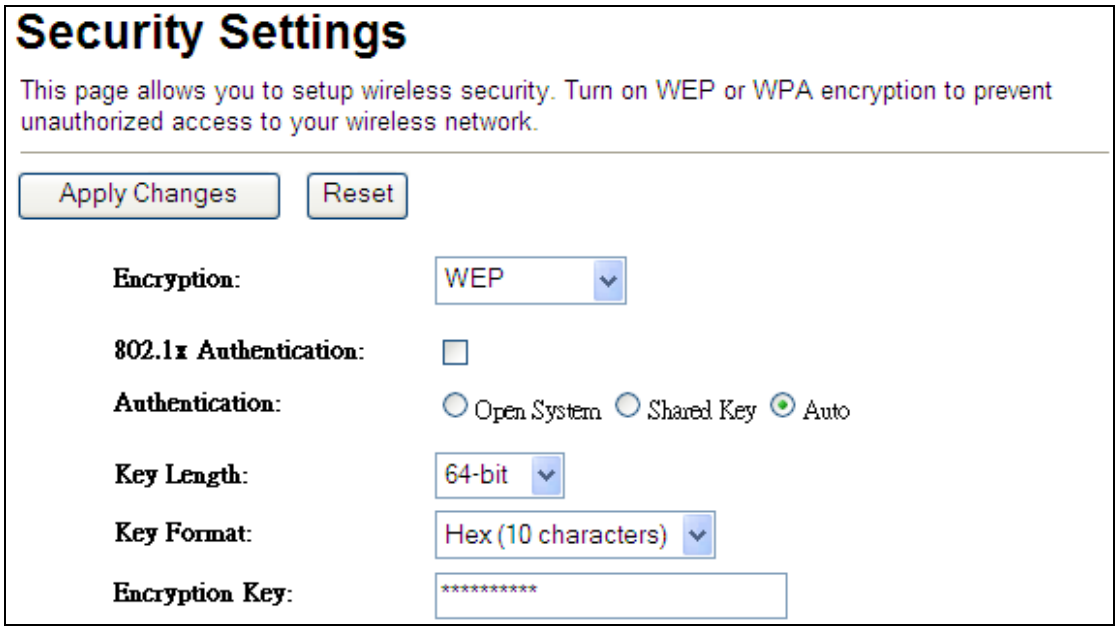
When you select 'Disable', wireless encryption for the network is disabled.

2.7.3.2 WEP

WEP (Wired Equivalent Privacy) is a common encryption mode, it's safe enough for home and personal use. But if you need higher level of security, please consider using WPA encryption (see next Section).

However, some wireless clients don't support WPA, but only support WEP, so WEP is still a good choice for you if you have such kind of client in your network environment.

When you select 'WEP' as encryption type, the following messages will be displayed:

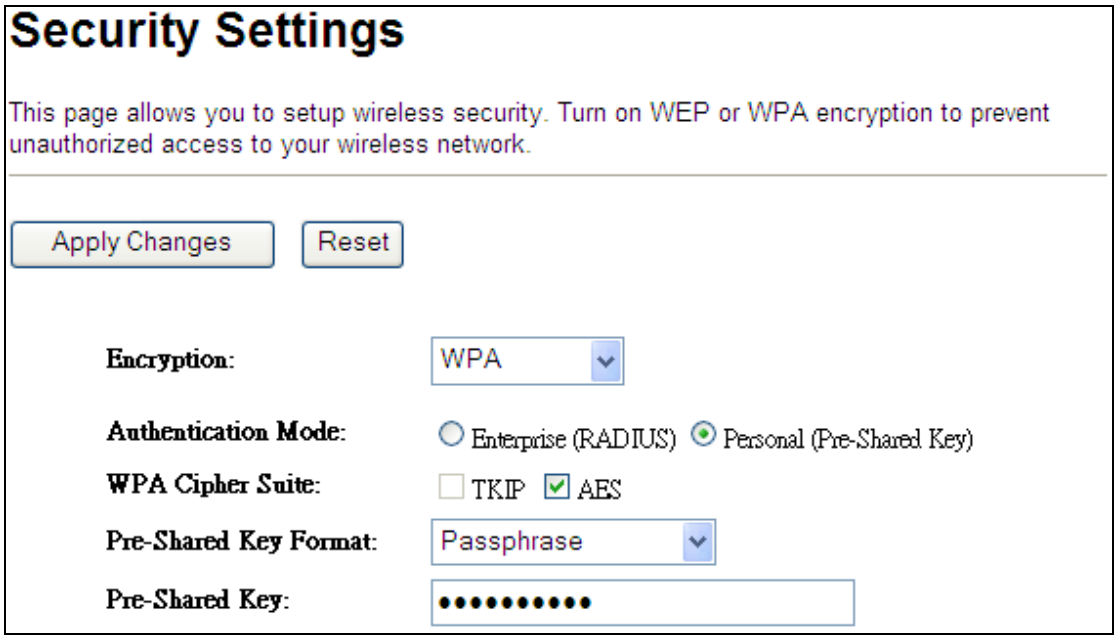


802.1x Authentication	While Encryption is selected to be Open and WEP. Click the check box to enable IEEE 802.1x authentication function.
Key Length	There are two types of WEP key length: 64-bit and 128-bit. Using '128-bit' is safer than '64-bit', but will reduce some data transfer performance.
Key Format	There are two types of key format: ASCII and Hex. When you select a key format, the number of characters of key will be displayed. For example, if you select '64-bit' as key length, and 'Hex' as key format, you'll see the message at the right of 'Key Format' is 'Hex (10 characters), which means the length of WEP key is 10 characters.

2.7.3.3 WPA/WPA2/WPA-Mix

WPA/WPA2/WPA-Mix is the safest encryption method currently, and it's recommended to use this encryption method to ensure the safety of your data.

When you select 'WPA/WPA2/WPA-Mix' as encryption type, the following messages will be displayed:



WPA Authentication Mode	While Encryption is selected to be WPA. Click to select the WPA Authentication Mode with Enterprise (RADIUS) or Personal (Pre-Shared Key).
Cipher Suite	There are two type of Cipher :TKIP and AES
Pre-shared Key Format	Please select the format of pre-shared key here, available options are 'Passphrase' (8 to 63 alphanumerical characters) and 'Hex (64 hexadecimal characters – 0 to 9 and a to f).
Pre-shared Key	Please input pre-shared key according to the key format you selected here. For security reason, don't use simple words).

2.7.4 Access Control

Another security measure you can use to keep hackers and intruders away is 'Access Control'. You can pre-define a so-called 'white-list', which contains MAC addresses of the wireless clients you trust. All other wireless client with the MAC address which is not in your list will be denied by this Wireless-N Powerline Adapter.

To setup MAC filtering, please click 'Access Control' on the left of web management interface and the following messages will be displayed:

Wireless Access Control Mode	Click the Disabled, Allow Listed or Deny Listed of drop down menu choose wireless access control mode. This is a security control function; only those clients registered in the access control list can link to this WLAN Broadband Router.
MAC Address	Fill in the MAC address of client to register this WLAN Broadband Router access capability.
Comment	Fill in the comment tag for the registered client.
Current Access Control List	It shows the registered clients that are allowed to link to this WLAN Broadband Router.

After you finish with setting, please click 'Apply Changes'.

2.7.5 WPS

Wi-Fi Protected Setup (WPS) is the simplest way to build connection between wireless network clients and this Wireless-N Powerline Adapter. You don't have to select encryption mode and input a long encryption passphrase every time when you need to setup a wireless client, you only have to press a button on wireless client and this Wireless-N Powerline Adapter, and the WPS will do the setup for you.

This Wireless-N Powerline Adapter supports two types of WPS: Push-Button Configuration (PBC), and PIN code. If you want to use PBC, you have to switch this Wireless-N Powerline Adapter to WPS mode and push a specific button on the wireless client to start WPS mode. You can push Reset/WPS button of this Wireless-N Powerline Adapter, or click 'Start PBC' button in the web configuration interface to do this; if you want to use PIN code, you have to provide the PIN code of the wireless client you wish to connect to this Wireless-N Powerline Adapter and then switch the wireless client to WPS mode. The detailed instructions are listed follow:

Note: WPS function of this Ethernet adapter will not work for those wireless clients that do not support WPS.

To use WPS function to set encrypted connection between this Wireless-N Powerline Adapter and WPS-enabled wireless client by WPS, click 'WPS Setting' on the left of web management menu, and the following information will be displayed:

Disable WPS	Check this box to enable or disable WPS function
WPS Status	Displays WPS status. If data encryption settings of this Wireless-N Powerline Adapter has never been set, 'unConfigured' message will be displayed her.; if data encryption settings has been set before, 'Configured' message will be displayed here.
Auto-lock-down state	When WSC daemon be attacked by wrong pin code 10 times, then wsc will enter lock-down state
Self-PIN Number	This is the WPS PIN code of this Wireless-N Powerline Adapter. This code is useful when you need to build wireless connection by WPS with other WPS-enabled wireless devices
Push Button Configuration	Click 'Start PBC' to start Push-Button style WPS setup procedure. This Wireless-N Powerline Adapter will wait for WPS requests from wireless clients for 2 minutes. The 'WLAN' LED on the Wireless-N Powerline Adapter will be steady on for 2 minutes when this Wireless-N Powerline Adapter is waiting for incoming WPS request.

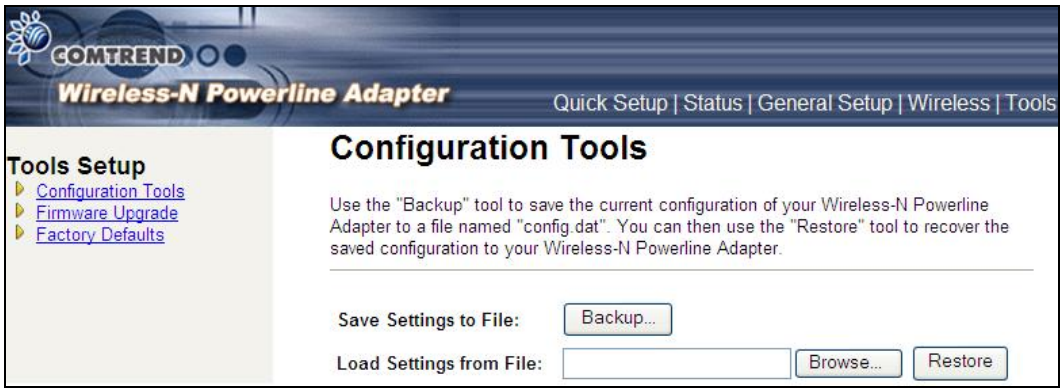
STOP WSC	Click 'Stop WSC' to stop WPS setup procedure.
Client PIN Number	Please input the PIN code of the wireless client you via client wish to connect, and click 'Start PIN' button. The 'WLAN' LED on the Wireless-N Powerline Adapter will be steady on when this Wireless-N Powerline Adapter is waiting for incoming WPS request.

NOTE: When you're using PBC type WPS setup, you must press 'PBC' button (hardware or software) of wireless client within 120 seconds; if you didn't press PBC button of wireless client within this time period, please press 'PBC' button (hardware or software) of this access point again.

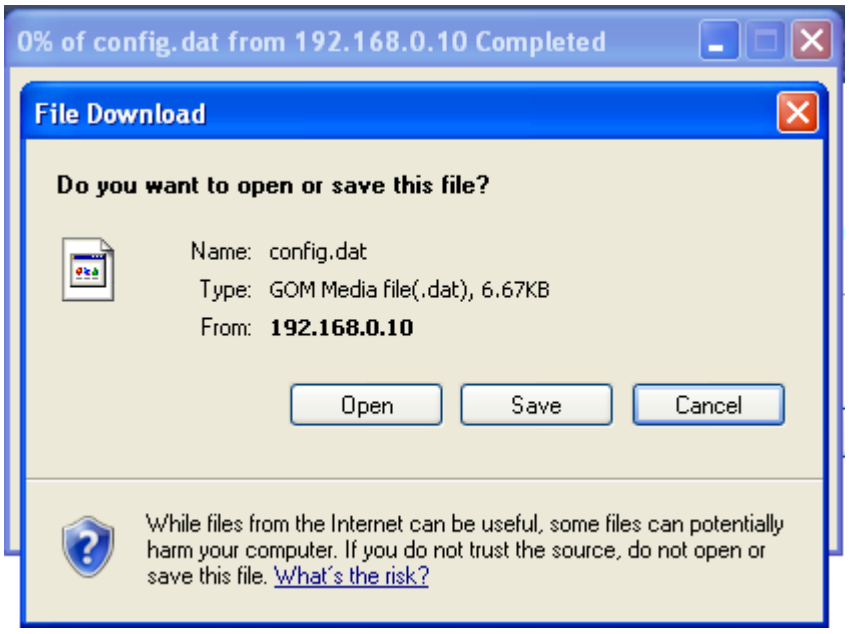
2.8 Tools

2.8.1 Configuration Tools

Use the "Backup" tool to save the current configuration of your Wireless-N Powerline Adapter to a file named "config.dat". You can then use the "Restore" tool to recover the saved configuration to your Wireless-N Powerline Adapter.



Click the Backup button to display the following.



Click the **Save** button to backup your current configuration.

2.8.2 Firmware Upgrade

This page allows you upgrade the Wireless-N Powerline Adapter firmware to new version. Please note, do not power off the device during the upload because it may crash the system.

After click ' Upgrade Firmware' on the left of web management interface and the following messages will be displayed:

Click the **Browse** button to locate the file.

Click the **Apply** button to apply the upgrade.

2.8.3 Factory Defaults

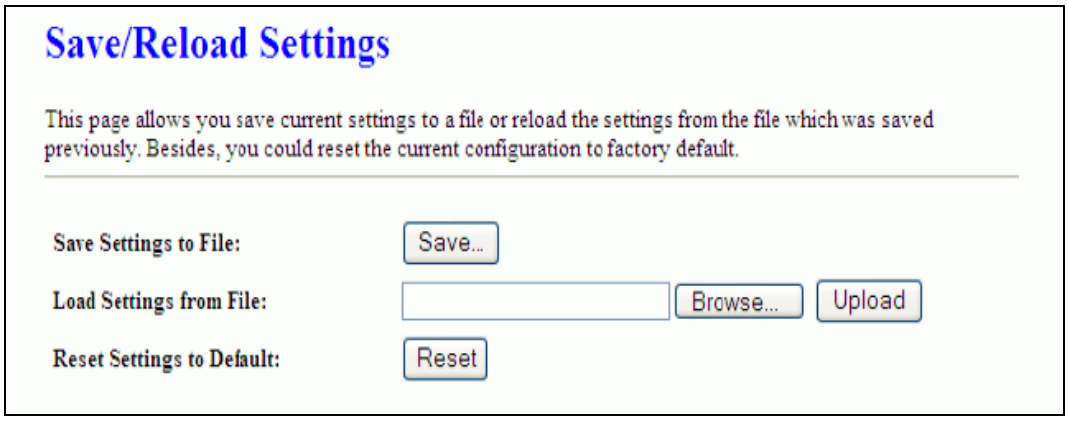
This page allows you to reset the current configuration to factory defaults.

Click the **Apply** button to reset the configuration.

2.8.4 Save/Reload setting

This page allows you save current settings to a file or reload the settings from the file that was saved previously. Besides, you could reset the current configuration to factory default.

After click 'Save/Reload setting' on the left of web management interface and the following messages will be displayed:



Chapter 3: HomePlug AV User Application Tool

This section provides the installation instructions for the HomePlug AV User Application Tool. This utility is meant to be used in the home by the end user for viewing and configuring the CG2x10 home network.

The following are the main features of this application:

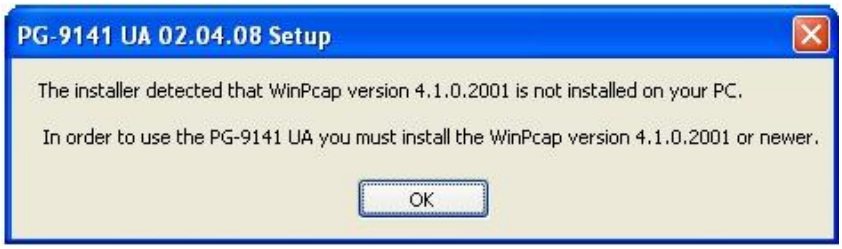
- Scans network for all available devices
- Lists all adapters found, including their names and MAC addresses
- Shows if the device is local or remote
- Enables renaming of the adapter
- Shows firmware version for each device
- Firmware upgrade - manually apply a firmware upgrade
- Security - specify device/network encryption key
- Add a device to the Power-Line network
- Works on Windows platforms (XP, Vista, and 7)

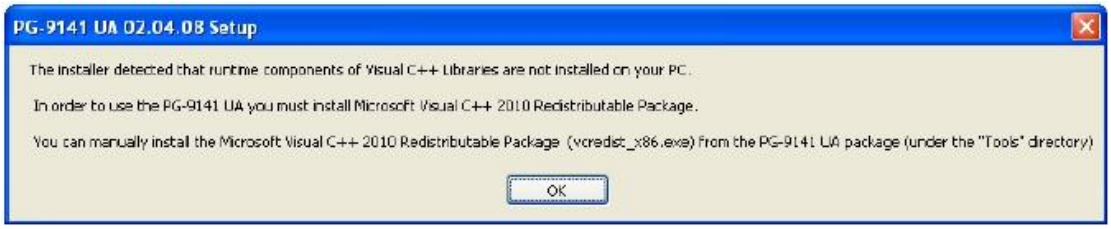
In order to use this application, one available LAN card must be connected to the CG2x10 device.

3.1 Installation Instructions

The following are instructions for running the setup executable and installing the User Application on your PC.

Run the Setup.exe file:

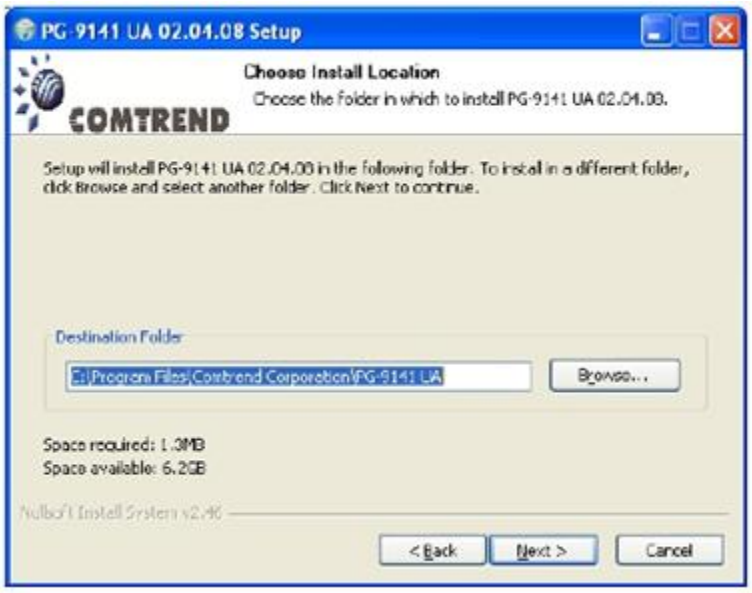




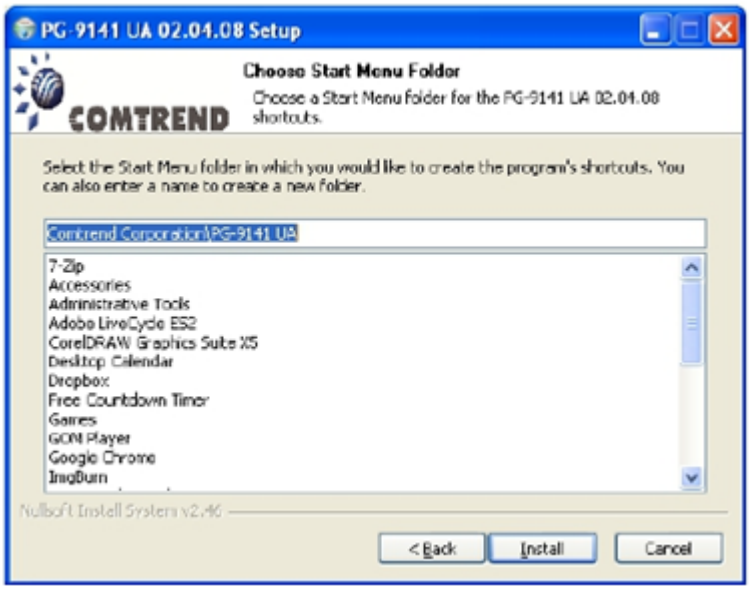
Should the above windows pop up, please go to Comtrend's North American Website to download the relevant software.

When the following window displays click the Next button.

Select the destination folder:



Select the Start Menu folder and then press Install:



Press Finish:

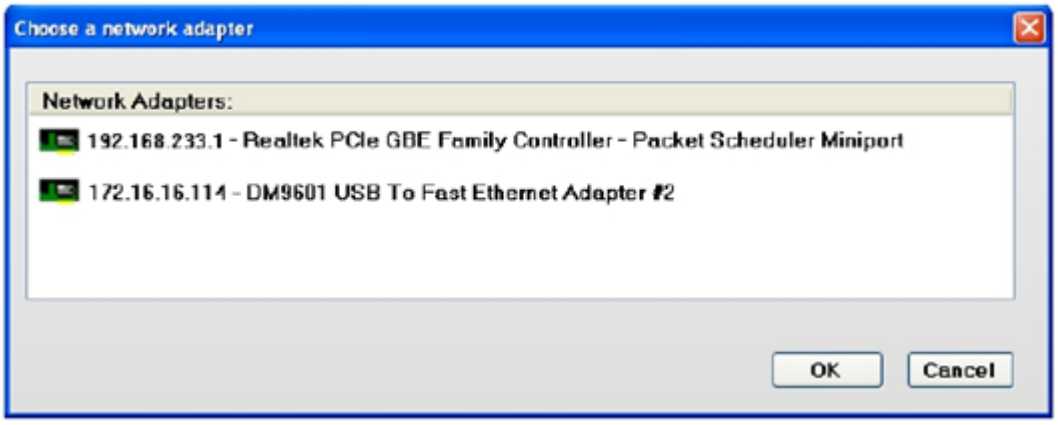
If you don't have Microsoft .NET Framework 4 installed on your PC, the following window will appear:

Click on the "Install" button to run the Microsoft .NET Framework 4 installation (from the web).

3.2 User Guide

3.2.1 Configuration

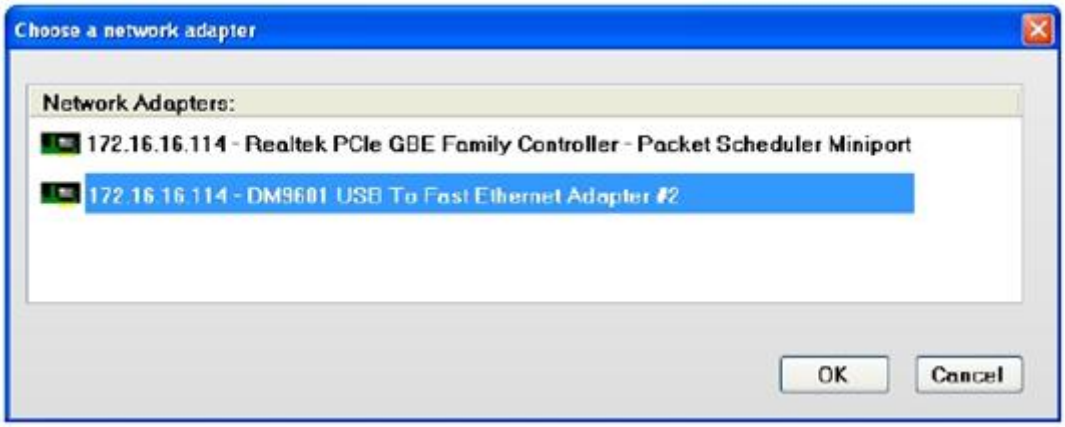
When you open the application, you will be asked to select the network card that is connected to your CG2x10 HPAV device:



Select the network card from the drop-down list.

NOTE: The PC NIC must have a fixed IP, either a static one or one that is given by a DHCP server (like a home router).

For example, let's suppose that IP 172.16.16.114 is connected to the CG2x10 HPAV device. In this case, you should select the proper card, and click on OK to continue.

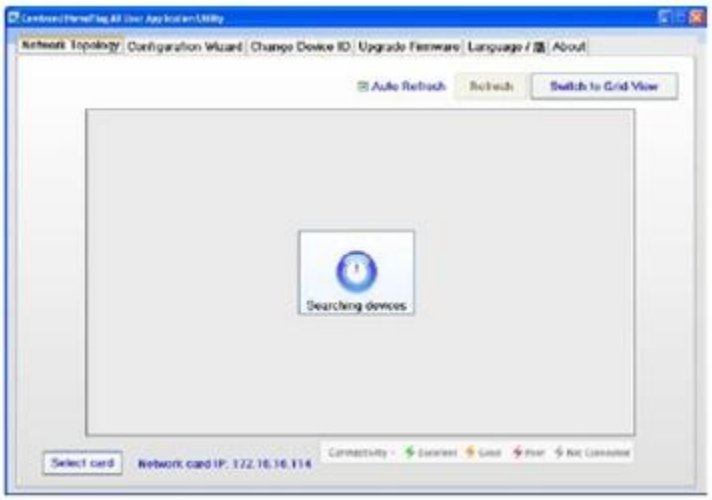


3.3 Network Topology

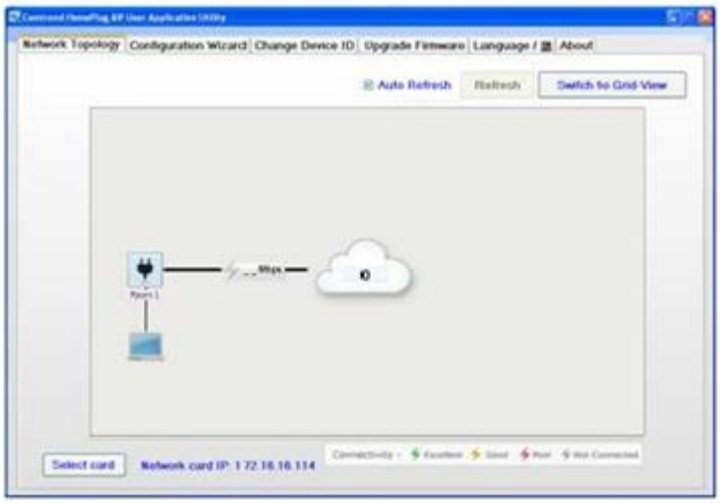
3.3.1 Topology Information

In the network topology tab, a graphic representation of all devices connected to your local CG2x10 HPAV device will be shown.

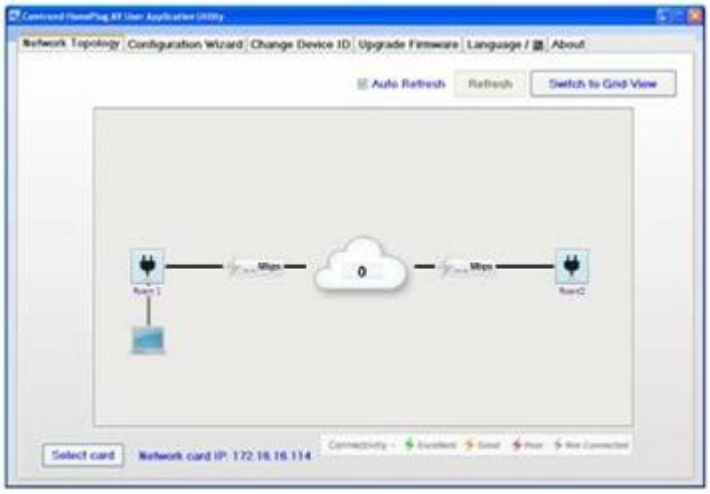
In the example below, there are no CG2x10 devices connected to your PC:



The example below shows one CG2x10 HPAV device connected to your PC.

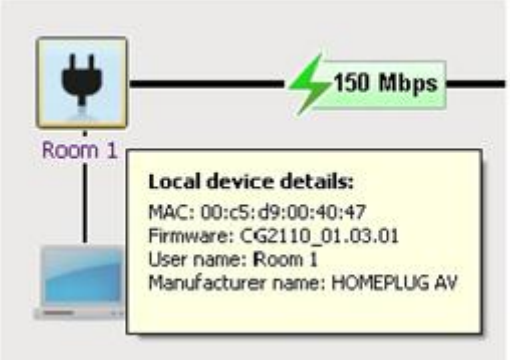


The example below shows two CG2x10 HPAV devices connected to the network. The name of the local device on the left is “Room1,” and the name of the remote device on the right is “Room2.”



3.3.2 Device Details

The MAC address and other information relevant to a device (e.g. firmware version, manufacturer name) can be seen by placing the mouse cursor over one of the devices of interest listed on the screen. For example, placing the mouse over device "Room1" will give the following:

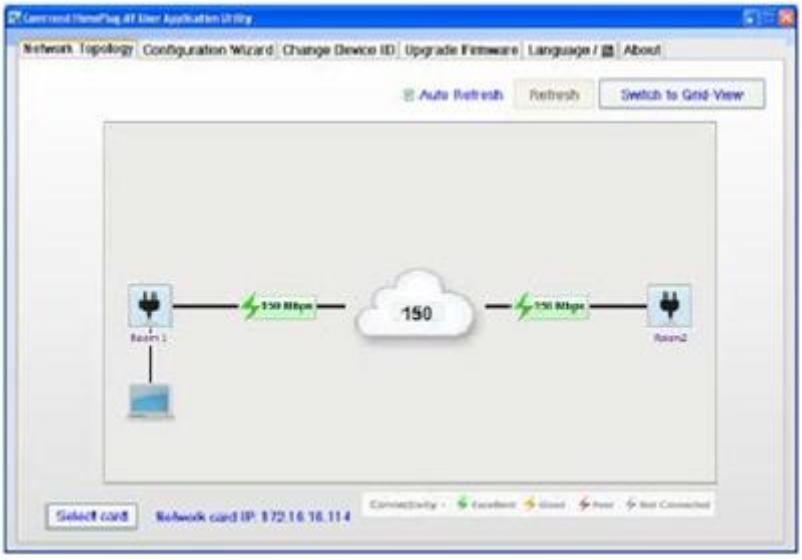


* Please note that all the information fields might not be available if the device has been removed from the network.

3.3.3 Connectivity Information on the Entire Network

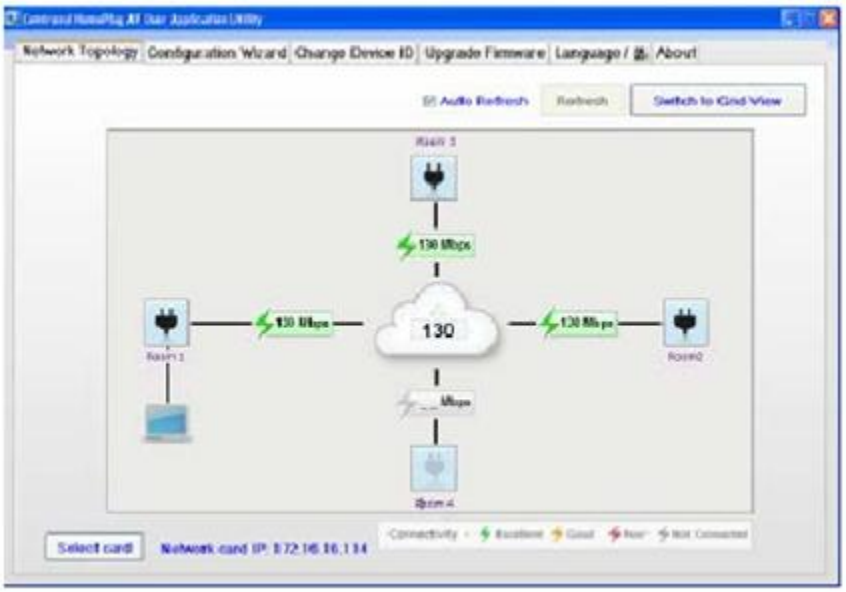
In order to get the current PHY rate for the entire network, you need to run traffic between the two CG2x10 HPAV devices. (Any program that sends bi-directional data between the two hosts connected to the "Room1" and "Room2" devices will be good enough.)

After running some traffic, you should immediately receive information about the quality of the connection. In the case below, the network's quality is shown as an excellent (colored green) connection (running at 150 Mbps):

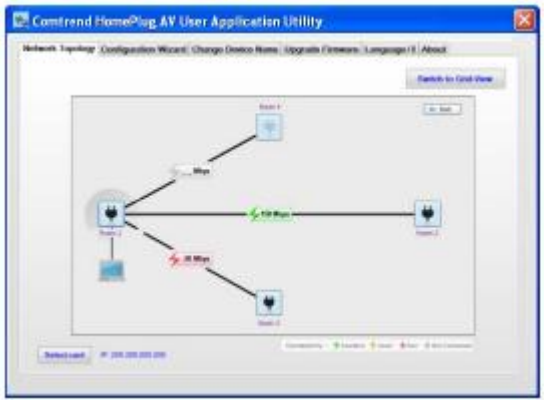
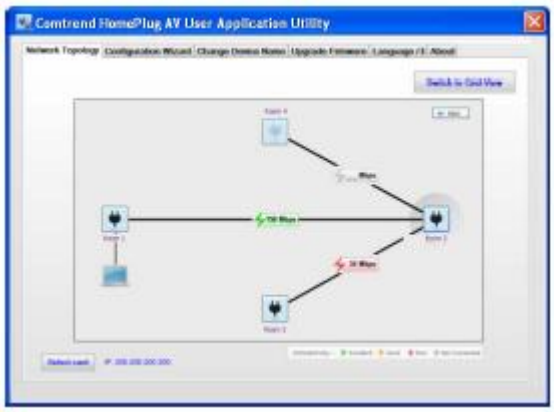
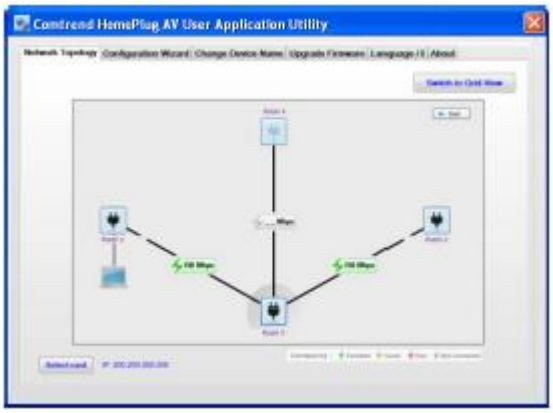
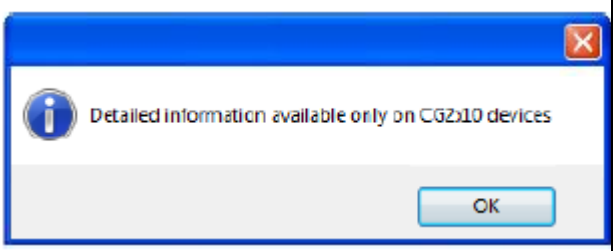


3.3.4 Connectivity Information for a Specific Device

1. "Room 1" CG2x10 device
2. "Room 2" CG2x10 device
3. "Room 3" CG2x10 device
4. "Room 4" Foreign (non-CG2x10) device



If you click on a specific device, you will get the connectivity quality towards that device from each of the other devices in the network.

Clicking on	Output Graph	Explanation
"Room 1" (left)		"Room 2" connectivity towards "Room 1" is excellent "Room 3" connectivity towards "Room 1" is poor
"Room 2" (right)		"Room 1" connectivity towards "Room 2" is excellent "Room 3" connectivity towards "Room 2" is poor
"Room 3" (down)		"Room 1" connectivity towards "Room 3" is excellent "Room 2" connectivity towards "Room 3" is excellent
"Room 4" (up)		Connectivity towards "Room 4" is n/a. This is a foreign (non-CG2x10) device.

3.3.5 Average Network PHY Rate

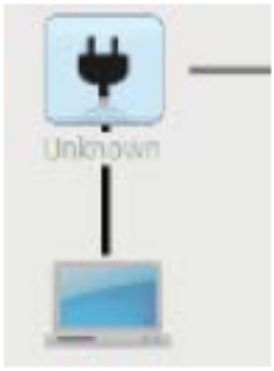
The average network PHY rate is shown in the center of the network topology screen. For the case shown in the previous table, the average rate is 110Mbps (excellent average connectivity among all devices).

3.3.6 Network Topology Legend

Connectivity legend:

☐	Excellent	> 80 Mbps
☐	Good	50 – 80 Mbps
☐	Poor	< 50 Mbps
☐	Not connected	no traffic

ICON Legend:

	The local drive is indicated with a picture of a PC connected to it.
	A CG2x10 HPAV device is represented by the black plug icon.
	A foreign (non-CGx10) device is represented by a black plug icon with hash marks.
	A device that is disconnected from the network topology will completely disappear after a long time-out.

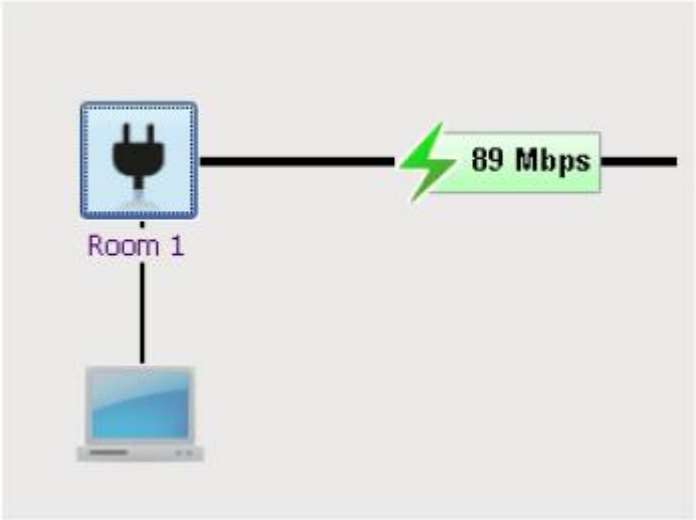
3.4 Change Device ID

A free-text unique name can be given to each HPAV device. To do so, choose the "Change Device ID" tab, select the device from the MAC-Address drop-down list, enter the new device name, and press on the "Change Device ID" button.

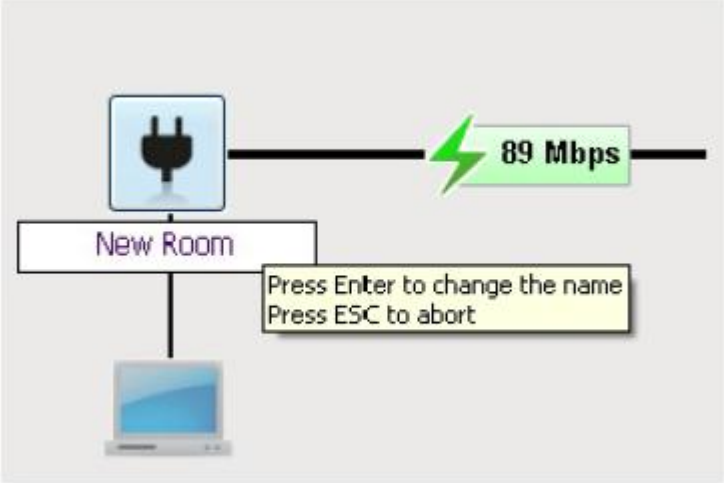
In the example below, the user selected the MAC (00:c5:d9:00:40:47) named "Room1" and entered a new name for the device ("New Room"). Pressing the "Change Device ID" button will change the name of the device.

Please note that you may also change the device's name by left-clicking on the device name while in the network topology tab:

In this example, we click on the “Room 1” name:

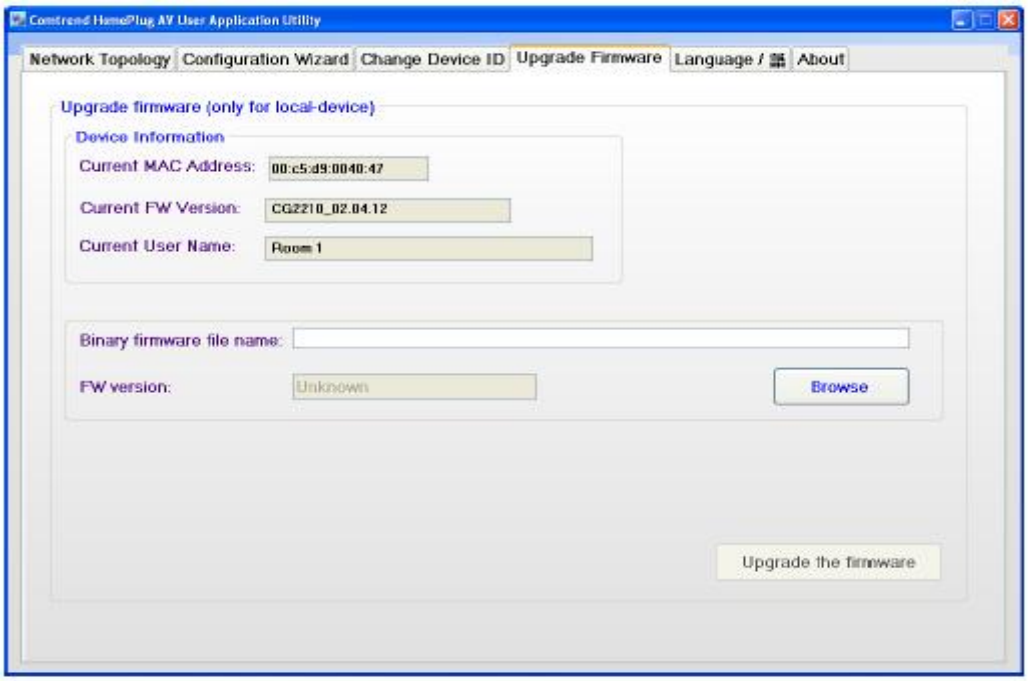


And enter a new device name in the white rectangle:



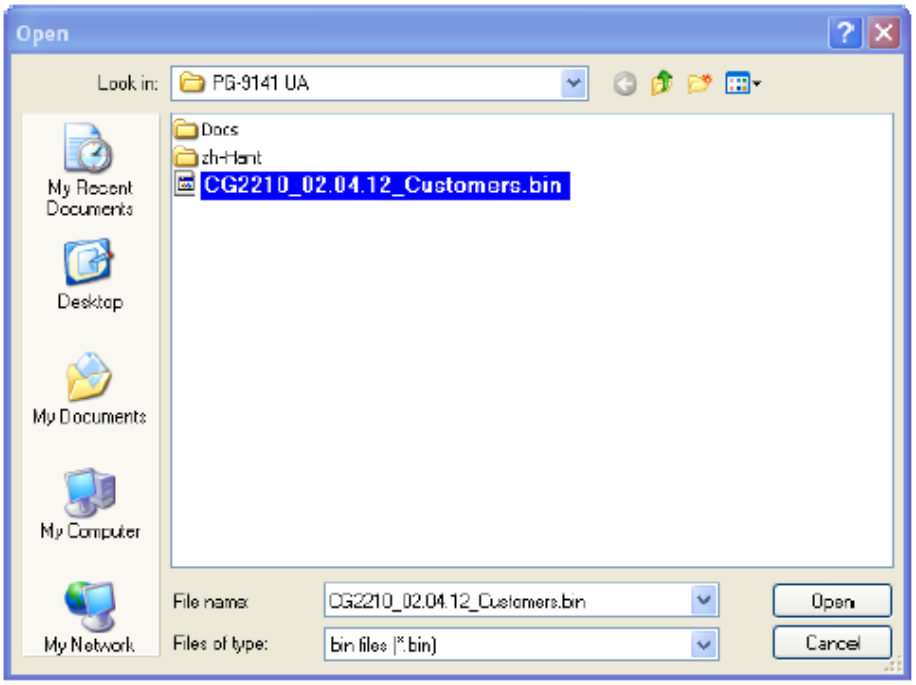
3.5 Update Firmware

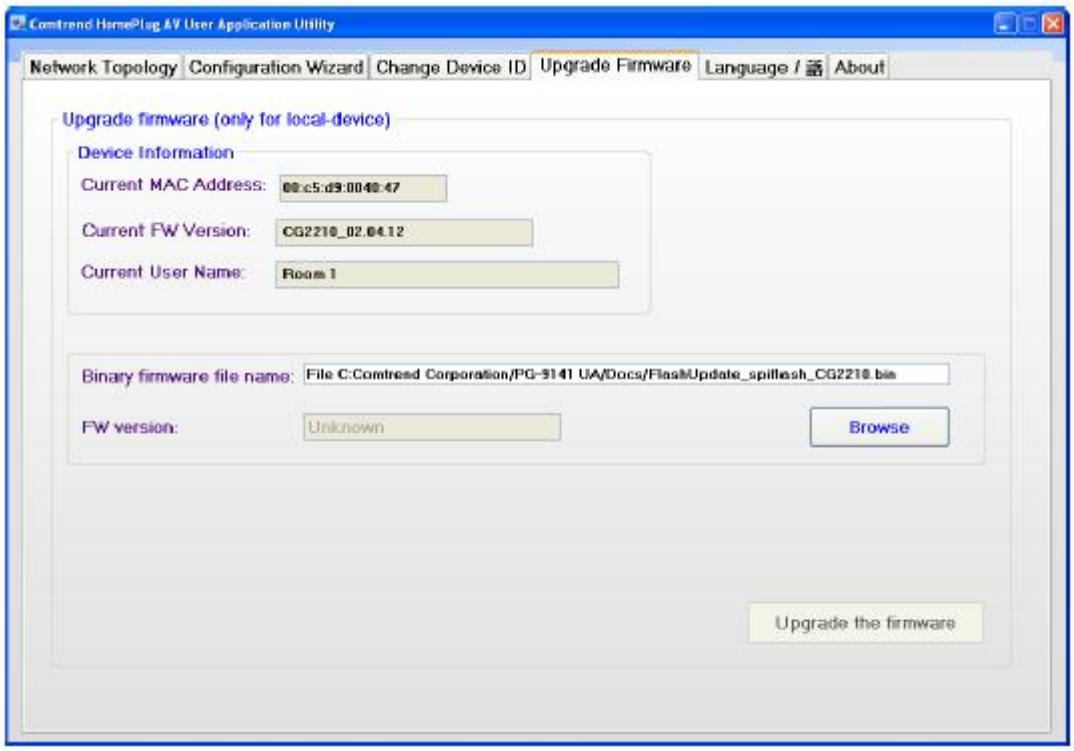
It is possible to update the firmware of a working device to a new firmware version. This is currently supported for local devices only. You are required to supply the bin file via the "Browse" button found in the Upgrade Firmware tab.



The following steps are required to update the firmware on a device:

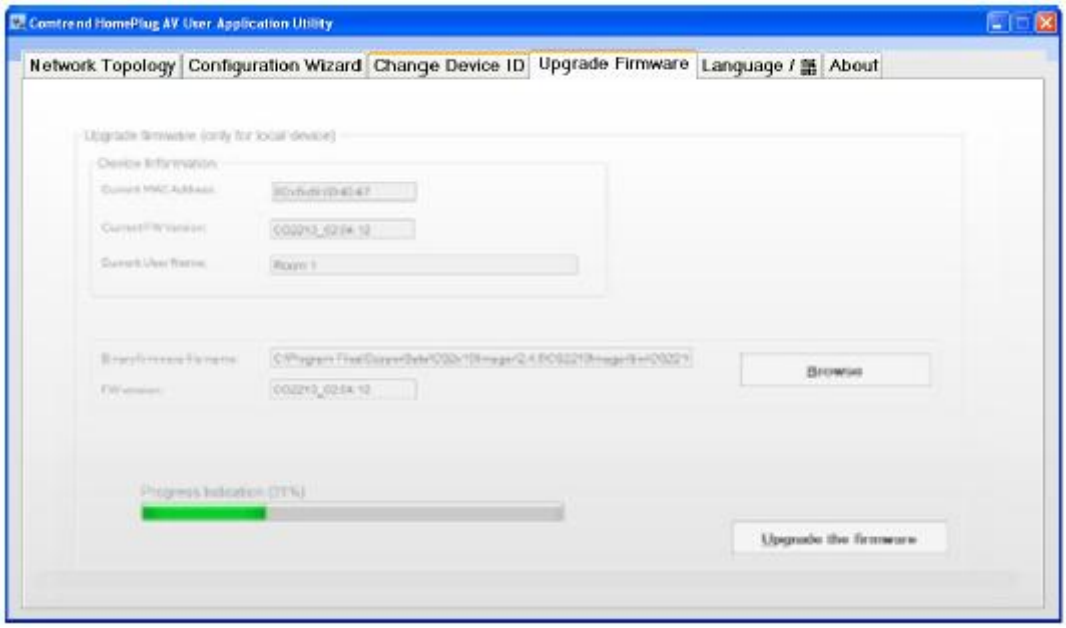
1. Press on the "Browse" button, select a firmware file and press open.



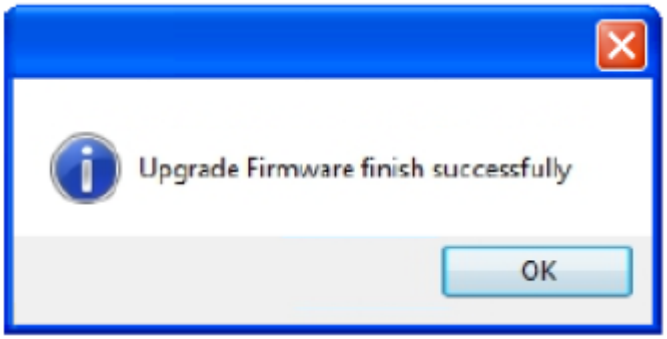


2. Press on the “Upgrade Firmware” button.

3. Confirm the update message (Click on Yes).



4. Wait until the upgrade process is finished.



5. Once the process is completed, the following message will be displayed:

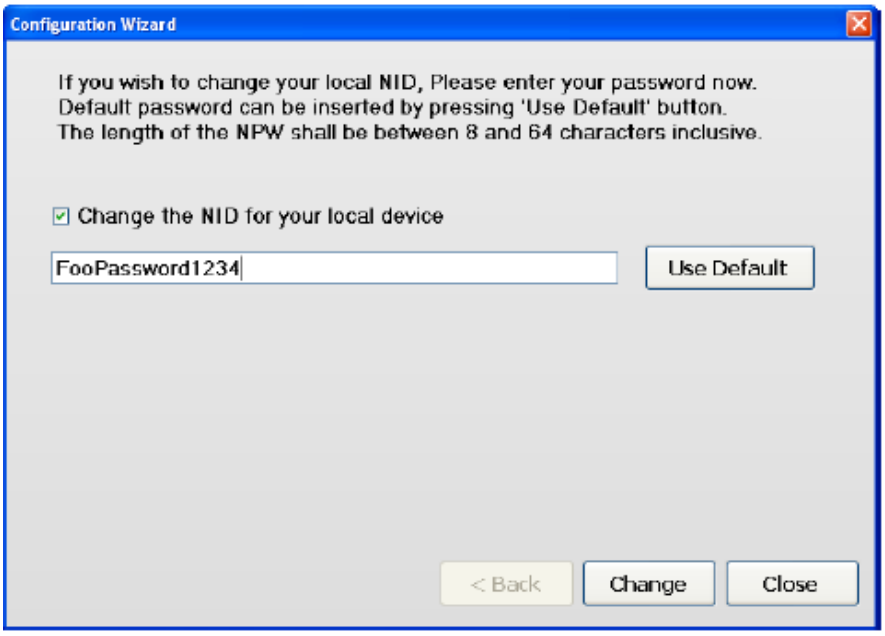
3.6 Configuration Wizard

This wizard enables you to create a new private network and to add remote devices to that network.

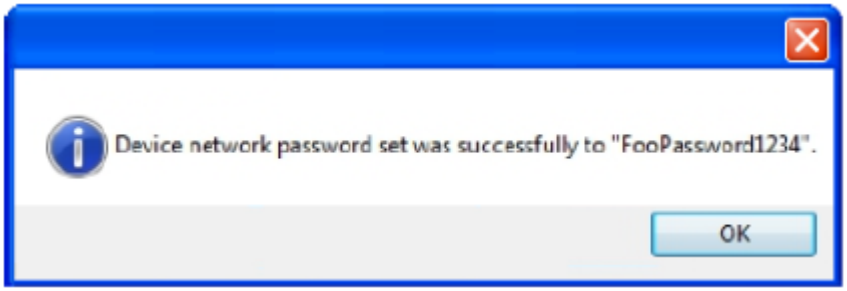
The following process can be used to create a private network and add remote devices to that network:

3.6.1 First Step – Creating a New Private Network

Press the "Launch Wizard" button. Check the "Change Password" box and enter a Network Password. You may enter any string of characters (up to 64 characters). In the example below, "FooPassword1234" was used as the password.



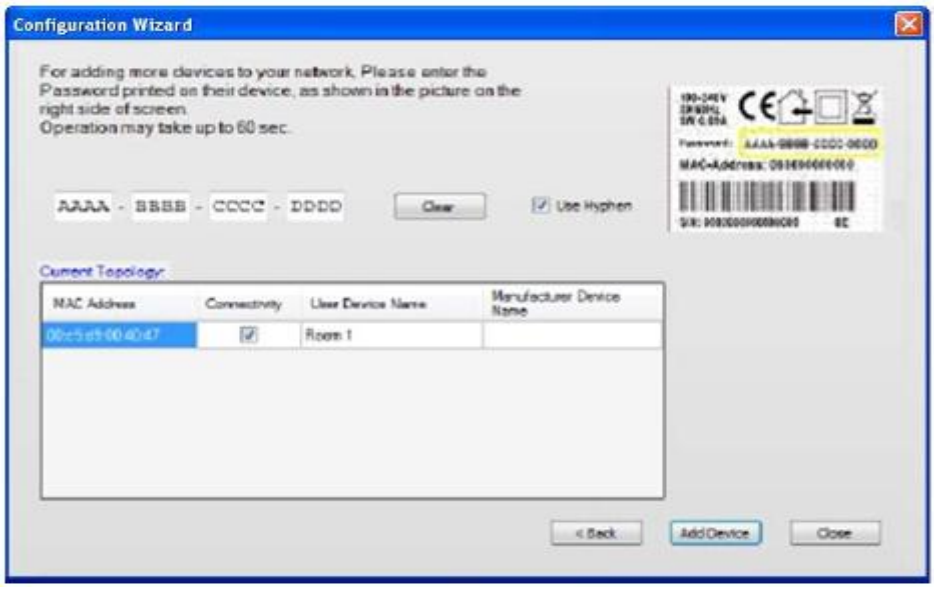
Click on "Change" and then "OK":



3.6.2 Second Step – Adding Remote Devices to the New Private Network

For each remote device that is added to the private network, you must enter the Device Password found on the remote device's label. Use the screen below to enter this information.
In this example, the remote device's password is: AAAA-BBBB-CCCC-DDDD

In the Configuration-Wizard tab, click on the "Launch Wizard" button and then click on the "Next" button.



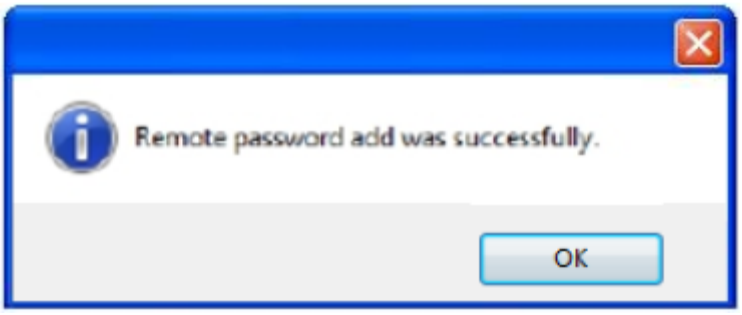
Enter the remote password, select with/without Hyphen, and click on "Add Device."

This operation may take up to 60 seconds:

In case of a failure, you will receive the following failure notification:

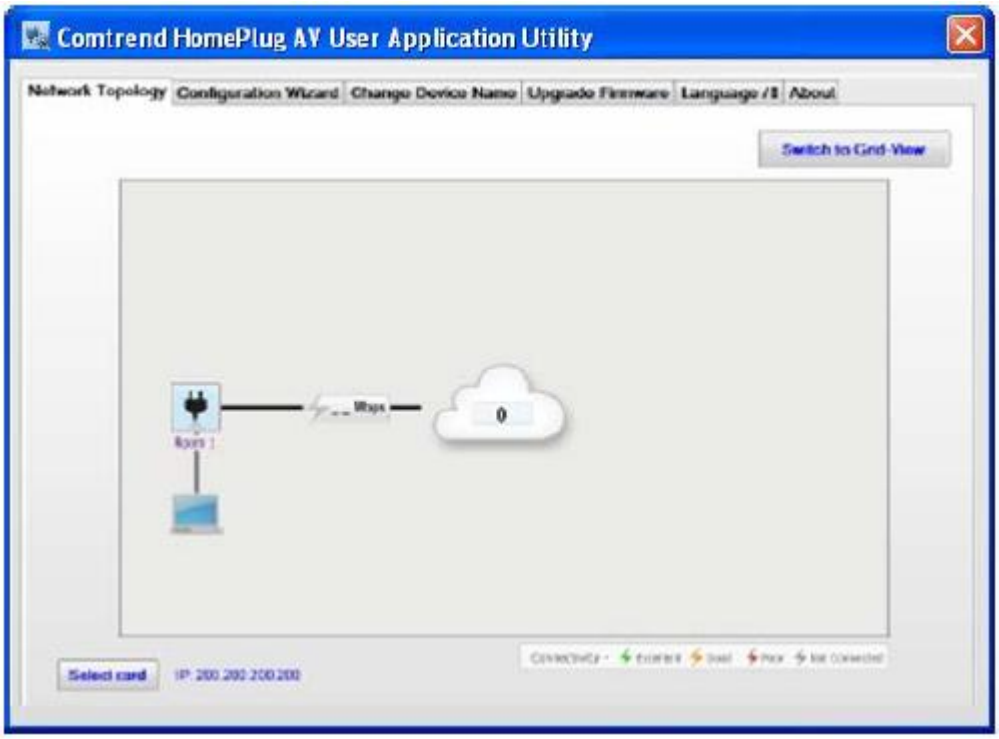
In case of success:

1. You will receive the following success notification:

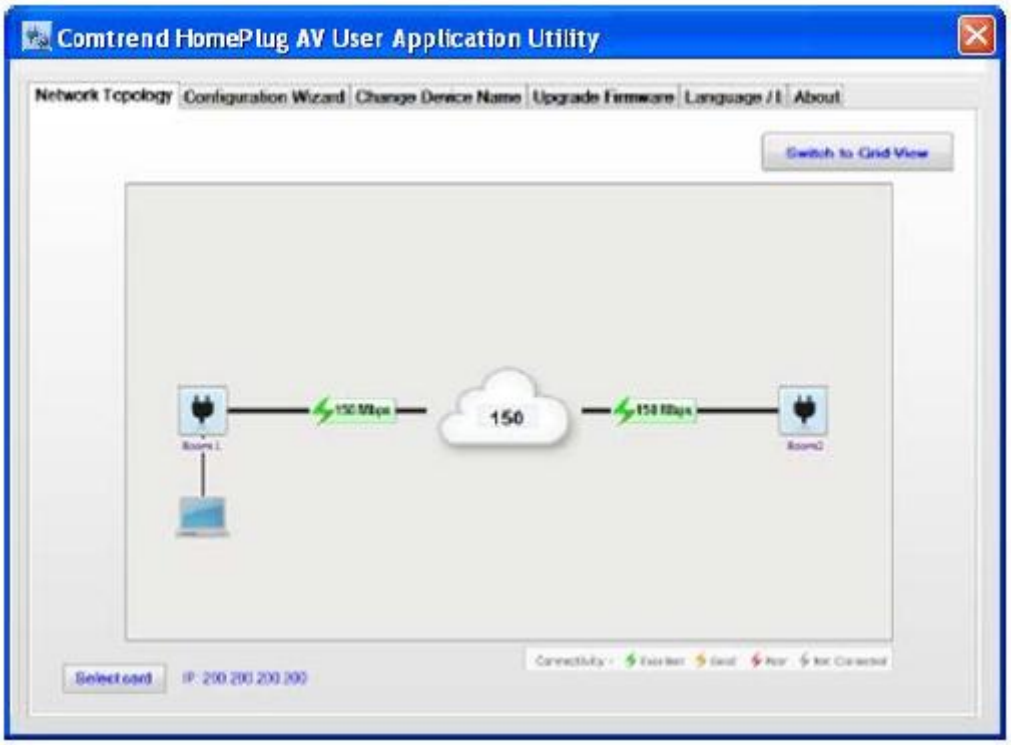


2. You should also see the details of the other device that you have just added to your network.

3. The network topology, before adding the remote password "AAAA-BBBB-CCCC-DDDD", was:



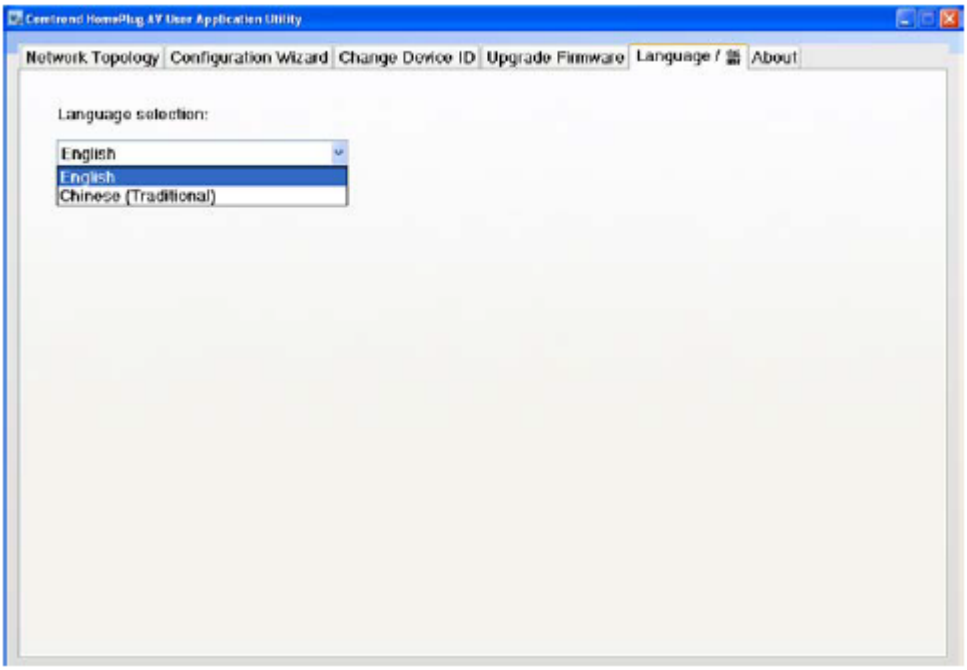
The network topology, after adding the remote device, is:



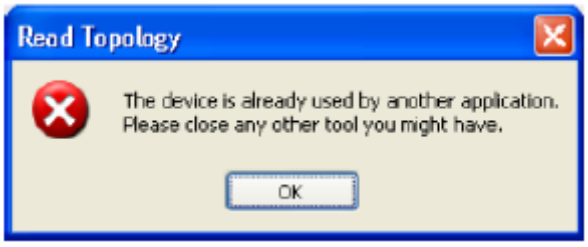
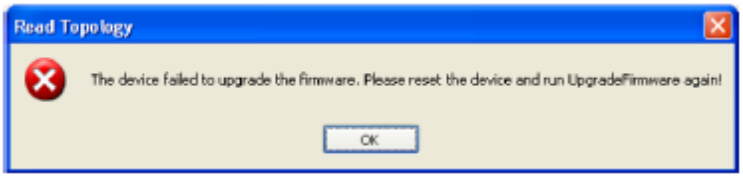
If you have more devices to add, you can add them by entering their device password and by clicking again on the "Add Device" button.

3.7 Language

It is possible to dynamically change the UA language between English and Chinese (traditional).



3.8 Troubleshooting

Error Message:	Explanation:
	The application failed to read the network topology information from the local device. Please check your IP settings and check your cables.
	Another CG2x10 application is open and communicating with the device. Please close any other tool you might have running on your PC.
	The application has identified a CG2x10 device connected to your PC, but the firmware of the device is corrupted. Please upgrade the firmware with the "Upgrade Firmware" tab.
	The application has identified a CG2x10 device connected to your PC, but the last upgrade firmware process failed. Please reset the device and try to upgrade the firmware again with the "Upgrade Firmware" tab.

Appendix A: Specifications

Interface

- RJ-45 x 1 for Ethernet connection
- Internal WiFi Antenna x 2
- AC power plug x1
- PLC paring button x1
- Reset button x1
- WPS button x1

Ethernet

- 10/100 Mbps BaseT auto-sense
- Auto rate and duplex negotiation
- MDI/MDX support

WLAN (WiFi)

- 802.11 b/g/n WLAN (2.4 GHz)
- 11 Channels (US, Canada)
- WEP/WPA/WPA2

Modulations

- OFDM, FEC, Flexible frequency configuration
- BPSK/QPSK/16-QAM/64-QAM for WiFi

Data Rate

- Up to 200Mbps by PLC transmission
- Up to 300 Mbps by WiFi transmission

Management

- HTTP Web-based; Firmware upgrade via TFTP
- TR-069 Supported

Networking Protocols

- 802.1D Ethernet Bridge
- 802.1Q VLAN
- Quality of Service (QoS)
- IGMP(IPv4) Snooping & MLD(IPv6) Snooping

Power

- 100-240 VAC 0.2A 50Hz/60Hz

Environment Condition

- Operating temperature: 0 ~ 40 degrees Celsius
- Relative humidity: 8 ~ 95% (non-condensing)

Dimensions

- EU (UK/French/NA) version 93mm (H) x 29.6mm (W) x 59mm (D) (with plug)

Certifications

- FCC, CE class B, WEEE, RoHS, REACH