



TRENDNET®



User's Guide

TPL-310AP
1.01

Safety

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 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.

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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.



CE Mark Warning

This equipment complies with the requirements relating to electromagnetic compatibility, EN 55022 Class A for ITE, the essential protection requirement of Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility and R&TTE Directive 1999/5/EC to meet the regulation of the radio equipment and telecommunications terminal equipment.

Company has an on-going policy of upgrading its products and it may be possible that information in this document is not up-to-date. Please check with your local distributors for the latest information. No part of this document can be copied or reproduced in any form without written consent from the company.

RoHS

This product is RoHS compliant.



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Chapter 1: Product Overview

The TPL-310AP 200Mbps Powerline AV Wireless N Access Point is an excellent solution that can be used to extend your network using your home or small office electrical wiring. In a home or small office building, use TPL-310AP adapters to link multiple locations without the need to run long Ethernet cables. Combined with a single broadband DSL/Cable Internet connection, every room with electrical power outlets can provide easy access to your high-speed Internet connection.

The TPL-310AP 200Mbps Powerline AV Wireless N Access Point allows you to create or extend a wireless network using powerline technology. Using powerline as the network backbone, the TPL-310AP can be placed at where a wireless signal is needed, rather than at the farthest corner of a wireless network. Multiple TPL-310AP adapters can be used to cover larger areas without increasing wireless radiation and through the use of powerline as your network backbone with no additional wiring required. In addition, any Ethernet-enabled device may be connected to the 10/100Mbps Auto-MIDX Fast Ethernet port.

The TPL-310AP coverage is provided by sending data signals through the walls themselves via the electrical system using powerline technology and then supplying 802.11 wireless connectivity in the room where it is needed. In environments where wireless cannot provide a high degree of performance/connectivity, powerline will provide an alternative option to this obstacle. With 802.11n wireless data rates of up to 300Mbps and HomePlug® AV speeds of up to 200Mbps, this easy-to-setup solution can provide fast streaming HD movies, online multiplayer games, and other data intensive applications for today's HD Entertainment Center demand.

This versatile Powerline product has many applications:

Expanding an Existing Powerline Network

If you have an existing Powerline AV network already installed, simply plug in TRENDnet's TPL-310AP into any outlet on your electrical system and connect it to your Powerline network. You will then have Internet access from the TPL-310AP's wireless network and from its Ethernet port.

Expanding a Wireless Network

If you already have an existing wireless network and would like to expand wireless coverage, simply connect a TRENDnet Powerline AV adapter to your existing router. Then plug in TRENDnet's TPL-310AP in an area with poor or no wireless coverage. Finally, connect the TPL-310AP to the first Powerline adapter using the one-touch Sync button. You will now have wireless coverage in an area that was not covered in the past.

Expanding a Wired Network

If you have an existing wired router and would like to create both a wireless and a Powerline network, simply connect TRENDnet's TPL-310AP to your wired router and plug it into an electrical outlet. To further expand the Powerline network, plug in up to 15 additional TRENDnet Powerline AV adapters into any outlet on your electrical system.

If you have an existing wired router and would like to create both a wireless and a Powerline network, simply connect TRENDnet's TPL-310AP to your wired router and plug it into an electrical outlet. To further expand the Powerline network, plug in up to 15 additional TRENDnet Powerline AV adapters into any outlet on your electrical system.

- Combination 200Mbps Powerline adapter and 300Mbps wireless n access point
- Create a 300Mbps wireless network from any room in your home
- Connect up to 16 high speed powerline adapters
- Wireless n access point offers Access Point, Client, WDS, and Mesh mode functionality
- Advanced encryption

1.1 Technical Features

Powerline

- 1 x 10/100Mbps Auto-MDIX Ethernet port
- Connect one 200Mbps** Powerline AV Adapter to the Internet and then plug in up to 15* additional Powerline AV adapters for instant building connectivity
- One-touch Sync button networks adapters quickly
- Share data intensive files, play games, download music, and more at faster data transfer rates
- Advanced 128-bit AES encryption to ensure total network security
- Neighbor network support for up to 4 overlapping networks
- Tri-color LED Indicator
- Network signal transmits up to 300 meters (984ft.)
- Auto QoS support through traffic classification and multiple priority queuing
- Windows-based Powerline configuration utility: compatible with Windows 7 (32/64-bit), Vista (32/64-bit), and XP (32/64-bit) operating systems

Wireless

- Integrated high performance wireless n access point
- Based on IEEE 802.11n technology and compliant with IEEE 802.11b/g standards
- High-speed data rates of up to 300Mbps*** with IEEE 802.11n
- One-touch Wi-Fi Protected Setup (WPS) button connects wireless clients quickly
- Supports Access Point or Access Point (AP) Client (wireless adapter) mode
- In Access Point mode: expand a wireless network using Repeater mode (listed as AP Mode Support), Wireless Distribution System (WDS), or Mesh mode (bridging)
- MAC filter feature for added security (AP mode only)
- Wireless security up to WPA/WPA2-RADIUS
- Create a weekly schedule to enable or disable wireless network
- Wi-Fi Multimedia (WMM) Quality of Service (QoS) support
- Broadcast up to 4 SSIDs with different wireless encryption
- Web graphical user interface provides backup, configuration, and firmware management
- Wireless indoor coverage up to 100 m (328 ft.)***
- 3-year limited warranty

* Maximum of 16 adapters (nodes) recommended for streaming video across your network. Additional adapters may decrease performance.

** 200Mbps is the maximum theoretical Powerline data rate. Actual throughput will vary depending on environment.

***Maximum wireless signal rates are referenced from IEEE 802.11 theoretical specifications. Actual data throughput and coverage will vary depending on interference, network traffic, building materials and other conditions.

**** Networked Powerline devices need to be plugged into power outlets that are on the same electrical system.

*****It is not recommended to use this product on electrical systems that use AFCI circuit breakers or plugged into GFI protected outlets as this may cause performance degradation or loss in connectivity.

1.1 Package Contents

The product package should contain the following items:

- TPL-310AP
- Multi-Language Quick Installation Guide
- CD-ROM (Utility & User's Guide)
- Network Cable (1.5 m / 4.9 ft.)

If any of the parts are incorrect, missing, or damaged, contact your dealer. Keep the carton, including the original packaging materials, in case you need to return the Powerline adapter for repair.

1.2 System Requirements

- CD-ROM drive
- A Desktop or Laptop PC with wired or wireless Network Adapter Installed
- Existing 10/100Mbps wired network when TPL-310AP is used as a bridge device
- Web Browser: Internet Explorer (6.0 or higher)
- Additional HomePlug® AV powerline adapter (e.g. TRENDnet TPL-303E, TPL-304E, TPL-305E or another TPL-310AP)

Note: You will need at least 2 powerline adapters to establish a powerline network. Please ensure that you have an additional powerline adapter before following the installation procedure for this product.

Powerline Configuration Utility System Requirements

Supported Operating Systems	CPU	Memory
Windows 7 (32/64-bit)	1GHz or above	1GB RAM or above
Windows Vista (32/64-bit)	800MHz or above	512MB RAM or above
Windows XP (32/64-bit)	300MHz or above	256MB RAM or above


1.3 Device Label

The device label can be located on the back of the device where the power prong is found.

TRENDNET

Product Model → **MODEL NO:**

Device Serial Number → **S/N:**



Device MAC Address → **MAC:**

Device Password (DPW) → **DPW: VARS-ECHE-SAGA-OWED**


Product Hardware Version → **H/W: V1.0R**

Powerline Firmware Version → **F/W:**

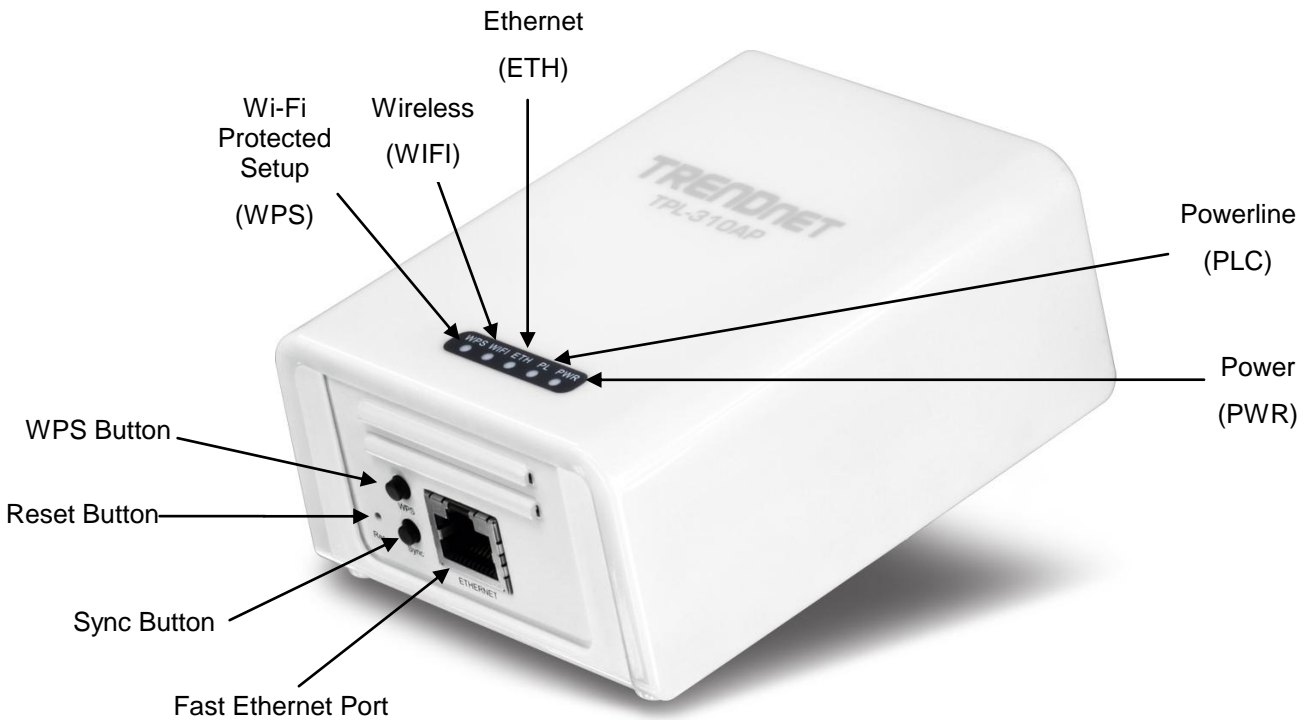
IP Address: **192.168.10.100** ← Default IP Address

Subnet Mask: **255.255.255.0** ← Default Subnet Mask

This device complies with Part 15 of FCC Rules.
Made in China



1.4 LEDs & Buttons



LED	Color	Sequence	Definition
PWR (Power)	Green	Solid	Device powered On
	N/A	Off	Device powered Off
PL (Powerline) Note: LED color indicates the strength and quality of the powerline connection through the electrical system	Green	Solid	Powerline Connected (Connection Quality is Best)
		Blinking	Syncing or Powerline Data Transmitting/Receiving (Connection Quality is Best)
	Amber	Solid	Powerline Connected (Connection Quality is Better)
		Blinking	Powerline Data Transmitting/Receiving (Connection Quality is Better)
	Red	Solid	Powerline Connected (Connection Quality is Good)
		Blinking	Powerline Data Transmitting/Receiving (Connection Quality is Good)
N/A	Off	Powerline is not synced or connected	
ETH (Ethernet Port)	Green	Solid	10/20 Mbps, 100/200Mbps, or 1000/2000Mbps (Half/Full Duplex) Connected
		Blinking	10/20Mbps, 100/200Mbps, or 1000/2000Mbps (Half/Full Duplex) Data Transmitting/Receiving
	N/A	Off	Port Disconnected/No Ethernet Link
WIFI (Wireless)	Green	Blinking	Wireless is on or enabled / Wireless Data Transmission
	N/A	Off	Wireless is off or disabled
WPS (WiFi Protected Setup)	Green	Blinking	WPS is activated
	N/A	Off	WPS is not activated or disabled

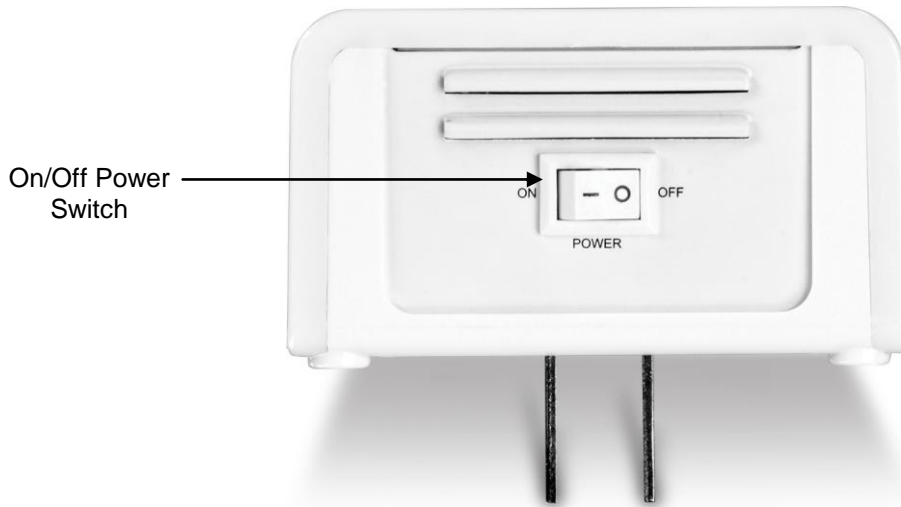
*Note: The following factors may affect the powerline network's connection quality:

- Noise – Generated by appliances that are connected to your electrical system through power outlets that have high power consumption requirements. (e.g. Microwaves, ovens, blow dryer, iron, dishwasher, etc.) The quality of your household electrical wiring may also cause additional noise on your electrical system.
- Distance – Long lengths of electrical wiring through your electrical system between connected powerline adapters.

Button	Action	Function
Sync	Push/Hold for 2 sec	Initiate Sync/Connection and generate random network name/key on first adapter (PWR LED will start blinking)
		Match network name/key on secondary or additional adapter and connect to first adapter. (PWR LED will start blinking)
		Note: The secondary or additional powerline adapter's Sync button must also be pushed within 2 minutes (120 sec) of pushing the Sync button of the first adapter in order to establish connectivity.
	Push/Hold for 10 sec	Erases the network name/key (All LEDs will turn off and turn back on)
WPS	Push/Hold for 3 sec	Activates Wi-Fi Protected Setup (WPS)
Reset	Push/Hold for 1 sec	Reset to Powerline factory defaults only (All LEDs will turn off and turn back on, PL LED will blink Amber) Note: Will reset to the factory default private network name "HomePlugAV". This will not reset Wireless Access Point settings and the settings will remain intact.
	Push/Hold for 5 sec	Reset to Wireless Access Point factory defaults only (All LEDs will turn off and turn back on) Note: This will not reset Powerline settings and the settings will remain intact.

1.5 Top Panel

There On/Off Power switch is located on the top panel of the device which is used to power the device on or off.



1.6 Defaults Settings

Wireless AP	Setting
IP Address / Subnet Mask	192.168.10.100 / 255.255.255.0
SSID	TRENDnet310
SSID Broadcast	Enabled
Mode	Access Point (AP)
Channel	Auto
Channel Width	20MHz
802.11 Mode	802.11b/g/n Mixed
Security	Disabled
Username / Password	admin / admin
Powerline	Setting
Network Name/Security Key	HomePlugAV

Chapter 2: Wireless Access Point Initial Setup

When installing the TPL-310AP for the first time, it required for you to configure the device from a wired computer. Since the default IP address of the TPL-310AP is 192.168.10.100, please make sure to assign an IP address to the TPL-310AP that is NOT assigned to any other devices on your network. If your network IP address range is NOT 192.168.10.x, then the TPL-310AP IP address should be assigned with your network's IP address range (i.e. 192.168.1.x, 192.168.2.x, 192.168.0.x) This chapter covers the typical configuration of the TPL-310AP in Access Point (AP) mode using the Setup Wizard. If you are an experienced user, other web configuration settings can be referenced in Chapter 3. Once the initial setup is complete, Chapter 4 will cover creating a powerline network with one additional powerline adapter, or adding the TPL-310AP to existing powerline network.

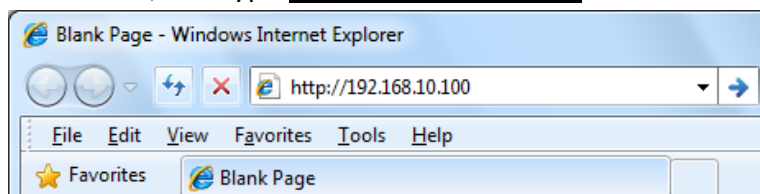
1. Plug the TPL-310AP into an available power outlet within reach of your computer's network cable.
2. Connect a network cable from the TPL-310AP Wireless Access Point's network port (located at the bottom of the device) into the computer's network port.
3. Move the power switch (located at the top of the device) to the "On" position.
4. Assign a static IP address to your computer's network adapter to 192.168.10.10 and subnet mask 255.255.255.0.

Windows 7: Click on the Start Button, select Control Panel, click Network and Internet, click on Network and Sharing Center, and click Change Adapter Settings. Then, right-click the Local Area Connection icon and click Properties. Click Internet Protocol Version 4 (TCP/IPv4) and then click Properties. Select Use the following IP address, and manually enter the IP address settings.

Windows Vista: Click on the Start Button, select Control Panel, click Network and Internet, click on Network and Sharing Center, and click Manage Network Connections. Then, right-click the Local Area Connection icon and click Properties. Click Internet Protocol Version 4 (TCP/IPv4) and then click Properties. Select Use the following IP address, and manually enter the IP address settings.

Windows XP/2000: Click on the Start Button, select Control Panel, double-click the Network Connections icon, and then click Properties. Click Internet Protocol (TCP/IP) and then click Properties. Select Use the following IP address, and manually enter the IP address settings.

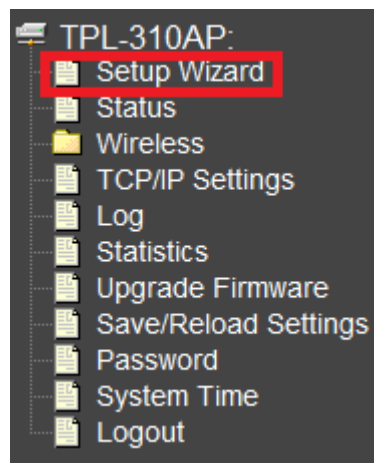
5. Open your Web browser, and type <http://192.168.10.100> in the Address bar, and then press Enter.



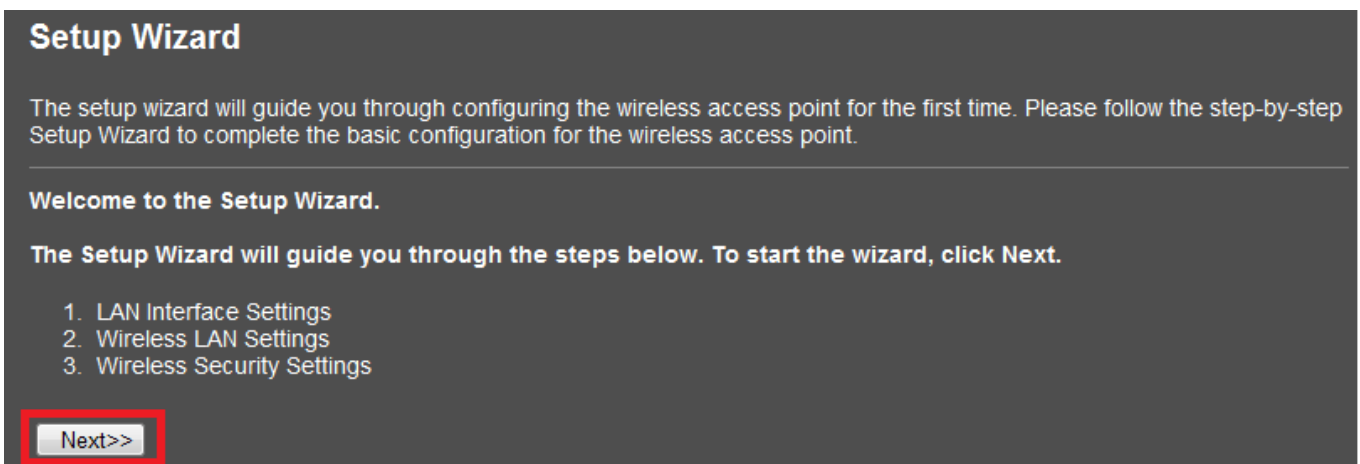
6. Enter the User Name and Password and then click *OK*.



7. In the menu in the left-hand panel, click on *Setup Wizard*.



8. In the Setup Wizard window, click *Next*



9. Configure the LAN Interface Settings of the TPL-310AP. Click *Next*.

Step 1: LAN Interface Settings

This page is used to configure the IP address parameters of the wireless access point for the local area network, which connects to the Ethernet port of your wireless access point. Please make sure that the IP address assigned to the wireless access point is available and is not being used by any other device connected to the local area network. When completed, click *Next*.

IP Address:	<input type="text" value="192.168.10.100"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>
DHCP:	<input type="text" value="Disabled"/>

IP Address: The assigned IP address should match the network IP address range of your network. This IP address should not be used by any other devices on your network.

Subnet Mask: The assigned Subnet Mask should match the network Subnet Mask of your network. In most cases, the default Subnet Mask setting (255.255.255.0) should be fine.

DHCP: Setting DHCP to *Client* will set your device to obtain an IP address automatically from your DHCP server (router). If *Disabled*, you will need to manually configure the IP address settings.

Note: It is recommended to manually configure the LAN Interface Settings (IP Address and Subnet Mask) in case you need access the device in the future. Please write down the IP address settings assigned for future reference.

10. Configure the Wireless LAN Settings. Then click *Next*.

Step 2: Wireless LAN Settings

This page is used to configure the wireless access point parameters for wireless LAN clients to discover and establish wireless network connectivity. When completed, click *Next*.

Band:	2.4 GHz (B+G+N) ▾
Mode:	AP ▾
Network Type:	Infrastructure ▾
SSID:	TRENDnet310
Channel Width:	20MHz ▾
ControlSideband:	Upper ▾
Channel Number:	Auto ▾
<input type="checkbox"/> Enable Mac Clone (Single Ethernet Client)	

Cancel <<Back Next>>

Band: In most cases, the default setting (2.4GHz (B+G+N)) should be fine.

Mode: In most cases, the default setting AP (Access Point) should be fine.

Network Type: This setting does not apply to (AP) mode, only in (AP Client) mode. Continue to the next setting.

SSID: The SSID is the network name of your wireless network (The name wireless clients will discover, when scanning for wireless networks). It is recommended to assign a unique SSID (Network Name) and to not assign anything that would be personally identifying like “Smith Family Network” however, an SSID easily identifiable when searching for available wireless networks. Manually enter the name of your wireless network.

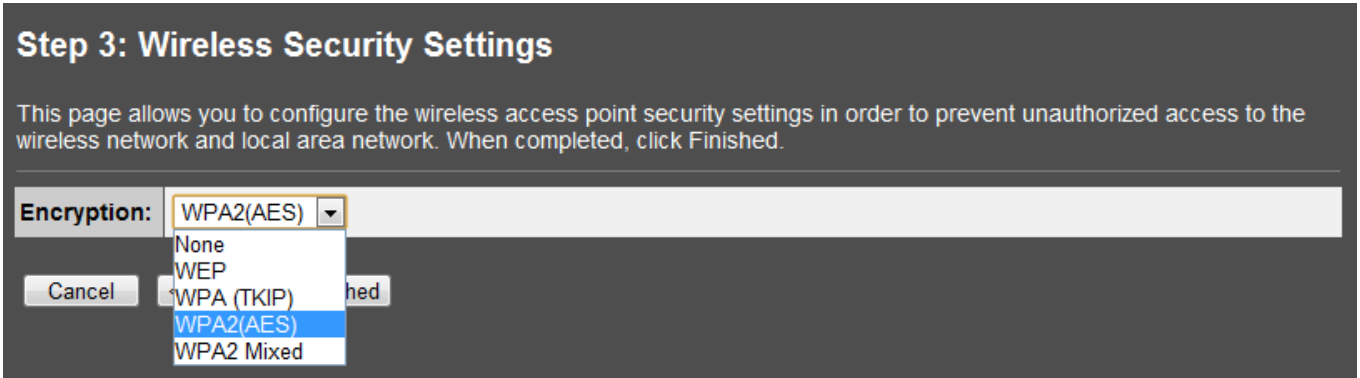
Channel Width: In most cases, the default setting (20MHz) should be fine.

Channel Number: This setting is only configurable when setting the Channel Width to 40MHz. In most cases, the default setting (Auto) should be fine.

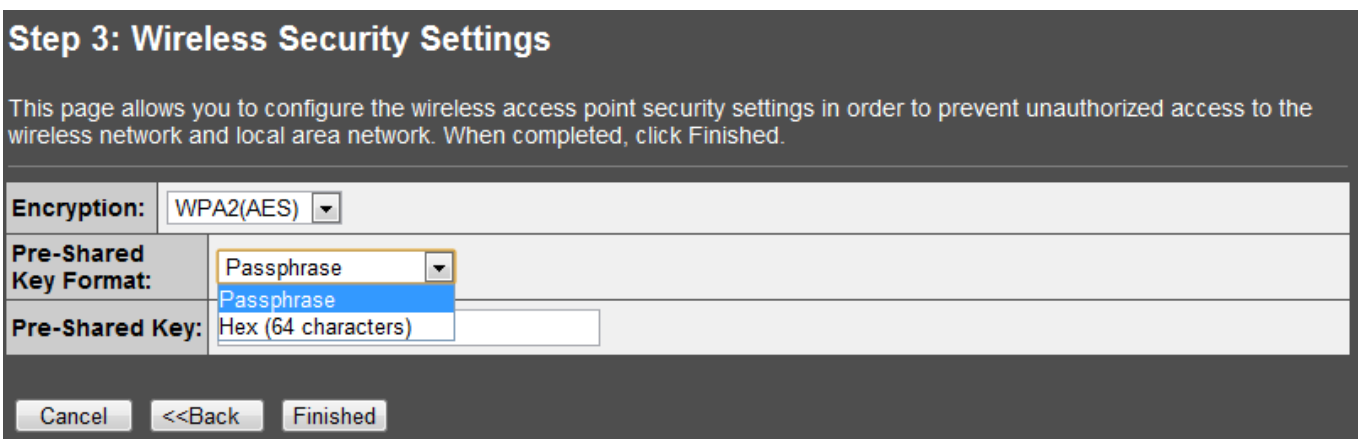
Enable MAC Clone (Single Ethernet Client): This setting does not apply to (AP) mode, only in (AP Client) mode.

11. Configure the Wireless Security Settings. Click the drop-down menu *Encryption:* and select *WPA2(AES)*.

Note: To protect your network from unauthorized wireless access, it is strongly recommended to enable wireless security. It is highly recommended to use WPA2 if all of your wireless devices also support WPA2, since it is the highest security protocol supported currently. Once wireless security is enabled on the TPL-310AP, each wireless computer or device must be configured to use the same protocol (WEP, WPA, WPA2) and configured with the same security key. Make sure your wireless devices support the security protocol configured on the TPL-310AP. If you are unsure of the security protocols supported, please refer the manuals for your wireless devices or contact the manufacturer to find out these details. The example demonstrates how to configure the TPL-310AP for WPA2.



12. Click the drop-down menu *Pre-Shared Key Format:* and select *Passphrase*.



13. In the box next to *Pre-Shared Key*, manually enter your wireless security key (8 – 63 characters).
Click *Finished*.

Note: This will be the key required to enter for your wireless computers or devices when connecting wirelessly. If needed, write down your wireless security settings and security key for reference when configuring your other wireless devices.

Step 3: Wireless Security Settings

This page allows you to configure the wireless access point security settings in order to prevent unauthorized access to the wireless network and local area network. When completed, click Finished.

Encryption:	WPA2(AES) ▼
Pre-Shared Key Format:	Passphrase ▼
Pre-Shared Key:	trendnet

Cancel <<Back Finished

14. Please wait 25 seconds while the TPL-310AP applies the changes and reboots.

Applying New Settings

Please do not power off or reboot the device during this process.

Please wait 25 seconds ...

15. If you are finished configuring the TPL-310AP wireless settings, after the changes are applied and the TPL-310AP has rebooted, disconnect the network cable from the TPL-310AP Ethernet network port, and unplug the TPL-310AP from the power outlet and skip over to the Powerline section (Chapter 4) for creating a powerline network. If you would like to configure any additional wireless parameters, continue to Chapter 3 for any additional wireless settings.

16. Change your computer's network adapter settings back to obtain an IP address automatically.

Windows 7: Click on the Start Button, select Control Panel, click Network and Internet, click on Network and Sharing Center, and click Change Adapter Settings. Then, right-click the Local Area Connection icon and click Properties. Click Internet Protocol Version 4 (TCP/IPv4) and then click Properties. Select Obtain an IP address automatically.

Windows Vista: Click on the Start Button, select Control Panel, click Network and Internet, click on Network and Sharing Center, and click Manage Network Connections. Then, right-click the Local Area Connection icon and click Properties. Click Internet Protocol Version 4 (TCP/IPv4) and then click Properties. Select Obtain an IP address automatically.

Windows XP/2000: Click on the Start Button, select Control Panel, double-click the Network Connections icon, and then click Properties. Click Internet Protocol (TCP/IP) and then click Properties. Select Obtain an IP address automatically.

Chapter 3: Wireless Access Point Web Management Interface

3.1 Default Configuration Settings

Wireless AP	Setting
IP Address / Subnet Mask	192.168.10.100 / 255.255.255.0
SSID	TRENDnet310
SSID Broadcast	Enabled
Mode	Access Point (AP)
Channel	Auto
Channel Width	20MHz
802.11 Mode	802.11b/g/n Mixed
Security	Disabled
Username / Password	admin / admin

3.2 Menu Items

Setup Wizard: Quickly configure the basic settings such as IP settings, SSID (Wireless Network Name), and Wireless Security.

Status: Displays the current device status and some basic settings of the device.

Wireless: Configure the wireless parameters such as AP, WDS, Mesh, AP client, and repeater modes. Configure wireless security settings, WPS, access control such as MAC filtering, and wireless scheduling.

TCP/IP Setting: Configure the IP address settings for the local area network or Ethernet port.

Log: Displays the device internal system log or configure the device to send system logs to a remote log server (Syslog).

Statistics: Displays the number of packets transmitted and received on the wireless and wired interfaces.

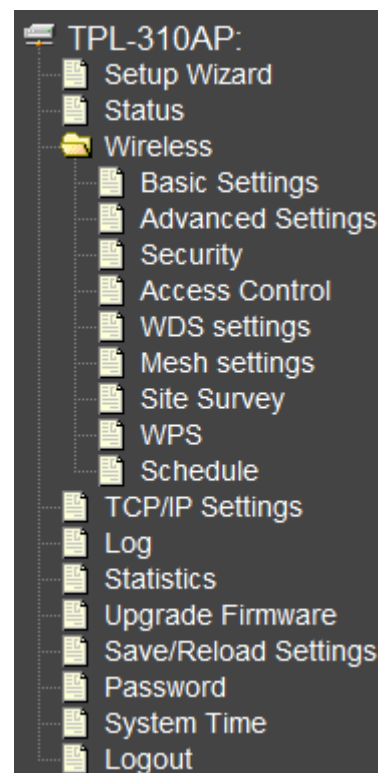
Upgrade Firmware: Upgrade the device firmware.

Save/Reload Settings: Backup configuration, restore from configuration file, and reset the wireless access point settings to factory defaults.

Password: Change the device username and password.

System Time: Set the device system time.

Logout: Logout of the web management interface.



3.3 Status

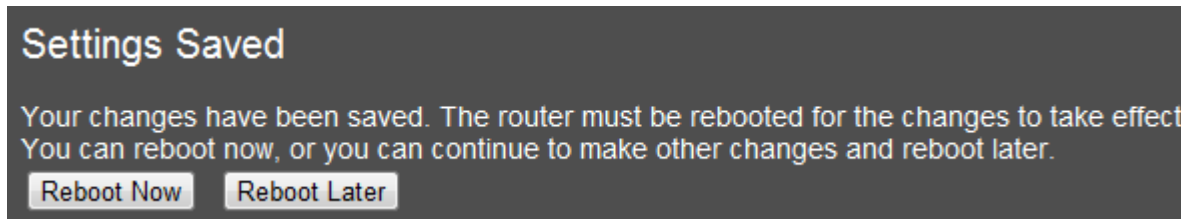
Access Point Status	
This page shows the current status and some basic settings of the device.	
System	
Uptime	2day:3h:46m:35s
Firmware Version	v1.61
Build Time	Fri Aug 27 03:03:12 EDT 2010
Wireless Configuration	
Mode	AP
Band	2.4 GHz (B+G+N)
SSID	TRENDnet310
Channel Number	6
Encryption	WPA2
BSSID	00:08:54:9a:a2:65
Associated Clients	0
TCP/IP Configuration	
Attain IP Protocol	Fixed IP
IP Address	192.168.10.100
Subnet Mask	255.255.255.0
Default Gateway	0.0.0.0
MAC Address	00:08:54:9a:a2:65

Items	Information
Uptime	The period that you turn the device on.
Firmware version	The current firmware version of the device.
Build Time	The build time of the device originally.
Mode	Displays the current Access Point mode.
Band	The band that the wireless AP operating.
SSID	The name of this wireless network.
Channel Number	The channel that the wireless network using.
Encryption	The security encryption type that the wireless network using.
BSSID	The Basic Service Set Identity of this AP (This parameter is the same as the MAC address of LAN port)
Associated Clients	The number of members who is currently connected with this AP.
Attain IP Protocol	Displays whether the IP address is set statically (Fixed IP) or obtained automatically (DHCP).
IP Address	The current IP address of this AP.
Subnet Mask	The current subnet mask of this AP.
Default Gateway	The current default gateway of this AP.
MAC Address	The current MAC address of this AP.

3.4 Wireless

3.4.1 Apply/Reset Changes

Clicking the **Apply Changes** button will take you to the confirmation screen that will prompt you to “Reboot Now” or “Reboot Later”



Clicking “Reboot Now” will apply the changes and reboot the device.

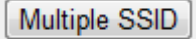
Clicking “Reboot Later” will store but not apply the current configuration changes and allow you to make more configuration changes before applying all the changes and reboot the device.

Clicking the **Reset** button will discard all of the current changes in the current page.

3.4.2 Basic Settings

This page is used to configure the wireless point parameters for wireless LAN clients to discover and establish wireless connectivity. This page is also used to set the wireless access point mode.

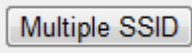
Items	Information
Disable Wireless LAN Interface	Mark the checkbox to disable wireless.

Band	<p>To select a band for this device to match 802.11b, 802.11g, 802.11n, 802.11b/g, 802.11g/n or 802.11b/g/n. optional parameters: 2.4GHz(B),2.4GHz(G),2.4GHz(N),2.4GHz(B+G),2.4GHz(G+N), 2.4GHz(B+G+N)</p>
Mode	<p>Configure this device as AP, Client, WDS or AP+WDS , AP+MESH,MESH. If you set this device as AP or AP+WDS mode, the  button is available for you to set up four SSID for this wireless network. Click on this button to do more configurations.</p> <p style="text-align: center;">Description of Modes</p> <p>AP (Access Point): Allows wireless clients or devices to establish connectivity.</p> <p>Client: Allows the device to connect to another wireless access point and establish connectivity through the network port. Also known as wireless adapter mode.</p> <p>WDS (Wireless Distribution System): Allows the device to establish a WDS wireless bridge to other WDS supported wireless access points.</p> <p>AP+WDS (Access Point + Wireless Distribution System): Allows wireless clients or devices to establish connectivity and allows the device to establish a WDS wireless bridge to other WDS supported wireless access points simultaneously.</p> <p>Mesh: Allows the device to establish a wireless mesh network with other mesh supported wireless access points.</p> <p>AP+Mesh (Access Point + Mesh): Allows wireless clients or devices to establish connectivity and allows the device to establish a wireless mesh network with other mesh supported wireless access points simultaneously.</p>
Network Type	<p>When you configure this device in AP Client mode, this drop-down list allows users to change the network type into infrastructure mode or ad-hoc mode.</p> <p>Ad-Hoc mode: connects two computers directly without the use of a router or AP. It is also know as a peer-to-peer network.</p> <p>Infrastructure Mode: the wireless network contains at least one wireless client and one wireless AP or router. This client connects to Internet or intranet by communicating with this wireless AP.</p>
SSID	<p>Service set identifier (SSID) for the name of the wireless network.</p>
Channel Width	<p>Select to use 20MHz or 40MHz as the wireless channel frequency.</p>
Control Sideband	<p>If you have selected the channel width of 40MHz for this AP, you can control this AP to use the frequency for a deflection of “Upper” or “Lower.”</p>

Channel Number	Select a channel for the wireless network of this device.
Broadcast SSID	If you enable "Broadcast SSID", every wireless station located within the coverage of this wireless AP can discover this wireless AP easily. If you are building a public wireless network, enabling this feature is recommended. Disabling "Broadcast SSID" can provide better security.
WMM	This will enhance the data transfer performance of multimedia contents when they're being transferred over wireless network. WMM is not available in 11n mode.
Data Rate	The transmission rate of data packets of this wireless AP. The wireless AP will use the highest possible selected transmission rate to transmit the data packets if set to Auto.
Associated Clients	Click " Show Active Clients " button, then an "Active Wireless Client Table" pops up. You can see the status of all active wireless stations that are connecting to the access point.
Enable MAC clone	Mark the checkbox to clone the MAC address of the device. This function is only available when you set this AP as Client mode. You can also manually set the MAC address in LAN setting.
Enable Universal Repeater Mode	Mark this checkbox to enable Universal Repeater Mode which allows the TPL-310AP to repeat the signal of another wireless access point. Available in AP, Client, or AP+WDS modes only.
SSID of Extended Interface	When enabling the Universal Repeater Mode, specify an SSID for the extended interface.

* Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configuration.

3.4.3 Multiple SSID

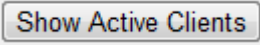
This is the window that pops up after clicking the  button.

Select one of the AP, and then click the button "Show", "Active Wireless Client Table – AP1" windows pops up.

Multiple SSIDs							
This page is used to enable and configure multiple SSIDs for wireless LAN clients to discover and establish connectivity.							
No.	Enable	Band	SSID	Data Rate	Broadcast SSID	WMM	Active Client List
AP1	<input type="checkbox"/>	2.4 GHz (B+G+N) ▾	<input type="text"/>	Auto ▾	Enabled ▾	Enabled ▾	Show
AP2	<input type="checkbox"/>	2.4 GHz (B+G+N) ▾	<input type="text"/>	Auto ▾	Enabled ▾	Enabled ▾	Show
AP3	<input type="checkbox"/>	2.4 GHz (B+G+N) ▾	<input type="text"/>	Auto ▾	Enabled ▾	Enabled ▾	Show
AP4	<input type="checkbox"/>	2.4 GHz (B+G+N) ▾	<input type="text"/>	Auto ▾	Enabled ▾	Enabled ▾	Show

Apply Changes Reset

3.4.4 Active Wireless Client Table

This is the window that pops up after clicking the  button. This will display information on wireless currently connected to each SSID including the primary.

Active Wireless Client Table

This table shows the MAC address, transmission, reception packet counters and encrypted status for each associated wireless client.

MAC Address	Mode	Tx Packet	Rx Packet	Tx Rate (Mbps)	Power Saving	Expired Time (s)
None	---	---	---	---	---	---

Refresh
Close

3.4.5 Advanced Settings

You can set advanced wireless LAN parameters of this AP.

Note: The settings on this page are intended for more advanced users who have sufficient knowledge of wireless LAN technology. Please do not modify these settings unless you are well aware of the effects on the wireless access point functionality and performance as a result of these changes.

Wireless Advanced Settings

The settings on this page are intended for more advanced users who have sufficient knowledge of wireless LAN technology. Please do not modify these settings unless you are well aware of the effects on the wireless access point functionality and performance as a result of these changes.

Fragment Threshold:	2346 (256-2346)
RTS Threshold:	2347 (0-2347)
Beacon Interval:	100 (20-1024 ms)
Preamble Type:	<input checked="" type="radio"/> Long Preamble <input type="radio"/> Short Preamble
IAPP:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
Protection:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Aggregation:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
Short GI:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
WLAN Partition:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
RF Output Power:	<input checked="" type="radio"/> 100% <input type="radio"/> 70% <input type="radio"/> 50% <input type="radio"/> 35% <input type="radio"/> 15%

Apply Changes
Reset

Items	Information
Fragment Threshold	This value should remain at its default setting of 2346. If you experience a high packet error rate, you may slightly increase your fragmentation threshold within the value range of 256 to 2346. Setting the fragmentation threshold too low may result in poor performance.
RTS Threshold	Request To Send threshold. This value should remain at its default setting of 2347. If you encounter inconsistent data flow, only minor modifications to the value range between 0 and 2347 are recommended.
Beacon Interval	Beacons are packets sent by an access point to synchronize a

	wireless network. Specify a beacon interval value. Default (100ms) is recommended.
Preamble Type	The length of CRC blocks in the frames during the wireless communication.
IAPP	To enables multiple AP to communicate and pass information regarding the location of associated Stations.
Protection	Some 802.11g wireless adapters support 802.11g protections, which allows the adapter search for 802.11b/g singles only. Select “Enabled” to support protection or select “Disabled” to disable this function.
Aggregation	To aggregate lots of packets into a big one before transmitting packets. This can reduce control packet overhead.
Short GI	Indicates that the 802.11g network is using a short slot time because there are no legacy (802.11b) stations present
RF Output Power	Select the signal strength for the wireless network.

* Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configuration.

3.4.6 Security

To protect your network from any unauthorized access, it is recommended to enable wireless security. Once wireless security is enabled on the Wireless Access Point, each wireless computer or device must be configured with the same encryption and key. If you select WPA or WPA2 sure your wireless adapters support WPA or WPA2. If your wireless adapters do not support WPA or WPA2, then select WEP. Please select Disable, WEP, WPA, WPA2, and WPA-Mixed in the drop list. If you select none, any data will be transmitted without encryption and any station can access the AP. Note: If you have the Multiple SSID feature enabled (Section 3.4.3), then those SSIDs will be available in the drop-down menu “Select SSID” and you can assign different security types to different SSIDs. Note: This section applies to both AP and client modes. For configuring security on WDS and Mesh, please refer to the their sections in this User Guide.

Step 3: Wireless Security Settings

This page allows you to configure the wireless access point security settings in order to prevent unauthorized access to the wireless network and local area network. When completed, click Finished.

Encryption:

None ▾

None

WEP

WPA (TKIP)

WPA2(AES)

WPA2 Mixed

Items	Information
Select SSID	Please choose a SSID you have set for this AP in the Wireless > Basic Settings from the drop-down list. The SSID will be shown on the

	wireless network for recognizing.
Encryption	There are 5 modes for you to select: Disable, WEP, WPA, WPA2, and WPA-Mixed. Please refer to the following description.
802.1x Authentication	Users that do not use this function or connecting to an open-wireless network please skip this part. Please configure the settings in accordance with the Certificated Server.

* Please click on the **Apply Changes** button or the **Reset** button to save/reset the configuration.

WEP Security

Select SSID: <input type="text" value="Root AP - TRENDnet310"/>		<input type="button" value="Apply Changes"/>	<input type="button" value="Reset"/>
Encryption:	<input type="text" value="WEP"/>		
802.1x Authentication:	<input type="checkbox"/>		
Authentication:	<input checked="" type="radio"/> Open System <input type="radio"/> Shared Key <input type="radio"/> Auto		
Key Length:	<input type="text" value="64-bit"/>		
Key Format:	<input type="text" value="Hex (10 characters)"/>		
Encryption Key:	<input type="text" value="*****"/>		

Select SSID: <input type="text" value="Root AP - TRENDnet310"/>		<input type="button" value="Apply Changes"/>	<input type="button" value="Reset"/>
Encryption:	<input type="text" value="WEP"/>		
802.1x Authentication:	<input checked="" type="checkbox"/>		
Authentication:	<input checked="" type="radio"/> Open System <input type="radio"/> Shared Key <input type="radio"/> Auto		
Key Length:	<input checked="" type="radio"/> 64 Bits <input type="radio"/> 128 Bits		
RADIUS Server IP Address:	<input type="text"/>		
RADIUS Server Port:	<input type="text" value="1812"/>		
RADIUS Server Password:	<input type="text"/>		

Items	Information
Encryption	Select a security encryption mode for this AP.
802.1x Authentication	Check this option if to use an external 802.1x RADIUS server for authentication.

Authentication	There provide three options for selecting: Open System, Shared Key, Auto
Key Length	Select 64-bit or 128-bit as the key encryption length.
Key Format	Select ASCII or Hex (0-9, A-F) to setup the key value.
Encryption Key	Enter the key according to the key format you select.

* Please click on the **Apply Changes** button or the **Reset** button to save/reset the configuration.

WPA/WPA2 Security

Select SSID:

Encryption:	<input type="text" value="WPA"/>
Authentication Mode:	<input type="radio"/> Enterprise (RADIUS) <input checked="" type="radio"/> Personal (Pre-Shared Key)
WPA Cipher Suite:	<input checked="" type="checkbox"/> TKIP <input type="checkbox"/> AES
Pre-Shared Key Format:	<input type="text" value="Passphrase"/>
Pre-Shared Key:	<input type="text" value="....."/>

Select SSID:

Encryption:	<input type="text" value="WPA"/>
Authentication Mode:	<input checked="" type="radio"/> Enterprise (RADIUS) <input type="radio"/> Personal (Pre-Shared Key)
WPA Cipher Suite:	<input checked="" type="checkbox"/> TKIP <input type="checkbox"/> AES
RADIUS Server IP Address:	<input type="text"/>
RADIUS Server Port:	<input type="text" value="1812"/>
RADIUS Server Password:	<input type="text"/>

Items	Information
Authentication Mode	There are two items, "Enterprise (RADIUS)" and "Personal (Pre-Shared Key)". You can select the mode by clicking the item.
WPA Cipher Suite	Select the WPA Cipher Suite to be TKIP or AES.
Pre-Shared Key Format	To decide the format, select Passphrase or Hex in the drop down menu.

Pre-Shared Key	Enter the Pre-shared Key according to the pre-shared key format you select. This is the shared secret between AP and STA. This field must be filled with character longer than 8 and less than 64 lengths.(The default value is 1234567890ab)
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* Please click on the **Apply Changes** button or the **Reset** button to save/reset the configuration.

WPA Mixed

Select SSID: Root AP - TRENDnet310 Apply Changes Reset

Encryption:	WPA-Mixed
Authentication Mode:	<input type="radio"/> Enterprise (RADIUS) <input checked="" type="radio"/> Personal (Pre-Shared Key)
WPA Cipher Suite:	<input checked="" type="checkbox"/> TKIP <input type="checkbox"/> AES
WPA2 Cipher Suite:	<input type="checkbox"/> TKIP <input checked="" type="checkbox"/> AES
Pre-Shared Key Format:	Passphrase
Pre-Shared Key:

Select SSID: Root AP - TRENDnet310 Apply Changes Reset

Encryption:	WPA-Mixed
Authentication Mode:	<input checked="" type="radio"/> Enterprise (RADIUS) <input type="radio"/> Personal (Pre-Shared Key)
WPA Cipher Suite:	<input checked="" type="checkbox"/> TKIP <input type="checkbox"/> AES
WPA2 Cipher Suite:	<input type="checkbox"/> TKIP <input checked="" type="checkbox"/> AES
RADIUS Server IP Address:	
RADIUS Server Port:	1812
RADIUS Server Password:	

Items	Information
Authentication Mode	There are two items, "Enterprise (WPA-Radius)" and "Personal (Pre-Shared Key)". You can select the mode by clicking the item.
WPA / WPA2 Cipher Suite	Select the WPA/WPA2 Cipher Suite to be TKIP or AES.
Pre-Shared Key Format	To decide the format, select Passphrase or Hex in

	the drop list.
Pre-Shared Key	Enter the Pre-shared Key according to the pre-shared key format you select. This field must be filled with character longer than 8 and less than 64 lengths. (The default value is 1234567890ab)

* Please click on the **Apply Changes** button or the **Reset** button to save/reset the configuration.

3.4.7 Access Control

To restrict the clients of Access authentication of wireless clients by MAC address, set up the access list in this page. If the Wireless Access Control Mode is set to "Allow Listed", only the wireless LAN clients whose MAC addresses are listed in the Current Access Control List will be able to connect to the wireless access point and all other clients not listed will be denied access. If the mode is set to "Deny Listed", the wireless LAN clients whose MAC addresses are listed in the Current Access Control List will not be able to connect to the wireless access point and all other clients will be allowed access. This feature is only available when using AP, AP+WDS, or AP+Mesh modes located under Wireless > Basic

Clicking "Delete Selected" will delete the checked entries in the list.

Clicking "Delete All" will delete all of the entries listed.

Items	Information
Wireless Access Control Mode	Click on the drop list to choose the access control mode. You may select "Allow listed" to allow those allowed MAC addresses or select "Deny Listed" to ban those MAC addresses from accessing to this device or select "Disable".
MAC Address & Comment	Fill in the MAC address that you wish to control, and give a definition to it. (MAC Address Format: xxxxxxxxxxxx)
Current Access Control list	Lists the MAC Access Control Settings you have added before. Click on the list to change configuration. To Delete the station on the list, mark the check box in the select item and click the "Delete Selected". If you want to delete all

	stations on the list, click “Delete All” to remove all of them.
--	-----------------------------------------------------------------

* Please click on the **Apply Changes** button or the **Reset** button to save/reset the configuration.

3.4.8 WDS Settings

Wireless Distribution System (WDS) mode uses wireless media to connect to other wireless access points. Another term for this feature is wireless point to point or point to multi-point bridging. Wireless access points using WDS mode must be configured to use the same channel number, wireless security type, and wireless security key. Add other WDS enabled wireless access points using their device MAC addresses. This feature is only available when using WDS, AP+WDS, Mesh, or AP+Mesh modes located under Wireless > Basic Settings. To use WDS, you will require at least 2 or more wireless access points that support WDS. Note: WDS is not a wireless standard and connectivity may or may not be established between different wireless access point devices that support this feature. It is recommended to use the same device model when using this feature.

WDS Settings

Wireless Distribution System (WDS) mode uses wireless media to connect to other wireless access points. Another term for this feature is wireless point to point or point to multi-point bridging. Wireless access points using WDS mode must be configured to use the same channel number, wireless security type, and wireless security key. Add other WDS enabled wireless access points using their device MAC addresses. This feature is only available when using WDS, AP+WDS, Mesh, or AP+Mesh modes located under Wireless > Basic Settings.

Enable WDS

MAC Address:

Data Rate: Auto

Comment:

Current WDS AP List:

MAC Address	Tx Rate (Mbps)	Comment	Select

Items	Information
MAC Address & Comment	Fill in the MAC address that you wish to control, and give a definition to it. (MAC Address Format: xxxxxxxxxxxx)
Data Rate	The transmit limitation of data packets of this wireless AP. The wireless AP will use the highest possible selected transmission rate to transmit the data packets.
Current WDS AP List	Lists the WDS Settings you have added before. Click on the list to change configuration. To Delete the station on the list, mark the check box in the select item and click the “Delete Selected”. If you want to delete all stations on the list, click “Delete All” to remove all of them.

* Please click on the **Apply Changes** button or the **Reset** button to save/reset the configuration.

1. Click on Wireless and then click Basic Settings. For Mode, select AP+WDS, WDS, Mesh, or AP+Mesh. Click Apply Changes. Click Reboot Later.
2. Click on Wireless and then click WDS Settings. Check the Enable WDS checkbox. In the MAC Address field, enter the MAC Address of the remote wireless access point to bridge with the TPL-310AP.
3. To enable wireless security for WDS, click Set Security and apply the appropriate wireless security. The same wireless security type and key will need to be entered into the remote wireless access point.
4. Click Apply Changes. Click Reboot Now to apply the changes to the device.

3.4.9 Mesh Settings

Wireless Mesh mode uses wireless media to connect to other wireless access points. Another term for this feature is wireless point to point or point to multi-point bridging. Unlike WDS mode, wireless mesh mode can provide redundancy and dynamic path selection through multiple Mesh enabled wireless access points. Wireless access points using wireless mesh mode must be configured to use the same channel number, Mesh ID, wireless security type, and wireless security key. This feature is only available when using Mesh or AP+Mesh modes located under Wireless > Basic Settings. To use Mesh, you will require at least 2 or more wireless access points that support Mesh. It is ideal to have at least 3 wireless access points.

Wireless Mesh Network Settings

Wireless Mesh mode uses wireless media to connect to other wireless access points. Another term for this feature is wireless point to point or point to multi-point bridging. Unlike WDS mode, wireless mesh mode can provide redundancy and dynamic path selection through multiple Mesh enabled wireless access points. Wireless access points using wireless mesh mode must be configured to use the same channel number, Mesh ID, wireless security type, and wireless security key. This feature is only available when using Mesh or AP+Mesh modes located under Wireless > Basic Settings.

Enable Mesh

Mesh ID:

Encryption:

Pre-Shared Key Format:

Pre-Shared Key:

Items	Information
Mesh ID	Enter the Mesh ID used for your wireless mesh network. The ID should also be entered on any other wireless access points that should belong to your wireless mesh network.
Encryption	To enable security for Mesh mode, select the encryption mode WPA2(AES).
Pre-Shared Key Format	To decide the format, select Passphrase or Hex in the drop down menu.
Pre-Shared Key	Enter the Pre-shared Key according to the pre-shared key format you select. This field must be filled with character longer than 8 and less than 64 lengths. The key should also be entered on any other wireless access points that belong to your wireless mesh network.

* Please click on the **Apply Changes** button or the **Reset** button to save/reset the configuration.

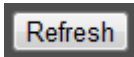
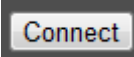
1. Click on Wireless and then click Basic Settings. For Mode, select Mesh, or AP+Mesh. Click Apply Changes. Click Reboot Later.
2. Click on Wireless and then click Mesh Settings. Check the Enable Mesh checkbox. In the Mesh ID field, enter the Mesh ID of your wireless mesh network.
3. To enable wireless security for Mesh, click the drop-down menu Encryption and select WPA2(AES). Next to Pre-Shared Key Format, select Passphrase. In the field Pre-Shared Key, enter the key for your wireless mesh network. The same wireless security type and key will need to be entered into any other wireless access point that belong to your mesh network.
4. Click Apply Changes. Click Reboot Now to apply the changes to the device.

3.4.10 Site Survey

This page displays basic information about available wireless networks. When the TPL-310AP is configured in Client mode located under Wireless > Basic Settings, this page will allow you to scan and establish wireless connectivity to available wireless networks (access points or wireless routers).

Wireless Site Survey						
This page allows you to scan and provide basic information about available wireless networks. When using Client mode located under Wireless > Basic Settings, this page will allow you to scan and establish wireless connectivity to available wireless networks.						
SSID	BSSID	Channel	Type	Encrypt	Signal	Select
	00:c0:02:1a:af:c1	8 (B+G)	AP	WPA-PSK/WPA2-PSK	52	<input type="radio"/>
	00:14:d1:62:0d:1d	10 (B+G+N)	AP	no	46	<input type="radio"/>
	00:0d:56:01:23:16	1 (B+G+N)	AP	WPA2-PSK	44	<input type="radio"/>
	00:14:d1:aa:cf:68	11 (B+G+N)	AP	WPA2-PSK	42	<input type="radio"/>
	00:14:d1:aa:50:88	11 (B+G+N)	AP	no	40	<input type="radio"/>
	00:14:d1:c3:bd:dd	3 (B+G+N)	AP	WPA2-PSK	38	<input type="radio"/>
	00:c0:02:e7:d0:f0	1 (B+G)	AP	WEP	36	<input type="radio"/>
	00:e0:4c:81:86:82	11 (B+G+N)	AP	no	34	<input type="radio"/>
	00:c0:02:90:f4:62	1 (B+G)	AP	WEP	32	<input type="radio"/>
	00:0e:8e:7d:2e:54	5 (B+G)	AP	WPA-PSK	32	<input type="radio"/>
	00:14:d1:cb:b2:58	9 (B+G+N)	AP	WPA2-PSK	32	<input type="radio"/>
	00:14:d1:cb:67:b8	6 (B+G+N)	AP	WPA2-PSK	30	<input type="radio"/>
	00:14:d1:c3:bfeb	1 (B+G+N)	AP	WPA-PSK	30	<input type="radio"/>
	00:14:d1:c0:64:19	2 (B+G)	AP	WPA-PSK	30	<input type="radio"/>
	00:14:d1:c6:c2:ef	1 (B+G+N)	AP	WPA-PSK	28	<input type="radio"/>

To establish wireless connectivity in Client mode:

1. Click on Wireless and then click Basic Settings. For Mode, select Client. Click Apply Changes. Click Reboot Later.
2. If the wireless network you will connect uses wireless security, click on Wireless and then click Security. Click Apply Changes. Click Reboot Later.
3. Click the Encryption drop-down menu, and select and configure the appropriate security settings of the wireless network you will connect to. Click Apply Changes. Click Reboot Now to apply the changes to the device. Note: When in Client mode, encryption is required to be configured first before connecting to the available wireless network.
4. Click on Wireless and then click Site Survey. Click  button to scan for available wireless networks. In the list under Select, click the radio button next to the available wireless network that you want to connect to and click the  button.

3.4.11 WPS

This page allows you to configure the settings for Wi-Fi Protected Setup (WPS). Using this feature allows you to connect WPS enabled wireless LAN clients to the wireless access point quickly and easily with one of the following methods: Virtual Push Button (PBC), Hardware Push Button (Located on physical device), or PIN number. This feature is only available when the Broadcast SSID is Enabled and using AP, AP+WDS, or AP+Mesh modes located under Wireless > Basic Settings. WPS can also be used in Client mode to establish connectivity to another wireless access point or wireless router.

Wi-Fi Protected Setup

This page allows you to configure the settings for Wi-Fi Protected Setup (WPS). Using this feature allows you to connect WPS enabled wireless LAN clients to the wireless access point quickly and easily with one of the following methods: Virtual Push Button (PBC), Hardware Push Button (Located on physical device), or PIN number. This feature is only available when the Broadcast SSID is Enabled and using AP, AP+WDS, or AP+Mesh modes located under Wireless > Basic Settings.

Disable WPS

WPS Status: Configured UnConfigured

Self-PIN Number: 09494244

Push Button Configuration:

Current Key Info:

Authentication	Encryption	Key
Open	None	N/A

Client PIN Number:

Items	Information
WPS Status	You cannot manually select the items here. The WPS Status will change from “UnConfigured” to “Configured” after you enable WPS function and setup a wireless security key for this device.
Self-PIN Number	If you use this device as a client, you can use this code when trying to connect this device to other AP by using the PIN method.
Push Button Configuration	Push Button Communication (PBC) method use a simple action of pushing a button on both the AP and the new STA to reach the function of easy setup WPS connection. You can simply click the <input type="button" value="Start PBC"/> button in this GUI page. After click on the button, please run the client’s WPS and push the PBC button within 2 minutes.
Client PIN Number	Personal Identification Number (PIN) method. Users have to fill in the PIN code of enrollee device and click on the <input type="button" value="Start PIN"/> button to make communication with other AP. After click on the button, please run the client’s WPS and push the PIN button within 2 minutes.

*Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configuration.

3.4.12 Schedule

This page allows you to setup a schedule when the wireless functionality is enabled. The wireless functionality will be disabled for any other days and time not configured within the schedule on this page. Please remember to configure the device System Time first (Section 3.11), before creating the wireless schedule.

Wireless Schedule

This page allows you to setup a schedule when the wireless functionality is enabled. The wireless functionality will be disabled for any other days and time not configured within the schedule on this page. Please remember to configure the device System Time first, before creating the wireless schedule.

Enable Wireless Schedule

Days :
 Everyday
 Sun
 Mon
 Tue
 Wed
 Thu
 Fri
 Sat

Time :
 24 Hours
 From 00 : 00
 To 00 : 00

Items	Information
Enable Wireless Schedule	Checking this box enables the wireless schedule function.
Days	<p>Everyday: Checking this option will select all days.</p> <p>Sun, Mon, Tue, Wed, Thu, Fri, Sat: Check the days you want the wireless schedule to be active.</p>
Time	<p>24 Hours: Checking this option will select all hours of the days you have selected.</p> <p>From: Click the drop-down menus to set the time the wireless functionality will be turned on. (The options are in 5 minutes increments)</p> <p>To: Click the drop-down menus to set the time the wireless functionality will be turned off. (The options are in 5 minutes increments)</p>

*Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configuration.

3.5 TCP/IP Settings

This page is used to configure the IP address parameters of the wireless access point for the local area network, which connects to the Ethernet port of your wireless access point. Please make sure that the IP address assigned to the wireless access point is available and is not being used by any other device connected to the local area network.

LAN Interface Setup

This page is used to configure the IP address parameters of the wireless access point for the local area network, which connects to the Ethernet port of your wireless access point. Please make sure that the IP address assigned to the wireless access point is available and is not being used by any other device connected to the local area network.

IP Address:	<input type="text" value="192.168.10.100"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>
Default Gateway:	<input type="text" value="0.0.0.0"/>
DHCP:	Disabled ▾
802.1d Spanning Tree:	Disabled ▾
Clone MAC Address:	<input type="text" value="000000000000"/> <small>Wireless Client Mode only and enable Clone MAC Address under Wireless > Basic Settings</small>

Items	Information
IP Address	The IP of your AP LAN port (default 192.168.10.100).
Subnet Mask	Subnet Mask of you LAN (default 255.255.255.0). All devices on the network must have the same subnet mask to communicate on the network.
Default Gateway	Enter the IP Address of the AP in your network.
DHCP	DHCP stands for Dynamic Host Configuration Protocol. It is a protocol for assigning dynamic IP addresses “automatically”. In this device, manual setting up your client IP is necessary when you want to use the AP as your client’s default gateway.
802.1d Spanning Tree (STP)	<p>Enabled: Suitable for office environment, for example, there are over 3 Ethernet switches or Routers or APs are being used at the same time. Because STP (Spanning Tree Protocol) needs 2~49 seconds to take effect.</p> <p>Disabled: Suitable for ordinary application when there are less than 3 Ethernet switches or Routers or APs working the same time, for example, ordinary home.</p>
Clone MAC Address	Applies to Client mode only. Enter the MAC address you would like to clone to the TPL-310AP. This will be the MAC address that will appear on the access point or wireless router you are connected to when in Client mode. If there is no value here, then the TPL-310AP MAC address will be used unless <i>Enable MAC Clone</i> is check under <i>Wireless > Basic Settings</i> . Section 3.4.2 (MAC Address Format: xxxxxxxxxxxx)

*Please click on the **Apply Changes** button or the **Reset** button at the bottom to save/reset the configuration.

3.6 Log

This page is used to display the device internal system log or send system logs to a remote log server (Syslog).

System Log

This page is used to display the device internal system log or send system logs to a remote log server (Syslog).

Enable System Log

Select Log Type:	<input type="checkbox"/> system all <input type="checkbox"/> wireless <input type="checkbox"/> 11s
Remote Log:	<input type="checkbox"/> Enable Remote Log Log Server IP Address: <input style="width: 100px;" type="text"/>

Items	Information
Enable Log	<p>Checking this option enables the in logging function of the TPL-310AP. If enable, the logging information will display in the blank white box in the page.</p> <p style="text-align: center;">Types of Logging</p> <p>system all – Logs all system and debug information.</p> <p>wireless – Logs only information related to the wireless functionality of the device.</p> <p>11s – Logs only information about wireless mesh. (Applies only when using Mesh & AP+Mesh modes.)</p>
Enable Remote Log	<p>Sends or forwards logging information to an external log server (Syslog server).</p> <p>Log Server IP Address: Enter the IP address of the external log server (Syslog server).</p>

*Please click on the **Apply Changes** button to save the configuration. Click the *Refresh* button to check for new logging information in the blank white box. Click the *Clear* button to clear all the logging information from the white box.

3.7 Statistics

This page displays the number of packets transmitted and received on the wireless and wired Ethernet interfaces for monitoring purposes. To display the latest information, click the **Refresh** button.

Statistics

This page displays the number of packets transmitted and received on the wireless and wired Ethernet interfaces for monitoring purposes.

Wireless LAN	Sent Packets	29629
	Received Packets	4767729
Ethernet LAN	Sent Packets	3645
	Received Packets	14361

3.8 Upgrade Firmware

This page allows you to upload firmware to the device. Firmware updates may provide bug fixes and/or enhancements to the functionality of the device and if available, can be downloaded from the downloads section on TRENDnet website (<http://www.trendnet.com>) Please do not power off the device until the firmware upload procedure is completed as this may crash the system or damage the device.

To upgrade the firmware, please click on the **Browse...** button, navigate to the extracted firmware file location on your computer and then click the **Upload** button to start the firmware upgrade.

Upgrade Firmware

This page allows you to upload firmware to the device. Please do not power off the device until the firmware upload procedure is completed as this may crash the system or damage the device.

Select File:

3.9 Save/Reload Settings

This page allows you to save your current wireless access point configuration to a file and restore the wireless access point settings from a previously saved configuration file on this device. This page also allows you to reset the wireless AP configuration to factory default settings. (Does not affect powerline settings)

Save/Reload Settings

This page allows you to save your current wireless access point configuration to a file and restore the wireless access point settings from a previously saved configuration file on this device.

Save Settings to File:	<input type="button" value="Save..."/>
Load Settings from File:	<input type="text" value="Browse..."/> <input type="button" value="Upload"/>
Reset Settings to Default:	<input type="button" value="Reset"/>

Items	Information
Save Settings to File	Click on the Save... button to save the current wireless AP configuration to file to a location on your computer.
Load Settings from File	Click Browse... to select the file that you want to restore, and then click Upload to start the restore process.
Reset Settings to Default	Click Reset to reset the wireless AP configuration to factory default settings.

3.10 Password

This page allows you to configure the administrative user account for managing the wireless access point and access to the web graphical user interface. Leaving the User Name and Password fields blank or empty will disable the user account protection. To change the administrator user name and password, enter the User Name, New Password, and confirm the password. Click the Apply Changes button to save the changes.

Password Setup

This page allows you to configure the administrative user account for managing the wireless access point and access to the web graphical user interface. Leaving the User Name and Password fields blank or empty will disable the user account protection.

User Name:	<input type="text"/>
New Password:	<input type="text"/>
Confirmed Password:	<input type="text"/>

3.11 System Time

This page allows you to set the device system time and also displays the current device time. Click Refresh to update the device time displayed. To set the device time, you can manually enter edit the time displayed or you can click on Copy Computer Time to copy your computer's current time settings. Click Apply Change to save the changes. Note: This section should be configured first, before configuring the wireless schedule (Section 3.4.12)

System Time Setting

This page allows you to set the device system time.

Current Time :	Year <input type="text" value="2010"/>	Month <input type="text" value="8"/>	Day <input type="text" value="28"/>	Hour <input type="text" value="5"/>	Minute <input type="text" value="43"/>	Second <input type="text" value="6"/>
	<input type="button" value="Copy Computer Time"/>					

3.12 Logout

This page is used to logout of the wireless access point web management interface.

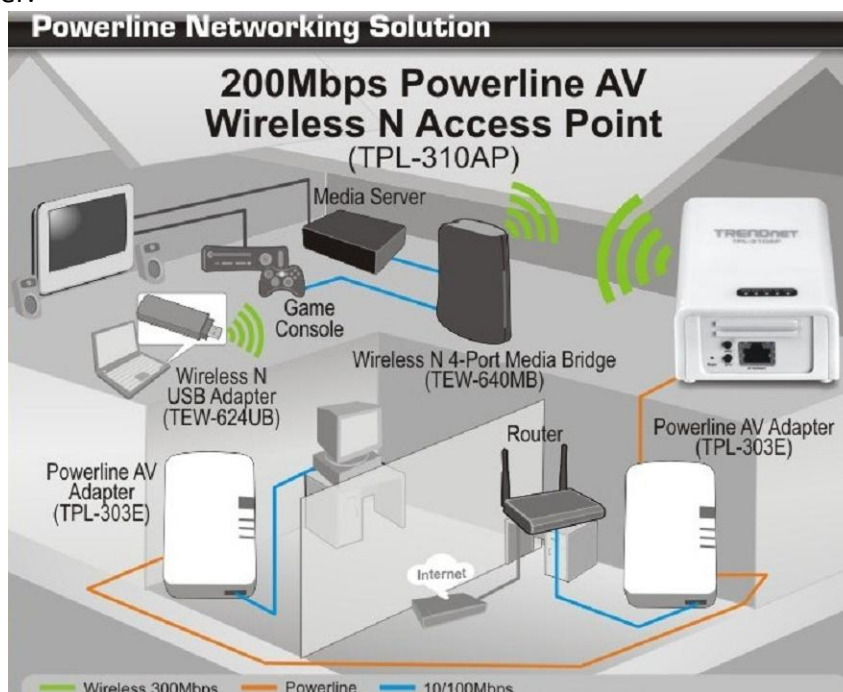
Logout

This page is used to logout of the device configuration.

Chapter 4: Powerline

At factory default powerline settings, the TPL-310AP 200Mbps Powerline AV Wireless N Access Point (or other TRENDnet HomePlug® AV powerline adapter models TPL-303E, TPL-304E, TPL-305E, TPL-401E) can be installed into any room in your home or small office with a wall power outlet, without the need for additional software or configuration. Assuming the TRENDnet HomePlug® AV powerline adapters are at factory default settings, to create a powerline network using the TPL-310AP and another TRENDnet HomePlug® AV powerline adapter, simply plug one of the powerline adapters into a wall power outlet in one room and plug the other powerline adapter into an available wall power outlet in another room to establish connectivity between the two rooms.

In order to share Internet connectivity through your powerline adapters, it is ideal to install at least one powerline adapter in the room where your modem and router are located and connect the powerline adapter to one of your router's LAN ports via Ethernet network cable. Any additional powerline adapters that are installed and connected in other rooms will then share Internet connectivity through your router. Once the powerline adapters are connected to each other through the electrical system, any additional devices such as computers or network appliances (e.g. Game Console, Blu-ray player, IP Set Top Box, network enabled TV, etc.) connected to any of your powerline adapters via Ethernet can then communicate to each other as well as share Internet connectivity through your router.



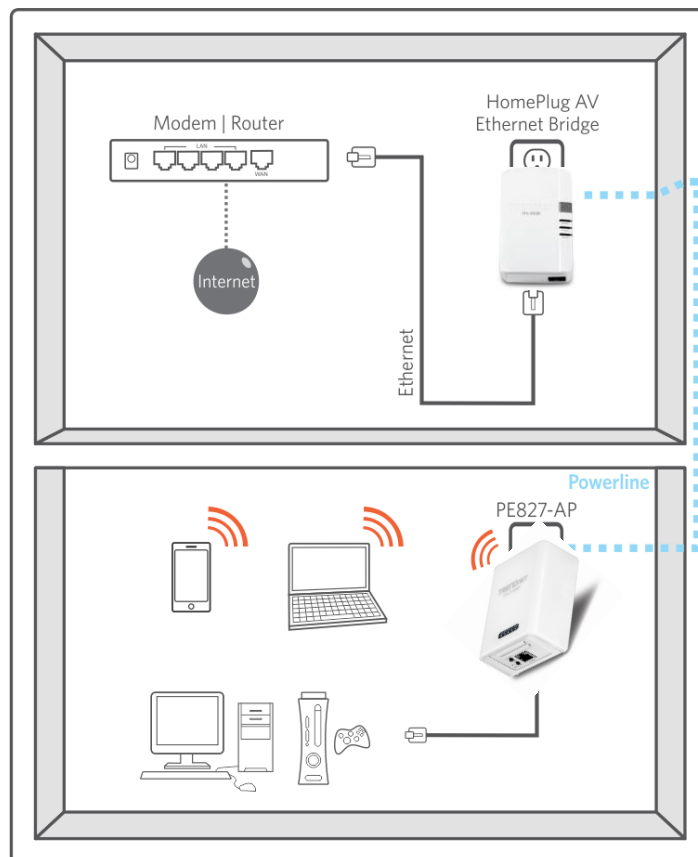
The installation diagram shows a typical setup of the TPL-310AP extending your wireless network connectivity to another room when bridged with two additional powerline adapters, in this case, the TRENDnet TPL-303E. One TPL-303E is installed in the room with the router and modem which will allow for Internet connectivity when connected through powerline. Any additional powerline adapters connected will then be able to provide Internet connectivity to the other rooms. The orange line represents the powerline connectivity established through your home's electrical system and the blue lines represent Cat. 5, 5e, 6 Ethernet connectivity to your network enabled appliances such as a computer, router, or IP set top box connected to your television. The green lines represent the wireless connectivity from your wireless device (e.g. laptop computer, media bridge, etc.) to the TPL-310AP.

4.1 Create a powerline network and extend you wireless network

The following procedure describes how to create a basic powerline network between the TPL-310AP and an additional TRENDnet powerline adapter model TPL-303E (or TPL-304E, TPL-305E, TPL-401E) and share Internet connection through a router to a computer or network appliance in another room.

The procedure assumes the following:

- You have one additional TRENDnet HomePlug® AV powerline adapter (models TPL-303E, TPL-304E, TPL-305E, TPL-401E) and the powerline settings are set to factory defaults. If you have an existing powerline network (2 or 3 other TRENDnet powerlines adapters already plugged in and connected) and you are adding the TPL-310AP, please refer to section 4.5.
- The TPL-310AP has already been initially configured in (AP) Access Point mode to allow wireless computers or devices to wirelessly connect covered in Chapter 2.
- Your router is already installed and configured for Internet connectivity.



1. Plug the TPL-303E (or TPL-304E, TPL-305E, TPL-401E) powerline adapter into an available wall power outlet in the room where your router is located.

Warning: Do not plug the powerline adapter into a power strip that has surge protection. Doing so will degrade power line performance. For best performance, plug all powerline adapters directly into a wall power outlet.

2. Connect one end of the Network Cable into the Ethernet port located at the bottom of the TPL-303E (or TPL-304E, TPL-305E, TPL-401E) powerline adapter and connect the other end of the Ethernet cable into one of the router's LAN ports.
3. Plug the TPL-310AP powerline adapter into an available wall power outlet in another room where your wireless computers or network appliances (e.g. Wireless Media Bridge, Game Console, Blu-ray player, IP Set Top Box, network enabled TV, etc.) is located or the room where you would like to extend your wireless network.
4. To verify connectivity between the TPL-310AP and the TPL-303E (or TPL-304E, TPL-305E, TPL-401E), make sure that the PL (P-Link on TPL-303E/304E) LED is on solid (Green, Amber, Red, Green only – TPL-303E/304E). Please refer to the LED section 1.4 for details on the TPL-310AP LED indicator.
5. You have successfully created a basic powerline network between the TPL-310AP and the TPL-303E (or TPL-304E, TPL-305E, TPL-401E) powerline adapters. The computer or network appliance connected to the TPL-310AP via Network Cable can now access the Internet. Wireless computers or appliances can now be configured to connect to the TPL-310AP wirelessly to access your local network and Internet.
6. (OPTIONAL – Wired Connectivity) Connect one end of the Ethernet Cable into the Ethernet port located at the bottom of the TPL-310AP and the other end of the Ethernet cable into the Ethernet port on your computer or network appliance (e.g. Game Console, Blu-ray player, IP Set Top Box, network enabled TV, etc.).

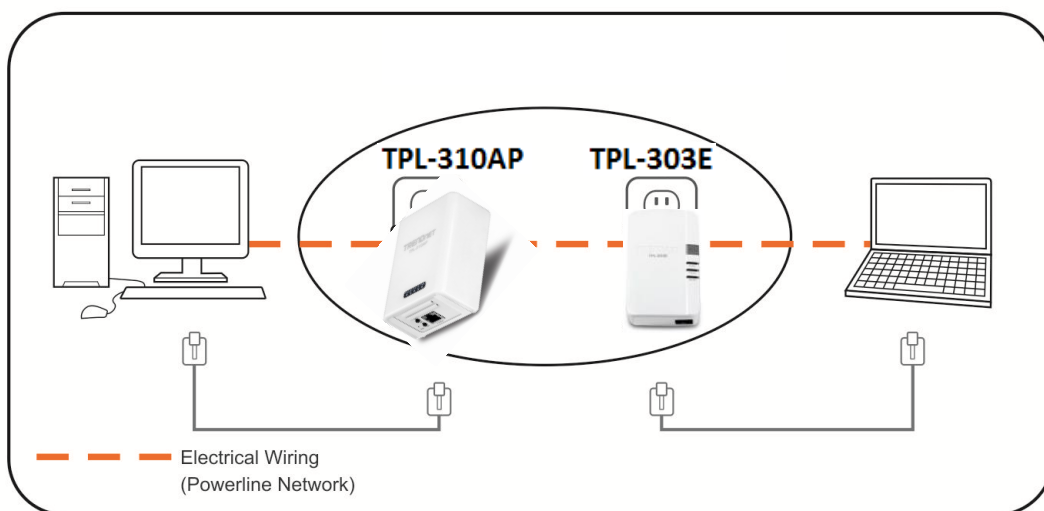
4.2 Securing your Powerline Network

The TPL-310AP 200Mbps Powerline AV Wireless N Access Point has a default powerline network name/security key assignment of “HomePlugAV”. When connecting TRENDnet HomePlug® AV powerline adapters, the adapters will be assigned the default network/security key which allows adapters to establish connectivity through your home or small office’s electrical system without the need for additional software or configuration. For added security, the default network name/security key can be modified using the TPL-310AP Sync button covered in the section 3.3 or through the use of the Powerline Configuration Utility in Chapter 5.

Note: The default network name/security key assigned to the TPL-310AP is “HomePlugAV”. All powerline adapters in the same powerline network must have the same network name/security key in order to establish connectivity. If the network name/security keys are not the same for all powerline adapters on the same powerline network, the adapter will NOT establish connectivity. TRENDnet Powerline AV models TPL-303E, TPL-304E, TPL-305E, TPL-310AP, and TPL-401E all have the same default network name/security key assignment of “HomePlugAV”.

4.3 Changing the Network Name/Security Key using the Sync Button

The procedure describes how to create a change the network name/security key between the TPL-310AP and an additional TRENDnet HomePlug® AV powerline adapter (models TPL-303E, TPL-304E, TPL-305E, TPL-401E). This procedure can also be used to establish connectivity between two powerline adapters that are currently disconnected and change the default network name/security key simultaneously. The example below demonstrates how to accomplish using the TPL-310AP and the TPL-303E, however, this procedure also applies to other TRENDnet HomePlug® AV powerline adapters.

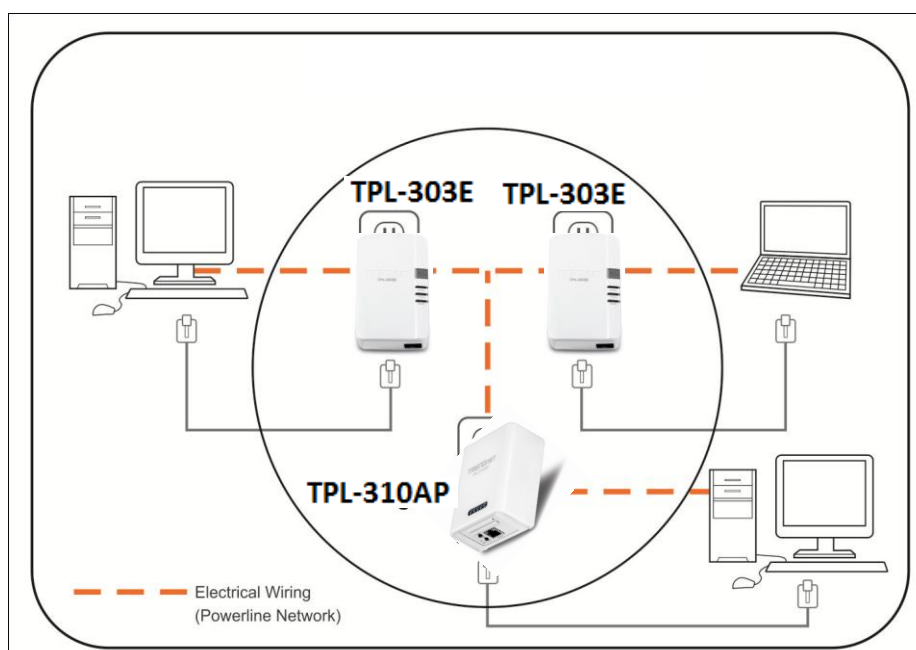


Assuming the TRENDnet powerline adapters are already plugged into wall power outlets and either currently connected or disconnected to each other.

1. Push and hold the Sync button on one of the TRENDnet powerline adapters (i.e. TPL-310AP) for 10 seconds and release it. All LEDs will turn off and turn back on. This will erase the current network name/security key assigned to this powerline adapter.
2. Push and hold the Sync button on the other TRENDnet powerline adapter (i.e. TPL-303E) for 10 seconds and release it. All LEDs will turn off and turn back on. This will erase the current network name/security key assigned to this powerline adapter.
3. Push and hold the Sync button on the first TRENDnet powerline adapter (i.e. TPL-310AP) for 2 seconds and release it. The PWR LED will start blinking. This will initiate sync/connection and generate a random network name/security key assignment to this adapter.
4. Within 2 minutes (120 sec), push and hold the Sync button on the other TRENDnet powerline adapter (i.e. TPL-303E) for 2 seconds and release it. The PWR LED will start blinking. This will establish connectivity between the two powerline adapters by assigning the second powerline adapter's (i.e. TPL-303E) network name/security key to match the network name/security key of the first powerline adapter (i.e. TPL-310AP).
5. To verify connectivity between the two powerline adapters, make sure that the PL LED (P-Link on TPL-303E/304E) on each powerline adapter is on solid (Green, Amber, Red, Green only – TPL-303E/304E). Please refer to the LED section 1.4 for details on the LED indicator.

4.4 Adding the Powerline Adapter to an Existing Powerline Network

The procedure describes how to add the TPL-310AP 200Mbps Powerline AV Wireless N Access Point to an existing powerline network. The example below demonstrates how to accomplish using the TPL-310AP and 2 additional TPL-303E powerline adapters, however, this procedure also applies to other TRENDnet HomePlug® AV powerline adapters.



Assuming the two TPL-303E powerline adapters are currently connected to each other and the TPL-310AP is currently disconnected.

1. Push and hold the Sync button on the TPL-310AP for 10 seconds and release it. All LEDs will turn off and turn back on. This will erase the current network name/security key assigned to the additional TPL-310AP.
2. Push and hold the Sync button on one of the two TPL-303E powerline adapters that are currently connected to each other for 2 seconds and release it. The PWR LED will start blinking.
3. Within 2 minutes (120 sec), push and hold the Sync button on the TPL-310AP for 2 seconds and release it. The PWR LED will start blinking. This will establish connectivity between the three powerline adapters by assigning the TPL-310AP network name/security key to match the network name/security key of the TPL-303E powerline adapters that are currently connected.
4. To verify connectivity between the three powerline adapters, make sure that the PL LED (P-Link on TPL-303E/304E) on each powerline adapter is on solid (Green, Amber, Red, Green only – TPL-303E/304E). Please refer to the LED section 1.4 for details on the LED indicator.

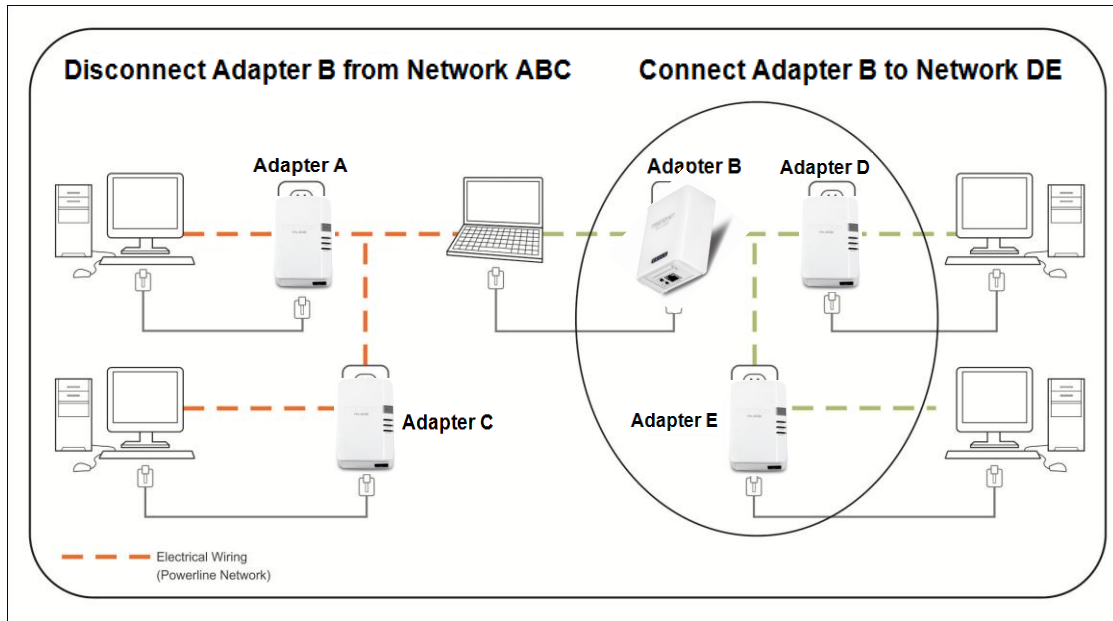
4.5 Overlapping Powerline Networks

It is possible to create multiple powerline networks on the same electrical system separated and grouped by different network names/security keys. The powerline networks will work and communicate independently of each other which can provide security between different groups of powerline adapters. For example, if you have five powerline adapters (Adapter A, Adapter B, Adapter C, Adapter D, Adapter E), you can group Adapters A,B, and C together on one powerline network and group Adapters D and E on a different powerline network. Each group will use a different network name/security key.

Note: It is recommended that only a maximum of up to 4 powerline networks can be created per electrical system. Any additional powerline networks above the recommended result in significant degradation in powerline performance.

4.6 Moving Powerline Adapters between different Powerline Networks

Use the previous procedures in Chapter 4: Powerline, Sections 4.1 - 4.4, to connect one group of adapters, then you can carry out the procedures on another group of adapters to create multiple overlapping powerline networks. This procedure describes how to disconnect a powerline adapter from one powerline network and connect the adapter to a different powerline network.



Assuming "Adapter B" is the TPL-310AP and all other powerline adapters are TPL-303E powerline adapters and for reference in the diagram and this procedure, the adapters will be labeled *Adapter A*, *B*, *C*, *D*, and *E*. *Adapters A*, *B*, and *C* are currently connect together to form one powerline network and *Adapters D* and *E* form another powerline network. *Adapter B* will be disconnected from *Adapters A* and *C* and connected to *Adapters D* and *E*.

1. Push and hold the Sync button on *Adapter B* (i.e. TPL-310AP) for 10 seconds and release it. All LEDs will turn off and turn back on. This will erase the current network name/security key assigned to *Adapter B* (i.e. TPL-310AP) and disconnect from *Adapters A* and *C*.
2. Push and hold the Sync button on *Adapter D* for 2 seconds and release it. The PWR LED will start blinking.
3. Within 2 minutes (120 sec), push and hold the Sync button on *Adapter B* for 2 seconds and release it. The PWR LED will start blinking. This will establish connectivity between *Adapters B*, *D*, and *E* by assigning *Adapter B's* network name/security key to match the network name/security key of *Adapters D* and *E*.
4. To verify connectivity between the powerline adapters, make sure that the PL LED (P-Link on TPL-303E/304E) on each powerline adapter is on solid (Green, Amber, Red, Green only – TPL-303E/304E). Please refer to the LED section 1.4 for details on the LED indicator.

Chapter 5: Powerline Configuration Utility

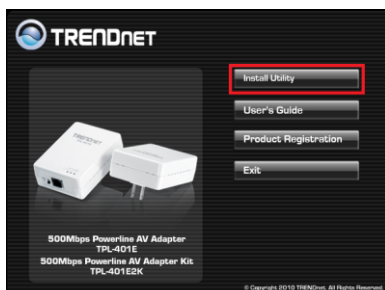
The Powerline Configuration Utility is an additional tool that allows you to centrally manage the powerline adapters that are connected to your network. Instead of using a randomly generated key with the Sync button, the utility allows you to manually configure the network name/security key for a single powerline adapter or multiple adapters simultaneously. This tool allows for easy management for multiple powerline adapters in your network. In addition, this tool also allows you to upgrade the powerline firmware.

Note:

1. Before installing and using the utility, write down the 16-digit Device Password (DPW) and MAC Address of each TRENDnet HomePlug® AV powerline adapter as this will be required to apply changes to remote devices discovered in the utility. This is located on the Device Label, please refer to Section 1.3.
2. Before installing and using the utility, make sure the computer in which you are installing the utility is connected to your network and your TRENDnet HomePlug® AV adapters are also connected to your network.
3. Make sure all of the TRENDnet HomePlug® AV powerline adapters are already connected to each other using the procedures in Chapter 4: Powerline
4. The utility is only compatible with Windows operating systems. For details, please refer to Section 1.2.

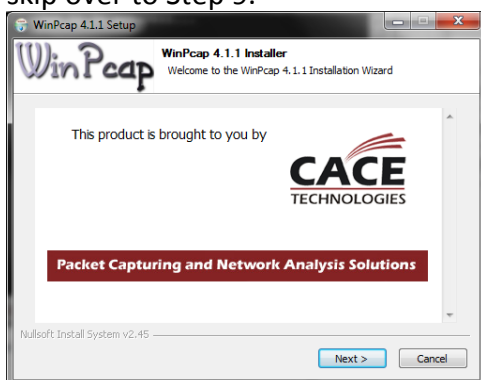
5.1 Software Installation

1. Insert the included CD-ROM into your computer's CD-ROM drive.
2. At the CD Autorun Prompt window, click *Run Autorun.exe*
3. At the CD-ROM menu window, click *Install Utility*.

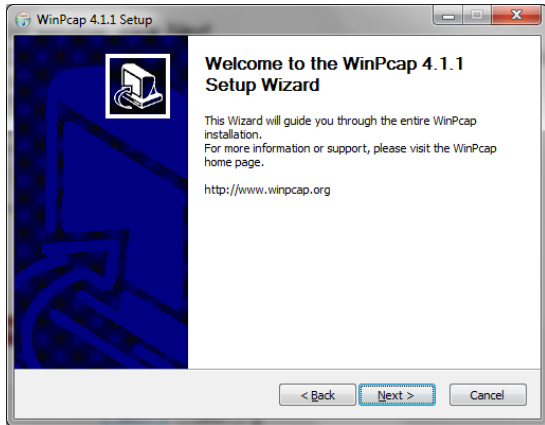


4. At the WinPcap installer window, click *Next*.

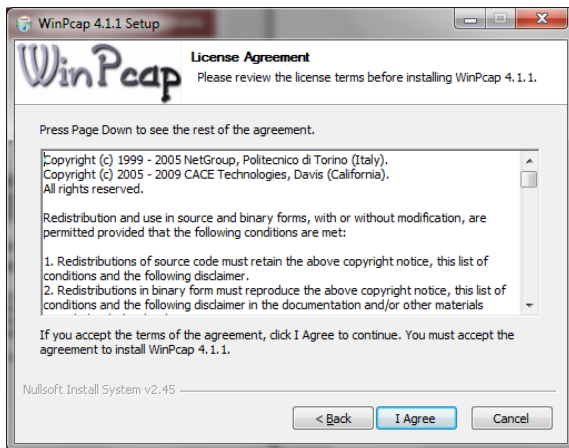
Note: The Powerline Configuration Utility requires the use of the WinPcap application. If this prompt does not appear, you may already have the WinPcap application installed. If so, please skip over to Step 9.



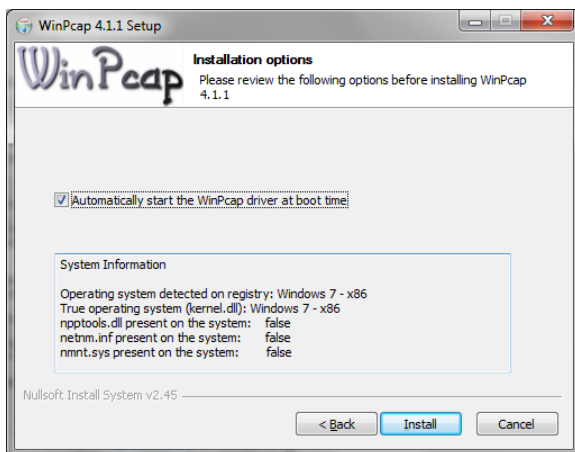
5. In the Setup Wizard window, click *Next*.



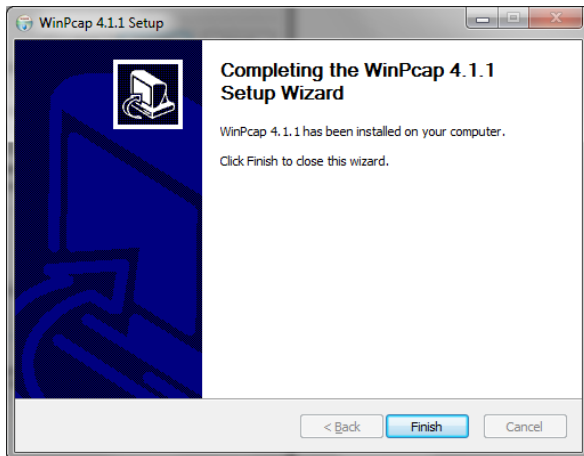
6. In the License Agreement window, click *I Agree*.



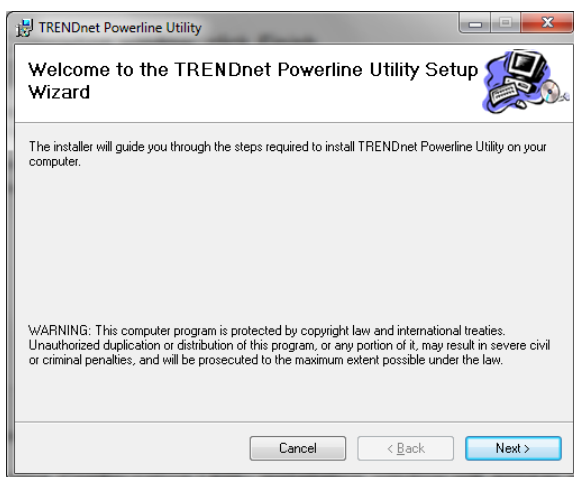
7. In the Install Options window, click *Install*.



8. At the Setup Wizard Completion window, click *Finish*.



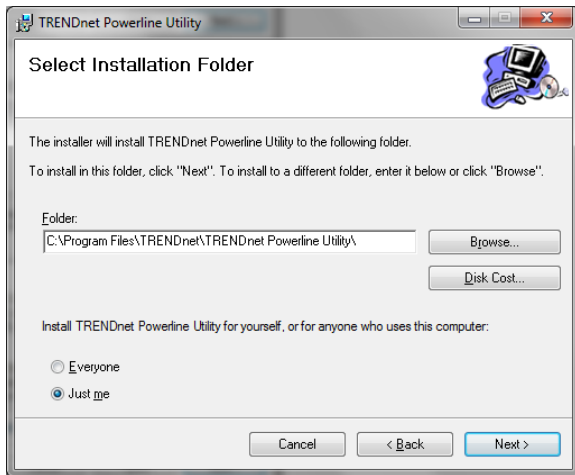
9. The TRENDnet Powerline Configuration Utility installation window will appear automatically. At the Setup Wizard window, click *Next*.



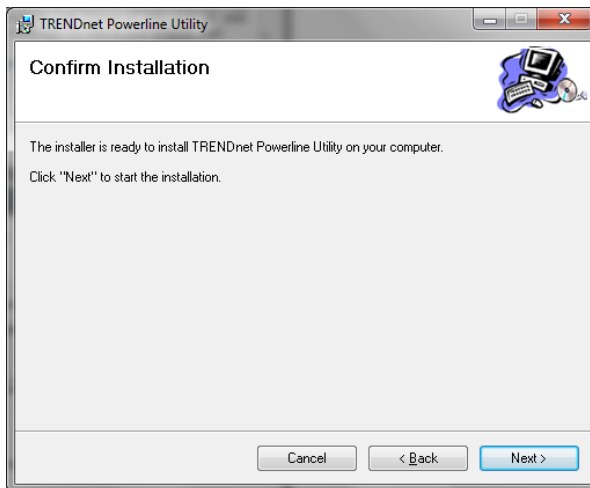
10. In the License Agreement window, check the radio button *I Agree*, and then click *Next*.



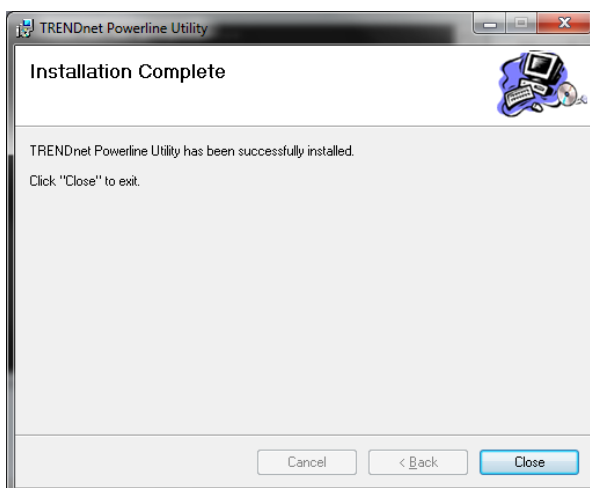
11. In the Select Installation Folder window, click *Next*.



12. In the *Confirm Installation* window, click *Next*.



13. At the Installation Complete window, click *Close*.



5.2 Using the Utility

Double-click the desktop icon to open the Powerline Configuration Utility application.



Local Device
The closest powerline adapter(s) that connects your computer to the electrical system.

Remote Devices
Powerline adapters that are connected to the selected Local Device across the electrical system.

Privacy Tab
Change the Network Name/Security Key

Upgrade Firmware
Upgrade the firmware of the Local Device

Rename
Rename the selected Remote Device

Enter Password
Enter the Device Password (DPW) for the selected Remote Device

Add
Add a Remote Device that was not detected

Scan
Scans for Remote Devices that were not detected

Close
Closes the utility application.

The screenshot shows the 'TRENDnet Powerline Utility' window with the following details:

- Menu bar: Main | Privacy | Diagnostic | About
- Local Device(s) on your computer:

Device Type	MAC Address
HomePlug AV 6x00 D...	00:90:47:15:83:02
- Buttons: Connect, Upgrade Firmware
- 2 Powerline Devices detected: Network Type: Private, Autoscan On

Device Name	Password	Quality	Rate (Mbps)	MAC Address
Device 6			?	00:70:28:64:12:2D
Device 5	LCHN-ZHDE-VGT...		184.00	00:90:47:15:82:DD
- Buttons: Rename, Enter Password, Add, Scan, Close

- To apply changes to Remote Devices through the Powerline Configuration Utility, you must enter the Device Password (DPW) for each Remote Device located on the Device Label.
- If you have not already done so, please write down the 16-digit Device Password (DPW) and corresponding MAC Address of each TRENDnet HomePlug® AV powerline adapter as this will be used to input into the utility. This is located on the Device Label, please refer to Section 1.3.

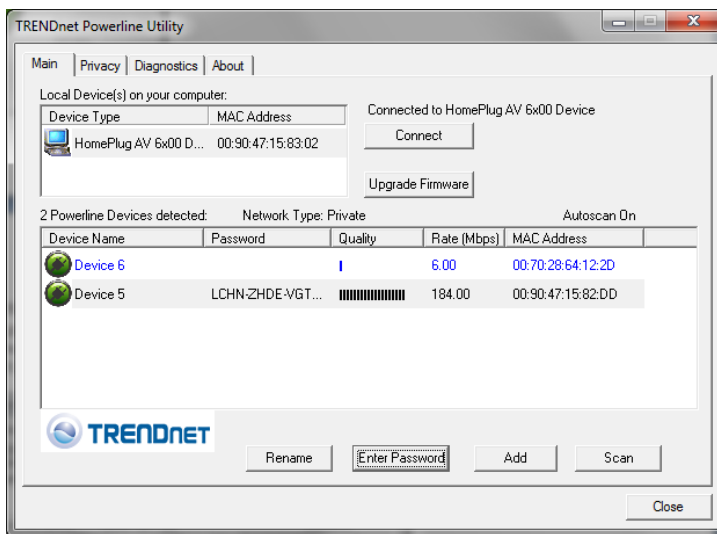
Enter the 16-digit Device Password (DPW) for each Remote Device in the utility

1. Click one of the Remote Devices in the list.
2. Click *Enter Password*.
3. Type in the Device Password according to the corresponding MAC address. Then click *OK*.



- If successful, the Remote Device will have the Device Password listed next to the device under Password.

Note: If the incorrect Device Password is entered, you will receive an error message. Click *Enter Password* and try entering the password again.



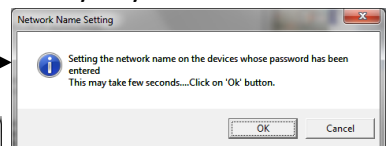
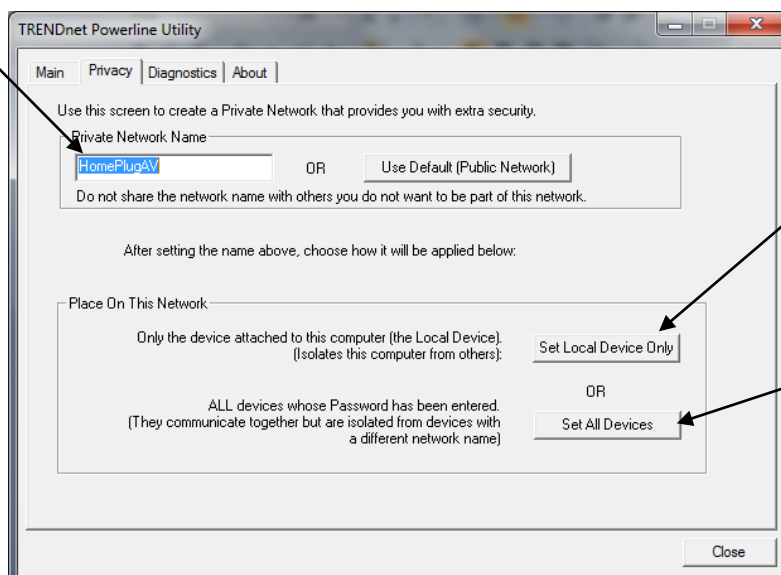
- Repeat steps 1-4 for any remaining Remote Devices.
- Once all of the Device Passwords (DPW) are entered into the utility, changes can be applied to the Remote Devices using the utility.

Change the Network Name/Security Key for multiple adapters using the utility

- Click the *Privacy* tab.
- Under *Private Network Name*, enter the desired network name/security key and click *Set All Devices*.
- At the Network Name Setting prompt window, click *OK*.

The current network name/security key assignment of the powerline adapter(s).

Note: If you had previously used the Sync button procedure in generating a random network name/security key. This will display "Unknown Networkname"



Applies changes to Local Device only.

Note: If you choose this option, you will disconnect the Local Device from the Remote Devices.

Applies changes to Local Device and Remote devices.

Note: If you have not entered the DPW for all remote devices, you will receive an error and the changes will not be applied to remote devices without a DPW.

Chapter 6: Troubleshooting

Powerline

Please reference the items below if you continue to experience difficulty with installing and using your TPL-401E 500Mbps Powerline AV Adapter.

- Try power cycling the unit by unplugging it from the wall power outlet for 15 seconds and plugging it back in.
- If the PL LED is red indicating good quality only, try plugging the TPL-401E into another available wall power outlet to check if you can obtain better connection quality.
- Use a pin or paperclip and push and hold the Reset button for 1 second on each TPL-401E powerline adapter. All LEDs will turn off and turn back on. This will reset the TPL-401E powerline adapters to the default settings, network name/security key assignment "HomePlugAV".
- The TPL-401E can provide better connectivity and performance when plugged directly into the wall power outlet instead of a power strip or surge protector.
- Connecting the TPL-401E to a power strip or surge protector may degrade network performance or completely stop network signals.
- The TPL-401E should not be used on GFI protected outlets as some outlets will filter out powerline signals.
- The TPL-401E should not be used in areas with excessive heat.
- Certain florescent or incandescent lights are noise sources on the electrical and can degrade powerline performance.

If your building has more than one circuit breaker box, the TPL-401E may not be able to establish connectivity between different circuit breaker boxes. In this case, connect a TPL-401E powerline adapter to a power outlet located on each of the circuit breaker boxes, and then connect an Ethernet cable between the TPL-401E powerline adapters to bridge the two circuits together. This will allow the TPL-401E powerline adapters from different circuit breaker boxes connect to each other.

Wireless Installation Considerations

There are a number of factors that can impact the range of wireless devices.

1. Adjust your wireless devices so that the signal is traveling in a straight path, rather than at an angle. The more material the signal has to pass through the more signal you will lose.
2. Keep the number of obstructions to a minimum. Each obstruction can reduce the range of a wireless device. Position the wireless devices in a manner that will minimize the amount of obstructions between them.
3. Building materials can have a large impact on your wireless signal. In an indoor environment, try to position the wireless devices so that the signal passes through less dense material such as dry wall. Dense materials like metal, solid wood, glass or even furniture may block or degrade the signal.
4. Antenna orientation can also have a large impact on your wireless signal. Use the wireless adapter's site survey tool to determine the best antenna orientation for your wireless devices.
5. Interference from devices that produce RF (radio frequency) noise can also impact your signal. Position your wireless devices away from anything that generates RF noise, such as microwaves, radios and baby monitors.
6. Any device operating on the 2.4GHz frequency will cause interference. Devices such as 2.4GHz cordless phones or other wireless remotes operating on the 2.4GHz frequency can potentially drop the wireless signal. Although the phone may not be in use, the base can still transmit wireless signal. Move the phone's base station as far away as possible from your wireless devices.

If you are still experiencing low or no signal consider repositioning the wireless devices or installing additional access points. The use of higher gain antennas may also provide the necessary coverage depending on the environment.

Chapter 7: Specifications

Hardware	
Standards	IEEE 802.3, IEEE 802.3x, IEEE 802.3u, IEEE 802.11n, IEEE 802.11b, IEEE 802.11g, IEEE 802.11s, IEEE 802.1d, HomePlug® AV
Interface	1 x 10/100Mbps Auto-MDIX RJ-45 Port, Power prong
Powerline Frequency	2 ~ 28 MHz
Modulation	OFDM Symbol Modulation on link synchronization, 1024/256/64/8 - QAM, QPSK, BPSK, ROBO Carrier
Protocols	TDMA and ,CSMA/CA
Wired Speed	Powerline: Up to 200Mbps** Ethernet: Up to 200Mbps (Full Duplex mode)
Utility OS Compatibility	Windows 7 (32/64-bit), Vista (32/64-bit), XP(32/64-bit)
Nodes	Up to 64 (max.) Recommended: Up to 16* per powerline network
Overlapping Powerline Networks	Up to 4 (per electrical system)
Powerline Coverage	Up to 300m (984ft.)
Powerline Security	128-bit AES (Advanced Encryption Standard)
LED	Power (PWR), Ethernet Link/Act (ETH), Wireless (WLAN) Powerline (PL) with Connection Quality Indication <ul style="list-style-type: none"> • Best (Green) • Better(Amber) • Good (Red)
Power Switch	On/Off power switch
Buttons	Sync, WPS, Reset
Dimension (L x W X H)	A: 103 x 81 x 66 mm (4.1 x 3.2 x 2.6 in.) EU: 103 x 81 x 81 mm (4.1 x 3.2 x 3.2 in.)
Weight	A: 266 g (9.4 oz) EU: 272 g (9.6 oz)
Power Source	A: 100~230V AC, 50~60Hz EU: 220~240V/ 5A AC, 50Hz
Consumption	8.4 Watts (max.)
Temperature	Operating: 0° ~ 40°C (32° ~ 104°F) Storage: -10° ~ 70°C (14° ~ 158°F)
Humidity	Max. 90% (non-condensing)
Certifications	CE, FCC

Wireless	
Modulation	OFDM with BPSK, QPSK, 16QAM, and 64QAM
Access Point Modes	Access Point (AP) Access Point (AP) Client (wireless adapter) Wireless Distribution System (WDS) Wireless Distribution System (WDS) with Access Point (AP) Mesh Mesh with Access Point (AP) Repeater (using AP mode only)
Frequency Band	2.412GHz ~ 2.472GHz
Data Rate***	802.11b: 1,2,5.5, and 11Mbps 802.11g: 6,9,12,18,24,36,48 and 54Mbps 802.11n: up to 300 Mbps
Security	64/128-Bit WEP (HEX & ASCII), WPA/WPA2 RADIUS, WPA/WPA2-PSK
Antenna	2 x 2dBi internal printed dipole antennas
Channel	2.4GHz: 1~11 (FCC), 1~13 (ETSI)
Output Power	16dBm typically @ 802.11b 14dBm typically @ 802.11g 13dBm typically @ 802.11n
Receiver Sensitivity	802.11n Typical -68 dBm 802.11g Typical -73 dBm 802.11b Typical -84 dBm

* Maximum of 16 adapters (nodes) recommended for streaming video across your network. Additional adapters may decrease performance.

** 200Mbps is the maximum theoretical Powerline data rate. Actual throughput will vary depending on environment.

***Maximum wireless signal rates are referenced from IEEE 802.11 theoretical specifications. Actual data throughput and coverage will vary depending on interference, network traffic, building materials and other conditions.

**** Networked Powerline devices need to be plugged into power outlets that are on the same electrical system.

*****It is not recommended to use this product on electrical systems that use AFCI circuit breakers or plugged into GFI protected outlets as this may cause performance degradation or loss in connectivity.

Limited Warranty

TRENDnet warrants its products against defects in material and workmanship, under normal use and service, for the following lengths of time from the date of purchase.

TPL-310AP – 3 Years Warranty

AC/DC Power Adapter, Cooling Fan, and Power Supply carry 1 year warranty.

If a product does not operate as warranted during the applicable warranty period, TRENDnet shall reserve the right, at its expense, to repair or replace the defective product or part and deliver an equivalent product or part to the customer. The repair/replacement unit's warranty continues from the original date of purchase. All products that are replaced become the property of TRENDnet. Replacement products may be new or reconditioned. TRENDnet does not issue refunds or credit. Please contact the point-of-purchase for their return policies.

TRENDnet shall not be responsible for any software, firmware, information, or memory data of customer contained in, stored on, or integrated with any products returned to TRENDnet pursuant to any warranty.

There are no user serviceable parts inside the product. Do not remove or attempt to service the product by any unauthorized service center. This warranty is voided if (i) the product has been modified or repaired by any unauthorized service center, (ii) the product was subject to accident, abuse, or improper use (iii) the product was subject to conditions more severe than those specified in the manual.

Warranty service may be obtained by contacting TRENDnet within the applicable warranty period and providing a copy of the dated proof of the purchase. Upon proper submission of required documentation a Return Material Authorization (RMA) number will be issued. An RMA number is required in order to initiate warranty service support for all TRENDnet products. Products that are sent to TRENDnet for RMA service must have the RMA number marked on the outside of return packages and sent to TRENDnet prepaid, insured and packaged appropriately for safe shipment. Customers shipping from outside of the USA and Canada are responsible for return shipping fees. Customers shipping from outside of the USA are responsible for custom charges, including but not limited to, duty, tax, and other fees.

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