

POWERLINE WIRELESS N EXTENDER

User's Manual

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1. IMPORTANT INFORMATION

1.1 IMPORTANT SAFETY NOTES

The Device is intended for connection to the AC power line. For installation instructions, refer to the Installation section. The following precautions should be taken when using this product.

- ◆ Please read all instructions before installing and operating this product.
- ◆ Please keep all instructions for later reference.
- ◆ Please follow all warnings and instructions marked on the product.
- ◆ For safety reason, when device is being powered on, this product should NOT be installed in any electric socket which makes the surface with venting holes on the product to face downward (facing the floor).
- ◆ Unplug the Powerline device from the wall outlet before cleaning. Use a dry cloth for cleaning. DO NOT use liquid cleaners or aerosol cleaners.
- ◆ DO NOT operate this product near water.
- ◆ This product should never be placed near or over a radiator, or heat register.
- ◆ This product relies on the building's electrical installation for short-circuit (over current) protection.
- ◆ DO NOT allow anything to rest on the product interconnect plug. DO NOT locate this product where people may walk on the cords.
- ◆ Because this product sends data over the power line, it is recommended that you plug directly into a power outlet. Do not plug the Device into a UPS or power strip with surge protection. The product has its own power filter for protection against surges.
- ◆ Only a qualified technician should service this product. Opening or removing covers may result in exposure to dangerous voltage points or other risks.
- ◆ Unplug the product from the wall outlet and refer the product to qualified service personnel for the following conditions:
 - When the interconnect cords are damaged or frayed.
 - If liquid has been spilled into the product.
 - If the product has been exposed to rain or water.
 - If the product does not operate normally when the operating instructions are followed.
 - If the product exhibits a distinct change in performance.

1.2 FEDERAL COMMUNICATIONS COMMISSION INTERFERENCE STATEMENT

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

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

CAUTION:

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

Labeling Requirements

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.

RF Exposure Warning

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Canada, Industry Canada (IC) Notices

This Class B digital apparatus complies with Canadian ICES-003 and RSS-210. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the Device.

Radio Frequency (RF) Exposure Information

The radiated output power of the Wireless Device is below the Industry Canada (IC) radio frequency exposure limits. The Wireless Device should be used in such a manner such that the potential for human contact during normal operation is minimized.

This device has also been evaluated and shown compliant with the IC RF Exposure limits under mobile exposure conditions. (antennas are greater than 20cm from a person's body).

Canada, avis d'Industry Canada (IC)

Cet appareil numérique de classe B est conforme aux normes canadiennes ICES-003 et RSS-210. Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférence et (2) cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.

Informations concernant l'exposition aux fréquences radio (RF)

La puissance de sortie émise par l'appareil de sans fil est inférieure à la limite d'exposition aux fréquences radio d'Industry Canada (IC). Utilisez l'appareil de sans fil de façon à minimiser les contacts humains lors du fonctionnement normal.

Ce périphérique a également été évalué et démontré conforme aux limites d'exposition aux RF d'IC dans des conditions d'exposition à des appareils mobiles (les antennes se situent à moins de 20 cm du corps d'une personne).

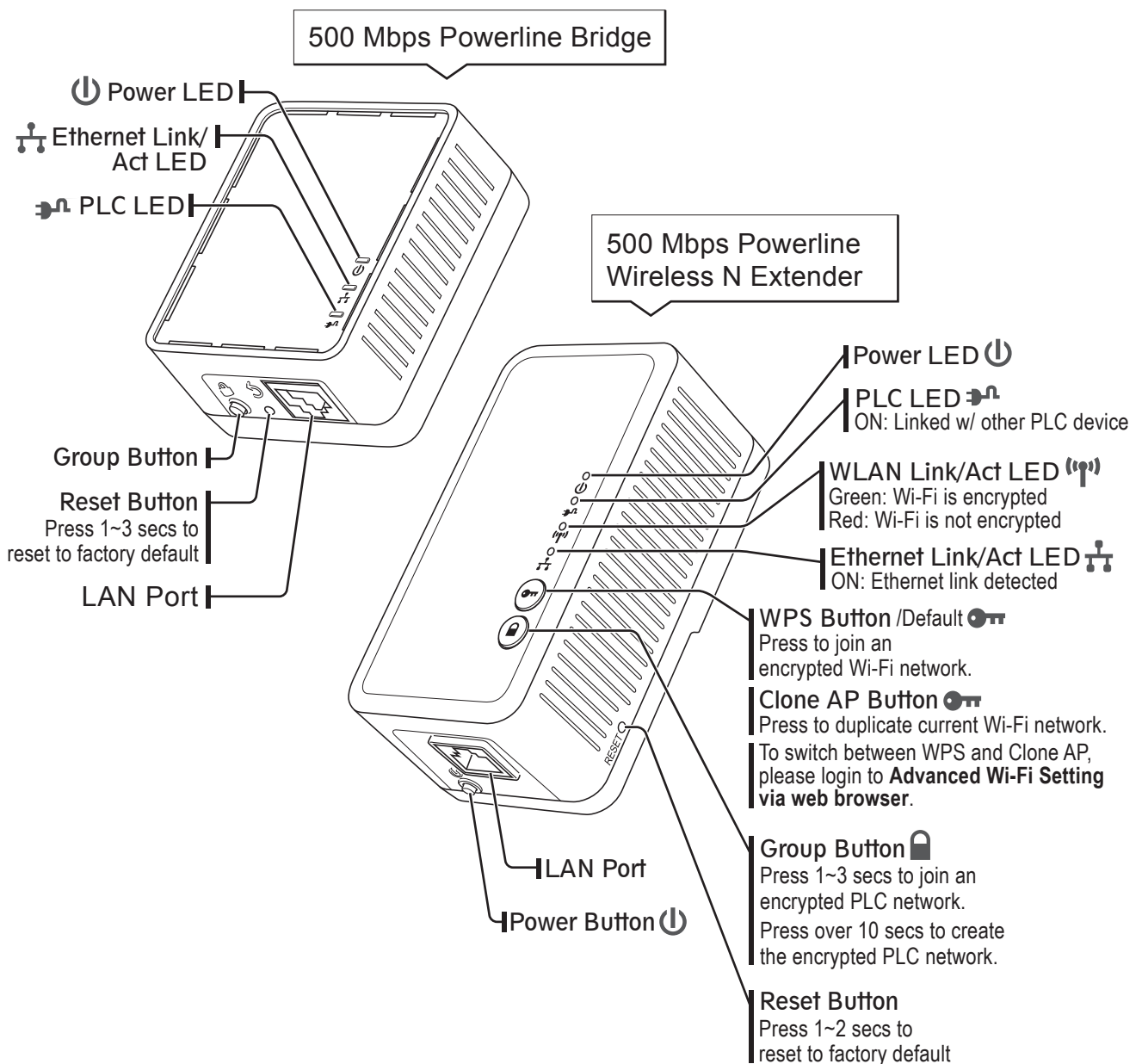
2. INTRODUCTION

2.1 PACKAGE CONTENT

Before starting the installation of the Device, please make sure the package contains the following items:








2.2 PRODUCT OVERVIEW











2.3 BUTTONS AND LEDS

500 Mbps Powerline Bridge

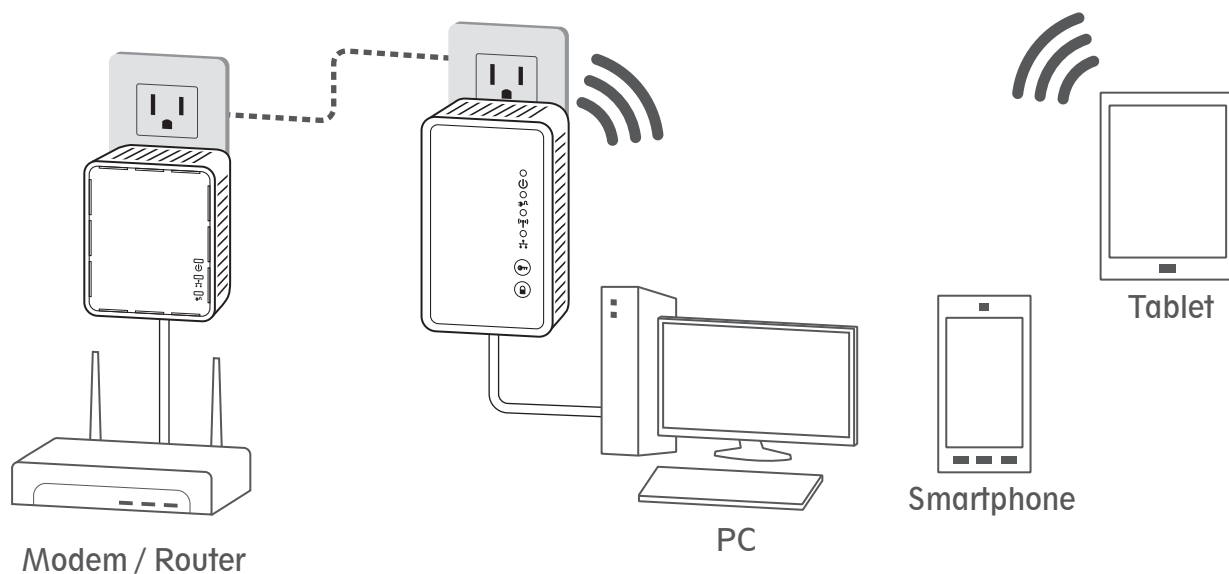
1	 Ethernet Link / Act LED	ON: Ethernet connection detected. Blinking: Network traffic in transaction. OFF: No Ethernet connection detected.
2	 Power LED	ON: Power on and ready. Blinking: PLC group pairing. OFF: Power off.
3	 PLC LED	ON: PLC connection detected. Blinking: 1. Fast: Powerline data rate > 60Mbps 2. Normal: 60Mbps > Powerline data rate > 10Mbps 3. Slow: 10Mbps > Powerline data rate OFF: No PLC connection detected. (They are too far to communicate or it is alone in its logical network).
4	 Group Button	Press 10 seconds: Randomly generate a new PLC network group name. Press 2 to 3 seconds: Start paring with the other PLC device. Paring procedure keeps for 2 minutes or ends automatically when they are paired. It can be stopped manually by pressing the button for 2 to 3 seconds again.
5	 Reset Button	Press 1 second: Reset to factory default setting. Press the button when the Device is powered (not in standby mode)

500 Mbps Powerline Wireless N Extender

A	 Ethernet Link / Act LED	ON: Ethernet connection detected. Blinking: Network traffic in transaction. OFF: No Ethernet connection detected.
B	 Power LED	ON: Power on and ready. Blinking: PLC group pairing. OFF: Power off.
C	 PLC LED	ON: PLC connection detected. Blinking: 1. Fast: Powerline data rate > 60Mbps 2. Normal: 60Mbps > Powerline data rate > 10Mbps 3. Slow: 10Mbps > Powerline data rate OFF: No PLC connection detected. (They are too far to communicate or it is alone in its logical network).
D	 WLAN Link / Act LED	Steady Green: Wi-Fi network with security protection. Flash Green: Wi-Fi network traffic in transaction with security protection. Steady Red: Wi-Fi network without security protection. Flash Red: Wi-Fi network traffic in transaction without security protection. Blinking Green (0.5 sec ON / 0.5 sec OFF): WPS negotiation. OFF: Wi-Fi disabled.
E	 Group Button	Press 10 seconds: Randomly generate a new PLC network group name. Press 2 to 3 seconds: Start paring with the other PLC device. Paring procedure keeps for 2 minutes or ends automatically when they are paired. It can be stopped manually by pressing the button for 2 to 3 seconds again.
F	 Reset Button	Press 1 second: Reset to factory default setting. Press the button when the Device is powered (not in standby mode)
G	 WPS / Clone AP button	WPS / Clone AP negotiation.
H	 Power Button	Push to power on/off the Device.

3. HARDWARE INSTALLATION

3.1 ESTABLISH POWERLINE NETWORK



Step 1

Plug the PLC adapter to AC outlet and connect to router or broadband modem with an Ethernet cable (provided)

Step 2

Plug the PLC Wi-Fi Extender to AC outlet and place it in a location you wish to extend Wi-Fi access.

Step 3

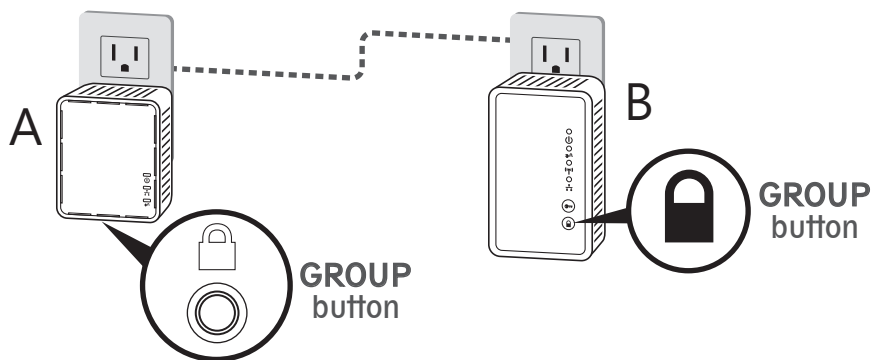
Search Wi-Fi network and connect it with (WPA-PSK) default password.*

* The default Wi-Fi password appears on the product label.

4. ENCRYPTED PLC NETWORK

4.1 CREATE AN ENCRYPTED PLC NETWORK GROUP

User can easily create an encrypted PLC network with 128-bit encryption for network security and data protection. Simply press **GROUP** button on adapters to set up hassle-free PLC encrypted network. To do so, please follow below steps!



Step 1

Press **GROUP** button on both adapters over 10 secs until LED light turns off and on at once to generate new encrypted PLC network. (PLC LED light will be off)

Step 2

Press **GROUP** button of adapter A again for 1~3 sec to start pairing procedure. (Power LED will start blinking)

Step 3

Press **GROUP** button of adapter B for 1~3 sec to start pairing procedure. (Power LED will start blinking)
Once Pairing procedure is completed, both of PLC LED light will be on.

4.2 JOIN TO AN ENCRYPTED PLC NETWORK GROUP

Simply follow step 1 to generate new PLC group name for PLC adapter. Afterward, follow step 2, 3 to join into the current encrypted PLC network.

4.3 REMOVE DEVICE FROM AN EXISTING NETWORK GROUP

If you would like to remove powerline device from an existing network group, you can generate a new group name (referring to Step 1) to stop communication with an existing network group.

4.4 CREATE ADDITIONAL ENCRYPTED NETWORK

If you want to create additional private network for your powerline devices that co-existence with your existing powerline private network group, please repeat the **Step 1 & 2** to generate new private network group for selected powerline devices.

P.S. Users can press the RESET button to reset the network name back to its factory default.

5. ADVANCED Wi-Fi SETTINGS VIA WEB BROWSER

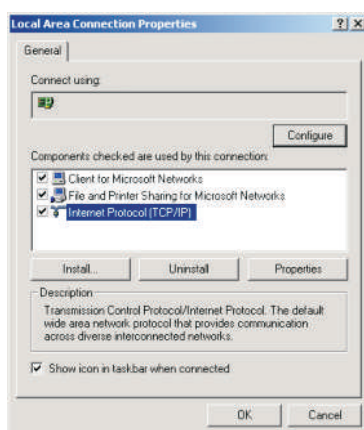
5.1 LOGIN TO SETTING PAGE

Default user name: **root**
Default password: **root**

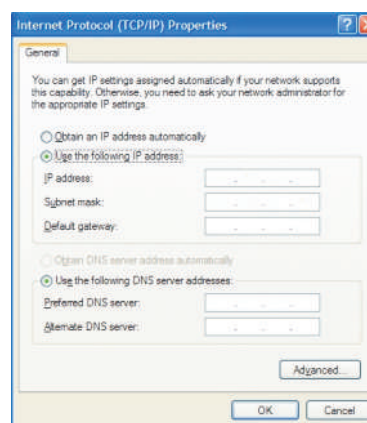
To setup advanced Wi-Fi features such as **SSID or password**, please connect to PLC Wireless N Extender via Ethernet or wireless connection, and login to setting page through web browser.

Before login to the setting page, PC or mobile device should be in the same subnet as this device. To do so, please manually change PC or mobile's IP address.

PC



Go to **Network Connections - Local Area Connection - Connection Status** and choose the **Internet Protocol (TCP/IP)** and click on **Properties**.



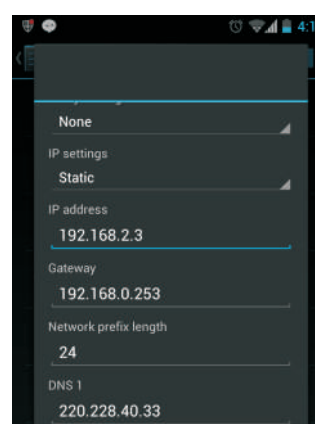
Enter IP address such as **192.168.2.XXX** (XXX can be set from 1-128) and click OK

Mobile device | iOS



Go to **Settings - Wi-Fi - Selected SSID - advanced settings**, then click on **Static** to enter IP address such as **192.168.2.XXX**. (XXX can be set from 1-128) and Subnet Mask **55.255.255.0**

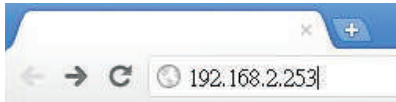
Mobile device | Android



Go to **Settings - Wi-Fi - press & hold Selected SSID** to modify network - then click on **Show advanced options**. Click **IP settings** to choose **Static** to enter address such as **192.168.2.XXX**. (XXX can be set from 1-128)

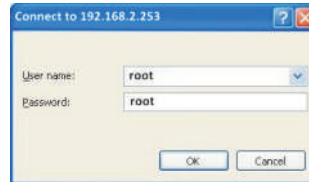
Step 1

Running Web browser and type the IP address of this device **192.168.2.253**



Step 2

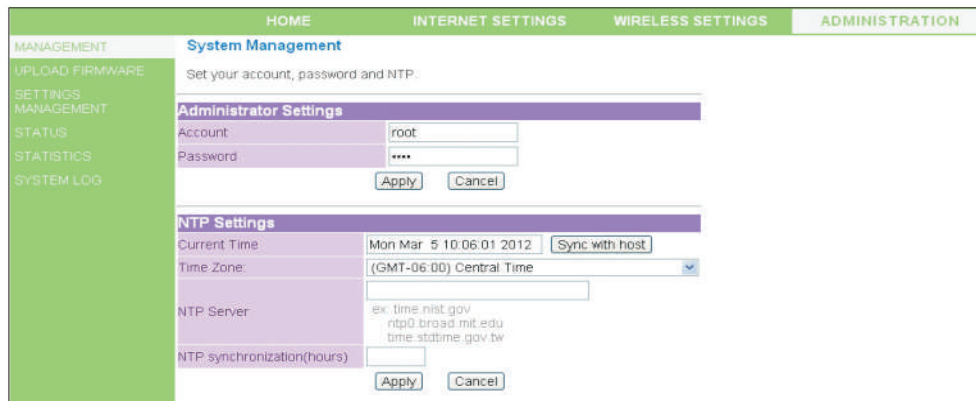
When see the login window, enter **root** in both user name and password fields.



Note: you can change user name and password in **Administration** tab.

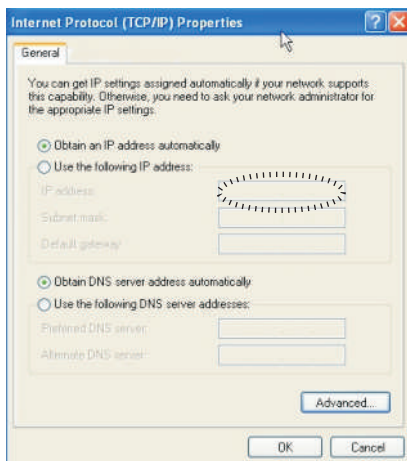
Step 3

The Powerline Wireless N Extender setting page will show up after successfully login.



Note: **After** the setup process is completed, **DO NOT** forget to set the PC or mobile device's IP address back to the original settings (DHCP) for web surfing.

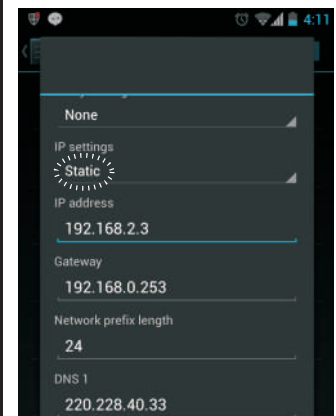
PC



Mobile device | iOS



Mobile device | Android



5.2 DUPLICATE CURRENT SSID & PASSWORD WITH ONE BUTTON

To switch between WPS and Clone AP, please login to **Advanced Wi-Fi Setting via web browser**.

HOME INTERNET SETTINGS **WIRELESS SETTINGS** ADMINISTRATION

BASIC
ADVANCED
SECURITY
WPS
SITE SURVEY
MAC FILTER

Wi-Fi Protected Setup

You could setup security easily by WPS through PBC or PIN. WPS will be available only with the two conditions: WPA-PSK, WPA2-PSK or WPAWPA2-PSK is set, and Hidden SSID is disabled.

WPS Config

WPS: ☒ Enable ☐ Disable

Apply

WPS Summary

WPS SSID:
WPS Auth Mode:
WPS Encryp Type:
AP PIN: 08558121

WPS Progress

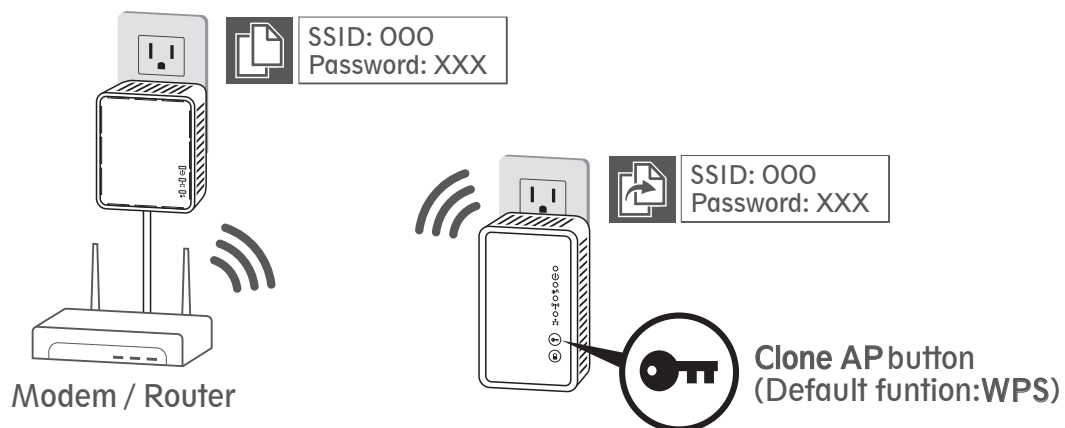
Operation Mode: ☒ **AP Clone** ☐ WPS

Apply

WPS Status

WPS Idle.

Simply press **Clone AP** button to duplicate your current Wi-Fi SSID and password.



Step 1

Press **Clone AP** button* on the extender and Wi-Fi LED will start blinking.

Step 2

Press **WPS** button on the router** and Powerline Wi-Fi extender will duplicate current Wi-Fi SSID and password from the router. The extender will reboot once procedure is completed.

*Make sure WPS button has been switched to Clone AP button via web browser.

Make sure router is **WPS supported.

6. SPECIFICATIONS

500 Mbps Powerline Bridge

Chipset	AR7420
Supported Protocols	LAN: 10/100 Base-TX PLC: HomePlugAV 1.1, IEEE 1901
Data Transfer Rate (PHY/TCP/UDP)	PHY Rate: up to 500Mbps TCP Rate: up to 95Mbps UDP Rate: up to 95Mbps
Frequency Band	2~28 MHz, 30~68 MHz
Security encryption	128-bit AES w/ Key management
Ethernet Port	1-port 10/100 Ethernet
Operating Temperature	0~40°C
Operating Relative Humidity	10~85% non-condensing
Power Supply	100 - 240 VAC, 50/60 Hz
Power Consumption	Full Load < 2.4W Standby Mode < 0.5W
Electrical Plug Type	Custom
Dimension (L x W x H)	67.5 x 56 x 31 mm
PLC Modulation	OFDM (QAM 8/ 16/ 64/ 256/ 1024/ 4096, QPSK, BPSK, ROBO)
QoS (Quality of Service)	Yes
Max IGMP based IPTV streams	up to 16
Transmission Distance	AC wiring: up to 300 meters
Maximum Supported Devices in a network group (Active/Total)	8/16
Regulation	FCC, CE, CE-LVD, RoHS, Erp/Eup

500 Mbps Powerline Wireless N Extender

Chipset	AR7420 + AR9331
Supported Protocols	WLAN: IEEE 802. 11 b/g/n PLC: HomePlug AV 1.1 LAN: 10/100 Based-TX Ethernet
Data Transfer Rate (PHY/TCP/UDP)	WLAN to Ethernet: up to 93 Mbps WLAN to PLC: up to 90 Mbps PLC to Ethernet: up to 95 Mbps (TCP)
Frequency Band	WLAN: 2.4~2.4835 GHz PLC: 2~28 MHz, 30~68 MHz
Security encryption	WLAN: WPS and PIN code, WPA-PSK, WPA2-PSK PLC: 128-bit AES
Ethernet Port	1-port 10/100 Ethernet
Operating Temperature	0~40 °C
Operating Relative Humidity	10~85% non-condensing
Power Supply	100 - 240 VAC, 50/60 Hz
Power Consumption	Full Load < 6W Off Mode < 0.5W
Electrical Plug Type	Custom
Dimension (L x W x H)	105 x 56 x 46 mm
PLC Modulation	OFDM (QAM 8/ 16/ 64/ 256/ 1024/ 4096, QPSK, BPSK, ROBO)
QoS (Quality of Service)	Yes
Max IGMP based IPTV streams	up to 16
Transmission Distance	AC wiring: up to 300 meters
Maximum Supported Devices in a network group (Active/Total)	8/16
Regulation	FCC, CE, CE-LVD, RoHS, NCC