

*Wireless 150N Dual Band  
Concurrent Repeater*

*User Manual*

**Version: 1.0a**

**(Aug, 2012)**

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# Federal Communication Commission Interference Statement

## FCC Part 15

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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:

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

## FCC Caution

This equipment must be installed and operated in accordance with provided instructions and a minimum 20 cm spacing must be provided between computer mounted antenna and person's body (excluding extremities of hands, wrist and feet) during wireless modes of operation.

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.

Any changes or modifications not expressly approved by the party responsible for compliance could void the authority to operate equipment.

**Federal Communication Commission (FCC) Radiation Exposure Statement**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm (8 inches) during normal operation.

The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The equipment version marketed in US is restricted to usage of the channels 1-11 only.

**For operation within 5.15 ~ 5.25GHz frequency range, it is restricted to indoor environment.**

# **R&TTE Compliance Statement**

This equipment complies with all the requirements of DIRECTIVE 1999/5/EC OF THE EUROPEAN PARLIAMENT AND THE COUNCIL of March 9, 1999 on radio equipment and telecommunication terminal Equipment and the mutual recognition of their conformity (R&TTE).

The R&TTE Directive repeals and replaces in the directive 98/13/EEC (Telecommunications Terminal Equipment and Satellite Earth Station Equipment) As of April 8, 2000.

## **Safety**

This equipment is designed with the utmost care for the safety of those who install and use it. However, special attention must be paid to the dangers of electric shock and static electricity when working with electrical equipment. All guidelines of this and of the computer manufacture must therefore be allowed at all times to ensure the safe use of the equipment.

## **EU Countries Intended for Use**

The ETSI version of this device is intended for home and office use in Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

The ETSI version of this device is also authorized for use in EFTA member states: Iceland, Liechtenstein, Norway, and Switzerland.

## **EU Countries Not intended for use**

None.



# CATALOG

<b>Chapter I: Product Information</b> .....	<b>1</b>
1-1 Introduction and safety information .....	1
1-2 Safety Information .....	2
1-3 System Requirements .....	3
1-4 Package Contents .....	4
1-5 Familiar with your new wireless repeater.....	5
<b>CHAPTER II: Setup your Repeater</b> .....	<b>8</b>
2-1 Quick Installation Guide.....	8
2-1-1 Hardware WPS button setup .....	9
2-1-2 Web browser quick setup .....	11
2-2 Advanced setup.....	16
2-2-1 WPS Setting .....	16
2-2-2 Advance Settings .....	16
<b>Chapter X: Appendix</b> .....	<b>20</b>
5-1 Configuring TCP/IP on PC .....	20
5-1-1 Windows XP IP address setup: .....	20
5-1-2 Windows Vista/Windows 7 IP address setup: .....	21
5-2 Specification .....	24
5-3 Glossary .....	26

## **Chapter I: Product Information**

### **1-1 Introduction and safety information**

Thank you for purchasing this mini 802.11a/b/g/n wireless repeater! The ultra-compact design with power built-in allows you to install this repeater everywhere, and the dual-band wireless providing excellent network performance to extend the Wi-Fi signal and wireless coverage.

*Other features of this wireless repeater including:*

- Extend the wireless signal inside your home or office.
- Ultra-compact design while maintaining excellent network performance.
- Dual-band provide user to the best compatibility to the wireless router.
- LED signal indicator to easily realize the best location placement to extend WiFi signal and secure better wireless performance.
- The device can support Repeater mode and AP client mode
- WPS (Wi-Fi Protected Setup) hardware button for easy installation and secure wireless security.

## **1-2 Safety Information**

In order to keep the safety of users and your properties, please follow the following safety instructions:

1. This wireless repeater is designed for indoor use only. **DO NOT** expose this device to direct sun light, rain, or snow.
2. **DO NOT** put this at or near hot or humid places, like kitchen or bathroom. Also, do not left this Wireless repeater in the car in summer.
3. Do not allow kids to put any small parts of this wireless repeater in their mouth, and it could cause serious injury or could be fatal. If they throw this wireless repeater, it will be damaged. **PLEASE KEEP THIS WIRELESS REPEATER OUT THE REACH OF CHILDREN!**
4. This Wireless repeater will become hot when being used for long time (***This is normal and is not a malfunction***). **DO NOT** put the Wireless repeater on a paper, cloth, or other flammable objects after the Wireless repeater has been used for a long time.
5. There's no user-serviceable part inside the Wireless repeater. If you found that the Wireless repeater is not working properly, please contact your dealer of purchase and ask for help. **DO NOT** disassemble the Wireless repeater by yourself, warranty will be void.
6. If the Wireless repeater falls into water, **DO NOT USE IT AGAIN BEFORE YOU SEND THE CARD TO THE DEALER OF PURCHASE FOR INSPECTION.**

## **1-3 System Requirements**

- Wireless network card which is compatible with 802.11b/g/n or 802.11a/b/g/n wireless network standard.
- Windows 2000, 2003, XP, Vista, or Windows 7 operating system
- CD-ROM drive
- At least 100MB of available disk space

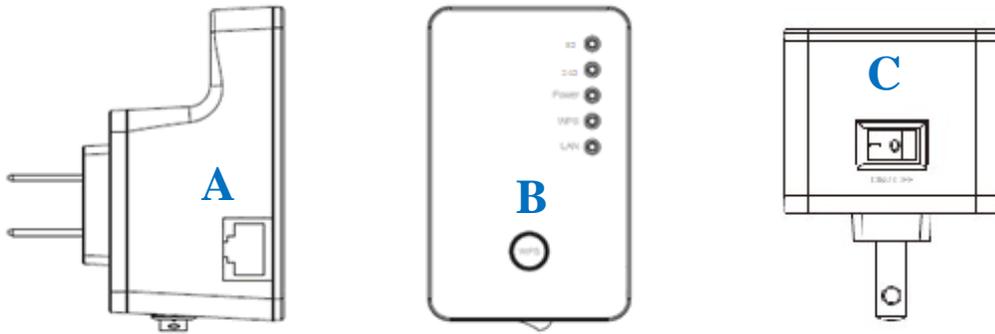
## 1-4 Package Contents

Before you start to use this wireless repeater, please check if there's anything missing in the package, and contact your dealer of purchase to claim for missing items:

- Wireless Repeater (1 pcs) ..... 1
- Quick Installation Guide (1 pcs) ..... 2
- User Manual CDROM (1 pcs) ..... 3

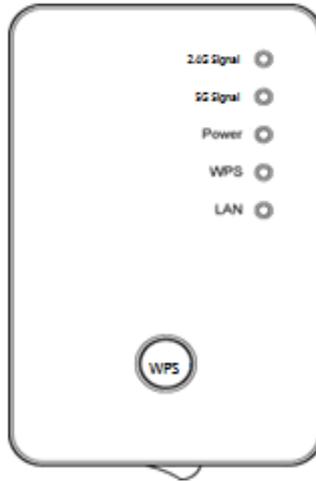
## 1-5 Familiar with your new wireless repeater

### *Interface Descriptions*



Item	Item Name	Description
A	LAN	10/100Mbps Ethernet LAN Port with Auto-MDI/MDI-X. Connecting to computer, switch or hub for local network sharing.
B	WPS / Reset button	This button support 2 functions: 1. Hold the button 2 seconds to start WPS function 2. Hold the button 10 seconds to reset all the values to the factory default.
C	ON/OFF switch	If you want to switch off the repeater, switch it to Off mode.

## LED Definitions



LED	Color	LED Status	Description
2.4G Signal	Amber	Steady ON	Good signal reception (signal strength 100%~50%).
		Blinking	Normal signal reception Slow blinking (50%~25%)
			Poor signal reception Quick blinking (<25%)
Off	Wireless network is switched off/ or LED off mode.		
5G Signal	Amber	Steady ON	Good signal reception (signal strength 100%~50%).
		Blinking	Normal signal reception Slow blinking (50%~25%)
			Poor signal reception Quick blinking (<25%)
Off	Out of signal or disconnected/ or LED off mode.		
Power	Green	Steady ON	Power is turned on. In LED off mode. (except power LED is on, other LEDs are off *)  <i>*If user selects to enable "LED OFF"</i>

			<i>mode”, power LED On/Off depends on user’s selection, user can select to leave only power LED on or turn off all LEDs including this power LED.</i>
		Slow Blinking	Ready for “Reset to factory default”, power LED is blinking.
		Off	power is turned off.
WPS	Green	Steady ON	When WPS connection is successful, turn on for 5 minutes.
		Blinking	WPS is in progress of waiting router’s connection, blinking (0.2 second on, 0.1 second off) for 2 minutes.
		Quick blinking	WPS error, blinking (0.1 second on, 0.1 second off)
		Off	NO WPS is in progress/ LED off mode
LAN	Green	Steady ON	LAN port is connected.
		Blinking	LAN port is active (transferring or receiving data).
		Off	LAN port is not connected/ or LED off mode

## CHAPTER II: Setup your Repeater

This repeater is your Wi-Fi range extender!

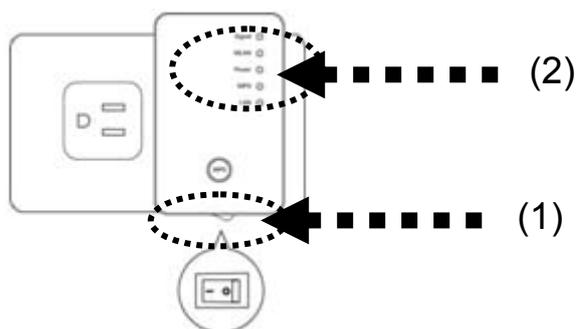
It can extend your wireless signal and coverage and help you to solve wireless dead zone problem.

This chapter will show you how to quickly install this device by using quick setup and web UI.

### 2-1 Quick Installation Guide

For the first time setup and easy installation, you can move this device close to the Wireless Broadband Router or wireless router you wish to connect, after installation done and wireless connection is built, you can move this repeater device to the place you wish to use.

Insert this device into power outlet on the wall, and switch wireless repeater's power switch to 'ON' (1). You should see '*Power*' LED light up in few seconds (2). If not, please check if the power outlet you're using is working.



You can build wireless connection via 'Hardware WPS button' or 'Web browser'.

If your wireless router supports 'WPS button', we recommend you to use WPS button to establish connection, it is the fast and secure way without computer.

**Using WPS button**

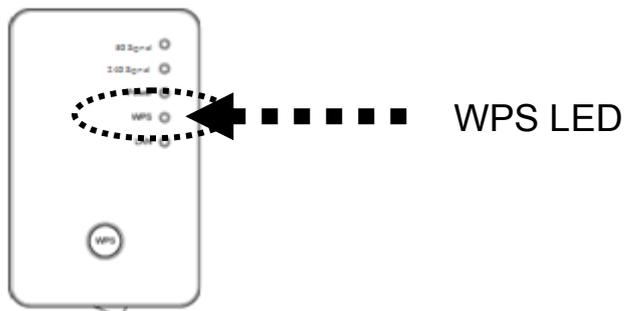
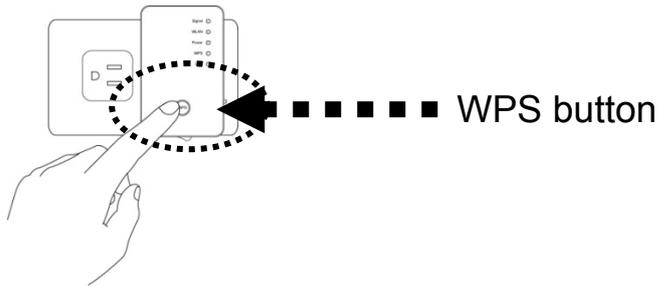
- please go to [section 2-1-1](#)

**Using Web browser**

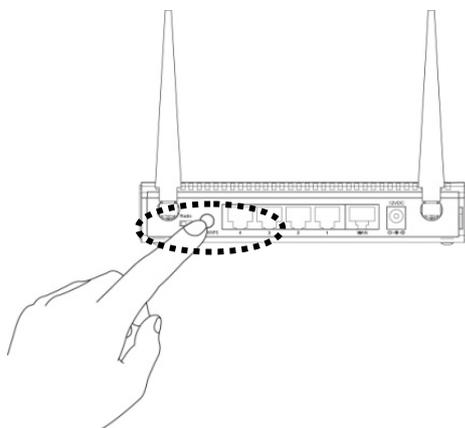
- please go to [section 2-1-2](#)

## 2-1-1 Hardware WPS button setup

(1) Press and hold **WPS button** on repeater for 2 seconds, '**WPS**' LED will start flashing.

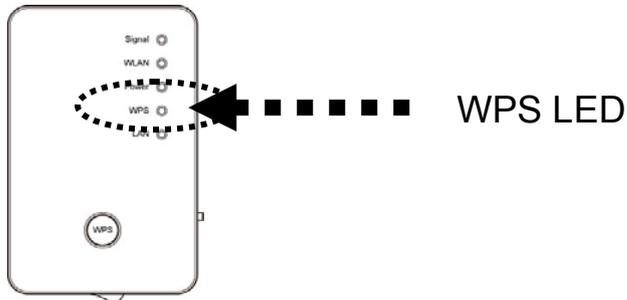


(2) Press **WPS button** on the wireless router you wish to connect within 2 minutes.

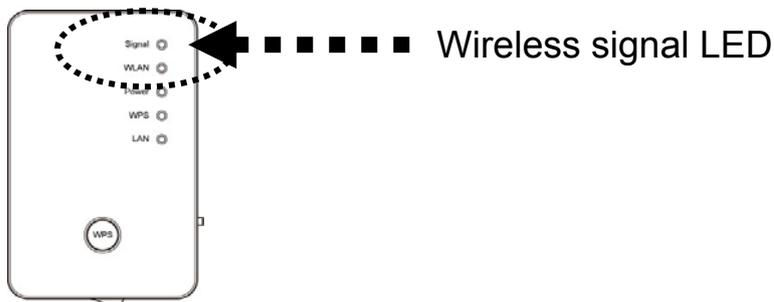


**NOTE: this WPS button position on wireless router is for example, different device may have different WPS button position.**

(3) If WPS connection is successfully established, '**WPS**' LED will light for 5 minutes; if '**WPS**' LED flashes fast, there's something error, please wait for 2 minutes until '**WPS**' LED off, and try from step(1) again.



When connection is created, the 5G or 2.4G signal LED will turn on.



(4) Please move repeater to the place you wish to use (a better place will be the center of your house) and insert this repeater into power outlet on the wall, the wireless connection will be established automatically. You can check "Wireless signal LED" status to understand signal reception level.  
Steady light: Excellent, Flash: Good, Fast flash: poor.

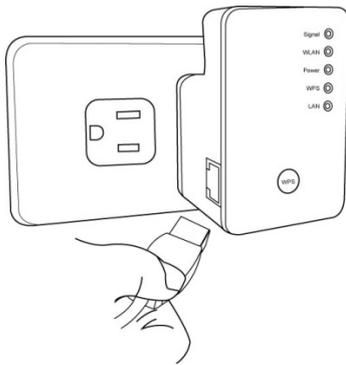
**NOTE: If the Signal LED is off, it means this place is out of the wireless signal of your wireless router, please move this repeater closer to wireless router until repeater device can receive signal from wireless router and extend its signal.**

The quick installation setup is completely done, you can refer to '2-2 Repeater mode Advanced Settings' to login in web UI for other advanced settings.

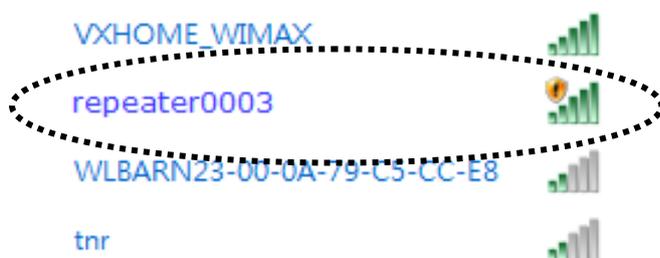
## 2-1-2 Web browser quick setup

Before you can connect to the repeater and start configuration procedures, your computer must be able to get an IP address automatically (use dynamic IP address). If it's set to use static IP address, or you're unsure, please refer to '[Chapter X: Appendix, 5-1 Configuring TCP/IP on PC](#)' to set your computer to use dynamic IP address.

(1) Use Ethernet cable to connect your computer's Ethernet port and wireless repeater's Ethernet port.



Or use your computer's wireless configuration utility to search for wireless router named '**repeater0003**' and get connected. (The default SSID of this repeater device is 'repeater0003', 0003 is an example, it is *the last 4 digits of device MAC number. Each device has different MAC number, please find it on your device label.*)



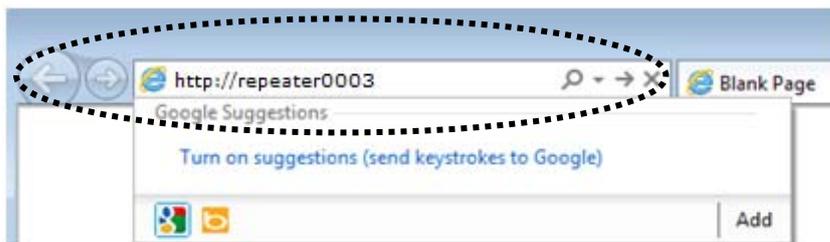
**NOTE: this default SSID 'repeater0003' is for example, different device may have different last 4 digits.**

If you are using wireless connection in Windows 7 and encountered the following screen, please click “Connect the network without setting it up” on the blue line then you can successfully link to repeater. Do NOT click “OK “.

In case you click ‘OK’, Windows 7 will ask for security key, please click “Cancel” to back to this page.

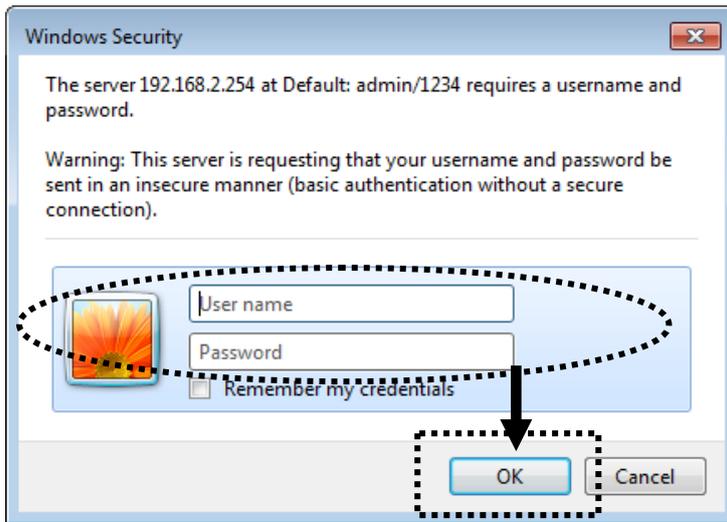


(2) Open web browser, it will redirect to web UI setting page.  
(or you can input the default IP address ‘http://repeater0003’ in address bar)



**NOTE: this ‘repeater0003’ is for example, 0003 is the last 4 digits of device MAC number. Each device has different MAC number, please find it on your device label.) You can also input default IP ‘http://192.168.2.254 instead of repeaterxxxx if your PC is not Windows OS.**

(3)Wireless repeater will prompt you to input username and password. Default username is ‘**admin**’ and password is ‘**1234**’. Click ‘OK’ button to continue.



(4) All wireless routers nearby will be displayed on the list. Select one wireless router you want to connect and click 'Next' button to continue. If the wireless router you wish to connect does not appear here, please click 'Refresh' until it appears on the list, or try to move wireless repeater closer to the wireless router you wish to connect.

**Quick Setup**

This quick setup helps you to install this repeater and build wireless connection. Please select one Access point (or WLAN Router) you want to connect and click "Next" button to continue. If the access point you wish to connect does not appear here, please click "Refresh" until it appears on the list, or try to move this repeater closer to the access point you wish to connect. Or you can input SSID manually when your access point is using hidden SSID.

Note: For the first time setup and easy installation, you can move this device close to the Access point you wish to extend wireless signal. After this installation is done and wireless connection is built, repeater's "Signal" LED will be enabled. You can check signal LED on the device to understand signal reception level. Steady light: Excellent, Flash: Good, Fast flash: poor, Off: out of signal.

Select Band	SSID	Channel	Encryption	Signal
<input type="radio"/> 5G	EdimaxHQ_5G	36	no	60
<input type="radio"/> 5G	25FDB46673BC39A632C7803166B0ACFB	36	WPA-PSK/WPA2-PSK	48
<input type="radio"/> 5G	454B922B428D28BE351CD62B18B8FECA	36	WPA-PSK	48
<input type="radio"/> 5G	001D73C383EB_A	40	no	47
<input type="radio"/> 5G	PA_Gavin_5G	48	WPA-PSK/WPA2-PSK	43
<input type="radio"/> 5G	PA_XX_N300DB(5.0G)	40	WPA2-PSK	42
<input checked="" type="radio"/> 5G	Owen-----5	36	WPA2-PSK	41
<input type="radio"/> 2.4G	11-CiscoA8446	1	no	41
<input type="radio"/> 2.4G	11g-2	1	no	41
<input type="radio"/> 2.4G	001D73C3384F_G	1	no	39
<input type="radio"/> 2.4G	6258GNL6666	1	WEP	36
<input type="radio"/> 2.4G	11g-3	1	WPA2-PSK	32
<input type="radio"/> 2.4G	logitec2nd54	7	no	30

Setup repeater manually 2.4G

Refresh Next

If you want to connect to a hidden wireless router, you can select to input SSID manually.

Setup repeater manually

SSID :

(5) You can select the connect frequency to wireless router by enable the option on the bottom of this page.

Setup repeater manually

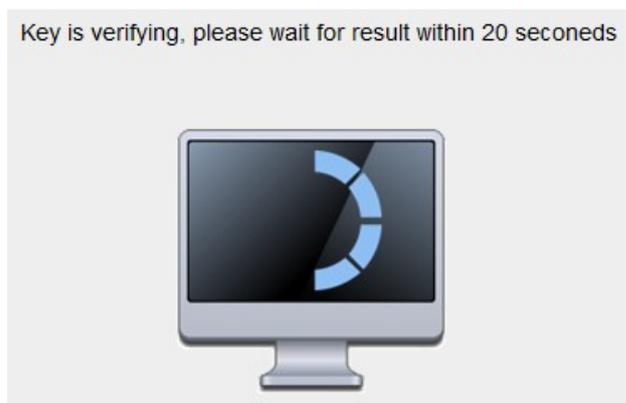
(6) You'll be prompted to input wireless router's wireless security key, input it in 'KEY' field and click 'Next' to continue.

**Security**

Please input wireless security key of your connected Access Point.

KEY :

(7) It will start to verify the wireless key with your associated wireless router and show you result within 20 seconds. Please follow the instruction to continue setup.



(8) When key is correct, wireless repeater will display the connection information for you.

'Device SSID' will be XXX\_YGre (XXX is the SSID of the wireless

router you connected, Y is the wireless band)

We recommend you to copy your 'firmware URL' (for example: <http://repeater.setup>) to you bookmark for quickly login into setting page next time.

**Save settings successfully!**

You may press CONTINUE button to continue configuring other settings or press APPLY button to restart the system to make the changes take effect.

Connected Access Point SSID : **VXHOME\_WIMAX**

Device SSID :

Security : **WPA-shared key**

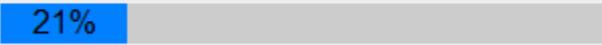
Add the URL to your bookmark(my favorite list): **http://repeater.setup**    
(we recommend you to save it for quick access to the Web setting page next time)

(Supports IE and Firefox only. Please add the access key to the bookmark manually if you use other browsers)

(9)Please wait for few seconds for wireless repeater to reboot.

**System Restarting! Please wait for a while !**

21%



(10) After reboot complete, you can close browser and use your computer to connect to this repeater by the SSID you set in last step and start using network.

**NOTE: After the wireless connection of this repeater and wireless router is built, repeater is DHCP client and will get IP address from wireless router automatically. If you want to login Web UI of repeater, please refer to '2-2 Repeater mode Advanced Settings' for more functions or learn how to login web UI again.**

## 2-2 Advanced setup

After you connect to the repeater from wireless, Please open the browser, and input the URL as you copied in the quick setup (default: <http://repeater.setup> )

### 2-2-1 WPS Setting

You can enable or disable WPS function, and also start WPS with software PBC (Push Button Communication) or PIN method in this page

**WPS(Wi-Fi Protected Setup) Settings**

This page allows you to change the setting for WPS(Wi-Fi Protected Setup).WPS can help your wireless client automatically connect to the Access Point.

Enable 2.4G WPS  
 Enable 5G WPS

- **2.4G Wi-Fi Protected Setup Information**

WPS Status:	Configured
Self PinCode:	09112926
SSID:	Xperia_arc_JOSH_2.4Gre
Authentication Mode:	WPA pre-shared key
Passphrase Key:	*****
- **5G Wi-Fi Protected Setup Information**

WPS Status:	Unconfigured
Self PinCode:	09112926
SSID:	repeater5g41bd
Authentication Mode:	Disable
Passphrase Key:	
- **Device Configure**

WPS setting :	2.4G WPS
(Device is as a AP/router) Config Mode:	Registrar
Configure via Push Button:	<input type="button" value="Start PBC"/>
Input client PIN code :	<input type="text"/> <input type="button" value="Start PIN"/>

### 2-2-2 Advance Settings

- A. WLAN 2,4G Settings: Setup extended SSID, Encryption and channel to 2.4G connection manually, you can also disable the 2.4G radio in this page.

**Security**

Please set your Device.

Wireless Radio :	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Device SSID :	VXHOME_WIMAX_2.4
Encryption :	WPA pre-shared key ▼
WPA Unicast Cipher Suite :	<input type="radio"/> WPA(TKIP) <input checked="" type="radio"/> WPA2(AES)
Pre-shared Key Format :	Passphrase ▼
KEY :	wxyz8789
Channel :	11 ▼

B. WLAN 5G Settings: Setup extended SSID, Encryption and channel to 5G connection manually, you can also disable the 5G radio in this page.

C. MAC address filtering: It's a security settings for access control, you can deny the user with specified MAC in the list, please follow the ways the setup the MAC address filtering:

- a. Enable the option "Enable Wireless Access Control"
- b. Fill in the MAC address ( 10 characters) and comments (not necessary) in the slot on the bottom of this page.
- c. Press "Add" button to increase the MAC address to the table.
- d. Press "Apply" button to make it effect.
- e. In the MAC address table, you can select one or select all to delete in the list

**MAC Address Filtering**

For security reason, the device support MAC Address Filtering allows authorized MAC Addresses associating to the device.

- MAC Address Filtering Table**  
 It allows to entry 20 sets address only.
 

NO.	MAC Address	Comment	Select
1	60:eb:89:ab:18:76		<input type="checkbox"/>
- Enable Wireless Access Control
 

New	MAC Address: <input style="width: 90%;" type="text"/>	Comment: <input style="width: 90%;" type="text"/>	<input type="button" value="Add"/> <input type="button" value="Clear"/>
-----	--	--	---

## D. Admin Utility

**System Utility**

You can change the default password & device IP address from this setting page. If you want to use DHCP server service, you should enter a unique IP for the Device.

- Password Settings
  - Current Password :
  - New Password :
  - Re-Enter Password :
- Management IP
  - Obtain an IP address automatically :
  - Use the following IP address :
    - IP Address :
    - Subnet Mask :
    - Gateway Address :
- DHCP Server
  - DHCP Server :
  - Default Gateway IP :
  - Domain Name Server IP :
  - Start IP :
  - End IP :
  - Domain Name :
  - Lease Time :

- a. Password settings: Change the default password to login the repeater.
- b. Management IP: The IP address to login the repeater, You can select “Obtain the IP address automatically” (default value) or set the IP address manually by select “Use the following IP address”
- c. DHCP Server: Setup the DHCP server manually, it’s disable in the default, if you want to setup this function, you select “Use the following IP address” in the Management IP option.

## E. Configuration :

**Configuration Tool**

Use the "Backup" tool to save the device's current configurations to a file named "config.bin". You can then use the "Restore" tool to restore the saved configuration to the device. Alternatively, you can use the "Restore to Factory Default" tool to force the device to perform System Reset and restore the original factory settings.

Backup Settings :

Restore Settings :

Restore to Factory Default :

**WEB Upgrade**

This page allows you to upgrade system firmware. It is recommended that upgrading the firmware from wired stations. Enter the path and name of the upgrade file and then click the APPLY button below. You will be prompted to confirm the upgrade.

**Reset**

In the event that the system stops responding correctly or stops functioning, you can perform a Reset. Your settings will not be changed. To perform the reset, click on the APPLY button below. You will be asked to confirm your decision.

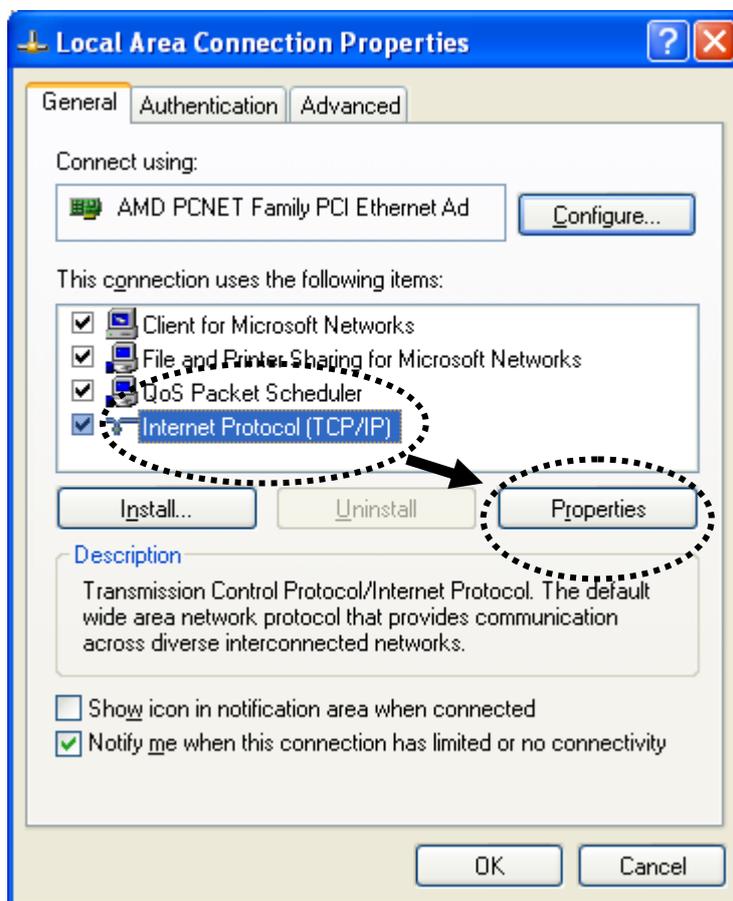
- a. Configuration Tool: to save (download) , upload or reset all the settings to factory default value here.
- b. WEB Upgrade: to use the “Browse” button to select the firmware file, then press “APPLY” button, you can start to update the firmware to this repeater, while you update the firmware, please do not turn off the power of the repeater.
- c. Reset: Reset this repeater without change any settings.

## Chapter X: Appendix

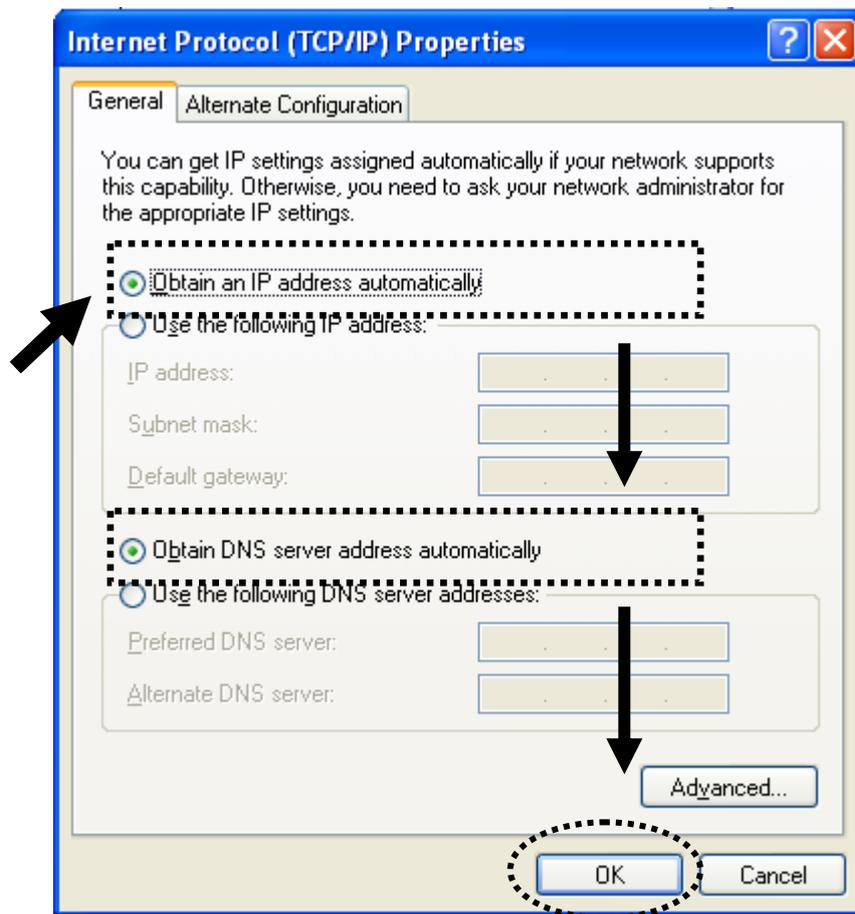
### 5-1 Configuring TCP/IP on PC

#### 5-1-1 Windows XP IP address setup:

1. Click 'Start' button (it should be located at lower-left corner of your computer), then click control panel. Double-click **Network and Internet Connections** icon, click **Network Connections**, then double-click **Local Area Connection**, **Local Area Connection Status** window will appear, and then click 'Properties'

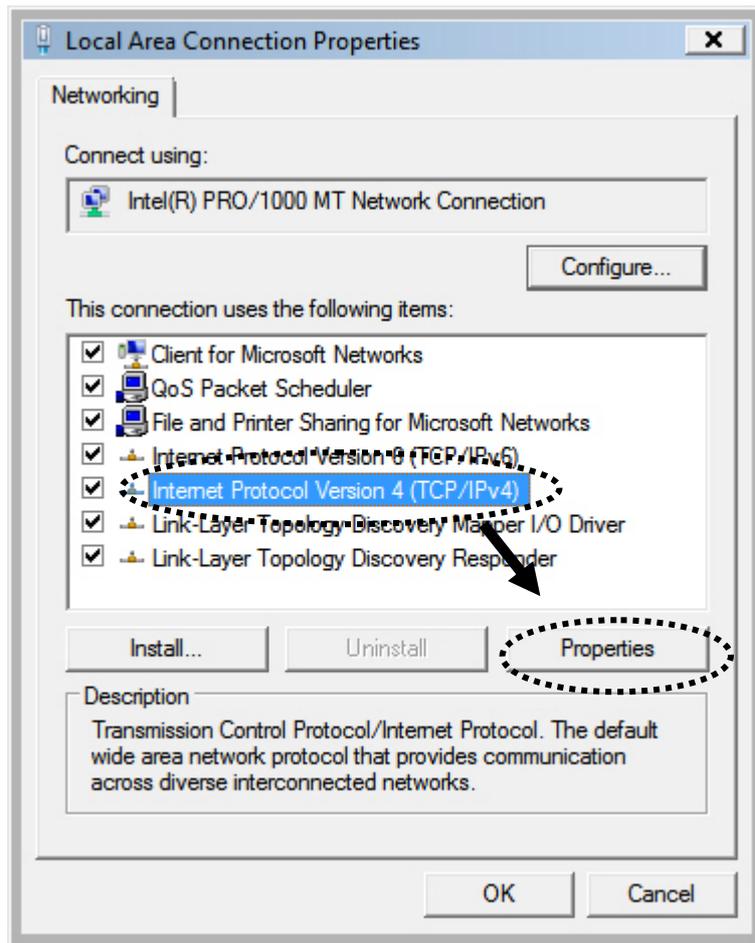


2. Select 'Obtain an IP address automatically' and 'Obtain DNS server address automatically', then click 'OK'.

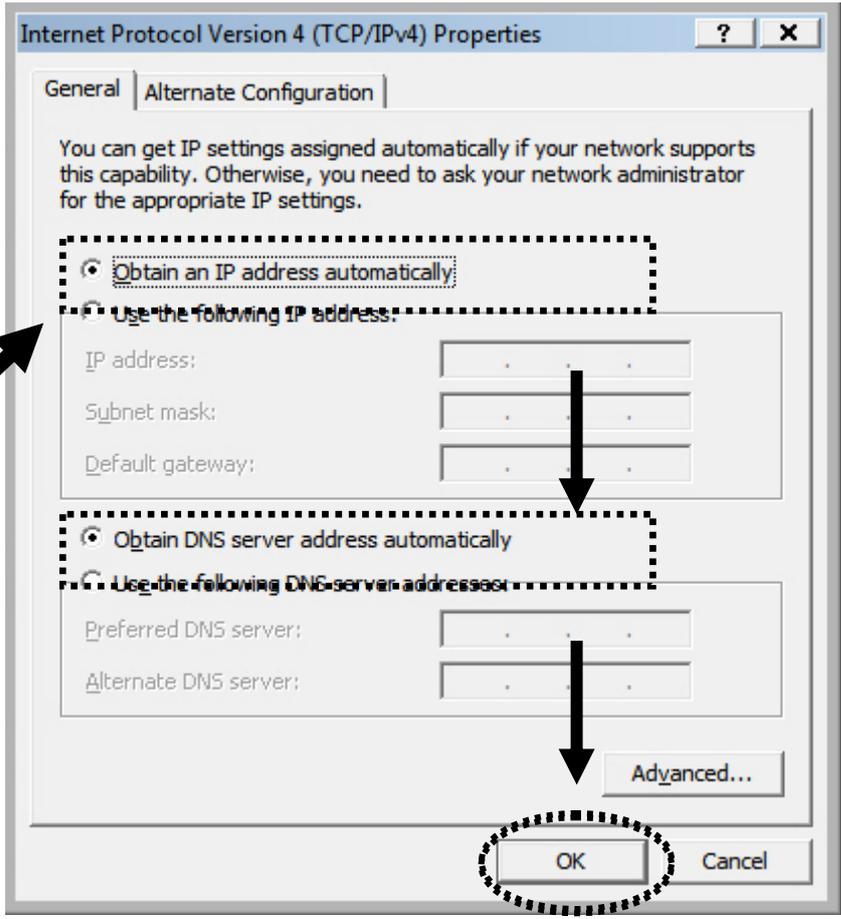


### 5-1-2 Windows Vista/Windows 7 IP address setup:

1. Click 'Start' button (it should be located at lower-left corner of your computer), then click control panel. Click **View Network Status and Tasks**, and then click **Manage Network Connections**. Right-click **Local Area Network**, then select '**Properties**'. **Local Area Connection Properties** window will appear, select 'Internet Protocol Version 4 (TCP / IPv4)', and then click 'Properties'



2. Select 'Obtain an IP address automatically' and 'Obtain DNS server address automatically', then click 'OK'.



## 5-2 Specification

SoC + RF: Realtek RTL8196CS+ RTL8192DR

Flash: 4MB

SDRAM: 32MB

LAN Port: 10/100M UTP Port x 1

Power: 5VDC, 1.2A Switching Power Module Inside

Dimension: 46.5(W) x 73(H) x 41(D) mm excluding power plug

Transmit Power:

2.4G		Data Rate	Channel	Power (±1.5dBm)
		11b	1Mbps	Ch 7
11Mbps	Ch 7		16 dBm	
11g	6Mbps	Ch 7	16 dBm	
	54Mbps	Ch 7	14 dBm	
11n20M	MCS0	Ch 7	15 dBm	
	MCS7	Ch 7	13 dBm	
11n40M	MCS0	Ch 7	15 dBm	
	MCS7	Ch 7	13 dBm	

5G		Data Rate	Channel	Power (±1.5dBm)
		11a	6Mbps	Ch36
Ch64	12 dBm			
Ch100	13 dBm			
Ch140	13 dBm			
Ch149	13 dBm			
Ch165	13 dBm			
11a	54Mbps	Ch36	13 dBm	
		Ch64	12 dBm	
		Ch100	13 dBm	
		Ch140	13 dBm	
		Ch149	13 dBm	
		Ch165	13 dBm	
11a20M	MCS0	Ch36	11 dBm	

			Ch64	11 dBm
			Ch100	11 dBm
			Ch140	11 dBm
			Ch149	11 dBm
			Ch165	11 dBm
		MCS7	Ch36	11 dBm
			Ch64	11 dBm
			Ch100	11 dBm
			Ch140	11 dBm
			Ch149	11 dBm
	11a40M	MCS0	Ch165	11 dBm
			Ch36	11 dBm
			Ch64	11 dBm
			Ch100	11 dBm
			Ch140	11 dBm
Ch149			11 dBm	

Temperature: 32~104°F (0 ~ 40°C)

Humidity: 10-90% (NonCondensing)

Certification: FCC, CE

## 5-3 Glossary

### 1. What is the IEEE 802.11g standard?

802.11g is the new IEEE standard for high-speed wireless LAN communications that provides for up to 54 Mbps data rate in the 2.4 GHz band. 802.11g is quickly becoming the next mainstream wireless LAN technology for the home, office and public networks. 802.11g defines the use of the same OFDM modulation technique specified in IEEE 802.11a for the 5 GHz frequency band and applies it in the same 2.4 GHz frequency band as IEEE 802.11b. The 802.11g standard requires backward compatibility with 802.11b.

The standard specifically calls for:

- A. A new physical layer for the 802.11 Medium Access Control (MAC) in the 2.4 GHz frequency band, known as the extended rate PHY (ERP). The ERP adds OFDM as a mandatory new coding scheme for 6, 12 and 24 Mbps (mandatory speeds), and 18, 36, 48 and 54 Mbps (optional speeds). The ERP includes the modulation schemes found in 802.11b including CCK for 11 and 5.5 Mbps and Barker code modulation for 2 and 1 Mbps.
- B. A protection mechanism called RTS/CTS that governs how 802.11g devices and 802.11b devices interoperate.

### 2. What is the IEEE 802.11b standard?

The IEEE 802.11b Wireless LAN standard subcommittee, which formulates the standard for the industry. The objective is to enable wireless LAN hardware from different manufactures to communicate.

### 3. What does IEEE 802.11 feature support?

The product supports the following IEEE 802.11 functions:

- CSMA/CA plus Acknowledge Protocol
- Multi-Channel Roaming
- Automatic Rate Selection
- RTS/CTS Feature
- Fragmentation
- Power Management

### 4. What is Ad-hoc?

An Ad-hoc integrated wireless LAN is a group of computers, each has a Wireless LAN card, Connected as an independent wireless

LAN. Ad hoc wireless LAN is applicable at a departmental scale for a branch or SOHO operation.

**5. What is Infrastructure?**

An integrated wireless and wireless and wired LAN is called an Infrastructure configuration. Infrastructure is applicable to enterprise scale for wireless access to central database, or wireless application for mobile workers.

**6. What is BSS ID?**

A specific Ad hoc LAN is called a Basic Service Set (BSS). Computers in a BSS must be configured with the same BSS ID.

**7. What is WEP?**

WEP is Wired Equivalent Privacy, a data privacy mechanism based on a 40 bit shared key algorithm, as described in the IEEE 802 .11 standard.

**8. What is TKIP?**

TKIP is a quick-fix method to quickly overcome the inherent weaknesses in WEP security, especially the reuse of encryption keys. TKIP is involved in the IEEE 802.11i WLAN security standard, and the specification might be officially released by early 2003.

**9. What is AES?**

AES (Advanced Encryption Standard), a chip-based security, has been developed to ensure the highest degree of security and authenticity for digital information, wherever and however communicated or stored, while making more efficient use of hardware and/or software than previous encryption standards. It is also included in IEEE 802.11i standard. Compare with AES, TKIP is a temporary protocol for replacing WEP security until manufacturers implement AES at the hardware level.

**10. Can Wireless products support printer sharing?**

Wireless products perform the same function as LAN products. Therefore, Wireless products can work with Netware, Windows 2000, or other LAN operating systems to support printer or file sharing.

**11. Would the information be intercepted while transmitting on air?**

WLAN features two-fold protection in security. On the hardware side, as with Direct Sequence Spread Spectrum technology, it has the inherent security feature of scrambling. On the software side, WLAN series offer the encryption function (WEP) to enhance

security and Access Control. Users can set it up depending upon their needs.

**12. What is DSSS? What is FHSS? And what are their differences?**

Frequency-hopping spread-spectrum (FHSS) uses a narrowband carrier that changes frequency in a pattern that is known to both transmitter and receiver. Properly synchronized, the net effect is to maintain a single logical channel. To an unintended receiver, FHSS appears to be short-duration impulse noise. Direct-sequence spread-spectrum (DSSS) generates a redundant bit pattern for each bit to be transmitted. This bit pattern is called a chip (or chipping code). The longer the chip is, the greater the probability that the original data can be recovered. Even if one or more bits in the chip are damaged during transmission, statistical techniques embedded in the radio can recover the original data without-the need for retransmission. To an unintended receiver, DSSS appears as low power wideband noise and is rejected (ignored) by most narrowband receivers.

**13. What is Spread Spectrum?**

Spread Spectrum technology is a wideband radio frequency technique developed by the military for use in reliable, secure, mission-critical communication systems. It is designed to trade off bandwidth efficiency for reliability, integrity, and security. In other words, more bandwidth is consumed than in the case of narrowband transmission, but the trade off produces a signal that is, in effect, louder and thus easier to detect, provided that the receiver knows the parameters of the spread-spectrum signal being broadcast. If a receiver is not tuned to the right frequency, a spread –spectrum signal looks like background noise. There are two main alternatives, Direct Sequence Spread Spectrum (DSSS) and Frequency Hopping Spread Spectrum (FHSS).

**14. What is WPS?**

WPS stands for Wi-Fi Protected Setup. It provides a simple way to establish unencrypted or encrypted connections between wireless clients and access point automatically. User can press a software or hardware button to activate WPS function, and WPS-compatible wireless clients and access point will establish connection by themselves. There are two types of WPS: PBC (Push-Button Configuration) and PIN code.