AC450 Wireless LAN 11ac Band Extender

(IEEE 802.11a/an/ac)

User's Manual

Version: 1.0

(Jan, 2016)

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Federal Communication Commission Interference Statement

FCC Part 15

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.

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.

■ Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

■ This device is restricted to indoor use

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.

This device is restricted to indoor use

Federal Communication Commission (FCC) Radiation Exposure Statement

This equipment complies with FCC radiation exposure 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.

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

Chapter I: Product Information

1-1 Introduction and safety information

AC450 Wireless LAN 11ac Band Extender is an 802.11ac certified client adapter enabling only IPTV Set-Top Box with an Ethernet interface to connect to a standard 11ac Wi-Fi router/AP wirelessly.
AC450 Wireless LAN 11ac Band Extender includes a WPS (Wi-Fi Protection Setup) button for simple and quick connection to a standard Wi-Fi Router/Access Point. Users can enjoy the robust high speed 11ac Wi-Fi connection instantly without the need to download software drivers or login in to the device.

1-2 Safety Information

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

1. This band extender is designed for indoor use only; DO NOT place this band extender outdoor.

2. DO NOT put this band extender at or near hot or humid places, like kitchen or bathroom. Also, do not left this band extender in the car in summer.

3. DO NOT plug, unplug & rotation LAN port with force.

4. If you want to place this band extender at high places or hang on the wall, please make sure the band extender is firmly secured. Falling from high places would damage the band extender and its accessories, and warranty will be void.

5. Accessories of this band extender, like antenna, cable and power supply, are danger to small children under 3 years old. They may put the small parts in their nose or month and it could cause serious damage to them. KEEP THIS BAND EXTENDER OUT THE REACH OF CHILDREN!

6. The band extender will become hot when being used for long time (***This is normal and is not a malfunction).*** DO NOT put this band extender on paper, cloth, or other flammable materials.

7. There's no user-serviceable part inside the band extender. If you found that the product is not working properly, please contact your dealer of purchase and ask for help. DO NOT disassemble the producy, warranty will be void.

8. If the product falls into water when it's powered, DO NOT use your hand to pick it up. Switch the electrical power off before you do anything, or contact an experienced technician for help.

9. If you smell something strange, or even see some smoke coming out from the product or power supply, remove the power supply or switch the electrical power off immediately, and call dealer of purchase for help.

1-3 Package Contents

Before starting to use this 11ac band extender, please check if there's anything missing in the package, and contact your dealer of purchase to claim for missing items:

□ 11ac Band Extender (1 pcs)
□ Quick Installation Guide (1 pcs)
□ User Manual CD-ROM (1 pcs)

1-4 Applications

AC450 Wireless LAN 11ac Band Extender can ONLY be used as a Wi-Fi client connecting ONLY SmarTV and STB to a standard 802.11ac Wi-Fi Router/AP wirelessly. (The device is restricted by the Software and the device will not be activated as an AP at all)
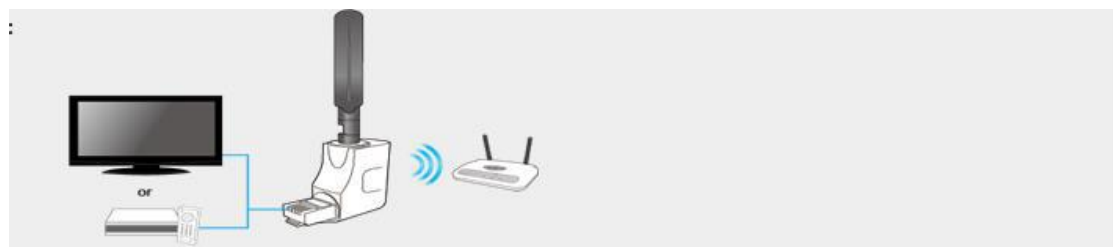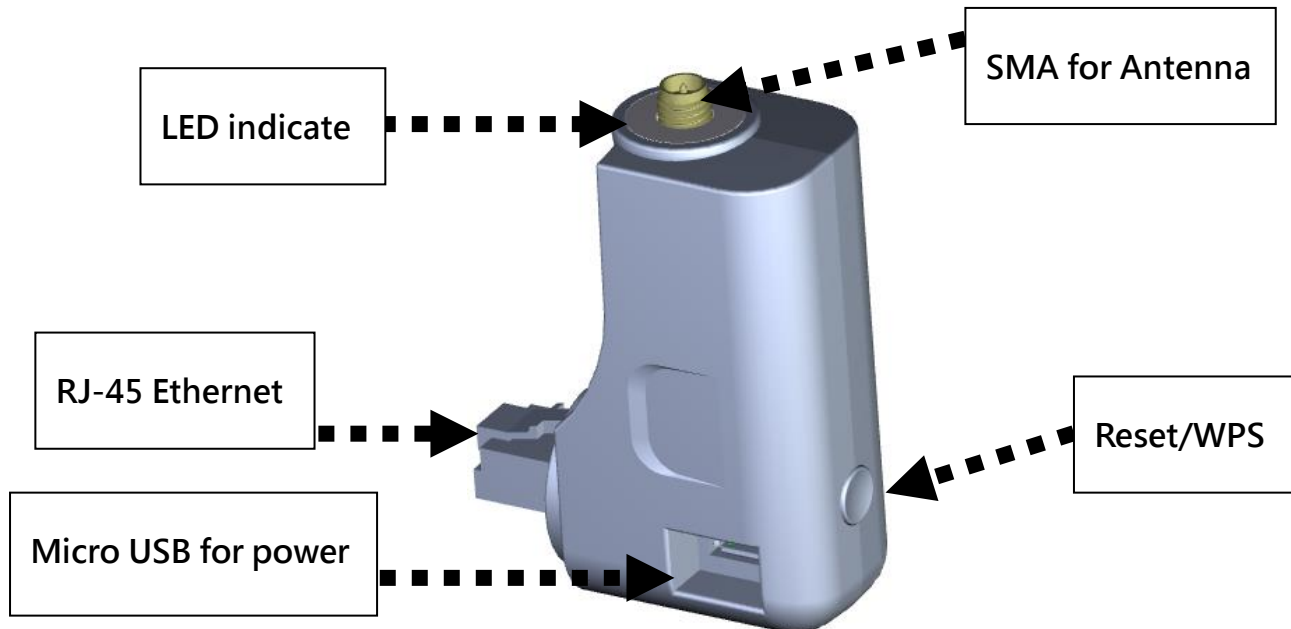

- IPTV Set-Top-Box for Multicast Linear Video streaming
- Enhancing Wi-Fi connection speed (upto 100mbps) on a SmarTV for high quality streaming of HD video
- Connecting a VoIP SIP phone to the Wi-Fi Router Wirelessly

1-5 Familiar with your new 11ac Band Extender

LED indication & Button Function

LED indicate

SMA for Antenna

RJ-45 Ethernet

Reset/WPS

Micro USB for power

LED Indication	Definition	Function	Definition
Client mode (Blue)	**Blinking:** Wireless LAN activity (transferring or receiving data)	RJ-45 Ethernet	**Client mode:** LAN Port
		Micro USB Connector	For 11ac band extender power supply only.
System status (Purple)	**On Solid:** Detect WPS button is pressed and hold for more 3 seconds, Wireless WPS function is enabled. **Blinking:** Detect Reset button is pressed and hold for more 10 seconds. (do restore all settings to factory defaults).	WPS / Reset	**WPS:** Pressed and hold for more 3 seconds to start WPS. **Reset:** Pressed and hold for more 10 seconds, till LED is blinking to do restore all settings to factory defaults.

Chapter II: System and Network Setup

2-1 Build network connection

Locate the WPS button and/or determine how to activate the WPS process on the Wi-Fi Router/AP.

1. Activate the WPS process in the AP/Router

2. Within less than 1 minute: press and hold the WPS button on the AC450 band extender for 3 seconds or until the LED color is solid purple

3. The LED on AC450 band extender will turn solid blue once the wireless connection is established
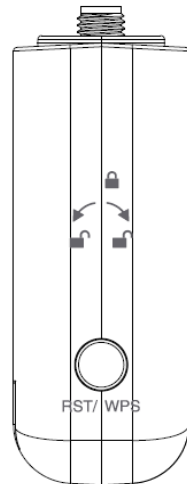
NOTE: If you can't see the web management interface, and you're being prompted to input user name and password again, it means you didn't input username and password correctly. Please retype user name and password again. If you're certain about the user name and password you type are correct, please go to '4-2 Troubleshooting' to perform a factory reset, to set the password back to default value.

TIP: This page shows the four major setting categories: Setup Wizard, Advanced Setup, WPS Setup and Status. You can find the shortcut which leads to these setting categories at the upper-right corner of every page, and you can jump to another category directly by clicking the link, and don't have to go back to the first page.

Chapter III WEB GUI configuration

3-1 Setup Wizard

The setup wizard will guide you to configure 11ac Band Extender for first time. Please follow the setup wizard step by step.

Welcome to Setup Wizard, please click "Next".
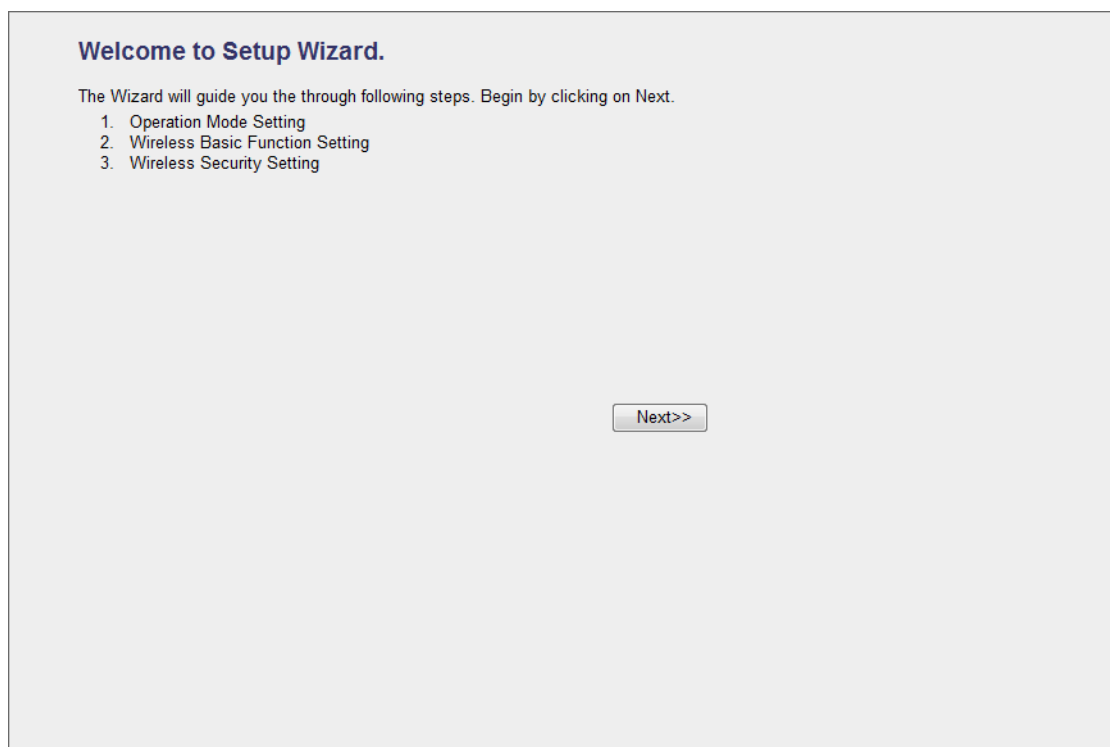
3-1-1 Client mode

In Client mode, it can let your networking device have wireless capability; it will become your networking device's wireless network card. You can connect this device to RJ-45 Ethernet port of your existing Internet TV or Set Top Box.

Please select "Client" mode, then click "Next".
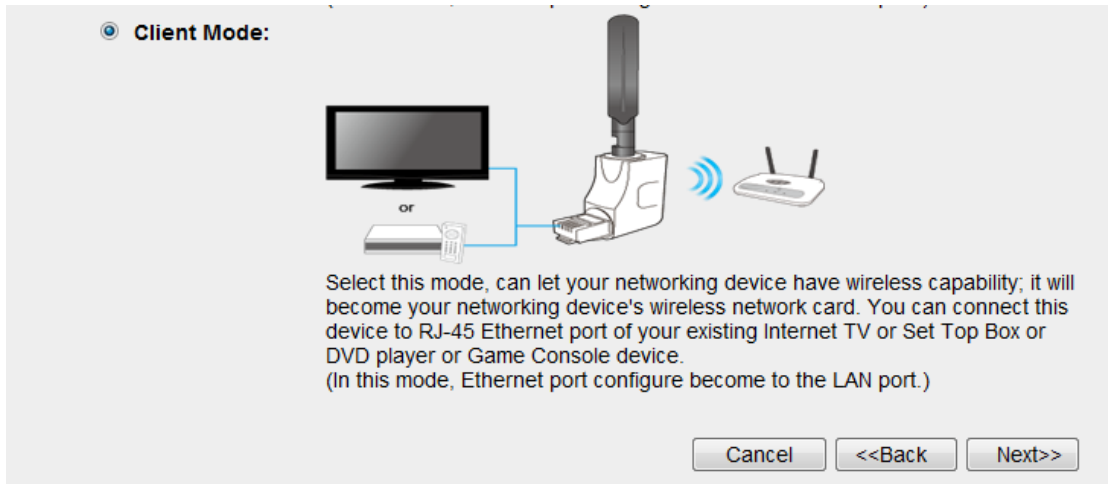
Wireless Site Survey: Please click "Site Survey" button to find WiFi AP in your area.
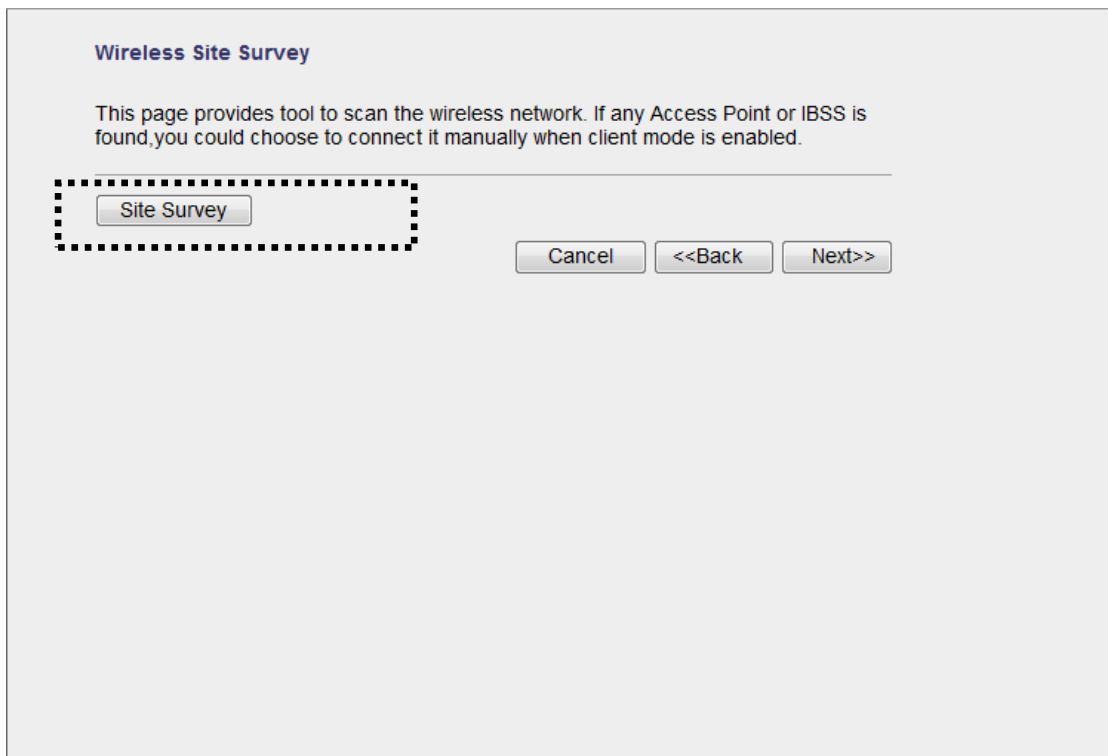
This page provides tool to scan the wireless network. If any Access Point or IBSS is found, you could choose to connect it manually. Please select a Root wireless AP and click "Next".

Root AP Wireless Security Key: Please setting encryption for the Root AP just you selected, then click "Connect" when you finish.

Connect Successfully: Please press "Reboot Now" to restart the Band Extender to make the changes take effect.

Connect successfully!

Your changes have been saved. The router must be rebooted for the changes to take effect. You can reboot now, or you can continue to make other changes and reboot later.

Add the URL to your bookmark(my favorite list) Save ▾
(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)

[Reboot Now] [Reboot Later]

Add the URL to your bookmark (my favorite list) **Default: "Save"**
(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)

Add a Favorite

Add this webpage as a favorite. To access your favorites, visit the Favorites Center.

Name: 11AC Upgrader Web Control Panel

Create in: ⭐ Favorites ▾   [New Folder]

[Add] [Cancel]
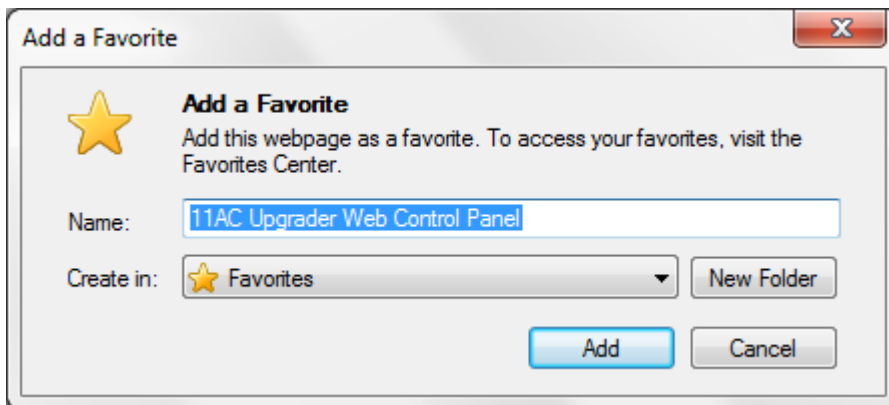
Changed setting successfully!

The Router is booting.
Do not turn off or reboot the Device during this time.

Please wait 19 seconds ...

3-2 Advanced Setup

This page allows you setting Password and Firmware upgrade to new version. Please note: do not power off the device during the Firmware upgrade because it may crash the system.

Advanced Setup

This page allows you setting Password and Firmware upgrade to new version. Please note, do not power off the device during the upload because it may crash the system.

Password Settings: You can change the User Name and Password required while logging into the Band Extender's web-based management system. By default, the password is 1234. So please assign a password to the Administrator as soon as possible, and store it in a safe place. Passwords can contain 1 to 30 alphanumeric characters, and are case sensitive.

Password Settings

You can change the User Name and Password required while logging into the 11ac Upgrader's web-based management system. By default, the password is 1234. So please assign a password to the Administrator as soon as possible, and store it in a safe place. Passwords can contain 1 to 30 alphanumeric characters, and are case sensitive.

User Name: [   ]
New Password: [   ]
Confirmed Password: [   ]

[APPLY]   [CANCEL]

Firmware Upgrade: This tool allows you to upgrade the Band Extender's system firmware. Enter the path and name of the upgrade file and then click the APPLY button below. You will be prompted to confirm the upgrade.

The system will automatically reboot after you finished the firmware upgrade process.

Please note: Do not power off the device during the Firmware upgrade because it may crash the system.

Firmware Upgrade

This tool allows you to upgrade the 11ac Upgrader's system firmware. Enter the path and name of the upgrade file and then click the APPLY button below. You will be prompted to confirm the upgrade.
The system will automatically reboot the system after you finished the firmware upgrade process.

Firmware Version: 1.03

Select File: [ ] [Browse...]

[APPLY] [CANCEL]

NOTE: Never interrupt the upgrade procedure by closing the web browser or physically disconnect your computer from Band Extender. If the firmware you uploaded is corrupt, the firmware upgrade will fail, and you may have to return this product to the dealer of purchase to ask for help. (Warranty voids if you interrupted the upgrade

3-3 WPS Setup

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

WPS

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 WPS**

- **WPS Information**

WPS Status :	Configured
PinCode Self :	68782467
SSID :	Bnad Extender_5G_5eec
Authentication Mode :	Disabled
Passphrase Key :	

- **Device Configure**

Config Mode :	Registrar
Configure by Push Button :	Start PBC
Configure by Client PinCode :	Start PIN

Chapter IV: Appendix

4-1 Hardware Specification

CPU: REALTEK RTL8881AM

RF: REALTEK RTL8881AM

Flash: 2MB

SDRAM RAM: 8MB (CPU inside)

LAN Port: 10/100M Port x 1

Antenna: External Dipole Antenna x 1 (5G)

Power: DC 5V/0.5A USB port power or 5V/0.6A Switching Power Adapter

Dimension: 60 (L) x 50 (W) x 23 (D) mm (without ANT)

Temperature: Operating: 0~40C

            Storage: -20~60C

Humidity: Operating: 10~90% (Non-Condensing)

        Storage: Max.95% (NonCondensing)

Certification: FCC

4-2 Troubleshooting

If you found the device is working improperly or stop responding to you, don't panic! Before you contact your dealer of purchase for help, please read this troubleshooting first. Some problems can be solved by you within very short time!

Scenario	Solution
Device become hot	a. This is not a malfunction, if you can keep your hand on the device's case. b. If you smell something wrong or see the smoke coming out from device or A/C power adapter, please disconnect the device and A/C power adapter from utility power (make sure it's safe before you're doing this!), and call your dealer of purchase for help.

4-3 Glossary

Ethernet: A standard for computer networks. Ethernet networks are connected by special cables and hubs, and move data around at up to 10/100 million bits per second (Mbps).

Idle Timeout: Idle Timeout is designed so that after there is no traffic to the Internet for a pre-configured amount of time, the connection will automatically be disconnected.

IP Address and Network (Subnet) Mask: IP stands for Internet Protocol. An IP address consists of a series of four numbers separated by periods, which identifies a single, unique Internet computer host in an IP network. Example: 192.168.2.1. It consists of 2 portions: the IP network address, and the host identifier.

The IP address is a 32-bit binary pattern, which can be represented as four cascaded decimal numbers separated by ".": aaa.aaa.aaa.aaa, where each "aaa" can be anything from 000 to 255, or as four cascaded binary numbers separated by ".": bbbbbbbb.bbbbbbbb.bbbbbbbb.bbbbbbbb, where each "b" can either be 0 or 1. A network mask is also a 32-bit binary pattern, and consists of consecutive leading 1's followed by consecutive trailing 0's, such as 11111111.11111111.11111111.00000000. Therefore sometimes a network mask can

also be described simply as "x" number of leading 1's.

When both are represented side by side in their binary forms, all bits in the IP address that correspond to 1's in the network mask become part of the IP network address, and the remaining bits correspond to the host ID.

For example, if the IP address for a device is, in its binary form,
11011001.10110000.10010000.00000111, and if its network mask is,
11111111.11111111.11110000.00000000
It means the device's network address is
11011001.10110000.10010000.00000000, and its host ID is,
00000000.00000000.00000000.00000111. This is a convenient and efficient method for routers to route IP packets to their destination.

LAN: Local Area Network. A LAN is a group of computers and devices connected together in a relatively small area (such as a house or an office). Your home network is considered a LAN.

MAC Address: MAC stands for Media Access Control. A MAC address is the hardware address of a device connected to a network. The MAC address is a unique identifier for a device with an Ethernet interface. It is comprised of two parts: 3 bytes of data that corresponds to the Manufacturer ID (unique for each manufacturer), plus 3 bytes that are often used as the product's serial number.

NAT: Network Address Translation. This process allows all of the computers on your home network to use one IP address. Using the broadband router's NAT capability, you can access the Internet from any computer on your home network without having to purchase more IP addresses from your ISP.

Port: Network Clients (LAN PC) uses port numbers to distinguish one network application/protocol over another. Below is a list of common applications and protocol/port numbers:

Application	Protocol	Port Number
Telnet	TCP	23
FTP	TCP	21
SMTP	TCP	25
POP3	TCP	110
H.323	TCP	1720

SNMP	UCP	161
SNMP Trap	UDP	162
HTTP	TCP	80
PPTP	TCP	1723
PC Anywhere	TCP	5631
PC Anywhere	UDP	5632

Protocol: A protocol is a set of rules for interaction agreed upon between multiple parties so that when they interface with each other based on such a protocol, the interpretation of their behavior is well defined and can be made objectively, without confusion or misunderstanding.

Router: A router is an intelligent network device that forwards packets between different networks based on network layer address information such as IP addresses.

Subnet Mask: A subnet mask, which may be a part of the TCP/IP information provided by your ISP, is a set of four numbers (e.g. 255.255.255.0) configured like an IP address. It is used to create IP address numbers used only within a particular network (as opposed to valid IP address numbers recognized by the Internet, which must be assigned by InterNIC).

TCP/IP, UDP: Transmission Control Protocol/Internet Protocol (TCP/IP) and Unreliable Datagram Protocol (UDP). TCP/IP is the standard protocol for data transmission over the Internet. Both TCP and UDP are transport layer protocol. TCP performs proper error detection and error recovery, and thus is reliable. UDP on the other hand is not reliable. They both run on top of the IP (Internet Protocol), a network layer protocol.

WAN: Wide Area Network. A network that connects computers located in geographically separate areas (e.g. different buildings, cities, countries). The Internet is a wide area network.

Web-based management Graphical User Interface (GUI): Many devices support a graphical user interface that is based on the web browser. This means the user can use the familiar Netscape or Microsoft Internet Explorer to Control/configure or monitor the device being managed.