Wireless-N Broadband Router

W316R

Notice

RF Exposure Statement
To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance between 20cm the radiator your body: Use only the supplied antenna.

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Chapter 1 Product Introduction

Thank y ou for purchasing the T enda W316R Wireless Broadband Router!

This easy -to-use router provi des si mple configuration interface which enables you to configure it with ease. It i s based on the l atest IEEE802. 11n standard, and i s backward compatible with devices of IEEE802.11b/g standards.

The W316R including router, wireless AP, four-port switch and fi rewall in on e provides powerful online monitor function and supports URL filter and MAC filter. With WDS function, it can repeat an d amplify wireless signals so as to enlarge network coverage area. It truly supports UPnP and WMM to make your audio and video smoother. With QoS function, it can efficiently distribute the downloading rate for the clients. Additionally, with super compa tibility, the r outer can break the access limits i n so me areas so that mul tiple computers can share the Internet access.

1.1 Package Contents

Please veri fy the fol lowing i tems afte r you open   the package:

> ➢   One W316R Wireless Broadband Router
> ➢   One Quick Installation Guide
> ➢   One Power Adapter
> ➢   One Software CD

If any of the l   isted i tems are mi ssing or damag ed, please contact the T   enda resel ler for   immediate replacement.

1.2 LED Indicators and Port Description

Panel and LED indicators show:

LED indicator description on the front panel

LED indicator	Status	Description
POWER	Continuously lit	Indicates the router is on and has power.
SYS	Flashing	Indicates the router is operating correctly.
WAN	Continuously lit	Indicates the router's WAN port is connected to an Ethernet device.
	Flashing	Indicates the port is transmitting and/or receiving data packets.
WLAN	Continuously lit	Indicates the wireless function is enabled.
	Flashing	Indicates it is wirelessly transmitting data
LAN(1/2/3/4)	Continuously lit	Indicates the router's LAN port is connected to an Ethernet device.
	Flashing	Indicates the port is transmitting and/or receiving data.
WPS	Flashing	Indicates the device is communicating with the client in WPS mode.

Back panel port show

Back panel port description

Port/Button	Description
WAN	Can be connected to Ethernet devices such as MODEM, Switch, Router, etc. Usually it is used to connect DSL MODEM or Cable MODEM, or ISP network cable for connecting to the Internet.
LAN **(1/2/3/4)**	Can be connected to an Ethernet switch, Ethernet router, or NIC card. Mostly they are used to connect to computers, Ethernet switches, etc.
RESET/ WPS	The system reset/ WPS button. Press and hold this button for 7 seconds and all of the settings will be deleted and router settings will be restored to factory default. Hold the button for 1 second and the WPS feature will be enabled. The WPS LED will flash when communicating in this mode.
POWER	The jack is for power adapter connection. Please use the included standard power adapter.

Chapter 2 Product Installation

1. Please use only the included power adapter to power your router. (**NOTE**: Use of an unmatched power adapter could cause damage to this product).

2. Please connect the router 's LA N port to your computer with an Ethernet cable as shown below.

3. Please connect your broadband line provided by your ISP to the router's WAN port.

4. Insert the included software CD into the CD drive of your computer . After t he software automati cally initiates, double click the "**Setup**" icon and follow the instructions to complete the installation. You can a lso enter the router 's Web-based Uti lity to compl ete the configuration.

Chapter 3 How to configure to access the Internet

3.1 How to Set the Network Configurations

Network Configurations under windows XP

1. Right click "**My Network Places**" on your computer
   desktop and select "**Properties**".

2. Right click "**Local Area Connection**" and select
   "**Properties**".

3. S elect " **Internet Pro tocol (TCP/IP)** " and click "**Properties**".

4. Select "**Obtain an IP address automatically**" and

"**Obtain D NS ser ver addr ess automatically** ".

Click "**OK**" to save the configurations.

Or select "**Use the following IP address** " and enter the IP addr ess, Subnet mask, Defaul t gatewa y a s follows:

➢ **IP Address:** 192.168.0.XXX: (XXX i s a number from 2~254)

➢ **Subnet Mask:** 255.255.255.0

➢ **Gateway:** 192.168.0.1

➢ **DNS se rver:** You s hould in put t he DNS s erver address provided by your IS P. Otherwise, you can enter 1 92.168.0.1. Cli ck "OK" to save the configurations.
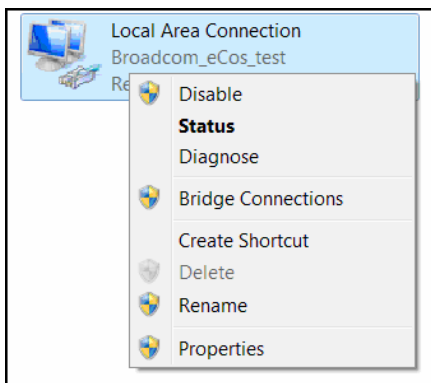
Network Configurations under windows 7

1. Click the network icon on the l ower right corner of your computer desktop, and then cli ck" Open Network and Sharing Center".
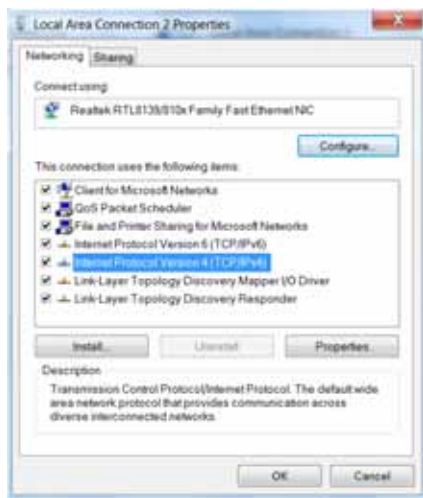
2. Click "Change adapter settings" on the left side of the window.

3. Ri ght click "Local   Area Connecti   on" and sel   ect "Properties".

4. Double click" Internet Protocol Version 4(TCP/IPv4)".

5. Select "**Obtain an IP address automatically**" and
   "**Obtain D NS ser ver addr ess automatically** ".
   Click "**OK**" to save the configurations.

Or select "**Use the following IP address** " and enter
the IP addr ess, S ubnet mask, D efault gatewa y as
follows:

➢ **IP Address:** 192.168.0.XXX: (XXX is a number from 2~254)

➢ **Subnet Mask:** 255.255.255.0

➢ **Gateway:** 192.168.0.1

➢ **DNS se rver:** You s hould in put t he DNS s erver address provided by your ISP. Otherwise, you can enter 1 92.168.0.1. Cli ck "OK" to save the configurations.

3.2 Log in to the Router

1. To access the R outer's W eb-based Utility, launch a web browser such as Internet Explorer or Firefox and enter http://192.168.0.1. Press "**Ente**r".

2. Type "**admin**" in the "**Password**" field. Click "**OK**".

3. If you enter the correct password, you will come to the router's web-based utility as is shown below.

3.3 Fast Internet Access

Two kinds of fast access methods are provided on the router's web-based utility: ADSL dial-up and DHCP.

If you select ADSL dial-up, you only need to enter the access accou nt and access password as we ll as the wireless password, and then click "Ok" to complete the settings.

If you select DHCP, you only need to enter the wireless password and click "Ok" to complete the settings.

The default access meth od is ADSL dial-up and the access account and access password are the same as the ADSL dial-up account and password, which you can inquire your broadband ISP. For other access methods, please refer to WAN settings in chapter 4.The wireless password can only consist of 8 characters, the default is 12345678 and you can modify it when necessary.

3.4 Fast Encryption

The router provi des two encryption s etting screens, one i s si mple and easy , the other i s adv anced (For advanced setting, please refer to chapter 5.2).

Simple and easy screen:

Log on to the router's web-based utility and you may set encrypti on for the router. The defaul t adopts WPA-PSK mode and A ES Al gorithm. The def ault password is 12345678, as shown below.

⚠ **NOTE**: The wi reless password can onl y be 8 characters in length and t he default is 12345678, you can modify it when necessary.

Chapter 4 Advanced Settings

4.1 System Status

System status screen al lows you to view the route r's WAN port status and system status.

WAN status:	
Connection status	Disconnected
WAN IP	
Subnet Mask	
Gateway	
DNS server	
Alternate DNS server	
Connection type	PPPoE
Connection time	00:00:00
Connect	Disconnect

✧ **Connection status**: It di splays the router's WAN connection status.
Disconnected: It i ndicates the router's W AN por t hasn't been connected with the network cable.
Connecting: It i ndicates the router's WAN port i s obtaining IP address.
Connected: It i ndicates the R outer i s well connected with the ISP.
✧ **WAN IP** IP address obtained from ISP.
✧ **Subnet mask**: Obtained from ISP.
✧ **Gateway**: Obtained from ISP.
✧ **DNS server**: Obtained from ISP.
✧ **Alternate DNS server**: Obtained from ISP.

✧ **Connection type:** It displays your current access method.

System status:	
LAN MAC address	00:22:33:00:25:22
WAN MAC address	00:22:33:00:25:22
System time	1970-01-01 00:28:42
Running time	00:28:42
Connected client	1
Software version	V5.11.002_multi
Hardware version	V0.1

✧ **LAN MAC address** It displays the Router's LAN MAC address.
✧ **WAN MAC address** It displays the Router's WAN MAC Address.
✧ **System time** It displays the system's updated time
✧ **Connected client** It displays the number of the connected computers(normally it displays the number of clients whose IP addresses obtained via DHCP server)
✧ **Software version** It displays the Router's software version
✧ **Hardware version** It displays the Router's hardware version.

4.2 WAN Settings

Virtual Dial-up (PPPoE)

- ➤ **Mode:** Show your current connection mode.
- ➤ **Access Account:** Enter the account provided by your ISP.
- ➤ **Access Password:** Enter the password provided by your ISP.
- ➤ **MTU:** Maximum Transmission Unit. It is the size of the largest data packet that can be sent over the

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network. The default value is 1492. Do NOT modify it unless necessary, but if a specific website or web application s oftware c annot o pen o r b e e nabled, you can try to change theMTU value to 1450, 1400, etc.

➢ **Service Name:** The connecti on name for current PPPOE, enter i t if necessary otherwise, l eave it blank.

➢ **AC Name:** The service name, enter it if necessary otherwise, leave it blank.

➢ **Connect Automatica lly:** Connect automati cally to the Inter net after rebooti ng the system or connection failure.

➢ **Connect on Deman d:** R e-establish your connection t o the Internet after the speci fic t ime (Max Idle Time). Zero means you are connected to the Internet al l ti mes. Otherwi se, enter the minutes to be elapsed before you are disconnected from the Internet.

➢ **Connect Manually:** Connect to the Internet by users manually.

➢ **Connect on Fixed Time:** Connect to the Internet during the time you fix automatically.

⚠**NOTE:**

The " **Connect on Fixed Time** " goes i nto effect only when you have set the current time in "**Time**

settings" from "**System tools**".

Static IP

If your ISP provides you the stati c IP, pl ease cho ose static IP, and you need to enter the IP address, subnet mask, gateway, DNS serv er and al ternate DNS server provided by your ISP or network administrator

➢ **Mode:** Show your current connection mode.
➢ **IP address:** Enter the WAN IP address provided by your ISP. If y ou are not c lear, pl ease inquire your local ISP.
➢ **Subnet ma sk:** Enter the W AN S ubnet Mask provided by your ISP. Generally it is 255.255.255.0
➢ **Gateway:** Enter the Gateway provided by your ISP. If you are not clear, please inquire your local ISP.

> ➢ **DNS serv er:** Enter th e necessary   DNS server provided by your ISP.

> ➢ **Alternate DNS serv er:** Enter the second DNS address if your ISP provides, which is optional.

Dynamic IP (Via DHCP)

If your connection mode is Dynamic IP, it means every time you access the Internet, you will get a different IP. You don't need to en ter any parameters in this mode, just Click "**Ok**" to finish the settings.

PPTP

➢ **Mode:** Show your current connection mode.

➢ **PPTP server address:** The IP address or domain name of t he d estination server a nd it is u sed t o specify the desti nation addres s whi ch needs fo r PPTP connection.

➢ **Username/Password:** Used to v alidate i dentity when connecting to the PPTP server.

➢ **Address mode:** Set the router's IP address mode, you can select either "Dynamic" or "Static". If your ISP doesn't provide the IP addre ss, pl ease sel ect "Dynamic".

➢ **IP address:** Please enter the IP address provided by your ISP, inquire your local ISP if you are not clear.

➤ **Subnet mask:** Pl ease enter the subnet mask provided by your ISP ,generally its 255.255.255.0

➤ **Gateway:** Please enter the gateway provided by your ISP, inquire your local ISP if you are not clear.

All the above parameters are provided by ISP.

L2TP

➤ **Mode:** Show your current connection mode.
➤ **L2TP server address:** The IP address or domain name of the destination server and it is used to specify the destination addres s which needs fo r L2TP connection.
➤ **Username/Password:** Used to v alidate identity

when connecting to the L2TP server.

➢ **Address mode:** Set the router's IP address mode, you can select either "Dynamic" or "Static". If your ISP doesn't provide the IP addre ss, please select "Dynamic".

➢ **IP address:** Please enter the IP address provided by your ISP, inquire your local ISP if you are not clear.

➢ **Subnet mask:** Pl ease enter the subnet mask provided by your ISP ,generally its 255.255.255.0

➢ **Gateway:** Please enter the gateway provided by your ISP, inquire your local ISP if you are not clear.

All the above parameters are provided by ISP.

4.3 LAN Settings

Click "Advanced s ettings" –LAN s ettings to enter the following screen.

➢ **LAN MAC address:** The Router's LAN MAC address, which is unchangeable.

➢ **IP address:** The Router's LAN IP address (not your PC's IP address).The default value is 192.168.0.1; you can change it when necessary.

➢ **Subnet mask:** The Router's LAN subnet mask. The default value is 255.255.255.0

⚠**NOTE:**

Once you modify the IP address, you need to remember it for next time you log in to the web-based utility.

4.4 DNS Settings

DNS stands for Domain Name System (or Service).

- ➢ **DNS setting:** Select to enable the DNS server.
- ➢ **Primary DNS   address:** Enter the necessary address provided by your ISP.
- ➢ **Alternate DNS address :** Enter the s econd DNS address if your ISP provides, which is optional.

⚠**NOTE:**

After the settings are completed, reboot the device to activate the modified settings.

4.5 Bandwidth Control

Bandwidth control is used to limit the communication traffic of LAN computers when accessing the Internet. It can simultaneously control maximum of 254 PCs' traffic. In addi tion, IP addres s r ange configuration i s supported.

➢ **Enable Bandwidth Control:** To enable or disable the i nternal IP bandwi dth control. The defaul t is disabled.
➢ **IP Address:** The IP add ress r ange of the hosts whose traffic has been controlled. It can be a single IP address or IP address range.
➢ **Upload/Download:** To specify the traffic heading way for the sel ected I P addre sses: upl oad or

download.

➢ **Bandwidth Range:** The maximum and minimum upload/download data tr affic of the hosts i n specified IP range. The unit is KByte/s. The uplink of upl oad and downl oad can not exceed the W AN port bandwidth limitation range.

➢ **Enable:** To enabl e th e current edited rul e. Otherwise, the rule will not go into effect.

➢ **Add to list:** After you edit the rule, click the "**add to list**" button to add th e current rul e to the rul e list.

Here we take 2Mbps b andwidth as an example . Theoretically, the bi ggest downl oading rate for 2Mb ps bandwidth is 2Mb ps=256KByte/s, and the bi ggest uploading rate is 512kbps=64KByte/s

Example 1

If you want to set the download rate of the computer at the IP ad dress of 192 .168.0.100 a s 80-90KByt e/s, upload rate as 10-15KByte/s, first add one upload rule as shown in the picture below:

1.Enter 192.168.0.100 in the IP address field

2.Select upload in the Upload/Download field.

3.Enter 10-15 in the bandwidth range field

4.Select "Enable"

5.Click "Add to list"

6.Click "Ok" to finish the upload rule settings.

And then add a download rule as shown in the picture below.

The setting method is the same as the above.

Example 2 Set the downl oad r ate of all computers within the r ange of 192 .168.0.2--192.168.0.254 as 100-120KByte/s, and the upload rate as 20-30KByte/s, as shown in the picture below.

The setting method is the same as **Example 1.**

4.6 Traffic Statistics

Traffic statistics is used to display the bandwidth that LAN PC used.

　Enable Traffic statistics: It is used to calculate the traffic used by the LAN computers. You can enable it to calculate the tr affic for you. Usua lly, di sable it to improve the router's data packet processing ability, and the default is disabled. When thi s function is enabled, the webpage will refresh automatical ly e very five minutes, meanwhile, each computer's traffic value will refresh automatically.

➢ **IP address:** the IP address of the computer whose traffic is being calculated.

➢ **Uplink rate:** the data sendi ng speed per second, the unit is KByte/s.

➢ **Downlink rate:** the data recei ving spee d p er

second, the unit is KByte/s.

➢ **Sent mess age:** the number of the cal culated computer's data packets that are sent out through the router.

➢ **Sent Byt es:** the vol ume of the cal culated computer's statistics that is sent out through the router

➢ **Received message:** the number of the calculated computer's t he data pac kets that are recei ved through the router.

➢ **Received B ytes:** the vol ume of the cal culated computer's statistics that is received through the router.

Chapter 5 WLAN Settings

5.1 Wireless Basic Settings

- ➢ **Enable wireless functio n:** Se lect to enable the Router's wi reless features; desel ect to di sable it and all functions related with wireless are disabled.
- ➢ **Wireless working mode** : T his r outer p rovides two ki nds o f worki ng modes: Wi reless Access Point(AP) and Network Bridge (WDS)

Wireless Access Point (AP)

- ➢ **Network Mode** : Se lect one mode from the

drop-down list.

11b mode Select it if you have only Wireless-B clients in your network.

11g mode Select it if you have only Wireless-G clients in your network.

11b/g mixed mode: Select it i f you h ave o nly Wireless-B and Wireless-G clients in your network.

11b/g/n mixe d mode : Select it if y ou have Wireless-B, Wireless-G and Wi reless-N cli ents in your network.

➢ **SSID:** It is the un ique name of t he wi reless network and can be mod ified. The S SID must be entered.

➢ **Broadcast (SSID):** Select "**Enable**" to enable the router' SSID to be scanna ble by wi reless devices. The defaul t i s enabl ed. If you di sable i t, the wireless de vices must know the S SID for communication.

➢ **Channel:** The currently used channel by the router. Select an effective channel (from 1 to 13\Auto) of the wireless network.

➢ **WMM Capable:** Enable it to enhance the transfer performance of the wi relessly tr ansferred multimedia data (such a s video o r o nline playing).We recommend enabling this option if you are not familiar with WMM.

➢ **APSD Capa ble:** It is used for auto power-saved service. The default is disabled.

➢ **Channel b andwidth:** Select an appropriate channel ba ndwidth to enhance the wi reless performance. Select 20/40M when the network has 11b/g and 11n wi reless clients. Select 20M when the network has onl y n on-11n wi reless cl ients. Select 20/40M to promote its throughput when the wireless network is in 11n mode.

➢ **Extension Channel:** T o confi rm th e network's frequency range in 11n mode.

Network Bridge (WDS) Settings

WDS (Wireless Distribution System) is used to expand wireless coverage area.

➢ **AP MAC ad dress:** Input the MA C address of another (opposi ng) w ireless router y ou w ant to connect.

Example: This example is to bridge two 316R routers.

1. If you know the connecti ng router's MA C address, please enter it into the AP MAC address field and click "Ok".

2. You can also search for the wireless router's signal by scanning.

a) Click "Open scan" and click the scanned signal and click the "O k" button on the di alog bo x and the corresponding wireless MAC address will be added to the AP MAC address field automatically.
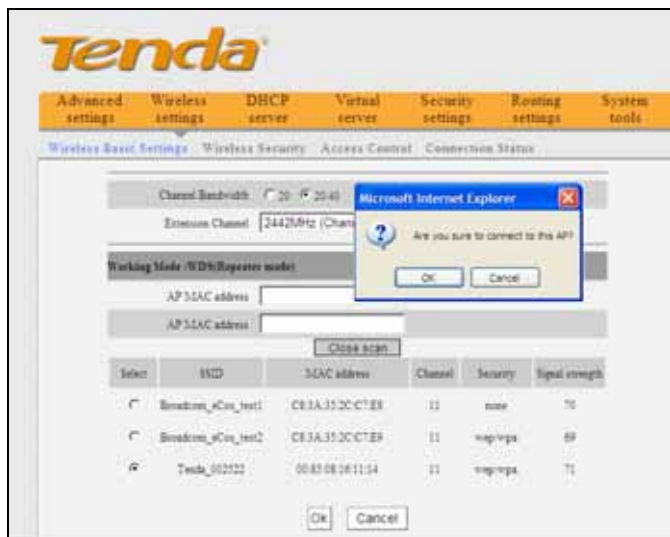
b) Click "Ok" after the MAC address is added.

After fi nishing the abo ve steps, you need to set the other W316R router in the same way.

⚠**NOTE**: WD S feature requi res both routers support this function and the SSID, channel, encryption method and password are the same as those of the connecting router.

5.2 Wireless Security Settings

With the wi reless securi ty funct ion, y ou can prev ent others from connecti ng to y our wi reless network and using the n etwork resources wi thout your cons ent. Meanwhile, you can al so bl ock ill egal users from

intercepting or intruding your wireless network.

5.2.1 WPS Settings

WPS (Wi-Fi Protected Setting) makes it quick and easy to establish a secure con nection between the wi reless clients and the router. The users onl y need to ente r a PIN cod e or press W PS b utton on the back panel to configure it without ma nually s electing a n e ncryption method or set a key.

➢ **WPS settings**: To enable or disable WPS function. The default is "**Enable".**

➢ **WPS mode:** Provide two ways: PBC (Push-Button Configuration) and PIN code.

➢ **PBC:** Select the PBC and cli ck **Ok,** or press and hold the WPS button on the back panel of the device for about one second. The WPS LED indicator will be fl ashing for 2 mi nutes, whi ch means t he WPS is e nabled. Du ring t his t ime (flashing W PS L ED), you can e nable t he wir eless client to implement the WPS/PBC negoti ation between the m. When the WPS connecti on is completed, the LED indicator will be continuously lit. To add more clients, repeat the above steps.)

➢ **PIN:** If this option is enabled, you need to enter a wireless client's PIN code in the field and keep the same code in the WPS client.

➢ **Reset OOB:** Press this button, the WPS client will be in an idle state, and the WPS indicator will turn off. AP will not respon d to the W PS cli ent's connection request and will set the securi ty mode as Open-None (Disable) mode.

⚠**NOTE**: The use of WPS function requires the wireless adapter to support this function.

5.2.2 WPA- PSK

WPA guarantees to protect WLAN users' data and o nly the authorized network users can have access to WLAN.

- ➢ **WPA Algor ithms:** Provides TKI P [Temporal K ey Integrity Pro tocol] or AE S [Adv anced Encrypti on Standard].

- ➢ **Key:** Enter the pass phr ase that consi sts of 8-63 ASCII characters.

- ➢ **Key Renewal Inter val:** Set the key' s renewal period, wh ich tells the d evice how often it should change the dynamic keys.

5.2.3 WPA2- PSK

WPA2 (Wi -Fi Protected Access versi on 2) pro vides higher security than and WPA (Wi-Fi Protected Access).

➢ **WPA Algor ithms:** Provides TKI P [Temporal K ey Integrity Pro tocol] or AE S [Adv anced Encrypti on Standard].

➢ **Key:** Enter the pass phr ase that consi sts of 8-63 ASCII characters.

➢ **Key Renewal Inter val:** Set the key's renewal period, which tells the device how often it should change the dynamic keys.

5.3 Wireless Access Control

Wireless access control is actual ly based on the MAC address to permit or forbid specific clients to access the wireless network.

➢ **MAC address filter:** "**Permit**" indicates to allow the clients in the list to access the wireless network, "**Forbid**" indicates to prevent the clients in the list from accessing the wireless network.

➢ **Configure MAC address:** Input the MAC addresses of the wireless clients to implement the filter policy . Click " **Add**" to fi nish the MAC add operation.

➢ **MAC Address list:** S how the added MA C addresses. You can add or delete them.

5.4 Connection Status

This screen shows wi reless cl ient's connecti on status, including MAC address, Channel bandwidth.

➢ **MAC address:** Shows the MAC addre sses of the hosts connected to the Router.

➢ **Bandwidth:** Shows the channel bandwidth of the current connected hosts (wireless clients).

Chapter 6 DHCP Server

6.1 DHCP Server

DHCP (Dynamic Host Control Protocol) is used to assign an IP addr ess to the co mputers on the LAN/pri vate network. When you enable the DHCP Server, the DHCP Server will allocate automatically an unused IP address from the IP address pool to the requesting computer in

premise of acti vating "Obtai n an IP Address Automatically". So specifying the start and end address of the IP Address pool is needed.

➢ **DHCP server:** Check the **Enable** box to enabl e DHCP server.

➢ **IP pool start/end address:** Enter the range of IP addresses for DHCP server distribution.

➢ **Lease time:** It i ndicates the v alid t ime of the dynamic IP address whi ch i s d istributed to the DHCP c lient's host com puter by DHCP serv er. During this time, the serv er will not distribute the IP address to any other host computer.

6.2 DHCP Client List

DHCP cli ent list di splays user comput er' IP a ddress, MAC address, host name and other i nformation which

are assi gned by the DHCP server . Y ou can manu ally
enter the IP and MAC address and convert them to static
assignment.

➢ **Host name:** It displays the name of the computer
whose IP is allocated by the DHCP server.

➢ **IP address:** Enter the I P add ress w hich needs
static binding.

➢ **MAC address:** Enter th e MAC address of the
computer you want to bind. Click "**Add**" to add the
entry in the list.

➢ **Lease time:** The r emaining t ime length o f t he
corresponding IP address lease.

Chapter 7 Virtual Server

7.1 Port Range Forwarding

➢ **Start/End port:** Enter the start/end port number which r anges the Externa l ports used to set th e server or Internet applications.

➢ **LAN IP:** Enter the IP address of the PC which you want to set as the server.

➢ **Protocol:** Select the prot ocol (TCP/UDP/Both) for the appl ication. If you a re not cl ear about the

protocol you are using, you can select "Both".

➢ **Enable:** Click the **Enable** checkbox to bring the set rule into effect.

➢ **Delete:** Clear all settings of this item.

➢ **Well-known service   port:** The well   -known protocol ports are   listed in the drop-down li st. Select one and select a sequence number in the ID drop-down list and then click "Add", this port will be added autom atically to th e ID l ist. For other wel l known servi ce ports that are not l isted, y ou can manually add them to the list.

➢ **Add to:** Add the sel ected well -known port to the policy ID.

For Example: You want to share some large files with your friends outside of your local area network, however, they are too bi g, and it's not con venient to tr ansfer them. Then, you can b   uild a F   TP server on y   our computer and set the router's port range forwarding to enable your friends to ac cess to thes e fil es on your computer. Suppose   that your F   TP server or your computer's static IP addr ess is 192.168.0.10, and you wish your fr iends can ac cess the s erver through the default port 21 and adopts TCP protocol.

Please follow the steps below to configure.

1.Enter 21 in both start port and end port fields, or you can al so sel ect F TP from the wel l-known servi ce port

and its port 21 will be added to the corresponding field automatically.

2. Enter 192.168.0.10 in the LAN IP column, and then select "Both" as the protocol and select "Enable".

3. As the picture shown below.

4. Click the "Ok" button to save the settings.

And now, when your friends want to visit the FTP server, they only need to enter ftp://xxx.xxx.xxx.xxx:21 in the address field. Here, xxx.xxx.xxx.xxx means the router's WAN IP address. For example, when your router's WAN IP address is 172.16.102.89; your friends need to enter

ftp://172.16.102.89:21 in the address field.

⚠️**NOTE:**

If you set theservice port of the virtual server as 80, you must setthe Web management port on Remote Web Management screen to be any value except 80 such as 8080. Otherwise, there will be a conflict to disable the virtual server.

7.2 DMZ Settings

The DMZ Settings screen allows one local computer to be exposed to the Internet for use of a special-purpose service such as Internet gaming or videoconferencing. DMZ hosting forwards all the ports at the same time to one PC.

> ➢ **DMZ Host IP Address:** The IP address of the LAN computer you want to set as DMZ host.
> ➢ **Enable:** Check to enable the DMZ host.

For example:
Set the computer at the IP address of 192.168.0.10 as DMZ host to connect another host on the Internet for intercommunication.

⚠**NOTE:** When the DMZ host is enabled, the firewall settings of the DMZ host will not function.

7.3 UPNP Settings

UPnP (Universal Plug and Play).With the UPnP function, the internal host can request the routerto process some special port switching so as to enable the external host to visit the resources of the internal host.

➢ **Enable UPnP:** Cli ck the checkbox to enabl e the UPnP.

⚠**NOTE**: This function goes into effect under Windows XP or Windows ME (**NOTE**: the system should integrate or have installed the Directx 9.0) or this function would go in to e ffect if y ou h ave in stalled s oftware t hat supports UPnP.

Chapter 8 Security Settings

8.1 Client Filter Settings

You can ena ble cli ent f ilter to control LAN computers' access to some ports of the Internet

➢ **Filter Mode:** You can select either "Permit only" or "Forbid only".

➢ **Access Poli cy:** Sel ect one number from the drop-down list.

➢ **Remark:** A simple description of the configured file. You can also leave it blank.

➢ **Start/End IP:** Enter the start/end IP address.

> ➤ **Port:** Enter the controlled TCP/UDP protocol port. You can specify a port or port range.
> ➤ **Type:** Select one protocol (TCP/UDP/Both) from the drop-down list.
> ➤ **Time:** Select the time range of client filter.
> ➤ **Date:** Select the day(s) to run the access policy.
> ➤ **Enable:** To enable/disable the access policy (forbid/permit the packets matched with the access policy to pass through the router.

Example1 Forbid LAN computers at the IP addreses of 192.168.0.100--192.168.0.120 to access the Internet.

Example 2   Permit LAN computer with the IP address of 192.168.0.145 to access websites during 8:00 to

18:00 from Sunday to Saturday.

8.2 MAC Address Filter

You can limit the computer's access to Internet by MAC Address Filter.

> ➤ **Filter mode:** You can select either "Permit only" or "Forbid only".
> ➤ **Access Poli cy:** Sel ect one number from the drop-down list.
> ➤ **Remark:** A simple description of the configured file. You can also leave it blank.
> ➤ **MAC Address:** Enter the MAC address you want to run the access policy.
> ➤ **Time:** S elect the ti me r ange of M AC address filter.
> ➤ **Date:** Select the day(s) to run the access policy.
> ➤ **Enable:** T o e nable/disable t he a ccess p olicy (forbid/permit the pack ets matched wi th the access policy to pass through the router).

Example 1 Forbid the computer with the MAC address

of 00:E0:4C:69:A3:23 to access Internet during 8:00 to 18:00 from Monday to Friday.

Example 2 Permit the computer with the MAC address of 00 E4 A5 44 35 69 to access Internet from Monday to Friday.

8.3 URL Filter Settings

You can use URL fil tering to forbi d t heir access to certain websites at a specified time.

➢ **Filter Mode:** You can select either "Permit only" or "Forbid only".

➢ **Access Poli cy:** Select one number from the drop-down list.

➢ **Remark:** A simple description of the configured file. You can also leave it blank.

➢ **Start/End IP:** Enter the start/end IP address.

➢ **URL character string:** Specify the text strings or keywords needed to be filtered.

➢ **Time:** Select the time range of URL filter.
➢ **Date:** Select the day(s) to run the access policy.
➢ **Enable:** To enable/disable the access policy (forbid /permit the packets matched with the access policy to pass through the router).

Example1 Forbid all computers on LAN to access baidu.com during 8:00 to 18:00 from Monday to Friday.

Example2 Permit LAN computers with the IP addresses of 192.168.0.100-192.168.0.115 to access yahoo.com.

⚠️**NOTE**: Enter only one domain name for each access policy for one access policy can only filter one domain name. So, if you want to filter multiple domain names, you need to set multiple access policies

8.4 Remote Web Management

This secti on i nstructs how to al low the network administrator to manage the R outer r emotely. If y ou want to acc ess the R outer from outs ide of the local network, please click the checkbox after "Enable".

- ➢ **Enable:** Check to enabl e remote web management.
- ➢ **Port:** The management port open to outside access. The default value is 80.
- ➢ **IP Address:** Specify the range of the IP addresses of the computers on the Internet for remote management.

⚠**NOTE:**

1. If you want to l og in the devi ce's Web-based Utility via port 8080, you need to use the format of WAN IP address: port (for exampl e http //220.135.211.56:8080) to implement remote login.
2. If your W AN IP addre ss starts and ends wi th 0.0.0.0, i t means al l hosts on the Internet ca n implement r emote W eb management. If you change the Internet IP address as 218.88.93.33-218.88.93.35, then onl y the computers at the IP addresses of 218. 88.93.33, 218.88.93.34 and 218. 88.93.35 can access the

Router to implement remote web management.

For example:

If you want to configure the computer at the IP address of 218.88.93.33 to access the router's web-based utility via port 8080, please set the parameters as above.

Chapter 9 Routing Settings

9.1 Routing Table

This page shows the router's core routing table.

The main duty for a router is to look for a best path for every data p acket, and tr ansfer thi s data packet to a destination station. In order to fulfill this function, many transferring paths, i.e. routing table, are saved in the router, for choosing when needed.

9.2 Static Routing

This screen is used to set the router's static routing.

A static route is a pre-determined pathway that network information must t ravel to r each a specific h ost o r network.

Destination network IP address : The destination host or IP segment you visit.

Subnet mask: Enter the subnet mask, generally it is 255.255.255.0

Gateway: The entry IP address of the next router.

⚠**NOTE:**

1. The gateway must be at the same net segment with the router's LAN IP.

2. If the destination IP address is one host' address, then the subnet mask must be 255.255.255.255.

3. If the destination IP address is an IP segment, then it must match with the subnet mask. For example, if the destination IP is 10.0.0.0 then the subnet mask must be 255.0.0.0

Chapter 10 System Tools

10.1 Time Settings

This section is to configure the router's system time. You can set it manually or obtain the GMT time from the Internet.

➢ **Time zone:** Select the time zone where you are operating the Router from the drop-down list.

➢ **Customized time:** Enter the time you wish to configure.

⚠**NOTE:**

When the Router is powered off, the time settings will be lost. The router will obtain the GMT time automatically when you next time access the

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Internet. Only when you connect to the Internet and obtain the GMT time or set the time on this screen, can the time settings in other functions (e.g. security settings) take effect.

10.2 DDNS

The DDNS (Dynamic Domain Name System) is supported in this Router. It is used to assign a fixed host and domain name to a dynamic Internet IP address. Every time you access the Internet, the dynamic domain name software installed on your host will tell the ISP'S host server its dynamic IP address by sending messages. And the server software is responsible for providing DNS service and implementing dynamic domain name resolution.

➢ **Main features:**

1. Mostly, your ISP provides a dynamic IP address and the DDNS is used to capture the changeable IP address and match to the fixed domain. Then users can have access to the Internet to communicate with others outside the network.

2. DDNS can help you to establish a virtual host in your home or company.

➢ **DDNS:** Click the radio button to enable or disable the DDNS service.

➢ **Service provider:** Select one from the drop-down list and click "**Sign up**" for registration.

➢ **Username:** Enter the username that you use to register from the DDNS provider

➢ **Password:** Enter the password that you use to register from the DDNS provider

➢ **Domain name:** Enter the effective registered domain name

For example:

Establish a Web server in the local host 192.168.0.10 and register in 3322.org as follows:

Username T	enda
Password 1234	56
Domain Name	tenda.3322.org

After mapping the port in the virtual server, and setting

account i nformation in DDNS serv er, y ou can then access the web page by entering http://tenda.3322.org in the address field.

10.3 Backup/Restore

On thi s screen, you can back up the router's curr ent settings or restore previous settings.
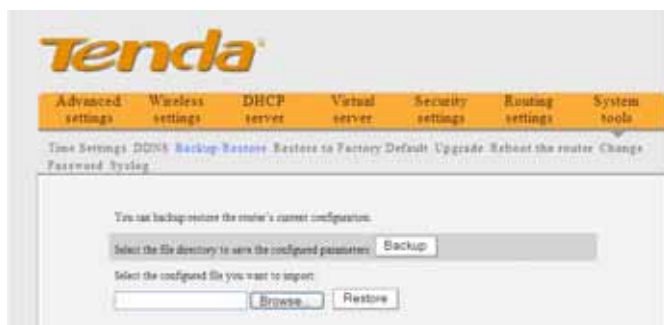
➢ **Backup Setting:**

Click the **Backup** button to back up the Router's settings and select a path to save them.
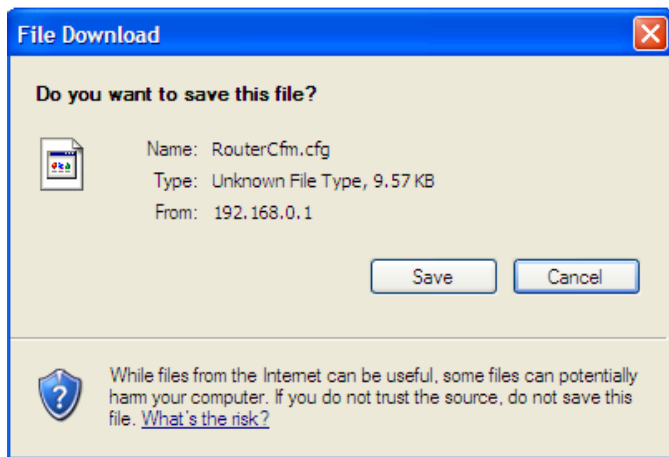
Click the "**Save**" button to save the configuration files.

➢ **Restore Setting:**

Click the " **Browse"** button to sel ect the backup files.
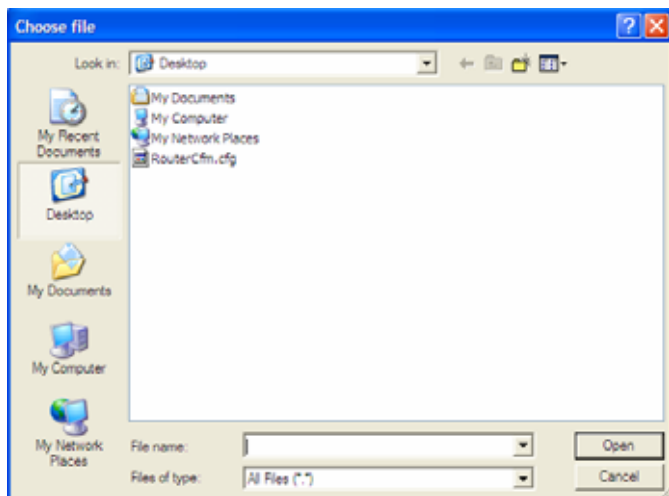
Click the " **Restore"** button to restore previ ous settings.

10.4 Restore to Factory Default

This screen allows you t o restore al l setti ngs to the factory default values.

➢ **Restore:** Click thi s butto n to restore to defaul t settings.
➢ **Factory default settings:**
   Password: admin
   IP address: 192.168.0.1
   Subnet mask: 255.255.255.0

⚠**NOTE:**

After restoring to defaul t setti ngs, please restar t the router to make the default settings effective.

10.5 Upgrade

By upgr ading the rout er's software, you'll get be tter software version and ap preciated ro uting functi on. Before upgr ading, downl oad the R outer's softw are

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upgrade file from our website, www.tenda.cn.

➢ **Browse:** Click thi s button to sel ect t he upgr ade file.
➢ **Upgrade:** Click this button to start the upgrading process. After the upgrade is completed, the router will reboot automatically.

10.6 Reboot the Router

Reboot the router to mak e the conf iguration effective. The router will cut its WAN connec tion automat ically after rebooting.

Reboot the r outer: Click th is butto n to reboot the router.

10.7 Password Change

This section is to set a new password to better secu re your router and network.

➢ **Old password:** Enter the old password.
➢ **New password:** Enter a new password.

➢ **Confirm new password:** Re-enter to confirm the new password.

⚠️**NOTE:**

To secure the router and your network, it is highly recommended t hat y ou c hange t he in itial password.

10.8 Syslog

The secti on is to vi ew th e system l og. You can view various cond itions appearing after system start, an d also check whether there's an attack on the network. The log can record at most 150 entries.

➢ **Refresh:** Click this button to update the log.
➢ **Clear:** Click this button to clear the current shown log.

10.9 Log out

After all settings are finished, please click'" Log out" to exit securely and completely.

Appendix 1 Glossary

Channel:

An instance of medium use for the pu rpose of pa ssing protocol data uni ts (P DUs) that may be used simultaneously, in the same volume of space, with other instances of medium use(on other channel s) by ot her instances of the same ph ysical layer (PHY),wi th an acceptably l ow fr ame error r atio(FER) due to mutua l interference.

SSID:

SSID (S ervice S et Identi fier) is the network name shared by all devi ces in a wi reless network. Y our network's SSID should be un ique to y our network a nd identical for all devi ces wi thin the network. It is case-sensitive and must not exceed 20 characters (use any of the characters on the keyboard).Make sure this setting i s th e same for all devi ces in your wireless network.

WPA/WPA2 Encryption:

A security protocol for wireless networks that builds on the basic foundati ons of WEP. It secur es wi reless data transmission by usi ng a key si milar t o WEP, but t he added str ength of W PA i s that the key changes dynamically. The changi ng key ma kes i t much mo re difficult for a hacker to learn the key and gain access to

the network.WP A2 i s the second gen eration of WP A security and provides a stronger encryption mechanism through Advanced Encryption Standard (AES), which is a requirement for some government users.

802,1x authentication

Static W EP k ey is d ifficult t o ma nage fo r wh en y ou change the key, you will have to inform all others, and if the key is disclosed in one of the places, the key can no longer provide security. Besides, there's severe security loophole about static WEP encryption. The WEP key can be d ecrypted after one person rec eives a speci fic amount of data vi a wi reless i ntercepting. 802, 1x i s initially used for wired Ethernet authentication access to prevent illegal users from accessing the network. Later, it is found that 802. 1x can better solve the wireless network securi ty probl em. EA P-TLS of the 80 2.1x successfully achi eves the two- way authenti cation between use rs and networks, i.e. can prevent illegal users from accessing the network and can also prevent users from accessing the ill egal AP. 802.1x utilizes dynamic WEP encrypti on to protect th e WEP key fr om being decryp ted. To sol ve the publ ishing probl em for digital certification, people make some changes to TLS authentication and TTLS and EAP come into exist, which enable you to access the network by usi ng the traditional way of aut hentication: username and password.

Appendix 2 Product Features

- Supports IEEE 802.11n, IEEE 802.11g, IEEE 802.11b, IEEE 802.3 and IEEE 802.3u standards.
- 5dBi hi gh gai n omn i-directional ant enna, wi th strong signals and long transmission distance.
- Wireless transmission rate up to 150Mbps
- Provides one 10/10 0Mbps auto -negotiation Ethernet W AN port to co nnect to the Wi de Area Network
- Provides four 10/100   Mbps auto- negotiation Ethernet LAN ports to co nnect to the Local Area Network
- Supports Auto MDI/MDIX
- Supports xDSL/Cable MODEM, static and dynami c IP in community broadband networking
- Includes router, wi reless access poi nt, fou r-port switch and firewall all in one
- SupportsWPA-PSK,WPA2-PSK,andWPA-PSK&WPA2 -PSK mixed security modes
- Supports WPS button
- Supports hidden S   SID functi on   and MA C address-based access control
- Supports WMM to mak e your audio and vi   deo smoother
- Supports SNTP
- Supports UPnP and DDNS

- Supports WDS to extend wireless network
- Supports virtual server, DMZ host
- Provides syslog to record the running status of the router

Appendix 3 FAQ

This section provides some solutions to the problems which ma y occur duri ng the router 's i nstallation or usage. The instructions below may help you deal with the problems. If your problem is not in the list, please log into our website www.tenda.cn or send an E-mail to support@tenda.cn, and we wi ll reply to you at the earliest time.

1. Can not log in to the Web-based Utility of the router after you enter the IP address in the address field?

Step 1: Check if the router is working correctly, after the devi ce i s powered on for a few se conds, the SYS indicator on the front panel should light up. If it is not, please contact us.

Step 2: Check the net work cabl es are connec ted correctly and the corresponding LED indicator lights up. Sometimes, the indicator lights up, but it does not mean it is functioning.

Step 3: Run "Ping" command and check i f it can ping

the R outer's LA N IP addres s 192. 168.0.1 (op en "Command Prompt" and type "Pi ng 192.168.0.1" a nd then enter). If it is OK, please make sure your browser does not access the Internet by proxy server. If the ping fails, you can press the "RESET" button for 7 seconds to restore to defaul t settings. And then repeat th e pi ng operation. If it still does not work, please contact us.

2. Forgot the login password and cannot enter the Web-based Utility. What can I do?

Press the "RESET" button for 7 seconds to restore t he Router to default settings.

3. The computer connected with the Router shows IP address conflict. What can I do?

Check if there are other DHCP servers in the LAN and if there are then disable them. The defaul t IP address of the router is 192. 168.0.1 pl ease maker sure the address is not being used by any other device. If there are two computers wi th the same IP address, pl ease change one of them.

4. I cannot use E-mail and access the Intern et. What can I do?

Sometimes happens wi th ADSL connecti on a nd Dynamic IP users. You may need to modify the default MTU value (1492). Please open the "WAN Setting" and modify the MTU value with the recommended value as

1450 or 1400.

5.How to share my c   omputer's resource w ith other users in Internet

If you want Internet users to access the internal server via the router such as: e-mail server, Web, FTP. You can configure the "**Virtual Server**".

Step 1: create your internal server, make sure the LAN users can access these servers and know related service port. For example, Web server's port i s 80; F TP is 21; SMTP is 25 and POP3 is 110.

Step 2: In the router's web click "**Virtual Server**" and select "**Port Range Forwarding**".

Step 3: Input the servi ce port provi ded by the rout er (i.e. the external port) for mappi ng the i nternal and external network, for example, 80-80.

Step 4: input the internal Web service port, for example, 80-80.

Step 5: Input the i nternal server 's IP address.   For example,   if your W   eb server 's IP addres   s i s 192.168.0.10, please input it.

Step 6: select the communication protocol used by your internal h ost: T CP, U DP, B oth.

Step 7: click "**Ok**" to activate the settings.

The following table lists some well-known applications and their respective service ports:

Server Protocol	Service Port

WEB Server	TCP	80
FTP Server	TCP	21
Telnet T	CP	23
NetMeeting T	CP	1503 1720
MSN Messenger	TCP/UDP	File Send:6891-6900(TCP) Voice:1863 6901(TCP) Voice:1863 5190(UDP)
PPTP VPN	TCP	1723
Iphone5.0 T	CP	22555
SMTP T	CP	25
POP3 T	CP	110

Appendix 4 Clear Wireless Configuration

Clear Wireless configuration file under windo ws XP

1. Right click "**My Network Places**" on your computer desktop and select "**Properties**".

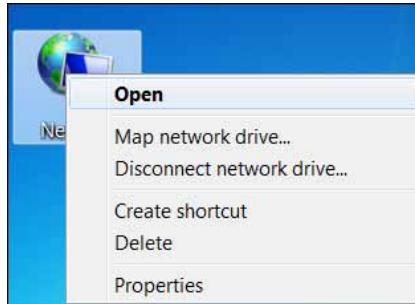2. Ri ght cli ck "W ireless Network Co nnections" a nd select "Properties".

3. Click "Wireless Network Configuration" and clear the corresponding wi reless configuration fil e as sh own below.

Clear Wireless configuration file under windows 7

1. Right click "Network" and click "Properties".

2. Click "Manage wireless networks" on the left side of the window.

3. De lete t he c orresponding c onfigured file in t he "Manage wireless networks".

Appendix 5 Regulatory Information

EU Declaration or Declaration of Conformity

Hereby, SH ENZHEN T ENDA T ECHNOLOGY C O.,LTD, declares t hat t his W ireless Br oadband R outer is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

FCC Statement

This equi pment has been tested and f ound to comply with the limits for a Class B digital device, pursuant to part 15 of th e FCC rul es. These l imits are designed to provide reasonabl e protecti on agai nst harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used i n acco rdance wi th the instructions, ma y c ause ha rmful interference t o r adio communications. However, there i s no guar antee t hat interference will not occur in a particular installation. If this equipment does cause harmful interference to r adio or tel evision recepti on, wh ich can be determined by turni ng 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 th e se paration betwe en th e equi pment and receiver.

-Connect the equi pment into an outlet on a ci rcuit different from that to which the receiver is connected.

-Consult the deal er or an experi enced radio/TV technician for help.

To assure c ontinued compl iance, a ny changes or modifications not expres sly approved by the party responsible for compli ance coul d void the us er's authority to operate this equipment. (Example- use only shielded interface cables when connecting to computer or peripheral devices).

"The antenna(s) used for this transmitter must not be co-located or oper ating in conjuncti on with any other antenna or transmitter."

FCC Radiation Exposure Statement

This devi ce complies wi th P art 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this devi ce must accept an y i nterference rec eived, including interference t hat may c ause undesi red operation