802.11g Wireless LAN (WLAN) User Manual, Model: RSVLD-0608

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Introduction:

The 802.11g WLAN Solution

The **802.11g WLAN** solution accesses wireless local area networks (LANs), enables the sharing of a local printer and files with others in the network, accesses the Internet, and enables roaming about the office—wire-free. This wireless LAN solution is designed for both the home user and small businesses—and it is scalable so that users can be added and new network features can be enabled as networking needs grow.

WEP is a security protocol for wireless local area networks (defined in IEEE Std 802.11, 1999 Edition) that encrypts data sent over radio waves. The use of the WEP key is optional and can be enabled or disabled. If the network being connecting to has enabled WEP, WEP must also be enabled in the network profile and the WEP key must be set to match the WEP key used by the network. Otherwise, it is impossible to connect to the network.

Enterprise Users

Obtain the following information from the network administrator:

- Network names (SSID) of the specific wireless networks to connect to
- WEP (Wired Equivalent Privacy) key information (if any) for the networks to connect to
- For Microsoft® Windows® networking, the customer name and workgroup name
- For a network account, a user name and password
- An IP address (if not using a DHCP server)

Using the 802.11g WLAN

The **802.11g** enabled device is an IEEE 802.11g based wireless LAN device. A LAN is composed of two or more computers that are connected to each other to share files or common equipment such as a printer or an Internet connection. A wireless LAN provides the same functionality of a wired network, but it eliminates the need to install networking cables and other networking equipment. Not only is a wireless LAN easier to deploy, but it also allows for roaming.

Features and Requirements

An IEEE 802.11 based wireless LAN includes the following features:

- Support for IEEE 802.11g draft specification
- Support for IEEE 802.11b standard
- 2.4-GHz band operation
- Network data rate of up to 54 Mbit/s
- Wired Equivalent Privacy (WEP) encryption

The 802.11g enabled device works with any Wi-Fi CERTIFIED® base station or wireless client adapter.

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Completing the Setup:

NOTE—Before starting, obtain the required network information from the network administrator or the wireless access point installer (see The Company 802.11g WLAN Solution in Introduction).

Modes of Operation

Modes of Operation

A wireless LAN can be configured for two different modes of operation: infrastructure network and computer-to-computer (ad hoc) network. Whereas each mode has its advantages, one mode may be more appropriate than the other, depending on the location and type of network connection.

Infrastructure Mode

The key difference between the infrastructure type of network and an ad hoc network is that the infrastructure network includes a base station (host) computer that has a built-in wireless network adapter and is connected to a wireless access point (AP). This functionality allows computers on the infrastructure wireless LAN to access the resources and tools of the wired LAN, including Internet access, e-mail, file transfers, and printer sharing.

Characteristics

Networked computers communicate with each other through a dedicated AP. All data transmitted between the computers on this wireless LAN passes through the AP.

Advantages

- Extended range. The access point extends the range of the wireless LAN. Each computer can communicate with other computers equipped by wireless networks that are within the range of the access point.
- Roaming. As the user moves around the home or office, the 802.11g enabled device determines the best access point to use to ensure continuous communication with the network.
- Network connectivity. An access point can provide wireless LAN access to an existing wired network by bridging the two networks together. This gives users of the wireless LAN access to all the functions of a wired network—from file server access to e-mail and the Internet.

Disadvantages

Because the infrastructure mode offers more features, it requires additional components and setup time to deploy.

Requirements

A base station computer having a wired connection to the Internet, a wireless network adapter, and a connection to an AP.

Computer-to-Computer Mode

A peer-to-peer (ad hoc) network is the easiest to deploy and is ideal for home use or in small offices. This mode allows the sharing of files with other employees, printing to a shared office printer, and access to the Internet through a shared modem. With ad hoc networking, however, the computer is only able to communicate with other wireless networks that are within a certain range and are in the same wireless workgroup.

Characteristics

Networked computers send data directly to each other.

Advantages

- Simple setup
- Cost efficiency

Disadvantages

Communication is limited to those who are located within a certain range.

Utility Functions:


Running Utility Functions

Running Utility Functions

The utility functions and details for the wireless network connection are available in **Control Panel**. These functions include **Disabling the network device**, **Renaming the connection**, **View status of this connection**, and **Change settings of this connection**.

Changing Settings

1. Click **Start**, then click **Control Panel**.
2. Double-click **Network Connections**.
3. Click **Wireless Network Connections**, and then click **Change settings of this connection**.

- Click the **Wireless Network** tab to configure available networks, add and remove networks, and change network properties.
- Click the **General** tab, then click **Configure**
    - To change the properties of the network adapter, click the **Advanced** tab.
    - To view details about the driver files, update the driver for the device, roll back to the previous driver, or to uninstall the driver, click the **Driver** tab.
    - To view resource settings, click the **Resources** tab.
    - To change power management settings, click the **Power Management** tab.

The **Advanced** tab in **Network Adapter Properties** lists the properties for the *Company* **54g Wireless LAN (WLAN)** adapter.
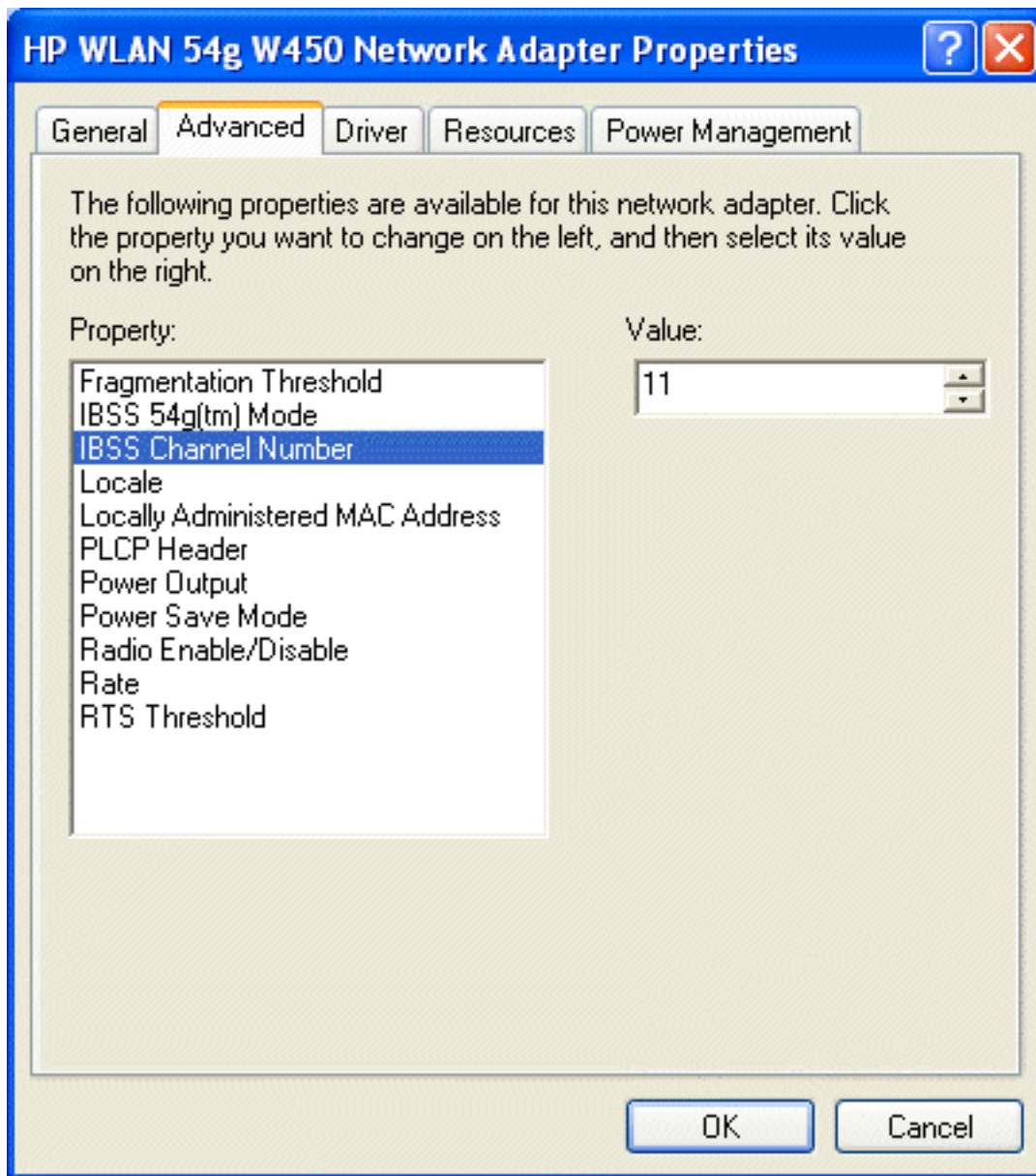
- **IBSS Channel Number** selects the independent basic service set (IBSS) channel number on which to operate. The *Company* **54g** enabled device comes preset for use on channels 1—11. This setting is acceptable in most countries. Some countries allow use on more channels. If you travel to a country that allows the use of other channels, change the **IBSS Channel Number** to that number.
- **Locale** selects the adapter properties that comply with the operating regulations for that locale. The **Locale** settings include **USA**, **Israel**, **Japan**, **Jordan**, **Thailand**, and **Worldwide**. This wireless LAN device is normally preset by default for the country in which the device is sold. Before operating this WLAN device, verify that the locale selection is correct by following the steps described in Changing Settings above. On the **Advanced** tab of **HP WLAN 54g W450 Network Adapter Properties**,
  - ○ Click **Locale**
  - ○ In the **Value** list, select the appropriate regional location
- **Radio Enable/Disable** allows you to turn the radio on or off as necessary to comply with restrictions prohibiting the emission of radio signals.

- **Rate** sets the transmission rate. The default setting is **Use best rate**. This automatically adjusts the data rate to the optimal rate based on the capabilities of the other clients and access points.

The default values for the properties listed below are set for maximum performance. Therefore, It is not recommended for home users to change the settings for any of these properties. Only network administrators or persons having technical wireless LAN experience should attempt to change any of the settings.

- **Fragmentation Threshold** is the threshold at which the IEEE 802.11 adapter break the packet into multiple frames.
- **IBSS 54g (TM) Mode** is used to set the connection type in an ad hoc network. The following options are available:
    - 54g - 802.11b compatible— links at the best rate with an IEEE 802.11b and an IEEE 802.11g network (recommended setting).
    - 54g - Performance— links only with IEEE 802.11g networks at the highest rate. In addition it excludes IEEE 802.11b networks.
    - 802.11b Mode— links only with IEEE 802.11b networks at the highest rate. In addition it excludes IEEE 802.11g networks.
- **Locally Administered MAC Address** is used to override the MAC address of the *Company* **54g Wireless LAN** adapter.
- **PLCP Header** is used to set the header type used for CCK rates. Can be long, auto (short/long).
- **Power Output** is used for putting out a percentage of the maximum output power.
- **Power Save Mode** is used to put the *Company* **54g** enabled device into the IEEE 802.11 Power Save mode. In Power Save mode, the radio is periodically powered down to conserve power. When in Power Save mode, packets are stored in the AP until the STA comes on.

Specifications:

Physical Characteristics
Temperature and Humidity Limitations
Power Characteristics
Networking Characteristics
Radio Characteristics

Physical Characteristics

Characteristic	Description
Form Factor	USB form factor
Dimensions (length, width)	40 mm × 44 mm

Temperature and Humidity Limitations

Condition	Description
Operating Temperature	0 to 85°C
Operating Humidity	90% maximum (no condensation allowed)
Storage Temperature	–40 to 90°C
Storage Humidity	90% maximum (no condensation allowed)

Power Characteristics

| Characteristic | Values | |
	IEEE 802.11g Operation	IEEE 802.11b Operation
Doze Mode	40 mA	40 mA
Receive Mode	350 mA	220 mA
Transmit Mode	350 mA	330 mA
Power Supply	3.3 V	3.3 V

Networking Characteristics

Characteristic	Description
Compatibility	IEEE Std 802.11b and IEEE Draft Std 802.11g for wireless LAN
Network Operating System	Microsoft® Windows® Networking
Host Operating System	Microsoft Windows XP
Medium Access Protocol	CSMA/CA (collision avoidance) with acknowledgment (ACK)
Data rate (Mbps)	IEEE Draft Std 802.11g: 1, 2, 5.5, 6, 11, 12, 18, 24, 36, 48, 54 IEEE Std 802.11b: 1, 2, 5.5, 11
NOTE—The **Company 54g WLAN** solution uses an automatic transmit rate select mechanism	

Radio Characteristics

Characteristic	Description
Frequency Band	2.4 GHz (IEEE 802.11b, IEEE Draft Std 802.11g)
Modulation Technique	Direct sequence spread spectrum (DSSS) • CCK for high and medium transmit rate • DQPSK for standard transmit rate • DBPSK for low transmit rate Orthogonal frequency division multiplexing (OFDM) • 52 subcarriers with BPSK, QPSK, 16-QAM or 64-QAM • Forward error correction convolutional coding rate: 1/2, 2/3, 3/4
Spreading	11-chip Barker sequence
Bit Error Rate (BER)	Better than 10(–5) ppm
Nominal Output Power	IEEE Std 802.11b: 19dBm; IEEE Std 802.11g: 16.5 dBm

NOTE—See Regulatory Information for country-specific performance characteristics and use restrictions.

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USA-Federal Communications Commission (FCC)

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. If not installed and used in accordance with the instructions, it 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 tuning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:
-Reorient or relocate the receiving antenna
-Increase the distance between the equipment and the receiver.
-Connect the equipment to outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.
Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Caution: Exposure to Radio Frequency Radiation.

To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons. This device must not be co-located or operating in conjunction with any other antenna or transmitter.

Canada – Industry Canada (IC)

This device complies with RSS 210 of Industry Canada.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of this device."

L ' utilisation de ce dispositif est autorisée seulement aux conditions suivantes : (1) il ne doit pas produire de brouillage et (2) l' utilisateur du dispositif doit étre prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

The term "IC" before the equipment certification number only signifies that the Industry Canada technical specifications were met.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication.

To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing.

Pour empecher que cet appareil cause du brouillage au service faisant l'objet d'une licence, il doit etre utilize a l'interieur et devrait etre place loin des fenetres afin de Fournier un ecram de blindage maximal. Si le matriel (ou son antenne d'emission) est installe a l'exterieur, il doit faire l'objet d'une licence.

Caution: Exposure to Radio Frequency Radiation.

The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's website www.hc-sc.gc.ca/rpb.

Europe—EU Declaration of Conformity and Restrictions

Hereby, Broadcom Corp, declares that this equipment complies with the essential requirements and other relevant provisions of Directive 1999/5/EC.

This equipment is marked with the $C\epsilon$ **0984** symbol and can be used throughout the European community.

This indicates compliance with the R&TTE Directive 1999/5/EC and meets the relevant parts of following technical specifications:

EN 300 328 – Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission Systems; Data transmission equipment operating in the 2,4GHz ISM band and using spread spectrum modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the R&TTE directive.

EN 301 489-17 - Electromagnetic Compatibility and Radio Spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 17 Specific Conditions for Wideband Data and HIPERLAN Equipment.

EN 60950 - Safety of Information Technology Equipment.

EN 50385 – Product standard to demonstrate the compliances of radio base stations and fixed terminal stations for wireless telecommunication systems with the basic restrictions or the reference levels related to human exposure to radio frequency electromagnetic fields.

Marking by the symbol indicates that usage restrictions apply.

France - 2.4GHz for Metropolitan France :

In all Metropolitan départements, wireless LAN frequencies can be used under the following conditions, either for public or private use:

· Indoor use: maximum power (EIRP*) of 100 mW for the entire 2400-2483.5 MHz frequency band

· Outdoor use: maximum power (EIRP*) of 100 mW for the 2400-2454 MHz band and with maximum power (EIRP*) of 10 mW for the 2454-2483 MHz band

Taiwan DGT warning statement

低功率電波輻性電機管理辦法
第十四條經型式認證合格之低功率射頻電機，非經許可，公司、商號或使
用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。
第十七條低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發
現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。
前項合法通信，指依電信規定作業之無線電信。低功率射頻電機須忍受合法通信
或工業、科學及醫療用電波輻射性電機設備之干擾。

Translation:

Article 14
Without permission granted, the frequency change, transmitting power enhance or alter of
original design characteristic as well as function by company, enterprise, or user for approved
Low-power radio frequency devices is not allowed.

Article 17
Low-power radio-frequency devices shall not influence aircraft security and interfere legal
communications; If found, shall cease operating immediately until no interference is achieved.

Above mentioned Legal Communications is defined as radio communications operation follows
Telecommunications Act. Low-power radio-frequency devices must susceptible with the
interference from legal communications, ISM radio wave radiated devices.