WIRELESS CARD

Wireless 802.11g PCI Network Card

PCI555WG

Instruction Guide

* Actual product may vary from photo

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

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

FCC CAUTION
This equipment must be installed and operated in accordance with provided instructions and a minimum 8 inches (20cm) 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.

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 8 inches (20cm) 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
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 manufacturer 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.

Table of Contents

Introduction

Thank you for purchasing a StarTech.com Wireless 802.11g PCI network card. This network card will allow you to connect to routers, access points, and other devices that comply with the 802.11g wireless standard at blistering speeds of up to 54 Mbps. This card is also backward compatible with the 802.11b standard and supports security protocols such as 64 and 128-bit WEP, WPA, AES, and IEEE 802.1x.

Features

- High speed wireless data transfer rates: up to 54 Mbps (802.11g) or 11 Mbps (802.11b)
- Supports automatic transfer speed fallback so that connections are always as fast and stable as possible
- Advanced security features, including support for 64 and 128-bit WEP encryption, WPA (TKIP with IEEE 802.1x), and AES
- The detachable antenna with cable allows for placement that achieves the best possible reception

Before You Begin

To make the installation and setup of the network card as easy as possible, please review this section carefully before attempting installation.

System Requirements

- An IBM compatible computer running Windows 98SE/ME/2000/XP
- An available PCI expansion slot
- CD-ROM or other compatible optical drive (for software installation)

WARNING! PCI expansion cards, like all computer equipment, can be severely damaged by static electricity. Be sure that you are properly grounded before opening your computer case or touching the network card. StarTech.com recommends the use of an anti-static strap when installing when installing any computer equipment. If an anti-static strap is unavailable, discharge yourself of any static electricity buildup by touching a large, grounded metal surface (such as the computer case) for several seconds. Also, be careful to handle the network card only by its edges, and not the gold connectors.

Contents

- 1 x PCI555WG Wireless PCI network card
- 1 x Detached dipole antenna
- 1 x Software CD (drivers and utilities)
- 1 x Manual

Installation

This section will guide you through the installation of your PCI card and the related software. Please read through the instructions carefully and complete each step in the order listed.

Installing the Card

1. Make sure that your system is unplugged and you are grounded.

2. Remove the cover of your system (see your computer's user manual for details, if necessary) and gently turn your computer onto its side.

3. Locate an available PCI slot (usually white in color) and remove the metal plate that covers the rear bracket. You may need a Phillips screwdriver to perform this step. **Retain this screw!** You will need it to secure the card later.

4. Gently insert the card into the empty slot, making sure it is firmly seated.

5. Secure the card in place using the screw you removed in Step 3.

Installing the Driver and Configuration Utility

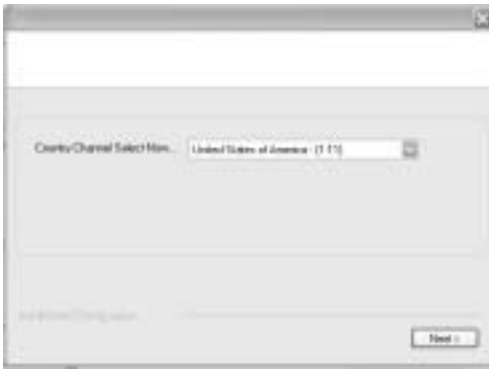
NOTE: The following images and procedures relate to the Windows XP installation of the PCI555WG. The installation for other versions of Windows is similar.

1. After the network card has been physically installed, start the computer.

2. When Windows loads, it will detect that new hardware has been installed and may display the **Found New Hardware Wizard**. Choose the **Cancel** option.

3. Insert the software disc that came with the network card into your computer's CD-ROM drive.

4. Go to **My Computer** located on the desktop or on the **Start** menu. Double click the **CD** icon for your CD-ROM. Double click the **Setup** icon. The installation program will start.



5. Click **Easy Install** or **Next** to continue.

6. The installation program will copy files to the computer. Wait for the process to finish.

7. If at any time you receive a warning about unsigned software, choose **Continue Anyway** when prompted.

8. The installation program will ask you to choose your country channel. The default option is **United States of America (1-11)**. Choose another option only if you are located in a region outside the United States or Canada. Click **Next**.

9. Click **Finish** to complete the installation.

10. At this time, you will be prompted to selected between two options: **Use RT2500 Configuration Utility** or **Use Windows XP Zero Configuration**. If you select **Use Windows XP Zero Configuration**, you will have to use the Windows Network Settings to configure the PCI555WG. *In order to access all the features of the card, it is strongly recommended that you use the Configuration Utility that came with the PCI555WG.* To use the Configuration Utility, select it when prompted (default) and choose **OK**.

NOTE: The selection you make at this point is permanent. If you wish to change your selection later, you will need to uninstall the Configuration Utility and re-install it to make the choice again. To uninstall the Configuration Utility, go to **Start > Settings > Control Panel > Add/Remove Programs**, highlight the Configuration Utility from the program list, and click **Remove**. Once the uninstall is complete, repeat steps 3 through 9 above.

11. If you elected to use the PCI555WG's software to manage your connection, the **Configuration Utility** window will open. See the next section for information on configuring the PCI555WG for your site. If you want to configure the card later, choose **OK**.

The System Tray

Configuring the Card

The installation program installed a Configuration Utility that loads automatically when Windows starts. You can use this utility to configure the network card after installation and whenever you want to make changes to the way the card is configured. The program appears in the System Tray near the clock. To access the utility at any time, right click the icon once and choose **Launch Config Utilities** from the menu. If you have just completed the driver installation and did not close the window, the **Configuration Utility RT2500** window will still be on the screen.

NOTE: Configuring the PCI555WG will require familiarity with several network-related settings. Depending on how other wireless devices are configured on your network, you may need to consult the User Guide for your wireless router or access point or your System Administrator for site-specific information to configure the network card.

Site Survey

When you start the configuration utility, it will scan the surrounding area to find available network devices such as routers and access points. It will list all of the devices within the range of the network card and automatically attempt to connect to the device with the strongest signal. You have three options from the Site Survey screen:

Available Networks: The grid in center of the window will show the name and particulars of the available wireless networks within the range of the card, including: SSID, BSSID, Signal Strength, Channel, Encryption, Authentication, and Network Type.

Rescan*:* This will refresh the information on nearby wireless networks displayed in

the *Available Networks* window.

Connect*:* Allows you to connect to the network device highlighted in the *Available* Networks window.

Add to Profile: Adds the network highlighted in the *Available Networks* window to the Profiles list (see below).

Profile

This area provides an easy way to manage the wireless networks that you access frequently. The Profiles List appears as a grid in the center of the window and shows general information about networks saved in the profiles list: Profile Name, SSID, Channel, Authentication, Encryption, and Network Type. From this screen, you have four choices that can be used by highlighting a profile on the Profiles List and clicking the appropriate button: **Add**, **Delete**, **Edit**, and **Activate**.

Add: Create a new profile for a wireless network.

Delete: Remove the highlighted profile from the Profiles List.

Edit: Configure the highlighted profile. (See additional information under "Configuring a Profile below.)

Activate: Make the highlighted profile the network that the wireless card will use. This is the same as choosing Connect from the Site Survey menu. (Note: Only one wireless connection can be active at any one time.)

Configuring a Profile

Often, wireless networks use a number of settings to configure how devices like the PCI555WG connect to their resources. You will not be able to connect to a wireless network unless the configuration settings for the network card match the settings of the wireless access device, usually a wireless router or access point. Unless the network you wish to access uses a completely "open" configuration (no security or encryption), you will need to configure a profile for it. This is also useful if you move between multiple sites or networks that use different settings. This section will allow you to configure the network card to the settings of the network or networks you wish to use.

When you choose **Add** or **Edit** from the **Profile** tab of the configuration utility, you will be presented to the following menu:

System Configuration Tab

Profile Name: A short nickname that will allow you to recognize which network the profile is configured for.

SSID: Short for Service Set Identifier, this is the name that a wireless access point or router broadcasts so that it can be recognized by other devices. It also allows for more than one wireless network to be installed in a single location without confusion. The SSID is set on the access device and cannot be changed through the PCI555WG. To add a network to the profile, use can use

the drop-down menu to choose its SSID from the list of available devices.

Power Saving Mode: This option manages the power consumption of the PCI555WG.

CAM (Constantly Awake Mode): Does not restrict the power use of the network card.

Power Saving Mode: Automatically reduces the power used by the network card when it is not in use.

CAM When AC Power: sets the computer to use the CAM setting when connected to a power outlet.

Network Type: Allows you to choose between two different configurations depending on the hardware in your network.

Infrastructure: Requires an 802.11b/g router or access point to be present; this is the most popular configuration type for most situations.

Ad-Hoc: Allows you to connect to another wireless computer or similar device without the use of a router or access point.

Transmit Power: Reduces the amount of power that the PCI555WG uses to send information to other devices on the network. This does not need to be adjusted in most situations, and can affect the data transfer performance of the card in some environments.

11B Preamble Type: Used only when the Ad-Hoc network type is selected, and adjusts the length of the CRC block.

Auto: Adjusts the preamble setting to whatever the remote device is configured to use (recommended).

Long: Forces the card to use the long preamble setting, regardless of the configuration of other devices.

RTS Threshold: Sets the minimum packet sized required for the PCI555WG to send a Request to Send (RTS). For packets smaller than the threshold size, the packets will be transmitted directly to the wireless network: adjustable between **0** and **2312** bytes (default setting recommended).

Fragment Threshold: Sets the maximum packet size that the PCI555WG will use to send information to the wireless network. High values may decrease errors but slightly reduce information transfer rates: adjustable between **256** to **3212** bytes (default setting recommended).

Channel: Used only when the Ad-Hoc network type is selected, and changes the channel the PCI555WG uses to connect to other devices.

Authentication vs. Security Tab

Authentication Type: This setting must match the configuration of the wireless network to which you are connecting.

None: No authentication is needed.

Shared: Only wireless devices using a shared key are allowed to connect to the network.

WPA: Wi-Fi Protected Access. Designed for businesses that use a Radius server for client authentication, a WPA-enabled router or access point, and WPA- enabled clients. Once enabled, all wireless clients must use WPA to access the network. The data is encrypted from point-to-point using the TKIP or AES protocols. It requires that 802.1x settings be entered; click **802.1x Setting** to enter the required security details.

WPA-PSK: Variant of WPA. Designed for small/home business users that do not use specialized network authentication servers. When a passcode called a Pre-Shared Key (PSK) is entered and enabled on the wireless access point or router, devices that do not have the passcode cannot connect to the network. The data is encrypted from point-to-point using the TKIP or AES protocols.

NOTE: To use WPA or WPA-PSK, you must be running Windows XP Service Pack 1 (or higher) and have the Windows XP Support Patch for Wi-Fi Protected Access installed. If you are unsure whether you have these programs installed on your computer, go to http://windowsupdate.microsoft.com or contact your System Administrator for assistance.

LEAP: Lightweight Extensible Authentication Protocol. This is a proprietary authentication/encryption protocol designed by Cisco Systems and is used in some of their access devices.

Encryption Type: This setting configures how the PCI555WG protects data sent and received between the computer and other wireless devices. This setting must match the configuration of the wireless network to which you are connecting. **NOTE:** Not all wireless devices support all of the protocols available on the PCI555WG.

None: Data is unencrypted. (Not recommended.)

WEP: Stands for Wired Equivalent Protocol; can be configured for 64 or 128-bit levels of encryption. Also requires that one or more keys be configured (see below).

TKIP: Stands for Temporal Key Integrity Protocol; changes the encryption key automatically every 10,000 packets.

AES: Stands for Advanced Encryption Protocol; an advanced level of 128-bit encryption, defined by the IEEE 802.11i standard.

WPA Pre-Shared Key: Used when WPA-PSK is selected as the Authentication Type. This passcode can be from 8 to 64 characters in length and can be comprised of letters or numbers, and must be the same as other devices on the wireless network.

WEP Key (Key1 ~ Key4): Used when WEP is selected as the Encryption Type. At least one value must be supplied; the default key is selected by clicking the button next to the

text box.

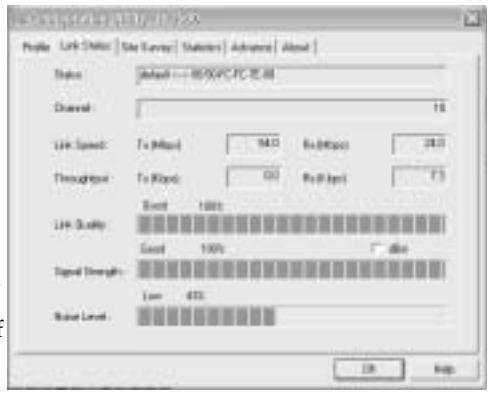
64-bit: 10 digit hexadecimal value (from A-F, a-f and 0-9 ranges) OR a 5 digit ASCII text value: 0123456aef or test1 are examples of valid keys.

128-bit: 26 digit hexadecimal value (from A-F, a-f, and 0-9 ranges) OR a 13 digit ASCII text value: 01234567890123456789abcdef or administrator are examples of valid keys.

Other Settings and Features

The Configuration Utility allows you to access other features of the PCI555WG and monitor the performance of your wireless connection. You have used the **Profile** and **Site Survey** features of the Utility to setup and configure the card. This section describes the features available on the other tabs of the Configuration Utility.

Link Status



Status: Displays the SSID and MAC address of the wireless access device the PCI555WG is connected to.

Current Channel: Displays the RF channel number and frequency of the active connection.

Current Tx Rate: Displays the highest possible transmission rate for the active wireless connection (maximum of 54 Mbps).

Throughput (Kbits/sec.): Displays the speed of data transmitted and received.

Link Quality: A visual indication of the quality of the connection between the PCI555WG and the wireless device; higher values represent a better connection.

dBm: Converts the signal strength of the current connection into a dBm measurement.

Signal Strength: Shows the relative signal strength of the signal being received by the card. A higher value indicates a stronger signal and may improve transmission rates and throughput. You can use this measurement to help you find the best possible location for the PCI555WG's antenna.

Noise: A relative measurement of the interference the PCI555WG is receiving from the outside environment.

Statistics

This tab displays transmit and receive statistics for the current wireless connection. You can return all of the values to zero by clicking **Reset Counter**.

Advance

This tab allows you to further optimize the settings of the PCI555WG for your environment.

NOTE: Use caution when changing these settings. While adjusting these settings from their default values may allow you to improve the performance of your connection with the PCI555WG, they may impair or disable the connection under some circumstances. If you are unsure as to whether a setting applies to you, contact your System Administrator.

Wireless Mode

802.11 B/G mix: Assumes that both 802.11b and 802.11g devices exist on the network (default). When selected, this allows the PCI555WG to connect to 802.11g devices (if present) at speeds of up to 54 Mbps. This is the recommended setting.

802.11 B only: If you are certain you will be connecting only to 802.11b devices, you can select this option to force the card to 802.11b-only mode.

Tx BURST: Enabling this option may improve the transmission throughput of the card.

B/G Protection: If your network is a mixed 802.11b/g environment, this feature can reduce the frequency of data collisions between the card and devices operating in a different mode. Performance is slightly reduced when this feature is enabled.

Auto: The PCI555WG automatically enables protection based on the status of the network (recommended).

On: The PCI555WG will always enable protection, regardless of network status.

Off: The PCI555WG will never use protection.

ADHOC_OFDM: If you have configured the card to work in Ad-Hoc mode, it will automatically default to 802.11b speeds as required by protocol standards. To override this setting and allow speeds up to 54 Mbps (802.11g), enable this checkbox. (Note: This only affects performance when the card is used in an Ad-Hoc connection.)

Tx Rate

Auto: The card will automatically choose the highest possible transmission throughput speed based on the signal quality and capabilities of other devices in the connection. The PCI555WG has the capability to increase or decrease throughput as the environment changes (i.e. interference). This setting is highly

recommended.

1/2/5.5/11/6/9/12/18/24/36/48/54Mbps: Forces the card to use only the transmission speed selected. If *Wireless Mode* is set to **802.11 B only** the only speeds available for this setting will be **1/2/5.5/11Mbps**. Note that the ability to make a successful connection at a particular speed is affected by both distance and environmental interference. If you select a value that is too high for the current environment and location, the wireless connection may be intermittent or fail.

Turn Off RF Button: When clicked, this will temporarily disable the wireless connection. Click again to re-enable the PCI555WG.

Once you have finished adjusting your settings, click **Apply** to enable them. Note this may cause a short disruption with your wireless connection as the card re-connects to the access device using the new settings.

About

This tab displays general information about drivers and software you installed with the PCI555WG, and well as information about the card including EEPROM version and MAC address.

Troubleshooting

This section addresses common problems with wireless connections. Please examine this section and attempt the solutions offered before contacting technical support. Given the complexity of some wireless networks, you may want to get assistance from your System Administrator or other professional if you encounter difficulties achieving a stable, secure wireless connection.

Problem: I cannot connect to my wireless network.
Cause: Your security and/or encryption settings may not match those of the wireless access device (router, access point) to which you are trying to connect, or there may be an environmental issue (distance, interference) that is compromising the connection.
Solution: 1) Go to the **Statistics** tab of the Configuration Utility. If a signal is present but extremely low, try reorienting the antenna of the PCI555WG or decrease the distance between the antenna and the access device to improve the signal strength.
2) If there is a great deal of potential interference-causing material between the antenna and access device (electrical cables, heavy machinery, solid walls) you may wish to relocate the computer or access device.
3) Ensure that the *Tx Rate* is set to **Auto** on the **Advance** tab in the Configuration Utility so that the card will negotiate the best possible

connection given your environment.
4) If no signal is present, adjust your encryption, authentication and other settings to match your network.

Problem: The card connects to my wireless access device and network, but I cannot see or browse other computers on my network or access the Internet.
Cause: There may be software (i.e. firewall) that is interfering with the operation of the PCI555WG.
Solution: 1) Disable the Windows XP firewall (if applicable). Double-click the icon for your wireless network connection in the System Tray (next to the clock). Click the **Advanced** tab. If the checkbox next to **Protect my computer and network…** under the **Internet Connection Firewall** menu is enabled, uncheck it.
2) Disable or uninstall any third-party firewall software.
3) Verify that the properties (protocols, etc.) for the wireless network connection are configured properly.

Problem: My wireless connection works, but it seems slow.
Cause: There is interference or a settings problem that is limiting the speed of the connection.
Solution: 1) If there is a great deal of potential interference-causing material between the antenna and access device (electrical cables, heavy machinery, solid walls) you may wish to relocate the computer or access device.
2) Ensure that the *Tx Rate* is set to **Auto** on the **Advance** tab in the Configuration Utility so that the card will negotiate the best possible connection given your environment.
3) Ensure that **802.11 B/G mix** is selected for *Wireless Mode* under the **Advance** tab of the Configuration Utility.
4) Enable the checkbox next to *Tx Burst* on the **Advance** tab in the Configuration Utility.

Specifications

Interface	32-bit PCI
Frequency Band	2.3000 ~ 2.4835GHz (Industrial/Scientific/Medical Band)
Modulation	OFDM with BPSK, QPSK, 16QAM, 64QAM (11g) BPSK, QPSK, CCK (11b)
Data Rate	54/48/36/24/18/12/11/9/6/5.5/2/1 Mbps Supports auto fallback
Security	64/128-bit WEP, WPA, AES, 802.1x
Antenna	Detached external dipole antenna, RP-SMA connector, cable length: 37 inches (94 cm)
OS Support	Windows 98SE/ME/2000/XP
LED Indicators	Tx/Rx, Link
Transmit Power	16 dBm ~ 18 dBm
Power Consumption	Tx: 350 mA, Rx: 250 mA
Receive Sensitivity	54 Mbps OFDM, 10% PER. -70 dBm 11 Mbps CCK, 8% PER, -86 dBm 1 Mbps BPSK, 8% PER, -92 dBm
Operating Temperature	32 ~ 131°F (0 ~ 55°C) Maximum humidity 95%, non-condensing
Dimensions	0.75" x 5.0" x 4.76" (19 x 127 x 121 mm) H x W x D
Certifications	FCC Class B, CE

Technical Support

The following technical resources are available for this StarTech.com product:

On-line help:

We are constantly adding new information to the *Tech Support* section of our web site. To access this page, click the *Tech Support* link on our homepage, **www.startech.com**. In the tech support section there are a number of options that can provide assistance with this product.

Knowledge Base - This tool allows you to search for answers to common issues using key words that describe the product and your issue.

FAQ - This tool provides quick answers to the top questions asked by our customers.

Downloads - This selection takes you to our driver download page where you can find the latest drivers for this product.

Call StarTech.com tech support for help:
USA/Canada: 1-800-265-1844
UK/Ireland/Europe: 00-800-7827-8324
Support hours: Monday to Friday 8:30AM to 6:00PM EST (except holidays)

Warranty Information

This product is backed by a one-year warranty. In addition, StarTech.com warrants its products against defects in materials and workmanship for the periods noted, following the initial date of purchase. During this period, the products may be returned for repair, or replacement with equivalent products at our discretion. The warranty covers parts and labor costs only. StarTech.com does not warrant its products from defects or damages arising from misuse, abuse, alteration, or normal wear and tear.

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