



Digi Connect® WAN Application Guide

Using the Digi Connect WAN and Digi Connect® VPN with a Wireless Router/Access Point

Scenario

Digi Connect WAN and Digi Connect VPN are used for primary remote site connectivity. The Digi Connect WAN/VPN Ethernet port is connected to an Ethernet port of a Wi-Fi SOHO router or Wireless Access Point (WAP), creating a small wireless network. The Digi Connect WAN/VPN provides IP routing via a cellular IP network much the same as a DSL or cable modem provides Internet access.

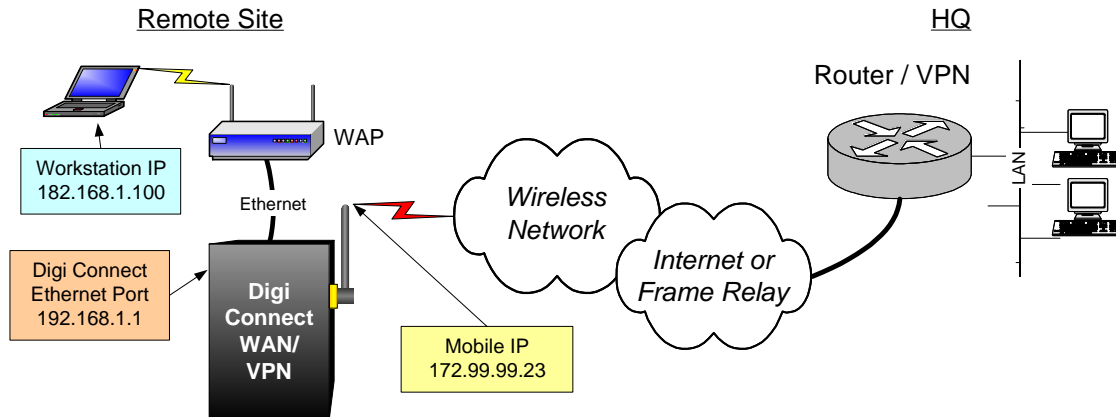
Theory of Operation

There are two main configurations possible with this scenario:

1. The WAP functions only as a wireless access point and/or Ethernet switch; the Digi Connect WAN/VPN is the primary WAN router. This is the most likely scenario.
 - a. The WAP behaves like a normal Ethernet switch. The Ethernet port of the Digi Connect WAN/VPN attaches to an Ethernet LAN port on the WAP just as it would to any other router's LAN port. The WAP's WAN port (if provided) is not connected, unless that port can be designated a LAN port; no routing is done by the WAP.
 - b. The Digi Connect WAN/VPN provides routing, NAT and/or VPN to/from the remote site via the cellular wireless network. Workstation IP configurations use the Digi Connect WAN/VPN as their default gateway. The Digi Connect WAN/VPN can also provide DHCP services.
2. The WAP functions as a router. The Digi Connect WAN/VPN connects to the WAP's Ethernet WAN port (typically via a crossover Ethernet cable) and simply passes traffic. This scenario might be used where the WAP performs some special function such as proprietary VPN. The Digi Connect WAN/VPN will likely need to be configured for GRE or VPN pass-through. See the appropriate Digi Connect application guides available at <http://www.digi.com/products/wireless/digiconnectwangsmdocs.jsp> for details.

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Sample Diagram:



Example Setup:

Refer to the diagram above using these sample IP addresses:

Digi Connect WAN/VPN/VPN cellular link	172.99.99.23
Digi Connect WAN/VPN/VPN Ethernet port	192.168.1.1
Wireless Access Point	192.168.1.2
Wireless workstation IP addresses	starts at 192.168.1.100

The WAP's IP address is used only for configuration since it behaves just like an Ethernet switch.

The workstation(s)'s default gateway points to the Digi Connect WAN/VPN/VPN Ethernet IP address of 192.168.1.1.

The Digi Connect WAN/VPN/VPN can also be used as a DHCP server. The WAP should be able to pass DHCP requests. If not, you may need to use the WAP's DHCP server instead of the Digi Connect device. Simply disable the Digi Connect WAN/VPN DHCP server in the Network Configuration screen.

Where to Get More Information

Refer to the Digi Connect WAN/VPN user documentation and Digi technical support website at www.digi.com/support for more information. Technical assistance is available at <http://www.digi.com/support/eservice/eservicelogin.jsp>.

For sales information, please contact Digi International at 952-912-3444.

EXTRA: How to Configure a Linksys Wireless Access Point (WAP) for Use with a Digi Connect WAN/VPN

This document explains how to connect a Linksys WAP to a Digi Connect WAN/VPN. The information used for the Linksys should apply similarly to other WAPs. See your WAP manufacturer's manual for more details.

1. Run the WAP setup utility.

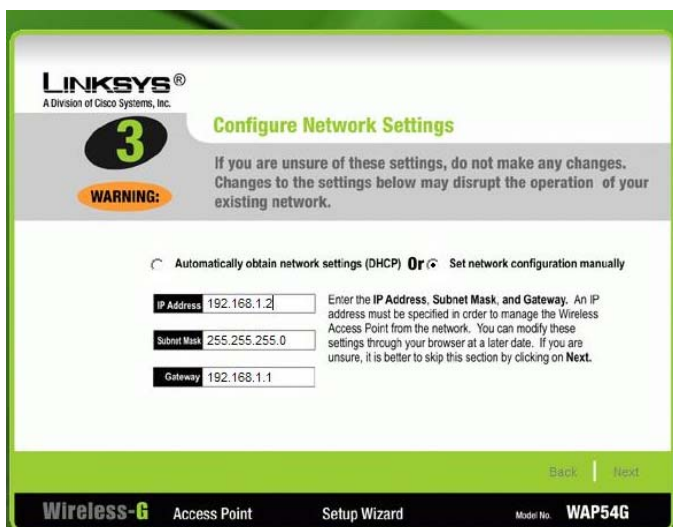


2. Make sure the WAP is cabled correctly to your network. Depending on the model and other devices connected, the WAP may use a straight-thru (standard) or crossover Ethernet cable. A WAP that does NOT have a built-in Ethernet switch connected directly to the Digi Connect device will most likely use a crossover Ethernet cable.



3. Configure the WAP Network Settings. In this example 192.168.1.2 is the WAP's IP address. The Digi Connect WAN's Ethernet port IP address, 192.168.1.1, is the gateway.

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3 Configure Network Settings

WARNING: If you are unsure of these settings, do not make any changes. Changes to the settings below may disrupt the operation of your existing network.

☐ Automatically obtain network settings (DHCP) **Or** ☒ Set network configuration manually

IP Address: 192.168.1.2
Subnet Mask: 255.255.255.0
Gateway: 192.168.1.1

Enter the IP Address, Subnet Mask, and Gateway. An IP address must be specified in order to manage the Wireless Access Point from the network. You can modify these settings through your browser at a later date. If you are unsure, it is better to skip this section by clicking on Next.

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Wireless-G Access Point Setup Wizard Model No. WAP54G

4. Enter the WAP password if required (default is admin):



PASSWORD

Password: *****

The default password is **admin**. You will use this password later to access the Web-Based Utility or the next time you use this Setup Wizard. For enhanced security, change this password through the Web-Based Utility's Password page.

Enter

5. Enter the appropriate Wireless Settings (these will match those of the workstations):



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4 Wireless Settings

If you are using Linksys wireless adapters in your computers, your network should work right out of the box. Changes to the settings below may disrupt the settings of your existing wireless network. Make sure you remember these settings as they will be needed when setting up your wireless computers.

SSID: linksys
Channel: 6
Device Name: Linksys WAP54G

The SSID is a unique identification shared among all computers within your wireless network and must be the same for all those computers. The SSID is **case sensitive** and should not exceed 32 characters.

The Channel setting is a unique number shared among all computers within your wireless network. If you experience poor performance on a certain channel, try changing to another channel. Channels 1, 6, and 11 are preferred.

The Device Name is a unique name for your Wireless-G Access Point and should be changed if you have multiple Access Points in your network.

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Wireless-G Access Point Setup Wizard Model No. WAP54G

6. Choose Security Settings:

Using the Digi Connect WAN/VPN with a Wireless Router / Access Point

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Security

Security Settings

At this point, you have the opportunity to enable wireless security, which prevents unauthorized access to your wireless network. For your own security, please read and choose from the following options.

weak **strong**

Disabled
If you are setting up a publicly available network, you can leave wireless security disabled.

WEP
Wired Equivalent Privacy (WEP) is a security system that encrypts the data sent over the wireless network so that only users that know the encryption key can access the network.

WPA-Personal
The Pre-Shared Key mode of Wi-Fi Protected Access (WPA-PSK) is similar to WEP but stronger, with longer and constantly changing encryption keys.

WPA-Enterprise
The RADIUS mode of Wi-Fi Protected Access (WPA-RADIUS) secures corporate wireless networks by authorizing each device against a master list held in a special authentication server.

Linksys Wireless Guard
Linksys Wireless Guard is a subscription service that gives small businesses the industrial-strength security of WPA-RADIUS, without the hassle of building your own RADIUS server. [Learn more](#)

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Wireless-G Access Point Setup Wizard Model No. **WAP54G**

7. Setup Wireless Security:

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6
Security

WEP Security Settings

Wi-Fi Protected Access (WPA) allow you to use either Pre-Shared Key (WPA-PSK) or RADIUS authentication (WPA-RADIUS). If you would like to use WPA-PSK or Wired Equivalent Privacy (WEP), enter the required information below. Please refer to the User Guide on how to setup WPA-RADIUS from the web browser interface.

Security WEP (128-Bits) Please choose WEP (64-Bit) or WEP (128-Bit)

Passphrase digi If you choose the Passphrase option for WEP, a WEP key will generate automatically. To manually enter a WEP key, select a WEP algorithm and leave the Passphrase option blank.

Key 1 A0552ED2E4B98E29B

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Wireless-G Access Point Setup Wizard Model No. **WAP54G**

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8. Finish setup and exit.



This completes the setup for the WAP.

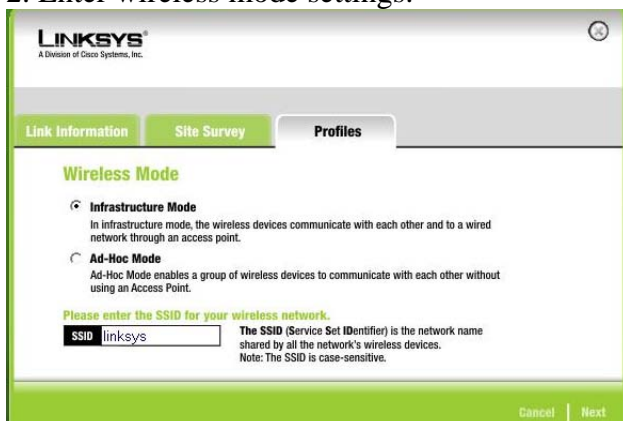
Wireless PC Card Set-Up (built-in wireless will have a similar setup)

1. Setup a new Profile for the wireless settings that you will be using as per the settings that you used in the WAP wireless settings:



Using the Digi Connect WAN/VPN with a Wireless Router / Access Point

2. Enter wireless mode settings:



The screenshot shows the Linksys configuration interface with the 'Profiles' tab selected. Under 'Wireless Mode', 'Infrastructure Mode' is selected. The SSID is set to 'linksys'. A 'Cancel' button and a 'Next' button are at the bottom right.

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Link Information | Site Survey | **Profiles**

Wireless Mode

☒ **Infrastructure Mode**
In Infrastructure mode, the wireless devices communicate with each other and to a wired network through an access point.

☐ **Ad-Hoc Mode**
Ad-Hoc Mode enables a group of wireless devices to communicate with each other without using an Access Point.

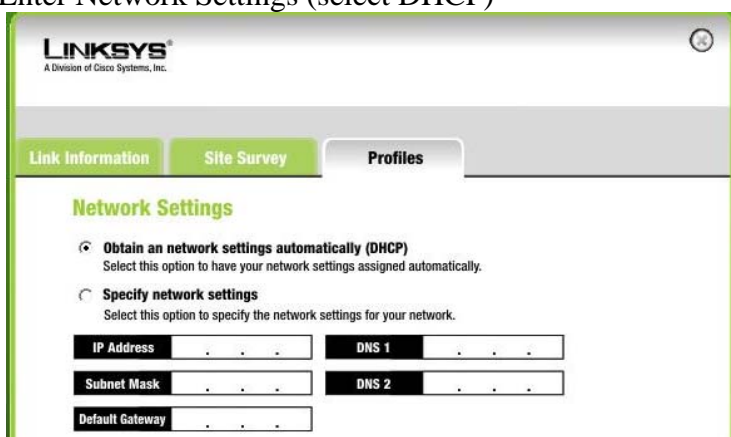
Please enter the SSID for your wireless network.

SSID:

The SSID (Service Set Identifier) is the network name shared by all the network's wireless devices.
Note: The SSID is case-sensitive.

Cancel | Next

3. Enter Network Settings (select DHCP)



The screenshot shows the Linksys configuration interface with the 'Profiles' tab selected. Under 'Network Settings', 'Obtain an network settings automatically (DHCP)' is selected. Fields for IP Address, Subnet Mask, Default Gateway, DNS 1, and DNS 2 are visible.

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Link Information | Site Survey | **Profiles**

Network Settings

☒ **Obtain an network settings automatically (DHCP)**
Select this option to have your network settings assigned automatically.

☐ **Specify network settings**
Select this option to specify the network settings for your network.

IP Address:

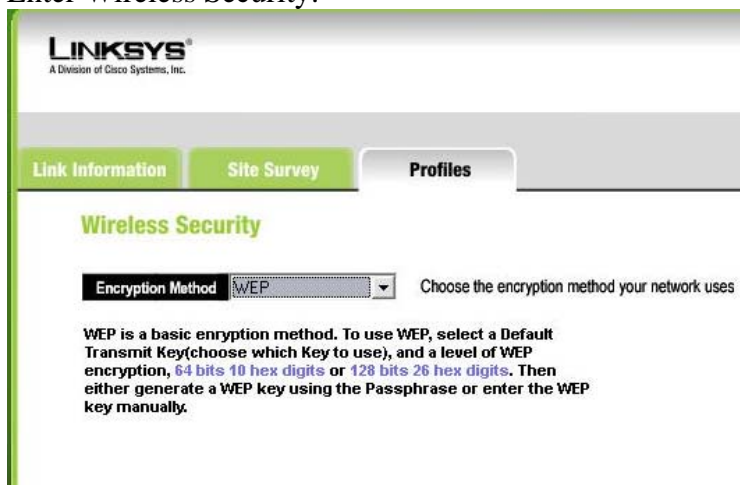
Subnet Mask:

Default Gateway:

DNS 1:

DNS 2:

4. Enter Wireless Security:



The screenshot shows the Linksys configuration interface with the 'Profiles' tab selected. Under 'Wireless Security', the 'Encryption Method' is set to 'WEP'. A detailed explanation of WEP is provided below the dropdown menu.

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Link Information | Site Survey | **Profiles**

Wireless Security

Encryption Method: Choose the encryption method your network uses

WEP is a basic encryption method. To use WEP, select a Default Transmit Key(choose which Key to use), and a level of WEP encryption, 64 bits 10 hex digits or 128 bits 26 hex digits. Then either generate a WEP key using the Passphrase or enter the WEP key manually.

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5. Enter Wireless Security Settings



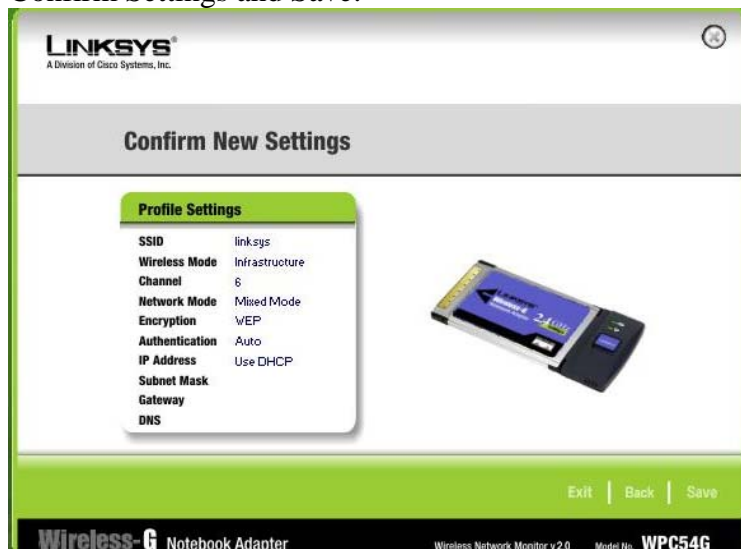
The screenshot shows the Linksys configuration interface for wireless security. The 'Profiles' tab is selected. The 'Wireless Security' section contains several settings:

- Security:** 128 Bits (dropdown menu)
- Passphrase:** digi (text input)
- WEP Key:** A0552ED2E4B98E2 (text input)
- TX Key:** 1 (dropdown menu)
- Authentication:** Auto (dropdown menu)

Help text on the right side of the page:

- To use WEP encryption, select either 64-bit or 128-bit encryption.
- The Passphrase is case-sensitive, and no more than 16 characters.
- Please enter 10 characters for 64-bit and 26 characters for 128-bit encryption. Valid hexadecimal characters are "A" through "F" and numbers "0" through "9".
- Transmit key for your network. (Default: 1)
- The network's authentication method. (Default: Auto)

6. Confirm Settings and Save:



The screenshot shows the 'Confirm New Settings' page in the Linksys configuration interface. It displays a summary of the 'Profile Settings' and includes a 'Save' button.

Profile Settings	
SSID	linksys
Wireless Mode	Infrastructure
Channel	6
Network Mode	Mixed Mode
Encryption	WEP
Authentication	Auto
IP Address	Use DHCP
Subnet Mask	
Gateway	
DNS	

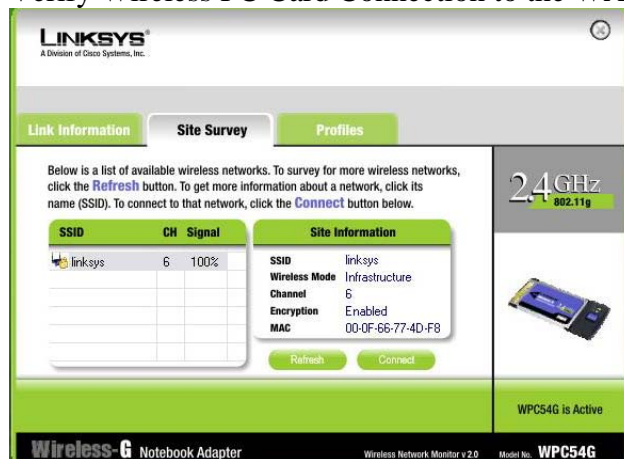
At the bottom right, there are buttons for [Exit](#), [Back](#), and [Save](#).

At the bottom of the page, it says: Wireless-G Notebook Adapter Wireless Network Monitor v2.0 Model No. WPC54G

7. Finish Setup:



8. Verify Wireless PC Card Connection to the WAP:

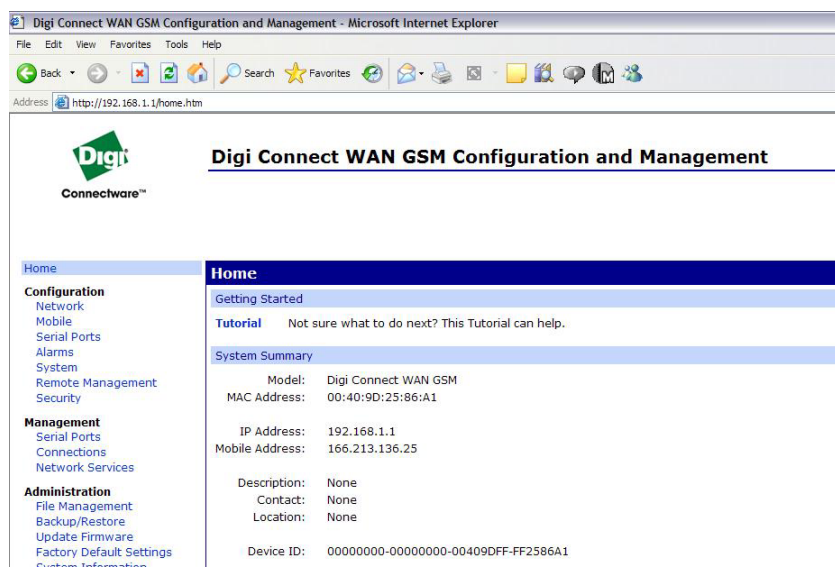


Connect the WAP to the Digi Connect WAN/VPN

After you verified the connection from the wireless PC to the WAP, connect the WAP to the Digi Connect WAN/VPN.

1. Connect the Ethernet cable from the WAP Ethernet port to the Digi Connect WAN/VPN's Ethernet port. Cabling will be one of these three possibilities:
 - a. WAP only: Ethernet cable is likely a crossover cable
 - b. WAP is also a router plus switch: standard straight-thru Ethernet cable
 - c. WAP and Digi Connect device attach to a switch or router: standard straight-thru Ethernet cable
2. Verify there is connectivity to the Digi Connect WAN/VPN by bringing up a web browser and entering the IP address of the Digi Connect WAN/VPN (default 192.168.1.1). You should see a screen as shown below:

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3. Verify you can communicate to the web via your browser. If you cannot communicate, verify the correct default gateway and DNS address information is being passed to your workstation. Open a command window via Start > Run > "cmd" > Enter. Type "ipconfig" in the command window:

```
C:\WINDOWS\system32\cmd.exe

C:\Documents and Settings\dad>ipconfig/all

Windows IP Configuration

    Host Name . . . . . : Laptop
    Primary Dns Suffix . . . . . :
    Node Type . . . . . : Hybrid
    IP Routing Enabled. . . . . : No
    WINS Proxy Enabled. . . . . : No

Ethernet adapter Wireless Network Connection 5:

    Connection-specific DNS Suffix  . :
    Description . . . . . : Wireless-G Notebook Adapter v.2.0
    Physical Address. . . . . : 00-0F-66-D0-7D-31
    Dhcp Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . : Yes
    IP Address. . . . . : 192.168.1.100
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.1.1
    DHCP Server . . . . . : 192.168.1.1
    DNS Servers . . . . . : 209.183.48.10
                           209.183.48.11
    Lease Obtained. . . . . : Tuesday, July 05, 2005 3:32:13 PM
    Lease Expires . . . . . : Wednesday, July 06, 2005 3:32:13 PM

C:\Documents and Settings\dad>
```

4. If the gateway and DNS IP addresses are not listed or are wrong then enter "ipconfig /release":

```
C:\WINDOWS\system32\cmd.exe

Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\dad>ipconfig/release

Windows IP Configuration

Ethernet adapter Wireless Network Connection 5:

    Connection-specific DNS Suffix  . :
    IP Address. . . . . : 0.0.0.0
    Subnet Mask . . . . . : 0.0.0.0
    Default Gateway . . . . . :

C:\Documents and Settings\dad>
```

5. Next do an `ipconfig /renew` to refresh the information:

```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\dad>ipconfig/renew

Windows IP Configuration

Ethernet adapter Wireless Network Connection 5:

    Connection-specific DNS Suffix  . : 
    IP Address. . . . .               : 192.168.1.100
    Subnet Mask . . . . .             : 255.255.255.0
    Default Gateway . . . . .         : 192.168.1.1

C:\Documents and Settings\dad>
```

6. Enter “`ipconfig /all`” and you should see the correct gateway and DNS addresses:

```
C:\WINDOWS\system32\cmd.exe

C:\Documents and Settings\dad>ipconfig/all

Windows IP Configuration

    Host Name . . . . .               : Laptop
    Primary Dns Suffix . . . . .      : 
    Node Type . . . . .               : Hybrid
    IP Routing Enabled. . . . .       : No
    WINS Proxy Enabled. . . . .       : No

Ethernet adapter Wireless Network Connection 5:

    Connection-specific DNS Suffix  . : 
    Description . . . . .             : Wireless-G Notebook Adapter v.2.0
    Physical Address. . . . .          : 00-0F-66-D0-7D-31
    Dhcp Enabled. . . . .              : Yes
    Autoconfiguration Enabled . . . . : Yes
    IP Address. . . . .                : 192.168.1.100
    Subnet Mask . . . . .              : 255.255.255.0
    Default Gateway . . . . .          : 192.168.1.1
    DHCP Server . . . . .              : 192.168.1.1
    DNS Servers . . . . .              : 209.183.48.10
                                         209.183.48.11
    Lease Obtained. . . . .            : Tuesday, July 05, 2005 3:32:13 PM
    Lease Expires . . . . .            : Wednesday, July 06, 2005 3:32:13 PM

C:\Documents and Settings\dad>
```

You should now be able to access the Internet via the Digi Connect WAN/VPN.