

Securing Wireless

By: Daniel Scarberry (please direct all questions to danscarb@uat.edu)

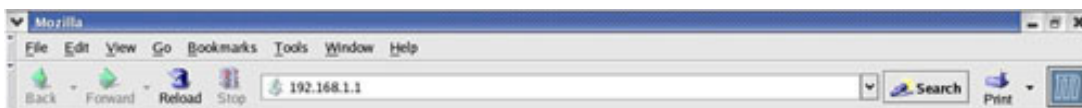
Four steps can be taken to secure a home users wireless connection: changing the default password, changing the default SSID, disabling the broadcasting of SSID, and enabling WEP encryption. With these four steps a casual home user is closer to keeping their Internet from unwanted intruders and securing his/her own computer files. The following document will provide a step by step method for securing your wireless connection using the four techniques listed.

*****Before making any changes to a router configuration you should be hardwired to the router. To do this, connect an Ethernet cable from the back of your computer to an open port on the back of your router. This will prevent you from mistakenly being locked out of your router. All changes made in this document are reversible. To revert to the default settings of your router refer to the **Default Settings** instructions listed at the end of the document.

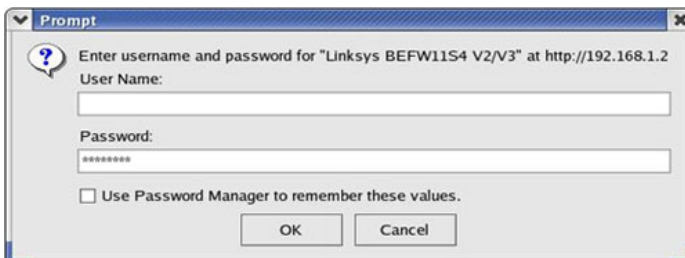
This document follows the steps to configure Linksys brand hardware. If you have a different brand router, the configuration will be very similar and you should still be able to follow these instructions closely. Are you ready to have fun? Good luck!

• *Changing the Default Password*

1. Open a web browser of your choice. (The Default Microsoft web browser is Internet Explorer.)
2. Point browser to <http://192.168.1.1> (This is the default ip address of your router)



3. A message box will appear prompting you for a **username** and **password**.
4. Leave the **username** field blank and for the **password** field enter **admin**. Click the



OK button. (Now we're in. How insecure was that?)

5. You are now at the main setup tab of the Linksys Web Configuration page.



6. Across the top of your screen you'll find a list of tabs. Click on the **Password** tab.



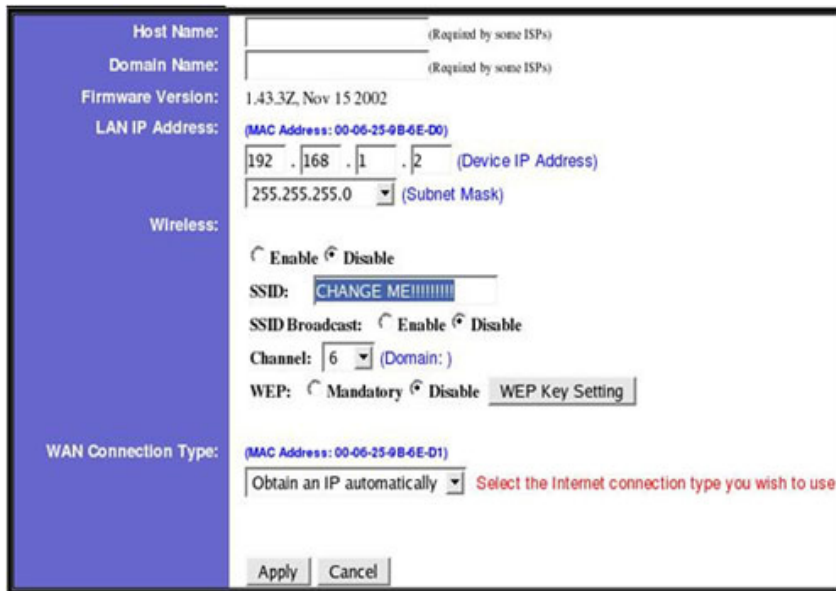
7. Input your new password in the **Router Password:** field and Click **Apply** at the bottom of the page.



8. Great Job! One security step down. Four to go.

● *Changing the SSID*

1. Login. (I will now refer to steps 1-5 in Changing password as a normal login scenario)
2. Find the **SSID** field and replace **linksys** with your choice of name for the wireless connection.



Host Name: _____ (Required by some ISPs)
 Domain Name: _____ (Required by some ISPs)
 Firmware Version: 1.43.3Z, Nov 15 2002
 LAN IP Address: (MAC Address: 00-06-25-9B-6E-D0)
 192 . 168 . 1 . 2 (Device IP Address)
 255.255.255.0 (Subnet Mask)

Wireless:
 Enable Disable
 SSID: CHANGE ME!!!!!!!!!!
 SSID Broadcast: Enable Disable
 Channel: 6 (Domain:)
 WEP: Mandatory Disable WEP Key Setting

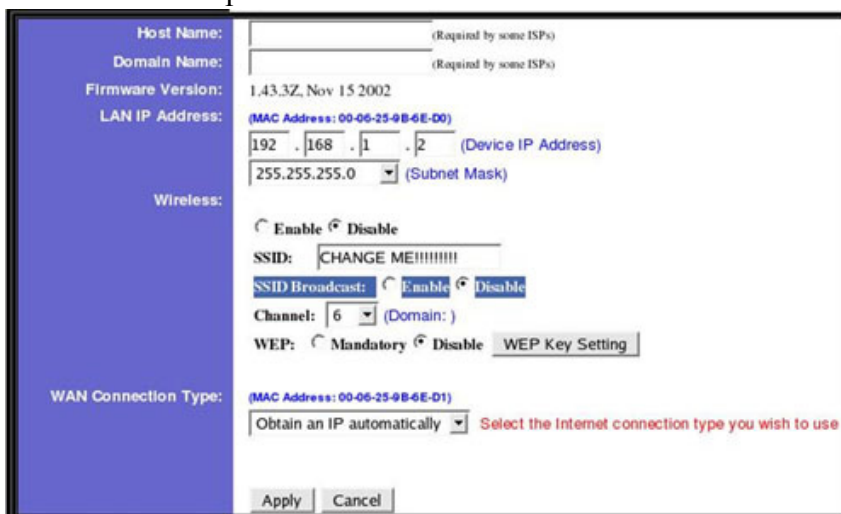
WAN Connection Type: (MAC Address: 00-06-25-9B-6E-D1)
 Obtain an IP automatically Select the Internet connection type you wish to use

Apply Cancel

3. Click **Apply** at the bottom of the page.
4. Congratulations! You've now changed the SSID of your router. One more step closer to nirvana.

● *Disable Broadcasting SSID*

1. Login
2. On the main setup tab check **Disable** in the box titled "SSID broadcast".



Host Name: _____ (Required by some ISPs)
 Domain Name: _____ (Required by some ISPs)
 Firmware Version: 1.43.3Z, Nov 15 2002
 LAN IP Address: (MAC Address: 00-06-25-9B-6E-D0)
 192 . 168 . 1 . 2 (Device IP Address)
 255.255.255.0 (Subnet Mask)

Wireless:
 Enable Disable
 SSID: CHANGE ME!!!!!!!!!!
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 Channel: 6 (Domain:)
 WEP: Mandatory Disable WEP Key Setting

WAN Connection Type: (MAC Address: 00-06-25-9B-6E-D1)
 Obtain an IP automatically Select the Internet connection type you wish to use

Apply Cancel

3. Click **Apply** at the bottom of the page.
4. Congratulations! Your SSID is no longer being broadcast for the world to see.

- **Enable WEP (128 bit)**

This is by far the longest set of instructions to follow, but it also a very important step in protecting your wireless network. If at anytime you are locked out of your router please follow the **Revert Configuration instructions at the bottom of this document.

1. Login
2. Along the top of the setup page find the **Advanced** tab and click it. After clicking Advanced another selection of tabs will appear. Find the **Wireless** tab and click it.

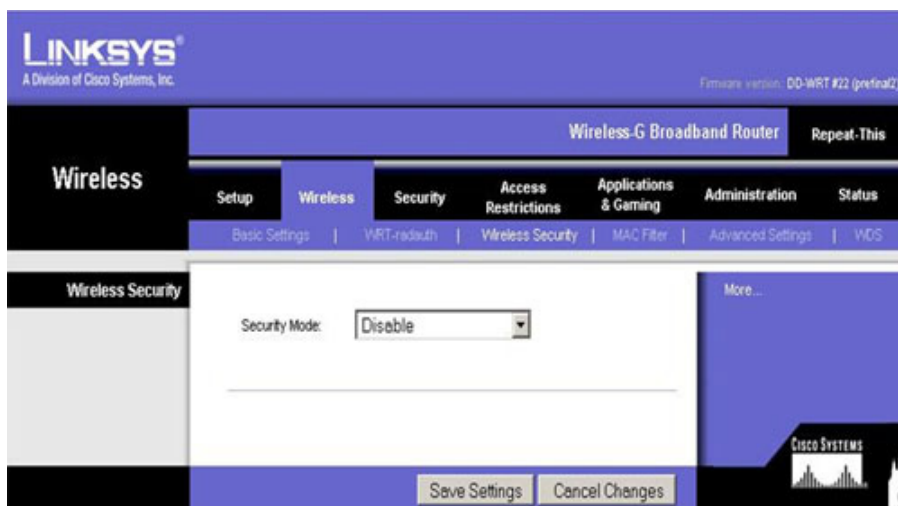


The screenshot shows the Linksys configuration interface for a Wireless-G Broadband Router. The page title is "Wireless-G Broadband Router" and the software version is "DD-WRT #22 (prefinal2)". The "Wireless" tab is selected, and the "Wireless Network" sub-tab is active. The settings are as follows:

Wireless Mode:	AP
Wireless Network Mode:	Mixed
Wireless Network Name (SSID):	bridge-this
Wireless Channel:	6 - 2.437GHz
Wireless SSID Broadcast:	<input checked="" type="radio"/> Enable <input type="radio"/> Disable

Buttons at the bottom: Save Settings, Cancel Changes.

3. From the **Wireless** tab find and click the **Wireless Security** tab.



The screenshot shows the Linksys configuration interface for a Wireless-G Broadband Router. The page title is "Wireless-G Broadband Router" and the software version is "DD-WRT #22 (prefinal2)". The "Wireless" tab is selected, and the "Wireless Security" sub-tab is active. The settings are as follows:

Security Mode:	Disable
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Buttons at the bottom: Save Settings, Cancel Changes.

4. At the **Security Mode** list select **WEP**



LINKSYS®
A Division of Cisco Systems, Inc.

Wireless-G Broadband Router

Wireless Security

Security Mode: WEP

Default Transmit Key: 1 2 3 4

WEP Encryption: 64 bits 10 hex digits

Passphrase: Generate

Key 1:

Key 2:

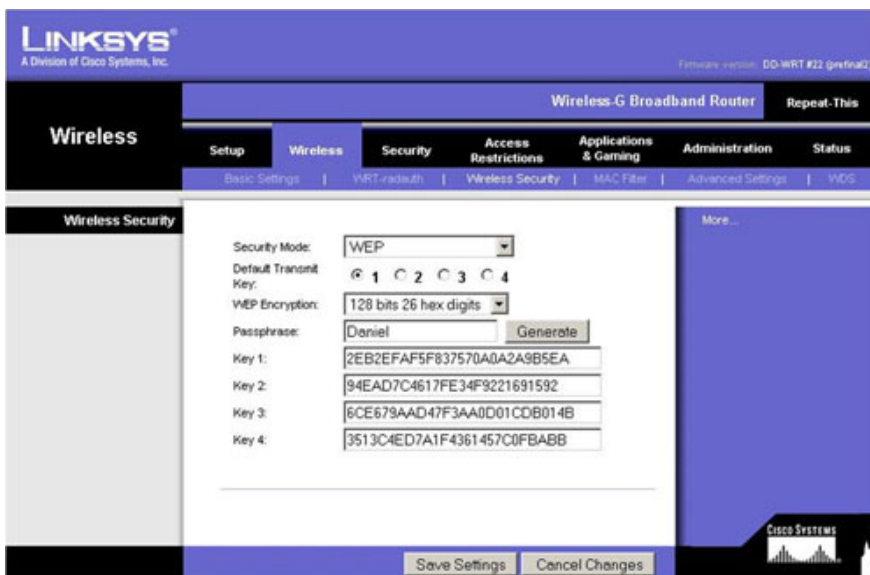
Key 3:

Key 4:

Save Settings Cancel Changes

5. Once the **WEP** dropdown is selected you will have an option between “**64bits 10 hex digits**” and “**128bits 26 hex digits**” Both require the same steps for setup. For this document select “**128 bits 26 hex digits**” for the added security.

6. For ease of use you can use a passphrase to automatically generate a key for you or you can create your own key. We will choose the passphrase option for its ease of use. The **passphrase** field is case sensitive and must not exceed 16 characters. Find the **Passphrase:** field and create your own pass phrase to be encrypted. Click the **Generate** button after you enter your passphrase.



LINKSYS®
A Division of Cisco Systems, Inc.

Wireless-G Broadband Router

Wireless Security

Security Mode: WEP

Default Transmit Key: 1 2 3 4

WEP Encryption: 128 bits 26 hex digits

Passphrase: Daniel Generate

Key 1: 2EB2EFAF5F837570A0A2A9B5EA

Key 2: 94EAD7C4617FE34F9221691592

Key 3: 6CE679AAD47F3AA0D01CDB014B

Key 4: 3513C4ED7A1F4361457C0FBABB

Save Settings Cancel Changes

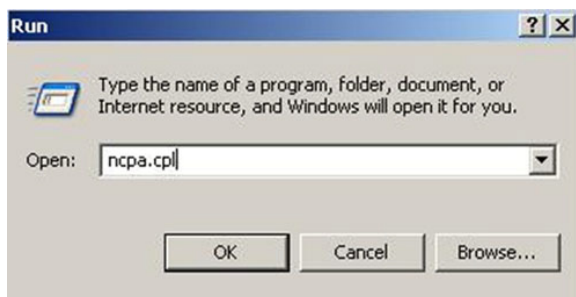
7. Click the **Save Settings** button at the bottom of the page. (If you're configuring your router from a wireless connection you will now be locked out of the router.) Congratulations!! Our router configurations are now complete. We will now move onto configuring the computer to communicate with the new configuration.

8. Four sets of keys were created in the fields **Key 1: Key 2: Key 3:** and **Key 4:** Copy the all of these keys generated to a Notepad file and save it for reference. All computers connected to your wireless network will need one to use one of these keys in order to connect to your network. It's your personal choice as to which of the four keys created you will use in your network.

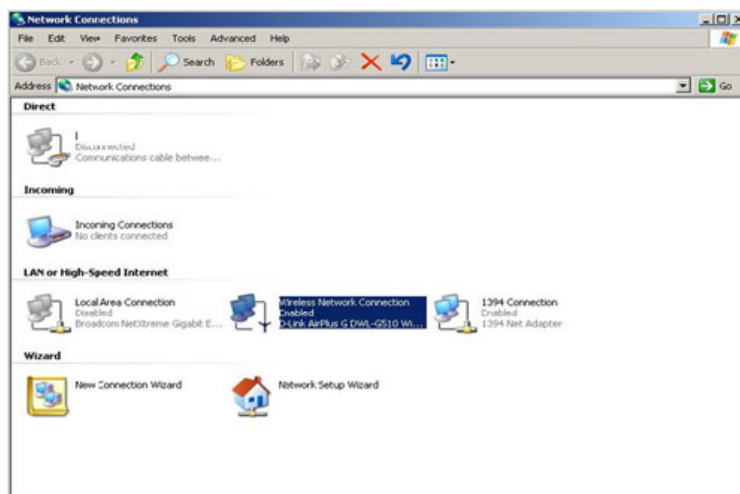
*The following instructions are geared towards users of Microsoft's Windows XP

9. Click on the **Windows Start Menu** on the bottom left hand side of your screen. Then click **Run**.

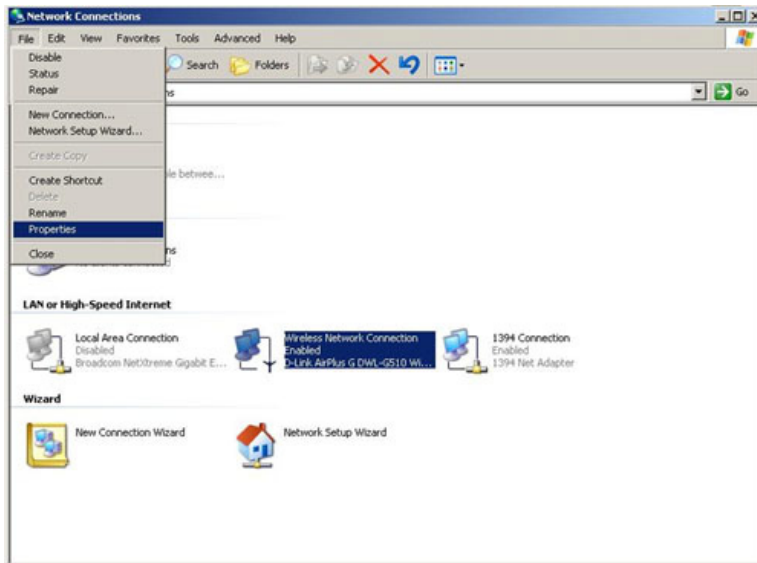
10. A message box will appear. Type **ncpa.cpl** in the Open: field and press **OK**.



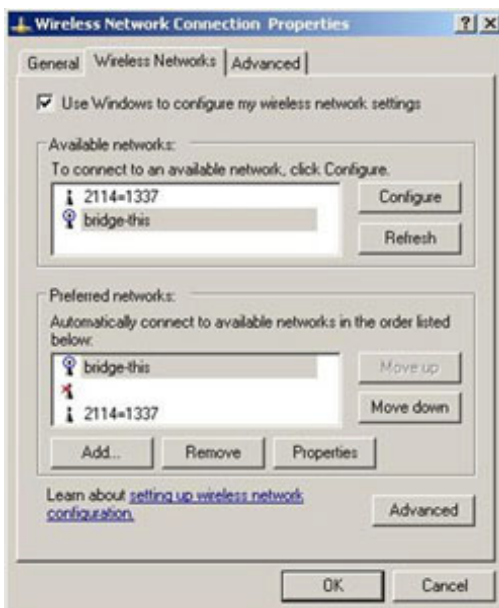
11. After pressing **OK** the **Network Connections** window will appear. Find the **Wireless Network Connection** icon. Click on the **Wireless Network Connection** icon once. The **Wireless Network Connection** is now selected.



12. Go to **File** on the top left of your screen and from within the **File** menu select **Properties**.



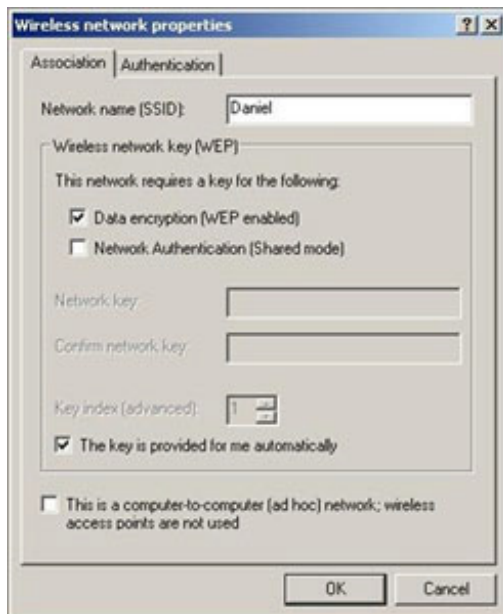
13. After selecting properties the *Wireless Network Connections Properties* window appears. The properties window contains three tabs. **General**, **Wireless Networks**, and **Advanced**. Click the **Wireless Networks** Tab. It's the second tab from the left.



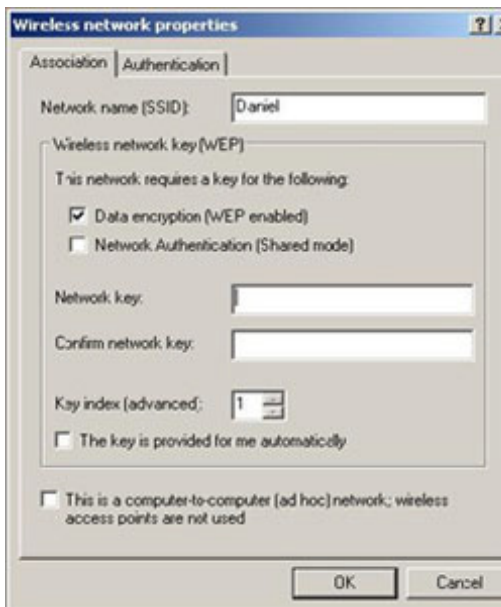
14. Great Job!! Only a few steps left. Do you remember what you changed your SSID to earlier in the *Changing the SSID* step? You'll need that name now. Click the **Add** button under *Preferred Networks*.

A screenshot of the 'Wireless network properties' dialog box, 'Authentication' tab. The 'Network name (SSID)' field is empty. Under 'Wireless network key (WEP)', 'Data encryption (WEP enabled)' is checked, and 'Network Authentication (Shared mode)' is unchecked. There are empty fields for 'Network key' and 'Confirm network key'. 'Key index (advanced)' is set to 1, and 'The key is provided for me automatically' is checked. At the bottom, 'This is a computer-to-computer (ad hoc) network; wireless access points are not used' is unchecked. 'OK' and 'Cancel' buttons are at the bottom right.

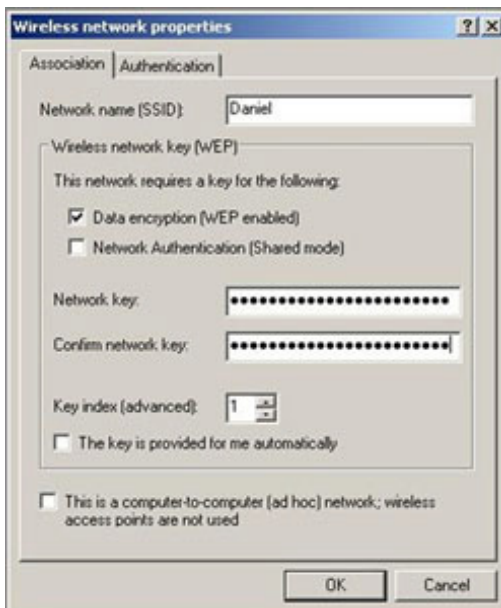
15. Find the **Network name (SSID):** field and enter the name you chose for your SSID earlier in our setup.

A screenshot of the 'Wireless network properties' dialog box, 'Authentication' tab. The 'Network name (SSID)' field now contains the text 'Daniel'. All other settings, including the checked 'Data encryption (WEP enabled)' option and the 'OK'/'Cancel' buttons, remain the same as in the previous screenshot.

16. Make sure the box: **Data encryption (WEP enabled)** is selected.
17. Uncheck the box: **The key is provided for me automatically.**
18. After un-checking: **The key is provided for me automatically.** Two fields, **Network key:** and **Confirm network key:** will no longer be shaded.



19. Remember those keys you copied to Notepad earlier? It's time to put those to use. Copy one of those keys into the **Network key:** field and copy that exact same key into the **Confirm network key:** field. If you decide to type the key in, you will not be able to see what you are typing.

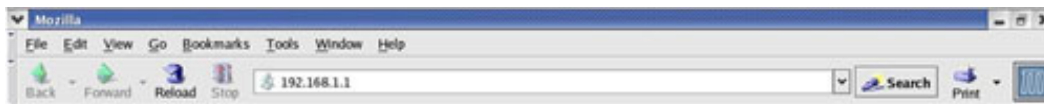


19. Press OK and then OK again. Then get ready to dance! Because you're DONE!

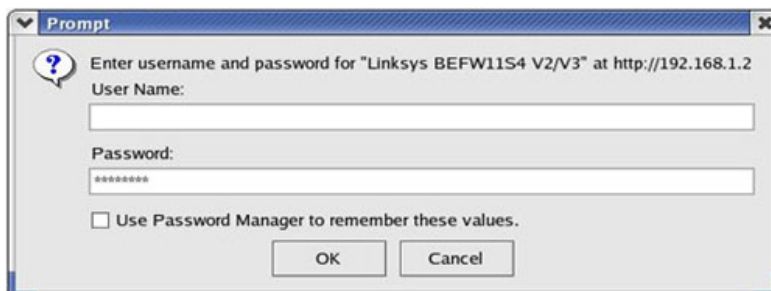
Modules

Logging into the Router:

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2. Point browser to <http://192.168.1.1> (This is the default ip address of your router)



3. A message box will appear prompting you for a **username** and **password**.
4. Leave the **username** field blank and for the **password** field enter **admin**. Click the **OK** button. (Now we're in. How insecure was that?)



5. You are now at the main setup tab of the Linksys Web Configuration page.

Return to Default Settings:

One day you'll inevitably need to reverse the changes you've made to your routers configuration. Maybe you've forgotten the password to the router or you setup WEP encryption from a wireless connection and locked yourself out. Don't worry, either way you're not lost, follow this single step and you'll be back in business.

- Look on the back of your router. You'll have a selection of Ethernet ports and a lonely button: **Press and Hold** this button for ten seconds. **WARNING: RESETTING YOUR ROUTER WILL CAUSE ALL SETTINGS TO BE LOST!**

