

ROUTER - SETUP & TIPS ©

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GENERAL ROUTER INFO:

1. When buying a Router, I recommend Linksys or D-Link. Setup is extra complicated and difficult on Netgear.
2. When finished configuring a Router, you must power all devices down and power back up in the "Network Power Up Sequence" before you can work to the Internet. See the "Networking Tips" Sheet for details.
3. When setting up a Router, be sure to write down all your custom settings and put in safe place. They can easily be lost in a power outage. They can also be lost by powering off the Router for an extended period of time.
4. PUSHBUTTON RESET. To reset a Router back to factory defaults, you usually have to hold the button in until some lights blink (about 15-30 seconds), then power the Router off, then back on for the reset to take effect. A Pushbutton reset should not remove any Firmware upgrades. *Note: "Netgear Routers may need you to power off, then hold in the button during the entire power on self test sequence to fully reset it to factory defaults.*
5. FIRMWARE UPGRADES. If you are having problems with an older Router, try upgrading the firmware. Basically you download a file and install it in the Router. Always make sure you download the exact file for your router Model and hardware version. Find out about this from the Internet.
6. Default settings for various router brands and models can be found at: <http://www.routerpasswords.com/>
7. When connecting up the network wiring, make sure the network cable from the MODEM is plugged into the WAN connector on the ROUTER. *If you plug the modem cable into any other position, you will have strange and hard to diagnose problems.*
8. See the "Networking Tips" Sheet for more details.
9. For more Router setup info, see: http://support.knology.net/content/setup_new_connection.cfm
10. Using a second router to extend wireless range: See this netgear knowledge base page for the general hookup: http://kbserver.netgear.com/kb_web_files/n101236.asp

WIRELESS SETUP OVERVIEW (or how to secure your wireless)

1. BASELINE TEST: Except for some Netgear Routers, the Wireless portion of a Router should work "Out of the box" with all wireless settings at "Default" (no security set-up). Although to fully test the wireless you will probably have to complete the Router Basic Settings that will get you on the Internet. If you have any problems, do a Router push-button reset and start over. Be sure to get the wireless running and tested from each wireless PC before continuing.
2. CHANNEL: From your PC's wireless monitor, do a site survey and find what channels show up from other networks in your area. Pick a channel that is different from the others to minimize interference. *(Note: This is much more difficult with 802.11n Dual-band Routers since they use multiple channels).* Be sure to configure and test all PC's with your newly selected channel before continuing.
3. "SSID" NOTES: The SSID is the name of your router's wi-fi network. Rename your network to something personal and easily identifiable like "JimsNetwork". Be sure to configure and test all PC's with your new SSID before continuing. *(Note: The default SSID for Linksys routers is "linksys" and for Netgear routers it is "NETGEAR". The SSID is continually broadcast out, so a neighborhood with several "linksys" or "NETGEAR" SSID's can be confusing).* Also, the SSID is case sensitive, so any AD-HOC PC's (PC to PC connections) must have the name entered exactly to connect).
4. WPA ENCRYPTION: Once all is running, secure your network by Enabling WPA Encryption. Use a good password. Be sure to configure and test all PC's with WPA and the new password before continuing.

5. ROUTER CLOCK - TIME AND DATE: Make sure this is correct. If the router's internal clock setting clock is wrong you may get a message: "Windows was unable to find a certificate to log you on.....", when trying to log on from a PC. If the Year, Month, Date, and Time does not match the PC that is trying to log on, a Certificate error will occur. This error may only occur when using WEP, WPA or WPA2 encryption.
6. DISABLE SSID BROADCASTING (Optional): For added security, you can disable "SSID Broadcasting" so no one can see that your network even exists. This can add confusion for regular users.
7. WIRELESS CARD ACCESS LIST (Optional): For even more security, you can enable a special list of "Allowed" MAC Addresses on your router. That means that no one outside you list can access your network even if they have the password. I always use this when I cannot get WPA to run for a user. Some systems (especially WIN 98) do not support WPA encryption. You must find the MAC Address for each allowed PC and manually enter it on a list in the Router. See my "Networking Tips" for how to find MAC Addresses.
8. When done setting up the Router, check out its security with "Shields Up" at <http://www.grc.com/x/ne.dll?bh0bkyd2>
9. For troubleshooting wireless, see my "Networking Tips" sheet.
10. Router setup screen shots for remote assisting: <http://www.pcwintech.com/router-screenshots>
11. EXTERNAL HI-GAIN ANTENNAS
 - Check out the Rosewill RNX-A5-EX 2.4 GHz Indoor Omni-Directional (5 dBi x3) High Gain Antenna
 - Hawking Technology also has several high-gain and directional Antennas and adapters.
 - See my writeup called "ROUTER - BUYING A WIRELESS ROUTER" for more antenna info.
12. WPS Security Problem Jan 2012, vulnerable routers:
<http://https://docs.google.com/spreadsheets/ccc?key=0Ags-JmeLMFP2dFp2dkhJZGlxTTFkdFpEUDNSSHZEN3c#gid=0>

LINKSYS ROUTER SETUP: *(Tested with a Linksys model "BEFSR41 v2". This particular model does not have wireless, so my wireless notes are very generic.)*

DEFAULT SETTINGS *(Defaults on a new Router, or after doing a PushButton reset)*

- IP address 192.168.1.1 *(as seen from the PC)*
- Log-in User Name = *Leave blank* (Note: Some linksys routers use a username of admin)
- Log-in User password = admin
- UPnP is on.
- DHCP is on *(This is for your local network and automatically assigns an IP Address to each PC).*
- The IP addresses assigned to PCs by DHCP start at: 192.168.1.100 (then 101, 102, etc.).
- WAN connection Type: "Obtain an IP automatically". (This means the Modem will assign a WAN IP Address to the Router)
- Wireless is Enabled and available to all.

LOGGING IN AS ADMIN: From your Internet Browser enter a URL of 192.168.1.1 (no http://). At the Log-in screen enter the default username & password as above or your personal password and click OK. *(You do not need to be connected to the Internet to do this)*

ADMIN PASSWORD CHANGE: Be sure to change the log-in password! *(Everyone knows the default).* Choose a very secure password *(Log-in > Password button > enter the new password twice > click Apply).* *(This prevents hackers from taking over your Router).* Write the new password down somewhere. Even writing it on the router is OK.

BASIC SETTINGS (Typical Cable Modem & DSL hookup without ISP Log-in)

Login as above. It will automatically go to the

Setup Tab

Firmware Version: x.xx.xx, mm dd yyyy *(Compare this to the latest available firmware)*
 LAN IP Address = 192.168.1.1 *(Leave it alone as well as the subnet mask of 255.255.255.0)*
 WAN Connection Type Obtain an IP automatically *(Leave it alone)*
 Click Apply only if you have made changes.

Password Tab

Router Password: *(Enter a new password twice)*
 UPnP Services: Disable *(for added security)*
 Restore Factory Defaults: No *(If you say Yes, all your custom settings will go away)*
 Click Apply, if you have made any changes.

Status Tab

WAN Section

IP Address *(Info only. Assigned by the Modem/ISP)*
 DNS *(Info only. Current DNS Server IP Addresses provided by the ISP)*

DHCP Tab

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DHCP Server: ☉ Enable with Starting IP Address: 192.168.1.100 (*Leave these defaults*)

Click Apply only if you have made changes

Advanced Tab

Filters

Leave all settings at default except

Filter IDENT(port113): ☉ Enable

Click Apply, if you have made any changes

MAC Addr Clone Tab

User Defined WAN MAC Address: xx.xx.xx.xx.xx.xx (*Enter the MAC Address of PC registered with ISP*)

Click Apply, if you have made any changes

Close your Internet browser to log off.

ISP LOG-IN: If you have a provider like EARTHLINK, you will have to set up the Router to-log in your ISP before you can get to the Internet. The tasks are similar to my notes for the Netgear Router. *I have not yet done this on a Linksys.*

MAC ADDRESS CLONING: (*Log-in > Advanced button > MAC Addr Clone > enter your "User Defined WAN MAC Address" xx.xx.xx.xx.xx.xx > click Apply*). Note: This is the MAC address from the PC that was used to set up the Account with your ISP. For info on finding that MAC Address, see my "Networking Tips" Sheet. (*If you only have one PC, you may not have to worry about this.*)

STEALTH:

1. Disable UPnP: (*Log-in > Password button > UPnP ☉ Disable > click Apply.*)
2. Enable Stealth on Port 113: (*Log-in > Advanced button > Filters tab > Filter IDENT (Port 113) = ☉ Enable*)
3. Make sure Remote Management is off. It should be off by default. (*Log-in > Advanced button > Filters tab > Remote Management = ☉ Disable*)
4. Test your stealthiness at <http://www.grc.com/default.htm> Run "Shields Up!" & "Leak Test".
5. Disable SSID Broadcasting (*wireless*).

WIRELESS: See WIRELESS SETUP TASKS (Overview) for all the tasks needed to secure your wireless. *When I can, I will add detailed steps for Linksys. For now, look at the Netgear wireless settings as a guide.*

FIRMWARE UPGRADE After you have downloaded the upgrade file, first compare the level of the new file to the current Firmware Version on the Setup Tab. Do not install the upgrade unless the new file is a higher version.

(*Log-in > Help Tab > click the "Upgrade Firmware" button to install it.*)

D-LINK ROUTER SETUP:

DEFAULT SETTINGS (*Defaults a new Router, or after doing a Pushbutton reset*).

- IP Address: 192.168.0.1 or 192.168.1.1 (*as seen from the PC*)
- Log-in Username: admin
- Log-in Password: (blank)
- UPnP is On. ???
- DHCP is On (*This is for your local network and automatically assigns an IP Address to each PC*).
- The IP addresses assigned to PCs by DHCP start at: ????
- Wireless is Enabled and available to all.

LOGGING IN AS ADMIN: From your Internet Browser enter a URL of 192.168.0.1 (no http://). At the Log-in screen enter the default username & password as above or your personal password and click OK. (*You do not need to be connected to the Internet to do this*).

ADMIN PASSWORD CHANGE: Be sure to change the log-in password! (*Everyone knows the default*). Choose a very secure password. (*This prevents hackers from taking over your Router*). Write the new password down somewhere. Even writing it on the router is OK.

BASIC SETTINGS (Typical Cable Modem & DSL hookup without ISP Log-in)

TIME / DATE / TIMEZONE: Log-in to the router and go to TOOLS > TIME (on the left) and make sure the router's Year, Month, Date, and Time are correct.

ISP LOG-IN If you have a provider like EARTHLINK, you will have to set up the router to log in to your ISP before you can get onto the Internet. The tasks would be similar to the Netgear Router EARTHLINK SETUP. *I have not yet done this on a D-Link.*

MAC ADDRESS CLONING:

1. Log in as admin.
2. Select the Setup menu option from the bottom of the screen. Make sure the WAN type is set to Dynamic and check the box to enable Renew IP forever. If the WAN configuration is not set to Dynamic, click the Change button and select it. Next, click the Save button and then the Reboot button on the bottom of the screen. Click OK when prompted to Reboot right now.
3. From the Device Information page, click on the Tools menu option at the bottom of screen. This will take you to the 'Useful Tools' menu. Click on the 'Clone MAC' button, then click on the 'OK' button when prompted to "Change MAC address right now?".
4. "New MAC address will take effective after rebooting!" will be displayed and the "Clone MAC" button will change to a "Restore MAC" button.
5. Click on the 'Reboot' button, then click on the 'OK' button when prompted to "Reboot right now?". This will take you back to the Device Information page. Click on the 'Logout' button and then close your browser.
6. Note: MAC Address Cloning copies the MAC Address of your PC's ethernet card to the Router. Be sure to use the PC that is registered with your ISP as the source of the MAC Address you wish to clone.

STEALTH: Tasks are similar to LINKSYS Router STEALTH setup.

WIRELESS: See the WIRELESS SETUP TASKS (Overview) section for all the things you need to do to secure your wireless. *When I have the opportunity, I will add detailed steps for D-Link. For now, look at the Netgear wireless settings as a guide.*

FIRMWARE UPGRADE After you have downloaded the upgrade file, first compare the level of the new file to the current Firmware Version on the Setup Tab. If the new file is higher, then install it.

NETGEAR ROUTER SETUP: *(Tested with a Netgear model WGR614 v5)*

WARNING: *Many Netgear Routers have a Setup wizard that requires it be connected to a Modem that is actively on the Internet to start initial configuration & setup. For me, this wizard wrongly detected the connection to my ISP as Static rather than DHCP. This was very annoying, timeconsuming, & painful. It also would not connect to the Internet (Out of the Box). I do not recommend this Brand. I have had some success in bypassing the Initial wizard by putting this text after the URL: 192.168.1.1/basicsetting.htm, then clicking Apply from the main Setup Screen to authenticate.*

NOTE: *Be sure to always finish each individual task section immediately with the "Apply" Button to complete that task. Be sure to Logout when done (bottom of the LH column).*

One last trick. *If the Router hangs and will not do a Pushbutton reset, try holding in the reset button while you power off then on, holding the button in until the power on self test sequence is complete.*

DEFAULT SETTINGS *(Defaults on a new Router, or after doing a Pushbutton reset)*

- IP Address: Either 192.168.0.1 or 192.168.1.1 or http://routerlogin.net *(Depending on the router model)*
- Log-in username: admin *(lower case only!)*
- Log-in password: password or possibly 1234 *(lower case only!)*
- Also try: Start, Run, http://www.routerlogin.com/basicsetting.htm *(bypass initial wizard)*
- UPnP is On.
- DHCP is On *(This is for your local network and automatically assigns an IP Address to each PC).*
- The IP addresses assigned to PCs by DHCP start at: 192.168.1.2 (then .3, .4, .5, etc.).
- Wireless is Enabled and available to all.

LOGGING IN AS ADMIN:

- From your Internet Browser, enter a URL of 192.168.0.1 or 192.168.1.1 (no http://) or http://www.launchmodem.com or http://www.routerlogin.net or http://www.routerlogin.com/basicsetting.htm (bypass initial wizard)
- At the "Authentication Required" Window enter the default username & password as shown above or your personal password, and click OK. *(You do not need to be connected to the Internet to do this).* You can bypass the Authentication screen, and although the Router will configure, it will not work. Do an Apply from the basicsettings Screen to Authenticate, then continue configuring.

ADMIN PASSWORD CHANGE: Be sure to change the log-in password! *(Everyone knows the default). Choose a very secure password: (Log-in > LH column under Maintenance, click Set Password > Click Apply). (This prevents hackers from taking over your Router). Write the new password down somewhere. Even writing it on the Router is OK.*

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BASIC SETTINGS (Typical Cable Modem & DSL hookup without ISP Log-in)

(Log-in > Setup):

Basic Settings

- ◆ Does Your Internet Connection Require A Login = NO (if changing to Yes, click Apply before continuing)
- ◆ Account Name & Domain Name - N/A
- ◆ Internet IP Address ☉ Get dynamically from ISP
- ◆ DNS Address ☉ Get automatically from ISP
- ◆ Router MAC Address:☉ Use this MAC Address and enter the MAC Address from your registered PC.
- ◆ Router MAC Address = set to clone, see "MAC Address Cloning" section for details.
- ◆ Click Apply after any changes.

Router Status (Under Maintenance in LH column)

Internet Port, IP Address (This is the WAN IP Address assigned to the Router by the Modem/ISP)

ISP LOG-IN: If you have a provider like **EARTHLINK**, you will have to set up the router to log in to your ISP before you can get onto the Internet. Here is the Netgear EARTHLINK SETUP:

(Log-in > Setup):

Basic Settings for EARTHLINK

- ◆ Does Your Internet Connection Require A Login? = Yes (if changing, click Apply before continuing)
- ◆ ISP = other
- ◆ Login = youraddress@earthlink.net
- ◆ pswd = ***** (your Earthlink ISP log-in password)
- ◆ Idle timeout = 5 min
- ◆ Use Static IP Address.172.n.n.n (your assigned IP address from Earthlink)
- ◆ Use these DNS Servers = 207.69.188.185 and 207.69.188.186
- ◆ Router MAC Address = set to clone (See trick below). Be sure to set up to cloning to use MAC Address used to register the Account with Earthlink.
- ◆ Click Apply after any changes.

MAC ADDRESS CLONING (NOTE: Netgear hides the "MAC Address Clone" settings, if the router is set-up for "Logging in to the ISP". To access MAC Address cloning, you must tell the setup wizard "Does Your Internet Connection Require A Login?" = NO, and then click Apply. After setting up MAC Address Cloning, you can then, if needed, set the option back to "Does Your Connection Require A Login?" = YES, and then click Apply again).

1. Connect the PC that is registered with your ISP to the Router. If you are unsure which computer was used, call your ISP, and ask what MAC address is registered.
2. Disconnect all other computers from the Router. (If you do not want to disconnect other computers, you need to know the MAC Address of the PC registered to your ISP, and then in step 6, select instead: 'Use This MAC Address', and manually type in the MAC Address.)
3. Log in to the router as ADMIN.
4. Go to Basic Settings > Router MAC Address.
5. Select 'Use Computer MAC Address', or select "Use this MAC Address" and manually enter it.
6. Click 'Apply'.
7. Click 'Test' to make sure you are connected. If you are not connected, contact your ISP

STEALTH

1. Disable UPnP: (Log-in > LH column under Advanced, click UPnP > uncheck " Turn UPnP On" > click Apply.)
2. Enable Stealth on Port 113: (NOTE: Port 113 was in Stealth status by default when I tested it).
3. Make sure Remote Management is off. It should be off by default. (Log-in > LH column under Advanced, click Remote Management > make sure the box is unchecked)
4. Test your stealthiness at <http://www.grc.com/default.htm> Run "Shields Up!" & "Leak Test".
5. Disable Wireless SSID Broadcast (Log-in > Setup > Main Screen > Advanced, Wireless Settings > uncheck Enable SSID Broadcast > click Apply)

WIRELESS: See the WIRELESS SETUP TASKS (Overview) section for all the things you need to do to secure your wireless. Note: Wireless will not run on some Netgear Routers until you set up the Basics, click Apply, and Authenticate. Then:(Log-in > Setup):

Setup

Wireless Settings

- ◆ Name (SSID) (Case sensitive). Choose a custom name for your network. Do not leave the default
- ◆ Region = United States (The default may be "Select Region")
- ◆ Channel = Choose one that does not conflict with neighboring networks
- ◆ Mode = g, b, or n (as of 2-2008 mode "n" is still not reliable)
- ◆ Security Options

Disable, WEP, WPA-PSK (Use Disable to get Router running first, then try WPA)

- ◆ Click Apply after any changes.

Advanced

Wireless Settings

- Enable Wireless
- Enable SSID Broadcast. (Note: This may be unchecked after all is running smoothly)
- ◆ Wireless Card Access List (Optional)
<Setup Access List> (Use this to restrict access to certain MAC Addresses for added security)
- ◆ Click Apply after any changes.

FIRMWARE UPGRADE

To install a Firmware upgrade:

- ◆ First, before starting, download the latest firmware from netgear.com. Make sure you use the full model and "v" number (ie: WGR614v5).
- ◆ To see the current firmware version: *Log-in > Maintenance > Router Status.*
- ◆ Compare the current firmware version to the new version. Do not install the upgrade unless the new file is a higher level.
- ◆ Write down ALL custom configuration settings. (There is also a backup/restore settings function)
- ◆ To upgrade: *Log in > Maintenance > Router Upgrade (LH column) > find the upgrade file using Browse > Click the "Upload" button.*
- ◆ Wait for the Router to reboot.
- ◆ Hold in the Pushbutton Reset button for about 15 seconds, then power off & back on.
- ◆ You must now reconfigure the Router from scratch.

HAWKING TECHNOLOGY ROUTER SETUP

DEFAULT SETTINGS (Defaults on a new Router, or after doing a Pushbutton reset)

- IP Address: 192.168.1.254
- Log-in username: admin (lower case only!)
- Log-in password: 1234 (lower case only!)
- UPnP is On.
- DHCP is On (This is for your local network and automatically assigns an IP Address to each PC).
- The IP addresses assigned to PCs by DHCP start at: 192.168.1.1 (then .3, .4, .5, etc.).
- Wireless is Enabled and available to all.

LOGGING IN AS ADMIN:

- From your Internet Browser, enter a URL of 192.168.1.254
- At the "Authentication Required" Window enter the default username & password as shown above or your personal password, and click OK. (You do not need to be connected to the Internet to do this). You can bypass the Authentication screen, and although the Router will configure, it will not work. Do an Apply from the basicsettings Screen to Authenticate, then continue configuring.

ADMIN PASSWORD CHANGE: Be sure to change the log-in password! (Everyone knows the default).

Choose a very secure password: (???????????????????????) > Click Apply. (This prevents hackers from taking over your Router). Write the new password down somewhere. Even writing it on the Router is OK.

BASIC SETTINGS (Typical Cable Modem & DSL hookup without ISP Log-in)

(Log-in > Setup):

Basic Settings **UNDER CONSTRUCTION**

- ◆ Does Your Internet Connection Require A Login = NO (if changing to Yes, click Apply before continuing)
- ◆ Account Name & Domain Name - N/A
- ◆ Internet IP Address Get dynamically from ISP
- ◆ DNS Address Get automatically from ISP
- ◆ Router MAC Address: Use this MAC Address and enter the MAC Address from your registered PC.
- ◆ Router MAC Address = set to clone, see "MAC Address Cloning" section for details.
- ◆ Click Apply after any changes.

Router Status (Under Maintenance in LH column)

Internet Port, IP Address (This is the WAN IP Address assigned to the Router by the Modem/ISP)

UNDER CONSTRUCTION.

EARTHLINK SETUP: See the NETGEAR ISP LOG-IN Setup as an example.