

**MAXIMIZING  
YOUR  
WIRELESS  
EXPERIENCE**

**HiPOINT**  
TECHNOLOGY SERVICES INC.

# UNDERSTANDING YOUR WIRELESS CONNECTION

Wireless technology makes it easy to get rid of messy wires and cables that tie computing to your desk, but while wireless has become a household norm, technology is advancing quickly, and there are some easy steps you can take to quickly improve your connectivity.

## WHAT IS WI-FI?

Wi-Fi is a radio wave that transmits on a 2.4 or 5 gigahertz frequency. Radio waves can go through many objects (such as walls), but these impediments will decrease the strength of the signal. Imagine you're playing with a cheap pair of children's walkie talkies. If you're using them outside, the range is pretty good, but the moment you take them inside, they'll start to pick up interference. This is what happens with your router. The only difference is that routers always get interference while in the house.

Many devices can use Wi-Fi, including personal computers, video-game consoles, smartphones, digital cameras, tablet computers and digital audio players. These can connect to a network resource such as the Internet via a wireless network access point. Such an access point (or hotspot) has a range of about 66 feet indoors and a greater range outdoors. Hotspot coverage can comprise an area as small as a single room with walls that block radio waves, or as large as many square kilometers achieved by using multiple overlapping access points.

## WHAT IS A WIRELESS ROUTER?

A router is a device that routes data between the Internet and your local computers. The router is also usually the device that broadcasts your personal wireless network, allowing your devices to connect to the Internet over Wi-Fi.

Usually the Ethernet ports on the back of a router are labeled WAN and LAN. We call the Internet a WAN (Wide Area Network) and your local computers a LAN (Local Area Network).

Make sure that the Ethernet cable in the WAN port is going to the wall jack or to your modem. Do NOT plug an Ethernet cable from the LAN port to the wall jack or to your modem! Doing so creates networking issues not only for your own connection, but for your neighbors' connections as well. There is only one WAN port; there are usually multiple LAN ports. A WAN port is usually labeled as WAN or Internet and sometime has a symbol of a globe (for World Wide Web), while a LAN port is usually labeled as LAN or Ethernet and has a numbered port.

Unless you're extremely familiar with setting up different kinds of routers, make sure to go over the documentation that comes with your router, as each model is slightly different.

## HOW DO I SET UP MY WIRELESS ROUTER?

Set up your router at a central location in your unit. This will ensure that you'll get the best signal strength anywhere in your living space.

Almost all new routers today come pre-configured, so that when you connect them right out of the box, there's already a name and password chosen for your wireless network. The pre-configured name and password are usually written on the router itself, or on a sticker close by.

Changing the network name and password is optional but highly recommended. Just remember this rule of thumb: NEVER use "password" as your password and avoid passwords like "ABCDEF," "012345" or "99999." Passwords like these are too easy to guess and could make your network vulnerable to intruders.

Before you can change the name or password of your wireless network, you have to connect your computer to the router either through the pre-configured wireless network, or with an Ethernet cable to a LAN port. The router doesn't need to be connected to the Internet for you to configure it.

Once connected to the router, you can navigate to the router's configuration page in a web browser. The exact address you'll have to navigate to will vary, but can almost always be found in a "Getting Started" booklet that came with your router.

## MY INTERNET IS SLOW OR SPOTTY. WHAT SHOULD I DO?

As a first step, **ALWAYS** check your connection directly at your modem (or at the wall jack if you have an Ethernet connection). To do this, connect a laptop or desktop computer directly to your modem (or directly to the wall jack for an Ethernet connection) with an Ethernet cable. Even if your router is brand new, it's the easiest way to find out if the actual service is experiencing issues, or if it's something you can easily fix without having to contact your Internet Service Provider.

If your connection and speeds are what they should be when you're plugged up directly to the modem (or to the wall jack for an Ethernet connection), but still slow or intermittent through your router, you can conclude that the router is experiencing some type of issue. Common causes of router problems stem from configuration settings or a failure of some kind.

Remember—unless you have a gigabit router, you won't achieve speeds higher than 100Mbps with a wired connection.

## HOW CAN I OPTIMIZE MY WIRELESS ROUTER?

### USE WIRES WHEN POSSIBLE

As fast as the newest Wi-Fi standard is, a wireless connection still isn't as fast or reliable as a standard wired one. When possible, connect bandwidth-hungry devices that stay in one location—like your Roku streaming media boxes or Xbox gaming consoles—directly to your

router, via a networking cable, and save the wireless connections for the stuff that moves around.

## **CHANGE THE POSITION OF YOUR WIRELESS ROUTER**

Do you have your wireless router nestled up against the broadband modem, tucked away in the entertainment center in a bedroom that's been converted into the family den or home office? Move it! You don't have to have the router in close proximity to your modem. Ideally, a Wi-Fi router should be in a central location. If you need more flexibility in centrally positioning the router, you can purchase custom-length Ethernet Cat5e cables from places such as Best Buy or MicroCenter, or from any other place that services computers.

## **UPDATE THE FIRMWARE ON YOUR WIRELESS ROUTER**

Updating router firmware is often overlooked by home users. Business networking devices usually display some sort of notification when newer software for the device is available for download.

Consumer wireless routers, especially older routers, don't always offer this notification. Check often for firmware updates for your router. There is typically a notification or popup in the router's interface for upgrading the firmware; however, you often have to go to the router manufacturer's website and search for the firmware, and then upload it through the router's interface. Often, the router's web interface will include a link for quickly redirecting you to the manufacturer's website. There are often accompanying release notes that tell you what the firmware helps to fix. These fixes often help solve various connectivity problems.

## **CHANGE YOUR FREQUENCY CHANNEL**

A channel is a way to organize a band of radio frequencies. If two devices are using the same channel, they will both experience interference. Ideally, you want your router to be the only one on the channel, but with only 11 channels available for most routers this can be difficult in a bustling building. You can adjust the channel that your router broadcasts on, and you might see a significant speed increase. Ultimately you'll see much better speeds with a 5 GHz network.

A typical or basic router broadcasts on the very popular 2.4 GHz band frequency of radio waves. If too many devices are using the same frequency, there will be a lot of interference, and your router is not able to communicate with your devices as easily over Wi-Fi. Many baby monitors and cordless phones operate at this frequency. Investing in a dual-band router would help avoid interference.

A dual-band router broadcasts on the 2.4 GHz frequency but also broadcasts on the 5 GHz frequency. If you have a dual-band router, you might see two different networks when trying to connect to the internet. If one of the network names has a '5g' after it, it's most likely the 5 GHz

network. In a high-rise building where a router is surrounded by routers and other 2.4 GHz devices on all sides, a dual-band router can be a lifesaver.

*Note that older devices may not see or be able to connect to the 5 GHz band network.*

When you set up a typical router, it usually chooses a certain channel by default. Some routers choose the least-crowded channel, but yours may not have this auto feature. Check for yourself which Wi-Fi channel is the least crowded to boost the router's performance, perhaps boosting signal range. A good, free tool to use is "Xirrus Wi-Fi Inspector." If you have an Android device, you can download an app called "Wifi Analyzer" to see if your router is broadcasting on the same channel as a neighbor.

## **HOW TO INSTALL XIRRUS WI-FI INSPECTOR**

In a web browser, type in the following website address:

<http://www.xirrus.com/resources/free-tools/wi-fi-inspector>

Under the section named "Download Now," provide a valid e-mail address and enter the Captcha code in order to continue with the installation.

## **HOW TO USE XIRRUS WI-FI INSPECTOR TO MONITOR CHANNEL USAGE**

Once you have installed the Xirrus Wi-Fi Inspector, launch the application. Don't be put off by the graphs and excess information; what you want to focus on is the "Channel" column. In the application, your Wi-Fi Network will be highlighted in orange. If your router is on the same channel as other networks in the identified range, you may want to switch it to a less-crowded one. The channel of your router can be changed by logging into its web interface. All routers have different ways to access the interface, so check with your manufacturer. Some common device manufacturers are listed at end for convenience.

## **CHANGING THE CHANNEL ON YOUR WIRELESS DEVICE**

Changing your wireless channel can seem daunting, but it's not as difficult as one might think! Following these instructions will help to get your wireless network broadcasting at better speeds.

## **IDENTIFY THE ADDRESS FOR YOUR WIRELESS ROUTER ON A WINDOWS COMPUTER**

1. Connect your laptop or desktop computer to your wireless router. While not strictly necessary, it's usually easier if you're plugged in rather than connecting wirelessly. If

you're using a laptop without an Ethernet port, you can still access the wireless router if you're already connected to the wireless network.

2. Click on the "Start" menu, and enter "CMD" into the search window. This will open a new, black window.
3. Type "ipconfig" and press enter.
4. Look in the text for "Default Gateway." The value is typically listed as "192.168.1.1" or "10.0.0.1."
5. Enter this IP address into a web browser's address bar.

```
C:\Users\HiPoint>ipconfig
Windows IP Configuration

Ethernet adapter Bluetooth Network Connection:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 12:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Ethernet adapter Ethernet:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . :
    Link-local IPv6 Address . . . . . : fe80::8af:35bb:2316:c188%3
    IPv4 Address. . . . . : 192.168.1.105
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.1.1

Tunnel adapter isatap.{B853995A-B79E-4112-95ED-5FA1F10869E7}:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Tunnel adapter Local Area Connection* 13:

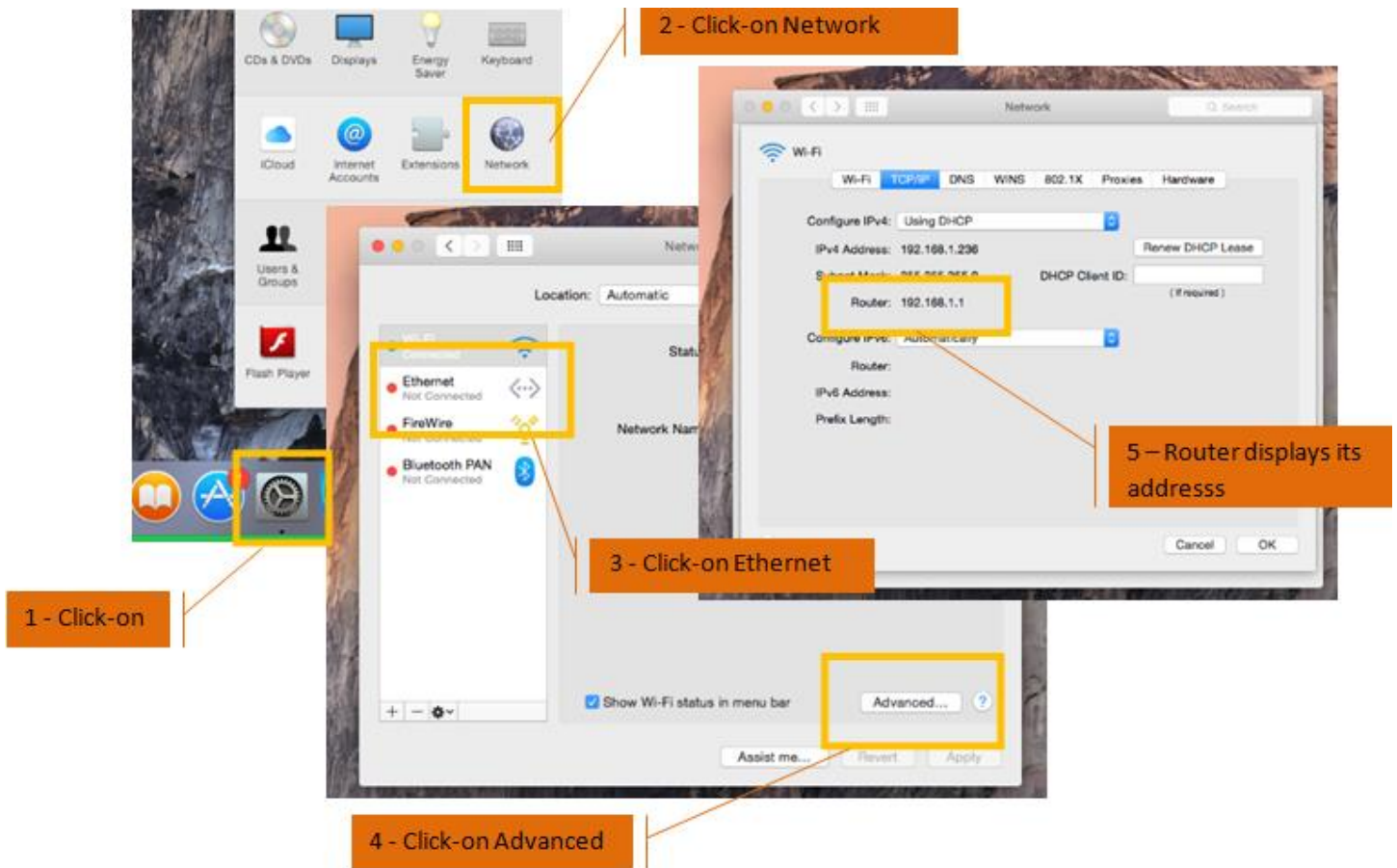
    Connection-specific DNS Suffix  . :
    IPv6 Address. . . . . : 2001:0:9d38:6ab8:3cc1:1c1:cd0b:de91
    Link-local IPv6 Address . . . . . : fe80::3cc1:1c1:cd0b:de91%5
    Default Gateway . . . . . : ::
```

You may have to scroll up or down to find the default gateway address

## IDENTIFY THE ADDRESS OF YOUR WIRELESS ROUTER ON AN APPLE COMPUTER

1. Connect your laptop or desktop computer to your wireless router. While not strictly necessary, it's usually easier if you're plugged in rather than connecting wirelessly. If you're using a laptop without an Ethernet port, you can still access the wireless router if you're already connected to the wireless network.
2. Click on the "Settings" icon.
3. Click on the "Network" icon.

4. Select Ethernet,” and then “Advanced.”
5. Look in the text for “Router.” The value is typically listed as “192.168.1.1” or “10.0.0.1.”
6. Enter this IP address into a web browser in the address bar



## COMMON MANUFACTURERS

# NETGEAR®

Connect with Innovation™

Default username: "admin"

Default password: "password"

- 1) Once you're in the wireless router configuration page click-on "Wireless"
- 2) In the "Wireless Setup" page adjust the "Channel" settings

The screenshot displays the Netgear Genie web interface for a DGN4000 router. The main menu on the left includes options like Home, Internet, Wireless, Attached Devices, Parental Controls, ReadySHARE, and Guest Network. A red arrow points to the 'Wireless' icon in the main menu. The 'Wireless Setup' page is open, showing the 'Region Selection' (North America), 'Wireless Network (2.4GHz b/g/n)' settings (Enable Wireless Isolation: unchecked, Enable SSID Broadcast: checked), 'Name (SSID):', 'Channel:' (set to 01), and 'Mode:' (set to Auto 7 Mbps). A red arrow points to the 'Channel' dropdown menu, which is currently set to 01. The 'Security Options' section shows WPA2-PSK [AES] selected. The 'Passphrase:' field is empty, with a note '(8-63 characters or 64 hex digits)'.

**Netgear**

**Customer service: 1-888-NETGEAR (1-888-638-4327)**

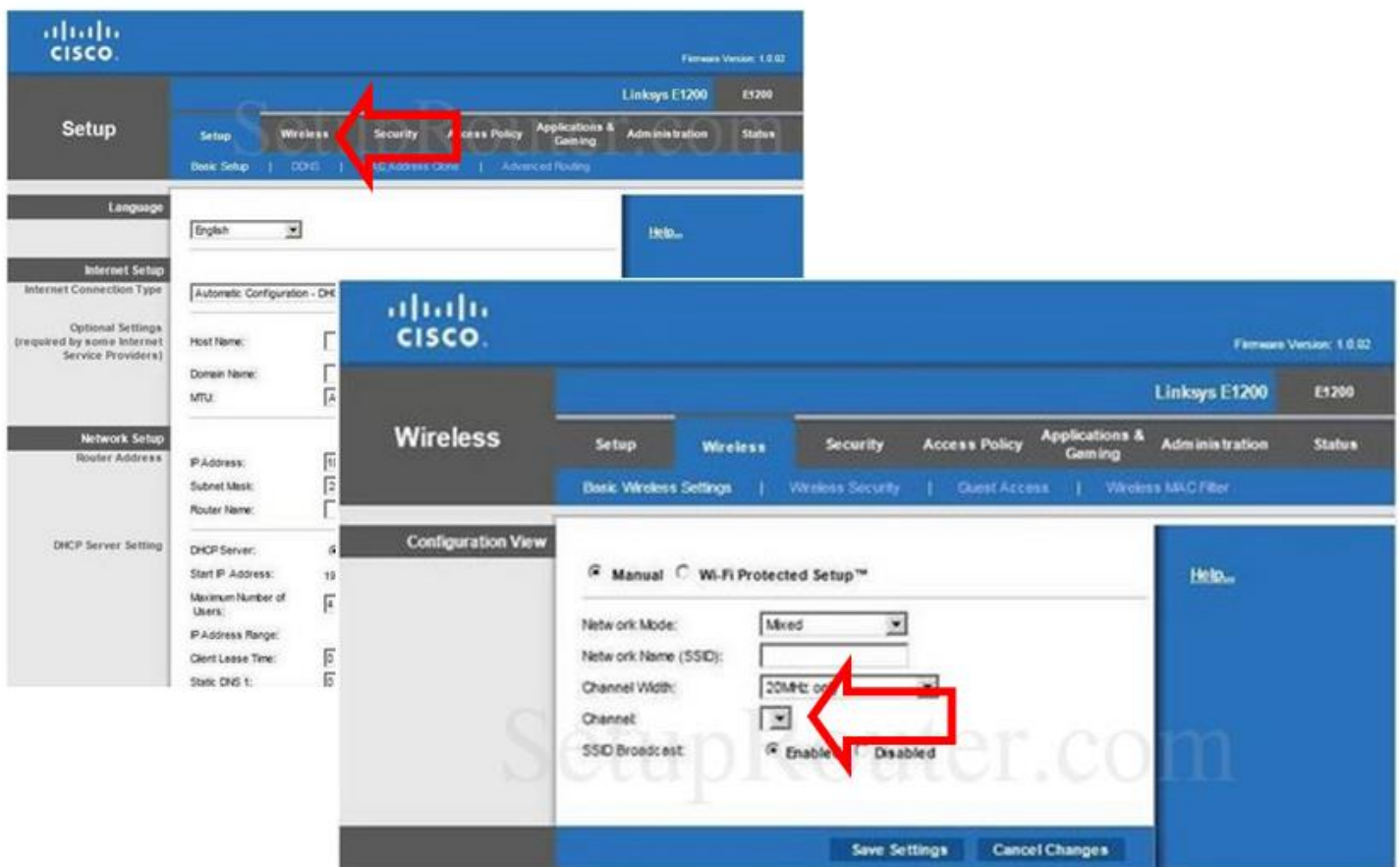
**support.netgear.com**



Default username: "admin"

Default password: "admin"

- 1) Once you're in the wireless router configuration page click-on "Setup"
- 2) Then click-on "Wireless" on this page adjust the "Channel" settings



**Cisco/Linksys**

**Customer service: 1-800-546-5797**

<http://support.linksys.com/en-us/support>



Default username: "admin"

Default password: "admin"

- 1) Once you're in the wireless router configuration page click-on "Wireless"
- 2) Then from the wireless page adjust the "Channel" settings



**Asus**

**Customer service: 1 (877) 339-2787**

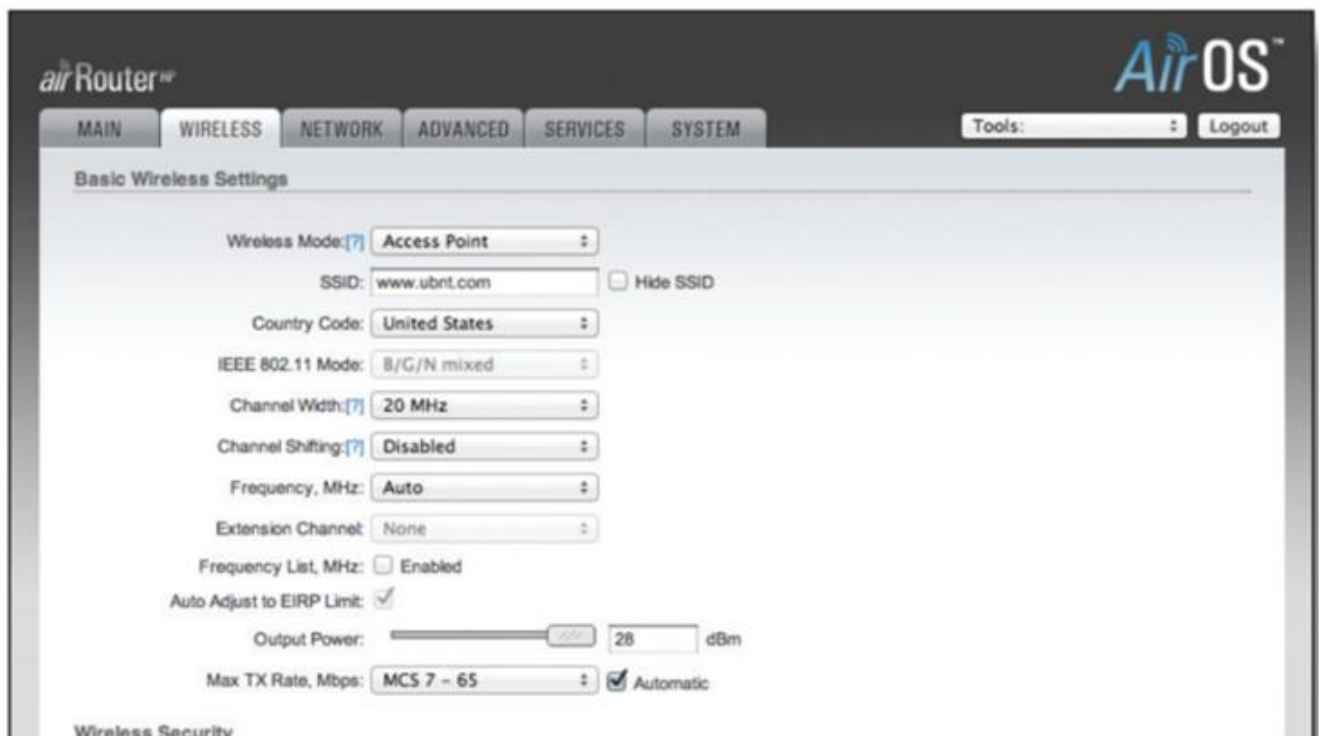
<http://support.asus.com/ServiceHome.aspx?SLanguage=en>



Default username: "ubnt"

Default password: "ubnt"

- 1) Once you're in the wireless router configuration page click-on "Wireless"
- 2) Then from the wireless page adjust the "Channel" settings by selecting "Enable" on "Channel Shifting"
- 3) Then Select the "Extension Channel" to adjust the channel.



**Ubiquiti**

**Customer Service:** (408) 942-3085

<https://www.ubnt.com/support/>



THANK YOU!

### SOME USEFUL CONTACT INFORMATION

**HiPOINT Customer Support (24/7/365)**

E-Mail: [support@hipointinc.com](mailto:support@hipointinc.com)

Chat: go to [www.hipointinc.com](http://www.hipointinc.com) and press chat on bottom right

Phone: 312-238-9506, Option 2

**HiPOINT Billing Support (9-5 M-F)**

E-Mail: [billing@hipointinc.com](mailto:billing@hipointinc.com)

Chat: go to [www.hipointinc.com](http://www.hipointinc.com) and press chat on bottom right

Phone: 312-238-9506, Option 3