

A Guide to Routers



Besides enabling wireless internet connections, routers also keep sensitive data private by safeguarding networks. Wireless routers are increasingly common, even in public spaces. This is a big upgrade from wired routers or modems. While the speed of the connection is largely affected by the service provider, a secure, smart router can still help improve connection.

To select the most appropriate router, first check the type of connection you're using - whether it's a phone line or an Ethernet cable. Following this, narrow down on the types of routers and the features that are most useful.

Connectivity Type

ADSL (Telephone Type)



- Always-on connection
- Works over regular, old telephone lines (RJ-11 pin connector)

- Allows simultaneous use of phone and internet

Ethernet (Broadband)



- Uses RJ-45 pin connector
- Uses Ethernet standard for internet connectivity
- Newer technology
- Used widely

Types of Routers

There are several different types of routers to choose from today. Wireless routers with modems are newer and generally considered better for their connectivity options.

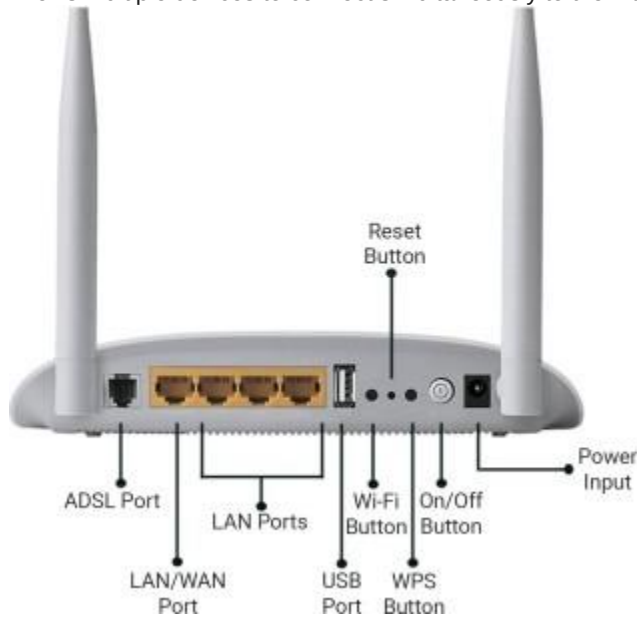
Wired Routers With Modems

- Routers with built-in modems save space
- Typically, they have a single port for broadband connections (ADSL or Cable) and single port for a local device such as a PC or a laptop
- Ideal for a single user or a small office



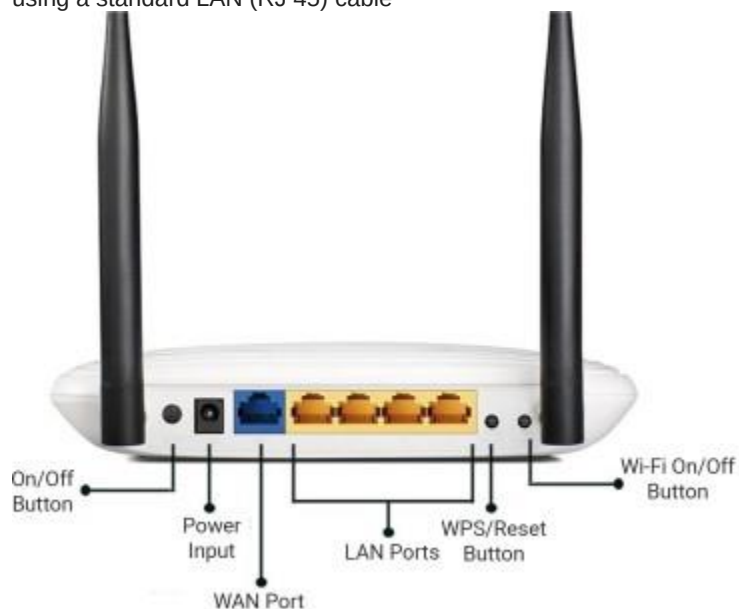
Wireless Routers With Modems

- Useful for small offices or homes
- Broadband connection (telephone line - RJ-11 type) connects directly to router
- Reduced clutter as a separate modem is not required
- Allows multiple devices to connect simultaneously to the Internet over Wi-Fi



Wireless Routers Without Modems

- Ideal for homes or small offices that already have a modem
- Connects your modem over broadband cable and shares internet access with multiple devices over Wi-Fi
- Has a built-in network switch that may have between two and eight network ports (LAN) to connect PCs and laptops using a standard LAN (RJ 45) cable



Portable Routers

- Great for internet connectivity on the move
- Directly connect a 3G-, 4G-, or LTE-enabled USB dongle to it
- Share the internet connection with other devices over Wi-Fi
- Some have built-in batteries



Range Extenders/Repeaters

- Extend the wireless range of an existing Wi-Fi router
- Useful for large areas or multiple floors that can't be covered with a single router



Speed

Higher speed here doesn't mean faster internet speed, as that also depends on the bandwidth plan you've taken from your ISP.

Here are the speeds available in routers:



Wired Speed

There are two types of wired routers - routers with standard Ethernet ports and the ones with Gigabit Ethernet ports. While routers with standard Ethernet ports can reach bandwidth speeds ranging from 10 Mbps to 100 Mbps, the ones with Gigabit Ethernet ports can hit bandwidth speeds ranging from 10 Mbps to 1000 Mbps.

Standard Ethernet (up to 100 Mbps) is fine for basic internet access and communication. Gigabit Ethernet (up to 1000 Mbps) is good for gamers and multimedia enthusiasts.

Wireless Speed

This is the maximum theoretical throughput that the router is capable of. Actual throughput may vary, depending on the ISP and the connection plan chosen.

Wireless Standard	Max Speed	Use
Wireless G (802.11n)	Up to 150 Mbps	Basic Applications (Up to 500 sq. ft. Range)
Wireless N (802.11n)	Up to 600 Mbps	Stream Media (Up to 1000 sq. ft. Range)
Wireless AC (802.11ac)	Up to 3200 Mbps	Stream HD, Play Online Games (Up to 2000 sq. ft. Range)

Antennae – Range Coverage

A router with multiple antennae usually performs better than one with fewer antennae. MIMO (Multiple Input/Multiple Output) is the technology used to enable this.

External Single Antenna



- Ideal for home users
- Good for browsing the Web and streaming content
- Up to 150 Mbps wireless speed

Dual External Antennae



- Typically used in homes and small offices
- For HD media streaming, gaming, etc.
- Up to 750 Mbps wireless speed

Triple External Antennae



- Generally used in homes or offices

- For multi-device HD streaming and gaming
- Up to 1.7 Gbps wireless speed

Quad External Antennae



- Used in large homes and offices
- For multi-device 4K streaming and multiplayer gaming on many devices simultaneously
- Up to 2.3 Gbps wireless speed

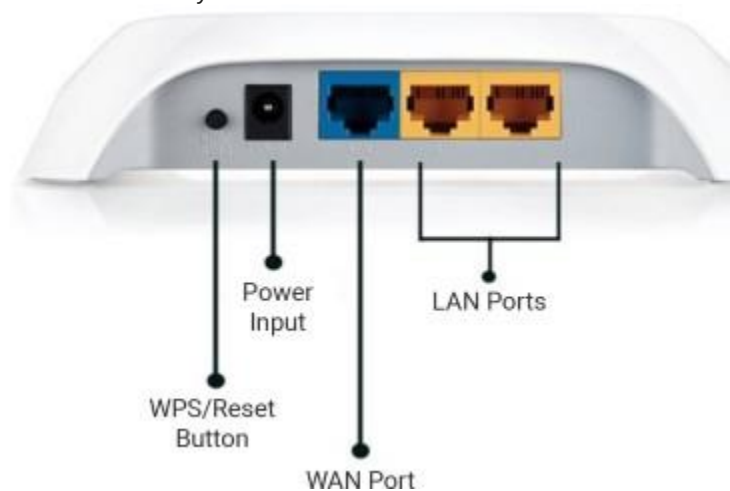
Six External Antennae



- Used in large homes and offices for multiple devices
- Buffer-free 4K streaming, online gaming on multiple devices, real-time monitoring, etc.
- Up to 3.2 Gbps wireless speed

Internal Antennae

Some routers have antennae that aren't visible. These antennae are built into the body.



Frequency

Wi-Fi routers work in two frequency bands - 2.4 GHz or 5.0 GHz. Each band has its own capabilities:

Single Band

Email, Browse the Web

- Broadcasts at a frequency of either 2.4 GHz or 5.0 GHz
 - Up to 750 Mbps wireless bandwidth speed
- Dual Band
Stream HD Content, Play Multiplayer Games
- Broadcasts both 2.4 GHz and 5.0 GHz frequencies
 - Up to 1.7 Gbps wireless bandwidth speed

Tri Band

Fastest Connection Possible

- Broadcasts signals over three bands - one on 2.4 GHz and two on 5.0 GHz
- Up to 2.6 Gbps wireless bandwidth speed

Security

A Wi-Fi signal can go beyond the physical boundaries of walls and rooms, so it's important to choose the right security features. Some security features to look for in Wi-Fi routers are:

- WPA2: The most basic level of security you should look for in a router. Anything below this, like the WEP security standard, is considered outdated.
- Parental Controls: A good feature to have if you have children at home.

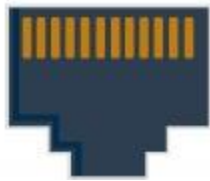


NAT (Network Address Translation)

- A feature that separates your computer (IP addresses of all your devices) from the Internet
 - All attacks on your computer will end at the router and not affect any device on your network
 - It can also be used to access a PC within the network from anywhere over the Internet
- Firewall
- Useful software that protects your home or office network from attacks coming from the Internet

Additional Features

Dual or Backup WAN Port



A second WAN port can function as a backup, for a separate internet connection. This can help balance connectivity load in cases where the usage is high. The second port could support cable, ADSL, or 4G broadband.

USB Ports



Some Wi-Fi routers have USB ports to share access to a printer or to a storage device.

Virtual LANs/Multiple SSIDs



Virtual LAN keeps the Wi-Fi network separate from guests while still allowing them access to the Internet. This technology works by creating separate SSIDs for guests, an ID that is separate and prevents access to local storage and printers.

QoS



- A feature that lets you define priority levels for different kinds of data

- Useful for when you want to watch a movie over the Internet, but your kids are using all the bandwidth, playing games online

Cloud Storage and Access



- A feature to monitor and control your home network remotely
- Access local USB storage connected to your Wi-Fi router over the Internet from anywhere