



Getting the most from your WiFi modem

A Brief Guide to optimising the WiFi experience in your home or business premises



Post- Install Tips

In order to enable customers to get the best performance from their newly installed Fibre line, a level of understanding of the essentials of how WiFi works is useful. This is a high-level overview of WiFi within the home/premises intended to assist a customer to identify problematic Devices, and possible issues for areas of poor coverage. A basic appreciation of how WiFi operates can help customers to realise their expectations relating to WiFi speeds.

Note: A table of definitions for key terms and components is provided at the end of this document.

Included are tips for customers on:

- ✓ How the specification of the Device used can influence WiFi performance.
- ✓ How to maximise the general in-home WiFi experience for the customer.

Assumptions

- The Service Provider has confirmed that the line is functioning normally, and the relevant line tests have been performed and passed.
- The customer is receiving the expected broadband speeds. (up to 1 Gb i.e. 1,000 Mb).
- The problem being experienced is probably Device or environment related.

Devices & WiFi speeds

Attainable WiFi speeds are influenced by:

- The data through put capacity of the processor in the Device being used.
- The specification of the WiFi card in the Device

WiFi Card	Expected Speed	WiFi Band
802.11 b	11 Mbps	2.4 GHz
802.11 g	54 Mbps	2.4 GHz
802.11 n	300 Mbps	2.4 GHz
802.11 ac	1,000 Mbps	2.4 GHz + 5 GHz

- Slow WiFi speeds can occur irrespective of the speed of the broadband line.
- The majority of the latest devices have an 802.11 n or 802.11 ac standard WiFi card.
- Older devices generally have lower spec WiFi cards (802.11 b or 802.11 g) and only operate on the 2.4 GHz band.
- Newer devices with the ac class WiFi card will probably be dual band (both 2.4 GHz and 5 GHz)

- If a household has a selection of devices, with a variety of WiFi card specifications from low to high speed, the modem can default to the speed of the connected device with the slowest WiFi card. All other devices connected during this session on the same band will only achieve this lower speed, irrespective of the speed of their WiFi card. (This generally occurs on the 2.4 GHz band.)
- Multiple users connected simultaneously on the 2.4 GHz band will impact WiFi speeds.
- To mitigate against being limited to a slow speed, devices with dual band WiFi cards should select the 5 GHz band if adjacent to the modem.
- WiFi card specifications for phones and tablets can be found by searching the model on <http://www.gsmarena.com/compare.php3>
- WiFi card specifications for laptops, games consoles and other devices can usually be found under the product description of that Device.

Environmental Tips

- Obstruction of the modem can result in reduced speeds.
- Customers should be attentive as to where the modem is located, for instance the modem should not be located behind the television / cabinet. Generally, it should be located centrally within the house.
- Modem height: Placing the modem on a shelf will give much better coverage than placing it near the floor.
- Modem orientation: Rotating the modem up to 90 degrees left or right can improve the WiFi coverage within the house.
- Thick walls, highly insulated walls, foil back plasterboard in walls and ceilings can inhibit the WiFi signal in a particular room or area in the house.
- It is advisable not to place the modem near reflective surfaces like glass, mirrors or water as these can distort the WiFi signal.
- If a room or an area in the house has poorer WiFi coverage than the rest of the house, devices such as home plugs can be purchased to extend the WiFi signal to these hard-to-reach areas.

Speed Testing

When conducting a WiFi speed test, the session should be initiated in the same room as the modem with no obstructions. (if possible not less than 3 metres from the modem)

Note: To accurately test the speed of the incoming line it is necessary to use a Device with an Ethernet Port capacity that exceeds the expected capacity of the line, and to connect it to the modem using an Ethernet cable.

Radio Spectrum Interference

Other devices transmitting within the same radio frequency spectrum can diminish the WiFi performance, e.g.:

- PIRs (security system sensors).
- Baby monitors.
- Cordless phones.

Spectrum interference is predominant in the 2.4 GHz range and is much less problematic in the 5 GHz range.

2.4GHz vs. 5GHz Frequency (Bands)

Note: It is possible to select the 2.4 GHz or 5 GHz bands when selecting the WiFi Network in the drop down menu on the device (Laptop / Tablet / Smartphone) during log in. The band can be changed by going into the same menu and logging off the current Network (band) and then logging into the other Network (band).

- 2.4 GHz band can give better data throughput where there are:
 - Obstacles between user and modem.
 - A greater distance between user and modem.
- 5 GHz band can give better data throughput where:
 - The customer is adjacent to the modem.
 - There are multiple simultaneous users.
 - There are slower devices connected to the modem.
 - There is potential interference from other devices.

The slower devices (b, g & n) will use the 2.4 GHz band and will therefore not interfere with any device using the 5 GHz band. Generally the 5 GHz band has a higher data throughput rate than the 2.4 GHz band.

Other Key Points

It is not recommended to deliver TV service over a WiFi connection.

Permanent devices like smart TVs, desktop computers, gaming consoles etc. should be hard wired to the modem with a DPE if possible. This will free up capacity on the WiFi network.

In the age of the IOT many more devices within the home are now connecting to the Internet.

Where possible these devices should be hard wired to the modem.

Summary

- ▶ Customers can experience WiFi speeds which are much slower than the broadband speed coming into the house or premises.
- ▶ Generally older user devices will have a slower WiFi speed than newer devices.

- ▷ The position of the modem will greatly influence the WiFi coverage/speed around the house.
- ▷ WiFi extenders may be necessary for hard-to-reach areas of the house.
- ▷ For best WiFi speeds use the 5 GHz band in locations adjacent to the modem and use the 2.4 GHz band in locations remote from the modem

Appendix

- If using WiFi extenders to increase the WiFi coverage they must be powered directly from the wall socket, i.e. not plugged into an extension lead.
- The modem should be approved by your service provider; other modems purchased separately may not perform optimally on the network.

Definitions table

Item	Definition	Notes
WiFi	Wireless networking technology using radio waves	A radio frequency that allows a customer to connect to the modem without the need for cables
WiFi Card	Radio transmitter and receiver	The unit in the device that sends/receives the WiFi signal to/from the modem
WiFi Band	2.4 GHz or 5 GHz	The frequency or speed of the WiFi signal. Sometime referred to as the network
Dual Band	2.4 GHz and 5 GHz Bands	Devices which support both 2.4 GHz and 5 GHz. (Some devices only support 2.4 GHz.)
Broadband Speed	The speed of the incoming line to the premises (Not the WiFi speed)	This is dependent on the product purchased by the customer from their Service provider
WiFi Speed	Speed of the signal between the Device and the modem	WiFi speeds will not exceed the Broadband speed
Device	Any unit a customer uses to connect to the Internet	E.g. PC, Laptop, Tablet, Smartphone etc
Environment	House layout and construction	The size and shape of the house, thickness of the internal walls and the presence of Foil backed slabs on walls and ceilings
Modem	The source of the WiFi. Also called modem	Allows the customer to connect their Device to the internet via WiFi or an Ethernet cable
Ethernet Port	RJ 45 socket	Located on Router and on some Devices, e.g. PC, laptop, etc. It is the connection point for an Ethernet cable
PIR	Passive Infra Red	This is a detector used generally in security systems to detect motion
DPE	Data Port Extension	Cable (CAT 6) used to hard wire devices to the modem
IOT	Internet of Things	Devices in the home used to control or monitor, e.g. timers or cameras etc. which are connected to the broadband modem
Home Plugs	Ethernet and/or WiFi extender	Home plugs can be used to extend the WiFi coverage in the house. They can be also used to connect a device to the modem in instances where it is not possible to run a cable (DPE). In this instance the home plug does not have to be WiFi enabled

Device	Wireless Networking Standard	Image	Dual-band
Samsung Galaxy S8	802.11 a/b/g/n/ac		Yes
Motorola Moto G5	802.11 a/b/g/n		Yes
Samsung Galaxy Tab A 7.0	802.11 b/g/n		Yes
Apple iPad Mini 4	802.11 a/b/g/n/ac		Yes
Apple iPhone 5s	802.11 a/b/g/n		Yes
Apple iPhone 7	802.11 a/b/g/n/ac		Yes
Lenovo 80WG-006SUK	802.11 ac/a/b/g/n		No
Nintendo Wii	802.11 b/g		No
Xbox 360	Supports 802.11n and 802.11g Wireless Adapters		No
Playstation 4	802.11 b/g/n		No



Tips on modem placement:

Single Story



Multi Story

