

Are you wiring for a Smart Home?

Guidelines for homeowners on the wiring requirements for telecommunications services (broadband and voice) and other 'wired' services.



INTRODUCTION

These Consumer Guidelines are based on the 'TCF Premises Wiring Cable Installers Guidelines', approved by the New Zealand Telecommunications Forum (TCF). The guidelines were last reviewed and updated in 2021.

Installing the right wiring when building or renovating your home can save you both time and money down the track. It can be done at the same time other services like electrical wiring and plumbing are going in and before wall linings restrict access. Not installing telecommunications wiring in line with the recommendations made in the TCF Guidelines may prove a costly choice if it isn't capable of delivering existing or future services and wall linings need to be removed.

The latest version of the Guidelines can be accessed on the TCF's website at:
www.tcf.org.nz/wiringyourhome

PURPOSE OF THIS GUIDE

This guide aims to help you set up your home so that you get the best out of your telecommunications services. It will help you understand which services you might want either now or in the future. Setting up the wiring in your home to be as flexible as possible will make sure your home is ready for both current and future technology. You can use this guide if you are building or upgrading a home.

This home wiring set up is designed to work with a range of connection types including fibre, cable, copper, fixed wireless, and satellite broadband. This means you have flexibility on what type of broadband service you purchase from a Retail Service Provider. And you can switch at any time.

WHO PROVIDES MY BROADBAND SERVICE?

Your Retail Service Provider (RSP) will provide your telecommunications (broadband and/or voice) services. They commonly use a Local Access Provider to connect from the street into your home (the 'lead in'). The RSP will provide a modem, sometimes called a Residential Gateway (RGW) to connect between the Local Access Provider's network and your home wiring.

Note, some providers use a modem which connects to the network using a cellular connection. These are called Fixed wireless connections, and no lead-in is installed for these.

If you have an issue with your service, please contact your RSP.

SHOULD I USE AN INSTALLER?

We recommend you use a qualified installer to set up your home wiring and that you only install good quality equipment that is independently tested and certified – e.g. those that are Underwriters Laboratories '(UL)' certified. The installer will be able to set up your home wiring in accordance with the recommendations set out in the 'TCF Premises Wiring Installers Guidelines'.

For your peace of mind, we strongly recommend that you ask your cable installer to provide a qualified test report confirming that the wiring has been installed correctly and that it will operate as expected for the telecommunication services connected to your home.

WHAT SERVICES DO I NEED TO THINK ABOUT INSTALLING?

The two main services you should plan for in your home are:

- Your broadband service, which can be used by a variety of in-home wired and wireless devices such as computers, tablets, televisions, media devices, Wi-Fi access points etc.
- Your home telephone line, which can be used with wired or cordless telephones.

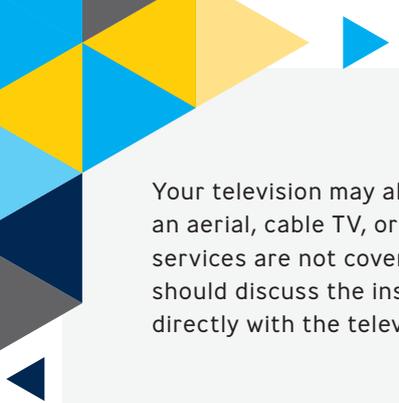
You may want one or both of these services in your home.

WHAT ELSE DO I NEED TO THINK ABOUT?

Where in the home will you use your services?

Your broadband service can be used for a variety of activities including watching streaming and/or broadcast television content, making video calls, home automation, email, web browsing etc. You should think about where in your house you might want to do these things so that you get a good connection in these places.

You may want to connect any or all of a television, digital media device, gaming console or a Wi-Fi Access Point to your broadband so you can take advantage of online services. You will get the best experience if you plug these directly into your home wiring. You can also use a strong Wi-Fi signal, but this can be more difficult to set up, and can be less reliable than a wired connection. You should discuss with your installer where in the house you might put these devices for the best connection.



Your television may also be connected to an aerial, cable TV, or a satellite dish. These services are not covered in this guide and you should discuss the installation of these services directly with the television service provider.

Do you have any specialised equipment such as medical or other monitored alarms?

Some equipment or services may need to be connected to your network in a special way so that it works correctly. Your equipment supplier can explain how their device should be set up and any limitations on how it can be used with different types of services.

You should always notify your telecommunications Retail Service Provider if you have a medical alarm and speak to your supplier to ensure it is installed to specification and will work correctly.

Do you need battery backup?

You should also think about whether you need a battery backup device. Most modern telecommunications services require mains power in your house to work. Your telephone and broadband services may stop working if there is a power cut. Battery backup devices can keep your services running for a period in a power cut.

In addition, the Commerce Commission's 111 Contact Code requires RSPs to have a scheme in place to protect Vulnerable Consumers who have a particular risk of needing to call emergency services. Those who qualify will be provided with an alternative means to access 111 emergency services in the event of a power failure. Customers should contact their RSP for more information on their scheme and how to apply.

Don't forget that charged mobile phones will often keep working in a power outage and can usually be used for emergency contact if the home is without electricity for a short period.

HOW SHOULD I WIRE UP MY HOME?

The aim of this guide is to help you set up your home wiring so that you can be flexible with the services you connect. RSPs have different ways of connecting their voice and broadband services in your home.

Making the right design decisions now means you can change your RSP, connection type and service requirements over time without having to rewire your home. It also gives you flexibility in where you place equipment like a wireless telephone base station and your RSP's modem or RGW (with Wi-Fi) so they have the best coverage.

And including wiring for Wi-Fi Access Points is also important. We recommend having one Wi-Fi Access Point for every 100m² of area in your house, and at least one on each floor if you have a multi-storied house.

You should discuss your requirements with your installer when wiring your home. The Installer's installation practice should be in-line with the TCF Premises Wiring Installers Guidelines.

THE GUIDELINES:

We recommend all the outlet positions in your home wiring are connected directly back to a single location in your home, called a Home Distributor, via star wiring. This is the most flexible way of setting up your home. Wiring in the house should be Cat6 cable, with two cables run to a pair of RJ45 sockets in each outlet position. You should put two pairs of RJ45 sockets (i.e. four in total) next to your television to make sure there is enough connectivity back to the rest of your home.

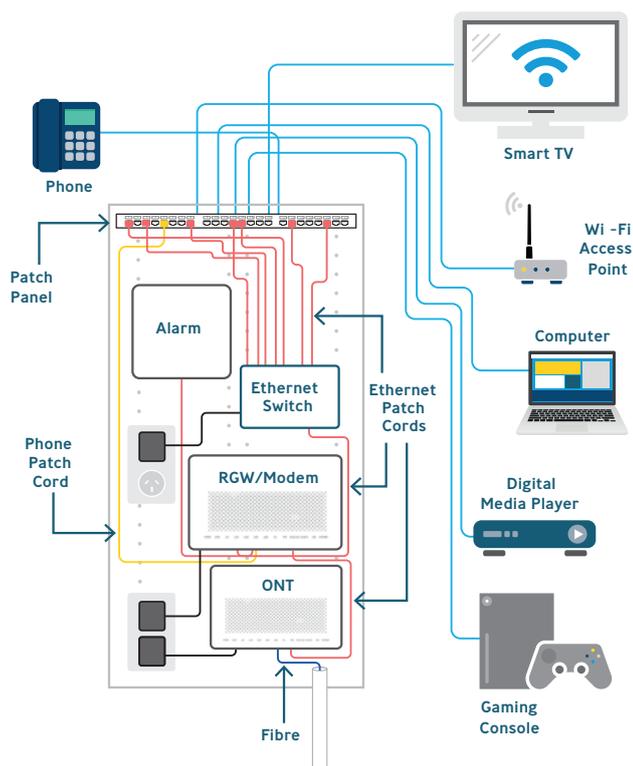
The Home Distributor may be located in a garage, a utility cupboard, or some other location. Inside the Home Distributor will be a 'patch panel' which will have an RJ45 socket corresponding to each socket in each room in the house. Short Ethernet cables called 'patch cords' are used to connect the sockets to other equipment to distribute services your home. This lets you set up each outlet for either a telephone or broadband service.

The TCF Premises Wiring Installers Guidelines contains a set of diagrams showing how you can use your star wiring to connect services from different Retail Service Providers.

You will also need to make sure there are sufficient power outlets for the equipment installed in the home distributor, along with your home battery back-up device (UPS) if required.



Home Distributor example



Note: The ONT is only required for fibre optic connections.

Modem location

In properties with star wiring, a RGW or Fixed Wireless Modem is most commonly placed within the Home Distribution Box, or near the primary TV. A Fixed Wireless Modem will need to be placed in a location with a strong cell signal and next to an outlet position.

Ducting within the home

To prepare ahead for future upgrades and services, installing ducting when you are building or renovating your home can be a good way of preparing a property for future options. Once the ducting has been installed, completing an upgrade can be as simple as feeding a new cable along it. Ducting itself is relatively inexpensive and we recommend you consult your cable installer for recommendations on ducting sizes – see the TCF Premises Wiring Installers Guidelines for more details.

CONNECTING MY HOME

Service Lead-in

The connection between your home and the street is called the 'lead-in'. This is owned by the local Access Network Provider who will usually be different from your Retail Service Provider. Your lead-in might be copper, cable or fibre depending on the Retail Service Provider and the services you require.

Most new homes now have fibre (UFB) services available at the boundary. If the RSP is providing a fibre service, a new fibre cable is required from the street to the home. The Access Network Provider will provide this connection (often for free) if the service is available.

The local Access Network Provider will install an External Termination Point (ETP) on the outside of your building. The ETP is important as it will allow transition of external cable to internal rated cable, and also allows your service to be restored in the event of a fault or damage to the network in the street.

The lead-in cable will then enter your home and be terminated in the home distributor.

If you are building a new home, you should speak to your Access Network Provider or Local Fibre Company to understand their specific requirements for your home lead-in to make sure the ducting or trench requirements are positioned correctly and are of the correct dimensions.

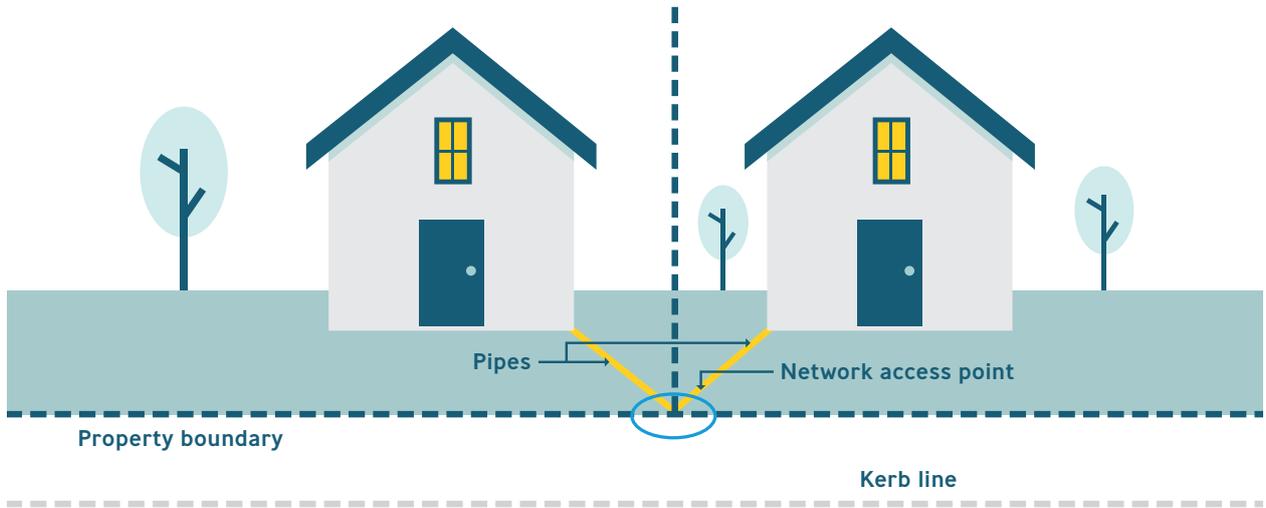
Third Party Consents

If you live down a Right of Way (ROW) or have a shared building you may need to gain permission from other people before the local Access Network Provider can install the cable to your home. You can discuss this with your Retail Service Provider if you think this might apply to you.

Wi-Fi technology

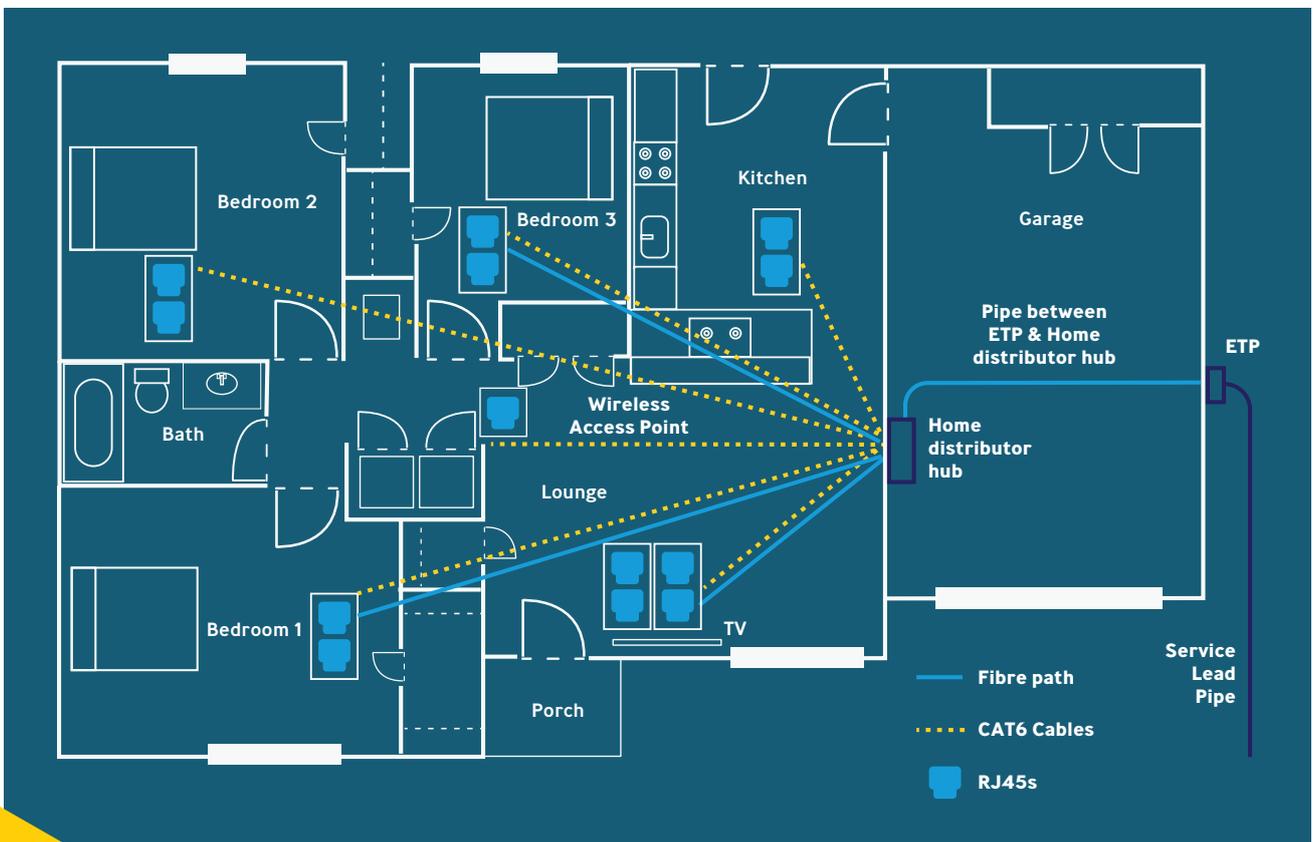
With the growth of Wi-Fi capable personal devices being used in the home today, Wi-Fi technologies always need to be considered. The modem or RGW in the Home Distributor will typically be Wi-Fi capable, but may not service the whole house. Thus, pushing the Wi-Fi signal to other parts of the house will be necessary. Your service provider may have recommendations or preferred methods of meeting your Wi-Fi needs.

Service Lead-in and ETP termination

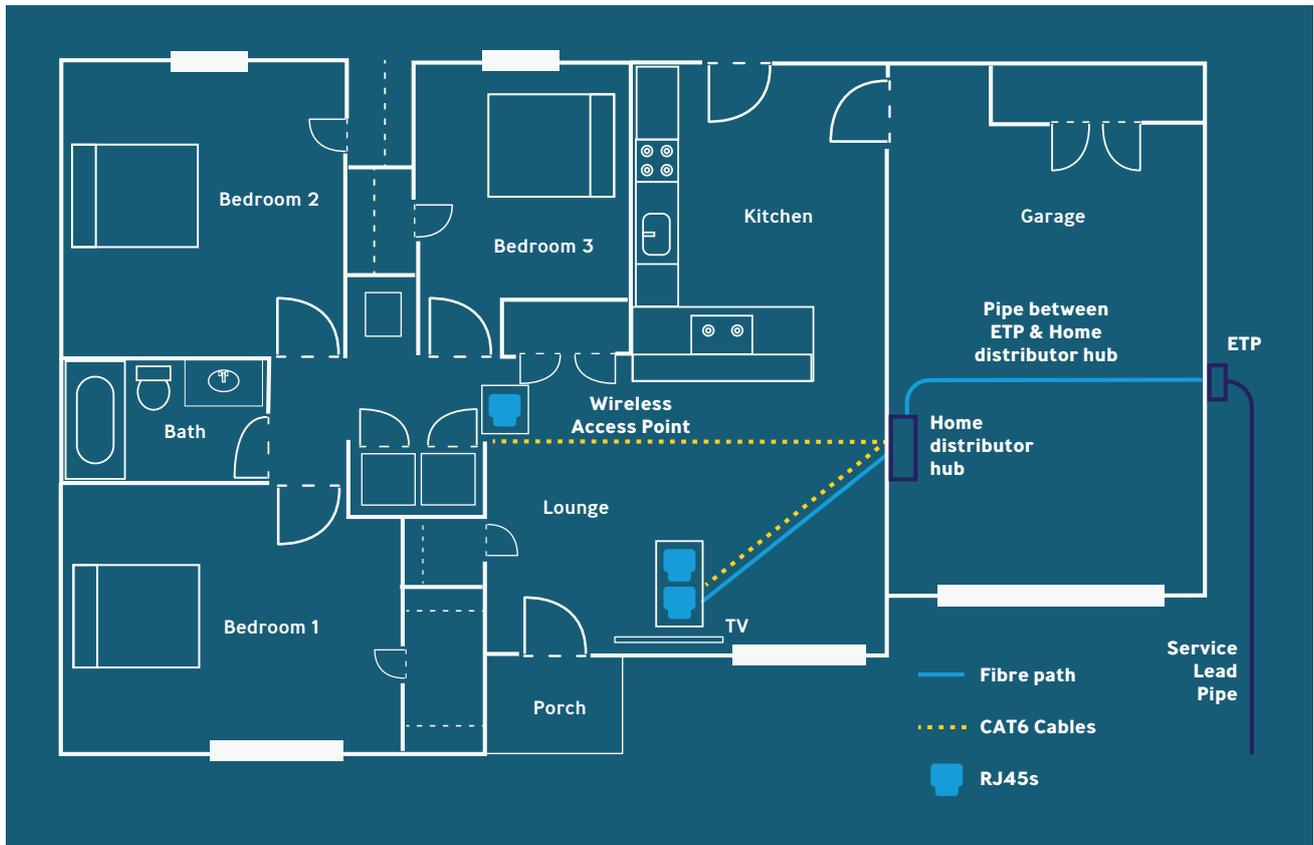


GENERIC CABLING SYSTEM COMPONENTS – ILLUSTRATIVE FLOOR PLANS

Best Practice Home Wiring



Minimum Home Wiring



CABLING THE REST OF THE PREMISES

When cabling:

- Two Cat6 cables should be fed from the star wiring point to each outlet position, plus four to the main TV position.
- Make sure clearances between communication cables and power cables are maintained. See the Premises Wiring Code of Practice for more detail on the 'segregation of services' (cable separation).
- Leave at least 300mm of Cat6 cable slack at each outlet.

When you're considering where to install outlets or jackpoints, be sure to consider the following:

- At least two RJ45 type jackpoints on the same faceplate (each with their own Cat6 cable) in each bedroom and normally occupied room.
- Two or more such outlets are recommended in the lounge, rumpus room, study, and any Wi-Fi access point position.
- Avoid wet areas such as bathrooms and laundries.
- Include 20mm pipe or microduct routes from the star wiring point to any future fibre position, such as the main TV position and any room which may be used as a home office. This will allow future technologies into your home.
- If requested, Coax cables should be fed from the external aerial/satellite dish position to the main TV position.

QUALITY COMPONENTS, TESTING AND VERIFICATION

We strongly recommend only installing good quality components such as patch cords and connectors that have been independently certified and are from a recognised supplier. Low quality components will affect the performance of broadband and/or phone services.

We also recommend that newly installed cabling be tested and verified (by its installer) as being capable of operating at the speed for which it is rated.

Service performance will be affected where:

- Too much cable insulation is removed, or there is excessive untwisting of copper cable pairs, at termination points;
- The wiring is incorrectly terminated;
- The communications cabling is too close to electrical cabling, lighting, or appliances that can cause interference;
- The minimum bend radius is exceeded; and/or
- Low quality components have been used.

CHECKLIST FOR WIRING A SMART HOME

1

Are you familiar with the cabling requirements necessary for wiring a smart home available at: www.tcf.org.nz/premwiring?

2

Is the home distributor made of plastic and large enough and easily accessible?

3

Is Cat6 cabling being used?

4

Are there multiple outlets assigned in key living areas?

5

Have you tested and verified the installed cabling?

FOR MORE INFORMATION

Visit the Premises Wiring page on the TCF website:
<http://www.tcf.org.nz/premwiring>