



# ARE YOU WIRING FOR A SMART HOME?

Guidelines for **homeowners** on the wiring requirements for telecommunications and other 'wired' services.



## INTRODUCTION

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. Installing telecommunications wiring not in-line with the recommendations made in the TCF Premises Wiring Installers Guidelines may prove a costly choice if it isn't capable of delivering existing or future services and wall linings need to be removed.

These Consumer Guidelines are based on the 'TCF Premises Wiring Cable Installers Guidelines', approved by the New Zealand Telecommunications Forum (TCF) in September 2015. The latest version of the Guidelines can be accessed on the TCF's website at: [www.tcf.org.nz/wiringyourhome](http://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 and how to set up the wiring in your home to be as flexible as possible. It will make sure your home is ready for fibre broadband, even if you do not have it today. You can use this guide if you are building or upgrading a home.

## WHO PROVIDES MY TELECOMMUNICATION SERVICE?

Your Retail Service Provider (RSP) will provide your telecommunications services. They will use a Local Access Provider to connect from the street into your home (the 'lead in'). The Retail Service Provider will provide a modem (sometimes called a Residential Gateway (RGW)) to connect between the Local Access Provider's network and your home wiring. 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' which can be found on the TCF website.

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

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 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 your television or a multimedia device 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 but you can also use a strong Wi-Fi signal. 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. If your house is connected by fibre then your telephone and broadband services will stop working if there is a power cut.

Battery backup devices can keep your services running in a power cut for a period of time. Speak to your installer about your requirements, telling them what services and equipment you need to keep running during a power outage.

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. Retail Service Providers have different ways of connecting their voice and broadband services in your home.

Making the right design decisions now means you can change your Retail Service Provider and service requirements over time without having to rewire your home. It also gives you flexibility in where you place equipment like wireless telephones and your Wi-Fi (modem) base station so they have the best coverage. 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 2 cables run to a pair of RJ45 sockets in each outlet position. You should put two pairs of RJ45 sockets (i.e. 4 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 central cupboard or some other location. Inside the Home Distributor

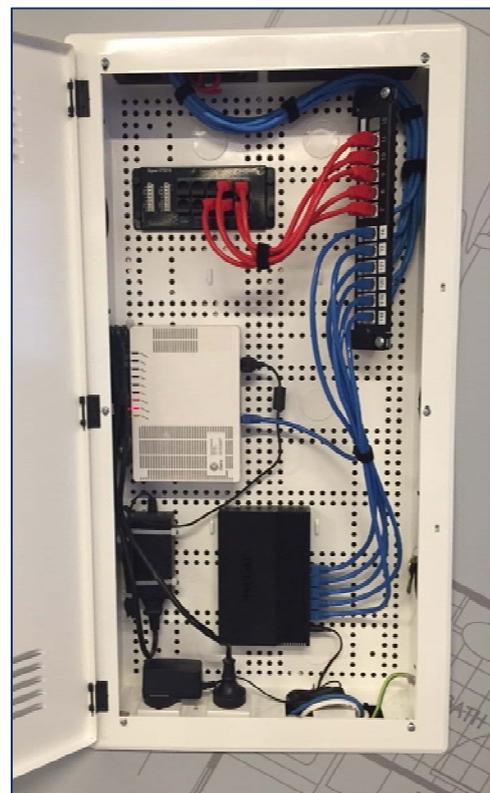
will be a 'patch panel' which will have an RJ45 socket corresponding to each socket in each room in the house.

Short 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 the battery back-up device (UPS) if required.

#### The Home Distributor

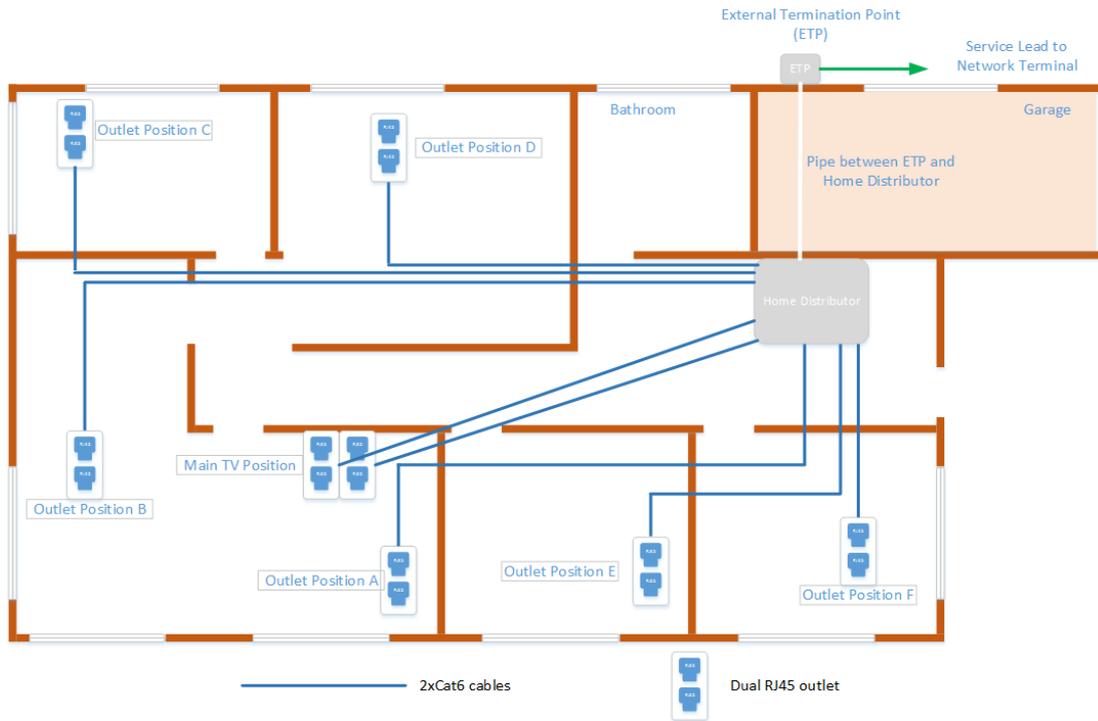


#### Ducting

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.

Generic Cabling System Components – Illustrative Floor Plan



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. .

Many people are moving to fibre (UFB) services which require a fibre connection from the street to the home. The Local Fibre Company 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 lead-in cable will then enter your home and be terminated in the home distributor.

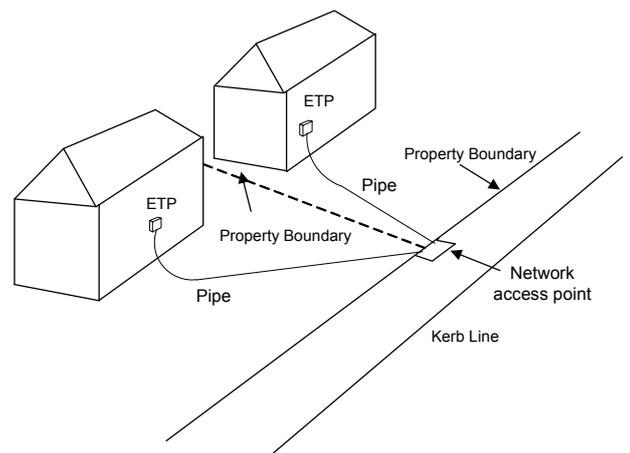
If you are building a new home you should speak to your Access Network Provider or Local Fibre Company to understand their specific requirements for your home lead-in to make sure the ducting or trench requirements are positioned correctly and are of the correct dimensions.

Third Party Consents

If you live down a Right Of Way 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.

Service Lead-in and ETP termination



Wireless technology

With the growth of wireless capable personal devices being used in the home today, WiFi technologies always need to be considered. The Residential Gateway in the Home Distributor, may or may not be WiFi capable, or may require signal boosting as a result of the location of the Home Distributor. Your service provider may have recommendations or preferred methods of meeting your WiFi needs.

## HOW DO I CONNECT IT ALL TOGETHER?

### Copper Broadband Service (e.g. ADSL and VDSL services)

Copper is terminated in your home distributor and needs to be connected to your Retail Service Provider's ADSL or VDSL broadband router to provide your broadband service. The router will provide Ethernet sockets which can be connected to the patch panel and Wifi to provide broadband throughout the home.

### Fibre Broadband Services - UFB

Fibre is terminated on a device called an ONT in your home distributor which you then connect to your Retail Service Provider's Home Gateway to provide your broadband service. The Home Gateway will provide Ethernet sockets which can be connected to the patch panel and to a Wifi device to provide broadband throughout the home.

### Telephone Service

Retail Service Providers have different ways of providing their voice services. If you have a voice service it may be provided from either the ONT, from the Retail Service Provider's Home Gateway, or it may be provided over a separate copper cable. Speak to your Retail Service Provider to understand where you need to connect your voice equipment.

## WIRING TERMINOLOGY

**Cat6 cable** - A high quality copper cable designed to deliver Ethernet-standard services with performance to 250MHz to support 1Gbits/sec Ethernet networks, with a maximum allowed length of 100 metres.

**Optical Network Terminal (ONT)** – is the point at which a fibre optic cable connection is integrated with your home's internal premises wiring network.

**'Patch cord'** – is a length of cable that with a connector on each end that is used to connect devices to each other or to network wall outlets.

**'RJ45'** – is a standard type of connector on the end of the computer (Ethernet) network cables, such as Cat6 cable.

**'Star Wired'** – Wiring that's fed from a central point, usually in the 'home distributor' (a star wiring box may be used for telephony) with the cabling provided to RJ45 sockets in rooms of the house.

## SMART HOME WIRING CHECKLIST

- ✓ Use a qualified cable installer that understands your requirements.
- ✓ Use Cat6 cable or better.
- ✓ Ensure your home is star wired to a central home distributor (star wiring box).
- ✓ The home distributor should be large enough to house additional Retail Service Provider equipment such as an ONT and/or a residential gateway. It should be easily accessible.
- ✓ Check that multiple outlets are installed in key living areas, especially next to the television.
- ✓ Discuss lead-in and fibre specifications with your Access Network Provider and Local Fibre Company.

## FOR MORE INFORMATION

Visit the Premises Wiring page on the TCF website:

<http://www.tcf.org.nz/wiringyourhome>