

Are you wiring for a Smart Home?

Advice for cable installers on the wiring requirements for access to telecommunications services (broadband and voice)



INTRODUCTION

Advances in technology mean it's more important than ever to make sure the wiring and connections in homes are capable of delivering modern telecommunications, entertainment and building services.

This pamphlet provides an overview to those things you'll need to do to ensure a home is being properly wired.

It is based on the 'Premises Wiring Cable Installers Guidelines for Telecommunication Services', updated and approved by the NZ Telecommunications Forum (TCF) in 2021. The latest version of this Code can be accessed on the TCF's website at: www.tcf.org.nz/premiring

MINIMUM COMMUNICATION CABLING REQUIREMENTS

Following are the minimum cable installation requirements we recommend for new homes and major renovations for which there is an opportunity to install new wiring:

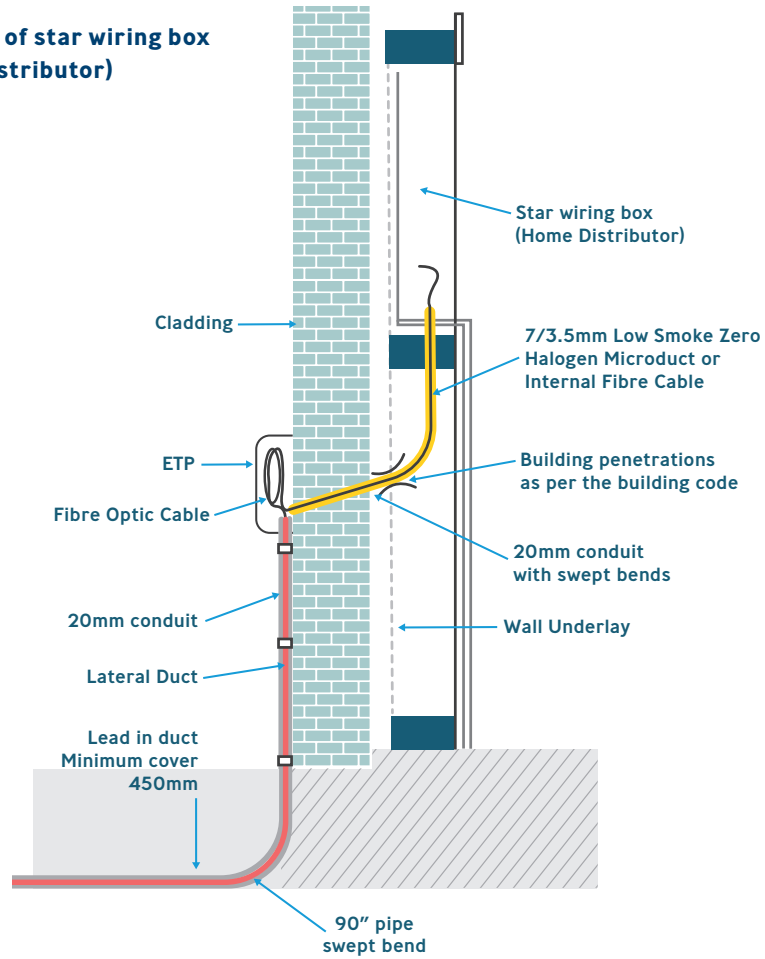
1. Cabling must be 'star wired'. Telecommunications Ethernet cables need to be a minimum specification of Cat6 (UTP) or better if spans exceed 50m.
2. A star wiring box (home distributor) needs to be located at a 'star point' – to provide for the interconnection and distribution of cabling around the home, as well as for testing capability. It is the homeowner or builder's responsibility to supply the home distributor, a patch panel, and patch cables.
3. The home distributor is usually installed in a wall cavity inside the home, somewhere easily accessible. If possible, it will be above the height of the External Termination Point (ETP) at about eye level (to minimise the risk of water entering the premises). Common locations for the home distributor are in an attached garage or a large cupboard or utility room.

4. The home distributor must be large enough to house devices such as an ONT, a router and an ethernet switch. Minimum dimensions of 350mm (W) x 700mm (H) x 80mm (D) are recommended, and made of non-metallic material as Wi-Fi capable equipment may be housed in here. It must also have integrated power sockets for devices. Two dual power outlets as a minimum are recommended. Ensure the door can be closed once power supply units are plugged in.
5. The door on the home distributor must be louvered so air can circulate and prevent the equipment from overheating.
6. A path from the ETP to the Home Distributor needs to be established. Ideally this is of plastic pipe – minimum of 20mm diameter and 300mm 90° bend up into the home distributor. Do not use an elbow bend. The ETP is important as it allows transition of external cable to internal rated cable. It also allows the customer's service to be restored in the event of a fault or damage to the network in the street.
7. If the path from the ETP to the Home Distributor contains more than 3 bends, and/or is longer than 20m, then installing an internal Low Smoke Zero Halogen (LSZH) microduct or a recognised fibre optic cable (such as Prysmian Optic@t) is an acceptable alternative. These are available from your Local Fibre Company.
8. At the star wiring point, all Cat6 cables will ideally be terminated on keystone RJ45 type modular sockets mounted in a patch panel. This will allow for very simple patching to/from routers and easy replacement if any develop a fault. It is recommended that the installer provides a diagram to show the outlet and port positions to simplify future patching.

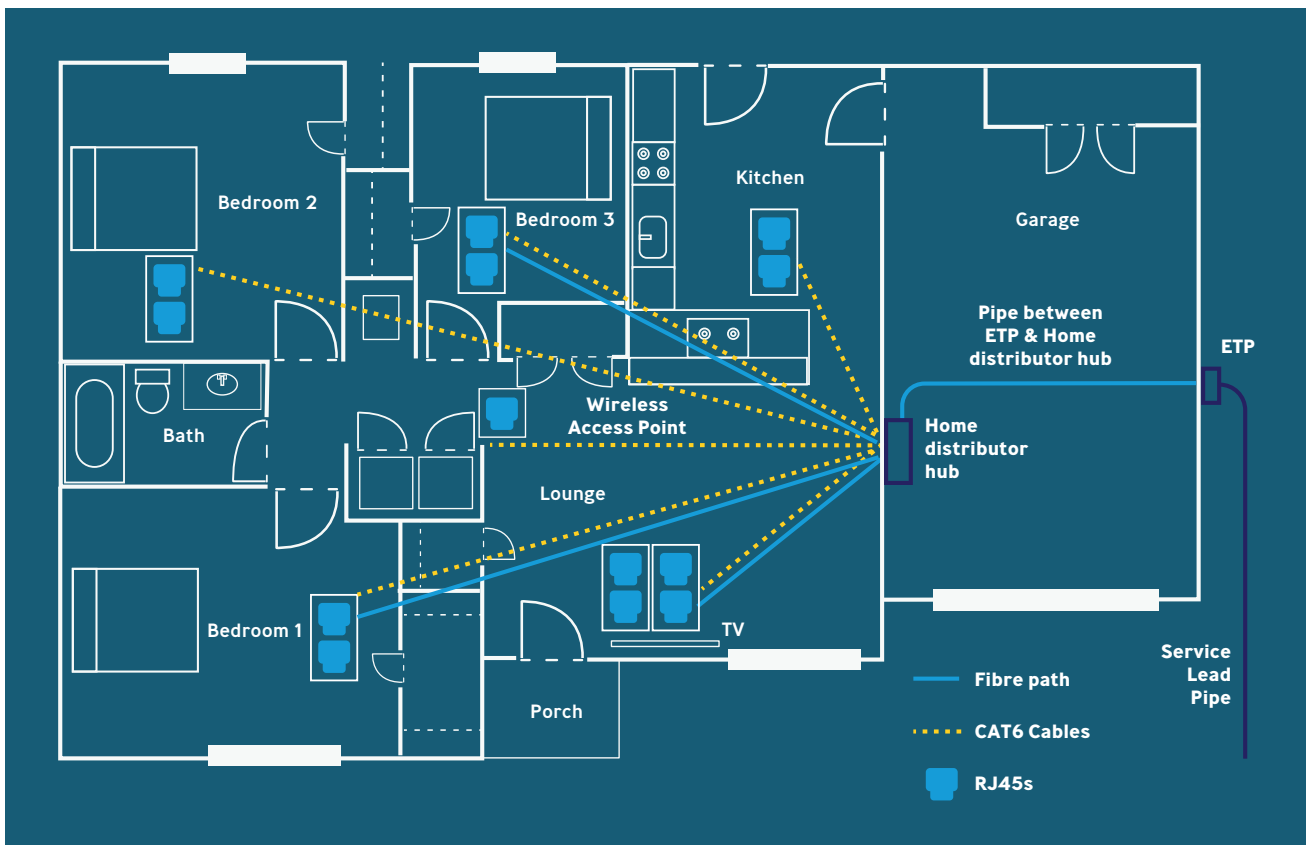
WIRING FOR THE FUTURE

Although Cat6 standard wiring is sufficient for meeting the bandwidth demands of existing telecommunications services, it is a good idea to prepare ahead for future upgrades and services. Installing pipe or microduct when building or renovating the home can be a good way of preparing a property for future options such as fibre optic cabling.

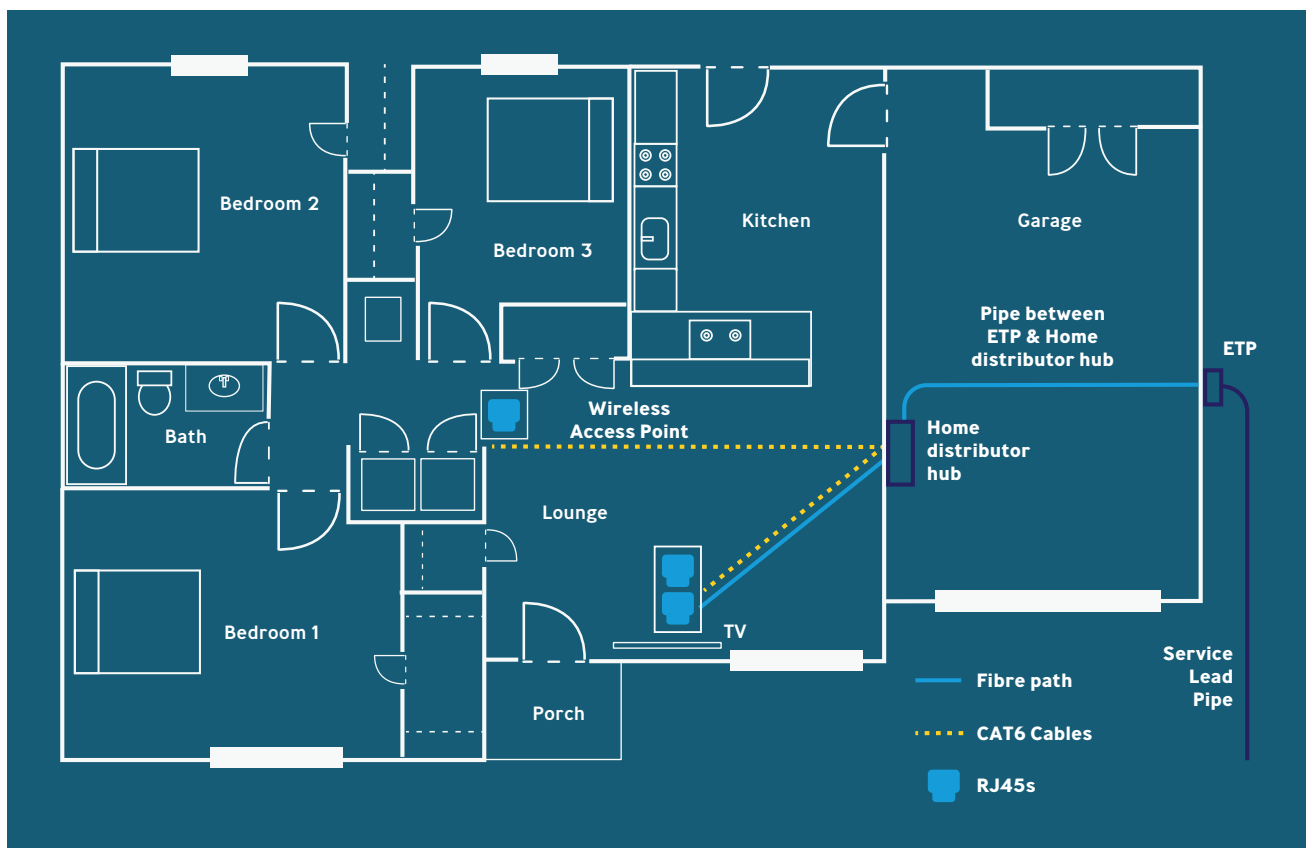
Location of star wiring box (home distributor)



Best Practice Home Wiring



Minimum Home Wiring



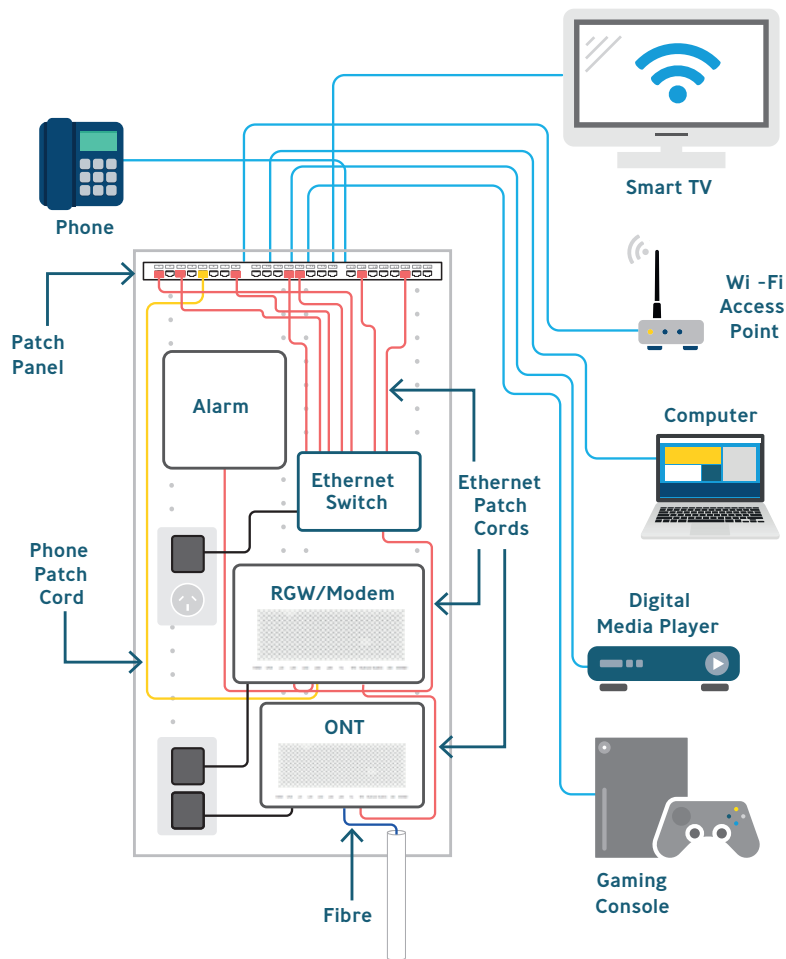
CABLING THE REST OF THE PREMISES

Best practice when installing cabling:

- The home distributor hub could also be placed centrally within the home i.e., within a cupboard.
- 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.
- If requested, Coax cables should be fed from the external aerial/satellite dish position to the main TV position.

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.
- We recommend having one Wi-Fi Access Point for every 100m² of area in the house, and at least one on each floor if it is a multi-storied house.
- 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.



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

Home distributor generic example

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 (no more than 25mm), or there is excessive untwisting of copper cable pairs (no more than 13mm), 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>