JULY 2015

EXCAVATION AND CABLING
USER GUIDE

altibox

EXCAVATION AND CABLING 1 Things you must do before installing the home hub

Thank you for choosing us!

Soon you will be able to use the services from Altibox. Before we install fibre optic cable and equipment in your home, you must make some important decisions.

Where will the fibre optic cable enter the house?
Wherever the fibre optic cable comes in, a media converter will be located. This is a small box that converts the light waves in the fibre optic cable into electrical signals. The media converter needs to be close to a power socket.
See chapters 2 and 3 for further information.

Running the white plastic conduit into the house.
The white conduit pipe that you received with the starter pack is used to lead the fibre optic cable to the location of the media converter. See chapter 4 for further information.

If you wish to do this yourself, you must do it within 14 days of the orange fibre optic cable conduit being laid at your property boundary. When you have done this it is important to notify your Altibox supplier – not one of the installers.

NB!
Even if you are not doing the job yourself, it is in any case important that you think about where you wish to place the media converter and home hub.

LOCATION OF THE HOME HUB

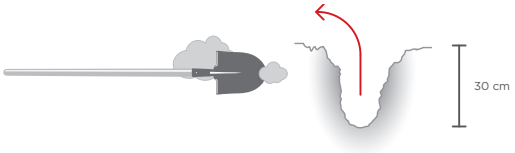
The location of the home hub will affect your user experience. Therefore, it is important to find an optimal location.
Please read our advice and tips in chapters 5, 6 and 7 before you make your decision.

EXCAVATION AND CABLING 2 Excavation in gardens

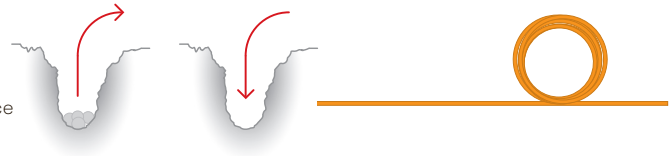
Somewhere at the boundary of your property awaits a coil of orange fibre optic cable conduit. This cable must be laid in a trench up to the house.

1. Begin by rolling out the orange fibre optic cable conduit on the ground and laying it where you will dig the trench, leading all the way to the house wall. Check that you have at least 1 metre of cable left – as you will need this extra length of cable for internal installation.

2. Dig a trench that is at least 30 cm deep. If you are digging a long trench, use a narrow spade – it will make the job much easier and quicker.



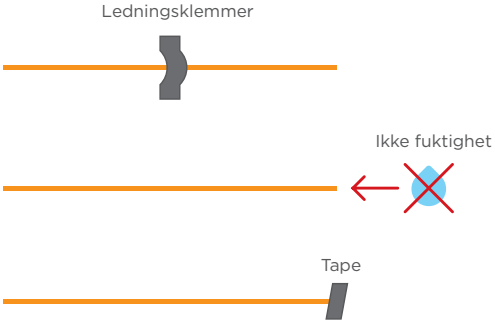
3. When you have finished digging, remove any rocks/stones at the bottom of the trench. Then you can place the orange cable conduit in the trench. Make sure that there are no kinks in the cable. The maximum bend must be no greater than the circumference of a CD disc.



4. Fill the trench with the same soil that you dug up; however, make sure that the first 10 cm layer does not contain rocks or stones. If the soil contains a lot of stones, you can lay sand or garden shingle under and over the cable.

5. If there is only a short distance from the ground to the hole in the outer wall, you should wait to cover the last metre until you have run the cable into the house.

6. To fix the conduit to the wall, use the large conduit clips you received in the starter pack. Make sure that you do not install the conduit in a place where it can easily be damaged. Also, make sure that no moisture can get into the conduit – seal the end with tape or similar when it has been pulled through. Water in the conduit can damage the fibre optic cable inside when it freezes.



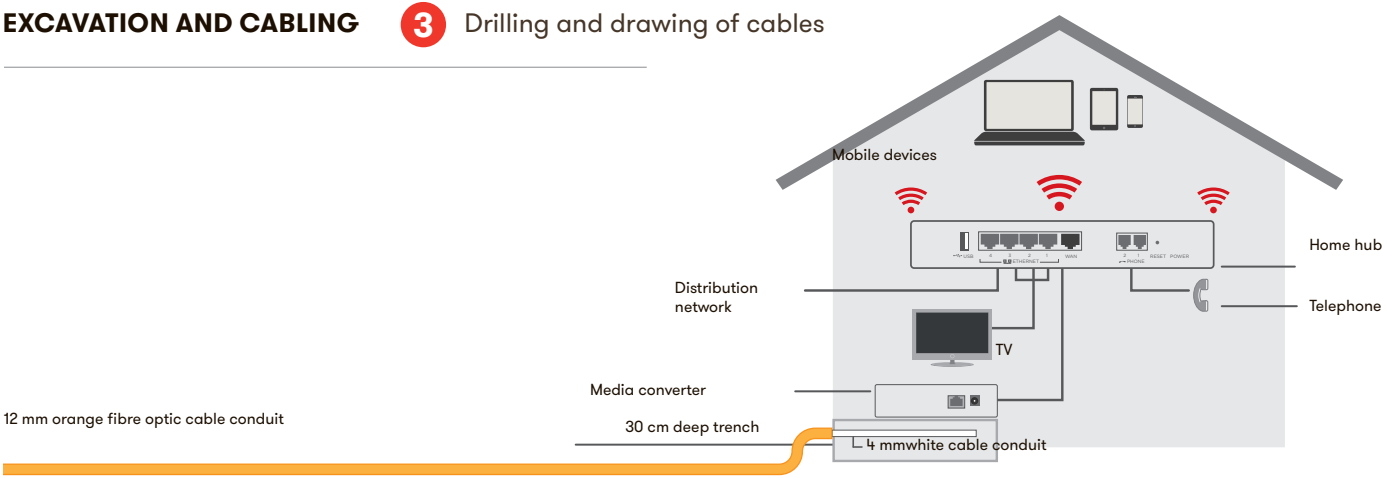
NB!
If you are digging the trench yourself as part of self-installation, it is your responsibility to consult local regulations regarding any necessary excavation notices. You can obtain more information from the municipality and/or local electricity company. See also gravemelding.no

7. Documentation. It is a good idea to note down exactly where the fibre optic cable conduit has been laid on the property. If in the future the house or garden is refurbished, or changes are made to water or sewage pipes, it is important to know where the fibre optic cable is located, so that any contractors can be informed. You are responsible for any damage to fibre optic cables/conduit on you own property and you must inform contractors that fibre optic cable is laid on your property.

   You can describe where the fibre optic cable is laid here →

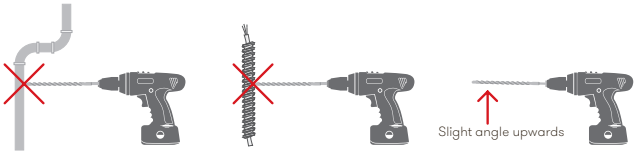
EXCAVATION AND CABLING

3 Drilling and drawing of cables



1. It is important to use the correct equipment when drilling the hole. You will need an electric drill with a minimum 25 cm long drill bit. If you need to make a hole in a brick or concrete wall, you will need a hammer drill with a masonry drill bit. The drill bit must in any case be at least 13 mm in diameter.

2. When drilling – check first that there is no risk of drilling into water pipes or electrical cables. Make sure that the hole is drilled at a slight angle upwards from the outside of the wall. This is important, as it prevents moisture from entering the cladding or brick

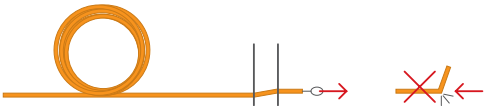


EXCAVATION AND CABLING 3 Drilling and drawing of cables

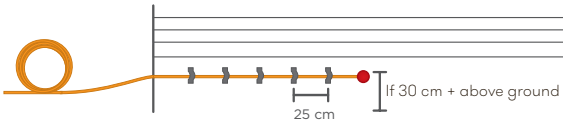
3. Before you drill a hole in the wall, you should think about the route that the conduit will take on the inside. We recommend an angle of 45 degrees from the hole in the wall. Remember that the conduit should not be bent more than the circumference of a CD disc. You should also angle the drilled hole, so that water cannot enter. When the hole has been drilled, run the orange conduit through. The best thing to use is a cable puller or wire. Be careful and make sure that the conduit is not kinked!

NB!

If anything unusual happens or you experience difficulties, contact Altibox immediately.

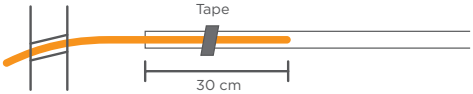


4. If the hole in the wall is more than 30 cm above the ground, the cable conduit should be fixed to the outside wall. You can use the large cable clips and attach them approx. 25 cm apart. (The conduit can also be hidden under cladding, corner pieces or other areas, it can withstand paint and wood stain).



5. After the cable has been drawn through and fixed on the exterior, the hole must be sealed. You can use sealing compound, silicone, putty or mortar.

6. The exterior part of the job is now finished. The orange end, that now pokes out from the interior wall, will later be connected together with the end of the white cable conduit you have received. You just need to tape the ends together with a 30 cm overlap. Our installation technician will make the connection between the orange and the white cables.



EXCAVATION AND CABLING 4 Running the white conduit to media

You have received a starter pack that contains 15 m of plastic conduit, a network cable and cable clips. The white plastic conduit is to be used to run the fibre optic cable from the orange cable to the desired location of the media converter.

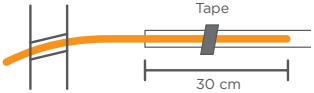
1. First, plan the best "route" for the conduit to the media converter. The most important thing is to make sure the conduit is protected, by running it along e.g. a skirting board. If the route is longer than 15 metres, call us and we will send extra conduit.

   NB! The white conduit must not be laid outdoors, and it must not be curved so sharply that it becomes kinked. The conduit must not be laid in a curve sharper than the circumference of a CD disc.

2. Before you begin to install the white cable conduit, make sure you have kept the 30 cm overlap with the orange cable conduit. We need this extra length in order to connect the cables together.

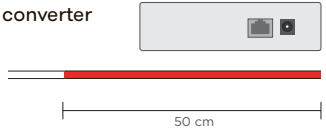
3. If required, drill all necessary holes in walls and ceilings. Remember to use a drill large enough (min. 5 mm), so that the white conduit can be pulled through the hole.

Overlap from the orange cable to the white conduit.



No kinks in the cable

Overlap from the white conduit to the media converter



4. Run the cable conduit along the route. If you are running the cable conduit through holes, use the same technique as when you ran the orange cable conduit through the exterior wall.

5. When you have run the cable conduit through to the place where the home hub is to be located, ensure that you have an additional half a metre of cable conduit left.

6. The starter pack includes small cable clips. Use these to attach the white cable conduit. These can also be used to attach data cables. Space them approx. 20–30 cm apart.

7. When you have finished installing, check that there are no kinks or other damage to the cable.

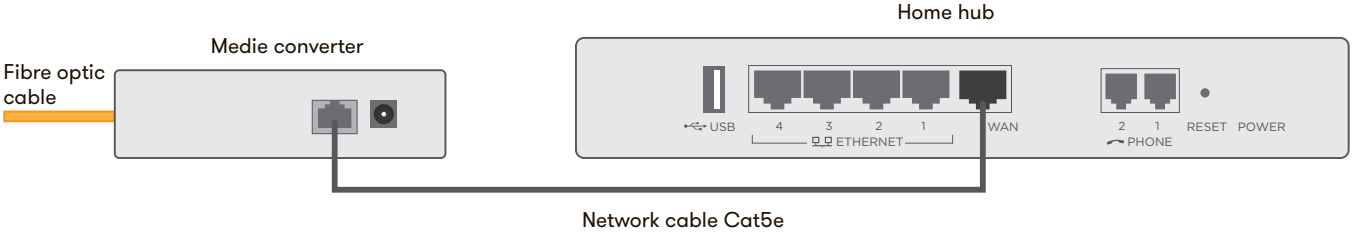
8. Then you can call your Altibox supplier and our technicians will come and complete the installation

When the white conduit is ready and the distribution network inside has been planned (see further details about distribution networks in chapter 6), one of our installation technicians will come and install a media converter and a home hub at the desired locations. The fibre optic cable itself will be blown through the orange conduit and further into the white conduit inside the house. Finally, the installation technician will connect the cable to the media converter, which in turn will be connected to the home hub.

The home hub is the "heart" of your fibre optic solution. Cables for your distribution network, set-top boxes and telephony are all run from the home hub.

1. The home hub is provided with a wireless router and firewall. If you are using a wireless network, the distance between the area in which you wish to have good coverage and the home hub should not be any greater than necessary.
   See chapter 7 for further information.

2. The home hub can be fitted to a wall. It does not have to be in the same place as the media converter. If the distance between them is more than 1 metre, you will have to run an unshielded network cable (Cat5e or higher) between them. If you wish to install the home hub close to the media converter, there must be a minimum distance of 10 cm between them.



3. Locate the home hub close to a power socket. If the distance to the power socket is more than 1.8 metres, you will need to use an extension cable.

4. You must also bear in mind that cabling for telephony, TV and cabled Internet starts at the home hub.

5. Avoid placing the media converter and home hub in areas with high humidity, where there is a lot of dust, where the temperature is less than +5 degrees, in areas exposed to rodents, etc. – e.g. workshops, washrooms, garages, cold lofts or storage rooms. Avoid mounting the media converter so low that it can be damaged by e.g. a vacuum cleaner.

6. The fibre optic cable connected to the media converter transfers "invisible" high-intensity light. If you look directly down the fibre optic plug, it can damage your eyes. Therefore the media converter must be placed out of the reach of small children.

Each TV must have a separate set-top box.

- You can have up to four set-top boxes connected to the fibre optic system. If you wish to have more than three set-top boxes, you will have to purchase a network switch. Our recommended switch can be found at www.komplett.no/altibox.
- When running cables from the home hub and/or switch to a set-top box, you must use a network cable (CAT5e or higher).
- We also offer wireless TV, so that you avoid having to run a cable from the home hub. Read more in the guidelines for TV.

Telephony

- You can use up to four telephones on the same line, connected in parallel.
- The telephone is plugged into the socket on the home hub marked Phone 1. The socket marked Phone 2 is only used if you require two separate telephone lines. If you require two separate lines, contact your Altibox supplier.
- Telephones more than 15 years old should not be used.
- You can only use analogue telephones.
- If you have ISDN from a previous installation, you must remove the terminating resistor on the

ISDN distribution network.

- Read more about connections for telephony in the guidelines for IP telephony.

Internet/home network

- The home hub has a socket for cabled Internet. This is marked Ethernet 1.
- If you wish to have more than one unit connected to a cabled network, you will need to purchase a separate network switch. NB! **You cannot use the same switch for TV and Internet.**

WHAT IS A WIRELESS NETWORK?

A wireless network allows you to connect several computers (PCs, tablets, smartphones) together without a physical connection, i.e. via cables. With an access point, it is possible to connect the wireless network to a cabled network, often to the Internet, so that several users can use the same resources.

The bandwidth available from a wireless connection point is however affected by several factors.

Location of the wireless router.

A wireless router is in many ways rather like a light bulb: It works best in the close vicinity of wherever you are. As a main rule, the router should be located as close as possible to the rooms and areas where the users require the wireless signal.

When planning the network it is important to have an overview of how many units may be connected at the same time. An optimal location within the house will provide a faster and more stable user experience.

The wireless signal from the home hub to the wireless units will always take the shortest route. When you are planning the location, it is therefore important to consider the following factors that can reduce the signal strength:

- Metal cabinets
- Rock, pipework and concrete walls, particularly reinforced concrete
- Plasterboard
- Heating cables
- Mirrors, glass
- Tiles
- Water (water boilers, pipework, aquariums, water-borne heating)
- TV, white goods

The wireless transmitter in the home hub has internal antennae. The best wireless signal is often achieved when the front side of the home hub (the side with the lights on) is pointing in the direction of where you wish to have the best coverage.

If you do not achieve optimal coverage throughout the house, it may be necessary to connect an extra wireless access point (extra equipment).

DISTURBANCES TO WIRELESS SIGNALS

There are many sources of electromagnetic energy that use the same frequencies as wireless networks, e.g. bluetooth devices, baby monitors and wireless analogue video cameras. If you experience problems with your wireless network, it can be a good idea to turn off this type of equipment.

With Altibox, you have fibre optic cable all the way into your house, which will offer full capacity at home. In an apartment block, however, your neighbour's wireless router can sometimes affect your signal when you are both on the Internet at the same time, as signals will often penetrate walls.

THE NUMBER OF WIRELESS DEVICES IS INCREASING

It is not only technology that is developing rapidly – our user habits are changing too. We are using the Internet more and more – with an increasing number of devices: Laptops, mobile telephones, tablets, games consoles, etc. All of these devices compete for the same capacity of the router. There is also a difference in the speed that wireless devices can manage to achieve.
As a rule, a modern PC has a much more efficient wireless antenna than a tablet or a mobile telephone. Therefore you can also experience that the speed is higher on the PC.

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