fibrus
HYPERFAST FIBRE BROADBAND

INSTALLATION GUIDE*

31st March 2021

*Fibrus offer wholesale access in areas where public funding has been used to build the Network. Fibrus Networks is currently building the Network to achieve optimal performance and to support future Services. Fibrus Networks will inform you of product availability during the onboarding and ordering process.

Contents

Network Installation

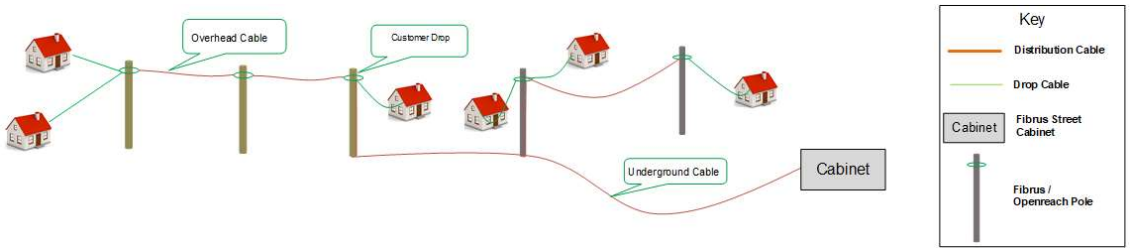
This document contains important information for Fibrus Wholesale Partners and should be read in conjunction with Fibrus' current Fibrus Networks Wholesale Access Services Wholesale Provider Agreement, Wholesale Price List, SLA Specification and the applicable Product Specification which are available on the Hyperfast website at: www.hyperfastni.com/wholesale-partners.
Fibrus offers wholesale access in areas where public funding has been used.

It is important to understand what will happen so that your customers can prepare for our technician's visit. We hope you will find this guide useful, but if you have any questions about our installation process please refer to your Wholesale Contact Details provided by the Wholesale Team.

Note, Fibrus 'standard' installations are subject to an installation charge, Fibrus 'non-standard' installations are chargeable and subject to quote, requiring an installation survey to be performed by a Fibrus technician. Please refer to our wholesale price list for further information which is available at: www.hyperfastni.com/wholesale-partners. The definition of a 'non-standard' installation is contained within this document. You must pass this information to your customer before any installation work is performed.

How do we connect your customers to the Fibrus network?

To connect your customers property to our network, we need to bring a fibre optic cable from the local connection point (ODP) to a location in the property where the customer requires our network termination equipment (NTE) to be located.



The majority of installation will be overhead, however in some cases we also use a combination of Fibrus and Openreach underground duct or simply the Openreach underground duct.

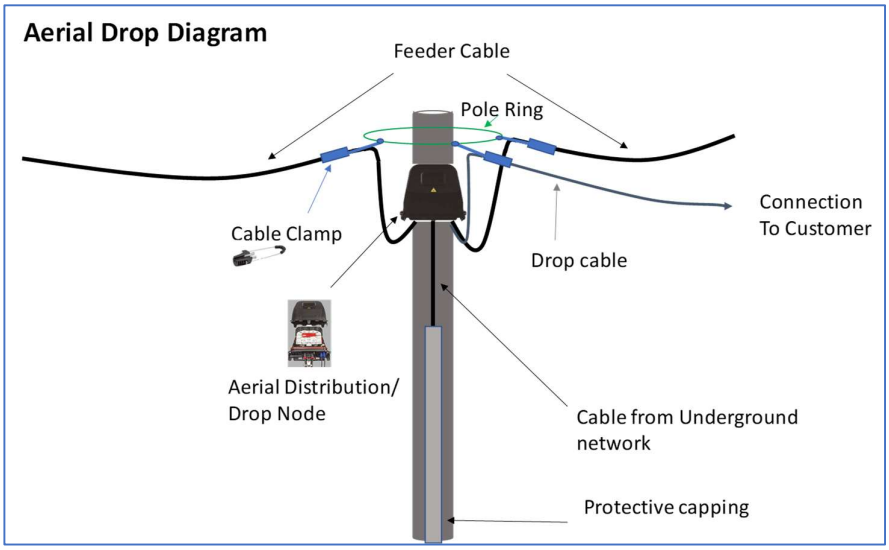
Overhead Components

The Access network can be delivered from the cabinet to the customer via underground, overhead or a combination of both methods. The aerial network is fed by a 48 fibre Ultra-Light-Weight (ULW) cable with strategically placed joints/splitters in pole mounted enclosures. During the build phase the customer drop ports are left with a terminated network fibre, so that on the receipt of a customer order, the port is ready to accept a drop cable from the customer premise without the need to open the enclosure.

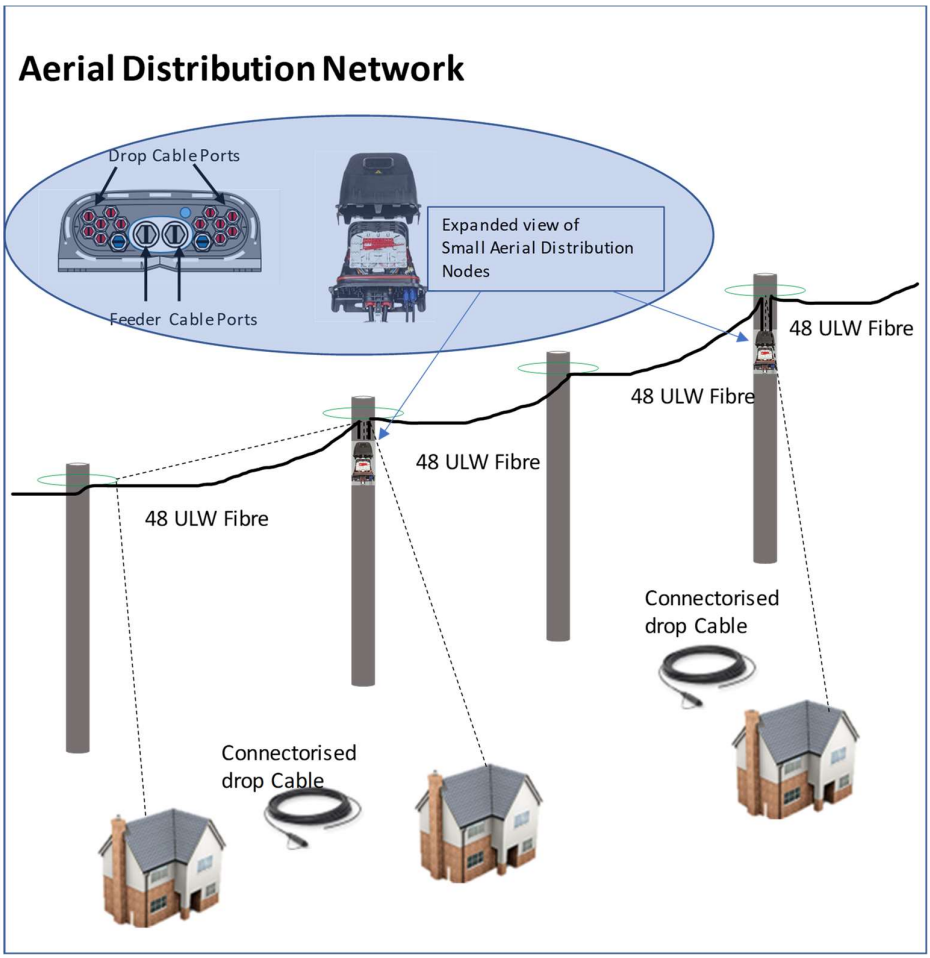
Each aerial distribution node has the capability of housing fibre splitters and splice joints, which enables the maximum number of premises to be connected by any multi-core aerial fibre. It is possible that multiple aerial fibre cables may be deployed on an aerial route.

The fibre is connected to the initial pole in the aerial network from the underground network as shown in the Aerial Drop Diagram below.

Stress on the connections to the aerial node is prevented by using aerial clamps that are connected to the metal pole ring. Feeder cables can be routed in different direction from the initial pole.



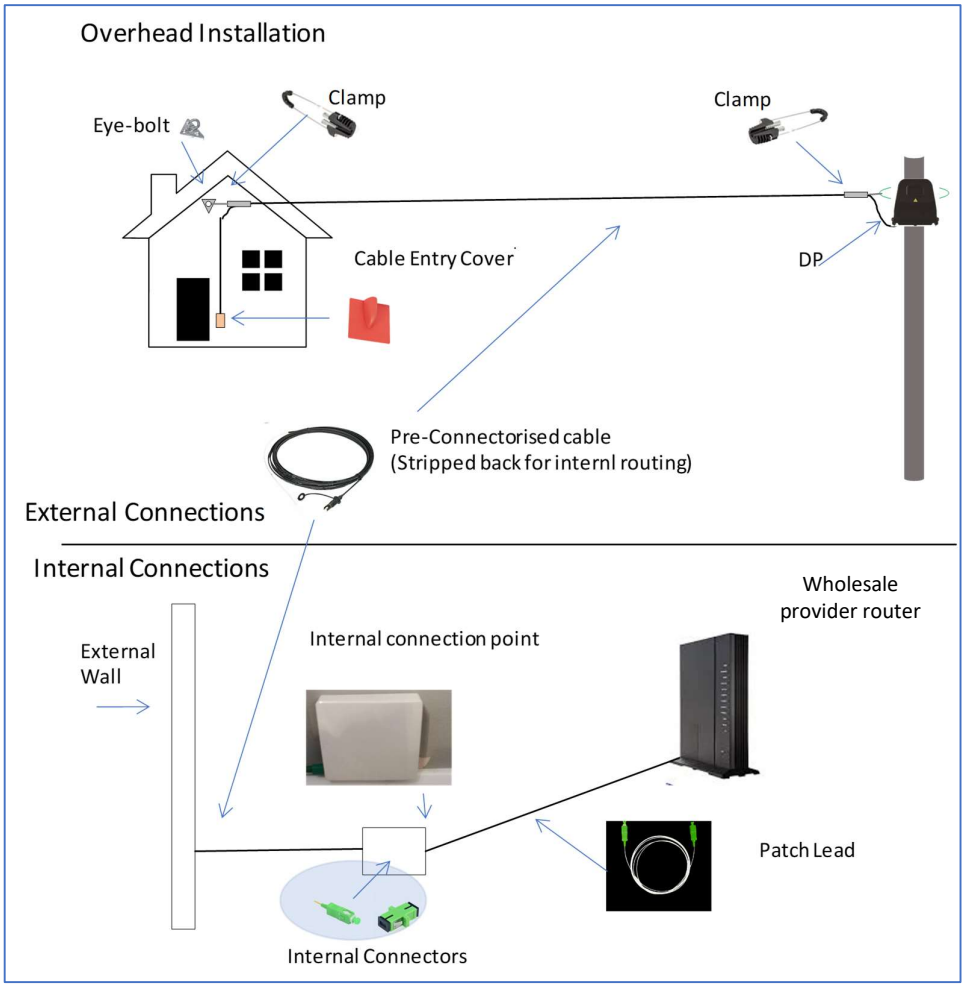
The feeder cables are then used to distribute the fibre to customers along the pole route. Feeder cables are passed through the distribution points while individual customer drops are made available for customer connections. The capacity of the 48 fibre can be maximised with the strategic placement of splitters within specific distribution nodes.


Aerial Distribution Network
Drop Cable Ports
Feeder Cable Ports
Expanded view of Small Aerial Distribution Nodes
48 ULW Fibre
48 ULW Fibre
48 ULW Fibre
48 ULW Fibre
Connectorised drop Cable
Connectorised drop Cable

Overhead Installation

For an overhead installation a cable is erected from the pole to a location at appropriate height at the premise.

An eye-bolt and clamps are used to tension the cable, that is then routed down the wall and into the premise. A cable entry cover is placed over the spot where the cable enters the premise. Inside the house the cable is the same as the underground cabling.



Our NTE must be fixed to a wall inside the property, close to a power socket. The external cable runs through a hole we will drill in the wall, down into the ground where it will then run back to connect to our network.

If the NTE is located away from the point of entry into the property, we will run internal cable to the point where the NTE is to be fixed. This cable will be up to 3m in length (unless you have placed a special order which may incur cost).

Before commencing the installation, the technician will ask the customer representative (who must be authorised to make the decision and over 18 years of age) to agree the route of the fibre optic cable into the property.

Please ensure that the route of the installation is within the boundaries of the property. If we are asked to install across a route where we do not believe we have the necessary consents or permission, we will not be able to carry out the installation and there may be a cancellation charge to the wholesale partner for a failed installation.

There must be someone over the age of 18 at the property during the installation. This is to protect us and the end customer and to ensure that the installation is carried out as we have agreed.

If the customer is not able to be present, please ensure that the adult who is present understands the requirements and has the customer authority to agree the installation route.

When the work is complete the customer should find that the work area has been left neat and tidy, holes are sealed with silicone and the ground outside has been reinstated as close as possible to its original state.

Important information about our network

Our network is made up of apparatus (fibre optic cables and related equipment) which is installed in the public highway and private property using rights granted to Fibrus under the part of the telecommunications legislation known as the Electronic Communications Code. This Code, in conjunction with the customers permission enables Fibrus to place apparatus on the customers property and to keep it there and maintain it.

The customer should ensure that any future purchaser of the property is made aware that the apparatus has been installed with these rights.

The customer should also ensure that any future owner or any other person doing work to the property is aware of the position of the apparatus, to enable them to avoid causing damage.

Important safety information

The Fibrus authorised technician will carry out a risk assessment before commencing any work.
Please note the following safety rules which apply to all installations:

1. Technicians are not permitted to work at any premises unless a person over the age of 18 is present at all times.

2. Technicians are not permitted to enter loft spaces or eaves cupboards unless they are correctly boarded and have a walk-in entrance and are not permitted to work in confined spaces.

3. Technicians are not permitted to use customer ladders, stepladders, access equipment or tools.

4. Technicians are not permitted to lend their tools or equipment to customers to complete parts of the job or any other work.

5. Technicians cannot disturb or work in the vicinity of areas where they believe that asbestos is present.

6. Technicians are not permitted to access flat roofs or roof structures.

7. Technicians cannot access underground structures, spaces or excavations or lift floor boards or drill through floors or ceilings.

8. Technicians are not permitted to move furniture.

Non-standard installations

Our standard installation service covers all installations except as set out in Fibrus Networks Wholesale Access Services Wholesale Provider Agreement, Wholesale Price List, SLA Specification and the applicable Product Specification which are available on the Hyperfast website at: www.hyperfastni.com/wholesale-partners and except for those installations which meet any one or more of the following criteria:

- Any hot lay tarmac being required to reinstate the ground;
- Unusual surface that will need specialist skills to lift and reinstate.

Wholesale partners must check with their customer to ensure that the installation does not meet any of the above criteria before booking the installation. If the customer installation does meet any of the above criteria then you must arrange a survey prior to the installation to make sure we have the correct equipment, materials and time available on the day of the installation. There will be an extra charge for non-standard installations.

Things to consider

This is a list of things to think about to make your customer installation a quick and easy experience.

1. What surfaces will we be digging:

   Turf, Loose soil, Loose gravel then soil, Compacted gravel, Concrete, Tarmac, Block paving**,Flag stones*.

   *each additional 10 metres takes about 1 hour to dig and reinstate with the correct tools

   **each metre takes about 30 minutes to lift and reinstate

2. Are there any garden walls or other structures to take into account?

   For example – walls, sheds, ponds, fountains, swimming pools, garages etc

3. Where will the router be situated (usually on the ground floor)

   First floor – this can be accommodated, but may require more time

   Basement – installation in the basement may require a full survey and risk assessment, prior

   to commencing the works. It might mean that the customer property falls outside the standard installation service.

   If the customer requires the NTE to be located at the back of the property this is likely to

   increase the time and cable length required to do the job and may move the installation into the non-standard category.

4. Thickness of walls (if known)

   If any external wall is over one meter thick, please let Fibrus know at the time of booking.

5. Is there anything unusual inside the property?

   For example:

   Are we installing close to a radiator or other water supply?

   Are we installing in a cupboard or any other obstruction?

   Please let Fibrus know at the time of booking the appointment.

Reinstating your property

We will reinstate the surface where we have installed our apparatus as close as reasonably possible to its original state. However, it is not possible to dig trenches without leaving any trace. We will make good any damage to the property caused while carrying the installation service. However, we are not responsible for the cost of repairing any pre-existing faults or damage to property that are discovered while providing the installation services.

If the customer has any concerns about the work performed by us at the property, then please contact us.

We hope that this information was helpful, and we look forward to connecting your customers to the Hyperfast Fibrus network.

Additional Services

The following additional services are available. Please let us if any are required. There may be a charge for these services.

- Internal cable run over 3m (using additional cable kit)
- Post installation router relocation
- Site Survey (a site survey is included in all non-standard installations)

Testing

Introduction

This guide is to help you understand the testing phases expected to be completed before handing any circuits as Ready for service.

NNI Testing

Once an NNI has been handed over with a certificate of service, Fibrus will provide a set of test data for you to use on your edge device to confirm connectivity between both parties.

Example of Test data

Test VLAN	Test IP
99	10.100.100.10/31

Once Both parties have completed a series of tests, a return of the Certificate of Service and Fibrus Ready For Service will be confirmed between both parties

Examples of tests

Name Of Test	Outcome
Ping Test	Pass
Latency Test	Pass
Light Level Test	Pass (Light levels captured)

Circuit Testing

Fibrus will terminate all services on a layer 2 ONT (Fig 1). This device terminates the fibre coming into the building to provide an ethernet hand over to customer.

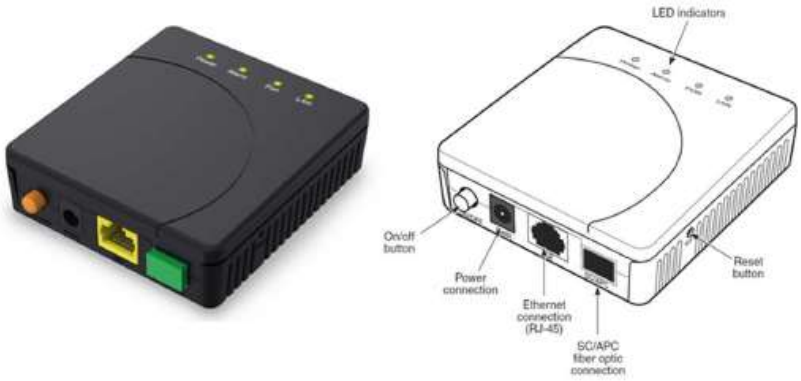
When a Circuit is handed over as Ready for Service we will hand over the activated ONT with confirmed Light Levels.

You will be in a position to pass traffic across the ONT and do your own testing. It is suggested that you complete the following:

Examples of Test

Name Of Test	**Outcome**
Ping Test	Pass
Latency Test	Pass
Bandwidth Test	Pass (Speed Documented)

Fig1



The ONT has the following Characteristics

- One RJ-45 IEEE 802.3 compliant 10/100/1000 Base-T Ethernet port
- Auto-negotiation and MDI/MDIX auto-sensing
- Data transfer at wire speed
- Fixed MTU size of 2kb
- Dimensions H x W x D (mm) : 89 x 82 x 27
- Operating environment: -5°C to +45°C (23°F to 113°F)

Faults

If you discover an issue in the hand over phases, Fibrus will treat these as ELFs.

NNIs will be handled with the named contact who sent the ready for service notification, however if an escalation is required please follow the escalation matrix found in the Customer Service Plan.

Circuit Faults also reported in the first 7 days of life will be treated as an Early Line Failure.

If, however, the fault occurs once the Ready for service and Certificate of service have been signed it will be treated business as usual.