fibrus
HYPERFAST FIBRE BROADBAND

WHOLESALE REFERENCE OFFER*

DARK FIBRE PRODUCT SPECIFICATION
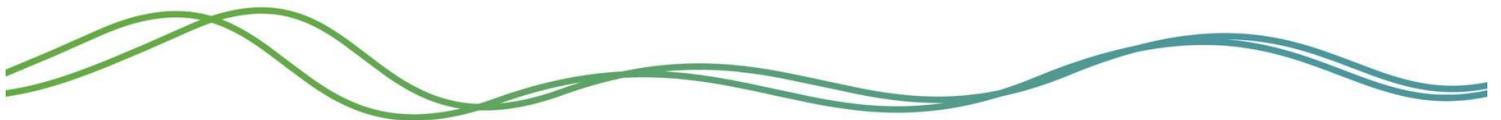
31st MARCH 2021

*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.

Fibrus Wholesale Dark Fibre Product Specification

Version Control

Version	Date	Description	Author
1.0	03/05/2020		P. Doyle
1.1	30/03/2021	Minor cosmetic edits and updating cross references.	S. Best

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Introduction

Fibrus offers wholesale access in areas where public funding has been used. This is the Product Specification for Fibrus Dark Fibre Wholesale products as defined in the table below. The document defines a set of processes that encompasses Network Deployment, Order Handling, Wholesale Billing and Service Management. Fibrus Wholesale provides Communication Providers (CPs) with access to interconnect at points of connection and flexibility in the Optical Fibre network where public funding has been taken[1].

The use of Dark Fibre Wholesale products may require the use of other Fibrus or Third Party passive Infrastructure products e.g. Pole and Junction Box access and/or hosting. The Fibrus Passive Infrastructure Product Specification defines the range of products provided by Fibrus Wholesale and is available at [e.g. FibrusWholesale.com]. For the avoidance of doubt, all access to Third Party passive infrastructure and related charges are the responsibility of the Communications Provider (CP) and Fibrus Wholesale will follow CP instruction for the location of equipment on that basis.

This handbook is designed for use by Communications Providers (CPs) as Wholesale customers of Fibrus. For information on how to become a Wholesale customer with Fibrus please see our guide *How to Become a Wholesale Customer* available at www.Hyperfastni.com/Wholesale-partners

This document should be read in conjunction with the Fibrus' current Fibrus Networks Wholesale Access Services Wholesale Provider Agreement, Wholesale Price List and Service Level Agreement, which are available on the Fibrus website at: www.Hyperfastni.com/Wholesale-partners

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[1] CPs should note that this product set has been specifically designed to meet the requirements of the 2016 Commission Decision with reference number C(2016) 3208 (as amended by the European Commission modification decision with reference number C(2018) 229) ("the Decision") in the relevant locations required under the Decision. Fibrus will consider requests to provide such products as a commercial offer in other geographic locations where requested by a CP.

Fibrus' approach is to enable our wholesale customers to self-serve via direct digital access to the systems capability required for high volume transactions alongside dedicated relationship management to assure your needs are met and to deal with specific requirements.

The Operator Wholesale Gateway (OWG) is the ordering and fault management system for Fibrus Wholesale products and services.

Wholesale Dark Fibre Product

Overview

Communication Providers (CPs) will be provided access to interconnect fibre optic at points of connection and flexibility in the Optical Fibre network where public funding has been taken.

The interconnection points are:
- Fibrus Active Cabinet Splice Chamber
- Fibrus Spine Cable Splice Joint
- Fibrus ODP Splice Joint

Access to at least one fibre per segment will be made available such that a CP could build an NGA network equivalent to Fibrus, although the fibre segment is provided to a CP on a full Open Access basis. A segment is defined by two end points, regardless of the actual routing of fibres which may share a common cable. Fibrus Wholesale has defined 3 dark fibre products:
- Segment 1 – Spine Fibre
- Segment 2 – Feeder Fibre
- Segment 3 – Distribution Fibre

Figure 1 shows a schematic of Fibrus network with the 3 segment products defined:
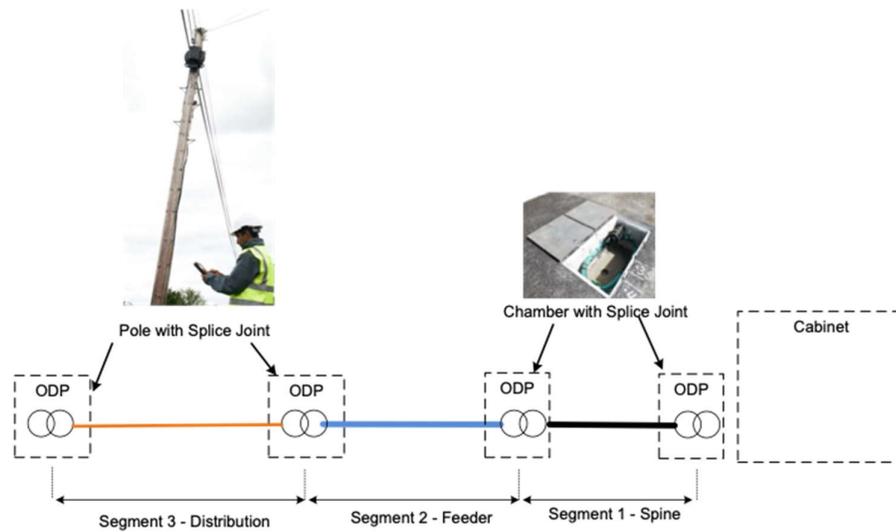

Figure 1 – Dark Fibre Segment Overview

Dark Fibre Product Features

Dark Fibre segment products utilises Fibrus fibre optic network where public funding has been taken. The description and diagram below illustrate the three products.

The segment tail at each node will be connected to the appropriate segment 1, 2 or 3 fibre and presented in a nearby CP defined passive infrastructure location (CP owned or third- party infrastructure).
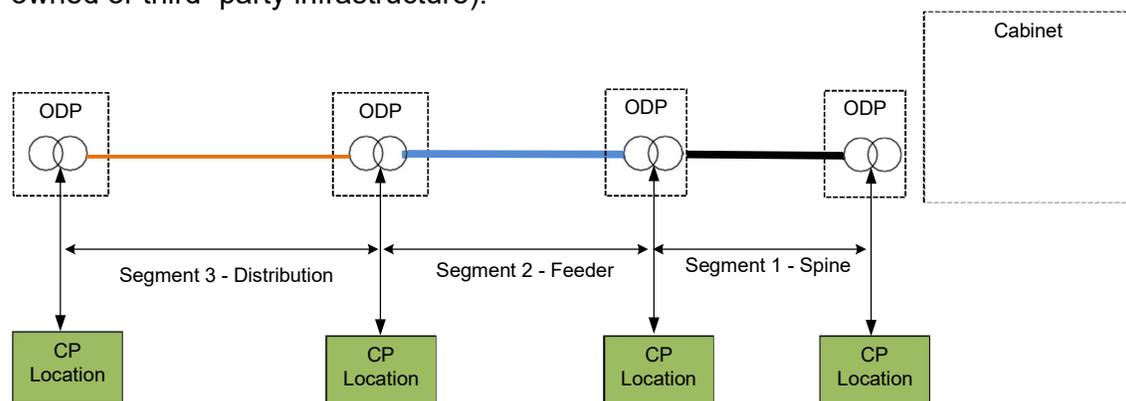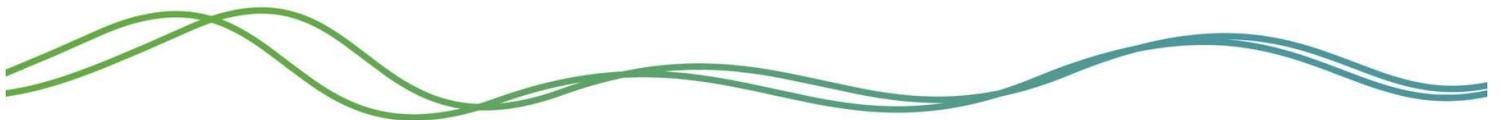

Figure 2 – Dark Fibre Product Overview

The Segment 1 product (Spine) can be described as the fibre connection from the Fibrus Active Cabinet Splice Chamber node to the Fibre Aggregation joint located at the first Optical Distribution Point (ODP) or other aggregation point in the network.

The Segment 2 product (Feeder) can be described as the fibre connection from the Fibre Aggregation joint located at the first Optical Distribution Point (ODP) or other aggregation point in the network to subsequent Optical Distribution Points (ODP).

The Segment 3 product (Distribution) can be described as the fibre connection from the splitter node to a Customer serving Optical Distribution Point (ODP).

The Backhaul segment can be described as the fibre connection between Fibrus Active Service Cabinets utilised for 'node to node' backhaul traffic where Fibrus builds such network. [**Note**: In line with Fibrus' general approach Fibrus will seek to utilise existing infrastructure where available e.g. leased dark fibre, active connectivity solutions].

Connection

Dark Fibre Products will be subject to connection fees per fibre, per termination point. New Dark Fibre connections requiring the first deployment of a Fibrus patch panel to the CP defined location will incur a higher charge than subsequent fibres utilising an in-situ patch panel. (See Fibrus Wholesale Pricing document for further information).

Technical Specification

The Dark Fibre segment product conforms to the **G.652.A** single mode optical fibre standard.
An estimated optical loss figure will be provided by Fibrus based on network configuration and standard losses. Fibre will be compliant to ITU-T specification G.652.
(NOTE: Chromatic Dispersion Compensation is not provided. Polarization mode dispersion (PMD) is not measured nor controlled.

CPs must ensure that equipment connected to a segment product service incorporates safety features that ensure lasers cannot operate at optical powers greater than Class 1M (as defined in IEC 60825-1) even under fault conditions and are safe for live working. Higher optical powers present a significant risk to people working on the network.

Service Presentation

Fibrus will supply the Corning 4 Port Ultra SC/APC with pre-connected network tails suitable to be installed directly into duct. The CP interface is (up to) 4 Optitap hardened SC/APC female connectors. The Corning 4 Port Ultra SC/APC dimensions are:

- Height (mm) - 260
- Width (mm) - 155
- Depth (mm) - 60

Figure 3: Corning 4 Port Ultra
SC/APC

It is the CP's responsibility to provide a connection from the Fibrus termination into optical transmission equipment owned by the CP, its customer or agent. Optitap SC/APC patch cable will be required to connect to the CP's equipment and it is the responsibility of the CP to supply and install these correctly.

Non-standard Installations

There will be additional charges for non-standard installations. Our standard installation service covers all installations except for those which meet any one or more of the following criteria:

- Locations that require a bespoke solution i.e. not suitable for the standard Fibrus presentation (Corning 4 Port Ultra SC/APC);
- Fibre tail cable length over 20m between the Fibrus Splice Point and the CP designated location;
- Overhead location which is not co-located adjacent to the Fibrus Splice Point (typically same pole);
- Non-typical, hazardous or unusual location requiring specialist skills or equipment to access.

It is the RSP responsibility to assure connections do not meet these criteria; a charge will be levied for failed connections where any of these conditions occur. Non-standard Installations will require a survey to define the work required and additional charges.

Wholesale Dark Fibre Ordering

Overview

This product set has been specifically designed to meet the requirements of the 2016 Commission Decision with reference number C(2016) 3208 (as amended by the European Commission modification decision with reference number C(2018) 229) ("the Decision") in relevant locations required under the Decision.

Ordering and delivering Dark Fibre products is a complex process requiring interaction between the ordering Communications Provider and Fibrus Wholesale for enquiry, definition, pricing offer, acceptance before product design and build. Small or single requests will be managed via email; larger requests will require an agreed project plan. Fibrus has defined a standard approach summarised below:
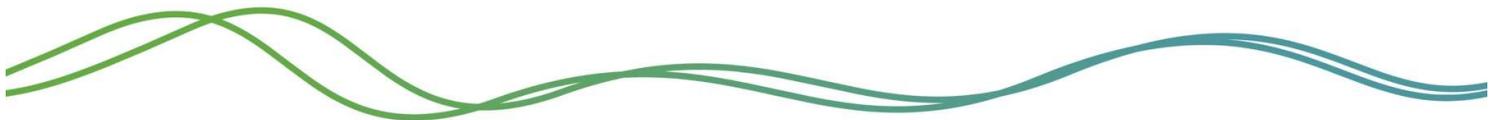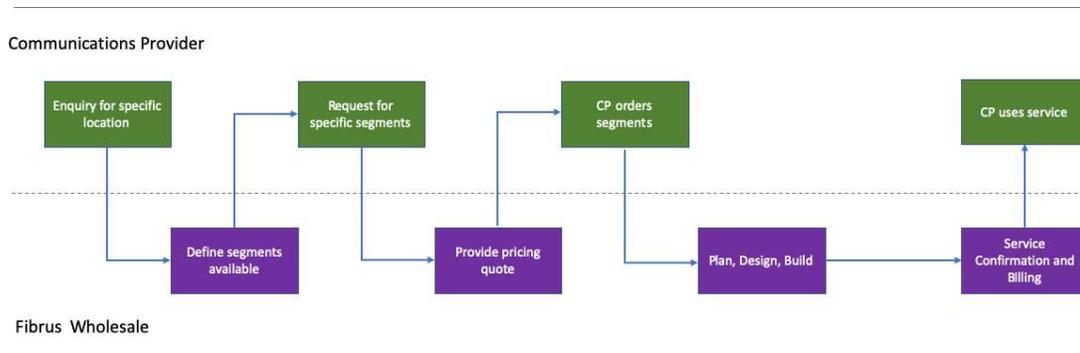
Figure 4 – Ordering Process Flow

Enquiry and Availability

CP contacts Fibrus Wholesale to register interest in Dark Fibre products in specific location(s). Fibrus review enquiry and subject to clarification will provide a list of available segments to the CP in the area of interest if applicable.

Pricing

Based on the information required the CP may request pricing for specific segments. In this case the CP should specify the segments to be priced by Fibrus Wholesale. Fibrus will then calculate pricing against the CP requirements and return it to the CP as an offer letter with relevant standard business terms.

(**Note**: there is a cost to Providers for survey where applicable, which is defined in Fibrus Wholesale Pricing document at www.Hyperfastni.com/Wholesale-partners

Acceptance and Order

If the CP accepts the offer, terms and conditions, the CP places an order and agreements are signed. Fibrus Wholesale will process the request as an order to fulfil the individual CP requirements.

Plan to Build

Fibrus Wholesale on receipt of the order will commence planning and design activity, leading to network build and inventory recording.

Confirmation and Billing

Fibrus Wholesale will confirm the service to the CP as it is completed and commence the generation of billing for the service.

Escalation Process

Where an RSP requires to escalate a service order it must contact the Relationship Manager. Orders may only be escalated where they are beyond SLA parameters.

Dark Fibre Service Management

Fibrus Wholesale operates to a principle of enabling CPs to manage their network and customers directly. As such, it is a fundamental principle that a CP must prove any service issues or faults are outside its own network and equipment before raising a trouble ticket.

Where an RSP cannot identify and remediate the issue, a trouble ticket can be raised within OWG for the attention of Fibrus Wholesale. Each trouble ticket should contain the following information:

- Segment(s) affected as defined in inventory
- Geographic location of CP handover points
- Nature of trouble e.g. failure, deterioration
- Time of first alarm or notification

Trouble Ticket Resolution Process

Trouble tickets should only be raised when the CP has identified the trouble as being within the Fibrus network or cannot localise the source of the trouble. The five key steps in trouble ticket resolution are:

- Trouble ticket reported – CP
- Trouble diagnosis and isolation – Fibrus
- Trouble repair – Fibrus
- Trouble ticket updated and closed – Fibrus
- Customer updated - CP

To complete diagnosis and repair Fibrus Wholesale may be required to work in conjunction with CP personnel. CP will be responsible for the availability and capability of such personnel and any resultant impact on fault duration.

Escalation Process

Where a CP requires to escalate a trouble ticket for resolution it must contact the Wholesale Relationship Manager. Trouble tickets may only be escalated where they are beyond SLA parameters.

Outages
Planned Outages

It is recognised that Planned Outages are a necessary, normal and regular occurrence. Where a Planned Outage will impact on the Dark Fibre services provided to a CP, the CP will be notified by email, including a description of the outage, customer impact, date, time and expected duration. Fibrus will endeavour at all times to carry out Planned Outages during the preferred hours of 00:00 to 06:00.

Unplanned Outages

Where an outage occurs that impact on multiple end-customers, Fibrus Wholesale will inform CPs to enable them manage operations and customer expectations effectively.

Billing

All connection, usage and recurring charges associated with the provision of the Dark Fibre product are charged on the next billing cycle following completion of an order. All charges are as defined in the contractual agreement with the CP and/or as published where appropriate.

Queries regarding billing and charges must be raised with the Wholesale Relationship Manager for resolution