FTTH System solutions

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Group

PRYSMIAN

Draka

FTTH SOLUTIONS

Products and solutions deployed throughout Europe.

EXCHANGE / HUB

FTTH SOLUTIONS − PRODUCTS

EXCHANGE / HUBS

In most cases, the equipment contained in a central exchange / hub, or intermediate consolidation point such as a Street Cabinet will be independent of the solution chosen for the final drop.

Rack Units, such as the RS3000, Modular Main Rack and the standard 19" / ETSI Rack will accommodate a wide range of different shelves for highly effective fibre management (Splice, Patch, Splice & Patch, Patchcord Storage, Splitter Management etc).

Consolidation racks are also available having all incoming cables terminated in one rack. The cables will be distributed via pre-terminated cables to the equipment racks, this reduces rack congestion, ensures efficiency and reduces the points of failure of the rack.

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OUTSIDE PLANT

FTTH SOLUTIONS − PRODUCTS

OUTSIDE PLANT

In most cases, the equipment used in the external environment (outside plant) is designed to achieve specific objectives with relevance to specific products / product attributes.

They are generally required to pass stringent performance testing for dust and water ingress (IP rating with 68 being the target measure)

Products are available that have been developed to be most attractive for:

+ cable splicing
+ cable breakout and distribution
+ cable looping
+ in-line jointing
+ splitter management
+ tube distribution for blown fibre and cable
+ pre-terminated cable drops
+ duct, direct buried or aerial systems

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CUSTOMER END

CUSTOMER END – SINGLE HOME

At the end of an FTTH network, there are usually two requirements: building entry and fibre termination.

Apart from the QUICKDRAW^{XS} system, where the Customer Demarcation Box provides both these functions, there are often two separate products.

Termination units are likely to be non-product specific e.g. the UCTBs, and CTBs can be used with traditional cable, RETRACTANET^{XS} , or SIROCCO^{XS} blown fibre.

There are also a range of tube management products to facilitate the entry of a SIROCCO^{XS} blown fibre tube through the building fabric.

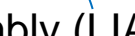# DEPLOYED
NETWORK SOLUTIONS FOR
FTTH/FTTC

RAPIER / QUICKDRAW^{XS}

Up to 8 customers per CLJ, feed by quick breakout Rapier cable, 2 x 1 by 8 splitters in the CLJ for a cascaded PON, cheaper solution for customer deployment, only 2 splices required per joint and no splicing equipment needed for customer connections.
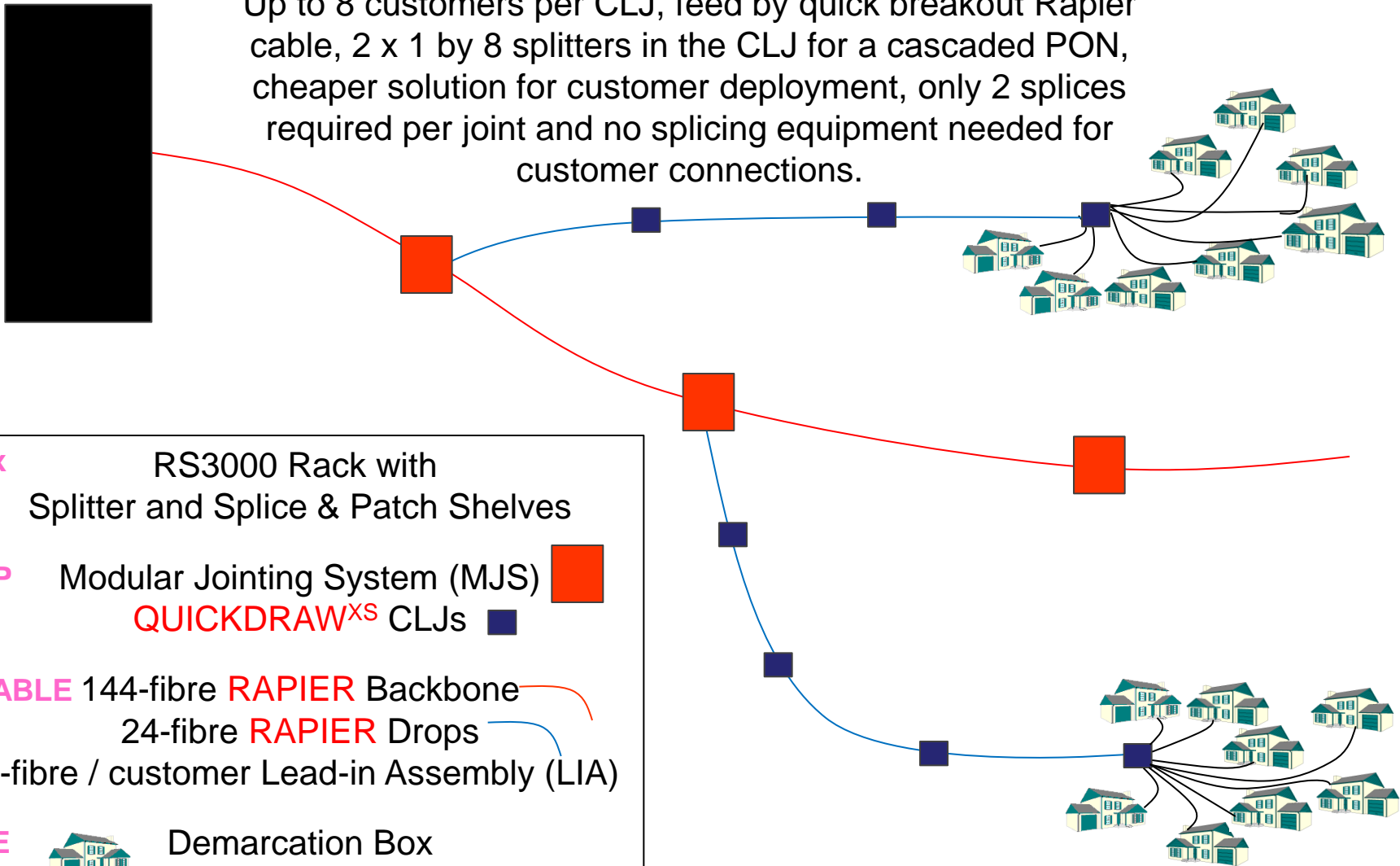
Ex RS3000 Rack with Splitter and Splice & Patch Shelves

OP Modular Jointing System (MJS)
QUICKDRAW^{XS} CLJs

CABLE 144-fibre RAPIER Backbone
24-fibre RAPIER Drops
1-fibre / customer Lead-in Assembly (LIA)

CE Demarcation Box
Home Hub Units
Compact Termination Box (CTB mk2)

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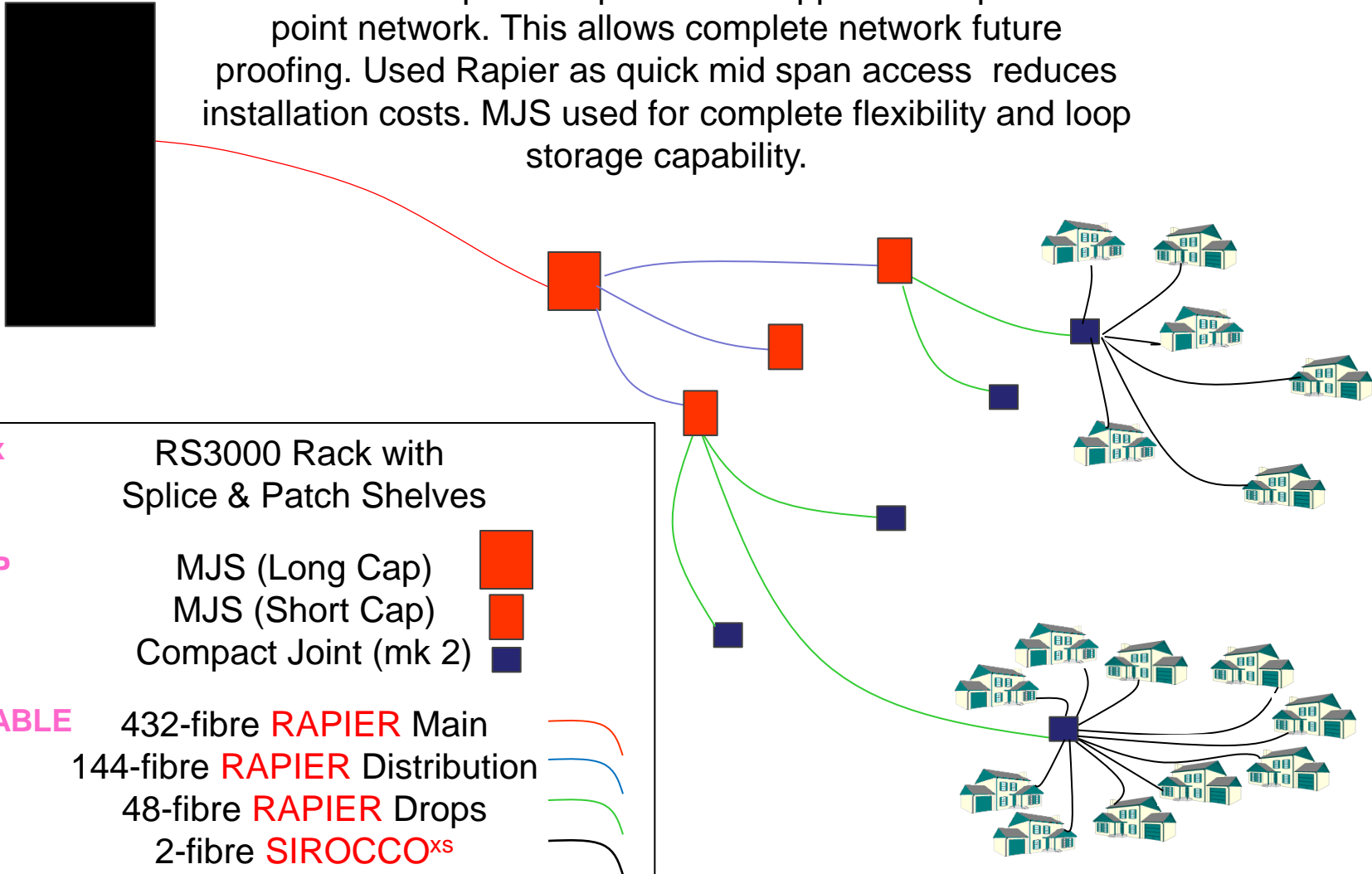16 customers per Compact Joint supplied as a point to point network. This allows complete network future proofing. Used Rapier as quick mid span access reduces installation costs. MJS used for complete flexibility and loop storage capability.

Ex RS3000 Rack with Splice & Patch Shelves

OP MJS (Long Cap)
MJS (Short Cap)
Compact Joint (mk 2)

CABLE 432-fibre RAPIER Main
144-fibre RAPIER Distribution
48-fibre RAPIER Drops
2-fibre SIROCCO^{xs}

CE Compact Termination Box (CTB mk2)

FTTH SOLUTIONS – NETWORK DIAGRAMS

Point to point solution for easy upgrade on customer circuits, Blown solutions used for easy upgrade and flexibility, install tube cable that can be deployed to different areas.
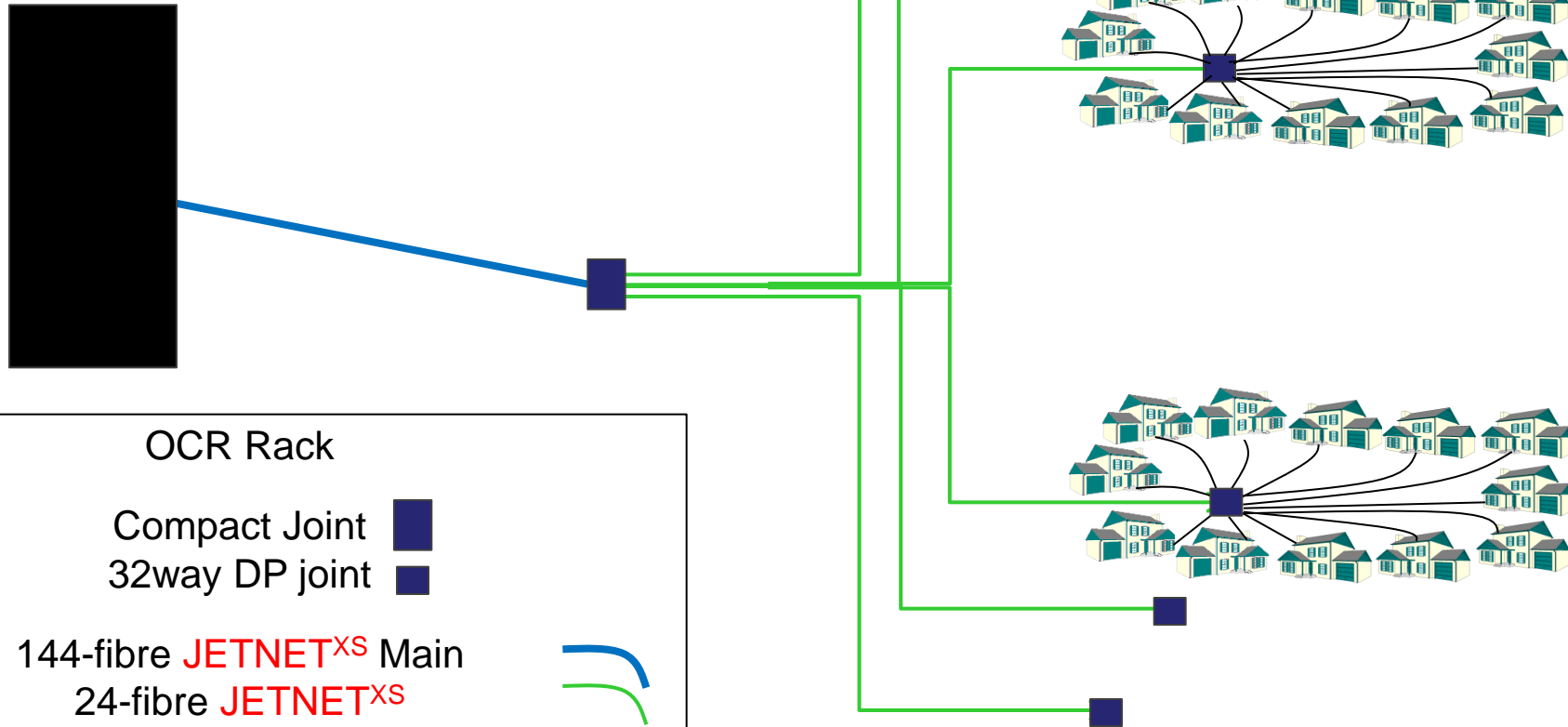
Ex OCR Rack

OP Compact Joint
32way DP joint

CABLE 144-fibre JETNET^{XS} Main
24-fibre JETNET^{XS}
2-fibre / 1 tube DB SIROCCO^{XS} Drops

CE Compact Termination Box (CTB mk2)

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SIROCCO^{XS}

Small development site, 500 customers or less. No need for a central office which reduces costs significantly. Direct buried blown solutions reduce the need for large quantities of chambers.
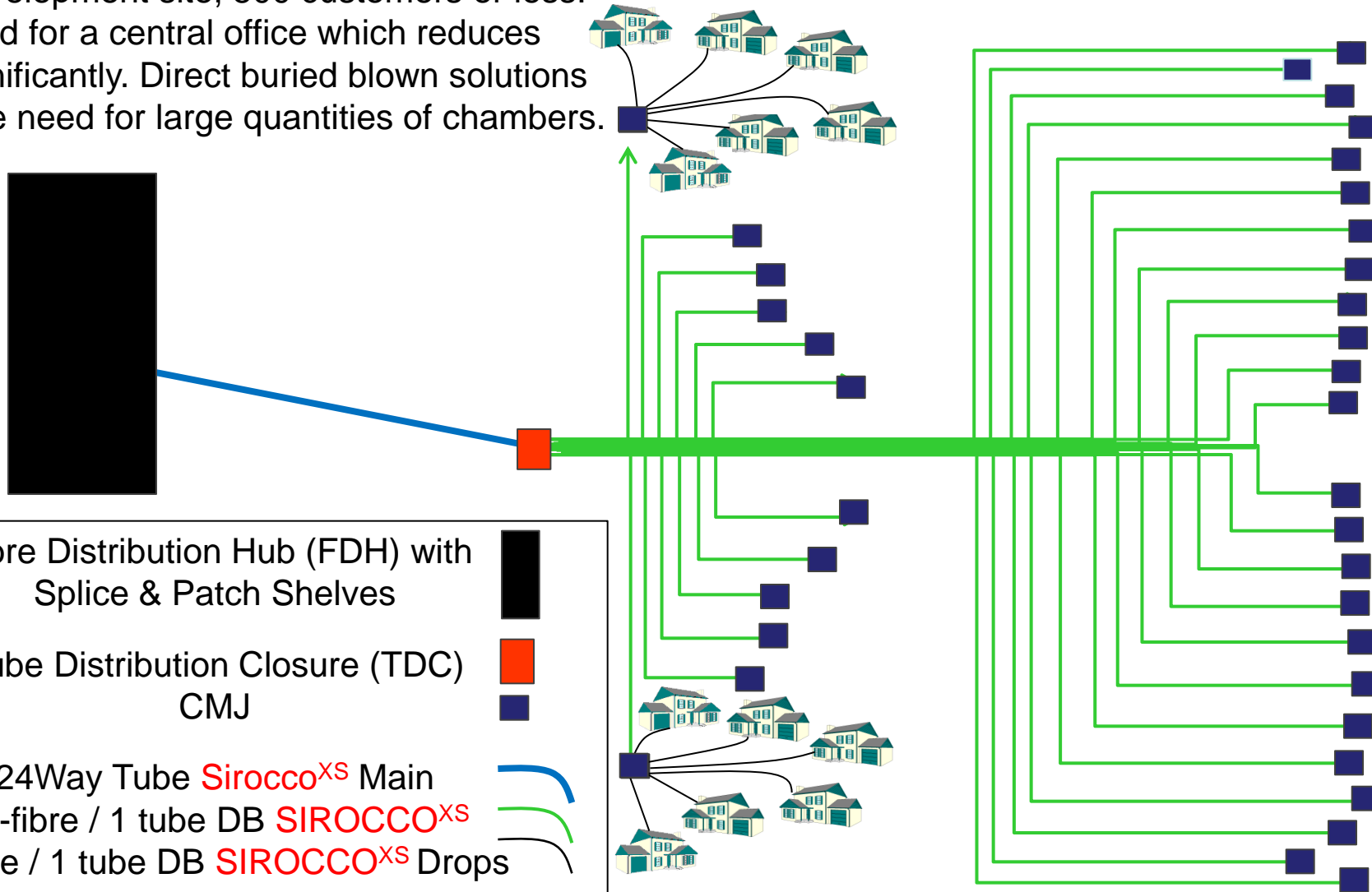
	Legend	
Ex	Fibre Distribution Hub (FDH) with Splice & Patch Shelves	■ (black)
OP	Tube Distribution Closure (TDC)	■ (red)
	CMJ	■ (navy)
CABLE	24Way Tube Sirocco^{XS} Main	(blue)
	12-fibre / 1 tube DB SIROCCO^{XS}	(green)
	2-fibre / 1 tube DB SIROCCO^{XS} Drops	(black)
CE	Compact Termination Box (CTB mk2)	

VERTICASA[xs]

Basement Boxes

Riser Boxes

Customer boxes

Riser cable

Customer connect cable/tube

Building connection cable

Extractable internal cable reduces the installation costs, deploy the cable and extract the fibres, no splicing required, riser boxes are deployed one per floor, all directly delivered to the customer premises. Reduced installation costs and easier installation in congested risers.

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FTTP - 2 Levels of Split (32 Way)
Underground Plant & FoD
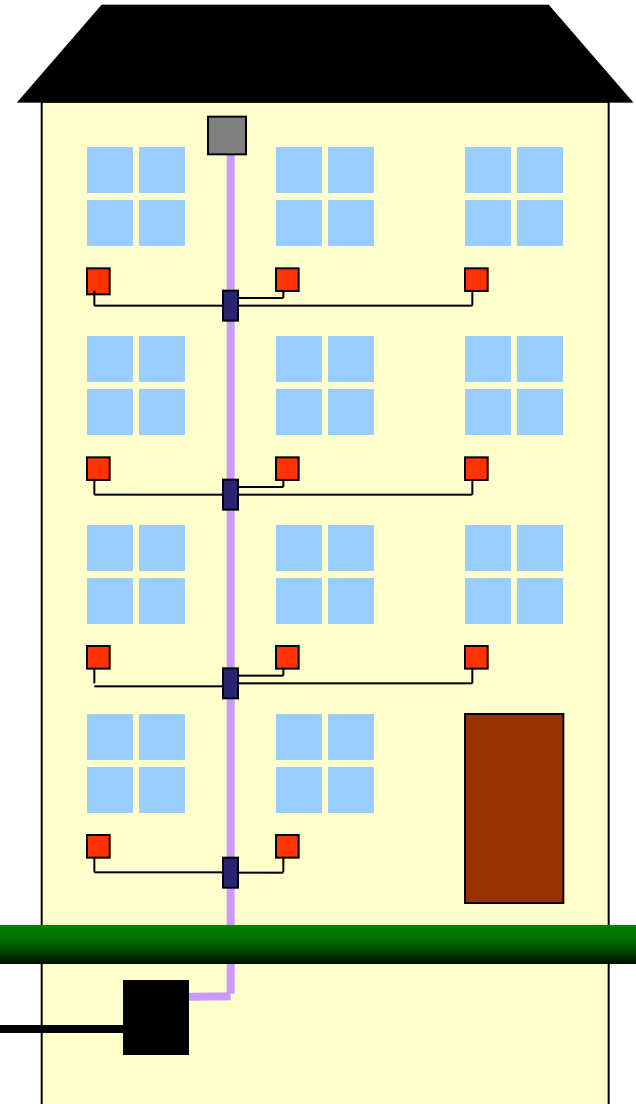
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Pole Mounted | 12 / 32 Fibre DP + Splitter Nodes

The pole mounted cabinets serve to replace underground closures when joint boxes are unavailable in areas with overhead networks. The cost premium of an all metallic closure is offset against the lack of civil costs usually associated with building the required joint box.

- Mounts to a standard BT pole.
- Six versions available, all with unique tray and port layouts:
  - *12 Way Fibre DP*
  - *32 Way Fibre DP*
  - *Primary Splitter Node*
  - *Splitter DP*
  - *Transition Joint*
  - *FoD 12 Fibre DP*
- Robust metallic cabinet manufactured using stainless steel for strength and security.
- Supplied with single address point customer locking trays with integral water blocking to stop network fibre creep inherent with OH networks due to ice and wind loading.
- Splice trays hinge upwards individually, allowing full access to spliced fibres without disturbance to live fibres in adjacent trays.
- Cables enter the unit via the top or bottom face and are sealed using cable glands. Support for Blown Fibre Tubing or aerial cable up to 96F.
- Input profile allows BT Capping Steel No.5 to interface with the cabinet to route the cables.
- The cabinet is sealed to IP65 and is provided with a BT standard D-lock.

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Home Hub

SPLITTER DP

FTTP - 2 Levels of Split (32 Way) - Brownfield & FoD - Version 7.3 PG

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FTTH SOLUTIONS

Product data

FTTH SOLUTIONS − PRODUCTS

RS 3000 RACK & RACK MOUNTED PRODUCTS

The RS3000 Rack is a standard rack supplied with 19" mounting rails, used to accommodate a range of SRS3000 shelves and sub-racks as well as any other 19" rack mounted products.

It is supplied with side panels and transparent doors. Cable anchor brackets can be installed in the left hand side of the rack.
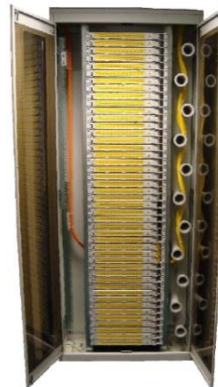
The range of SRS3000 shelves and sub-racks provide Splicing and Patching, Patching Only, Splicing Only and Patchcord Storage.

In addition, Connectorised Splitter Shelves and a Horizontal Routing & Storage Shelf can extend the facilities available.

Racks can be 42U or 47U with a maximum capacity of 2160 fibres (splicing or patching).

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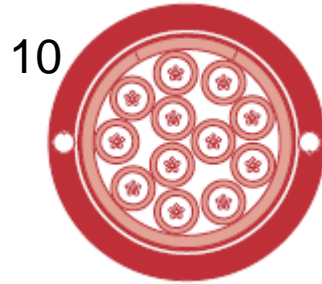
432F

RAPIER CABLES

Uses easy-breakout bundles supporting simple mid-span breakout particularly suitable for ring and point-to-multipoint networks.

Available in a wide range of fibrecounts from 432-fibre made up of 72-fibre sub-units down to single 12-fibre tube cables for drops from the central ring or main cable backbone.
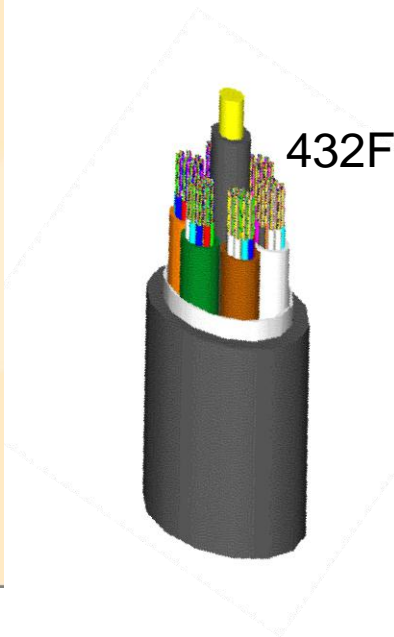
Fibres can be extracted at network joint locations and spliced directly to drop cables, into splitters or within a Connectorised Lead-In Joint (CLJ) to an array of adapters ready for plug-in customer connection.

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MODULAR JOINTING SYSTEM (MJS)

The Modular Jointing System (MJS) is a range of joints for access applications within the external network for track, spur & loop applications.

They are UV resistant and sealed to IP68. Loose tube and ribbon cables and SIROCCO^{XS} blown fibre can be used with these joints.

The trays hinge upwards individually, allowing full access to spliced fibres without disturbing live fibres in adjacent trays.

The trays can be SCM (Single Circuit Mangement), SEM (Single Element Management) or Ribbon. Splitter modules can be mounted in the joint.

For FTTH distribution, the short cap MJS will accommodate 32 Single Circuit Management (SCM) trays (128-fibres), medium cap 48 trays (192-fibre), long cap 80 trays (320-fibre) and the extra long cap 96 trays allowing 384 splices to be managed.

CONNECTORISED LEAD-IN JOINT (CLJ)

Allows the plug-in connection of 8 individual customer lead-in assemblies (LIAs) at the time of service activation.

It is available with adapters - either eight SC/APC (for single fibre working) or 16 LC/APC (for dual fibre drops).

Spliced at the time of main network construction to incoming fibres or through a 1 x 8 splitter to a single extracted fibre.

An additional hinged tray enables spur cables (up to 24 fibre) to be spliced to the main cable.

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LEAD-IN ASSEMBLY (LIA)

The lead-in assemblies (LIAs) are installed, by low-skilled operators at the time of service activation.

The LIA is provided with connectors at each end - either one SC/APC (for single fibre working) or two LC/APC (for dual fibre drops).

The connectors are protected during installation by a sleeve (on the CLJ end) and a pulling shroud for the customer end which is removed after pulling the LIA through a 20mm mini-duct.

Standard lengths of LIAs are from 25 metres to 300 metres and packed as shown.

CUSTOMER DEMARCATION BOX

The Demarcation Box is located at the entry to each customer's building on the external wall.

The Demarcation Box provides a housing for connectors - either one or two SC/APC (for single fibre working) or two /four LC/APC (for dual fibre drops).

The connectors mate with internal customer patchcords through the fabric of the wall that link through to the customer's network equipment.

CUSTOMER END – Home Hub with CTB

In the Home, patchcords or pigtails fed from the rear of the Demarcation Box through the wall can be terminated at a Customer Termination Box (CTB) managed within a Home Hub box.

The Home Hub can contain all of the electronics (router, plugs etc) used throughout the home (possibly with the help of an extender unit to double its capacity).

This will ergonomically and attractively package operator equipment and keep it all together within a lockable unit.

The CTB (mk2), designed for use in residential or business applications will manage the termination of up to four optical fibres.

COMPACT MULTI FUNCTION JOINT (CMJ)

The CMJ is multi-functional. This allows the joint to be used for:

- connecting optical fibre cables at single circuit or single element level,
- allowing multiple cables to be dropped from an incoming cable (16 drops)
- has an oval port for straight-through fibres,
- will accommodate 4 X 1 by 8 splitters or 2 x 1 by 16 for application in a
  PON environment,
- Has a loop storage facility to reduce splicing requirements,
- Has kevlar anchor points for all cables,
- has a mechanical sealing system to manage flexible cable entry and
  provide IP68 rating,

COMPACT JOINT

The primary application of a Compact Joint is connecting optical fibre cables at cable element level. It is ideal for cable chamber, track or spur applications within an external network.

The Compact Joint is available in two sizes; with 48 or 144 fibre splicing capacity.

The Compact Node is the equivalent product for ready access applications using loose tube or SIROCCO^{XS} blown fibre drops.

The 12 trays are single circuit trays enabling the breakout of 24 fibres (dual fibre circuits).

For both applications, fibres are easily accessible (hinged trays) but well protected (units sealed to IP68).

For FTTH, the Compact Joint can be used for primary distribution and the Compact Node for customer drops in a cable / SIROCCO^{XS} blown fibre network.

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HDPE SHEATH

RIPCORD

WATER BLOCKING COMPOUND

UPSHEATHED NON-METALLIC
CENTRAL STRENGTH MEMBER

POLYMER TUBE

OPTICAL FIBRE

13

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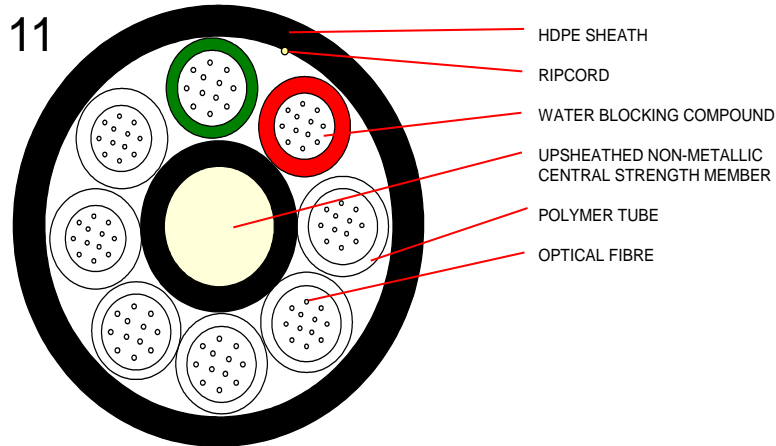
BLOWN FIBRE CABLE

Blown fibre cable allows for quick and easy deployment of specific cable designs.
The cable can be 2F all the way up to 288F.

We have numerous designs from a standard tight buffered style cable through to a standard Multi Loose Tube (MLT).

These cables can be blown in up to 2km dependant on route difficulty and tube installation.

Installation speeds can be a major factor in reducing costs.

The cable diameter range is 2.3mm up to 17mm.

SIROCCO[XS]

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FTTH SOLUTIONS − PRODUCTS
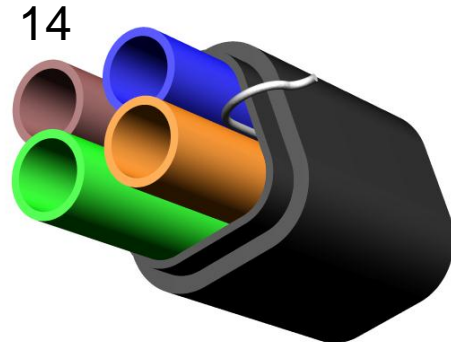
FIBRE DISTRIBUTION HUB (FDH)

The Fibre Distribution Hub (FDH), and the similar SC3000 Streetside Cabinet, provides an externally located unit for managing distribution and customer drops particularly for FTTH passive optical networks (PONs).

It can provide 24U of workable space (16U in the Streetside Cabinet) to accommodate a range of patching and splicing configurations for cable and/or for SIROCCO^{XS} blown fibre management.

The FDH will accept a splitter shelf delivering a number of pre-connectorised modules, up to 1 x 64 terminated with FC, SC and LC connectors, UPC or APC versions. The maximum capacity is 1152-fibre.

SIROCCO^{XS}

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12
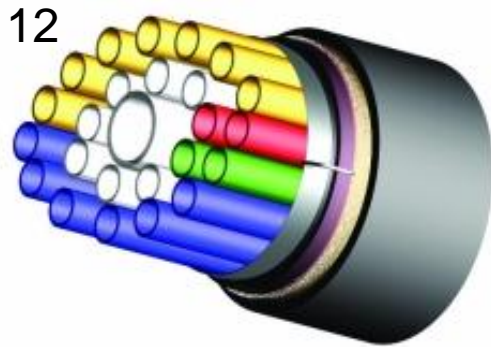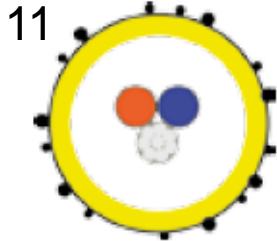
BLOWN FIBRE TUBE CABLES

A complete network from the exchange / hub to the customer can be constructed using the SIROCCO^{XS} blown fibre system.

This can be done without any external fibre splicing, blowing the EPFU from the central point to multiple locations through a set of tubes linked by a range of connectors through Tube Distribution Closures (TDC) in whatever configuration is required.

By accommodating splicing in the network and the adoption of signal splitting, in the exchange / hub, in joints or in customer premises, the scope for network expansion is considerable.

SIROCCO^{XS}

TUBE DISTRIBUTION CLOSURE (TDC)

The SIROCCO^{XS} Tube Distribution Closure (TDC) is used to distribute tubes (and, therefore, fibre bundles) from an intercepted, main tube cable.

It is UV resistant and sealed to IP68, with rubber seals and glands around the in-line cable and drop tubes.

The TDC can be installed at the time of tube cable installation or fitted over an already-installed cable as a retro-fit allowing ultimate flexibility.

It can provide a distribution point at the heart of a high capacity network or the final drop to customer locations.

7 to 24 tube in-line	4 to 12 tube or 4 x 1 tube	4 to 12 tube or 4 x 1 tube

1 or 4 tube

1 or 4 tube

1 or 4 tube

1 or 4 tube

1 or 4 tube

1 or 4 tube

7 to 24 tube in-line	4 to 12 tube or 4 x 1 tube	4 to 12 tube or 4 x 1 tube
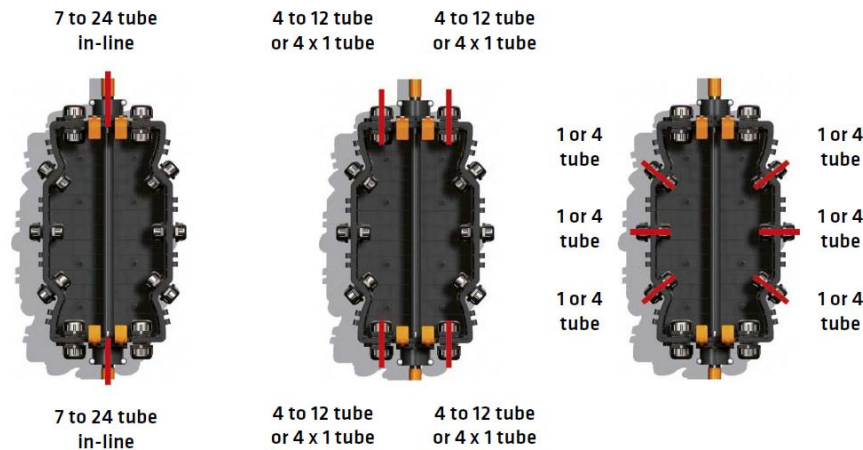
SIROCCO^{XS}

OPTICAL DISTRIBUTION DRAWER (TDC)

For installation in ETSI or 19" racks or cabinets, the Optical Distribution Drawer is available in 1U (48 SC/APC adapters) or 2U (96 SC/APC adapters) for use with ANT splice protectors.

The swing-out design allows for easy access to the splice cassettes and patch panel at the back.
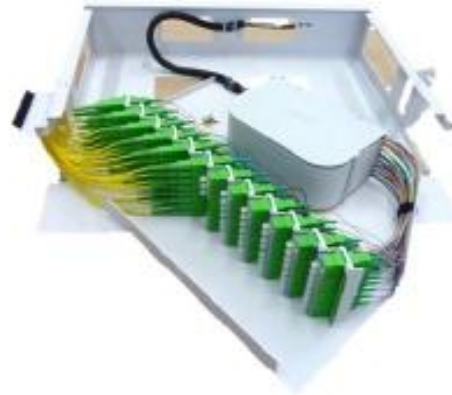
In the defined example, the 2U Optical Distribution Drawer with its 96 adapter capacity, can manage the termination of the 96-fibre JETNET^{XS} cable and provide a 96-fibre patch panel face to connect into the active equipment side of the exchange / hub.

XOK RETRACTANET^XS DISTRIBUTION JOINT

The XOK RETRACTANET^{XS} Distribution Joint is designed to provide a full watertight and high crush resistant protection for the splice of feeder cables to RETRACTANET^{XS} cable in buried installations.

The closure has two oval ports, each with a mechanical cable entry seals allowing the termination of 4 cables / microducts each. T

In the defined example, the closure takes a 96 fibre JETNET^{XS} cable in and protects the cables and splices into two 48-fibre RETRACTANET^{XS} cables for local distribution (FTTH).

There is a storage area within the body of the joint for excess lengths of feeder cables and RETRACTANET^{XS} modules. The trays can thus be extended to a workbench or van when remedial work is required.

RetractaNet^{XS}: five simple steps
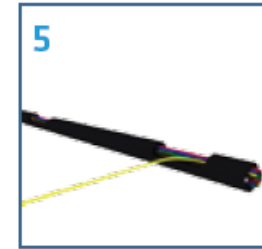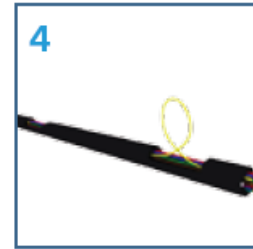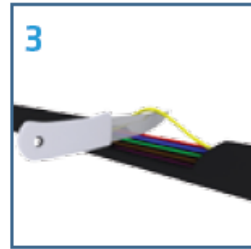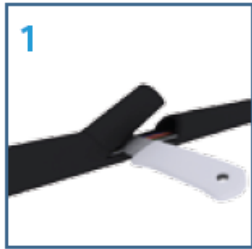
1: **LAY** the *RetractaNet*^{XS} cable from the Outside Distribution Point along a main trench.

2: **OPEN** the RetractaCable with a knife or the custom cutting tool. The *RetractaNet*^{XS} tapping box should be installed at all openings.

3: **CUT** the designated module or modules at the opening furthest from the access point.

4: **RETRACT** (pull back) the cut module(s) to the chosen location, using the DomoJet Tool to pull and store the retracted length. The opening is protected by the *RetractaNet*^{XS} tapping box.

5: **PUSH** and/or **BLOW** the extracted module or modules into a pre-laid micro-duct running from the main cable to the customer premises.

TAPPING BOX

The RETRACTANET Tapping Box is used to breakout and distribute fibres from an in-line RETRACTANET cable.

It is UV resistant and sealed to IP68, with a gel encircling both in-line cable and drop tubes.

Having removed a section of sheath from the main cable, the fibre unit is then extracted.

The current design (TPE-I2) will allow two tubes to exit the box (one left and one right).   It can also accommodate two splices should excess fibre length be required.

Each tube then feeds a RETRACTANET fibre unit from the main cable to the customer interface.

RETRACTANET^{XS}

CUSTOMER END – Multi-Dwelling Unit (MDU) - Cable

The VERTICASA^{XS} system was developed specifically for MDU apartment building distribution for FTTH.

The VERTICASA^{XS} cable contains a number of bundles of fibre (each bundle with 1 to 12 fibres) which can then be distributed around a building.

As each customer requests service, the cable can be simply cut, a fibre bundle extracted, pushed through a drop tube and terminated at the customer premises.

Multi-Dwelling Unit - Basement

In a large apartment block, the entry connectivity solution may manage incoming fibres and the building distribution network. At this consolidation point, the numbers of incoming fibres, customers & fibres per customer will determine the equipment required.

These solutions can manage the PON technology or alternatively point to point.

The PMI is a solution for multiple operators coming in to the same MDU, this allows for flexibility and quick non disruptive change.
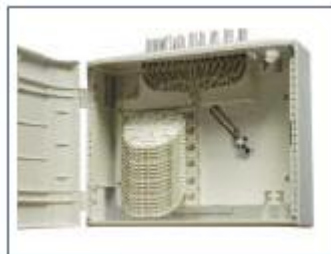
The Large and medium MDU wall boxes will allow you to distribute up to 32 customers per wall mounted box, reducing deployment costs.

The large MDU metallic box will support 2 X 1 by 64 splitters , this is for larger deployments.

Multi-Dwelling Unit – Riser Boxes

Within an apartment block, the requirement will be to provide a service, where required, to each separate flat (equivalent to an office in an office block).

The terminations will require a breakout point in the riser.

4 & 8 tray versions – the Multi-Tray Riser Box is designed to accommodate splices and/or splitters to support wider distribution of VERTICASA drops.

The 1 & 4 Port Breakout Units are used when extracting one, up to four, VERTICASA bundles from the riser cable and distributing them throughout a building floor.

The Top Loop or Storage Box, located at the top of an MDU, is used to store excess length of VERTICASA bundles to provide spare fibre to achieve longer customer drops.

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Multi Dwelling Unit – Customer premises.

The Ultra compact termination box gives the customer 2 fibres with a extra protective shuttered SC adaptor.

The pre-terminated Compact termination box comes in several manageable lengths, the box allows for fast flexible, less disruption to the customer and additional safety benefits.

The Internal Transition Box is a compact splicing unit, enabling the splicing of up to 4 drop cables to a VERTICASA riser cable.

The Mechanical Splice Holder is used for splicing together up to 2 fibres using mechanical splices (4 using heatshrink) to extend fibre module drops from a VERTICASA cable.

Identification Stripe

Optical Fibre

PBT Tube

Metallic Strands
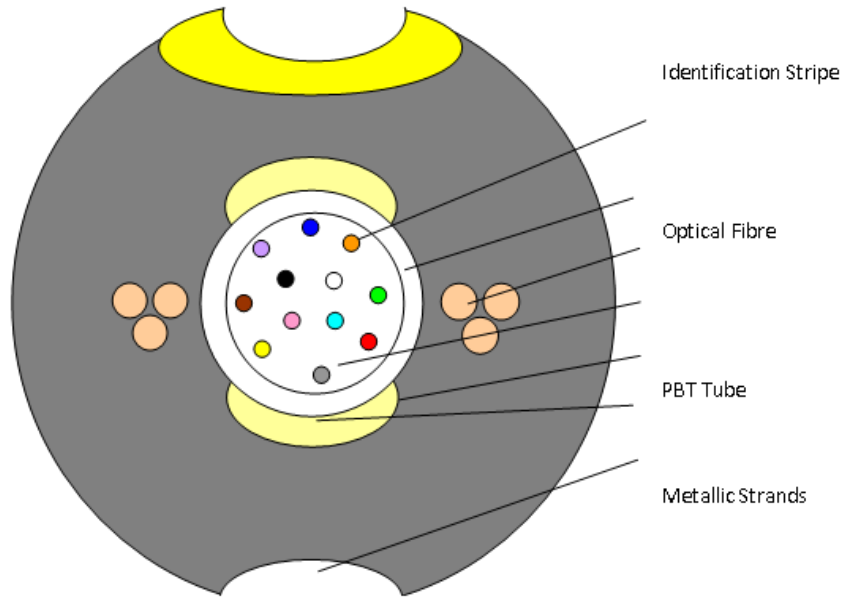
The Aerial drop cable solution is for use on short span solutions up to 70mtrs.
This cable is designed to be deployed on a pole network allowing a complete system.
The cable is supplied with all of the items needed, helical tension clamps, anti creep devices etc.

The cable can also be used in a drop solution underground. It has an HDPE sheath and is a very robust construction.

This cable is available in 2, 4 and 12fibre constructions.

JOINT SOLUTIONS

FTTP Joint Variations

Aggregation Node
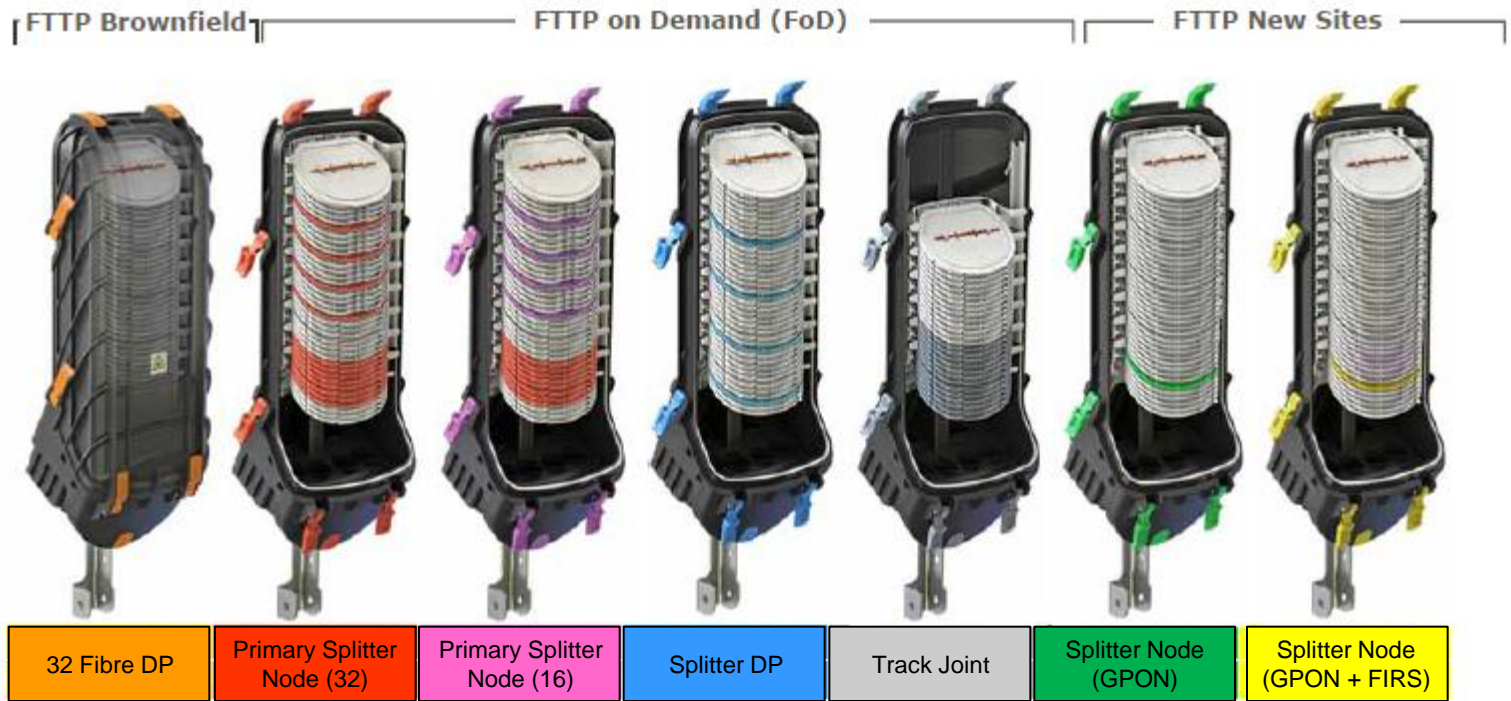
MDU DROP SOLUTIONS

6 FDP **12 FDP** **24 FDP**

8 Splitter DP **16 Splitter DP** **32 Splitter DP** **Primary Splitter Node**

POP

Existing Sewer
Sewer Cable 144 OF

Cabinet

POP

QUICKDRAW^{XS}

Quickdraw Cable 4 OF
Pre-connectorised

JetNet 50 mm/7 x 12 mm
JetNet Cable 144 OF

POP

Connectorised Lead In Joint
Max. 4 Subscribers per Lead In Joint
Fibre capacity 4 x 4 OF = Max. 16 OF

Duct 40 mm with
Duct cable max. 576 OF
(288 x 2 OF per Subscriber)

Distribution Point

VERTICASA^{XS}

Max. 288 Subscribers per Cabinet
Fibre capacity 288 x 4 OF = Max. 1156 OF

EASENET^{XS}

Cabinet

Tapping Box for
Fibre module 4 OF

RETRACTANET^{XS}

EaseNet 7 x 14 mm with
EaseNet Cable max. 96 OF
(24 x 4 OF per subscriber)

Distribution Point

Max. 24 Subscribers per Distribution Point
(22 Planned + 2 Spare)
Fibre capacity 24 x 4 OF = Max. 96 OF

RetractaNet Cable with
12x or 24x Fibre module 4 OF

Thick walled microduct 7 mm
with Fibre module 4 OF

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THANKYOU FOR YOUR TIME

Adam Ashenden

Connectivity and Fibre systems Manager