

# FIBRE SYSTEMS

FOR PROFESSIONALS IN THE  
OPTICAL COMMUNICATIONS  
INDUSTRY

Issue 42 • FTTH Special Issue 2024

FTTH PLANNING  
NETWORK DESIGN

FTTH INSTALLATION  
INCORPORATING AI

POST DEPLOYMENT  
MAINTENANCE & MONETISATION



SPECIAL ISSUE

## FIBRE-TO- THE-HOME



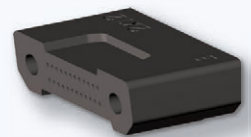
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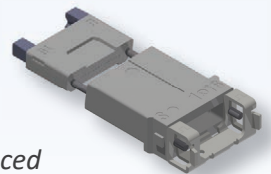
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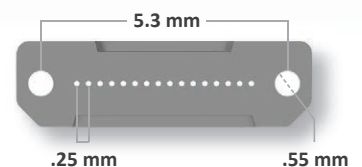
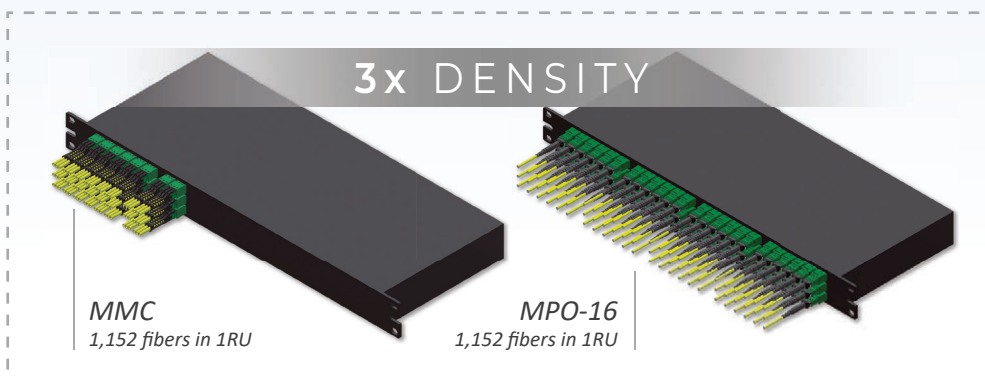
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# FIBRE SYSTEMS

## IN THIS FTTH SPECIAL ISSUE...

### 4 FTTH NEWS ROUND-UP

60% of Europeans now enjoy FTTH access

- Deutsche Glasfaser modernises network
- UK altnet reaches £100m milestone
- Finland operator to decommission legacy copper

### 8 FTTH DESIGN & PLANNING

**Keely Portway** looks at the key factors network owners and operators should consider when designing and planning their FTTH network build

### 12 FTTH ACCESS EQUIPMENT

**Katia Safonova** provides an outline of today's existing PON technologies, with a glance at their potential future direction, including 100G-PON

### 14 TECH FOCUS: OPTICAL LINE TERMINATION

A summary of the market for network optical line termination (OLT) equipment and some of the products and solutions available

### 16 FTTH CONFERENCE PREVIEW

A preview of some of the topics and themes that will be covered during the FTTH Conference 2024 programme in Berlin

### 18 SPONSORED: FIBRE & CABLES

Why some of the biggest European FTTH network operators are turning to Wrapping Tube Cable (WTC) with SpiderWeb Ribbon (SWR) Fibre to expand their networks

### 20 FTTH INSTALLATION AND MAINTENANCE

**Keely Portway** examines why FTTH network operators in Europe are increasingly leveraging the latest AI and computer vision tools to optimise network deployment, maintenance and monetisation

### 24 FTTH INSTALLATION

**Chris Bacon** offers an answer to the all-important question: when it comes to fibre optic cable installation, which way to go – push, pull or blow?

### 26 TECH FOCUS: INSTALLATION EQUIPMENT

We round up the latest tools and equipment for FTTH network installation

### 28 FTTH POST-DEPLOYMENT

**Joe Thompson** reveals three ways that end-of-life street cabinets can contribute to network operators' ESG initiatives

### 30 PRODUCTS

A round-up of recent product announcements



## FIBRE'S COMING HOME

**W**elcome to our new, dedicated fibre-to-the home (FTTH)-focused edition of *Fibre Systems!*

We're getting ever-closer to the EU connectivity deadline of 2030, and FTTH deployment across Europe is accelerating. It will be interesting to find out at the upcoming FTTH Conference just how far along the continent is when it comes to coverage and adoption. If the 2023 figures from the FTTH Council Europe are anything to go by, progress is steady, with more than 60% of coverage in Europe.

But, there are still challenges for operators. Rural deployments are still the outlier, while the drive to cut operational costs and increase efficiency and sustainability is higher than ever. And this is at a time of higher expectations from private investors and a shortage of skilled workers. Outside of the deployment work, operators and ISPs also have a challenge ahead of them when it comes to translating the coverage into customers. Consumer education and high service levels will be key to rectifying this, as will be ensuring that legacy copper networks are switched off.

We appreciate the challenges that our core audience faces every day while deploying and maintaining their networks. So, we took the decision to change the way we do things slightly for 2024. It's still the same *Fibre Systems* brand you know, but we felt that, given the industry in which we operate, it made sense to implement a "digital-first" approach to our content. Our premium print product is still crucial, so we decided to bring a more focused approach to what matters to you. Our key content pillars will form the themes for these issues. These have been selected according to the main applications that provide opportunities. They are: FTTH, Long-Haul Networks and Short-Haul Networks.

As such, we'd relish the opportunity to speak to more of our core audience members about the issues closest to them, and the work they have done to overcome these. If this sounds like you, we want to tell your story, so please get in touch with us.

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# FTTH NEWS ROUND-UP

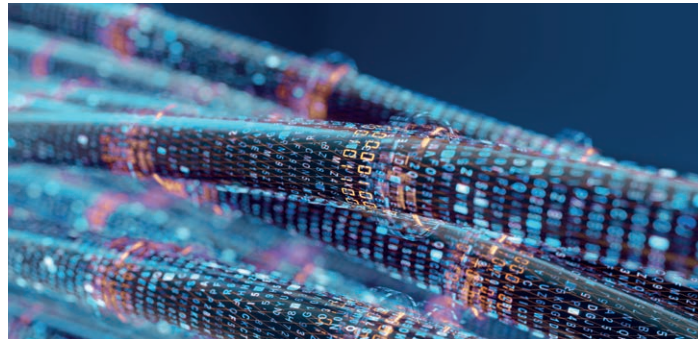
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## ETNO: 60% OF EUROPEANS NOW ENJOY FTTH ACCESS

The European Telecommunications Network Operators' Association's (ETNO) "State of Digital Communications 2024" report, undertaken by Analysys Mason reveals that telecoms investment reached a record €59.1bn, while 6 in 10 Europeans had access to FTTH by the end of 2023. However, it detailed that just 10 out of 114 networks in Europe were 5G standalone, and the continent was lagging behind both Asia and North American on edge cloud offers, which ETNO said signalled a crossroads for the European connectivity ecosystem.

The EU aims to reach both full 5G and full gigabit coverage by 2030, and the report found that, to achieve this, significant additional investment in roll-out is needed. Analysys Mason also said that at the end of the decade, around 40 million people in the EU will still have no access to a



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fixed gigabit connection. But on a more positive note, Europe's FTTH coverage of the population (excluding FTTB) reached 63.4% in 2023, up from 55.6% the previous year.

According to the ETNO report, delays in deployment, which affect users, are mirrored in both suboptimal investment per-capita and the overall weak financial health of the sector, which are cause of concern in terms of competitiveness.

Lise Fuhr, ETNO Director General, said: "Users are expecting new networks and Europe's competitiveness relies on innovative connectivity. This is why we must take urgent policy action to help strengthen the European telecom sector. The status quo – both in terms of investment and of policy – will not deliver the levels of innovation that are so desperately needed to sustain growth and deliver on the Open Strategic Autonomy".

## DZS, ORANGE COLLABORATE ON POLISH FTTH DEPLOYMENT

DZS successfully completed the first phases of a live pilot solution deployment of its Velocity fibre access portfolio within Orange's production network in Poland.

Orange provides FTTH throughout Europe with more than 13 million residential, business and campus subscribers. As part of its multi-vendor strategy, the provider seeks partners to

meet the evolving needs of its growing residential, business and mobile customer base. DZS Velocity OLTs are designed to provide service providers such as Orange with multiple options to address current and emerging deployment and service demands in their network by leveraging next-generation PON and point-to-point solutions via any

service port across the range of systems

Gilles Bourdon, Vice President of Wireline Networks and Infrastructure at Orange says: "DZS was given the opportunity to become part of our ecosystem, and we are working closely with them to meet our expectations from today's 2.5 gigabit passive optical network (GPON), 10G (XGS-PON) and point-to-point technologies; in a context of heterogeneous situations coming from the diversity of countries where we operate."

## FINLAND OPERATOR TO DECOMMISSION COPPER

Finnish network operator DNA, the subsidiary of Swedish firm Telenor, is to terminate its old copper network in Northern Finland in June and October this year, having started work to decommission it in favour of fibre optics in 2022.

Mikko Kannisto, Vice President of DNA says of the progress: "The decommissioning of the old copper-based network has proceeded according to plan, and I'm happy to say that our customers have been very understanding. The copper-based networks in Northern Finland are next in line during summer and autumn 2024, with alternative solutions in the form of cable, fibre and mobile to be offered in place of the services being terminated. These modern solutions are faster, cheaper and more reliable than old copper connections."

The operator also placed an order of access switches to a value of approximately SEK 20m with Waystream, which should be delivered successively until August.

Kannisto says: "This collaboration holds immense potential to drive groundbreaking advancements in network infrastructure and deliver better and faster services to DNA Plc customers."

# Setics Group

## CONSULTING IN DIGITAL INFRASTRUCTURE & SERVICES



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- Assistance in contractual and financial project set-up
- Consultancy



- Valuation of infrastructures
- Technical and economic studies
- Technical & operational due diligence

## OUR SOFTWARE SOLUTIONS



Plan and design optical fibre networks by unlocking the power of automation



Follow-up and monitoring of FTTx projects

## DEUTSCHE GLASFASER MODERNISES NETWORK

German operator and service provider, Deutsche Glasfaser (DG) is modernising its optical transport network infrastructure throughout Germany. The company has selected the Ekinops360 optical transport platform for work, under a multi-year contract.

DG serves nearly 1,800 municipalities with more than 1.2 million households, and is adding around 40,000 new homes-passed per-month. The operator is expanding rapidly and, recognising the need for a unified network to simplify operations, sought a new optical transport infrastructure that could not only automate its service provisioning and speed its time-to-market, but also lower its capital and operational expenditures as it scaled.

After considering multiple bids, DG selected Ekinops as a single vendor for deployment of the Ekinops360 portfolio across all tiers of its optical transport network.

Pascal Koster, Chief Operating Officer of Deutsche Glasfaser says: "As pioneers of fibre rollout in Germany we have always sought to employ state-of-the-art technology in our network. The Ekinops360 gives us the ability to streamline our operations with a single end-to-end system that meets our ambitions to be even more efficient and responsive."



Deutsche Glasfaser

## BT GROUP TURNS OLD STREET CABINETS INTO EV CHARGERS

Etc., the start-up and digital incubation arm at BT Group is powering up its first EV charging unit built from a street cabinet..

The company says this is the first step in the rollout of new technical trials, exploring the potential to upgrade up to 60,000 cabinets, as fibre is increasingly brought directly to the home.

The charging solution works by retrofitting the cabinets with a device that enables renewable energy to be shared to a charge point alongside the existing broadband service with no need to create a new power connection. EV charging can be deployed to cabinets that are in-use for current broadband services, or in those due for retirement, depending on the space and power available to the unit. Once the cabinet is no longer required for broadband,



as nationwide full-fibre rollout progresses, the broadband equipment is recycled, and additional EV charge points can be added.

The pilots were developed to help solve EV charging infrastructure needs by repurposing existing street furniture. They will explore how this solution could be scaled to address the lack of chargers on UK roads. Tom Guy, CEO, Etc.

at BT Group says: "Our new charging solution is a huge step in bringing EV charging kerbside and exploring how we can address key barriers customers are currently facing. Working closely with local councils in Scotland and more widely across the UK, we are at a critical stage of our journey in tackling a very real customer problem that sits at the heart of our wider purpose to connect for good."

## OPERATORS COLLABORATE ON GERMAN FTTH

Solutions30 and GlasfaserPlus signed an agreement to roll out a fibre optic FTTH network in Germany. The move is a step in GlasfaserPlus' goal of giving high-speed internet access to up to 4 million households in Germany's rural and small and medium-sized urban areas in the coming years. The companies plan to provide FTTH services

of both homes passed and connected.

On the partnership, Volker Diekmann, CFO of GlasfaserPlus, says: "GlasfaserPlus has set itself an ambitious target for network expansion, by 2028 we want to connect up to 4 million households in Germany with FTTH. To achieve this

ambitious goal, we are relying on an experienced, international network of construction partners who have extensive experience in building fibre infrastructure."

Luc Brusselaers, Chief Revenue Officer of Solutions30 adds: "We are committed to deploy our solid organisation and strong knowledge in fibre optic networks to support GlasfaserPlus in its mission and accelerate Germany's FTTH deployment for the years to come."

## FIBRE DUCTING BRINGS FASTER CONNECTIVITY TO CAMBRIDGE, UK

Bus and cycleways in Cambridgeshire are being used to accelerate digital delivery and save carbon emissions, while offering more sustainable travel options. The Connecting Cambridgeshire programme, hosted by Cambridgeshire County Council, is working with Greater Cambridge Partnership (GCP) on the project. Fibre ducting is being integrated during the construction of new

bus and cycle ways as part of the programme's "Dig Once" policy.

The fibre ducting is being made available on a commercial basis via Light Blue Fibre, a joint venture with the University of Cambridge allowing operators to avoid costly and disruptive retrofitting.

Gigaclear is using the ducting to install fibre broadband to reach more than 2,000 premises that might not have had access

otherwise. The company is investing £39m extending its fibre broadband network into Cambridgeshire.

Gigaclear Project Manager Gary Darvill says: "We welcome Cambridgeshire's 'Dig Once' policy because, where it is possible to use existing infrastructure, it makes sense to do so on so many different levels. Rather than embark on expensive, time-consuming and disruptive engineering work to lay our cables along the 11-km stretch, we're working with LightBlueFibre to use their existing fibre ducting."

Read the latest White Papers and online articles from our library of free vendor-supplied technical content\*

\*registration may be required

## VIEWPOINT - THE CRUCIAL ROLE OF OPTICAL PRODUCTS IN ACHIEVING NETWORK SUSTAINABILITY

### PRYSMIAN

Richard Moyes, Marketing, Intelligence & Development Director at Prysmian Group advises how selecting the right optical products can help network operators achieve their all-important sustainability goals.



## WHITE PAPER - MAXIMISING DUCT EFFICIENCY: THE KEY TECHNOLOGIES OF SPIDERWEB RIBBON (SWR) CABLE AND SZ BUNCHING

### WEBRO AND FUJIKURA

The White Paper from Webro, in partnership with Fujikura, introduces Fujikura's Wrapping Tube Cable (WTC) with SpiderWeb Ribbon (SWR) cable and SZ Bunching as key technologies, demonstrating their significant impact on reducing costs and optimising existing infrastructure for optical network operators.



## VIEWPOINT - HOW TO OVERCOME FIBRE DEPLOYMENT OBSTACLES USING PRE-CONNECTORISATION

### COMMSCOPE

José Luis Gonzalez, Network Architect at CommScope advises how pre-connectorisation could offer a single solution to the biggest fibre rollout challenges.



## WHITE PAPER - OSNR MEASUREMENTS ON OPEN SUBMARINE CABLES WITH EMULATED LINE TERMINALS

### VIAVI

This white paper provides an overview of the growing use of Optical Submarine Cables throughout the world and walks through recommendations for proper measurement, troubleshooting and characterization of the submarine amplified line systems. Key topics covered include: measurement basics and SLTE emulation; measurement implementation; GOSNR vs OSNR; OSNR as a primary measurement and SLTE Emulation.



## WHITE PAPER - FROM HIGH-LEVEL TO LOW-LEVEL DESIGN: A NEW EXTENDED AUTOMATION PROCESS FOR FTTX NETWORKS

### SETICS

This White Paper reveals how the process can help Business Developers, Project Managers, and Network Planners systematically organise the elements related to each optical network planning phase and produce the necessary outputs.



## WHITE PAPER - INFINERA CHM6 ENCRYPTION: WHAT NETWORK OPERATORS NEED TO KNOW ABOUT LAYER 1 ENCRYPTION

### INFINERA

This application note from Infinera details how, by focusing on layer 1, operators can reduce the cost of encryption while minimising latency and scaling throughput, and provides more details about Infinera's CHM6 encryption solution.



# FTTH NETWORK DESIGN FOR LIFE

A look at the key factors that network owners and operators should consider when designing and planning an FTTH network build

## KEELY PORTWAY

With targets for full gigabit connectivity in many geographic markets getting ever closer, the deployment of full-fibre or fibre-to-the-home (FTTH) networks is accelerating at pace. In Europe, statistics from both the FTTH Council Europe and the European Telecommunications Network Operators' Association (ETNO) put FTTH coverage in the continent at more than 60%.

Some of the driving factors for this include a proactive approach from European Institutions and regulatory bodies in placing connectivity as a top priority on their agenda. "The European Commission was extremely active in 2023,

with gigabit connectivity recommendations, and the next legislative cycle, with the Gigabit Infrastructure Act (GIA), the Gigabit Connectivity Recommendation (GCR), all of these acronyms coming out of Brussels," explained Vincent Garnier, Director General at the FTTH Council Europe.

These types of frameworks had the added benefit of boosting investor confidence, and the industry experienced a burst of private investment activity over the last 12 months.

### Starting the FTTH network deployment journey

For operators at the beginning of their FTTH deployment journey, there are a number of important factors that need to be considered at the planning stage. A well-thought-out network design will be key to its implementation and success. Considerations such as service coverage are important, and operators are encouraged to research the specific locations they plan to cover, including potential customer demand and profitability.

Deployment strategies will need to vary between different types of regions, with factors including urban density, suburban spread, or rural expanse influencing the network design. Urban areas, for example, may benefit from higher subscriber density to enable cost-effective solutions, while rural deployments might require longer fibre runs, affecting costs and logistics. Likewise, regulatory issues will vary between geographical regions, so requirements such as wayleaves access, permits, and adherence to standards will need to be factored in at the planning stage.

Undertaking a cost-benefit analysis is also crucial in evaluating the initial investment against its long-term gains. This should factor in deployment costs, maintenance expenses, and potential revenue streams.



A well-thought-out network design will be key to its implementation and success





Deutsche Telekom's T-Cars can optimise land surveying and make sure that laying routes are as short and simple as possible when expanding the network

### FTTH network technology selection and integration

Then there is the topology and technology to consider. Point-to-point and passive optical network (PON) architectures are common, but there has been a growing migration from many FTTH operators towards the latter.

Garnier explained: "We see a continuation of the shift from point-to-point to PON architecture, with an acceleration towards a 10G solution being rolled out now. Operators are no longer going only for 1G, there they are setting up an infrastructure then getting ready. This is in line with the quest for operational excellence, the focus is on anything that reduces installation time, cost, and total cost of ownership. So things such as pre-connectorised solutions, cable miniaturisation etc.. have an impact on the chain when it comes to the total cost of deploying, and some operators are going into that direction."

On the technology front, there is also a need to plan for emerging and future technologies, like 5 and even 6G integration, advanced optical solutions, and of course, artificial intelligence (AI) to ensure the network's longevity and scalability.

### The FTTH funding conundrum

As well as taking all of these factors into account during the planning stage, operators will need to have a clear strategy and value proposition when it comes to acquiring funding. This is particularly the case now, at a time where higher interest rates are impacting the market, and there is more of an air of caution amongst private investors.

Said Garnier: "A few years back, investment in an FTTH network was seen as a safe place to invest money without thinking too much about the return on investment. It was more a way to secure money that will still be available and valuable in 20-30 years. Some investors were not even expecting a return every year and some of them might have been a bit inexperienced about investing in fibre and maybe they believed a lot of very appealing business cases, but are now seeing the difference between what was offered and what was delivered."

This is not to say that investment has dried up, and Garnier believes that there is still an appetite, but, he said: "Clearly the expectations are a bit different. The money is more expensive. There is overall a bit less funding available than there was in 2022. The expectation level now for

THE EXPECTATION LEVEL NOW FOR OPERATORS IS THAT THEY SHOW A TRACK RECORD OF BEING ABLE TO ROLL OUT ACCORDING TO OR CLOSE TO THEIR PLAN

operators is that they show a track record of being able to roll-out according to or close to their plan."

### How to increase take-up in FTTH subscribers

Interestingly, the issue of FTTH take-up once the network is in place is something that Garnier sees being a key topic and challenge going forward. He says: "I think there's still a huge question around how to increase take-up, and consequently, how to better monetise."

But this is something that now needs to be considered even earlier in the process, particularly for wholesale operators, in order to gain investor confidence.

→ Continues Garnier: “For wholesale operators, securing anchor tenants, and even more importantly, securing a national brand of internet service provider on their network on a stable contract is important to reassure and to de-risk the investment for private investors or banks. I would also say that the exit conditions are given more importance, so investors that come into a business for three, five years. They look at the return on investment. They look at profitability much more than they look at how they can effectively trust what is present in a business plan. And think about their position when they decide to exit in three or five years and how they can monetise their investment and exit in a profitable way.”

**Network design for acceleration**

It’s not necessarily just important for providers and operators at the start of their journey to invest time and effort in the design and planning stage. Germany-based Deutsche Telekom has been providing telecoms services for almost 30 years. Today, the company serves around 245 million mobile customers, 25 million fixed-network lines, and 21 million broadband lines across 20 countries. In Germany alone, the company serves around 60 million mobile customers and approximately 20 million fibre connections, of which seven million are FTTH.

The company has experienced a massive build-out of its FTTH footprint in Germany in the last two years, increasing by 2 million connections in 2022, a further 2.5 million in 2023 and projections for this year are between 2.5 and 3 million. With approximately 750,000km of fibre optic cable in the ground, Berthold von Schimmelmann, Business Owner of FTTH Factory at Deutsche Telekom revealed during a webcast hosted by FTTH Council Europe, how planning was integral to the network’s success.

■ ■  
THERE’S STILL A  
HUGE QUESTION  
AROUND HOW TO  
INCREASE (FTTH)  
TAKE-UP, AND  
CONSEQUENTLY,  
HOW TO  
BETTER MONETISE  
■ ■



**Adopting automation and AI at the network design stage can help operators more quickly establish where to place trenches**

He said: “One of the main assets that helped build all of this in the last couple of years was the establishment of the FTTH factory, which is an end-to-end process to enable the fibre planning and construction process.”

**Automated FTTH network planning**

The FTTH factory is integrated with Comsof Fiber software to help with automated planning. Continued von Schimmelmann: “The FTTH factory process starts off with an environmental recording where we send out T-cars. We then start off in the next process step where we take the data that is recorded by the car and use AI components to do an automatic classification of the surface and then, based on that, do an automatic calculation of the potential trench network.”

The cars are sent to the city ahead of an FTTH roll out, and in the last three years have driven around 150,000km. Henning Wulf, Product Owner at Fiber Planning Factory at Deutsche Telekom Technik added: “We have currently four T-cars driving around Germany. The car is equipped with a lot of cameras and GPS receivers and 3D environmental sensors so that all details of the construction area are recorded by the car.”

To create the design using the software, Wulf revealed that the first step is to collect all the data gathered by the T-car, and process it so there is an automated classification of the surfaces and objects, based on approximately 30 trained classes (such as asphalt, concrete, etc..).

Said Wulf: “This is so that we know on which side of the street which surface is present, and all these different surfaces are collected and identified by our automated process and out of this data we generate

the so-called potential trenches. These are the potential ways our network could be built inside one roll-out area, and of course the surface information is written to the potential trenches, so we know exactly on which side of the street which surface is present and how much each side of the street would cost. This information is then passed to our integration of the Comsof Fiber Designer, so we generate a really cost-optimised and good FTTH network design also utilising our existing infrastructure.”

The operator has already calculated in the region of 12 million demand points over the last three years – in s 2022 it started with one million households calculated, and this year it reached nearly five million. “In addition,” said Wulf, “in this year this automated process reduced our effort by up to 75%, so using previous processes, our network designers had to draw these FTTH areas manually and that was not a nice job and so this has been a real benefit.”

The automated process has also benefited Deutsche Telekom by streamlining the liaison process with local authorities, for example, when it comes to the positioning of street cabinets. Said Wulf: “With this tool you can change the position of each cabinet in an automated 3D way so that we can we want to place this cabinet here and then no one is blocked by this cabinet.”

This provided time and labour saving benefits over the previous method, where engineers would physically attend the location, take photographs and draw the planned cabinet on a PDF file. “This was particularly beneficial during the pandemic,” said Wulf. “We could coordinate the locations of these cabinets together with the local councils via the internet and no one had to meet onsite.” **FS**

## CASE STUDY: SETICS STTAR PROVES INDISPENSABLE FOR LIT FIBRE'S NETWORK DESIGN STRATEGY

Barry Luff, UK Business Development at Setics explains how UK FTTH network operator Lit Fibre transformed its workflow thanks to a new physical network inventory and design automation capabilities from Setics

Over the past few years, Setics has been actively supporting the nationwide fibre rollout initiatives in the UK by leveraging its innovative solution, Setics Sttar, to enhance connectivity and streamline the network design process.

Working closely with operators, investors, service providers, and altnets, Setics Sttar has played a crucial role in advancing the quality and accessibility of full-fibre internet connections in the UK.

Lit Fibre, as a testament to this collaboration, delivers full fibre-to-the-premises (FTTP) internet connections of the highest quality to towns and small cities of the UK. With a primary customer base comprising residential customers, the company aims to bridge the gap in fibre network availability within the UK.

As Lit Fibre scaled its network, it sought vendors capable of offering flexible fibre network solutions, especially those enabling end-to-end designs for small and mid-size towns while utilising physical infrastructure access (PIA) data.

In addition to choosing a physical network inventory system, Lit Fibre was looking to add design automation capabilities for evaluating the projects (50 towns envisioned) from a business point of view and producing detailed designs ahead of construction work.

### Cost and quality challenges

The challenges Lit Fibre was facing impacted not only the cost but also the quality of the roll-out, among those were:

- Evaluating the feasibility of the project;
- Prioritising PIA infrastructure for roll-out ;
- Reducing new builds as much as possible;
- Taking into account PIA duct capacity;
- Working with complex architecture, different splitting levels and equipment;
- Managing single-dwelling units (SDUs) and multi-dwelling units (MDUs);
- Importing HLD into the inventory system.

Setics



**Setics Sttar is design automation software that optimises the network design process and streamlines its workflow**

### The Setics Sttar solution

Setics Sttar presented the solution to all those challenges by:

- Automating data preprocessing using Feature Manipulation Engine (FME), a spatial ETL application, focusing on the translation of geographic data;
- Categorising PIA ducts according to their capacity. In particular, using "RAG status" (Red, Amber, Green) attribute to prioritise less filled ducts;
- Creating a design process including multiple runs of Setics Sttar for dimensioning SDUs and MDUs, including different splitting ratios and spare fibres;
- Exporting the results directly into the inventory system through a plugin, as both systems were compatible;
- Generating an accurate BOQ (Bill of Quantity) from the HLD, which helped with the business-decision making.

Upon integrating Setics Sttar into its operations in 2020, Lit Fibre experienced a transformation in its workflow. The Setics Sttar development team showed exceptional dedication by customising the software to suit the company's specific requirements. Setics Sttar has seamlessly provided comprehensive fibre connectivity solutions, bridging the gap from central office to end customers.

Setics Sttar's capability to generate high-level designs (HLDs) through the Setics Sttar Advanced Designer licence has proven indispensable for Lit Fibre's network design strategy. The adaptability of the software enables efficient design modifications directly on the map interface, providing comprehensive solutions that cater to varying geographical areas.

Notably, the flexibility of Setics Sttar's platform allows for direct design alterations on the map interface, facilitating swift changes based on area size, along with providing an accurate Bill of Quantities (BOQ). Setics Sttar's capability to generate accurate BOQ adds further value to Lit Fibre's design and implementation processes, contributing significantly to their mission to bring world-class full-fibre, high-quality full-fibre internet to 500k homes by 2026.

A spokesperson from Lit Fibre said: "The Setics Sttar development and support team provided excellent help and guidance throughout the process of configuration and customisation of the application to suit our purpose." **FS**

### More information

Founded in 2000, Setics is one of the leading independent French consultancies specialising in the design and management of high-speed broadband network projects, software editing and digital development of territories around the world.

Setics Sttar is a design automation software that optimises the network design process and streamlines workflow. As a result, operators, altnets, and internet service providers benefit from substantial savings in time, cost, and resources. Setics Sttar has been used to plan and design millions of homes worldwide.

**Book a Setics Sttar demo with our UK team: [more@setics.com](mailto:more@setics.com)**

# HOW CAN PON EVOLUTION HELP NETWORK OPERATORS ACCELERATE EXPANSION?

An outline of today's existing PON technologies and a look at their future direction, including 100G-PON

## KATIA SAFONOVA



WITH THE EU... TARGETING 100MB/S FOR ALL EUROPEAN HOUSEHOLDS BY 2025, THE PREVIOUS PON AREN'T PROVIDING THE NECESSARY SPEED

Driven by more remote work, the demand for higher bandwidth is increasing. This is a challenge for network operators, who need to expand their networks faster and more efficiently to meet demand. With standardised and interoperable components, installation is simplified, maintenance costs reduced and upgrades can be made quicker and easier.

This leaves operators with a choice to make: Do they want their networks to be fibre-rich or fibre-lean? Do they want to install more optical fibres in the ground or maximise the ones they already have by multiplexing the existing fibres?

Passive optical networks (PON) are also evolving to satisfy the need for higher speeds and lower latency of the end users. But where are we right now? And how can the evolution of PON help network providers to connect more homes faster and more cost-effectively than before? The decision which PON to use will have a direct effect on the revenue of the providers as users decide which contract to sign based on the speed provided for them. With the push of the European Union towards the Gigabit Society targeting 100Mb/s for all European households by 2025 the previous PON aren't providing the necessary speed, making additional investments all the more pressing.

### The move from 10G to 50G+

From 10G to 50G+ there have been many improvements over the last years. Let's take a look at the existing PON technologies and where they are headed.

GPON is an ITU domain with a single upstream and downstream wavelength,

while the 10G-PON comes in the forms of XG-PON and XGS-PON, both of which are ITU standard and have single upstream and downstream wavelengths. They are working with symmetrical or asymmetrical line rates and due to a lower upstream rate can use more cost-effective optical network units (ONU's).

XGS-PON works on the same wavelengths as XG-PON and 10 Gb/s -EPON. The 10G-PON has surpassed GPON in ports sold. This led to commercial launches of 2-to-5 Gig residential services in 2022. The forecast for XGS-PON deployments continues to ramp through 2026, as a growing number of network operators around the world are moving forward with XGS-PON as their next-generation PON technology.

One of the reasons for the increased use of XGS-PON is the need for more upstream speed. The previous GPON with an upstream of 1.2Gb/s can't keep up with the demand. Instead, symmetrical PON with a higher upstream is the most sought after technology making every second new installed PON an XGS-PON in 2023. Additionally, operators tend to use the more recent XGS-PON because it is possible to have a split ratio of 1:128 without sacrificing the quality of the service, making it more cost-effective and resulting in a much higher ROI.

GPON offers in direct comparison only a split rate of 1:64. In order to achieve the higher 1:128 XGS-PON split ratio, an additional splitter is included before the OSP Cross Connect as shown in Figure 1. This example by an European operator shows how they combine GPON and XGS-PON to connect more people with high

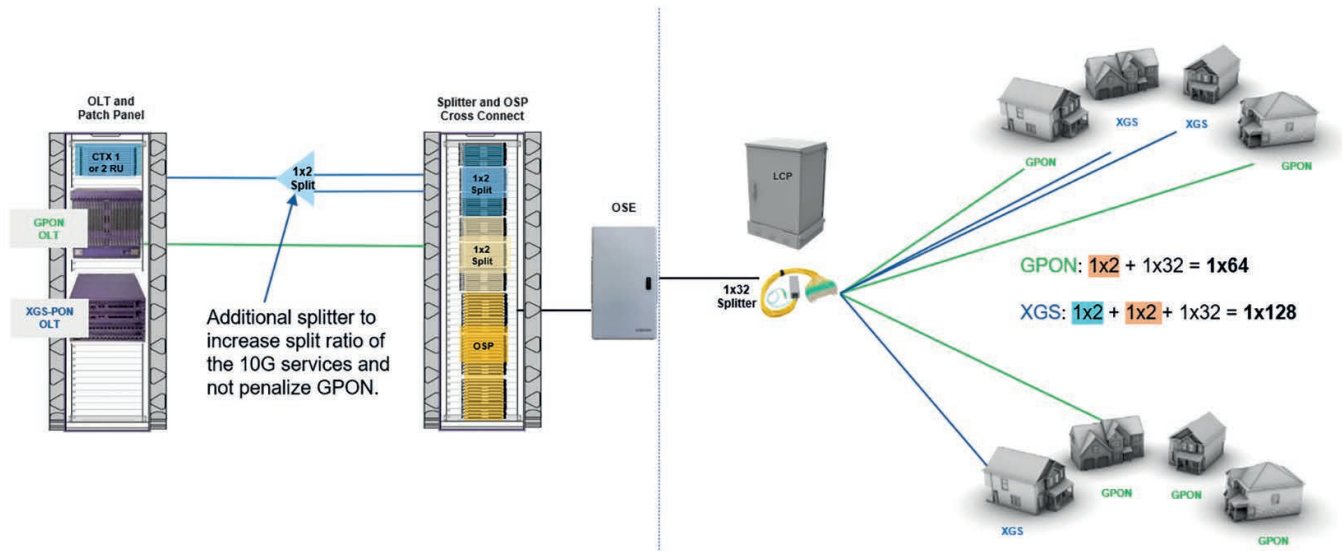


Figure 1: In order to achieve the higher 1:128 XGS-PON split ratio, an additional splitter is included before the OSP Cross Connect

upstream and downstream rates without the need of more optical fibres.

Another technology, the 10G-EPON (Ethernet PON), is an IEEE standard that uses the same wavelengths as XGS-PON. China has embraced Ethernet PON, as well as the North American CATV industry, due to its backward compatibility with DOCSIS via DPOE. Additionally, the 25G-PON is not an IEEE or ITU standard, but rather a MSA formed in 2020 and led by Nokia. With more than 20 members now, the technology leverages the need for enterprise and mobility requirements based on mature 25G optics technology.

**Will we go directly to 50G?**

With the move past 10G to 50G+, several technologies have emerged, including 25G-EPON evolving from 10G-EPON, 50G-PON, which requires expensive dispersion compensation with integrated digital signal processors (DSPs) or 50G-EPON which doesn't require DSP for dispersion compensation.

Prior to 50Gb/s-PON becoming available, 25Gb/s-PON will achieve market traction between 2022 and 2026, primarily in enterprise and 5G transport applications. This technology will allow service providers to deliver high-bandwidth and low latency for cloud services and applications. However, beyond 2026, the future of 25G-PON remains in question due to the split among vendors and standards bodies between 25G-PON and 50G-PON. The timeline for 50G-PON component and equipment availability is uncertain, with general availability likely to occur in 2026. Until then, service providers will continue to rely on XGS-PON for their

**10G-PON TECHNOLOGIES ARE QUEUED UP TO OVERTAKE GPON AS THE DOMINANT PON SOLUTION**

large-scale residential PON deployments and 25G-PON for their 5G transport and enterprise networks.

As the deployment of 5G networks increases, service providers are looking for efficient ways to transport traffic from small cell units to the core network. 25Gb/s-PON is expected to be a suitable technology for this requirement, especially for operators who have experience using standards for transport in existing LTE networks.

**Network scenarios: Ensuring smooth migration for operators**

It is important to make sure that the migration to XGS-PON is smooth. It can be achieved through two ways of deployment. The first is through Greenfield deployment, where XGS OLT's are deployed on day one without any changes to the existing OCS business. This deployment scenario is most suited for competitive carriers (OTTC).

The second deployment scenario involves using the existing ODN with spare feeder fibres. In this scenario, both GPON and XGS-PON can use their own fibres in the same sheath. To achieve coexistence,

an External or MultiPON Module (MPM) with an internal CEX can be used. This approach allows for a smooth transition to XGS-PON without disrupting the existing GPON service, which can continue to operate until it is phased out over time.

**What to expect and what the future will bring**

In conclusion, the deployment of PON technologies is rapidly evolving to meet the growing demand for high-speed broadband services. XGS-PON is currently the preferred technology for most operators, with trials already moving to production deployments. However, 10G-PON technologies are queued up to overtake GPON as the dominant PON solution, while the 50G-PON is expected to be the next major ITU PON standard. The future PON technologies will gain momentum after 2024, with 25G-PON expected to gain traction as operators seek future-proof solutions that are backward compatible with existing PON deployments. Ultimately, 50G-PON is expected to dominate in the long term due to its ability to deliver unprecedented bandwidth, and Chinese telcos' adoption of the technology is expected to decrease equipment prices.

While 100G-PON lab tests started in 2022, the technology is not expected to see widespread adoption until after 2027. Overall, the PON industry is continuously innovating to meet the ever-increasing demand for faster and more reliable broadband services. **FS**

**Katia Safonova is Market Development Manager at Corning Optical Communications**



# IN THE END

A look at the market for network optical line termination (OLT) equipment and some of the products and solutions available

Optical line terminals (OLT) are used by service providers as the endpoint hardware of a passive optical network (PON). Their main functions include conversion between the electrical signals used by the service provider's equipment and the fibre optic signals used by the PON network; and the coordination of multiplexing between the conversion devices on the optical network terminals (ONT).

OLT features include a downstream frame processing function for receiving and churning an asynchronous transfer mode cell to generate a downstream frame, and converting a parallel data of the downstream frame into a serial data. It also provides a wavelength division multiplexing (WDM) means for performing an electro/optical conversion of the serial data of the downstream frame and performing WDM.

Upstream frame processing functionality allows data extraction from the WDM

means searching an overhead field, delineating a slot boundary, and processing physical layer operations administration and maintenance (PLOAM) cell and a divided slot separately. Control signal generation allows the performance of a media access control protocol and generation of variables and timing signals used for the downstream and upstream frame processing functionalities. There is also a control method for controlling the downstream frame and the upstream frame processing functionalities by using the variables and timing signals from the control signal generation function.

## Commercial products

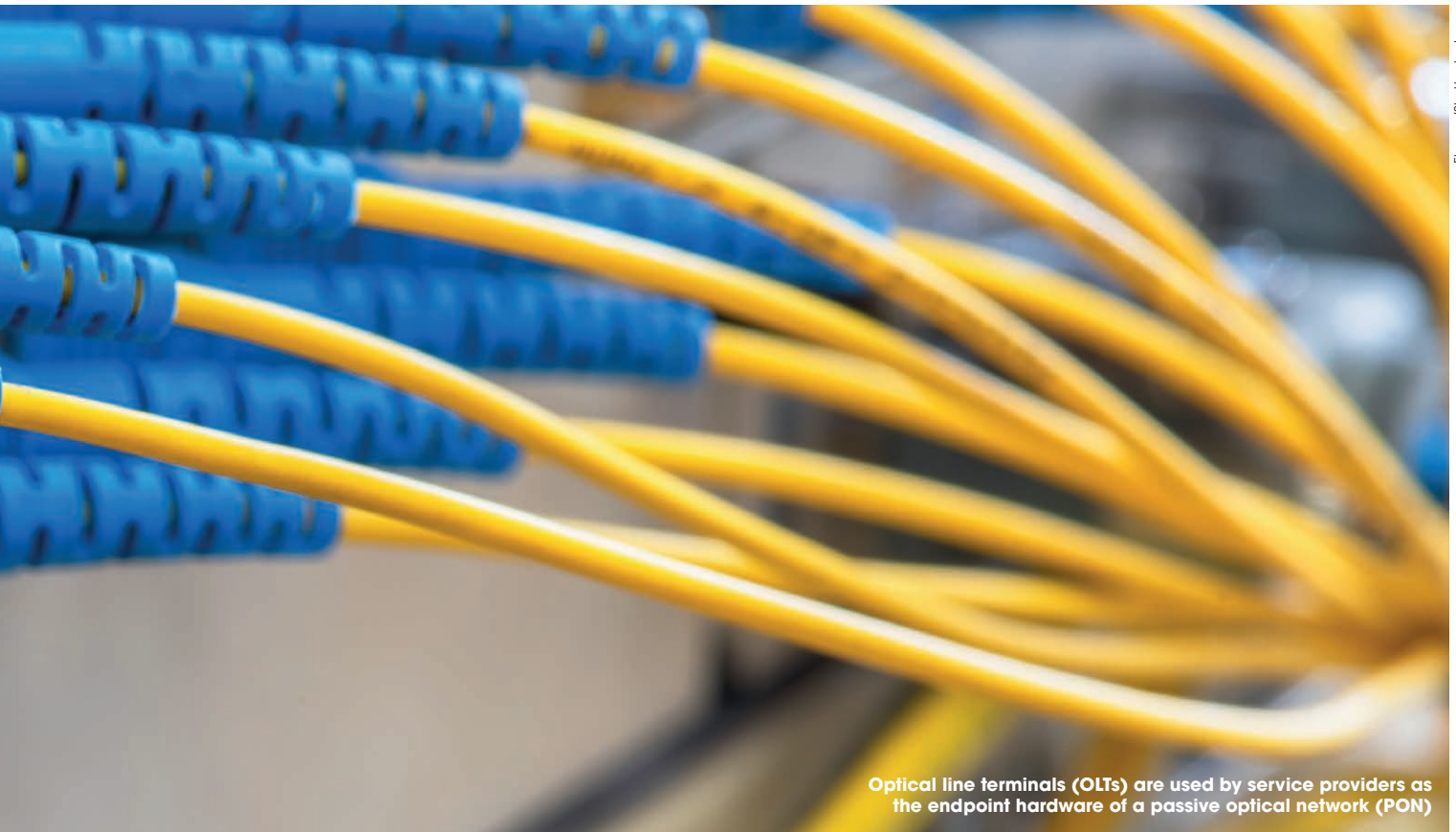
Vendors of OLT equipment include **Adtran**, which provides OLT solutions spanning dense urban, sub-urban and rural market use cases. Each OLT variant delivers distinct and differentiated value for each

specific fibre access network operator segment. Products include integrated OLTs, disaggregated OLTs and remote OLTs.

**Broadcom's** PON portfolio is designed to play a key role in advancing the technology. The company offers an end-to-end solution that includes OLT MACs, ONUs and integrated home gateways. Support is available for multiple PON protocols on a single silicon architecture, delivering software development leverage to system vendors. Solutions below include products optimised to deliver the industry's latest requirements, including XGS-PON and NGPON2 standards.

**Calix's** Intelligent Access Edge suite of products, powered by the Axos platform, is designed to aid 10G PON deployments. Products include the GigaPoint ONT and AXOS E7-2 intelligent modular system line cards. The E7-2 XG801 XGS-PON/GPON line card enables 100G deployments in temperature-hardened environments, with two 100G transport uplinks over IP/Ethernet-based networks. It provides eight XGS-PON/GPON OLT ports and four additional 10GE SFP+ sockets for point-to-point Ethernet connections or 10G transport.

**Cisco** offers OLT solutions as part of its broader portfolio of networking equipment. Its OLT products support GPON and other PON standards for delivering high-performance broadband services. The



Optical line terminals (OLTs) are used by service providers as the endpoint hardware of a passive optical network (PON)

Catalyst PON Series offers various OLT and ONT options for different deployment needs. CGP-OLT products are compact and high-density network aggregation devices, meeting the requirements of ITU-T G.984 and relative GPON standards, with high access capacity, reliability and powerful security function.

DZS's Velocity Broadband Connectivity solutions range is designed to accelerate and simplify the network-wide deployment of future-proof, next-generation multi-gigabit services over fibre. The solutions are designed to be used with any topology, service, network location and physical media. OLTs are complemented by a line of fibre-fed g.fast DPUs to support the delivery of multigigabit services to those subscribers for which copper is still the only practically viable access network physical media.

FiberHome provides OLT equipment for GPON and EPON networks. Its products are used by telecommunications operators globally. The company's OLT platform AN6000 series is designed to be next-generation intelligent OLT devices that offer users integrated service access solutions. The platform can meet the requirement of hybrid scenarios and can be applied to all FTTx scenarios, as well as service scenarios, including smart home access, government / enterprise group customer access, and 5G fronthaul.

Huawei provides a range of passive, all-optical network access solutions, including the OptiXaccess EA5801E-GP16 – a box-shaped OLT with GPON access, supporting both passive optical LAN (POL) and FTTH solutions. It carries all services over a single fibre network. Also available is the SmartAX EA5800 – a full-service distributed OLT that provides GPON, XG-PON, XGS-PON, GE and 10 GE access and supports multiple network solutions, including FTTO, FTTM and FTTH.

The SI3000 Lumia is Iskratel's flagship broadband-access platform. Within this, the compact SI3000 Lumia GPON, XGS-PON and Combo PON OLTs are designed for low-density deployments and serve all types of users, deployment scenarios and business models. The dual nature of these OLTs is designed to help facilitate cost-effective virtualisation, while the low energy consumption per port helps operators implement their sustainability strategies.

Nokia has a number of OLT solutions within its Lightspan family of products that are specifically designed for SDAN use cases, which bring data centre practises to the central office and introduce cloud and operational agility to the copper/fibre outside plant. The latest addition, available with the Quillion chipset, is the Lightspan DF-16GM. It can simultaneously provide services from 1 to 25Gb/s and incorporates GPON, XGS-PON and 25G PON.

Available from Optokon is a series of GPON OLTs. Designed to be particularly suited to small village or apartment applications, the OLTs have up to 8 PON ports, 1U case and hot-swappable redundant power units. Remote management is provided via simple network management protocol and command line interface.

The Radisys series of OLTs support Combo PON, G-PON and XGS-PON with software based on VOLTHA/SEBA reference architecture. Open APIs that use standard interfaces for all management functions will help ease the transition to an SDN-controlled environment. The OLTs leverage virtual hardware abstraction for greater agility, programmability, increased automation, faster product innovation cycles and deeper network visibility.

ZTE's Light PON solution enables flexible, economical and efficient FTTx network construction. It is designed as an end-to-end solution for FTTx network construction and includes a series of small-capacity OLTs, Combo PON, outdoor cabinets, pre-connectorised ODN and intelligent OAM. **FS**

**This is not an exhaustive list. If you provide OLT solutions and would like your company to be included, please contact editor.fibresystems@europascience.com.**

# FLYING THE FTTH FLAG IN BERLIN

A preview of some of the topics and themes that will be covered during the FTTH Conference 2024 in Berlin

The FTTH Conference, run by the FTTH Council Europe, takes place from 19-21 March in Berlin, Germany.

Focused specifically on the deployment of fibre-to-the-home (FTTH) in Europe, the event brings together a high-profile pan-European audience of decision-makers, investors, technical and regulatory experts. It will feature up to 24 workshops, 16 conference panel sessions, and numerous high-profile keynote speeches.

The conference and exhibition, which is hosted by a different European city every year, comes to Berlin for 2024 – which is coincidentally, the FTTH Council's 20th anniversary year.

Host country Germany was noted by the 2023 Market Panorama report – carried

out on behalf of the FTTH Council Europe by iDate – to be one of the three European countries with work still to be done when it comes to FTTH deployment. This presents opportunities for operators to provide significant growth in fibre coverage in the next five years for these markets, and there will be an opportunity to hear from a panel of CEOs representing German FTTH network operators during the conference about their strategies to intensify rollout and ensure adoption. The talk will also address the role of private investments and regulation when it comes to bringing fibre to all German households by 2030.

Vincent Garnier, Director General at the FTTH Council Europe told *Fibre Systems*: “Germany is by far, the largest market and the largest market still to cover with fibre.

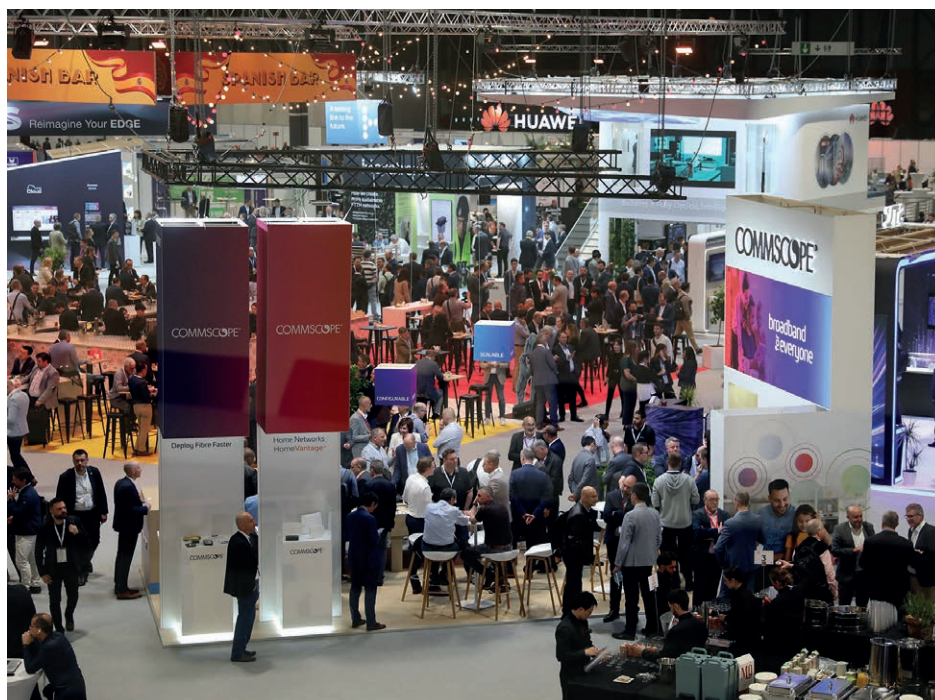
Germany has a quite significant cable coax HFC network footprint compared to the UK or France. It also has a legacy copper network, which is good quality. So that explains why it took them more time to start investing in fibre.”

## German FTTH rollout and adoption plans

Germany will also be represented by a number of the keynote speakers, such as Volker Wissing, Minister for Digital and Transport at the Federal Government of Germany. Wissing will discuss Germany's digital strategy and FTTH rollout and adoption plans, including the actions being put into place by the Federal Government to make sure that all German citizens have access to fibre connectivity by 2030.

On the topic of the Market Panorama Report, the 2024 FTTH Conference will also be the launchpad of the latest round of figures, detailing how European countries advanced FTTH deployment over the last 12 months in line with connectivity targets set by the European Commission for 2030. Last year's report put the total number of homes passed with FTTH/B in EU39 countries at 219 million in September 2022, compared to nearly 198.4 million in September 2021, with the biggest growth in absolute numbers in the United Kingdom (+4.2 million), France (+3.5 million), Turkey (+2.9 million), and Italy (+2.1 million). In terms of FTTH/B penetration, Iceland topped the charts for the fourth year in a row, with a 76.8% penetration rate. Can it reach the top spot for a fifth time?

Garnier said: “Our next FTTH/B Market Panorama report is expected to show a continuation of this growth in coverage and adoption. One of the fundamental drivers behind this positive evolution is the proactive approach of European Institutions and regulatory bodies, placing connectivity as a top priority on their agenda. the general trend is that there is



The two-day exhibition will host more than 100 fibre network technology vendors (Image from the FTTH Conference 2023 in Madrid)





The conference will feature up to 24 workshops, 16 conference panel sessions, and a number of high-profile keynote speeches (Image from the FTTH Conference 2023 in Madrid)

no major change compared to what we presented before. It's a continuation of the good progression we have witnessed in the past."

### EU initiatives for fibre deployment

On topic, Roberto Viola, Director-General of DG CONNECT at the European Commission is another big name keynote speaker this year. He will take to the stage to unveil the latest EU updates and initiatives for FTTH deployment in Europe, offering insights into strategic policies, regulations, and financial support mechanisms designed to accelerate connectivity and innovation across member states.

In addition to the keynotes and panel discussions, the FTTH Conference programme will also once again feature the FTTH Awards ceremony, designed to recognise outstanding companies and individuals that have actively contributed to the acceleration of FTTH in Europe in the last 12 months.

Award categories include the Operator Award, which acknowledges an operator company that has significantly contributed to the development and roll-out of FTTH in Europe; the Individual Award, which

honours a single person for their efforts to make FTTH happen in Europe, and the Champion of Diversity Award, which returns for its second year to recognise the efforts made by a company to address diversity within the fibre industry. Last year's winners included UK incumbent Openreach, which took home the Operator Award; Gerda Meppelink, Senior Expert Politics and Administration at Deutsche Glasfaser, who bagged the Individual Award; and Fiberhost, which won the Champion of Diversity Award.

### FTTH Innovation Awards

New for 2024, these categories will be joined by the new FTTH Innovation Awards. These will be divided into five different categories, all of which are aimed at recognising exhibiting sponsors of the event for the most innovative FTTH products and solutions. The five categories are: Passive Infrastructure; Active Infrastructure – Central Network; Active Infrastructure – Home Network; Planning, Workflow, Mapping, GIS, AI/Software; and Installation Equipment, Tools, Test and Measurement Instruments. The judging panel will be made up of FTTH experts such as FTTH Council Europe board



## OUR NEXT FTTH/B MARKET PANORAMA REPORT IS EXPECTED TO SHOW A CONTINUATION OF THIS GROWTH IN COVERAGE AND ADOPTION



members, committee chairs and conference and workshop speakers from the 2024 event. Winners will be announced during the conference and exhibition in March.

On the technology side, visitors to the conference will also be able to walk the floor of the two-day exhibition, featuring more than 100 fibre network technology vendors, including Adtran, DZS, Commscope, Corning, Huawei, Nokia, Linksys, Prysmian Group, ZTE and Zyxel. Keep your eyes peeled in the coming weeks for a more detailed exhibition preview on the Fibre Systems website, and if you're exhibiting at the event and have some exciting news or technology you want to shout about, or if you're attending and have a story to tell, please let us know:

[editor.fibresystems@europascience.com](mailto:editor.fibresystems@europascience.com). **FS**

# FTTH NETWORK OPTIMISATION: WRAPPING TUBE CABLE (WTC) WITH SPIDERWEB RIBBON (SWR) FIBRE



Webro, in partnership with Fujikura

With Fujikura Wrapping Tube Cable (WTC) with SpiderWeb Ribbon (SWR) Fibre, operators can increase capacity to meet the demands of businesses and communities across the UK and Europe

Why some of the biggest FTTH network operators in Europe are turning to Fujikura Wrapping Tube Cable (WTC) with SpiderWeb Ribbon (SWR) Fibre to expand their networks and meet the demands of an increasingly digital future

**A**s we generate more data, network operators are striving to increase capacity to meet the demands of businesses and communities across the UK and Europe. The specific discussion surrounding ribbon fibre cable is one about efficient and cost-effective optical network deployment and management. This is where Fujikura Wrapping Tube Cable (WTC) with SpiderWeb Ribbon (SWR) Fibre\* steps in.

WTC with SWR is an innovative ribboned optical fibre product. It has a fully dry central core cable which enables 12-fibre mass fusion splicing, and drastically reduces cable diameter and weight. Ribbon fibre facilitates the simultaneous splicing of 12 fibres, which reduces installation

time significantly by up to 72% versus the traditional practice of splicing individual fibres. It's easy to see why the product is enabling some of Europe's biggest network operators to expand their networks and meet the demands of an increasingly digital future. The structured ribbon configuration makes them a valuable solution for high-capacity telecommunications networks, data centres, rail, and mass transit networks, along with other environments where space optimisation and efficient fibre management is crucial.

**Specifically, there are five key reasons why WTC with SWR is a game changer...**

## #1 Industry-leading fibre density means more effective use of duct space

Optimising duct space is vital. The unique construction of WTC with SWR enables customers to get more fibres in their cables. Empowered with increased fibre density, they're able to place more fibres into the available duct space.

By contrast, traditional loose tube cables use a strength member that runs through the centre of the cable, which is surrounded by different tubes containing individual fibres. This design results in sizable dead space in the cable. The WTC with SWR design is superior because the strength members

are inside the cable, and the cable interior is packed full of fibres that use all of the available space.

Demonstrating this superiority, a 1728-fibre Fujikura Wrapping Tube Cable is 37% smaller than a 1728-fibre conventional ribbon loose tube cable, and 65% lighter. This results in the optimum use of duct and manhole space, which are often congested with legacy cables - especially in larger, older cities.

## #2 Cost of ownership is reduced

It takes less time to splice WTC with SWR. With SWR you can splice 12 fibres at once using a mass fusion splicer (e.g. Fujikura 90R), as opposed to undertaking hundreds of individual fibre splices. Field studies have shown that splicing together two 432-fibre to 432-fibre loose tube joints is a job that can take 41 hours of preparation and splicing time on average. By contrast, the same task using WTC with SWR cable would take approximately eight hours.

Because WTC with SWR enables work to be carried out 8 to 12 times faster than traditional loose tube fibre, the total cost of ownership requires less man hours. This is a significant benefit to customers in the current climate, where rising labour costs and difficulty securing sufficiently skilled labour to complete the work are both major challenges.

### #3 Deployments are sped up

To access the fibre and begin splicing with traditional loose tube cable the binding yarns have to be cut, the tubes must be unwound from the CSM, and each tube has to be cut and removed. Traditional loose tube cable also contains a jelly to keep it watertight, which has to be removed from the fibres using alcohol wipes and further extends preparation time. Overall, it's a messy, time-consuming process.

By contrast, the ease of splicing SWR fibre – especially with the dedicated Fujikura 90R splicer, is a powerful benefit, and it's complemented by the dry construction of WTC. Because it uses a water blocking tape to keep moisture out it's free from jelly and doesn't contain binding yarns or tubes, so accessing the fibres is quick, easy, and simple.

### #4 Manpower efficiencies are optimised

One engineer working on a single job for a whole week using traditional loose tube cable could reduce the time to get the job done to just one day by using Fujikura WTC™ with SWR. This is hugely beneficial to network operators who organise teams of engineers as they prosper from increased labour capacity. With combined faster deployments, the increased flex in the workforce frees them up to both deal with repairs and to move on to

new jobs sooner. Furthermore, self-employed engineers gain because with jobs taking less time, they get more opportunity to find work, plan work, and administer their business. They also gain credibility by building a reputation for being a faster installer.

### #5 WTC with SWR is kind to equipment

Because Fujikura cable is dry it's kinder to equipment. There's less material to get into the splicer and prevent it from working, whereas the jelly in traditional cables picks up dirt that inevitably finds its way inside splicers and strippers and results in them needing to be taken apart and cleaned. Fujikura WTC with SWR is clean to start with, and that property remains.

### In summary

The significance of ribbon fibre cable can't be overstated in the fast-evolving fibre optics sector. At the forefront of technological development, Fujikura has delivered an innovative solution that enhances installations, drives efficiency, and increases speed.

Fujikura WTC with SWR is spearheading a future where installation times are reduced by an impressive 72%. The meticulously organised ribbon structure holds the key to unlocking unparalleled fibre density and streamlined installations. From FTTH

## THE SIGNIFICANCE OF RIBBON FIBRE CABLE CAN'T BE OVERSTATED IN THE FAST-EVOLVING FIBRE OPTICS SECTOR

connections and data centres to rail and mass transit communications, Fujikura WTC with SWR is a cornerstone asset in project environments which prioritises fibre management and the optimum use of space.

As technology advances and our world becomes increasingly interconnected, Fujikura's WTC with SWR fibre cable solution will continue to boost efficiency, reliability, and innovation across the modern communications infrastructure. **FS**

If you need technical help and advice to choose the right cable for your project, talk to the dedicated Webro Team for expert advice: [sales@webro.com](mailto:sales@webro.com)  
0115 972 4483 | [www.webro.com](http://www.webro.com).

\*Wrapping Tube Cable (WTC) and SpiderWeb Ribbon (SWR) Fibre are registered trademarks of Fujikura

# NEW WHITE PAPER

## THE KEY TECHNOLOGIES OF SPIDERWEB RIBBON (SWR) CABLE AND SZ BUNCHING

The White Paper from Webro, in partnership with Fujikura, introduces Fujikura's Wrapping Tube Cable (WTC) with SpiderWeb Ribbon (SWR) cable and SZ Bunching as key technologies, demonstrating their significant impact on reducing costs and optimising existing infrastructure for optical network operators.



\*Registration required

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# A VISION FOR OPTIMISED NETWORK INSTALLATION

FTTH network operators in Europe are increasingly leveraging the latest AI and computer vision tools to optimise network installation, maintenance and monetisation

## KEELY PORTWAY

When it comes to FTTH network deployment, the installation process is one of the most critical stages when it comes to reducing the total cost-of-ownership. Taking the time to get the fibre termination right first time, every time is the only way to minimise costly truck rolls and call outs.

Unlike other stages of the network deployment, the last mile installation is additionally a customer-facing role for engineers. They need to be able to access the customer's premises in order to plan the optimal route for the interior cabling route, taking into account existing infrastructure and making sure they minimise any impact on the aesthetics of the customer's property. This means that they need to be able to effectively communicate with consumers so that they understand what is involved during the installation process, address any concerns they may have, and set expectations around downtime or disruptions.

While every property will be different, in many smaller or more difficult to access flats, apartments of multiple dwelling units, it is even more important to handle the fibre optic cables with care to prevent bending beyond recommended specifications in order to fit. Although this is good practice at any property, in addition to avoiding any excessive pulling or tension. If the fibre bends too much, there is a risk of the light escaping and reducing the optical signal strength.

As part of this customer-facing aspect of the network installation, the operator needs



Valmedia/Shutterstock.com

**Operators can use computer vision AI to perform checks and documentation when using existing infrastructure from incumbents**

to keep and maintain accurate records of the installation process, including diagrams, photographs, test results, and any challenges encountered.

### Computer vision AI for optimised record keeping

This is an area in which the adoption of computer vision AI can help to optimise the process. Mike Greening, CCO at Inveniam and former product director at UK altnet,



OPENREACH IS QUITE STRICT ON ENSURING THAT THE PHOTOS CONFORM TO SPECIFIC REQUIREMENTS, SO THE WORK IS DONE TO SPECIFIC STANDARDS





PRAVEEN CHAKRAVARTY/Shutterstock.com

### Computer vision AI can be used by operators to help optimise network installation and maintenance

CityFibre explains: “When the engineer goes into the premises to do the install, there are a number of checks that an operator will want to make sure are done correctly. These include the quality of the splicing in the wall box outside, or making sure that when the equipment goes on to the wall that it’s done to a high standard, the right distance from the skirting board etc.. Another factor is the position of the router. One of the reasons why there are calls into an inbound call centre is that the router may not be in the best position to give the optimal Wi-Fi service. So, a customer might switch networks and the position of the router may be different than it was before and they find that the Wi-Fi service is not as good, so that may result in a reason to call into the contact centre.”

Computer vision AI involves machines interpreting and understanding visual information. It does so by creating algorithms and techniques that can empower computers to extract vital information from data, such as images or videos. Its ultimate goal is to replicate human vision capabilities in machines, allowing them to perceive, analyse, and make decisions based on the data.

In the FTTH industry, operators have been using AI in customer communications for a number of years. Vodafone’s TOBi generative AI chatbot, for example, was contacted around eight million times in 2022, and it is designed to learn with every customer request. Today, it can recognise several hundred different subject areas and use that information from connected systems to answer customer concerns about the delivery status of hardware or current network disruptions.

More increasingly, AI is being leveraged in network design and planning, such as outlined on page 8. Computer vision AI technology specifically can also be used to enhance operations and improve infrastructure maintenance. As an example, computer vision algorithms can analyse fibre optic cables to identify potential issues like cuts, bends, or other physical damage. This proactive approach allows operators to address problems before they escalate, helping to minimise downtime and service disruptions.

One particular use case relates to operators using existing infrastructure for incumbents or other operators to build their networks. Greening explains: “This is

■ ■  
I THINK THAT THE NEXT WAVE (OF AI) WILL BE HOW IT CAN BE USED FOR THE PLAYERS THAT SPECIALISE IN THE CUSTOMER SERVICE SPACE  
■ ■

particularly the case in the UK market. In terms of the roll-outs of networks, whether it’s CityFibre or one of the other altnets that are out there, they’re relying on physical infrastructure access (PIA) from [UK incumbent] Openreach. As part of using Openreach’s ducts, poles chambers etc.. to roll out their networks, they have to submit notices of intent. If they find blockages in Openreach’s network, they submit a network adjustment and each of those processes requires photographic evidence. Openreach is quite strict on ensuring that the photos conform to specific requirements, so the work is done to specific standards.”

Greening explains that, with so many altnets and such a vast legacy network in →

borzwoj/shutterstock.com



Computer vision AI can be leveraged to check the quality of the splicing in the wall box outside the customer's premises

IT USED TO TAKE  
OUR ANALYSTS 10  
DAYS TO CHECK  
4,000 PHOTOS,  
NOW WE DO IT  
IN SECONDS

→ the UK, it's perhaps little surprise that there should be a volume of these types of reports. "There's a significant proportion of them that get rejected by Openreach," he says.

**Computer AI for reducing streetwork costs**

In order to ensure that this does not happen, the altnet has to put a lot of compliance work, with a high headcount and many hours, into managing this process. "If they've got to go back and retake photos because they may not be done to the right standard on the first occasion, then that actually then creates a bit of a headache because they've got to physically return to site or send contractors back, which could result in additional bill from the contractor, but also further streetwork costs associated with repeating jobs such as lifting manholes, which requires permission," says Greening.

This, in turn, can result in general delays to getting a network signed off. "What we're finding at the moment," says Greening, "is that the possible main pain points off the back of these compliance processes include delays to networks going live, but it can also result in delays to the network adjustment process from a cash flow perspective. So getting those reports right the first time can make things a lot easier."

Incorporating computer vision AI can help to ensure compliance with quality standards and photographic obligations. It can also reduce the number of people required on site to prepare or review photographic evidence and speed up the

sign-off process for all parties, avoiding unnecessary delays and costs for non-compliance, penalties or site revisits.

It can also be a useful tool before the network goes ready for service, where operators must undertake a number of audit checks to make sure the network is ready to go live. It allows engineers to detect and resolve issues while they are already on site, and therefore eliminate potential rework and network roll-out delays.

**Computer vision AI for fault resolution**

An additional use case for computer vision AI in FTTH rollout is around installation, maintenance, and management fault resolution, and this is the area that Greening believes to currently be the most untapped. "Most of the focus is on build and install," says Greening, "and then I think that the next wave will be how it can be used for the players that specialise in the customer service space."

Then there are the ways in which operators in different geographical locations can leverage computer vision and AI to meet their specific requirements. We have touched on the UK wholesale market,

but in the French market, Greening has seen a move towards operators using the tool to perform checks on street equipment. "All operators have this check, but we have seen in the French market, operators using computer vision to look for litter in the bottom of a cabinet. They can detect whether there's litter in a cabinet and they can detect geographic information system (GIS) location and the photos coming in. They can also make sure that all of the labels are on correctly, that they're the right labels, right down to the straps that are being used."

One operator that has done just this is Axione, an altnet set up in 2003 by five entrepreneurs to provide a shared fibre-optic network solution on a market where the major commercial operators were not yet present. In 2022 the wholesale operator reached one million FTTH subscribers on its networks.

In the same year, the operator took the decision to incorporate computer vision AI into its network in order to improve efficiency and operational performance. Explains the company in a news release about the project: "Our mandate is to monitor the quality of connections made in street cabinets in the regions by commercial operators. Using multiple contractors in these different stages leads to technical malfunctions (overcrowding, crossing of fibre optic cables) which impair the quality of the network."

The company's technicians used computer vision AI to report in real time on the connections made in a street cabinet using photos taken live on the platform. This can identify potential anomalies by analysing various parameters that it has been told to recognise. Says Axione: "It used to take our analysts 10 days to check 4,000 photos, now we do it in seconds! This saves time and allows workers to solve the problem on the spot. In the past, without this tool, Axione's Operations Department was unable to monitor all street cabinets. We are making the telecoms sector more professional through improved reliability and performance."

In terms of the results for the operator, more than four million images were processed over two years, each contributing to Axione's maintenance strategies and predictions. The operator has also enjoyed a 46% reduction in incidents and can more easily undertake a complete anomaly detection, as its AI models can detect, report, and suggest rectifications. Gauthier Nanoux, Head of Operations at Axione says: "With this solution, our cabinets have undergone significant enhancements, making FTTH cabling and quality checks more efficient and precise across the region." **FS**

## CASE STUDY: HOW PRYSMIAN IS HELPING TO KEEP THE UK CONNECTED

From urban to rural, how Prysmian has leveraged its connectivity solutions to bring fibre optic internet to two very different UK locations

If the UK was a little slow to enter the FTTH deployment race in the beginning, it has certainly made up some ground in recent years, with full-fibre coverage reaching 42% of UK homes, or around 12.4 million by September 2022, according to the most recent Market Panorama report figures from the FTTH Council Europe.

Colchester is one city that has seen investment in FTTH connectivity over the last few years, after Colchester Borough Council first received funding in 2017 to bring fibre broadband to Colchester Town Centre. As the dark fibre network grew and spread to more regions in the city, for the installation designers, led by Colm Coyle, managing director of Rio IT, it became clear that space could be an issue when it came to updating the existing infrastructure.

### Fibre densification for urban dark fibre network

Said Coyle: “The target was to reach 7,000 people with a new super-fast fibre system, inserted into the existing duct system, which was built mainly to operate CCTV cameras around the area. They only require a relative handful of fibres. For this task, we were going to have to squeeze around 500 individual fibres into a 16mm diameter duct, which means we actually only had 9-11mm of space inside the tube. I needed the densest possible fibre cable to be able to achieve a great result on this project.

Happily for Colm, he found Prysmian’s 552 Sirocco HD fibre cable in time to specify 26km for the project, supplied by Fusion Utilities, and installed by Scotech in a ring around the city. The cable is made up of 552 individual G657A2 fibres, with a fibre density of up to 10.5 fibres per mm<sup>2</sup>. It uses Prysmian’s BendBright-A2 200µm single-mode (ITU-T

G.657.A2) bend insensitive fibre, allowing it to retain enough flexibility to be bent around tight corners without being damaged. The apparatus for blowing the cable was set up at three points, one of which was the Town Hall, from where 26km of cable was blown along the existing duct route, right around the city. The installation was completed in December 2021 with minimal disruption to the community, with no road works or loud maintenance.

“The 552 Sirocco HD fibre cable is awesome,” said Coyle, “It’s really easy to handle and about a quarter of the weight of other fibre cables of a similar capacity. Truly an outstanding piece of engineering.”

### Pre-connectorised CMJ closures speed up rural fibre deployment

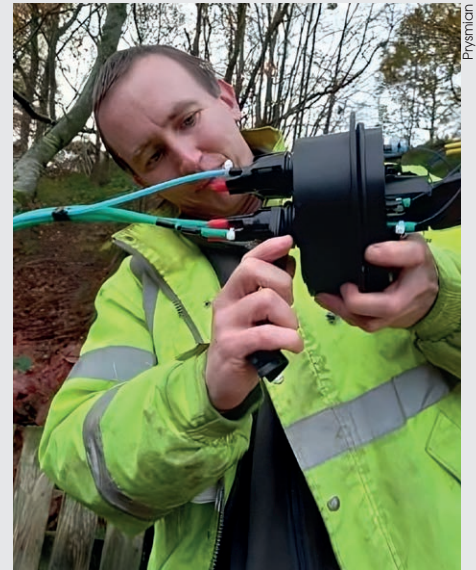
And it’s not just in urban areas of the UK that Prysmian is helping to connect. The company also successfully trialled its pre-connectorised Compact Multifunction Joint (CMJ) closure

BY BEING ABLE TO USE PRE-TERMINATED BLOWN FIBRE WE’RE SAVING BETWEEN 45 MINUTES TO AN HOUR INSTALLATION TIME PER PROPERTY

during a rural fibre-optic installation between the Atyre Estate and Rafford in northeast Scotland, where it helped to speed up the deployment of fibre to individual properties.

The installation was carried out by alternative internet service provider (ISP) External Reality, led by Richard Allan, Managing Director, who said the closure helped make significant time savings on the installation. “By being able to use pre-terminated blown fibre we’re saving between 45 minutes to an hour installation time per property.”

The trial took place on the project’s second phase, for which more than 6km of fibre optic cable was installed to 15 properties in the area



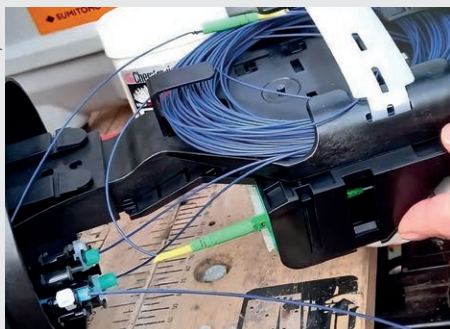
Richard Allan, Managing Director of External Reality, the ISP that carried out the rural fibre-optic installation between the Atyre Estate and Rafford in northeast Scotland

south of Forres, between the Atyre Estate and Rafford. External Reality had already been using Prysmian Small Joint Closures (SJC)s, Ultra Compact Multi Function Joints (UMJ)s, and CMJ)s for spliced connections, but as it used pre-terminated cables to speed up final deployment to individual properties, it became apparent that a pre-connectorised joint closure was also required.

Said Allan: “We don’t work in big built-up areas, instead we’re often targeting about 20 or so properties spread over 2 or 3km. I know splicing has become pretty straightforward, but there is the prep-time involved and you don’t want to be sat in the corner of a field in the cold splicing if you can help it, so pre-terminated cables and pre-connectorised closures helps simplify and speed the installation.”

Having trialled pre-connectorised closures from other manufacturers, External Reality found them to be “quite inflexible” and “did not work particularly well”. So the team took the opportunity to trial the Prysmian Group pre-connectorised CMJ unit on the final connection to three properties. Local contractors had already buried the ducting and External Reality had installed the pre-terminated cable, so installation was simply a matter of plugging in the fibre to the pre-connectorised closure. “It was good just being able to plug in the cable to complete the installation to this point,” explained Allan.

A fibre connection from the CMJ closure connects to a Prysmian Hybrid Drop Box (HDB4) on the outside of each property to enable the final connection. External Reality plans to adopt the pre-connectorised CMJ unit on the next phases of its work, says Allen: “We’d definitely use Prysmian’s pre-connectorised CMJ unit on future schemes, whenever it is appropriate.” **FS**



Prysmian's pre-connectorised CMJ unit

# WHAT IS THE BEST METHOD FOR FIBRE OPTIC CABLE INSTALLATION?

The answer to the all-important question: when it comes to fibre optic cable installation, which way to go – push, pull or blow?

## CHRIS BACON



Installers in the telecoms industry often ask whether they should push, pull, or blow fibre optic cables. Here we discuss the options and applications where we would consider the use of conventional pulled cables, hand and machine pushable cables, or air blown cables as the alternatives. In each case we also highlight the relative differences, advantages, and challenges associated with them.

### Pushed cable installation

Pushed cables are typically used within last-drop environments towards properties where the distance from points of presence is short. The challenge faced with pushable cables relates to rigidity and flexibility.

Cables are pushed through dry duct or conduit environments over short runs to reduce friction within the line. In long runs increased levels of friction may be

encountered, which can cause blockages and/or damage to fibre optic cables that then require expensive repair time on site.

This method is used less than pulled or blown applications and is often reserved for pre-terminated short span applications.

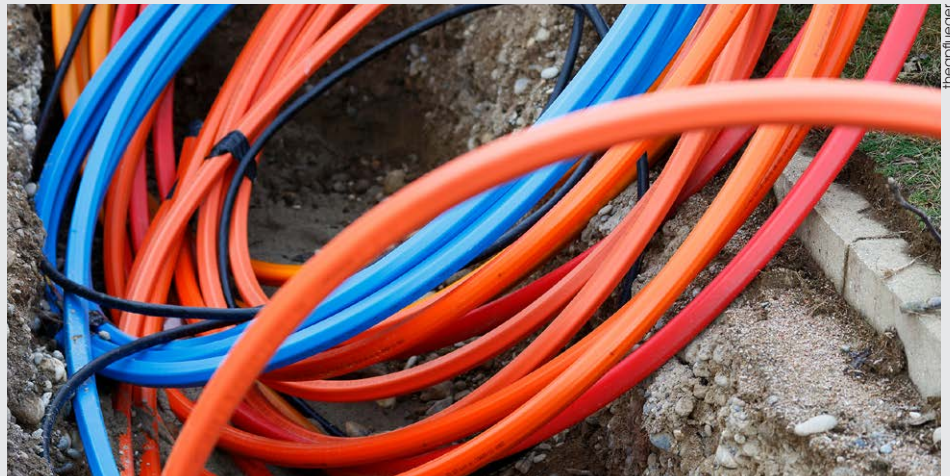
### Blown cable installation

Cable blowing is performed using compressed air to float cables through ducts or subducts (smaller ducts that can be bundled together for multiple pathways) using a blowing machine. This enables installation teams to lay long-distance networks in an efficient and reliable way.

Blown cables are typically called microcables. They tend to be smaller than conventional pulled cables as they're usually installed within small diameter ducts, although they do retain a sufficient element of rigidity to allow for high levels of blown installation performance. This is



THE SUCCESS OF INSTALLING CABLE IN THE DEPLOYMENT OF FIBRE OPTIC NETWORKS IS CRITICAL TO THE SUCCESS OF EVERY PROJECT



TheOptiGeiger



Network installers often ask whether they should push, pull, or blow fibre optic cables



often the preferred method of installation as it reduces stress on cables which can otherwise be experienced with pushing or pulling methods.

#### Pulled cable installation

In this method, a pull line (drawstring/tape) is initially threaded through the duct/conduit. The cable is then attached to the pull line and drawn through the conduit. This method can be used for both short and long runs using larger cables.

Multiple cables can be pulled together if the total cable fill and pulling tension don't exceed recommendations. Care must be taken to avoid applying too much tensile pressure though, as it can damage the cable. Swivel pulling eyes are recommended to reduce swivel load, and for high tension loads a breakaway swivel can be used.

#### Which fibre optic cable installation method is best for your project?

The success of installing cable in the deployment of fibre optic networks is

## UNDERSTANDING THE DIFFERENCE BETWEEN PUSHED, PULLED, AND BLOWN FIBRE CABLES IS ESSENTIAL FOR MAKING INFORMED DECISIONS

critical to the success of every project. The crucial decision is to choose the right installation method for the application.

Fundamentally, there are several key elements to consider when choosing either pushed, pulled, or blown fibre cables:

- Network distance
- Environment and accessibility
- Speed of installation within the context of project timelines
- Network performance requirements
- Compatibility with the existing infrastructure

- Cost versus budget considerations
- Expansion capability
- Maintenance and repair requirements
- Supplier product quality, expertise, and customer service capability

#### In conclusion

Understanding the difference between pushed, pulled, and blown fibre cables is essential for making informed decisions when it comes to designing, implementing, and maintaining fibre optic networks. All three installation methods offer distinct advantages over one another across different scenarios, which is why it's so important to understand them. Factors such as installation speed, network distance, and the environment play pivotal roles in determining which method is more suitable.

The choices made during cable installation directly impact performance, the overall efficiency of the network, and ultimately the success of the project. **FS**

**Chris Bacon** is Sales Director at Webro.

# TOOLS OF THE TRADE

We round up the latest tools and equipment for FTTH network installation

**F**ibre-to-the-Home (FTTH) operators and installers use a multitude of network equipment and tools to deploy and install fibre optic networks. Common installation equipment used in FTTH installations includes the single- or multi-mode fibre optic cables themselves and the optical network terminals (ONTs) such as those mentioned on page 14, that connect the network to the customer's premises.

When it comes to handling the fibre itself, splicers are used to join the ends. These can be mechanical, or fusion splicers, which splice the fibre optic cables together by melting and fusing the ends. Cable pullers and tensioners are used to install fibre optic cables through ducts or conduits, while cable blowing machines are used for installations in microducts. Installers also use tools to strip and cut fibre optic cables during installation, and cleaning kits ensure that connectors and splicing achieve optimal performance.

Fibre connectors are used to link the fibres in order to transmit light signals. Connectors such as SC, LC, ST, or other types, depending on the network design, can be pre-terminated or field-terminated. Fibre optic patch panels are used to organise and manage fibre optic connections in a central location, while a frame or enclosure houses fibre optic connections, providing a central point for network distribution.

There are also a number of test and measurement tools used for installation purposes including fibre optic tests – which use optical time domain reflectometers (OTDR), optical spectrum analysers, fibre test systems, attenuators and inspection probes. As well as these, there are separate tools available for copper testing, network protocol testing, home network testing and broadband testing.

## Commercial products

FTTH installation equipment vendors include **AFL**, which provides a number of products for network installation, including fibre optic cables, connectors, fusion splicers, and test equipment.

**Anritsu** specialises in test and measurement equipment, including tools for optical fibre and cable testing in FTTH networks.

**CommScope** offers a variety of fibre optic and access solutions, including cables, connectors, and closures for FTTH deployments. The company's portfolio is designed to encompass everything an operator might need for installation works, from the central office and head-end through the outside plant to the home, business or cell site.

As well as its range of fibre optic cables, **Corning** also supplies FTTH installation accessories including cable fibre access tools, tool kits, polishing film, cleaning accessories, and replacement pieces for previously purchased tool kits. A range of hardware solutions is also available to fit a project's cabling needs. Operators can select from racks, panels, modules, splice trays, and other structured cabling components.

Available from **Exfo** is a range of test and measurement equipment for fibre networks. This includes field testing fibre optic cables to measure performance, and inspection solutions to help technicians and engineers assess and rectify issues. The company also provides handheld optical fibre multimeters (OFMs) to do quick measurements of multiple key optical parameters and optical time-domain reflectometers (OTDRs).

**Fujikura** offers fusion splicers, fibre optic cables, and accessories for FTTH and other optical network applications. The company's passive optical products and connectivity solutions have been used by telecom



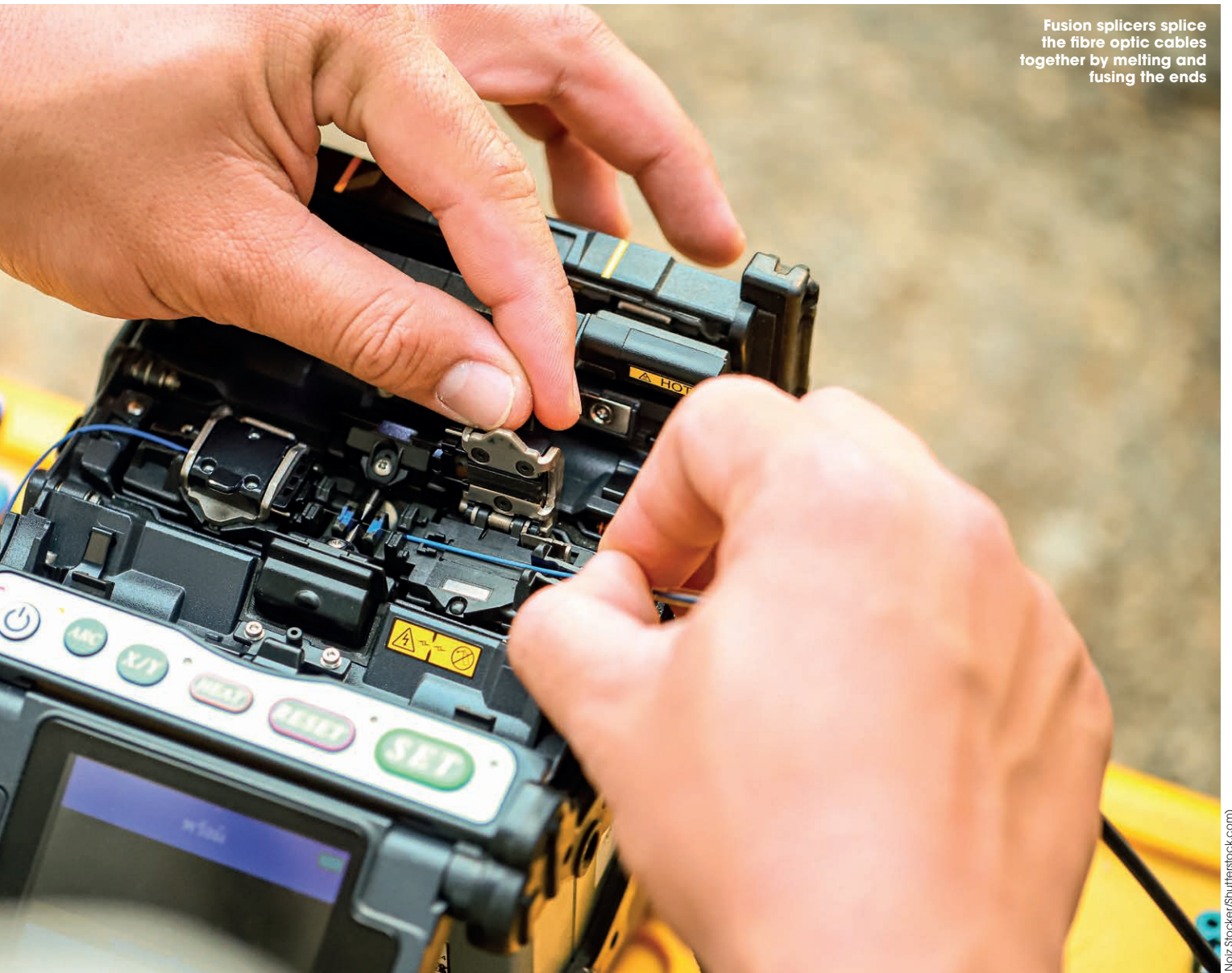
operators, contractors, governments and academia for decades.

**HellermannTyton** offers a variety of products and solutions for cable management, connectivity, and network infrastructure, including those relevant to FTTH installations. Products include fibre optic enclosures, connectors and adaptors, patch panels, cable management products, FTTH drop cable accessories, termination tools, labelling solutions and more.

**Huber + Suhner's** range of products for FTTH installations are designed to support the organisation of fibre connections and building a future-ready system. The company's dedicated structured cabling solutions help to enable flexible, modular and intuitive systems that are easy to operate, maintain, and upgrade.

**Inno Instrument** is a manufacturer, supplier, and provider of products and services for fibre optic network installation.

Fusion splicers splice the fibre optic cables together by melting and fusing the ends



Noiz Stocker/Shutterstock.com

The company specialises in fusion splicers, with a range of splicing machines available for different types of fibre optic cables. Inno also provides tools and accessories and test and measurement equipment for FTTH installation.

**Jonard Tools** manufactures more than 125 fibre optic tools and offers a range of kits for the fibre optics industry. Also available is a large range of fibre optic testers specifically designed for the fibre optics industry. In addition, 25 different fibre optic tool kits are available, each of which was assembled to give fibre optic technicians the tools they would need to take on a range of projects in one place.

**Prysmian** is known as one of the world's largest cable manufacturers, delivering cable solutions to network operators for more than 150 years. But it is not just the cables. The company offers a suite of connectivity solutions, including racks, joints, wall

boxes, customer termination boxes and pre-connectorised products such as indoor, outdoor, CoEx and high-density products.

**Senko Advanced Components** specialises in fibre optic interconnect solutions that can enable complex systems to transmit information from one location of the network to another. The company's product range includes ONTs, drops assembly connectors, drop terminals, patch panels in FDH, splitters, FDH connectors, distribution fibre connectors and cleaning products.

**Sticklers** provides a variety of portable cleaning tools, designed for use on the go. The company's latest Pro360 Touchless Cleaner is designed to remove oils and dust all the way to the ferrule edge of both male and female connector ends. The Coanda spray nozzle dispenses a micro-dose of atomised, high-purity cleaning fluid within a narrow column of pressurised air onto the fibre optic connector end face, so the

microscopic contamination is removed as the cleaning fluid evaporates.

**Viavi Solutions** offers test and measurement solutions that can support complex PON and FTTx networks. Its products can be used throughout the planning, construction, activation and maintenance of FTTx networks to accurately verify and monitor service quality indicators. The company's handheld fibre testing solutions are designed for PON activation, maintenance and troubleshooting, while its OTDR technology can enable detailed fibre testing and characterisation for FTTx and PON network certification. **FS**

**This is not an exhaustive list. If you provide installation solutions for FTTH networks and would like your company to be included, please let us know: [editor.fibresystems@europascience.com](mailto:editor.fibresystems@europascience.com)**

# WASTE NOT, WANT NOT

Three ways that end-of-life street cabinets can contribute to network operators' ESG initiatives

## JOE THOMPSON



Gigabit broadband now reaches 75% of UK homes, spurred by initiatives such as Project Gigabit and private investment flooding the sector.

As part of this drive to expand connectivity, altnets and incumbent network operators and internet service providers (ISPs) have widely deployed street cabinets up and down the UK to deliver broadband to properties, communities and businesses. Their use today is functional, but operators are now exploring how the infrastructure can offer ESG benefits to the areas in which they are based.

While no operator or internet service provider (ISP) ever sets out to disturb local communities, issues such as poor placement or disruptive installation of these cabinets can happen. Currently, the best-case scenario is for these to go unnoticed, but are operators and ISPs missing a trick? Can they do more? They have untapped potential with excess power and connectivity. With strategic residential placement, they're poised to do more than just provide internet – they could become

important edge computing assets for their communities.

Through the use of sensing equipment, these fibre cabinets could transform into a network for monitoring environmental conditions, contributing valuable data for social or governmental ESG initiatives. This pivot could turn a simple cabinet into a multi-functional asset, enriching community relations and underpinning local and national data-driven projects. Setting these sensors up would be fairly painless, as cabinets already have the power and connectivity required and are evenly spread across residential areas.

### Operators and ISPs could monitor air quality

Air pollution reduction is one of the UK's biggest environmental health strategies. Shockingly, it's estimated that it contributes

THROUGH THE USE OF SENSING EQUIPMENT, FIBRE CABINETS COULD TRANSFORM INTO A NETWORK FOR MONITORING ENVIRONMENTAL CONDITIONS



to 40,000 excess premature deaths per year, and costs the UK economy upwards of £20bn a year, according to the Royal College of Physicians. In 2019, it was found that the average UK resident lived in areas with air quality levels exceeding those recommended by the World Health Organisation.

Effective air quality monitoring is key if the UK is to mitigate the impact of pollution. Operators and ISPs could contribute to this by fitting external sensors to the top of cabinets to provide 24/7 monitoring of local air quality. The granularity that ISP data could provide could go a long way in developing more targeted measures, even at street level. But more broadly, with their data, they could help local government bodies track the impact of existing initiatives like ULEZ, work with environmental charities like Global Action Plan, or publish the data directly as part of a wider initiative.

### Operators could provide data on climate change

Climate change is a big-picture issue, but its effects can have extremely local significance. The UK has experienced



record-breaking weather in recent years and this, alongside rising sea levels has led to councils across the country preparing for more extreme weather and floods.

This is where cabinet data – which includes measurements around temperature, humidity and moisture – can provide a lot of value, both to local councils and specialist environmental initiatives. While specialist weather stations operate across the UK, cabinets could provide a fresh outlet for local weather monitoring, providing more data points to build a more accurate picture.

Fibre cabinets can also be fitted with water sensors at their base to provide early-warning flood detection. Many operators and ISPs already use water sensors on the inside of the cabinets to monitor for any water damage to equipment, so expanding this to protect and monitor the local community would be fairly simple.

#### Monitoring busy roads with street cabinets

One final example of how cabinets could be leveraged to support communities across the UK, is by fitting them with cameras to monitor traffic on busy roads. Fibre

cabinets possess enough power to support video surveillance and ample connectivity to support local councils, public services or neighbourhood watch initiatives.

This is a much more localised example of how cabinets can provide value to the community, helping keep people safe and potentially providing local councils with more cost-effective options for public safety and traffic management.

Through partnership with local authorities, the data collected through this surveillance could serve a broader purpose. It could inform infrastructure improvements, optimise traffic light sequencing, and support data-driven urban planning initiatives that aim to reduce emissions and improve air quality. Theoretically, cabinets like this could even be used as part of smart cities, supporting more intelligent and responsive traffic management.

#### Street cabinets could give back to the community

These are just a few examples of how cabinet estates can be used to give back to the communities they are scattered across. We recently canvassed altnets on their

cabinet infrastructure and many are already starting to explore these options.

While there are more commercial alternative use cases for cabinets like the EV charging pilot currently underway with Openreach, the possibilities for ESG initiatives are great. Not only is this an opportunity to give back to communities, it can also provide a way to forge relationships with local authorities. Providing data to a council free of charge, for example, will not only benefit the community but could strengthen the relationship between the operator or ISP and authorities, potentially making things like future planning permission much easier to obtain.

Another bonus of these initiatives is their potential to create a better relationship between ISPs and local communities. Rather than being seen as a nuisance, street cabinets and the companies that operate them could be perceived as active contributors to the local community.

This could be crucial for altnets when moving into new areas. Processing and moving legislation through easier, more collaboration on road and traffic closures to enable build and if they can get buy-in from their communities it will help them grow.

Street cabinets have been a fixture across the UK for years, in one form or another. With this new wave of fibre cabinets and sensing equipment, there's a glaring opportunity to leverage this infrastructure in new ways for the good of the environment and the local community. **FS**

**Joe Thompson** is Global Head of Optical & Network Product at TXO.

# PRODUCT UPDATE

www.fibre-systems.com/products

## Extreme Networks cloud-managed switches, Wi-Fi 7 access point

www.extremenetworks.com

Extreme Networks launched two new solutions to help enterprise organisations create improved network connectivity, security and application performance. The AP5020 is a new Wi-Fi 7 Universal access point that operates on the 6 GHz spectrum and is designed to support high-bandwidth, latency-sensitive applications and IoT devices.

The 4000 Series cloud-managed switches, the latest addition to Extreme's Universal portfolio, offer faster setup time by eliminating nearly all manual configurations. Paired



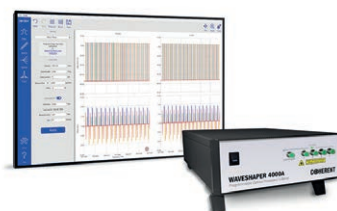
with ExtremeCloud Universal ZTNA, these offer automated onboarding, configuration and policy enforcement to strengthen security as organisations move to a Zero Trust architecture across their network. Both solutions use artificial intelligence for IT operations and machine learning features to help proactively identify network issues and make recommendations that help reduce IT time to resolution.

## Coherent Waveshaper instruments for U- and super C-bands

www.coherent.com

Coherent introduced new members of the WaveShaper family, providing instruments capable of testing optical components and networking systems in the U- and super C-bands. The WaveShaper 1000A and 4000A are programmable optical processors operating in the U-band of optical communications. They support generation of arbitrary filter shapes in attenuation and phase over a large wavelength range that extends beyond 1650nm.

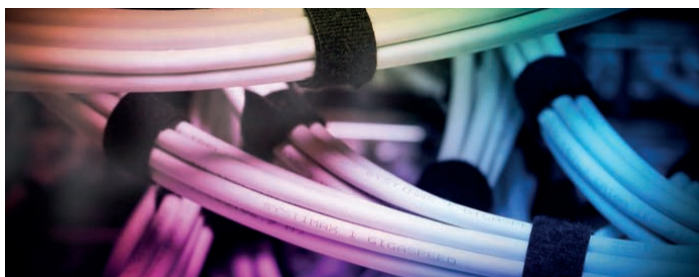
The instruments can be used in lab environments to support research on wide-band multi-wavelength transmission experiments for future high-capacity optical networks.



The WaveShaper 500B is a programmable optical filter that can generate arbitrary filter shapes in attenuation over the super C-band from 1523.53nm to 1573.301nm. It supports development and production of components and systems for the upcoming optical multi-wavelength communication systems operating in the super-C Band.

## CommScope Systimax 2.0 structured cabling solutions

www.commscope.com



CommScope's latest Systimax 2.0 enhancements are designed to provide structured cabling solutions and support to meet current and future network infrastructure challenges.

The two solutions include the GigaSPEED XL5 technology, for customers needing to step up from 1Gb/s copper before making a commitment to 10Gb/s

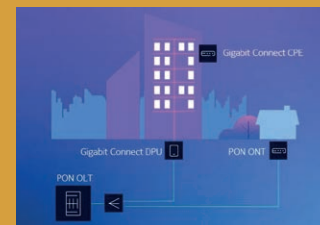
copper. It supports applications such as multigigabit backhaul connectivity for advanced wireless access points. The VisiPORT solution is an automated copper and fibre port status and capacity monitoring system designed to improve efficiency, reduce errors and remove the need for ongoing database maintenance.

## Nokia multi-dwelling unit (MDU) solution for cable operators

www.nokia.com

Nokia introduced its first integrated, fibre-to-the-home (FTTH) and multimedia over Coax alliance access (MOCA Access) solution to enable cable operators to deliver multi-gigabit services using existing coaxial cables in MDUs and buildings that are too difficult to serve with fibre. The addition of MoCA enables multiple system operators (MSO) to deliver multi-gigabit services over the existing coaxial cable, not only in MDU buildings where fibre is not feasible, but also in co-wired commercial buildings such as hotels and hospitals.

The Gigabit Connect solution allows operators to easily



combine fibre and MoCA Access to connect subscribers in MDUs. Nokia's MoCA access solution connects to the FTTH network, uses the building's existing coax, and is managed as a single system. Notably, MoCA also allows for coexistence with legacy services, including terrestrial, satellite and cable TV and DOCSIS.



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We are uniquely qualified to deliver innovative fibre connectivity solutions that overcome difficult deployment scenarios and deliver better value and sustainability for our network operator customers—and their customers.

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