CONNECTIONS 58

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Fiber Optic Networks:
The Foundation Walls of a Smart City

Unifree Duty Free, Turkey:
Duty Free in a New Dimension

Fiber Optic Cables made by R&M

Single Pair Ethernet:
Using SPE Correctly?

R&M

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Networking
Now Basic Supply

Dear Business Partners

The new coronavirus has hit the world with full force. It is confronting society and the economy with challenges of unusual proportions. The IT and cabling industry is increasingly becoming a basic supplier. Business disruptions, home office and quarantine are currently making it clear to society what a key role products that are responsible for a smooth network infrastructure play.

In order to make networks fit for coming requirements, developments in the field of networking are progressing rapidly: Fine-tuning is playing just as important a role with faster FO transmission technologies (800G Ethernet) as it is with space-saving transmission protocols on just one wire pair (SPE). Read our articles in the TRENDS section in which experts from R&M share their background knowledge.

The increasing urbanization and digitalization of large cities also calls for new solutions and innovations. In order for different technologies to converge, a city must be networked in compliance with the latest standards. Smart cities are emerging, which are becoming a melting pot of technologies from the most diverse segments. You will find in-depth information on this in our FOCUS article.

Digital buildings link electronics, sensor technology and control systems. The connection of data transmission and the supply of power to end devices by Power over Ethernet (PoE) enables new concepts. All-IP is on the advance and is increasingly competing with classic field bus systems. The largest project for IP-based building automation was recently realized in Paris – this is also featured in our magazine, along with other case studies from all over the world.

Innovation is taking place at R&M on all levels. Thanks to the innovative strength of the company, R&M now covers the entire connectivity range and provides suitable offers from connectors to software. We are proud to be one of the companies shaping the networks of the future in the usual manner and ensuring their functionality and security with our products and solutions.

We hope that, as far as the coronavirus is concerned, the situation will improve and calm down soon, and wish you the very best of health.

Sincerely,

Matthias Gerber
Market Manager LAN Cabling

Contents

Focus

News

Success

Trends

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R&M solutions network the attractions of the world's largest duty-free zone at Istanbul Airport.

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Fiber Optic Networks: the Foundation Walls of a Smart City

Two megatrends are changing the world: urbanization and digitalization. Cities are growing at a phenomenal rate. And digitalization is maturing even faster. Communication and data networks can help cities to use digital technology to support their growing tasks. However, it will have to be ensured that the infrastructures are up to the new tasks.

According to the UN (United Nations), more than half of the world's population is already living in urban locations. A change of historic proportions. It is not just city administrators that are going to have to increasingly adapt to the new challenges this entails. Municipal utilities, telecommunications network operators, hospitals, public transport companies, trade, industry, facility management and even the police are going to be affected. More people means more economic strength, more traffic, more energy, more service, more costs, more data, more communication requirements.

How are cities going to cope with this change? The answer you will often hear is: with «smartification». However, the models and definitions vary. On the surface, it is about different technology worlds being able to interact effectively. The ideal situation would be a comprehensive synergy between information and communication technology.

Greater quality of life

Decision makers are hoping they will be able to manage growth with smartification. The faster the flow of information and the more intelligent the use of data, the smarter the city - or certainly that is the focus of the discussions. The Smart City Expo World Congress in Barcelona and the Smart Cities Week in Sydney recently confirmed these high expectations. From October, the Expo 2020 in Dubai will be a real model for smart buildings and smart cities.

From October 2020, Dubai with the Expo will be a real model for smart buildings and smart cities.

The faster the flow of information and the more intelligent the use of data, the smarter the city.

A range of goals is substantiating the idea of the smart city. Among other things, cities want to:

- better network people, companies, education etc
- optimize the quality of life, safety and security, and service
- automate administrative tasks
- improve the implementation of resources and carbon footprints

The McKinsey Global Institute has examined 30 indicators for urban quality of life and has come to the conclusion that: «Smart technologies can improve each of these areas by between 10 and 30 percent.»

Smart search for a parking space

Some very exciting technical options and applications are being tested or are in fact already being used worldwide:

- Smart cities monitor and influence the quality of air and the consumption of water and energy in real time. An example: Amsterdam.
- Cities such as Santander in Spain automatically guide traffic using «digital signage», something which shortens how long it takes people to find a parking space and cuts down on traffic jams.
- Garbage cans report how full they are to waste disposal services which can then optimize their routes accordingly.
- Street lamps become smart pillars with environmental sensors, cameras, WiFi and 5G antennas as well as charging stations for e-scooters and electric cars.
- Robots take on some of the simpler police work as is already the case, for example, in Dubai.
- «Augmented reality» technology guides tourists through the metropolises of the world, providing them with information as they go.

In the future, millions of sensors could be loading data from streets, buildings and the IoT into the cloud to enable analyses for optimized city management. In the Portuguese model project «PlanIT Valley», it is assumed that in the future on average more than 400 sensors will be being used per inhabitant. This would allow a digital image of the city ecosystem to be generated. Providing, that is, that all data sources are well interconnected.

«Before a city can be smart, it has to be networked.»

McKinsey Global Institute

Even the self-driving car needs a smart city ecosystem because it is not fully autonomous. It depends on a permanent, unrestricted and almost real-time data exchange with roads, infrastructures, other road users and the environment. And produces several terabytes of data a day in the process.

In this context, cities are not the only entities relying on the 5G cellular phone standard. In comparison to the currently installed 4G/LTE technology, 5G increases the speed of data traffic between vehicles, smartphones, machines, data centers, buildings, sensors, devices and controls of all kinds by a factor of 50-100. For many of the conceivable use cases of a smart city, 5G can offer near real-time responses at very low latencies and offers the use of higher frequency ranges with a simultaneous increase in frequency capacity.

The prerequisite for this, however, is, on the one hand, the creation of almost ten times as many small cells in comparison to the radio coverage of today. This will take place especially in the continuously growing urban centers. Another important aspect is the provision of fiber optic connections between all these new antenna sites and the existing network as well as additionally the intensive capacity extension of the core network, also in FO technology, to be able to handle the massive data streams of the «smart» cities and their growing populations.

Forgotten the cabling?

A crucial aspect often gets forgotten about in discussions on smart cities. Namely, the physical connectivity, the cabling between antenna sites, central switching exchanges as well as data centers above and below the asphalt.

Cables form the foundation walls of a smart city. Smart technology cannot deliver data if it is not networked. It is true that networking is in part wireless between end subscribers and the network. But from the first network-side receiving antenna, modern FO cabling is definitely a must. The news service TechTarget writes: «Perhaps the greatest challenge for smart cities is the complexity of connectivity.» And the McKinsey Global Institute stresses: «Before a city can be smart, it has to be networked.»

Even 5G base stations and mini radio cells have to be integrated in FO networks. A survey by consultants Deloitte concludes that, «Optical fibers are the lifeblood of 5G».

Is there sufficient capacity?

The question of capacity also plays a role. «Existing communication networks often no longer offer the necessary capacities for processing these massive volumes of data and for safe transmission,» says Steffen Braun,

Control room of a smart city: This is where data from numerous sensors, cameras, mobile devices, streets, buildings, vehicles etc comes together. Monitoring and analysis of the data can lead to decisions being made more quickly and to the optimization of everyday routines in lots of different situations. Providing the corresponding networking in FO technology is available.

Head of the Urban Systems Engineering Center at the Fraunhofer Institute for Industrial Engineering (IAO) in Stuttgart, Germany.

According to a survey by Deloitte, network operators will no longer be able to support the forecast increase in data traffic on their own. They will have to roll out or provide additional FO cables right into the metropolitan areas. In order to be able to implement this within a realistic time frame, additional co-operations must be entered into, flexible fiber management concepts developed and capacities rented from other independent FO suppliers.

The Journal of Internet Services and Applications confirms: «When a smart city application is used across the board, it generates massive amounts of data traffic which can lead to serious performance problems in the underlying network infrastructure.»
Network architectures for smart cities require an open planning concept because data traffic is going to continue to develop dynamically for decades. Where today a single fiber may suffice, tomorrow you may need multi-fiber cables with up to 256 fibers.

Long-term planning

R&M draws the following conclusions and recommendations from global observations, analyses and customer projects which enjoyed intensive support:

Today, the master plan for a city must include the creation of closely-meshed fiber optic communication and data networks and the gradual replacement of obsolete networks. Network planning covers anything between 20 to 30 years. It is just as important as the planning of water, sewage, electricity and gas lines.

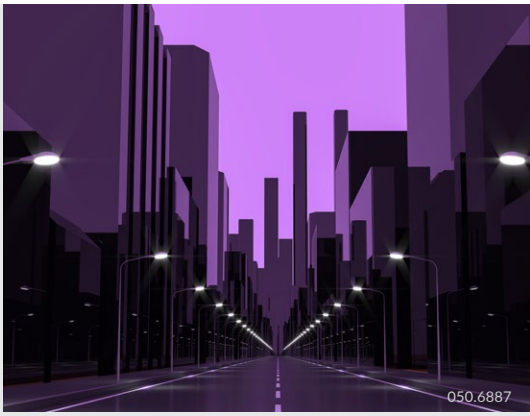
Radio and fixed networks can no longer be calculated separately from one another. Fiber to the Antenna (FTTA) and Fiber to the Home (FTTH) networks will grow together in the future. In terms of planning, the ideal solution is a city-wide Universal Fiber Grid (UFG) supporting all potential applications. Separate lines for individual functions will also soon

How cities can become smarter: bundling functions

Example: street lamps. In the future, street lamps will be able to take on nu-merous additional digital functions that will make a city «smarter». The example of street lamps shows just what is possible. Always assuming they are networked in a perfect manner.

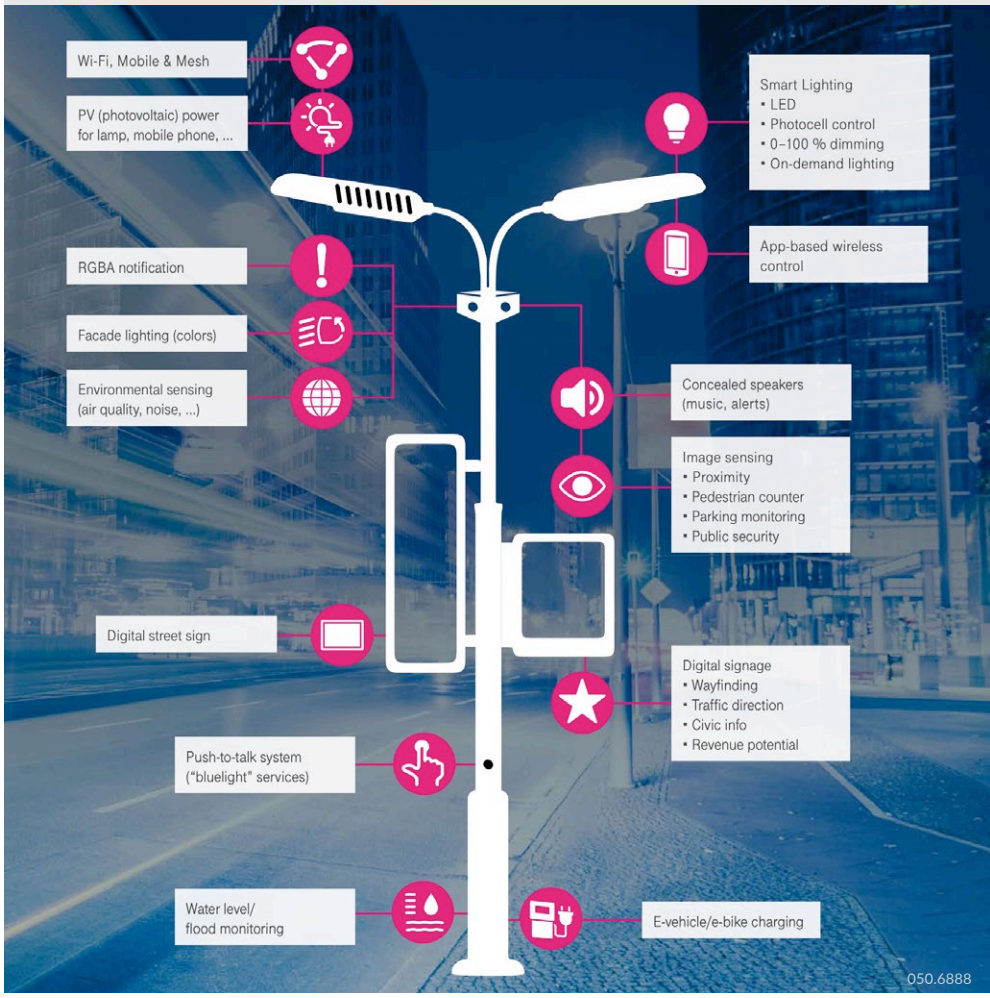
Smart street lamps measure dust, temperatures, rain, noise. They count the number of pedestrians or cars going past on the street. Motion sensors tell the LED lamp whether it can be dimmed or whether there is someone on the sidewalk, which means more light is needed. An illuminated display on a lamppost indicates whether there are any free spaces in the next parking lot. In-built cameras see what is happening in the vicinity, helping the police to detect a critical situation from a distance. An alarm button on the side makes it possible to call emergency services in a matter of seconds if need be.

A screen at eye level provides information on places of interest in the vicinity and also on when the next bus will be arriving. And what is more, the lamppost also



contains charge stations for smartphones, e-scooters and electric cars. An app will enable users to settle their bills for the service directly and smartly.

The upper part of the street lamp offers a public WiFi hotspot for a free and fast Internet connection. At the same time, a 5G antenna in the street lamp may well be communicating with mobile subscribers of various service providers as well as with self-propelled cars nearby using individual frequencies. Naturally the street lamp has one or more IP addresses. There is an FO cable in the ground. It connects the street lamp with the broadband network in the entire city.



When street lamps are converted into multifunctional stations and detect what is going on around them, a city becomes a lot smarter. However, the street lamp not only requires electricity but also a modern FO connection. Graphic: Deutsche Telekom

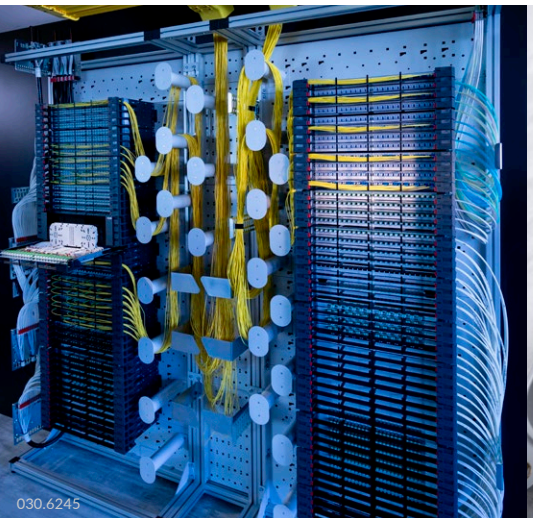
A smart city is created when all levels, from the physical network infrastructure under the asphalt to the digital image of the city, are working together. 050.6889

be a thing of the past, e.g. for controlling traffic lights, street lighting, WiFi hotspots, surveillance cameras and monitoring supply lines. Otherwise, cities will have to repeatedly dig up their roads in the future to add to their infrastructures. It is more useful to think in a «networked» way and to bundle functions as early as the planning stage.

Public and private network operators are coordinating their rollouts. Together, they are making maximum use of their infrastructures and resources: Application-independent cabling and modular, integrated solutions in connecting technology are key topics when it comes to realizing the high density of future, intermeshed networks. Together with modular active technology and its software, which makes various service platforms available to end users at the same time, they create the prerequisites for a smart future.

The establishment of FO connections between 5G antennas and the backhaul network is a complex matter. Sometimes creative cabling routes have to be found in the most unusual places to be able to link in the dense antenna network and the active electronic sending equipment. The FTTX solution portfolio from R&M provides the suitable modules for this.

At the network infrastructure level, only a correctly dimensioned, uniform and scalable fiber optic infrastructure can permanently ensure the transmission performance required. It has to be able to grow continuously with the city and its requirements. Optical fibers are the only way to handle the expected data



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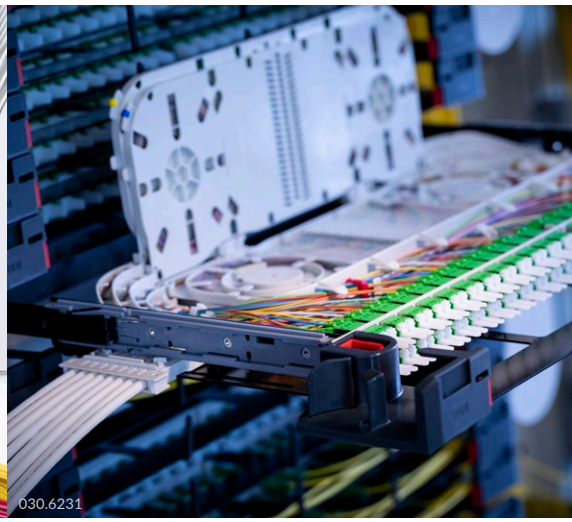

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«The infrastructure level is one of the most expensive components for a smart city. Consequently, selecting a partner can become a very expensive matter when it turns out you've chosen the wrong one.»

Deloitte

traffic across the board and virtually in real time between mobile end devices, vehicles and the whole range of Internet of Things (IoT) applications as well as network subscribers.

This can be made possible with, for example, modularly extendible, high density FO distribution systems such as PRIME ODF, the distribution and connection boxes of the Polaris box family, which can be used in a number of different ways, and the innovative SYNO dome closure family from R&M. With a SYNO dome closure, FO cables of a whole range of sizes and with different laying technologies can be extended or adapted to suit requirements, for example with subsequent 5G small cell installations or future, local IoT applications.

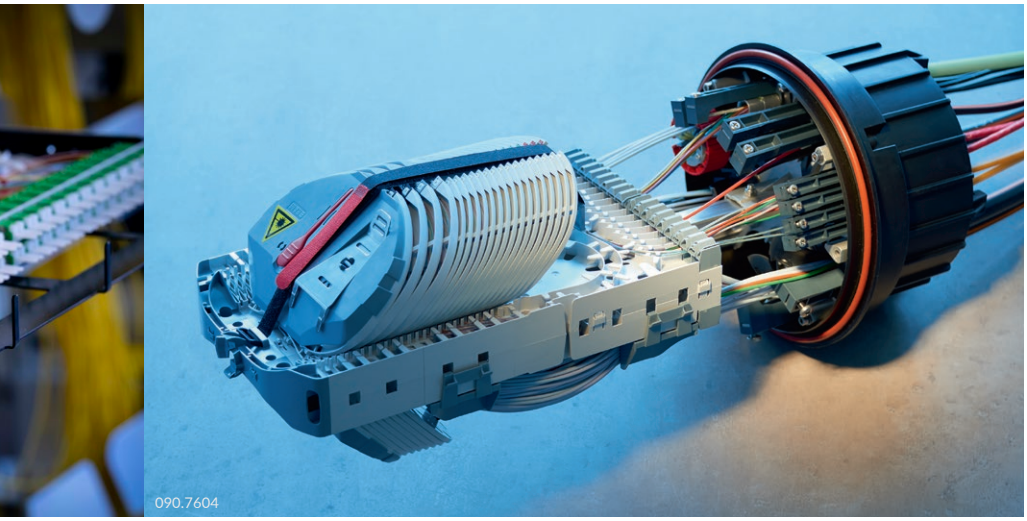
Tailor-made, compact mini data centers at the edge of the networks (edge data centers) are indispensable for the future expansion of what are referred to as time-critical applications, such as remote-controlled surgical operations or autonomous driving in the city. The interaction between the end device and the network cannot take more than a few nano seconds, i.e. as far as possible the data has to be able to be processed close to the action in real time and a low-latency, almost instantaneous flow of information is a must. This kind of micro data center with redundant FO connections should be available every 5 to 15 km.

Data and data flow will become a smart city's most important resource. Fiber optic networks ensure a fast flow of information.

Looking for partners

Conclusion: The metamorphosis of a city to a smart city can be successful when all the necessary resources and capabilities are available at the level of the FO infrastructure. Cities can create some of these themselves or have to plan and provide these with existing telecom and CATV network operators, but also with utilities and private market players. As a consultant and solution provider, R&M can incorporate its expertise from a large number of smart city projects which have already been implemented. The know-how ranges from the planning through the design of customized connection solutions to function verification for FO cabling and its management in operation.

Typical project partners for the realization of smart city FO infrastructures are public or private utilities, telecommunications network operators and private investors in the real estate sector.



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The Road to 800G

The strong demand on solutions specifically optimized to serve the hyperscale data center market has led to a series of developments in the industry. There is a general push towards interoperability, open systems and faster unification of the solutions.

One manifestation of this is the proliferation of MSAs (Multi Source Agreements) as opposed to the traditional path for the generation of standards which is usually a slower process.

The MSAs created to standardize fiberoptic solutions for 400 Gigabit Ethernet (400G) have recently released their specifications. Several companies have already deployed pluggables and on-board optics modules that support 400G.

QSFP-DD (high-speed double-density quad small form factor pluggables) which supports 400G in an 8-channel configuration had a strong presence across the vendors exhibiting at OFC and ECOC meetings in 2019. COBO (Consortium for On-Board Optics) modules were showcased by several vendors.

Radical shift

The shift towards on-board optics that can be observed today is a more radical one and thus requires adaptation from the industry. It must rethink the installation process in data centers and the time required for monetization. However, the promoters of the COBO approach fully support this development.

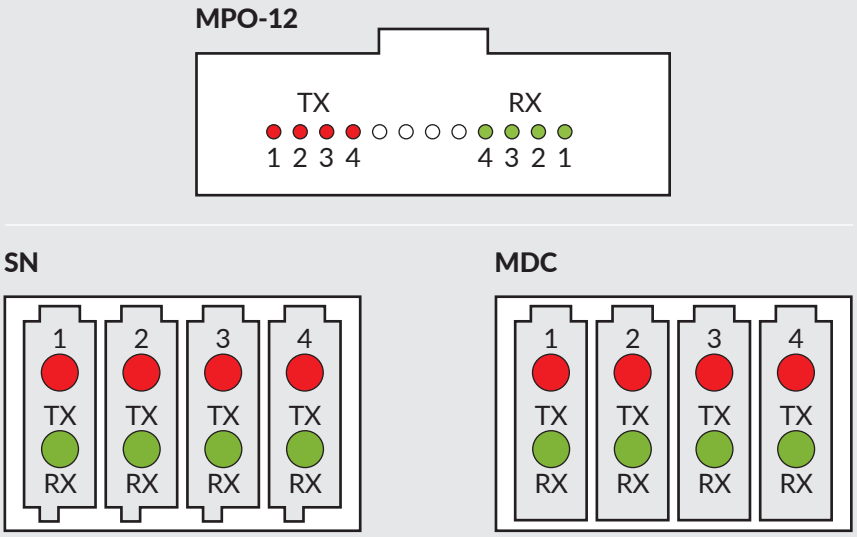
New MSAs for the 800G generation were announced fast on the heels of all the 400G releases. The most notable of these are the QSFP-DD800 and 800G Pluggable.

QSFP-DD800 is a natural step from the original 400G specification. The change will be achieved by increasing line speeds to 112Gb/s while retaining the physical form factor. Backwards compatibility is an important issue for this consortium and an important factor of their success in attaining industry support for the 400G generation.

Now they will be able to continue this backwards compatibility. Modules will be able to function correctly when connected to legacy equipment.

Currently, the promoters of QSFP-DD800 are limited to a small group of large American companies. Further companies will be allowed to join once the key design elements have been incorporated in the specification. The companies joining at a later point will be invited to work on refining the specification.

Connectors for QSFP-DD800



The form factor of the 800G pluggable is expected to be compliant with that of the 400G version.

The most likely connectors to be adopted in the 8 fiber configuration are the well established MPO and the two additional newcomers SN and MDC from vendors SENKO and USconec respectively.

Additional configurations of MPO16, CS and LC are also considered in the QSFP-DD specification.

Source: www.qsfp-dd.com

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New competition

Meanwhile, the 800G Pluggable MSA group was formed in late 2019 and is comprised mostly of companies based in China with a few exceptions. The approach of this MSA towards 800G is based on both 8x100G and 4x200G routes. The key work is meant to be in the definition of the modulation and multiplexing of signals.

The MSA has two different use cases, one is data center connectivity up to 100 m where they focus on cost and power minimizing. The other is the 2 km scenario for Tier 1-2 and Tier 2-3 connections. When it comes to form factor, 800G pluggable aims to adopt the available QSFP-DD or OSFP cage and connector specifications.

Companies are invited to join this consortium although only as contributors with voting rights reserved to those companies listed as promoters.

Third in the league

The Consortium for On-Board Optics (COBO) specification, that currently already includes an 800G solution (although based on a 16-channel configuration), is also prepared for doubling the transmission rates to obtain 1.6Tb. COBO's 800G solution can be compared in certain circumstances to the future QSFP-DD800 and 800G Pluggable modules. Regardless of the double number of channels, the density in the front panel is much higher and thermal management greatly improved.

The COBO topic of moving towards co-packaging with a fully optical front panel and away from pluggables also gained momentum.

Several parts of the industry would prefer to delay the shift as long as possible. But everyone agrees that this may be the last speed generation where this delay is feasible. To this effect, Microsoft and Facebook have jointly launched the Co-Packaged Optics Collaboration with the aim to unify development efforts across the industry.

Short deadline

It is expected that cloud companies will need these 800G modules by 2023-2024 to keep up with the bandwidth growth inside their data centers.

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XOC Opts for PRIME ODF

Xarxa Oberta de Catalunya (XOC) is a telecommunications operator based in Catalonia (Spain). It was founded in 2010 having obtained a contract with the Catalan Government for the deployment of a transportation network based on fiber optics. XOC has its own FO network of about 3,800 km and 55 technical nodes with passive and active telecommunications equipment.

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In July 2018, one of the main wireless infrastructure operators in Europe, Cellnex Telecom, acquired XOC through its subsidiary Tradia Telecom. Cellnex currently has more than 53,000 locations in Europe offering housing services for mobile communications operators. It provides wireless communications services for the segments data connectivity, audiovisual broadcasting, security and emergency networks (PPDR, Public Protection and Disaster Relief), smart cities and IoT. With the acquisition of XOC, Cellnex has strengthened its position in the connectivity segment.

Main objectives

One of the main objectives is to deploy a high bandwidth FO telecommunications network, allowing the connection of current sites of the «Generalitat de Catalunya» and the administration agencies that may depend on it. On the other hand, the network must be operated, maintained and managed in line with the conditions dictated by the Directorate General for Competition of the European Commission.

The XOC network topology is based on the deployment of backbone cables of 96 or 128 singlemode optical fibers, which interconnect the different telecommunications nodes; these can cover an area with a radius of up to 100 km. The different links in fiber optic distributors are terminated and the optical transport equipment and IP aggregation equipment is installed in these nodes. In the various municipalities where service provision is required, the deployment and distribution network is deployed from the backbone or nodes to the end customers. Given the market towards which the deployed network is oriented (wholesale market of telecommunications operators with services of very high availability and high capacity, or dark fiber), it could be supposed that the density requirement of fiber optic distributors is not an important condition for the selection and homologation of the fiber distributors.

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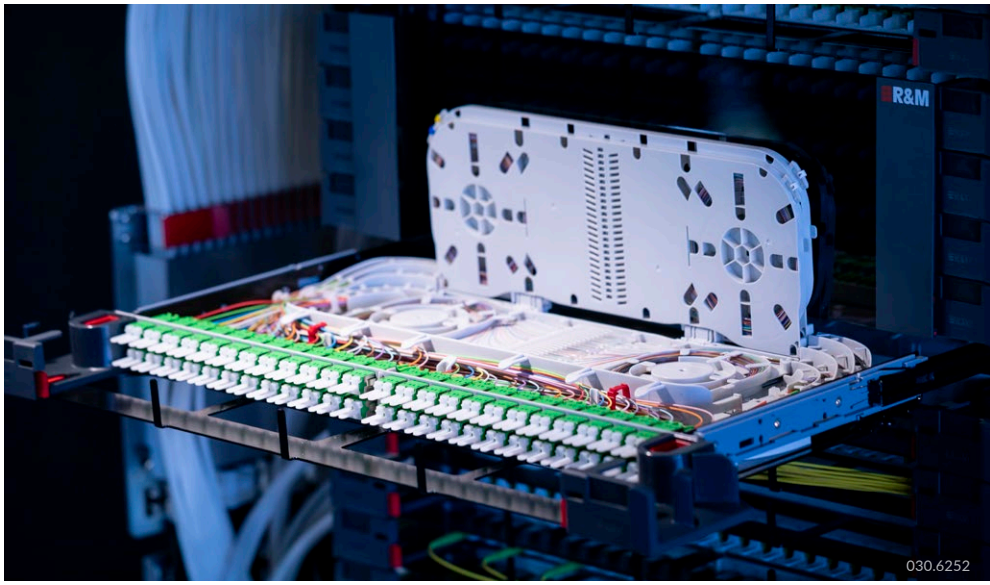
«The constant technological evolution of R&M in top quality and high density fiber optic solutions means we have a reliable partner with whom we can engage in constant dialogue to face the coming years of continuous expansion.»

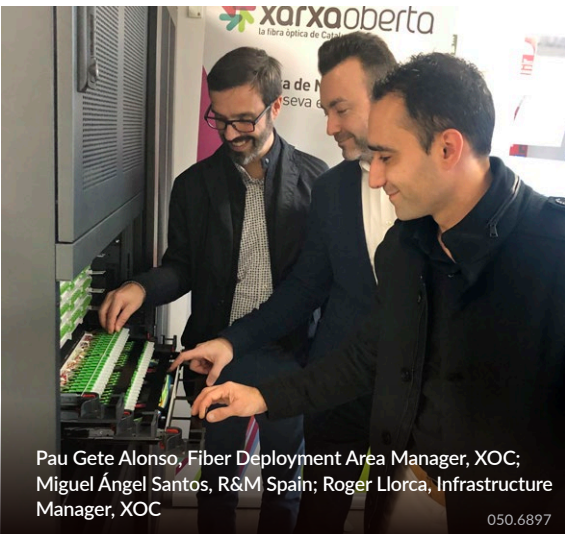
Roger Llorca, Infrastructure Manager, XOC



Versatility of PRIME ODF is key

But in the search for efficiency and savings in OPEX, the size of the technical rooms hosting the nodes has tended to be significantly reduced. This results in significant cost savings (rent, air-conditioning, power consumption) but implies facing challenges regarding the efficient use of space and its correct organization. It is in this context that XOC has placed its trust in the R&M ODF solutions since 2013. In the early project phases, XOC deployed the ODF SCM main distributor, 19" and 21" 42U cabinets, Uniracks, Raceway and HD fiber modules from R&M; the perfect design, reliability, modularity, flexibility and customer support and orientation were all key factors in the choice of R&M solutions for the termination of the passive fiber optic network. In the course of 2019, XOC approved the new R&M main distributor PRIME ODF to be installed on its nodes. PRIME is a natural evolution that increases the density of ports on fiber distributors, while retaining the other characteristics that have made R&M a reliable provider in the deployment of networks for XOC and the Cellnex Telecom Group.

The compact and versatile PRIME ODF modules are suitable for the flexible use of fiber optic terminations. They enable fast and simple installation in cramped environments as well as at sites with high fiber density. The tool-free system approach and the high modularity guarantee uncomplicated migration into new and existing network infrastructures. The 3U sub-rack 19" PRIME unit's front mounting and its modular application (pure splice, splice patch, breakout applications, fiber storage) bring a new versatility to the XOC network, and is highly valued by the customer.



Pau Gete Alonso, Fiber Deployment Area Manager, XOC; Miguel Ángel Santos, R&M Spain; Roger Llorca, Infrastructure Manager, XOC
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Facing new challenges with the help of R&M

Cellnex Telecom must face new challenges in the deployment of fiber optic telecommunications networks. 5G networks require a large transport bandwidth, and the connection of mobile phone sites with fiber optics will be a common occurrence in the coming years. Having a high capacity transmission output will be a requirement for mobile operators to choose locations for their antennas and radio access equipment. In this context, the possibility of having a comprehensive, reliable and scalable technical solution is of paramount importance for the successful deployment, operation, management and maintenance of the passive fiber optic network, and the fundamental pillar for its subsequent commercialization.

Cellnex Telecom, together with XOC, will face future challenges with the support of technology partners such as R&M, with the confidence of having solutions adapted to technological evolution and future market needs.

The R&M solution

- 19" and 21" cabinets
- ODF SCM
- Unirack and FibereasyRack
- Raceway
- HD fiber modules and 19" 1U HD panel
- New ODF PRIME 19" front mounting
- MiniBreakout cable SM SC/APC

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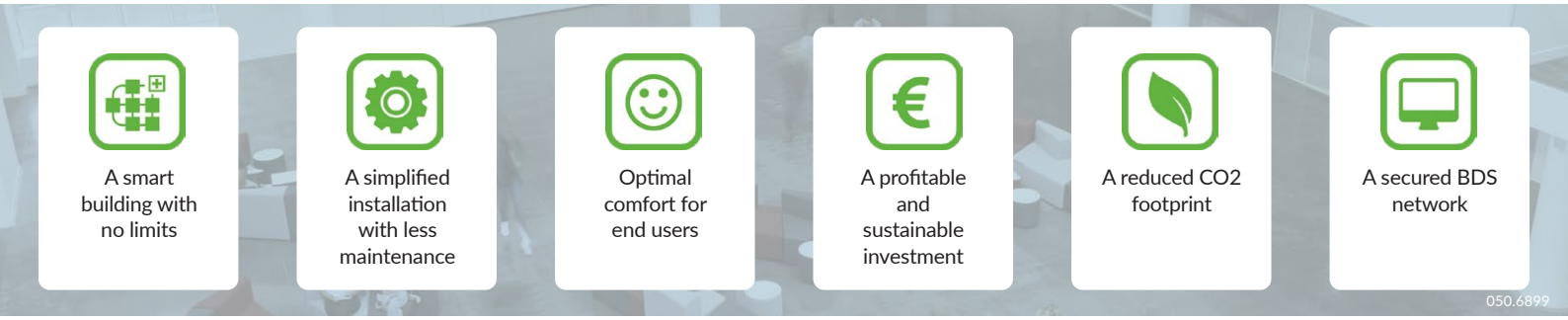

Smart Energy
over Ethernet for Buildings


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An infinitely smart building. That is the vision of the French start-up Energie IP. Because tomorrow is now.

Founder Grégory Besson Moreau and his team want to overcome the barriers between the areas of building services management. And Power over Ethernet and R&M are helping them on their way.

Energie IP develops, produces and operates new kinds of Building Management Systems (BMS). The principle: Data network, IT, Internet Protocol and Power over Ethernet connect building management and building technology. The copper cabling transports data, signals and DC current with up to 90 Watts. Services and devices can be simultaneously networked, remotely powered, remotely controlled and remotely monitored. Switches, driver modules and sensors are developed by Energie IP itself. They contain innovative open source technology. This enables Energie IP to integrate any number of services into the digital building management system. Sales and Operation Director Antoine Cussac gives examples: «LED lighting, blinds and air conditioning (HVAC) can be controlled and remotely powered from the same interface.»


060.2076

Proud to be a partner and providing comprehensive PoE know-how

When it comes to connectivity, Energie IP relies on the copper range from R&M. Among the preferred products is the field-terminable FM45 connector. With this innovation, installers on site have the freedom to decide where they want to place connectors and connections – an advantage when it comes to flexibly connecting different building technology systems with the data network. Furthermore, R&M includes its comprehensive PoE know-how in its new partner's projects. As an innovation leader, R&M is proud to be accompanying this young player in the smart building technology market.

«We want to simplify and optimize the end user's comfort level by delivering a viable, safer and greener solution for today's office buildings and lay the foundation for tomorrow's innovation.»

Grégory Besson Moreau,
Founder and CEO Energie IP

ENERGIE IP

Energie IP is a French start-up company which offers a connected, flexible and universal smart Building Management System (BMS) using the latest Power over Ethernet technology. The company's goal is to control and monitor all DC-powered devices in offices – from LED lighting, HVAC and window blinds to the next generation of IoT solutions, such as geopositioning, robotics, speech recognition and artificial intelligence.


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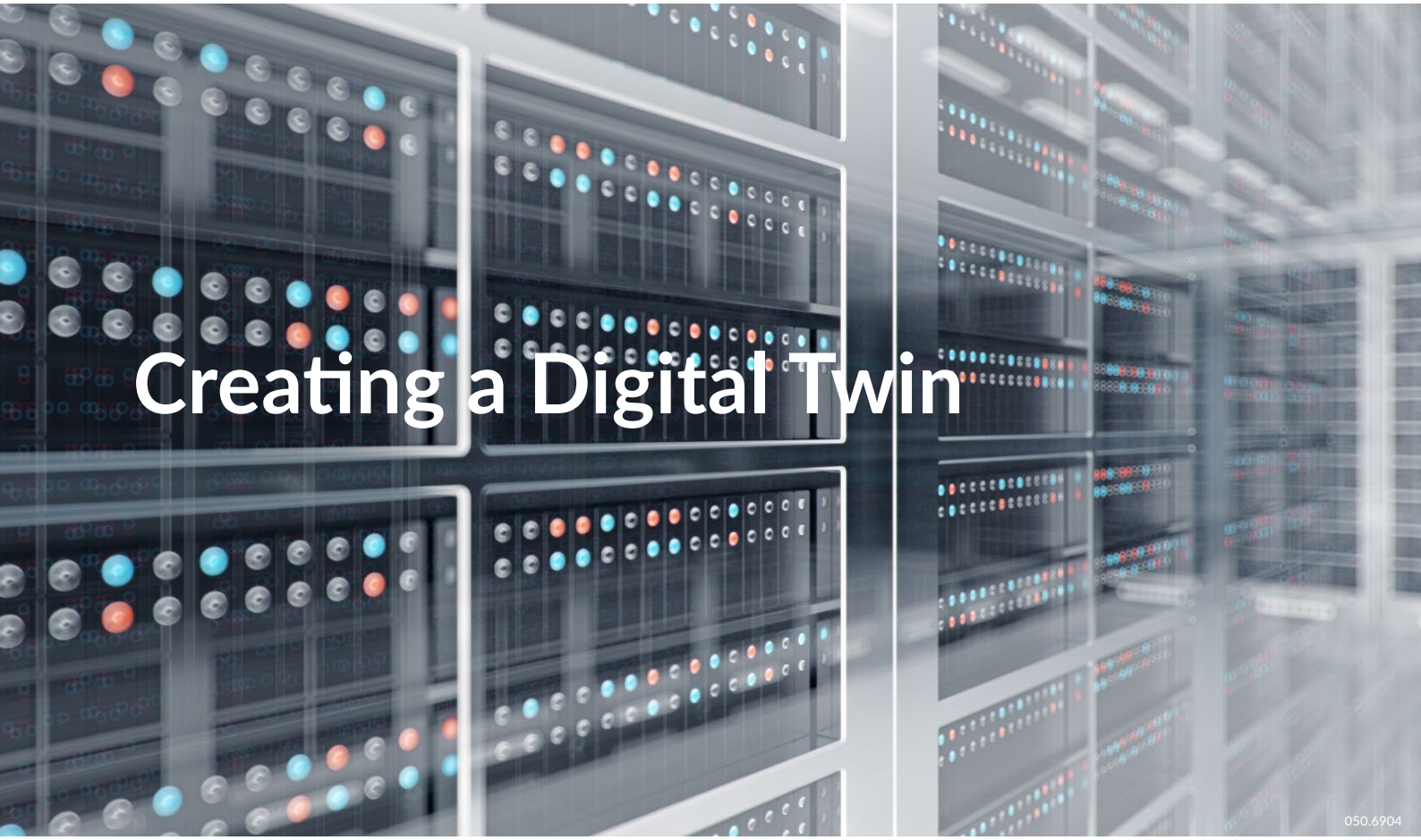


Creating a Digital Twin

Infrastructure management – today, more than just a buzzword. It helps data centers to check, monitor and manage their complex tasks in real time, and exclude human error. But how can comprehensive infrastructure management be realized?

For infrastructure management to be able to work, data centers have to create a digital twin, a database-based image of the entire operation. The digital twin bundles and visualizes all necessary information. It promotes

- fast, accurate decisions
- proactive management and forecasts
- the sharing of knowledge and analyses
- provisioning and resource utilization
- planning, maintenance, MAC and migrations
- clear work instructions and supervision
- risk management and danger prevention
- reporting and proof of compliance
- investment and cost control

This would seem to be a sensible path to take, particularly today as stakeholders often work at a number of distant locations. In other cases, the responsibility for a large area is focused on one place. In both cases, the digital twin serves to provide those involved with the basis for making decisions automatically, simultaneously and independently of a specific location.

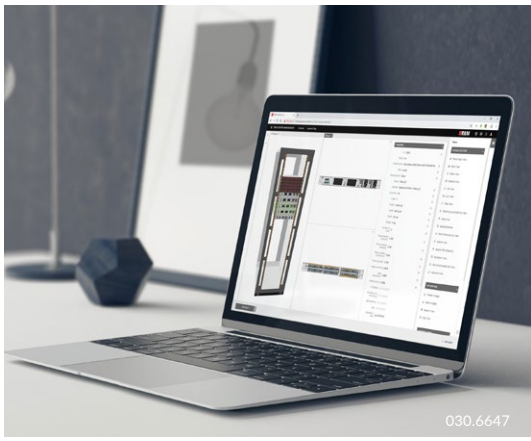
Using data sources

In the context of a data center, what does a digital twin have to consist of for it to be of real use? The answer: The more data sources are connected and the more information is brought together, the more valuable and useful it is.

First of all, the digital twin consists of complete and correct documentation. Data collection starts off with cabling and patch panels. It also involves the monitoring of connectivity – a process referred to as Automated Infrastructure Management (AIM). Naturally, it wants to know which IT devices are in the racks and cages. The physical inventory has to be monitored constantly – a process referred to as Asset Tracking.

Finally, the digital twin wants to know something about the environment. This is why it requires information on building infrastructures, temperatures, climate, energy consumption and access control.

And everything together results in smart Data Center Infrastructure Management (DCIM).



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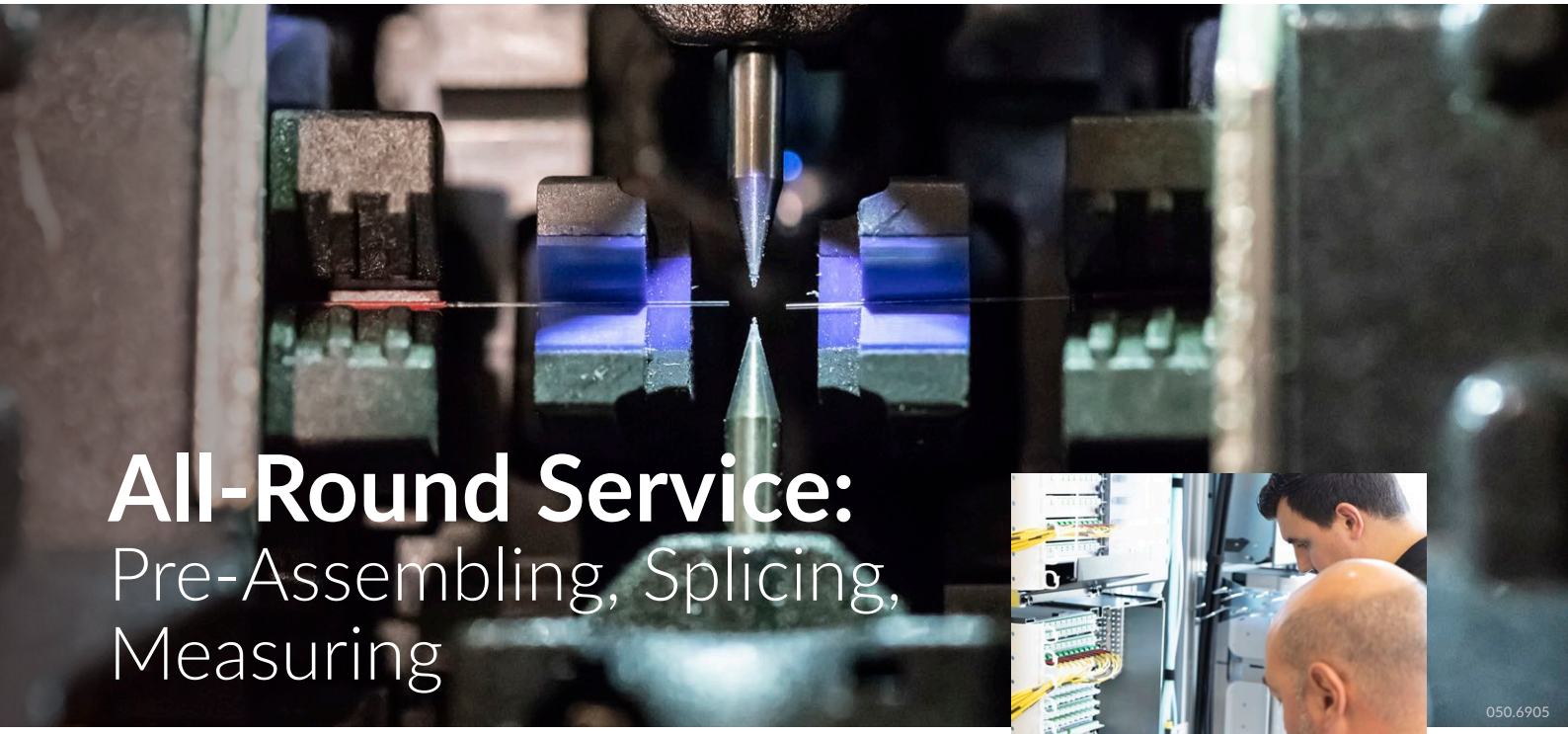


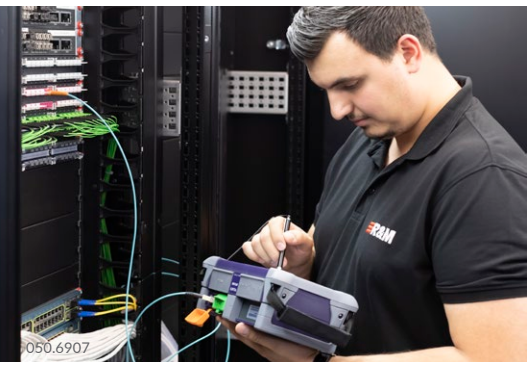
All-Round Service: Pre-Assembling, Splicing, Measuring

Services from R&M take the pressure off project managers and installers when it comes to time-consuming cabling. These services comprise pre-assembly, splicing on the building site, measurements, documentation and training sessions.

The market launch initially took place in Switzerland. R&M officially launched the service program in the fourth quarter of 2019 and is now busy extending it. It is perfect for the cabling of office buildings, functional buildings and data centers. Project managers and installation companies delegate specific, individual tasks or construction phases to R&M. Telecommunications providers use the service for Fiber to the Home projects.

FO cabling is the perfect example for illustrating the practical use: Thousands of fibers often have to be connected on a construction site under great pressure. Splicing necessitates manual dexterity, patience and know-how. Sometimes, time, specialist personnel and equipment are simply lacking. In such cases, R&M is happy to send splicing experts to the construction site.

Racks, patch panels and individual cards are pre-assembled exactly in line with project plans. Specialists from R&M prepare everything ready-wired in the plant in Wetzikon. R&M takes responsibility for a standard-compliant, expert installation.



Just in time

The service is perfect for the cabling of meet-me rooms, building entry points and racks of all sizes. But the experts from R&M also terminate consolidation points for office premises as well as individual terminal blocks in accordance with project plans. Delivery takes place «just in time». There is no wastage or residual packaging on the construction site. This means project managers can optimize their planning and logistics.

«I will be pleased to use this service again in our next project!»

Project Manager, Felix Platter Hospital, Basel

FO measurements when installation is completed require conscientious working and precise knowledge of the parameters, attenuation values as well as the latest standards. The R&M service not only comprises the measurements but also the documentation. This makes it easier for project managers to provide customers with the necessary information and fulfill conditions for warranty.

The R&M Academy offers qualification programs for installation experts to increase routine and expertise with up-to-date specialist knowledge. The systematic setup is the perfect way of gaining additional skills and certifications as R&M shares expert know-how gathered over decades.

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Digitalization: Calculating the Project in the Webshop

Poring over catalogs, searching the net, creating parts lists and calculating every construction phase. Planners, project managers and installers are all too aware of these time-consuming activities. Digitalization can help them – something R&M proves with a tailored webshop and new services.

For R&M, digitalization means creating a reasonable business model geared to actual needs. Its purpose should be to gradually make work easier both in-house and for planners on the market. The targets are greater efficiency and value creation for everyone and a sustainable transformation of the business processes. That means, for example: If you are no longer poring over catalogs, but instead creating data records at the click of a mouse button and automating calculation, you are gaining time and can manage your projects in a more relaxed manner.

A new webshop plays a central role in the digitalization strategy at R&M. It welcomes the person searching or the project leader in an informative Internet portal. Orientation for users is intuitive as they are guided directly to the FO and copper solutions.

Digital representation of a construction project in your own account

Configurators help users to put the required material together quickly. R&M had the digital helpers programmed to suit the requirements of network planners and installers. They automatically generate decision aids, proposals on assembling cabling units, and even entire calculations.

Customers store all important project data in their own account as a digital profile of their construction project. The data can be used in a number of ways, for example to put services out to tender digitally and order deliveries in due time. In the shop, customers can make templates to be able to efficiently prepare follow-up orders or future projects (re-ordering).

Customers have access to orders, production data, stocks, deliveries (tracking) and specific conditions. They can call up dimensions, standards, documentation and test results for all products. That helps them to control their projects exactly, finish them just in time and document them exactly.

R&M has already opened the webshop for Germany, Austria and Switzerland. The digital platform will be available worldwide from 2021. Dedicated customers can test it early. The aim is to make it possible to use the platform in different languages, tailored to specific countries, or embracing all countries, and at various levels. R&M specialists familiarize users with the shop.

Andreas Rüsseler | CMO
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Efficient FO Expansion
with PRIME-Ribbon

Whether Fiber to the Home, city networks, Internet of Things, smart buildings or data centers – these fast growing markets are all facing the same challenge: The growing need for more fibers as well as the arrival of new cable types introduce a new level of complexity. Even more optical fibers are required. How are the resulting quantities to be managed? R&M opens up new possibilities.

The modular PRIME program is being extended with distribution modules for ribbon fiber cables that go under the name of PRIME-Ribbon. These ribbons make it possible to successively extend the fiber optic cabling within existing infrastructures and in the PRIME ODF rack.

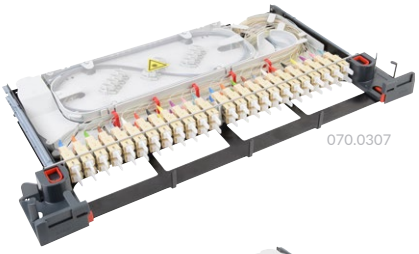
The new distribution modules are based on the tried and tested concept of the PRIME 3/4U sub-racks and have a capacity of up to 96 fibers. Alongside the splice patch variant with LC Duplex or SC adapters, R&M offers a cable-to-cable splicing variant for up to 288 splices.

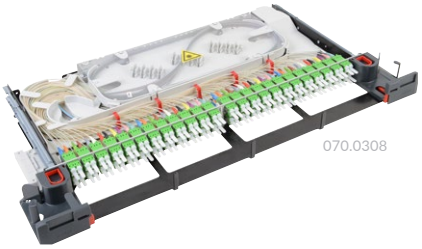
The PRIME-Ribbon distribution modules can be used modularly and combined as desired. This opens up the way into the fiber optic future for users. The latter can now process and manage the existing loose tubes, single fiber cables and new ribbon fiber cables in parallel in a rack. Within a 3U high module, the three types of cable can even be mixed. An option unique to date.

Network operators can now introduce the new, rollable ribbon fiber technology in stages. They can continue to use existing channels, cable guides and PRIME-racks, and, with ribbon fiber cables, they can accommodate considerably more fibers in the same amount of space. Previous investments retain

Up to 40 % more fibers in the cable

In comparison to single fiber cables, ribbon fiber cables offer a number of advantages. They enable a higher number of fibers with the same cable diameter as well as the splicing of 8 or 12 fibers in one working step. This allows cables to be constructed with 30 - 40 % more fiber with the same outside diameter. Thanks to the new, rollable ribbon fiber technology, these fibers are comparable with individual fibers and permit flexible, stress-free processing.





their value. This frees network operators from rigid extension concepts. New requirements, which necessitate cabling for pico radio cells or for the Internet of Things, can be quickly fulfilled.

Looking into the future

The PRIME program once more confirms how R&M detects coming needs at an early stage and develops perfect connectivity solutions. Numerous network operators are currently asking themselves how they can master the unavoidable migration to ribbon fiber technology because in the future they will have to accommodate considerably more FO connections in existing and often cramped infrastructures. Ribbon fiber cables solve this problem. They multiply the number of available fibers without taking up more space.

The PRIME ODF racks and PRIME-Ribbon distribution modules are ideal for use in Fiber to the Home networks. They enable expansion in Central Offices, POPs and above-ground street cabinets. In data centers, the PRIME distribution modules are also the ideal solution for meet-me rooms and – together with the new 1U sub-rack – zone distributors. Campus networks and backbones in large buildings are also possible application fields.

Easy handling

The PRIME-Ribbon distribution modules are compelling thanks to their simple but safe installation as well as the flexible use PRIME is famous for. As an all-rounder, PRIME enables guided and protected fiber entry from the left, right or behind. Thanks to the separation of cable preparation and fiber entry, the decision in favor of a large number or high fiber cables is easy.

With the unique, fully integrated fiber management in PRIME-Ribbon, R&M unites the varied requirements of single and ribbon fibers. The factory-assembled modules make it possible to use a fan-out length which is a major advantage in service. The splice tray which has been optimized for ribbon fiber applications makes fiber storage simple. It has an integrated splice holder for 8F/12F ribbon splice contactors.

Thanks to the front pullout system, the PRIME distribution modules are also compelling in operation. It is simple to bring them into the positions «patching», «cleaning» and «splicing». Additional feature: when in the «cleaning» position, the front panel can be lifted which considerably simplifies the cleaning of the connector. Furthermore, the modules can be removed with a flick of the wrist so that splicing can be carried out on one work surface.

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FM45 for Success in the Field

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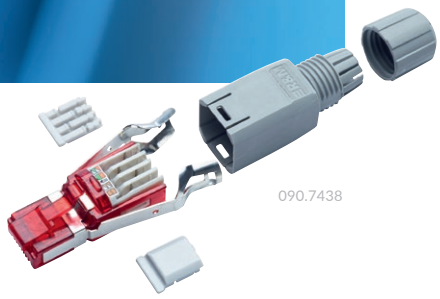

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The field-terminable FM45 connector from R&M really shows what it is made of wherever installers have to set up an RJ45 connection on an ad hoc basis. And in the future that can even be proven in accordance with standards.

With the increasing number of possible applications, the FM45 is enjoying growing popularity worldwide. It is now making a number of contributions to making buildings smarter. In fact, the FM45 is turning out to be the key to the Internet of Things (IoT). Its great advantage: It can be used completely freely as a link between the LAN, the communication technology and the building technology. A brochure on the R&M website provides all the relevant information on possible uses:

050.6914

The concept of the field-terminable RJ45 connector makes it possible for installers to reach even the most remote places in a building. One installation cable and one FM45 are all you need to connect IoT systems, monitors, cameras, antennas etc. wherever they are needed.

The FM45 is thus extending the concept of structured cabling with its service outlets (SO) and patch cords. In sprawling areas with a low density of possible end devices, the connection with service outlets may not always be the cost-efficient answer. In such cases, the targeted connection of a single device could well make sense. If the exact location of this device is known, the FM45 can be used for the direct, cost-efficient connection of the device, while doing away with the need for an outlet.

Power over Ethernet (PoE) is also one of the playing fields of the FM45. It makes the remote powering of IoT end devices over long distances possible because wires with a large diameter (AWG 22 to 26) can also be connected. Furthermore, the FM45 supports the PoE performance classes up to type 4.

Standards create trust

Soon, project managers, installers and users will be placing more confidence in field-terminable connectors than ever before. The SC25 will soon ratify a new measurement test standard, the ISO/IEC 14763-4 ED2. It describes how Modular Plug Terminated Links (MPTL) are to be tested. The standard allows the measurement of installation cables that are terminated directly with a field-assembled connector and are used as connecting cables. That means: Installations of this kind can be tested according to standards in the future.

A further benefit: As long as the necessary equipment is available, installations can be measured immediately. Project managers can prove to their customers on site that the cabling satisfies the standard. They are handing over a secure, tested installation, which is being included in the R&M QPP program and which thus has a 25-year system warranty from R&M. The FM45 from R&M has fulfilled all the relevant standards from the outset.

090.7783

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On the Way to Becoming **No. 1 Cloud Provider**

ESDS is one of India's leading managed data center service and managed solution providers. Founded in 2005 by Mr Piyush Somani, a distinguished and renowned member of the cloud computing fraternity, ESDS is breaking the downtime cycle with the aim of building an unstoppable, brighter and enlightened future globally by enabling organizations to embrace advanced technologies.

ESDS is on the way to becoming India's no.1 cloud service provider with proficiency in providing managed data center services, managed cloud hosting services which includes double-patented eNlight cloud hosting and community clouds, advanced technologies such as AI, ML, IoT, big data, disaster recovery hosting in the cloud, digital banking services, SAP HANA hosting and more. These conventional services are backed with excellent technical support which has helped ESDS build lifetime relationships with its customers.

Experienced support professionals at ESDS possess superior technical capabilities in managing various operating systems, databases and open-source applications. ESDS has also expanded its competencies to application support for all applications developed using open-source technologies as well as a few legacy applications from SAP and Oracle. ESDS caters to multiple industries such as Banking & Finance, Healthcare, Education, Energy & Utilities, Agriculture, Manufacturing, IT, Entertainment & Media, Travel & Tourism, Telecom, Government and eCommerce.

«R&M has helped us get a secure network with faster data transfer capabilities. We can rely on the solution provided by R&M and this will also enable us to have a future-proof network as well.»

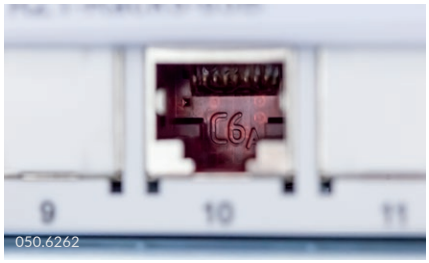
Mr Sajiv Nair, Head of Managed Security Services, Network Operations & DC Management, ESDS India

esds
enabling futurability..

Best option to address network requirements

To meet their network requirements, ESDS thought of R&M and sent their IT team to visit R&M's India office, customer experience center and the manufacturing facility. After thorough analysis, ESDS' IT team was convinced that R&M's cabling was the best option to address their network requirements. R&M's network solution is future-proof, offers excellent transmission speeds, and saves space. Other factors which were under analysis and convinced ESDS were the simple and user-friendly handling, the manufacturing process, quality of the products and the security solutions in the R&M portfolio.

R&M provided ESDS with Cat. 6_A EL patch cords, MPO solutions and cable routing solutions. With R&M's network ESDS can ensure high-performance network connectivity and expect interruption-free connections. ESDS was impressed with the products and solutions provided by R&M and looks forward to future collaborations.



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For Every Situation the Right Splice Closure

030.6423-1

Choosing the right splice closure is the deciding factor on the cost-effective use of an FO network. Telecommunication companies look for suitable solutions for every distribution point based on their network structure. And R&M supports them along the way.

FO networks place a range of high demands on splice closures. Regardless of whether it is a backbone, access or local distribution network, the splice closures have to have suitable characteristics for each network area.

Decisive issues

These characteristics include splice capacity, flexibility and speed of installation. Other criteria are sealing technology, a reliable fiber management system and the ratio of operating to capital expenditure. Another important aspect is how long a splice closure is likely to be used.

Usually, it is unlikely for one particular type of splice closure to «tick all the boxes» and be a best performer in all categories, and there is no one specific standard splice closure either, which is why R&M offers a wide range of splice closures worldwide. This ranges from standard splice closures to the customizable SYNO dome closure with innovative gel sealing. This means that R&M offers the perfect splice closure for every type of distribution point.

R&M is familiar with the requirements of the telecommunications sector and has been collecting practical experience in the field for decades. Together with customer feedback, this knowledge is incorporated in the development of new splice closure generations.

Tests in climate chambers

Temperature fluctuations put strain on plastic and seals over time and cause material to age. This is why, by default, R&M subjects all splice closure types to demanding tests in climate chambers. In this way, leak tightness can be tested and guaranteed long term. Production expertise, product and material quality all contribute to making it possible for the splice closures from R&M to remain fully deployable for much longer than the required 30 years.

R&M splice closures at a glance


030.6480
SYNO


030.6381
SCM


090.7757
SCM Flex


030.6378
STD


030.6375
STD Flex


090.7300
GSC

What is the significance of the type of IP protection?

Making a specification about the type of IP protection provides users with information on the leak tightness of housings. The relevant tests are carried out at room temperature in accordance with the standard. This is why it must always be remembered that the type of IP protection gives no reliable indication of leak tightness for splice closures which are going to be used outdoors for a longer period of time. Details on the type of IP protection are thus not suitable for splice closures which are installed in trenches or shafts.

The first digit «6» means that the housing is dust tight. The second digit means that it is suitable for permanent immersion in water. The standard states that immersion depth and duration are left to the manufacturer. However, housing with an IP68 rating always has to be better than one with IP67.

Products cannot be compared with each other without specifications on immersion depth and duration. Users should always ask the manufacturer for the relevant details to ensure they make the right choice.


050.6112

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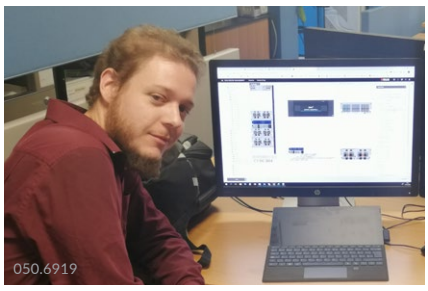
Inside inteliPhy net

With the new inteliPhy net software, data centers gain a one-hundred percent insight into their network and cabling. But R&M thinks much further than that and has therefore integrated numerous additional functions.

Infrastructure management in the data center? That used to sound like heroic work in an impenetrable forest. But who should understand more about infrastructure management than a manufacturer of infrastructure solutions such as R&M? R&M customers who rely on inteliPhy net benefit from this understanding.



Marc-Olivier Domenjoz

vaudoise

Along with the documentation of all connections in the data center, the software also supports capacity administration. One function makes it possible to find the best place to install new devices using specific criteria. Graphics visualize the current utilization of the data center. Automatically generated e-mails warn of capacity bottlenecks. Network managers can use the reporting function to prove that they make optimal use of resources and satisfy quality, compliance and service requirements.

User-defined data

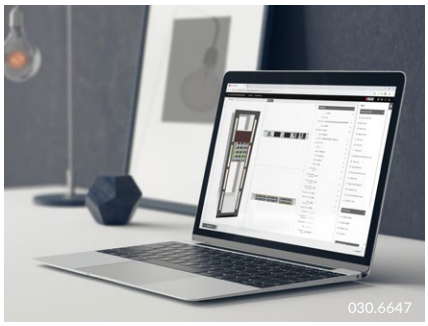
Administrators can store user-defined data such as inventory numbers, warranty periods or maintenance documents on individual devices. inteliPhy net uses this data to automatically identify devices whose warranty agreement is due to expire soon. The templates already contain data such as performance, consumption, weight and size. They also contain information about cards, modules, network and feed connections.

Stocks in check

Storage places for patch cords, servers, switches and other objects can be captured digitally with inteliPhy net. Predefined storage reports constantly provide information on the stocks. inteliPhy net sends e-mails as soon as stock falls below a certain value.

Controlled changes

inteliPhy net helps to use structured work orders to control changes and maintenance processes across company, departmental and team boundaries, and verify that these orders are carried out correctly.



«Being the first user of inteliPhy net was a great experience. We really enjoy the privilege contact with the R&M development team. We are 100 % satisfied with this product and can easily manage our data center cabling, which is a real improvement for us.

Using the inteliPhy net software really saves time. We can now delegate responsibilities to our different teams for each domain of data center management. We would like to thank our management for allowing us to be the first users and would like to encourage other customers to make the same choice!»

Marc-Olivier Domenjoz, Service Operations IT, Vaudoise Assurances

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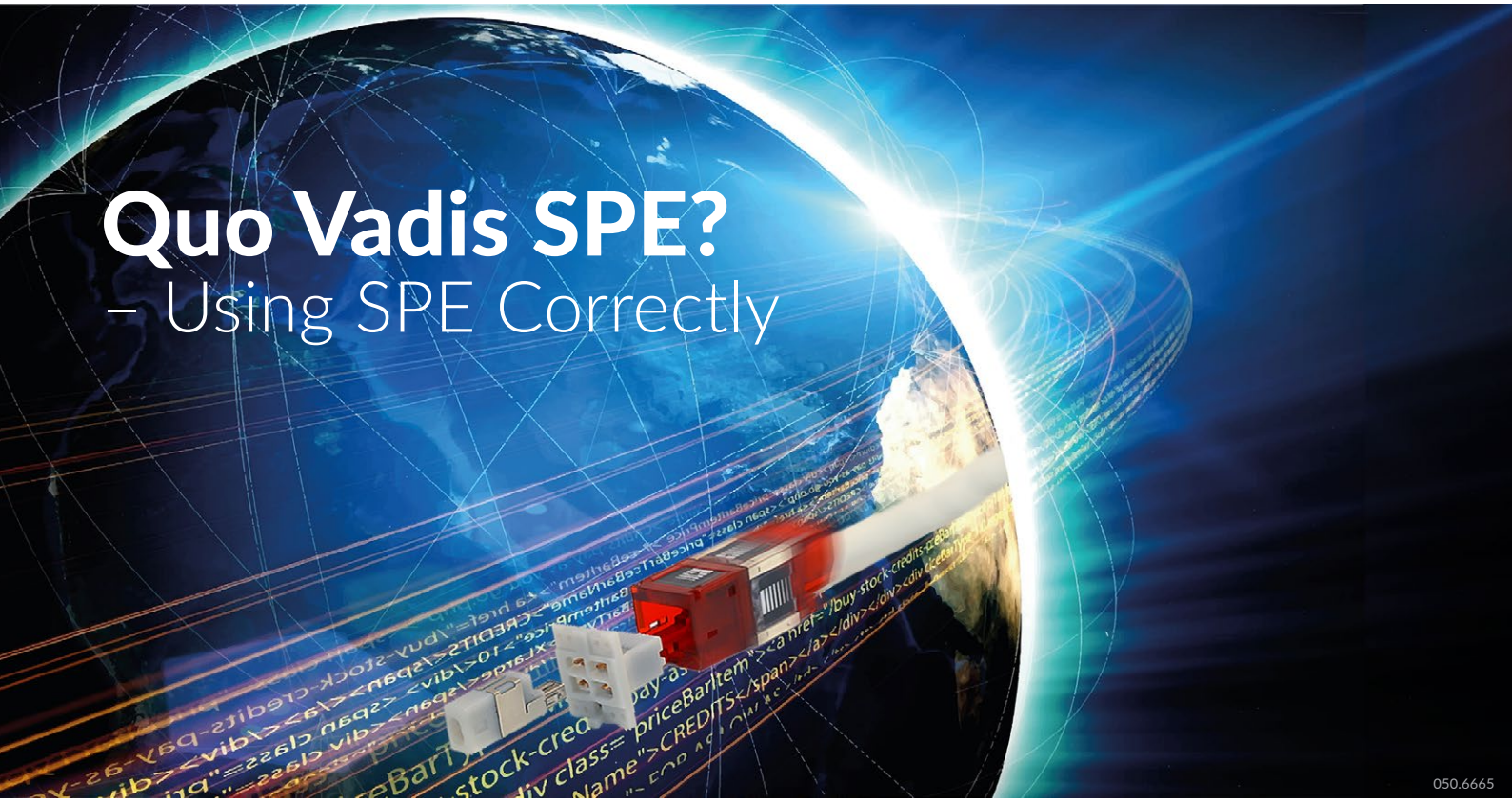


Quo Vadis SPE?
– Using SPE Correctly

050.6665

A network technology with revolutionary potential is currently being worked on: Single Pair Ethernet (SPE). Several committees are working at high pressure on the standards. But there is still significant need for clarification until SPE can expand in building automation and in the LAN.

Experts agree: SPE is becoming a key technology in the Internet of Things (IoT) and Industrial Internet of Things (IIoT). Please also refer to Connections No. 56, «Ethernet Goes Lean». However, no one is yet able to say exactly how and where SPE will be used. Due to a range of different interests, the committees are avoiding addressing open questions.

For example, to date the standardization committees have not dealt sufficiently with the influence of remote power supply (Power over Data Line, PoDL) or the implementation of multi-drop capability. To save time, they are focusing almost exclusively on point-to-point connections without remote power supply.

And that results in the following situation: The standards for the SPE cabling link are today at the same level as those for existing cabling (Cat. 5, 6, 6A or 8.1). But that does not mean that SPE should replace the tried and tested RJ45 interface. The possible uses still have to be fully discussed. For example, this concerns the implementation of the new possibilities in application standards such as ISO/IEC 11801-6. (see box: Overview of IEEE SPE applications).

SPE as an extension of the digital ceiling

One specific operational area is building automation. R&M is convinced that SPE is perfect for connecting a large number of applications in building automation to the data network. SPE components are much smaller than RJ45 adapters. Therefore the connection density on network devices can be increased. The connectors on sensors and actuators can be downsized. The cabling will become comparatively inexpensive.

However, SPE does not support the bandwidths which classic structured cabling with the tried and tested RJ45 interfaces enable. Applications such as WiFi6 and 5G DAS require bandwidths over 10 Gbit/s. Currently, SPE can only provide 10 Mbit/s on the required distances of up to 100 m. This means that initially SPE is not suitable as cabling for an application-neutral infrastructure in a building or on a campus.

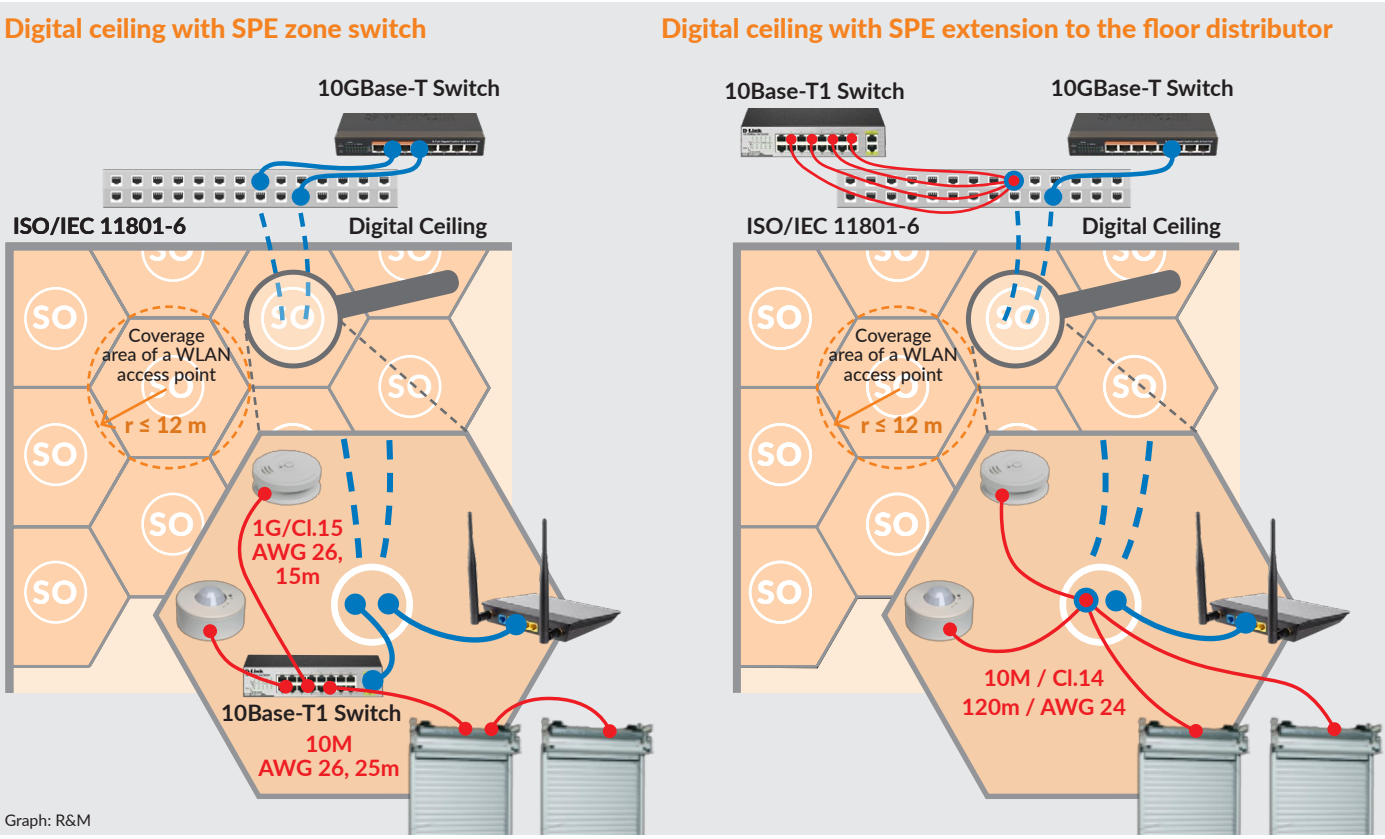
Overview of IEEE SPE applications

Protocol	IEEE	Bandwidth	Distance	Structure	Publication
100Base-T1	802.3bw	100 Mbit/s	15 m	PP	2015
1000Base-T1 Type A	802.3bp	1000 Mbit/s	15 m	PP	2016
1000Base-T1 Type B	802.3bp	1000 Mbit/s	40 m	PP	2016
10Base-T1L	802.3cg	10 Mbit/s	1000 m	PP	2020
10Base-T1S	802.3cg	10 Mbit/s	15 m	PP	2020
10Base-T1S	802.3cg	10 Mbit/s	25 m	Multidrop	2020

So far, the IEEE organization has defined 6 different transmission protocols for Single Pair Ethernet (SPE). Each protocol makes different demands on the cabling.

Remote powering (PoDL) is possible with all protocols apart from 10Base-T1S. There are 3 PoDL classes. Class 13: 8 W; Class 14: 20 W; Class 15: 50 W

Graph: R&M 050.6876



The example confirms: SPE cannot displace RJ45 in the near future. Cabling for a LAN or digital-ceiling infrastructure will continue to require the universal RJ45 connectors in the future to be able to provide the required bandwidths.

Things will become interesting, however, within the digital ceiling zones, between the service outlet (SO) and small IoT applications. From the point of view of R&M, there are diverse and new possibilities here for SPE. The ISO/IEC 11801-6 standard already makes it possible to use application-specific cabling after the service outlet. This has thus laid the foundation stone for a solution for the network connection of light, temperature, smoke and air sensors or of controls for windows and blinds.

Two attractive models

A specific model: An xBase-T1 zone switch for SPE cabling is placed directly beside the SO (figure 1). With the recommended zone diameter of 8 to 12 m, an SPE transmission distance of 15 m is sufficient to reach every point within the digital ceiling zone. All SPE variants can be used: 10 Mbit/s to 1000 Mbit/s, Point to Point and Multi-Drop, PoDL of the highest level (class 15, 50W). The terminal equipment is connected directly to the switch with SPE patch cords.

A further attractive model is the SPE extension. This involves SPE channels being transmitted within the structured digital ceiling cabling over several zones to the floor distributor (figure 2). Structured cabling is application neutral by definition, and, with the right specification, can thus also transport SPE protocols.

According to estimates by R&M, four SPE channels of the category 10Base-T1L can be transmitted 100 m in Cat. 6 cabling. This means that four different SPE applications can be connected via a single SO directly with an SPE switch in the floor distributor.

In this model, all network devices are united in the conventional, tried and tested way in the floor distributor. The number of SPE switches can be reduced. A special splitter will link the SPE connector system with the RJ45 jacks at both ends of the permanent link. This solution can provide 10 MBit/s data transmission and 20 W power per line.

The SPE solutions described build on R&M's long-term experience in structured cabling. They do not require any additional cabling and just minimal investment to integrate Single Pair Ethernet in a digital ceiling infrastructure. This once more confirms the advantages of the digital ceiling concept. It offers investment and future security. This is how Single Pair Ethernet can be realized cost effectively at short notice.

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Building a Smart City's Vital **Communication Infrastructure**

The Indian city of Gurugram is starting into the future with an extensive fiber optic network. It is developing into a sophisticated smart city – supported by Sterlite Power and R&M.

«The R&M team understands the customer's challenges and is entrusted to quickly develop uniquely designed and innovative products to meet the project objectives and delivery timelines.»

Mr NR Patil, Assistant Vice President – Projects at Sterlite Power

Sterlite Power is a global integrated power transmission developer and solutions provider, focused on addressing complex challenges in the sector by tackling the key constraints of time, space and capital.

Sterlite Power has invested and created a world-class optical fiber infrastructure through PPP (Public Private Partnership) for supporting data requirements of the city of Gurugram in India.

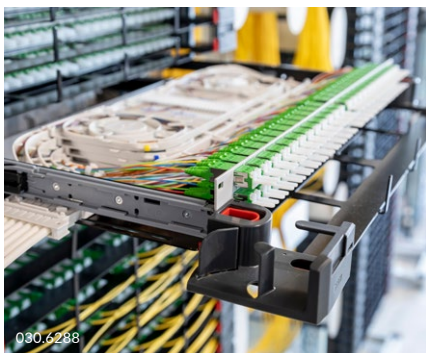
As part of this unique model, Sterlite Power's Convergence business entered into a partnership with GMDA (Gurugram Metropolitan Development Authority) to design, build, finance, operate and maintain the intracity fiber network. Sterlite Power is building a fiber network of 138 km in Gurugram which includes both the core network and last-mile connectivity to support the city's communication needs. Sterlite Power will manage and maintain this network for 21 years.

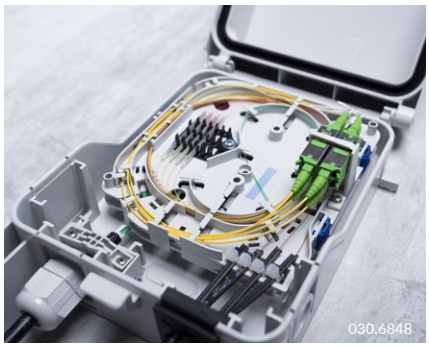
Solution: PRIME ODF, Polaris-box

Sterlite Power is known for innovation in the industry and was looking for a solution to the complicated installations of the highly-dense fiber at the crowded nodes with the need for cable management and network surveillance.

In 2019, R&M India joined hands with Sterlite Power and provided them with the required number of distributors and housings at short notice. With the solution, they succeeded in getting the network up and running in the desired timeframe.

For three sites, Sterlite Power selected the PRIME ODF distribution frame which was launched in 2019. It is being used to densify, distribute and ensure 100 % monitoring of the fiber optic infrastructure.





Sterlite Power implemented the Polaris-box 16 in the government buildings where it perfectly fits their requirements by being sturdy, lockable, waterproof and compact. The other critical condition of fitting splice and splitter modules into housing together was also met with this solution.

Through this newly created fiber network, GMDA aims to connect more than 160 government offices including police stations, public hospitals and business clusters with an integrated command and control center. It will also help in managing traffic, solid waste, property, and land records, water and air quality. GMDA will use real-time data for coordinated fast decision making by the government machinery.

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Measuring Cat. 8.1
Reliably

Cat. 8.1 is coming. In the coming years, more and more data centers and building networks will be starting out with the highest category of copper cabling. Increased caution is required when it comes to measuring a Cat. 8.1 installation.


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Field measurements once cabling has been completed are part of the routine tasks of installers. This does not change with Class I/Cat. 8.1 cabling. In principle, it is the same procedure as for cabling for the lower classes EA, E and D.

Nevertheless, the bar is much higher with Cat. 8.1 or with Class I. The permissible transmission frequency of 2 GHz is four times as much as the highest frequency of the next lower class EA.

Various procedures

Class-I field measurements can be implemented in two ways:

- as a permanent link: installation cables with connection modules at both ends
- as a channel: permanent link plus patch cords at both ends

When measuring the permanent link, the testing plugs of the test device are part of the connection. Together with the connection modules, they have a decisive impact on the result. The testing plugs of different manufacturers ostensibly meet the standards, but deliver varying results. The high frequency with Class I/Cat. 8.1 intensifies the effect.


050.6921

Cat. 8.1 system from R&M, channel under test, different test plugs

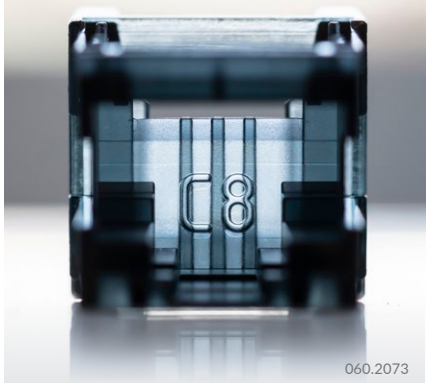
When measuring the channel, the real patch cords are used for the check. The advantage: The measurement covers only parts of the actual cabling system. The influences of the test equipment connection with the patch cord are eliminated mathematically. All device manufacturers use their own algorithms for this. This can, however, affect the quality of the measurements.

The relevant standards for transmission parameters do specify testing plugs and test modules. However, with high frequencies of 2 GHz, the conditions are difficult to fulfill and vary considerably between connectors of the same brand. The testing plugs available on the market thus behave differently and considerably influence the permanent link measurements.

This is why, when measuring Class-I cabling, R&M will initially only accept the channel configuration with special patch cords, the plugs of which have been approved by R&M. This is the only way the variation can be reduced to an acceptable level. Besides, to ensure backward compatibility, R&M recommends making two measurements, one for Cat. 8.1 and one for Cat. 6_A.

Cat. 8.1 complete

R&M is on the front line for this quantum leap in copper cabling. In 2019, R&M was one of the first manufacturers to introduce a complete Cat. 8.1 cabling system. It consists of the Cat. 8.1 connection module, a Cat. 8.2-S/FTP installation cable and a wiring tool. Standard-compliant permanent links can be created in accordance with ISO/IEC 11801, Class I, and ANSI/TIA 568.2-D, category 8, with the module and cable. This is a universal, backward-compatible Cat. 8.1 product.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Duty Free in a New Dimension

A 300-meter long curved LED facade follows the walkway through the duty-free zone at Istanbul Grand Airport. The LEDs visualize an animated picture of the Bosporus.
Image: IGA
050.6924

In the future, ninety million travelers a year will stroll through the duty-free zone at Istanbul Grand Airport and take away with them breathtaking experiences. They can look forward to a massive LED facade, three-dimensional holograms, enhanced digital signage systems and digital shopping. R&M cabling networks all attractions of the world's largest duty-free zone.

The company Unifree Duty Free has created state-of-the-art shopping opportunities at the heart of the terminal of Istanbul Grand Airport (IGA). The sales area run by Unifree covers 56,000 m^2. Since the airport was opened in 2018, 54 brand, concept and flagship stores have moved in. A further 102 sub-operators, exclusive boutiques and a bazaar with local products round out the offer.

An electronic customer profile, shopping analytics and an online pre-order shop support the shopping concept. Travelers' needs can thus be captured digitally resulting in the presentation of personalized offers. Enhanced digital signage systems give customers the opportunity to virtually try on luxury watches, jewelry and suits before they decide whether to buy or not.

«R&M is characterized by its quality, innovation, fast delivery times, expertise, flexibility and modular products.»

Osman Ayhan, Director of Information Technology at Unifree Duty Free


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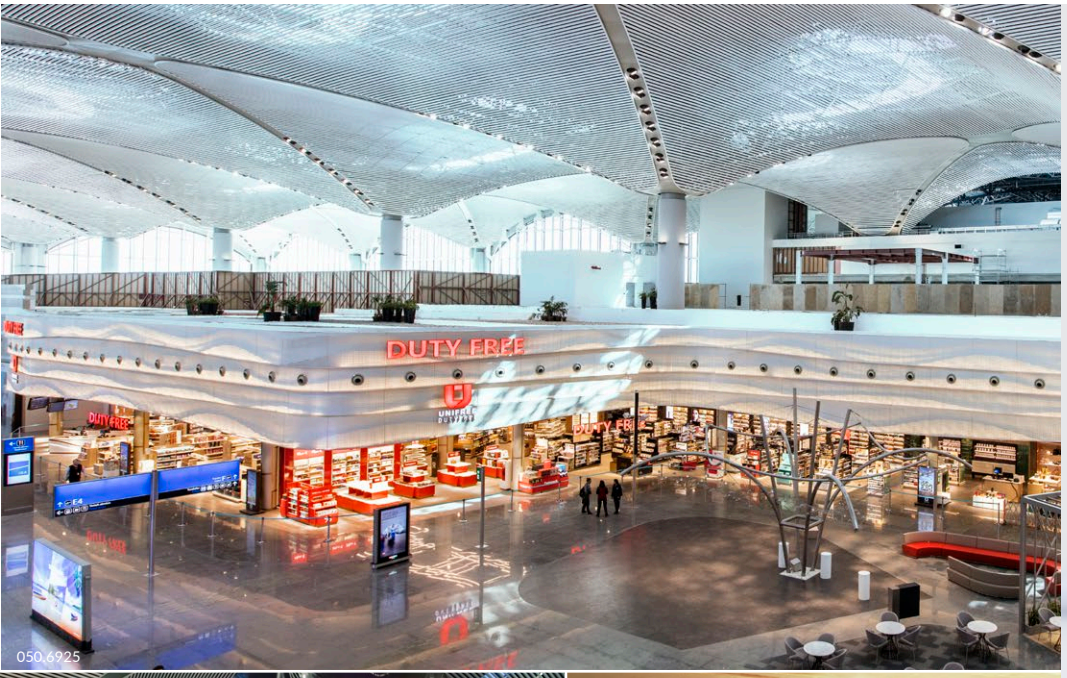

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The solution for Unifree Duty Free

«We opted for Cat. 6_A UTP cabling – the cost-optimized solution which fulfills both today's needs and tomorrow's requirements,» says Osman Ayhan, Director of Information Technology at Unifree Duty Free.

The network consists entirely of R&M products. Among other things, it includes: 750,000 m Cat. 6_A copper cable, 100,000 m OS2 FO cable, 800 Cat. 6_A patch panels, Cat. 6_A EL modules, FO patch panels and patch cords.

With the field-terminable FM45 connector from R&M, the installers were able to flexibly position 2,000 IP-supported surveillance cameras.

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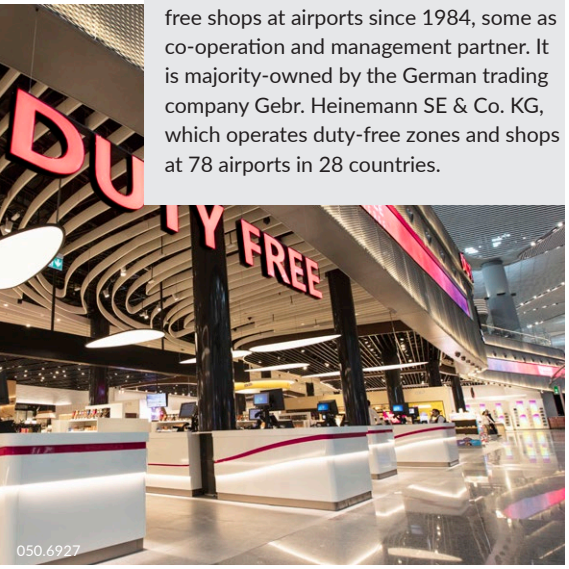
The customer Unifree Duty Free

The operator of the world's largest duty-free zone at the new Istanbul Grand Airport aims to provide a breathtaking shopping experience. Unifree Duty Free relies on high service quality, selected brands and particularly polite personnel. The Turkish company has been operating duty-free shops at airports since 1984, some as co-operation and management partner. It is majority-owned by the German trading company Gebr. Heinemann SE & Co. KG, which operates duty-free zones and shops at 78 airports in 28 countries.



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This kind of technology-based shopping experience requires a seamless Ethernet/IP infrastructure throughout as well as reliable data coverage. Unifree Duty Free selected R&M as supplier because the cabling offered fulfilled the required specifications exactly. R&M had already equipped the airport building with structured Cat. 6_A cabling and 15,000 network ports.

Osman Ayhan, Director of Information Technology at Unifree Duty Free, says: «R&M is characterized by its quality, innovation, fast delivery times, expertise, flexibility and modular products.» He also sees the team spirit at R&M, the back-office support and the special training of installers on site as a definite advantage.

The airport's IT department had recommended R&M as a cabling partner. Osman Ayhan confirms: «R&M provides the optimal network technology for airports and large retail areas.»

Alongside comprehensive data transmission with 10 Gigabit Ethernet, the cabling supports numerous screens as well as digital and multimedia applications in the duty-free zone. Office workstations, Voice-over-IP telephones, payment and security systems are also connected.


050.6513

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New Cables – **New Opportunities**

The interest in FO cables made by R&M is growing. With its own cable manufacturing facility, R&M supports distributors, producers and installation partners in a number of different ways. Now, R&M is extending the range even further.

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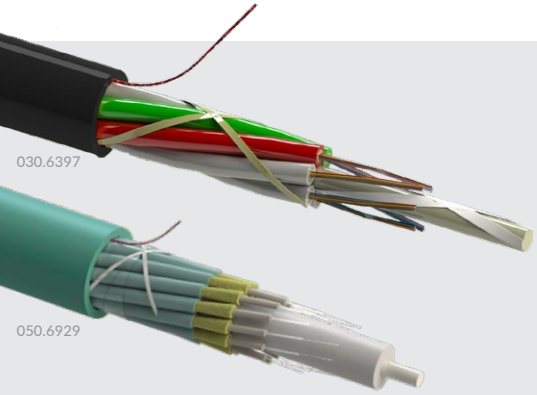
The expert team in the R&M cable plant in the Czech Republic is always focusing on new and special requirements in the market. And that is how the range grows. R&M partners can thus extend their own offer in a targeted manner. Among other things, the plant now provides longitudinal watertight, gel-free universal installation cables. These include cables with central loose tube cables with up to 24 fibers and stranded loose tube cables with up to twelve bundles, each with twelve fibers – in other words, a total of 144 fibers.



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More choice in FO cables

The range of new distribution cables comprises:

- Gel-free all-purpose central loose tube cables
- Gel-free all-purpose stranded loose tube cables
- Buffered fibers in 12 colors
- Compact fibers in 12 colors
- Simplex patch cords (2.0 mm and 2.7 mm)
- Duplex zipcord figure-8 cables (2.0 x 4.2 mm and 2.7 x 5.6 mm)

Gel-free loose tube cables

The installation cables can be perfectly combined with R&M splice panels and FO modules, such as UniRack2 and Fiberliners. The new products are suitable for laying outdoors over short routes, for example on a campus. R&M constructed the FRLSZH sheath (fire resistant, low smoke, zero halogen) in such a way that water simply cannot penetrate it. A barrier prevents any water that happens to be present from penetrating any deeper in a longitudinal direction. Glass roving filaments under the sheath protect the loose tubes from rodent bites.

Installers appreciate the advantages of these dry, gel-free loose tube cables. They do not have to wipe off any gel or stop a flow of gel. That saves time and is more pleasant.

Quality from a single source

R&M also offers new solutions for the distribution cable segment. The range comprises buffered and compact fibers as well as patch cords. The cables are coordinated with the high-grade R&M connectors or their crimping to minimize attenuation and attain high performance.

The cable offering gives connector producers new possibilities on the market. When they combine the R&M cables with the tried and tested R&M connector components, they increase the performance and possible uses of their FO prefabricated products. They obtain all parts from a single source, can simplify the assembly process, extend the production depth and react more flexibly to customer requirements.

For more information and specialist knowledge, please refer to www.rdm.com/sites/Fiber-Optic-Cable.

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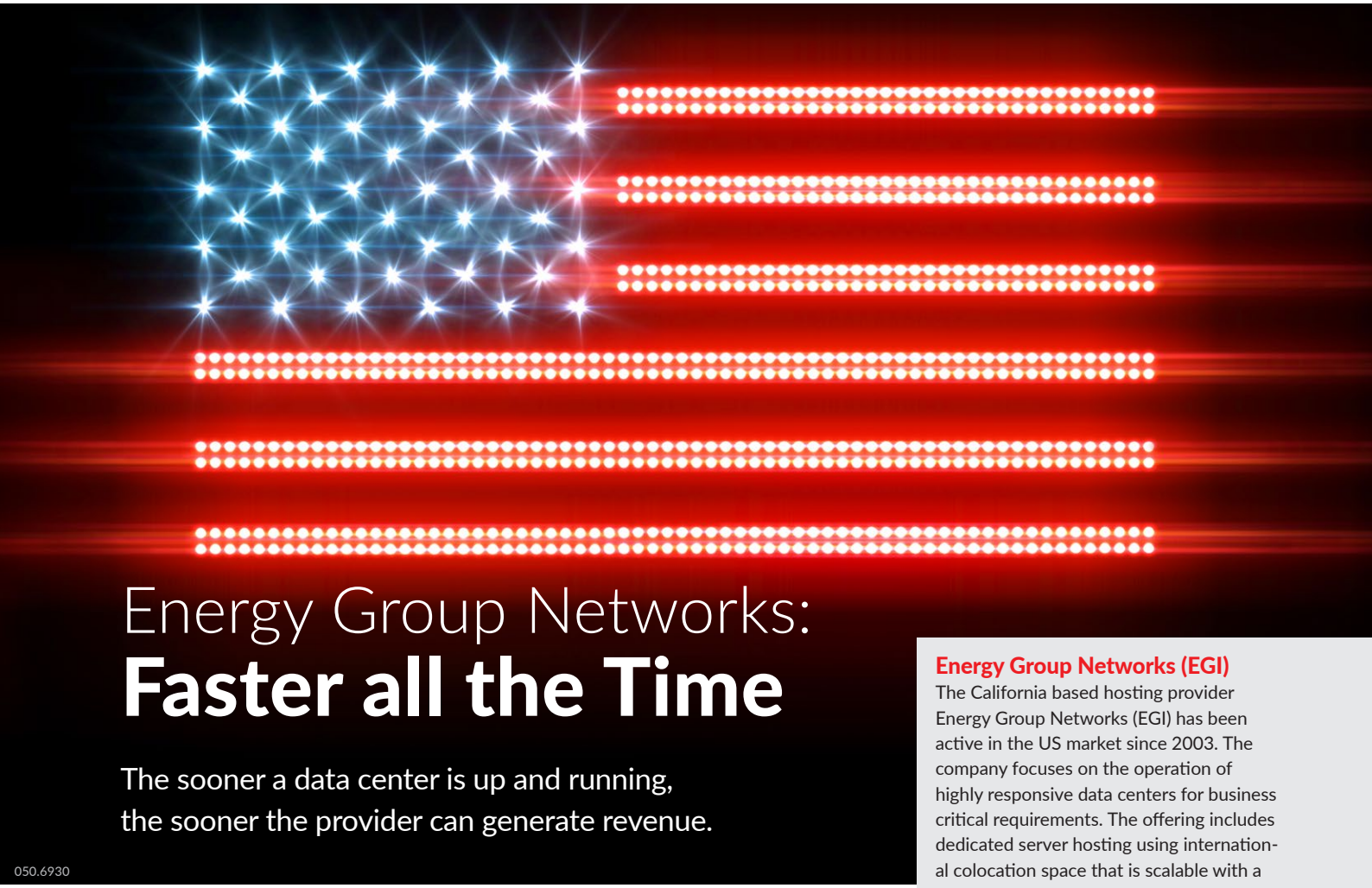


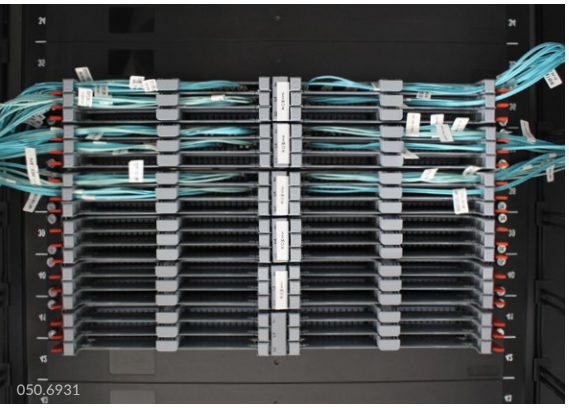
Energy Group Networks: **Faster all the Time**

The sooner a data center is up and running, the sooner the provider can generate revenue.

050.6930

This forces companies to increasingly make networking and infrastructure decisions on the fly. This is sometimes called plan-as-you-go. Despite the obvious pitfalls of such planning, the partnership of R&M and California based Energy Group Networks demonstrates that this can be successfully navigated.

Because of time constraints and a desire for maximum flexibility, Energy Group Networks had not initially called out the cabling system in full detail when planning its new OpenColo data center in Santa Clara. Construction began in 2018 but the management was confident R&M would provide the appropriate cabling solution in time.



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Start with Netscale 72

R&M recommended an FO infrastructure and the new distribution platform Netscale 72. At the time Energy Group Networks needed to move forward, only a prototype was available. However, impressed by what they saw and because of the relationship with R&M, Energy Group Networks ordered Netscale 72. To accommodate the construction timeline, R&M started production earlier than planned. This sort of rapid deployment is an example of Silicon Valley's rapid pace at its best.

OpenColo datacenter can now utilize the distribution technology of tomorrow from day one. With Netscale 72, FO cabling can be densified to a high degree and can be changed, upgraded or scaled in just a few easy steps. Netscale 72 supports several cabling philosophies, upcoming Ethernet generations, the largest leafspine architectures and digitalized infrastructure management.

When business partners trust each other and work towards the same goals, even a job as extensive a data center cabling can be enacted under plan-as-you-go time pressure. For more info about OpenColo check out opencolo.com

OpenColo

Energy Group Networks (EGI)

The California based hosting provider Energy Group Networks (EGI) has been active in the US market since 2003. The company focuses on the operation of highly responsive data centers for business critical requirements. The offering includes dedicated server hosting using international colocation space that is scalable with a rapidly growing business. EGI works with multi-homed facilities from upstream providers such as NTT, GTT, Cogent and HE.net. This allows EGI to ensure international traffic routing.

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