CONNECTIONS 60

Megatrend **5G**

Medical University of Gdańsk, Poland:
A New Era for Medicine

Netscale 48:
Perfect Versatility

Aerial Deployment:
Caution when Splitting!

R&M

050.7000

Sustainable Digitalization
Thanks to 5G

050.7001

Dear Business Partners

As paradoxical as it may sound, the benefits of digitalization were particularly apparent during the pandemic. Without the Internet, social life would have collapsed in many places. This showed us that crisis-resistant connectivity and bandwidth are just as much a part of basic services as a tap and a power connection.

Last year, leading telecom companies relied on our PRIME distribution modules and the multifunctional Polaris boxes for power supply connections. At the same time, our distribution platform Netscale 72 and the inteliPhy net management software for data centers scored highly. Further new products are about to be launched on the market. Read more about them in our NEWS articles.

Digitalization is shaking up the market and affecting companies along the value-added chain. Thanks to webinars, virtual trade shows and online training, we can support our customers professionally at all times. During the pandemic year, we became more agile and digital faster than we had anticipated.

Network convergence must be planned

5G promises even more and even faster data transfer. Around the world, billions are being invested in upgrading antennas. But what you can't see is just as important: Communication only runs smoothly if 5G radio cells are connected to FO networks. Fiber to the Antenna (FTTA) is a future market. With this development, the convergence of existing network architectures is becoming more important than ever. Their planning demands a great deal of flexibility from all those involved.

The effort is worthwhile as the new standard provides impetus for innovations in all sectors. The 5G ecosystem is likely to take digitalization to a new level and drive the Internet of Things forward. Read our FOCUS story to find out which business models could prevail. As a farsighted partner, we are happy to support you on the road to 5G.

What is often forgotten is that 5G transmits data volumes with very little electricity thanks to exemplary energy efficiency. When used smartly, digitalization is also contributing to sustainable change in this sector.

In a family company such as R&M, sustainability is one of the cornerstones of the organization. It goes without saying that we act in an environmentally conscious and socially responsible manner. The stable development and exemplary commitment of R&M bear witness to our sustainable company philosophy. The company keeps the balance between economic, ecological and social perspectives. Our tried-and-tested approach to sustainability will carry us forward into the future and will gain considerably in significance strategically at all levels. You will soon learn more about this because we are also making our reporting more transparent.

Connectivity contributes to the quality of life around the world. We are once again happy to be presenting you with groundbreaking international projects – from a wide range of industries and locations. Working on the sustainable infrastructure of tomorrow is what motivates us every day.

I wish you lots of inspiration!

Robert Merki, CTO

Contents

Megatrend 5G

050.7002

The 5G race is on. All over the world, telecom companies are investing massive amounts of money in the radio network of the future. At the same time, the 5G ecosystem opens up opportunities for new market players and for providers with a wide variety of services. It is time to rethink business models and discuss attractive value creation approaches.

This year, China is doubling its 5G investments. In the country's agglomerations, 600,000 new 5G base stations are to be built to add to the existing 700,000.

Swiss provider Swisscom is making 5G reception available throughout the country. The network was already reaching around 90 % of the population at the end of December 2020.

Last year, Deutsche Telekom had 45,000 existing antennas upgraded, and added 5,000 new ones to its network. In 4,700 towns, 5G is running in the 2.1 GHz band; in 26 cities there is already exhaustive coverage in the 3.6 GHz band. It is said that by the end of 2021, 80 % of the German population will be able to use 5G. Competitors Telefonica and Vodafone are no less active. All together,

they have already invested billions in the 5G rollout. And their commitment continues unabated.

These are just a few examples of the 5G megatrend.

Taking a look behind the antennas
Equally significant developments are taking place behind the scenes. The 5G cell sites must be connected to fiber optic networks as new access points (FTTA, Fronthaul Connectivity). But the majority of these fiber optic networks still have to be expanded or additional capacity created accordingly in existing networks. Furthermore, 5G requires a great degree of flexibility in the planning, operation and operational management of such network infrastructures. That is a major

Fiber optics on the rise compared to traditional microwave radio

Small cell antenna

challenge and, at the same time, a learning process for everyone involved. Business planners and technicians alike have been used to distinguishing between optical fiber for fixed network and for cellular phone network applications, and planning such capacities and costs separately.

In addition, computing and storage capacities will have to be moved to the edge of the networks as 5G service expansion progresses (edge computing). In edge data centers, providers will in future make available the processing power and software applications required in particular for mission critical services (time-critical and data-sensitive services and applications). This is the only way to minimize transmission times for sensitive data on the path between the data center and subscribers.

New approaches on the market
The paradigm shift brought about by 5G is leading to new approaches to network design, network planning and infrastructure solutions. New types of service providers and variants of business models will be required to manage the shift and meet demand.

Large companies will, for example, create private 5G networks for their company-specific communication and process needs and secure their own transmission bandwidths, i.e. 5G frequencies, for this purpose. This is already the case in some European countries where first wireless 5G enterprise or campus networks, as they are called, are already in test operation. First complex interoperability tests between the different system suppliers and the relevant industrial end user and that user's specific IoT/5G applications are being carried out. With 5G, a whole new world of applications and individually designed solutions can be realized in the enterprise sector.

Classic cellular phone network operators, who are now gradually upgrading their infrastructure and antenna sites with 5G technology, must, among other things, connect existing and many additional, new antenna sites with fiber optic networks. Due to time and capacity bottlenecks, these will no longer solely be proprietary optical fiber networks in the future. Increasingly, operators are using the capacities of existing FO networks for this purpose. They are relying on operators in the fixed network, FTTH and CATV sectors as well as on private data center connections and even FO networks of railway companies or local and regional utilities.

New market players will discover their 5G opportunities, extend FO capacities and then rent them out for example to cellular phone network operators. They will become «neutral hosts». The tower companies (owners and operators of mobile communications or radio relay masts) are already in business with mobile communication suppliers. They will also take on additional new tasks and develop business models as the 5G rollout progresses.

We would like to take a closer look at two models here.

«Neutral host» model
One of the new concepts, which is already well established particularly in the US and the UK, is that of the neutral host. The host operates a communication network with its own optical core, edge and remote access infrastructures. Mobile network operators rent optical network capacity or even complete services from these service providers on certain routes. In this way, they save on investments in infrastructure and system hardware as well as on personnel and costs for operation and maintenance. They thus gain time and budget for the development and marketing of new end-to-end applications, the provision of new software packages and media content. Mobile network operators want to focus in particular on market development for new 5G applications, especially in the lucrative, professional customer environment (5G Wireless Enterprise) and on media and direct interaction with their end users.

This concept ultimately challenges traditional network construction and operation by telecom carriers. Instead, a third party builds,

Focus

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Neutral host architectures and business models are usually particularly suitable for the local level, for urban areas with lots of future 5G small cells. With neutral hosts, mobile network operators and other providers of communications services can cover decentralized locations that are often still waiting to be developed. To date, these sites have suffered either from technical obstacles or high implementation costs. The new model makes it possible for mobile network operators to implement 5G services at such locations without using their own capital.

An interesting option: At an ideal time, a neutral host could sell its own acquired 5G spectrum to an interested company, system integrator or the MNO itself in an application-bound manner for a profit.

«Tower Company» model

There is another approach on the side of the radio mast operators, or tower companies as they are known. 5G networks require many tightly meshed antenna systems due to the short range of the radio signals in some of the new frequency areas and because of the service-specific data rates and latency requirements of certain services. It is estimated that blanket coverage with 5G requires – in comparison to 4G – seven to ten times as many radio cells and corresponding locations. These are small cells with a diameter between a few dozen and a very few hundred meters.

operates and maintains a fundamentally important, central part of the network, offering network architectures, connectivity and services. The neutral host could provide the entire chain from antennas to the FO core network as a one-stop shopping service. In the future, the host could also realize software-defined networks and maintain the corresponding capacities, which could then be allocated and scaled to different mobile network operators as required depending on the situation and demand.

Potential providers on the 5G market

The paradigm shift due to 5G described above opens up attractive opportunities for all kinds of new providers. The spectrum ranges from network offerings through neutral hosts to radio mast operations. Other options come about through public-private partnerships, extended business models, services and private 5G networks from existing companies and institutions. Potential market players:

– Cities and utilities
– IT services, data centers
– Cable TV providers
– Real estate companies
– Shopping malls, event and congress centers
– Outdoor advertising suppliers
– Airports, stations, harbors
– Highway operators
– Universities, authorities
– TV stations, newspaper publishers
– Large industrial companies
– Private investors

Apart from the above-mentioned FO capacities, further solutions and services in the portfolio of a neutral host would include proprietary, additional frequencies or a certain frequency range for small cell sites and applications, location-based radio coverage or, for example, event-related, dedicated transmission and reception technologies.

However, the number of parties involved in turn also increases the complexity of the business models, necessitating considerable cooperation between the players. This is the only way, for example, to make a national or regional 5G rollout beneficial for all sides. This is particularly the case for towns and regional conurbations where large corporations will be asking for 5G services.

Option for service providers

A neutral host can be a former cable TV provider. Holders of a public-private network license with a specific infrastructure are also possible. Equally, banks or IT service providers with their own infrastructures would be feasible. These market players have their own FO and cable networks, their own data centers and distribution nodes, developed, distributed access points and connections for power and data transmission already available there. This is often particularly the case in interesting «hot spots» in the city and other conurbations. These assets can be used to offer third parties special network capacities, network slices, processing power and software services.

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Originally, telecom companies built the antenna masts. This activity has more and more become the responsibility of specialist radio mast operators or tower companies. Mobile network operators sell their masts to such companies and rent them back from them. This gives them liquidity for further investments, product developments and services, which are more in focus than infrastructure.

The tower companies operate the infrastructure and gradually assume more and more responsibility. Not only for the operation of currently installed systems, but also for future upgrades of existing sites and even for the development, planning and construction of new sites – especially in the context of 5G rollouts. There is an immense need for consulting and exchange of experience, as these topics pose new challenges for radio mast operators, who to date have focused primarily on operational service provision. Expertise on various technologies and trades is required to further develop the sites. At most, those leasing from the tower companies will order complete upgrades and the provision of service packages for specific site types. It is important to find the right balance between standardization and the individualization of solutions. Responsibility for invitations to tender and selection of system solutions, technical bid evaluations and complex cost calculations will be transferred from mobile network operators to the tower companies.

Comparing 4G and 5G

		4G	5G		
10 ms	Latency		Latency	<1 ms	
7.2 Exabytes/month	Data traffic		Data traffic	50 Exabytes/month (2021)	
1 Gb/s	Peak data rates		Peak data rates	20 Gb/s	
3 GHz	Available spectrum		Available spectrum	30 GHz	
100 thousand connections/km²	Connection density		Connection density	1 million connections/km²	

Source: Cabling installation and maintenance   050.7098
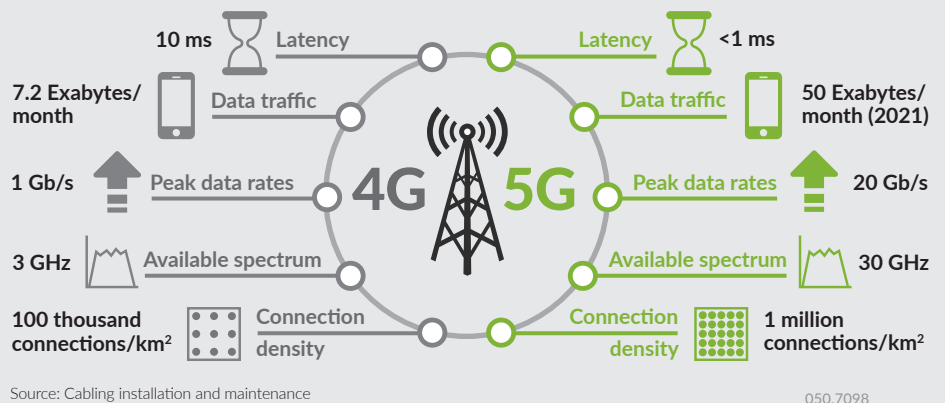
Those are some of the challenges. But there are a large number of advantages:
– Radio mast operators have a certain competitive advantage. Initially, they only have to take the current operating expenses into consideration. New competitors would first have to overcome high investment hurdles before entering the market.
– Radio mast operators can offer hosting services to multiple mobile network operators. Sharing allows revenues to be multiplied and investments to be spread across multiple projects.

Expert consulting services needed

As shown, the mobile communications market will open up surprising opportunities for new or additional value creation in the coming years. Nevertheless, 5G networks are a complicated affair. Those responsible will encounter a range of technologies, locations, legal and financing issues, and many unknown challenges.

This why network operators should find expert support for their 5G projects at an early stage. In this way, they avoid an excess of specification work, unnecessary expenses and future risks. For example, they could run the risk of being inflexible in just a few years. That happens when parts of an infrastructure, equipment or interfaces can only be adapted to suit new requirements with considerable effort, if at all.

Professional advice pays off. It all depends on defining the suitable technical solution at an early stage. On the one hand, mast operators require cost-optimized, customized infrastructures in many cases. On the other hand, as far as possible, the technology should be standardized to be able to implement expansion projects quickly.

Towns and communal utilities will often provide key sites and thus the foundation, especially for 5G small cell network expansion, with their FO capacity and «infrastructure» in many forms. These include unused fiber optic cables, pipes, street lamps, traffic lights, above-ground street cabinets, electricity boxes, advertising boards, transformer cabins, a wide variety of buildings – always some kind of access to fiber optic and power supply, even in unusual locations. But they are usually lacking the expertise in mobile communications technology or in determining the typical requirements of a potential site in their own infrastructure for its integration into the 5G world. This is another reason why they should draw on external expertise.
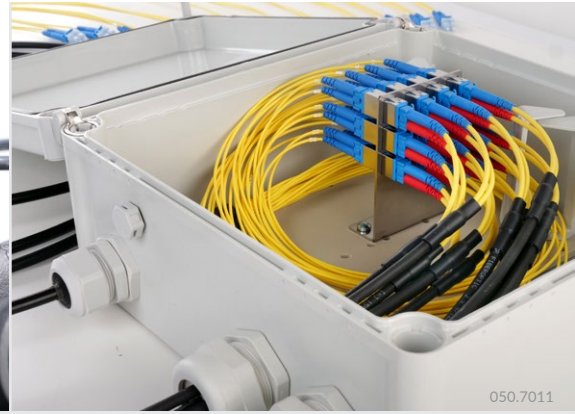
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New perspectives with 5G for tower companies and power grid operators

Focus
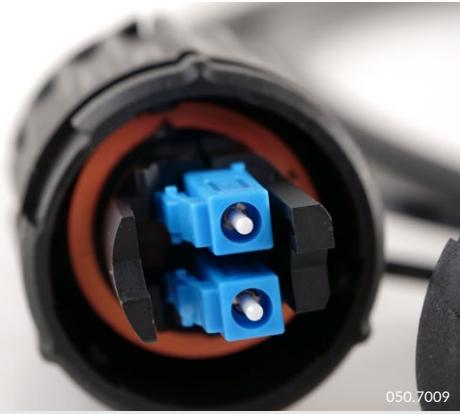
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R&M's outdoor connectivity solutions for upcoming 5G rollouts are in preparation.

Know-how for the road to 5G

Don't tread the path to 5G alone! That is certainly what R&M would recommend. Far-sighted, expert advice and development partnerships will help market players to make the right decisions at an early stage.

Services and competencies R&M can incorporate in 5G infrastructure topics:

– **Know-how sharing:** Experience in planning, manufacture and delivery with components and solutions for infrastructure projects in the telecoms sector including in the area of broadband expansion (FTTx). Knowledge and consideration of industry-relevant standards, but also local regulations, etc.

– **Consulting:** Comprehensive support, starting with network and topology planning as well as with developing business and operator models. The wide spectrum ranges from market and site analysis through specification and evaluation, for example, of the FO infrastructure solution to selecting the right local project partners.

– **Moderation:** Management in cooperation projects and public-private partnerships.

– **Technology:** Modular fiber optic solutions for network technology and connectivity from R&M cover the entire FTTx topology. From outdoor connection technology at the antenna, termination, cable routing inside and outside buildings, fronthaul and backhaul connection solutions to large-scale optical distribution systems in the central office or in core and edge data centers.

– **System integration:** Selection of suitable components and systems for all network layers. Merging of various application areas: public and private communication networks, professional data networks and data centers, local IoT applications, smart buildings/smart cities.

– **Quality assurance:** Monitoring of the project from A-Z, technical support at all levels of data transmission: fiber optics, copper, and signal technology in all project phases.

– **Logistics:** Just-in-time delivery of all components to the construction site as well as pre-assembly or assembly of cabinets, distributors, patch panels and cables. Added to this are global supply chain, warehousing, web store and digital product data.

– **Development partnerships:** R&M designs future-proof technology solutions and specific products together with its customers. Local application engineering is provided based on the recognized quality criteria of R&M.

– **Training:** R&M helps with the special training of assembly and operation teams both on site and from a distance. Specialist support from R&M staff is available centrally and regionally at short notice at all times.

Urban Development

Public and private network operators

Railroad communication

Utilities

Public networks

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The opportunities of change

The transition to 5G is taking place rapidly. The key benefits of 5G include the possibility to implement a wide range of applications, services and operator models. These occur – as described above – for example in the construction, operation and marketing of infrastructures. Whether they are radio masts, small cells, FO networks, corporate networks or access offerings.

This is just the time for newcomers to discover interesting opportunities on the mobile communications market.

050.7012

Thomas Ritz
Market Manager Public Networks
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Digital Measurements
and Product Data

Measurement protocols on paper? For everyone involved in a project, including installers, it is tedious to have to manually document all the data of network connectors. R&M is doing away with that and is ringing in the next stage of enterprise-wide digitalization.

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R&M is optimizing its measurement data service for its customers. A QR code with a link to the R&M measurement data database simplifies all the quality assurance, protocol and documentation processes.

The strain relief sleeve of the R&M connectors now features a label bearing a data matrix code and a serial number. The code can be read using a smartphone and a scanner app. It contains an Internet link that leads directly to the Report section of R&M's website.

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This is where existing measurement results, specifications and other details on each individual connector of an assembly can be retrieved. The values can also be queried by entering the serial number. There is no need for time-consuming labeling on the construction site. Above all, measurement protocols no longer have to be printed out and filed. Everyone involved in the project saves time, paper and resources.

Traceability back to the production steps

The new service is called «Measurement Data on Demand» and enables exact tracing of the connectors back to the production steps. In the future, it will also be possible to store fiber-optic measurement data for interferometry and the surface image.

R&M is planning on adding other products, such as panels, racks and multifiber cables to its digital service. The system is modular in design. This means R&M can extend the functions and constantly enlarge the range entered. The supply chain will use the data to optimize production and delivery times.

This step in digitalization gives users and customers a range of other benefits. The link in the QR code not only accesses the measurement data, but in the future will also show relevant news, manuals and videos. This means that installation instructions can simply be called up using a smartphone, making work on the construction site much easier. Customers can also store their own protocols.

An extensive project in the R&M production plants preceded the launch. The plants introduced uniform data recording. Pioneering work was carried out in particular at the sites in Bulgaria and Switzerland. The global rollout is due to follow soon.

www.rdm.com/report/
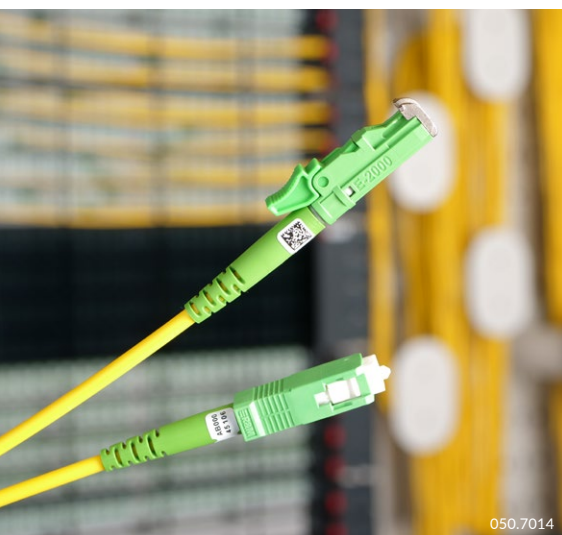
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Success

Ultra-Rapid
Network Expansion

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Full speed ahead for Belgium's largest network operator. By the end of 2028, Proximus will be connecting more than 4.2 million households and companies to its ultra-high-speed fiber optic network. The PRIME-ODF platform from R&M is speeding up work in the field.

The largest infrastructure project in decades on the Belgian telecommunications market started in mid-2020. And it is catapulting the entire country into the fiber optic era. Fiber to the Home and Fiber to the Business with Gigabit speeds for Internet access are soon to be the norm. The provider-neutral Proximus network will cover around 70% of the country's fiber optic supply. Proximus is even aiming to offer Fiber to the 5G Antenna.

Traditionally a pioneer

The Belgian carrier is investing around three billion euros for this purpose. Half of the ambitious investment program should be implemented as early as 2025. «Belgium has always been a pioneer in creating high-speed networks,» Proximus Chief Technology Officer Geert Standaert is quoted as saying in a specialist article.

Fiber optic networks have been rolled out to the street cabinets before (Fiber to the Cabinet). With VDSL technology, Proximus got the most out of the copper-based last mile. To date, about 85% of the market has been served with 30 Mbit/s and 50% with an impressive 100 Mbit/s.

Diligent evaluation

The management approached the project with due diligence. Geert Standaert is quoted in the specialist article as follows: «A fiber optic access network is a completely different technology from the copper line we have been working with for some time. And that is why we had to seriously rethink our tools and processes.»

From the very beginning, it had to be ensured that the rollout could take place as quickly as possible. The numerous FTTH sections in the field had to be as easy to build, operate and maintain as possible. Proximus assumes that the fiber optic cabling can be adapted to all the special features to be found locally: the types and sizes of residential units, distribution rooms, channels, shafts and cabinets.

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Price/performance ratio

A project group was given the task of evaluating a high-density platform for main distribution frames that could be used to build a future-proof FTTH network. The key was to find a panel that could accommodate the highest possible number of fibers per rack unit and still remain operable. Some important points for the specification were:

– **Costs:** Which construction kit can we use to implement our plans most efficiently and cost-effectively? How high is the total cost of ownership?
– **Density:** How many cables per height unit fit into the rack? Can the mass of new cables be accommodated in existing rooms? Does the solution avoid or minimize additional space requirements?
– **Future:** Does the platform offer sufficient resources to be able to cover the coming demand for fiber optic cables for 5G antennas?
– **Openness:** Is the platform compatible with the modularity of the historical cables and does it also connect the new, specially developed feeder access cables with 192 fibers?
– **Operation:** Does the product support the operational requirements and familiar working methods out in the field? Are the connectors easy for the technicians to use? How can the fibers be spliced onto the drawers at high packing density?

PRIME ODF components adapted for Proximus: Cable Termination Unit (left) and 1U Fiber Termination Panel with 48 LC Duplex ports

Proximus found answers to these questions at the Congress of the FTTH Council in Amsterdam in 2019. That was where R&M's fiber optic main distributor PRIME ODF was launched. It offered the highest cabling density on the smallest possible footprint. R&M demonstrated that PRIME components can be adapted to customer needs immediately.

This provided rapidly deployable, high-density 1U panels with 48 LC Duplex ports and Cable Termination Units (CTU). Seba Service in Mechelen, a certified R&M distributor, set up the logistics hub for flexible supply to the construction teams. And that is how Proximus found the solution they were looking for.

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Success

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High-speed Fiber to the Home: Proximus wants to supply 70 % of Belgium's households with fiber by 2028.

Monks now brewing with fiber optics

The Belgian network operator Proximus uses a practical example to describe the benefits of ultra-fast fiber optic connections for small companies. The product concerned is beer – something very popular in Belgium.

The famous monastery brewery Notre Dame de St. Remy Rochefort has recently acquired a fiber optic connection. Now the master brewers can digitize their production processes. The brew kettles can be operated remotely and monitored in real time thanks to state-of-the-art IT and stable fiber-optic signal transmission.

Abbot Gumer Santos appreciates the convenience. The brewery no longer needs to be manned around the clock but the monks can still ensure the quality of the beer. A smartphone app allows direct intervention in production. And this represents a considerable competitive advantage for the brewery.

«The best solution for us»

Stephane Cambier was a member of the High Density Distribution Frame project group, which evaluated a high density platform for main distribution frames. He is Transmission Equipment Specialist Networking Engineering & Operations at Proximus and gave R&M an interview.

What did you like most about the PRIME ODF from R&M?

Technically speaking, PRIME doubles the cabling density compared to the old platforms. However, we have to accept that we now work with LC/APC connectors as opposed to SC/APC connectors. Part of the solution package is of course the support offered to us by Seba and R&M. We very clearly felt the willingness to convince Proximus that they had the best solution for our requirements.

Can you describe your experiences with the R&M team when it came to adapting the end products?

A standard product is very rarely something you can use as it comes. We have to take the past into account and each network operator has its own particularities. R&M understood that and was very flexible in fulfilling our requirements. Great customer support.

What are your teams in the field reporting back to you?

Well, there was some resistance at first. The practical-minded had reservations about the fiber density and the new way of handling the Cable Termination Unit. But after some laboratory tests and a pilot project, the new installation method was accepted.

For nine months now, we have seriously been putting the material to the test and have had very little negative feedback. That's a good sign. Another plus point is that there were no delivery delays even during the most intense phase of the pandemic.

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Success

Millennium:
Expect the Unexpected

The Millennium is one of the most innovative buildings in Switzerland.
And a network from R&M is part of its top-class equipment.

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A fascinating glass amphitheater overlooking Lake Geneva. The Millennium has a magic attraction. «Expect the Unexpected» is the mission of the avant-garde business and event center just outside Lausanne. Visitors can sense they are about to experience a new kind of lifestyle simply by taking in the architecture. Anyone entering the building walks into a pleasant future. The Millennium's design, technology, equipment, working, living and communication conditions as well as its service culture seem to be from an upcoming future.

«We have created the most prestigious and innovative building in Switzerland,» says the investor. The principle of «either the best or nothing» was implemented in the Millennium in a convincing way.

Cabling for the future

Following the high standards, R&M worked together with the project partners to develop a sophisticated network infrastructure for communications, IT, numerous digital applications and building technology. Singlemode cabling was given preference in the planning of the backbone on R&M's recommendation.

It is the best you could possibly have for future data transmission.

On all twelve floors, a copper cabling system connects up with the Cat. 6_A ISO system from R&M. As an infrastructure for the application of 10 and 25 Gigabit Ethernet, this solution also offers the greatest performance headroom for the future.

High demands were made of network performance. The network transmits control signals to the glass frontage, where electrochromic nanotechnology regulates the incidence of light. In the offices and co-working spaces, 1,500 workplaces need unsurpassable data transmission. As do ten conference rooms, an incubator floor for start-ups, an auditorium with 500 seats, a data center, WiFi, digital signage displays and smart building technology. In terms of network cabling, the Millennium also exceeds users' expectations.

www.millennium.ch
www.millennium.ch/gallery/

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The project partners
– Architecture: Studio Ensemble architecture et urbanisme SA, Lausanne
– Technical planning: RTM SA Réalisations Techniques Multiples, Martigny
– Building cabling: Consortium Electro Millennium, consisting of the R&M partners Bouygues, Maréchaux and SPIE

The R&M solution
– OS2 singlemode cabling, 20 km, MPO connectivity
– Color-coordinated fiber optic cables to identify the transmission paths
– Cat. 7_A copper cabling for 1,500 MHz, 200 km, HD panels, Cat. 6_A ISO connectivity
– Specially designed cable management for electric power cables
– Splicing and measurement services from the R&M FO team

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BMW's
New Home in Japan

Sheer driving pleasure is just as much a part of Japan as magic design, rich tradition and fascinating technology. BMW embodies these attributes, too. This is why the brand has felt at home in Japan for 40 years. Now BMW has built a new regional distribution center with a high-performance network to express these values even better.

BMW's new home, the Goodman Business Park, is exactly what a premium manufacturer is looking for. The strategically planned technology and logistics base is located in the middle of the highly developed, northern economic region of Chiba Prefecture.

The site between the capital Tokyo and Tokyo-Narita Airport is in the city of Iznai. The area has continuously occupied top spot in the rankings of the best places to live in Japan for seven years. A nearby park is home to Japan's largest mountain cherry tree, a 300-year wonder of nature.

Space for international brands

The Goodman real estate group is developing a generous space for global brands here. It will become a convenient business, work and living center for IT, logistics and sales professionals. Alongside BMW, several global brands have settled on the site, which will soon cover a built-up area of 900,000 square meters. These include Google, Esprit, Zalando and logistics specialists such as DB Schenker and Kühne + Nagel.

Stage 4, the eastern part of the business park, was opened in October 2020 – with BMW Sales as the main tenant. The car manufacturer occupies 70,000 square meters of usable space in the four-story office and logistics building. Stage 4 is more than just a reloading point for supplying car dealers, workshops and BMW customers: Architecture, interior and business premises are characterized by modern design, quality of stay and resource-saving building services management.

At home in Japan for 40 years: premium brand BMW   050.7030
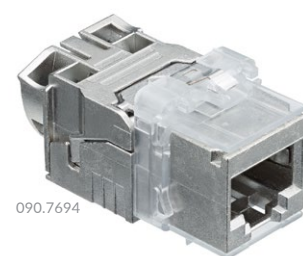
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R&M products: Cat. 6$_A$ EL and E-2000™

The Japanese BMW organization expected the building, offices and equipment to meet the needs of a premium brand in every respect. «The BMW Group, the world's leading manufacturer of premium automobiles and motorcycles and provider of first-class financial and mobility services, is set to take customer service in Japan to a new level with its new regional distribution center in the Goodman Business Park,» Goodman announced when the contract was signed back in May 2019.

Key role for R&M

The high requirements also applied to IT and network technology. R&M played a key role in this right from the start and maintains a close, long-term partnership with BMW worldwide and especially in the Asia Pacific sales region. In addition to quality and the ability to supply, the local availability of technical consulting services plays a decisive role. BMW uses certified R&M copper and fiber products with past usage records which guarantee good quality and proven performance.

This was the first time that R&M was able to help the customer on site in Japan. The regional market organization supported property developer Goodman as early as the tendering and evaluation phase. In addition to consulting services, R&M established contact with the rack manufacturer and potential installers.
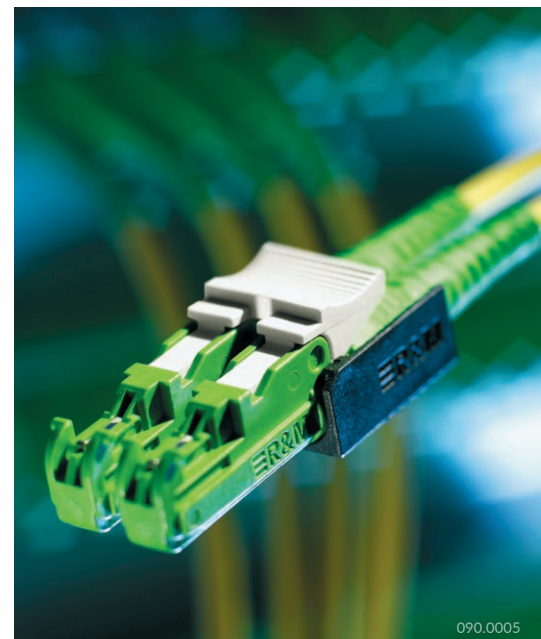
«And that increased the trust,» Goodman confirms. The business park provider decided to select R&M as the exclusive supplier of network cabling for the Stage 4 building as well.

Then, the experienced specialist for ICT solutions, MIRAIT Corporation, was awarded the installation contract. They were particularly impressed by the convenience of installation and the quick mounting technology of the R&M products. The partners implemented the project on schedule, allowing BMW to ensure that sheer driving pleasure continues to establish itself in Japan.

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R&M solution for BMW in the Goodman Business Park

The equipment for the local data network in the new BMW distribution center in Japan supports data throughput of 10 Gbit/s, perfect for an office environment.
The infrastructure consists of:
– BMW-certified copper and FO cabling including patch cords
– E2000™ for FO connectivity
– Cat. 6_A EL STP modules for the copper-based connectivity
– 12,000 meters of singlemode and 60,000 meters of Cat. 7 S/FTP installation cables

Goodman

«Logistics space for the world's greatest ambitions.» In accordance with this mission, the New Zealand based real estate group Goodman operates warehouses, logistics, commercial and business parks worldwide. The publicly listed company owns, develops, rents out and manages industrial real estate. Goodman looks for strategically attractive, easily accessible premium locations near major conurbations. The Group owns 392 properties in 13 countries. One of these is Goodman Business Park near Tokyo. The areas are developed according to master plans and are geared to the specific needs of industries and customers.

For example, Goodman also hosts data centers, light industry, e-commerce brands and retail space. In addition to all facilities for logistics and freight management, Goodman offers integrated services at its locations. These include restaurants, stores, lounges, recreational, fitness and leisure facilities, childcare and medical care. Goodman attaches great importance to sustainability in terms of environmental protection, customer relations and site development as well as its own growth.

BMW Japan

The sales organization BMW Japan Corp. is a subsidiary of BMW AG, headquartered in Munich, Germany. The long established brand is seen as the world's leading premium car and motorcycle manufacturer. BMW Japan Corp. was established in 1981 and was the carmaker's first wholly-owned subsidiary in Japan. Since then BMW Japan Corp. has led the import car business setting various benchmarks in product, service and customer care initiatives. BMW Japan Corp. today sells BMW and MINI brand vehicles through 200 showrooms nationwide and is responsible for BMW Japan Finance Corp. and direct sales by BMW Tokyo Corp.

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BMW's new Japanese Sales Center in Goodman Business Park near Tokyo

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Intelligence
for Every Network

R&M is launching a manufacturer-neutral smart networks service.
Now, after individual preparation, data centers can integrate all patch panels
into their automated Data Center Infrastructure Management (DCIM).

The new service is called inteliPhy Brownfield Service Customization Program. It gives infrastructure managers the opportunity to retrofit patch panels from any manufacturer with an IoT layer. This service is unique worldwide.

The IoT layer is R&M's RFID-based sensor solution. It is retrofitted to existing patch panels and patch cords, and communicates with the software for Data Center Infrastructure Management (DCIM) – a pragmatic use of the Internet of Things (IoT).

The DCIM software makes it possible to document the entire network, and quickly localize and identify network components. Changes, such as patching, take place in a controlled manner and are based on work orders stored on the DCIM platform. All data on the network infrastructure is available in an up-to-date form and can be audited at all times.

Customizing with the customer
R&M can handle customer-specific projects involving more than 300 patch panels with the inteliPhy Brownfield Service. The service has three phases: During a three-week feasibility study, R&M analyzes whether the patch panels and patch cords provided by the customer are suitable for integrating the IoT layer. The subsequent six-week prototyping phase concludes with an acceptance test of initial samples on the customer's premises. This is followed by series production.

Potential users include the pharmaceutical industry, airports, public administrations, banks and colocation data centers. For example, R&M integrated an IoT layer in the cabling of a large pharmaceutical group incorporating both patch panels and patch cords from a third-party supplier.
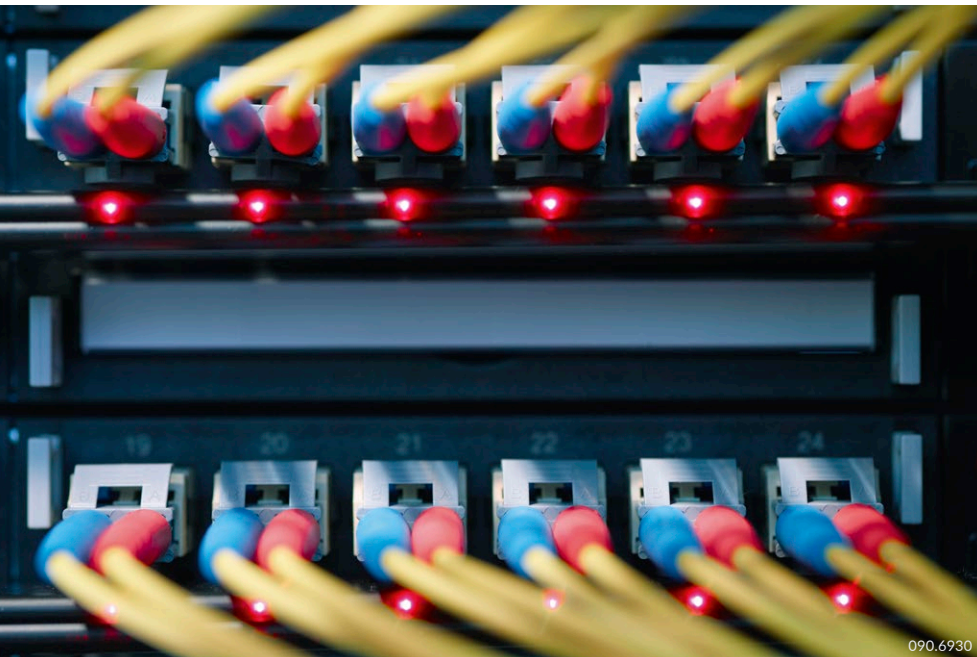
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Real-time insight
It is based on R&M's smart networks architecture. It brings intelligence and automation to the physical network layer. Regardless of the cabling and patch panel supplier, it provides full insight into the network in real time and continuously monitors every connection. Users benefit from a customized IoT layer and from R&M's DCIM software inteliPhy net as well as inteliPhy Manage which are also offered as part of the inteliPhy Brownfield Service.
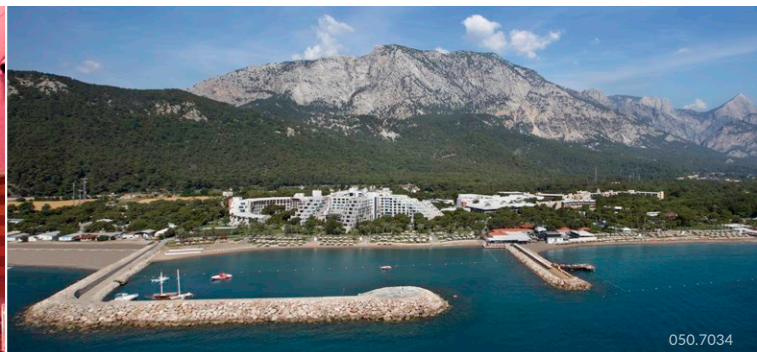

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Success

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Exclusivity
at the Rixos Sungate

Golden beach. Azure blue sea. Suites with a whirlpool and a view of the sunrise. And all around it, nature, parks and Mediterranean forests. The ambience in the five-star Rixos Sungate resort is very definitely appealing. A new, stable data network rounds off the luxury.

The Rixos Sungate embodies a lifestyle. It's about more than a vacation on the Gulf of Antalya. The resort with more than 700 rooms wants to create a perfect harmony of nature, sun, sea, mysticism and exclusivity. With traditional Turkish hospitality on top.

In the extensive 250,000 square meter complex, guests recharge their batteries in well-tended parks and villas with gardens. On patios and balconies, they can enjoy the warmth of the Mediterranean sun. A refreshing breeze blows from the nearby forests and the Taurus Mountains.

This exclusivity continues in the suites, villas and other hotel offerings. Be it an exclusive restaurant, pools, entertainment, beauty and fitness areas or a spa in feng shui style.

New LAN with Cat. 6
The Rixos Sungate opted for the classic Cat. 6 program from R&M as the basis for the new network infrastructure. Around 1,100 outlets had to be replaced. The planning also included the installation of new indoor and outdoor cables, patch panels and patch cords. Field-mountable FM45 connectors simplified termination in many places.

A particular challenge was to replace the cabling in the guest rooms step by step while sticking to a tight schedule and, at the same time, without disturbing ongoing operations. This is why R&M delivered the material required just in time and in close cooperation with the local installation partner, which also helped ensure the ambitious schedule could be met.

WLAN throughout
This sophisticated environment requires robust infrastructures that run smoothly. And that also applies to the LAN. It ranges from Internet access, IT and telephony to network connections in service spaces and guest rooms. Several hundred access points are integrated for full WLAN supply.

In the future, the LAN is to meet higher technical requirements of the administration and the increasing desires of the guests in terms of convenience. This is why the hotel started modernizing the network infrastructure in February 2020. And they found just what they were looking for in R&M's office cabling program.

Compelling quality
Suleyman Tokmak, Managing Director R&M Turkey, and Technical Manager Ibrahim Kargi had convinced the management of the R&M solution. The Swiss quality and the ease of operation for users were two of the decisive plus points, explains Süleyman Savaş, Information Systems Manager at the resort.

The hotel management felt it was essential to integrate a particularly durable and maintenance-free infrastructure, something which certainly eases the cost situation. And R&M's office cabling program fulfills these requirements, too.

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A Gigabit Network
for Halle

Slow Internet connections are a challenge for lots of towns and cities. Citizens should have equal rights when it comes to participating in the information society and digital opportunities. The northwest German town of Halle, Westphalia, has found the ideal solution.

«In the information society, fast Internet is just as important in terms of infrastructure as drinking water or electricity, cycle paths, roads and rail networks,» says Jochen Strieckmann, CEO of hallewestfalen.net GmbH. And it's not just hot air, but something that is being put into practice in Halle. Considerable efforts are being made to ensure that undersupplied districts receive full broadband coverage.

And that will be the case in the summer of 2021. Because that is when 800 buildings, 1,132 private homes, 261 companies and 20 schools will have free access to gigabit-fast fiber optic Internet. A success in which a new development by R&M Germany is playing an important role: the turnkey PoP (Point of Presence) station.

Town initiative

It all started with a unanimous vote by the town council in April 2015. They decided that broadband provision is in fact a basic need and thus a task the town has to actively take in hand.

Their ambitious goal was to establish their very own continuous, maximum-speed fiber-optic network – financed, built and leased by a dedicated company. This is why, in the fall of 2016, Halle, Westphalia founded the company hallewestfalen.net GmbH as a wholly owned subsidiary of the town. This independence brings with it a whole range of advantages, but also challenges.

Outer districts at a disadvantage

The project focused on the outer districts of the town and its rural areas, specifically the «white spots» on the broadband map. They were deemed undersupplied because telecommunication companies offer less than 30 Mbit/s download speed here with no investments in FTTH. A communal supplier such as hallewestfalen.net is allowed to supply end users in such areas whereas competition with private-sector providers is not allowed in well-supplied town centers. These are the competition rules.

Despite these clear prerequisites, there were numerous hurdles to obtaining approval for this key project. Among other things, rights of use for public traffic areas had to be applied for from the state supervisor, the German Federal Network Agency.

Patience was needed until government funding was ready, covering 90% of the project costs totaling 21 million EUR. The money comes from the state of North

«There's nothing better than what we are building here.»

Jochen Strieckmann, CEO of hallewestfalen.net GmbH

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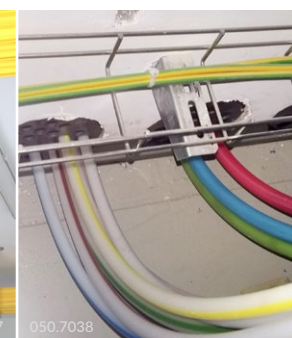
> ### «Our staff really appreciated R&M's training sessions and product briefings.»
>
> *Meikel Lüders, CEO of Lüders Dienstleistungs GmbH*

Rhine-Westphalia (7.4 million EUR) and from the federal broadband funding program (9.3 million EUR).

Making up for lost ground

Despite intensive planning work, the start of construction was delayed by six months. The groundbreaking ceremony took place on October 11, 2019. A 120-kilometer FTTH network was to be rolled out over an area of 52.7 square kilometers within 14 months. But flooding caused a temporary halt to construction in the spring. The COVID-19 pandemic also slowed things up and some changes had to be made to the technical requirements. But things have progressed much more quickly since the summer of 2020.

The R&M solution for Halle
– 5 turnkey POP stations with ODF from the R&M*foxs* program
– 44 splitters (NVT) with Single Circuit Management System (SCM)
– 690 Polaris boxes and 23 Venus boxes as service area interface (SAI)
– All-round support: Planner consulting, technical specification, support as well as user training on site and on-time logistics

The project partners
– Client: hallewestfalen.net GmbH
– Project planning: IEBL Ingenieurbüro Werle Trammer GbR, Wilhelmshaven
– Construction site management: BIB TECH GmbH, Rodenberg
– Construction work:
  – Lüders Dienstleistungs GmbH, Soltau
  – SPIE SAG GmbH GB City Networks & Grids, Essen branch, service bureau Osnabrück
– Network technology: R&M Deutschland GmbH, Gummersbach

«We are working from the house connections to the junction points,» says site manager Lothar Jung from BIB TECH GmbH as he details the project. The first step involved the construction company laying the tubes along the streets and to the buildings. In the second step, the fiber optic cables were blown in and the network terminations (APL) installed in the buildings.

From the buildings, the lines run to 44 splitters which are in turn connected with five PoP stations. In the bidding competition, R&M Germany had won the contract for the corresponding network technology. Top marks went to the modular R&M*foxs* cabling system, the equipment for the splitters and the PoP stations.

Since the PoP cells are completely prefabricated by R&M, the construction companies in the field are spared time-consuming work steps. This helped accelerate the project and make up for lost time.

All partners – hallewestfalen.net, Deutsche Telekom AG, the consultancy company IEBL, project manager BIB TECH, R&M and the construction company Lüders and SPIE – got the FTTH project on track. Deutsche Telekom AG feeds the signal from its own network in the five hubs. It has leased the city's fiber optic network and can offer gigabit-fast Internet performance to end customers. The town of Halle, Westphalia, has achieved its goal.

Turnkey point of presence (PoP)
They weigh up to 30 tons, are made of reinforced concrete, can be as big as freight containers and contain everything operators of an FTTx network need at any nodal point: The point of presence stations developed and prefabricated by R&M Germany.

R&M equips the PoP cells to suit customer specifications and delivers them as turnkey modules to the site on a flat-bed trailer. This saves the construction companies in the field time-consuming work steps. On site, all that has to be done is pull the cables from the ground into the cabinet and connect them.

The principle is one PoP – one partner. R&M integrates all passive and active technology required: Tubes for the cable inlets and outlets, underground distribution chambers, raceway cable guides, 19" racks, ODF from the R&M*foxs* or PRIME program, electric installation, illumination, UPS, air conditioning, fire protection, burglar alarms, access control. The cells come in three standard sizes from 3x3 to 6x3 meters. The interiors provide space for the installation of 4,608 to 32,256 fibers or ports. The magnitude depends on the particular ODF concept.

R&M plans the PoP stations in a streamlined process. The customer is given a draft in the very first meeting with R&M consultants. This is followed by calculations, layout, parts lists, schedules, logistics, installation. After a total of twelve steps, the hub goes live.

> ### «R&M always delivered on time, always responded quickly and was helpful throughout the entire project.»
>
> *Michael Trammer, engineering company IEBL Ingenieurbüro Werle Trammer GbR*

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CTO RIO –
Sturdy FTTH Box

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Brazil wants Fiber to the Home – as fast as possible. The country's telecom industry is making massive investments. And with a solution from R&M, they can move up another gear.

The telecom industry once called the Brazilians' demand for Internet services: *«The Brazilian Internet phenomenon»*. Virtually no other country in the world used the Internet more intensively than Brazil. That was ten years ago – and demand continued to rise. The country urgently needs more fiber optic broadband networks, and the telecoms are investing billions of reals in the expansion of fiber optic networks. In the middle of 2020, the three largest providers made FTTH access available to 22.5 million households (homes passed), according to statistics from the regulatory authority, Anatel.

Now things will really be heating up. R&M Brazil is helping telcos with a new, easy-to-install FTTH distributor box for outdoor use: the CTO RIO – Caixa Terminal Óptica **R**eal **I**nter **O**perability.

The box was designed with the daily challenges of installers in Brazil's cities in mind. It is also suitable for other markets that require robust, elementary and functional small FTTH distributors. The decisive strengths of the CTO RIO: construction, assembly, termination.

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The box made of PC+ABS plastic is extremely robust, impact resistant, heat resistant and waterproof, compliant with protection class IP67. It is ideal for tropical climates. The discreet box (231x296 mm) can be anchored just about anywhere outside. The CTO RIO was built to be assembled on masts, ropes and facades, but can also be used in shafts, cellars, etc. It can be attached anywhere without special tools.

Installers can integrate and remove the inlay with a flick of the wrist without removing the box. The tray contains cable, fiber, splice tray, splitter and plug connections of the FTTH distributor. Thanks to the two-part concept, installation crews can share the work. One team works on the ground, splicing and terminating the cabling. In the meantime, the other team assembles the box at the top of the mast and then inserts the inlay.

The CTO RIO box is suitable for network termination and as a pass-through solution. The inlays come in seven different colors. This facilitates the identification of buildings, streets and subscribers.

The capacitance of the CTO RIO
Along with the five cable entries, there is enough space for three small distributors with up to 16 connectors (SC, E-2000™ or LC Duplex) and 48 splices, enabling several configurations with balanced and unbalanced cabling. The range includes a drop cable inlay with 16 cable outlets and pre-terminated variants.

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Aerial Deployment:
Caution when Splitting!

Aerial deployment is a solution for urgently needed fiber optic broadband coverage in rural areas, and public interest is growing. In this architecture, the signal is split where connections to the subscribers are to be branched off. But this is exactly where network operators have to be careful.

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As in towns and cities, the demand for state-of-the-art broadband coverage is also growing in rural and sparsely populated areas. Fiber optic networks are the best way to close this supply gap. Aerial deployment is the perfect way for network operators to drive expansion forward quickly and at low cost.

There is, however, an important difference to underground cabling: The optimal case scenario is to use as few aerial cables as possible when serving all subscribers over long distances. When using splitters, the signals for the customers are branched off in this case, too. There are, however, physical limits when it comes to a serial application: The power budget of the signal is used asymmetrically and the signal drops exponentially the further it moves along the series of splits.
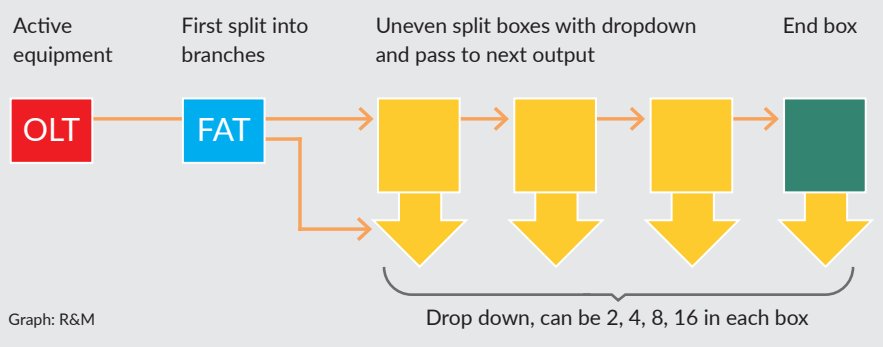
The split ratio is all important

To distribute the power budget more evenly, experts recommend an uneven division of the signal. The larger part continues and a small part is used for the dropdown. Here we are looking at split ratios of 10/90, 30/70 etc. This helps to attenuate the uneven distribution a little. To compensate for the following splits, it would be necessary to choose a different split ratio for each split box.
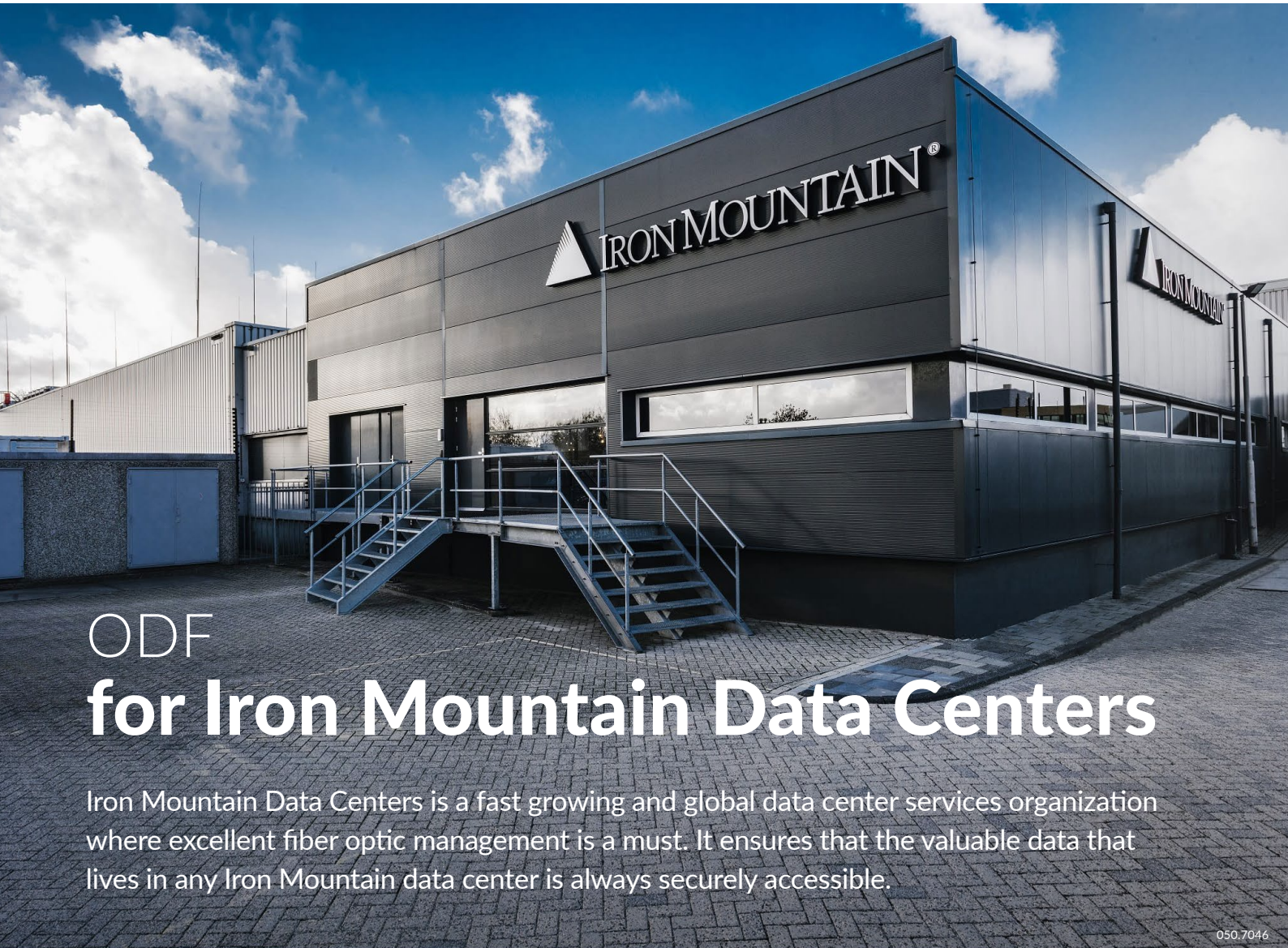
This means every split box has to be designed carefully to reverse the effects of the sequential signal division. This would make it at least theoretically possible to spread the available power equally between the customers. The number of users operating an Optical Line Termination Point (OLT) could be increased.

Nevertheless: The power budget drops with every splitter. Even with top-quality splitters, the loss is 1dB – regardless of the split ratio. If four split boxes were to be cascaded, at least 60 % of the output power would be lost. The number of split boxes per backbone is thus limited.

This passive, serial architecture would be simple and inexpensive to implement but network operators should nevertheless carefully consider whether to use the passive solution or active systems.

Active equipment	First split into branches	Uneven split boxes with dropdown and pass to next output		End box

OLT → FAT → [yellow boxes] → [green box]

Drop down, can be 2, 4, 8, 16 in each box

Graph: R&M

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Success

ODF
for Iron Mountain Data Centers

Iron Mountain Data Centers is a fast growing and global data center services organization where excellent fiber optic management is a must. It ensures that the valuable data that lives in any Iron Mountain data center is always securely accessible.

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The more digital information needs to be stored, the more the services of the US based company Iron Mountain are in demand. And that is why the data center campus AMS-1 near Amsterdam is growing strongly – and it's not the only one. At 15 locations in North America, Europe and Singapore, Iron Mountain Data Centers operates and expands fail-safe colocation, hyperscale, edge and underground data centers.

The campus just west of Amsterdam now comprises eight halls and a data center area of 17,000 square meters. It is the largest multi-tenant colocation data center – and the first one that is climate neutral – in the Netherlands. The next phases of the data center campus that can be expanded up to 40.000 square meters are being planned.

Redundant connection
It is crucial that the data centers remain accessible at all times – securely and on redundant paths. That's why Iron Mountain uses multiple entry points to global IP networks.

Other must-haves are latency-free lines to cloud providers and Internet exchanges. High-performance cross connects and data center interconnects connect sites and computer rooms to optimally distribute workloads and ensure availability.

The challenge: Iron Mountain requires large, expandable meet-me rooms in each hall for these diverse connections. The nodal points between the outside world and the white spaces have to accommodate vast quantities of cable and fiber optic connectivity.

One cabinet for everything
In 2018, the data center operations team was looking for a new Optical Distribution Frame. The goal was to centralize the fiber optic management in the meet-me rooms. They were looking for a single cabinet that could hold everything.

Traditionally, separate fibers were drawn in from the cable entry to the distributors – an arduous task that requires a lot of time and

material. A central cabinet would be clearer and easier to assemble. This would further minimize the risk of cabling errors and network failures. Iron Mountain could increase data center availability with better and more secure fiber optic management. This is what they were looking for.

Benefits for Iron Mountain
Frans Ruijsestein, Senior Service Delivery Engineer at Iron Mountain Data Centers, has taken a close look at the advantages of R&M's ODF main distributor. He lists them as follows: «The ODF-SCM is characterized by high packing density and flexible usage options. It can connect fiber trunks or act as a cabinet for splice cabling. And in this way, both can be accommodated simultaneously in this ODF. Another advantage is that the ODF is easy to expand. That makes it scalable and thus future-proof. And then there's the quick mounting technology with snap-in attachment. The modules can be installed without the need for any tools.»

«We are very satisfied with the quality of the R&M solution.»

Frans Ruijsestein, Senior Service Delivery Engineer at Iron Mountain Data Centers

And while they were doing so, the team came across the ODF from R&M. They gained an initial impression in the R&M Roadshow truck which happened to be on site at that time. Then, R&M gave the team an opportunity to get to know the ODF in a live environment on customer premises.

Successful start

After this exchange of experience, Iron Mountain was convinced and had R&M provide the desired configuration. That was the beginning of a new, successful partnership.

The first joint project was the configuration of the ODF for Hall 9, which was completed in late 2020. R&M helped with the design – incredible value added for the customer as their team was relieved of a number of tasks. The installation experts from the company Bestconnection assembled the cabinets to R&M's specifications with an R&M technician helping them on site.

Frans Ruijsestein, Senior Service Delivery Engineer at Iron Mountain Data Centers, confirms: «The collaboration with R&M is outstanding. We received all the technical and sales support we needed.» He also finds the logistics support provided by R&M compelling: «Before the ordered products are delivered, R&M gives us a heads-up and lets us know when and in what way the products are being delivered to us. And then they ask us if there is anything else we need. That is a major plus.»
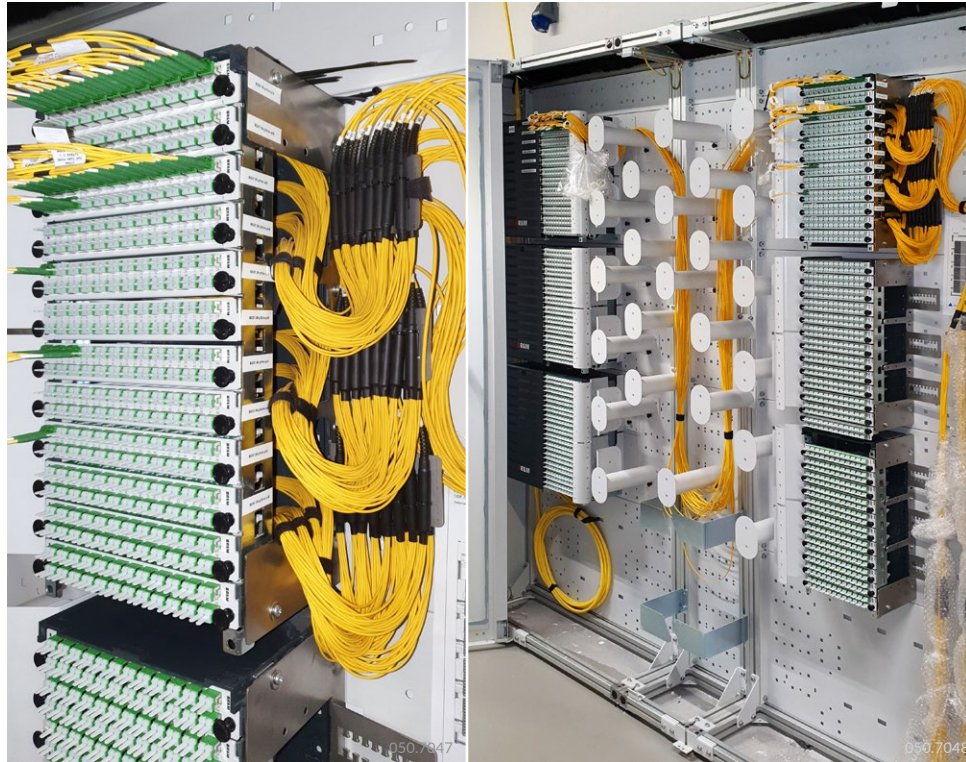
Everything in one cabinet: Fiber trunks, splice and breakout cabling in the ODF-SCM cabinets from R&M. This is how Iron Mountain centralizes fiber optic management in the meet-me rooms at the AMS-1 data center campus near Amsterdam.

After the installation of 500 connections in the ODF from R&M, he concludes: «There have been no failures so far, we are very satisfied with the quality.» Iron Mountain Data Centers will be continuing the collaboration. ODFs are also required for the meet-me rooms in future campus expansion plans.

R&M solution for Iron Mountain

The configuration of the Optical Distribution Frames with a capacity of 2,304 optical fibers each consists of
– ODF SCM modules and cable management
– LC Duplex connectivity
– Mixed splice and breakout cabling, designed to suit customer requirements
– Glass doors that provide a view of the entire fiber optic and patch management

The company

Iron Mountain Data Centers operates a global colocation platform that enables customers to build tailored, sustainable, carrier and cloud-neutral data solutions. As a proud part of Iron Mountain Inc., a world leader in the secure management of data and assets trusted by 95 % of the Fortune 1000, the company is uniquely positioned to protect, connect and activate high-value customer data. The company leads the data center industry in highly regulated compliance, environmental sustainability, physical security

and business continuity. Iron Mountain Data Centers collaborates with 1,200+ customers in order to build and support their long-term digital transformation on an area of 3.5 million square feet spanning 3 continents. More information: www.ironmountain.com/data-centers.

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Project was carried out by Arch-Deco Sp z o.o., Gdynia

A New Era for Medicine
in Gdańsk

Six professors at the Gdański Uniwersytet Medyczny are currently in the top 2 % of all medical researchers worldwide. They conduct valuable research in the new clinic buildings. Now they also have a new center for non-invasive medicine. It serves cutting-edge research as well as the treatment of tens of thousands of patients. An R&M network supports the physicians in their work.

One of the largest clinic construction projects in Europe has now been completed. The Gdański Uniwersytet Medyczny (GUM) and its university clinic are at the beginning of a new era. This applies to its internationally respected research as well as to healthcare in the north of Poland and the training of young medical professionals.

For years, the state and the GUM had invested in the modernization and construction of new clinic buildings. The most recent project was the Centrum Medycyny Nieinwazyjnej (CMN), which was completed at the end of 2020.

Complex construction project
Due to the challenging site conditions, the new CMN could only be realized in stages. Operations in the immediately adjacent clinic buildings were not to be interrupted. Over the years, everyone involved, from the Arch-Deco architectural studio, the university leadership and project managers to the installation partners coordinated numerous details.

Project was carried out by Arch-Deco Sp z o.o., Gdynia

Phase 1 lasted from 2015 to 2018, phase 2 from 2018 to 2020. First, clinical departments had to move within the campus to free up space for the new building. This was then followed by the demolition of three old

> *«I am pleased that a good university such as the Gdański Uniwersytet Medyczny is going to have state-of-the-art research and science centers. Without them, medicine simply would not advance.»*
>
> *Poland's Minister of Health Professor Łukasz Szumowski, 2019, on the occasion of the inauguration of the first part of the Centrum Medycyny Nieinwazyjnej (CMN).*

buildings. In their place, the construction companies erected the six-story CMN – starting with the bunker for radiation therapy and ending with the bridges to the equally new Centrum Medycyny Inwazyjnej (CMI).

Multifunctional LAN

Uninterrupted data traffic plays a significant role in this medical environment. Enormous amounts of data are generated during diagnoses, treatments and in laboratories. This includes high-resolution tomography images, radiological images and other data from analysis and visualization procedures. The radiology archive of a university hospital can be several hundred terabytes in size. This information must be available at all times for consultations, research, intensive and emergency care.

Increasingly, physicians are exchanging information with each other and with the research industry – locally and internationally via cloud and telecooperation. To do so, they require

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Project was carried out by Arch-Deco Sp z o.o., Gdynia

networks which can transfer several Gigabit/s loss-free. The 6,000 medical students at the GUM expect powerful equipment for digitized training: PC workstations, fast WLAN, broadband connections.

Sensitive medical devices and high-frequency signal transmission require continuous shielding. Discharge at plug connections must be avoided, especially in the vicinity of patients and monitoring devices.

The university clinic manages the data of hundreds of thousands of patients. Active and passive data protection has to be guaranteed for these patients from the LAN outlet to the data center. Furthermore, clinics have to be prepared for comprehensive digitalization. The buzzword for the future is «smart hospital».

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Network isolator

A network isolator ensures galvanic separation in Ethernet-based networks. It interrupts electrically conductive connections between the periphery and the devices. This is a precautionary measure to protect patients and sensitive medical technology. The reason is that current must not flow over a patient's body in case touchable conductive parts of the device come into contact with the patient. A network isolator prevents currents from building up while at the same time enabling virtually lossless

Make way for 10 Gigabit/s

The data network of the Centrum Medycyny Nieinwazyjnej (CMN) at the Gdański Uniwersytet Medyczny (GUM) is based on the standard star topology model. In both construction phases, the infrastructure consists of fiber optic cabling for the backbone and risers, and double-shielded copper cabling for the floors.

Fiber optics:
– Backbone: OS2/OM4 cables, 96 fibers
– Risers: OS2/OM4 cables, 48 and 24 fibers
– Patch panels: Unirack2 OS2/OM4 (190 pcs.)

Copper:
– Horizontal cabling on the floors
– Installation cables: Cat. 7 S/FTP for 1,000 MHz (1,300 km)
– Patch panels: 1U with 24 or 48 Cat. 6_A ISO/s modules (560 pcs.)
– Outlets: Cat. 6_A ISO modules, FM45 Cat. 6_A connectors, protection class IP54 (20,730 pcs.)

The 104 racks with 750 patch panels can be retrofitted with the infrastructure management system R&M*inteliPhy*.

SafeLine network isolators from R&M ensure galvanic separation of electrical equipment close to the patient beds in accordance with IEC 60601-1.

The three-level R&M security system with mechanical protection of the connections prevents manipulations and patch errors.
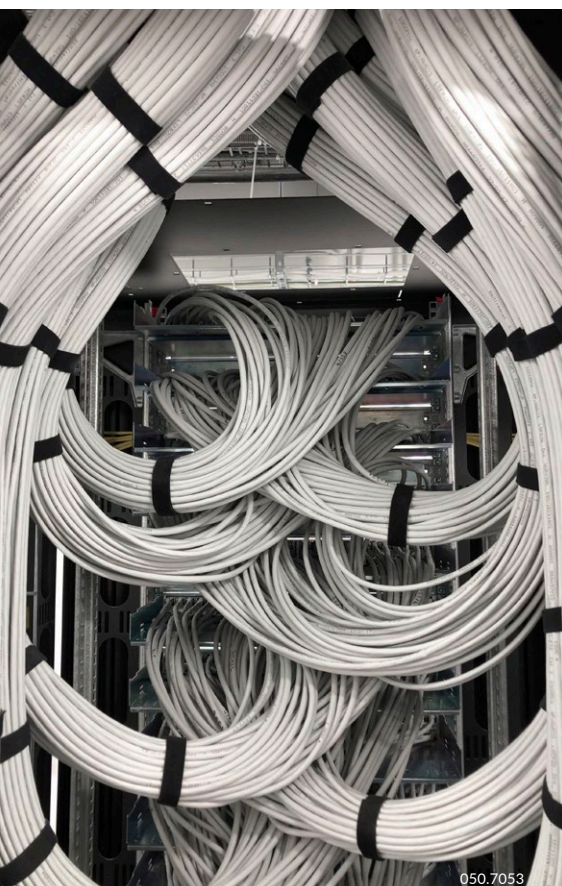
Success

In the upshot: The data network of a clinic has to be able to master an incredible number of different applications and complex functions. At the same time, it has to be many times more powerful and robust than a conventional LAN.

Gdański Uniwersytet Medyczny

Gdański Uniwersytet Medyczny (GUM) is the largest medical academic institution in Northern Poland. Its four faculties continuously train 6,000 medical students. The proportion of international students is 17 %.

The GUM was founded in 1945 but the tradition of medical education and research in Gdańsk dates back to the foundation of the Gdańskie Gimnazjum Akademickie in 1558. The GUM was designated a research university in 2019 – the only university in the country with this status.

There are currently 1,051 scientists at the university. Its areas of expertise include heart, lung and bone marrow transplants, advanced oncology and first phase clinical research. Six professors and fellows at the GUM are in the top 2 % in the ranking of the world's most influential medical researchers. This ranking is organized by Stanford University in California in cooperation with the companies Elsevier and SciTech Strategies.

The GUM includes the university clinic with the newly established Centrum Medycyny Nieinwazyjnej (CMN), and Centrum Medycyny Inwazyjnej (CMI). The two centers together form one of the largest and currently most modern medical complexes in Poland. Both at home and in Europe, the Uniwersyteckie Centrum Kliniczne is counted as being in the premier league due to its current research possibilities.

It cares for around 60,000 inpatients and 250,000 outpatients a year. The clinic is responsible for a catchment area of 3.5 million people. Doctors there perform around 21,000 surgical procedures annually. Two million samples are tested in the laboratory each year.

www.uck.gda.pl

Project was carried out by Arch-Deco Sp z o.o., Gdynia

Project was carried out by Arch-Deco Sp z o.o., Gdynia
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Figures and data on the new Centrum Medycyny Nieinwazyjnej

– Investment volume: 600 million PLN (135 million EUR, 145 million CHF)
– 75,000 square meters of usable space on six floors
– More than 2,000 rooms, 688 hospital beds
– 20 clinical departments from allergology to radiation therapy in the underground bunker, plus a central laboratory
– Spacious wards with bathrooms, restaurants and service points

Opting for R&M

This is why the planners of the CMN named three main criteria for the evaluation of network cabling: quality, reliability and functionality. They opted for the universally usable cabling system from R&M.

This means that all current technical and functional options are available at the passive network infrastructure level, something confirmed by Michal Dudo, Technical Administration IT at the university clinic. The R&M solution makes it possible to continuously operate Class EA channels for the use of 2.5 Gbit/s, 5 Gbit/s and 10 Gbit/s. This means the cabling will also support future generations of IT and medical technology.

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Buying inteliPhy net
Online

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The DCIM software inteliPhy net is now available in the online shop. R&M offers direct delivery over the Internet. Users can also download a time-limited, free trial license in the same way.

R&M is expanding sales of its user-friendly DCIM software inteliPhy net to the Internet. Interested parties and users can now obtain the software online directly from R&M **(www.rdm.com/inteliphy-net)**. Users simply make their purchase using a credit card. The free test license is also available on the web portal.

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Users can choose between two levels:
– inteliPhy net Standard for simple applications
– inteliPhy net Plus for more complex needs

The Data Center Infrastructure Management (DCIM) software is used for digital, smart and central data center organization. In particular, it enables connectivity, device and capacity management of networks, cabinets, power supplies and assets.

The software is a central element of R&M's smart network architecture. inteliPhy net supports the full documentation and real-time monitoring of the various data center areas. Network components, free resources, patching and also problems can be localized immediately at any time. As a result, it helps users to meet service level agreements and MTTR deadlines as well as to complete audits excellently.

During development, R&M drew on its own decades of experience in cabling and equipping data centers. Specific, everyday needs of technicians, network managers and CIOs were incorporated in the development. The result is thus a software product that stands out for its ease of use, even though data centers are a complex entity. Customers are absolutely impressed with the dashboard widgets, drag-and-drop functions, performance indicators and 3D visualizations.

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Success

Co-Working
in Brisbane

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Brisbane is bursting with quality of life. The work here is also of a high quality. And Christie Spaces, a provider of top-class co-working offices in the Central Business District, is one of the reasons for this. A Cat. 6_A solution from R&M contributes to the first-class infrastructure.

«We are more than just a shared office space. We are a unique boutique gallery workspace.» Christie Spaces invites you to work in a flexible, networked, comfortable way at 320 Adelaide Street in Brisbane. «We're committed to reinventing what co-working can be for the entire Christie community.»

This particular expression of the modern working style offers fully furnished offices with numerous amenities in a fresh design environment. Hot desks – individual workstations that can be booked as spontaneously as a hotel room – are particularly attractive.

Turnkey offices

Christie Spaces takes a flexible approach. The building on Adelaide Street, one of six locations in Australia, offers turnkey co-working spaces of various sizes – ranging from a few square meters with a desk through private offices to entire floors. The building also houses the largest conference center in the city.

The focus is on giving people and companies the opportunity to grow and work productively. The purpose of the co-working rooms is to create a dynamic and revitalizing working environment. The Christie Spaces team connects and mediates partnerships

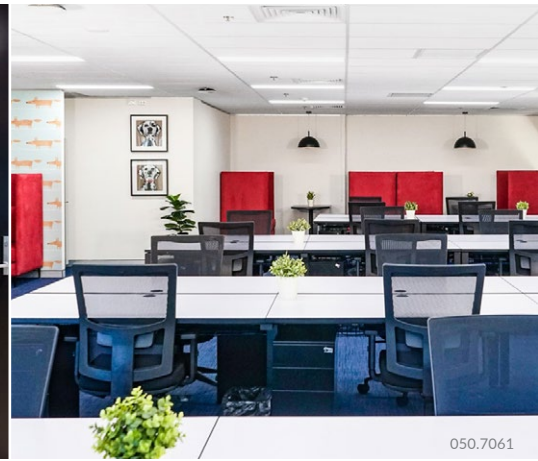and industry contacts. This teamwork mission makes Christie Spaces unique in the co-working market.

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CHRISTIE SPACES

Support ranges from a 24/7 concierge service, fast WiFi and Gigabit Ethernet to screen-sharing facilities and zoom TV. As a certified Internet service provider, Christie Spaces offers its own network and IT configurations, and is currently starting to equip the locations with its own edge data centers.

As a 100% Australian company, Christie Spaces focuses on innovation, reliability, convenience and flexibility, naturally including the data networks of co-working locations. When it comes to connectivity, the customer relies on Swiss quality from R&M.

Universal connectivity

This is also true of the most recent project, a 1,750-square-meter, elegant co-working space on Adelaide Street that goes by the name of Common Ground. A shielded Cat. 6_A solution from R&M was chosen to meet the diverse requirements of users.

The robust connectivity technology from R&M ensures the necessary interoperability. Users of the event rooms do not have to bring bulky or proprietary connectors with them.

Certified R&M partner Sunshine State Electrical (SSE) successfully installed the cabling. SSE is one of the selected suppliers of Christie Spaces due to its unparalleled quality of workmanship and attention to detail.
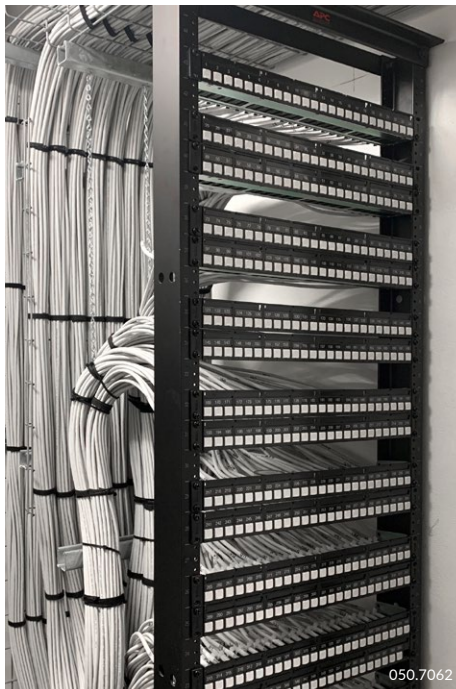
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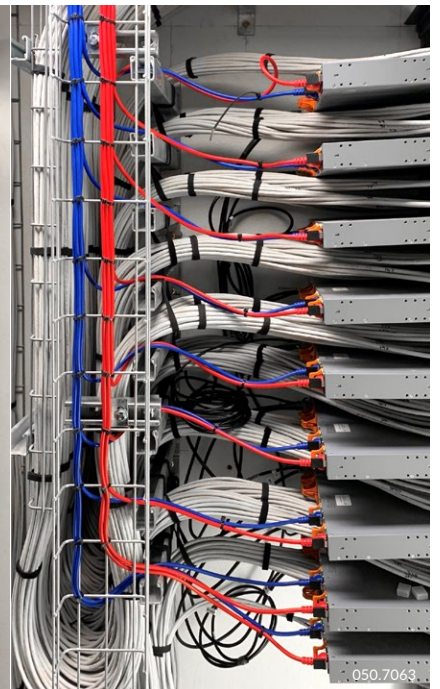
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Single Pair Ethernet:
First Products in Sight

Single Pair Ethernet (SPE) took the decisive hurdles in 2020. A basic application standard has been adopted. R&M and other manufacturers founded the Single Pair Ethernet System Alliance. Now, R&M is launching the first continuous SPE cabling system.

The interest in SPE is growing due to the wide range of possible uses in both buildings and industry. This was demonstrated, among other things, by the response to the founding of the Single Pair Ethernet System Alliance a year ago. The application standard IEEE802.3cg has opened the door to the wide use of SPE in building automation.

One specific use in structured cabling systems is that SPE extends the digital ceiling concept. It helps in the integration of the Internet of Things (IoT) into the LAN and thus accelerates IP expansion right down to the sensor-actuator level. SPE can replace a large part of existing field bus applications.

System complete
In the meantime, R&M has developed a complete cabling system on the basis of two SPE connector types: LC-Cu (IEC63171-1) and the MSP (IEC63171-2).

Cabling experts see the LC-Cu as the connector system of choice for structured cabling systems and building automation. In the industrial environment, many companies prefer the MSP connector system with its more compact but nevertheless robust design. To give customers full freedom of choice, R&M decided to offer them both the LC-Cu (preferred choice for building automation) and the MSP (for industrial LAN).

R&M implements the tried and tested, user-friendly IDC wiring in both SPE connector systems. The compact format of the connectors ensures high connection density. The outstanding cable strain relief and the strain relief sleeve in the connector ensure easy handling of the patch cords.

Range more than 600 meters
On the installation cable side, an AWG-22 type is part of the basic equipment. Operated with the 10Base-T1L protocol, the cabling system can achieve transmission distances between 70 and 600+ meters. The range depends on whether a remote power supply is used and at what performance level.

The LC-Cu and MSP duplex socket can accommodate two SPE connections. Its front surface corresponds to the RJ45 cut-out. This makes it possible, for example, to create daisy-chain connections for using the 10Base-T1s protocol.

## Tried and tested connectivity technology

R&M is the first company to provide continuous SPE cabling. Development was not focused on one individual connector format amongst all those discussed, but on a holistic concept for the channel. The system includes patch cords, connection modules (for patch panels and outlets) and an installation cable.

The connectivity technology is based on tried and tested technologies which means users do not have to worry about a generation change. R&M has implemented IDC technology in the SPE connector for the patch cords and in the SPE connection module. It has proved itself millions of times in the RJ45 connectivity technology. Industrial pin contacts establish the connection in the transition between the connector and the socket. This technology is also well known and has proven itself for decades.

The SPE cabling system is compatible with R&Mfreenet, R&M's modular and scalable platform for structured cabling. The SPE connection modules fit in freenet outlets and panels. This gives planners flexibility and headroom. They will be able to put the right products together to suit each particular situation. Furthermore, they can select the right connector system for every operational area, whether LC-Cu or MSP.

R&M's goal was to be able to offer future SPE users a one-stop shopping service. And that has worked very well. For development purposes, R&M has put an evaluation kit together for each of the two connector systems. These each contain two patch cords, two connection modules and 10 m of installation cable.

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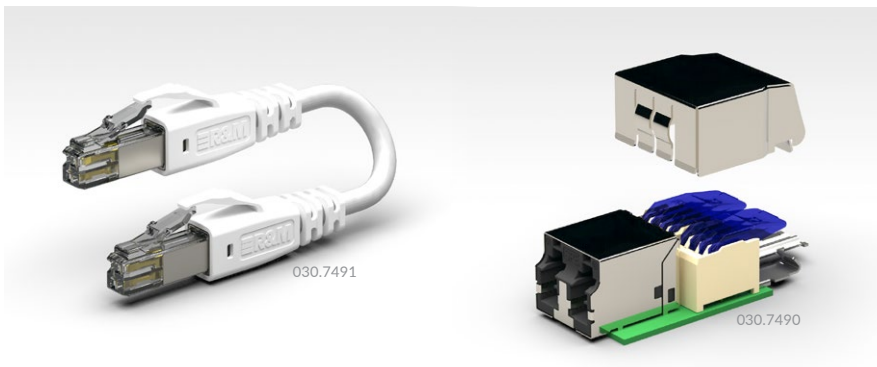
R&M's SPE connectors: LC-Cu (above) and MSP (below)

The standards for LC-Cu and MSP

The SPE connector systems are described in the IEC 63171 standard. Various types are specified within the standard.
– IEC 63171-1: Corresponds to the LC-Cu. This connector system is, for example, recommended for use in building automation in the MICE 1 environment in the drafts for the ISO/ IEC 11801-6 cabling standard
– IEC 63171-2: Corresponds to the MSP connector for MICE1 applications. Many experts in the industrial field prefer the connector system because of its compact dimensions, technical advantages and compatibility with the familiar M8 external sheath (IEC 63171-5).
– IEC 63171-5: Corresponds to an MSP connector for MICE3 applications in an M8 housing (IP67 protected)
– IEC 63171-6: This connector is available in both a MICE1 and MICE3 version. It is, for example, recommended by the ISO/ IEC 11801-3 cabling standard, but does not fit in a conventional M8 housing due to its dimensions.

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Success

The Best Medicine
for Oman

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Citizens and guests of the Sultanate of Oman will now find the most advanced healthcare and medical technology on their doorstep, thus saving long journeys to special clinics abroad. The new Oman International Hospital in Muscat unites high-tech and first-class medicine.

A successful blend of traditional Islamic architecture, Omani heritage and modernity. This is how the new Oman International Hospital in the capital Muscat presents itself to visitors. Inside they will find top international medical care provided by the renowned International operator Idealmed GHS, the company solely responsible for the entire project, from conception, design and installation to management and commissioning.

The hospital unites 43 specialist clinics and medical centers. It is the first private hospital in the country to have a 3-Tesla magnetic resonance imaging (3T MRI) scanner for the most accurate and rapid tissue diagnoses. In addition, there is a robotic lab system, modular operating rooms, three labor rooms, 100 variably configurable patient beds and a medical spa as well as a 24/7 emergency room. Or to put it another way: this is a five-star, next-generation healthcare facility.

Key role for IT

In the background, there is an equally forward-looking composition of clinical IT systems, provided by the international company CIBERBIT. It supports physicians in diagnoses, treatments and telemedicine. Manuel Carvalho, Chief Operating Officer of the Oman International Hospital, explains: «IT plays a key role. It allows us to bring in experts from around the world at the touch of

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Board members of Oman International Hospital on a visit to the hospital site

«Installation continued to run smoothly even during the pandemic and R&M implemented virtual training sessions for the Bahwan Projects & Telecoms LLC team at ultra-short notice, so that they had immediate access to tools and information.»

Yasser Mohammed Kheir, General Manager, Bahwan Projects & Telecoms LLC

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a button and introduce innovations to deliver better patient care. This justifies why we have chosen the most sophisticated and modern HIT (health information technology) system.»

For Manuel Carvalho and his team it was important to network the complex infrastructures the best way possible. The elementary component the hospital needed was a solid and durable broadband data network.

The R&M*freenet* program was the perfect solution. The planners were also impressed by the antimicrobial R&M*healthLine* portfolio. It helps the hospital to adhere to strict hygiene standards, even with network connections in operating rooms and patient rooms, and to minimize the risk of infection.

Reliable supply chain
Together with local Oman partner Bahwan Projects & Telecoms LLC, R&M META organized the supply chain and the support for the installation team. This regional support from R&M played a significant role during the most important construction phases in 2020.

Idealmed GHS Group
The operator of the Oman International Hospital is the Portuguese IGHS Group. It operates several hospitals and clinics abroad and advocates the highest standards in medicine and healthcare. IGHS always uses state-of-the-art medical technology in the hospitals. In close collaboration with the University of Coimbra and its Faculty of Medicine, other international renowned institutions and companies, and in particular with Siemens, the Group created the IGHS Academy, dedicated to the ongoing training of medical staff.

For the development of the project, the partners Oman Brunei Investment Company, Suhail Bahwan Holding Group and IGHS Group founded the Al Afia Healthcare Development and Investment Company.

Despite the pandemic, all the installation material was always delivered on time. «Even when the measures to prevent the spread of the pandemic came into force, we were able to keep our timeline» says Yasser Mohammed Kheir, General Manager at Bahwan Projects & Telecoms LLC.

«In addition, R&M was able to implement virtual training sessions for the Bahwan Projects & Telecoms LLC team at ultra-short notice. They gave our employees immediate access to the tools and information they needed to do their jobs in the field,» he adds.

Ready for further expansion
With the support of R&M and Bahwan Projects & Telecoms LLC, the Oman International Hospital is rapidly approaching completion. Thus the mission to bring world-class medical facilities to the country has been fulfilled.

As the hospital expands its capacity in the coming years, the data network can grow seamlessly with it. The modular principle of the R&M*freenet* cabling system makes it possible to expand and scale the network flexibly.

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The R&M solution for Oman International Hospital
The hospital network is based on R&M*freenet*. Some of the facilities installed:
– FO backbone, 2 km
– Copper-based structured Cat. 6$_A$ cabling, shielded, 80 km
– Cat. 6$_A$ connection modules, shielded
– R&M*healthLine* outlets and front panels, ISO 22196 compliant

بهوان للمشروعات والاتصالات ش.م.م
Bahwan Projects & Telecoms LLC

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OMAN
INTERNATIONAL HOSPITAL
MANAGED BY IDEALMED GHS
مستشفى عُمان الدولي
بإدارة آيدل ميد

The Next Step:
Fiber in the Home

Everybody is talking about Fiber to the Home. What they usually mean is fiber optics to the front door or the cellar. But what about inside the home? Fiber in the Home would be the next logical step.

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Nowadays, the following scenario is becoming the norm: In a multi-dwelling unit, there are several people working from home at the same time. They need ultra-fast Internet connections to their company server, the cloud, for video conferences, for controlling machines remotely and many other things. Other residents stream videos or start their 4K IP-TV. Adolescents use the connections for home-schooling and VR gaming. And that all translates to high volumes of data traffic.

Basic supply

Traditional two-core copper cabling in residential properties will soon no longer be able to cope with such situations. If everybody in a building requires transmission rates of several hundred Mbit/s at the same time, fiber optic connections are part of the basic supply. We are talking about Fiber in the Home (FITH), Fiber to the Floor and Fiber to the Homeoffice.

How can fiber optic connections for ultra-fast Internet access be installed throughout a building at an acceptable cost?

First of all, there are a few requirements that should be met. Property owners and service providers expect complete packages, ready for installation, for the route from the building entry point (BEP) to the outlet. They are not interested in long and complex construction work. The installation cables and fibers have to be slender and flexible. Fitters have to be able to pull them through narrow ducts, old empty tubes and around many corners.

Finally, there are also requirements being made of outlets, such as R&M's FiberOutlet: Ideally, people are looking for pre-assembled and retrofittable outlets as well as self-explanatory assembly, effortless splicing on site, a design to match users' homes and clear labeling of links and ports. And above all, safety. The laser beam emitted must not be allowed to endanger anyone.

FITH range from R&M

R&M has a modern FITH solution for the fiber optic basic supply in residential properties and small companies. Its core is the installation-friendly and elegant FiberOutlet. It takes ultra-fast fiber optic Internet access to all floors, homes, offices and functional rooms.

With its 60x60 format, it fits modern outlet combinations – both surface mounted and concealed. Thanks to its compact format, the FiberOutlet can be easily placed in discreet locations.

Singlemode cables, splice connections and LC Duplex adapters make the connections application-neutral. R&M quick mounting technology and breakout sets simplify installation, even with subsequent cabling.

The FiberOutlet can be spliced flexibly. It is pre-assembled with one or two LC Duplex adapters and the cables are available in different lengths. The adapters feature laser protection flaps. R&M uses slender, bend-resistant cables with LowBend fibers.

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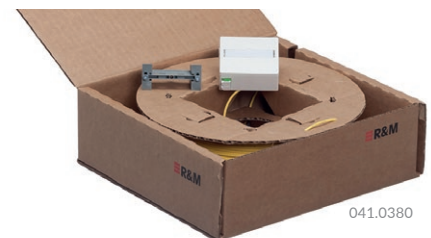
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Hyperscale
at the Transition Splice Point

The family of Building Entrance Facility (BEF) products for large data centers is growing. R&M USA is launching three new models on the market. The scalable splice cabinets will set new standards for fiber optic management at the Transition Splice Point.

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Whether data centers are capable of growth or not is already decided at the gate. The cabling capacities at the building entry point must be as scalable as networks and racks in the white space.

The growing number of arm-thick high count fiber cables is an issue for hyperscale and colocation data centers. Their fiber bundles should be distributed as efficiently as possible over the smallest possible area. This is a complex matter as it regularly involves tens of thousands of fibers. And the numbers are increasing all the time.

R&M wants to simplify things which is why the BEF cabinets were developed. After the successful launch of the BEF 60, three cabinets for 24, 72 and 144 splice drawers are now being added. Up to 384 fibers can be spliced in each splice drawer. In the case of ribbon fiber cabling, up to 55,296 splices fit into the double cabin BEF 144.

Smart innovations

Modular lightweight construction, quick mounting technology, stable cable guides and splice drawers with intuitive operation facilitate work. The cabinets are made of aluminum plate and can be stacked. This means data centers can make use of the room height and minimize the amount of floor space required. Doors, walls and the drawer supports can be removed for assembly. Spacers allow the cables to be inserted at the rear.

The cable entry guides are one of the clever innovations in the BEF cabinets. Fast and sturdy shingles hold the rigid cables firmly in place. They support the subsequent introduction of additional cables. The angles can be positioned and divided in different ways in order to insert the cables in the appropriate places. Time-consuming threading through holes is no longer necessary. The cables can be prepared for mounting outside the cabinet.

Stackable high count fanout kits with a flat breakout box can be assembled anywhere on the rear wall. They pick up the cable ends and stabilize the fiber bundles on their way to the splice drawers.

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BEF 24
– For small sites, subdistribution
– One 3,456-fiber cable
– Reserve for up to 9,216 splices
  (ribbon fibers)

BEF 60
– The flexible cabinet
– All types of cable up to an outer diameter
  of 2.5" (63 mm)
– 288 to 6,912 fibers
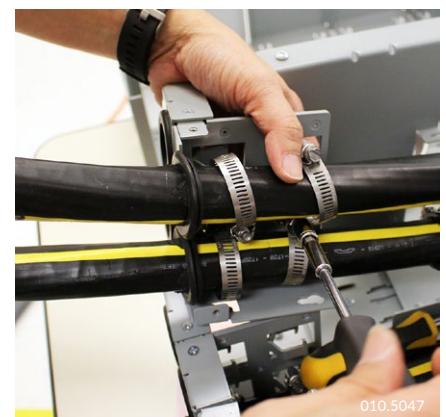– Up to 23,040 splices (ribbon fibers)

BEF 72
– For the splicing of up to four 6,912-fiber
  cables to lower fiber count cables
– Up to 27,648 splices (ribbon fibers)

BEF 144
– Two-part cabinet, separate installation
– Up to 55,296 splices (ribbon fibers)

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Opportunities Abound –
Why the Middle East is an Attractive Growth Market for Swiss Businesses

Frank Eggmann, Consul General of Switzerland, and Nabil Khalil, EVP R&M META, discuss the tremendous potential that the Middle East holds for Swiss organizations and share the keys to business success in this rapidly advancing market.

Please tell us about the opportunities that the Middle East market presents for Swiss organizations.
Frank Eggmann (FE): The Middle East has its own dynamics and has proven to have great adaptability. In its efforts to diversify from an oil-based economy to one driven by tourism, trade and transport, the region is creating new opportunities for businesses. There is a realization across the region that reducing CO_2 emissions is a top priority. In line with this, the UAE has taken the lead among Gulf states when it comes to renewable energies – in particular solar energy given the climate of the region. In fact, the project for the world's largest plant for turning waste to energy is being executed by a Swiss company in Dubai.

And finally, digital transformation was accelerated massively in the region through 2020 and will continue to play a key role here. There are tremendous opportunities for Swiss businesses here as there is a clear need for foreign investments and expertise in this area.

R&M has been present in the Middle East for over two decades now and has followed the approach of investing «in the region, for the region». Could you outline some examples that showcase this commitment?
Nabil Khalil (NK): R&M maintains its position as one of the top three connectivity vendors in the region and has played a lead role in large scale FTTx, public infrastructure, mega projects, and private enterprise deployments. Unlike other technology vendors that simply operate sales organizations in the region, R&M has invested to develop world-class supply chain, marketing, training, and production facilities within the region itself.

This strategy proved to be especially useful during the pandemic as it enabled us to use our well-established local presence to continue delivery and operations without impact to our business. Our inbound material kept flowing and our outbound material to partners and customers remained on track through 2020. R&M's production centers in Saudi Arabia and the UAE remained operational and, at the same time, our engineering and consultancy teams engaged with the customers to set up online seminars and training sessions. We also used this time to enhance our partners' skills and capabilities.

If other Swiss organizations that are new to the region wanted to replicate R&M's success, how would you recommend they approach the market?
FE: Apart from R&M's top-notch technology and proximity to its customers, I believe R&M's success is the result of three important pillars. First: R&M walks the talk – so you know exactly where you stand, and this is Swiss precision at its best. Second: they work in the region, for the region which really drives success. And third – something I believe every company needs to follow – is their focus on the most important capital: human resources. It is when a company empowers employees to realize their full potential that they have a winning formula.

So, to any Swiss company looking to succeed in the Middle East, I would say, talk to my friend Nabil, he will tell you how to do it.

What are the biggest opportunities in the Middle East at the moment? Which countries does R&M see the most growth potential in and what types of projects are driving growth?
NK: Countries in the Middle East have been demonstrating an ambition to build world-class infrastructure and establish themselves as global hubs for innovation. The region is now home to mega projects in smart cities, airports, and smart buildings, and the region also leads global averages in FTTx penetration and the rollout of 5G.

Over the course of the last two years, R&M has seen success in the telecoms, healthcare and airports sectors with noteworthy projects such as the New Istanbul Airport and FTTx rollouts in Saudi Arabia and the UAE. In the

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left: Frank Eggmann, Consul General of Switzerland in Dubai, right: Nabil Khalil, EVP R&M META

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coming years, as the UAE gets set to host «Expo 2020», and Qatar the FIFA World Cup in 2022, there will no doubt be plenty of opportunities for businesses – whether in the hospitality, IT, education, healthcare, smart government, or enterprise segments – to thrive in the region.

To capitalize on these types of projects, are there any particular regional nuances you believe Swiss organizations need to adapt to?
FE: Coming from China where I was previously posted, I had to adapt to the fact that, sometimes, things in the Middle East take longer than in other countries. Personal relationships need to be established before getting to business. I therefore had to learn patience to adapt to this. Of course, the region is now witnessing a massive acceleration with COVID-19 and businesses have realized that things must move fast if they are to remain competitive. So there has been an evolution in the region too.

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On a personal level, I have come to love the Islamic culture which I have enjoyed getting to know – especially with its human centricity. I found this experience of diving into a new mentality both very peaceful and very balanced. So, it isn't just adapting but also learning to enjoy a new culture.

You have had an illustrious career, involving prominent positions at the Swiss Consulates in China, South America, Kenya, and now the Middle East. Could you tell us how the region stands out on both a professional and personal level? Any personal motto you can share with us to describe the Middle East?
FE: Having been in this diplomatic career for 35 years and lived in 12 different countries, I often get asked which country has been my favorite. I am unable to answer because each country I served offered me its share of happiness, challenges, and discoveries. I have been fortunate enough to maintain my child-like curiosity and continue to love trying new things – both in my personal and my professional life. My driving motto is a quote by Nelson Mandela who said, «I never lose. I either win, or I learn,» and I think this accurately sums up my life's philosophy.

As a business leader in the region, you have witnessed its transformation into the melting pot of cultures that it is today. Could you tell us how this has helped shape the region, its culture, and its perception across the globe?
NK: It has been inspiring to see the Middle East become a powerhouse of innovation on the global stage. We see daily reports in the media about innovative government initiatives and investments. The region is making great strides in IoT, 5G, Big Data, space exploration and so on. These initiatives will continue to attract the brightest minds who will contribute to the homogeneous melting pot of culture. This is transforming economies in the region from being traditionally oil-based, to knowledge- and service-based. This translates to incredible new opportunities – both for local citizens as well as the millions of expats who also call this wonderful region home.

Could you tell us about the collaboration and strong relationship between R&M and the Swiss Consulate in Dubai?
FE: We are both straightforward and respect each other's field of expertise. Apply this to any kind of business and you will understand that it is fundamental to success. So, our secret is that we support each other and work hand in hand.

NK: We work together in promoting not only Swiss businesses and Swiss solutions, but also the Swiss way of doing business, which is geared toward transparency, efficiency, and making collaboration seamless. There is no doubt that the region benefits from this approach.

What do you hope for R&M's future?
FE: I wish R&M, myself, and the rest of the world a COVID-free future, and a fantastic «Expo 2020» in Dubai as this is expected to be the first truly global event since the pandemic. It is in less than a year's time and we will have everything in place to make it a grand success. So, I appeal to everyone reading this to visit us here in Dubai during the Expo!

NK: It goes without saying that I too hope for a COVID-free future. On a professional level, I aim to have growth for R&M in the coming years. But equally importantly, I aim to also promote R&M's culture which is based on integrity, honesty, and modesty. As we expand and bring our innovative technologies to an ever-growing customer base, my hope is that we will also have the opportunity to share not only our world-class products and services, but also this unique and fulfilling company culture with a wider audience.

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Watch the interview on YouTube

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Success

Cat. 6$_A$ for
Japan's National Education Project

The innovative, reliable connectivity solutions from R&M open up access to high-speed data networks for pupils and students in Japan.

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As part of the GIGA education project, Japan is currently equipping 35,000 schools with cutting-edge ICT. They are being given access to high-speed networks. R&M is supplying the Cat. 6$_A$ connectivity technology for the classrooms.

GIGA means «Global Innovation Gateway for All». Japan's Ministry of Education, Culture, Sports, Science and Technology (MEXT) is looking to set new standards in education with this national project. It combines proven educational practices with modern IT to enrich learning and provide digital support. Every Japanese pupil and student is given a tablet or a PC and access to fast data networks.

Teachers address all students directly via the devices. They can support and stimulate students according to their personal abilities and needs – whether in the classroom or remotely at home. Students can use the devices to develop individual learning content. Finally, the devices facilitate cooperation in project groups or with remote universities. In 2020,

MEXT already invested 229.2 billion yen (JPY), the equivalent of around 1.96 billion Swiss francs (CHF), in this program.

Cat. 6$_A$ to become standard

When it came to choosing the connectivity technology in the classrooms, MEXT opted for the Cat. 6$_A$ WARP technology from R&M. It comprises Cat. 6$_A$ EL connection modules for structured cabling systems as well as patch cords with WARP shielding and FM45 connectors. Additionally, R&M is providing patch panels and adapted mini surface mount boxes.

For the first time, a major Japanese institution is specifying the Cat. 6$_A$ standard for local data networks. And this is how MEXT wants to set new standards in classroom cabling,

too. R&M's Cat. 6_A products meet the MEXT requirements for transmission performance and applications in schools.

Other features of the R&M products enjoy high recognition with well-known and long-standing Japanese partners. And they also convinced the ministry.

Fast installation

The Cat. 6_A EL modules for network connections can be installed in just a few easy steps. All it takes is one click to wire all conductors in robust insulation displacement contacts, IDC. The insulation displacement technology from R&M guarantees permanent loss-free signal transmission due to its precise design.

The field-mountable FM45 plugs for patch cords also follow the quick mounting principle. Installers can freely decide on site how they want to lay the cables. And then, in just a few easy steps, they connect the FM45 connectors.

The offered and commissioned solution was characterized by the special WARP technology (Wave Reduction Pattern). The

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Japan's Ministry of Education selected the sturdy Cat. 6_A connectivity and the field-mountable FM45 connectors from R&M.

WARP alien crosstalk protection made of integrated metal foil effectively protects the cabling from electromagnetic interference. WARP cables do not have to be grounded. That saves additional, complex working steps.

Interested in the reputation

During evaluation, the system integrator was particularly interested in R&M's reputation in Japan. R&M is one of the country's top providers of connectivity solutions.

Local, certified partners and the R&M product managers are increasingly committed to further establishing the innovative Cat. 6_A cabling on the Japanese market. The R&M Supply Chain ensures supply throughout the Asia Pacific region.

The GIGA school project proves the outstanding transmission performance of Cat. 6_A throughout the country. R&M's innovative, reliable connectivity will prove its quality in a particularly demanding field of application.

Universities and educational institutions all over the world rely on network technology from R&M. Users include the University Science Park TECHNICOM of the Technical University of Košice in Slovakia and the NSBM Green University Town in Pitipana, Sri Lanka. Among other things, the UCSB University of California, Santa Barbara, California, is using R&M platforms to expand the campus-wide FO network.

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Wave of Virtualization
in 2020

When people meet online, they learn amazing things. You have one person giving a presentation on a PC at home and thousands can attend it with just one click. Even with virtual distance, trust and personal networks are growing.

In 2020, a year marked by the pandemic, we all went through this kind of experience. Lockdowns led us to spontaneously expand and professionalize virtual communication with our customers. It took just a few weeks to establish new marketing strategies, capabilities and processes. Many an engineer and customer advisor discovered his/her talent to moderate video conferences or address a virtual audience.

R&M started a range of projects to make optimal use of this virtualization trend. When the first pandemic-related restrictions became known, regular interactive webinars were introduced to provide customers and employees with important information and training. These webinars are now very well established and have become part of our standard program.

High participation rate

The spectrum ranges from specialist regional training courses to multi-part training series, developed and conducted at headquarters. The participation rate is at an above average level of 58 % of all customers and prospective clients approached. Participants confirm the high information content of the training sessions and are happy to use the efficient virtual continuing education offerings.

For the very first time, R&M hosted a virtual partner event for Eastern and Western Europe. This gave distribution partners from the region the opportunity to become acquainted with the latest trends and products online, something made necessary by the pandemic. The information came straight from the horse's mouth, with management and market managers answering questions on the webinar platform.

The Virtual Conference 2020 of the FTTH Council Europe at the beginning of December 2020 provided a further opportunity to address the market online. The R&M exhibition stand served as a studio, in which new products such as the Polaris boxes and PRIME ODF were presented. Sales, product and market managers held expert chats in which they answered questions from around 2,000 virtual conference visitors.

R&M at the Virtual FTTH Conference 2020

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Digital Ceiling
Live

The change of technology in building automation is easy to complete providing the building is suitably prepared. And that means the all-clear for All-over-IP. R&M and partners are now demonstrating how All-over-IP building automation can be implemented. Installers, system integrators, planners and real estate operators will receive first-hand information.

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Total coverage with wireless networks is state of the art in functional buildings. But how are the countless transmitting devices on the ceilings connected to the LAN as efficiently as possible? The solution is structured ceiling cabling compliant with ISO/IEC 11801-6. The concept of structured work area cabling is transferred to the ceilings. This is where service outlets (SO) connect the WLAN routers with the LAN. Planners and installers are familiar with this approach.

Expanding the field of vision
The very title of ISO/IEC 11801-6 encourages a broader field of vision: «Distributed Building Services». The digital ceiling and service outlets make the LAN and Ethernet/IP available for the entire building, not just for WLAN routers. They pave the way to All-over-IP (ALL-IP), to building automation based on the open Internet protocol and structured cabling. This path ultimately leads to smart buildings.

ALL-IP offers a whole host of advantages. Nevertheless, there is palpable uncertainty due to the lack of an overall overview. And the installation industry wants to know what this kind of cabling looks like and what they can expect.
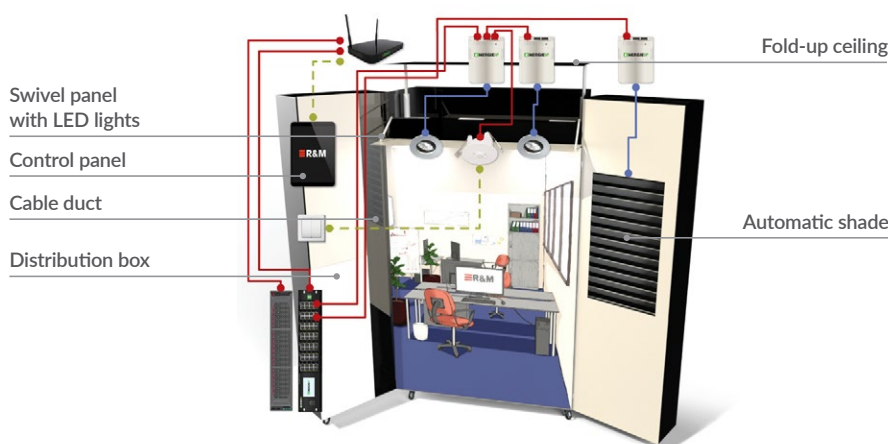
Mobile solution demonstrators to be provided by R&M, together with partners, from the third quarter of 2021 will supply the answers. These mobile technology platforms show everything that is part of ALL-IP.

The first demonstrator shows a solution with network components from French manufacturer, Energie IP. In this example, the network connects all devices in building automation with a central floor distributor. Application examples include IP-based, PoE-powered LED lighting, sensors, shades, operating panels, etc.

Staying independent
R&M provides information on application-neutral, structured ALL-IP cabling in the mobile showrooms and accompanying events. The advantage: Users remain independent. This universal cabling will always support them – regardless of the services and devices they want to use in their building or retrofit at a later date.

Visitors to the demonstrators will definitely discover just how feasible ALL-IP is and can set the change of technology in motion.
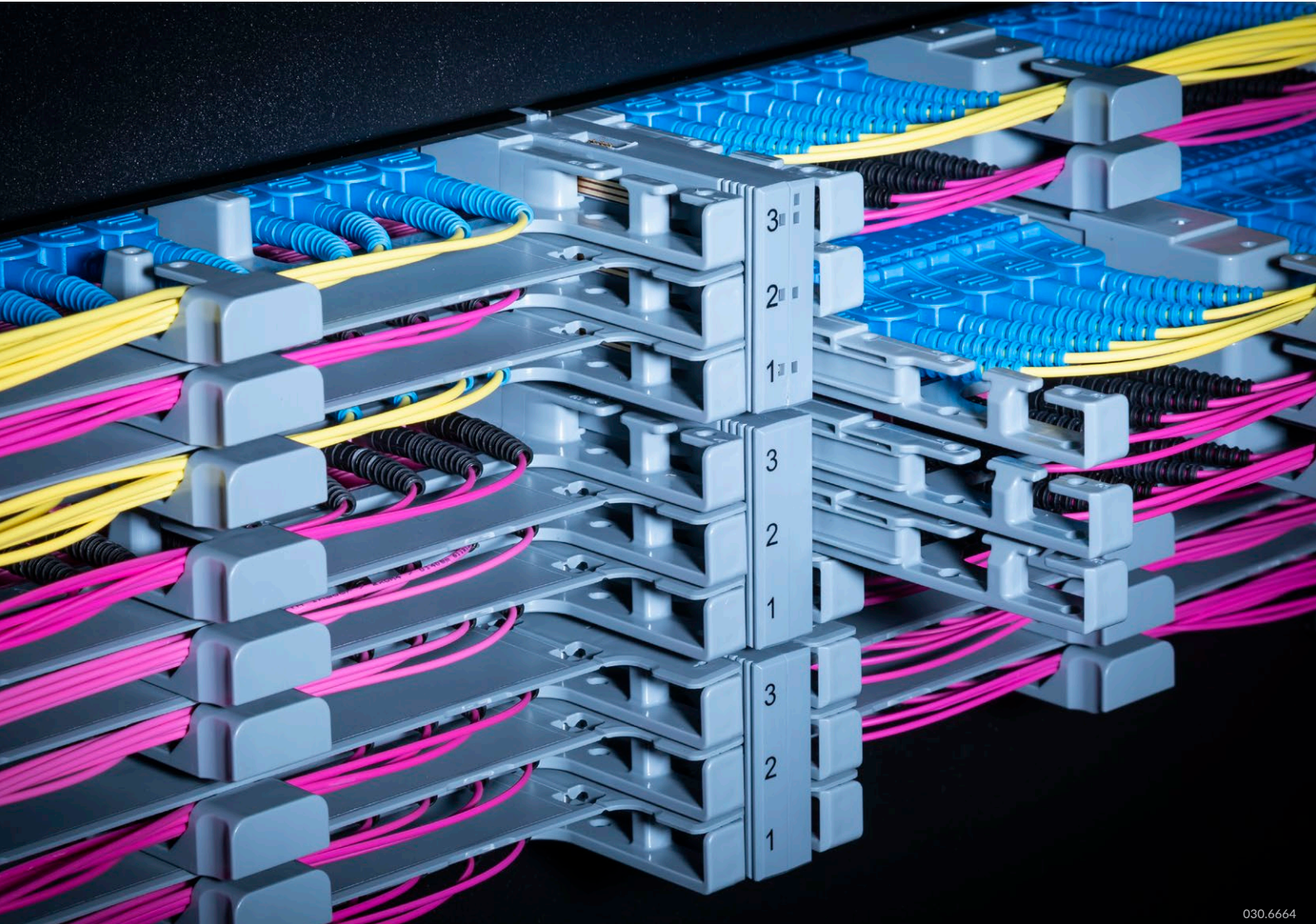
Swivel panel with LED lights
Control panel
Cable duct
Distribution box

Fold-up ceiling
Automatic shade

R&M shows what cabling for ALL-IP looks like in the demonstrator. 050.7106

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The Packing Density
Competition

There is a small surprise waiting at the threshold to 400G. Data centers have
to choose between new options when it comes to connectivity and packing density.
Which connector is the best?

Three new connector types are supple-menting the connectivity range for ultra high density cabling: CS, SN and MDC. They have been causing a sensation since 2019. Their formats promise much more compact patching. And that is now interesting with the start of migration to 400 Gigabit Ethernet.

Senko developed the types CS and SN. US Conec presented the MDC. CS stands for Corning Senko, SN stands for Senko Nano and MDC is the acronym for Mini Duplex Connector.

Tried and tested core: 1.25 mm ferrule

The construction of these new duplex connector types is based on the 1.25 mm ferrules. These already figure in the LC, the traditional workhorse of structured cabling. The housings, however, are more slimline. In the SN, the ferrules have a spacing of 3.1 mm – unlike the 6.5 mm in the LC.

This means the new connectors make use of the tried and tested core of connectivity: primarily, transmission performance, reliability as well as simple cleaning and inspection.

MSA are setting the course

The reason behind the development was to clear the way to 400G on the passive connectivity side. Data centers need more bandwidth and more transmission channels. This is why the packing density of the connectors increases in the front of the switches and panels.

On the active side, the progressive MSA manufacturer groups had already pointed the way. With their new transceiver formats QSFP-DD and OSFP, they opted for 8-channel configurations in a compact form factor.

While MPO connectors with 12, 16 or 24 fibers could also help, the new miniature connectors enable direct access to every individual channel. They can be patched individually. This makes it simpler, for example, to establish links between different switches with 4x100G to 400G. A decisive advantage for network planning.

Packing density multiplied

First of all, Senko launched the CS connector. It doubles the packing density of the LC connector and can triple the fiber density in patch panels. Then Senko quickly came up with, and launched, the SN connector. It takes up even less space than the CS. It can be used to terminate up to 384 fibers on one height unit.

US Conec followed suit with its MDC connector. The MDC can also triple fiber density. It is said to allow a packing density of 432 fibers on one rack height unit.

The footprint of the SN and MDC connectors is about the same. They are classified as VSFF connectors (Very Small Form Factor). They are not compatible due to small design differences in the plug face.

The IEC is currently standardizing the two VSFF connectors. Form and functionality will no longer change. They have already

been anchored in the specifications for the multi-source agreement (MSA). MSA manufacturers are integrating the design of the plug faces in the first QSFP-DD and OSFP adapters.

Eight-channel configuration

Four channels (eight fibers) per module can be set up with both VSFF connectors. This would pave the way to 400G using 8-channel configuration (8 x 50G). Hyperscale data centers would be the first users. Edge data centers could also benefit with an increase in capacity.

Currently – April 2021 – it is difficult to identify a winner. The data center market appears to be welcoming both VSFF connectors with equal enthusiasm. At the moment, it is impossible to say which is the optimal connector for migration to 400G. The Senko pioneer, the CS connector, is receiving more attention in the telecom industry.

Netscale as a platform

R&M offers the option of using both VSFF connectors, as well as the CS connector, in the latest Netscale distributors. The already record-breaking Netscale port density with up to 120 LC Duplex ports per height unit can thus be increased effectively once more. Users will ask how they should handle the cables with this packing density.

Three new connector types for ultra high density cabling
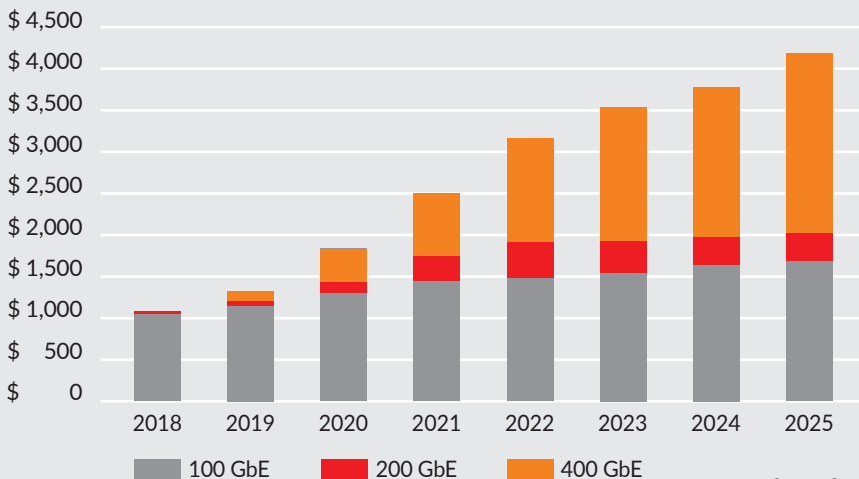

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CS connector from Senko

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SN connector from Senko

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MDC connector from US Conec

The R&M development team has looked at this challenge in detail and already knows the answer. An advanced, carefully designed cable management system will facilitate work on the patch panel front. The solution supports the monitoring of the ports and cables. Market launch is imminent.

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Demand for next generation network

Datacom Transceivers

Revenue ($mm)

050.7108
Source: Ovum

Legend: ■ 100 GbE ■ 200 GbE ■ 400 GbE

Corporate

Faster Unpacking
– **Less CO$_2$**

R&M, partners and data centers are all making their contribution to climate protection with the new Netscale packaging program. The concept is: unpack faster, throw away less, save storage and transport costs, reduce CO$_2$ emissions.

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The packaging and pre-assembling services for Netscale 120 bring a number of benefits to data centers worldwide. They certainly install fiber optic distributors more efficiently. R&M is now offering the program for Netscale 72, a larger customer base and more projects.

Cardboard volume reduced

This is how the program works: First, planners specify the high-density distributors according to data center requirements. R&M assembles complete modules precisely to suit their requirements. They are pre-assembled and delivered packed accordingly. This

reduces the packaging volume by 67 % in comparison to the delivery of single parts.

The modules can be unpacked in a flash on site. This work step is reduced by 84 % compared to conventional work preparation.

The cabling project moves forward faster and the work costs decrease. A rack, a cage or a data center can start operation earlier.

Further positive effects: Distributors, installation companies and data centers save storage costs. These drop by 74 %. The Netscale packaging program also brings benefits for logistics, as freight volumes and transport costs are reduced. That can make a significant difference on long, international routes and in large countries.

The success for climate protection: R&M estimates that CO$_2$ emissions drop by 76 %.

What are the advantages of the Netscale packaging program?
 – 84 % time saved on work preparation
 – 76 % reduction in CO$_2$ emissions
 – 74 % reduction in storage costs
 – 67 % less cardboard volume

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Perfect
Versatility

The Netscale family is growing. Users can now look forward to Netscale 48 –
the world's most versatile high-density panel for fiber optic and copper distributors.
The 1U platform is full of surprises.

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Netscale 120 with its unsurpassed fiber optic packing density is just celebrating its fifth birthday.

And now, the family is being joined by Netscale 48. The Netscale series includes further highlights: the migration-friendly Netscale 72 platform, compressed TAP modules and the Blade Cabling Manager for addressing switches.

Netscale 48 increases the density of mixed media cabling. To date, two height units were usually occupied in order to combine copper and fiber optic cabling systems in one rack. Netscale 48 allows both media to be condensed onto a single height unit.

From LC to Cat. 8

R&M's understanding of modularity makes Netscale 48 the world's most versatile panel. The most important benefits:

– Everything that is state-of-the-art and the widest conceivable connectivity range for a 48-port panel are suitable: LC, SC, MPO, E-2000™ and even the latest VSFF connectors CS, SN, MDC for fiber optic equipment. Cat. 6_A ISO, Cat 6_A EL and Cat. 8 for copper cabling.

– Technicians can install and remove pre-terminated modules in just a few easy steps. They splice optical fibers directly on the platform.

– Active channels remain active. Netscale 48 is designed in such a way that changes can be made without interrupting the network.

– Netscale 48 was designed to optimize both trunk cable and patch cord management.

Trunk cables can be inserted at the back and sides.

– The integrated patch cord manager – an industry-leading design – guides the patch cords compactly, tidily and in a protected manner. Space-consuming cable guides and patch cords hanging around untidily are a thing of the past.

– Identification features in the housing and on the modules, as well as labels in the door, are very obvious. That ensures efficient, error-free documentation.

– Netscale 48 supports Automated Infrastructure Management (AIM). The sensor bars of the R&M*inteliPhy* AIM system are hot-pluggable and can be retrofitted during operation.

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Corporate

Sustainability
and Social Commitment

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Companies can only be successful in the long term if they operate in an environmentally sustainable and socially oriented manner. Corporate Social and Environmental Responsibility (CSER) is not intended to be a compliance culture at R&M, but to be implemented on the basis of a future-oriented CSER strategy. This is why R&M is now incorporating social and ecological goals even more firmly in its corporate strategy.

The latest CSER report from R&M is being published at the same time as this edition of CONNECTIONS. The report details the sustainability measures taken in the areas of environmental management, the supply chain and human resources in 2019 and 2020. The report is based on the standards of the Global Reporting Initiative (GRI).

The COVID-19 pandemic demonstrated the weaknesses of our economic, social and ecological systems all over the world. Sustainable action requires continuous commitment, something which in this situation particularly applies to people's health and well-being.

R&M takes its responsibility towards employees, customers and business partners seriously. The health and safety of the employees is of key importance. With the outbreak of the coronavirus pandemic, comprehensive protection measures were implemented at all R&M sites within a very short period of time. Employees are kept informed and made aware of relevant issues on an ongoing basis. Fortunately, the number of infected employees is comparatively low.

ISO 45001 at all locations
Occupational safety is also a top priority at all production sites. In addition to country-specific regulations, R&M is gradually introducing the ISO 45001 standards. In the reporting period, R&M also dealt with the issue of equal pay for men and women. The Nomination Committee carried out an analysis and defined measures for the coming years.

Responsible action along the value-added chain is obligatory at R&M. Accordingly, the global supply chain strategy was developed further in the reporting period. Cooperation with suppliers and logistics service providers is carried out as regionally as possible. R&M plans transport routes highly efficiently in order to keep CO_2 emissions from vehicles as low as possible.

The environmental goals of the production sites, defined on an annual basis, were successfully implemented. The volume of waste generated at the sites is continuously recorded and monitored.

In 2020, a packaging and pre-assembling service for the R&M solution Netscale 120 was introduced. The service also offers customers from the data center industry environmental advantages and benefits.

Transport costs are reduced and packaging waste decreases by 67% in comparison to the delivery of single parts. Storage costs can be saved. The result: CO_2 emissions drop by 76%.

These are just a few examples of measures from the 2019/2020 reporting period. R&M will fine-tune its CSER strategy significantly in order to make measurable contributions to solving environmental, economic and social challenges.

You can read more about this topic and download the latest Sustainability Report here:
www.rdm.com/company/about-rm/corporate-social-responsibility/

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Corporate

Two Plants
in China

R&M continues to expand its production sites in China. The second plant went into operation at the end of 2020. Infrastructure solutions for the fast-growing Chinese data center market can now be offered from a single source.

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The new plant is located in the Pinghu Economic-Technological Development Zone (PEDZ), an ideal environment for international technology companies. One thousand companies have settled there. Despite difficult conditions and restrictions due to the pandemic, R&M's second production site in China was put into operation with only a slight delay.

R&M operates in a state-of-the-art industrial building. In addition to production, it houses a warehouse, a showroom and offices. More than 100 jobs will be created here in the coming months. With the support of the headquarters in Wetzikon, lean and efficient production processes are being established according to proven R&M standards. Fiber optic and copper solutions for data networks are assembled here. Production capacity is to be expanded in the coming years.

Production for network cabinets and enclosures well established

The company acquired in the nearby Jinshan District in 2019 develops and manufactures network cabinets and enclosures for data centers and server rooms.

Both sites are located southwest of Shanghai and are incorporated in R&M's global supply chain.

In China, the world's second largest market for structured cabling, and in other Southeast Asian countries, data center operators are among the main customers of the two plants. R&M serves the market as a full-range supplier of network infrastructures. Solutions include cabinets, power distribution, cabling, distributors and infrastructure management software.
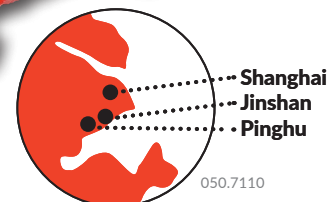
The Chinese IT market recovered relatively quickly from the pandemic. R&M is experiencing rising local demand and is continuing to invest in further market development.

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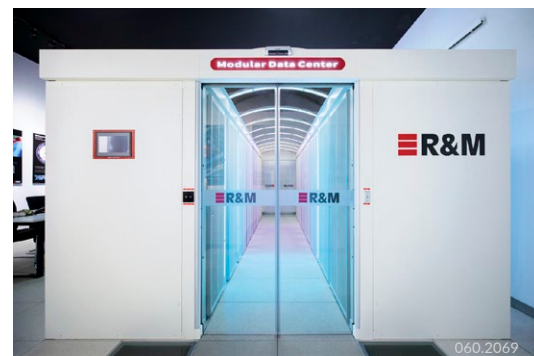
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R&M

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Project was carried out by Arch-Deco Sp z o.o., Gdynia