

CONNECTIONS 62

Specialist magazine Reichle & De-Massari AG | May 2022



Relief

for Data Center and
Network Operators

Landwerke M-V Breitband GmbH:
Gigabit for the Land of Lakes

ZOONA:

Compact Splice Closure
for FTTH Access Networks

Using SPE
in Buildings

Sustainable Business Activity



050.7176

Dear Business Partners

Data centers are experiencing a boom. With ever greater performance, they are vying for the favor of their customers. Infrastructure management is often viewed as a costly but necessary evil. However, it is worth operators' while to integrate dynamic management into their processes and get experts involved at an early stage. R&M offers a holistic solution approach; our customers receive everything from a single source of supply. In this issue's Focus story, we show which criteria data center operators should take into account.

Extending competence centers

Data center and network operators want to be supplied locally around the world. R&M is systematically expanding its value-added chain with a regional focus. This enables us to deliver solutions quickly, locally, with optimized costs and, above all, sustainably. The Italian rack and housing manufacturer TecnoSteel S.r.l. from Brunello has also been part of the R&M Group since the beginning of 2022. The new site is to be continuously expanded into a center of excellence for racks and housing. Our plant in Bulgaria, which celebrated its tenth anniversary last year, serves as a model. Over the years, the

production plant in Sofia has developed into R&M's international FO competence center, now employing over 450 people. Find out more in the Corporate articles.

If you want to stay ahead of the pack when it comes to connectivity, you have to get to grips with the demands of the future. In this issue, you can, for example, read how fiber optics can be brought quickly and efficiently to family homes in Switzerland. The FO Field from R&M is part of the concept. And to ensure that the last mile in the FTTH access network can now be rolled out quickly, R&M is launching the compact ZOONA splice closure. It is waterproof, can be mounted anywhere and can be expanded step by step thanks to its modular principle.

The trend towards Single Pair Ethernet (SPE) continues to gain momentum. R&M has been at the forefront of this development for several years, including in alliances and expert committees, and now has a complete SPE product portfolio. You can also find out more about this and other product and trend information in this magazine. The latest case studies show where our products and solutions are currently in use.

R&M develops connectivity solutions for the next generation and takes the same sustainable approach to them as to all other corporate processes. From now on, this will be reflected much more transparently and with long-term objectives: We want to halve our greenhouse gas emissions by 2030 and be able to guarantee climate-neutral production by 2050. You can find out more about this in the article on page 33, which takes you straight to our latest Sustainability Report.

I wish you an inspiring read.

Markus Stieger-Bircher
COO, Sustainability Lead

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The Mecklenburg Lake District in the north of Germany is becoming a broadband paradise. With the support of R&M, the fiber optic networks in this region are growing quite fast.

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Taking the Burden off Data Center and Network Operators

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The pandemic has significantly accelerated digitalization and thus also developments in the telecommunications and data center market. The breathtaking momentum continuously demands more power and resources from data center and network operators. Every day, infrastructures have to be expanded, increased and rebuilt.

Data center providers cannot generate ROI with cabinets and cables. For them, infrastructure is a time-consuming topic. But 50 million new IT and IoT devices go online every day, with the expectation that data centers in the cloud will have the necessary resources at their disposal.

Today, 51 % of the world's population communicates on mobile devices and every smartphone is connected to data centers. Subscribers also expect their apps to be able to work in real time at all times.

Data center operators are doing everything they can to ensure that these expectations are met. They are building continuously and more than ever before. The momentum of digitalization demands it.

Warning: Costs

However, there are also signs that investment and operating expenses are no longer growing with the same momentum. Right now, global data center operators and telecom providers should be putting their TCO to the test. They should also consider the factors that will slow down the rapid growth: climate targets, power supply, cyber security, supply bottlenecks, political and economic challenges, travel restrictions, a shortage of skilled workers.

What options do these service providers have in this difficult situation? How can they ease the burden so they can concentrate on the market, productivity and return on investment?

The answer: by leaving the planning and management of infrastructures related to productive IT to the system provider! Why take care of every single patch panel as well as ports, cables and racks yourself when there are dedicated experts who can do the job for you?

R&M has recognized the potential and expanded its business model accordingly. Based on global experience with data center projects, an extended system approach for infrastructure solutions has been developed, based very much on the principle: everything from a single source. It will make life easier for data center providers in dynamic times, as they will be able to outsource their infrastructure tasks in entirety.

Ten criteria

In addition, ten business- and cost-relevant criteria can be derived from R&M's wealth of experience to help data centers evaluate infrastructure solutions:

1. Speed

Data center and network operators no longer wait weeks for plans, offers and technicians. If a customer wants to relocate part of their IT to the colocation building tomorrow, the provider must react immediately. It may even be necessary to provide fully equipped racks or entire cages the day after tomorrow.

Speed is feasible when key technologies come from a single source and complete infrastructure solutions are available from the provider on demand. The systems must be compatible with one another and be able to be seamlessly integrated into the existing environment, regardless of their size.

2. Innovation

Fast does not mean that data centers want to get standard products out of a drawer. When their customers launch novel applications, they may need innovative, scalable, or specifically configurable solutions.

Data centers find innovations from system providers who know the market and think ahead. These providers are proficient in different technologies, production methods

and product worlds, and combine them to suit specific requirements.

3. Integration

Planners and project managers know that suppliers focus first and foremost on their perfect product. If data centers want to combine products from different manufacturers, they may have to accept compromises. Typical traps: cable management, port density, monitoring systems.

Data center operators should look for suppliers who have mastered integration, in other words providers who look beyond their original technology field and routinely combine all the modules of an infrastructure. Ideally, they commission manufacturers who are skilled in turnkey project management to deliver turnkey packages.

The benefits of an inclusive approach: There is less or no need for coordination between the trades on site. The construction and provision of the infrastructure are a success.

4. Production depth

The issue of procurement costs must not be allowed to fall by the wayside in boom times. In fact it needs to be re-emphasized, see above. When selecting the infrastructure solutions, it is therefore important to check whether the provider operates in a cost-optimized way in the interests of the data center.



R&M advocates the complete digitalization of infrastructure management from end-to-end from the outset.

Providers such as R&M can vary their costs. The key factors: a high degree of production depth, in-house manufacturing expertise, centrally coordinated production network and flexible logistics. They combine serial production skillfully and sensitively, and address the project and purchasing plans of a data center.

A manufacturer with a high level of production depth doesn't need to worry about the comparison. Other suppliers purchase the components for their solution at a high price and deliver the finished goods at fixed conditions with a significant surcharge.

With the acquisition of TecnoSteel S. r. l. in Brunello, Italy, at the start of 2022, R&M can perfectly complement its portfolio and manage larger project volumes. The new site in Brunello will be expanded into an R&M competence center for racks and housing. With R&M solutions, the «integrated data center» from a single source is becoming a reality.



Fiber optic production is being continuously expanded at the Czech cable plant.



Committed on all continents: R&M now has 14 production plants

5. Expertise

Data center providers are looking for contacts who can offer more than good products and good prices. If you order a system solution, it should immediately fit the business model and network architecture of the data center.

Thanks to the system approach, sales representatives will be able to say what is feasible immediately and fairly precisely. This is demonstrated by their expertise in finding solutions. Data center operators should

always ask for this expertise. The chosen provider should even be able to manage an infrastructure project in order to further reduce the burden on data centers.

R&M goes a few steps further and is the «trusted advisor» for data centers when it comes to strategic issues. Documents such as planning aids and the Colocation Migration Handbook bear witness to this expertise.

6. Presence

Major providers work at a supra-regional level. If at all possible, they want to use the same infrastructures at all premises. That is efficient and simplifies load sharing and remote management across borders.

This is precisely why data center providers expect the recommended system approach to be able to be implemented everywhere. They also expect the contracted infrastructure provider to be nearby and to be able to deliver complete units anywhere at short notice. This presupposes that the supplier has international manufacturing facilities and global logistic capabilities. On-site presence is particularly important when a prototype or localized customizing is needed quickly.

7. Quality

Despite all the standards, there are still differences in the quality of the products. Example: Some FO connections exhibit slightly poorer attenuation values than expected – one of the biggest concerns in the industry. If data centers are unable to meet the agreed latency values or if network operators are struggling with network outages, their customers will not be pleased.

From the point of view of everyday operations, precision and quality are more important than price. For data centers, a permanently stable, guaranteed transmission quality is one of the criteria when selecting the optimal infrastructure and cabling system. Good connectivity secures competitive advantages.

8. Sustainability

The data industry now accounts for 2 % of the world's electrical energy, and this figure is rising. But together with their suppliers, data centers are doing everything they can to reduce power consumption and CO₂ emissions. The criterion of sustainability also has to play a role in the choice of infrastructure systems.



The fiber optic production line at the new plant in China went into operation in June 2021.

What has to be taken into account? Three examples: cooling, packaging, transport.

- Today, cabinets and cabling systems can be designed in such a way that the cooling air can flow with measurable effectiveness. This reduces power consumption.
- The packaging of network technology can be reduced dramatically if suppliers supply pre-terminated and ready-to-install racks, patch panels and assemblies. This means less waste.
- Transport routes can be shortened through intelligent logistics and supply chain management and decentralized manufacturing. Fuel consumption decreases. R&M is leading the way.

9. Digitalization

Where thousands of ports and links, patch cords and test results and more have to be managed, every process and every work step should be digitized. Hardly any data center still has the time and personnel for manual documentation and control.

How much digitalization does the provider have in its portfolio? What software is included and how deep does the solution penetrate into the infrastructure? Data center operators have to ask themselves these questions.

Retrofitting smart port monitoring or integrating an individual rack into the DCIM at a later date can be very tricky. This is why

R&M advocates digitizing infrastructure management completely from end to end from the outset (see blog: «DCIM: Think about the connectors!»).

10. Service

And finally, data center and network operators should determine how much service is to be provided with the infrastructure solution: Network planning, application support, integration services, on-site assembly, online support, certifications, quality assurance, metering data and material management, remote maintenance as well as services relating to the required DCIM software are just some of the many services that a global company such as R&M already offers today.

Two questions

There are two remaining questions: How high are the costs and do dependencies arise when all solutions from the cabling infrastructure to the DCIM software, including services, come from a single source? The strategy certainly requires a solid and long-term basis of trust.

The provider should be familiar with the data center's working methods, goals and customers. This means that both sides can assume that the financially and technically appropriate infrastructure solution will be found. This makes life easier for the data center in dynamic times.

Expanded system approach

The R&M Group is taking a new approach to be able to supply data center and network operators around the world. The aim is to make life easier for customers in the infrastructure of productive IT and, if possible, to offer everything from a single source. Experience has shown that this shortens the path to being able to develop or configure coordinated solutions for each individual project quickly and in some cases locally. In this way, costs can also be optimized.

It is crucial to fully integrate additional production opportunities into the Group along the value-added chain. R&M has recently acquired suitable companies for this purpose: a fiber optic cable plant in the Czech Republic, new fiber optic competence centers in Brazil and the US, as well as network and data center housing manufacturers in China and Italy. Added to this, there is consulting as well as software and electronics development for Data Center Infrastructure Management (DCIM). All plants are integrated into a centrally managed supply chain.

Not least due to the pandemic, R&M has further professionalized the organization of this network very successfully and at an accelerated pace. Over the past two years, R&M has remained capable of supplying all over the world despite many bottlenecks in the transportation industry as well as with subcontractors.

For more information:

www.rdm.com/solutions/data-center/



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050.7086

R&M's FO competence center in Sofia celebrated its tenth anniversary in fall 2021.



Suhr Invests in the Future

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Fiber to the Home can do more than Internet and entertainment, as demonstrated by the utility TBS in the Swiss municipality of Suhr. With the new fiber optic network, TBS is simultaneously paving the way to smart metering.

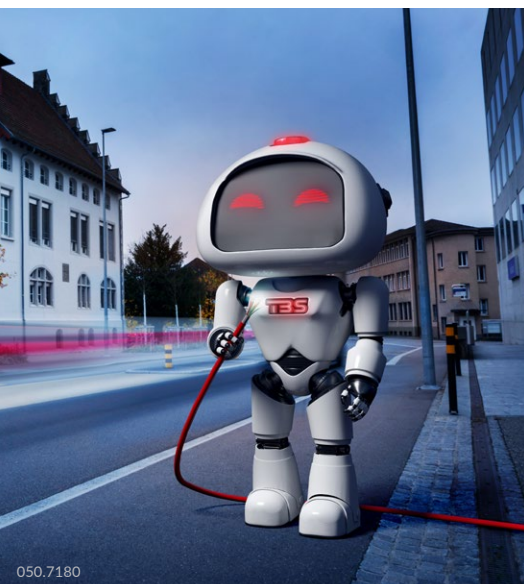
TBS Strom AG has set itself an ambitious goal: By the end of 2023, all residential units in the municipality of Suhr are to be able to transfer huge data packets at the speed of light. To this end, the utility is building a blanket FO network in four phases for 2,000 properties and 5,300 lots, apartments and offices.

Fiber to the Home is replacing TBS's decades-old cable TV network. One Gigabit per second in both directions, download and upload, is the benchmark for TBS today. It also offers telecom, Internet and TV services. Internet service provider Quickline even wants to offer 10 Gigabit/s on the network – a quantum leap for users.

High packing density

An advantage for TBS AG: It will save a lot of expensive ground work. It owns the infrastructures of the old cable network and the electricity supply. Most of the new FTTH infrastructures with point-to-multipoint topology can be accommodated here.

However, some of the 28 transformer cabins in the power supply system are quite cramped. «There is hardly any space to accommodate PoP stations for the FO network with the standard 19-inch cabinets,» says Stephan Senn, Head of Technology and Projects at TBS Strom AG. That's why he was looking for more compact distributor solutions that accommodate all the passive functions of a Point of Presence (PoP) and fit into existing spaces and rooms.



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The TBS mascot, a likable robot, informs the citizens of the municipality of Suhr about the progress of the FTTH project.

FTTH plus smart meter

Parallel to Fiber to the Home, TBS is equipping its properties with digital meters. In the future, smart meters will automatically transfer energy consumption data to the municipal utilities via the FO network, doing away with the need to read analog electricity meters. Parallel investment in FTTH and smart metering saves construction costs and creates synergies. By 2027, 80% of the buildings in Suhr are to have smart meters.

This is a major step towards the digitalization of the communal utility company, which incidentally is free of charge for the municipality's citizens. TBS Strom AG is investing in the future at its own expense. The strategy is: By proactively engaging with trends and innovations, TBS can open up new areas of activity and business at an early stage.

Why R&M?

- Compact distribution platforms suitable for confined spaces
- Modular design and possible combinations of systems
- Solution-oriented overall package to suit the requirements
- Maintenance and installation services, logistics, basis of trust

«R&M is the best choice on the PoP side in terms of packing density and processing.»

Stephan Senn, Head of Technology and Projects, TBS Strom AG

Stephan Senn explains the result of the evaluation: «R&M is the best choice on the PoP side in terms of packing density and processing.» R&M products are particularly suitable for confined spaces, for splicing and maintenance work where space is limited.

Modular platforms

Other criteria included ergonomics and future potential. TBS management always thinks far ahead. It may be necessary to expand fiber optic cabling in the future or to retrofit it for new providers and new services.

For this reason, the splitter, splice and patch assemblies should be easily accessible in order to be able to adjust or maintain the PoP stations at any time without great effort. The distributors should be able to expand gradually in line with the pay-as-you-grow

principle. The modular R&M platforms ODF PRIME and R&Mfoxs can be used together and certainly convinced project manager Stephan Senn in this respect.

Fast installation

Ultimately, time played a decisive role. The PoP stations were to be built as quickly as possible as part of the tight overall plan. This is why R&M, as a supplier, also managed assembly. «We were very pleasantly surprised



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at how quickly and easily the PoP stations were set up,» says Stephan Senn.

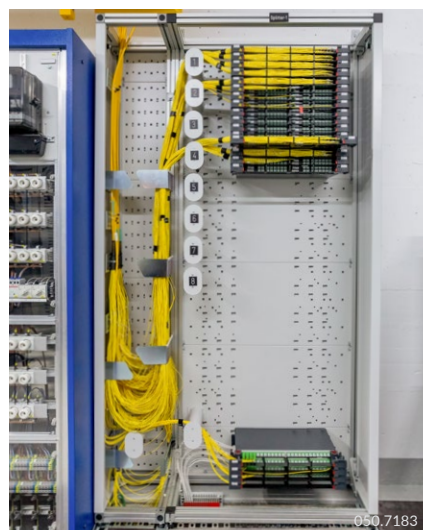
At the end of 2021, TBS was able to connect the first 200 subscribers to the new FTTH network.



Stephan Senn, Head of Technology and Projects, TBS Strom AG; Thomas De Steffani, R&M Switzerland



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The R&M solution

R&M combines the Optical Distribution Frames (ODF) of the PRIME and R&Mfoxs families for the TBS PoP stations in the confined transformer cabins.

R&M equips PRIME racks with splitter and splice/patch modules. Using 1:32 splitters ensures a high density of subscriber lines.

The R&Mfoxs racks act as a splice platform – especially for interconnections to external providers. A rack holds 4,608 splices. Reserve fibers for point-to-point cabling are also placed in the R&Mfoxs racks.

R&M combines the Optical Distribution Frames (ODF) of the PRIME and R&Mfoxs families in the TBS PoP stations.



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Using SPE in Buildings



060.2131

Despite the cancellation of some on-site industrial trade fairs, Single Pair Ethernet (SPE) has been a major topic in recent months. The automation and electrical engineering industries are discussing the two wires that are changing the world. First products are on the market. It is time to take a closer look at possible applications.

The SPE interest groups sent out a clear signal in October 2021. The Single Pair Ethernet Consortium of TIA decided to work closely with the Single Pair Ethernet System Alliance. In other words, SPE is getting further impetus. Expertise and interest in applications are increasing.

SPE has the potential to close the Ethernet gap in industrial, process, and building automation. It enables barrier-free communication from the sensor via the LAN to the cloud using the universal Ethernet/IP protocol. This is why Single Pair Ethernet is a key technology for smart buildings and Industry 4.0. An enabler for the Internet of Things (IoT), the Industrial Internet of Things (IIoT) and IP applications in building automation (ALL-IP).

Smart user experiences

IoT and smartness inspire. For example, a homeowner communicates with the radiator thermostats, video surveillance or lawnmower while on the move via a smartphone app and the cloud. At home, a WLAN antenna establishes the connection between Internet access and the terminal equipment. All of this is already possible today, but mainly on the basis of proprietary stand-alone solutions.

Let's apply such user experiences to larger dimensions. In commercial, industrial and public buildings, there are many applications waiting for continuous digitalization and smartness. LAN and SPE cabling network them. In the future, buildings will control themselves in order to optimally adapt to the needs of users. Networked systems exchange

information and control each other. Ideally, facility managers can parameterize the entire property remotely via the cloud. This makes buildings more economical, safer and more convenient. But where and how could SPE be used in larger properties? Here are a few examples:

– **Elevators:** It is often impossible to integrate some comfort and safety functions. Additional bus wiring would be complex, space-consuming and there is often a lack of bandwidth for data transmission. Lightweight, thin SPE cabling can be accommodated on almost all sides. A single SPE infrastructure networks WLAN routers and sensors in the elevator shaft, cameras, LED lights, control panels, access controls and more.

«SPE is ideal for connecting a multitude of building automation applications to the data network.»

– **Underground car park:** Complete illumination with WLAN, video, motion and smoke sensors, access control and parking space management would be desirable. Plus automated, central control for a building service. SPE can connect everything at low cost. The cabling only requires a connection to service outlets or switches. The thin cables can be laid discreetly in joints and small ducts. Multidrop infrastructure reduces the amount of cabling required.

– **Energy saving:** Lots of users, lots of wishes. Some want warmth and turn the heating up very high. Others want more fresh air. Some forget to close their windows and turn off the lights in the evening. This is how energy is wasted. Smart room and building automation intervenes to regulate. With SPE, all sensors, switches and controllers can be addressed uniformly and transparently via Ethernet/IP. Weather data from the Internet, holiday and event planning, and self-learning systems in the cloud can be

integrated to further optimize the building's control system and energy efficiency.

– **Digital ceiling:** Building automation devices can be added to the existing IP infrastructure or exchanged via plug & play. A service outlet or zone distributor in the ceiling connects them with the LAN and the Internet. SPE expands the concept of the digital ceiling for floors, rooms and halls. Use case: The number of digital devices in a zone is increasing sharply because new functionalities are being added, for example. The number of installed RJ45 connections is insufficient. The number of ports can be increased rapidly with the help of an SPE system. Either a small zone switch with a multitude of SPE connections can be used, or existing four-pair RJ45 connections are converted into four individual SPE connections. SPE will not replace generic cabling, but is ideal for point-to-point connections to IP-based terminal equipment. These include light, temperature, smoke and air sensors, digital signage, controls for windows, blinds, ventilation, heating, doors and much more.

Lightweight, universal, inexpensive

There are several points that make SPE an ideal candidate for industrial and building applications:

- Transmission up to 1000 m at 10 Mbit/s, up to 40 m at 1 Gbit/s
- Universal Ethernet/IP protocol
- Transparent architecture
- Manufacturer-neutral, application-neutral, environment-neutral
- Inexpensive, slimline, lightweight cables, small connectors
- Easy installation, just one pair of wires
- Terminal equipment can be integrated via plug & play
- Higher connection density than RJ45 connectivity
- Multidrop-capable, multiple devices on one line
- Remote power supply over cables
- Field bus systems no longer necessary
- Synergies reduce operating expenses



[www.rdm.com/en/
single-pair-ethernet-spe/](http://www.rdm.com/en/single-pair-ethernet-spe/)



Complete SPE system

As an SPE pioneer, R&M presented the first complete SPE cabling system with connection technology for industry and buildings in 2021. It is based on the two connector types LC-Cu (IEC 63171-1) and MSP (IEC 63171-2). R&M relies on IDC wiring in both systems.

With the 10BASE-T1 L protocol, the system achieves transmission distances of up to 600 meters. Integration into the R&Mfreenet system means that outlets and panels are also available. This makes it possible, for example, to set up an entire transmission channel in accordance with IEC 63171-1 with products from a single source.

R&M has created SPE evaluation kits for development purposes. They contain two patch cords, two connection modules and ten meters of installation cable. R&M supports interested parties in the planning, proof of concept, evaluation and further steps towards the successful use of SPE.



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Transparency with inteliPhy net

050.7187

By deploying the DCIM software inteliPhy net, data centers gain complete insight into their network and cabling. R&M has incorporated a new function that makes it possible to track all IT assets.

With an overwhelming number of IT assets to be monitored, such as switches, servers and storage systems, tracking these internally used resources in data centers is becoming increasingly complex and fault-prone. In addition, the devices age over time and must be serviced or replaced.

The main functions are the documentation of all devices, identification of sites, maintenance planning and calculation of depreciation. This ensures an overview of the assets over their entire life cycle, including the need for new equipment. Software-based asset tracking

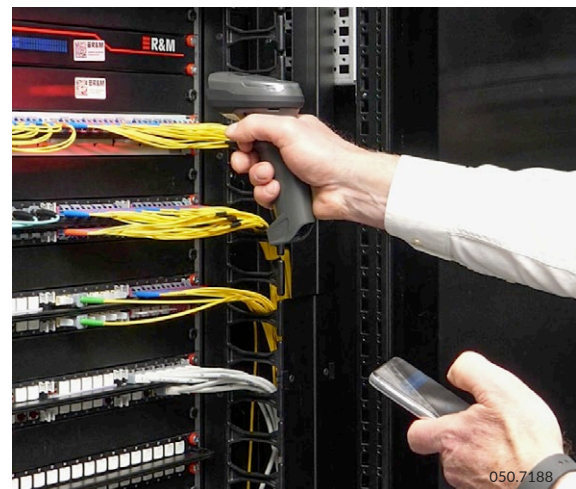
is essential to simplify these processes and achieve the necessary transparency.

Organizations that operate several large and many small (edge) data centers are particularly challenged. For example, the entire inventory maintained on an inteliPhy net server must be checked by means of regular audits. This typically takes place every few months and is very time-consuming, as the inventory has to be compared with reality rack by rack and device by device.

Straightforward audits

The new IT asset tracking function in the inteliPhy net software from R&M can do just that. How it works: Each asset is given a globally unique identification in the form of a QR code and is registered on the inteliPhy net server.

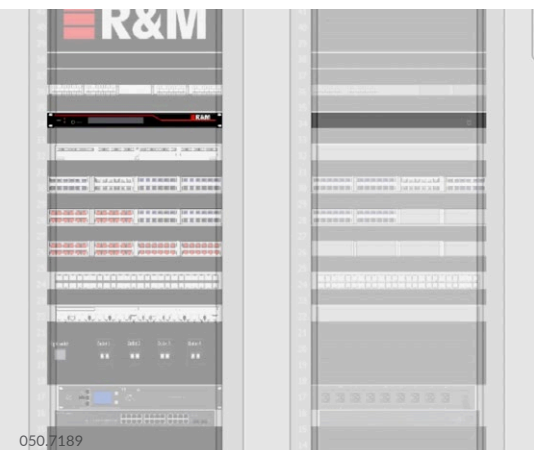
During the audits, the code is simply scanned using a smartphone or hand-held scanner. An image of the rack appears on the smartphone with unknown or misplaced assets marked in color. Additional information such as notes and pictures can be captured directly on site using a smartphone. The effort involved in audits can thus be drastically reduced, while increasing precision at the same time.



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inteliPhy net logs all audits, which are then available for more extensive revisions at a later date. The separate IT asset tracking software module can be easily added to any inteliPhy net server.

www.rdm.com/inteliphy-net



050.7189



050.5558

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Success



The Future for Midtjylland

Denmark's Midtjylland region is celebrating another success of its digitalization strategy. Two fully redundant data centers of the regional administration recently went into operation. R&M developed a cross-connect solution with potential for the IT infrastructure to grow.

The mirror data centers of the Midtjylland regional administration were built on the site of the new, large, centrally located hospital in Gødstrup. They have made four old data centers redundant. Consolidation saves operating expenses and reduces power consumption by a third.

Based on this new infrastructure, IT operations are migrating to a hybrid cloud. This guarantees the secure, stable and economic performance of the data services. Each of the 600 m² data centers operate at the Tier III level. The healthcare system in the region, which has 1.3 million inhabitants, is particularly dependent on IT operation being highly available.

Why R&M?

- Quality and reputation
- Customizing
- Packing density
- Fast installation
- On-site support
- Training
- Logistics
- Short delivery times
- Flexibility

Easy access to MPO

The cross-connect solution with R&Mfoxs combimodules and OM5 cabling ensures a reliable infrastructure that is, importantly, adaptable in the long term. It was important to those responsible to be able to access the MPO adapters and MPO cables easily. This makes it easy to expand the network in the future and adapt it to the growing IT infrastructure. R&M fulfilled this requirement with combimodules that were specially equipped with MPO technology.

R&M's Netscale 72 distributors in the racks are also easing the path to the future. The customer only has to change trays in order to be able to change the parallel optical cabling and migrate to the next network generation. The Netscale range offers the industry's highest density for fiber optic ports in 19" cabinets.

Each of the two data centers is starting with 40 racks. Their surface areas are sufficient for an expansion of up to 70 racks. This is why the cabling solution offered should include corresponding expansion possibilities. The R&M concept fulfilled this requirement.



The R&M solution

For the data centers of the Midtjylland regional administration, R&M designed a continuously redundant cabling concept to meet the customer's requirements. The cross connects consist of 10 ODFs with 22 R&Mfoxs combimodules – equipped with MPO connectivity in a new way. Twenty-four-fiber OM5 cabling with MPO connectivity links the racks with the cross connects. The series racks contain 40 Netscale 72 patch panels with MPO/LC Duplex connectivity.

The adjustment and expansion options and the high packing density were the decisive factors in the choice of R&M products. This gives the operator headroom for the expected growth of IT and the further digitalization of the regional administration.

R&M will assist the regional administration on its way to digitalization long term. On-site support, training, logistics and short delivery times are part of the sustainable service.



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A Solution for **Perfect FTTH** in Family Homes

Swisscom is taking a new approach to the optical connection of family homes. The responsible employees of Swisscom and its partners recommend an efficient solution to homeowners. The building entry point (BEP) will be replaced by a new and innovative transition point. OTO@BEP is a splice box with an integrated OTO (Optical Telecommunications Outlet). The Optical Telecommunications Outlet, which serves as an interface to home wiring, is integrated directly in the OTO@BEP. From here, the existing building infrastructure determines the path the fiber optic cabling takes to the Internet router. And in many cases, this is where the challenge begins.

Lots of ways...

Almost every family home has a different building structure. The cabling concepts are also diverse. That doesn't make FTTH connection easy. Network operators often have to deal with properties that were only built recently and now have to be retrofitted for FTTH. These buildings are usually the smaller challenges. Things become more challenging in family homes that are 50 years old or older. These properties may still have large pipe systems, but there is no central cabinet for telecommunications with space for OTOs, distributors and routers.

On the one hand, this diversity exists among potential FTTH customers. On the other hand, network operators such as Swisscom follow the principle of standardization. Large numbers of buildings can only be supplied efficiently with standardized installation concepts.

Then there is the principle of quality. The transmission performance offered by the fiber optic network should not end at the OTO@BEP; the service should be delivered all the way to the OTO. This requires high-quality cabling and a secure connection in a family home. It should reach at least as far as the Internet router, which is located somewhere in the building.

Fiber to the Home (FTTH) is only perfect when fiber optics arrive at the right place in a home. The journey there is almost always a challenge. Together with Swisscom, R&M has developed a solution that is cost-effective, fast and sustainable.



Fully assembled FO Field connector



Installation with OTO outlet



Assembly at OTO@BEP

...clear recommendation

For this reason, Swisscom has drawn up specific recommendations for the attention of homeowners and installers. The OTO@BEP should always be placed in the basement if possible. R&M and René Imholz, Technical Manager Inhouse at Swisscom, developed the OTO@BEP concept for this back in 2017. At that point, it was intended for business applications. With R&M products such as the Polaris boxes, OTO and BEP can be combined in one housing. Since 2021, the OTO@BEP concept has been a Swisscom guideline for family homes.

Swisscom was then faced with the challenge of describing an efficient path from the OTO@BEP to the Internet router in a family home. It had to be a safe path to ensure that the signal reaches the living room or home office in high quality. And it had to be a solution that can be implemented efficiently in every home by any trained installer.

In principle, it is a fiber optic patch cord between the OTO@BEP and the Internet router. It often has to be fed in over all floors and around many corners. The market offers many pre-terminated solutions, but none of them have earned the «fast and ecological» seal. If the route through the house is longer or shorter than the cable, this becomes a challenge, resulting in additional costs, additional work or cut, redundant cable waste – not a sustainable solution.

FO Field is becoming groundbreaking

Swisscom defined an efficient approach together with R&M: A thin and flexible single-fiber in-house cable is laid from the OTO@BEP in the basement to a second, remote and permanently mounted extension OTO at the router location in the building. This cable can be cut to length on site and installed in accordance with the Swisscom FTTH manual. An FO Field connector is terminated and

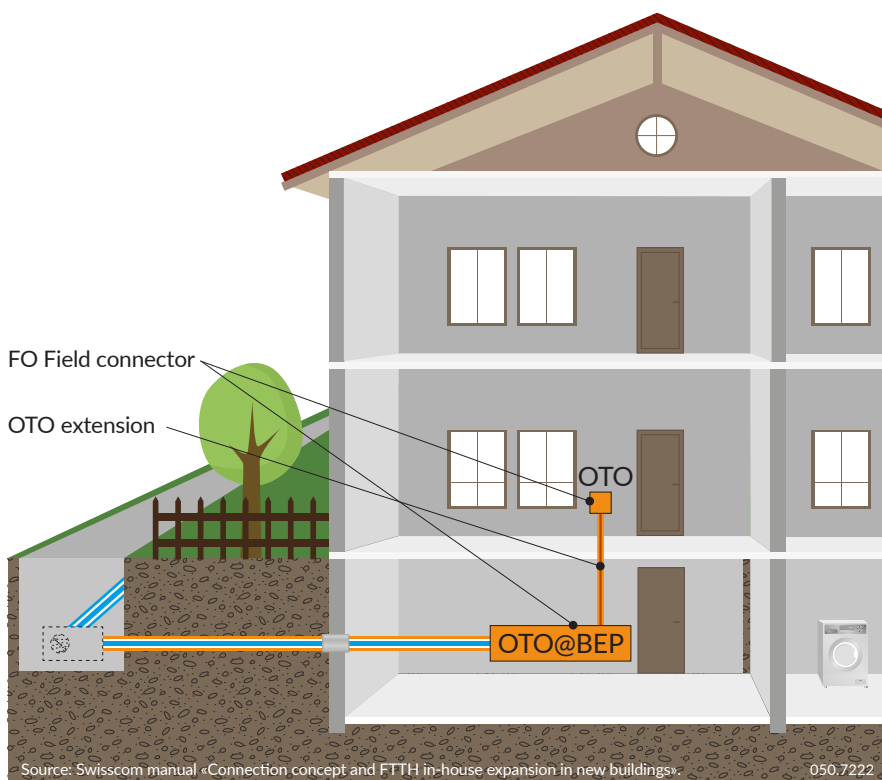
Freedom with the FO Field

The FO Field from R&M gives users independence. With the connector, they can terminate any length of patch cord at any location. And they can mount the connector to any installation cable, thus eliminating the need for splicing. With a bit of routine, the installation of the connector takes less than 60 seconds.

The FO Field fulfills the transmission requirements of the singlemode performance levels Grade Cf/1 (APC) and Grade Cf/2 (PC) and the multimode performance level Grade Bmf/3. It is compatible with all cable types with diameters from 1.4 to 3 mm.

plugged into the OTO at both ends. A simple, reliable and aesthetically pleasing solution.

The field-terminable FO Field connector from R&M, which Swisscom recommends for installation, is particularly suitable for this extension model. All installers have to do is pull the flexible R&M cable from the drum and feed it into pipes, and then they can install the connectors in a matter of minutes. The fiber optic supply to the router is completed.



www.rdm.com/fo-field/



050.7192

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Gigabit for the Land of Lakes

Water and forests as far as the eye can see. The Mecklenburg Lake District is a vacation paradise par excellence. Now it is also becoming a broadband paradise. With support from R&M, FO networks are growing pretty quickly.

050.7175

The picturesque Mecklenburg-Western Pomerania region with its more than 1,000 fish-rich waters, nature parks and reserves offers maximum relaxation. It is located just 100 kilometers north of Berlin and is one of Europe's insider tips for explorers and nature lovers.

The inhabitants of rural areas had to wait a long time for Fiber to the Home and fast Internet. Large telecommunications companies, local utilities, cities and districts are now working flat out to build fiber optic networks for underserved areas. By 2026, more than 50,000 kilometers of fiber optic cable are to be laid in the federal state of Mecklenburg-Western Pomerania. Including subsidies, 1.45 billion euros will be invested in the construction of gigabit networks.

Construction will take place almost simultaneously in 115 project areas until 2026. Landwerke M-V Breitband GmbH, based in Neustrelitz, has received state-subsidized construction contracts for 19 project areas. One of its current major projects comprises 351 kilometers of civil engineering work for the connection of 4,117 households and 684 commercial enterprises.

Support from the outset

The company got partner R&M on board at an early stage in order to score points in the bidding process with tailor-made infrastructure solutions. Specific outdoor PoP stations were to be offered for the project. The FTTx team of experts from R&M Germany worked intensively on creating concepts and samples.

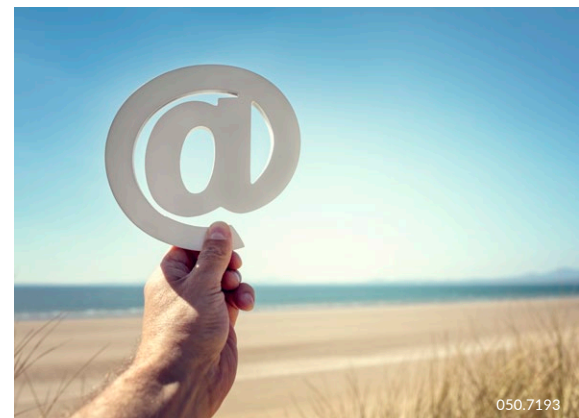
Throughout the entire project, R&M supported the customer with technical advice on site. The client was won over by the technically well-prepared offer with informative system descriptions. From spring 2021, R&M supplied the Optical Distribution Frames for 28

Why R&M?

- Technical advice
- Support in the planning phase
- Pre-assembled cabins
- Solution for power supply
- Logistics to the construction site
- Time-critical delivery

«With blanket fiber optic infrastructures, the region is optimally positioned for the data-intensive future.»

**Frank Schmetzke and Caspar Baumgart,
Managing Directors Landwerke M-V Breitband GmbH**



050.7193

PoP stations as well as 189 multifunctional enclosures including power supply columns for mini PoP stations.



No time to lose

Everyone involved was aware of the urgent nature of the contract. Landwerke M-V Breitband GmbH and its contractors managed to provide all the necessary components very quickly so that the distribution sites could be set up within a short period of time.

R&M's system and logistics model played a significant role in this. R&M Germany offers complete systems for FTTH projects such as this instead of single parts from a catalog. The R&M plant in Wehnrath has everything in stock. The R&M team assembles, checks and sends the distributors in accordance with the customer's specifications and plans. They are standardized on a project-specific basis so that all distributors are identical. This simplifies the work of service technology.

Ready-to-install delivery

R&M delivered the finished multifunctional enclosures and power supply columns directly to the individual construction sites in Mecklenburg-West Pomerania by freight

forwarding agent. All the construction teams had to do was unload them, place them on the pedestal, and feed in the cables.

Once again, it was confirmed that with the R&M model, FTTH projects can be driven forward very efficiently.

Mini PoP with power supply columns – the R&M solution for Landwerke M-V Breitband GmbH

For the current FTTH project of Landwerke M-V Breitband GmbH, R&M configured specific multifunctional enclosures for the mini PoP stations (Outdoor PoP) in consultation with the customer.

The cabinets each contain two combimodules from the R&M range for main distributors. These are fastened to the right on mounting plates. The modules contain the splice trays and patch assemblies for managing 576 fibers each. Nineteen-inch racks with 21 height units are placed on the left of the enclosure. If required, the network operator can install an additional combimodule here for 288 fibers. The backbone is terminated on an R&M UniRack. The cable entry is configured for loose tube cables, mini cables and tubes.

R&M had to find its own solution for the air conditioning of the cabins, as the active technology used by the customer generates a lot of waste heat. The heat exchanger was installed in the roof for this purpose. Ventilation gills recessed all round provide the necessary airflow.

R&M designed external columns to supply the energy. They are flush with the multifunctional enclosures and contain everything needed for the power connection.

The advantage: Utilities can record the energy consumption of the mini PoP station independently of the FTTH network operator. Their meter is located in the column, which is easily accessible. The cabin of the mini PoP does not need to be opened to record the energy consumption.



Landwerke MV
Breitband GmbH

The customer

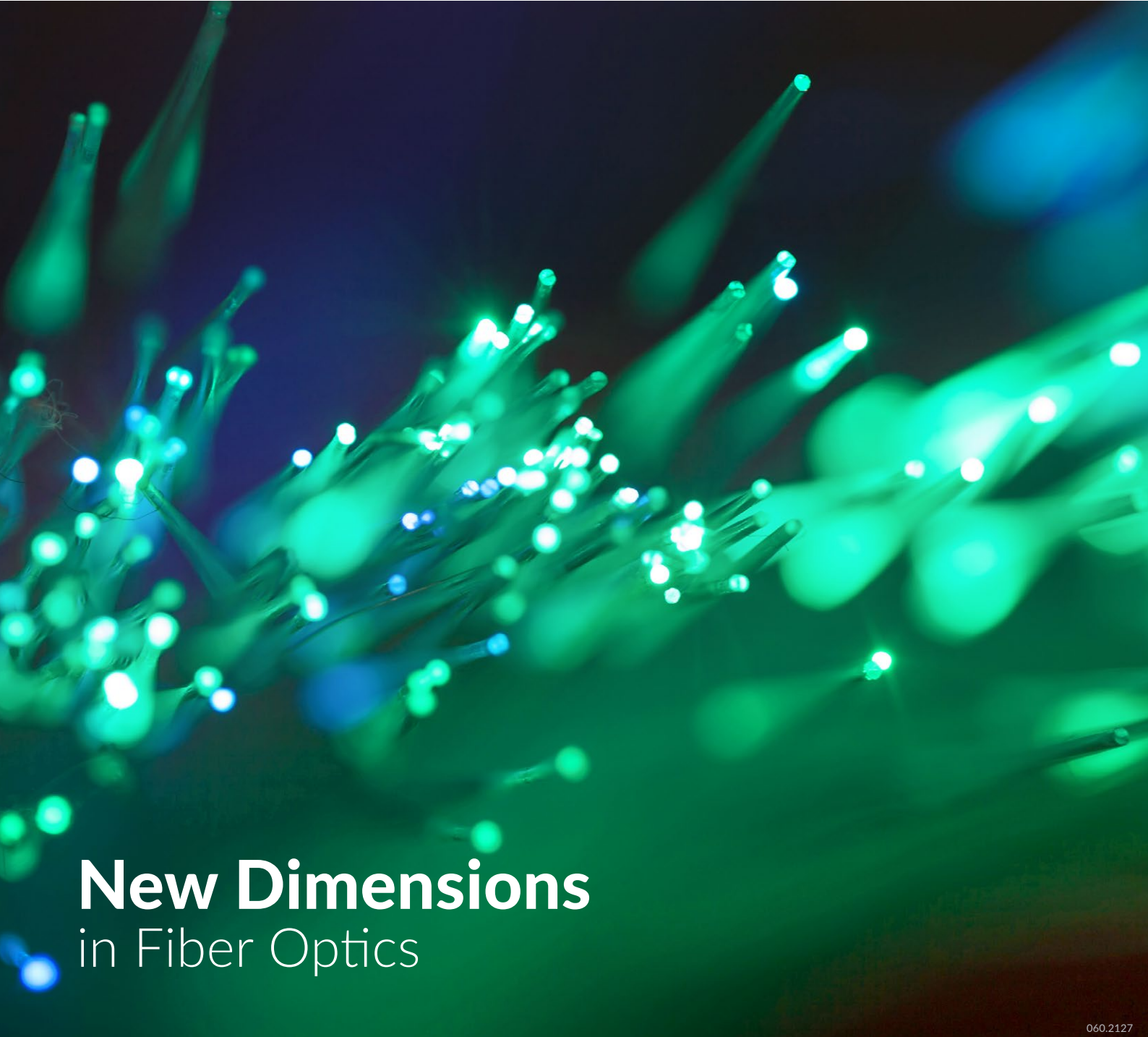
Landwerke M-V Breitband GmbH is an association of five municipal utilities in Mecklenburg-Western Pomerania and was founded in October 2016. It has set itself the task of using regional power to advance the supply of high-speed FO Internet to the Northeast. True to the motto «From the region. For the region.»



Source: breitlandnet.de/Landwerke M-V Breitband GmbH



050.7196
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New Dimensions in Fiber Optics

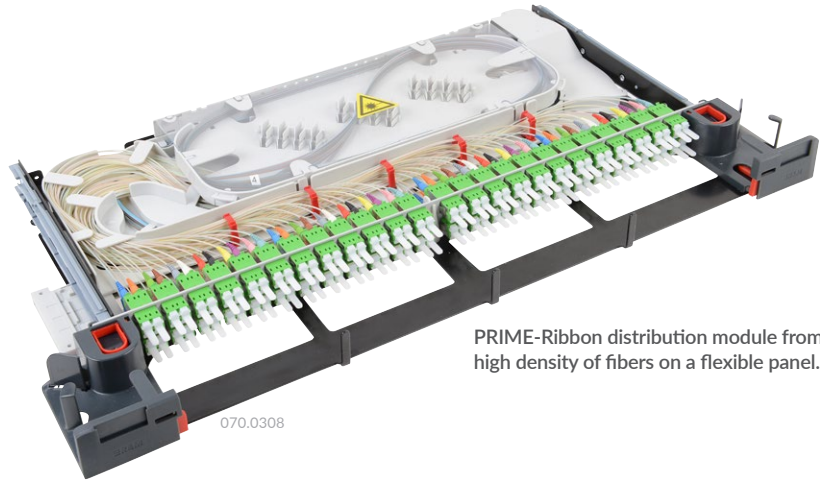
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The magic formula for more, faster and more cost-effective data transmission with optical fibers is: transporting more light in more channels in the smallest possible cross section. To achieve this, the boundaries of fiber optics have to be pushed further and further.

Fiber optics is advancing into new dimensions. After years of research, it is foreseeable that new types of fibers will be introduced to the market that carry multiple beams of light spatially separated within their body. These are multicore fibers (MCF). They will enable the highest possible density of fiber optic data transmission and connectivity.

The distance between the four or more cores or transmission channels is only a few micrometers. Each channel can transfer as much information as a conventional singlemode fiber. The appropriate and equally innovative transmission method is called Space or Spatial Division Multiplexing (SDM) – the spatial division of the light signal.

The old methods are based on the fact that only one core is available for light guidance. Here, the transmission capacity can be increased primarily with the help of modulation techniques (time, wavelength, polarization division multiplexing). However, these procedures are gradually reaching their limits.



PRIME-Ribbon distribution module from R&M: high density of fibers on a flexible panel.

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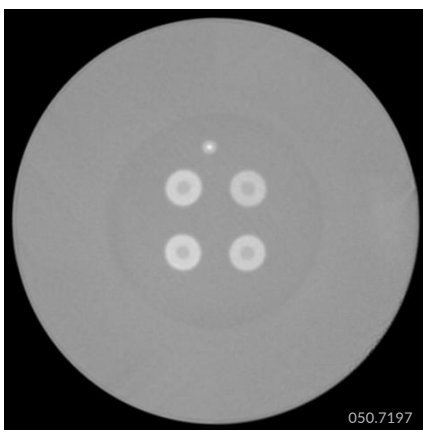
Until now, price and complexity have prevented the widespread market launch of MCF cables. As yet there are no connectors, apart from prototypes. Standardization procedures are underway.

Precision required

MCF connectivity does not require a new connector format. It's all about aligning the fiber in the connector more precisely. Off-center marking would be the orientation aid for identifying the channels and aligning the fibers correctly (see graphic).

In other words, this is not a new type of connectivity, but a new type of assembly process.

Another challenge: At many points, multicore fibers have to be coupled with individual core fibers to divide the light-carrying channels and vice versa. The pairing will take place in an element called the fan-out or fan-in/fan-out (FIFO). FIFOs can be based on various technologies: waveguides on PLC chips, the fusion of fibers, lens optics among others.



050.7197

Diagram of an MCF with four cores. The small off-center marking serves as an orientation aid to identify the channels.

Source: businesswire.com

Solution for tomorrow

MCF technology was originally intended for intercontinental submarine cables. It has become more attractive, not only in the field of photonics integration. As development progresses, it is also becoming interesting for more immediate applications. Specifically, campus networks and data center interconnects.

The halls of large data center locations can be several kilometers apart. The connections between them must become even more efficient in the future. Thin, lightweight MCF cables could be a solution. They have a more favorable ratio of data volume to space requirements than any other cabling solution. Data centers will get more transmission performance for their investments in racks, cable ducts, etc.

With the same diameter, MCF cables will provide significantly more channels than the highest density cable solutions available today. These are the high count fiber cables with ribbon fibers.

High density today

Today, high count fiber cables with 3,456 ribbon fibers are the ultimate in compression in fiber optic data transmission. They contain 30-40 % more optical fibers with the same overall diameter as single fiber cables.

As above, the following also applies here: Data centers get more transmission performance for their investments in infrastructures in comparison to conventional cabling.

Calculations of the total time for laying show that splicing the individual ribbon fiber cables is more time-consuming than splicing single fibers. But overall, the time saved is tenfold.

This is an important plus in view of the current time pressure and the lack of qualified technicians.

A splice device for ribbon fiber cables is four to five times more expensive than a high-quality single fiber splice machine. On the other hand, the costs for the materials fall because ribbon fiber cables require less splice protection and fewer points of attachment than single fiber cables.

There is a lot of support on the distribution platform side. Suppliers such as R&M have launched pre-terminated panels with ribbon fiber cable fan-outs. This significantly reduces the setup time. R&M's modular PRIME range offers distribution modules for ribbon fiber cables, which can also be used flexibly in existing PRIME infrastructures. This makes it easy to decide to opt for high count fiber cables in the coming years and to calmly watch what the future of MCF brings.



050.6231

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Success

An Inspiring Faculty

The cultural heart of the University of Warwick now beats in the inspiring new Faculty of Art. It connects Media, Art, History and Humanities around a sculptural staircase. Cabling from R&M links research, teaching, digital learning, a creative community and smart building technology.

The new building of the Faculty of Art (FOA) on the campus just outside Coventry satisfies six principles: encounter and cooperation, inspiration and creativity, innovation and sustainability. Since September 2021, lecturers and students from all over the world have been able to experience the building's amazing spirit on eight floors and 15,000 square meters.

The universe of ideas

The vision for the new building was to create a platform for engagement and interaction at the center of the campus. The designers from Feilden Clegg Bradley Studios designed four light-filled pavilions grouped around a multi-purpose arena.

The wood-clad staircase winds its way up above it as a work of art. It connects performance, exhibition, event and rehearsal rooms, movie theaters, studios for TV and film production.

Why R&M?

- Availability of products and ability to deliver within a tight project time frame
- Support before, during and after the project
- 25-year system warranty

The staircase brings together all departments and disciplines as well as students and research groups to form a universe of ideas.

The School of Creative Arts, Performance and Visual Cultures is the main focus of the faculty. It has long since entered the digital age. A Digital Arts Lab sets new standards in creative and cooperative digital communication.

The University of Warwick also wanted to create a shining example of sustainability with its new cultural heart. Smart building management systems help to automatically minimize power consumption and CO₂ emissions as well as increase comfort.

Network with headroom

Research, teaching, creativity, art, culture, media, digitalization, wireless fidelity on eight floors and smart building technology – so many functions under one roof require a stable and powerful data network.

The university's project team and the planning offices opted for a LAN solution from R&M with Cat. 6_A connectivity. It enables network operation with 10 Gigabit/s Ethernet. That means plenty of headroom for the inspiration and creativity of both today and tomorrow.

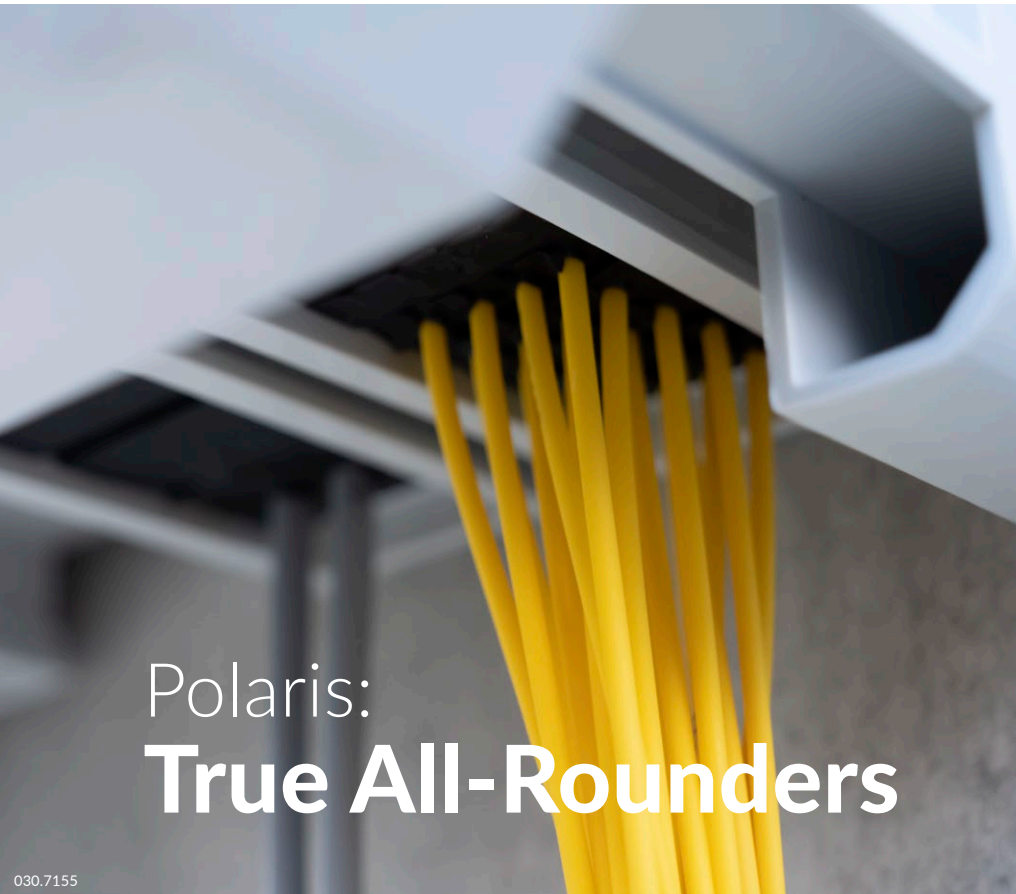


The R&M solution

- Structured copper cabling
- 95 km Cat. 6_A 650 MHz screened Cca grade cable
- 1,700 Cat. 6_A modules for 10 GbE
- 79 Cat. 6_A 24 port screened patch panels
- Applications:
 - LAN, WiFi for departmental building
 - Research, teaching, digital learning
 - Art and media education
 - Smart building systems



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Polaris: True All-Rounders

030.7155

With the Polaris box family, the last few meters of fiber to a family home or building complex can be bridged quickly. The terminal boxes are designed in such a way that they simultaneously offer sufficient options for future demand.

Fast network connections are now one of the most important basic needs, which means that the demand for fiber optic installations is constantly growing. This is why fiber optic supply has to be constantly adapted to

market needs. This also applies to Fiber to the Home (FTTH) components such as the Polaris FO building connection boxes. They connect the growing number of fiber optic cables in the smallest of spaces.



030.7768



030.7769

Multifunctional and flexible

In order to cater for the numerous applications and specific customer requirements, R&M has constructed its Polaris box family according to a modular principle. The boxes can be used multifunctionally under different ambient conditions for flexible fiber optic termination inside and outside.

They accommodate everything needed for FTTH supply: drop cords, subscriber cables and patch cords, fiber or loose tube storage, modules for trays, splice, splitter and patch connections. The family comprises five models. The smallest variant accommodates up to four adapters for FTTH subscribers, the largest up to 36 adapters or 288 splice connections.

R&M offers the boxes both as a set with the desired accessory parts and fully pre-assembled with the required cable entries, FMTS trays, connectors, fiber pigtailed and splitters.

Small is big

Where things get tight, the Polaris box 4 – the smallest in the family – can even fit into tiny niches. The four-fiber model is the right choice if four fibers per unit and no or only a small number of connections are required in the building entry points (BEP) for each SCM splice tray.

The trick: To increase splice tray capacity accordingly, R&M has designed new fiber inserts. The small box is fitted with a new fiber tray with a splitter fastening point and has space for the first twelve splice connections. In addition, four additional FMTS splice trays can be retrofitted.

[www.rdm.com/
polaris-box-family/](http://www.rdm.com/polaris-box-family/)



050.6970

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Faster Calculations with Hortense

050.7201

They affectionately call her Hortense. This is the name of the new supercomputer of Ghent University. The lady calculates 3.3 petaflops per second and is one of the 500 fastest of her kind. Speed was also required when supplying the cabling.

A supercomputer serves many purposes. Hortense – which is part of the Vlaams Supercomputer Center (VSC) – supports Belgian science in cancer and genetic research. She helps to decipher viruses as

well as model climate, galaxies and plasma states. She provides industry with artificial intelligence for technology development and much more besides.

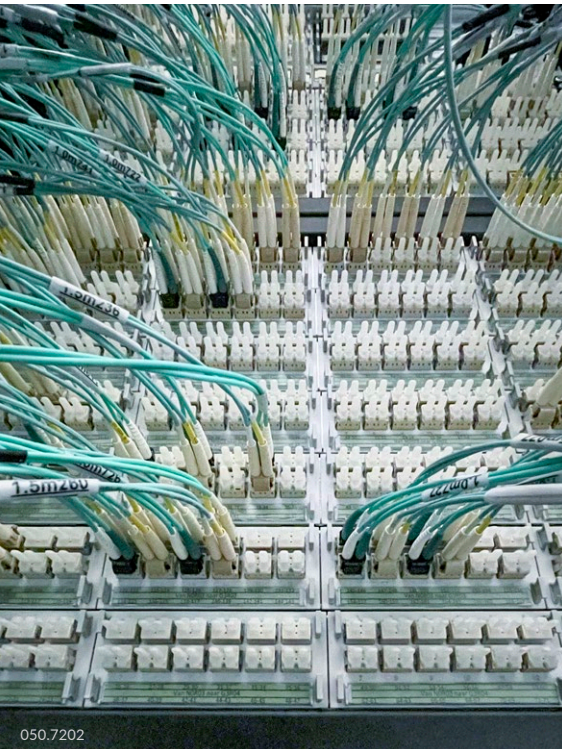
One of the strengths of a supercomputer is that it can execute millions of processes in parallel. Networks with high bandwidth and low latency connect the many nodes and cores. Of course, a supercomputer like this must never fail. These criteria – processing power, transmission rate, signal quality, operational reliability – require powerful processors and pretty good network cabling.

«For some calculations that a supercomputer can manage in a couple of hours, a regular computer may need over 100 years.»

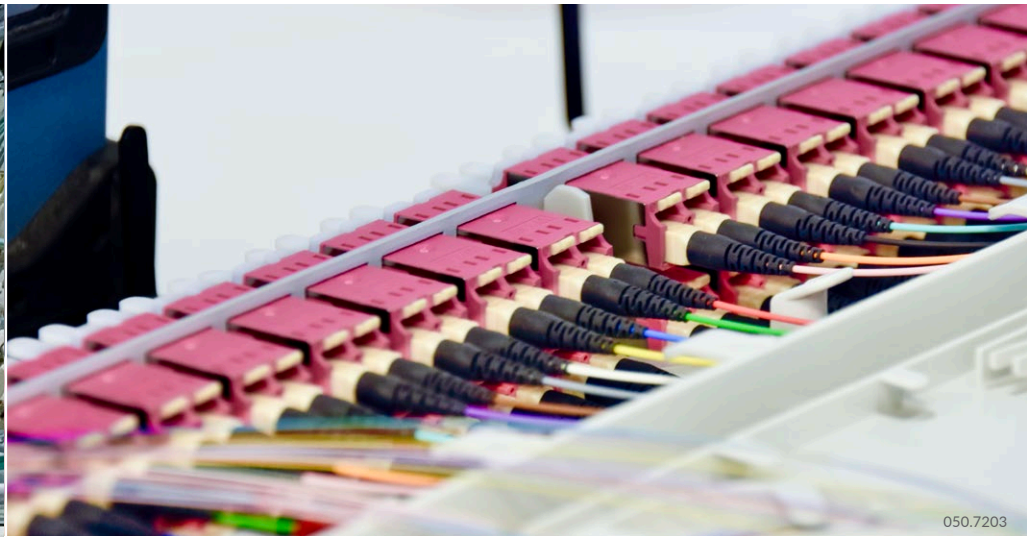
Johan Van Camp, Head of ICT Infrastructure, Ghent University

Why R&M?

- Short response time, ability to deliver
- Flexible integration into ongoing projects
- Product quality and shielding
- Best return-on-investment for partners



050.7202



050.7203

«The best return on investment was achieved for everyone involved in the project.»

Tom Van Looy, Managing Partner, NetConnect BV

Fast delivery

With corresponding requirements, the VSC approached network provider NTT and system integrator NetConnect. The Center needed a cabling solution at short notice for a project in the field of supercomputing. Up to 2,000 copper links and 5,000 fiber optic links were to be installed with high density.

This was a time-critical assignment and NetConnect chose the offer of its partner R&M. The required products were immediately available.

In addition, there were organizational and logistical challenges due to existing moves, adds and changes in the data center. R&M and NetConnect reacted very flexibly and adapted to the work in progress. As a result, NetConnect was able to meet all deadlines.

From the point of view of the partners, this cooperation paid off. In comparison to the market, NetConnect and R&M were the most flexible and had the shortest lead time. Tom Van Looy, Managing Partner at NetConnect,

confirms: «The best return on investment was achieved for everyone involved in the project.»

R&M solution for VSC

- Cat. 6_A high density (HD) panel, shielded, for up to 2,000 links
- Fiber optic HD panel, OM4 and OS/2 cabling for up to 5,000 links
- Splicing work on site for cable management

The customer

Vlaams Supercomputer Centrum (VSC) is a consortium of the five universities in the Flemish region of Belgium and associated partners. In VSC, they combine four powerful supercomputers and their expertise in scientific and technical computing. At the top of the list is the Tier 1 supercomputer Hortense from Ghent University, launched in 2021, with six computer clusters. Hortense combines 44,000 processors, 100 terabytes of memory and calculates at a speed of 3.3 petaflops per second. The name refers to the French astronomer and mathematician Nicole-Reine «Hortense» Lepaute (1723-1788), who used her computer-like capabilities to calculate the return of Halley's comet and other astronomical phenomena.



050.7204

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050.6737

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ZOONA: Compact Splice Closure for FTTH Access Networks

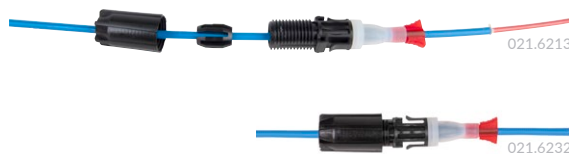
The construction of FTTH access networks can be significantly accelerated. With the help of ZOONA. The new generation of splice closures for classic as well as hybrid network expansion enables quick installation at any location. R&M is starting out with the ZOONA48.

Compact, robust, waterproof, lightweight and can be installed anywhere. These are the basic features of the new ZOONA splice closure family for FO access networks. In addition to an innovative sealing technology, there are other advantages.

Installation does not require any special tools or training. A wall holder is integrated into the splice closure body; mast holders and cable guide accessories are available. Measuring 274 mm x 229 mm x 94 mm, the splice closure fits virtually everywhere: in masts, street lamps, posts, facades, street cabinets and cable ducts.



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021.6232

R&M QIKseal seal for cable entries and loop configurations

Good for the budget

The modular construction of the compact splice closure family simplifies planning, budgeting and rollout. Network providers only procure and install what they currently require for the premises, the respective application and existing network topology. They can then extend the splice closure step by step – to suit demand and subscriber growth.

Depending on the configuration, the ZOONA48 can accommodate one loop cable and up to twelve individual cables. With the universal R&M Single Channel Fiber Management System, four splice trays for a total of 48 fibers can be individually processed in the inlay of the splice closure.

The fitters assemble the individual cables completely outside the splice closure. Any cables already installed do not need to be touched or removed for the installation; network operation continues undisturbed. After splicing, the hood is pushed over the splice closure inlay. Two strong clips lock the splice closure and, together with the innovative recirculating seal, seal the splice closure body against environmental effects. Among other things, it can withstand pressure of 0.3 bar and a depth of three meters under water.

New: QIKseal seal

The R&M QIKseal seal for cable entries and loop configurations. It offers an innovative combination of solutions to cover the three challenges «sealing to cable jacket», «sealing

the entry to the housing base» and «securing or strain relief of the cable» with a single system element. R&M QIKseal seal elements are available for various cable diameters and types: for loop cables with diameters of 6 – 16 mm and for individual cables with diameters of 2 – 8.5 mm.

The strain reliefs can accommodate cable types with and without reinforcement elements. During installation, the QIKseal cable entries snap into place with a click when they are positioned correctly. The QIKseal loop combines this with an additional mechanical gel seal.

The ZOONA splice closure family is configured to roll out the last mile in the FTTH access network quickly and efficiently. It is particularly suitable for suburban and rural areas. R&M will be presenting further options, features and possible applications shortly.



050.7012

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050.7205



Network Outlets for Rough Conditions

Data networks everywhere. Local area networks and the Internet also have to function reliably in wet and dusty conditions. Radio is not always the best solution. This is where R&M's IP-protected outlets and boxes come into their own.

For industry, buildings and outdoors

Network connections in industrial production plants are among the first areas of application for IP outlets and boxes. WLAN outdoor aerials and surveillance cameras are easy to connect to LANs and the Internet with the new outlets.

The outlets also provide access to the local data network in gastronomy, food production and agricultural businesses. Further fields of application of IP products are building automation, air conditioning and solar technology, workshops, sports facilities, stages, stores,

self-service terminals, freight forwarders and logistics, the military, research and laboratories.

Establishing IP protection

In practice, IP protection for plug connections is implemented either with correspondingly protected power cables on mounting frames on the exterior of IP outlets and boxes, or inside with cable grommets. The benefit of external concepts is that they take up significantly less space and are more flexible when it comes to the installation location. IP boxes with cable grommets and internal connectors are easier to expand and do not require any additional measures for the plugged connection itself.

Cost-effective and weather-proof

The tried-and-tested IP54 splash outlets with two RJ45 ports have been completely revised and are now even easier and safer to install than those of the previous generation. The Splash range is compelling as all standard patch cords can be protected retroactively and cost-effectively as well as against the weather.

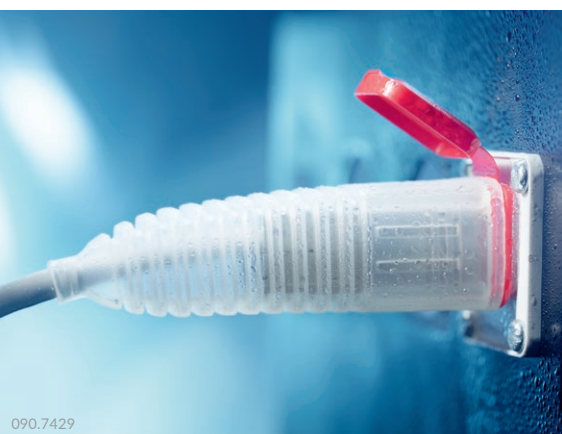


The new IP67 connection boxes are recommended for higher requirements. With an IP67 power cable, the plug-in connections are not only dust- and waterproof, but also optimally equipped to cope with higher mechanical loads such as wind or ice load.

IP products with internal connections

Connection boxes from the Polaris product line offer the optimum size for every application.

All IP products from R&M can cope with the toughest conditions. They can withstand moisture, dust and temperatures ranging from -25° to +80° Celsius. They are resistant to gasoline, oil, alkaline solutions and salt water, and are permanently UV-resistant.



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With the R&M PoE Calculator V3, building operators have the documented assurance that the installation planning corresponds to their tender.

Cable Installation for PoE – Correct Planning in Smart Buildings

With Power over Ethernet (PoE), terminal equipment can be supplied with power directly via the Ethernet cable – now even powerful terminal equipment with up to 90 W. However, the table-based design of the cable installation in line with the standard is a complex task for the sanitary engineer.

It is much easier with an R&M solution, which also provides the building operator with documentation showing the planning corresponds to the tender. The fact that it is possible to transfer power via data cables does away with the need for the time-consuming laying of power cables and sockets. This makes it possible to install PoE devices even in hard-to-reach places or in areas where a large number of cables would interfere. More and more building operators and planners are therefore addressing the issue. However, the standards seem complicated and the feedback from the market is not

always positive. The reason is that, initially, the power transmission of PoE was 13 W. Since 2018, however, 4PPoE has been able to transfer up to 90 W. Where there is more current flowing, the resistance generates more heat. To ensure the reliability of cabling even at higher currents, the installation standards (EN 50174-2 for Europe and ISO/IEC 14763-2 worldwide) were adjusted in 2020 and the remote power supply categories (RP1 – RP3) were introduced. These differ considerably on the one hand in terms of design costs and, on the other hand, in terms of operational reliability. For RP1, up

to an average of 212 mA are permitted and no special planning measures are required. But during operation, it must be ensured that the average current does not exceed the permitted limit.

Major challenges with conventional planning methods

In the case of type 4 4PPoE devices, however, the average supply current in a cable can be up to 500 mA. If a 4PPoE device is now connected, no other PoE devices can be connected to other cables in this installation bundle. The standard therefore stipulates

that appropriate warning signs must be attached to RP1 and RP2 installations. Before another PoE device is connected, compliance with the maximum permissible current must always be checked. This is easy when it comes to planning an installation, but it is very time-consuming for the building operator. With RP3, the cabling is already configured during the planning phase so that all cables can transfer the maximum PoE current at the same time. This makes the system very safe in terms of operation. But the challenge for the planner now is to make sure that the attenuation budget for data transmission can always be adhered to with RP3 cabling and that the permissible temperature in the cable is not exceeded. This is achieved by adjusting the link lengths to suit the ambient conditions of the installation. The installation standards offer tables for this purpose that show the temperature increase. However, in order to keep the number of tables manageable, considerable simplifications were introduced. The consequence of this is that it has become very difficult to find the right parameters.

What's more, the conditions along a cable are not always the same. The temperature increases in the different sections must be determined individually and then averaged using a complex weighting procedure. This average temperature can then be used to read off the maximum permissible cabling length from another table. As a result, planning on the basis of the tables is very complex and prone to errors.

PoE Calculator V3: documented safety

This is why R&M has now expanded its PoE Calculator, developed in 2015, to include functionalities for the new RP categories. The PoE Calculator V3 offers benefits to building operators and planners alike: The latter can enter significantly more different parameters than are shown in the tables – in other words, it is much closer to reality. For example, you can enter the cable type that is actually used instead of having to assign the cable to a general category in the table. Furthermore, cable types, bundle thicknesses, environmental temperature and other parameters can be entered for up to three segments of a fixed cabling link. The PoE Calculator immediately delivers the expected temperatures within the cable bundle of a segment and the resulting

PoE in building installations

PoE applications are described by the IEEE 802.3 committee. With IEEE 802.3bt, PoE is now experiencing a leap in development: Instead of 13 or 22 watts, end devices will be able to be supplied with up to 90 watts of power. Type 3 and Type 4 PoE uses all 4 wire pairs (4PPoE) for power transmission. High-performance terminal equipment, such as wireless access points, multimedia devices and intelligent end equipment, IP telephones as well as sensors and actuators for the IIoT, can then be operated via the office and building cabling without an additional power connection.

maximum link length as an essential criterion.

This allows the planner, for example, to choose a cable from a different category, make the cable bundle narrower, optimize the cable duct or ventilation, and change other underlying conditions. The PoE Calculator immediately displays the result. Documentation detailing the framework conditions is also generated. Building operators thus obtain the documented assurance that the installation planning corresponds to their tender.

The R&M PoE Calculator is the only tool on the market to implement documentation in accordance with the remote power categories. R&M uses this document to list the RP categories in the warranty certificate and present them to the end customer as part of the R&Mfreenet system and is the first manufacturer ever to do so.

www.rdm.com/power-over-ethernet/



- PoE: Power over Ethernet (Type 1)
- PoEP: Power over Ethernet Plus (Type 2)
- 4PPoE: Four Pair Power over Ethernet (Type 3 [55 W] and Type 4 [90 W])



Power over Ethernet (PoE) is one of the key drivers for smart buildings and Industry 4.0 – especially since higher powers up to 90 W can also be transmitted.



050.7067
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Portfolio Optimization

Standing still is not an option. R&M is expanding and modernizing its production at its own cable plant in Děčín, Czech Republic, and is continuously expanding its product portfolio.

One of the latest developments is the FTTH mini loose tube cable. It supplements the tried-and-tested «FiRis» cable types, which are distinguished by their outstanding fire protection properties and increased CPR classification.

R&M has now combined this feature with its gel-free mini loose tube construction. The exciting thing about this solution is that installers save time and avoid having sticky fingers because they no longer have to clean the fibers.

The cable with the designation IFAF FiRis is equipped with four singlemode fibers of the type G.657.A2 and has a diameter of 2.3 mm. It is ideal for indoor installations if the

cable is to be spliced in outlets or distribution modules with fiber pigtailed. Termination on the FO Field connector is also quick and easy.



050.6449

Tried-and-tested products even more versatile

Over the course of the year, R&M will be adding valuable designs to another classic – the mini breakout cable. These impress with benefits such as: space-saving, flexible and easy to handle, without gel and directly terminable with field-terminable connectors such as the FO Field.



030.6839

The smallest variant, the Simplex Indoor Drop Cord, is a 900 µm buffered fiber of type G.657.A2, surrounded by aramid yarn and an FRLSZH jacket. The cables with diameters of 2.4, 2.7 and 3.0 mm have a Dca CPR classification, with the 2.0 mm cable even boasting a Cca.



030.7013



030.7012

The larger version is the FTTH mini breakout cable with a 4 x 600 µm buffered fiber construction and a jacket in FiRis design for improved fire protection.



030.7257

Last but not least, the mini breakout portfolio is rounded out with the construction variants UB9tErF and UB9tGrF FiRis with different tensile strength. The otherwise identical pair is available with 4, 6, 8, 12 and 24 buffered fibers. It is possible to select between OM3 and OM4 for multimode and G.657.A1 standard singlemode fibers. The glass roving armored cables are also equipped with rodent protection.



050.7206

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Cooperation in the Far North

Many regions are waiting for Fiber to the Home, but are not receiving government funding for the construction of the networks. Joachim and Stephan Lührs from IngCommerce do not see this as a disadvantage, but as an entrepreneurial opportunity.

Cities generally have well-developed fiber optic networks. This is where the leading telecom companies are actively involved. These days, it is often the local authorities that get involved in more remote locations. They use government funding for the development of broadband supply.

But the regions in between are also waiting for FTTH offers. They do not receive government funding because they could – theoretically – get their supply from existing providers. Nevertheless, telecom companies are reluctant to invest here.

IngCommerce is active in this market niche. Locations in northern Germany that offer favorable underlying conditions were systematically acquired. For some undertakings, IngCommerce and their partners founded their own local installer companies, flexibly and independently. The most recent project was launched in early 2022 in the district of Gifhorn. Here, 14,000 homes are to be fitted with a fiber optic connection.

«R&M supports our projects optimally.»

Stephan Lührs, co-owner of IngCommerce

Efficiency as a success factor

Efficiency is one of the success factors in opening up these markets. The project partners have to coordinate the construction work precisely with IngCommerce as lead contractor and adhere to deadlines exactly. Joachim and Stephan Lührs know from experience that R&M guarantees the desired efficiency. For 20 years, they have valued R&M as a reliable supplier of high-quality fiber optic products. For several projects in the far north, R&M supplied the street cabinets for fiber optic splitters and Polaris boxes for the service area interfaces.

Ready-to-install cabinets

The R&M plant in Wehrath prepares the street cabinets ready for assembly. R&M has them brought directly to the construction site on schedule and with the right equipment. All the construction teams have to do is take the housing off the pallet and place it on the foundation. They can immediately feed in the cables, install cable management and mount the splice trays.

R&M solutions

- Street cabinets for fiber optic splitters
- Splice trays with Single Circuit Management (SCM)
- Polaris box 4 for service area interfaces



«This is really efficient for us,» says Stephan Lührs. He emphasizes: «R&M supports our projects optimally with easy-to-install solutions, reliable delivery, smooth cooperation and open communication based on partnership.»



050.7208

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Fiber Optic Networks Even Easier to Install

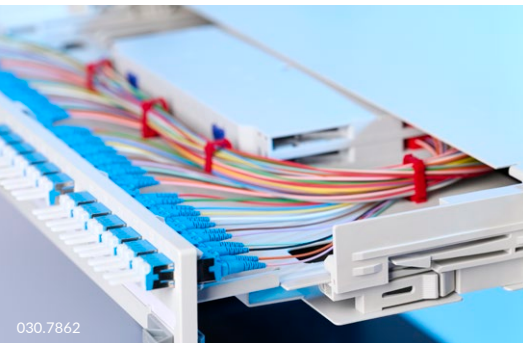
R&M has given its UniRack 2 patch box a new lease of life to make splice cabling a lot more practical for installers.

The specialists from R&M took a close look over users' shoulders and optimized their tried-and-tested concept for fiber optic installation. It's the inner values that have

been improved – you can't see anything has been changed looking at the outside of the UniRack 2. The new UniRack 2 has been given a new pull-out mechanism. It is thus easier to install the drawers in the topmost unit and between two patch panels in the 19" rack. The splice unit can now be pulled out straight without having to lift it.

The various stopper positions are also an inspired addition. These were incorporated in the front pull-out and further simplify handling. Depending on the splice or maintenance work on the adapter, pigtail or tray, the unit can be released and snapped into place in stages with a snap lock.

During further development, the R&M team also paid attention to weight optimization: The new UniRack 2 is now also available with aluminum cable termination.



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Changing Polarity in Just Five Seconds

Mega-cloud, big data, hyperscale – the challenges for data centers are growing. R&M has once again dipped into its innovation box and further optimized the tried-and-tested MPO-QR connectors with an additional feature.

MPO connectors are becoming increasingly adaptable and flexible. However, this often makes it difficult for installers to decide whether they need an A- or B-polarity connector to manage the thousands of fibers.

When good technology gets even better

This is why R&M has now given the MPO-QR connector an integrated «polarity change» – which makes it easy to change the polarity on site.

The rotation lock is designed to be releasable for this purpose. The red wedge can now be removed from the connector without tools and pushed back on the other side. And that means a polarity change only takes five seconds.

The polarity is indicated by the letters on the housing. Important in this connection is the fact that, in future, R&M will supply all MPO-QR connectors with the new function and will therefore dispense with the color differentiation of the strain relief sleeves in order to avoid confusion.



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Competence Center for Racks and Housing



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With the takeover of the Italian rack and housing manufacturer Tecnosteel S.r.l. in Brunello (VA), R&M is now able to offer customer-specific integrated data center solutions of all types and sizes.

Tecnosteel, with its approximately 90 employees, has been part of the R&M Group since January 7, 2022. The manufacturer of 19-inch racks and housings for IT equipment and networks in data centers is the market leader in Italy and well positioned in Europe and parts of the Middle East. The portfolio includes compact distribution and server cabinets, housings for computer rooms, power distributors, cooling and air-conditioning systems as well as systems for network management and monitoring in data centers. The company fits perfectly with R&M's value-oriented corporate culture. The shared focus on quality, sound know-how, flexibility and strong customer orientation as well as the family spirit are characteristics that define both companies. The strategic goal is to offer integrated, complex infrastructure solutions for data centers from a single source, to perfectly complement the portfolio and to harmonize and sustainably expand customer

relationships in Europe. Tecnosteel is already developing green data center solutions under the brand name «BladeShelter».

The highly automated production site in Brunello will be continuously expanded and will in future be R&M's center of excellence for racks and housing. Another focus is the joint development of innovations with which the density of networks can be increased and data centers can be operated in a more energy- and cost-efficient manner. The combined product range enables R&M to offer complete and tailor-made infrastructure units for data centers of all types and sizes.

www.tecnosteel.info/homeita



Product range focus

- Compact 19" IT housing
- Flexible 19" IT cabinet systems
- Data center server cabinet systems
- Integrated and modular data center solutions
- Edge and micro data center solutions
- Data center cooling, energy distribution and monitoring systems



050.7212



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050.7214

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HEC 16 – a Tough Connector

One current driver of increasing data rates is the megatrend 5G. This results in special requirements for networks and components – as well as for interfaces.

For some time now, data has been covering longer distances using fiber optics. But increasingly, data has had to switch from copper to fiber, even for short distances, in order to maintain the data rate and manage without additional active devices for conversion. The fiber optic connection is moving ever closer to the user. In the mobile network, this means: to the antenna (FTTA = Fiber to the Antenna).



It is well known that antennae are located in a wide variety of environments in cities, rural areas, on wind turbines and on the coasts, where there are genuine challenges: extreme temperatures, vibrations, salt mist, dirt and humidity. Robust and reliable fiber optic interfaces that can be installed securely and without any errors are therefore in demand.

Connectors – plugged blind, perfectly protected

As an experienced specialist for outdoor connectivity solutions, R&M offers modular fiber optic products and covers the entire FT Tx topology.

To match the FT TA portfolio, there is now a new connector type: the HEC 16. HEC stands for Harsh Environment Connector – a connector for harsh environments, even under extreme conditions. R&M tests the connectors in accordance with Telcordia GR 3120 and the IEC 61753-1 Extreme Environment category. For example, they have to survive 3 m under water for several days. They are also UV-resistant and, with a tensile load of up to 450 N, the strongest in their class.

For this purpose, the standard connector is securely embedded in robust housing and decoupled from the outside cable. This ensures resistance to extreme temperature

fluctuations without being affected by cable shrinkage. The housing is based on variant 01 as specified by IEC 60603-7 (and ODVA) with a quarter-turn fastener and 16 mm nominal radius and is available as LC duplex, SC simplex and MPO. A hybrid version for data and power supply in one connector will soon follow. Both bulkhead and inline adapters are designed with protection class IP68.

Finally, the connector features an additional highlight that reduces time and stress: blind mating. This makes it possible to establish connections without a clear view, without contaminating or scratching the end of the connector – all with one hand and, of course, with gloves.

Of course, the range of application of the HEC16 is not limited to FT TA. It feels at home wherever harsh ambient conditions prevail.



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Priority Given to Climate Protection



060.2141

SUSTAINABLE DEVELOPMENT GOALS

R&M's sustainability strategy has four priorities:



Reduction of environmental and climate impacts



Focus on humanity, social commitment, equality



Strict corporate ethic and zero-tolerance policy



Sustainable supply chains

R&M is pushing climate protection forward and aims to halve its greenhouse gas emissions by 2030. The R&M plants worldwide should be CO₂ neutral by 2050 at the latest. These are the main objectives of the new, expanded sustainability strategy.

R&M is committed to the 17 UN Sustainable Development Goals and applies the ten principles of the UN Global Compact. The focus on sustainability is being intensively expanded on the basis of the firmly established values and principles of the family business. A team of executives manages the sustainability strategy at the operative level.

First carbon footprint

R&M is currently having the climate-relevant emissions of its 14 plants assessed by the myclimate Foundation in Zurich. This is the first occurrence of external and scientifically based CO₂ accounting. This is what R&M wants to be measured against in the future.

Previously, R&M had calculated the annual total energy consumption of each plant, among other things. This was reduced by six percent last year with the plants running at full capacity. Eleven of the 14 R&M plants already have an environmental management system that is certified in accordance with ISO 14001.

In addition to «environmental and climate protection», the extended sustainability strategy also includes the main spheres of activity «social commitment, humanity and equality», «strict business ethics and zero tolerance policy» and «sustainable supply chains».

Corporate governance is emphasized even more strongly and documented in a more transparent manner. R&M will further deepen and document its tried-and-tested commitment to fair pay, equal rights, safety, health and education. And the supply chain will be widely integrated into the sustainability strategy. R&M expects its suppliers and logistics partners to consistently comply with international regulations for the protection of people and the environment, and to make the best possible contribution to climate protection.

Each year, R&M documents the measures and progress in the four spheres of activity in its Sustainability Report. It can be downloaded from the website.

www.rdm.com/company/about-rm/corporate-social-responsibility/



050.7174



050.7216

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R&M's Fiber Optic Competence Center



From 20 to more than 450 employees. From connector assembly to an international center of excellence for fiber optics. This is something R&M can be proud of after ten years of production in Bulgaria.

The R&M plant in Sofia celebrated its tenth anniversary a few months ago. It has developed extremely successfully and is now R&M's largest production plant.

R&M's long-term growth strategy and the market situation at the time required another site for the manufacture of fiber optic products. The business-friendly situation in Bulgaria and the excellent network of the well-established local sales organization made the idea of setting up a plant in Sofia a compelling choice. At the same time, the decision enabled R&M to have a strategically important production location in the EU.

The R&M plant was the first high-tech industrial company of its kind in Bulgaria. The number of workplaces rose rapidly from 20 at the beginning to 150. Today, R&M Bulgaria Production employs more than 450 people and is considered one of the country's most attractive employers. In addition, the plant trains young specialists and up-and-coming engineers to become fiber optics specialists using state-of-the-art methods, extensively following the example of the Swiss dual professional education system.

Production expertise

Broadband coverage is expanding worldwide. Telecom companies are investing in the expansion of fiber optic networks. Demand for fiber optic products is increasing accordingly. As a result, capacity usage at the R&M plant in Bulgaria has recently been far above expectations. At times, the R&M locations in India, Dubai and California provide support as extended workbenches so that customers can always be supplied on time.

The dedicated team in Sofia is purposefully building up expertise in manufacturing, development and engineering to continuously increase efficiency. For the R&M Group, the

site is now its state-of-the-art FO competence center. Other R&M plants use this know-how for their own efficiency-increasing programs.

To mark the anniversary, capacity was increased once again and the fifth FO production line was put into operation. The production program covers the entire field of connectivity and custom-made assemblies. Production of the new R&M Fiber-to-the-Antenna range will soon commence in Sofia.

The R&M plant in Sofia is certified in line with ISO 9001 (QMS), ISO 14001 (environmental management) and ISO 45001 (safety).



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10th R&M Roadshow

The R&M roadshow trucks are going on tour for the tenth time. In the coming months, they will once again be bringing exclusive, up-to-date, and practical information to cabling experts throughout Europe. R&M partners can use the trucks for customer events.

The R&M roadshow trucks are becoming popular industry meeting places with real added value. In the last two years of the pandemic in particular, they have proven their worth. Customer events involving the trucks are a manageable size and absolute infection protection can be guaranteed.

Meeting specialists

Visitors can experience and try out the R&M products in the rolling showrooms. They can discuss with experts in person in the tent by the truck or in the rooms of the local organizer. Questions on installation can be answered spontaneously. Virtual trade fairs cannot offer this.

While one truck provides information about data center and LAN cabling, the second one has the FTTX world on board. Using the Netscale platform as an example, visitors learn how to increase the density of fiber optic infrastructures and simplify network management. A smart building model shows

how LAN, building automation, Power over Ethernet and Single Pair Ethernet work together. With the Polaris boxes, R&M demonstrates how homes of all sizes can be supplied quickly and efficiently with broadband connections. And with the new ZOONA splice closure, the new generation of fiber optic distributors for subscriber connections in rural broadband networks, among others, is also included.

On the road throughout Europe

The two R&M trucks – the first launched in 2013 and the second in 2019 – have experienced quite a lot. They have covered 260,000 kilometers on Europe's roads. They have traveled from Portugal to Russia, from England to Macedonia, and from Finland to Italy. In 30 countries and at 1,000 roadshow meetings, customers and R&M partners met up at and in the trucks. Installers, specialist planners, architects and distributors were provided with exclusive information on the latest developments in network technology.

Due to the pandemic, a truck had to take a long forced break in Belgium in spring 2020. Birds promptly used it as a nesting site. A full-body scan of the truck was once ordered at the Russian border. The scan confirmed that only high-end Swiss cabling products were on board. Once a German parking garage was too low and in Bulgaria an entire building was in the way. Otherwise, the trucks have fortunately been doing their job almost accident-free.


R&M partners will once again be able to use the roadshow trucks for customer events in 2022. The aim of the roadshow is to present innovations and exchange practical experience. The tried-and-tested program is ready for the tenth round.

[R&M Roadshow](#)



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