CONNECTIONS 61

Specialist magazine Reichle & De-Massari AG | October 2021

Security
Starts with the Connector

Jungfraubahnen, Switzerland:
Top of Technology

New Fiber Unit for PRIME
with Single Fiber Management

PoE: With a Cool Head to Cool Cables

R&M

050.7115

Editorial

Dear Business Partners

Networking connects people and machines around the world and enables the smart organization of processes. Quality of life can be further improved as a result, as innovation, security and sustainability go hand in hand.

Our latest specialist magazine focuses on data center security. Data centers are the heart of digitalization and have to be up and running around the clock. Data management is still too often done «by hand». In order to avoid costly downtime, zero-defect production is required. Implementing DCIM and AIM solutions is worthwhile and will be indispensable in the near future. But what people often forget is that reliable availability begins with the connector. Even the most modern DCIM only works if the right cables are plugged into the right port. Our model therefore starts at the physical network layer. Among other things, we offer RFID tags for connectors with unique identifiers, patch panel sensors, analyzers and our inteliPhy net software for DCIM and AIM. Read more about this in our Focus story.

The London 1 Data Center, commissioned by leading IT provider NTT at the end of 2020, is a flagship data center project. The multi-tenant building offers exemplary, interruption-free service. This was also made possible by tailor-made ODF solutions from R&M, see the Success story on pages 8 & 9.

It is interesting to see how many edge data centers are now in operation. Edge providers are successful if they can master all of their offerings at the same time, from the modest 40 Gigabit Ethernet up to 400 Gigabit. Such data centers have to be able to be managed centrally and remotely. The operator relies on real-time information about each port. Which brings us back to inteliPhy net. And this system now also monitors all network areas in the new building of the Swiss Tropical and Public Health Institute (Swiss TPH) in Basel. Read more about the all-in-one concept developed by R&M for the data center of this renowned institute on pages 22-24.

What does all this have to do with sustainability? Digitalization offers the potential for efficiency gains. FO networks, e.g. used for Fiber to the Home (FTTH), require less electricity than copper-based networks. Maintenance costs are also lower. R&M supports network operators in the optimization of their resources.

In our company, sustainability is part of our way of thinking. Like all successful family businesses, we have always striven for solutions that stand the test of time. We are currently working on specific goals to reduce our carbon footprint at all locations. We embrace our values globally. Find out more in the interview with our Corporate Quality Manager on pages 36 & 37.

Helping to build the network infrastructure of tomorrow spurs us on every day. New solutions and portfolios are being launched in all segments. Find out more in the latest issue of our specialist magazine CONNECTIONS.

I wish you an inspiring read and would like to thank you for the trust you have placed in us.

Michel Riva
CEO

Contents

Focus

News

Success

Trends

Corporate

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Cover picture:
In the Bernese Oberland, in the immediate vicinity of Eiger, Mönch and Jungfrau, the tourism infrastructure has been modernized with a new V-Cableway. A universally usable cabling system from R&M is part of it.

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Editorial team:
Erica Monti (Editor-in-Chief),
erica.monti@rdm.com,
Silvia Brüllhardt, Bernward Damm, Robert Merki, Andreas Rüsseler

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Security
Starts with the Connector

Five thousand FO ports in one cabinet. How can you hope to keep track of everything? Data center cabling is reaching new dimensions. This world can no longer be managed by hand, using a laptop and tables.

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On the road to 400 Gigabit Ethernet, data centers are making the most of every millimeter. In the computer room, power has to be consolidated. Spine-leaf architectures are gaining ground. Racks need to accommodate more channels, fibers and ports than ever before.

Cables with 1,782 or 3,456 fibers are establishing themselves in data centers. The market is now demanding distributors in the Ultra-High Density class, as is the case with the Netscale family from R&M. This means that, ideally, more than 5,000 ports can be packed into a rack. In most cases, this potential is not fully exploited.

Nevertheless, the question remains: How should data center operators manage the mass of cables, fibers and ports? How can they cope with the increasing complexity of networks with fewer and fewer staff?

What does experience say?

Five everyday experiences underline the drama of these questions.

1. Traditionally, laptops, tables and labels are cost effective tools. This is how the physical network layer, documentation, service and MACs are organized in data centers. Experience shows that errors creep in when things are done by hand. People can forget or misunderstand something. The data becomes obsolete within a few days. The worst consequences: outages, patch errors, malfunctions on customer premises, faulty audits, breaches of compliance.

It is no longer economically justifiable to manage networks and connectivity «by hand».

2. If someone overstretches a fiber while managing cables in a packed cabinet, attenuation can increase. If dust settles on the contacting surfaces, there are consequences then, too. Individually, there is a small loss of performance in each case. But put them together and the latency of 5G cells, traffic control centers, factories, Internet services and AI applications could increase.

How can such performance losses be precisely measured and located – with thousands of fibers in a single rack?

3. Packed to the brim with equipment, a long way away from the operator, no technician on site – this is the situation at edge data centers (see article on page 21).

How can connectivity be managed and controlled outside at the edge?

4. A study by the Uptime Institute suggests that data center operators could prevent

«Without the network, there is no data center. And without a strong network monitoring practice, the IT team won't have the information necessary to demonstrate that network monitoring has protected the data center and prevented potential disruption.»

Jordan MacPherson, Enterprise Operations Center Program Manager, Park Place Technologies
Source: Network Monitoring Whitepaper, Park Place Technologies

about 75 % of known outages. They would have to improve management, tools and processes and exclude typical homemade errors in cable management and network documentation.

In aviation, such negligence would have catastrophic consequences. So far, it has been tolerated in data centers. Even at the top quality level – in TIER IV data centers – an availability of 99.995 % is considered standard. This corresponds to a downtime tolerance of 25 minutes a year.

5. Inadequate directories of patch panels and connectors have often turned into nightmares. For example, in the case of a global provider of secure cloud connections. During maintenance work, a technician was supposed to remove inactive equipment from a rack. He followed instructions to the letter and pulled out the connectors – briefly, also on an active panel. What he didn't know was that this patch panel contained fiber optic connections to the company's other data centers. Important services were unavailable for four and a half hours. It took a lot of time to identify the cables for the external connections.

The company wants to label cables and patch panels in the future. Technicians should be given precise information as to which cables they must not touch. Which brings us back to the original point: Simple labeling comes under the heading of fault-prone «manual work».

Need for a paradigm shift

It is time for a paradigm shift in the management of the physical network layer. People talk about zero-defect production when data centers are to meet the security needs of the digital decade. And the market already offers a lot of what is needed for this – Data Center Infrastructure Management (DCIM) and Automated Infrastructure Management (AIM) solutions.

DCIM is available in all shapes, sizes and complexity. DCIM machines can be used to manage buildings, access, electricity, UPS, temperature, fire protection, resources, assets, cabling and much more. There are all-powerful and modular offerings. None offers unconditional transparency. There are stand-alone and SaaS products. Even artificial intelligence is available.

Very few people would first think about the network connector. But this small, non-virtualizable part may decide on the availability of an entire data center or a global network.

DCIM dependency

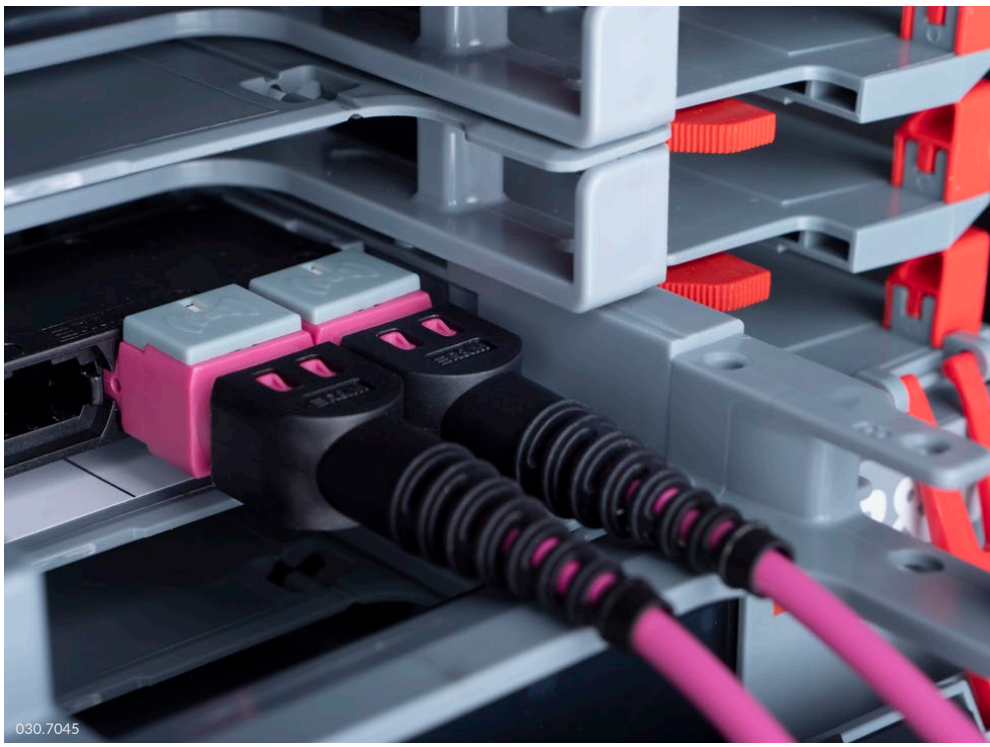
There is even a dependency relationship. DCIM only works if the right patch cords are inserted in the right port. What happens if critical information does not immediately appear on the operator's DCIM dashboard? There is certainly at least one redundant LAN connection, but it does not change the realization that **availability starts with the connector.**

There can be no high security in the data center without 100 % end-to-end control of the passive network layer. Whether enterprise, colocation, or edge data center.

Ten reasons

This is why data center operators are increasingly investing in AIM for the physical network layer:

- Replacing inefficient, inconsistent documentation methods
- Digital mapping of networks for management, planning, audits
- Gaining visual insight into the cabling up to the port
- Eliminating sources of error, managing patch jobs live
- Localizing faults immediately, deploying technicians in a targeted manner
- Recognizing, planning and exhausting capacities in racks, etc.
- Working more productively and remotely with fewer staff
- Integrating the management of complex networks into DCIM
- Simpler planning, simulating and coordinating of MACs, workflows
- Meeting more stringent security and quality requirements



«Availability starts with the connector.»

Carsten Ludwig, Market Manager Data Center, R&M

Bottom-up approach

DCIM and security must be viewed from the network connector. This bottom-up approach, in a simplified form, is as follows:

- Each connector is given its own, unique, passive identification, e.g. with RFID tags.
- Sensors on the patch panel «see» the connectors, read the identifiers and assign them to the ports. That is the intelligence of the connector.
- LEDs show active links, free and occupied ports, patching jobs and patching errors live. They «guide» the technician.
- Sensors and signaling communicate via simple networks (bus, SNMP, SPE) with an analyzer that bundles information from the computer room.
- The analyzer communicates with the AIM server on site or in the cloud via Ethernet/IP.
- TAP modules continuously measure the performance of the fiber optic lines to make the service quality visible.
- The server knows the status of the entire LAN automatically and always in real time.
- The operator accesses the server in-house or remotely via management software. This is where the operator has stored a digital profile of spaces, inventory, racks, cabling, measured values, etc. The server tracks, documents, monitors, alarms and communicates with the other management systems in the building in real time.

These are the main elements of AIM/DCIM. An unbroken digital chain of information is created from the ports to the operator's dashboard. No connector will be «forgotten» any more. Nobody has to deal with tables or labels on site. All work is centrally organized and automatically monitored.

Further criteria to consider in an evaluation:

- **Expertise:** The vendor is well versed in the technology and provides mature AIM products, know-how and a roadmap.
- **Standards:** The hardware fits into every rack. It supports future network generations.
- **Customizing:** The AIM can be expanded to include functions such as MAC planning, asset management.
- **Openness:** Software and products from partners, IoT devices, etc. can be docked on as required.
- **Integration:** The AIM is easily scalable and capable of up-down integration, e.g. into a higher-level DCIM.
- **Security:** There are protection and security solutions, firewalls, authentication, etc. for all levels.
- **Operation:** The user interface can be operated intuitively. The software is simple and localizable.
- **Training:** Webinars, explanatory films and short learning units quickly familiarize those responsible with the system.
- **Compliance:** The infrastructure management must meet compliance, SLA, QMS, data protection and documentation requirements.

Investing step by step

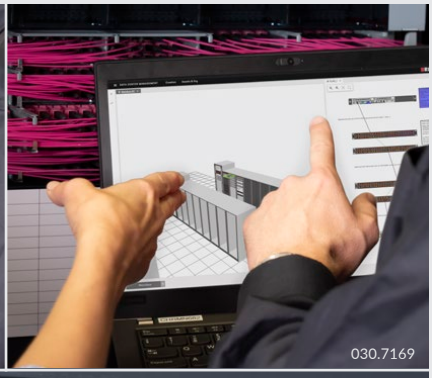
The bottom-up approach is also of interest to the CIO as the company can invest gradually. The CIO will first include the essential AIM components in the budget. Using a profes-

R&M's contribution to today's infrastructure management

The management of complex infrastructures in data centers starts with connectivity. The network connectors have to fit perfectly for the data center to function properly. This is why the R&M model for smart networks starts at the physical network layer. The R&M*inteliPhy* modules:

- RFID tags for connectors with unique identifiers
- Sensors and signaling on the patch panel
- Analyzers bundle data, interact with servers
- inteliPhy net software for DCIM
- Netscale Ultra-High Density platform
- TAP modules with passive splitters

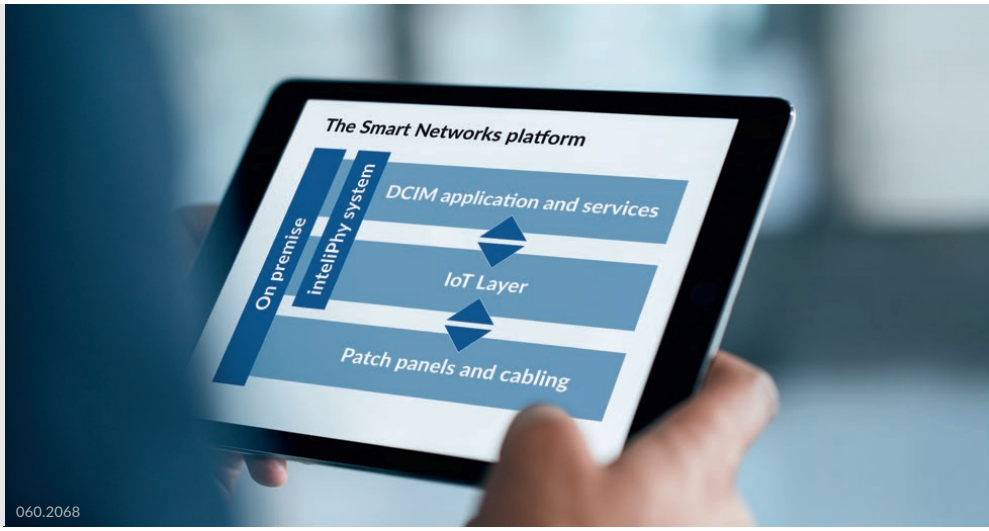
R&M supports data centers with customizing for the AIM system and the DCIM software as well as with partner solutions. The cards can be delivered pre-terminated. The inteliPhy Brownfield Service is new. It equips patch panels and connectors of any manufacturer with R&M*inteliPhy* components and connects them to the inteliPhy net AIM/DCIM program.



Driving forces: capacity, safety, automation

DCIM systems are increasingly being used in data centers. Demand is growing at an annual rate of 22 % to 25 %. This is being reported by several market research services on the basis of various surveys.

Data center operators invest in DCIM with the expectation of increasing operational reliability, eliminating errors and outages, and saving costs. Automation is another reason. DCIM systems can take on demanding, time-consuming, labor-intensive and remotely controllable tasks. This makes it possible to overcome the shortage of skilled workers.



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Approaches to infrastructure management in network cabling

	Traditional	Bottom-up	All-in-one
Tools	Laptop, tables, templates, labeling, inconsistent in-house databases, and web-based apps available	Connector- and port-based identification, online monitoring, simple in-house or SaaS/cloud software	Comprehensive DCIM with complex software, 3D/4D visualization, analyses, etc. software in-house or SaaS/cloud
Focus	Network cabling, manual documentation	Network cabling, assets, management, dynamic connectivity capture and end-to-end network insight	Holistic, management, facility, infrastructures, processes, security, safety, power, environment, etc., often no genuine integration of the physical network layer or connectivity
Complexity	Low	Easy to learn	Requires special training
Automation	No automation, great effort for documentation	Continuous real-time monitoring from layer 1	Depends on configuration and equipment
Availability	Availability of the network only ensured through good planning and provision	100 % patch control, reaction in seconds	Up to 100 % control in all areas, depending on configuration and equipment
Customizing	Random, individual, in-house	Universally usable and scalable basic components, flexible configuration and integration in DCIM context	Diverse modules, flexible customization options
Personnel	Generally technicians must be on site/in the computer room	Focus on operator desk, some remote work possible after initial installation/implementation	Focus on control center, heavy workload in the operator area, extensive remote activities and outsourcing possible
TCO vs. security	Low costs, theoretically no end of life, high time and personnel expenditure, fault-prone	Step-by-step investment, targeted deployment of personnel, partially manufacturer-neutral, open technologies, flexible with system change, 100 % real-time monitoring of layer 1	Large investment, partially proprietary solutions, high follow-up costs (modules, updates, support), high dependency, comprehensive real-time control options

sional roadmap, the CIO will head towards a comprehensive DCIM that will hopefully not be too overloaded and complex.

The project starts in the meet-me room or in cross-connect cabinets. Further racks will gradually be connected with the smart AIM system. Each step makes the data center more secure, more efficient and more competitive.

Future cabling dimensions, security requirements and operational challenges require zero-defect production on layer 1. Using a bottom-up approach, data center operators can align connectivity management with the DCIM future. Smart technology for connectors, ports and monitoring relieves them of inefficient, expensive «manual labor» in high-density networks.

www.rdm.com/inteliphy-net/
www.rdm.com/netscale-fiber-cabling/


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Carsten Ludwig
Market Manager Data Center
carsten.ludwig@rdm.com

London 1

NTT Ltd. is one of the largest IT providers in the world. The company has now set a further milestone with the London 1 (LON1) Data Center, which was opened in December 2020. LON1 is tripling NTT's capacities in the UK. The multi-tenant building leaves nothing to be desired. R&M's bespoke cabling solution plays a major part in the realization of this.

A network of more than 160 data centers makes NTT Ltd. the third largest carrier- and cloud-neutral supplier in the industry. The Global Data Centers Division, set up in 2019, unites NTT's own and integrated sites in more than 20 countries. The consolidated area of server rooms totals 500,000 square meters and is constantly being extended.

The most recent mega complex: the London 1 Data Center in Dagenham, East London. The first construction phase took just a few months. It offers a colocation area of 12,800 square meters with a capacitance of 32 MW IT load. Once completed, the London 1 Data Center will provide 25,600 square meters of IT space and 64 MW IT load.

Multiple use

Colocation customers enjoy a wealth of possibilities here. On the opening, Masaaki Moribayashi, Senior Executive Vice President, Services NTT Ltd. said: «London 1 offers a flexible, scalable and secure infrastructure as well as individually customizable solutions. It was designed for a wide range of NTT customers and partners.»

The options for colocation customers start with an individual rack – which they install themselves or use as part of the NTT full-stack service. They are given space for fail-safe cloud and SaaS applications or workload distribution. The number of carriers providing their services within the London 1 Data Center is increasing continuously.

The data center also contains a Technology Experience Lab. This is something only on offer from NTT. In the lab, customers and developers can try out and demonstrate innovative hardware, software and cloud services under live conditions. This saves them having to make their own infrastructure investments. Topics featured include cyber security, artificial intelligence and block chain technology.

Proximity to LINX

Fiber optic lines, multi-service interconnection platforms and cross-connect cabling are available for millisecond-fast connections into the global network. Expert NTT personnel can also be consulted, providing remote-hands services.

With the Dagenham site, NTT offers short transmission paths to the London Internet Exchange (LINX) in the Docklands. The peering point is just 15 km away.

Florian Winkler, CEO of the Global Data Centers EMEA Division at NTT, says: «Our British data centers are of crucial importance for the global economy and guarantee interruption-free service 365 days a year.» The pandemic has shown just how important this connectivity and reliable infrastructure are when it comes to operating internationally active companies.

NTT guarantees multiple redundancy and an availability of 99,999 % in compliance with Tier III classification. High-quality services on the basis of its own global IP network are a matter of course at NTT. All data centers offer a range of direct access points to telecommunications networks, cloud providers and other Internet exchanges.

The R&M solution for London 1

Backbone interconnections:
- High-density modular ODF with splice LC connectivity
- OS2 cables with 24 CLT, 144 fibers with CST and B2Ca CPR rating

Customer colocation area:
- ODF (combimodules) with LC/MPO to provide cross-connection capability
- HD 1U 48f panels with 4 cassette slots using MPO/LC connectivity
- OS2 MPO Cca trunks to enable ease and speed of deployment

Warranty:
- 25-year system warranty

Project success factors

- Trusted technology solutions
- Understanding of customer requirements
- Working with knowledgeable and experienced certified partners (Indigo Telecom Group)
- Engagement with NTT and Indigo Telecom Group from the conception to project completion
- Effective project management and coordination of lead times, delivery and logistics
- Guaranteed compliance with global NTT DC standards and installation practices

Technology at its best

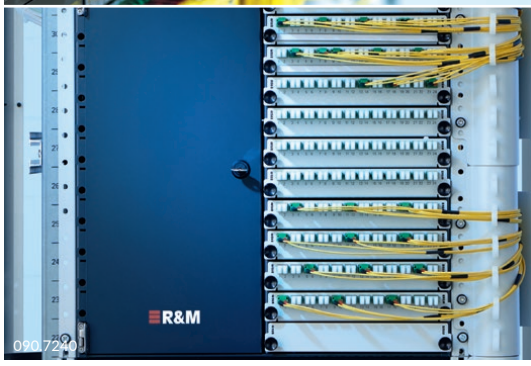
NTT pride themselves on offering the best environment for their clients and expect nothing less from their service providers. R&M's long standing technology cooperation with NTT, enhanced by involvement of Indigo Telecom Group, proved to be a successful combination.

Having delivered ODF solutions to NTT on several sites over many years, R&M understood NTT's requirements; every project is slightly different, however, resulting in new challenges.

For LON1, R&M was asked to provide an ODF solution that would allow LC to MPO connectivity between MMR and the client. To adhere to NTT's design concept both in terms of technology, solution, usability and general product aesthetics, the engineering team in the UK, with support from the Swiss design team at headquarters, re-engineered the HD Combi ODF for an LC/MPO solution and took it from concept to delivery to site within six weeks.

Thanks to NTT's request and R&M's quick reaction time, the company now has a new ODF LC/MPO product range that offers high performance, high-density OS2/MM fiber connectivity on a small footprint, excellent patch cord management to facilitate efficient administration and avoid downtime, and fast and efficient deployment to NTT customers.

Furthermore, R&M provided expert support and logistics management from the very beginning. The smooth communication with the certified R&M partner Indigo Telecom made a decisive contribution to achieving the project goals quickly. Despite the pandemic-related challenges, it was possible to get London1 up and running in December 2020. NTT LON1 is a fantastic facility and a credit to the NTT team. It is one of the most remarkable projects R&M had the pleasure of being involved in.



Fatholah Zaki | R&M UK
fatholah.zaki@rdm.com

Netscale 72
Can Do Even More

High-density avant-garde is a perfect fit. Netscale 72 offers enough space for the latest miniature connector families. They increase port density by up to 300 %.

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Three new connector types are showing the market that fiber optic connectivity can be increased even further in 19-inch racks. R&M is integrating these three into the high-density distribution platform Netscale 72, thus further increasing packing density.

The avant-garde products are called CS, SN and MDC. They belong to the VSFF (Very Small Form Factor) class. Senko developed the duplex types CS and SN. The MDC is made by US Conec. CS stands for Corning Senko, SN means Senko Nano and MDC is the acronym for Mini Duplex Connector.

Tried-and-tested ferrule technology

Both Senko products contain the tried and tested 1.25 mm ferrule of the LC. This builds confidence in connectivity. The housings, however, are more slimline. In the SN, the ferrules have a spacing of 3.1 mm – unlike the 6.5 mm in the LC.

The CS offers a third more packing density than the LC connector. The SN takes up even less space than the CS. It can be used to terminate up to 384 fibers on one height unit. With the MDC, fiber density can be tripled in comparison to conventional LC/MPO cabling. It packs 432 fibers into one rack height unit. The multipatch variant comprises eight fibers per MDC quad.

The increased connectivity density makes it possible to expand MPO applications in connection with CS, SN or MDC. A lack of space had prevented this to date as the plug connectors took up too much space.

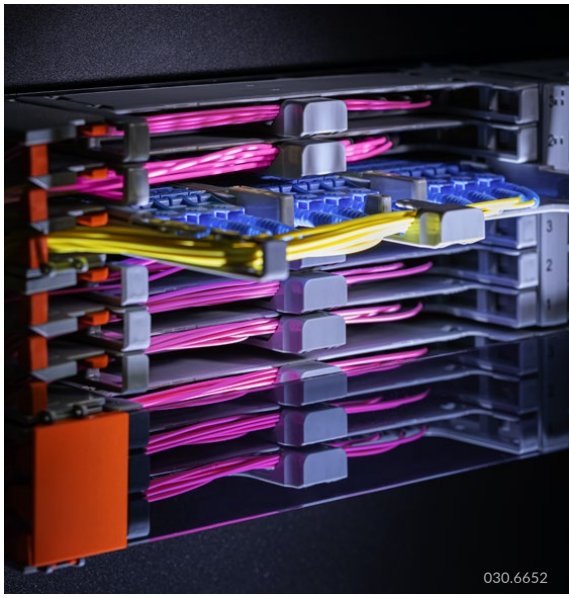
Clear the way for 400G

In high-density programs, the main task now is to prepare the networks for 400 Gigabit Ethernet. Large data centers are working intensively on the migration to 400G and on further network densification in meet-me rooms. They quickly need more bandwidth and more transmission channels.

The advantage of miniature connectors: They can be patched individually. This makes it easier, for example, to create links between different switches with 4x100G to 400G. With both VSFF connectors, four channels can be set up per module. This would pave the way for 400G with an 8-channel configuration (8 x 50G).

Flexible platform

The fiber optic distribution platform Netscale 72 natively supports the two parallel optical cabling types BASE8 and BASE12. This



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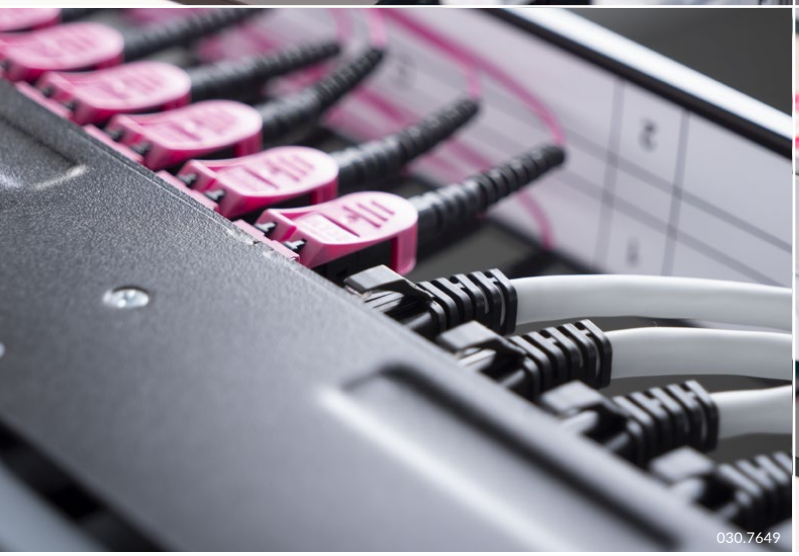

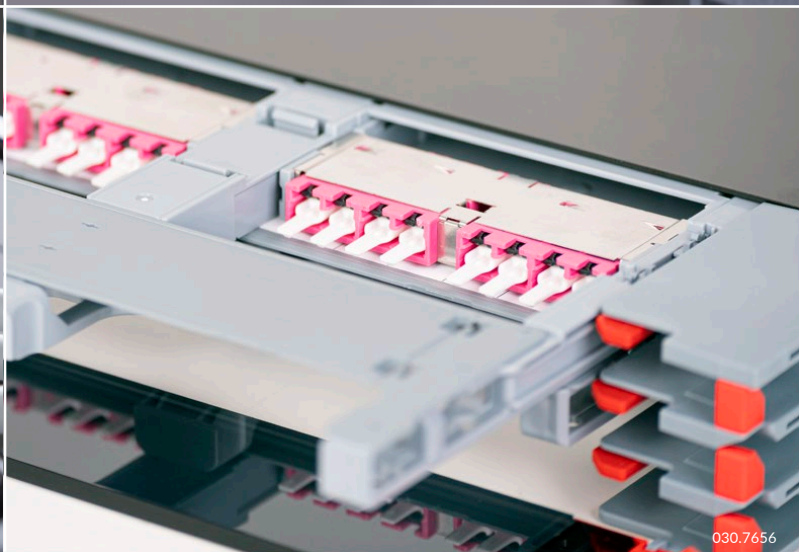

means that distribution modules for both applications fit into the same drawers. Data centers can adapt the trunk cabling within the existing racks and housing. All they have to do is change or supplement the R&M trays.

R&M provides all typical connection solutions: MPO and LC trays, MPO and LC splice trays, MPO-to-LC modules. Technicians can splice ribbon cables with up to 144 fibers on a 12-port MPO tray. Multifiber loose tubes, micro ducts, mini-core and ribbon cables can be attached to the splice trays.

In this way, Netscale 72 facilitates fast migration to new network generations. Netscale 72 is particularly used to create large spine-leaf network architectures in cloud data centers.

The Netscale range from R&M already offers the industry's highest density fiber optic ports in 19" cabinets. With the integration of the high-density avant-garde CS, SN, and MDC, this figure will rise once again. A major step for data centers.

Safe handling

R&M is extending the current high-density range with a pre-mounted dust cover for LC adapters: LC Shuttered.

The cover opens and closes automatically when it is plugged in. Technicians can patch quickly and safely. The risk of contamination is reduced. You no longer have to clean the fibers or only very rarely.

Netscale 72 panels have divided drawers. The sides can be equipped separately. Technicians can easily work on individual links. The divided drawer minimizes the risk of having to unplug individual links during installation work or of damaging fibers.

The appropriate cable management from R&M helps network technicians to reliably control the high packing density on the patch cord side. The quick-release mechanism from R&M simplifies handling with high connector density.

www.rdm.com/netscale-72/

Beat Koch | Product Manager
beat.koch@rdm.com

Carsten Ludwig
Market Manager Data Center
carsten.ludwig@rdm.com

Top of Technology

In the Bernese Oberland, in the immediate vicinity of the Eiger, Mönch and Jungfrau, the tourism infrastructure has been modernized in a remarkable way with a new V-Cableway. The latest technologies such as ALL-IP, IoT, PoE, WLAN, 5G and digital signage have been in use on site since December 2020.

«We opted for tried and tested technology and once again chose R&M products. The model with the customer-specific manual has proved its worth.»

Urs Siegenthaler, CIO, Jungfraubahnen Management AG

Jungfraujoch – Top of Europe. The Jungfrau Region with the majestic backdrop of the Eiger, Mönch and Jungfrau peaks, glaciers, steep ski slopes, hiking trails, mountain railways and cableways: This destination in the heart of the Swiss Alps has been attracting travelers, adventurers, sports lovers and artists from all over the world for over 100 years.

The Jungfraujoch alone, with the world's highest railway station, attracts one million visitors a year. Until now, you had to spend a lot of time reaching Top of Europe and sometimes book a seat on the train well in advance. The trip on the historic mountain railways via Kleine Scheidegg is nice and leisurely. But now, there is a faster option.

Reasons for choosing R&M

- Universally usable cabling system
- Customer-appropriate portfolio
- Customer-specific manual for all parties
- Trust and reliable communication
- Flexible, fast response within the project
- Logistics under extreme conditions

Forty-seven minutes faster

That all changed in December 2020, when the new Eiger Express operated by Jungfraubahnen went into operation on schedule. It shortens the trip to Top of Europe by 47 minutes. The journey from Grindelwald Terminal to the Eiger Glacier now takes just 15 minutes.

The Eiger Express is the new top tricable gondola in the Alps. It travels at a record speed of eight meters per second from the new terminal in Grindelwald to the Eiger Glacier mountain station. This intermediate plateau is where passengers can connect to the Jungfrau railway if they want to.

En route, you soar along the legendary north face of the Eiger like an eagle. The fully automated cabins feature WLAN, air conditioning, heated seats, heated panoramic windows, and the design of a sports car. The power

«Best Terminal in the Alps»: Wooden facade on the outside, a mobility center inside with digitized tourist operations on the inside – the new terminal in Grindelwald combines the Eiger Express, the Männlichen cableway, shopping, parking and access to public rail transport.

R&M manual

During the project, Jungfraubahnen optimized plans as necessary. For example, twice as many WLAN access points and 100 more digital signage displays were required for the terminal in Grindelwald than planned. Network planners, installers and R&M were able to react flexibly at all times thanks to the close cooperation.

The R&M manual was a decisive factor for success: It specifies and standardizes the material for structured cabling for Jungfraubahnen. A quick look at the manual is all it takes to identify and order the right products. The manual also shows how the Cat. 6_A EL modules from R&M are wired and what needs to be taken into account during measurements for formal acceptance. This eliminates time-consuming steps for evaluation, ordering and work preparation.

Urs Siegenthaler, CIO at Jungfraubahnen, and Bruno Perren from elektroplan Buchs & Grossen AG confirm: «The R&M model with the customer-specific manual has proved its worth.»

Urs Siegenthaler: «The manual ensures that the same material is used everywhere.» Bruno Perren adds: «Our team benefited from standardization. The manual was used virtually every day.» Only the PoE infrastructure required more intense planning to precisely calculate the switch locations and the electrical power.

«All partners demonstrated a high degree of flexibility and did an outstanding job.»

Bruno Perren, Project Manager, elektroplan Buchs & Grossen AG

R&M*freenet* solution and customer-specific manual

Top technologies

From Grindelwald to the Jungfraujoch, Jungfraubahnen are deploying digital technology for:

- Automated boarding
- Digital signage, signposting
- Infotainment, information on the pistes
- Cabin communication
- Access control
- Ski pass management
- Ticket machines, cash registers
- CCTV
- WLAN, Internet access
- Building automation
- Telephony, company radio
- 4G/5G coverage indoors

is supplied by generators in the rollers. The international iF Forum Design presented the cabins of the Eiger Express with the Red Dot Award – for their «timeless elegance» and «unparalleled functionality».

Two GPS-controlled screens show passengers live what can be seen from all angles. Modern information technology adds a virtual component to the cable car ride, making the trip on the Eiger Express a multimedia experience.

Digitalization in tourism

Jungfraubahnen also made the quantum leap towards digitized tourism operations in the valley and mountain stations in a very impressive manner. Technologies that currently leave nothing to be desired are being used in the state-of-the-art terminal in Grindelwald – known as the «Best Terminal in the Alps» – and on the Eiger Glacier. Based on the R&M*freenet* cabling system, Jungfraubahnen uses, for example:

- ALL-IP: The building technology communicates via Ethernet/IP and LAN. This is how smart buildings with the Internet of Things (IoT) come into being. The advantage: Building automation with standardized digital protocols simplifies building management.
- PoE: The data network supplies power to terminal equipment such as cameras, antennas and locking systems (Power over Ethernet). The advantage: one single type of cabling for everything.
- Digital signage: Display surfaces receive information live via the LAN. The advantage: Visitor flows can be managed centrally, ad hoc and to suit demand.
- WLAN: 250 access points in the terminal ensure seamless network access. The advantage: Guests can access the Internet everywhere for free on their smartphones.
- 5G: The network infrastructure is 5G ready. There's nothing stopping high-speed radio now.

elektroPLAN BUCHS & GROSSEN AG

Facts about the Eiger Express

- Grindelwald terminal 943 m
- Eiger Glacier station 2,320 m
- Difference in altitude 1,385 m
- Distance 6,483 m
- Journey time 15 min
- 44 cabins, one VIP cabin
- Capacity 2,200 persons/h
- Construction time 908 days
- The first cable car to combine fully automatic passenger and freight operations

V-Cableway:

Construction diary videos:

Project partners

- Building owner/end user: Jungfraubahnen AG
- Electrical planning/project management: elektroplan Buchs & Grossen AG, Frutigen
- Installation of Grindelwald base terminal: Frey + Cie, Interlaken
- Installation of the Eiger Glacier station: Elektro Hunziker, Thun
- Installation of the Männlichen cableway: Consortium: Aeschimann Elektro AG, Wilderswil; Elektro Seiler, Bönigen; Elektro Wyler AG, Interlaken

From left to right: Jürg Gerber, R&M; Peter Meier, R&M; Bruno Perren, Project Manager, elektroplan Buchs & Grossen AG; Urs Siegenthaler, CIO, Jungfraubahnen Management AG.

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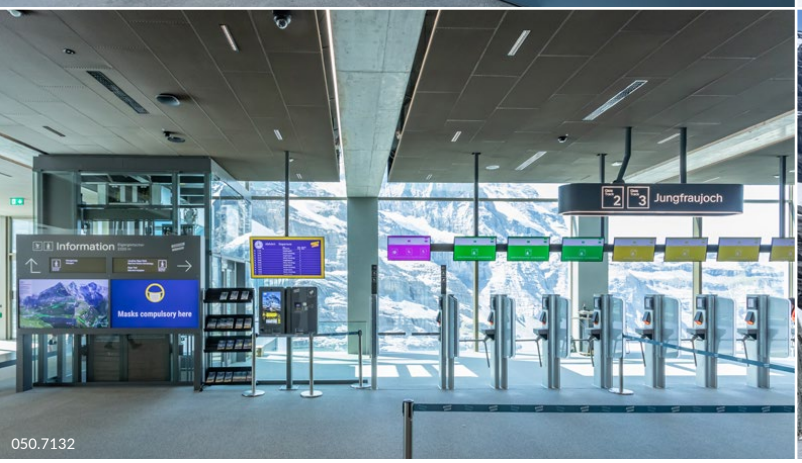

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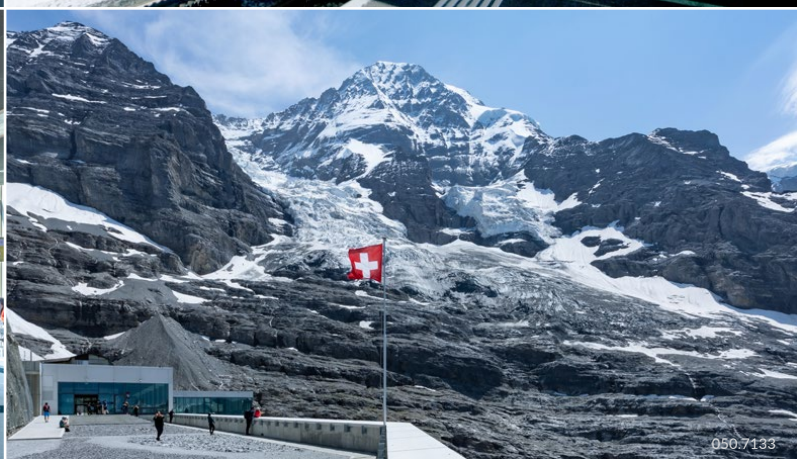
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Top performance in a megaproject

Anyone who takes on the Eiger, Mönch and Jungfrau has to deliver top performance – something once again confirmed by the multi-generational project for the new V-Cableway, the name of the overall project. Nobody was going to be stopped by storms, snow, frost or a pandemic. There were times at the Eiger Glacier when concreting was carried out in shifts of 24 hours, six days a week. Logistics required exact timing in 48-hour chunks.

After 908 days of construction, the Eiger Express went into operation a week earlier than planned. Previously, the new Männlichen cableway and part of the terminal had been completed as a mobility center.

Jungfraubahnen invested around 470 million Swiss francs in the V-Cableway project. The megaproject secures the future of tourism in the region. Even in the digital era, the Eiger, Mönch and Jungfrau can look forward to enthusiastic guests.

The V-Cableway project shows that networks can be installed smoothly even under extreme conditions. The prerequisites for this are the exemplary identification of the teams involved with the project, enthusiasm and smooth, efficient communication.


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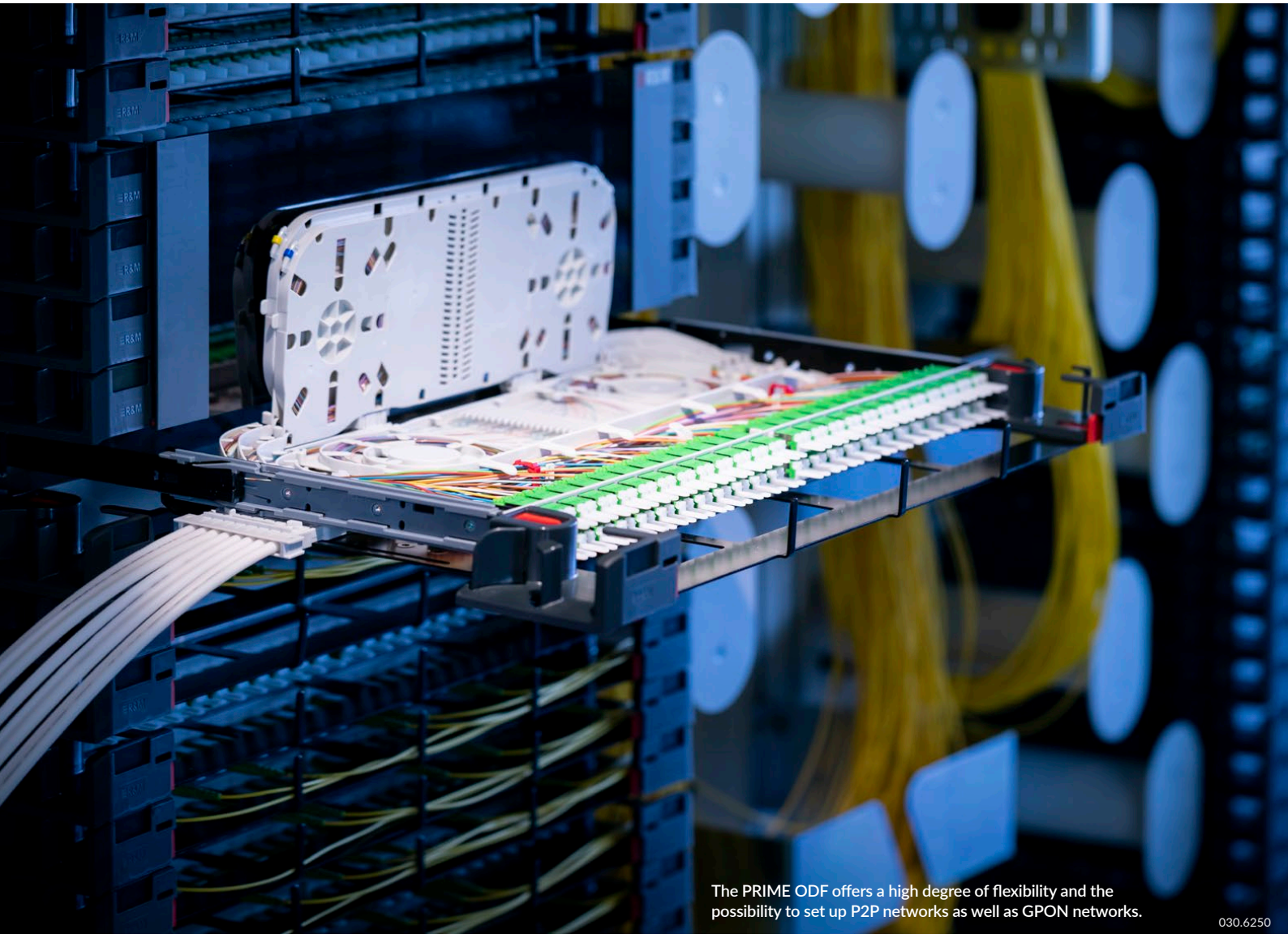
Jürg Gerber | R&M Schweiz
juerg.gerber@rdm.com


050.6814

Peter Meier | R&M Schweiz
peter.meier@rdm.com



The PRIME ODF offers a high degree of flexibility and the possibility to set up P2P networks as well as GPON networks. 030.6250

One PoP Station – **One Partner**

«One net. One point of presence. One partner.» That's the new formula for success for the accelerated expansion of FTTH networks. The R&M market organization in Germany has developed the concept and solution for it.

The expansion of FTTH broadband networks is advancing, in Germany too. But it could be progressing faster. Many regional network operators and communal utilities would be happy to have more efficient solutions.

It is particularly the construction of the points of presence (PoP) that takes time. Previously, clients had to coordinate all details, parts lists, suppliers, and assembly themselves. They had to take care of cells, pipes, channels, racks, patch panels, fiber optic cables and connectivity. They also needed to know about static and climatic conditions as well as standards to be taken into account.

With the turnkey PoP stations from R&M, everything can be mastered at once and with a single supplier. The formula is: one PoP – one partner.

Twelve steps to the goal

R&M plans the PoP stations in a streamlined process. The customer is given a draft in the very first meeting with R&M consultants. Twelve individual steps take care of costing, layout, parts lists, the timeline, expansion of the cells, logistics, and on-site assembly.

R&M has the PoP stations manufactured and expanded by several precast concrete component manufacturers in Germany and in neighboring countries. Other partners are involved in air-conditioning technology, access control and 19" racks. The passive fiber optic equipment is based on R&M's modular FTTH systems R&M*foxs* and PRIME, whereby up to 32,256 fibers can be terminated in one PoP.

The turnkey cells are transported to the construction site by flat-bed trailer and are then lifted and aligned to the defined location with the help of a crane. This on-site process takes around 30 minutes, depending on the circumstances. After the successful positioning of the PoP, construction companies only have to draw in and connect the incoming pipe braces and cables from the ground. Telecom companies install their active network technology. After that, the hub can go into operation.

The German R&M market organization is planning even faster availability in the future. The standardization inside the PoP is intended to ensure rapid availability. Other customer requirements are also to be covered: This is why R&M is also planning to offer civil engineering and complete commissioning in the future.

Key product PRIME ODF

The PRIME ODF enables very high packing density in PoP stations. R&M equips the turnkey PoP stations for FTTH networks with the entire passive fiber optic equipment and the racks for active technology. The cells are available in three standard sizes from 9 to 18 m². They can accommodate:

- 2 – 6 ODFs, R&M*foxs* and/or PRIME
- Patch cord and overlength management
- Depending on configuration, 4,608 to 32,256 fibers
- Up to 174 patchable splitter modules
- 2 – 4 active racks, size 19", 46U

The PRIME ODFs from R&M also support single fiber management if necessary (separate version as PRIME-SCM). This gives FTTH suppliers more planning freedom. Initially, they will configure the main distribution boxes to suit the requirements on site. Later, they will be able to scale the broadband service on a pay-as-you-grow basis. The PRIME ODF offers a high degree of flexibility and the possibility to set up P2P networks as well as GPON networks. Upcoming broadband technologies are just as easy to implement.

PRIME is a high-density distribution platform which can be assembled, adapted and extended like separate blocks. At maximum capacity, PRIME modules can connect up to 5,376 optical fibers in one ODF. And that is setting new standards on the FTTH market. PoP stations, building basements, main distributors, central offices as well as outdoor multifunctional housings (mini PoP) are some of the locations where the PRIME ODF is used.

Why R&M?

In addition to the complete package, R&M offers additional success factors, which make it possible to generate more and more projects with PoP stations throughout Germany.

The key factor here is the speed – in other words, how quickly can a specific project proposal be available to the customer. The information is provided in a detailed manual with custom-tailored CAD drawings. This allows customers to identify with the solution they will later find on the construction site right from the planning phase.

Another success factor is the R&M project management expertise in combination with the sales field service because an initial customer inquiry is not always already suitable for optimum operation of a PoP station. The aim is to implement a precisely adapted, specific PoP station for each customer. This also includes presenting an efficient alternative solution.

Follow-up project support is also an integral component of the R&M solution. After the successful sale of a PoP station, there are still many steps to follow – these are the responsibility of the R&M project management team. Drawings must be prepared, delivery schedules, civil engineering works, and crane stations scheduled, coordinated, and implemented before production actually begins.

Since early 2020, the R&M market organization in Germany has built up extensive know-how with numerous reference projects, guaranteeing added value in the planning and implementation of future projects.

R&M Germany delivers turnkey point of presence cells to the deployment site by flat-bed trailer. They contain everything network operators need for cabling and operating the nodes of their FO networks. This saves on building and installation work on site. FTTH projects thus progress faster.

Victor Bogdan
FTTX Project Manager R&M Germany
victor.bogdan@rdm.com

PoE: With a Cool Head to Cool Cables

Power over Ethernet is booming. According to market studies, the number of PoE ports will double by 2027. New PoE-capable devices for LANs, industry and building automation come onto the market almost daily, which is why now in particular it is all the more important to pay attention to the right cabling. Otherwise things could get dangerously hot.

The demand for PoE is growing with new application possibilities – for example in smart buildings. Power supply via data cables is ideal for operating building automation devices.

Today, countless terminal devices of the Internet of Things (IoT), room sensors, IP cameras and access points can be powered via PoE. Even PoE-capable, LAN-controllable LED lights (connected lighting) are becoming increasingly popular. IP-based networking in production – Industry 4.0 – also relies on PoE.

New construction directives should lead to a reduction in power consumption and CO_2 emissions. PoE can help to achieve the defined goals.

Four-pair PoE becomes standard

The latest PoE generation delivers power via all four twisted pairs of the data cable (4PPoE). At 90 watts, it offers more than three times as much electrical power as the previous standard – and more than six times as much as the original PoE standard.

High-power PoE has considerable consequences for structured cabling. Users should keep a cool head and not plunge into PoE applications without first planning carefully. There are a number of criteria to be considered when selecting and handling the cabling.

Cables can get hot

The first point: 4PPoE can heat cables. The greater the power transmitted, the more heat is generated. Several criteria must be considered in particular during network planning and installation: cable type, cable diameter, bundle size, characteristics of the cable duct, length of the connections.

If you plan appropriately and choose suitable products, your cabling system will be able to withstand higher temperatures. The PoE Calculator from R&M helps you to find the right solution. One of the most important preventive measures is to plan shorter links. The shorter the cable link, the less resistance, heating and attenuation losses during data transmission.

Take spark erosion into account

The second point: connectors. When a connection is cut under load, sparks are generated. Spark erosion can damage the spring contacts in the adapters. The greater the power transmitted, the greater the risk. Whether an RJ45 jack is affected depends on its mechanical construction and the contact design. These characteristics should be taken into account when selecting a product and specified accordingly.

Consider the connection technique

Thirdly: The connection technique and quality of the signal conductor can also have a major influence. In extreme cases, the connection deteriorates over time. Therefore, the advantages and disadvantages of the two prevailing wiring technologies should be taken into account when selecting a product.

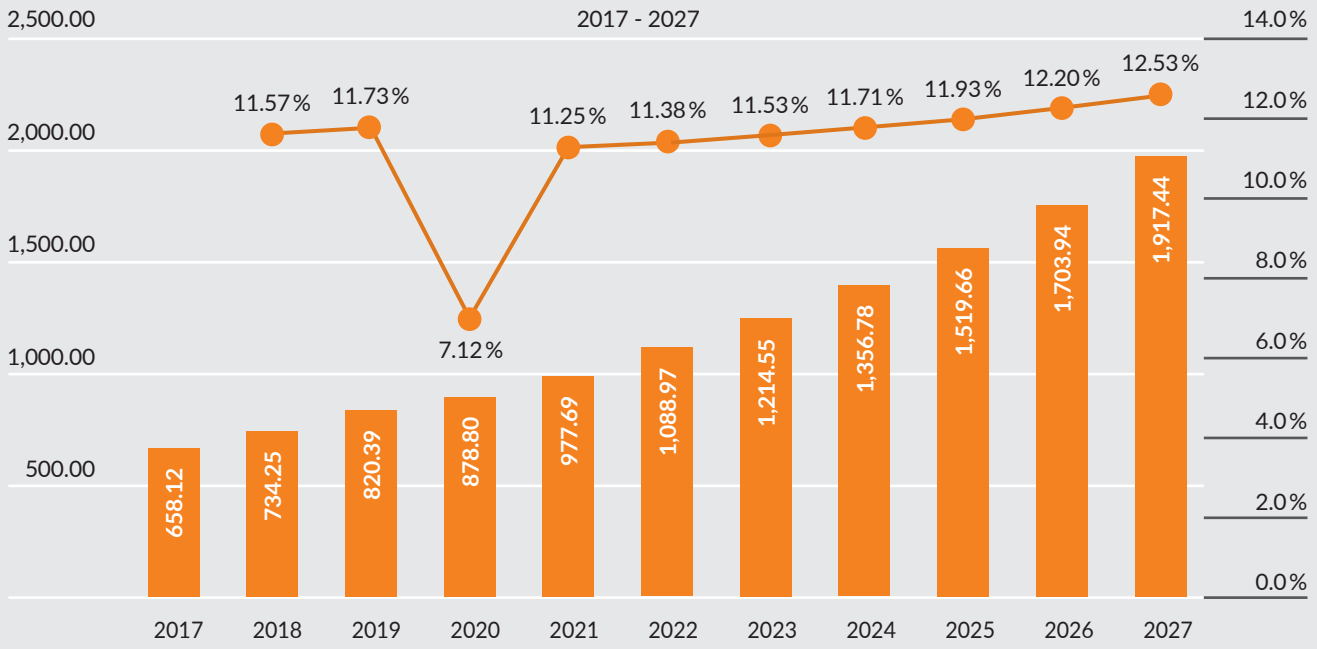
– The insulation piercing contact, IPC, which is frequently used in patch cords, is unstable over the long term. The connection may become loose if the material ages or as a result of cable movements. The contact resistance between the contact mandrel and the stranded wire increases, and with it the danger of heat developing and contact loss in the connector.

R&M a leader in PoE

Power over Ethernet (PoE) is rightly creating great expectations. This technology opens the door to smart buildings and Industry 4.0. R&M is dedicated to PoE development and, as a pioneer of IDC wiring technology, is setting new standards here as well. The company's position as a technological leader in the PoE area is being continuously expanded. This has been underpinned by various activities in 2021:

- **PoE Calculator:** The revised PoE Calculator simplifies the input of the size of cable bundles as well as data in accordance with ISO/IEC 14763-2 and EN 50174-2.
- **Demonstrator:** The new tool demonstrates heat generation in cables when using PoE. R&M uses it for training purposes.
- **PoE display:** R&M has developed a PoE Indicator that shows whether cabling links are equipped with PoE.
- **Special cables:** R&M is introducing special installation cable programs with higher wire diameters and better temperature resistance.

Power over Ethernet Market – Revenue and Forecast to 2027
(US$ Million)



Source: The Insight Partners Analysis

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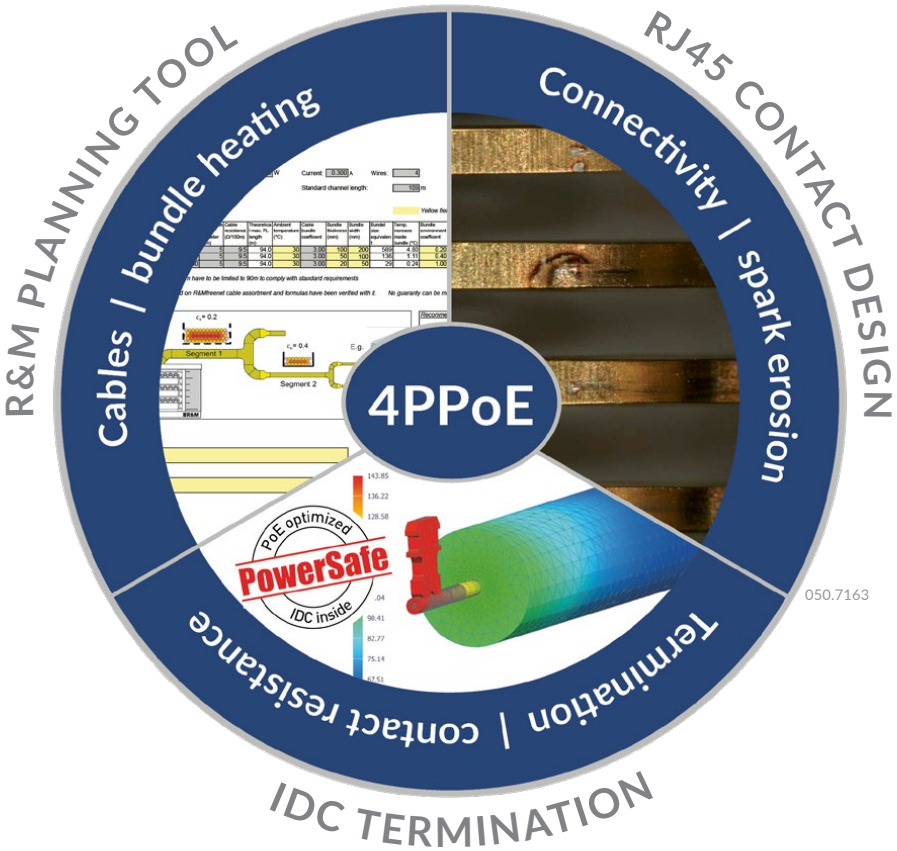
The PoE market is growing at an annual rate of 11% to 12%.

– Insulation Displacement Contact (IDC) ensures consistently high contact quality over the entire service life of the product. In IDC, a fork-shaped spring contact clamps the wire. The contacts cut through the insulation and press the stranded wire at the side. This makes the connection permanently resistant to tension and vibration, dust tight, water- and gas-tight, and corrosion-free.

Recommendation from R&M: IDC should be chosen for channels with continuous, high PoE performance and for the use of 4PPoE. Patch cords with IDC termination ensure reliable long-term connection security.

Standardization has responded

The international standard-setting bodies have recognized how important the topic of PoE has now become. The cabling installation standards (ISO/IEC 14763-2 and EN 50174-2) have been expanded by the remote power supply categories RP1 – RP3. The various categories define what is necessary before installation and during operation in order to be able to operate cabling safely with PoE. Operators of cabling installations will have to consider how to operate PoE in their own buildings. R&M is happy to help with the evaluation.



Three «hot» factors influence cabling with 4PPoE: Heating of cable bundles due to current carrying, spark erosion when unplugging, contact resistance at the wire contact. Using the PoE Calculator and the PoE-optimized connectivity technology from R&M, users can set up the infrastructure for safe high-power applications with long-term stability. Graphic: R&M

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

youtu.be/RG4m-SFulZY

PoE Indicator from R&M

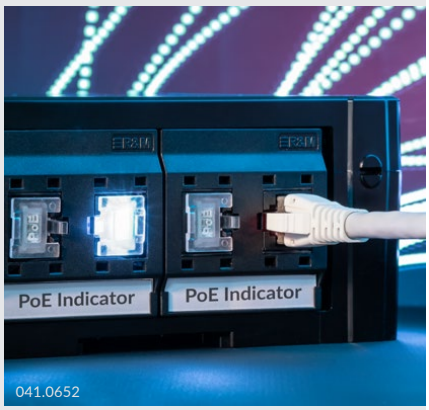
PoE is increasingly being used in the office environment. However, not every port or outlet automatically provides PoE. How can users find out where they can plug in a PoE device?

They would have to check the network documentation or take a direct look into the floor distributor or try out several outlets. This takes time and can be frustrating.

The PoE Indicator from R&M eliminates the search. The accessory part is inserted into the outlet port like a dust cover. It contacts the signal pins and detects whether current is flowing or whether a PoE-capable network device (PSE) is waiting at the other end of the connection. A flashing LED in the indicator shows that the port provides PoE.

The patent-pending PoE Indicator fits all R&M RJ45 jacks. It is particularly useful for moving and maintenance projects in office and IT environments. Users can see at a glance which outlets they can use for new or additional PoE terminals.

The PoE Indicator signals whether a port is connected to power source equipment.



Matthias Gerber
Market Manager LAN Cabling
matthias.gerber@rdm.com

Understanding
the Edge

An edge data center is not a server cabinet with a few patch cords. It is all about a new dimension of functional diversity in the smallest of spaces. It calls for a new understanding of infrastructures. Here are a few aspects that really count.

All conceivable interests meet directly in the data center at the edge. Some users only need a rack or even share it with others. Larger customers expect independent cloud services or alternative colocation packages. Others are looking for an operations base for 5G.

Sometimes an air-conditioned building is available. Sometimes a container outside forms the shell. The edge certainly calls for a paradigm shift on the part of infrastructures.

High density

Ultra-High Density (UHD) is a key term. More than 100 ports per rack unit and hybrid capabilities would be desirable for the future. The patch panels should enable media and application mixes and be usable in harsh environments.

Edge providers will be successful if they can master all variants concurrently. Maybe a customer is planning a modest 40 Gigabit Ethernet. At the same time, another expects the host to pave the way to 400 Gigabits during operation. R&M demonstrates solutions with the Netscale family.

Central management

Edge data centers should basically be able to be managed centrally and remotely. It would not be financially viable to keep expert personnel available at each site. This is why the DCIM system must offer control and intervention options similar to those of an in-house data center.

The standards include real-time monitoring, performance measurement, resource management and security functions. Intuitive tools for quality, asset and lifecycle management, risk assessment, predictive maintenance, and cost control should be available.

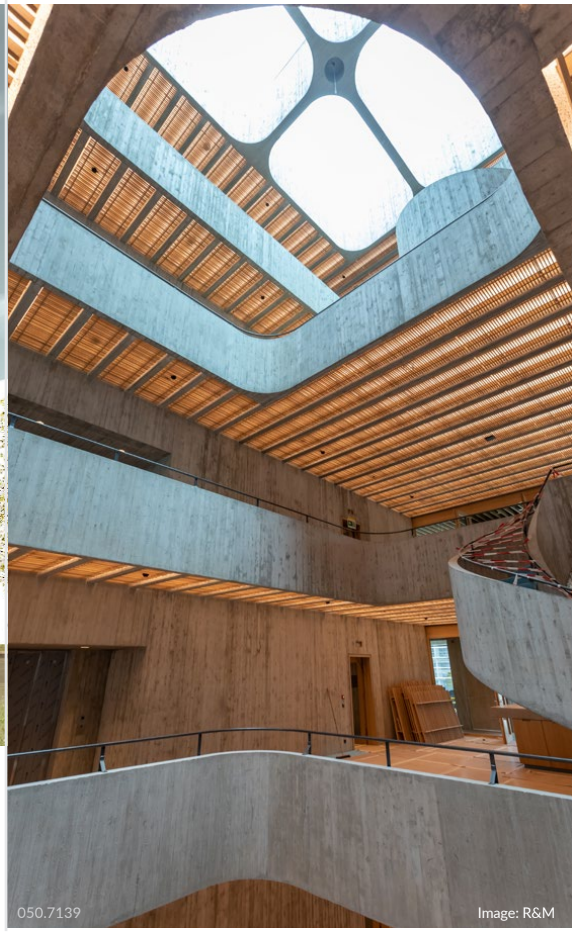
Possible distribution of edge data centers in a town

Data Center Infrastructure Management with R&M*inteliPhy*

It is crucial to fully integrate the passive network technology into the DCIM system. Operators need digital and up-to-date information about each port and each link. For example, they must be able to locate performance losses in the data network immediately and precisely in order to prevent disasters.

This potential lies in R&M's DCIM software inteliphy net. Connection with the AIM system R&MinteliPhy is essential for keeping the network under control.

Carsten Ludwig
Market Manager Data Center
carsten.ludwig@rdm.com



«Belo Horizonte» – the new Swiss TPH building in Allschwil near Basel – opens up new horizons for health.

New Horizons
for Health

Whether malaria, tuberculosis or coronavirus, recalcitrant diseases threaten people's health time and again. The Swiss Tropical and Public Health Institute in Basel is helping to combat these diseases more quickly and effectively. In the new «Belo Horizonte» building, the institute will be able to fulfill its mission better than ever. A robust, multifunctional network supports the mission.

«We are extremely excited about our new home,» says Jürg Utzinger, Director of the Swiss Tropical and Public Health Institute (Swiss TPH). «The new building combines state-of-the-art laboratories, education and work spaces in a unique way and will enable us to better fulfill our mission to improve the health of people around the world.»

Architects Philipp Kunz and Renato Mösch combine this mission with timeless aesthetics and a far-sighted design. They call their masterpiece «Belo Horizonte» – an allusion to the architect Mendes da Rocha and to the home of modern architecture, the Brazilian city of Belo Horizonte (beautiful horizon).

Espazium, the Swiss magazine for building culture, declared: The architecture stacks research, teaching and services individually on top of each other and combines them in a way that promotes interdisciplinary exchange.

Partner for innovation

In this sense, new horizons for improving people's health are emerging here – in Basel, Switzerland and all over the world. For example, the Swiss TPH has been cooperating with the Basel-based biotech start-up RocketVax since June 2021. The partners are developing vaccines for the future.

«With R&M we were able to optimally implement our holistic plan.»

Roger Brogli, Electrical Project Manager, Pro Engineering AG

«The R&M network guarantees high availability and maximum data throughput.»

Alain Bertolotti, Head of IT, Swiss TPH

The new home of Swiss TPH is situated on the BaseLink site in Allschwil, just outside Basel. This will be a new life sciences hotspot with more than 6,000 workplaces. Swiss TPH is one of the largest investors. Seven previously separate locations are now being united under one roof.

Multifunctional building

The multifunctional new building with a green facade was completed in fall 2021. All staff and students will have moved in by March 2022. It offers up to 725 workplaces and 150 laboratory spaces on around 13,000 m^2 of usable space and six floors. In addition to offices and laboratories, the building also houses a library, auditoriums, training rooms and a data center.

A resilient and multifunctional data network had to be created to cope with the wide range of tasks that Swiss TPH unites under one roof. For example, with their frequently changing projects and devices, laboratories have different connectivity requirements than office workplaces.

A robust LAN required

The IT unit of Swiss TPH also called for a state-of-the-art data network. «Our tasks extend far beyond the conventional IT spectrum,» explains Head of IT Alain Bertolotti. This unit is responsible for management, engineering, consulting, support, processes as well as the maintenance of the IT and communication infrastructure, provides support for international projects and trains specialists.

Reasons for choosing R&M

- Material quality
- All-in-one solution
- Expert advice
- Support in product selection
- Collaboration within the project
- Pre-terminated racks
- Just-in-time delivery

Furthermore, it is also responsible for the operation of the in-house data center. It provides special applications for data storage, content and document management, as well as a collaboration platform. Up to 900 users at Swiss TPH's headquarters and 25 offices worldwide expect reliable data transmission for their research, teaching and service activities.

The R&M solution

The holistic concept for structured cabling systems in the new Swiss TPH building was implemented with R&M*freenet*, supplemented by automated infrastructure management with R&M inteliPhy.

The LAN connects the office environment, laboratories, auditoriums, training rooms, the data center and building technology.

It comprises:

- Backbone with 10 km fiber optic cable
- A horizontal network with 190 km Cat. 7_A copper cable
- 5,000 plug connections with Cat. 6_A modules
- 10,000 Cat. 6_A patch cords
- 100 racks for building distributors and data center

R&M developed an all-in-one concept for the data center. It includes rack housings, panels, internal cabling with cable management, PDUs, rack-series cooling systems and monitoring with R&M inteliPhy.

The infrastructure management system R&M inteliPhy monitors all network areas in the building.

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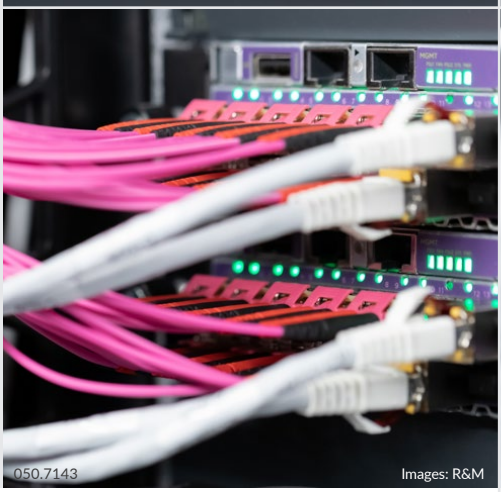
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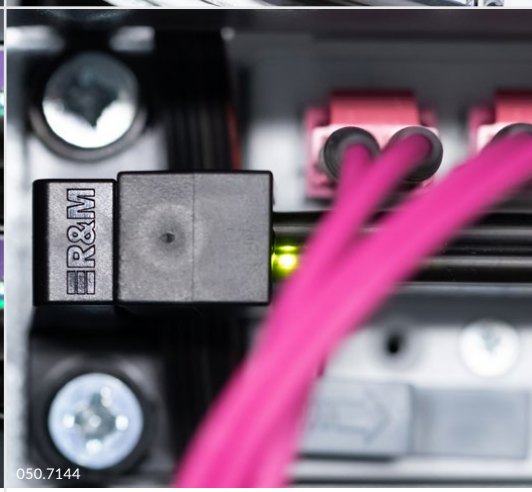
Images: R&M



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«Communication with R&M works smoothly.»

Marco Erbsmehl, Head of Installation, Jaisli-Xamax AG

Swiss TPH

The Swiss Tropical and Public Health Institute (Swiss TPH) is a world-renowned institute in the field of global health with a particular focus on low- and middle-income countries. Associated with the University of Basel, Swiss TPH combines research, teaching and services at a local, national and international level. More than 800 people from 80 countries work at Swiss TPH in areas such as infectious and non-communicable diseases, environment, society and health, as well as health systems and programs.

Swiss TPH covers the entire value-added chain from innovation to application to solve global health problems and strengthen public health systems. The interdisciplinary approach is considered unique.

The international teams research infectious and tropical diseases and test diagnostics, drugs and vaccines. Swiss TPH devotes great attention to social and ecological impacts on health with the aim of developing public health systems accordingly.

Last year, the portfolio included over 300 active projects in 135 countries. Swiss TPH employs 868 professionals, including 694 in Basel and 174 in the 25 offices worldwide (2021).

Swiss TPH works closely with scientific partners, health organizations, such as the WHO, industry and sponsors. It is supported by the cantons of Basel-Landschaft and Basel-Stadt. The institute is an institution associated with the University of Basel.

www.swisstph.ch/en/

Cabling from a single source

Pro Engineering AG as electrical planning engineer and Jaisli-Xamax AG as installation partner impressed with a plausible overall concept for the desired multifunctional network. Everything was to come from a single source:

- Structured cabling for buildings, IT, offices, laboratories and data center
- Connection to the public broadband network
- System for monitoring the network infrastructure throughout the building

«We were free to choose our products and opted for R&M. With R&M, we were able to optimally implement our holistic approach,» says Roger Brogli from Pro Engineering. R&M developed the cabling of the data center directly with the customer.

Direct support from the supplier from the tender to acceptance was very important to the planning company. R&M was available at all times throughout the entire project with support, advice on design, planning and product selection. «Communication with R&M works smoothly,» confirms Marco Erbsmehl of Jaisli-Xamax.

Just-in-time deliveries were agreed due to the tight schedule. In addition, R&M delivered the racks to the construction site pre-terminated in order to minimize the installation effort on site. The project was implemented on time and according to the customer's wishes.

From left to right: Alain Bertolotti, Head of IT, Swiss TPH; Matthias Kummer, R&M; Roger Brogli, Electrical Project Manager, Pro Engineering AG; Marco Erbsmehl, Head of Installation, Jaisli-Xamax AG.

Daniel Gyger | R&M Switzerland
daniel.gyger@rdm.com

SPE for Smart Buildings
and Industrial Automation

Single Pair Ethernet cabling from a single source! R&M is the first manufacturer to achieve this goal. A complete cabling system for smart buildings and industrial automation is now available on the market.

The new Single Pair Ethernet (SPE) network technology expands the cabling possibilities of local data networks (LAN) and structured cabling systems. It requires just two instead of eight copper wires for signal and data transmission or one wire pair instead of four. As a result, SPE cables are thinner and the connectors smaller than their traditional counterparts on the RJ45 cabling side.

The advantages of miniaturization: SPE cabling requires very little space and reduces the potential fire load. It can be installed discreetly everywhere in the building. The small connectors can connect a large number of devices in the tightest of spaces.

As a result, SPE has become a key technology for smart buildings. Thanks to its large transmission ranges, SPE brings the Ethernet/IP protocol to the remotest corners of a campus or building. SPE cabling links the digital terminal devices and sensors in buildings with data networks and the Internet, resulting in the Internet of Things (IoT).

SPE portfolio from R&M: Patch cords and connector systems in compliance with LC-Cu and MSP standards can be combined with panels and outlets from the R&M*freenet* range.

SPE in the building: All over IP

R&M is convinced that the future belongs to smart buildings. Building management will be digital and IP-based throughout. The trailblazers are new network structures such as digital ceiling, expanded with Single Pair Ethernet for the cabling of the last meters or the connection of remote areas. This allows all areas of building automation to be integrated in a structured solution concept.

SPE can network countless digital terminal devices. A few examples:
- Smart LED lights and indicators
- Cameras, monitors, access control
- Temperature, light and climate sensors
- Heating and ventilation controllers and regulators
- Self-service terminals

R&M sees a wide range of possible applications in industrial parks, office centers and administrative facilities.

Use in the digital ceiling

Digital ceiling, structured digital ceiling cabling for building automation, is initially the largest area of application alongside industrial automation. Starting with floor distributors or service outlets in the ceilings, SPE cabling can spread a long way. The SPE system from R&M offers a transmission range of 600 meters. The range depends on whether a remote power supply is used and at what performance level.

R&M is the first manufacturer to introduce a complete SPE cabling system for the entire route from the distributor to the outlet. R&M offers two connector systems: LC-Cu in compliance with IEC 63171-1 for structured cabling systems and building automation, and MSP in compliance with IEC 63171-2 for the industrial environment. The new products can be combined with existing R&M outlets and 19" panels.

www.rdm.com/single-pair-ethernet-spe/

Matthias Gerber
Market Manager LAN Cabling
matthias.gerber@rdm.com

Universal Use:
FO Field

The more fiber optic cabling spreads, the simpler the installation technology has to become. Installers should be able to establish FO connections at any location in the blink of an eye. Why should they have to wait for fiber optic specialists and splicing equipment?

Field-terminable fiber optic connectors, such as the FO Field from R&M, help installers to create the desired connectivity everywhere. The FO Field allows them to work independently, spontaneously, quickly and economically. This means they can make faster progress with fiber optic connections in every building.

R&M is continuously optimizing the development of the FO Field. The goal is to further simplify fiber optic cabling. From 2022, the FO Field – initially the SC connector – will also cover butterfly cables. The modified connector type is compatible with the flat cable design and is just as easy to install as the types introduced previously. This means that the FO Field family is complete for the time being.

With their 2x3 mm profile, butterfly cables or drop cables differ significantly from the structure of classic round cables. Butterfly cables guide the strain relief in the wings. In round cables, the aramid strain relief is on the inside. The flat cable design makes it difficult to clamp the wire. R&M has developed a reliable clamping system.

High transmission performance

The FO Field is available as an LC or SC connector with APC or PC contact, and comes in green, blue and beige. The mechanical and optical properties correspond to the quality of prefabricated and factory-tested connectors. The transmission requirements of singlemode performance levels Grade $C_f/1$ (APC) and Grade $C_f/2$ (PC) and multimode performance level Grade $Bm_f/3$ are met. The FO Field is compatible with all types of cables with diameters of between 1.4 and 3 mm. Its high stability also qualifies it for possible use in areas outside controlled room temperature.

More for less

The FO Field is becoming the new favorite among installation engineers. Demand is increasing. Higher quantities and process optimization are enabling R&M to make the connector available at improved conditions.

As a result, the connector can also be increasingly used in operational areas requiring large quantities and low costs, such as the connection of residential buildings. Another step toward fast Internet for every home.

www.rdm.com/fo-field/

Daniel Eigenmann | Product Manager
daniel.eigenmann@rdm.com


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R&M

All Set for **Aerial Deployment**

In future, Fiber to the Home will come more frequently through the air in remote locations – just like electricity and telephone used to. Because aerial deployment is faster and more cost effective than underground cables. R&M provides everything for network operators to be able to take this alternative route.

In some rural areas there is a painful lack of fiber optic broadband service. Now things are getting moving in this area of network expansion – with above-ground aerial deployment. The telecoms industry and public financiers are increasingly recognizing the advantages of this model.

FTTH can be rolled out quickly and comparatively inexpensively along old routes. It is easy for network operators to hang fiber optic cables on existing masts and facades. They can also use some of the infrastructures of telephone companies, electricity utilities, property owners and municipalities.

Suitability for outdoors is decisive

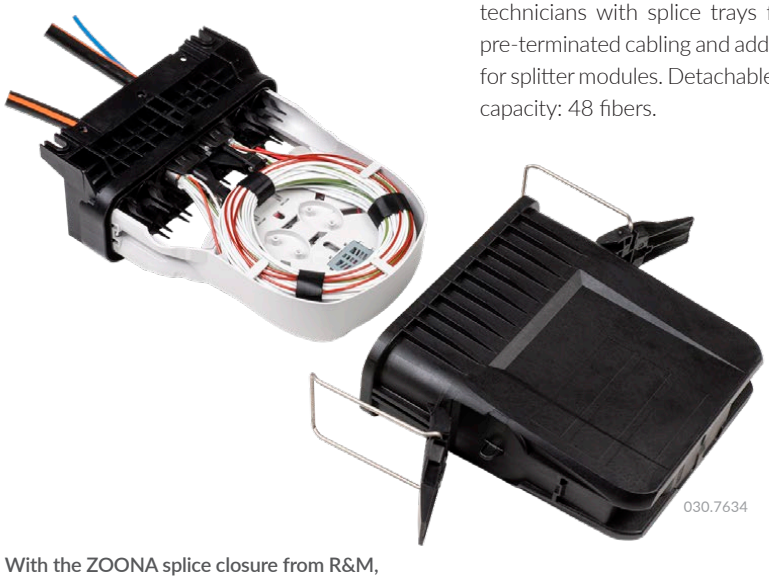
However, this requires more than self-supporting fiber optic cables and fastening technology. In addition, distribution boxes suitable for outdoor use, small splice closures for mounting on masts and buildings, connectivity with protection class IP67, pre-terminated cable sets, drop cables and boxes, application-specific terminals and much more are required.

050.7146

R&M is currently building up a corresponding portfolio for such aerial deployment.

- Flat ADSS cables for outdoor lines: They have a span of 70 meters. Inside, they accommodate loose tube cables with six or twelve fibers.
- The tried and tested SYNO dome closure family is being supplemented by a new, compact multifunctional access platform (the «ZOONA splice closure», due to be launched in 2022). Its modular floor accommodates pre-terminated multi fiber distribution cables and single fiber drop cables. The splice closure also provides technicians with splice trays for half-side pre-terminated cabling and additional space for splitter modules. Detachable connection capacity: 48 fibers.
- The «RIO» distribution box was also designed for uncomplicated outdoor installation in harsh environments. Detachable connection capacity: 16 connectors, 48 splices.
- The smaller variants of the Polaris box family (Polaris 4 and 6) serve as possible termination points on the building. Drop cables pre-terminated on both sides as well as pre-terminated on one side can be terminated in the box by the customer using splice or patch.

R&M configures the FTTH units individually according to the needs of the network operators and network topology or optimizes them to suit a particular location. In addition to the aerial deployment range, R&M offers decades of experience with FTTH rollouts under harsh conditions.



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With the ZOONA splice closure from R&M, telecom companies can expand FTTH access networks faster.

050.7012

Thomas Ritz
Market Manager Public Networks
thomas.ritz@rdm.com

Fiber Optics **for the Climate**

When it comes to protecting our atmosphere, fiber optics is a good choice. The CO_2 emissions caused by modern broadband provision can be curbed with Fiber to the Home (FTTH).

Broadband networks require electrical energy. The data doesn't come into your home under its own steam. Access networks account for 70% to 80% of the power consumption in this sector. This is often forgotten in everyday life.

When broadband connections work smoothly, nobody really thinks about them anymore. But from the central office to the subscriber, electrical systems are working around the clock to deliver data to homes and transfer it back to the Internet. Each appliance indirectly contributes to greenhouse gas emissions.

Two to three percent worldwide

Telecommunications services today already consume two to three percent of the energy generated worldwide. Data traffic continues to increase, for example through video streaming or teleworking. Data transmission can account for up to 80% of the power consumption of video streaming.

So is broadband provision at odds with climate protection?

Not in the case of fiber optic cabling. A report from the German broadband association BREKO from January 2021 states: Based on energy consumption per bit rate, copper-based networks (VDSL2 vectoring, super vectoring) consume up to seventeen times more electricity than full-fiber networks. Unbeatable energy efficiency.

BREKO published this together with europacable and the FTTH Council Europe. The report is based among other things on a study conducted by TH Mittelhessen University of Applied Sciences in May 2020.

More powerful than copper

Fiber optic networks require virtually no electricity for the journey from the PoP to the subscriber. At the same time, they are able to transfer more data faster over longer distances to the most remote places. FTTH networks could even accommodate the data traffic from 5G antennas around them if they were configured for this purpose.

Power consumption plays a role for broadband providers not only for climate protection reasons, but also for cost reasons. The industry consultants at WIK Consult have calculated that switching off copper saves 60% of energy costs.

BREKO adds: Fiber optic networks are more reliable than copper-based alternatives with fewer service interruptions, fewer failures and lower maintenance costs. This also saves energy. R&M supports network operators with solutions that are already ensuring high efficiency in the planning and construction phase.

It should also be noted that according to the International Energy Agency (IEA), the overall energy intensity of the data networks is halved every two years. What remains is the power consumption of the subscriber devices, whether routers or TVs. Their energy efficiency increases 2.7-fold each year.

Verizon's fiber optic comparison

Network operator Verizon determined the cost advantages of its FO networks in the US.

- Overall balance: 60% cheaper than copper
- Real estate: 60% to 80% cheaper
- Power consumption: 40% to 60% less
- Reliability: 70% to 80% better
- Maintenance, vehicles: 40% to 60% less

Sources: BREKO, IEA, Verizon

Robert Merki | CTO
robert.merki@rdm.com

The Right Feel
for the Market

São Luís guarantees a good time. After all, it is Brazil's reggae metropolis. Relaxed and passionate at the same time – the city pulsates. Something that could also be said about Wiki Telecom. The provider based in São Luís guarantees a relaxed future to their clients with super-fast Internet. New data centers give them the right sound.

Totally relaxed, but unwavering. This is how the young Internet service provider Wiki Telecom presents itself in northeast Brazil. Paulo de Tarso Bayma Filho founded the company in 2010. He is doing pioneering work in São Luís and the state of Maranhão. Wiki consistently relies on new fiber optic networks and GPON technology. The provider covers most of the market in Maranhão and other states in Brazil, such as Piauí, Ceará, Pará, Rio de Janeiro and São Paulo.

Paulo Bayma initially composed services exclusively for business customers, the government and authorities. These included dedicated, secure Internet lines, VoIP, cloud and remote applications.

Stable lines needed

Word of Wiki's talents got around. Fans were looking for stable cables and lines so they could use the Internet without any worries. That's why Wiki opened up to the broad market. The provider developed a keen sense of the wishes of private subscribers and accelerated the pace of product development.

As of 2021, its repertoire for the public market now includes: fiber optic connections, fixed network telephony and WiFi, generous Internet packages and Full HD TV with 120 channels.

Wiki is constantly expanding its sales area. It now extends over the entire northeast of Brazil and is also moving into the southern metropolises of Rio de Janeiro and São Paulo. In the state of Maranhão, Wiki supports the state project Maranet, which provides the population with free Internet access.

Fiber optic networks growing

The rapid expansion of Brazilian fiber optic networks is a welcome benefit to the provider. Wiki has access to 12,000 kilometers of fiber optic lines serving more than 250 regions. In the northeast, Wiki Telecom operates its own, 3,000-kilometer 100-Gbit network. It covers the states of Piauí, Maranhão, Ceará and Pará.

Wiki is also passionately dedicated to commercial customers. The provider promises: «Your network grows with your company.» The dedicated links can be scaled almost indefinitely and made available exclusively and immediately in every region.

In-house data center

Wiki is rapidly expanding and updating its portfolio of IP and hosting services to meet the needs of large companies and government agencies. Most recently, services such as software-defined data centers (SDDC) and the private cloud have been introduced. With

«R&M offers support that meets the needs and expectations of Wiki Telecom. The following points are worth mentioning: cable quality and fiber organization, which minimizes the space required.»

Marcos José dos Passos Sá, Data Center Director, Wiki Telecom

service and quality, Wiki aims to gain further market shares and new market segments in the northeast. The growth target is 30%.

The wave of success motivated Wiki to make further investments in spring 2020. Undeterred by the pandemic, the management team decided to move into new headquarters and set up their own data center there. It was urgently needed to meet demand.

They chose Mocelin Tower in the center of São Luís. It offered good underlying conditions for a service provider and access to FO networks.

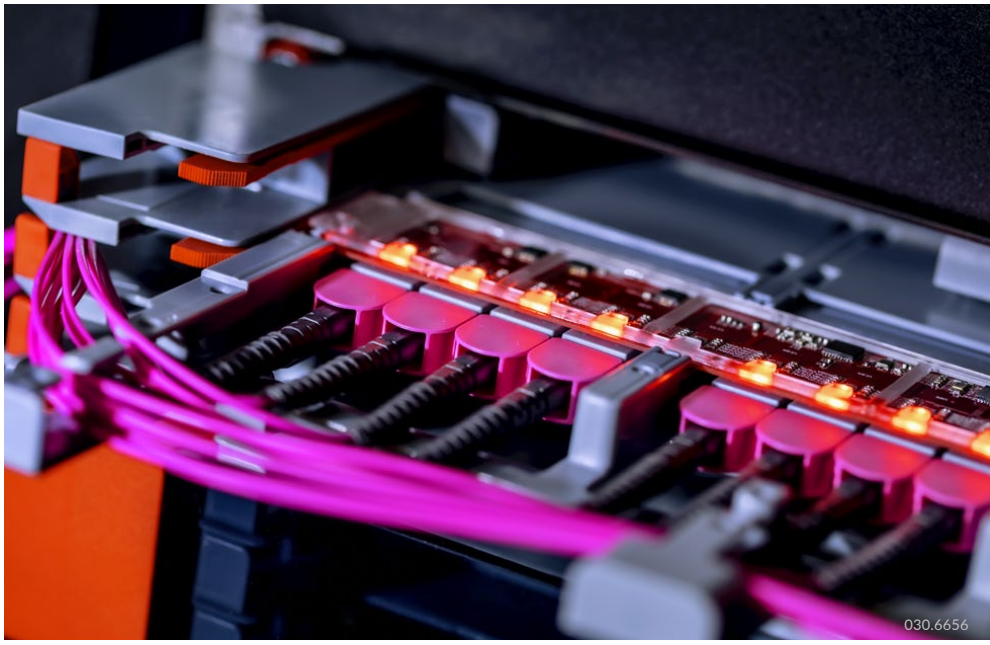
Rapid speed, rapid implementation

The management selected the technologies and suppliers for the data center in short, highly efficient evaluation procedures. In July 2020, R&M came into play as a partner for network technology. By this time, the racks and cooling systems had already been installed. Seven months later, the first section of the data center went into operation. A second one is to follow. Further data centers are planned.

Why R&M?

- Intensive customer care
- Expandable system
- Excellent quality
- Domestic production
- Delivery on time
- Exemplary references
- R&M and partners nearby

f.l.t.r.: Marcos José dos Passos Sá, Data Center Director, Wiki Telecom; Rodrigo Maschi, R&M Brazil; Paulo Bayma, CEO Wiki Telecom.



«With R&M and Integrar, we certainly reached our goals.»

Paulo Bayma, CEO Wiki Telecom

The decisive factor was the quality of support from the R&M team and the certified R&M partner Integrar, who in particular understood the customer requirements and provided a solution that fully met the customer's expectations.

Logistics in Brazil challenged a customer-oriented manufacturer such as R&M. The distance between the R&M plant in Santa Rita do Sapucaí and the Wiki site in São Luís is 2,900 kilometers. This was compounded by travel restrictions as a result of the pandemic. That is why the R&M consultants mostly managed the project remotely. Integrar boss Renato Christ personally monitored the installation work. Together they were able to meet the R&M quality standards, the project's tight timing schedule and the deadlines.

The R&M solution

- Fiber optic trunks: SM and MM-OM4 cables with MPO and SC/APC connectivity on the scalable/migration-capable, high-density FO platform Netscale 72, variant Base 12.
- Copper cabling to active equipment: Warp cables, connectivity: Cat. 6_A EL UTP.
- The Brazilian R&M manufacturing facility assembled customized, ready-to-install MPO and SC trunks.

FTTH is standard

The Brazilian broadband market is growing exorbitantly. According to Statista, the number of FO connections increased by 20% in the second half of 2020. According to the government, 99% of all municipalities will be supplied with fiber optic networks by 2024.

Fiber to the Home (FTTH) is standard for 89% of Brazilian Internet service providers. Two thirds of providers deliver a download rate of more than 100 Mbit/s.

Rodrigo Maschi | R&M Brazil
rodrigo.maschi@rdm.com

New Fiber Unit for PRIME
with Single Fiber Management

Two modules for single fiber management are expanding the PRIME range. The Single Termination Unit (STU) and the Single Splice Unit (SSU) help network operators to implement the two- and four-fiber model in a central location and thus round off the PRIME symphony.

Two years ago, R&M successfully introduced the new generation of optical distribution systems to the FTTx market. The compact and versatile PRIME ODF racks and modules exactly meet the cabling needs of network operators. The PRIME ODF particularly demonstrates its advantages in cramped locations, such as street cabinets, PoP stations and building basements. It can also be used successfully in data centers.

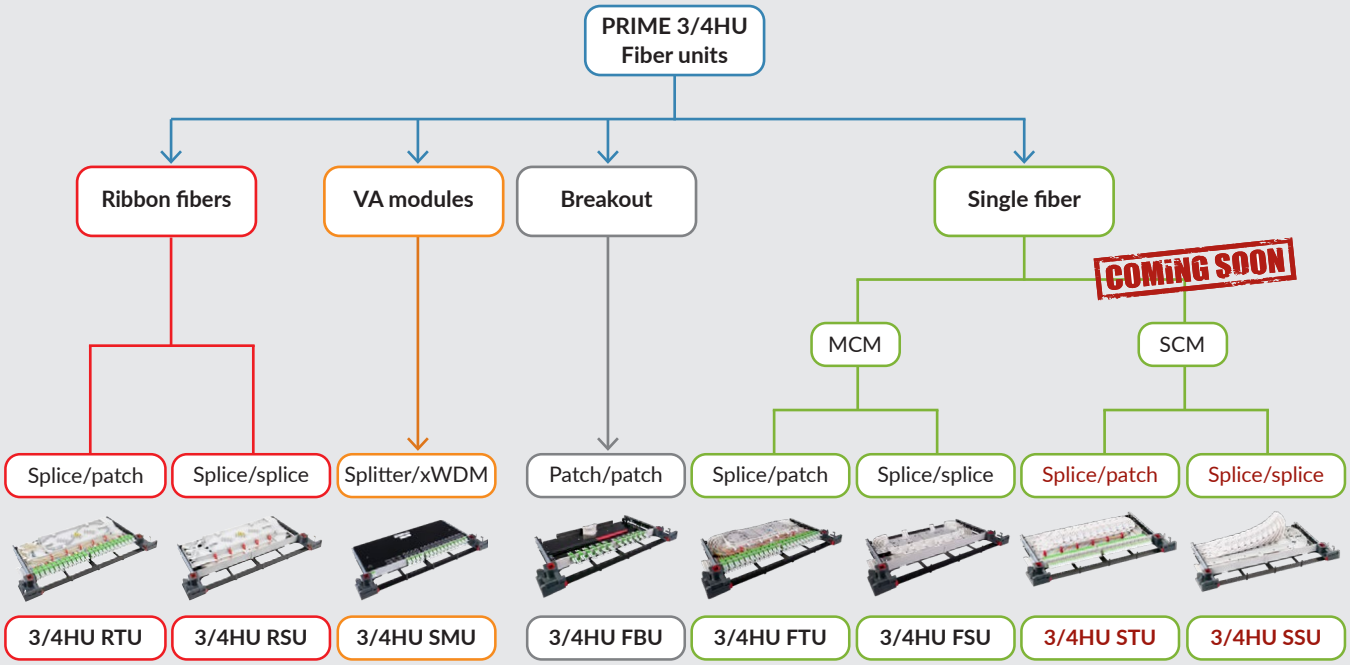
Up to 384 LC connectors on three units

Four PRIME platforms cover the standard requirements. These are fiber units at 3/4 height for splice patch cords as well as pure splice, splitter and breakout cabling. In combination with the 1U and 3U sub-racks, they form the core of the PRIME distributors. Up to 192 SC or E-2000™/Simplex or 384 LC connectors fit on three height units.

R&M has also developed a PRIME platform at 3/4 height for ribbon fiber cables: the termination and splice inserts RTU and RSU for eight- and twelve-fiber ribbon fibers. With these cables, telecom companies are accelerating the expansion of FTTx networks. Splicing costs are reduced massively in comparison to conventional central loose tube cables. Existing conduits can accommodate even more fibers.

PRIME SCM – Overview of the range of fiber units

PRIME SCM & SSU for single fiber management



Graphic: R&M

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Two- and four-fiber model

These are now followed by the PRIME ODF Single Termination Unit (STU) and Single Splice Unit (SSU). They offer network operators the opportunity to manage individual fibers or subscribers in twelve dedicated FMTS Compact splice trays. For example, the new inserts support the two-fiber and four-fiber concepts for access networks.

- The PRIME STU is a combined 3/4U fiber unit with a capacity of 48 plug connectors (LC-D, SC or E-2000™).
- The PRIME SSU is used for cable-to-cable splicing of the fibers. Each tray holds up to four fibers. ANT or HV splice contactors protect the fibers.

The drawer holds twelve miniaturized SCM splice trays (SCM = Single Circuit Management). R&M has also redeveloped the splice trays. They follow the principle of tool-free assembly. It only takes a few steps to attach them.

Technicians will find it easy to keep track:

- Incoming and outgoing fibers are cross-over-free in the guides of the fiber unit.
- Each tray has only two or four fibers. The fibers can be identified at a glance.
- The two-fiber and four-fiber concepts build on existing network architectures. This eliminates the need for additional documentation.

A better overview means smart single fiber management, error-free assignment and splicing, simple and fast maintenance, increased operational reliability.

Working quickly and safely

The movable fiber channel (moving channel) guides the incoming fibers directly into the protected splice area. The pull-out mechanism is fully integrated into the drawers. Snap-in positions ensure they are fixed for splice, patch and maintenance work. This stable foundation enables technicians to complete their tasks quickly and routinely. This also contributes to operational reliability.

The sub-racks for STU and SSU inserts are easy to install in existing racks. The PRIME range offers fastenings for 19" and 21" racks. For STU and SSU there are side and rear cable entry guides for the rack variants. For the existing fiber connection block, R&M is supplying a new mounting plate on which up to three NW7 or NW 10 transport hoses can be fastened tool-free.

PRIME ODFs are suitable for various FTTx scenarios and network terminations. They enable quick and easy installation in environments with little space as well as in locations with high fiber density. The tool-free system approach and the modular principle ensure uncomplicated migration into new and existing network infrastructures. The distributors are just as easy to retrofit and scale.

The lightweight and robust PRIME-ETSI racks are also available in various sizes and versions. The tool-free installation of the 3U sub-racks and patch cord management support fast and flexible configuration of the distributors. R&M has fully integrated cable management to simplify handling.

The capacity

- PRIME STU
  - 24 x LC Duplex (48 fibers)
  - 24/48 x SC (24/48 fibers)
  - 24 x E-2000™ (24 fibers)
  - 24 E-2000™ Compact (48 fibers)
- PRIME SSU
  - 12 x 4 ANT/HS splices

More information:

www.rdm.com/prime-odf/

050.6759

Patrick Schilter | Product Manager
patrick.schilter@rdm.com

Fiber to the Antenna
Raring to Go

Setting up 5G infrastructures is quite a complex matter. R&M develops the solutions.

There are a number of hurdles on the way to 5G networks. It will take a few years for providers to be able to achieve sufficient 5G coverage with lots of small radio cells and modern features. One of the initial challenges is to upgrade existing and additional antenna sites (macro cell sites) with 5G hardware. The network architectures have to be considerably strengthened and densified to make 5G possible on a large scale.

Along with the antennas, providers are also expanding the cabling. Cell sites require more access to fiber optic networks (Fiber to the Antenna, FTTA) and a greater power supply (Power to the Antenna, PTTA). Sometimes companies have to lay new, additional or hybrid cables in unusual ways. In some cases, they can use the available capacities of radio and fixed network providers or municipal utilities.

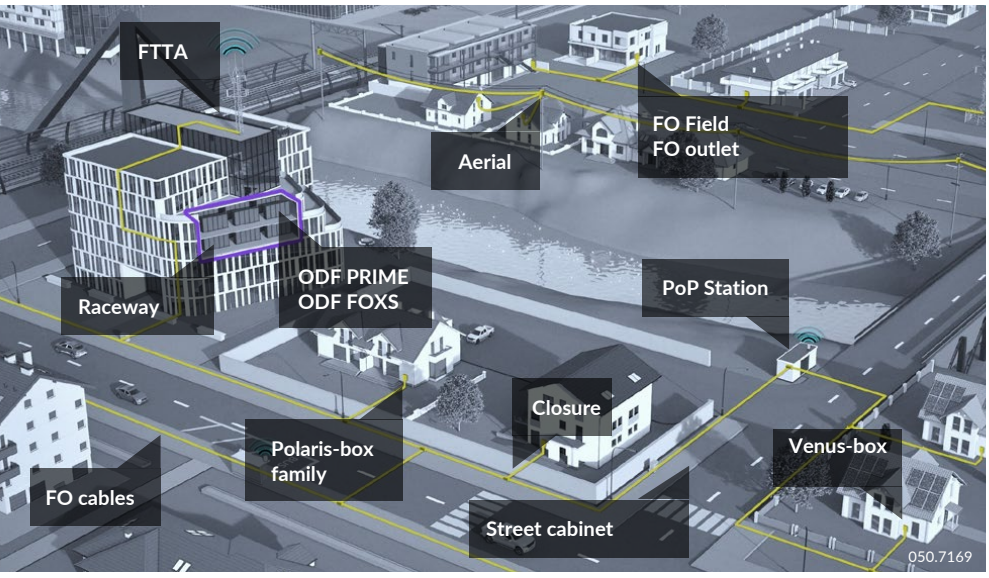
R&M's solutions for fiber optic networks

- Central office, main distributor frame
- FTTx splice closures
- Network termination, building connection
- Aerial and drop cabling
- FTTA, PTTA
- FO connectivity

Need for new ideas

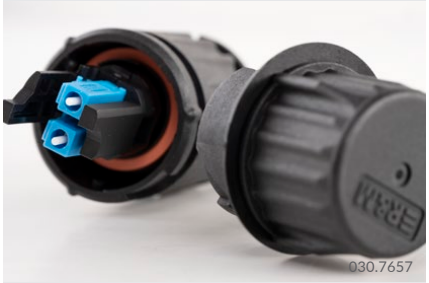
In any case, 5G requires new ideas for the cabling of cell sites. R&M is already implementing and developing an FTTA/PTTA product line under the name CONEXIO. The first portfolio includes FO outdoor connectors, cable dividers, connection and distribution boxes, cable heads and terminals. All CONEXIO solutions are designed for use in extreme temperature and weather conditions. There are also indoor and outdoor cables, jumper cables and patch cords. R&M offers individual solutions for customers, hybrid networks, special locations and special climatic conditions.

An important element is the outdoor connector HEC16 (Harsh Environment Connector 16 mm). The three designs cover a multitude of connectivity variants, whether LC, SC, MPO, RJ45 or hybrid fiber optic/copper connections.



For 5G, network operators now have to equip the macro cell sites with more fiber optic cabling (Fiber to the Antenna, FTTA). R&M develops FTTA solutions that expand the tried and tested FTTH portfolio and offer attractive additional benefits. For example, antenna sites can be used as expanded ONT or customer premises or for combinations with FTTH infrastructures.

R&M's FTTA program CONEXIO



Central element: the outdoor connector HEC16

OEM-specific connectivity

Hybrid FTTA/PTTA cable head

FTTA plus FTTH

The CONEXIO program expands R&M's tried and tested portfolio for broadband supply (Fiber to the Home, FTTH). This means that R&M and its customers are optimally prepared for the upcoming network convergence, in which there will be combinations of FTTH (RtmP) and FTTA (PtP) fiber optic links and connections in the same network.

Thomas Ritz
Market Manager Public Networks
thomas.ritz@rdm.com

Innovative
Cable Plant

Five hundred million kilometers of fiber optic cable are laid all over the world each year. In the ground, in the sea, in buildings, data centers and other places too. By 2023, this figure will increase to six hundred million kilometers a year*. R&M is also feeling the rising demand.

The R&M cable plant in Děčín, Czech Republic, has been able to continuously increase its cable production volume since its integration into the R&M Group in 2018. Since taking over the production plant, R&M has constantly invested in new cable production facilities and optimized the development and manufacturing processes in order to be able to meet the demand for high-end fiber optic cables and pre-terminated cable systems in the usual manner.

In addition to the continuous rise in demand for FO cables for the expansion of access and backbone networks, the market is increasingly demanding ready-to-install, pre-terminated cable assemblies tailored to the system technology. And often at very short notice. R&M has made adjustments to meet this demand. The plant in the Czech Republic and the headquarters in Wetzikon are combining their expertise in cable production and fiber optic connectivity. Project managers at customer sites no longer have to worry about every detail of the cabling. They receive ready-to-install and factory-tested assemblies with R&M cables and R&M connectors.

R&M's fiber optic cable plant in Děčín, Czech Republic, is characterized by a wide range of products, customer-made solutions and a high ability to deliver.

New plastics

As a driver of innovation, R&M is advancing cable technology. FO cables with improved shrinking characteristics are among the latest developments. Their jacket is made of a new plastic. Here, too, R&M has refined the manufacturing process in order to further optimize shrinkage behavior.

The plastic retains its structure when there is a change of temperature. This is why it exerts less stress on the fiber in critical situations than conventional cables. This ensures that attenuation values and ultimately data transmission remain stable at all times.

In another project, R&M developed a sliding sheath for what are called micro cables. These cables are easier to blow into underground pipes (micro ducts), something which accelerates the construction of Fiber-to-the-Home networks. By saving time, telecom companies can save on construction costs and connect subscribers sooner.

More security and reliability

Cables with extended operational reliability, for example equipped with increased rodent or fire protection, are already part of R&M's standard portfolio. Certain industries use such cables to be able to guarantee interruption-free data transmission at all times in the case of critical connections or harsh ambient conditions.

The CPR (Construction Products Regulation) fire behavior classes introduced by the European Union and applicable from mid-2017 determine and classify the fire behavior of cables and have also become an increasingly important topic at R&M.

R&M is currently working on optimizing the most important fiber optic cables for indoor applications in terms of fire behavior. New, long-term fire-resistant and low-emission cables that meet the increasing safety requirements of the market and represent the higher CPR classes (Cca/B2ca) are in preparation.

Future innovations include cables with 0.6 and 0.9 mm compact fibers as well as dry, longitudinally watertight universal installation cables. These are loose tube cables with 24 fibers and stranded loose tube cables with 12 bundles of 12 fibers each. Installers appreciate the advantages of dry loose tube cables. You do not have to wipe off gel when stripping the cables or preparing splices. It is also easier to handle the fiber overlengths in splice trays later on. This saves time and is more pleasant. The new products will be publicized on an ongoing basis.

** According to CRU Group*

For more information:
www.rdm.com/fiber-optik-kabel

Andreas Rüsseler | CMO
andreas.ruesseler@rdm.com

Sustainability as a Success Factor

Wolfgang Huber has been Head of Corporate Quality Management at R&M since spring 2020. His role includes, among other things, the further development of a holistic strategy in the areas of social and environmental responsibility. In this interview, he talks about sustainable growth and the associated goals and challenges.

Wolfgang, sustainability has many different connotations – what do you personally understand by it and what do you associate with it in the B2B environment?
The 17 UN «Sustainable Development Goals», which Switzerland has also included in its Agenda 2030, helped me to map the issue more comprehensibly for the B2B environment (see box). These can be used to derive direct requirements and goals for the company.

The term sustainability is often used as an excuse not to implement measures. «That's not sustainable,» I hear time and time again. But sustainability quickly becomes comprehensible when specific goals are defined. Even though the UN's SDGs are rather general, it is clear that very specific individual guidelines for sustainable action can be derived from them without great effort.

Our management wants to further anchor sustainable growth strategically. Where do you see the most important areas of action at R&M?
Since its inception, R&M has anchored the topic of sustainability in its DNA. I believe an owner-managed company can only survive if the company values put into practice focus on sustainability. We implement this successfully with our values on a global scale.

In recent years, however, the focus of our sustainability efforts has changed considerably. Climate protection is also becoming increasingly important in our industry. When it comes to ethics, we have an excellent basis, but are increasingly dealing with standardized reporting obligations.

The most exciting task will be to fully integrate meaningful long-term improvements into our company processes and thus into our daily actions. But we don't want «pseudo-sustainability» – we want genuine improvement. Well-intentioned initiatives and requirements from outside, such as laws or specific requirements from partners, may entail the risk of requirements being implemented in a costly and formal manner. Here, it is important to make sensible distinctions and proceed in a very goal-oriented and measurable manner.

What specific sustainability goals does R&M set itself?
We are working on a future-oriented KPI matrix that can be fully integrated into our operational pursuit of targets. We will set ourselves clear goals for reducing CO_2 emissions and implement the corresponding measures. We are currently working on defining our full carbon footprint and deriving further strategic goals from it. CO_2 optimization may well mean cost optimization.

Objectives and measures for the areas of employees, ethics and occupational safety will also be used on a more global scale.

How can progress in this area be systematically recorded and measured?
We are still at the beginning in terms of our carbon footprint. Areas such as environmental performance are more easily measurable. Of course we can measure exactly how much energy and water we consume, how much waste we generate and what recycling rates we have. This data has been incorporated into specific improvement projects for many years.

Other issues, however, are more challenging. Although we can measure accidents at work or fluctuation rates, determining the causes is not always that easy. Compliance issues, such as bribery or the acceptance of benefits, are very complex. Here, too, some people expect us to back up such issues with key figures. If a company has a problem in this area, it will not solve it by collecting key figures, but only by taking consistent action and adapting the corporate culture.

Wolfgang Huber, Head Corporate Quality, R&M

«For me, sustainability and economic potential are not mutually exclusive.»

Wolfgang Huber, Head Corporate Quality, R&M

In terms of sustainability, where do you see the greatest challenges that we are going to have to deal with now and in the future?
As I said, no one can or should turn a blind eye to the issue of climate protection. Knowledge about it has improved considerably over the past five to ten years. One challenge in terms of sustainability management is our decentralized structure of powerful, highly autonomous units. The necessary process and data standardization is a challenge. The local adaptation of sustainability efforts also requires a rethink that will not just happen overnight. The local circumstances and cultural differences make things very complex for all international companies.

All areas of a company are affected by sustainability. How can a transformation with such far-reaching implications be implemented efficiently?
The good thing about sustainability is that hopefully everyone identifies with it. The methods of implementation may not be the same for everyone, but the issue affects everyone.

Identifying goals and defining processes is a clear management task. We are on the right track, determining the requirements and developing applicable solutions. The initial effort is considerable but worthwhile. Specialists from a wide range of fields must be actively involved and be able to identify with the meaning, purpose and measures.

Regular, transparent communication, both internally and externally, is just as relevant. Once the staff are familiar with the objectives and the overall picture and understand the associated measures, there is unlikely to be any resistance. Ideally, sustainability issues should be integrated into day-to-day work. R&M addresses sustainability globally, with clear signals from its headquarters. When the workforce sees that the managers are systematically setting an example and implementing the sustainability strategy, this has a lasting impact on the corporate culture.

Will our companies be able to exploit long-term economic potential with greater sustainability?
Definitely, yes. We are constantly optimizing our energy and transport costs, to name just one example. For me, sustainability and economic potential are not mutually exclusive. Any company that turns a blind eye to sustainability will soon run into economic problems.

Our customers and suppliers are faced with the same or greater challenges.

For example, our offering focuses not only on the product, but also on application expertise. When we offer our customers solutions that provide them with not only functional requirements, but also, for example, non-functional sustainability information (CO_2 accounting, waste disposal declarations, environmental declarations, etc.), we generate added value and a competitive advantage. The customer might say: «At R&M, I get all the necessary certificates for the solution and don't have to worry about anything else.» This will increasingly be part of the standard expectation.

What can the individual employee contribute to sustainability?
Each and every one of us can contribute to this in our daily actions. Rules must be followed, but there must also be room for suggestions for improvement and the topic must be appreciated. I see our company as a very healthy basis that internalizes this to a great extent. Private approaches to sustainability should also be implemented in the company.

Furthermore: Treating people respectfully and correctly, regardless of their gender or background, is a matter of course and should not require any appropriate rules of conduct, although this naturally has to be properly documented.

Sustainable behavior should be a matter of course both at home and at work.

«Saving electricity and water, etc. doesn't stop when you walk through the company door.»

Wolfgang Huber, Head Corporate Quality, R&M

SUSTAINABLE DEVELOPMENT GOALS

The 2030 Agenda with its 17 Sustainable Development Goals (SDGs) is a global plan to promote sustainable peace and prosperity and to protect our planet. Since 2016, all countries have been working to translate this shared vision of poverty reduction and inequality into national development plans. It is particularly important to address the needs and priorities of the most vulnerable population groups and countries – because the 17 targets can only be reached by 2030 if nobody is left behind.

Source: United Nations, https://sdgs.un.org/goals

Silvia Brüllhardt
Senior Communications Manager
silvia.bruellhardt@rdm.com

Attractive Jobs in the Far East

Vaccination drive at R&M India: 100 % of the workforce was vaccinated and protected from Covid-19 in July 2021

050.7155

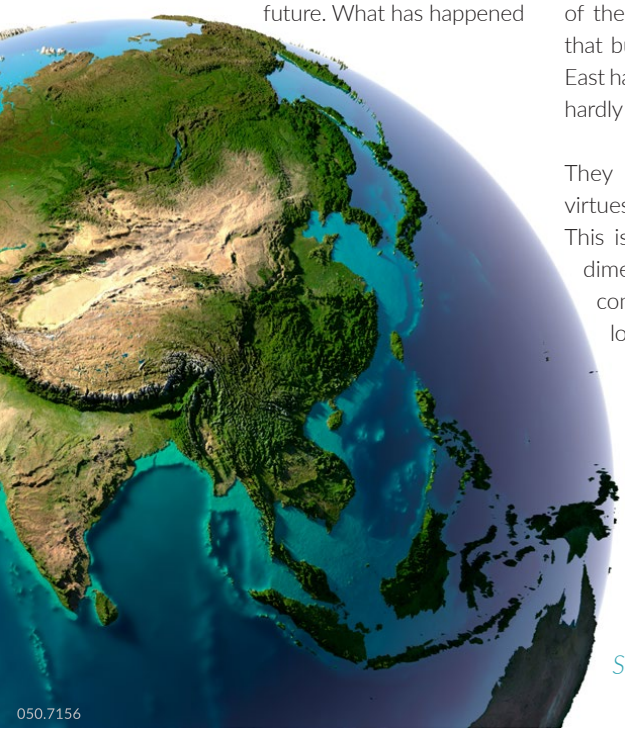
The Asia-Pacific economic region is developing dynamically. R&M is more active in this region than ever before. The quality standards of the R&M brand are compelling. In China, R&M has already created 100 new workplaces since 2019.

When Reichle & De-Massari founded the first Asian sales office in Singapore in 1994, expectations were high. The company entered the Chinese market in 2005 and the Indian market in 2006. R&M also has its own local sales offices in other countries in the region. Asia is considered a region of the future. What has happened here over the past 30 years exceeds all expectations. Business and technology are developing in a fascinating way in this part of the world.

With all due respect for Asia's success and for the epoch-making progress in large parts of the region, it is important to remember that business and social systems in the Far East have their own way of working. They are hardly comparable to European traditions.

They require dialog and empathy – two virtues that also characterize Switzerland. This is the only way to understand Asia's dimensions, its strict hierarchies, its uncompromising desire to progress and its love of technology.

R&M is following Asia's path!



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The advantage: customer focus

R&M has positioned itself optimally in Asia in the premium cabling technology segment. Today, ten APAC branches and the plants in China and India supply the data centers of well-known organizations, the telecommunications industries such as FTTH and FTTA and the diverse LAN markets.

R&M's customer focus and delivery reliability, professional and technical support as well as the Swiss quality philosophy are appreciated across the region. As a rule, R&M employs locals to work as executives and plant managers. With these strengths and high commitment, R&M wants to gain market share in APAC region and create more jobs.

The acquisition of AFS in Bangalore, India, in March 2014 and enclosure manufacturer

«Swiss companies enjoy an excellent reputation as employers in China.»

Prof. Dr. Rudolf Minsch, Chief Economist at economiesuisse

Source: www.economiesuisse.ch/de/dossier-politik/die-schweiz-und-china

«With the traditional values of an independent family company, R&M feels at home in India and China.»

Laurent Amestoy, Executive Vice President, R&M Asia Pacific

Durack Intelligent Electric Co. Ltd. in Jinshan in 2019 as well as the development of a patch cord production facility in Pinghu since 2020 have been crucial in this. They underline R&M's commitment to production plants in India and China to fulfill local demands.

Investment in the locations

R&M is a responsible employer at its locations, naturally also at those in Asia. In 2018, for example, R&M opened a new, modern plant for manufacturing fiber optic products in Bangalore, India. With around 300 workplaces, health and ecological projects, the site is setting new standards and is now one of the largest plants in the international R&M production network.

Fair, progressive conditions of employment apply to employees at all sites. Continuous training, protection at the workplace, trust and transparent communication are all very important.

Good team spirit

Especially during the pandemic, it became clear how well the R&M plants stick together. The operations teams at HQ and at the plants had to work together virtually over great distances – using an action cam, smartphone, messenger or WeChat and web conferencing. It was possible to train new employees in accordance with R&M standards, install production lines and issue production approvals remotely. In regions particularly affected by the pandemic, vaccination programs were carried out at the plants.

Adapting Western perceptions sustainably

R&M has almost thirty years of experience in the Asian market. This experience shows that it is extremely important to get involved on the ground – in the region, for the region.

This attitude inspires respect. Western views can be conveyed in a credible way – particularly on individual and entrepreneurial freedom, fair competition, healthy working conditions and the protection of intellectual property. The result is a global corporate culture that can be used everywhere, based, as it is, on R&M's value system which can be adapted to suit local conditions.

In addition to the state requirements in employer guidelines, the guidelines of the OECD, the Swiss State Secretariat for Economic Affairs (SECO) and the guidelines of the respective free trade agreements are binding principles for R&M.

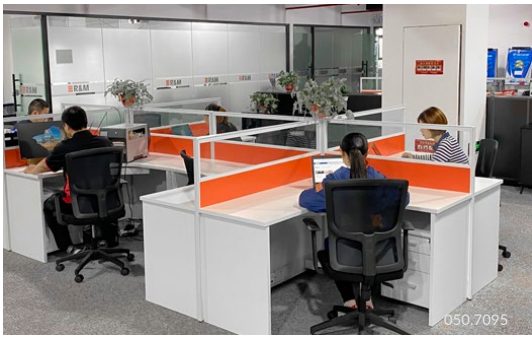
And something that is also particularly appreciated in many places in the Far East: R&M represents the traditional values of an independent family company.

R&M in Asia Pacific

- Singapore: headquarters for the APAC region
- China: rack production in Jinshan
- China: new Pinghu site (copper and fiber optic patch cords)
- India: sales and production plant in Bangalore
- Japan: sales location
- Australia: sales locations

Patch cord production at the new plant in China started in fall 2020.

Production at R&M India



Offices at the new plant in Pinghu, China

Showroom in the Jinshan site, China

Laurent Amestoy
Executive Vice President, R&M Asia Pacific
laurent.amestoy@rdm.com

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Reichle & De-Massari AG
Binzstrasse 32
CHE-8620 Wetzikon/Switzerland
Phone +41 (0)44 933 81 11
www.rdm.com

R&M