

CONNECTIONS 63

Specialist magazine Reichle & De-Massari AG | October 2022



Solutions from a Single Source

The Fine Art of Integration

ŠKODA AUTO:
**Digitalization Projects
with R&M Solutions**

FTTA Portfolio
Connectivity Kit
for Macrocells

Edge
Data Center Goes Hybrid

Supporting our Customers as Best as Possible

050.7232

Dear Business Partners

The challenges of growing data traffic need to be managed. Data center providers in particular are faced with complex and very demanding infrastructure issues. R&M has been supporting global data center providers with suitable products and solutions for many years. We are now taking a major step forward in our approach by providing complete infrastructures with all the core elements for computer rooms in the future. We can support you from the initial planning stage to ongoing operations. In our Focus Story, you can read about how our integrated data center infrastructure solutions model works.

Environmentally sound and fast, thanks to local proximity

The journey from a component manufacturer to a supplier of complete solutions shapes our business activities in an exemplary manner. The extension of the global value-added chain, the continuous expansion of our production network with various areas of expertise, and sophisticated partner and training management are important building

blocks in this regard. Today, we are able to provide complete solutions from a single source for connectivity infrastructures of any size, significantly lightening the burden on our valued clientele. In addition, with our numerous market organizations and plants, we are very close to our customers, something which is proving to be a major advantage in today's world.

All of this is only possible with a forward-looking strategy and a high degree of innovation, not least thanks to you. Time and again, our business partners approach us with suggestions and ideas, which, if possible, we implement in the solutions of tomorrow. The fact that R&M's innovation activities are currently materializing strongly is reflected in the latest products presented in this issue. Read more about the miniature connectors for fiber optic distribution platforms, outdoor connectors suitable for all weather conditions, connectivity solutions for FTTA/5G applications and our portfolio for aerial deployment in the News articles. And we are particularly pleased to be the first supplier to offer a complete, proprietary SPE range. The years of pre-investment in this area in particular are now bearing fruit.

Smart and secure communication infrastructures promote networking within our society. We want to make a significant contribution to this – that has been R&M's mission for almost 60 years now. This stability is only possible with a concrete sustainability model implemented at all levels. In this respect, too, we are improving continuously, as you can read in our latest article on the subject and in our new sustainability roadmap. To underline this, we also show how uncompromising we are when it comes to data protection and cybersecurity.

We look forward to continuing to shape the networked and sustainable future with you and wish you an inspiring read.



Andreas Rüsseler
CMO

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Publication details:

CONNECTIONS 63 | October 2022

Cover picture:

Modern broadband connections are often still wishful thinking in rural areas. Aerial deployment can provide a quick and easy remedy. R&M has developed products and solutions for this application so that FTTH networks can be established in rural areas within a short time.

Publisher:

Reichle & De-Massari AG, Binzstrasse 32,
CHE-8620 Wetzikon, Switzerland
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R&M blog portal: <https://www.rdm.com/blog/>

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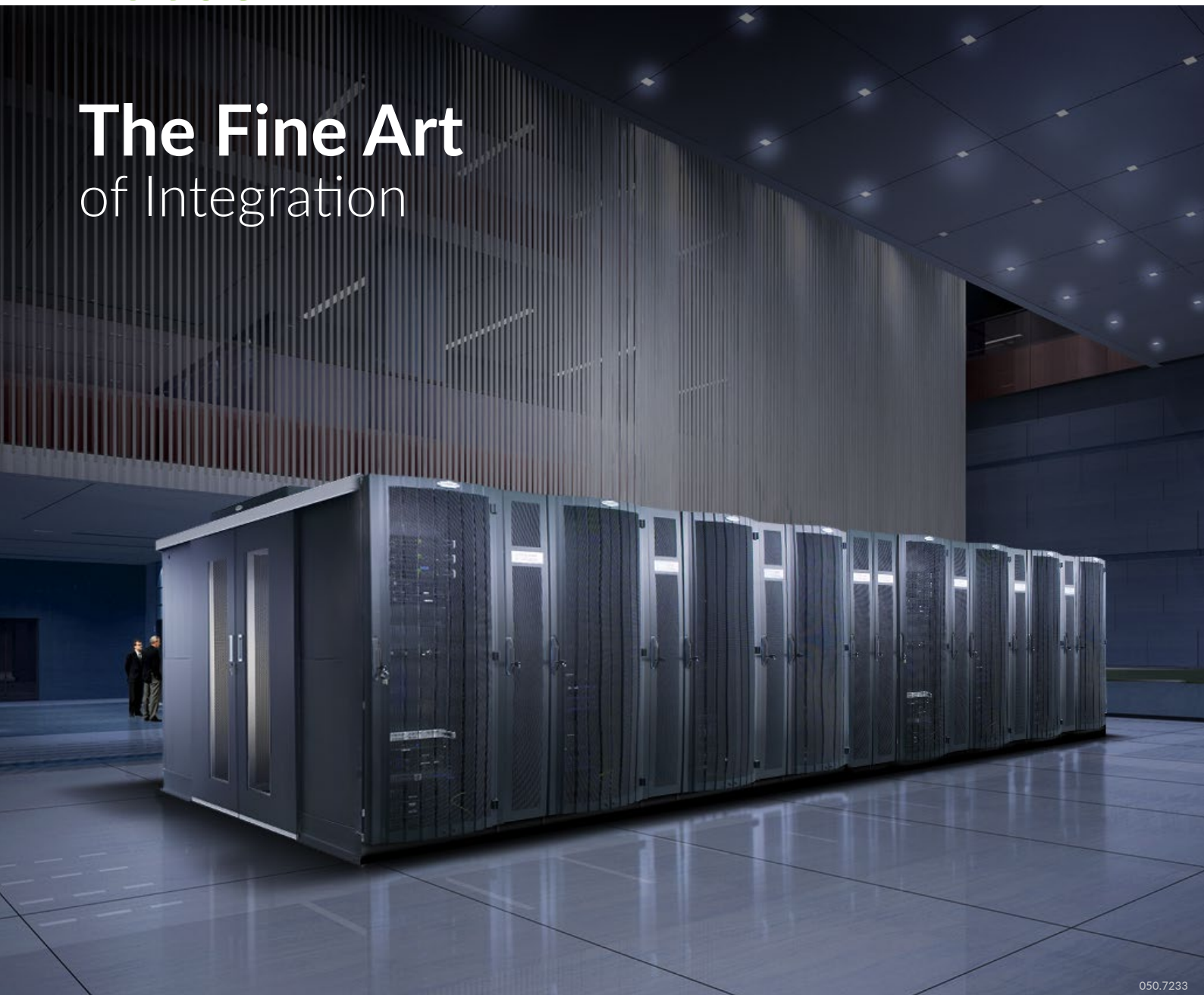
Layout: KplusH, CHE-Amden, Markus Kuhn

Printing: Ostschweiz Druck AG, CHE-Wittenbach

Print run: 7,000 copies

CONNECTIONS is printed twice a year and can be ordered from the publisher. Reproduction allowed with permission from the editorial team.

The Fine Art of Integration



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How did you buy your last car? Did you just have the bodywork delivered and then procure and install the chips, cables, controllers, battery, doors, ventilation and spoiler yourself? Of course not – the car was ordered as a complete entity and with the desired configuration.

The comparison is exaggerated, but it does depict the situation in which data center providers are increasingly finding themselves today. The next investment is imminent and a computer room must be built or expanded as quickly as possible. The parts required for this can be found as single items in catalogs and ordered individually. But is this what is done nowadays and is it efficient?

Planning and building yourself...

...takes time and requires expert personnel, detailed knowledge, planning, project man-

agement and the coordination of the various trades. If you closely examine your own strengths and design-build competencies, you will soon see that this approach is often no longer the best choice today.

You could use online configurators to design the interior for the computer room. Experience shows, however, that things such as properly dimensioned ventilation paths, fiber reserves for the next generation of Ethernet, sensors for port monitoring and spatial restrictions are regularly overlooked.

«Out of the box»

Operators can also purchase standardized, preconfigured modules and a «data center out of the box». This should be considered when the «time to market» or a globally consistent infrastructure matters. The advantages: rational and external planning, short-term

delivery and slightly lower costs compared to a data center designed and built individually.

Data center providers may be subjecting themselves to the proprietary constraints of turnkey solutions. Individual requests, urgent upgrades or unforeseen market adjustments can only be implemented with difficulty or at additional expense. In some cases, the container data center is not a turnkey solution at all because cabling still needs to be installed or a connection to the main building established.

Better: outsourcing

You can hire general contractors and integrators. They will oversee the project from the outset, implement it responsibly and put together a tailor-made infrastructure consisting of suitable systems and products. Some deliver largely pre-terminated components to the building and bring the fitters along with them.

R&M advocates the latter approach. Recent years have clearly shown that data center operators are grateful for any help when it comes to organization, personnel, structure and technology. Everything now has to be simpler and faster and fit individually.

Outsourcing to qualified integrators or general contractors is the right choice when it comes to building local infrastructures quickly.

Better still: preferred sourcing

The model with the trusted integrator can be perfected – with preferred sourcing. To this end, as part of its growth strategy, R&M has created a global supply chain with 14 of its own manufacturing facilities, numerous regional subsidiaries, competence centers, suppliers and logistics. In addition to development, design, manufacturing, packaging and assembly, the facilities offer customizing and local technical support.

With these prerequisites, R&M can now provide complete solutions from a single source for data center infrastructures of all sizes, be it for greenfield or brownfield projects, individual cages, construction phases or modernization projects. The facilities have the critical size to be able to also serve internationally active cloud providers.



The DCIM software intelIPhy net from R&M enables asset management of IT hardware



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Integration includes:

- Connectivity, cabling
- Racks and housing
- Rows and cubes
- Sensors, electrical systems
- Cooling, fire protection
- Safety and security
- Monitoring, asset management and DCIM

The R&M Group has mastered the ability to merge complete systems from simple connectors to complex data center infrastructure management. The interplay of our own supply chain, in-house sourcing, global manufacturing facilities and integrated production control has a cost-optimizing effect.

What does it involve?

R&M's infrastructure solutions traditionally include connectivity and network cabling, racks and distributor housings. These now also include enclosures, power supply, cooling and airflow, sensors and fire protection solutions. The intelIPhy network and asset documentation system with intelIPhy net as a virtual operations center and open interfaces to well-known DCIM systems round out the portfolio.

The modular system includes industry-recognized product lines. These include the fiber optic Ultra-High Density distribution platform Netscale, PRIME ODF, QuickRelease connectors, the Cat. 8.1 copper system and the AIM/DCIM system intelIPhy.

Enclosures are supplied by the premium manufacturers Durack for Asia and TecnoSteel for EMEA, both of which have recently joined the R&M family. TecnoSteel is also introducing a pioneering, elegant module and housing program: BladeShelter (see box).

Involved right from the start

With the housing program, R&M is strengthening the integrative model to be a decisive competitive presence in the data center and



030.8061

Access control and sensors, integration into intelIPhy net



050.7235

Fire extinguishing systems



The LeFonti AWARD® confirms that the new Italian R&M subsidiary R&M TecnoSteel in Brunello (VA) is at the forefront of technology development. «Excellence of the year 2022 for Innovation and Leadership for Datacenter Solutions.» This is the title of the award, which was presented in Milan in April. The LeFonti AWARD® committee includes academics and selected legal, business and finance journalists from 120 countries.

BladeShelter is at the heart of the current technology development at R&M TecnoSteel. BladeShelter is a modular platform for cabinets, corridors, cubes and functional facilities in computer rooms. A well-coordinated team, consisting of the experts in Brunello as well as various data center experts from other sites, is addressing the issue of green data centers.

The construction of the enclosures contributes to efficient cooling by strictly separating hot and cold air flows and optimally conditioning them. The more efficient this passive cooling, the less energy the data center needs and the more costs it saves. In this way, sophisticated profiles, panels and air ducts make an effective contribution to green data centers.

The door grilles of the IT cabinets also play a role in ensuring a high throughput of cooling air. This is why BladeShelter door grilles have a perforation rating of 82%. This is significantly higher than conventional specifications.

In addition to the goal of energy saving, modularity and operational reliability determine product development at TecnoSteel.



BladeShelter containment

The BladeShelter enclosures contain even more technology. An access control system via automatically closing sliding doors and transparent polycarbonate ceiling modules insulate the cubes. Indirect LED lighting in the ceilings illuminates the working area in the corridor. Solenoid switches open the ceiling modules in the event of a fire alarm so that the smoke can clear quickly. Gas pressure dampers allow the modules to slide down in a controlled manner so that they do not cause damage or injure technicians in the event of a fire.

Safety begins at the construction stage. The frames of the BladeShelter racks consist of sevenfold vertical profiles made of high-strength steels. The torsion-resistant and earthquake-proof cabinet structure is certified in accordance with NEBS 4.

Large modular system

The BladeShelter line includes in-row cooling systems and scalable Blade Cool modules, which are configured for high heat loads of up to 42 kW.

The BladeShelter modular system also includes intelligent PDUs as well as monitoring and sensor packages for security, indoor climate, space surveillance, fire protection and infrastructure management. Top-of-rack power distribution, cable guides and cable management complete the infrastructure solutions. R&M TecnoSteel integrates external climate, protection and security systems, UPS systems and gas extinguishers into the project according to demand. The construction and design of the BladeShelter program and the network platforms from R&M harmonize perfectly. The necessary cabling and distributor housing can be combined at an early stage in the planning process – a crucial aspect of the integration model. The engineering and design team in Brunello brings 20 years of experience with infrastructure solutions to the R&M Group. It forms R&M's new competence center for data centers and LAN – cabinets, enclosures, air conditioning, PDUs and UPS.



Blade cooling for heat loads from 4 to 42 kW



In-row cooling

R&M's data center solutions:
[www.rdm.com/solutions/
data-center/](http://www.rdm.com/solutions/data-center/)



BladeShelter –
data center technologies:
www.rdm.com/bladeshelter/



Video BladeShelter
green data center solutions:
<https://youtu.be/cwEQr3OsQcQ>



«Complete solutions from a single source for data center infrastructures of any size. Now possible with preferred sourcing.»

LAN project business. System and infrastructure solutions can be realized sustainably without any hassle.

The benefits of the design-build approach: Even in the initial planning stage, it becomes clear how everything fits together and interacts later on. The secure integration of all physical infrastructure components is at the top of the list of priorities for 75% of data center managers when they think about their construction or expansion project.

Source: IDG Research.

Planners, architects and specialists can deal with challenges and risks at an early stage. They develop a common understanding of the analyses and customer situation. Change requests can be accommodated and implemented flexibly. There is less need for coordination on site. The construction works smoothly and on time.

The model's soft power includes more than 20 types of service: Consulting and commitment, interdisciplinary engineering, CAD and Building Information Modeling, customer-specific standardization, project management, assembly and maintenance, end-to-end support, documentation, measurements and acceptance, application development, certification, quality assurance, long-term warranties, warehousing and logistics.

Another crucial offer is knowledge sharing. R&M trains and qualifies the expert personnel working for project partners and data center providers. The program covers all product groups and assembly steps. Explanatory films, online documents and webinars expand knowledge transfer. This ensures professional installation, which forms the basis for long-term warranties.

The R&M Group develops and manufactures integrated infrastructure solutions for:

- Hyperscale and colocation
- Enterprise data centers
- Building entry, meet-me rooms
- Edge data centers
- Campus and DC Interconnect
- Network providers, Internet exchange

Looking into the future

For R&M, integration means thinking beyond the infrastructures of the white space. Meet-me rooms and cross-connect zones should ideally be included. The same applies to the gray space with air conditioning, fire protection, power supply, access control and much more. This is always done with a view to the future. Anyone equipping data centers today must honestly tell their customers that they will be migrating to 400G and 800G tomorrow because the valuable infrastructure should be able to be scaled and upgraded later.

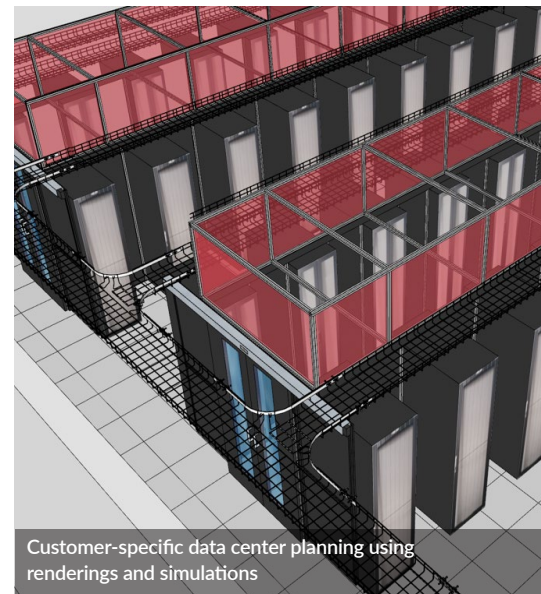
In other words, reserves for compacting the parallel optical cabling should always be built in. As an integrator with decades of experience, R&M knows what such future-proof infrastructures look like.

Outside data center and functional buildings, operators will also need new and stronger infrastructures, be it for campuses, interconnects, edge data centers or the connection to 5G, Internet and network providers. Single sourcing is also recommended here. The R&M portfolio offers outdoor systems such as cable distributors, splice closures and weatherproof building connections. It is based on a proven program for telecom networks.

Single sourcing also applies to building automation. Networks for offices, WiFi and building services in data centers can be established with R&M's LAN portfolio. Innovations such as the high-performance PoE-compatible connectors and the innovative SPE systems from R&M for digital ceiling solutions pave the way to the Internet of Things (IoT) and smart building.

The next steps

Integration has a future. Customers can therefore expect R&M to take further steps in this direction. Production capacities and competence centers are being expanded around the world. Suppliers, the supply chain and production management continue to network and automate. This enables customer projects to be implemented regionally, at short notice and at an optimized cost.



Customer-specific data center planning using renderings and simulations

R&M Tecnosteel services

- Project planning, consulting
- CAD, spatial planning
- Renderings, demos
- Engineering, customizing
- Air conditioning, electrical planning
- Consumption optimization
- Order picking
- Assembly, project support
- Testing, construction acceptance

The developers are working on new ideas for high-density cabling and the modularization of infrastructures. New solutions are constantly being presented for edge and micro data centers and for the integration of 5G cells. R&M is consistently continuing its journey to becoming a trusted integrator and an international provider of integrated data center infrastructure solutions.



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KSW: Hospital with Vision

Photo: KSW

Technical and architectural cutting-edge solutions, years of patience and far-sighted planning made it possible: A groundbreaking new hospital building has been built in the middle of Winterthur. R&M provided comprehensive support for the project.

After ten years of planning and construction, the replacement new building for the Winterthur Cantonal Hospital (KSW) went into operation in early 2022. An architecture award and certification as a sustainable building in the Minergie-P-Eco category underline the fact that it is an exemplary institution for regional health care. The catchment area of the KSW is constantly being expanded and the hospital is now one of the ten largest hospitals in the country.

«More than 100,000 people will be born here. More than one million people will spend time in hospital here,» predicts CEO Rolf Zehnder for the next 40 years. This is how long the high-tech building is expected to be in operation. During this time, the infrastructures must function reliably and be ready to support the rapidly changing generations of medical technology.

A test of patience

The project managers from the city, the cantonal administration and the KSW had to overcome a number of hurdles and tests of their patience. The project had to be integrated into the existing complex in the middle of the city in stages. The new 13-story building with a lightweight travertine facade replaces a 55-year-old high-rise. In the course of the planning, new technologies for medical and

building technology came onto the market and had to be integrated.

Construction work was delayed due to the COVID-19 pandemic. The responsible teams, in particular the installation partner Melcom AG from Zurich, were nevertheless able to complete the cabling on time. Reliable material procurement, just-in-time delivery of pre-terminated distributors and R&M's measurement services were crucial. «We

were able to rely fully on R&M,» says Jasmin Lonic, senior project manager at Melcom AG.

Digitalization

«The future is digital. I firmly believe that digitalization will make our lives easier. For example, when patients can register with us digitally without having to wait a long time,» says Alexander Nelles, CIO of the KSW
Source: Video KSW



Facts about the new KSW building

- Bed wing with 13 floors
- 6 operating theaters, 1 hybrid operating theater
- 95 treatment rooms
- 213 multi-bed and single rooms
- 33,800 sqm net usable area
- Investment of 350 million Swiss francs
- Architects: ARGE RA-B Architekten, Rapp Architekten AG and Butscher Architekten AG, Basel

KSW Kantonsspital
Winterthur

Photo: KSW

«We very much value the cooperation with R&M and René Wunderli.»

**Werner Jampen, Head of Network Technology,
Cantonal Hospital Winterthur**

A futuristic-looking hybrid operating theater with robots, monitors and precise 3D digital imaging techniques enables fast, minimally invasive and gentle procedures. Automated shading of the windows ensures a pleasant climate in the 213 patient rooms. Patients have a view over the city and the mountains from their bed through floor-to-ceiling windows.

A considerable amount of persuasion

The far-sighted decision to systematically pursue the path of digitalization and automation in medical and building technology required more than conventional structured

cabling. «The network was an important topic right from the start. The specialist planners built the entire new building around the cabling concept,» explains Werner Jampen, Head of Network Technology at KSW. However, he first had to do a lot of persuading. This involved listing R&M's advisory and international expertise in hospital projects.

In particular, it was a matter of planning sufficiently large distribution rooms. The 46 new rooms must provide reserves for future IT and network generations. «In hospitals, it is imperative to plan very long-term,» says Werner Jampen from his own experience. And all his persuasion paid off. Resources were approved.

The R&M solutions also impressed. The project management team decided early on to primarily use network solutions from R&M in addition to KNX bus systems for parts of building automation. The cooperation has already been in place for many years.

Reasons for choosing R&M

- Project-specific system approach
- Application-oriented solution
- Fiber optic redundant backbone installation
- Quality, 25-year system warranty
- Personal support for years
- Competence, reliability
- Services, manual
- Proximity, logistics, transparency



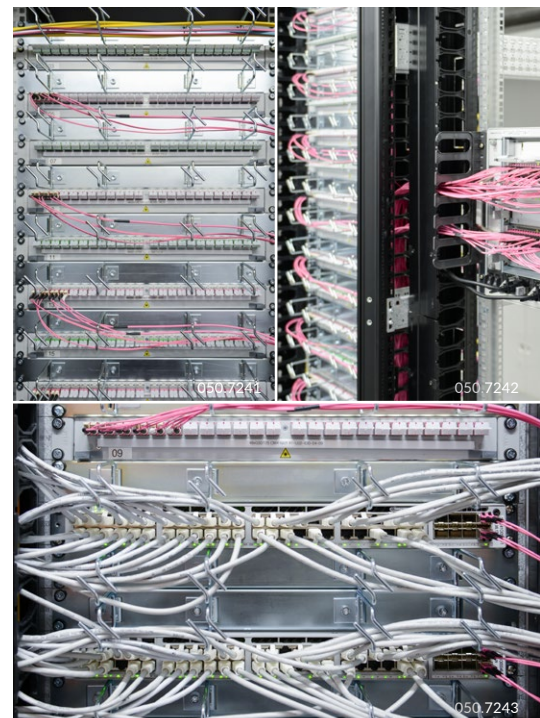
Left: Werner Jampen, Head of Network Technology, KSW; right: René Wunderli, R&M Switzerland

R&M solution for KSW

- Building and ICT networks based on R&Mfreenet
- Safety system for connectors
- Power over Ethernet (PoE)
- R&M SafeLine, medical network insulators
- Services:
 - Support with design, planning, construction
 - Manual for cabling infrastructure
 - Pre-termination, splicing, measuring
 - 25-year warranty



Around 1,000 km of electric cables were laid for the new building.



Supported applications

- Structured cabling (communications cabling systems) for ICT/LAN, data center, 6,000 terminals, 1,800 laptops, WLAN
- Networking of medical informatics, operating theaters, patient rooms, administration, medication robots
- Integration of WLAN, building automation, surveillance, security center, building technology, information systems (screens), TV

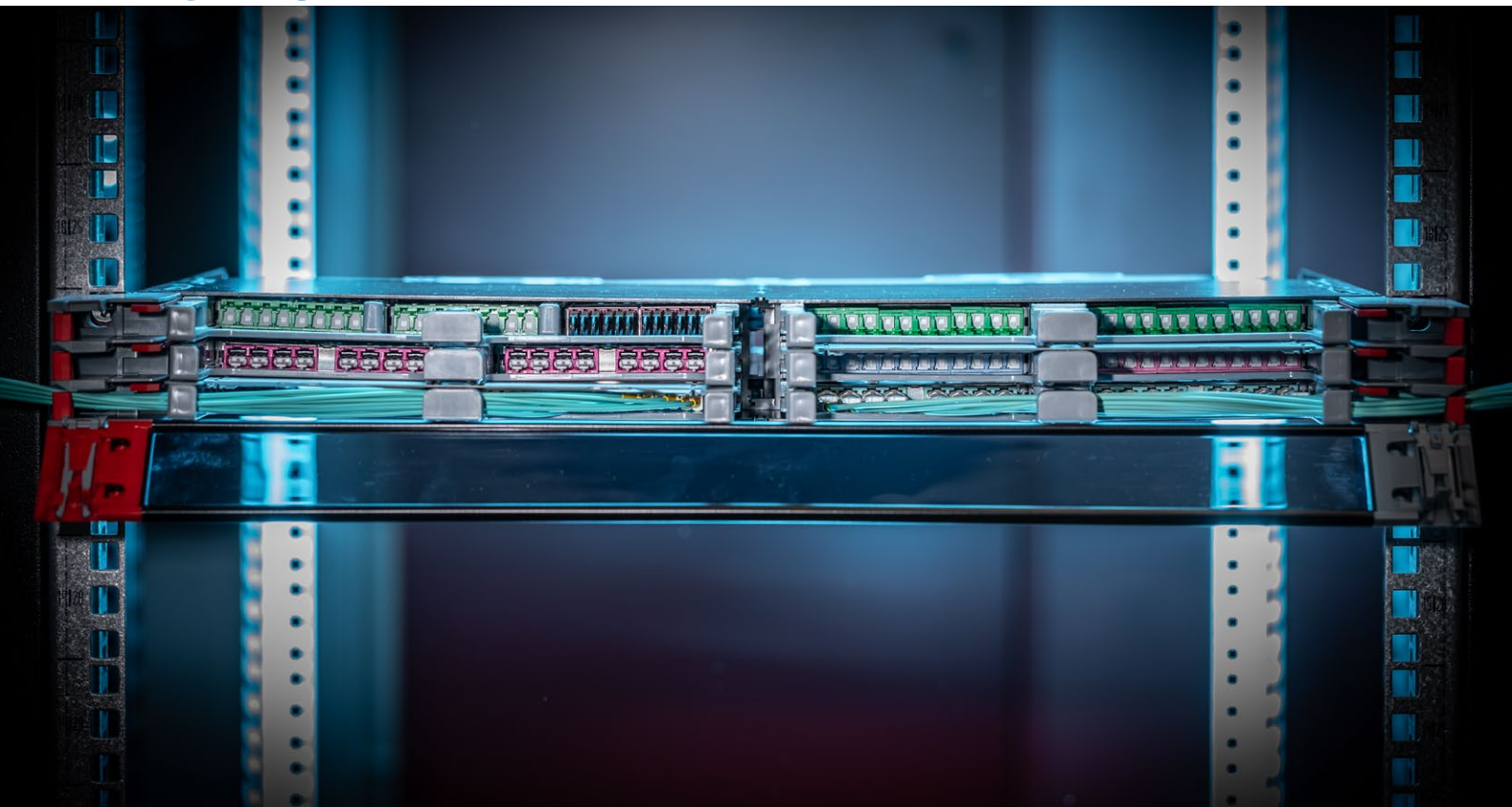
Helpful manual

Factors for the smooth installation and commissioning of the networks included the R&M manual, prepared specially for the KSW. The documentation produced by R&M in conjunction with Werner Jampen specifies the cabling components to be used in the KSW. This simplifies material ordering and installation planning.

The manual explains the cabling in network cabinets, the wiring of the Cat. 6_A EL module and defines the convention for the labeling of ports and links. It also describes guidelines for standard measurements as the basis of R&M's long-term system warranties.



René Wunderli | R&M Switzerland
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Miniature Connectors for 800G+

To enable data center providers to use their space even more efficiently, R&M is integrating the new miniature connectors CS, SN and MDC into its fiber optic distribution platforms Netscale 72 and Netscale 48: This increases their packing density by 30% and even trebles it for SN and MDC.

030.7801

Bandwidth requirement is growing and growing. Driven by a wide range of areas such as working from home, streaming services, AI applications, video inspections by drone, but also tele medicine and 5G campus networks, it is not only the large hyperscalers that will require significantly more bandwidth in the future. 400G (Gigabit Ethernet) is already establishing itself, something which was the focus of attention at the OFC 2022 in San Diego. However, 800G is also already raring to go. In addition to 400G transceivers, some exhibitors already had 800G transceivers with them. Due to the rapid growth in the amount of data that data centers have to process and store today and in the future, there is enormous cost pressure due to the limited space available, making increasingly higher port density in the tightest of spaces necessary.

VSFF – very small connectors

These solutions now need to be wired as sustainably as possible and in such a way that they take up little expensive space. The connectors also need to be more robust to ensure reliable connectivity.

LC Duplex and MPO/MTP® connectors (12/24 fibers) are the well-known interfaces for transmission rates of 10, 40 and 100G. For the higher data rates of 400G, 800G and beyond, more plug faces are now being added: These include the new MPT-16 design and the miniature connectors SN, CS and MDC – which belong to the VSFF class (very small form factor). They enable up to three times the packing density in ferrule-based cabling and 30% higher density in ribbon-based solutions.

In addition to higher density, the design of the VSFF connectors also offers maximum scalability to meet new demands as required. The connectors are easy to install, include user-friendly functions and provide optimum optical performance. Data center

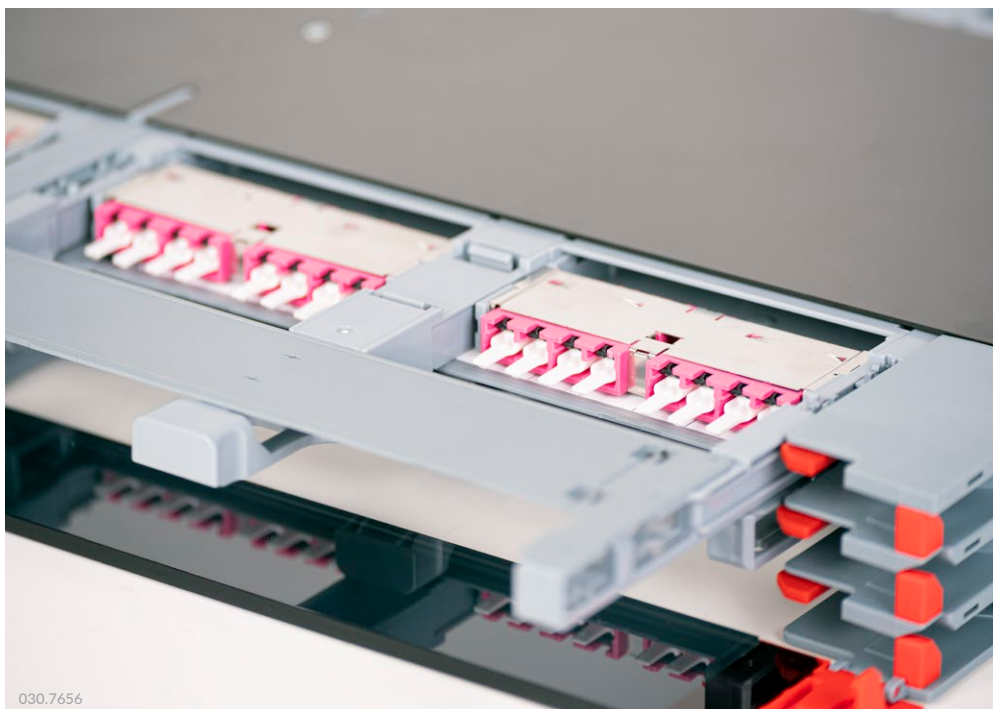
800G OSFP multimode applications

800G-SR8: With this solution, data transmission takes place at 800 Gbit/s over eight parallel full duplex 100 Gbit transmission channels (lanes) with PAM4 coding (8x100G=800G) and ranges of up to 100 m, with OM5 even 150 m. Possible connections: Multimode MPO/MTP® 16 APC 8° or Dual MM MPO/MTP® 4+4 OCTO, 4 x Multimode OM5 / OM5 MDC Duplex or 4 x SN Multimode OM5 / OM5 SN Duplex.

operators can thus reduce their operating and life cycle costs.

R&M integrates the miniature connectors

The trays and modules of the high-density distributor Netscale 72 can now be fitted with the connector types CS, SN and MTP-16. The distributor thus offers the highest packing density in its class. The connector types SN, MDC and MTP-16 are used in the trays and modules of the mixed media distributor Netscale 48. This means that a unique packing density of the connecting technology is available on a single platform



Miniature connectors CS, SN and MDC – enabling data center providers to use their space even more efficiently

800G OSFP singlemode applications

The 800GBASE-R standard defines the base layer for 800G networks. The existing 106.25G lanes defined in 400G Ethernet applications are the basis for the 800GBASE-R specification. To achieve greater bandwidths, the number of total lanes in Physical Coding Sublayers (PCS) is doubled from four to eight.

800G-DR4: With this solution, data transmission takes place at 800 Gbit/s over four parallel full duplex 200 Gbit transmission channels (lanes) with PAM4 coding (4x200G=800G). Reach: 1 to 2 km. Possible connections: 4 x Singlemode MDC Duplex or 4 x Singlemode SN Duplex.

– from the RJ45 and optical single and multi-fiber connectors to the miniature connectors. This makes it possible to meet all current and future challenges in data centers and especially in edge applications.

The Netscale family members 48 and 72, combined with the cabling system from R&M, are perfectly suited to a transmission length of up to 100 m. Despite the high port density, network technicians can easily plug in and unplug patch cords with CS, SN and MDC connectors. They can be patched individually. A long shaft and non-slip strain relief sleeve ensure accurate handling. To save installation time, R&M supplies the Netscale 72 modules and the modules for Netscale 48 pre-terminated.

Netscale 48

www.rdm.com/netscale-48/

Netscale 72

www.rdm.com/netscale-72/



Beat Koch | Product Manager
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Flexibility with Freenet



030.8189

R&M is expanding its range with 19-inch cabinets. The new family is called Freenet and is starting with three product lines. The advantage for R&M customers: They can now obtain housing and infrastructure from a single source. The global market launch will take place in early 2023.

The standard-compliant 19-inch housings from R&M are typically suitable as server, switch, cabling and distribution cabinets. The main areas of application are local data networks (LAN) and building automation.

Thanks to their neutral design and robust construction, they fit into almost any environment: offices and IT rooms, commercial and public buildings, residential buildings and industrial enterprises.

From our own production

R&M manufactures the 19" network cabinets in its own factories in Europe and China, compliant with its own quality standards. Customers receive a five-year product warranty. The aim of product development is to meet individual customer requirements and to be able to offer system solutions from a single source. The entire R&M network range fits in with the new housing.

The cabinets can be configured in a variety of ways. The components are supplied either screwed together or disassembled. R&M offers pre-assembly. It saves customers from searching for single parts in catalogs and simplifies the ordering process. The pre-assembly process helps to reduce installation work and packaging material.

Freenet: the 19" cabinets from R&M

Wall cabinet

- 9 variants, 9 to 24U
- Width 600 mm, depths 400 and 600 mm
- Glass door, sheet metal walls
- Cable entry in the roof
- Optional: fans, adjustable legs, castors



030.8005



030.7993

Classic Line

- 19" rack, 42U
- Width 800 mm, depths 800 and 1000 mm
- 800 kg payload
- 2 base frames with 4x19" profiles
- Glass door or perforated doors
- Sheet metal walls
- Cable entry in the roof
- Pedestal, adjustable legs

Expert Line

- 19" rack, 42U
- Width 800 mm, depths 800, 1000, 1200 mm
- 1,200 kg payload
- 4 base frames with 4x19" profiles
- Glass door or perforated doors
- Sheet metal walls
- Cable entry in the roof
- Pedestal, adjustable legs

Accessories: vertical profiles, blind panels, cable leadthrough plates, cable managers, cable brackets, shelves, drawers, document holders



050.7244

Andreas Klauser | Product Manager
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The Australian Taxation Office (ATO) built its data center with R&M Australia, Syndeticom, Trilogy Network Solutions and the global R&M Supply Chain making a record-breaking contribution.

For an authority such as the Australian Taxation Office (ATO), there can be hardly anything more important than absolute security. Australians rely on their data staying in the country and assume their personal information is being protected. Furthermore, digitalization is also advancing in the tax sector and the ATO thus needs future-ready facilities for hosting services.

In building a new data center, the government required a certified, independent provider, capable of taking on the project immediately and completing the data cabling within four months.

The project partners had to be able to rule out any possibility of failure from the outset. Their collective expertise, high understanding of the requirements and collaboration led to a fast and valuable outcome. During the design pro-

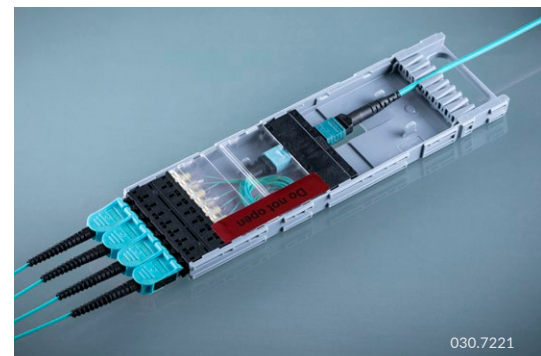
cess, the team worked with the ATO to finalize the design of the infrastructure and structured cabling to suit the proposed solutions.

Connectivity adapted

The ATO required a customized structured cabling solution, as per the local Government InfoSec requirements. Port density, polarity, MTP modules and patch cords all had to be configured accordingly. Trilogy, Syndeticom and R&M worked collaboratively to come up with an innovative and suitable solution for the structured cabling.

The entire R&M Supply Chain collaborated on the design and delivery process. Teams at HQ in Wetzikon and in the FO plant in Sofia organized the engineering and assembly. Together with the R&M team in Singapore, it was possible to deliver more than 500 Netscale platforms with 1,500 trays and other components punctually and in record time – despite the obstacles and challenges presented by the pandemic.

R&M's expertise as a reliable and fast supplier for government authorities was once more successfully put to the test.



030.7221



030.6240



030.6677

R&M solution for ATO

R&M designed a high-class network for the Australian Taxation Office (ATO) and its host. It is characterized by bespoke packing density and upgrade capability.

- Fiber optic distribution: Netscale 72 HD patch panel, PRIME ODF, ELISO patch panels
- FO cabling with QuickRelease connectivity: MPO-QR harness cables, MPO-QR/LC-QR fanout cables, LC-QR patch cords, OS2/OM4 cables
- Copper cabling: Cat. 6_A EL modules and field-mountable FM45 connectors, U/FTP cables



050.6958

Ian Russell

Managing Director, R&M Australia
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Project partners

Distributor: Trilogy Network Solutions (Trilogy)
Installation: Syndeticom
Design and consultation: DXC
Connectivity: R&M Australia

Assurance Maladie is Growing

Assurance Maladie attends to more than 59 million policyholders in France. Its data center in Toulouse manages highly sensitive and confidential customer data. The infrastructure had to be densified at short notice in order to reliably handle the growing data traffic. With Netscale from R&M, the fiber content of the cabling could be increased by a factor of eight per unit.

Assurance Maladie is responsible for health care within the French social security system. It manages data on 88 % of all French people in continental France and overseas territories. The data centers of Assurance Maladie (CTI, Centre de Traitement Informatique) in Toulouse and Strasbourg form the operative basis.

The 1,000-square-meter data center CTI Sud in Toulouse is spread over two buildings. These are connected via redundant fiber optic and copper lines to guarantee high availability. The CTI is available around the clock.

Major platform provider

Twenty international and national authorities and 152 individual social security organizations rely on the computing services of the two CTIs. In particular, they purchase PaaS products (PaaS = Platform as a Service). Among other things, CTI Sud provides virtual machines. Hosting includes 10,000 partitions per virtual machine on a storage area network of more than ten petabytes.

«Our aim is to deliver everything customers need for their platforms. This means that we provide area, power, air conditioning, network, system, storage space and data security, as well as databases and middleware,» says Philippe Mollet, IT Manager at CTI in Toulouse.

Why R&M?

- High packing density
- Simple management
- Robustness, modularity
- Functional labeling
- Fast commissioning
- Quality of advice
- Long-term support
- 25-year warranty

«At present, we don't know of any better product on the market.»

Philippe Mollet, IT Manager, CTI Toulouse



f.l.t.r.: Richard Blanc, R&M; Marc Castarede, Jean Luc Fabre, Frederic Andreu, CTI Toulouse; Christian Doumeng, Michel Pech, H2P

«The collaboration and communication worked perfectly to the satisfaction of our common customer.»

Michel Pech, H2P communications

Capacity limit reached

Demand for digital services from Assurance Maladie grew strongly during the pandemic. Data traffic had already been increasing at double-digit annual growth rates before that. As a result, usage of the infrastructure skyrocketed. This development pushed CTI Sud to its limits. The existing cabling in Buildings 1 and 2 was stretched to the limit. That's why those responsible had to act quickly.

R&M had already equipped Building 1 with everything a powerful network requires in 2012 and 2013. The infrastructure essentially consisted of top-of-rack cabling, 12-port patch panels and LC Duplex connectivity.

Now the network was to be strengthened within the existing infrastructure – first in Building 1. The pragmatic solution was to maximize the packing density in the racks in order to be able to use more ports and links.

Quick solution required

The management of CTI Sud needed the project to be completed as quickly as possible. They were looking for the expanded capacity to be ready by April 2022. The inquiry reached H2P, R&M's long-standing integrator in Toulouse, in mid-November 2021. After a product demonstration by H2P and R&M,

R&M solution

For Building 1 of the CTI Toulouse, R&M and its partner H2P developed a high-density fiber optic, redundant infrastructure, supplemented by copper cabling. Key modules:

- 148 Netscale 120, each equipped with 90 ports per height unit
- 370 trunks with MPO-12 connectivity for top-of-rack connection
- 1,500 FO patch cords, 2.1 mm cross section, lengths of 1 to 7 m, connectors: LC Quick Release
- 11 km OM4 fiber optic cable with 36 fibers
- 74 ELISO 48-port patch panels with 1,800 Cat. 6A Easylock modules
- 1,200 copper patch cords, thinLine Cat. 6A, lengths of 0.5 to 5 m
- 32 km Cat. 7 SFTP copper cable
- Adapted chassis for patch panels
- Custom labels for port designations



it was clear to the planners that they would only achieve their goals with the fiber optic Ultra-High Density distribution platform Netscale 120. The concept was developed within an hour.

With Netscale, it was possible to increase the packing density of fiber optic cabling from 12 to 90 ports. At the same time, the CTI remains flexible in order to be able to adapt the distributors to new situations at any time. «At present, we don't know of any better product on the market,» says Philippe Mollet from CTI enthusiastically. He has long been convinced of R&M's quality and reliability. The installation was carried out during operation. Interruptions would have cut millions of users off from the service provided by Assurance Maladie.

The partners implemented the planning, production and installation within three months of the order being placed. R&M's fiber optic plant in Bulgaria performed a masterly feat. It produced the trunks and assemblies in record time. The densified network infrastructure then went into operation at the beginning of April 2022.

Adapted chassis

One challenge was the limited space available for installation. There was not enough space for classic patch panels. That's why H2P had the chassis tailor-made to facilitate the installation of the Netscale platforms. The CTI team can open them at any time in just a few simple steps. Technicians can flexibly

The customer

With 59 million policyholders, Assurance Maladie attends to around 88% of all residents in France and the French overseas territories. With 152 individual organizations, it is available as a local point of contact for employers and policyholders. Assurance Maladie uses a total of four data centers to process information digitally.

These data centers ensure round-the-clock supply and processing of information to the local authorities of health insurance companies at international, national, regional and local level.

add, replace, maintain and adjust fibers and modules.

This means that the CTI is well prepared for the next flood of data.



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All-inclusive: The network solution from R&M (planned and installed by QPP partner ROLVA) for the Lara Barut Collection supports all the hotel's IP applications.

Ultra All-Inclusive – Even in the Network

Lara Barut Collection located in Antalya has been pampering its guests more than ever since April 2022 with its great transformation. The network also provides greater convenience, designed and implemented by the regional QPP partner ROLVA.

Lara Barut Collection consists of 535 rooms and 16 room types including lagoon rooms and suites, penthouse suites, designer suites, family and deluxe rooms. With this great transformation, completed between November 2021 and April 2022, new room types, new à la carte restaurants, an award-winning aquapark, unique sound insulation and more were included in the wide services. The surprises of the ultra all-inclusive hotel include 9 à la carte restaurants. Furthermore, the hotel has been constructing 24 Bayou Villas which were opened in October 2022.

Barut Collection Hotels are among the top players in the Mediterranean. A Barut Collection hotel offers much more than just enthusiastic staff, luxurious surroundings and exquisite entertainment.

Why R&M?

- Ability to deliver, punctual installation
- Price/performance ratio
- Low-maintenance, durable products
- Waterproof outdoor connectivity
- Integration of numerous applications
- Local round-the-clock support

Stay online everywhere

In particular, guests expect a ubiquitous, fast Internet connection. When they relax at the pools, on the beach and in the restaurants, they stay online. They share images, stream videos and play virtually.

That's why Lara Barut Collection planned a high-performance, high-density WLAN infrastructure. It is intended to meet the social media, gaming and broadcasting needs of guests everywhere. The company was looking for a solution for robust, waterproof and tamper-proof outdoor cabling that could be extended over the entire complex.

Time-critical modernization

In the context of sensitive tourism competition, modernization projects are under considerable time pressure. In addition to the architectural work, Lara Barut Collection aimed to renew and upgrade the entire data network. This meant large quantities of installation material had to be available locally, always delivered on time and installed on schedule.

R&M solution

- Netscale 48 distribution platform
- Outdoor distributor/cabling
- Field-mountable FM45 products
- 1,500 FO, 9,000 Cu connections
- Connectivity: Cat. 6/6_A, Cat. 8.1
- 20 km FO cable, OM5 and OS2
- 500 km copper cable, Cat. 8, Cat. 6_A and Cat. 6
- Design-compliant outlets
- intelPhy net network management

R&M META and the regional QPP partner ROLVA accepted this challenge. Among other aspects, the price/performance ratio, the cost-saving installation, the long product life cycles and the all-inclusive approach were convincing.

The new network not only provides guests indoors and outdoors with fast, seamless WLAN. It integrates hotel and building management, offices, finances, telephony, IP-AUDIO, telemetry, VOIP, security, surveillance, entertainment, CAST and IPTV.



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PRIME-ODF – Flexible and Sustainable

030.7790

Rapid developments in new technologies are causing the demand for bandwidth to rise incessantly and with it the number of fiber optic lines in the field. A challenge for fiber management. With PRIME-ODF, R&M offers the right optical distribution system.

Broadband coverage is growing every day. Network operators need flexible and sustainable solutions. The developments from R&M aim at high density and scalability of cabling on platforms that can be used efficiently. These include ODF optical distribution systems. At many sites, these are the interface between the active and passive network and thus the heart of every optical network.

Reliability and an easily expandable ODF system are important attributes when it comes to meeting today's requirements for fiber optic distribution. Basic installation and ongoing operation must also be ensured. The R&M PRIME-ODF system meets these requirements.

PRIME – modular and high density

The compact and versatile PRIME optical distribution modules are suitable for the flexible use of fiber optic terminations. They enable fast and simple installation in cramped environments as well as at sites with high fiber density. The tool-free system approach and the modularity guarantee uncomplicated migration into new and existing network infrastructures.

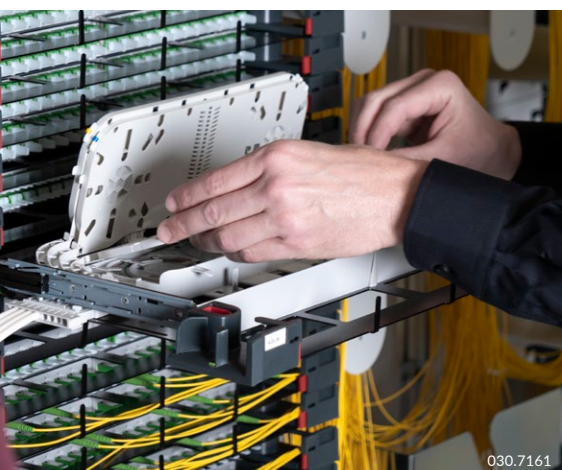
The 3U sub-racks for the 3/4U fiber units, which can be inserted tool-free, are the basis of this. There are different fiber units to choose from. Depending on customer requirements, these can be fitted modularly and individually in the 3U sub-rack. They cover

splice/patch, strictly cable-to-cable splicing or plug connections, and splitter solutions with single fibers and ribbon fiber applications.

The 3U sub-racks can be installed in the in-house ETSI rack range as well as in new and existing 19/21-inch cabinet systems with front or rear mounting. A 2.20 m high rack can accommodate up to 14 3U sub-racks with a fiber capacity of up to 2,688 Simplex or 5,376 LC connectors.

Nevertheless, the planning of an optical main distribution system for network operators is complex. In addition to personal advice, R&M provides support with an interactive planning aid:

www.rdm.com/prime-odf/



030.7161



050.6970

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Outdoor Connectors

The Internet of Things is expanding into the great outdoors. Street lights, traffic hubs, wind farms, industrial sites, modern urban infrastructures and also facilities such as alternative power generation need fast data lines. The many new 5G and WiFi antennas for mobile data communication are additionally driving up the demand for weatherproof connections.

Demand for robust outdoor connectivity is increasing noticeably. Today, digitalization is not only taking place in protected ambient conditions. For decades, traditional copper cabling was sufficient for outdoor use. Connectivity there consists, for example, of circular connectors, screwed connections, coax or upgraded RJ45 adapters. UV-stable plastic

housings and rubber seals, such as R&M's splash products, protect the connectors.

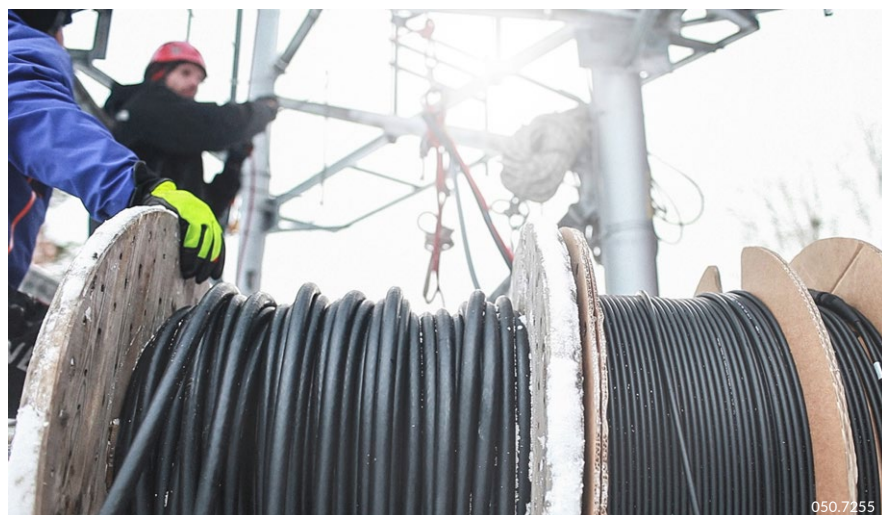
Copper contacts in outdoor network connectors must of course be corrosion-resistant, dust-, gas- and water-tight, and be able to withstand vibrations. The insulation displacement technology advanced by R&M meets

the requirements optimally and absolutely reliably. During wiring, the copper wires are firmly clamped while the insulation is retained.

More fiber optics

Increasingly, however, the focus in outdoor areas is now on fiber optic connections. At present, this special market is growing by 7.5% per year, say the market researchers from Facts & Factors. In fiber optics, expanded beam connectors have traditionally been considered a pragmatic outdoor solution. The expanded beams at the fiber stubs do not require direct physical contact with micrometer accuracy. This simplifies the connection. They ensure stable transmission even in dusty, damp and mobile outdoor conditions.

However, their attenuation values and transmission performance cannot meet all requirements. Many expanded beam connectors are too thick and too heavy for future applications. In relation to their format, they offer few transmission channels.



More performance

The digital era requires fiber optic outdoor cabling to provide more power than was previously conceivable and more transmission channels in condensed infrastructures. An example of use: Fiber to the Antenna (FTTA). The 5G antennas are connected to fiber optic networks in order to be able to transport unimaginable amounts of data in real time.

Fiber optic connectivity at the antenna sites is subject to similar space, performance and quality requirements as in an FTTx node or edge data center. Therefore, today only filigree, ferrule-based connectors (LC, SC, E-2000™, MPO) with physical contact of the fiber stubs and corresponding attenuation values are possible. They should support singlemode fibers.

More hybrid

Depending on the site, antenna and network architecture, fiber optic and electrical connectivity must be accommodated in a single connection box. Power to the Antenna (PTTA) and FTFA will often form a symbiosis. There is likely to be even more demand for

hybrid solutions in the future. The outdoor devices in the Internet of Things need power. When fiber optic and copper lines are routed in one cable, connection is greatly simplified.

Many applications

In addition to FTFA, other areas of application for high-grade FO connectivity in outdoor areas are emerging, such as:

- Augmented reality environments in smart cities
- Distributed antenna systems in industrial parks
- Tunnels, railway lines, traffic management systems
- Autonomous container terminals and ports
- Airport communication, airspace surveillance
- FTTH aerial deployment in rural areas
- On- and offshore wind turbines, industrial photovoltaic systems

New developments

As a provider of telecom, building and data center networks, R&M has long been concerned with outdoor cabling and robust connection technology. R&M is driving



forward several fiber optic developments for broadband provision and applications in the digital era.

One result is the new HEC 16 connector, or the HEC 9 which will soon be market-ready. These products are part of R&M's FTFA/PTTA portfolio. The company's own cable plant in the Czech Republic supports connector development with hybrid cables for harsh operating conditions from -40°C to +75°C.

Other R&M development projects deal with the easier handling of outdoor connectors. The more easily these can be connected, the faster projects at the most unusual premises will progress. Optimized port and connector solutions can replace splicing in shafts or on roofs. In addition, R&M supports customers with assemblies, logistics, measurements and knowledge for installers.



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Hybrid FTFA/PTTA Cable Head



The HEC 16 connector feels at home wherever harsh ambient conditions prevail.



With the waterproof and dustproof splash outlet from R&M, Cat. 6_A and Cat. 8.1 connections and Power over Ethernet can be made available in harsh environments.

For every place of use

R&M's Harsh Environment Connector (HEC 16) with a diameter of 32 mm is suitable for any harsh place of use, not just for mobile communication antennas. Variants with LC Duplex, SC Simplex and MPO-12 connectivity are available, as well as a hybrid variant for data and power connections.

R&M has tested the connector in accordance with Telcordia GR 3120 and IEC-61753-1. The requirement is: IP68 (remain waterproof for several days three meters under water). With a tensile load of up to 450 N, the HEC 16 is one of the strongest in its class.

The housing with a quarter-turn fastener decouples the connector from the outside cable. This minimizes the influence of temperature fluctuations and cable shrinkage.

The Blind Mating assembly technology developed by R&M, allows the HEC 16 to be connected with one hand with gloves without a clear view without soiling or scratching the fiber endface.

Connectivity infrastructures for data centers

Total reliability from R&M





800 Gigabit is Just Around the Corner

Now that 400 Gigabit Ethernet (400G) has just established itself in the large data centers, the next generation is making surprisingly fast progress. 800G technology is actually market-ready. In two years, it will rule the spine-leaf networks.

Let's take a look at the ongoing process. Several specifications are still in the works. But optical transceiver modules of the two determining form factors QSFP-DD800 and OSFP are already being mass-produced.

The MSA Group 800G Pluggable has specified modules for 8x100G and 4x200G. The 8x100G module will have an interface for

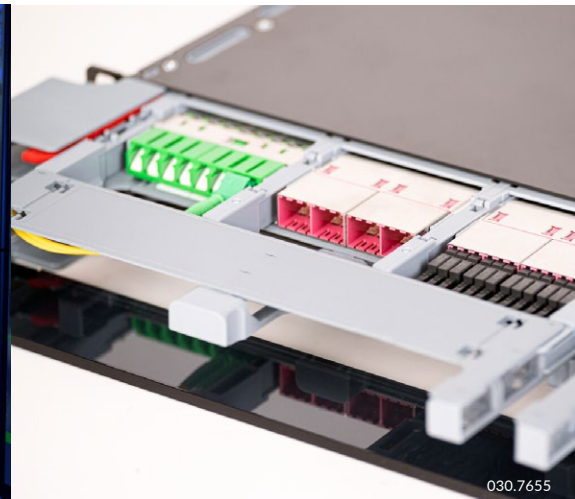
eight parallel singlemode fibers for transmission links up to 100 meters. The 4x200G module is designed to work with Wavelength Division Multiplexing (WDM). It is to transfer 200 Gbit/s signals over four wavelengths via singlemode fiber for two kilometers. So hyperscalers would be well catered for.

The responsible IEEE group (IEEE 802.3df) is not yet able to submit final 800G specifications. At the same time, it wants to define the framework for the next but one generation with 1.6 Terabit Ethernet. Standards for the following are in the works: 8x100G via multimode fiber for links up to 100 meters, 8x100G in parallel via singlemode fiber for links up to 500 meters and 8x100G with WDM via singlemode fiber for up to ten kilometers.

The Ethernet Technology Consortium (ETC) and the Optical Internetworking Forum (OIF) are also working on 800G specifications. The MSA Group OSFP-XD has presented a solution with 16 channels per module that will pave the way to 1.6 Terabit Ethernet.

The racks are cramped

Data center operators should think about cabling, distributors and connectivity for 800G and the next generation at an early stage. The passive infrastructure cannot be replaced as quickly as switches and transceivers. But it



With the migration to 800 Gigabit and 1.6 Terabit Ethernet, cabling in data centers will continue to increase in density. Miniature connectors can triple the packing density of the Netscale 72 and 48 fiber optic distribution platforms.

has to be adaptable. Cabling, connectivity, transmission methods and transceiver solutions are mutually dependent.

Where four fibers are sufficient so far, eight or 16 fibers will soon be needed – depending on the configuration. As a result, things will get even more cramped in the racks and cable guides.

With Ultra-High Density platforms, such as R&M's Netscale family, data center providers can acquire additional resources. It is important that these platforms significantly simplify the handling and management of the many fibers, ports, patch cords and assemblies.

Inward compression

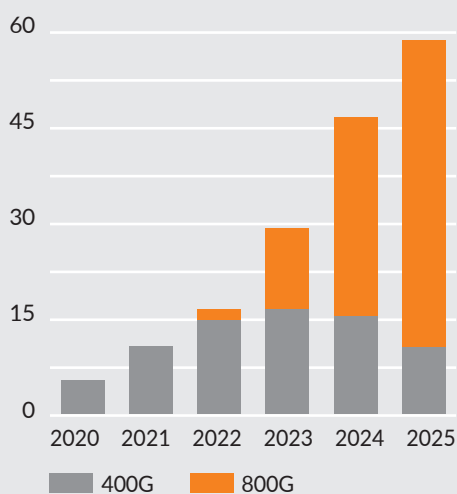
The next compression step will lead inwards into the connectors. It makes sense to use MPO 16 and MPO 24 on the trunk side in the future.

With the new miniature connectors CS, SN and MDC, four duplex connections can be packed into a breakout port and individually patched.



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400G to 800G Optics Transition (Bandwidth Mix)



Source: 650 Group Market Intelligence, 2021.

Now the 800 Gigabit generation of fiber optic data transmission is coming to the data centers.
Source: 650 Group Market Intelligence, 2021.

Connectivity Kit for Macrocells

050.7008

Modern 5G services will only be possible with tightly meshed fiber optic networks. 5G antennas need robust fiber optic connections. Each antenna site places specific demands on connectivity and integration into existing infrastructures. With its CONEXIO portfolio, R&M offers flexible solutions.

5G applications require huge amounts of data to be transported in real time. Continuous and tightly meshed fiber optic Layer 1 infrastructures must be available from the core network to the radio heads to ensure smooth data traffic.

This is why network providers are currently investing in FTTA (Fiber to the Antenna), i.e. fiber optic connections to new 5G radio stations and antenna systems. First, existing 4G macrocell sites must be upgraded accordingly with new 5G systems. In the near future, 5G

stand-alone sites will be expanded to include 5G-specific small cells. This will happen in several waves, and the use of existing locations as well as the multiple use of fiber optic capacity and radio locations will be mandatory in order to manage 5G network expansion.

Diverse requirements

This is not an easy thing. As a rule, signal cabling and power supply for the 4G/LTE infrastructure are already in place at the sites. The new 5G active technology and associated cabling must also be accommodated – in buildings, access points and ducts, on facades, scaffolding and masts. There is often a lack of space or the load capacity of existing masts is exhausted. The construction of additional masts or new sites would require lengthy approval procedures.



«Virtually all 5G cabling with its fiber optic and copper-based components has to be planned individually for each location and operator.»

Various stakeholders must be taken into account and can offer possible solutions: tower companies, neutral hosts, network operators, service providers, cities, public utilities, land and building owners. The need for planning and communication is increasing and new partnerships are emerging between existing and new market players. The actual cabling in the different fiber optic sections is similarly complex. The readiness for the convergence of fixed and mobile networks is expected. Fiber optic infrastructures for 5G sites can easily be combined with local FTTH projects or networks operated by city carriers, power providers or railways.

And that means virtually all 5G cabling has to be planned individually for each location and operator. As a result, network providers need adaptable solutions that connect new 5G active components (radio heads) and the fiber optic network on masts in the ground.

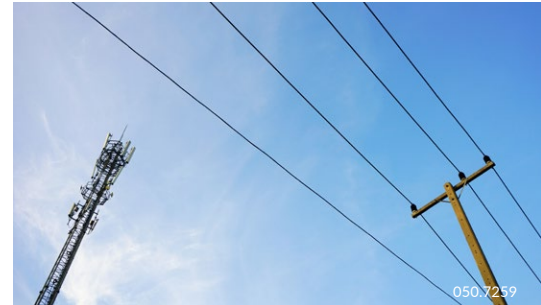
This includes cable head terminals, canisters or cable dividers, manufacturer-specific jumper cables and solutions with connection boxes, pre-terminated and assembled, in lengths of 50 to 200 meters. Depending on

the site requirements, fiber optic and copper cable systems are required separately or as hybrid solutions for power supply (DC or AC) and high-performance, bidirectional fiber optic connections. It goes without saying that the entire infrastructure must be outdoor-capable and operate without interruption for decades under harsh climatic conditions.

Cable heads, canisters, boxes

From R&M's point of view, a modular system consisting of various solution modules is the perfect answer. With this in mind, R&M is developing the CONEXIO product line. Outdoor connectors and adapters play a key role here. One example is the HEC16, which is being launched by R&M in connection with the introduction of FTTH solutions, but which can also be used for other outdoor applications in industry and in public networks.

A portfolio of cable head terminals, canisters and boxes will be available for cellular phone macrocell sites from the end of 2022. All three solutions will be available in three variants: FTTA (Fiber to the Antenna), PTTA (Power to the Antenna) and HYBRID (FTTA/PTTA). For all variants, R&M will be offering

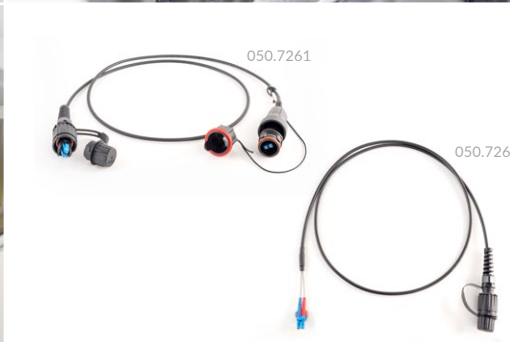
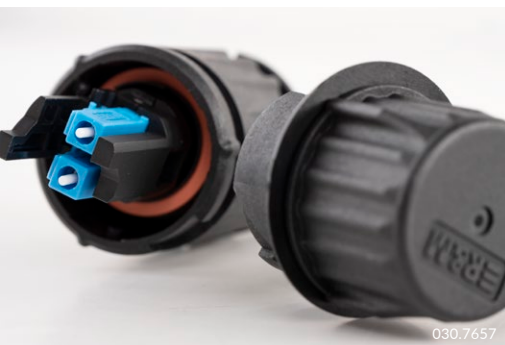


customizing, planning support, application engineering as well as sales, logistics and supply chain support all round the world from a single source.

From the core network to the antenna

With the FTTH portfolio for cellular phone macrocell sites, the R&M cable assembly and connectivity portfolio for robust outdoor applications in the telecom sector is being significantly expanded. This provides a modern, modular range of solutions for stakeholders involved in 4G/5G network expansion. These include network operators and their planning and installation service providers, tower companies, neutral hosts and city carriers. Today, R&M provides fiber optic infrastructure solutions that range from the core network and the main distributor to the antenna site and the building infrastructure.

In this way, network operators can map different topologies, use and further expand existing fiber optic infrastructures for broadband provision and thus efficiently drive forward the necessary convergence of the networks and their infrastructures with products from a single source.



Thomas Ritz

Market Manager Public Networks
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With the FTTH portfolio for cellular phone macrocell sites, a modern, modular solution portfolio will soon be available for stakeholders involved in 4G/5G network expansion.

Ready to Deliver at All Times



Alongside individual solutions, to date R&M has supplied more than 900 km of Cat. 6_A cables and more than 20,000 Cat. 6_A EL connection modules, which can be assembled in minutes.

Everyone involved wants to expand the cooperation. The decision-makers at ŠKODA AUTO will also be able to implement future digitalization projects with R&M solutions.

The Czech car manufacturer ŠKODA AUTO a.s. chose R&M to supply network infrastructures at its headquarters. The decisive factor was that R&M products exhibit above-average quality and performance, and that R&M is able to deliver at all times.

On the road to the future of the automobile, the company needs powerful, expandable data networks. ŠKODA AUTO is constantly strengthening the infrastructures at its headquarters in Mladá Boleslav.

Following a careful evaluation, ŠKODA AUTO decided to further develop the networks with the help of R&M in 2019. R&M was audited in accordance with the Internal Technical Standards (IST). In the audit, R&M was able to prove that its product performance values always exceed the minimum requirements of

the standards. First and foremost, it was the product quality that was the deciding factor.

Diverse applications

The wide range of solutions for LANs, industrial LANs and data centers as well as indoor and outdoor cabling was also convincing. The number of possible applications of the R&M cabling systems also surprised the decision-makers.

R&M was able to offer dedicated FO cabling for the smoke alarm infrastructure. And the company also implemented Fiber to the Desk cabling for the design area.

Local support

It is very important for the customer that support is provided by local specialists. This is why R&M works with certified and regularly trained Czech partners. R&M also ensures that approved material is always available. Over the past years of the pandemic, the company has remained able to deliver at all times.

The installations are carried out in accordance with tried-and-tested R&M standards. A 25-year system warranty is granted. In addition, R&M supports the installation projects from planning to maintenance.

R&M solution for ŠKODA AUTO

- Copper: Cat. 6_A cables, Cat. 6_A EL modules
- Fiber optics:
 - OS2 and OM3/OM4 cables
 - Netscale 72 distributors
 - Polaris boxes for outdoor use
 - Fireproof installation cables
 - FTTD for design

Reasons for choosing R&M

- Quality and performance
- Wide range of applications
- Availability and logistics
- Local, qualified support



Jan Vaculín, Sales Manager R&M Czech Republic, and Adam Kracík, Data Networks Manager ŠKODA AUTO a.s. – in front of the ŠKODA AUTO Headquarters in Mladá Boleslav



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Data Center Goes Hybrid



050.7265

Have there ever been limits in the cloud? In the past, the market differentiated quite strictly between hyperscale, colocation and on-premise. Sometimes one category was «in», and at other times a different category was the one to go for. Now the boundaries are opening up. The idea of decentralization is returning in the form of the edge.

«We're moving everything to the cloud.» That is something people have heard a lot over the past twenty years. Many companies still understand this to mean that remote and central mega data centers host their data. With mixed feelings, they said goodbye to their old in-house data center.

For many reasons, IT departments still need to have full access to their own resources and applications. To this end, they are increasingly using the rental offers of diversified colocation providers. The operative premises are of secondary importance.

Local data processing

As part of the digitalization of our professional and private lives, it became necessary to process some of the data locally after all.

The long journeys to the cloud cost time and money. Young growth markets demand enormous, low-cost, real-time processing power for their data-intensive services and applications. The service is to be provided by agile, local edge data centers.

New applications are now coming along that require a more complex hardware architecture – partly supplemented by local and specific installations. Apps, operating systems, IT stacks, data and workloads are to be distributed globally, intelligently and cost-effectively.

The result: The data center can no longer be seen as a single, fixed infrastructure, but as a hybrid IT architecture between the data source and the cloud.

Industry Adoption of Edges is growing Fast



Automotive

9.7%



Manufacturing

6.2%



Health Care

8.6%



Smart Cities

6.1%



Smart Grid

4.6%



Retail

4.5%



Commercial Drones

1.5%

Source:
The Linux
Foundation

050.7285

Customer-specific design

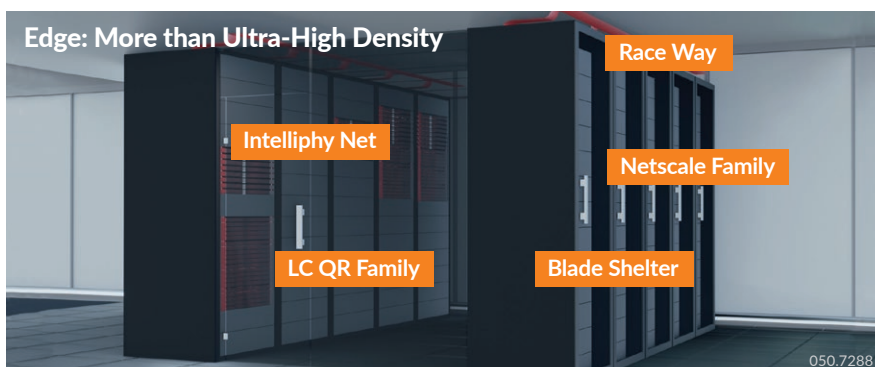
The market calls this model distributed IT architecture. To this end, edge architectures are designed specifically to meet the needs of customers, the business model, the applications, or the performance. Software and IT must be able to be configured flexibly, as must physical infrastructures: carrier connectivity and backhaul, interconnects and networks, meet-me and computer rooms.

Component-based, integrated infrastructure solutions are R&M's answer to the trend. Data center providers and their customers receive everything from a single source of supply – from a single rack and connectivity to a computer room and management system. This allows them to quickly and independently build and organize their own architectures, networks and services in the new hybrid IT world.

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



Edge: More than Ultra-High Density



050.7288



050.7091

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050.7230

With ZOONA Faster on the Last Mile

R&M has configured its ZOONA concept to make it possible to roll out fiber optic broadband networks easily, quickly and at low cost. A new generation of splice closures contributes to this in the access area.

Today, modern broadband connections are part of the basic supply – like water and electricity. However, because FTTH services outside of cities have so far only promised low profitability due to the high investments that would need to be made by telecom carriers, there are still many undersupplied rural areas. Network providers therefore need to consider how fiber optic networks can be implemented faster and more reliably there. They are making faster progress in the blanket expansion of broadband via the alternative means of aerial deployment. R&M has set itself the goal of supporting this and is developing suitable products and solutions

for this purpose. This includes a new generation of compact fiber optic closures, which require little space and help to save investment costs. In addition to the classic underground installation in street cabinets, shafts or subsoil, R&M has also designed the new ZOONA splice closure for use in above-ground applications. The mechanically sealed splice closure also fulfills the most stringent protection conditions (IP68) and can be installed in assembly shafts, street cabinets and walls in a time- and cost-efficient manner using the integrated wall holder. With custom-fit accessories, it can also be used on overhead line or power supply masts.

For agile networks: quick and easy to install with the intelligent «QIKSeal» cable entry system

The ZOONA splice closure enables fast and time-saving installation without special tools. Installers can prepare the individual cable or loop entries completely outside the splice closure. The innovative QIKseal cable entry concept offers an intelligent, easy-to-use and securely sealing solution for a range of cable diameters and injection tubes. Despite its compact dimensions, there is sufficient space and innovative components inside the splice closure for overlength management (loop and single fibers), fiber management with up to



Perfectly sealed thanks to QIKseal

four FMTS30 splice trays and a holder for up to four mini splitters. Depending on the configuration, the splice closure also holds a multi-fiber cable loop and up to twelve individual cables. Up to four splice trays for a total of 48 fibers can be individually processed in the inlay of the splice closure with the universal R&M fiber management system. This is available in two variants – Heatshrink (HS) and Sandwich (ANT).

Step-by-step installation is possible, starting with an initially reduced and more cost-effective assembly, which covers the demand for an initial connection. Thanks to the modular concept, additional subscribers can be connected, splice trays and cable entries added, the number of fibers upgraded and cables replaced at any time during operation. For these subsequent installations, cables that have already been installed do not need to be touched or removed; network operation continues undisturbed.

Perfectly sealed

The ZOONA splice closure offers a fiber-glass reinforced, robust housing, complies with protection class IP68 and has been pressure-tested at a 0.3 bar/3 m water column over seven days. All cable entries are real-

ized and sealed with the newly developed, innovative QIKseal modules. The QIKseal concept comprises sealing to the cable jacket, between the entry and housing base, and also serves to secure or relieve the strain on the cable. QIKseal cable entry guides are available for diameters of 6-16 mm (loop, 1x) and 2-8.5 mm (single cable, 12x).

Overall, assembly does not require any special tools or training. This reduces installation costs and time. But the total cost of ownership can also be reduced with the use of R&M ZOONA splice closures because they are individually assembled according to the customer's requirements and configuration scenario, and the easy access to the splice closure creates the possibility of gradually adding new subscribers during operation («invest as you grow»).

PRECON – pre-terminated and ready for use

FTTH expansion is even faster with pre-terminated splice closures and cable configurations that are used in precon or index network concepts and implementations. Four configurations are currently available: 1 loop / 8 drop; 2 loop / 8 drop; 1 loop / 16 drop and 2 loop / 16 drop. Input/output



Precon ZOONA splice closure: pre-terminated and ready for use

for the loop can be via either an SC or an MPO adapter. There are up to 16 drop-out SC adapters in the maximum configuration. This makes it possible to build typical configurations with 1:4, 1:8 or 1:16 splitters.

With precon ZOONA splice closures from R&M, suppliers can quickly set up access networks for rural communities. Even 5G locations, such as small cells in daisy chain structures, can be connected to the fiber optic network in this way.

www.rdm.com/zoona-closure/



Increasingly better fiber optic supply in rural areas thanks to aerial deployment



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Finding PoE Connections Not Looking for Them

041.0652

Which ports of an outlet have Power over Ethernet (PoE)?

The new, small PoE Indicator from R&M provides the answer immediately.

This question regularly arises when network technicians want to connect PoE-powered terminal equipment in a building. You don't have the latest network documentation to hand and getting to the floor distributor is too tedious. You often have to test on site and try out several connectors in order to identify the current-carrying ports and outlets.

That takes up valuable time. Problems like this often occur in difficult-to-access cabling, maintenance work, relocations and the subsequent integration of PoE.

Like a dust cover flap

Although the PoE Indicator can also be used as an aid during patching, it is actually configured to be permanently applied to all outlet ports. It is plugged into an RJ45 socket like a dust cover flap. There, it contacts the signal pins and uses the PoE management signal to determine whether PoE transmission is possible.

The PoE Indicator from R&M makes the activated ports visible right away. Its LED lights up when a PoE-capable network device (PSE) is waiting at the other end of the link.

R&M's PoE Indicator works for all PoE application types and protocols, and for both end-span and mid-span power supply. PoE switches show ports with an inserted PoE Indicator as unassigned ports. The Indicator is suitable for insertion with all R&M RJ45 sockets.

In the case of unused ports, the PoE Indicator can also serve as a dust cover that is permanently attached to the socket. For example, if a PoE power supply unit is connected in the floor distributor, technicians immediately find the right outlets in the rooms.



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www.rdm.com/poe-indicator/

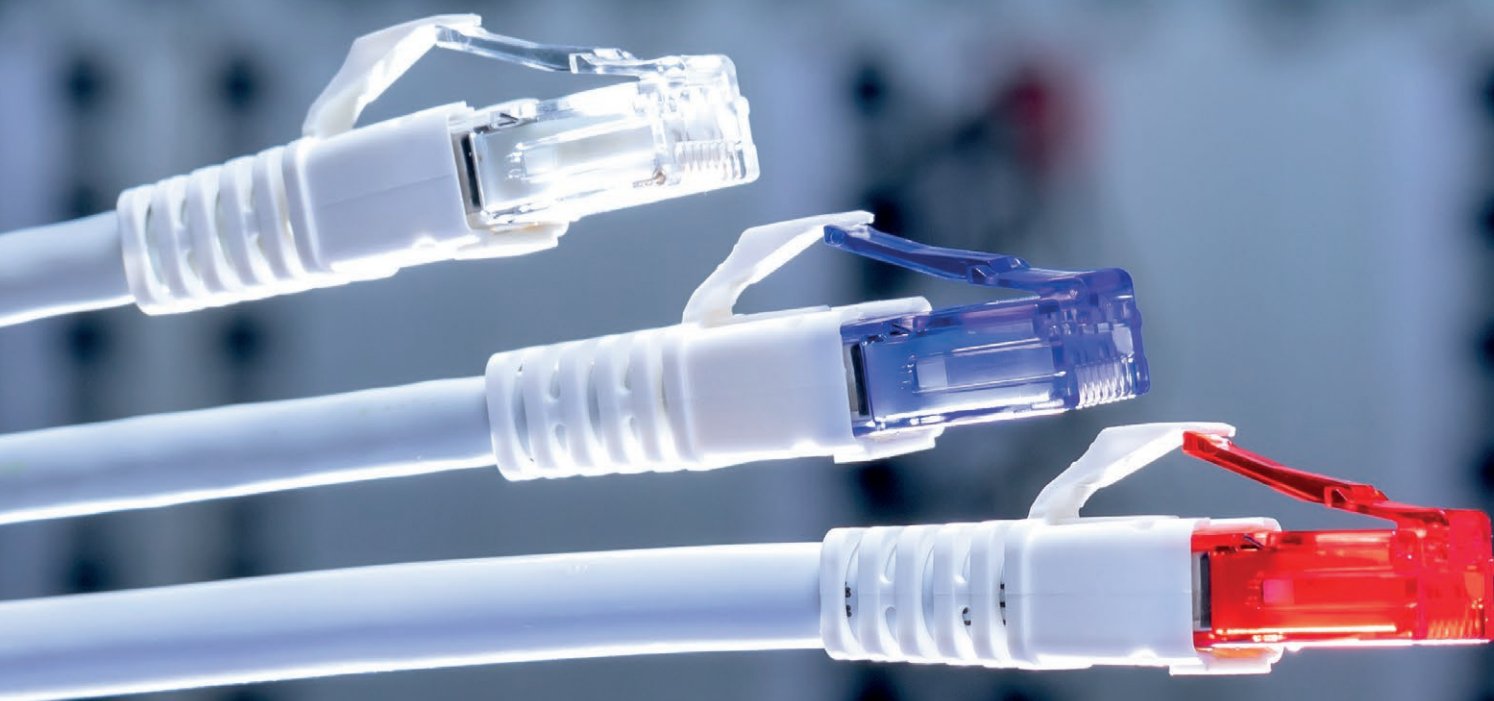


050.7268

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Treat your building to a local area network from R&M

End-to-end network technology
for offices, buildings, industry and
smart buildings



050.7269

Excitement about the FO Field

Professional Swiss installers are connecting residential buildings to the new FO networks at record speed. With the FO Field and the training courses from R&M, they are now even faster.

Together, Swiss network provider Swisscom and R&M want to simplify the installation of fiber optic connections, including in family homes. With the support of R&M, Swisscom has created an FTTH installation concept and published a corresponding manual.

This manual describes solutions for cabling in family homes and is intended to ensure that the FO connections meet Swisscom's quality standards. In particular, it concerns the section from the building entry point (BEP) via the network termination (OTO) to the router. In this context, Swisscom installs the field-mountable FO Field fiber optic connector from R&M for the connection of remote OTO outlets.

Installation in three minutes

R&M has been offering training courses throughout Switzerland since 2022 so that installers can use the FO Field in a routine and standard manner. They last one to two hours. Participants learn how to insert the optical fiber into the FO Field, wire the connector and test the functionality. Installation takes around three minutes with corresponding routine.

«The FO Field clearly simplifies our work on Swisscom's FTTH projects.»

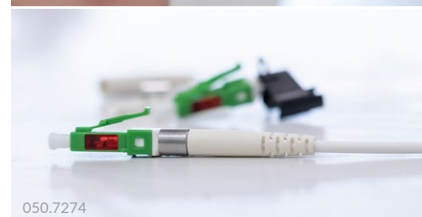
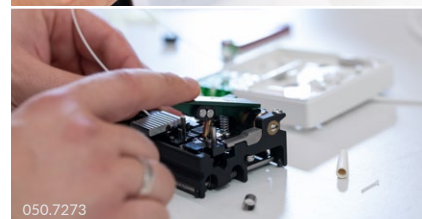
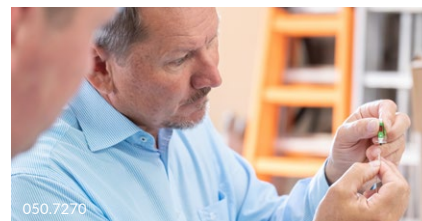
Nerman Mujagic, Construction Specialist, Cablex AG

On-site training at Cablex and other installation companies has decisive advantages. Participants learn in their familiar professional environment and using their own tools. This means that the newly acquired knowledge can be applied immediately and practically.

R&M also provides videos with installation instructions. When installers want to see a certain technique again, all they have to do is pull out their smartphone and watch the video.

Experience shows that initial skepticism quickly turns into enthusiasm. Nerman Mujagic of Cablex confirms: «The FO Field clearly simplifies our work on Swisscom's FTTH projects. We only need a small number of tools and no splicing device for installation. FTTH customers' wishes can be implemented spontaneously.»

With the thin single-fiber installation cable and the FO Field from R&M, installers can position the remote OTO outlets to suit homeowners' wishes. You can rewire the FO Field up to five times. This allows the outlet's position to be changed several times.



With the FO Field, patch cords of any length can be terminated in no time at all. It makes it possible to repair or change existing fiber optic installations spontaneously. The cables are cut to the required length with centimeter precision on site to prevent waste and overlengths.

[FO Field
Installation Video](#)



[FO Field
Installation Guide](#)



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SPE – From Theory to Practice

A lot has already been said about the vision of Single Pair Ethernet (SPE): barrier-free data flow from the sensor to the cloud without gateways. Now the implementation can begin: R&M has developed a complete transmission channel with patch cords, connection modules and installation cables for building automation.

Switching from four- or eight-wire cabling to a single twisted-pair cable for data transmission and miniaturized connections is a major technological advance: This results in continuous ALL-IP communication with bandwidths of 10 Mbit/s to 1 Gbit/s. Due to the higher connection density in the device, less space is required on the printed circuit board. The volume in the cable duct is reduced with a concurrent lowering of the fire load. This reduces space, weight and installation effort, reduces costs and saves materials. The cabling system reaches transmission distances of up to 1000 m.

Complete system solution

R&M is the first manufacturer to offer a complete transmission channel in accordance with the IEC 63171-1 standard, making the LC-Cu product line now available. Cabling and infrastructure specialists can use the patch cords, connection modules and installation cables. The SPE connection modules fit into the existing 19" panel and outlets with a Freenet interface. With this, R&M guarantees a complete end-to-end SPE connection from a single source:

- Patch cords: With IEC 63171-1 connector, with proven IDC connection technology and AWG 26 stranded cable for transmission frequencies up to 600 MHz (Class T1-A and T1-B)
- Duplex connection module: 2x SPE IEC 63171-1 jack with IDC connection technology for AWG 26 – AWG 22 wire and stranded cables for transmission frequencies up to 20 MHz (Class T1-A)

- Installation cables: SPE installation cable S/FTP AWG 22/1 with LSZH sheath of fire classification Dca for transmission frequencies up to 600 MHz (Class T1-A and T1-B)

SPE components

For manufacturers of active devices such as network switches or IoT terminals, R&M is the first manufacturer to provide a jack with solder pins for integration on printed circuit boards. The printed circuit board jack in accordance with IEC 63171-1 is available with or without an optional light guide for simple status display via LED. In addition, there are corresponding pin-out and dimensional drawings for successful design-in.

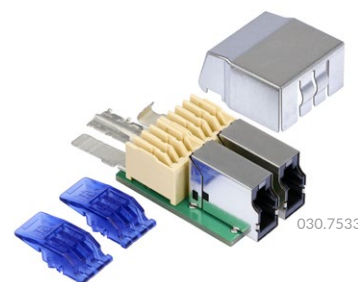
Together with the print socket and patch cord, the entire connection technology is ready for use so that development departments can easily set up their SPE application. A digital building infrastructure of the future is just around the corner: SPE can network sensors, such as on fire alarm systems, brightness and temperature sensors, as well as access control systems, information boards and much more.

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

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Holistic Fiber

050.7275

Convergence is currently a key trend, as 5G and fiber networks are being joined up. However, convergence isn't just limited to linking wired and wireless networks. Convergence also means building a foundation for tomorrow, when every kind of network communication will move to a ubiquitous fiber backbone.

What are the benefits of convergence – and what do we need to take into account?

In recent years, we've seen wireless and wired connectivity converge, utilizing fiber cabling. 5G and FTTx will continue to merge – and without adequate fiber backhaul, there can be no 5G. Combining 5G with fiber-rich network cabling makes it possible to meet fast-growing 5G speed requirements, using small cells to eliminate bottlenecks, on a single network. This also makes it possible to maximize use of all system assets and, therefore, improve ROI. As complementary solutions, 5G and FTTx can share network infrastructure. Both rely on availability of fiber, and both require a significant number of fiber connection points. Combining infrastructure and rollouts for both technologies offers great opportunities to increase efficiency and realize cost improvements in the coming years.

FTTH studies show this makes sense from the perspective of technology as well as business. A 2019 study from the FTTH Council

Europe shows that anticipating a Fiber to 5G Antenna/base station (FTT5G) network while planning for an FTTH network can deliver cost savings between 65 % and 96 %. In short, it pays to build in ample spare capacity for 5G when rolling out a fiber network. Especially

because in the future, fiber network convergence will expand to include more than FTTx and 5G.

Now, data centers are also ready to join in the convergence trend. In order to meet





to define different functions and integrate hardware and software. That requires greater attention to:

- Interoperability
- Integration
- Standards (observing possible constraints caused by competing standards)
- Monitoring (which can be done from a single dashboard)
- Optimization (constantly manage the functions and bandwidth requirements of different services across many device types)

today's vast demand for bandwidth, 100G and 400G might be standard sooner than we imagine. Fiber allows DC operators to migrate to higher speeds relatively quickly and easily - this could not be achieved with copper cable infrastructure. Local networks can establish long-distance connections via a fiber backbone providing fast, high-capacity connectivity between DCs, edge DCs, and end users. Some DC operators are even developing their own optical point-to-point networks in order to realize cost savings while accommodating bandwidth growth and increasing flexibility.

Besides wireless networks and (edge) DCs, other trends are driving the need for bandwidth, uptime, and therefore ubiquitous fiber: Internet of Things (IoT) which incorporates digital building management systems, All IP-networks, Digital Ceiling networks. According to Statista, the IoT will connect over 75 billion devices by 2025.

IP-based convergence enables the sharing of (virtualized) resources across applications and provides high levels of standardization, availability, reliability and support for new deployments. An ALL-IP approach extends the data network and PoE through an entire building's ceiling, making it possible to connect devices to building automation via zones with pre-installed overhead connecting points. All areas of building automation can be integrated into a structured solution concept. Introduction of smart, converged networks means energy-conserving technologies and applications can be introduced, such as intelligent management of building space, resources and LED lighting.

Smart cities and autonomous traffic will also enormously drive the need for fiber and convergence. Once 5G is widely available, people will use more streaming and remote working services on the go, as well as more virtual and augmented reality applications.

Convergence offers greater flexibility, scalability, and uniformity. It allows users to make the most of increasingly sophisticated system intelligence. It provides enormous efficiency increases, from both technical and business perspectives, by centralizing management of IT resources, consolidating systems, boosting resource utilization rates and lowering costs. Deployment of converged networks helps reduce overall power consumption, improves cooling efficiency and enables introduction of further energy-saving measures.

Understanding the networks' needs

Within a few years, every network will operate on the same combined fiber backbone. Data communication, mobile, video, and everything else will merge onto a coexisting network - which implies that we need to stop thinking in discrete networks.

The benefits include reduced investments in rollout and maintenance, phasing out of legacy technologies, and a unified underlying technology and interfacing. Network operators and users can focus on their core business and develop applications that exactly match requirements, interact across systems and platforms, and are always up to date.

However, one challenge springs to mind: Previously, we would use a separate device for each specific function, but now we need

R&M products support the convergence development by allowing customers to design, build, test and deploy any functionality, based on fiber, with a single set of products and tools. We offer low, mid, and high density solutions, even completely preconfigured racks and data centers. We provide a complete package, including aerial, wireless, and wired solutions. The offering encompasses all hardware and software services as well as advice and consulting. Because top quality products are only half the solution: You need to fully understand the needs of every part of the network - and how different networks fit together - in order to provide the right solutions!



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Priority for Cybersecurity

050.7277

R&M uncompromisingly protects the data of customers, partners and employees. Corporate governance and IT follow strict rules. What exactly is R&M doing to prevent cyberattacks and data misuse?

Data protection and cybersecurity are part of R&M's sustainability strategy. Equally important is the protection of information about business relationships, products and technologies.

As a responsible company, R&M determines itself how the corresponding targets are achieved. An IT security roadmap has been setting the course for several years now. Investments in IT security have tripled over the past three years.

Standards for quality management, the principles of sustainable companies in accordance with the UN Global Compact and international regulations are incorporated into the security strategy. IT security and cyber risk management meet the requirements of ISO 27000. R&M is preparing to be certified in accordance with ISO 27001 in the near future with stricter IT security measures.

R&M is constantly tightening its protection measures and security processes. The IT team is currently strengthening the directory services (Active Directory) of the internal servers. For example, the team checks access

rights and restricts them further if demand arises. The SharePoint work platform RACE is additionally secured externally.

R&M took out an extended cybersecurity insurance policy in 2022. The provider not only insures damages, but also provides security specialists. The specialists help R&M to prepare measures against potential cyberattacks.

Employees trained

Repeated phishing tests teach employees how to detect dangerous e-mails. The success rate is over 98 %. Protection programs such as Microsoft Defender continuously analyze data traffic. They usually detect attempted attacks within seconds. Using simulated break-in attempts (penetration tests), the IT team searches for gaps in the firewall.

In the coming year, R&M will be focusing on the topic of endpoint detection and response. The planned solution will proactively detect anomalies on the 1,300 computers in the building. It removes workstations from the network before attackers can cause damage. Further safety measures will follow.

As we all know, it is virtually impossible to detect every attack and every small security leak immediately. Cybercrime, software defects, unauthorized access and human error will continue to exist in the future. But R&M continues to expand its protection every day. Customers, partners and employees can be sure that their data and information is still in good hands at R&M.



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Increasingly Transparent Sustainability

In the 2022 EcoVadis Sustainability Assessment, R&M received the Silver Award for sustainable, ethical and responsible action.

In the overall assessment of the sustainability rating, R&M improved by 30 percent within a year. R&M is well above the industry average value. Every year, EcoVadis examines which measures a company is taking to protect the climate and the environment and what progress it is making.

The auditors also evaluate procurement, business ethics and the commitment to labor and human rights. In all these areas of activity, R&M is achieving better ratings than before.

CO₂ accounting started

R&M has always acted sustainably. It is part of the culture of the independent Swiss family-run company. In early 2021, the management and the Board of Directors defined the sustainability strategy. A dedicated project team manages sustainability at the operative level.

R&M is guided by the United Nations 2030 Agenda with its 17 Sustainable Development Goals. The aim is to halve greenhouse gas emissions at the plants by 2030, and to achieve climate-neutral production by 2050.

Management defined a catalog of measurable goals and expanded them in 2022. Examples of specific goals: The proportion of women in management positions is set to exceed 45% by 2030 and the number of apprentices in the company is to be doubled. The proportion of suppliers that guarantee IT security in accordance with ISO 27001 is to increase from 2% to 40%. In future, R&M will measure packaging, waste and energy intensity in kilograms or kilowatt hours per CHF 1 million in sales.

Eleven of the 14 R&M plants worldwide already use an environmental management system that is certified in accordance with ISO 14001. R&M is currently having the myclimate Foundation in Zurich record the climate-relevant emissions of the 14 plants for the first time. This is a scientifically based CO₂ accounting method.

Roadmap published

R&M has published a sustainability roadmap for the first time. It describes the most important goals and main measures for the coming years. The Sustainability Report, which is published every spring, documents the progress in detail. All documents can be found on the website.



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



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