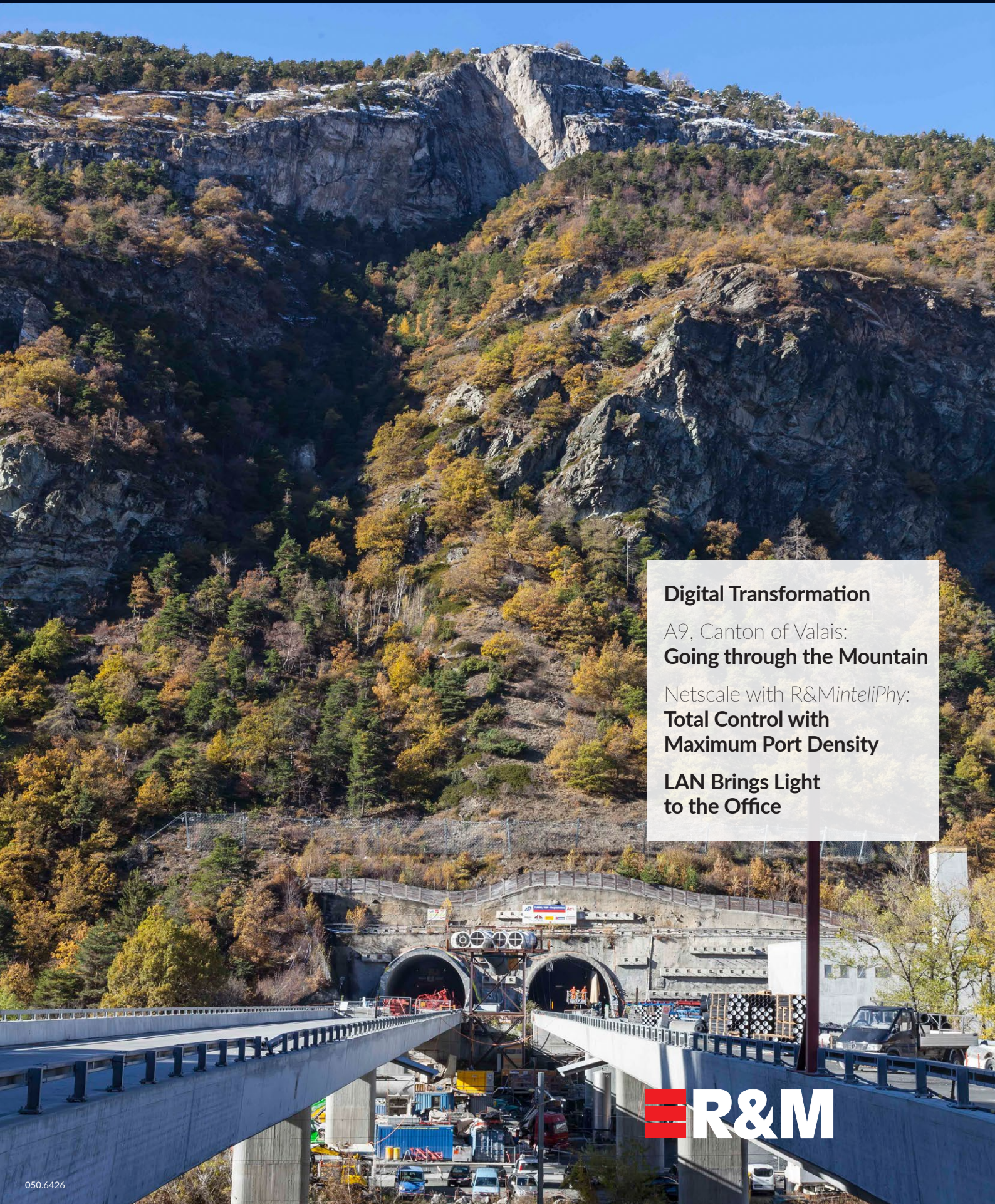


CONNECTIONS 52



Digital Transformation

A9, Canton of Valais:

Going through the Mountain

Netscale with R&MinteliPhy:

**Total Control with
Maximum Port Density**

**LAN Brings Light
to the Office**





On the Way to the Digital Era

Dear Business Partners,

A new technology is changing the world faster than anything before it. For ten years now smartphones have been on the increase, rapidly, and are making the Internet mobile, taking it to virtually every corner of the world. But this is only the beginning of a new era. We are on the verge of the comprehensive digitalization of private and public life, the economy and production.

This transformation is also impacting in particular companies such as R&M. The range of connectivity solutions is extending in the direction of software and digital services. Customers, suppliers, employees and management are learning about new forms of global digital collaboration.

Perfectly prepared

R&M is certainly well prepared with more than 50 years of experience in communication and network technology. Although our family company sets great store by continuity and tradition, we are always open to new challenges and flexible enough to accept them. Corporate culture and strategy support the digital change.

This is something that is confirmed in the expert interview in this latest issue of our customer magazine. And it is also something that is, for example, confirmed by the deployment of our infrastructure management system R&M*inteliPhy* in UBS data centers in London. Find out more on pages 16+17.

Recognizing new opportunities

Digitalization brings opportunities. The service offering for you, our esteemed customers, can be further optimized and tailored to suit your individual requirements over the entire product life cycle. Project planning, ordering processes, logistics and testing cabling solutions can all be made simpler. Road tunnels, hospitals and office lighting can all be managed more simply digitally, as you can see from the articles in this issue. We also want to offer our customers added value with digitalization.

As far as we are concerned, digital transformation should be seen as a cross-division discipline. The technical trend – full-coverage connectivity – is, in a way, being transferred to people, their actions, and their personal and virtual relationships. Rigid hierarchies are giving way to network thinking. The article by Prof. Dr. Andrea Belliger underscores this approach.

Committed and engaged

Digital innovations require the entrepreneurial courage to change and develop. And this is true now of digital transformation. To ensure this transformation is successful, it needs employees and partners who think like young entrepreneurs. They can try things out and make mistakes. The requirements-oriented implementation of digital concepts, which continue to focus on customer benefit, is of central importance.

R&M is following this path consequently which is, in the owners' opinion, a key core competency of the company. Ultimately all stakeholders will become more efficient in the process and will be given the opportunity of discovering completely new business models.

I hope you enjoy reading this issue and would like to take the opportunity of thanking you for placing your trust in our company.

Martin Reichle
Co-Owner and
Vice-President of the Board

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Project of the century in the canton of Valais (Switzerland): The development of the national A9 highway with around 16 km of tunnel tubes is accompanied by a state-of-the-art network, equipped with components from R&M.

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From Hierarchies to Networks

The worlds of work and business, product development and the internal organization of companies are all currently facing up to digital transformation. René Eichenberger from the CONNECTIONS editorial team discussed the subject with Swiss researcher Prof. Dr. Andrea Belliger and R&M CEO Michel Riva.

Question: Mrs. Belliger, to what extent has digital transformation already changed the business world?

Prof. Dr. Andrea Belliger: Well, if we look back at the last ten years – in other words at the period since the iPhone hit the market – we can see that our communication behavior has changed incredibly. The economic world has changed, the business world is changing and so is the competition.

Question: Mr. Riva, what influence does digitalization have on the customer and partner management of a global player such as R&M?

R&M CEO Michel Riva: Digitalization is already omnipresent in various areas. For us there are primarily two areas affected: the interaction with customers and the digitalization of our products and solutions.

I can give you an example: With the new website we are trying to provide digital support to customers on their entire path of decision making, on their customer journey so to speak. In future the customer will be supported in the end-to-end configuration of complex solutions through to order processing, including supplementary training.

Our solutions are becoming more intelligent with digitalization. For example three years ago we launched our first product with sensors: the network monitoring system R&MinteliPhy. This kind of solution provides information all the time. Customers can use the information to continuously optimize their network or data center. I am convinced that digitalization will bring massive advantages for our customers in the future, as well as for R&M.

Question: What role does digitalization play within organizations?

Belliger: When it comes to digital transformation, people often only think about technology innovation. That is without doubt part of the transformation, but essentially we are looking at a social transformation process. The path we are treading leads from systems to networks. You will also find these new forms of organization within companies.

They are no longer controlled in a top-down manner. They don't determine who is active in what function in the network. The networks have open borders. And the overall effect is an internal change process. We are looking for values such as open communication, participative approaches, a new way of dealing with employees, transparency. There is an ever increasing demand for soft skills.





050.6428

Question: What is the situation with internal digital communication at R&M?

Riva: It's a really important topic for us. We are a global company with six production locations, more than 30 sales organizations and various R&D sites. The entire communication and coordination setup requires digitalization, particularly in the case of international projects. Last year we introduced Skype for Business to improve international communication. Currently we are investing in digital workplaces with the aim of speeding up and simplifying processes.

Question: Have we got the right people to deal with this topic? There is a lot of complaining about the fact that there is a shortage of skills.

Belliger: Actually the question is what skills do we need in our companies and in society in the future. We certainly need people with social skills who are capable of working on complex problems, dealing with incredible amounts of information, of collaborating in international virtual teams, dealing with information overloads and of reacting flexibly to change. These are factors that we are not yet seeing reflected in the school curriculum.



050.6429

Question: What is R&M doing to make sure we have the right people on board?

Riva: We think about which experts we need for which project. And we could do with more support in the areas of digitalization and social media. Our main task and challenge, however, is not finding individual specialists. But rather how we can sensitize the 1000 people we employ worldwide to this topic. I think we have had great success so far in supporting our employees in these processes with appropriate training and learning opportunities.

Question: How has digitalization affected you personally?

Belliger: I am totally digital and more or less completely networked. What I haven't gotten yet is house automation. Digitalization is the

subject I do my research on. I live and breathe it, it fascinates me. Without networking, without digitalization, I couldn't live my life balancing these different functions of job, company and family. This combination would simply be inconceivable without networked working.

Riva: The situation is very much the same for me. Digitalization is omnipresent both at work and in my private life. You have to be open because things are developing very quickly. If you miss out on a few years, then you're out of the game. I am convinced that digitalization will bring many advantages both for society and for companies. But I must admit I do really enjoy a day totally without digital instruments.

The full-length video is available here:
www.youtube.com/user/ReichleDeMassariAG



Digital Transformation: Changing the Way We Communicate



050.6431

Recently I spent 10 days in Berlin with my family. I booked a loft and paid for it using the Airbnb platform, bought the flights through an airline's app and sent my husband and children their boarding passes by MMS. We parked the car in a parking lot that we had found using the app of a parking lot provider. Once we had arrived in the German capital, we started looking for interesting restaurants in the quarter that would appeal to us as lovers of innovative gastronomy concepts. In the process we found some really positive feedback on a new Indian restaurant. So we reserved ourselves a table for that very evening using an online booking platform. We had not been in the city very long before, during the course of an online chat, a colleague and entrepreneur invited us over for an aperitif. We talked about our projects in Berlin and Switzerland. And about the planned dinner at the new Indian restaurant. My colleague knew the place, but to date had only had food delivered from it both to her home and office by bike courier and had been wanting to try the restaurant out for some

time. So we quickly added two extra people to our reserved table using the booking app and changed the time of our reservation, putting it back one hour because we were enjoying our aperitif so much. And then the four of us went to the restaurant, enjoyed the good food and had a fantastic evening in Berlin. The kids, who had made themselves comfortable in the apartment watching a children's movie over pizza, enjoyed the parent-free zone and kept us up to date with what was going on via WhatsApp. We gave the restaurant the thumbs up by liking their Facebook site and thanked them for the good service and the great food.

This report may seem very digital and perhaps my behavior is not (yet) typical. I deal with digitalization in my job and am really passionate about the changes it is bringing with it. I must admit I am not as much interested in individual technical applications as in the change in our communication behavior and the social transformation that entails.

Changed communication behavior

Today people reveal private, sometimes even intimate, details of their life online: You can call up videos of a recent party on YouTube and there's a lot of liking going on on the social media platforms. This development is amazing: Twenty years ago people in Switzerland were nervous about what they saw as a surveillance state. The population census and a secret files scandal in Switzerland were the subject of many a heated debate. People made sure they did not reveal personal data so that the state did not have access to too much information about its citizens. But now people are more than willing to post personal information, preferences and passions on the net. The danger to our privacy, however, is greater than ever before: video surveillance, Internet user profiles, mobile call data capturing, data preservation, identity management – to name but a few. And yet this does not seem to bother a lot of people. On the contrary, people are quite enthusiastic about their own media profile.

«With digitalization, interactions and strengths are constantly coming to bear which simply have nothing to do with hierarchical organizational patterns – executives will have to get used to the idea that networks can no longer be controlled in a top-down manner.»

Our communication behavior and our associated use of the Internet have changed massively over the last ten years. This is due, in particular, to the development of the Internet. From starting out as a medium for publishing information, the web has become a veritable communication platform. This development is referred to as Web 2.0. And Facebook, YouTube, business platforms such as Xing and LinkedIn, blogs, Wikis, Twitter and hundreds of others are at the heart of it, usually free of charge. What started out as a trend in 2005, has become a movement. What is interesting and new about it is already explained in the term 'social networks'. The core of the Web 2.0 is a simple but convincing philosophy – that of disclosing and sharing, interacting and participating. Web 1.0 (the Internet up to around 2005) was very much about networking documents – Web 2.0, on the other hand, is about networking people. And the online networks are not only a domain for the younger generations: Silver surfers are on the increase. Interestingly, people of over 65 are part of the fastest growing population when it comes to using social media.

Digital is becoming normal, but...

Digitalization is to be found in virtually all sectors. Most companies have a website, many of which, in turn, have links to social media platforms and digital corporate processes, and use digital technologies for stock procurement. But use is not nearly as widespread when it comes to customer communication, reputation management, HR processes, internal communication and knowledge management. Major obstacles preventing people from using digital channels in these areas are: insufficient time, lacking expertise, concerns about data privacy, cost and lacking investment security. It is not easy to decide to fully embrace the digital world. If you don't take part, you could well miss out on the opportunity to tap a new market. And if you are going to opt just for individual services, you should calculate carefully to make sure it is worth your while. Because there are not just advantages such as increased turnover due to new sales channels and a

higher profile but also a number of risks: for example the danger of high commission or that large platforms can come between companies and their customers as a brand with companies losing some of their control and customer loyalty.

A question of corporate culture

But more often than not companies are standing in their own way because at operative and strategic management levels it is often thought that digital transformation has taken place once the new technologies, digital processes and platforms have been introduced. But digital transformation is much more than that. It is essentially a change process that affects organizational structures. Open, heterogeneous networks now take the place of closed systems controlled in a top-down approach. And that means new styles of leadership. Executives will have to get used to the idea that networks can no longer be controlled in a top-down manner. People are going to have to realize that interactions and strengths are constantly coming to bear which simply have nothing to do with hierarchical organizational patterns.

The digital transformation necessitates new values and standards, a changed attitude toward customers and employees, and a corporate culture that can accommodate networked communication. Customers and employees want open communication, transparency and participation. Corporate communication both within the company and to the outside should be open, self-critical and honest, and be ready to engage in dialog. An increase in two areas is also required. First, transparency: People in authority who do not act in a transparent way may well have something to hide. And secondly, participation: Customers and employees want to communicate on a level playing field and be involved.

Conclusion

After about 20 years of the Internet and 10 years of social media it is clear that these media are changing our lives more dramatically than any technology before.

Due to the general availability of knowledge and information, old acquired rights become worthless; society is no longer allowing itself to be managed and ruled with the mechanisms that had been valid to date. Networks have their own standards. They are used to judge us as individuals and companies. Somebody once said that moving in the networked world resembled a mental exercise perfect for getting value systems moving. If you start making use of the new possibilities, your whole way of working will change and, after a while, so will your attitude.

The fascination with this digital transformation can no doubt be attributed to the fact that it lets us share and take part in a major social process of change. The companies that will ultimately triumph are probably those that live and breathe the values of the networked world – open communication, transparency and authenticity – and manage to make their mark online by establishing their own strong brand.



050.6432

About the author

Prof. Dr. Andrea Belliger
Prorector, University of Teacher Education
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Communication & Management
focuses on all aspects of digital transformation
in various branches.

Going through the Mountain

For a long time now, drivers have not felt at ease in Visp in spite of the fact that this is where the sunshine is at its most beautiful and is also home to Europe's highest vineyard. Because in terms of roads and traffic, the town in the Swiss canton of Valais has to date been very much in the dark. But that is something that is about to change.

050.6433

The sun-kissed town of Visp has been a traffic junction in the middle of the Central Alps for centuries now. If you want to cross the Furka or Simplon Pass, you have to go through Visp. Or if you want to go to one of the renowned skiing destinations of Zermatt, Saas-Fee or Grächen, you have to go through Visp. The small town on the Upper Rhone has perfect conditions for both tourism and vine growing in Europe's highest vineyard. But Visp also has the reputation of being something of a bottleneck for traffic.

Now, through traffic is to be diverted away from Visp. Which in fact in this case means through the mountain. Two tunnels totaling

«With R&M it is possible to define customized solutions fast and without any complications.»

Stefan Wenger, responsible for operational and safety equipment, ANSB, Canton of Valais

16 km in length are to provide the long-awaited southern bypass. Switzerland has been investing in the extension of the national A9 highway in upper Valais since 2001 to create perfect conditions for residents and road users alike.

In Switzerland, optimal road conditions include modern highways that are exemplary and future-proof in terms of safety, technology and convenience. This requires extensive installations and a highly modern network along the way.

Complex technology behind the scenes

Drivers are hardly likely to notice just how much technology there is behind the scenes. They expect traffic to flow without congestion, signs and traffic systems that are easy to follow as well as uninterrupted radio communication, not only for their safety.

Around 100 kilometers of fiber optic cabling, 90 kilometers of communication cables and 1000 fiber modules from R&M are providing the network in the southern tunnel bypass of Visp. Around 10 percent of the overall investment is being pumped into operational and safety equipment. The installation is

designed to provide an uninterrupted life cycle of 15 years. A tough demand because climatic conditions in the tunnels facilitate corrosion.

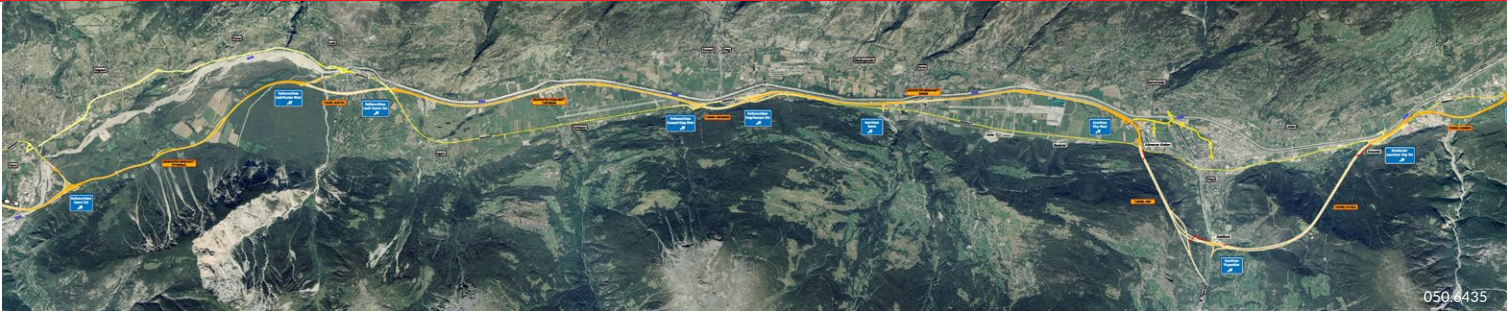
When the two tunnels go into operation, there will be massive amounts of digital information at all times. This will come from more than 100 video cameras, over 100 emergency telephones, traffic signals, fire and smoke alarms, sensors and hundreds of controls. The control center in Sierre will use the data to control the flow of traffic, ventilation, gates/doors and other tunnel equipment. To ensure the information flows as fast as possible, the planners designed the tunnel network to offer a transmission performance of 10 Gigabit/s.

Long-term trust

As in earlier projects, the cantonal branch of the Federal Road Building Office (ANSB) is relying on R&M as a partner for cabling in the mountain. The ANSB sets great store by expertise, continuity and individual support. The network technology must be compatible with earlier construction sections. This is why R&M is involved in the individual planning phases – in this case in collaboration with installation partner Marti Technik AG.



From left to right: Peter Meier, R&M Switzerland; Roberto Quartara, Marti Technik AG; Stefan Wenger, ANSB Valais; Walter Kurzen, R&M Switzerland



050.4435

Added value

- The Visp southern bypass project proves:
- R&M's experience in road and tunnel building
 - R&M's expertise in complex key projects
 - R&M's capability of providing consulting services in the early stages of planning
 - R&M's resources for very long-term projects
 - R&M's commitment to tailor-made solutions
 - R&M's willingness to take part in long-term cooperation

It is not only price that is decisive when it comes to choosing a supplier. For Stefan Wenger, responsible for operational and safety equipment at the ANSB in the canton of Valais, important factors include criteria that simply cannot be defined in figures. Quality and experience from previous projects are just two of those criteria. He also sets store by good collaboration with the installation company and its recommendations.

Flexibility in the project

Handling is of major importance for installation engineers. When glass fibers have to be spliced five thousand times in a tunnel project, time is of the essence. Roberto Quartara, project lead at Marti Technik AG, speaks from experience: «However good your planning is, at the end of the day the timeframe for the installation engineer is always tight. Lots of other companies are involved and the infrastructure is already in use. And changes are constantly being made and these have to be taken into consideration.» This is why Quartara appreciates R&M's flexibility and support: «During the process, suggestions for improvement were

The R&M solution

The data and communication network for the Visp southern bypass comprises:

- 100 km FO cabling
- 90 km communication cable
- 1000 R&M fiber modules each with 12 E-2000™* connectors, Grade B
- Tailor-made housing for emergency call boxes
- Components for switch cabinets and computer room

* E-2000™, under license from Diamond SA, Losone

Project of the century in Valais

The two-lane Visp southern bypass is separated into its two different directions and is part of the Swiss national A9 highway that goes from Lausanne up to Simplon and thus to the Italian border. The highway and the new tunnels will, on the one hand, take the pressure off the towns and, on the other, provide new traffic connections for the canton of Valais. The ANSB (Federal Road Building Office) in the canton of Valais was commissioned by the Federal Roads Office (ASTRA) to drive this project forward and hopes to see a sustainable development in trade and tourism because of the improved connections. ASTRA and ANSB see the project as «complex and long-term, the project of the century so to speak». Costs are estimated at around 1.5 billion Swiss francs.

The twin-tube Eyholz Tunnel, the longest of the A9 at 4.2 km, is soon to be completed. The twin-tube Visp Tunnel, 2.6 km long, is scheduled for completion in 2023/24. It will incorporate part of the 3.2 kilometer long Vispental Tunnel which currently has only one tube – with a striking intersection-free branch inside the mountain. In total, the



050.6436

southern bypass will feature around 16 km of tunnel tubes. The network alongside the route is, in terms of communication technology, very definitely state of the art. And it is equipped with components from R&M.

being made all the time and R&M took them into consideration immediately in each case.»

Stefan Wenger agrees: «We need contact with the suppliers to define specific solutions. With R&M we know that this is possible.» For example, R&M provided snap-on metal housing for the emergency call boxes which were tailored to suit the specific needs of the ANSB.

Stefan Wenger sees increasing bandwidth requirements as a future challenge. Road users have more and more information and infotainment possibilities. And the network

has to be able to provide the necessary transmission performance. The drivers of the 17000 vehicles that will be using the A9 at Visp every day in the future will want to have the full range of their electronic features at their disposal. They assume that an Alpine tunnel will have a reliable, fast and multifunctional data and communication network.



090.6099

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Small Housing Big Impact

It is multifunctional, dust tight and waterproof and fulfills all requirements for the perfect fiber optic termination in buildings or outside on facades and masts. The new Polaris-box extends the R&M FTTH solutions in the single and multi dwelling unit segment.

Only a few meters to the customer. At last optical fibers are entering our homes. There is a palpable wave of excited anticipation at the prospect of virtually unlimited bandwidth. But what form does the fiber optic termination on a building, in the cellar or on individual floors of a building take? Here network operators need professional, sturdy solutions that can be implemented immediately.

The solution: Polaris-box. The new housing – for fiber optic terminations in and on buildings offers professional, sturdy, protected, optical connectivity.

The Polaris-box sees itself as a talented all-rounder. It can be used in all kinds of premises from a single dwelling unit, such as a family home, to extensive building complexes. From the building entry point through risers and floor distributors to the optical termination outlet. The fiber management inside supports patch, slice and splitter configurations as well as individual assembly. All typical FTTH topologies can be implemented.

In the standard basic version the new compact Polaris-box 6 has space for twelve splice connections and six SC and *E2000™ (BFF – Big Form Factor) or alternatively 12 LC simplex (SFF – Small Form Factor) patch connections. The equipment can be extended with four new FMT (Fiber Management Tray) splice trays or two additional splitter trays.

Twelve fibers with crimp or shrink splice protection fit in each of the 1TPU (Tray Position Unit) trays. The 2TPU splitter trays accommodate PLC splitters with a maximum split ratio

of 2:32 – when using 250 µm fibers. When fully assembled, the box terminates 60 splice and 12 plug connections in the protected interior of the housing. Every configuration can be retrofitted, extended or modified at a later date.

With the integrated housing seal, the box fulfills the requirements of housing protection class IP67. The cable seals fulfill the IP65 requirements. A unique feature is the two-part, modular seal solution with slit elements for cable inlets.

The Polaris-box has three outside installation points with slotted holes. This means it can be positioned on walls and adjusted perfectly in

no time at all. For fast access, the hood can be opened, removed or locked at a position of 120° without tools.

* E-2000™, manufactured under license from Diamond SA, Losone



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

Network Transformation: It's Time for Lime

A new category of fiber optics and a new modulation technique are paving the way to a faster future: OM5 and SWDM4. These give data center managers the opportunity to opt for more favorably priced multimode cabling.

050.6438

As internal data center traffic will increase by 80% over the coming three years, there are bound to be bandwidth bottlenecks. To be prepared for the upcoming traffic, network managers are now going to have to support increased bandwidth by implementing fiber optic cables which will facilitate simplified network transformation.

To date there were two ways of migrating network infrastructure to 40 Gbit/s: LC Duplex with singlemode fiber (LR4) or a parallel optical solution with multimode fibers and MPO connectors (SR4). Both variants are expensive and complex. Now there is an attractive alternative with OM5 and SWDM4.

Advances in laser technology and multiplexing got the ball rolling. To date, Wavelength

Division Multiplexing (WDM) was reserved for expensive singlemode lasers. In the meantime, multimode VCSELs have also become multiplexing-capable.

In the most recent evolution phase, signals are transmitted on the four short wavelengths 850, 880, 910 and 940 nm (Shortwave Wavelength Division Multiplexing). This is why the technology is called SWDM4. The corresponding SWDM4 transceiver modules transmit 10 or 25 Gigabits per wavelength. This would clear the way for 40 or 100 Gbit/s on a single bidirectional multimode fiber pair.

But the four colors move at different speeds through the fibers. With conventional OM3 or OM4 fibers this would result in chromatic dispersion. The new category OM5 will solve



030.5691

Easy to identify: OM5 multimode bidirectional fiber optic cables are lime green.

this problem. It was detailed and published in TIA-492AAAE and is now standardized as OM5.

OM5 fibers facilitate future standards such as 40GBASE-SR, 100GBASE-SR, 200GBASE-SR and 400GBASE-SR4 over four fibers. The new category is backward compatible with OM4 and OM3.

Optical transmission for 40 and 100 Gbit/s

Data Rate	No. of Lane Pairs		Lane Rate	SW Code	LW Code
Gb/s	Fiber	λ	Gb/s	(MMF)	(SMF)
40	4	1	10	SR4	<i>PSM4</i>
40	1	4	10	SWDM4	LR4
40	1	1	40		FR
100	10	1	10	SR10	
100	4	1	25	SR4	<i>PSM4</i>
100	1	4	25	SWDM4	LR4 SWDM4

IEEE standards in BOLD; all others in ITALICS are proprietary
Source: Ethernet Alliance

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Dr. Thomas Wellinger
Market Manager Data Center
thomas.wellinger@rdm.com

INCIBE:

One of the Top Cybersecurity Reference Centers in Spain



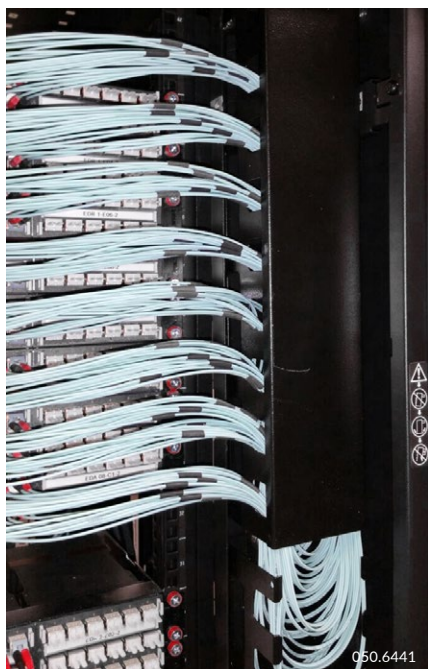


050.6440

The country has a new data processing center that will house the secret archives of the Spanish Ministry of the Interior.

The National Institute of Cybersecurity (INCIBE) is a body under the Ministry of Industry that advises citizens, companies and public bodies, and shares capabilities with the administration and strategic companies to detect cyber threats and issue appropriate warnings.

It is located in the city of León, in the northwest of the Iberian peninsula, and has become the technological center of reference at European level in terms of innovation, technological research and information system security. It is one of the most important data processing centers in Spain today.



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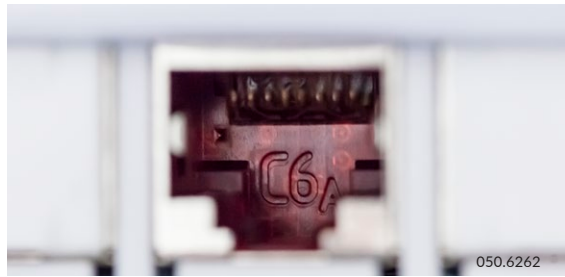
The new national security room will link other companies with the Ministry of the Interior, all supervised and managed by the National Intelligence Center. The aforementioned data processing center works with islands – a concept of operation that also has to do with the extreme security measures surrounding this type of center.

Being an island means it can work even if an attack or other incident should leave it without communications. The INCIBE data center has the capacity to generate its own energy and maintain communications, even by satellite. But, in addition, these types of centers often replicate their information as «mirrors» to other CNI (Spanish intelligence agency) centers. The INCIBE is in fact already one of the CNI reference centers.

Its primary mission is to be the cybersecurity incident response center. Working round the clock 365 days a year, it focuses on answering and analyzing any security incidents that occur, working in conjunction with the Spanish security forces.

At the beginning of 2015, work started on the actual design with construction being completed in 2016. TRC Informática was the technological company responsible for installation, one of R&M Iberia's main partners and a company with which it has worked successfully for several years now.

In the project, more than 1500 RJ45 Cat. 6_A ports were installed, as well as the R&M



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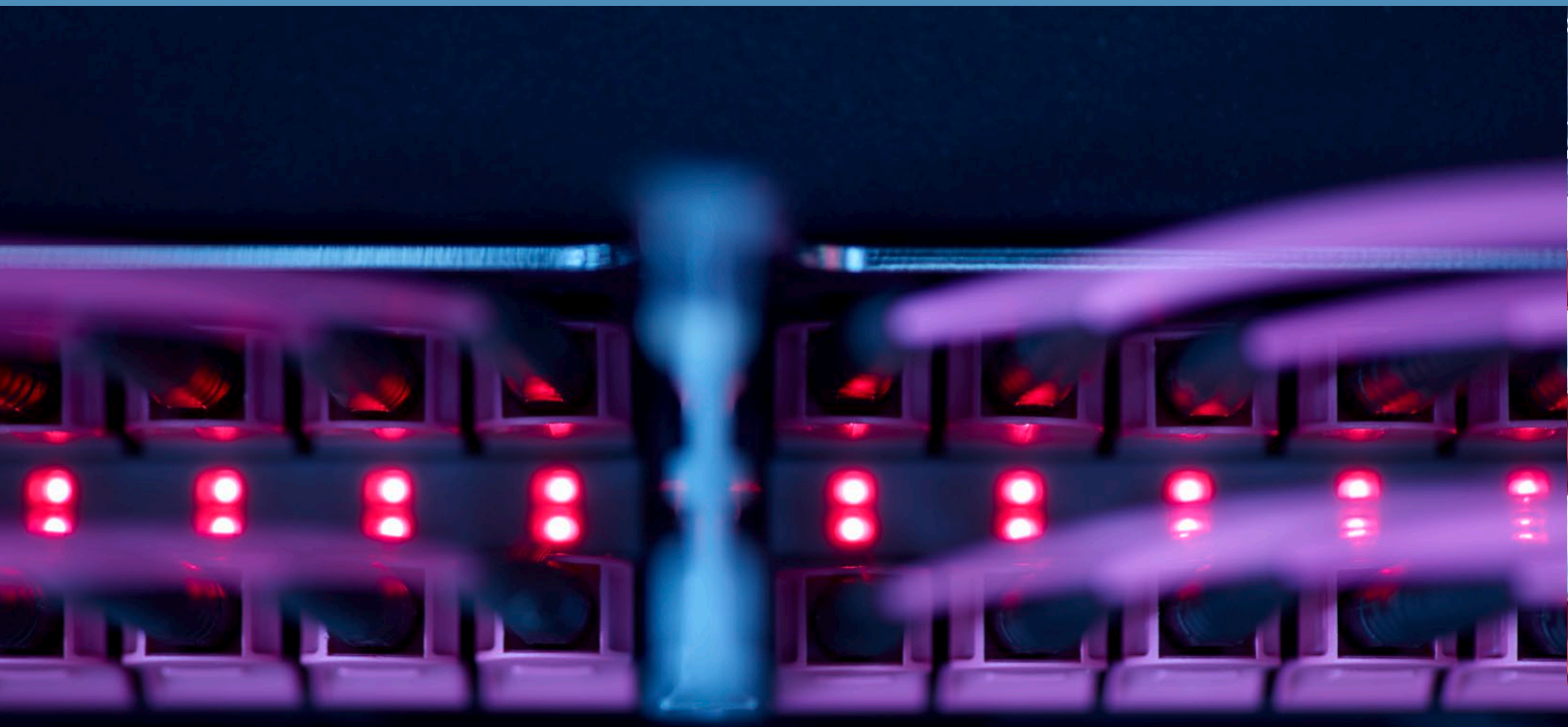
connectivity solution and cabling. The solution includes more than one thousand OM multimode FO ports with a capacity of 10/40/100GB to provide connectivity to a total of 25 server and distribution racks.

In October 2016 there was an external audit of INCIBE with the purpose of reporting the status of the center. All R&M installed materials achieved optimal results. Undoubtedly, a project with demanding levels of response during the course of which it was possible to exceed all expectations thanks to the perfect execution by TRC Informática and the quality of R&M material.



050.6619

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Total Control with Maximum Port Density

Up to 120 plug connections per height unit in a 19" rack. The R&M platform Netscale offers top packing density for FO networks. But how can administrators keep a clear over-view of everything? R&M*MinteliPhy* takes care of that automatically.

090.7812

Two R&M innovations for data centers are now forming a symbiosis: the ultra high density patch panel Netscale and the infrastructure management system R&M*MinteliPhy*. The advantage for users: Thousands of FO connections in one rack can be monitored simultaneously, fully automatically and in real time.

A further development of the RFID sensor technology for R&M*MinteliPhy* makes that possible. Specially developed sensor components can easily be integrated into the Netscale modules for LC and MPO connectivity technologies where they replace an adapter series. The connectors themselves are retrofitted in the field with RFID tags.

The flexibly usable Netscale module structure with its practical sliding tray technique has been retained. The modules can be removed from the module holder individually for maintenance or cabling work without the R&M*MinteliPhy* functions of the other modules being affected.

R&M is extending the solution with a further helpful new development: The R&M*MinteliPhy* RFID sensors for Netscale feature a self-test function. The electronics monitor themselves during operation and can issue a warning if problems are detected. This increases the availability of the network because any errors occurring can be remedied in good time before they lead to total failure.

R&M*MinteliPhy* for Netscale is integrated seamlessly into the R&M*MinteliPhy* product family and is compatible with existing R&M*MinteliPhy* hardware and software that may have already been installed. With R&M*MinteliPhy*, data centers automate their infrastructure management.

The most important functions:

- Monitoring of the patch cord connections in real time
- Automatic warning when any non-authorized changes are made
- Automatic documentation of connection paths, equipment etc.

- Technician guidance during patching
- Monitoring of patching operations with automatic subsequent documentation of the network connections

Netscale is thus the only high density solution on the market which unites top port density with comprehensive management and automation functions.





R&Mfreenet Goes USA

050.6442

R&M USA Inc. is increasing its product portfolio. A complete range for structured LAN cabling with copper technology was presented in March in Milpitas, California. It is based on the tried-and-tested cabling system R&Mfreenet, extended with tailor-made solutions for the US market.

Starting out just one year ago as an FO specialist, R&M USA Inc. is now also establishing itself as the leading technology supplier of copper solutions for local data networks. The LAN range for the US market is a specially tailored selection from the modular cabling system R&Mfreenet.

The range focuses on the higher categories such as Cat. 6 unshielded and Cat. 6_A shielded/unshielded. The shielded Cat. 6_A variant is perfectly suited for 10GBase-T transmission as it offers a significantly increased protective effect against electromagnetic interference from the outside. The R&M connection

technology, made in compliance with Swiss quality standards, fulfills all transmission standards as a matter of principle, also the ANSI/TIA standards predominant in the US.

R&M USA Inc. has built up a new range of installation cables and patch cords to fulfill the specific requirements of fire prevention and the protection classes CMR and CMP. To ensure a fast and flexible response to customer requirements, a production line for RJ45 patch cords was established in the R&M plant in Milpitas. The manufacturing process is subject to R&M quality standards, seen as exemplary worldwide.

At the presentation in Milpitas, customers were impressed in particular by the many additional functions. The installation-friendly cabling system R&Mfreenet can, for example, be extended with the three-level R&M security system, IP cases, microsplitters and the network monitoring system R&MinteliPhy. Field-terminable FM45 connectors in combination with Cat. 6_A installation cables attracted great interest no doubt because comparable solutions were simply unknown in the US up to this point.

R&M has been holding training sessions and offering certification for installation engineers in the US since the end of 2016. The certification allows them to enjoy the advantages of the international R&M Qualified Partner Program (QPP). These include extended support and warranty services.



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R&MinteliPhy in the City of London



050.6443

The architect called it a «perfect machine for the financial sector». But it's not just the design that is perfect. The infrastructure of the new UBS headquarters in London is also a triumph. R&MinteliPhy gives the property a «sixth sense» for ports and cables.

Infrastructures in buildings like these only work perfectly if they are correctly documented. Sooner or later, any errors in the documentation will lead to things going wrong when implementing changes, which could have far-reaching consequences. A study by Gartner showed that 28% of downtime in data centers is caused by incorrect or incomplete documentation. At 5 Broadgate, a 65 000 m² office space and trading center in the City of London, the question was clear: What is the best way to tackle these impressive dimensions?

Network administrators would no doubt immediately wonder who or what could control 63 000 class E_A links and the more than 125 000 ports of the data, communication and building network. How could the endless information on the structured cabling and the current status of the data network be documented and evaluated in a sensible way? R&M agrees that management and documentation of network connectivity are among the biggest challenges in such systems.

CIOs have the job of asking the big questions about these issues. In addition to economic data, their departments require an insight into the entire IT network – essentially a «sixth sense» for the structure as a whole. Ultimately, there is only one solution worth considering that fully meets all the security and compliance requirements of a globally active financial service provider.

For this reason, the project partners searched for an infrastructure management system for 5 Broadgate that was reliable, high-performance and easy to use. In addition to 5 Broadgate, the system would also have to enable reliable documentation of the infrastructure of several other office buildings and data centers. It would also have to be able to identify bottlenecks that could impair network operations in advance. So that it could be seamlessly adapted to the latest challenges of the digitalized finance market at any point in the future, the system also had to be flexible and scalable.

Digital image of the network

Reliability, top performance, flexibility and scalability are all in the DNA of cabling specialist R&M, meaning that answers to all the questions and solutions for all the requirements could be found under one roof. The project partners chose R&MinteliPhy as their universal planning, documentation and reporting tool. But perfection also means adapting every last detail of this system to meet the individual requirements of the specific application.

»R&M, together with service partner Redstone, flexibly fulfilled all our customization requests.»

Robin Holmes, Project Manager, UBS

The customer: UBS

UBS is a global firm providing financial services to private, corporate and institutional clients. The Swiss based UBS Group is present in all major financial centers and has offices in over 50 countries. In the UK, UBS offers wealth management, investment banking and asset management services.

The partner: Redstone

Redstone Converged Solutions Ltd.'s 30-year heritage of delivering ICT infrastructure engineering is unmatched in the UK market. At Redstone, the infrastructure engineering services are backed by a depth of industry expertise and quality that assure building network infrastructure and systems. The large and experienced team understands the complexities of delivering cabling and ICT infrastructure projects and works with key stakeholders to ensure their needs are met.

Redstone has a long history of delivering some of the biggest and most complex ICT infrastructure and cabling projects in the UK.

Added value

The project has proved that:

- R&MinteliPhy offers a robust solution for infrastructure management. It meets the sophisticated demands of financial service providers.
- R&M and its service partners have the resources necessary to construct the server and create a precise digital image of a complex network infrastructure.
- The R&MinteliPhy software can be adapted to the specific needs of an individual customer.
- R&MinteliPhy can be scaled freely so that even the very largest networks can be documented.



090.6934



Photographer: John Madden, johnmaddenphoto.com

R&MinteliPhy Manage – the software for automated infrastructure management

R&MinteliPhy is a flexible and intelligent system for automated infrastructure management (AIM) of data centers and office cabling networks. Tree diagrams, network maps and meaningful reports give administrators a precise overview of the network. Analyses, diagnoses, emergency assistance – everything can be taken care of centrally with just a few clicks of the mouse.

R&MinteliPhy supports planning and controlled execution of changes, automatically generating work instructions, bills of material and cable labels for installers. Graphics and statistics can be called up in just seconds from the built-in R&MinteliPhy reporting facilities – for SLA compliance, for monitoring, planning, risk analysis and for audits or certifications. Data protection, safety and compliance provisions can be fulfilled inexpensively and reliably.

One of the customer's wishes was to re-brand R&MinteliPhy to match their in-house corporate design and give it the name CMS (cable management system) conventionally used at UBS. They also asked for special templates and reports to be prepared on the R&MinteliPhy server.

With the support of the R&MinteliPhy Competence Center in Wetzikon, the engineers of British R&M partner Redstone Converged Solutions Ltd. got to work. While the cabling was being installed, they developed a complete digital image of the network on the R&MinteliPhy server for 5 Broadgate. After a test run starting in October 2015, the server was put into full operation in June 2016 with complete documentation of more than 500 racks in the machine and in two other data centers in the UK. A further 90 racks and an international data center are also set to be integrated. Redstone is providing ongoing support on site.

Three-dimensional visualization

The users particularly appreciate the three-dimensional visualization of the physi-

cal network infrastructure (3D modeling and rendering). This R&MinteliPhy feature makes it easy to keep track of the system and provides realistic three-dimensional views of the installations. Other important functions of the R&MinteliPhy that have proved indispensable both when preparing the documentation and now during operation are:

- Determination of the cable routing, and calculation of cable lengths for planning new connections based on this
- Work order management for controlled processing of the patch orders that arise daily

- Resource management for efficient utilization of the capacity in racks and conduits

UBS project manager Robin Holmes is delighted with the results: «R&M, together with service partner Redstone, flexibly fulfilled all our customization requests.» Following the good experiences so far with R&MinteliPhy, the customer is now investigating ways to expand the system into a global documentation platform.



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Preannouncement

New 48 Port Panel for Cat. 6_A Modules

High-density cabling on one height unit can be extremely simple. This is proven by the new generation of 48 port HD panels from R&M. They are suitable for Cat. 6_A and Cat. 6_A EL modules as well as optionally for FO adapters.

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Today data centers are looking for the greatest possible packing density because fitting more connections into a 19" rack means a corresponding increase in efficiency and profitability. Added to this there is the demand for patch panels that can be used in a number of ways because versatility reduces costs. And at the same time, installation and maintenance should cost as little as possible. That means: Patch panels have to be fast and easy to handle.

The new 48 port HD panel from R&M, which has been optimized in particular for using the copper modules Cat. 6_A and Cat. 6_A EL in the data center, fulfills all these requirements and more. With optional adapters, LC Duplex and SC Simplex FO adapters can be integrated. If required, splice trays can be attached to the back.

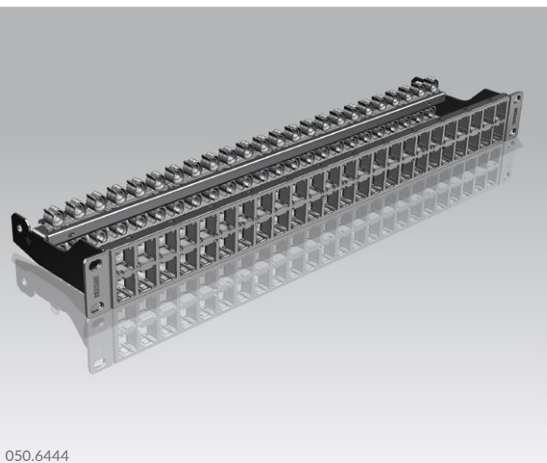
The hybrid construction made of metal and plastic offers several advantages. The metal with an anti-corrosion coating brings stability and is easy to ground. The plastic insert at the front is attractive and fulfills several functions. It contains the front unlatching mechanism for the modules. They can be installed and removed in next to no time.

At the same time the plastic front offers all options for security accessories and effortless administration. Color coding keeps everything clear and even an individual company logo can be integrated. The blind cover and label fields of the existing HD panels are compatible. By simply turning the new blind covers, these can be used together with the label fields. The three-level R&M security system with color coding and mechanical

protection corresponds, as do the sensors, to the automated infrastructure management system R&MintelIPhy.

R&M has also developed a new kind of cable routing. The reusable plastic holder with flexible, round lugs can be attached to the back carrier in next to no time. The cables are clicked into the lugs and are just as easy to take back out again. This saves tiresome work with cable ties and speeds up maintenance jobs. Nevertheless there are also holders for traditional strain relief using cable ties.

The 48 port HD panel comes in black or gray, either as a shielded or unshielded version.



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TCL: the Blind Spot of Standardization

The time has come. Around half of all customers are demanding copper cables suitable for 10 Gigabits with Category 6_A cables and components, and numbers are rising. Does this mean the suitability of the installation is guaranteed for 10GBASE-T?

When it comes to 10-Gigabit suitability, network technicians have to keep an eye on NEXT and near-end crosstalk as these are critical parameters for the transmission quality and performance of a link. Another parameter is also becoming increasingly important with the higher data rate: TCL, Transverse Conversion Loss.

The effect is as follows: Imbalance in cables and connectors converts part of the differential signal, which ideally should be symmetrical, into a common mode signal. That in itself is not necessarily critical because typically it is eliminated in the input transformer of the receiver.

However, a common mode signal generated in one component can be converted to a differential signal in another where it is experienced as additional NEXT. And – apparently paradoxically, but comprehensible in physical terms: Shielded cables, which offer excellent protection against noise coupling from the outside, are often inferior to unshielded cables when it comes to balance.

For everyday installation routines, this means: When a 10GBASE-T link just manages to adhere to the standard without the influence of the common mode signal, users should take a second look. Because it can be assumed that in the case of additional crosstalk due to the re-conversion of the common mode signal, the limits will be exceeded.

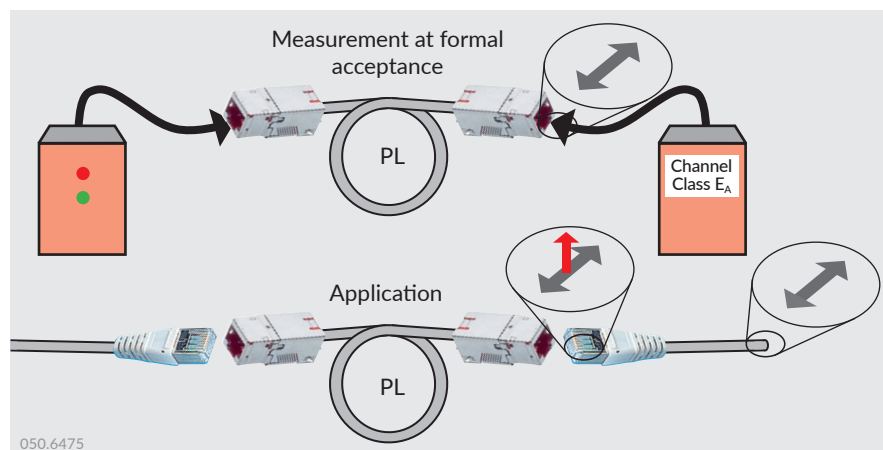
In this respect, the standards represent a blind spot. The tolerances they define are too large for the TCL limits. It could happen that a 10-Gigabit transmission is not possible although all individual components adhere to the standard – a nightmare for end users and installers.

Components from R&M are designed to exceed by far the requirements of the standards. For example, the permanent link of Class E_A guarantees a crosstalk reserve of 2 or 4 dB with components from R&M depending on the product. Deterioration caused by the TCL of patch cords can thus be compensated. On the other hand, R&M patch cords are subject to an in-house specification that is stricter than stipulated in the standards.



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With R&M cabling systems of Class E_A, installers and users can be sure that the installation is suitable for 10GBASE-T instantly, also in combination with components from other providers. The NEXT reserve in R&M permanent links allows a certain deterioration of the values due to standard-compliant patch cords from other suppliers. On the other hand, R&M patch cords are specified in such a way that the generated common mode signal in permanent links of other providers does not result in an excessive increase in crosstalk.



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Permanent link measuring devices have defined good symmetry characteristics: The measured link is deemed to be satisfactory. A standard-compliant patch cord with considerable imbalance can nevertheless destroy 10-Gigabit suitability by converting TCL into NEXT. (Gray: differential signal; red: common-mode signal)



050.5749

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High Availability for the Best of Health

050.6446

Best Swiss patient care meets leading Swiss network technology: The University Hospital Basel has opted for expertise and products from R&M in its new data center.

The University Hospital Basel is one of five university hospitals in Switzerland and is the central hospital in the entire northwest of the country. Around 6500 employees, including a large proportion of apprentices, attend to the recovery and well-being of more than 35 000 patients every year. The close collaboration with the university guarantees interdisciplinary treatment concepts and innovations in all medical disciplines.

Centuries-old cooperation with the university

The diagnostic and therapeutic methods used at the University Hospital Basel are all state of the art. Furthermore the hospital management sets great store by optimal patient care and the interdisciplinary collaboration of the specialist personnel. There is also intense cooperation with external partners, such as referring physicians, other hospitals, health

«R&M really took our needs into consideration – we benefited a lot from the expertise of the connectivity specialists.»

Roger Liniger, Head of Operations of the ICT Department, University Hospital Basel

insurance companies and authorities. There is a particularly close collaboration with the medical faculty of the University of Basel which is based on a long tradition; it can be traced back to the year 1460, the year the university was founded. Its medical faculty was the very first north of the Alps. Today, the key joint tasks are research as well as the training and further education of doctors.

Innovative medicine

The good coordination between the faculty and the hospital renders possible innovations

and improvements in medical diagnosis and treatment. In recent years numerous specialist treatment centers have been established and further developed. These include the tumor center and various other centers: cardiac, pulmonary, ER, strokes, spine, kidney transplant and stem cell transplant. The University Hospital Basel also has close ties with local life science companies.

The high quality of medical diagnosis and treatment as well as the intense collaboration with external partners naturally generate



extensive amounts of data. The University Hospital Basel had to renew its existing server infrastructure as its data center was no longer at the cutting edge of technology. The new data center was to fulfill the highest of demands, particularly in terms of high availability and redundancy.

End-to-end solution from one source

R&M was already involved in the planning and concept phase. Christian Giddey, owner and managing director of the company A4P.ch, took on overall project management. The company specializes in the development and management of ICT and data center projects. The result is an end-to-end solution from a single source. R&M helped realize the project as solution provider right through to acceptance and is accompanying the customer after completion. Thanks to inputs from R&M in the concept phase, the cabling infrastructure was quick and easy to implement. This minimized the risk to the contracting party while maximizing profitability. Further major advantages for the University Hospital Basel were the high port density and scalability of the R&M products.

Warranty and satisfaction

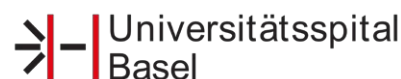
As part of the 25-year system warranty, R&M guarantees the faultless, long-term functioning of the installed cabling system and the transfer of all ratified network services. R&M took the measurements in formal acceptance procedures as the basis for the

system warranty. Ultimately there will be two data centers at different locations. The data center created in the ultra modern, new «Rossetti Building» of the University Hospital Basel represents 50% of the entire project. The second location is due to be completed in 2017.

The R&M products totally fulfill the requirements of the University Hospital of Basel. Furthermore, the great degree of professionalism of the R&M employees and all partners involved guaranteed the success of the project. The installation work was carried out by Alpiq InTec Switzerland – once again very reliable, at a high standard and on schedule.

Roger Liniger, Head of Operations of the ICT Department at the University Hospital of Basel, is absolutely satisfied with the project: «The collaboration with R&M was awesome; the company really took our needs into consideration. We benefited a lot from the expertise and experience R&M brought into the project. The result is a solution that perfectly corresponds to our needs.»

Christian Giddey is impressed by the R&M products: «I find it impressive that such a challenging project can be implemented to this high degree of quality with standard products. That illustrates that R&M's range is perfectly tailored to market requirements.»



From left to right: Matthias Kummer, R&M Switzerland; Patrick Hagen, Head Service Technician, Alpiq InTec Switzerland; Roger Liniger, Head of Operations of the ICT Department, University Hospital Basel; Christophe Barreca, Electro Project Lead, Alpiq InTec Switzerland; Christian Giddey, Managing Director of A4P.ch; Paolo Iazurlo, R&M Switzerland.

Facts & Figures, University Hospital Basel Data Center:

- 600 ports copper Cat. 6_A ISO pre-terminated with 6-way Cat. 6_A/s trunks
- 1152 MM fibers pre-terminated to MPO system with LC trays
- 60 meters of fiber raceway

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Saving Even More Space: R&M *thinLine* Patch Cords

Saving space in data centers is a must. But minimizing cable volume is a genuine art form and something that has now been perfected with *thinLine*, the new patch cord from R&M. It is one quarter thinner than standard cables.

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R&M is launching new copper patch cords specially designed for use in data centers. Their characteristic feature: the slimline construction. The new *thinLine* cords have a diameter of just 4.5 mm – leading to around 50 percent volume reduction, compared to standard Cat. 6 or Cat. 6_A patch cords. The unshielded *thinLine* variant features twisted pair stranded cables with a diameter between AWG28 and AWG30.

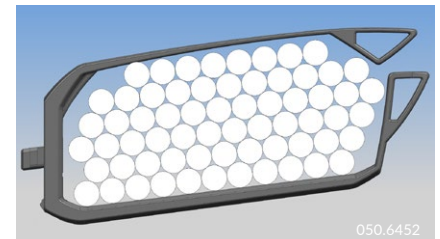
The *thinLine* cords are not just thinner and lighter, but also more flexible than conventional cables. They can be laid in tight bending

radii and are easy to store in racks and cable guides – a plus for cable management in data centers.

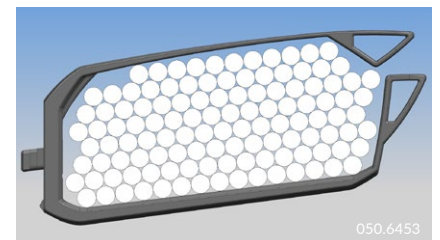
R&M specifies *thinLine* cords for channels up to class E/E_A and guarantees the corresponding performance. The table shows which links are supported. *thinLine* cords are manufactured in accordance with strict R&M quality criteria.

Further areas of use are offices, home offices and apartments. Here, the thin cords are easy to hide under base boards making for a more attractive installation.

The cords are suitable for Power over Ethernet performance levels PoE and PoEP. The bundle size has to be reduced for 4PPoE to counter increased heat generation.



6mm cable – 65 cables total



4.5mm cable – 119 cables total

Office cabling horizontal link length equations

Model	Implementation Equation		
	Class D Channel	Class E/E _A Channel	Class F/F _A Channel
2 Connector	$H = 109 - F * X$	$H = 107 - 3^a - F * X$	$H = 107 - 2^a - F * X$
3 Connector	$H = 107 - F * X$	$H = 106 - 3^a - F * X$	$H = 106 - 3^a - F * X$
3 Connector SP	$H = 107 - F * X - C * Y$	$H = 106 - 3^a - F * X - C * Y$	$H = 106 - 3^a - F * X - C * Y$
4 Connector	$H = 105 - F * X - C * Y$	$H = 105 - 3^a - F * X - C * Y$	$H = 105 - 3^a - F * X - C * Y$

- YC Length of the CP cable (CP = consolidation point) (m)
 - F Combined length for the patch/connection cables, equipment/workplace side (m)
 - H Maximum length for the fixed horizontal cabling (m)
 - L Length of the LDP cable (m)
 - X The cable attenuation factor for difference between smaller copper core diameter of flexible cable and that of installation cables (UTP/STP = 1.5) and for *thinLine* cables (UTP/STP = 2.0)
 - Y The cable attenuation factor for difference between smaller copper core diameter of flexible cable and that of installation cables (CP – cable UTP/STP = 1.5)
 - Z Maximum length of the fixed zone distribution cable (m)
- a This length reduction is to be used to provide a margin for attenuation differences at high frequencies.*

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The greater cable attenuation is taken into consideration with factor 2 (value X) in the cabling model enabling correct length calculation.

R&M at the FTTH Council Conference 2017

The annual FTTH Conference is the world's largest FTTH-related event, offering workshops, conference sessions, tech exhibitions and hands-on demos. At this year's conference in Marseille, Tobias Münzer's speech, 'Moving from FTTH to Fiber to everything', discussed digitalization as a potential game changer for fiber networks.

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Tobias Münzer, R&M's Market Manager for Public Networks, explained how industries face serious challenges and changing business models as communication infrastructures need to work on availability, latency, capacity and data throughput. He mapped out the progress toward digitalization from early technologies to the age of ICT, and from the earliest stages of the WWW and PDAs to developments in 4G mobile computing and the advent of Artificial Intelligence and 5G. This will enable a move from the currently used Web 3.0 (semantic Internet) to Web 4.0, which is basically a merge of Internet and reality, knowing which information we need without expressly requesting it.



The IFO Institute for Economic Research has stated that fiber deployment is not necessary for the time being, as higher data rates will be based on mobile devices. However, a much greater number of mobile communication cell sites are needed to cover the demand for increasing bit rates and low latency – these must all be connected to core networks. The rollout of mobile and fixed networks therefore has to go hand in hand, while keeping in mind that the passive infrastructure will stay for decades to come.

As end-user and device-to-device data grow, network quality, reliability and flexibility are

Recurring key challenges for passive infrastructure	Requirements for passive infrastructure
Continuous bit rate / bandwidth increase	Flexibility to upgrade in line with the evolution of transmission technologies
Low latency and high availability	Highly reliable products with adequate specification
Long-term functionality	Proper installation supported by intuitive handling

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key factors for current and future success. This requires precise specifications, in line with local needs and requirements, quality products, a trustful long-term reliable equipment manufacturer and an eye for detail in the execution and maintenance phases.

'Installers vs. weather disasters'

The multifunctional Polaris-Box 6, in accordance with IP54 and IP65 protection classes for indoor and outdoor fiber optic termination requirements, was also introduced at the conference. Visitors experienced the outstanding features of the box in a playful way with a virtual reality game based on the theme 'installers vs. weather disasters' and could configure Polaris themselves in 3D.

The FTTH Council is a global organization with separate divisions for Africa, Asia Pacific, Europe, Latin America, Middle East and North Africa, and the US. Shajan George, R&M Technical Director India, is a member of the Education & Training Committee of the FTTH Council Asia Pacific and Managing Director for Western Europe Edgar van Essen is a member of the FTTH Council Europe Board of Directors.

Minimum must-haves for passive infrastructure specification:

- Application & usage description
- Standards for requirements and testing methods (IEC / EN / Telcordia, etc)
- Installation methods
- Maintenance requirements
- Compatibility
- Exchangeability / reparability
- Product and spare part availability



050.5963

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R&M Supplies Jordan's First Fiber-to-the-Home (FTTH) Project with World-class Connectivity Solutions



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Saraya Aqaba, the luxury mixed-use tourism and leisure destination located on the shores of the Red Sea in the Gulf of Aqaba in Jordan, has become the first in the country to roll out Fiber-to-the-Home (FTTH) connectivity by leveraging state-of-the-art cabling solutions from R&M. The undertaking will allow more than 800 residential units and commercial establishments to enjoy high-speed connectivity and the latest triple-play services from telecom operators.

The top-flight hospitality and leisure destination covers over 634,000 square meters, features residential units, premium five-star hotels, several entertainment outlets, state-of-the-art business facilities and Souk Saraya - a shopping and entertainment district with a unique mix of restaurants, retail outlets and nightlife spots. The deployment of R&M's cabling solutions was expertly executed by Optimiza, the cabling vendor's systems integrator partner in Jordan.

In recent years, FTTH has become a key aspect of city development projects as the in-home lifestyle of consumers in the region is being transformed into an online-dominated

experience. Raed Al-Omari, Director of Mega Projects, has this to say: «Saraya Aqaba is designed to provide the very latest facilities and amenities to residents and guests. The fiber infrastructure we have deployed provides the robust platform upon which a host of critical modern services will be offered. We have invested in the best technologies from R&M, a market-leading vendor, which will ensure that this network is capable of meeting the needs of users for years to come.»

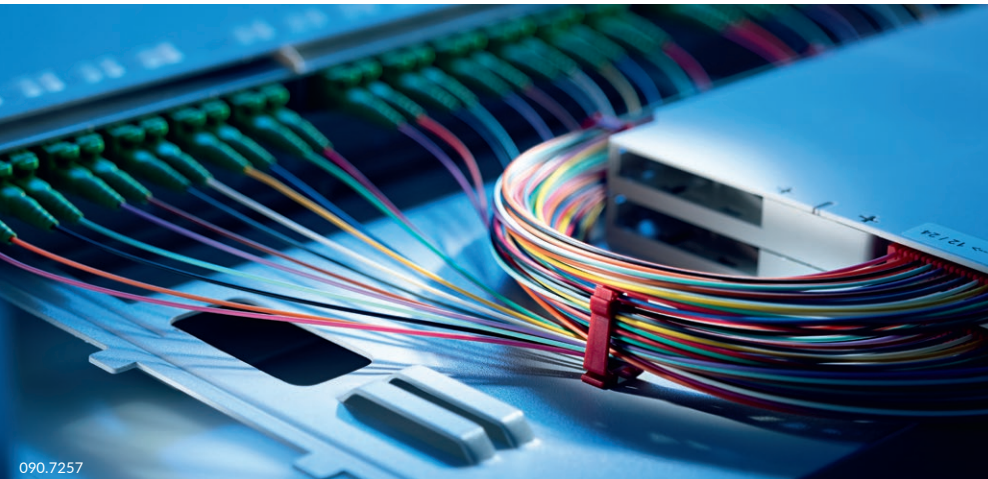
With the ability to provide Gigabit connectivity, FTTH opens up a range of possibilities. Among these are triple-play services - the packaging of voice, high speed Internet,

and television as a combined offering from a single telecom provider. Convenience and safety are also top priorities for the developers of the mega project which is why vital services such as fire alarms, CCTV, intercoms, and access control will all be connected to a centrally managed system via the secure FTTH network.

As this is the first FTTH project in the country, the project's consultants were keen on leveraging the expertise of qualified experts for the undertaking. Having successfully delivered many such projects in the UAE, Saudi Arabia, and Oman, R&M boasted an impressive list of regional references and was fully qualified to

«We have invested in the best technologies from R&M, which will ensure that this network is capable of meeting the needs of users for years to come.»

Raed Al-Omari, Director of Mega Projects



provide the technical expertise and guidance necessary through the design, deployment and testing phases. Product quality was also a major factor in vendor selection as the network had to meet present and future requirements. «Today we provide 10GbE connectivity over this network, but thanks to the quality and capabilities of the solutions we have invested in, we can increase this speed by a factor of four without having to make any changes to the cabling infrastructure,» says Raed Al-Omari.

Optimiza has utilized R&M's Cat. 6 copper cabling system for the horizontal cabling system. The entire compound is networked by FTTH using GPON technology whereby every subscriber has broadband-ready connectivity. The deployment has also entailed the use of specially customized Smart Home cabinet solutions from R&M, housing copper, fiber optic as well as the ONT equipment from the service provider on all customer premises.

R&M is proud to add another high-profile city development project to the list of FTTH successes. With the advancement of technology in the Middle East and the tech-savvy nature of consumers, FTTH is the clear way forward to meet growing expectations. Thanks to market-leading solutions and the efforts of the expertly qualified partner Optimiza, Saraya Aqaba today has a future-proof physical infrastructure upon which the latest services can be offered.



050.5661

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Floor Distributors for Passive Optical LAN (POL)

How can the standard-compliant installation of a Passive Optical LAN (POL) be effected as efficiently as possible? R&M's answer: by developing a specially configured floor distributor. It is based on the Venus platform and offers a surprising number of options.

The floor distributor for POL infrastructures has a name: Venus FLA2-POL-32/16-SPL. The housing offers space for connecting 37 horizontally laid cables, five of which can be used as direct ports. The R&M distributor comes in three versions: for splice connections, for field-terminable connectors and for pre-terminated cabling solutions.

Pre-installed pigtails considerably simplify the connection of the splitter sub-rack. Installers just have to lead the incoming cables onto the splice system and then splice them. At the same time the arrangement in the housing denotes a clear border between the backbone and floor cabling. Shrink splice protection is used in the splicing process. Overlength management with radius limitation for the incoming backbone and outgoing horizontal cables is a standard feature.

R&M's ODF splitter sub-rack is available as a 1U or 2U version. The maximum splitting envisaged in the case of a 1U sub-rack is 2:16. The 2U sub-rack supports a split of up to 2:32.

The dust caps of the splitter connections have a dual purpose: They protect the adapter ends and/or fiber stubs, and hold the pigtail connectors in park position. The advantage: safety, security and control for installation engineers. When enabling a port, you must first remove the relevant dust cap and release the connector from its parking position. Only then can it be plugged in. This solution means you can identify the active and free ports at a glance at all times. The well-thought-out concept of deliberate port enabling shows exactly what R&M means with its slogan «Connectivity that matters».

The standard version of the Venus FLA2-POL-32/16-SPL comprises two pre-terminated direct ports. This means subscribers or consumers can bypass the splitter and be connected directly. The solution makes it possible, for example, to support devices with a greater bandwidth requirement, such as wireless access points.

R&M's floor distributors designed for POL not only make life easier for installers with

their easy-to-understand quick mounting technology. Planners can be sure of being able to adhere to the guidelines for structured cabling. This is a genuine end-to-end solution from one source. The POL system catalog offers a corresponding overview. Important: The modular principle of the R&M solutions makes it possible to seamlessly extend, integrate or adapt cabling for many years to come.

For more information:



050.6456

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R&M Quality Standard is a Conscious Choice of Global Giant British American Tobacco

050.6457

British American Tobacco (BAT) has been operating successfully in the Ukrainian market for over twenty years.

BAT is a global company founded in 1902, and one of the top 10 listed entities on the London Stock Exchange. The company has been operating successfully in the Ukrainian market for more than twenty years. BAT Ukraine was the first foreign investment into the Ukrainian tobacco industry. The company employs about 1000 people in Ukraine and was recognized as the country's fourth highest taxpayer in 2016. The Pryluky tobacco factory manufactures nine cigarette brands and exports its products to six countries. In the course of its activities in the Ukrainian market and worldwide, BAT is constantly developing and optimizing its production capacities, implementing the most advanced manufacturing technologies.

R&M solutions were chosen for reconstructing the factory network in Pryluky and building

the structured cable system in the new office in Kiev. Creating functional working space and an infrastructure with outstanding network characteristics, as well as a comfortable employees' recreation zone, were the main concepts of the new BAT office. The British American Tobacco office occupies two floors providing space for servers and technical rooms, office infrastructure, spacious reception and working space, conference halls, relaxation and recreational rooms. Cat. 5e connectivity solutions were used to create the office network, which complies with the international standard requirements of ISO/IEC 11801 for transmission channels class D.

This project was a collaboration between Office Solutions Ukraine (<http://www.office-solutions.com.ua/>) and Synergia SE, the R&M distributor in Ukraine. Together the companies took care of all issues, including the technical background and specification for this project.

The R&M Solution

- Total number of ports - 435
- Patch panels, 24 x RJ45, Cat. 5e, shielded, fully populated - 20
- Connection modules Cat. 5e, RJ45/s - 435
- Patch cords Cat. 5e, SF/UTP - 495
- Installation cable Cat. 5e, F/UTP, 4P, 200 MHz, LSZH - more than 24 km

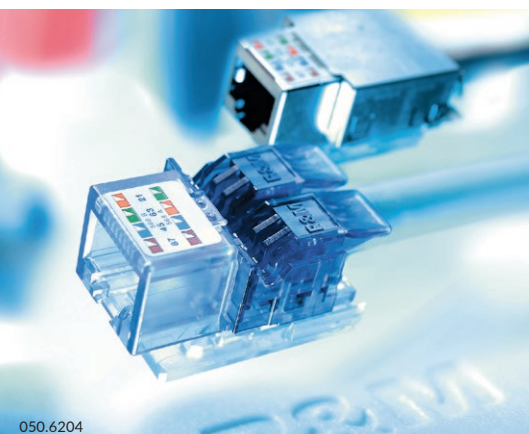


**BRITISH AMERICAN
TOBACCO**



Office Solutions

Valeriy Letyagin, Project Manager at Office Solutions Ukraine, explains that R&M solutions were chosen due to their high quality and reliable, outstanding connectivity performance on the one hand, and modularity and flexibility on the other. The other important advantage of R&M components is the compatibility with accessories from a range of producers. From the installer's point of view, the R&M solutions "Easy Lock" and "Tool Free" are extremely easy to terminate and use.



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050.6235

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LAN Brings Light to the Office



050.6458

The trend toward LED lighting is opening up new perspectives. Thanks to the low energy requirement, Power over Ethernet can be used to supply power to the latest LEDs. In this way, they actually acquire an IP address and can be used as ubiquitous sensor platforms for intelligent building automation – providing there is optimal cabling planning.

Progress in LED technology today renders possible light endpoints that provide professional lighting with just 30 Watts, a magnitude that can even be provided using Power over Ethernet Plus (PoEP). That means that a local data network with PoE operation could actually provide the necessary infrastructure for lighting offices and buildings.

This would give each light endpoint its own IP address; data could be sent to and received by it. Light endpoints would thus be equipped with sensors for controlling

intelligent building management. Temperature, air quality and room reservation would become variables for climate and lighting control.

Using light as a form of communication facilitates new applications such as, for example, a precise «indoor positioning system» or the guiding of people with optical signals. These are fascinating new possibilities. All leading manufacturers of lighting technology have recognized the potential and are supplying appropriate solutions.

The obstacle: service outlets

But things are not yet working out quite so easily in the field due to the lack of appropriate cabling and a power supply solution. For example, EN 50173-6 specifies cabling with service outlets (SO) installed on office ceilings. These are currently designed to supply WLAN access points. The light endpoints can also be integrated into the LAN via the service outlets. But often there are not sufficient connection points available at the SO for this purpose.

This structure would, however, make it possible to supply every component of a lighting system from the floor distributor using PoE, although elaborate star cabling to every individual endpoint would be required. R&M is already offering solutions based on the U-Box for this application, providing up to 24 ports per service outlet.

To reduce the amount of cabling, each individual SO can be equipped with an active switch. A switch specially designed for LED supply facilitates line multiplication within a zone. Switch manufacturer Cisco is treading this path, for example, with the «digital ceiling» concept.

This approach significantly changes the requirements made of the service outlets, however. In the past, planners and installers could usually assume that connected devices would be supplied with power by the floor distributor. More recent concepts require the SO to have a dedicated, ideally uninterrupted 230V power supply for high-performance active devices.



050.6459

Solution for digital ceiling

R&M's Extended Office Cabling (EOC) range offers just the thing. It makes it possible to extend the concepts of structured cabling to this new application. The EOC portfolio also makes the U-Box and power outlets available. Combining both products enables the distribution of data lines and power supply in the office ceiling. This results in the required equipment for the service outlets and LED lighting.

With these special solutions, R&M is supporting Cisco's digital ceiling initiative. In this case, the U-Box acts as a service outlet (SO) or service consolidation point (SCP). The specific U-Box variants give the zone switch connectivity for data connection and a 230V power supply.

In the simple SO version, the connection between the switch and light endpoint is created on the fly using patch cords. In the SCP version, the switch and light endpoint are linked using pre-installed CP cabling through the SCP. In this way, the passive infrastructure can be set up and checked completely separately from the active devices. The digital ceiling switch is outside the box and the ports are connected with the light endpoints when brought into service by patching to the SCP.

On the road to building automation

R&M's concepts are paving the way to a plannable development of the ceiling for IP-based intelligent building automation using structured cabling. In work area access, the solutions use proven approaches from the world of data cabling that have been tried and tested millions of times. Depending on the situation, one of the concepts could well be the perfect solution for the future-oriented infrastructure cabling of a modern office building.



050.5749

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Colt Opts for SYNO Dome Closure

A new fiber optic network was required. And it had to be set up quickly to last long term. The British IT and telecommunications service provider Colt needed an immediate solution for a site in Switzerland. The challenge was quickly mastered with the new SYNO gel dome closure from R&M.

Colt Group S.A. maintains data and communication networks for sophisticated services in 28 countries and 205 agglomerations. The company focuses in particular on its own metro networks, which are based on fiber optics, and also buys itself into other specific networks over interconnection points. This means Colt can perfectly satisfy its customers' requirements from the long distance and metro area down to the last mile.

But a third-party supplier surprisingly terminated a several-kilometer-long rented route at a site in Switzerland. Colt needed a solution at very short notice, and one which would last long term so the company could be sure it would be able to supply its customers in the future. The aim was to have an alternative cabling solution fulfilling exclusive performance requirements that could be combined with existing infrastructures.

Easy to handle

Colt contacted R&M and together the two companies quickly found a qualitatively compelling solution. It was to be the first use of the SYNO gel dome closure R&M had launched in 2016. It took just a few days to set up the alternative FO network using the SYNO dome closure. The installers' work was straightforward thanks to the logical construction of the closure. And there was no need for extra training.

The modular system of the SYNO dome closure eliminates the laborious task of threading the fiber optic cable through the bottom of the closure. This meant the technicians could work much faster than would normally have been the case. Colt wanted a flexible platform to cover any subsequent installation work. The SYNO dome closure from R&M fulfills precisely this requirement. It can be assembled differently at any time.

Stéphane Gottraux, Manager of Service Delivery and Customer Experience at Colt: «I still find the Swissness of R&M solutions compelling. Products from R&M satisfy customers' needs better than those of the competition.» Here he defines Swissness as familiar Swiss precision, reliability and being able to deploy user-friendly technology. The customer sees the investment in the new closures as an investment in the future and will commission R&M when it comes to further system components.

«I still find the Swissness of R&M solutions compelling. Products from R&M satisfy customers' needs better than those of the competition.»

Stéphane Gottraux, Manager Service Delivery and Customer Experience, Colt



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Stéphane Gottraux was also impressed by R&M's support and flexibility: «I can contact my customer adviser at any time and he is always willing to listen to my concerns and wishes. R&M always makes specific customizations possible.»

Colt and R&M have been collaborating successfully for years now. The customer already opted for R&M's Optical Distribution Frame (ODF) in 2012 (see the article in CONNECTIONS no. 43). The ODF precisely covers the requirements of the IT and telecommunications service provider which is why it is used in several countries. Quality, space-saving construction, simple assembly and extremely convenient installation immediately impressed Colt.

Sophisticated infrastructure

Colt offers companies in Europe, Asia and North America high-bandwidth customized network services. With its own intelligent network, the Colt IQ Network (<http://www.colt.net/our-network/>) which is completely integrated in the cloud, Colt supports companies in their digital transformation. Worldwide, more than 700 data centers as well as more than 24500 buildings are directly connected to the Colt IQ Network, with numbers rising all the time. Colt is an innovation leader when it comes to Software-Defined Networking (SDN) and Network Functions Virtualization (NFV).

Customers are very much Colt's top priority. The company focuses on local solutions and local support for companies active globally. Its customers are companies from data-intensive sectors in more than 200 cities in around 30 countries.

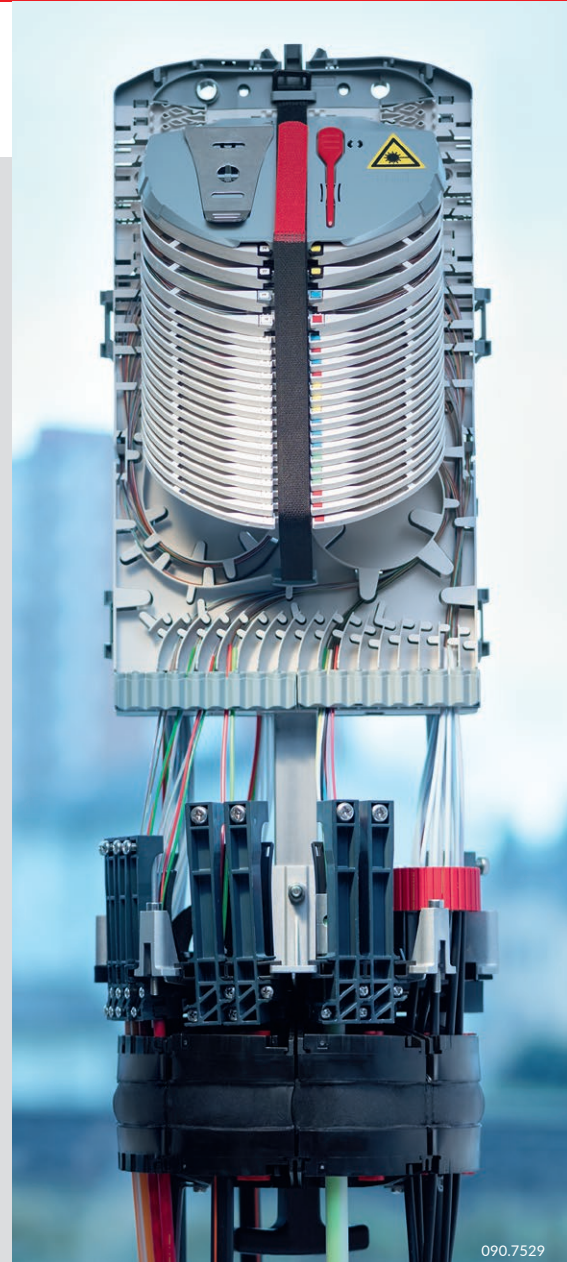
Modular and flexible

The SYNO dome closure boasts optimum flexibility. The eight radially arranged, modular cable entry bays support all desired configurations and mixed assemblies of cables and micro ducts. Network operators have more freedom to tailor their plans and change them at short notice because conversions are always possible. The cable entry kits can be opened, closed, changed, and retrofitted in just a few simple steps.

The modular system for cable entries eliminates the laborious task of threading fiber optic cables through the bottom of the closure. The cables are inserted laterally. There is no longer any need for time-consuming sealing using shrink tubes. Instead, integrated blocks made from the company's own SYNO gel seal the splice closure. The cable bays and individual cables remain freely accessible, meaning that the splice closure can be modified or fitted with additional fiber optic cables even during network operations.

The SYNO gel technology developed by R&M is an innovation for mechanical cold sealing. When the cable entry is sealed, gel surrounds each cable, preventing dust and moisture from getting in. Fluctuating temperatures, mechanical loads, or water pressure cannot damage the dome-end splice closure in any way.

A further advantage is R&M's system approach. Inside you will find R&M's Single Circuit Management System with its scalable tray technology. The largest of the three splice closure models can hold up to 1152 fibers and splices. A bending radius of 40 mm is gentle on fibers and is guaranteed regardless of packing density.



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Colt enjoys an excellent reputation in the market and has positioned itself as a technology leader. To ensure it lives up to its good reputation, the company is currently investing in a Next Generation Network. In

future, customers will only have to pay for the bandwidth they effectively need as the capacity usage of networks significantly depends on the daily business and thus demonstrates considerable differences.



050.6461

colt



050.5562

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Safety First

Just three minutes. That is about how much time you have, under normal circumstances, to get out of a burning building. Life-threatening smoke spreads immediately when plastics burn. R&M is following an EU directive and supporting preventive fire protection.

050.6425

With the new Construction Products Regulation (CPR), the European Union wants to implement a form of international, standardized fire protection assessment. The aim is to better protect people in buildings from poisonous gases in an emergency and curb the fast spread of fire.

The CPR is equivalent to a law. It demands that cabling, regarded as a construction product, should be tested and labeled to indicate its fire behavior from July 1, 2017. Fixed products

such as data and communication cables – both copper and FO – are particularly affected by the directive. Pre-assembled cabling links are also included if they are to remain in the building permanently due to their function.

R&M tailored the range to European and international standards at an early stage. This comprised extensive testing in test labs and, wherever necessary, the development of new cable types which were then included in the portfolio.

Since March 2017, R&M has been labeling installation cables with fire protection classification as defined in the CPR. From July 1, 2017, the pre-terminated cabling systems will also feature this labeling.

The CPR also demands what are referred to as performance declarations, which R&M provides on request. R&M data sheets provide planners, installers and customers with extensive information which can be referred to for the purposes of building safety.

Planners should note that safety requirements may vary. While the CPR does actually standardize the classification of construction products, local fire prevention authorities in the EU member states can freely choose classification for different areas of application. The table on the left shows R&M's recommendations on how to sensibly use fire protection classification. Since March 2017 new R&M installation cables have been on the market which completely cover fire protection classes E, D, C and B2. R&M will monitor the market with reference to the requirements of fire protection classification and add further cables to the portfolio as necessary.

Recommendations for the future use of EU fire protection classification				
Euro classification	Additional classification			Fire protection level of the installation cables (Use recommendations from R&M)*
Flame propagation Development of heat	Production/density of smoke	Acid development/corrosivity	Burning drops	
A _{ca}				NA
B1 _{ca}				NA
B2 _{ca}	s1	a1	d1	Very high (e.g. emergency exits, tunnels, high-security industries)
C _{ca}	s1	a1	d1	High (e.g. hospitals, nursing homes, schools)
D _{ca}	s2	a2	d1	Medium (e.g. public buildings, hotels, airports, industrial environment)
E _{ca}				Normal (e.g. normal office building, residential premises)
F _{ca}				Low (not recommended)

* The necessary fire protection classification for installation cables is prescribed by the relevant fire prevention authority. 050.6484



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Benfica Inaugurates New High-tech Stores in Lisbon



050.6462

As Portugal is a country that focuses on technological innovation, it is no surprise that soccer club Sport Lisboa e Benfica has also set its sights on being a club of technological reference.

The club has 14 million fans all over the world, 120 players, a stadium with a capacity of 65000 and 500 000 subscribers to its television channel, Benfica TV. It is only logical that technology is one of the main pillars of the Portuguese club.

SL Benfica has implemented technology in various ways, including with regard to the players and even the pitch. It has also inaugurated three new stores which provide a range of state-of-the-art technology, including a video wall and various interactive features.

Interactive stores

To address fans' main interests, the club redesigned its megastore, situated inside the club grounds, and at the same time opened up two new shops, one in the center of Lisbon covering 300 m² and another in the Strada Outlet covering 130 m².

«Working with R&M means working with a brand that provides quality and technical support.»

João Feio, Pre-Sales Manager Cilnet, Portugal

Certified partnership

The store construction project was a collaboration between R&M and Cilnet, a certified partner and integrator of all projects previously carried out with the club.

«Working with R&M means working with a brand that provides quality and technical support,» says João Feio, Cilnet's Pre-Sales Manager. «We opted for new digital trends. In order to achieve this, it was only natural that we wanted to work with the best integrator and connectivity brand to transform all our requirements into the perfect customer experience,» explains José Pedro Ribeiro, IT Manager at SL Benfica.

This year sees the 113th anniversary of Benfica and fans will take great delight in the new retail offerings.



050.6262



050.5772

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Viva la qualità!

050.6463

Vivacom is the leading telecommunication company in Bulgaria. Its services comprise all kinds of data services such as fixed network and mobile telephony as well as broadband Internet over FO, copper and satellite transmission.

The range even includes several radio and TV stations. In addition, Vivacom develops individual customized telecommunication solutions. Such an extensive product range requires the corresponding equipment, both technically and in terms of HR: The company employs 6000 people, with around 1200 of them working in the head office in Sofia.



Vivacom provides around five million services, both for companies and private households. There are 3159 million mobile subscribers, 957 000 fixed network telephones, around 422 000 broadband customers and

404 000 pay-TV customers, as well as around 4000 Internet hotspots throughout Bulgaria connected to the Vivacom network. The 4G network spans to 83% of the population, while the 3G network covers 99.99% of the population and 99.65% of the territory of Bulgaria.

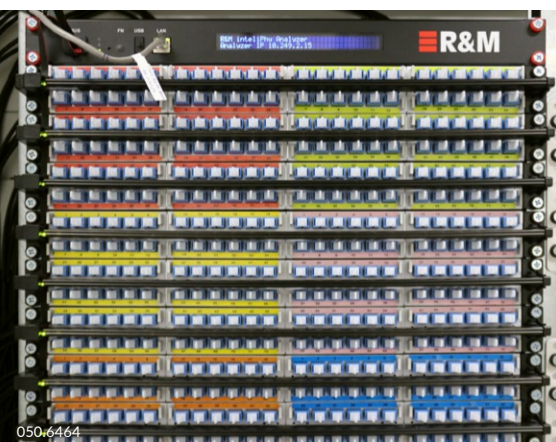
Powerful service for top demands

As far as the technical equipment is concerned, Vivacom was faced with the task of expanding its data center in 2016. The aim: to cover the great need for fast data transmission and to be equipped to face the growing demands of the future. For this reason, maximum port density had to be created in the patch panels and an intelligent monitoring system set up. R&M convinced the customer with its high-density Optical Distribution Frame and the new R&MinteliPhy system for automated infrastructure management.

R&M equipped three sites in Sofia as well as two others in Plovdiv and Varna with its solution. The delivery and installation comprised nine cabinets (1200 x 380 x 2200 mm) each with 1704 SC/PC ports as well as the corresponding cable management. R&M products accounted for 99% of the installed material whereby the entire system solution was adapted to the specific requirements

of the customer. The volume of the project totaled around EUR 580 000.

The AIM system from R&M now delivers a one-hundred-percent overview of the state as well as configuration of the network and replaces manual activities with standardized processes. These requirements could be fulfilled thanks to numerous additional configurations as well as newly created templates from R&M. The information is always up-to-date and complete. Vivacom can reduce its running costs with the R&M solution as less effort is needed for the maintenance of tables and databases as was previously the case. The company benefits from efficient error search, smooth-running MAC processes, optimal capacity utilization and reliable quality management.



050.6465

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Best Practice for Reference

A new series of guide leaflets from R&M gives planners and installers practical ideas and suggestions on how to solve cabling tasks encountered in day-to-day work. The application notes contain specific tips on how to use R&M products to deal with various cabling tasks. Customers and partners can look up specific topics in the digital brochures and thus considerably simplify their daily planning and installation work.

The application notes focus on one more or less typical task per page. They even sometimes cover more exotic challenges. Possible approaches using R&M products are shown, detailing both advantages and disadvantages.

The first application note has just been released and focuses on the field-mountable FM45 connector. It describes six scenarios in which the FM45 can contribute to quickly and pragmatically solving cabling challenges.



The application note series is to be continued. In this way R&M will gradually establish a library detailing numerous ideas and tips.



R&M Emphasizes Sustainability

With the fourth Corporate Social Responsibility (CSR) Report, R&M is confirming its sustainable corporate management. The comprehensive document focuses on the economic, ecological and social progress made by R&M in the fiscal years 2015 and 2016 and also contains a detailed catalog of targets. «All CSR targets were achieved in the reporting period,» says CEO Michel Riva.

Primarily, balanced and sustainable corporate governance is crucial. The economic section focuses on strategic corporate development, while corporate culture as well as topics that are close to employees' hearts are explained in the social section. The report also has to detail what an organization undertakes to protect the climate, nature and resources. R&M has resolutely been using environmentally friendly materials and means of production for years. The business and manufacturing

processes are not only geared to corporate responsibility and an increase in efficiency. They are also subject to an externally audited environmental management system in compliance with ISO 14001:2015. The R&M Group successfully completed an appropriate certification procedure in 2016.



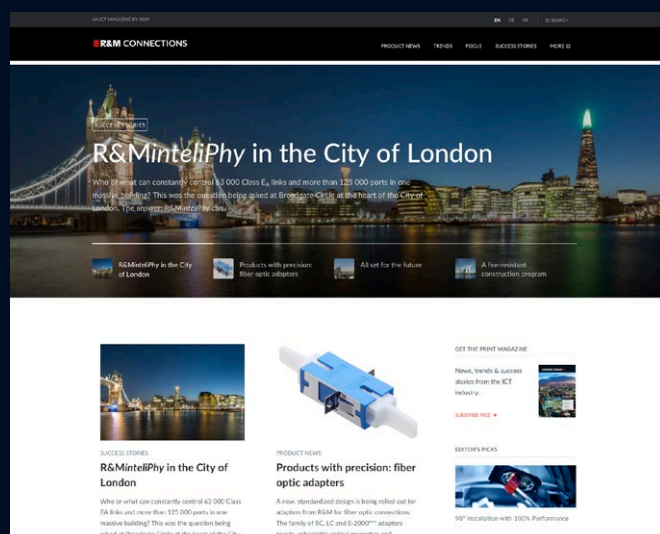
The R&M CSR Report is oriented to the standards of the Global Reporting Initiative (GRI), an international organization promoting sustainable economic and ecological behavior in business and society.

More information: www.rdm.com/Company/Corporate-Social-Responsibility



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