

CONNECTIONS 30



International Success

Initially there was courage and foresight. Today, the internationalizing of R&M is an intoxicating process, which moves all divisions of our company to creative vitality. Our mission "number 1 for layer 1 in dedicated markets" is being implemented in 108 countries. Persistently, we expand the resources for the growing international commitment. Today, R&M generates more than 70 percent of sales in foreign markets.



In the past, the limits have been demonstrated in the home market of Switzerland. To pursue long-term visions, compete in the quality sector and have above-average growth requires putting the sights higher. In the end, it is in the nature of any larger company to cross the borders and experience the international challenges. In fact, Swiss industry has always done it.

Our sector, information and communications technology, has changed the world in the past 30 years – precisely because of its international approach. Many of our customers are globally active and expect the same from their supplier of choice. The outstanding relationships and partnerships of the base markets need to be used and maintained in new markets. R&M must be close to where R&M customers are active.

Therefore, it is necessary and logical to present R&M internationally. In fact, we are very successful in doing so.

The first steps in a new market are frequently followed by the first inquiries. R&M has barely arrived, word gets around that Swiss quality and efficiency are here. Customers in these markets recommend R&M to potential future customers. The excellent reputation of "installers' best friend" precedes the brand and solutions. This phenomenon is being experienced in the Far East, where R&M, in part, enters totally new territory. You will find examples in this magazine.

Image and success give our employees the self-confidence for making further advances. Success awakens the intuition for additional market opportunities. We are an independent, medium-sized family enterprise and, as such, pay attention to a balance between security and risk, because we want to remain a reliable supplier in the future. This portfolio equilibrium has significantly more possibilities internationally than in a national market.

We, as a partner go along to new markets and grow organically, and accordingly, offer our customers security. The R&M employees are here when needed. Our systems and the appropriate support are available when necessary. To have a local presence means to better grasp the culture of a market. This in turn promotes confidence in the supplier and R&M becomes a stable entity in the world of information and communications technology.

Positive results follow: in the home market of Switzerland, R&M can remain a more reliable partner, grow and even create new jobs.

Upshot: The more international R&M becomes, the better off are all customers, partners and employees.

A handwritten signature in black ink that reads "H. P. Legler". The signature is written in a cursive, flowing style.

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Masthead CONNECTIONS 30 / March 2006

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New Products from the R&M Braintrust

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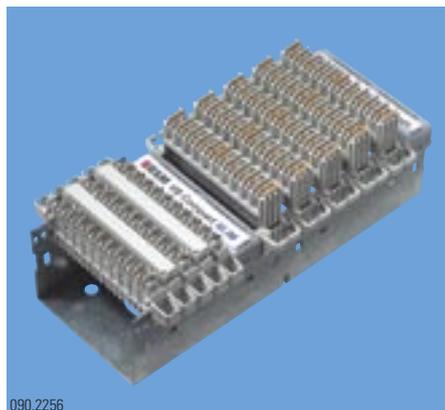


R&M uses the spring trade shows as a platform to bring new products and ideas closer to our customers. The suspense is high in both camps. Our customers, and even our competitors, always expect something special from R&M. On the other hand we are curious about the feedback from the market. The 2006 highlights, which will be unveiled to the trade visitors at the ITnT in Vienna and the CeBIT in Hanover, will feature considerable innovations.

Development continues in all four business sectors where R&M is active. In 2006, we want to provide you again with more convenience and applications, more security and reliability for your networks. These are current examples of how we create more value with clever ideas – or from the point of view of our customers: GET MORE @ R&M.

VS Compact SLIM module – saves space and money

The new connection module from the VS Compact product line helps to lower costs in modern carrier networks.



The SLIM module is completely compatible with the 10 DA VS Compact module.

Thanks to the extremely compact design, the packing density is double that of conventional VS Compact modules – it saves space in distributors and housings and indirectly lowers costs. The new connection module is also appropriate for harsh environments, which guarantees maximum operational reliability even under difficult conditions. For more information, see article on page 9.

DRM45 – data technology for DIN rails

The classical data technology is used in new installation areas – in home as well as industrial cabling. The conventional 19" technology of floor distributors for office buildings is rarely found in any of these application areas. Instead, DIN rails with top hat rails are frequently used in distributors.

Data technology can be integrated into these distributors with the new DRM45 from R&M. The adapter is simply locked into place on the 35 mm top hat rail. It can accommodate any compact R&M module: Cat. 5 and Cat. 6 modules, shielded and unshielded, as well as twisted pair cabling. In fiber optics, the SC-RJ

and E-2000™ Compact with all variations – multimode, single mode and POF, are compatible.

This great flexibility of the DRM45 provides planning and investment security. The technology can be changed at any time. As an option, the connections can be equipped with the R&M security system. This allows that greater security requirements can be implemented subsequently in no time.



Compact and universal. The DRM makes copper and FO connections onto the top hat rail possible.



090.2262

Small but powerful – the VS Compact SLIM module with greater protection and packing density.

Patch Guard blocks mishandling

We are expanding our security system with the Patch Guard. It protects RJ45 connection cables towards the equipment against unauthorized handling. A locking mechanism releases the unlatching lever of the connector only when the appropriate key is used. For the first time, active ports (PC, notebook, hubs, switches, access points) can be protected against unauthorized disconnection.

This function allows users to increase operational reliability and costs are reduced that are incurred due to power failure and fault tracking. The use of the Patch Guard pays off when high power supply availability is crucial for the business process and very high costs would result from failures. Patch Guard is also useful where unauthorized people can access connections relatively easily: in warehouses, libraries, schools, Internet cafés ... For more information see article on page 7.

Protection against unauthorized handling also in carrier networks

R&M has a dynamo in the E-2000™ connector from fiber optics. It satisfies the highest transmission quality requirements. We are enhancing the high-quality connector by an additional unique feature. The new unlatching lever, Patch Guard E-2000, stops unintentional or unauthorized unlatching or disconnecting and carriers avoid costly network failures.

E-2000™ connectors are locked with a special key. This function can easily be upgraded in all existing E-2000™ installations. Only the standard unlatching lever must be replaced.

Multimedia in the entire home using plastic fiber

It is light, robust, easy to install and now also the powerful backbone for strong multimedia cabling in the entire home: the polymer optical fiber (POF). We have implemented a total solution for Fast Ethernet LAN cabling around the plastic optical fiber.

R&M is setting new benchmarks with POF in home cabling and becomes the first POF system supplier. The solution is also particularly appropriate for upgrading of buildings, since POF can be installed invisibly and flexibly even in tight spaces. For more information, see pages 28-29.

E-2000™ manufactured under license by Diamond SA, Losone.



090.2337

Simple and effective. Patch Guard protects connection points against mishandling.



020.1509

Robust and simple. POF as data network in the home.

R&M Patch Guard



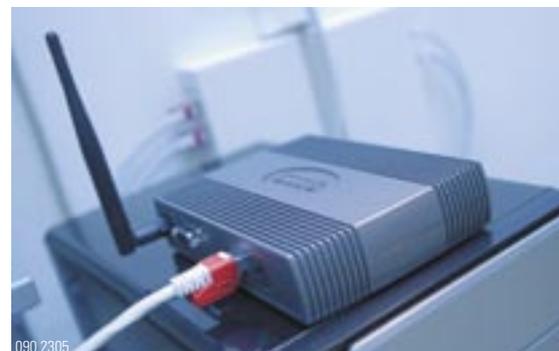
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LOCK PATCH CORDS – ELIMINATE BREAKDOWNS

In spite of every security precaution, time and again it happens that an unauthorized person disconnects a patch cable. The network is no longer available. Production is at a standstill – at the PC work place as well as in manufacturing. There is a threat of lost time and damage. R&M has the solution.

- Security: Authorized access for all RJ45 connections
- Modularity: Compatible with R&M standard patch cords
- Convenience: Can be mounted tool-free subsequently

Patch Guard from R&M – the lock on the patch cord. With Patch Guard you complete the security and availability of your network for passive cabling. R&M – the innovative partner for your secure and reliable network infrastructure.



090.2305

Reliable protection for all RJ45 connections, for example, Wireless LAN Access Points.



Convincing cabling solutions

Get More @ R&M

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Plug & Lock: RJ45 Patch Cable – now lockable

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Daily, companies and administrations demand greater availability of their networks. Breakdowns must no longer occur. Therefore, R&M is closing the last security holes in layer 1. Patch Guard now gives IT managers the key for total network security. Patch Guard is the first lockable plug-out protection for RJ45 patch cables.

The lock on the cable consists of a two-part plastic sleeve with a locking mechanism that can be mounted tool-free at a later time. Users can later attach it to the cable end in a few steps. The Patch Guard blocks the RJ45 connector with the unlatching lever. Only authorized persons in possession of the compatible key can open the plug-out protection.



Efficient security solution with high packing density on the switch.



A security advantage for video monitoring with network connection.

Patch Guard is compatible with the R&M standard RJ45 connection cables. It can be coded with color clips from the R&M security system product line in order to ensure correct plugging in.

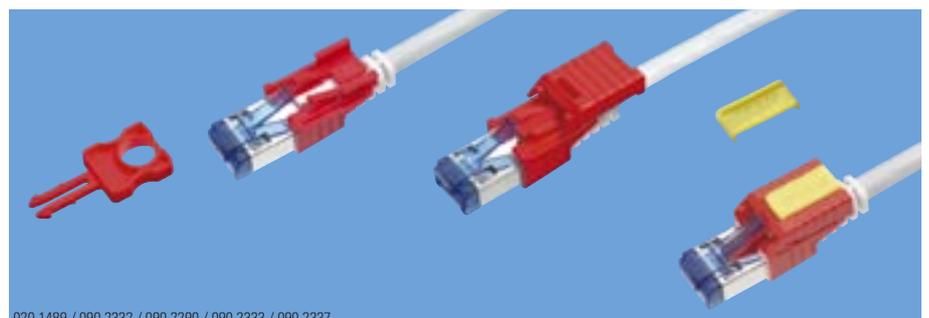
The new solution supports the security goals in all classical application areas in the office and home as well as in industrial cabling. In companies, Patch Guard can be used from the server room via active network components and distributors to the individual PC workstation with its peripheral devices. The compact design allows Patch Guard to fit anywhere – even on the switch with high packing densities.

More and more Wireless LAN Access Points are installed at publicly accessible locations – for example, in hotels, event halls, airports or in highly frequented departments. Specific measures are required in these environments because many customers and guests with laptops might be disconnected from the data

traffic if an Access Point inadvertently or deliberately is disconnected from the network. Patch Guard provides a clear advantage regarding security in these scenarios. Patch Guard can also help fending off manipulations on connections for monitoring cameras with RJ45 connectors.

Industrial companies are introducing Ethernet with RJ45 network connections to obtain production data in real time. Failures of the data stream can have serious consequences. Patch Guard keeps the RJ45 ports of manufacturing systems safely locked and thus becomes an important factor for quality management, cost control, productivity and operational reliability.

Patch Guard expands the third layer of the modular R&M security system. It features an intelligent plug-out protection, a locking mechanism and authorization solutions. Now RJ45 connections can be locked on the jack as well as on the cable.



Mounting: Join Patch Guard parts (red), attach color clip (yellow) (left, key).

Without Screws and Flush: Mounting Plate, 45 x 45 mm

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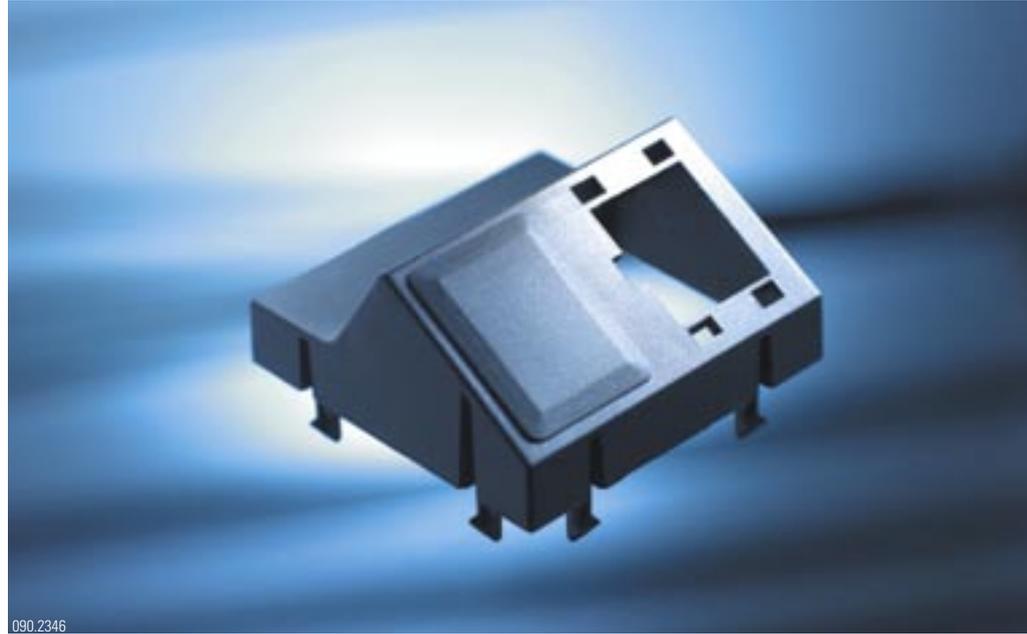


Only the best for customers – for the new mounting plate, a product from the R&Mfreenet system product line, this means: trouble-free snapping in at any place, in any situation and at the same time to be able to use the complete R&M security system layer 1 and 3.

The new mounting plate, a product from the R&Mfreenet system product line, fits into cover frames and duct covers with cutouts of 45 x 45 mm. It can be mounted on walls, ducts and in floor box outlets. No screws and flush – a smooth affair. The conditions are ideal when the outlet or the floorboxes are 70 mm deep.

Upon snapping it, there is no guessing game about the “correct” or “wrong” way: The plate can be turned 90 degrees and fits in all four positions. Snap, and you are done.

The mounting plate can accommodate all R&M modules. In the twisted pair sector Cat. 5e and Cat. 6 modules are possible in shielded and unshielded versions. The FO sector is outstandingly covered with the SC-RJ and E-2000™ Compact modules.



090.2346

The new mounting plate of the R&Mfreenet system.

New, with user comfort in mind, are the Smartholes. These allow using the R&M security system universally, from the simple, but clear color identification with clips (layer 1) to the effective plug-out and plug-in protection with Plug Guard (layer 3). An additional labeling field provides well-defined identification.

R&M manufactures the new mounting plate in an angled and in a flat version, in black (RAL9005) and in white (RAL9010) made out of environmentally friendly material. This plate is a perfect mounting solution for customers in the entire EU area. R&M is leading the trend for the 45 x 45 plate as a “mounting standard”.



090.2322

Angled version.

E-2000™ manufactured under license by Diamond SA, Losone.



090.2323

Flat version.

get more

Mounting plate, 45 x 45 mm

More modularity and flexibility

- Snaps in in 90° steps
- 2 x 1 port, flat or angled, compatible with RJ45 copper and SC-RJ fiber components

More security

- Smartholes for R&M security system
- Labeling field



SLIM Allows Double Packing Density

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Added value in telecommunications – specifically this means higher packing densities in distribution systems, greater protection and security for connections, modular and convenient installation. R&M achieves the desired effects with the new 10DA SLIM connection module.

The established VS Compact distribution system is a perfect example for a highly compact design. It can accept up to 4300 DA per square meter and is particularly appropriate for sites with limited space. Its main applications are in the areas of Remote Access, KVz or PABX. VS Compact covers the pair sizes 2, 5, 8, 10, 16, 20 and 25 and in addition it allows double wiring and wiring with stranded wires.

The SLIM connection module completes the VS Compact distribution system. Network operators wanting to attain a higher packing density in an existing infrastructure are using it.

It goes well with the time-tested system and is seamlessly compatible with the 10 DA VS Compact module. The mounting profiles are identical, which allows different combinations. The module is installed with the usual steps and technicians and installers can continue to use the available wiring tool.



090.2261

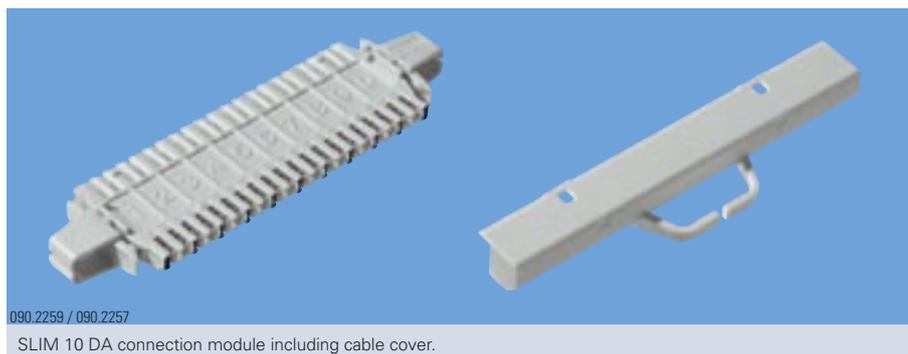
Compact – saves space. Double packing density compared to conventional distribution modules. The SLIM module achieves this thanks to an extremely small design with a grid size of only 10 mm.

R&M once more demonstrates with the compact design that there is still innovation potential in the copper distribution system technology. Through the arrangement of the contacts – cable side on the back and transfer side on the front – an extremely small format with a grid size of 10 millimeters is obtained. This represents a doubling of the packing density in the distribution system and expands the headroom in the existing infrastructure. The SLIM module enhances investment security.

Additional goals in the development of the SLIM connection module were application-oriented performance and bandwidth, as today, telecommunications networks must withstand any challenge in data transmission. From the outset,

the SLIM module makes available the full Cat. 5e performance.

In many cases it can only be decided on location whether the protection against dirt and moisture needs to be stepped up. R&M has developed a solution for such cases. A practical gel set assists installers in sealing the module. Cable covers and front covers are filled in a few steps with durable soft polymer. Thanks to this seal, the modules are still fully functional after having been immersed in salt water for 14 days. Immersion test according to Bellcore TR-NWT-000975.



090.2259 / 090.2257

SLIM 10 DA connection module including cable cover.

get more

VS Compact SLIM

- Packing density
- Security
- Modularity
- Flexibility
- Protection



Home Termination Unit – Fiber to the Home

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Services diverge – communications technologies converge. Therefore, network operators are searching for solutions. In the medium term, the easiest way for broadband access networks to connect to subscribers is via fiber optic cables. Hence, R&M in collaboration with EMC Electronic Media Communication SA, has developed a new Home Termination Unit – compatible with Fiber To The Building and Fiber To The Home.

The development of completely digital networks from one end to the other is not concluded in one or two years. Therefore, the established cable network operators search for systems supporting their existing CATV services and at the same time provide broadband reserve for future requirements.

On the other hand, there are power suppliers, city utilities and city carriers, which provide high-speed data in order to be able to offer their customers TV programs as part of a total service package.

This presented a challenge to EMC and R&M. The new Home Termination Unit had to be designed in such a way that active and passive modules would leave open any possibility for network operators.



020.1500
Home Termination Unit. Housing with EMC optical transceiver NHP-3155

Requirements for a Home Termination Unit

In a Fiber-To-The-Building (FTTB) architecture, the Home Termination Unit takes on the task to connect the subscriber with the fiber connection (drop fiber) of the network operator. This forms the transition point for both "parties". The unit is installed directly on the subscriber's house or e.g. in the basement of an apartment building.

Since private customers would like to use several different services, the network infrastructures and specifically the Home Termination Units must support the entire spectrum of subscriber services – including TV, DOC, SIS and IP services.

Modularity for versatile functions

The Home Termination Unit is based on a modular concept providing network operators with versatile possibilities to supply their customers with broadband services.

The housing contains protected areas for patching and splicing of incoming fibers and an easily accessible tray to accommodate a multitude of optical-electronic modules.

The following combinations are available:

- Optical TV receiver (47-862 MHz) and high-speed Ethernet converter. This is ideal for new accesses where it is desired to combine an improved fiber infrastructure for broadband communication with conventional TV services.



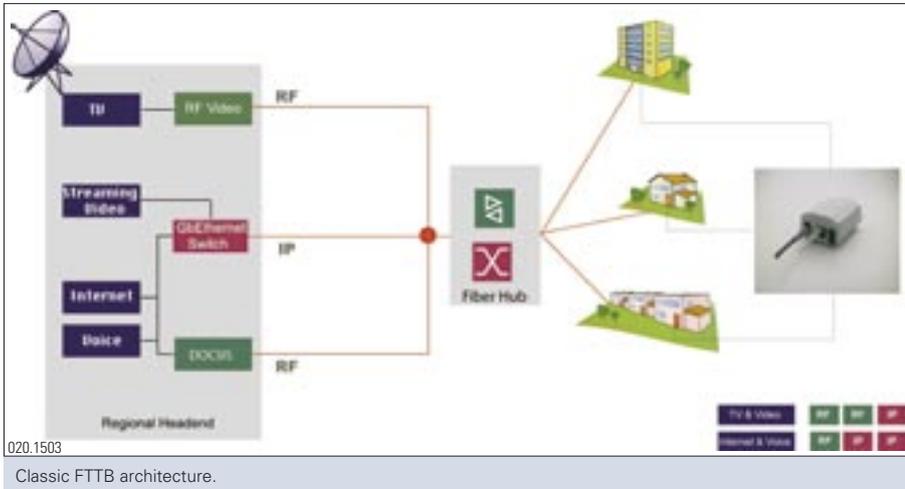
020.1501
Splice-Solution.



020.1502
Break-out-Solution.



EMC Electronic Media Communication SA
 www.emc-web.com
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020.1503
 Classic FTTB architecture.

- Optical transceiver (5-65 / 47-862 MHz). This is the solution for established cable network operators who, bit by bit, would like to develop their fiber infrastructure as an alternative to the conventional coax system thus allowing them to deliver Ethernet when requested.
- CATV transceiver and high-speed Ethernet converter. This is the best solution for cable network operators, who intend to introduce new services without putting their income from existing business at risk.

The Key factor – easy installation

The unit is designed for quick and easy mounting on location. This saves installation costs in all work steps: wall mounting, splicing of the incoming fiber and plugging in of module. Expansion – for example for more bandwidth or for con-

ventional TV services – are possible at any time without too much work. Thanks to its compact design and the high-quality materials used, the unit can be installed almost in any place – exactly there where needed. This pays off, and not only after years of service but already prior to starting operation of the first unit.

Successful collaboration

In close collaboration, the optical-electronic module from EMC combined with the passive components from R&M resulted in the top class Home Termination Unit. The Home Termination Unit provides all options for current and future services based on the active modules from EMC – from the high-performance CATV transceiver to the switched Ethernet converter. Thus, R&M and EMC free the way for FTTB.

get **more**
Home Termination Unit

- Room for TV receiver or TV transceiver and Ethernet converter
- Built-in splice tray
- Easy installation thanks to easy access
- Appropriate for mounting in the house or outside
- Impact resistant plastic material
- Rubber seals for cable grommets
- Sealed Locking system

High Bandwidth for Celebrity Guests

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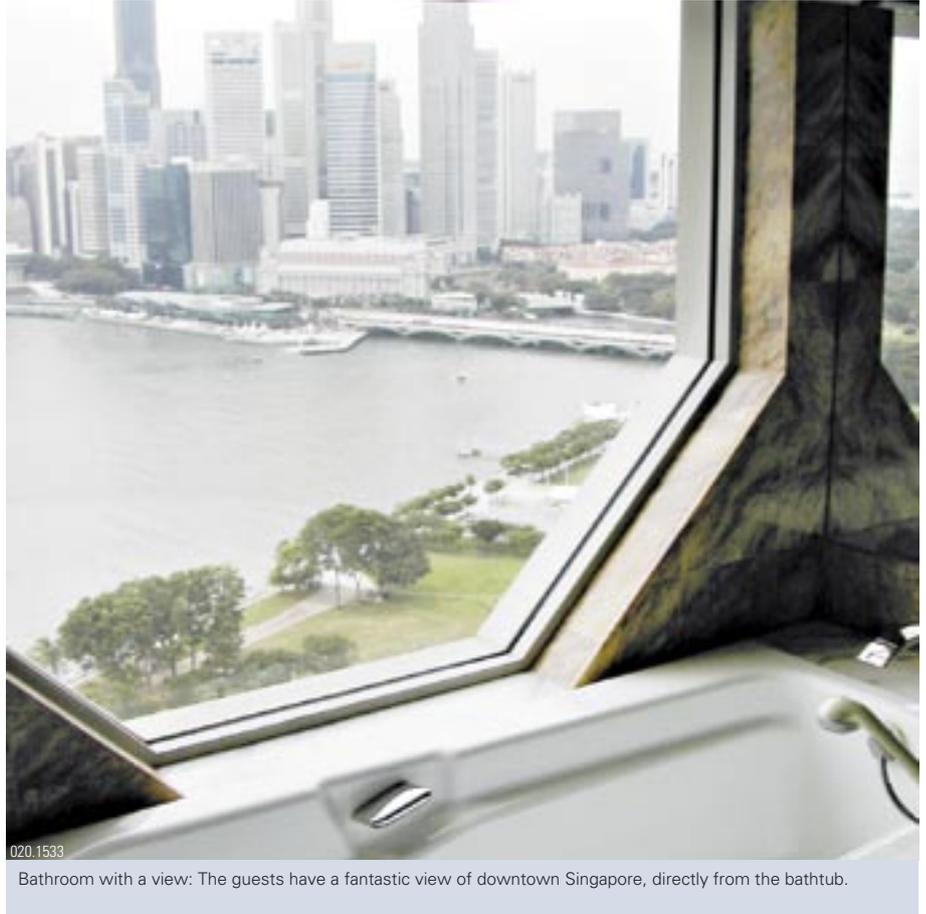


Ritz-Carlton – a name conjuring up pictures of hotel doormen dressed in black, marble-tiled entry halls and golden shiny crystal chandeliers. However, the time, when posh travelers wanted to enjoy only comfortable accommodations and eat delicious meals, is over. The guests of the Ritz-Carlton Millenia Hotel in Singapore can now use the most modern broadband applications from their suites thanks to the R&M products and know-how.

Singapore is considered the Switzerland of Southeast Asia. The reason: the cleanliness of all public areas. In particular, however, Singapore is a strongly expanding world metropolis with its international financial market and one of the largest trading centers. The modern infrastructure, well-known tradeshows and the concentration in the tightest of spaces, attract more and more global players and business people to come to the “City of Lions”.

The pinnacle of the hotel industry

The Ritz-Carlton, Millenia, Singapore belongs to the Ritz-Carlton hotel chain with more than 50 luxury hotels worldwide and is a classic example of the pinnacle of the hotel industry. In 2005, the *Asiamoney* magazine nominated it the best Hotel in Asia. It is centrally located in the new business and trading center in Singapore, has 32 floors and sits in the middle of a three-hectare, award-winning tropical garden with waterfalls. More than 608 rooms ranging in size from 50 to 200 m², enormous bathrooms, fitness and spa center as well as five restaurants and several bars make for outstanding conveniences. There is a permanent exhibition in the hotel of more than 4200 items of contemporary art. For more information visit: www.ritzcarlton.com/hotels/singapore.



Bathroom with a view: The guests have a fantastic view of downtown Singapore, directly from the bathtub.

Luxuriating in 200 square meters

Right in the middle, surrounded by an almost three-hectare tropical garden, towers the 32-story high Ritz-Carlton Hotel, Millenia Singapore. As a member of the highly regarded Ritz-Carlton Hotel chain with more than 50 additional luxury hotels worldwide, it can provide any amenity to private and business travelers: rooms that range in size from 50 m² for the deluxe rooms to 200 m² for the Ritz-Carlton Suites with Jacuzzi and butler. However, luxury and comfort alone no longer suffice to satisfy, in particular the large number of business people, who require quick and powerful communications possibilities for the constant contact with their companies and business partners.

High bandwidth in every room

In addition to private applications such as video streaming, music downloads and satellite or cable TV, IP telephony, multimedia conferences, broadband Internet and E-mail traffic with large file attachments must be possible. High bandwidth, which can only be implemented with the latest transmission and network

technology is required. The products of choice for R&M and its local partner “Wire&Wireless”, therefore, were Cat. 6 with UTP cables (unshielded twisted pair) for the outlets and R&M 50/125 µm fiber optic as backbone. The hotel management could be won over for this solution – in spite of fierce competition.

Special customers – special requirements

Initially, a new network was to be installed only in the offices of the hotel management. Convinced of the high-quality R&M cabling system and the professional installation by Wire&Wireless, the second phase was started in November 2004: installation in more than 600 rooms and suites.

However, a customer named Ritz-Carlton also presents special challenges. For example, during the planning phase, the request was made to configure the RJ45 outlets to be compatible with the existing electrical connections: as a single port and with a gold-colored front, of course, all this without compromising the quality. The biggest challenge for the R&M team



Orderly cabinet: IT server room ① prior to and after the installation, as well as the floor distributor ②.



Outlets on the switch ① and in the reception lobby ②.



The golden-colored RJ45 outlets had to be compatible with the existing terminals ①. The guests connected via an R&M patch cord ②.



Structure of concrete: The Ritz-Carlton with its 32 stories, rises up to the sky like a monolith.

was the request to install the 100 km cable and 1200 outlets while the hotel was in full operation. In other words, without disturbing the sophisticated clientele. This was only possible in that individual floors were totally blocked off in sections. Thus, the guests were not at all confronted with the installation work.

Convincing performance

In spite of the special circumstances of an extremely short time frame, this phase too, was completed on time and to the complete satisfaction of the Ritz-Carlton Management. They did not hesitate very long before they announced the third phase. In addition to the administration offices and the employee workspaces, the lobby and other hotel areas were to be converted to the new Cat. 6 cabling.

R&M – always on the go

During his visit at the Ritz-Carlton, Millenia Singapore, the CEO, Martin Reichle, once more confirmed how R&M, thanks to its market-oriented products, is in a position to respond quickly and competently and to meet customers' needs. After he could not find the newly installed



Ritz-Carlton System Manager Chew Hanwei; Wire&Wireless Project Manager Nick Lee.

R&M RJ45 connection cable in his room, he recommended the installation of the "Plug Guard" to reduce losses and to secure the connection cables. Not long after this incident, all outlets in the Ritz-Carlton were equipped with the Plug Guard.

The Ritz-Carlton, Millenia Singapore selected the following R&M Products:

- Cat. 6 UTP copper cabling, 100 km, for horizontal configuration
- 50/125-µm fiber optic cables for backbone cabling
- 1200 customer-specific RJ45 outlets
- Plug Guard, a product from the R&M security system product line

get **more**

for the Ritz-Carlton

- Continuous broadband supply
- Installation during running operation
- Reliability under big time pressure
- Individual adaptations
- Security for patch cables

Performance Counts: Zhejiang Military Hospital

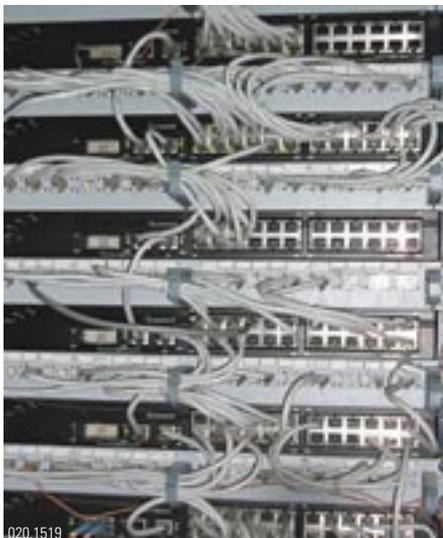
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China is experiencing an economic boom like no other country in the world. Accordingly, the need for powerful and reliable communications technology is great. R&M was able to demonstrate its capability with a complete R&Mfreenet solution in the Zhejiang Military Hospital.

The Zhejiang province lies on China's East Coast south of Shanghai. The province is known for its high-quality silk products and the much praised Longjing green tea – but more particularly for West Lake, a picturesque lake in the middle of the provincial capital, Hangzhou.

The provincial military hospital with its eleven general clinics, six specialty clinics and more than 500 patient beds is considered extremely modern and progressive. To expand its capacities, an annex was planned, which provides more than 26,000 square meters of additional space for medical services on six floors.



R&M Cat. 5e patch panel with switches from local manufacturers



020.1518

020.1520

Military Hospital of the Zhejiang province.

Small picture: Project participants (from left): Gavin Chew (Regional Manager, R&M Far East), Chen Jie (Assistant to the "Chief of Capital Construction", lieutenant in the Chinese Army), Pan Min Lian (Engineer, Hang Zhou DevoTecom), Zhu Gang (Project Manager, Hang Zhou DevoTecom).

R&Mfreenet in action

With Cat. 5e, R&M could offer a solution for the entire cabling system from one source for this project. As backbone and for the connection of the annex to the existing building, two kilometers of multimode fiber optic cables were run. Unshielded twisted pair cables provide 1100 ports with data, video and speech. Distribution rooms on the 1st and 5th floor make network connections available for the entire building.

Top products and competent support

The combination of powerful components and professional installation made the total success possible. Chen Jie, a Member of the Military and Assistant to the Chief of Capital Construction was not only expressing his thanks for the timely completion of the project but also praised the competent technical support from R&M and the system partner Hang Zhou DevoTecom. In particular the modular design of the R&Mfreenet system had facilitated the easy and flexible expansion.

Pan Kin Liang, Technical Engineer at Hang Zhou DevoTecom was particularly convinced by the easy and efficient installation and the outstanding performance of the outlet modules. The extremely good measurement results, after cabling had been completed, proved his expectation and confirmed the 100% performance capability of the network. Zhu Gang, Project Manager at Hang Zhou DevoTecom joined the consistently positive findings and will highly recommend R&M to his customers.

R&M solutions in the Zhejiang Military Hospital:

- R&Mfreenet
- 1100 ports, Cat. 5e, unshielded twisted pair cables
- 2 km multimode fiber optic cables, 6 fibers
- 700 VS Standard 2-pair modules

get more

for Zhejiang Military Hospital

- Modularity simplifies expansion
- Convenient installation technology
- Quality with high performance reserves
- Easy maintenance without the need for special tools



Swiss Quality from Germany to China

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010.3328



020.1494

Bosch opens new development and manufacturing site in China (Photo: Bosch).

R&M is never far away from where R&M customers are building. In this spirit, the Shanghai subsidiary supports the Bosch group with its projects in the Far East. Chinese companies of the Bosch group equipped some of their new development and manufacturing sites with cabling "made in Switzerland". Trust, ability to deliver, quality and environmental concerns, were crucial points in selecting the R&M solutions.

The Bosch group clearly wants to expand their commitment in China. This was announced in November 2005 on the occasion of the opening of a new development and manufacturing site in Wuxi. The China plans are a significant part of Bosch's overall Asia/Pacific strategy. Wuxi plays a pivotal role for the future of environmentally sound Diesel vehicles.

Bosch is establishing the development and production of modern common rail Diesel systems for Chinese motor vehicle manufacturers on the approximately 300,000 square meter Wuxi site, approximately 200 kilometers west of Shanghai. The project is the result of a joint venture with the Chinese Wuxi Weifu group.

As a multinational company accepting co-responsibility for a healthy future for people and nature, Bosch raises the bar

for all products regarding quality, reliability, future reliability and environmental soundness. Therefore, Bosch demands high standards for the plant equipment. The selection process was appropriately rigorous – R&M passed the test.

Tested supplier relationship – a well-oiled team

Based on the supplier relationship test at the group's home base in Germany, the decision was made to use R&M fiber optic and copper cabling in Wuxi. The entire campus, building and office cabling is based on R&M solutions. At the same time, the new computer center at the Suzhou Bosch site and three additional plants were equipped with R&M cabling and security solutions.

The confidence in R&M played an important role, since in the booming Chinese market it is essential to collaborate closely to implement such major projects in the shortest of time. A well-oiled team, reacting quickly and consistently with focus on the customer, was able to respond optimally to the requirements of the customer, from Europe to the Far East.



020.1495

Handshake between Bosch and R&M (from left):
H. Andreas Buse (Bosch IT Coordinator), H. Christian
Treitel (Department Manager of Bosch IT Coordination),
H. Andreas Mürdter (R&M Germany), H.P. Bouvard
(R&M China).



020.1524

75 years of Diesel injection systems from Bosch (Photo: Bosch).

Almost 500 km of cable for Wuxi

Bosch selected R&M fiber optic and copper solutions for the networking of the new Chinese Wuxi production site:

- 500 km Cat. OS1 fiber optic cable for backbone
- 330 km Cat. 7 cable
- 12000 shielded Cat. 6 ports
- R&M security system
- IP67 industrial solution
- 85 voice panels

get more

for Bosch

- Global customer management
- Ability to deliver
- Custom-designed solutions
- High product quality



New Illuminated Structure in Downtown Warsaw

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A modern downtown is appearing in Warsaw, where renowned architects distinguish themselves with contemporary skyscrapers. Rondo1, a filigree, vitreous illuminated structure, stands out from the cluster of new buildings. The office and business complex that just opened, is setting an international benchmark with its exclusivity and flexible possibilities of use. R&M's data and power cabling contributes to this factor.

Rondo1. The name stands for light and the future at a prestigious site in downtown Warsaw. This office building rises 194 meters up to the sky and is completely encased in glass. The transparent facade illuminates the night and is an imposing symbol of the new identity of Warsaw as a financial center and business and competence center for Eastern Europe.

Piotr Olbry, Managing Director of the Hochtief Project Development Polska said on the occasion of the roofing ceremony in June of 2005: "Rondo1 will soon be compared with buildings such as the John Hancock Center and Sears Tower in Chicago or the Jin Mao in Shanghai". The Polish company of Hochtief Development Group is responsible for the 200 million Euro project. It was developed by



020.1488
The modern Warsaw skyline

the Architectural firm AZO in Warsaw together with the high-rise building specialists from the architectural firm, Skidmore, Owings & Merrill in Chicago.

Maximum comfort – greatest flexibility

In the 40-story office building, Rondo1 provides maximum comfort based on international standards. "It is a building of the AAA class", explained Piotr Stark, Marketing Director of the developer Hochtief Project Development Polska. Not only is Rondo1 one of the safest buildings in Poland but also one with the most progressive user technology

– among the notable tenants is the consultant firm Ernst & Young, which moved into 10 floors with 1,000 employees.

The building is fully climate controlled including a humidity regulator. The waiting time for elevators is maximum 30 seconds. There is a central server room. External data back up. Telecommunications connections of various providers. SDH and xDSL transmission systems. Satellite connection. Node for large data transmission networks in the building. These are just a few of Rondo1's special features.

The tenants can freely arrange their space on the office floors. They can arrange walls, functions and workstations in the entire space as they wish. They can install their own switchboards and select the cabling system for their space. The cabling system featuring the R&M freenet system and the Extended Office Cabling (EOC) program from R&M support this flexibility from the server room to the individual workstation.

The basic data, communications and power cabling structure as well as the easy handling of the cable outlets facilitate changing or relocating connections – an advantage appreciated by the sophisticated tenants. They are spared to hire contractors for installation work or to purchase new cabling material when changes in work organization or room structures are necessary. Outlets for

Rondo1 Facts & Figures

The Rondo1 complex with a total area of 103,000 square meters is located at the corner of Jana-Pawla-II Allee and the Swietokrzyska-Strasse close to the cultural palace in the center of Warsaw. Rondo1 consists of two buildings – a 40-story high-rise with approximately 58,000 square meters of office space and a ten-story building with 3,700 square meters of trading and service space. Each office floor provides 1400 to 1500 square meters of floor space. The two properties are connected with a 14 meter high winter garden. Several four-story high atriums, glass facade and north-south orientation, give the building its light-flooded character. An upside down glass cone forms the main entrance. The elevators run in three exterior towers. There are 500 parking spaces in the building as well as a conference center with rooms for 250 people and a dental clinic. More than 6000 people will be working in Rondo1 in the future.



020.1490

An architectural masterpiece of international stature: Rondo1.

R&M solutions in the Rondo1 project:

- LAN and telecommunications cabling with R&Mfreenet and VS Standard
- Server room cabling
- Structured cabling for tenants (fiber optic and copper infrastructure)
- Extended Office Cabling solutions for tenants (power supply)

get more for Hochtief

- Data and power cabling from one source
- Less planning work
- Easy, quick, faultless installation
- Flexible adaptation to tenant requirements
- Low operating expenditures
- Quality, reliability and service life



computer, telephone and power connections can be arranged near the desks – regardless where they sit.

Cabling from one source

After a rigorous selection process, the investor Hochtief and the planning office in charge, in the end, selected the R&M solutions – so did the first tenants. The price-performance ratio was crucial as were quality, reliability and trust. Another determining factor was that Reichle & De-Massari Polska Sp. zo.o was able to provide the data and power cabling from one source, at the requested security and convenience level.

The Extended Office Cabling program (EOC) was adapted to the security requirements and specifically certified. It allowed a quick external installation without any planning work. This too was a determining factor for the award of so far the largest EOC project. The cabling was

implemented with noticeably fewer coordination meetings than are usual for such projects. The R&M certified installation company, TELIN, provided qualified work in the double floors and ceilings. Touch ups were entirely unnecessary.

Integrated Cabling in the Stade de Suisse

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Wankdorf. The name has written soccer history. The old Bern stadium has lived through dramas and has shaped legends. In July 2005, a new multifunctional stadium opened on the same site – again with a “sacred” turf, but also with a business and shopping center as well as cultural venues. This stadium writes its own history based on featuring technical masterpieces, including R&M cabling solutions.

The Stade de Suisse has already experienced its first major challenges. The Young Boys Bern scored their first victories on the well-maintained turf. The FC Thun made its debut in the Champions League and the Swiss National Team conquered a place in the 2006 World Soccer Championships. The excitement of 32,000 fans rises when the soccer stars score. Rock and Pop stars, such as Bon Jovi and Robbi Williams will honor the arena with their presence in the summer of 2006. At the latest, the new national stadium, Stade de Suisse, will prove itself as the most modern soccer field in Switzerland and the largest multifunctional arena in the country during the European Soccer Championships in June of 2008.

Impressive stadium technology of the highest level

A significant part goes to the technical infrastructure – including the world’s largest stadium-integrated solar power station on the roof, a lawn heating system with regenerative heat recovery and a convenient communications and information infrastructure. A stadium with such dynamic use demands the best of the networked information flow. The entire communication must be controlled from one computer. Video cameras, security and monitoring systems, display boards and monitors, conference rooms, offices, VIP lounges, server rooms and media rooms for advertising, press and TV transmission require flexible convenient and secure connections to high-speed data transmission and power supply.

R&M supports these key functions with its overall solution for data and communications network and power cabling. Components from the R&Mfreenet system program as well as the Extended Office Cabling program (EOC) were requested for the stadium. Roland Beeler, R&M Product Manager explained: “With this approach we are performing a balancing act between structured data cabling and mains supply”.

A partner for both cabling worlds

The big advantage for contractors and project partners: in the technology partner, R&M, they had found a single competent contact for both cabling worlds. A partner, who was able to implement a custom-made solution and synergy effects. The project managers were impressed with the short communication channels at R&M, the quality of the products, service and ability to deliver as well as the price-performance ratio. The entire planning, public tender, order procedure and installation, based on the R&M integration concept, was processed more easily and more quickly than is usual in construction projects of this size. Once

more, it was demonstrated that a coordinated interplay of data and power cabling has significant effects on the overall project. Thus, the Stade de Suisse has already written a piece of history about modern technology.

The contractors were also confident about the innovative quick installation of cable outlets from the EOC program. The participants confirmed that it was a surprisingly simple and quick installation process. In addition, pre-assembled connection and combi boxes, cable supports and mounting technology from the EOC program were used for the installation in the Stade de Suisse.

Cat. 6 and Cat. 7 cabling from the R&Mfreenet system program were implemented in substantial areas of the data and communications infrastructure. A convenient solution for high transmission rates is thus available. Additional components included connection modules and rack installations as well as security solutions for offices, which prevent accidental plug-out of equipment connection cables.

Quick installation for mains cabling

Easy and quick – that’s what is expected of cabling. R&M introduced quick installation with the RCO power adapters for mains cabling. Adapters for power connections are wired in a few steps and without additional tools anywhere onto the uninterrupted standard round cables. Upon connection, a piece of the cable jacket is removed. Subsequently, the installer inserts the conductors in the color-coded guides of the adapter. Upon pressing shut the wiring cover, the contacts cut through the insulation of the conductors and establish the contact. This insulation displacement contact technology provides a faultless, secure and durable contact. Pre-assembled connection cables are simply plugged into the adapters and connected to the powered equipment – outlets, lamps, etc. This type of installation eliminates many connection and distribution outlets, terminals and incidentals and is extremely reliable.



020.1491

Stade de Suisse – A multifunctional stadium including a business and shopping center as well as cultural venues.

For power as well as data cabling, the Consolidation Point concept (CP concept) was consistently applied: it integrates product policies and resource management, and economically configures the processes for planning, purchasing, production and installation and finally commissioning.

As is so often the case in such complex projects, success is the result of an excellent collaboration with our R&Mfreenet partners.

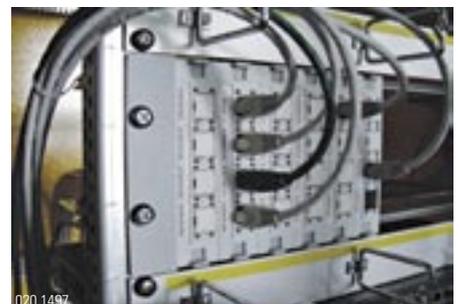
R&M solutions in the Stade de Suisse:

- Data cabling with R&Mfreenet (Cat. 6 and Cat. 7 cables, patch panels)
- Power cabling with Extended Office Cabling (RCO 5-pole connection boxes)



020.1496

The ready-to-plug-in connection box is connected to the energy bus cable outlet.



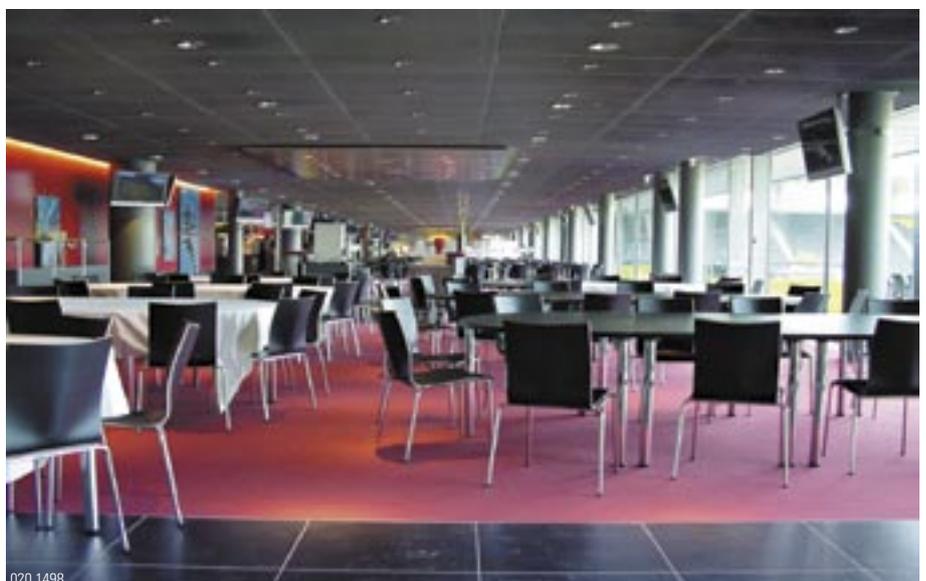
020.1497

Global rack in use for the multifunctional building cabling.

get more

for Stade de Suisse

- Integrated cabling solutions from one source
- Innovative, easy installation process
- Less planning and communication effort
- Cost savings through time gain and resource protection



020.1498

VIP lounge – a special ambiance.

Partner in the Land of Pyramids

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The Egyptian enterprise, EL Fanniea Plastic Co., a licensed R&M partner, achieved extraordinary success in the telecommunications market.

El Fanniea Plastic was founded in 1965 and quickly expanded as a plastics manufacturer. Before long the company positioned itself as a supplier for the telecommunications industry. For approximately 20 years, the company's core competence has been the switching technology in the telecommunications market. The company is among the leading suppliers in its market segment in Egypt.

Quality and innovation

The El Fanniea Plastic Company is active worldwide and thus can benefit from any opportunity that opens up in the telecommunications sector through increasing global requirements. The strongest incentives for the growth of the company are quality and innovation. El Fanniea, a licensed R&M partner for the production of network products, can rely on a dependable partner. The cooperation between R&M and El Fanniea was established in 2002 and is proceeding to the satisfaction of both partners. A successful business relationship was in particular developed through the national Egyptian telecom company. This is one of the most important customers for R&M products of El Fanniea Plastic Co. The Egyptian telephone company, which has been in business for 150 years, generated sales of 3.8 billion Egyptian pounds (CHF 866 million/EUR 563 million) in 2004. The company uses R&M products particularly because of their quality and easy handling.



020.1515

Partner handshake.



020.1514

El Fanniea outdoor box with VS Compact module from R&M and wiring tool.

Partnership and success

The R&M product range of El Fanniea includes telecommunications connections for outside and inside of buildings and is divided into three product groups:

- The MDF (Main Distribution Frame) product line for distributors in the trunk sector, free-standing and wall mounted
- Distributors for outside plant distribution cabinets, drop-wire system, cable terminal boxes
- User products: Building distributor, flexible busbars, LAN distributors, telephone outlets

El Fanniea Plastic, in partnership with R&M, was in a position to successfully establish the VS Compact as a connection module of high quality and conductivity in the Egyptian telecommunications market. Thanks to the advantage of being constantly supplied with the latest solutions from Wetzikon, El Fanniea was also able to increase sales on the international markets. All in all, El Fanniea was able to establish itself as a first-class solution provider and to secure a stronger market position thanks to the partnership with R&M.

Multimedia Apartments for the Digital-Savvy Swedish family

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A leading Scandinavian builder turned to R&M to create truly multimedia-ready apartments in a new development in Stockholm

"Apotekaren" is a tranquil and stylish development of apartments in Nynäshamn, just outside the Swedish capital Stockholm. It may look like any other modern block of family dwellings, but the site is setting new standards in creating broadband-enabled digital homes for the future. Currently, the second phase of Apotekaren is nearing completion by NCC, one of Scandinavia's leading construction companies.

The use of Reichle & de Massari multimedia outlets and technology has helped NCC create digital homes which raise eyebrows, even among the already very networking-savvy Swedes.

While many homes around the world have already telephone, television and Internet feed, not many will have as elegant and stylish a solution as Apotekaren: child-safe, color-coded wall outlets integrate neatly into the modern design of the apartments, revealing how everyday ease of use was an integral element of the design phase. Even from the installation point of view, it is well designed with a thoroughly thought-out design of cable ducts and of individual patch panels in each flat.

While the inhabitants will enjoy the everyday use, the developer enjoyed the ease and reliability of R&M's products during the construction.

"It is a key parameter for NCC to implement solutions that are reliable and cost-efficient to work with during construction, thereby helping to achieve an altogether successful project. We have been very pleased with the R&M cabling and outlet solution which we received exactly as specified, and with impressive years-long warranties," stated Mattias Jönsson, who is the NCC project manager for the Nynäshamn site.



010.2954
R&M multimedia outlet – an outlet for the future.

From the perspective of the developer, the R&M cabling solution used in Nynäshamn, is truly ground-breaking. The wall outlets contain plugs for all kinds of terminals and the cabling system contains ducts for all types of cables whether unshielded twisted pair, coax or fibre.

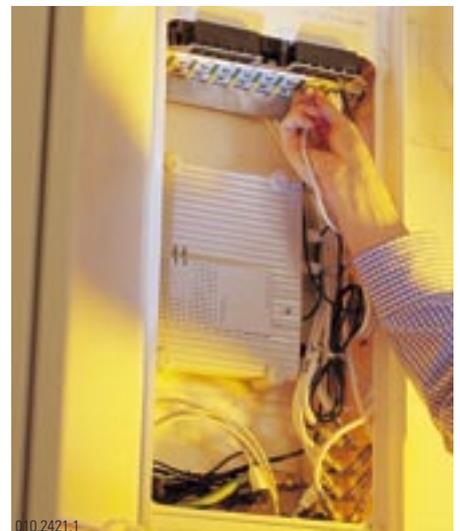
Until recently, NCC would need to manage three different installation projects to ensure access to all types of multimedia traffic in each dwelling. With the R&M solution, only one installation phase was needed saving valuable time and minimizing risk of errors or malfunction.

From the perspective of the family taking occupancy of the new homes, the multimedia system is equally attractive. All rooms - even corridors and the kitchen - have at least one multimedia wall outlet, and each plug is color coded to enhance ease of use (red is data, green is telephony). The color coding is even child-safe; a child cannot detach it and swallow it!

Additionally, in each apartment a neat patch panel makes it simple and straightforward for the tenant to reroute connections to the wall outlets.

Reichle & de Massari's Swedish operation worked closely with NCC to satisfy the specifications, and as part of the project all installers were trained and certified by R&M prior to taking up work.

The digital future is almost a reality in Nynäshamn - the cabling and the wall outlets are ready for the multimedia family to plug in and enjoy!



010.2421-1
For clearly arranged installations: the central communication distributor

get more

for NCC

- Reliability
- Complete solution
- R&M warranty program
- Color coded outlets for child safety
- R&M certification
- Future reliable



How "Culture" got connected in Arendal

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A new office and cultural center in Norway was fitted with 1,300 wall outlets – and not a single error.

Arendal in southern Norway is a cozy mid-sized Norwegian town of 40,000 souls, about a 3-hour drive south of Oslo, the Norwegian capital. The city center oozes with charm, its low-built wooden houses create a calm and peaceful atmosphere. Yet this is also a very modern, hi-tech town, and nothing proves this better than its new town hall and culture center – Arendal Kulturhus.

Inaugurated in 2004, the stylish glass-fronted Kulturhus boasts an impressive IT networking installation, future-proof and high-quality.

When Arendal built its new Kulturhus, the project also gave the local municipality much needed new office-space, and in total the project encompassed a data



020.1527
The stylish glass-fronted Kulturhus.

network with more than 1,300 wall and ceiling outlets, making this one of the largest IT installations in Arendal.

The new office space boasts bright open-space floors, with many of the networking outlets placed in the ceilings. This in turn makes for a very flexible office use, allowing the staff of the various administrative units to literally move their workspaces around in a matter of minutes, plugging into outlets almost as they please.

IT manager Øyvind Haugmoen said: "We aim to create a flexible and efficient office environment, and having many network outlets is a good way of achieving this."

In addition to the reliability ensured by the high-quality outlets and plugs used, the integrated security features of the R&M plugs also mean that there is no security risk with many easily accessible network outlets. R&M Plug Guard ensures that no one can tap into the network by us-



020.1526
The fascinating auditorium.



090.2010
Cat. 6 UTP solution by R&M.

ing a vacant outlet. Additionally the use of R&M Safe Clip plugs on connected workstations further ensures that no one is able to make any unauthorized physical changes to connections.

The entire networking solution in Arendal takes up more than 53 kilometers of category 6 UTP cable, all installed by local Reichle & de Massari systems integrator Nedig AS, along with patch and voice panels, patch cables, plug guards, clips, compact boxes and fibre panels. The use

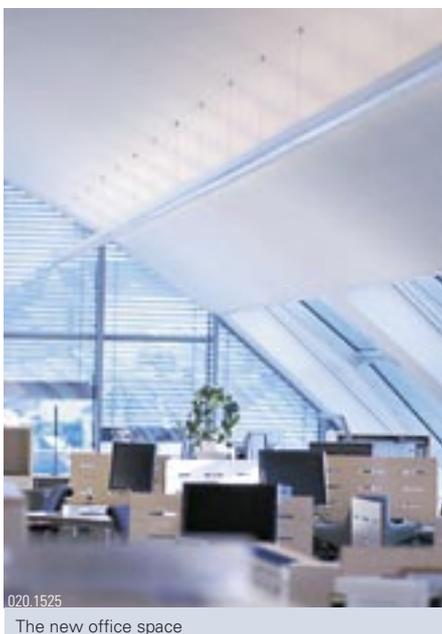
of R&M equipment for the network has proven its worth in terms of reliability of the completed solution.

Working closely with the builder, Nedig AS saved valuable floorspace by cabling the entire network to only one single patch room as opposed to the originally planned patch rooms on each floor of the new building. This frees up valuable floorspace and makes life easier for the IT staff managing the network.

Nedig AS gained a direct benefit from using R&M hardware when cabling Arendal

Kulturhus: all of 1,300 wall and ceiling outlets were installed without a single error to the final network. All 1,300 outlets were fitted and connected in less than a week by only one worker.

“No doubt he was a very diligent technician who did things the right way – however it is still impressive that we had as few errors in the final network as we did. In my view this is proof of the quality and reliability of the components used. The installation went exceptionally smoothly and the operation of the network since inception has been flawless”, said Aage Tengs, manager at Nedig AS.



020.1525
The new office space

Installed products

- 1300 wall and ceiling outlets fitted and connected by one person in one week – and no errors
- Cat 6 UTP solution:
 - 1300 wall outlets
 - 53 km cable
- Global patch panel
- Voice panel
- Patch cables
- CP-cable
- Plug guard
- Safe clip
- Compact box
- Fiber panel

get more

for Arendal

- Reliability
- Speed of installation
- Complete solution



An Excellent Formula for a Regional Network



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Take: a lot of room, sturdy fiber optic bundles, a clever corporate strategy combined with a large portion of customer orientation and a highly efficient installation concept, which brings everything to fruition. The formula for success could be rewritten exactly in this way for osnatel, a regional carrier that is becoming increasingly faster, more flexible and powerful. The R&M Fiber Optic Management System is part of the optimally balanced formula for the future.

osnatel GmbH is pushing ahead with the development of their regional network including a powerful exchange in Georgsmarienhütte and the reinforcing of the node at the corporate site in Osnabrück. The new hub in Georgsmarienhütte has a great future. On several hundred square meters, there is room for the company's own distributors, internal and external gateways as well as for server housing and carrier hotel services.

A regional network that grew rapidly
Thorsten Meyer, team manager of osnatel transmission technology explained: "The basis for the large project was our need for a second exchange facility to support the regional network, which has grown rapidly in the past five years". In addition, osnatel wanted to be able to respond more flexibly to customer requirements and specifications from its own network operation. Space limits were reached in the Osnabrück corporate center. Action was needed. The energy supplier, EWE AG, majority shareholder of the osnatel GmbH, was able to provide a favorable infrastructure with the construction of the exchange in Georgsmarienhütte – ten kilometers south of Osnabrück.

With the new construction, the opportunity arose to implement an infrastructure design that was well thought out from the beginning. The fiber optic distributor acting as the central point is starlike connected via two fiber optic cables to every system and creates a quick connection between switching, information and network technology. Depending on need,



020.1539

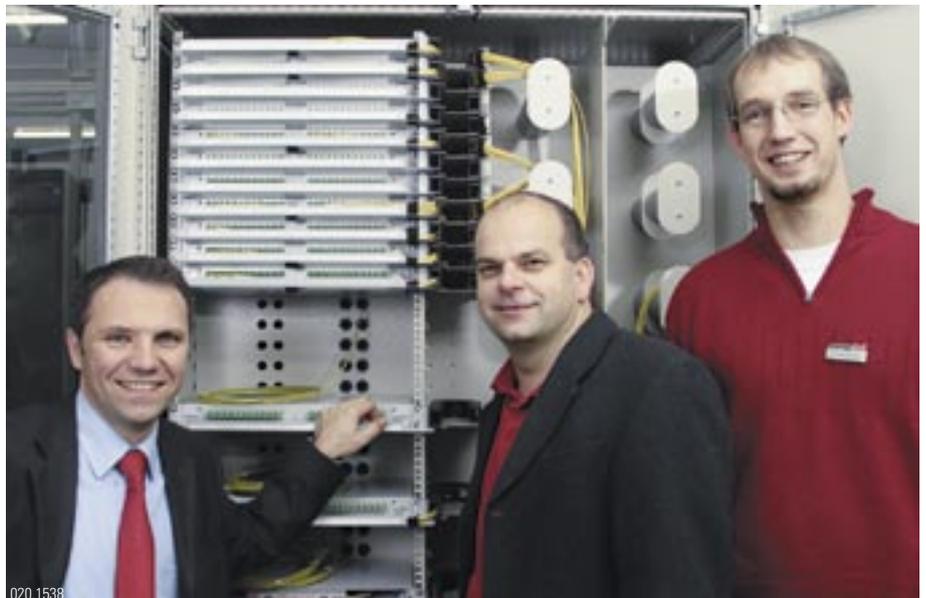
R&M FOM distributor with Uniracks including drag chain guide and double overlength management.

patch panels can rapidly be installed in the appropriate cabinet positions without extensive cabling work. This creates planning security and great flexibility without major pre-investments. For carrier connections or rapid exchange system expansions, the connection takes place via one-side assembled breakout cables with a 25 m unit length, which, depending on the application, are coupled and directly spliced open in the FOM distri-

butor. Thorsten Meyer said: "Thanks to this supply concept, we were able to shorten our response time from three to four weeks to a maximum of one week". Another example of efficient formulas à la osnatel: there are only uniform patch cable lengths. This simplifies storage and provides uniform processes. R&M E-2000™ APC 8 connectors are used as the standard.

25 local exchange networks and 614-kilometer of regional fiber optic network

osnatel GmbH has become one of the strongest network operators in the Osnabrück region. Attractive services for private customers, such as free telephone calls within all the local networks of the direct connection area resulted in this success. The catchment area in the German federal states of Lower Saxony and North Rhine Westfalia has approximately 1 million people and is characterized by a versatile industry. The subsidiary of the energy supplier, EWE AG, and the Stadtwerke Osnabrück AG has developed 25 local exchange networks for their telephone, Internet, data and system services since the year 2000. osnatel has a 614 kilometer long fiber optic interconnection network and more than 400 km of a subscriber network with copper twisted pair. SDH and GbE technologies (up to 10 Gbit/s) are used in the backbone network.



020.1538

osnatel and R&M are ready for new action: Andreas Wenzl (R&M, left) Thorsten Meyer (osnatel Transmission Technology Team Manager, center) and Jürgen Alberti (osnatel Network Planning, right).

Efficiency with the Fiber Optic Management System

The R&M Fiber Optic Management System (FOM) plays a pivotal role in the new exchange with its cabinets specifically adapted to the needs of osnatel. The feeding of the loose tubes from the double floor to the individual UniRacks occurs separately. Robust flexible tubes guide the cable well protected through the cabinet.

Well organized patch panels in easy-to-handle sliding tray technique allow osnatel technicians to work very quickly and in an uncomplicated and efficient manner while protecting the fiber. The patch cable guide via drag chains, alternations, strain relief and the chamber with the cable reserve are all designed for maximum protection of the cables and for easy handling. Brackets already exist for transferring cables into the next cabinets for subsequent development.

osnatel reinforced the existing node at the corporate site in Osnabrück at the same time as the distribution center in Georgsmarienhütte was being built. The network, which had grown rapidly, needed to be supported with additional fiber optic distribution systems in order

to meet the market requirements. R&M supplied compact FOM cabinets with a small installation depth, which seamlessly blend into the expanded infrastructure in particularly tight and windy conditions in the basement of the main building. Thorsten Meyer summed up the situation: "We need these surfaces and distribution technologies to be able to respond quickly and flexibly, to fulfill new requirements and provide new services. Long-term, we are ready for any situation with our fiber optic infrastructure". The R&M FOM system clearly contributes to the improved efficiency. The vision of a Next Generation Network is noticeably in his mind.



020.1507

osnatel believes in the high R&M quality.

E-2000™ manufactured under license by Diamond SA, Losone.

FOM: easy handling, complete network availability

A new era of efficient network management started at osnatel with the installation of R&M Fiber Optic Management Systems (FOM). Now, 25 local exchange networks, many sub-distributors and small distributors as well as connections of major customers can now be more reliably and flexibly supplied than ever. The adaptable, modular FOM cabinets with the UniRacks mounted with the sliding tray technique, facilitate and accelerate splicing, patching and service work in high-speed distribution networks. R&M planned many features, which prevent a mechanical effect on the vulnerable cables. Installers have the easily accessible fiber storage and fiber guide under control so that convenient handling, increased security and thus, complete network availability are guaranteed.

get more

for osnatel

- Efficient Fiber Optic Management
- Improved response time
- Adaptable cabinet solution
- Excellent price-performance ratio



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E-Media Manager
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Living in the future – this is not an experiment but technology that functions today. The Steiners have made this a reality in the residential project, Futurelife, in Hünenberg. They now live even more comfortably with the R&M home wiring system. All networks in the home can be managed with Plug & Play and can be optionally adapted at any time.

R&M, a Gold Sponsor of the occupied home of the future, had a new backbone installed for all relevant network requirements: the home wiring system (HWS). The Steiners became network managers in their own right. Previously, screwdrivers, incidentals and extension cables were needed to change cabling, now everything works directly with Plug & Play.

If a PC, video beamer and DVD recorder is relocated or these devices are networked with each other, only a few cables have to be re-plugged or plugged-in in the central house communications distributor and the devices have to be plugged-in into the multimedia outlet nearby – networking is complete. Connections for telephone, broadband Internet, music transfer, home



020.1483

Everything is networked in the residential project, Futurelife, even the kitchen is online. On the right in the picture, there is a control center with a touch panel. On the left: The “intelligent refrigerator” is arguably a myth, however, the new appliance series from V-Zug allows downloading of recipes and cooking programs from the Internet.

equipment, control and security technology can be easily adapted to the present needs and situations in the home. The basis is always the combination of communications distributors in the electricity room, powerful star cabling with shielded copper cables and POF on well situated multimedia outlets in all rooms.

Freedom in the home network

The home wiring system, which meanwhile is used as the standard in countless residential communities, provides maximum freedom to the user in configuring his home network with proven, standardized connector systems available any-

where today. Any telecommunications, computer, consumer and electronic entertainment devices can immediately be networked.

Communications distributor – a cabinet for everything – regardless of size

The communications distributor networks the multimedia outlet with central components, such as modem, antenna, receiver, router, hub and with the house connections of telephone and cable providers. The distribution cabinet accommodates the active devices and contains patch panels for coaxial and twisted pair

Futurelife – the occupied home of the future

The non-profit Futurelife project in Hünenberg, which was started approximately five years ago, has turned into a unique hub for the latest developments and experiences in intelligent living. Futurelife is known all over Europe and recognized as a leading project in representing of how our life could play out in a modern environment. The project is considered the best example for networked living and the handling of future technologies.

The occupant, Daniel Steiner, emphasizes: “Unique experiences with technology are resulting from our occupied home of the future, which will shape future product developments. In addition, we have jumped ahead in flexibility and compatibility with the innovative R&M solutions.”

Within the scope of visits for specialists and the public, Ursi and Daniel Steiner demonstrate how they can configure in a few steps house internal networks or integrate a new device into the multimedia infrastructure. They accept requests for house visits via E-mail at the following address: hausbesuch@futurelife.ch.

get more

for Futurelife Hünenberg

- Flexible home network
- Universal compatibility
- Structured solution for the home
- Added real estate value





020.1482

All connections on the table: Deskboxes (behind the laptop in the picture) facilitate quick plugging-in and changing of computers in the home workplace.

cabling. Upon request it is also available for fiber optic or Plastic Optical Fiber cabling (POF), which in fact are used in the Futurelife house with the RCC45 connector system.

The RCC45⁽²⁾ is an all-round connector – a hybrid connector based on the RJ45 standard, which additionally accommodates Plastic Optical Fiber (POF) and power cables. Using RCC45⁽²⁾ and POF simultaneously with classical copper cabling allows the configuration of a viable FO broadband infrastructure in the entire house. RCC45⁽²⁾ with power allows multimedia devices in the living area or the transmission of audio signals to be supplied with power without cable spaghetti. The many bothersome power supply units can be hidden in the communications distributor and loudspeaker cables become an integrated part of home wiring.

Deskbox – makes bending over a thing of the past

In addition to the home wiring system, the CATV panel from R&M is used in the Futurelife home. It transmits cable television signals to conventional communication networks (Cat.5e or Cat. 6 copper cabling with RJ45 connector systems). Additional installation of coaxial cables is not necessary in many areas.

The new dabs of color on the tables of the Steiners are from the R&M Extended Office Cabling program. These are designer deskboxes, which make available power and data connections in a compact and protected way close to the user – for

example PC or laptop. The advantage of deskboxes: it is no longer necessary to kneel on the floor and crawl to the wall outlet to plug-in connections or plug-out connectors. All jacks are on the table. The feed cables are well protected in a flexible wire duct.

Connections for a digital lifestyle

With R&M's commitment to the "Futurelife" project, present and future connecting technologies should be integrated even more consistently together with partner companies participating in the project from the sectors of home entertainment, appliances, building equipment and building technology, to do justice to "intelligent living". Digital lifestyle for "today and in the future".



020.1480

Modern cabling and energy systems facilitate access to data, media and PC networks and form the backbone for the home network in the Futurelife residential project. The individual multimedia outlets are made accessible via a floor conduit system. Left: The multimedia outlet with RJ45 connections as well as coax for TV, radio and xDSL. Center and right: Multimedia outlet with RCC45⁽²⁾ in combination with power and Plastic Optical Fiber.



020.1481

In the central communications distributor – which is here, project specific, somewhat larger, are the patch panels for the individual "services". RCC45⁽²⁾ with Power and POF, coax, CATV panel, power panel as well as the house connections with fiber optics.



020.1484

At first sight everything seems normal: A community with twin houses in Hünenberg (ZG). At number 77, a solar operated lawn mower tends the lawn and everywhere there are high-tech installations. What's happening here? The answer to the puzzle is, Futurelife!

POF is Ready for Prime Time!

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Triple Play is the magic word that network operators use to keep or win back their customers: Telephone, broadband Internet and digital TV come into the house via one and the same connection, mostly into the basement. How are the services brought to where they are really needed? A single – and unique – medium is enough: Polymer Optical Fiber, in short POF. R&M offers a system solution for this application for the first time.

To be precise, there are two trends, which mutually reinforce each other. Today, most households no longer have only one PC, but instead there are several PCs and multimedia devices, such as TV, Hi-Fi systems, radio, VCR, DVD player, monitoring camera, etc., which leads to the strong desire to network the devices

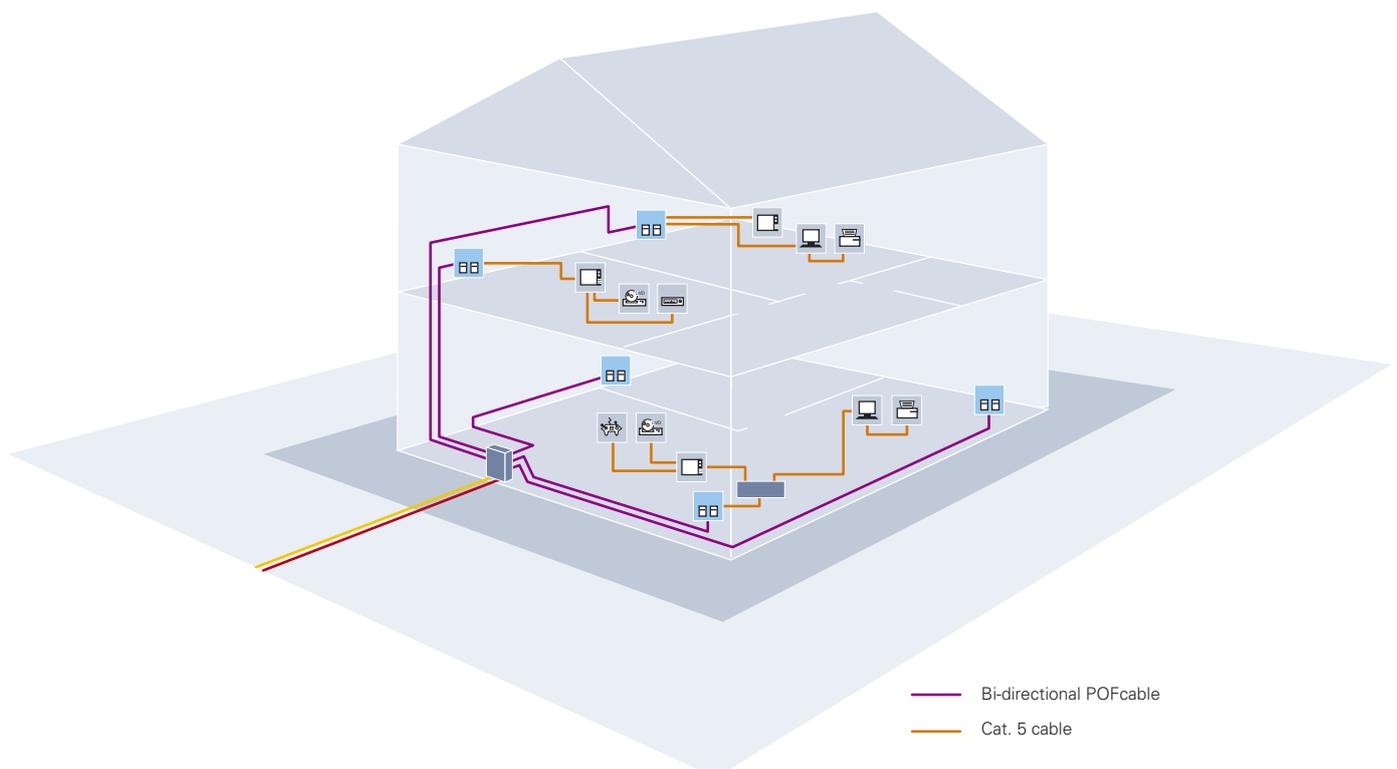
and their functions. In these cases, Fast Ethernet as the current Local Area Network (LAN) technology, is the medium of choice. At the same time, broadband services, usually via DSL come from the outside - and are also converted to Ethernet. This is a perfect combination; the integration into a single LAN imposes itself.

Retrofitting Cat. 5 cables?

The problem of the first mile has been solved through the broadband connection to the house. Now, the problem of the last meters remains. To be able to reach all devices, Cat. 5 cables would have to be retrofitted in most residential buildings. Not everyone is prepared to have slits knocked out, conduits pulled in and have a lot of dirt produced at high cost. However, the alternatives to Cat. 5 LAN cabling must be considered carefully:

- WLAN: As a shared medium it is only conditionally secure against external interferences, in principle, abuse cannot be ruled out. The same applies to Bluetooth.
- PowerLine: This too is a shared medium where the interferences caused by other devices are difficult to control. A combinatorial component can suffice to make the transmission quality for multimedia applications useless.

Both media show clear weaknesses in the streaming of multimedia contents. It is not surprising that telecommunications companies request fixed LAN cabling as otherwise they cannot get away from error messages - and frequently these are interferences for which they are not responsible.



020.1512

Structured cabling with POF.



Planet media converter with R&M SMI connector.

POF, disrespectfully called plastic fiber, is in reality, however, an inexpensive high-tech product offering a real alternative. Compared to the Cat. 5 cables, the POF cable has a thinner cross section but, nevertheless, is mechanically robust. For example it can be laid behind baseboards. Since the sleeve and optical conductor are electrically insulating, the cable can be pulled through conduits, which previously only guided the power supply, without any protective measures. Based on the optical transmission, it is naturally immune to electromagnetic interferences and causes no electrosmog. Thus, POF is ideal for retrofitting LANs in residences. Where there is a multimedia device, there is also an outlet, and where there is an outlet there is a way for POF.

Everything via POF

POF is universal. The fiber transmits telephone thanks to VoIP as well as broadband Internet, digital TV and more. If CATV and other services are received via coax cables, these signals can also be converted to Fast Ethernet with a CATV module and be brought to the fiber via router/firewall and media converter. Those who do not wish to do without WLAN find a simple solution in POF, that is, to connect the Access Point at the best place to the Ethernet LAN.

POF as a real alternative Installation without problems

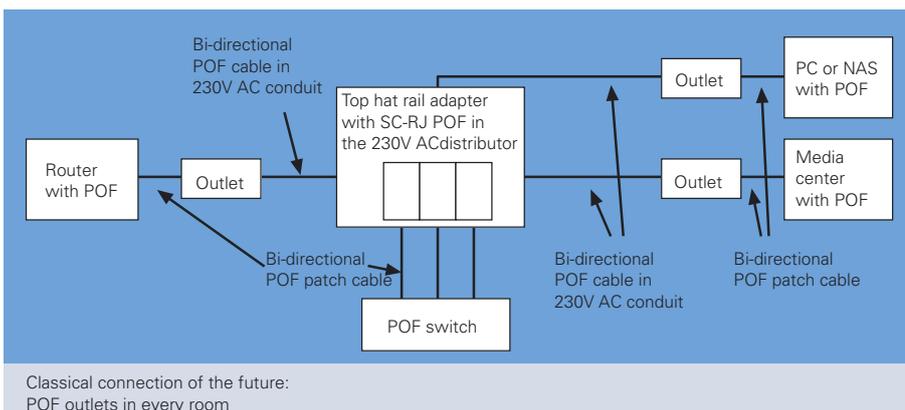
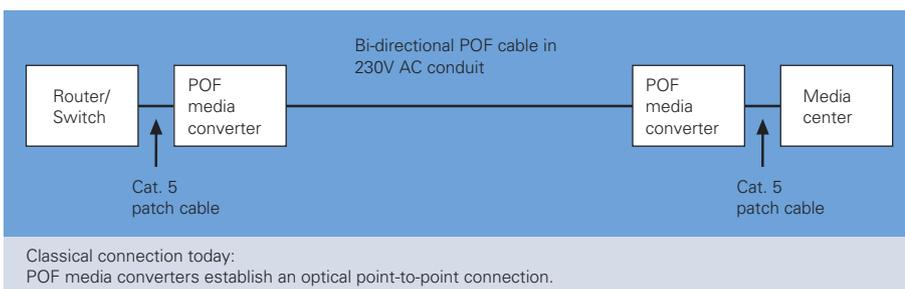
The POF fiber has a diameter of 1 mm. Therefore, it is almost as easy to handle as a copper cable. Only two optical con-

ductors must be assembled for a LAN connection. The optical wavelength used for transmission is in the visible range, thus, sending and receiving directions can be checked with the naked eye.

R&M as pioneer

R&M early recognized the advantages of the polymer optical fiber for home wiring and has established already time-tested products on the market with the POF compatible SC-RJ and RCC45² connectors. Now R&M is the first company to offer a system solution for Fast Ethernet LAN cabling via POF consisting of a POF Fast Ethernet media converter, optical fiber, SMI connector and an assembly kit for trouble-free installation.

R&M provides an unusual solution for subsequent LAN cabling in existing buildings. Telecommunications and cable network operators, electric installers and homeowners who want to enhance their real estate value and last but not least the users ranging from multimedia freaks to people who simply want to use attractive Triple Play applications can benefit from it.



NGN – Next Generation Networks



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010.3187

Internet everywhere. Always online. All over IP. Flexible VPN. These buzzwords point out that once more extensive changes are emerging in the realm of telecommunications networks. The megatrend of convergence is aiming for new heights. The Next Generation Networks (NGN) concept is gaining importance and presents new challenges and not only for network operators.

This subject is among the topics currently hotly debated regarding the future of telecommunications. The up to now separate media worlds of telephone, television, Internet, E-business, mobile and niche

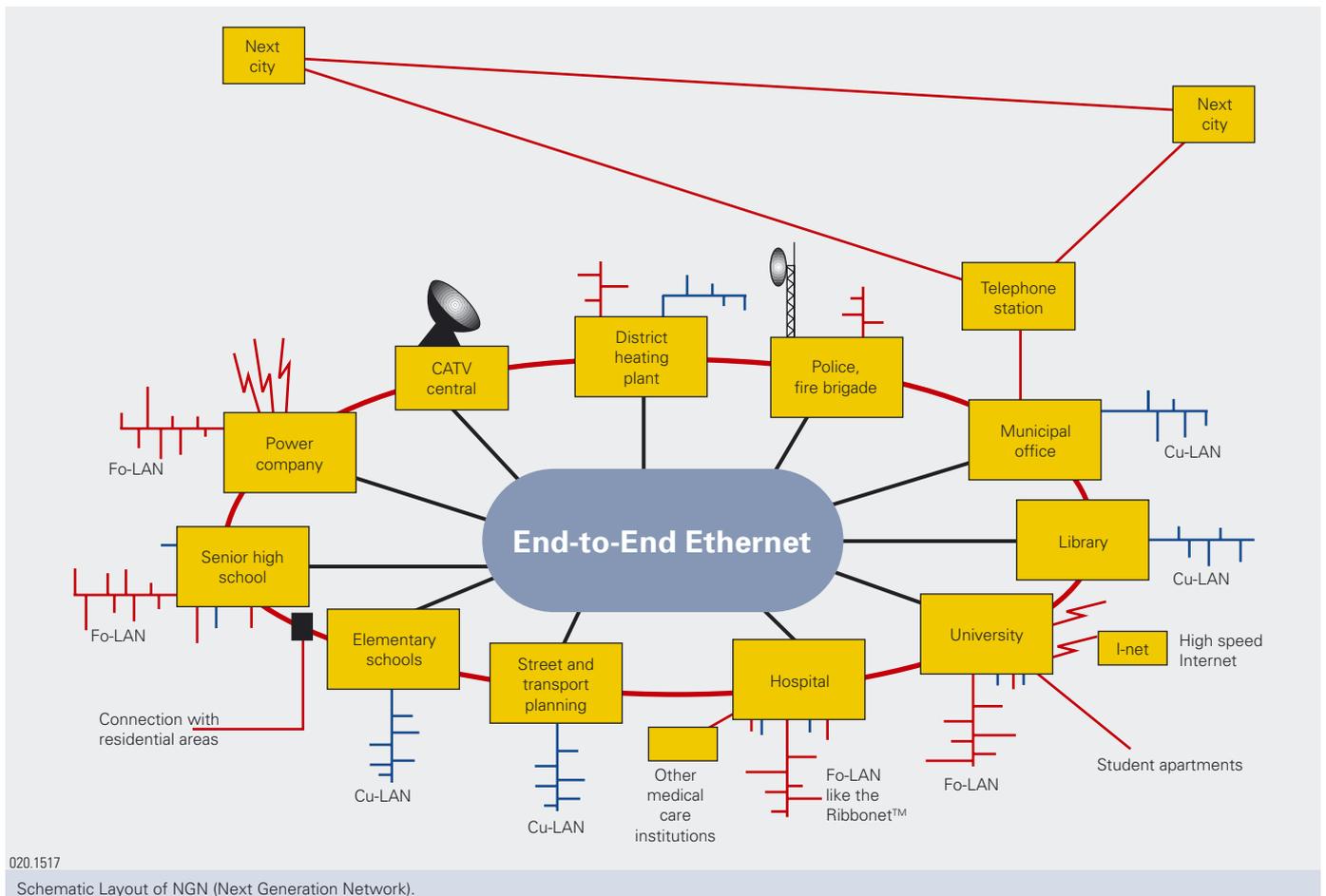
applications want to merge and so they should in the long run. Virtual Private Networks (VPN) should be able to be used with greater flexibility; therefore, the communications network requirements are newly defined. The need for technical overall solutions and development of network designs increases. Probably the Internet Protocol (IP) will be the key for merging all the different media.

Classical design methods assign a network to every service or a network element to every function together with the appropriate protocols. The vision is that NGN will transfer the most varied transmission methods and network structures

into a convergent network architecture, such as circuit switched telephone networks, the clocked ISDN, cellular phone technology with its multiplex modes, television and the packet-oriented IP networks. An IP network is the backbone via which the integration will be most effective according to today's point of view.

**Consequence:
A new system architecture**

Based on today's perceptions, an NGN is characterized by a system architecture, which consists of the following components:



- Media Gateways – physically connect the individual networks and provide information transmissions including format and data conversions.
- Softswitches – control the Media Gateways and for example establish and terminate connections across all network limits.

It is assumed that Media Gateways and Softswitches are separate systems. Presented more simply this means a conventional switching system physically divided into two parts, with appropriate gateway functions added.

With the separate Media Gateways and Softswitches it is possible that both parts can be developed independently from one another. For example, it is expected that the introduction of a new service only requires Softswitch changes. On the other hand, for the integration of a new network technology, only appropriate new Media Gateways are required on the network interfaces.

Content: Next Generation Media

To consider NGN simply as a technology would be an incorrect oversimplification. The NGN range of services will be significantly more extensive than that of conventional telecommunications networks. Content will be more easily made available and marketed more widely. In an NGN, the user has at his disposal an intelligent information management and has greater possibilities than before to adapt services to his requirements.

Telekom Austria, as one of the first network operators, is working on a comprehensive solution, which exceeds the physical plane. Telekom Austria has created a convergent media platform with the Next Generation Media (NGM).

Solutions: Greater performance, greater quality, greater security

The connection to the outside world is established via the broadband infrastructure. In this context, the importance of powerful broadband communications networks and innovative services cannot

be rated high enough, as have shown the experiences from the first Telekom Austria field tests.

The high expectations of NGNs also have an effect on the technology of the passive network structure. High bandwidths must be reliably transmitted. The connection quality and availability of distribution systems must be enhanced once more. When expanding networks, the interaction between passive and active layers must be looked at more closely.

R&M has tackled the NGN challenges and has looked ahead in the development of copper as well as fiber optic distribution systems. Today, R&M can provide innovative overall solutions in cooperation with partners from the active component sector. Fiber Optic Management System (FOM), xDSL and Triple Play solutions particularly stand out from the network operators' portfolio. Of course, you can also resort to the R&M know how, consulting and training programs.



010.3025
Fiber Optic Management System (FOM).

getmore

NGN

- Passive infrastructure solutions for Next Generation Networks
- Greater availability and performance
- Effective management in distribution systems

WARP: Small Foils, Great Effect

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10 Gigabit Ethernet with copper cabling over 100 meters: R&M's shielded Cat. 6 / class E cabling system is a natural. Thanks to the WARP technology the unshielded cabling system achieves the same. The patchwork like appearance of the cable jacket is in fact a hidden, intelligent high-tech solution. This solution allows unshielded cabling (UTP channel) to achieve the performance of real 10 Gigabit Ethernet over a full 100 meters. We call it Real10 UTP.

R&M, in collaboration with a renowned cable manufacturer, has pushed ahead with an innovation: WARP – the UTP technology for 10 Gigabit Ethernet. WARP is new and will shake up the UTP market.

The idea is simple. WARP means WAVE Reduction Patterns. Foil segments are inserted in the jacket of the UTP installation cable. The segments are

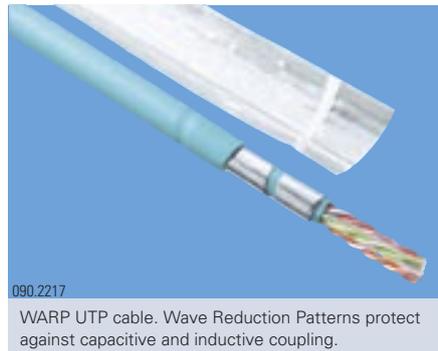
- mutually insulated to prevent compensating currents
- sufficiently short to avoid antenna effects
- sufficiently dense to effectively inhibit crosstalk.

Snap-on shields for connection modules and optimized patch cables enhance this protection function.

Protection against Alien NEXT

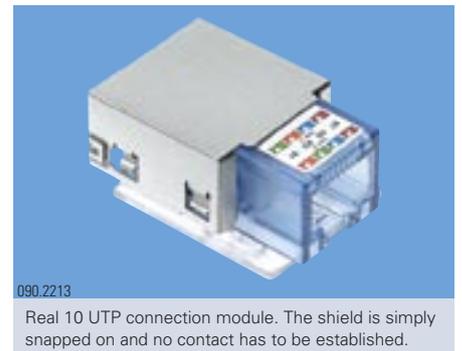
WARP provides effective protection against Alien NEXT, the worst enemy of 10 Gigabit performance with:

- Capacitive coupling (electrical field) causes current interferences. In WARP these are compensated in the shield segments. Therefore, WARP provides effective protection against capacitive Alien NEXT at all frequencies.
- Inductive coupling (magnetic field) causes limit interference voltages. In WARP, they induce eddies on the shield segments and thus have no inward effect. The shielding effect increases with the frequency. Therefore, WARP provides effective protection against inductive Alien NEXT at high frequencies.



090.2217

WARP UTP cable. Wave Reduction Patterns protect against capacitive and inductive coupling.



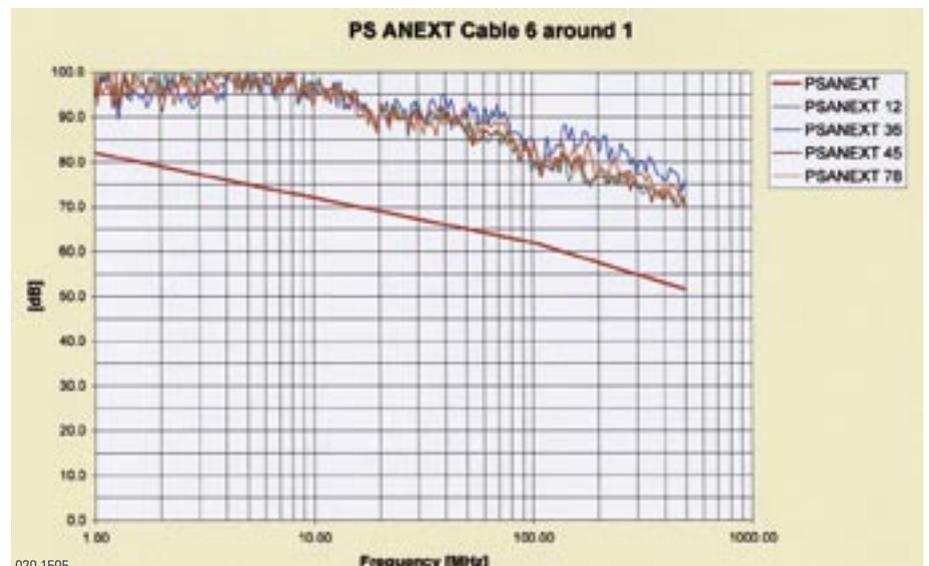
090.2213

Real 10 UTP connection module. The shield is simply snapped on and no contact has to be established.

The same installation as for U/UTP

The shield is not end-to-end and thus WARP behaves like a normal U/UTP system, i.e. the cables are as easy to wire as standard UTP cables. Additional spacing for connections, which are not compatible, must neither be considered in the conduits nor in the distribution panels.

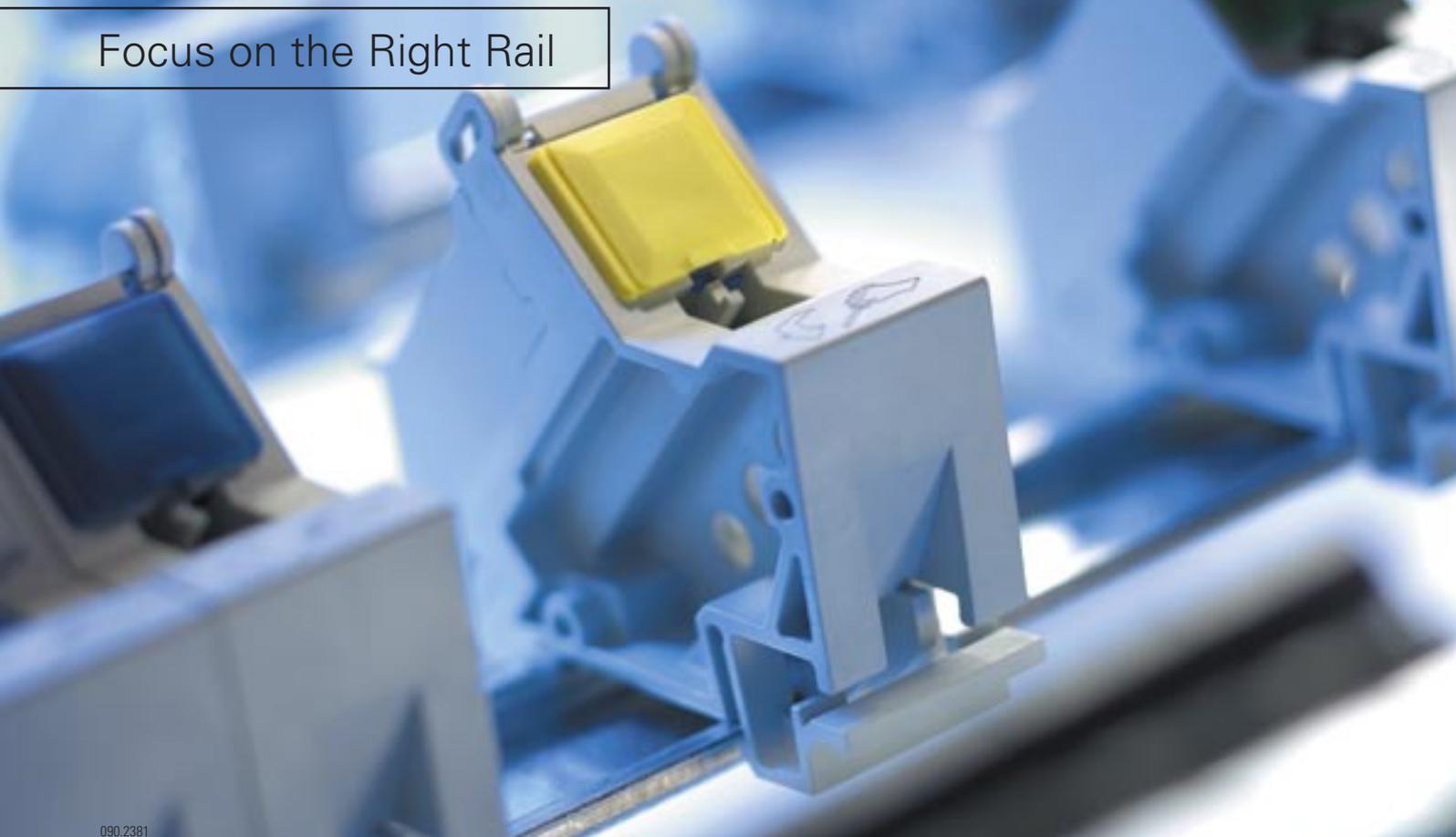
With WARP, R&M has transferred the know-how from shielded cabling to the world of unshielded cabling and has shown itself to be a technology leader in this field. WARP UTP is not a substitute for STP, but an alternative.



020.1505

Power-sum Alien NEXT: Compared to a standard Cat. 6 U/UTP cable, WARP improves the values by approximately 30 dB, far above the standard minimum requirements (red curve).

Focus on the Right Rail



090.2381

DRM45 – DATA SYSTEMS ON DIN RAILS

Whether you configure Ethernet distributors for industrial applications or install cabling in residences, the data system installation on 35 mm top hat rails is a snap. The adapter is simply locked into place. Copper and fiber optic connection modules are also conveniently integrated. This is an R&M innovation with added value.

- Modularity:** An universal adapter allows the installation of data systems with all R&M modules onto 35 mm standard top hat rails (DIN EN 50 022)
- Flexibility:** Versatile use. A technology change is possible at any time. You gain planning and investment security.
- Security:** Plug-in and plug-out protection, color coding and more security features can be retrofitted without changing components.
- Convenience:** Easy handling in any situation, quick assembly and robust design.

DRM45. The universal adapter for data connections onto 35 mm DIN standard top hat rails. The R&M solution for industrial and residential cabling.



090.2390

DRM45 from R&M: Single channel module for effortless integration of the data system onto 35 mm DIN top hat rails.



Convincing cabling solutions

Get More @ R&M

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www.rdm.com

Precision Process for the Smallest of Fibers

Robert Schäppi
Leiter Fiber Optic
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Light – a fascinating and unmatched information carrier, but at the same time a delicate medium. If a beam misses, the information is lost. Danger lurks in the interfaces. Therefore, R&M manufactures the optical fiber connections with exceptional precision, quality and care.

Manufacturing and assembling fiber optic connectors is work bordering on precision engineering – in the manual as well as automated production steps. The precision of the components is in the region of 0.5 micrometers. In the current discussions on standards, even tolerances of 0.25 micrometers are aimed for to improve the quality of fiber optic transmission. This reaches into the realm of microsystem technology.

Quality – documented for decades

The effort is worth it, particularly looking at the results demonstrated by this example: «1300 IL 0.11 RL >65, 1550 IL 0.09 RL >65» is written on a E-2000™ connector, the type, R&M assembles in great numbers every day. During the final control – optical measurement – the code is printed on the connector housing next to the serial number and it is documented, that the light channel was tested at 1300 and 1550 nm wavelength, the insertion loss (IL) of the connector is 0.11 or 0.09 dB and the return loss (RL) is above 65 dB. The imprint guarantees that the



090.2366
Assuring of reliability with final measurement and laser labeling



090.2361
Precision and dexterity with the assembly of FO connectors.

origin and parameter of every individual connector can still be traced back after 20 years.

Consistent quality control already starts at the beginning of the process chain. Depending on the requirements, ceramic ferrules, which later accommodate the fibers, even are subjected to a single-part test. A needle scans the drilling and checks its concentricity. At the highest quality level, R&M stipulates a precision of 0.1 micrometers.

Dexterity for delicate fibers

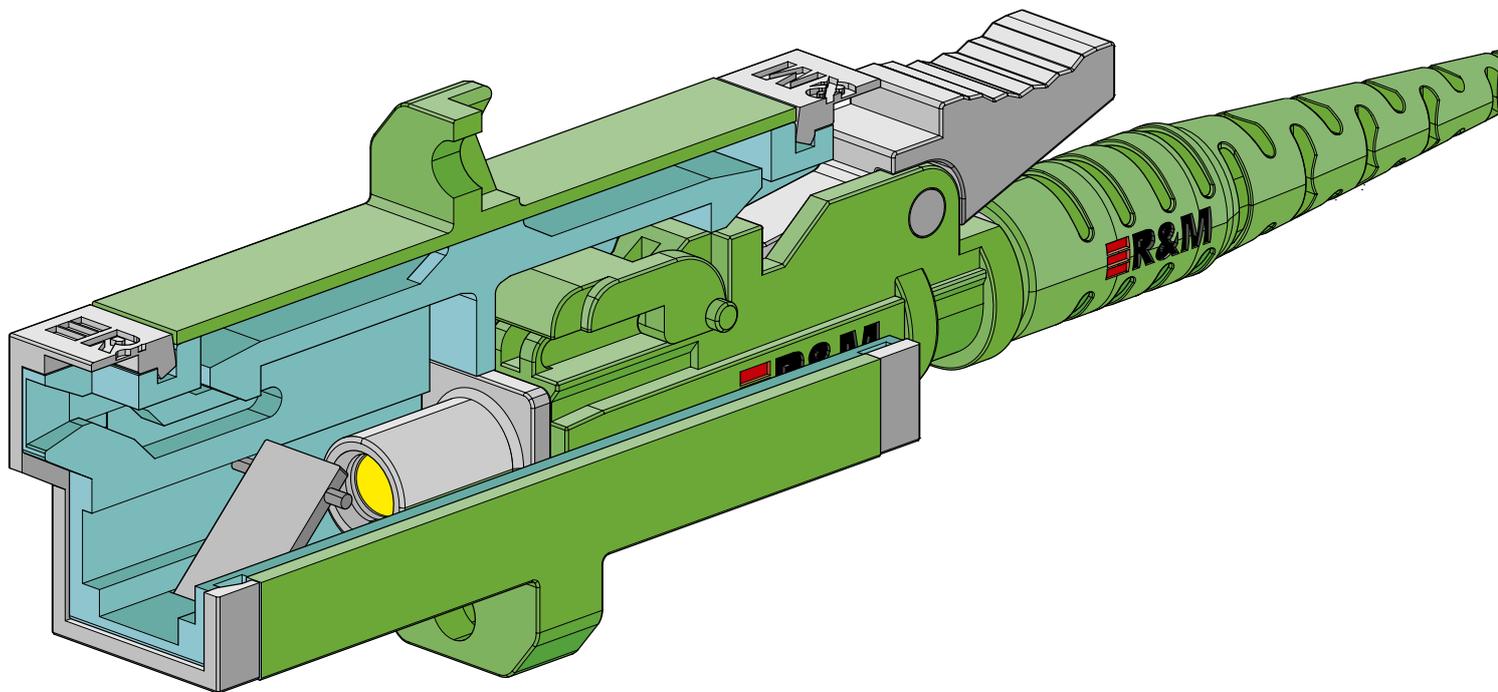
In the assembly process the sleeves and springs are initially inserted into the Alberino (inner connector housing) and the ferrules are attached with adhesive. R&M has developed a semi-automatic process for the injection, evaporation and hardening of the adhesive, a process that integrates fine mechanical and chemical know how and guarantees a perfect reproduction.

Subsequently, the optical fibers are introduced into the ferrules and also bonded. The composition ratio of the adhesive components and the metering of the drops play a significant role. The adhesive should not form any blisters as otherwise it will run irregularly into the razor-thin space between optical fiber and ceramic sleeve.

In the next stage, the protruding fiber end is scored with carbide, cleaved and pre-polished. Cleaving also requires flair and experience because the glass can easily splinter into the ferrules, which would make the connector useless. After pre-polishing and a first quality check of the fiber end, the tuning process begins. This is the focal and most decisive stage.



090.2368
Semi-automation guarantees exact adhesive metering



010.1545.1

E-2000™ – unique precision connector for maximum transmission security.

Tuning – polishing for the light beam

Tuning consists mainly of a storage and polishing process. In the storage process the sector of the fiber core is determined in which the light center or the optical guide unit is situated. A mark is applied to the preferred sector. It is intended for the geometric alignment in the final as-

sembly. This allows having the smallest lateral displacement of the optical guide unit in the adapter.

Up to three polishing stages are necessary to condition the fiber-end surfaces and to achieve ideal conditions for the light transfer in the interface. The quality

is repeatedly checked with the interference device having a resolution in the nanometer range. The measurement results are recorded cable by cable.

Based on this complex precision work and intensive quality assurance, fiber optic cabling today is the ideal solution for enterprises requiring a future reliable infrastructure for their data and communications networks. Fiber optics provides long-term and durable operational reliability and an unmatched performance for constantly increasing bandwidth and data volumes. In the overall comparison of IT investments, the share of the infrastructure costs is only a few percentage points.



090.2364

Software-assisted tuning for high quality.



090.2365

Permanent production monitoring on the highest level.

Top performance in summary

The stress, to which the small components of a fiber optic connector (picture on top) is exposed to, could not be more challenging. The connectors are designed for a service life of 200,000 to 250,000 hours or 25 years. In addition, the connectors must withstand high shear force; they should easily endure 500 to 2,000 mating cycles.

The adhesive surfaces, holding together the fibers, ferrules and inner connector housing must not yield. This is based on the assumption of a perfect adhesion and form closure. A spiral spring presses the ferrules with their fiber end to their counterpart and tension must be maintained. The fiber ends must withstand a permanent pressure of 10 N – on the small cross section of usually 25 µm. The 8° angled polish – the convex endfaces are polished at an angle to the fiber axis – plays a pivotal role in limiting the reflection development at the interface and in achieving the highest possible return loss.

E-2000™ manufactured under license by Diamond SA, Losone.

R&M Trade Show Participation from now to October 2006:

CeBit 2006, Hanover, Germany

March 9–15, 2006

Zhejiang Intern. Intelligent Building, Hangzhou, China

April 7–9, 2006

Light & Building, Frankfurt, Germany

April 23–27, 2006

Hannovermesse HMI, Hanover, Germany

April 24–28, 2006

Eliaden, Oslo, Norway

May 8–11, 2006

ANGA Cable, Cologne, Germany

May 30 – June 1, 2006

CommunicAsia 2006, Singapore

June 20–23, 2006

ECOC 2006, Cannes, France

September 25–27, 2006

Matelec, Madrid, Spain

October 24–28, 2006

FIHAV'06, La Habana, Cuba

October 30 – November 6, 2006

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Convincing cabling solutions