

# 10 Gigabit Ethernet Solutions



Vision becomes reality – Real 10 Gigabit Ethernet  
with shielded and unshielded cabling –  
STAR Real10 superior performance and  
WARP technology – Visionary with fiber optics –  
The future with R&M



Convincing cabling solutions

## MORE BANDWIDTH, MORE RESOURCES

**A huge step forward for your enterprise. A new dimension for the local data network. By upgrading to 10 Gigabit Ethernet, you can tap into the vast potential for information and communications. At last, you will have enough bandwidth and resources to last long into the future. With R&M, you can be sure you will really achieve full 10 Gigabit performance.**

get more

### More innovation

- Real 10 GbE performance
- Forward-thinking designs
- Investment security
- Proven technology

### More usability

- Tool-less termination and installation
- Easy and secure handling
- Automatic grounding
- Modular, scalable system



### VISION AND REALITY –

#### THE FACTS ABOUT 10 GbE

More bandwidth! More performance is needed from enterprise networks. The new dimension is 10 Gigabit Ethernet (10 GbE). But how can you be sure that the cabling will really deliver full 10 Gigabit performance?

High-quality optical fiber infrastructures easily meet all the criteria. When it comes to twisted pair copper cables, shielded or unshielded, reality may be far removed from the vision. Examine the facts. Learn here how to make a safe investment and migrate to 10 Gigabit Ethernet without any problems using the R&Mfreenet system.

#### STANDARDIZATION STATUS

10 Gigabit Ethernet over glass fiber was standardized in 2002 in IEEE 802.3ae. The market is growing steadily, component prices are falling. Everything indicates that 10 Gigabit Ethernet is going to dominate communications, from enterprise backbones to wide area networks.

But 10 GbE is also making inroads into local area networks, and into horizontal cabling within buildings as a result. Here copper cabling is usually preferred as it is more cost effective. But, it must deliver the performance needed.

The IEEE 802.3an standard for 10 Gigabit Ethernet over twisted pair cables is currently being defined. The physical constraints represent a real challenge, since all aspects of communications technology have to be pushed to the limits of what is technically possible. Drafts of IEEE 802.3an that are fairly stable technically have been available since the second quarter of 2005.

As a member of the ISO/IEC working group JTC 1/SC 25, R&M is always "on the ball" and is actively involved in determining future cabling specifications.

Convincing, dependable solutions are already available. R&M supports 10 Gigabit Ethernet over copper and optical fiber with perfected, innovative concepts and products of uniquely high quality. They meet all the passive network infrastructure requirements for true 10 Gigabit performance under real conditions.

Fiber optic solutions from R&M definitively meet the demands of 10 GbE. R&M twisted pair solutions offer all that is needed to support 10 Gigabit Ethernet operations without problems, regardless of the details of the final standard.

**STAR REAL10 BRINGS 10 GbE TO COPPER**

The STAR Real10 product range in the R&Mfreenet system provides real 10 GbE performance over the full 100 meter range.

Shielded Cat. 6 components (STP) from R&M handle 10 GbE as a matter of course. As an R&M customer, that means your investment is secure!

If you prefer unshielded (UTP) copper cabling, you can now take advantage of the extensive know-how that we as STP specialists put in to the development of a new UTP solution.

Leading technology, no-compromise quality, and innovative design. That's what R&M stands for. And that's what planners, installers and end-users can rely on, "shielded" or "unshielded".

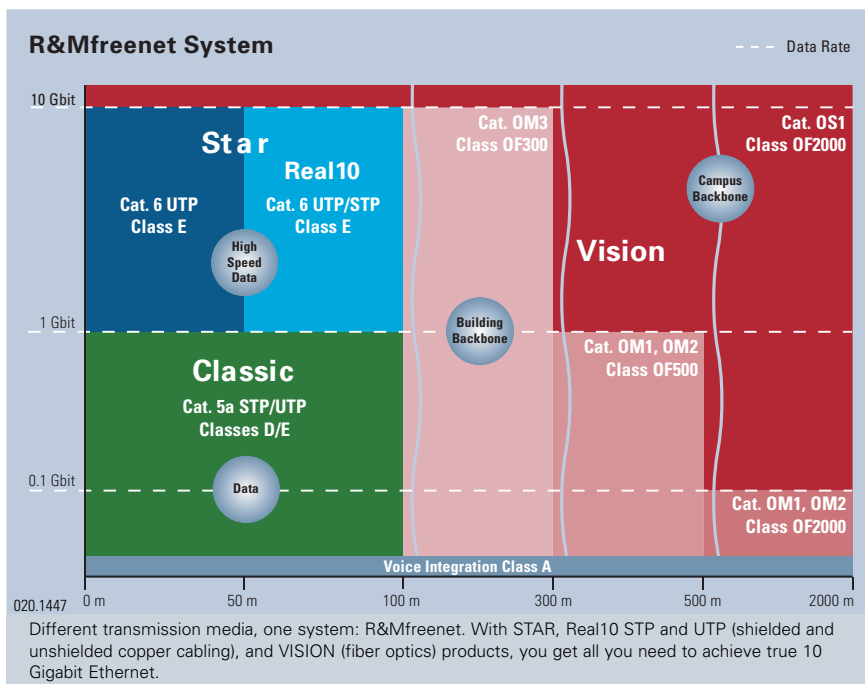
**VISION BRINGS 10 GbE TO FIBER**

VISION from R&M offers a complete range of products for 10 GbE over all types of optical fiber – with installation cables, patch cords, connector modules and distributors.

In addition to SC-Duplex connectors, R&M offers two high-quality alternatives: SC-RJ und E-2000™ (\*)Compact.

**MODULARITY GUARANTEES FLEXIBILITY**

10 Gigabit Ethernet seamlessly links LAN, MAN and WAN, and in doing so creates a unified, economical, and adaptable network topology. This concept is reflected in the 10 Gigabit Ethernet products from R&M: They are modular and scalable, regardless of the transmission medium. You can combine twisted pair and optical fiber components as needed. Start now with a solution to meet your current needs, knowing that you will be able to build on and expand it in the future. We guarantee it!



# STAR Real10: True 10 Gigabit Eth

## REACH FOR THE STARS!

**Why be satisfied with anything less than true 10 Gigabit Ethernet? STAR Real10 from R&M delivers the best that twisted-pair copper cabling offers: Guaranteed 10 Gigabit Ethernet over 100 meters of horizontal cabling – shielded or unshielded.**

### SUPERIOR FEATURES

#### WITH SHIELDING: REAL10 STP

Protected against all eventualities: The STP products in the STAR range in the R&Mfreenet system fulfill all the requirements specified in the standards and guarantee 10 GbE transmission over a full 100 meters of horizontal twisted pair copper cabling. This is due to the excellent protection against Alien NEXT, or crosstalk between adjacent cables. It means installers have the most critical parameter determining 10 GbE capability fully under control.

#### ALL-ROUND SHIELDING

Full 360° shielding of every single module means that the Cat. 6 STP module has all-round protection against disturbances from neighboring cables and modules. Nothing gets out, and nothing gets in. This guarantees optimum reliability of the 10 GbE signals.



010.2859

Cat. 6 STP connection module in the STAR range – all-round shielding

### INDEPENDENT CERTIFICATION

Our four-connector channel has been certified up to 600 MHz by independent laboratories, well above the 500 MHz stipulated in the draft of IEEE 802.3an.



020.1286

The STAR Channel, independently certified up to 600 MHz.

### EASY INSTALLATION

The shielded modules can be quickly and simply connected without the need for special tools. Practical tests show that connecting takes just 10 seconds longer than for unshielded modules. The intelligent design ensures that all of the components are automatically grounded properly during the installation process. That's something installers working to a tight schedule can really appreciate.

## **MORE THAN 3 MILLION 10 GbE-CAPABLE STP CHANNELS**

Thanks to R&M's forward-looking product development, since the year 2000 cabling installed using STAR products can be used for 10 Gigabit Ethernet without problems. That's already more than 3 million 10 GbE-capable STP channels made by R&M. A very good reason for planners and installers to recommend the STAR range to their clients as an investment with a sure future.

## **GET ALL THE ADVANTAGES: WARP UP TO REAL10 UTP**

If you prefer unshielded twisted-pair copper cabling (UTP) and want to use it to get started in the 10 Gigabit age, the R&Mfreenet system has the right solution for you: STAR Real10 UTP.

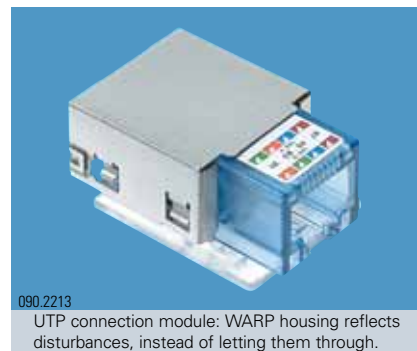
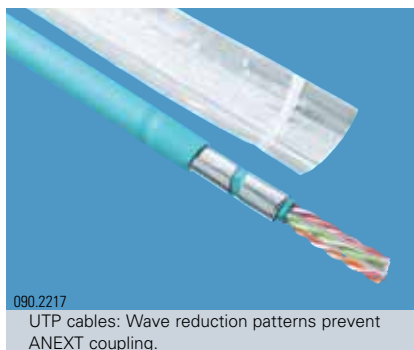
R&M has used its recognized know-how in "shielded" technology to create a unique UTP solution. The new WARP technology means you can reach for the stars with unshielded cabling, too.

The concept: The installation cables, connection modules, and patch cords in the STAR Real10 range have a special shielding system which does not need to be grounded. This shielding provides more reliable protection

against external crosstalk than simply increasing the cable diameter or the distances between connectors on distribution panels and outlets.

## **WARP TECHNOLOGY**

WARP – **W**Ave **R**eduction **P**atterns – is the name of this new development. The UTP installation cable is wrapped in foil segments – isolated from one another to stop loop currents, short enough to prevent antenna effects, close enough together to suppress alien crosstalk effectively. WARP installation cables exceed the values specified for Alien NEXT and Alien FEXT in current standards, yet they are as easy to terminate and plan as conventional UTP cabling. Clip-on WARP housings for the connector modules together with optimized patch cords ensure this protective function is continued over the entire channel.



## **COMPATIBLE, CONSISTENT**

Installation-friendly and reliable: The unique construction means that the cable stays round and easy to install. No irregularities hinder efficient cable pulling.

Compatibility protects investment: No need for new distribution panels or outlets, no new connection procedures. Yet another way that R&M provides consistent investment protection.

## **100% TESTED**

R&M manufactures its Cat. 6 connecting modules right in Switzerland. During production, each module is subjected to a battery of automatic tests, not just a random sample test. This means every module shipped by R&M has been 100 percent tested.

# VISION: 10 Gigabit Ethernet on g

## VISION IS REALITY

**Greater ambitions? Turning visions into reality? Are you looking beyond the bounds of copper cabling? Move up seamlessly with VISION, the optical range for 10 Gigabit Ethernet. With the R&Mfreenet system copper and optical fiber, horizontal and backbone cabling all work together to satisfy enterprises and applications that demand the absolute best from the network.**

### 10 GbE OPTICAL LAN AND WAN

VISION is the name of the complete fiber optics program for 10 GbE in the R&Mfreenet system. It offers all fiber types, from multimode fibers for building cabling (OM3) through to single mode fibers (OS1) for campus backbones and wide area networks. Complete with installation cables, patch cords, connector modules and distributors.

The connectors play a significant role in transmission quality. With SC-RJ and E-2000™ (\*), in addition to SC-Duplex, R&M provides two high-quality systems.

### OPTICAL IN RJ45 FORMAT

The world's smallest SC duplex connector is the SC-RJ. It is no bigger than a RJ45 plug. That gives you enormous packing densities. It also offers a number of security options: It cannot be connected the wrong way round, so transmit and receive paths cannot be crossed, color coding ensures clear assignment when patching, and a lock prevents unintentional or unauthorized disconnection. SC-RJ connects multimode and single-mode fibers, and stands out with its excellent optical characteristics and high transmission reliability – the right choice for many 10 Gigabit Ethernet applications.



090.2030

SC-RJ, the smallest of its class, fits in every RJ-45 cutout.



## COMPACT HIGH PERFORMANCE

The high-performance E-2000™ and E-2000™ (\*) Compact are ideal for wide area, metro, and campus networks, as well as for infrastructures within larger enterprises. Connectors and adapters are designed for optimum transmission reliability at high bit rates. Self-closing dust protectors, color coding, mechanical connector locks with release levers, and complete protection of the ceramic ferrules by the plug housing all contribute to high operational reliability.



090.0005

E-2000™ (\*) Compact comes with all the benefits of the WAN.

## YOU CAN RELY ON US

A number of 10 Gigabit Ethernet solutions are available on the market. But, when it comes to performance and investment security, there is only one choice. You can only consider an infrastructure that gives you true, reliable 10 Gigabit performance in every situation, and offers long-term protection of your investment.

Our clear dedication to providing highest performance and absolutely reliable, convincing products means that R&M is your partner on the road to 10 Gigabit Ethernet. You can rely on us. Profit from the unique added value and real performance of the 10 GbE solutions from the R&Mfreenet system. Let STAR Real10 STP or UTP and VISION put you on the right course for the future. Our warranty system, which ensures quality from the planning stage right through to complete installation, means you can be sure that all our 10 GbE solutions will work without problems.

The unlimited flexibility of our internationally active family-run company ensures you have the technological edge and the best quality when taking this important strategic step. Test our 10 Gigabit solutions now. R&M Logistics delivers fast, worldwide.

Do you need support? Our R&M partners are present locally in many countries and provide fast, highly-qualified advice. R&M supports you with solutions from a single source, made to measure, with specifically developed products. R&M offers you long-term warranties, comprehensive support, training, and product information.

Do you want to know more about 10 Gigabit Ethernet? Read our Technical Reports and White Papers. Information from: [www.rdm.com/ten\\_gbit](http://www.rdm.com/ten_gbit).

(\*) E-2000™ manufactured under license from Diamond SA, CH-6616 Losone.

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