

Direct access to 10 Gigabit Ethernet with Cat. 6

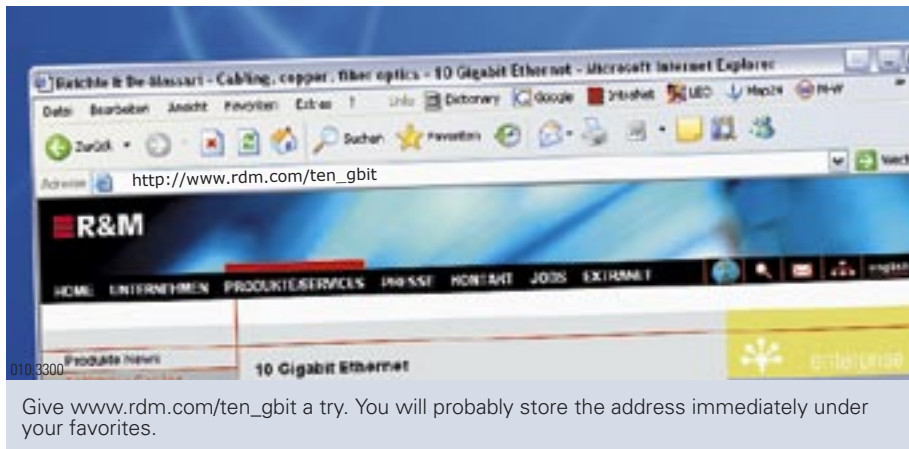
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IT decision makers, planners and network administrators are confronted with a prevailing challenge: 10 Gigabit Ethernet is coming! They must plan data networks for the future, however, the discussion on standards, range and shielding has not yet been concluded. Nevertheless, today they can already build reliable, powerful systems using Cat. 6 components. R&M supplies facts and information online, which are important for the understanding of 10 Gigabit Ethernet (10GbE or 10GBASE-T).

Today, when planning a network with a transmission performance of 10 Gigabit per second, one is confronted with several options. On the one hand there are Cat. 6/Class E solutions with universal compatibility on the market and on the other hand Cat. 7/Class F solutions with RJ45 non-compatible connector systems. Furthermore, at the time of the investment decision, the question as to whether possibly existing unshielded cabling can be used or whether everything needs to be newly laid in which case shielded cables can immediately be used, plays a significant role.

As a pathfinder for the 10 Gigabit Ethernet, R&M offers, apart from the appropriate Cat. 6 solutions, its entire technological know-how, service and consulting



services. We want the market to be fully informed and optimally prepared for this quantum leap. The R&M expert team for 10GBASE-T prepares the current standards and technical discussions in compact expert articles and white papers, which are made available online at www.rdm.com/ten_gbit. Furthermore:

R&M takes a stand

R&M supports all 10GE installations – from fiber optics to shielded and unshielded copper cabling. R&M is active from the outset in the development of standards by collaborating on various standardization committees and in various user organizations. Cat. 6 solutions from R&M, already on the market for a number of years, exceed demonstrably the values for quality and performance required by the current draft standards for 10GBASE-T.

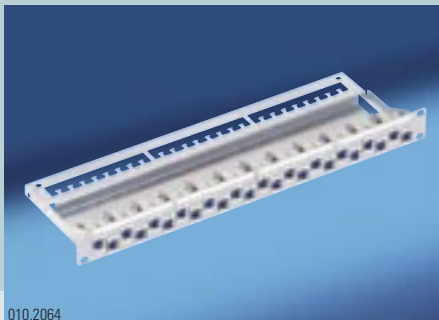
The cables fulfill all expected specifications and the modules are verified by de-embedded testing up to 600 MHz, which is beyond the currently required 500 MHz. The connection modules and patch cords go through a 100 percent unit test. With shielded Class E, R&M provides planners

and technicians with the security that the customer can operate 10 GbE up to a length of 100 meters.

With unshielded Class E, R&M offers a solution superior to standard products available on the market. For example, the staggered arrangement of the connections in the R&M 24-port panel and the “healthy” line distances in the modules indicate that the minimum range of 55 meters can be exceeded. Thus, many customers will be able to use their previous R&M UTP installation for 10GBASE-T, since approximately 75 percent of lines in office buildings are shorter than 55 meters (according to a study by LAN Technologies in July 2003). Therefore, for many customers a remeasurements is all that will be required.

Costs: The shielded Cat. 6 solution can be calculated

UTP is less expensive – when it works. If not, subsequent improvements are necessary. Those costs cannot be calculated in advance. If the network in the end provides a lower transmission security, even more costs will accumulate, which do not appear in any calculation.



R&M 24 port panel

With Cat. 6/unshielded Class E, R&M offers a solution superior to standard products available on the market. For example, the staggered arrangement of the connections in the R&M 24-port panel and the “healthy” line distances in the modules indicate that the minimum range of 55 meters can be exceeded. Thus, many customers will be able to use their previous R&M UTP installation for 10GBASE-T; for many customers a remeasurements is all that will be required.

The initial costs are higher for shielded cabling. This is mostly based on the material and installation expenditures. However, based on extensive experience and high predictability, the installation costs can be calculated exactly.

R&M has designed its Cat. 6 solution for quick and reliable installation. Among the outstanding features are an easy and time-saving patented shielded contact with integrated cable strain relief. To attach a shielded cable to a R&M module takes on average only ten seconds longer than to attach an unshielded cable.

Cat. 6, Cat. 7, shielded, unshielded – does it make any difference for 10 GBASE-T? In its responsibility towards planners, technicians and end customers, R&M must point out the “subtle” differences. Therefore, on www.rdm.com/ten_gbit even the “fine print” is big.

Give www.rdm.com/ten_gbit a try. You will probably store the address immediately under your favorites.

Status of standardization

At the end of November 2004, draft 1.1. of the 10GBASE-T standard was completed and discussed at the meeting of the IEEE 802.3an Task Force in Ottawa. The new standard supports structured cabling via copper wires according to ISO/IEC 11801 or TIA-568-B with a range of up to 100 meters (shielded) or 55 meters (unshielded).

The technical report discussed in the EN and ISO (R&M author) is based on the acceptance of draft 1.1.

Keyword compatibility

The declared goal of the IEEE 802.3 High Speed Study Group for the development of the 10GBASE-T standard was maximum compatibility with previous Ethernet standards. The standard covers transmission and access details, the integration of Power over Ethernet and generally the transmission over four twisted pairs in a structured cabling. R&M offers a solution with its Class E/Cat.6 system, which is also backwards compatible in regard to the connectors.

Shielded or unshielded?

Shielded, 10 GBASE-T has a range of at least 100 meters. With unshielded pairs (UTP) currently only 55 meters can be reached reliably. Particularly external noise presents difficulties, more precisely, the Powersum Alien NEXT. This parameter is insufficiently specified in ISO/IEC or TIA. Both committees have therefore formed project groups to change or supplement appropriately the cabling standards (ISO/IEC 11801, TIA-568-B).

Powersum Alien NEXT is, however, not only a characteristic of cables and modules but also the installation method. The values can only be checked in an installed system – however, at this time, this is unfortunately not

possible, since the appropriate field testing devices are not available. The A NEXT value might be enhanced with expensive subsequent improvements, e.g. by reducing the port density in the distributor, having greater distances between the cables, by improving the cabling systems or by reducing the cable length.

10GBASE-T will, without a doubt, also be possible on unshielded cabling. However, the advantage of the greater filling coefficient in the cable conduit is gone and the installation is much more critical as otherwise with UTP. The base costs for shielded cabling may be greater, but can be planned for.



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R&M shielded Cat. 6 connection module

With shielded Cat. 6/Class E modules, already on the market for a number of years, R&M provides planners and technicians with the security that the customer can operate 10 Gigabit Ethernet up to a distance of 100 meters. The cables fulfill all expected specifications and independent laboratories verify the modules with de-embedded testing up to 600 MHz, which is beyond the currently required 500 MHz. All connection modules and patch cords go through a 100 percent unit test before delivery.