

3M Telecommunications

Solutions for Networks

Volition™ 10G Copper Solutions



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In less than 10 years, the speed of local area networks (LAN) has gone from less than 10 Mbps to several Gigabits per second. Market specialists foresee LAN requirements accelerating and a progression in bandwidth of horizontal cabling, traditionally on copper cables. The IEEE 802.3an 10GBASE-T study group is currently working on a 10 Gigabit Ethernet standard* for twisted pair copper cabling. The new revisions of international standards** on cabling systems ISO/IEC 11801 and TIA/EIA 568B define a new class E referred to as "augmented" category 6 which offers a higher bandwidth of 500 MHz.

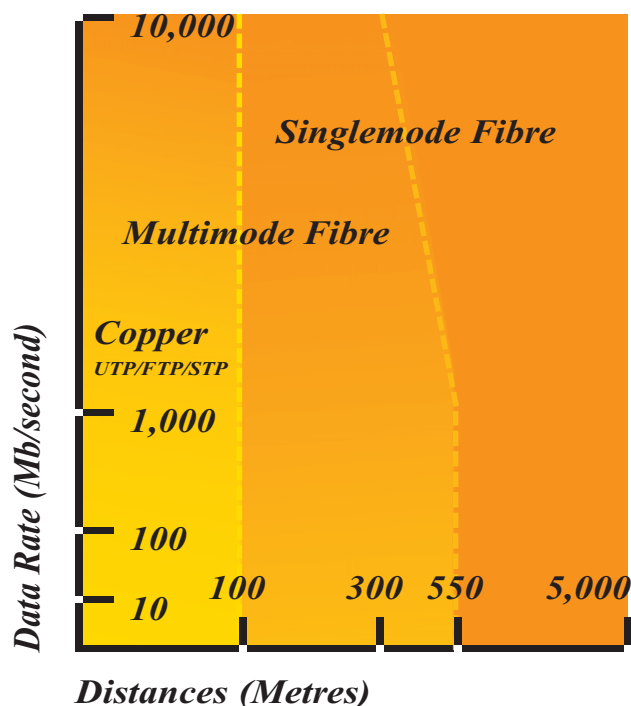
These developments mean that companies need to put in place a high-speed fibre optic backbone and migrate towards higher speed copper cabling in the horizontal. Many LAN administrators plan to install high performance copper cabling systems which make it possible to support both present and future applications. Volition™ Network Solutions from 3M comply fully and economically with the advances in 10 Gigabit copper applications.

* Applications

IEEE 802.3an 10GBASE-T

** Reference standards

ISO/IEC 11801 Edition 2
ISO/IEC 60603-7-5
EN 50173-1
ANSI/TIA/EIA-568-B-2-1



10 Gigabit copper cabling technologies

The initial objective of the IEEE 802.3an group was to study the feasibility of 10 Gigabit cabling systems with a channel length between 55 m and 100 m. The IEEE chose a maximum frequency of 500 MHz which doubles the frequency range of the original category 6/class E which is specified as up to 250 MHz. The IEEE group has defined a new electrical parameter for the channel which is "alien cross talk" (AXTLK). AXTLK is all the noise created on a cable or an RJ45 jack by neighbouring cables and jacks.

The number one interference in 10GBASE-T is AXTLK, the effects of which disturb not only the cables, particularly in the cable routes, but also the RJ45 jacks, especially in the patching racks where there are many adjacent links.

Volition™ 10GT Solutions

The Volition™ 10GT is designed for 10 Gigabit Ethernet applications on twisted copper pairs in compliance with 10 Gbit/s Ethernet standards. The new Volition™ 10GT solution is differentiated by the unequalled reduction of the effects of AXTLK over the entire channel.

The solution is comprised of a complete range of new RJ45 jacks, twisted pair copper cables, 19" patch panels and RJ45 patch cables. The Volition™ 10GT solution meets the requirements of a 10 Gbit/s local area network infrastructure.

RJ45 Volition™ OCK10S8 jack

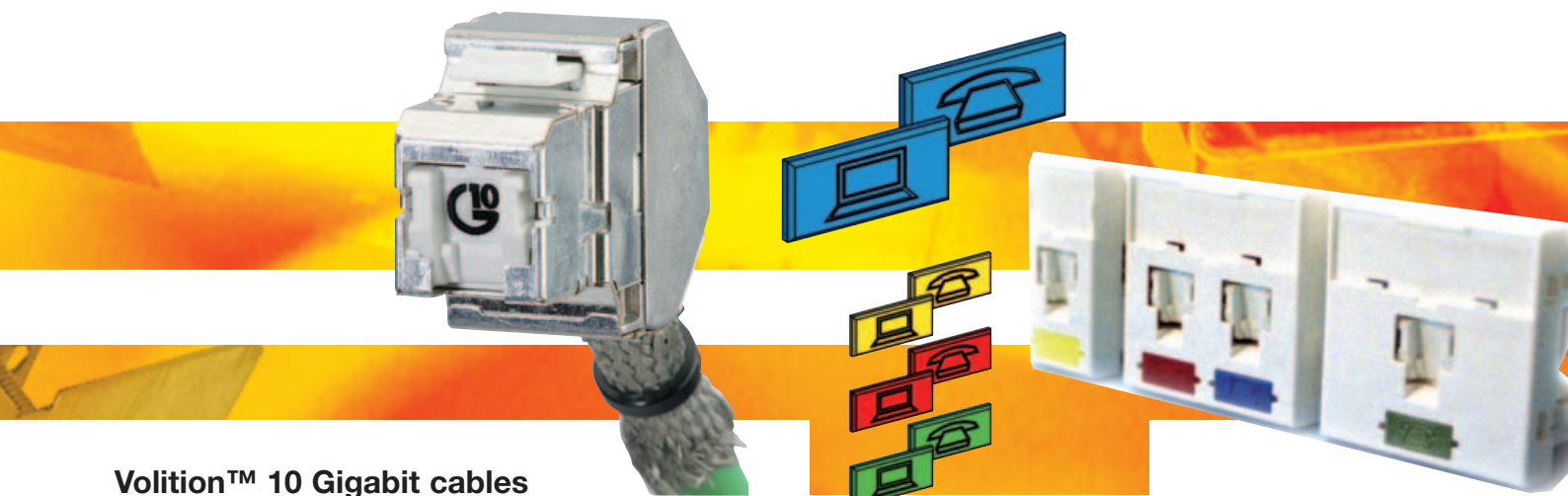
The new RJ45 Volition™ OCK10S8 jack has been specially developed for 10 Gigabit Ethernet applications on twisted pairs (10GBASE-T) in compliance with the standards ISO/IEC 11801, EN 60603-7-5 and TIA/EIA 568B. With its patented design, it can be connected to Volition™ 10 Gigabit cables without any special tools. The 360° connection to the cable shield, thanks to the metallic braid of the cover, is a unique, unequalled method of cabling. The 360° shield acts like a Faraday cage around the RJ45 Volition™ OCK10S8 jack, giving unrivalled immunity against alien cross talk.

Volition™ 10 Gigabit RJ45 Jacks

Volition™ 10 Gigabit RJ45 Jacks have been specially developed for Ethernet 10Gps over twisted pairs applications (10G BASE T), according to ISO/IEC 11801, EN60603-7-5 and TIA/EIA 568B standards. Volition™ faceplates are made in ABS, white colour (RAL 9011), either 22,5x45mm or 45x45mm formats. Volition™ faceplates are delivered with white colour identifying insert. The identification can be completed by adding a plastic colour insert.

Description	Qty per carton	3M reference	Short ID
RJ45 K10 jack, shielded, batch of 8	6	OCK10S8	281072

Description	Qty per carton	3M reference	Short ID
RJ45 K10 shielded 10 Gigabits 45 x 45 Jack	10	K10S45	281058
RJ45 K10 shielded 10 Gigabits 22,5 x 45 Jack	10	K10S22	281055



Volition™ 10 Gigabit cables

The new Volition™ 10 Gigabit cables have been specially developed to ensure excellent immunity against AXTLK up to 500 MHz. They have been developed to support the 6 around 1 test i.e. the cumulated sum (PowerSum) of the ANEXT effect generated by 6 cables (i.e. 24 pairs) on a central cable. All cables of Volition™ 10 Gigabit design have a general shield and/or screen per pair. Volition™ 10 Gigabit cables benefit from unequalled immunity to AXTLK (see Delta certificate).

Volition™ 10 Gigabit cables are easy to install and do not require any special installation precautions. Connection to the Volition™ OCK10S8 jack remains simple and familiar. Pulling in the cables is easy, due to the fact that their outer dimensions are the same as the current category Volition™ category 6 / class E cables. Volition™ 10 Gigabit cables are available in type LSOH (Low Smoke Zero Halogen).

3M reference	Description	Packaging
<i>Horizontal Cable</i>		<i>standard</i>
VOL-6aFL4	4 pairs Cat 6a FTP LSOH, 10 Gbit	500/1000
VOL-6aFL8	2x4 pairs Cat 6a FTP LSOH, 10 Gbit	500/1000
VOL-6aUFL4	4 pairs Cat 6a UFTP LSOH, 10 Gbit	1000
VOL-6aUFL8	2x4 pairs Cat 6a UFTP LSOH, 10 Gbit	1000
VOL-10SFL4	4 pairs Cat 7 S/FTP LSOH, 10 Gbit	500/1000
VOL-10SFL8	2x4 pairs Cat 7 S/FTP LSOH, 10 Gbit	500/1000

Volition™ 10G Copper Solutions

Comparative studies show that competing 10 Gigabit UTP cables have outer diameters larger than those of current category 6 or are oval in shape. Cabling techniques to reduce AXTLK between 10 Gigabit UTP cables consist of moving the pairs further apart, strengthening the outer sheaths, and placing an insulator or separator between the pairs. The outer diameter of 10 Gigabit UTP cables is thus increased. Another technique consists of making 10 Gigabit UTP cables oval to reduce the risk in cable routes of one pair being adjacent to another pair with the same twist. This makes the cables harder to install and this technique for noise reduction remains only a statistical hypothesis!

Volition™ 10 Gigabit patch cables

Volition™ 10 Gigabit patch cables have been specially designed to give excellent immunity against AXTLK up to 500 MHz, in particular to reduce the effect of AXTLK in patching racks where there are many adjacent links. Volition™ 10 Gigabit patch cables have a general braid and a screen per pair. Volition™ 10 Gigabit patch cables benefit from unequalled immunity against AXTLK. Volition™ 10 Gigabit patch cables are available in LSOH (Low Smoke Zero Halogen).

Description	In boxes of	3M reference	Short ID
RJ45/RJ45 cable, Cat. 6, SSTP LSOH turquoise cable length 1 m	12	VOL-6SSLL1	545089
RJ45/RJ45 cable, Cat. 6, SSTP LSOH turquoise cable length 2 m	12	VOL-6SSLL2	545098
RJ45/RJ45 cable, Cat. 6, SSTP LSOH turquoise cable length 3 m	12	VOL-6SSLL3	545105
RJ45/RJ45 cable, cat. 6, SSTP LSOH turquoise cable length 5 m	6	VOL-6SSLL5	545112



Volition™ extended 20 year warranty

3M Telecommunications offers an extended 20 year warranty for the entire range of components in the Volition™ 10GT system. 3M Telecommunications guarantees the electrical performance of the Volition™ 10GT solution in relation to the specifications ISO/IEC 11801 and TIA/EIA 568B for cabling systems of the new class E and category 6 augmented to 500 MHz.

Volition™ 10 Gigabit patch panels

Volition™ 10 Gigabit patch panels are modular and can accommodate up to 24 OCK10S8 ports in one unit of rack space (1U). Their modular design makes them easy to install on site in 19" racks.

All Volition™ 10 Gigabit patch panels have an earth which permits continuity of earth with the RJ45 10 Gigabit OCK10S8 jacks.

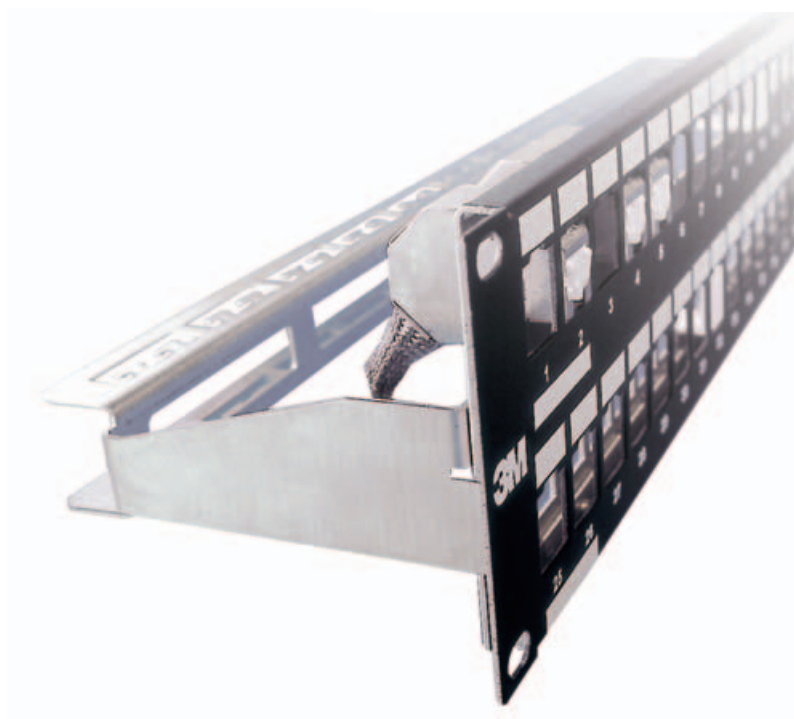
Description	In boxes of	3M reference	Short ID
Panel for 16 ports, keystone not fitted, 1U, brushed alu	1	VOL-PPCAF16K	509017
Panel for 24 ports, keystone not fitted, 1U, brushed alu	1	VOL-PPCAF24K	509018
Panel for 32 ports, keystone not fitted, 2U, brushed alu	1	VOL-PPCAF32K	509019
Panel for 48 ports, keystone not fitted, 2U, brushed alu	1	VOL-PPCAF48K	509020
Panel for 16 ports, keystone not fitted, 1U, black alu	1	VOL-PPCBF16K	509021
Panel for 24 ports, keystone not fitted, 1U, black alu	1	VOL-PPCBF24K	509022
Panel for 32 ports, keystone not fitted, 2U, black alu	1	VOL-PPCBF32K	509023
Panel for 48 ports, keystone not fitted, 2U, black alu	1	VOL-PPCBF48K	509024



Advantages of the Volition™ 10GT solution

The new Volition™ 10GT solution has been designed for 10 Gigabit Ethernet applications on twisted pair cables in compliance with 10 Gigabit Ethernet standards. The Volition™ 10GT is differentiated by the unequalled reduction of the effects of AXTLK on its entire channel.

The Volition™ 10GT solution gives incomparable immunity against AXTLK. It offers double the bandwidth of the current category 6 / class E cabling.



Features

RJ45 Volition™ OCK10S8 jack

- 360° metallic shield
- Total 360° cover of cable shield by metallic braid
- Tool-free connection
- Reusable connections
- Cabling guide
- Insulation displacement connections compatible with solid and stranded cables
- Built-in dust shutter, closes automatically
- Small in size
- Immunity against AXTLK. Noise compensation and cancellation between pairs of neighbouring cables
- Incomparable transfer of impedance for immunity against electro-magnetic disturbances
- Connection quality is independent of the quality of tools or labour
- No waste in the case of cabling errors
- Minimum, standard untwisted length
- Consolidation point assembly with patch cables
- Immunity to dust both on patch panels and on terminal outlets
- Can be used in shallow casings

Advantages



Features

Volition™ 10 Gigabit cables

- 10GBASE-T cable with round design
- General shield and/or screen per pair
- Metric markings on exterior sheath
- Easy to terminate with RJ45 Volition™ OCK10S8
- Unequaled protection against AXTLK, the number one interference in 10GBASE-T
- Makes it easier to manage the installation

Advantages

Electrical parameters	Link margins "Channel" ISO/IEC 11801:2002 "Class E"	Link margins "Channel" ISO/IEC 11801:2005 "New class E"
Insertion Loss	7 %	3 %
NEXT	6 dB	2 dB
PSNEXT	7.5 dB	7.5 dB
ELFEXT	6 dB	10 dB
PSELFEXT	8 dB	10 dB
Return Loss	3 dB	1 dB

- The "Channel" link Volition™ 10GT guarantees the above mentioned margins as far as ISO/IEC 11801 Edition 2 standard for system installations VOL-10GT certified by a qualified installer (VIP) and in conformity with our Volition™ Design, Planning and Installation Guide.
- Margins guaranteed up to 1000ohms with 3 x OCK10S8 jacks and 10 Gigabits cable.



3M innovation

The Volition™ 10GT solution is an innovation from the 3M Telecommunications Laboratories. 3M is the fifth largest brand in the world and is renowned for its commitment to research and development and its sense of innovation. The Volition™ 10GT solution has been specially designed for 10 Gigabit Ethernet connections on twisted pairs (10GBASE-T) in compliance with cabling systems standards ISO/IEC 11801 and TIA/EIA 568B for new class E and category 6 augmented to 500 MHz. The Volition™ 10GT solution is an innovation which has been patented by the 3M Telecommunications Laboratories.

Advantages of 3M Telecommunications

3M Telecommunications has dedicated more than 40 years of study to designing and improving networks. 3M continues to follow the evolution of information technology and to develop high performance solutions which meet the increasing need for bandwidth. Thanks to its network of branches in 60 countries in the world, 3M is in a position to offer world class service support on three levels: certified installation training, assistance with the design of networks and on-site assistance with installation.

important important Notice

3M does not accept responsibility or liability, direct or consequential, arising from reliance upon any information provided and the user should determine the suitability of the products for their intended use.

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3M

3M Telecommunications

Europe, Middle East & Africa

c/o Quante AG

Carl-Schurz-Straße 1 · 41453 Neuss · Germany

Tel: ++49 (0)2131 / 14-5999

Fax: ++49 (0)2131 / 14-5998

Internet: www.3MTelecommunications.com