



Extending the Life of the
Enterprise Network
SYSTIMAX[®] GigaSPEED[®] X10D UTP and FTP Solutions

As you probably know, improving network performance is simply a matter of moving the bottlenecks around. Right now, your network's bottleneck may not be inadequate bandwidth. It may be underpowered servers, or out of date workstations.

However, it is no secret that you are under constant pressure to offer more services, to more users, while coping with new applications and technologies.

In addition, you are asked to minimize the risk of downtime and failure, or rather maximize uptime, while lowering costs.

You need to build in tolerance, installing high-performance, high-quality systems, while protecting against uncertain future developments in technologies, products, and applications that may require major (and costly) upgrades. This risk is managed only through a careful selection of systems with reliability, scalability and the future in mind.

This is particularly true for the cabling infrastructure. Consider that cabling solution you have deployed running out of capacity in the next five years.

Why? Because:

- Today's server will be tomorrow's desktop
- Every five years you can add a zero to your current Ethernet data rate
- Cost of bandwidth is dropping faster than packets on a poorly designed network
- Processing power will continue to double every 18 - 24 months while cost declines
- Terabytes of data moving and stored on today's networks will triple over the next five years
- High-performance computing, multi-site collaboration, and real time streaming media will choke today's network infrastructure over the next five years

The good news is CommScope has the answer today for many of tomorrow's problems

The SYSTIMAX® GigaSPEED® X10D Solutions

Growth in Bandwidth

Current trends show the migration of LAN speeds from 100 Mb/s (100BASE-TX) today towards 1000 Mb/s (1000BASE-T) is already well under way. In particular, as the density and processing power of computer devices located in data centers and enterprise networks increases, so will the demand for higher speeds at data aggregation points. Additionally, there is an increasing demand for high-performance structured cabling solutions to support bandwidth intensive applications such as real time multi-media presentations, data base access and storage, CAD/CAM, and convergence of voice data and video. As computer density and bandwidth requirements increase, we expect the demand for a cost effective 10 Gigabit structured cabling solution utilizing twisted pair copper technology to grow.

Likewise, in today's high-bandwidth computing environments it is not unusual to find multiple applications running in the foreground such as: Word Processing, Electronic Mail, Imaging, Instant Messaging Applications, Media Player, Streaming Media, Videoconferencing, and VoIP. Background tasks such as virus scanning, software updates, system monitoring, encryption, compression and proactive information organization are creating an additional drain on bandwidth that is not easily detected by the end-user.

Another driver of higher data speeds are Data Centers (employing Storage Area Networks) that first emerged on the scene as a result of the Internet boom and the increased demand for web hosting. Subsequently, further growth in Data Centers was stimulated by security and business continuity concerns based on the increasing awareness of potential internal and external threats. More enterprises today realize the necessity to have secure and easily accessible data storage facilities in order to protect their business, and strategies range from redundant in-house infrastructure to off-site data storage.

10 Gigabit Copper Technology

To satisfy the growing requirement for adequate network bandwidth, the IEEE 802.3an Task Force developed 10GBASE-T, the 10 Gigabit Ethernet standard for copper twisted pair cabling.

Due to the complexity of electronics to support 10GBASE-T, the initial objective to develop a standard to support Category 5e cabling was dropped, and the exact maximum distance over compliant Category 6 cabling remains uncertain. Cabling standards bodies have developed informative documents for the installed base of Category 6/Class E or higher performance cabling (TR24750 by ISO/IEC, TR 50173-99-1 by CENELEC and TSB-155 by TIA), that are intended to provide guidelines to verify support for 10GBASE-T. These guidelines include a number of mitigation procedures that range from unbundling of cables to replacement of various components in order to minimize crosstalk from adjacent channels and improve high frequency performance. A maximum distance of 37 meters may be achievable in some cases, and may require mitigation steps.

In anticipation of these limitations, cabling standards bodies have rapidly developed the new ISO/IEC 11801 Class E_A and ANSI/TIA-568-C.2 Category 6A specifications that will guarantee 100 meter support for new installations. The 10GBASE-T standard refers to the Category 6A/Class E_A channel specifications, which applies to both UTP and FTP/STP cabling. In addition to detailed characterization up to 500 MHz of cabling channel parameters such as Insertion Loss, Crosstalk and Return Loss, a critical electrical parameter known as Alien Crosstalk has been added to the list of channel design specifications. Alien Crosstalk is the undesired coupling noise from adjacent cables and connectors into a given cable or connecting device in close proximity.

The IEEE 802.3an 10GBASE-T specification, and the new cabling standards, will accelerate the migration to 10-gigabit capable infrastructures, with the Category 6A/Class E_A cabling specifications offering the assurance of performance that exceed the requirements of the IEEE standard.

Breakthrough crosstalk performance, improvement in Insertion Loss, extrapolated performance to 500 MHz and compliance to Category 6A/Class E_A channel specifications are some of the key elements of the GigaSPEED X10D Solutions.

The SYSTIMAX GigaSPEED X10D Solution

CommScope, through its SYSTIMAX brand, is recognized worldwide for its relentless drive to provide the world's most robust, responsive and reliable network infrastructures. We're proud to continue that legacy with the latest innovation from CommScope Labs.

The GigaSPEED X10D Solutions have been specifically engineered with enhanced cable and connector performance designed to support the emerging 10 Gigabit Ethernet requirements and in particular the new Category 6A/Class E_a cabling specifications. Using patented technology and the scientific capabilities of CommScope Labs, we believe the GigaSPEED X10D Solutions exhibit far superior channel performance for legacy solutions, along with innovative engineering techniques to meet the specific demands 10 Gb/s brings to the physical layer. The GigaSPEED X10D Solutions deliver next generation support by giving users nearly double the bandwidth of today's Category 6 cabling channel and real-world performance in worst-case installation conditions.

The GigaSPEED X10D UTP Solution

Extending... the usable bandwidth of the enterprise

Extending... the peak performance of the enterprise

Extending... the technology of copper UTP

Extending... the value of the IT budget

Extending... the life of the enterprise

The Science Behind the Solution

'Top Down' Solution Performance

The SYSTIMAX GigaSPEED X10D UTP and FTP end-to-end channels have been designed to be extremely well-tuned, well balanced systems. Patented Modal Decomposition Modeling (MDM) technology has enabled CommScope Labs to quantify and predict phenomena in the channel due to complex interactions between the cable, patch cords and connectors that are not easily detected with traditional testing technology. The challenge of achieving 10 Gb/s performance has been addressed using sophisticated system testing tools that solved the component challenges and translated to a SYSTIMAX guarantee of end-to-end channel performance. CommScope Labs utilized the Modal Decomposition Modeling system to evaluate and model all interactions between components, as well as to introduce variables such as different cord and cable lengths in order to analyze the system fully and predict the performance of the complete channel.

The Modal Decomposition Modeling tool is vital in two key areas of designing the GigaSPEED X10D channel:

1. A system design and diagnostic tool for extended frequency performance.
2. A modal cascade simulator for channel balance measurement, used to optimize product designs to mitigate Alien Crosstalk.

With the unique MDM tool, CommScope Labs can see both common and differential mode interference on the cabling, and guide improvements to minimize it. The designs of both the GigaSPEED X10D UTP and FTP Solutions are a leap forward in total system performance, with all the components exhibiting far superior crosstalk of all types including breakthrough suppression of alien crosstalk and advanced balance characteristics.

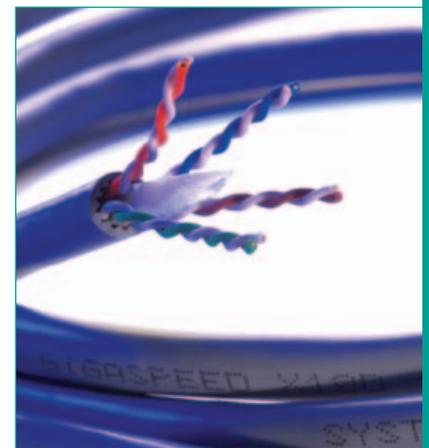
The unique 16-port MDM tool was developed at CommScope Labs in order to resolve the problems associated with traditional test and measurement technologies. In addition to traditional parameters such as Insertion Loss, NEXT, PSNEXT, ELFEXT (ACR-F), PSELFEXT (PSACR-F), Return Loss, Delay and Delay Skew, this advanced technique can facilitate the measurement of high frequency balance that has always been a very challenging problem for the cabling industry. This has been found to be the crucial element in minimizing the effects of crosstalk on the GigaSPEED X10D channels.

Cabling Solution Selection

The GigaSPEED X10D UTP and FTP solutions exhibit the same key functional benefit - exceed the IEEE 802.3an 10GBASE-T cabling channel specifications, plus the TIA Category 6A and ISO/IEC Class E_A specifications. The selection of cabling media, UTP or FTP, is dependent on factors such as performance, reliability, cost, environment, space consideration, ease of installation and use, and availability of good earthing/grounding points. Selection is a customer preference based on what is appropriate for the installation/environment.

The GigaSPEED X10D UTP solution is recommended for the majority of installations and environments. It is a true globally portable solution and delivers performance in excess of the Category 6A/Class E_A specifications, while remaining easy to install and maintain.

The GigaSPEED X10D FTP solution addresses customer environments where there is preference for FTP cabling, and overcomes performance deficiencies that exist with traditional FTP solutions to deliver Category 6A/Class E_A performance.



GigaSPEED X10D Decision Matrix		
Customer Requirements	GigaSPEED X10D UTP	GigaSPEED X10D FTP
Support 10GBASE-T to 100 meters (up to 4-connection channel)	YES	YES
Meet or exceed ISO/IEC Class E _A Channel Specifications (up to 4-connection channel)	YES	YES
Meet or exceed ISO/IEC Class E and TIA Category 6 Channel Specifications	YES	YES
Meet or exceed TIA Category 6A Channel Specifications (up to 4-connection channel)	YES	YES
Meets Class A Emission requirements	YES	YES
Meets Immunity requirements per IEC CISPR 24, EN 55024 and IEC/EN 61000-6-1 (Office environments)	YES	YES
Meets Immunity requirements per IEC/EN 61000-6-2 (Heavy Industrial environments)	NO*	YES
No additional attention to earthing/ grounding requirements for cabling	YES	NO
No additional attention to bonding requirements for cabling	YES	NO
Independence from power supply system requirements (TN-S system recommended for all FTP systems)	YES	NO
Avoid extra termination steps related to screen, drain wire (i.e. shorter termination time)	YES	NO
Avoid maintenance of screen/shield integrity over time	YES	NO
Less space required for work area connector housing and cable bend radius	YES	NO
Preferred twisted pair cabling media worldwide	YES	NO
Supported by design and installation documentation	YES	YES
Backed by 20 year Product Warranty and Application Assurance	YES	YES

* (YES if in metal containment)

GigaSPEED X10D Product Portfolio

GigaSPEED X10D 91 Series Cables

The GigaSPEED X10D Solutions include uniquely designed four-pair UTP and FTP cables (1091/2091/3091 UTP cables and 1291/2291/3291 FTP cables). The GigaSPEED X10D Solutions are designed to deliver channel performance that exceeds Category 6A/Class E_A channel specifications, satisfying the stringent performance requirements out to 500MHz.

The 91 series cable exhibits significant improvement in cable performance-enabled via patent pending high-tech jacket technology, using a finned inner surface in the jacket for the UTP cable and foil tape for the FTP cable. These improve cable core separation as well as cable flexibility. An optimized twist and strand scheme also dramatically enhances performance using the CommScope Labs Cable Twist Accuracy Technology (CTAT). The cables have also been optimized to work with the connectors to minimize cross coupling noise between pairs within a cable, and also between cables in close proximity. The 91 series cables have a round smooth shape that speeds the handling and termination process. The cables have been designed and tested to withstand what CommScope Labs believe to be the most challenging test configuration.

The 91 series cables are available in plenum, non-plenum and Low Smoke Zero Halogen (LSZH) versions. The 91 series is also available in a wide range of colors and capable of supporting frequencies beyond 500 MHz to support high-bandwidth applications operating at 10 Gb/s.

GigaSPEED X10D GS10E UTP and G10FP FTP Patch Cords

For use at both ends of a GigaSPEED X10D channel as well as cross-connects, CommScope has developed new patch cords and data outlets. Along with cable and patching hardware, CommScope Labs has characterized the performance of these cords in thousands of different channel configurations using the MDM tool. This allows engineers to model any combination of connectors, cords and cable lengths ensuring that the guaranteed performance will be delivered even in the most demanding installed channel configurations.

The high performance GS10E UTP and G10FP FTP modular patch cord families each have a patented plug design and improved round cordage exhibiting superior performance. Together with high precision manufacturing, this gives the electrical performance needed to deliver the GigaSPEED X10D Solutions. The GS10E and G10FP plugs exhibit dramatic reduction in performance variation via innovative design of the plug housing and cable termination method.

GigaSPEED X10D MGS500 UTP Outlets and MFP520 FTP Outlets

The GigaSPEED X10D MGS500 UTP and MFP520 FTP information outlets feature patent pending crosstalk cancellation and compensation techniques. They exhibit significant improvement in high frequency crosstalk suppression enabled via new Printed Wiring Board (PWB) materials and compensation technology. In addition, excellent results in Alien Crosstalk mitigation have been achieved through new materials and PWB compensation enhancements. This connector design excellence has been made possible via the CommScope Labs Connector Field Pattern Modeling (CFPM) technology, coupled with the system level MDM tool enabling cross modal effects to be drastically reduced.

GigaSPEED X10D M2000 UTP, M2100 UTP, M3000 UTP and M3200 FTP Modular Patch Panels

The GigaSPEED X10D M2000, M2100, and M3000 Modular Patch Panels are 19-inch rack mounted panels that accept MGS500 UTP information outlets for patching and interconnection in the telecommunications closet or equipment room. The GigaSPEED X10D M3200 Panel is 19-inch rack mounted panel that accepts MFP520 FTP information outlets.

The panels' modular concept allows termination of outlets in the field, or the use of pre-terminated cables for fast and reliable onsite installation, often required in Data Center applications.

GigaSPEED X10D 1100GS5 and PATCHMAX GS5 UTP Patch Panels

The GigaSPEED X10D 1100GS5 and PATCHMAX GS5 Patch Panels are 19-inch rack mounted panels available in 24 and 48-port versions. The 1100GS5 is also available in angled and intelligent options.

The SYSTIMAX® iPatch® Intelligent Panels are at the heart of the Intelligent Infrastructure Solutions. The iPatch M4200i universal modular panel supports unshielded twisted pair (UTP) copper M-series information outlets, including Category 3, PowerSUM, GigaSPEED XL and GigaSPEED X10D. The M4200i supports GigaSPEED X10D foiled twisted pair (FTP) applications as well.

Visipatch 360 System

The SYSTIMAX® VisiPatch® 360 System is a new generation of patching systems that seamlessly incorporates patching and integrated cable management to deliver an ergonomically designed and aesthetically pleasing solution that saves time, space and money.

The VisiPatch 360 System utilizes a unique reverse patching technology that allows the patch cord to be projected away from the user and into the patching field. This design improves cord management by reducing the "spaghetti" cord clutter associated with poorly installed RJ-45 systems and makes reading the labeling information easy, facilitating future moves, adds and changes.

These cable and connector innovations give performance that is guaranteed to meet or exceed Category 6A/Class E_A channel specifications extrapolated to 500 MHz without sacrificing convenience or backward compatibility.

The SYSTIMAX Advantage

Industry-leading Support

We believe CommScope is the only company with the depth, the reputation and the worldwide resources to provide support when and where you need it — with global sales facilities, four-tier technical support and a network of highly trained BusinessPartners on every continent of the world. Every certified installation of the SYSTIMAX GigaSPEED X10D Solutions is performed by our Certified BusinessPartners to give you and your enterprise peace of mind on your investment.

According to independent industry researchers, SYSTIMAX Network Infrastructure Solutions is the most widely used enterprise cabling system in the world. Today, best estimates find that our cabling is being installed at a rate of more than 1,000 miles per day (1,600 km), in more than 90 countries.

Why? The answer is very simple. We build superior solutions and we serve our customers well.

Developed by CommScope Labs, the GigaSPEED X10D Solutions are certified to provide the same quality, reliability and performance of our industry-leading copper and fiber solutions.

To learn more about the SYSTIMAX GigaSPEED X10D Solutions, or the many other innovative products or solutions, please contact your CommScope representative. We'll be glad to explain how we have surpassed the expectations of companies large and small, around the world and how quickly, easily and cost effectively we can do the same for you.

Highlights from the Best Warranty in the Industry

- The GigaSPEED X10D Solutions are backed by the SYSTIMAX Network Infrastructure Solutions 20-year Extended Product Warranty and Applications Assurance that we believe to be the best in the industry.
- Our Application Assurance covers an extremely comprehensive suite of applications from voice, data and video applications to complex building management systems by some of the world's leading manufacturers.
- We provide guaranteed channel performance specifications — not “average,” not “nominal,” as many companies state, but guaranteed worst-case channel performance — and we warrant that your certified SYSTIMAX GigaSPEED X10D Solutions will meet or exceed those specifications for 20 years.
- The GigaSPEED X10D Solutions are so advanced that we can include support of 10GBASE-T and even applications that do not yet exist in the SYSTIMAX Network Infrastructure Solutions 20-Year Extended Product Warranty and Applications Assurance. Specifically, we will warrant any application introduced by recognized user standards or user forums that specify applicable ANSI/TIA-568-C.2 or ISO/IEC 11801 components and link/channel specifications for cabling.



GigaSPEED X10D M2000 UTP Modular Patch Panel



GigaSPEED X10D M2100 UTP Modular Patch Panel



GigaSPEED X10D M3000 UTP Modular Patch Panel



GigaSPEED X10D M3200 FTP Modular Patch Panel



GigaSPEED X10D MFP520 Information Outlet & G10FP Patch Cord



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